

承認書

SPECIFICATION FOR APPROVAL

客戶 (Customer) : 仁寶電腦工業股份有限公司

客戶零件名稱 (Customer Description) : COMMON INVERTER

供應商零件名稱 (Vendor Description) : DA-1A08-CO01A2 L

客戶零件料號 (Model Part NO.) : PK070008J00

供應商零件料號 (Model Part NO.) : 541380001009

發行日期 (Issue Date) : 2007/09/06

製 作 Prepared By	審 核 Checked By	核 准 Approved By
		

貴公司承認章
(Customer approval signatures)

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DIRECTORY LIST

Model name: DA-1A08-CO01A2 L

Part No: 541380001009

1. Revision Change History	3
2. Inverter Specification	4 ~ 9
3. Outline drawing	10
4. Bar Code Define (specification)	11 ~ 14
5. Packing drawing	15
6. Schematic	16
7. PCB Layout Drawing	16 ~ 27
8. Bill of Material	28 ~ 31
9. Description of Transformer	32 ~ 56
10.Fuse Specification & License	57 ~ 92
11.Connector Specification & UL file	93 ~ 118
12.Safety Certificate	119 ~ 191
13.Test Report	192 ~281

Revision Change History

REV.	REVISION DESCRIPTION	Prepared By	APPROVED BY	DATE
R00	Issued	Cob. Yang	Bear. Hsiung	2007/09/06

REV.	REVISION DESCRIPTION	APPROVED BY	DATE
R0A	PRODUCTION RELEASE	COB YANG	2007/06/08

SPECIFICATION

Of

DA-1A08-CO01A2 L

12.1'' & 15'' Common

Inverter

CONFIDENTIAL

 MITAC TECHNOLOGY CROP. 11TH FL., NO. 75, MING SHENG E. RD., SEC, 3, TAIPEI, TAIWAN,. R.O.C. Tel : 886-2-25068898#3360 Fax : 886-2-25095887		ENGINEERING SPECIFICATION		REV: R0A	
ISSUE DATE: 2007/06/08	MODEL: DA-1A08-CO01A2 L	ISSUE NO:			
PAGE: 1 OF 5	PREPARED BY: <u>COB YANG</u>	CHECKED BY:	E.E	<u>COB YANG</u>	
			M.E	<u>Louis.Lu</u>	

MODEL: DA-1A08-CO01A2 L

TABLE OF CONTENTS:

0.	<u>REVISION CHANGE HISTORY</u>	3
1.	<u>ELECTRICAL CHARACTERISTICS</u>	4
2.	<u>PROTECTION</u>	5
3.	<u>ENVIROMENTAL CHARACTERISTICS</u>	5
4.	<u>MECHANICAL CHARACTERISTICS</u>	6
5.	<u>BURN-IN</u>	6
6.	<u>MECHANICAL DRAWING</u>	7
7.	<u>INSULATOR DRAWING</u>	8

Revision Change History

REV.	REVISION DESCRIPTION	Request By	ECN NO	APPROVED BY	DATE
R0A	Issued	--	--	COB YANG	2007/06/08

MODEL: DA-1A08-CO01A2 L

Electrical Specifications

(Rating at operating temperature range unless otherwise specified)

1. Electrical Characteristics Load: PANEL AU B150XG01

	Item	Symbol	Min.	Typ.	Max.	unit	Remark
1.1	Input Operation Voltage	INV_PWR	9	--	20.0	V _{DC}	7.5V(continuous) can work *Note 1
1.2	Input Current	I _{in}	--	0.33	--	A	
1.3	Lamp current	IL	6.2	6.5	6.8	mArms	DAC_BRIG: 0V PWM: 100%Note4
1.4	Lamp current	IL	3.0	3.3	3.6	mArms	DAC_BRIG: 0V PWM: 30% Note4
1.5	Lamp current	IL	5.7	6.0	6.3	mArms	DAC_BRIG: 1V PWM: 100%Note4
1.6	Lamp current	IL	3.19	3.3	3.56	mArms	DAC_BRIG: 1V PWM: 35% Note4
1.7	Lamp current	IL	5.2	5.5	5.8	mArms	DAC_BRIG: 2V PWM: 100%Note4
1.8	Lamp current	IL	2.97	3.0	3.3	mArms	DAC_BRIG: 2V PWM: 35% Note4
1.9	Starting voltage	V _s	1600	--	--	V _{rms}	At 0 degC
2.0	Shutdown Time	Shutdown Time	1.0	--	1.5	S	
2.1	Limited lamp maximum current	DAC_BRIG	0	--	3.3	V	*Note 2
2.2	Lamp Working Frequency	Freq.	45	55	65	KHz	*Note 3
2.3	Efficiency	H	83	--	--	%	

Notes:

*1 The inverter can work in 7.5V input voltage(continuous),but 7.5V electronic characteristic will not be care.

(Note:the display must be normal and can not glitter or become dark)

*2. Limited lamp maximum current by DAC_BRIG signal:

When DAC_BRIG voltage is 0V and INV_PWM enables (100%), lamp has max. limited current.

When DAC_BRIG voltage is 3.3V and INV_PWM enables (100%), lamp has min. limited current.

*3. Inverter operating frequency should be within specification (50~65kHz) at max. and min. brightness load. If operating frequency is too low(over spec),J1 must be short.

*4. If IL is too low(over spec),J2 must be short.

MODEL: DA-1A08-CO01A2 L

Electrical Specifications

(Rating at operating temperature range unless otherwise specified)

2. Protection

	Item	Conditions	Specification
2.1	Short Circuit Protection	Short H.V to Gnd	No damage
2.2	Open Lamp Protection	H.V is open	No damage

3. Environmental Characteristics

	Item	Conditions	Specification
3.1	Operating Temperature	Operating	0 to 50
		Storage	-25 to 70
3.2	Humidity	Operating	10~90% RH, without dewdrop.
		Storage	5~95% RH, without dewdrop.

MODEL: DA-1A08-CO01A2 L

Electrical Specifications

(Rating at operating temperature range unless otherwise specified)

4. Mechanical Characteristics

	Item	Specification																														
4.1	Dimensions	L×W×H(mm) = 135.0 (typ.) × 10.0 (typ.) × 4.7 (Total height).																														
4.2	Weight	Approximately to 8 gm.																														
4.3	Input Connector	CN1: ACES 87213-0700G; JST SM07B-SRSS-TB <table border="1"> <thead> <tr> <th>Pin No.</th><th>Symbol</th><th>Description</th></tr> </thead> <tbody> <tr> <td>1</td><td>INV_PWR</td><td>Input voltage(9V~20V)</td></tr> <tr> <td>2</td><td>INV_PWR</td><td>Input voltage(9V~20V)</td></tr> <tr> <td>3</td><td>INV_PWM</td><td>Burst mode(3.3V 150Hz)</td></tr> <tr> <td>4</td><td>DISOFF</td><td>On/off,HIGH(3.3V)</td></tr> <tr> <td>5</td><td>DAC_BRIG</td><td>Max. current limit</td></tr> <tr> <td>6</td><td>GND</td><td></td></tr> <tr> <td>7</td><td>GND</td><td></td></tr> <tr> <td></td><td></td><td></td></tr> <tr> <td></td><td></td><td></td></tr> </tbody> </table>	Pin No.	Symbol	Description	1	INV_PWR	Input voltage(9V~20V)	2	INV_PWR	Input voltage(9V~20V)	3	INV_PWM	Burst mode(3.3V 150Hz)	4	DISOFF	On/off,HIGH(3.3V)	5	DAC_BRIG	Max. current limit	6	GND		7	GND							
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4	DISOFF	On/off,HIGH(3.3V)																														
5	DAC_BRIG	Max. current limit																														
6	GND																															
7	GND																															
4.4	Output Connector	JST P/N: SM02B-BHSS-1-TB or equivalent. <table border="1"> <thead> <tr> <th>Pin No.</th><th>Symbol</th><th>Description</th></tr> </thead> <tbody> <tr> <td>1</td><td>HV</td><td>AC Output</td></tr> <tr> <td>2</td><td>GND</td><td>AC Return</td></tr> </tbody> </table>	Pin No.	Symbol	Description	1	HV	AC Output	2	GND	AC Return																					
Pin No.	Symbol	Description																														
1	HV	AC Output																														
2	GND	AC Return																														

5. Burn-In

	Item	Conditions	Specification
5.1	Burn-in	1. Percentage of output load: 100% 2. Ambient Temperature: 45~55	1. Initial burn in time is 24Hr; 2. If the failure rate is less than 1%, then the burn in time can be change to 4 Hr.

Code 128B Inserter Barcode Label

Compal Barcode Scanner Information

Barcode Scanner Manufacturer	Hand Held Products, Inc. (蘇州金東康代理)
Barcode Scanner Model Name	HHPIT3800LR
Reading Distance	25mm to 203mm on medium density codes
Reading Width	127mm code width at 178mm distance
Resolution	5 mil at 88mm distance
Symbologies	Codabar, Code 3 of 9 including PARAF, Interleaved 2 of 5, Code 2 of 5, Matrix 2 of 5, Code 11, Code 93, Code 128, UPC, EAN/JAN, China Postal Code, RSS.

Barcode Data Field Position and Description

Code 128B



HRI Prefix	Human Readable Information (HRI) denotes barcode characters. *Note: Dashes not included in the barcode, HRI only.
Compal Part Number	11 alphanumeric characters assigned by Compal to identify the part.
Part Number Revision	3 alphanumeric characters represent the OEM supplier revision level.
Date Code	3 alphanumeric characters represent the year, month and day of manufacture.
Serial Number	5 alphanumeric characters used to uniquely identify each individual part.

Compal Part Number

Assign by Compal Power Department Engineer.

Part Number Revision

Assign by part manufacturer.

Suggestion: X00~X99 for evaluation sample, A00~A99 for MP product.

Date Code

1st Character---Year Codes

<u>Year</u>	2000	2001	2002	2003	2004	2005	2006	So on
<u>Code</u>	0	1	2	3	4	5	6	

2nd Character---Month Codes

<u>Month</u>	January	February	March	April	May	June
<u>Code</u>	1	2	3	4	5	6

<u>Month</u>	July	August	September	October	November	December
<u>Code</u>	7	8	9	A	B	C

3rd Character---Day Codes

<u>Day</u>	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	9 th	10 th	11 th	12 th	13 th	14 th
<u>Code</u>	1	2	3	4	5	6	7	8	9	A	B	C	D	E

<u>Day</u>	15 th	16 th	17 th	18 th	19 th	20 th	21 st	22 nd	23 rd	24 th	25 th	26 th	27 th	28 th
<u>Code</u>	F	G	H	I	J	K	L	M	N	O	P	Q	R	S

<u>Day</u>	29 th	30 th	31 st
<u>Code</u>	T	U	V

Serial Number

1 st Character	2 nd Character	3 rd Character	4 th Character	5 th Character
Numbers 0~9 And Letters A~Z	Numbers 0~9	Numbers 0~9	Numbers 0~9	Numbers 0~9

Barcode Label Type

Label Specification---Code 128B

Symbologies	Code 128B
Total Digits	22
Barcode Label Size(Length*Height)	40mm*6mm
Barcode Height	4mm
Minimum Narrow Bar	6mil
Font Type	Arial font
Font Size	4pt. Or (Font height less than 1.8mm)
Label Material	1. White polyester 2. White Polyimide

Appendixes

To prevent conflict with RoHS regulation, hereunder are preferred Label Material:

1. BRADYBONDZ(TM) **B-423** THERMAL TRANSFER PRINTABLE GLOSSY WHITE POLYESTER LABEL STOCK
2. BRADY **B-478** THERMAL TRANSFER PRINTABLE GLOSSY WHITE LOW PROFILE STATIC DISSIPATIVE POLYIMIDE LABEL STOCK
3. BRADY **B-497** MATTE WHITE LOW PROFILE THERMAL TRANSFER PRINTABLE POLYIMIDE LABEL STOCK

Length Unit:

1 inch=25.4mm=1000mil

Font Size Unit: pt. (point)

1pt. = 0.013837 inch → 72pt. = 0.996264 inch

1pica = 12pt.

Printer Length Unit: dot

If Printer=300dpi, means 1 inch=300 dots, so 1mm=11.8 dots.

If Printer=203dpi, means 1 inch=203 dots, so 1mm=8 dots.

Barcode Label Length Calculation Formula:

Code 128B (alphanumeric)

$$\begin{aligned}\text{Barcode Label Length (L)} &= [(\text{Number of Characters} \times \text{Module Number of Character}) + (\text{Module} \\ &\quad \text{Number of Start} + \text{Module Number of Checksum} + \text{Module Number of} \\ &\quad \text{Stop} + \text{Module Number of Termination Bar} + \text{Module Number of Quiet} \\ &\quad \text{Area Left} + \text{Module Number of Quiet Area Right})] \times \text{Minimum Narrow} \\ &\quad \text{Bar} \\ &= (C \times 11 + 11 + 11 + 11 + 2 + 10 + 10) \times X \\ &= (11C + 55) \times X\end{aligned}$$

Where C=Number of Characters, and X=Minimum Narrow Bar

Code 128C (numeric only)

$$\begin{aligned}\text{Barcode Label Length (L)} &= [(\text{Number of Characters} \times \text{Module Number of Character}) + (\text{Module} \\ &\quad \text{Number of Start} + \text{Module Number of Checksum} + \text{Module Number of} \\ &\quad \text{Stop} + \text{Module Number of Termination Bar} + \text{Module Number of Quiet} \\ &\quad \text{Area Left} + \text{Module Number of Quiet Area Right})] \times \text{Minimum Narrow} \\ &\quad \text{Bar} \\ &= (C \times 5.5 + 11 + 11 + 11 + 2 + 10 + 10) \times X \\ &= (5.5C + 55) \times X\end{aligned}$$

Where C=Number of Characters, and X=Minimum Narrow Bar

CO01A2 L PHOTO

Mylar 上條碼圖片



A vertical number line with points labeled A, B, C, D, E, and F. The points are evenly spaced, with A at the top and F at the bottom.

- NOTES.
1. DA— | ABB—CDD | AAZ | _ | BCKI | _ | D | C W | I | _ |

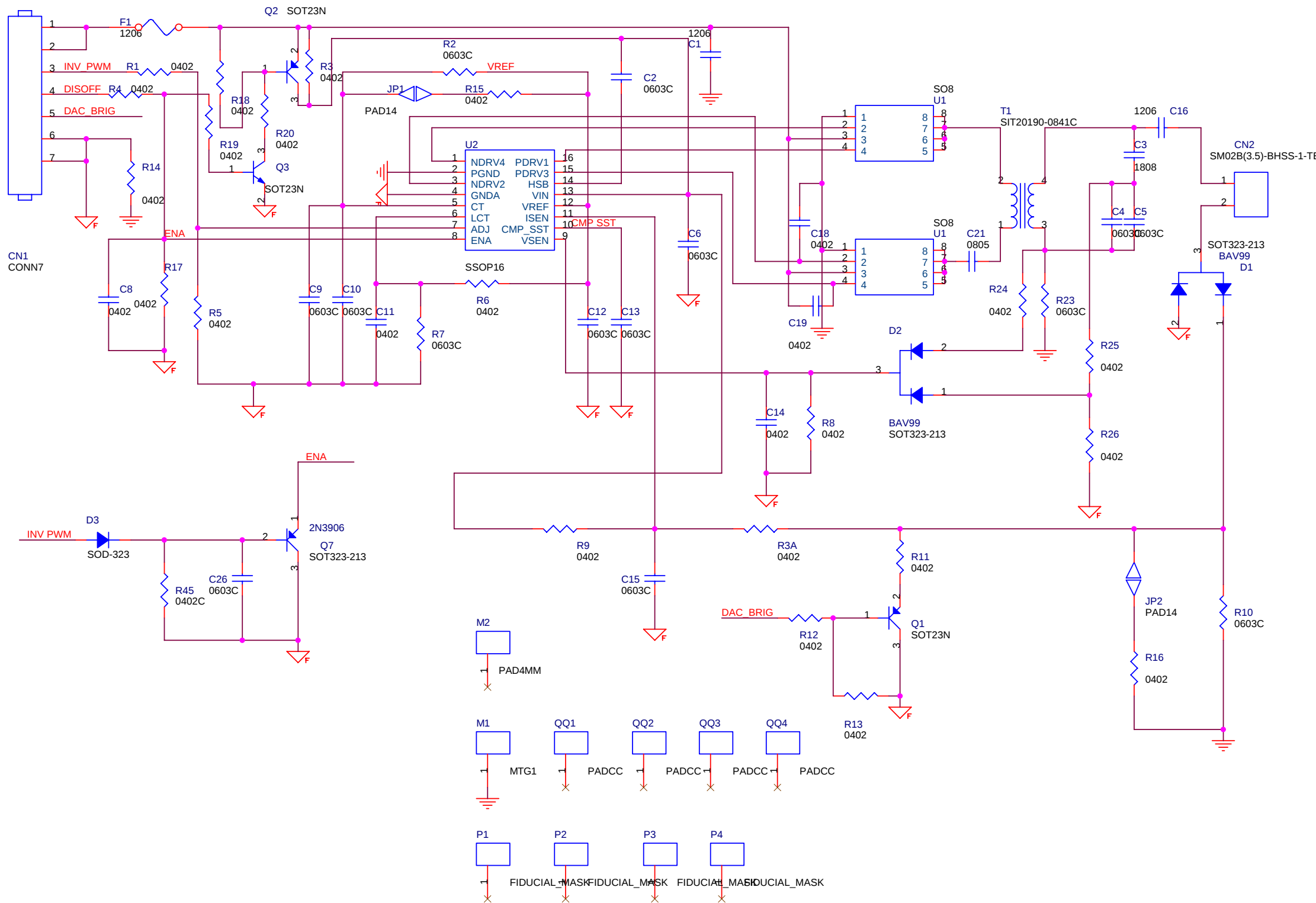
25 EA PVC PAN

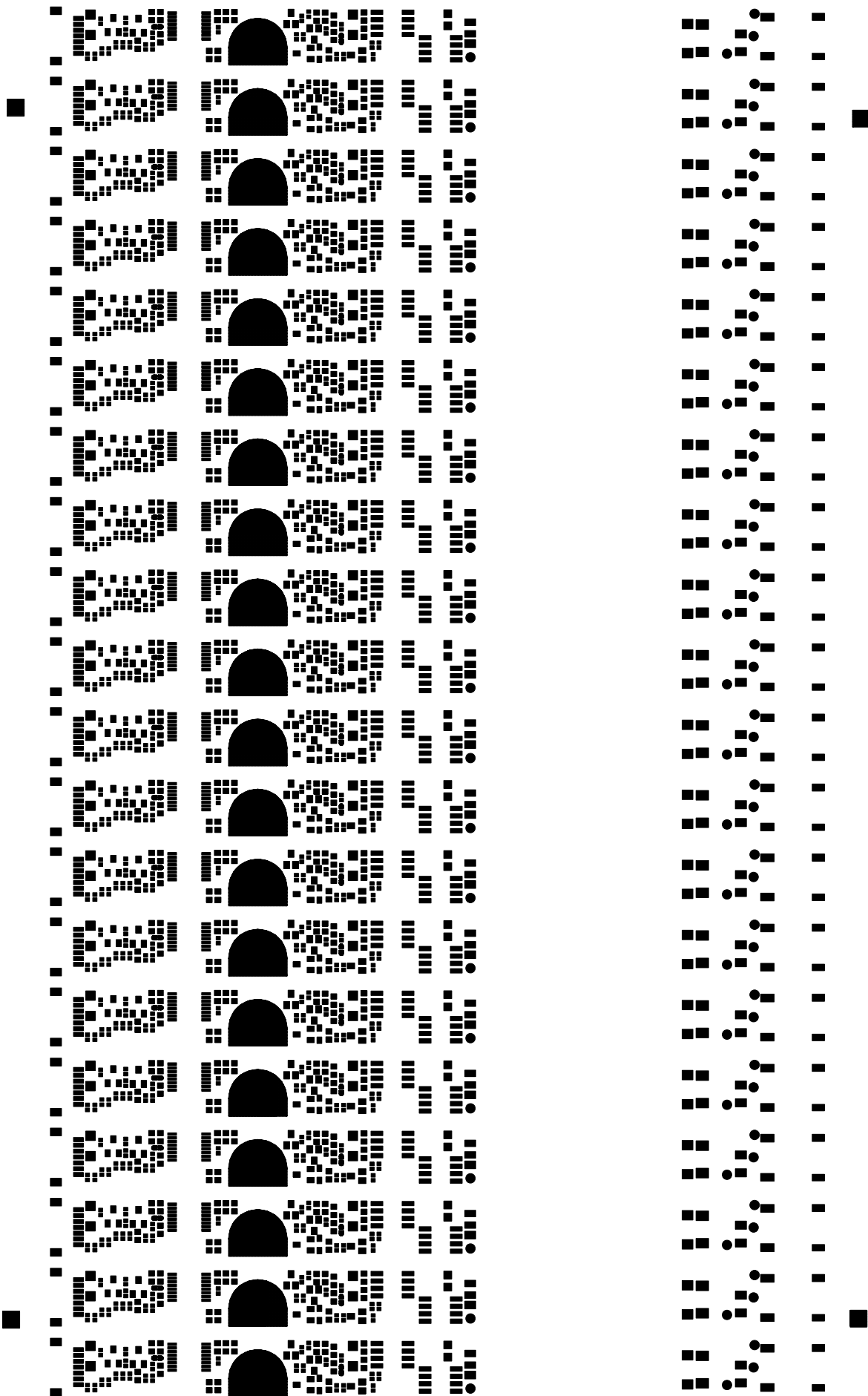


INVERTER BOARD

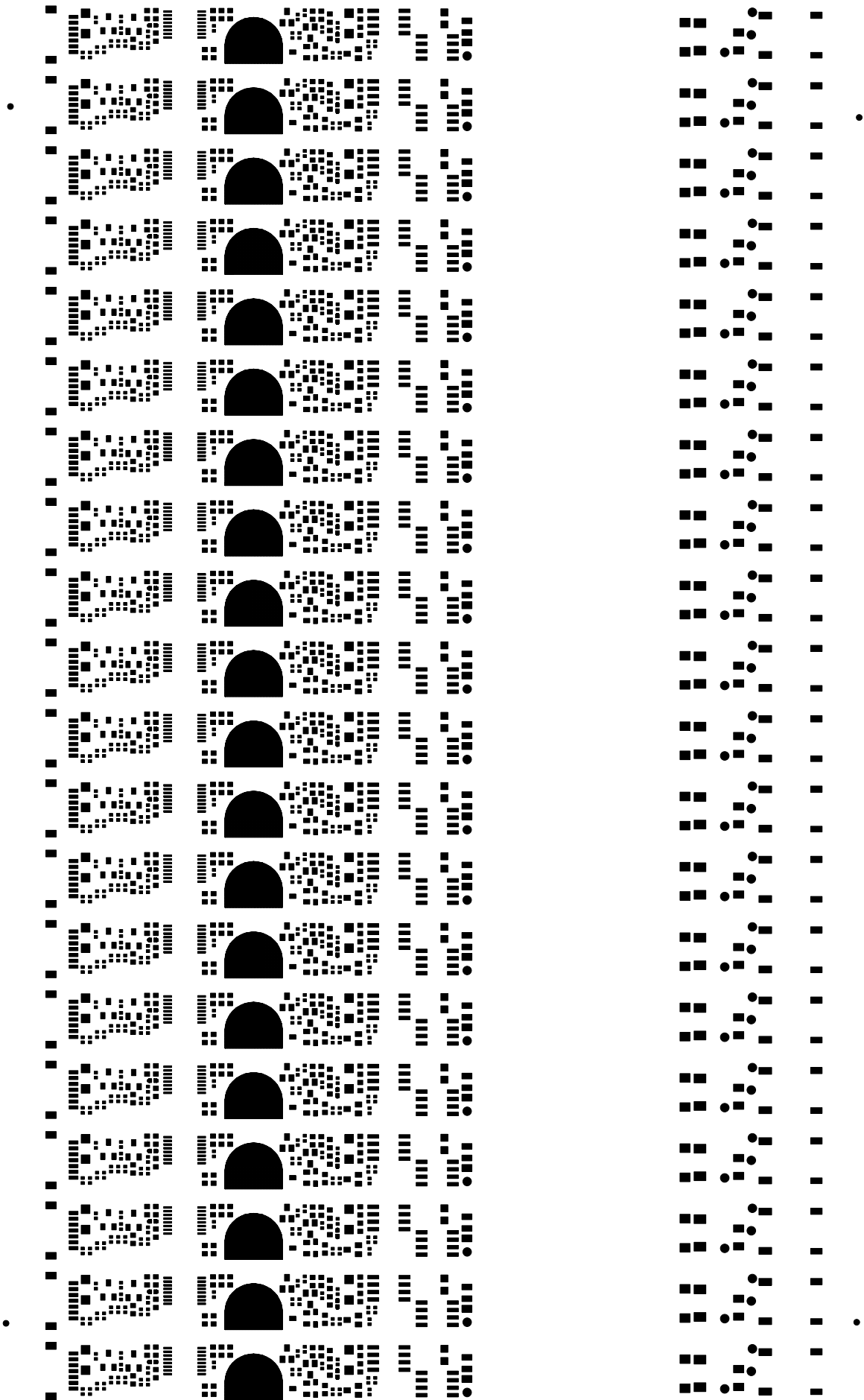


A	B	C	D	E	SHEET No. 1 of 1





	POWERPCB		SHEET
			3 OF 10
COMPMASK	DATE	2007.08.03	REV
	FILE NAME	DA-1A08-C001A2	ROD
DRAWN: Nikki DOC ID:	PCB PN	316800000106	



POWERPCB

SHEET
2 OF 10

comppaste

DATE 2007.08.03

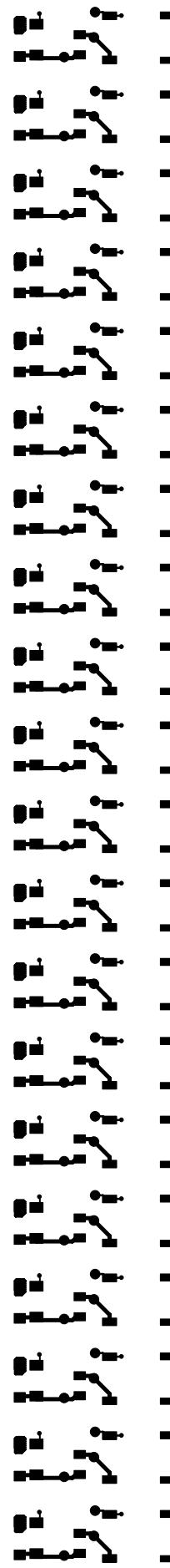
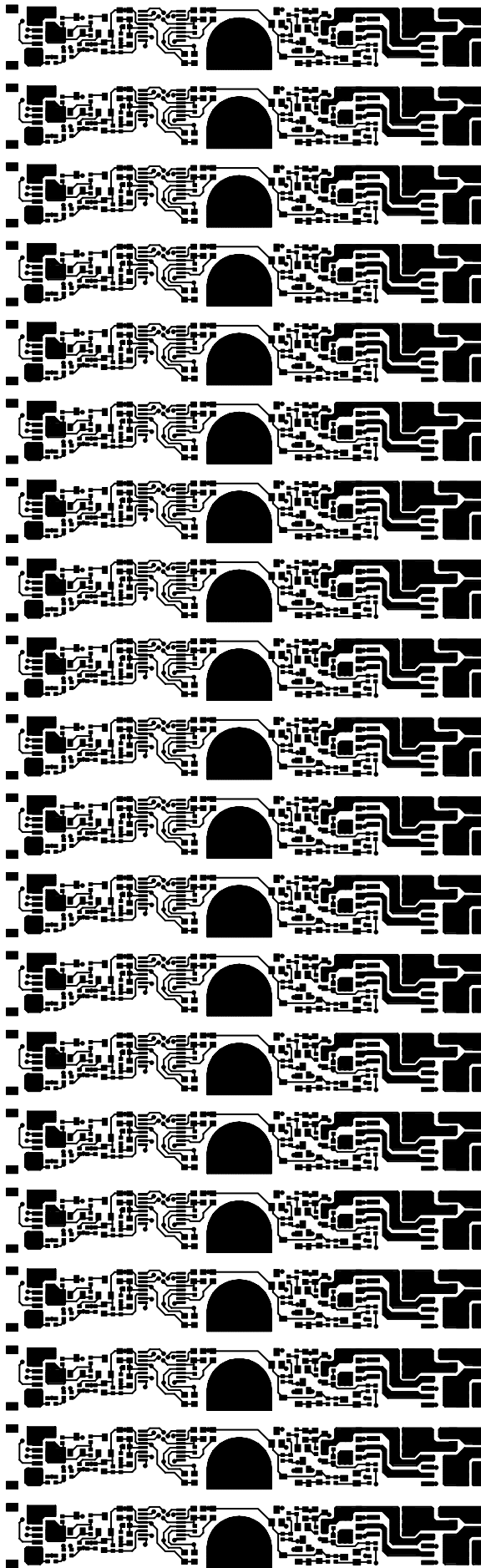
REV

FILE NAME DA-1A08-C001A2

PCB PN 316800000106

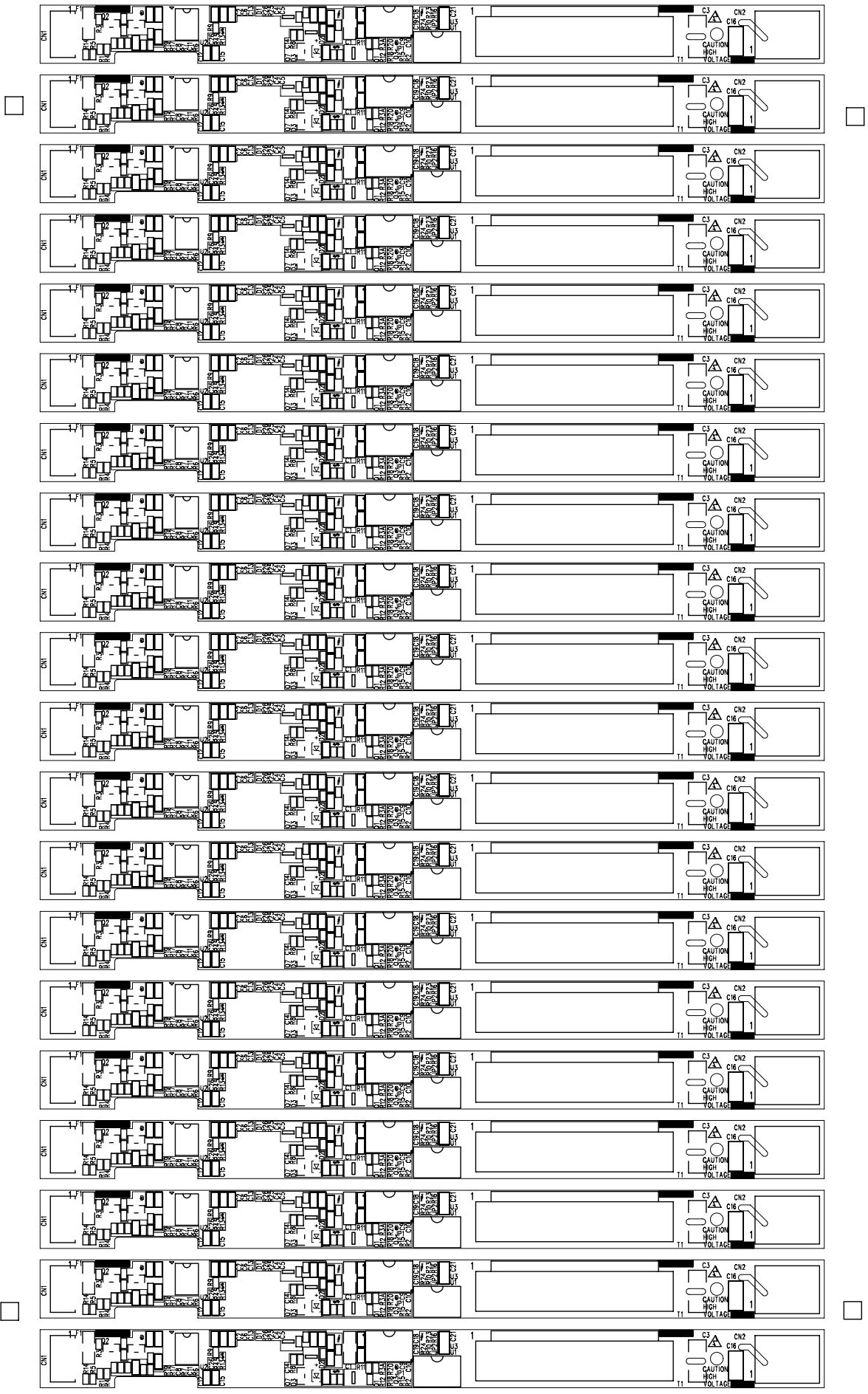
R0D

DRAWN: Nikki DOC ID:



 COMPSIDE	POWERPCB		SHEET 1 OF 10
	DATE	2007.08.03	REV
	FILE NAME	DA-1A08-C001A2	ROD
	PCB PN	316800000106	

DRAWN: Nikki | DOC ID:



POWERPCB

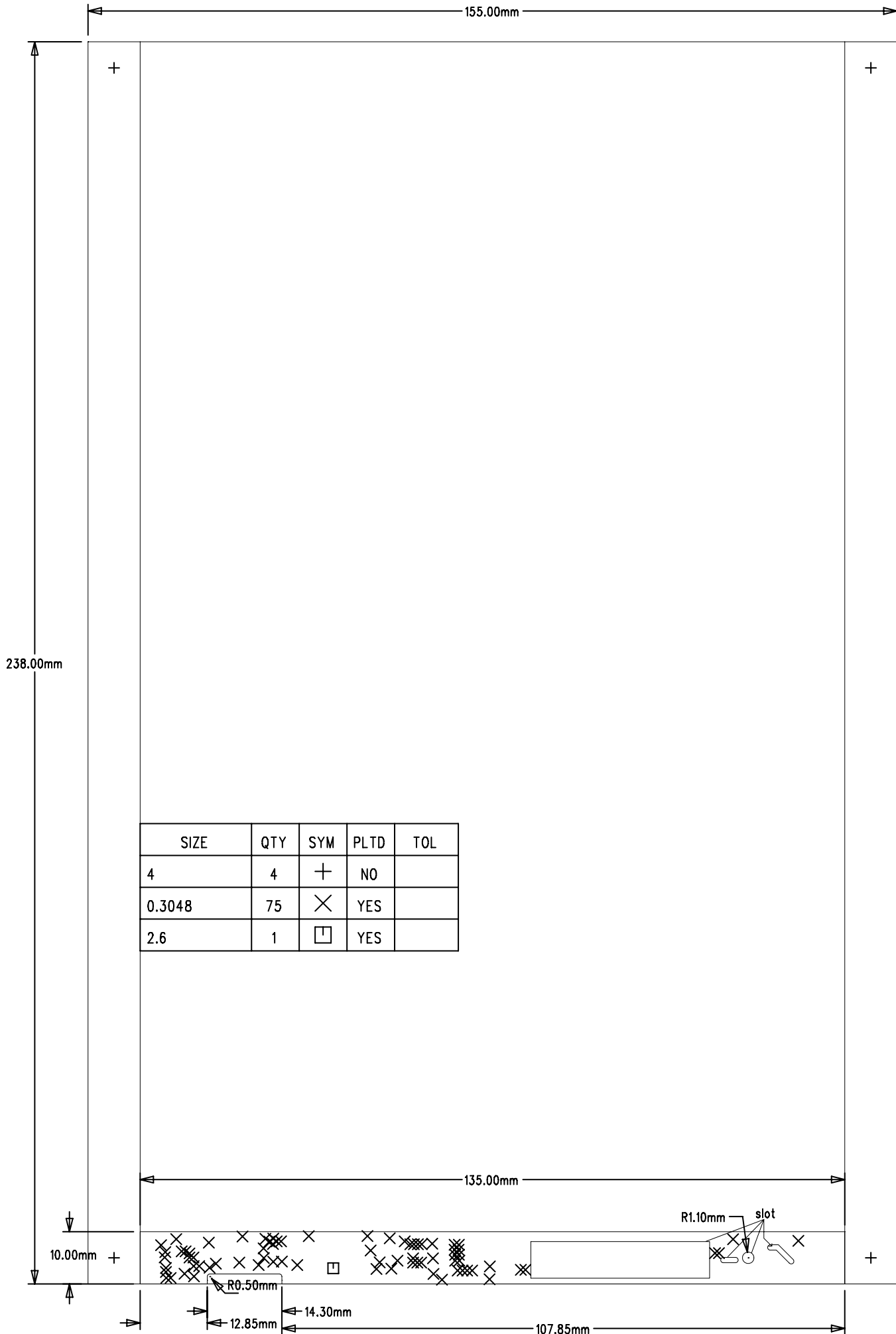
SHEET
4 OF 10

COMPSILK

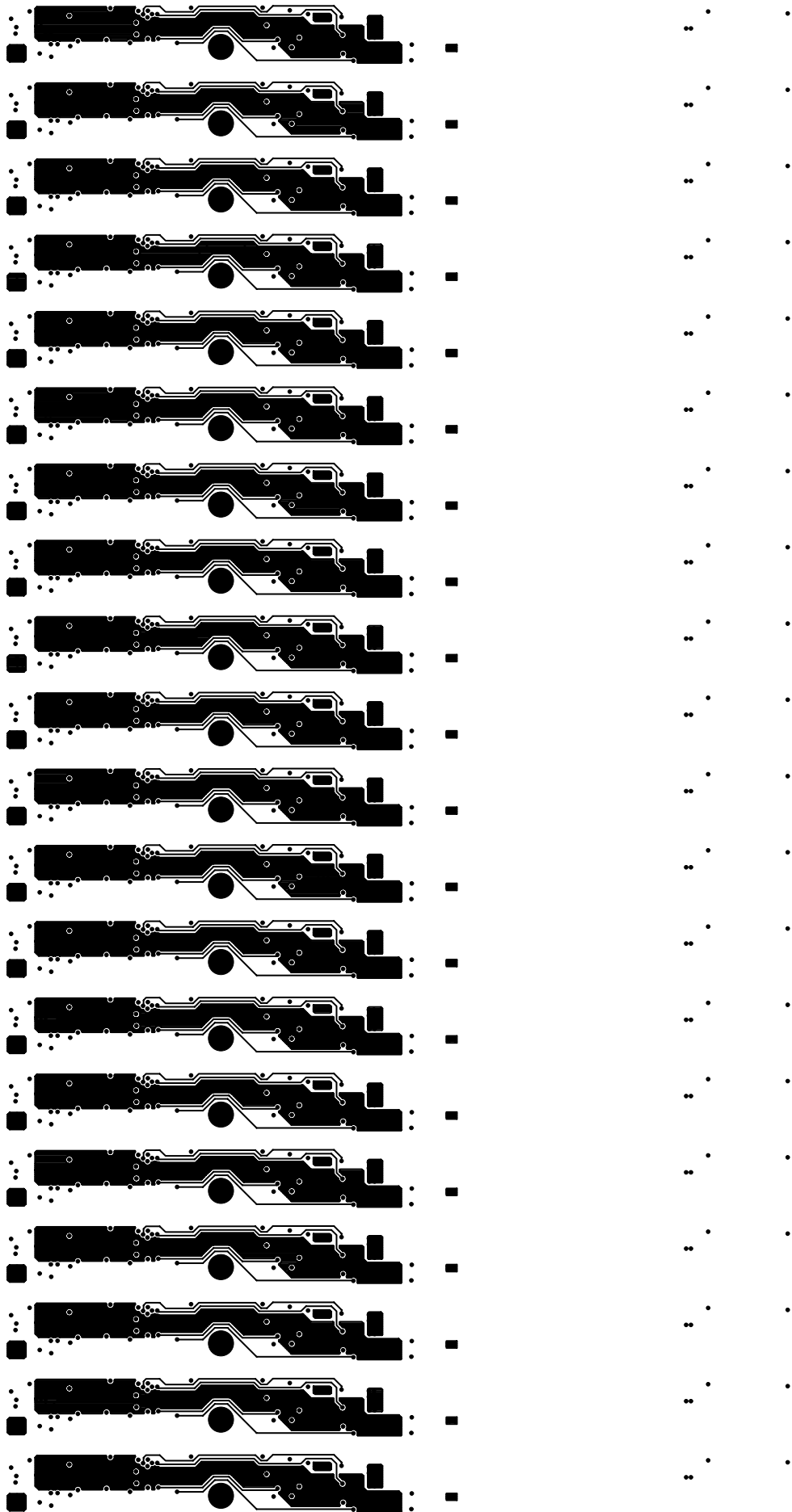
DATE 2007.08.03
REV

DRAWN: Nikki DOC ID:

FILE NAME DA-1A08-C001A2
PCB PN 31680000106
ROD

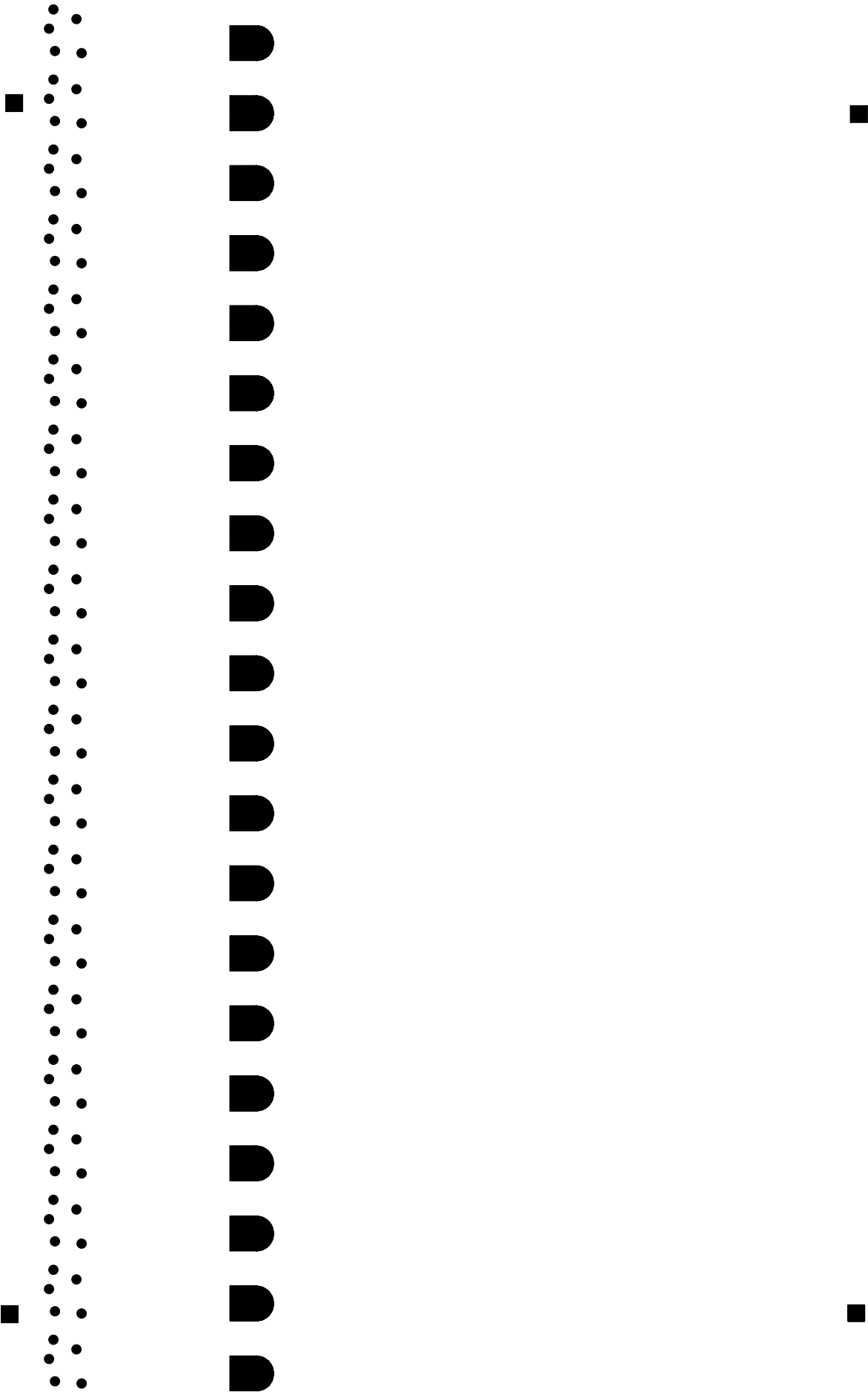


SIZE	QTY	SYM	PLTD	TOL
4	4	+	NO	
0.3048	75	×	YES	
2.6	1	□	YES	

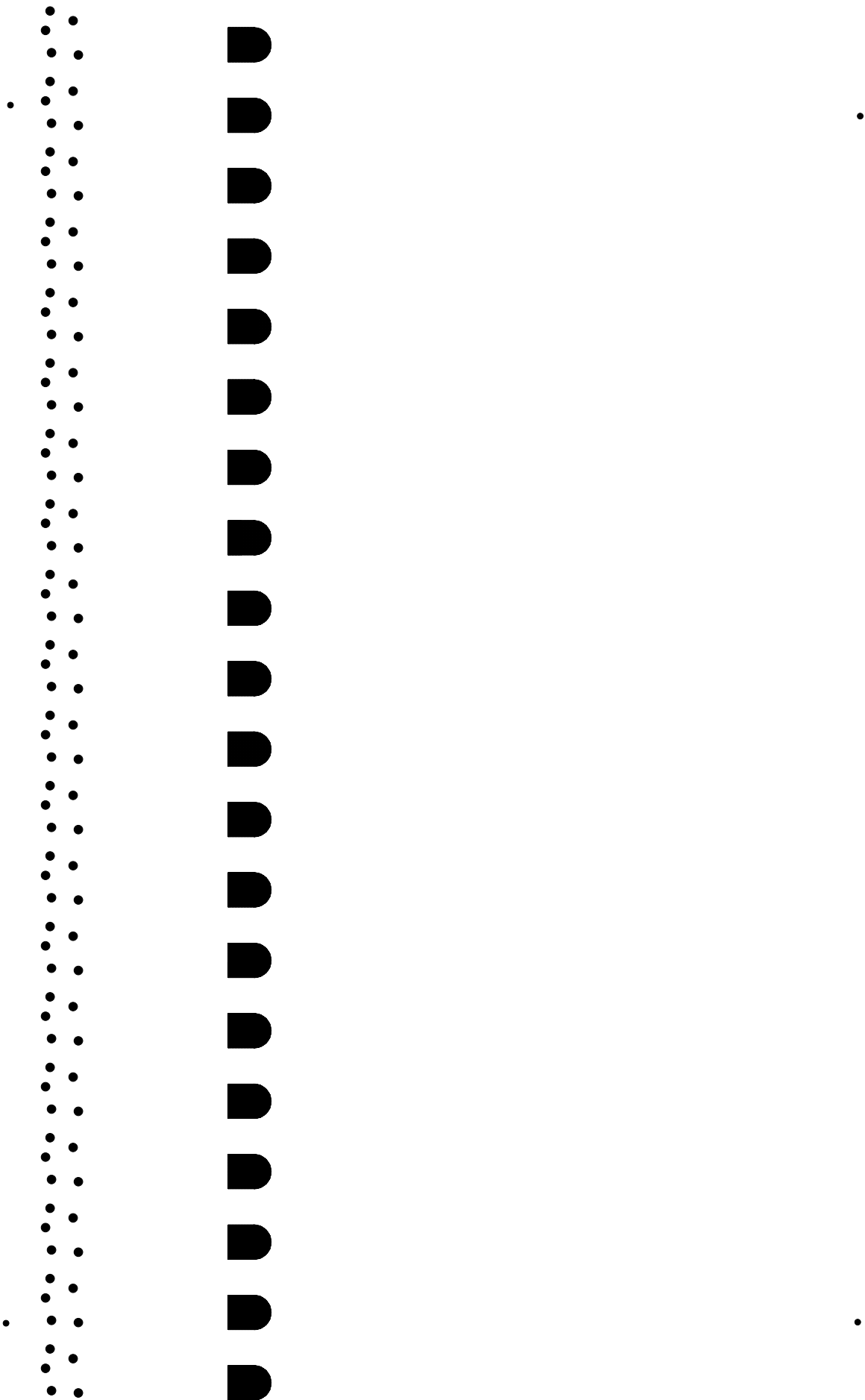


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			9 OF 10
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	FILE NAME	DA-1A08-C001A2	R0D
	PCB PN	316800000106	

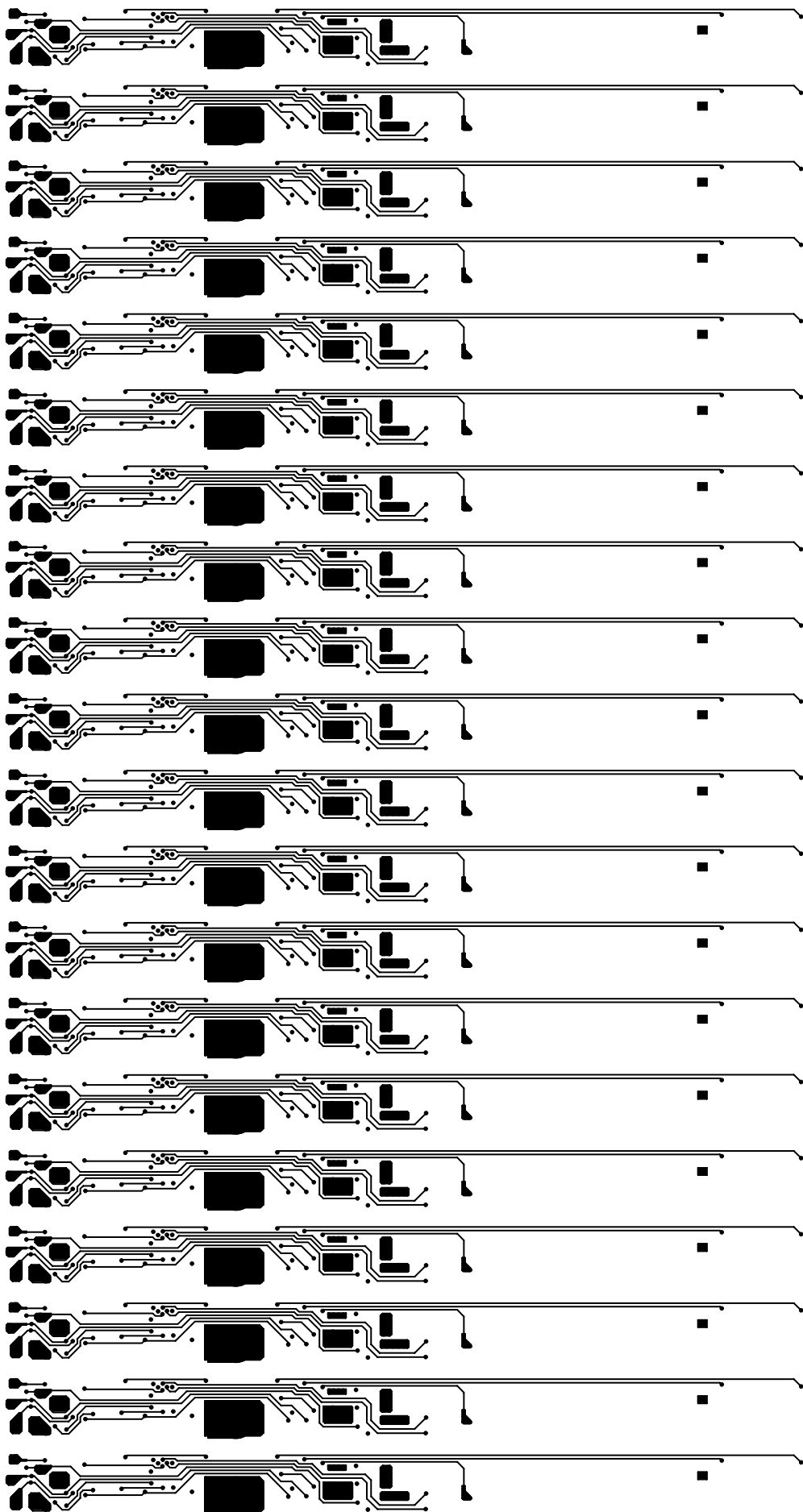
DRAWN: Nikki | DOC ID:



	POWERPCB		SHEET
			7 OF 10
SOLDEMASK	DATE	2007.08.03	REV
	FILE NAME	DA-1A08-C001A2	R0D
DRAWN: Nikki DOC ID:	PCB PN	316800000106	



	POWERPCB		SHEET
			6 OF 10
SOLDEPASTE	DATE	2007.08.03	REV
	FILE NAME	DA-1A08-C001A2	R0D
DRAWN: Nikki DOC ID:	PCB PN	316800000106	



	POWERPCB		SHEET 5 OF 10
	SOLDESIDE	DATE 2007.08.03	REV
DRAWN: Nikki	DOC ID:	FILE NAME DA-1A08-C001A2	R0D
		PCB PN 316800000106	



POWERPCB

SHEET
8 OF 10

SOLDESILK

DATE 2007.08.03

REV

FILE NAME DA-1A08-C001A2

PCB PN 316800000106

R0D

DRAWN: Nikki DOC ID:

C001A2

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神基科技股份有限公司

PAGE 1

EFFECTIVITY DATE: Current

INDENTED BILLS OF MATERIAL

PARENT PART: 541380001009 TF041-FRU; INVERTER BD, DA-1A08-C001A UM:SET ERC:1 PLAN_CODE:PC3 DEPT:GSD

ITEM TYPE: FG

REV NO: R00008

GP:V

LEVEL	ITEM	NO	COMPONENT	DESCRIPTION	WEIGHT	ERC	GP	STK	IT	UM	QTY	DEPT
-------	------	----	-----------	-------------	--------	-----	----	-----	----	----	-----	------

EFF_DATE	END_DATE	OPR	REMARK	DESCRIPTION	DESIGNATOR	SUB_COMP_QTY	SUB_COMP_WEIGHT					
			SUB_COMP			D	V	PPW	P	EA		
1	20	226800000001	290	TF041-						.052	RD	
12-JUN-07				BOX; PET, 1/20, 180x20.5x15, CHENGTAI, GPP, PWR								
		226815600001		TF041-BOX; PET, 1/20, C003 INVERTER, GPP, PWR		.05						
		226800020001		TF041-BOX; PET, 1/20, SEC-V6, GPP, PWR		.05						
1	30	242800000002	290	TF041-LABEL; "GP", D43MM, FOR PACKAGE, SEC-		0 2	V	PPW	P	EA	.002	POWE
12-JUN-07				V6, GPP, PWR								
1	40	242800000003	290	TF041-LABEL; "GP", D14MM, FOR PACKAGE, SEC-		0 2	V	PPW	P	EA	.05	POWE
12-JUN-07				V6, GPP, PWR								
1	50	411800010021	290	TF041-PWA; PWA- INVERTER BD, DA-1A08-		0	V	PPW	PH	ST	1	GSD
12-JUN-07				C001A2 L, GPP, PWR								
.2	10	230000010028	280	TF041-GLUE; 9002GA-SH, GPP, PWR		2	V	PPW	P	KG	.0002	RD
12-JUN-07				TF041-GLUE; 9001A, GPP, PWR		.00						
.2	20	230000010029	280	TF041-GLUE; 9002GB-SH, GPP, PWR		2	V	PPW	P	KG	.0001	RD
12-JUN-07				TF041-GLUE; 9001B, GPP, PWR		.00						
.2	30	242680000021	280	TF041-LABEL; 40mm*6mm, BLANK, COMMON, GPP		2	V	PPW	P	EA	1	POWE
12-JUN-07				TF041-		1	V	PPW	P	EA	1	PRC
.2	40	346800000004	280	INSULATOR; MYLAR, 8B35, L135*W10.5*T0.125, PWR								
12-JUN-07				TF041- INSULATOR; MYLAR, 8B35, C001A, GIN, GPP, P		1						
		346800000009		TF041- INSULATOR; MYLAR, 8B35, L135*W10.5*T0.1		1						
.2	50	346800000005	280	TF041-		1	V	PPW	P	EA	1	PRC
12-JUN-07				INSULATOR; KAPTON, L135*W10.5*T0.125, DA-1A08-C001, PWR								
		346800000029		TF041- INSULATOR; KAPTON, C001A, GIN, GPP, PWR		1						
		346800000012		TF041- INSULATOR; KAPTON, C001, S&D, GPP, PWR		1						
.2	60	365350000009	280	LF- SOLDER		M		PPW	P	KG	.0000	MSL
12-JUN-07				WIRE; SN96.5/AG3.0/ CU0.5KG, MATERIAL								
.2	70	411800010022	280	TF041-PWA; PWA- INVERTER BD, SMT, DA-1A08-		0	V	PPW	SA	ST	1	GSD
12-JUN-07				C001A2 L, GPP, PWR								
.3	20	271061104108	210	TF041-TH-RES; 100K , 1/16W, 1% , 0402, SMT		M	V	PPW	P	EA	2	RDH
27-JUL-07				R17, R25								
.3	30	271061105104	210	TF041-TH-RES; 1M, 1/16W, 1% , 0402, SMT		M	V	PPW	P	EA	1	RDH
27-JUL-07				R8								
.3	40	271061563103	210	TF041-TH-RES; 56K, 1/16W, 1%, 0402, SMT		1	V	PPW	P	EA	1	RDH
06-AUG-07				R13								
.3	50	271061103114	210	TF041-TH-RES; 10K , 1/16W, 1% , 0402, SMT		M	V	PPW	P	EA	1	RDH
27-JUL-07				R4								
.3	90	271061243121	210	TF041-TH-RES; 24K, 1/16W, 1%, 0402, SMT		1	V	PPW	P	EA	1	RDP
27-JUL-07				R5								
.3	100	271061335101	210	TF041-TH-RES; 3.3M, 1/16W, 1%, 0402, SMT		M	V	PPW	P	EA	2	RDH
27-JUL-07				R15, R6								
.3	130	271061473103	210	TF041-TH-RES; 47K , 1/16W, 1% , 0402, SMT		M	V	PPW	P	EA	2	RDH
27-JUL-07												

分頁(1)

C001A2

..3	140	271061124180	TF041-TH-RES;120K,1/16W,1%,0402,SMT	1	V	PPW	P	EA	1	rd
27-JUL-07		210								
..3	160	271071753102	TF041-TH-RES;75K,1/16W,1%,0603,SMT	1	V	PPW	P	EA	1	GSD
27-JUL-07		210								
..3	170	271071693101	TF041-TH-RES;698K,1/16W,1%	M	V	PPW	P	EA	1	POWE
27-JUL-07		210	,0603,SMT,PWR							
			R7							

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PAGE 2

EFFECTIVITY DATE: Current

INDENTED BILLS OF MATERIAL

PARENT PART: 541380001009 TF041-FRU; INVERTER BD,DA-1A08-C001A UM:SET ERC: PLAN_CODE: DEPT:GSD

ITEM TYPE: FG

REV NO: R00008

GP:

LEVEL	ITEM	NO	COMPONENT	DESCRIPTION	WEIGHT	ERC	GP	STK	IT	UM	QTY	DEPT
-------	------	----	-----------	-------------	--------	-----	----	-----	----	----	-----	------

EFF_DATE	END DATE	OPR	REMARK	DESCRIPTION	DESIGNATOR	SUB_COMP_QTY	SUB_COMP_WEIGHT					
..3	180	271061142109		TF041-TH-RES;1.4K,1/16W,1%,0402,SMT		1	V	PPW	P	EA	1	RDH
27-JUL-07		210										
..3	210	272101104442		TF041-TH-	R11			M	V	PPW	P	RDH
27-JUL-07		210		CAP;0.1U,CR,10V,10%,0402,X7R,SMT								
..3	220	272072473409		TF041-TH-CAP;0.047U,16V	C8	0	M	V	PPW	P	EA	RD
27-JUL-07		210		,10%,0603,X7R,SMT								
..3	240	272013106504		TF041-TH-CAP;10U,25V,+/-	C13			M	V	PPW	P	PBU
12-JUN-07		210		20%,1206,X5R,SMT								
..3	270	272023106505		TF041-TH-CAP;10U,25V,M,1210,T2.5MM,X5R,SMT	C1	1						
27-JUL-07		272105472406		TF041-TH-		M	V	PPW	P	EA	1	RDH
		210		CAP;4700PF,50V,10%,0402,X5R,SMT								
..3	280	272073223408		TF041-TH-CAP;0.022U,CR,25V	C14			M	V	PPW	P	GSD
12-JUN-07		210		,10%,0603,X7R,SMT								
..3	300	272105392404		TF041-TH-CAP;3900P,50V,+/-	C15	1		V	PPW	P	EA	RDH
27-JUL-07		210		10%,0402,X7R,SMT								
..3	320	272075221202		TF041-TH-	C11			M	V	PPW	P	IBU
27-JUL-07		210		CAP;220P,50V,2%,0603,NPO,SMT,GPI								
..3	330	272075221311		TF041-TH-CAP;220P,50V,5%,0603,NPO,SMT	C10	1						
12-JUN-07		273001051551		TF041-TH-		1	V	PPW	P	EA	1	EDD
		210		XFMR;C18.5,26T/1900T,155mH,ONLY TOP-NATION,PWR,GPP								
..3	340	286009910009		TF041-TH-IC;0Z9910ASN-B5,CCFL	T1	1		V	PPW	P	EA	RD
02-AUG-07		210		CTRL,SSOP-16,SMT,PWR,GPP								
..3	350	288100099019		TF041-TH-DIODE;BAV99W,75V,200MW,SC-	U2			M	V	PPW	P	RD
27-JUL-07		210		70,SMT,PHILIPS								
..3	350	288100701003		TF041-TH-DIODE;BAV70LT1,70V,225MW,SOT-	D1			M	V	PPW	P	GSD
27-JUL-07		210		23								

D2

分頁(2)

C001A2									
..3	380	288100070012	TF041-TH-DIODE;BAV70W,SC70,SMT,PHILIPS	1					
27-JUL-07		288205003007	TF041-TH-TRANS;P5003QVG,N&P-	1	V	PPW	P	EA	2 RD
		210	MOSFET,S08,SMT,GPP						
			U1,U3						
..3	390	288204619001	TF041-TH-TRANS;A04619L,N&P-MOSFET,S08,SMT,	2					
08-AUG-07		288204604001	TF041-TH-TRANS;A04604L,N&P-MOSFET,S08,SMT,	2					
		288224403002	TF041-TH-	M	V	PPW	P	EA	2 IBU
		210	TRANS;2N4403,PNP,40V/600MA,SOT323						
..3	400	291000007003	Q1,Q7						
12-JUN-07		210	TF041-TH-CON;HDR,7P*1,1,87213-	1	V	PPW	P	EA	1 PRC
			0700G,ACES,SMT ,PWR						
			CN1						
		291000000721	TF041-TH-CON;7P,PITCH=1.0mm,R/A,SMT,3703-U	1					

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PAGE 3

EFFECTIVITY DATE: Current

INDENTED BILLS OF MATERIAL

PARENT PART: 541380001009 TF041-FRU;INVERTER BD,DA-1A08-C001A UM:SET ERC: PLAN_CODE: DEPT:GSD

ITEM TYPE: FG

REV NO: R00008

GP:

LEVEL ITEM NO COMPONENT DESCRIPTION WEIGHT ERC GP STK IT UM QTY DEPT

EFF_DATE END_DATE OPR

REMARK DESIGNATOR

SUB_COMP SUB_COMP_QTY SUB_COMP_WEIGHT

..3 410 291000020229 TF041-TH- 1 V PPW P EA 1 POWE

12-JUN-07 210

CON;HDR,MA,2P*1,3.5MM,R/A,SMT,SM02B,ACE
S,SEC-V6

..3 420 291000000243 TF041-TH-CON;2P,PITCH=3.5mm,R/A,SMT,4100-U 1

27-JUL-07 295000013226 TF041-TH- M V PPW P EA 1 RDP

FUSE;2.5A/32V,FAST,1206FA,SMT,AEM,PWR,G
PP

..3 430 295000010414 TF041-TH-FUSE;FAST, 2.5A/63VDC, TR/3216FF2 1

08-AUG-07 295000010350 TF041-TH-FUSE;2.5A/40V,FAST, SMT,ONLY KOA, 1

316800000106 TF041-PCB;PWA-INVERTER BD (DA-1A08- M V PPW P PC 1 RDP

CO01A2 L);PWR,GPP
ROD

..3 440 361200001026 TF041-CLEANER;TF-2000-1,TONGFANG 1 V PPW P L .0001 IE

12-JUN-07 210

..3 450 361200003204 TF041-SOLDER PASTE;PF606-P;FORMOSA 1 V PPW P KG .0001 IE

12-JUN-07 210

..3 460 361200003064 TF041-SOLDER PASTE;SN96.5/AG3.0/CU .00

12-JUN-07 365350000009 LF-SOLDER M PPW P KG .0002 MSL

WIRE;SN96.5/AG3.0/CU0.5KG,MATERIAL

..3 470 242683200024 TF041-LABEL;5*20,BLANK,COMMON M V PPW P PC 1 POWE

07-JUL-07 210

..3 490 272073105404 TF041-TH- M V PPW P EA 1 PRC

27-JUL-07 210

CAP;1UF,16V,10%,0603,X7R,SMT,SEC-V6,PWR

..3 520 272003475401 TF041-TH-CAP;4.7U,25V,10%,0805,X5R,SMT 1 V PPW P EA 1 PRC

27-JUL-07 210

..3 530 271071681103 TF041-TH-RES;680 ,1/16W,1% ,0603,SMT 0 1 V PPW P EA 1 RD

27-JUL-07 210

..3 540 271072161103 TF041-TH-RES;160,1/10W,1%,0603,SMT,GPP M V PPW P EA 1 RDP

27-JUL-07 210

..3 550 271061183103 TF041-TH-RES;18K,1/16W,1%,0402,SMT M V PPW P EA 1 RDH

27-JUL-07 210

..3 560 271061494101 TF041-TH-RES;499K ,1/16W,1% ,0402,SMT 1 V PPW P EA 2 RD

07-SEP-07 210

C001A2

..3	570	271061000003	TF041-TH-RES;0	R19,R9 ,1/16W,0402,SMT	M	V	PPW	P	EA	2	RDH
07-SEP-07		210									
..3	580	272073105403	TF041-TH-CAP;1U	R14,R24 CR, 25V, 10%, 0603	1	V	PPW	P	EA	2	PRC
02-AUG-07		210									
				,X5R, SMT,PWR							
..3	590	272010101304	TF041-TH-	C2,C6	M	V	PPW	P	EA	1	GSD
06-AUG-07		210									
				CAP;100P,2KV,5%,1206,NPO,SMT,only Hol							
..3	600	272030180306	TF041-TH-	C16	M	V	PPW	P	EA	1	POWE
06-AUG-07		210									
				CAP;18P,3KV,5%,1808,NPO,SMT,ONLY							
				HOLYSTONE,SEC-V6							
				C3							
..3	610	272030180307	TF041-TH-CAP;18P,3KV,5%,1808,NPO,CCT,SMT,G		1	V	PPW	P	EA	1	RDH
08-AUG-07		272071225406	TF041-TH-CAP;2.2U	CR,6.3V	M	V	PPW	P	EA	1	RDH
		210									
				,10%,0603,X5R,SMT							
..3	620	271061153110	TF041-TH-RES;15K	,1/16W,1%,0402,SMT	M	V	PPW	P	EA	3	RDH
07-SEP-07		210									
				R18,R20,R45							

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PAGE 4

EFFECTIVITY DATE: Current

INDENTED BILLS OF MATERIAL

PARENT PART: 541380001009 TF041-FRU; INVERTER BD,DA-1A08-C001A UM:SET ERC: PLAN_CODE: DEPT:GSD

ITEM TYPE: FG

REV NO: R00008

GP:

LEVEL ITEM NO COMPONENT DESCRIPTION WEIGHT ERC GP STK IT UM QTY DEPT

EFF_DATE END DATE OPR

REMARK

DESIGNATOR

SUB_COMP

DESCRIPTION

SUB_COMP_QTY

SUB_COMP_WEIGHT

..3 630 288104148022 TF041-TH-DIODE;1N4148WS,75V,200mW,SOD-

08-AUG-07 210

323,SMT

D3

..3 640 288114148023 TF041-TH-DIODE;1N4148WS,0.2A,75V,SOD-323,S

07-SEP-07 210

TF041-TH-RES;1K ,1/16W,1%,0402,SMT

R3A

..3 650 288204401006 TF041-TH-TRANS;MMBT4401-7-F,NPN,SOT-23

07-SEP-07 210

Q3

..3 660 288204403010 TF041-TH-TRANS,PMBT4403,PNP,SOT-

07-SEP-07 210

23,3P,PRC

Q2

1 60 221800020006 TF041-

02-AUG-07 290

CARTON;B,425*310H240,SZCHENGTAI,GPP,PWR

221800020002 TF041-CARTON;425*310H240,SEC-V6,GPP,PWR .00

***** END OF REPORT *****

承 認 書

SPECIFICATION FOR APPROVAL

Customer: **MITAC**

Description: **INVERTER TRANS CI8.5**

Part No.: **273001051551**

Sample No.: **YS04970045**

Date: **2006.09.20**

Please return on copy after approved

Authorized Signature		

耀勝電子股份有限公司

YAO SHENG ELECTRONIC CO., LTD.

台北縣五股鄉五股工業區五權六路15號5樓

5TH FL NO. 15 WU CHUANG 6TH RD.,

WU KU INDUSTRIAL ZONE WU KU SHIANG,

TAIPEI HSIEN TAIWAN R.O.C.

TEL:(02)22902373 FAX:(02)22988583,22902369

E-Mail:ysttrns@ms62.hinet.net



E212542
E173643 (S)

東莞石碣首邦電子廠

DONG-GUAN SHEK-KIT TOP NATION ELECTRONIC FACTORY

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NO.3 INDUSTRIAL AREA, JUZHOU SHI JIE TOWN

CERTIFICATE NO.:4164 ISSUE NO.1 OF ISO 9001

TEL:86-769-6636606,6632772,6637039 FAX:86-769-6311267

E-Mail:tneeng@top-nation.com,tne@pub.dgnet.gd.cn,

HTTP://www.top-nation.com

首邦電子(蘇州)有限公司

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吳江市汾湖經濟開發區

WUJIANG FENHU ECONOMIC DEVELOPMENT ZONE

JIANGSU PROVINCE CHINA

TEL:86-512-63271988,63271989 FAX:86-512-63271990

E-Mail:tne@pub.sz.jsinfo.net

HTTP://www.top-nation.com



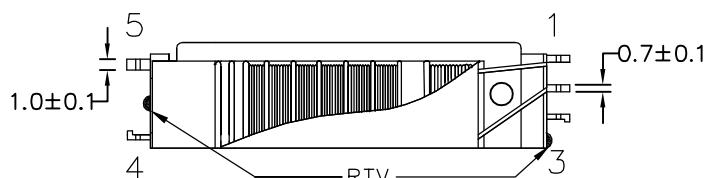
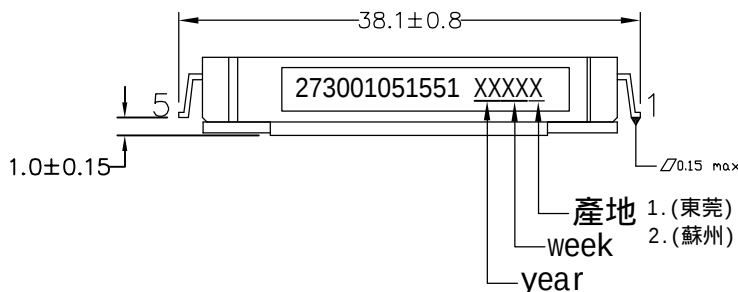
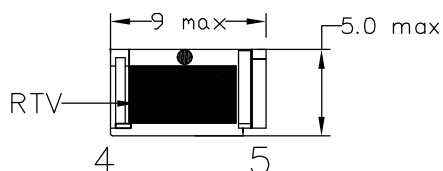
SPECIFICATION APPROVAL



Customer	MITAC	P/N:	273001051551
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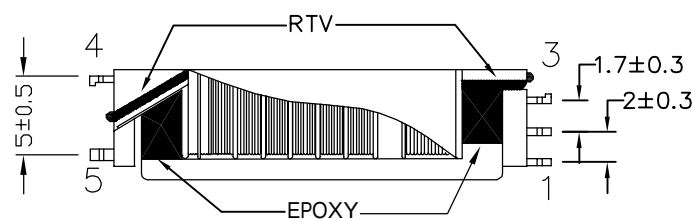
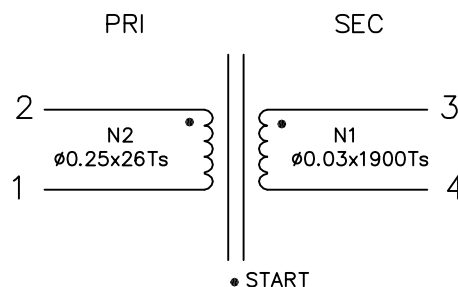
Sheet 1 of 4

1. DIMENSION: Unit: mm



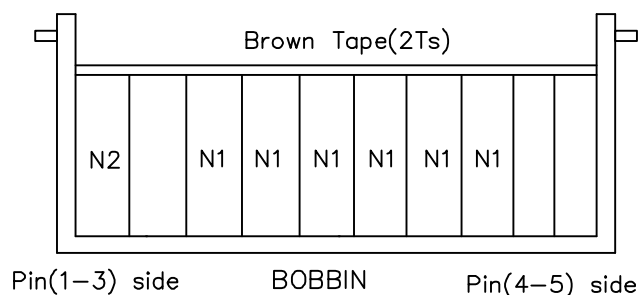
Bottom view

2. SCHEMATIC:



Top view

3. WINDING SEQUENCE:



NOTE: 線包刷凡立水, CORE不刷凡立水.

DRAWN	CHECKED	APPROVED	Mfgr. Part No.	YS04970045
劉濤 09/20	蔣玉萍 09/20	吳銀波 09/20	REV.02	
			Date: Sep 20,2006	

SPECIFICATION APPROVAL

Customer	MITAC	P/N:	273001051551
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4. ELECTRICAL SPECIFICATION:

Sheet 2 of 4

- 4.1 INDUCTANCE TEST: at 1KHz, 1V. (內阻100 Ohm)
L(3-4): 400 mH±10% L(2-1): 79.8 uH±15%
- 4.2 Leakage inductance test: at 50KHz ,1V.
P(3-4): 155 mH±8% (short pin 2,1)
- 4.3 DC RESISTANCE: at 25°C
P(3-4): 730 Ohm±8% P(2-1): 150 mOhm±15%
- 4.4 HI-POT TEST:
AC 0.5KV/60Hz/3mA hi-pot for two seconds between pri to sec.
AC 0.5KV/60Hz/3mA hi-pot for two seconds between pri to core.
AC 1.5KV/60Hz/3mA hi-pot for two seconds between sec to core.
- 4.5 INSULATION TEST:
The insulation resistance is between winding to winding and winding to core measured by DC 500V,must be over 100 MOhm.

5. TERMINAL STRENGTH:

1.0 Kg on terminals for 30 seconds, test the breakdown.

MATERIALS LIST:

COMPONENT	MAT'L	MANUFACTURE	UL FILE NO.
1.CORE	P4,3C90	Ferrite core: CI8.5 ACME,FERROXCUBE.	
2.BOBBIN	LCP E4008	Sumitomo chemical co.,ltd.	E54705
3.WIRE	PRI	DD-NYU(130°C)	Pacific electric wire & cable co.,ltd.
		UEW(130°C)	Taya co.,ltd.
		UEW-2(130°C)	Tatung.,ltd.
		UEW(130°C)	Salom electric(xlamen) co.,ltd.
		LUY(130°C)	Jung Shing wire co., ltd.
	SEC	P180 Grd2	Elektrisola(malaysia)sdn bhd.
4.TAPE	201*(180°C)	SHANGHAI JINZHANG INSULATING MATERIAL CO.,LTD.	E229667
	#KA10(180°C)	Hexin co.,ltd	E173444
	#310F (180°C)	Xin Yong co.,ltd	E148410
	#K-CJ01(180°C)	Changshu changjiang co.,ltd	E300797
5.VARNISH	BC-346A(200°C) BC-359(200°C)	John C Dolph co.,ltd.	E51047(M)
6.EPOXY	S-9001A-6LF	Shaw huow enterprise co.,	E105888
	K1408	Flygon engineering resin co.,ltd.	E101381
7.RTV	SE9176	Sminetsu	
	ES2488B	CICERO INDUSTRIAL CO.,LTD.	
8.SOLDER	Pb<1000ppm		

Mfgr. Part No.	YS04970045	REV.02	
		Date: Sep 20,2006	

TOP NATION ELECTRONIC (SUZHOU) CO., LTD. TEL:86-512-63271988 FAX:86-512-63271990

YAO SHENG ELECTRONIC CO., LTD.

TEL:(02)2290-2373 FAX:(02)2290-2369

SPECIFICATION APPROVAL

Customer	MITAC	P/N:	273001051551
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6. ENVIRONMENTAL TEST:

Sheet 3 of 4

6.1 HIGH TEMPERATURE HIGH HUMIDITY

TEMPERATURE: 40°C±2°C

HUMIDITY: 90% ±2%

DURATION: 96 HOURS

AFTER THERE IS NO ABNORMALITY IN THE ELECTRICAL PROPERTY AND APPEARANCE.

6.2 HIGHT TEMPERATURE:

TEMPERATURE: 105°C

DURATION: 240 HOURS

AFTER THERE IS NO ABNORMALITY IN THE ELECTRICAL PROPERTY AND APPEARANCE.

6.3 LOW TEMPERATURE:

TEMPERATURE: -30°C

DURATION: 240 HOURS

AFTER THERE IS NO ABNORMALITY IN THE ELECTRICAL PROPERTY AND APPEARANCE.

6.4 THERMAL SHOCK CYCLES:

REPEATING 100 CYCLES FROM THE STAGE AS SPECIFIED,SHOULD MEET THE REQUIREMENT OF THE SPEC.AND THERE SHALL NOT BE ANY ABNORMALITY.

STAGE	TEMPERATURE	ITEM (MINUTE)
1.	-30°C±2°C	30
2.	NORMAL	10-15
3.	105°C±2°C	30
4.	NORMAL	10-15

Mfgr. Part No.	YS04970045	REV.02	
		Date: Sep 20,2006	

SPECIFICATION APPROVAL

Customer	MITAC	P/N:	273001051551
6.5 BREAKDOWN TEST:		Sheet 4 of 4	
THERE IS NO ABNORMALITY IN FUNCTION UNDER THE TEST CONDITION OF 30-80KHz SINEWAVE WITH OUTPUT VOLTAGE V_{o-p} 2969V(2100Vrms) MAX. IT SHALL BE DAMAGE TO THE TRANSFORMER WHEN THE ABOVE APPLY VOLTAGE HIGHER THAN V_{o-p} 2969V(2100Vrms),AT DURATION THREE SECONDS MAX.			
7. MECHANICAL CHARACTERISTIC:			
7.1 VIBRATION:			
APPEARANCE AND STRUCTURE SHALL BE NO ABNOMALITY AFTER VIBRATING AT THE FREQUENCE VARY UNFOMLY BETWEEN 10-55-10HZ TRAVERSED IN ONE MINUTE AND THE AMPLITUDE OF 1.5 mm FOR 2 HOURS IN 3 MUTUALLY PERPENDICULAR DIRECTION.			
7.2 TERMINAL STRENGTH:			
A.TENSILE STRENGTH:			
THE TERMINAL SHALL NOT BREAK AND DAMAGE OF BOBBIN WHEN PULL A FORCE OF 1KG LOAD ON THE TERMINAL.			
B.BENDING STRENGTH:			
APPLY A FORCE OF 1KG SHALL BE APPLIED IN THE DIRECTION OF THE AXIS OF TERMINAL AND SHALL BE MAINTAINED FOR PERIOD OF 2-3 SECONDS.			
7.3 SOLDERBILITY:			
AFTER SUBJECTING THE TERMINAL TO PRE-SOLDERING IRON AT $245\pm 5^{\circ}\text{C}$ THERE SHALL NOT BE ANY ABNOMALITY WITH 5 SECONDS.			
Mfgr. Part No.	YS04970045	REV.02	
		Date: Sep 20,2006	

QMFZ2 Component - Plastics

Saturday, March 21, 1998

E54705

SUMITOMO CHEMICAL CO LTD

5-33 KITAKAWA 4-CHOME CHUO-KU OSAKA 541-8550 JAPAN

Material Designation: **E4008(k)**

Product Description: Liquid Crystal Polymer (LCP), designated "EKONOL, SUMIKASUPER" furnished as pellets.

Color	Min. Thick. (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str	IEC GWIT	IEC GWFI
NC, WT, BK	0.30	V-0	-	-	130	130	130	-	-
	0.75	V-0	3	4	220	180	220	-	-
	1.5	V-0	2	4	220	200	240	-	-
	3.0	V-0	1	4	220	200	240	-	-
CTI: 4			HVTR: 0		D495: 5		IEC BP: -		

- (k) Virgin and regrind from 1 to 50% by weight incl. have the same basic material characteristics except for the tensile impact property for regrind 26 to 50% by weight incl.

Report Date: 08/17/1992

Underwriters Laboratories Inc®

683604011

UL94 small-scale test data does not pertain to building materials, furnishings and related contents. UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in components and parts of end-product devices and appliances, where the acceptability of the combination is determined by ULI

UL Online Certifications Directory

OBMW2.E142108 Magnet Wire - Component

[Page Bottom](#)

Magnet Wire - Component

[See General Information for Magnet Wire - Component](#)

**PACIFIC-THAI ELECTRIC WIRE &
CABLE CO LTD**
8 MU 5 TUMBON BAN MAI
AMPHUR MUANG
PHATHUM THANI, 12000 THAILAND

E142108

Mtl Dsg	Coating Type		ANSI Type	TI
	BC	TC		
AEW	Polyester(amide)(imide)	Polyamideimide	?/TD>	220
			MW 35-C	200#
PEW-FU	Modified Polyester	?/TD>	MW-5C	155#
PEW-FY	Modified Polyester	Polyamide	?/TD>	200
			MW-76C	180#
			MW-24C	155#
UEW-A	Polyurethane	?/TD>	MW-79C	155
			MW-75C	130
UEW-NY	Polyurethane	Polyamide	MW-28C	130
UEW-U	Polyurethane	?/TD>	MW-75C	130
UEW-F	Polyurethane	?/TD>	MW-79C	155#
EIW-U	Polyester-imide	?/TD>	MW-30C	180#
UEW-L	Polyurethane	?/TD>	?/TD>	130
UEW-H	Polyurethane	?/TD>	MW-82C	180
UEW-FY	Polyurethane	Polyamide	MW-80C	155#

- This Wire may perform better than its temperature rating reflects. Hence, it may not be suitable to use in an insulation system thermal aging program.

Marking: Company name and material designation on packages or reels.

[Last Updated](#) on 2005-10-04

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OBMW2.E197768

Magnet Wire - Component

Page Bottom

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Questions?

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Magnet Wire - Component

See General Information for Magnet Wire - Component

TA YA ELECTRIC WIRE FACTORY

E197768

XIA GANG

INDUAREA CHAN AN

DONGGUAN

GUANGDONG 523873, CHINA

Mtl Dsg	Coating Type		ANSI Type	TI
	BC	TC		
Magnet wire coatings.				
THS4-U130	Polyurethane	—	MW 75	130
THB5-EI180L	Modified Polyester	—	MW 30	180
THFN-216	Polyurethane	Polyamide	MW 28-C	130
THLT-E155S	Modified Polyester	—	MW 5-C	155
TYKH-E155	Modified Polyester	—	MW 5-C	155
TYPU-130	Polyurethane	—	MW 75C	130
TYE4-I050	Polyester-imide	—	MW 77C	180
TY1700-U155	Polyurethane	—	MW 79C	155
TYA1-130	Polyurethane	—	MW 75	130
TY981-DAI220	Polyamide-imide	—	MW 81C	200
			—	220
TYPEAI-N200	Polyester-imide	Polyamideimide	MW 35C,	200
			MW 73C	
TYSSEI-H180	Polyester-imide	—	MW 77C	180
			MW 74C	200

TYSUN-F155	Polyurethane	Polyamide	MW80C	155
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Marking: Company name and material designation.

Last Updated on 2001-12-14

Page Top	Notice of Disclaimer	Questions?	Previous Page
UL Listed and Classified Products	UL Recognized Components	Products Certified for Canada	

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OBMW2.E106004

Magnet Wire - Component

[Page Bottom](#)
[Print-friendly version](#)
[Questions?](#)
[Previous Page](#)

Magnet Wire - Component

See General Information for Magnet Wire - Component

TATUNG CO

E106004

22 CHUNGSHAN N RD, SEC 3

TAIPEI, 10451 TAIWAN

Mtl Dsg	Coat Typ			ANSI Type	TI
	BC	TC	Bond		
UEW	Polyurethane	—	—	MW-75	130
PEW-H @	Polyester-amide-imide	—	—	MW-30	180
PEW-HC	Polyester-imide	Polyamide-imide	—	MW-35, MW-36, MW-73	200
UEYW	Polyurethane	Polyamide	—	MW-28	130
PEW-F	Polyester	—	—	MW-5	155
PEYW-F	Polyester	Polyamide	—	MW-24	155
PEW-HS	Polyester-imide	—	—	MW-77	180
UEYW-F	Polyurethane	Polyamide	—	MW-80	155
PEW-H+	Polyester-amide-imide	—	—	MW74	200
TSB-PEW-HC	Polyesterimide	Polyamideimide	Aromatic Polyamide	MW102	180

@ - Actual rating is higher than shown. Consult recognition report when considering for use in system thermal aging programs.

Marking: Company name and material designation on packages or reels.

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[Page Top](#)
[Notice of Disclaimer](#)
[Questions?](#)
[Previous Page](#)

UL Listed and Classified

UL Recognized

Products Certified

UBMW2

April 1, 2002

(System - Electrical Insulation) Magnet Wire - Component

SALOM ELECTRIC (XIAMEN) CO LTD

31ST BLDG HULI INDUSTRIAL DISTRICT XIAMEN, FUJIAN

361005 CHINA

E189722

MIL Dwg	Coating Type		ANSI Type	T1
	RC	TC		
MEW	Polyester	—	—	155
DEW	Polyurethane	—	MW75	130
DEW-155	Polyurethane	—	MW78	155
FW-180	Polyester-Imide	—	MW72	180

Marking: Company name and type designation on package or reel.

See General Information Preceding These Recognitions
for use only in equipment where the acceptability of the combination is determined by
Underwriters Laboratories Inc.

4/17/2002

Underwriters Laboratories Inc.

Card 1 of 1

OBMW2
Magnet Wire - Component

September 8, 2000

JUNG SHING WIRE CO LTD
231 CHUNG CHENG RD, SEC 3 JEN-TEH HSIANG, TAINAN
HSIEH TAIWAN

E174837

NSL Dwg	Mark Dwg	Coat Type		ANSI Type	Temp Class
AIW	—	BC	OC	—	—
CPUCW3	—	Polyamideimide	—	MW81-C	220
ELIWI	—	Polyurethane	—	MW75C	130
ELIWI	—	Polyesterimide	Polyamideimide	MW35C	200
ELIWI	—	Polyesterimide	Polyamide	—	180
ELIWI	—	Polyesterimide	Modified Epoxy	—	200
ELIWI	—	Polyesterimide	—	—	220
ELIWI	—	Polyesterimide	—	MW74-C	200
FLIWI	—	Modified Polyester	Polyamide	—	155
LSFW	—	Polyurethane	—	MW79-C	155
LSUEW	—	Polyurethane	—	—	130
PEW	—	Polyester	—	—	155
PEY	—	Polyester	Nylon	MW24-C	155
SFBIW	—	Modified Polyester	—	MW26C	155
SFBIW	—	Polyesterimide	—	MW77C	180
SFBIW	—	Modified Polyester	Nylon	MW27-C	155
SFBIW	—	Modified Polyester	Nylon	MW27-C	155
SFBIW	—	Modified Polyester	Modified Polyamide	—	155
SFBIW	—	Polyester	Polyamide	—	155
SFBIW	—	Polyesterimide	Polyamide	—	180
SFBIW	—	Polyesterimide	Modified Polyamide	—	180
SFBIW	—	Modified Polyester	—	MW26C	155
SFBIW	—	Polyurethane	—	MW79	155

267806002

Page 1 of 2

A not-for-profit organization
dedicated to public safety and
committed to quality service

NSL Dwg	Mark Dwg	Coat Type		ANSI Type	Temp Class
SFBIW	—	BC	OC	—	—
UEW-1	—	Polyurethane	Polyamide	MW80C	155
UEW-2	—	Polyurethane	—	MW2-C	105
UEW-4	—	Polyurethane	—	MW75C	130
UEW-2	—	Polyurethane	Nylon	MW25-C	130
UEW-2	—	Polyurethane	Polyamide	MW28-C	130

UL may be used by UL; it may be used by UL, EL, or LUL.

LUL: Signifies magnet wire twisted together; EL: Signifies base coated magnet wire laid parallel with top coat applied overall; LUL: Signifies base coated magnet wire twisted together and covered with top coat overall.

Marking: Company name or trademark (UL) or 标志, material designation or marking designation on package or reel, and Recognized Component Mark.

See General Information Preceding These Recognitions

Use only in equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc.

267806002

Page 2 of 2

OBMW2/E174837
September 8, 2000

INSULATING DEVICES AND MATERIALS (NYYV2)

971

Magnet Wire (OBMW2)—Continued

SAN-EI ELECTRONIC IND CO LTD

971 OHAZA-WADA KOMORO-SHI, NAGANO-KEN 384-0093 JAPAN

E129486

Mtl Dsg	Mark Dsg	Coat Typ	BC	OC	ANSI Type	Temp Class
UEX	—	Polyurethane	—	—	MW 75C	130
UEX21	—	Urethane-ester	—	—	MW 75C	130
<u>SEXC</u>	—	Polyester-Imide	—	—	—	155
		Urethane				
PEX-Y	—	Polyester	Polyamide	—	MW24C	155
FSX	—	Polyester-Imide	—	—	MW26C	155
FSX-H	—	Polyester-Imide	—	—	MW77C	180
PXT-LB	—	Polyester	Polyamide	—	MW24C	155
SEX-L	—	Polyester-Imide	Polyamide	—	MW27C	155
NCX-K	—	Polyurethane	—	—	MW75C	130
FHX-K	—	Polyester-Imide	Epoxy	—	—	180
UEX-N	—	Polyurethane	Polyamide	—	MW28C	130

Marking: Company name, trademark  or "SAN-EI" and material designation on packages or reels.

ELEKTRISOLA (MALAYSIA) SDN BHD

JALAN DAMAI SATU JANDA BAIK 28750 BENTONG, PAHANG DARUL MAKMUR MALAYSIA

E143312

Mtl Dsg	Mark Dsg	Coat Typ	BC	OC	ANSI Type	Temp Class
Estersol 180	E180	Polyesterimide (solderable)	—	—	MW-77	180
Amidester 200	A200	Polyesterimide	—	—	MW-74	200
Polysol-N 155	PN155	Polyurethane	Nylon	—	MW-80	155
					MW-28	130
<u>Polysol 155</u>	<u>P155</u>	Polyurethane	—	—	MW-79	155
					MW-75	130
Polysol 155g	Pg155	Polyurethane	—	—	MW75	130
Polysol 155p	Pp155, Gp155	Polyurethane	—	—	MW79	155
Polysol 160	P160	Polyurethane	—	—	MW-79	155
Polysol 180	P180, G180	Polyurethane	—	—	MW79	155
					—	180
Polysol 170	P170 or G170	Polyurethane	—	—	MW79	155

Mtl Dsg	Mark Dsg	Coat Typ	BC	OC	ANSI Type	Temp Class
Polysol-N 180	PN180	Polyurethane	Nylon	—	—	180

Marking: Company name, material designation or marked designation and factory identification on package or reel.



OANZ2.E229667

Insulating Tape - Component

[Page Bottom](#)

[Print-friendly version](#)

[Questions?](#)

[Previous Page](#)

Insulating Tape - Component

See General Information for Insulating Tape - Component

**SHANGHAI JINZHANG INSULATING
MATERIAL CO LTD**

E229667

717 ZHONG SAN NAN NO 2 RD
200032 SHANGHAI, CHINA

Polyimide film insulating tape, Cat. No. 201*, rated 180 C.

* - Complies with flame retardant requirements when so marked.

Marking: Company name or "E229667" and catalog designation printed on the central paper core, or outer package.

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[Page Top](#)

[Notice of Disclaimer](#)

[Questions?](#)

[Previous Page](#)

[UL Listed and Classified
Products](#)

[UL Recognized
Components](#)

[Products Certified
for Canada](#)

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OANZ2.E173444

Insulating Tape - Component

Page Bottom

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Questions?

Previous Page

Insulating Tape - Component

See General Information for Insulating Tape - Component

SOLAR PLUS CO

E173444

18 LANE 1778 KWANG-HSING RD

TAIPING CITY

TAICHUNG HSIEN, TAIWAN

Polyester (PET) film insulating tape with acrylic adhesives, Cat. Nos. ET*, ETF*, @ rated 130°C.

Reinforced polyester (PET) film insulating tape with acrylic adhesive, Cat. No. 301F*#, rated 130°C.

Polyimide film insulating tape with silicone adhesives, Cat. No. KA10* \$, rated 180°C.

Cat. No. KA105*&, rated 150°C.

* - Complies with flame retardant requirements when so marked.

@ - May be marked "Film/adhesive side CTI performance level category PLC = 0, voltage 600+, per UL 746A/ASTM D3638" or equivalent.

- May be marked "Film side CTI performance level category PLC = 1, voltage 545 or less, per UL 746A/ASTM D3638" and/or "Adhesive side CTI performance level category PLC = 0, voltage 600+ per UL 746A/ASTM D3638" or equivalent.

\$ - May be marked "Film side CTI Performance Level Category PLC=4, Voltage 125 or less, per UL 746A/ASTM D 3638" and/or "Film side CTI 125V per IEC112" and/or "Film side CTI Material Group IIIb per UL 1950/IEC950" and/or "Adhesive side CTI Performance Level Category PLC=1, Voltage 580 or less, per UL 746A/ASTM D 3638" and/or "Adhesive side CTI 580V(540) per IEC112" and/or "Adhesive side CTI Material Group II per UL 1950/IEC950" or equivalent.

& - May be marked "Film side CTI Performance Level Category PLC=4, Voltage 172 or less, per UL 746A/ASTM D 3638" and/or "Adhesive side CTI Performance Level Category PLC=0, Voltage 600+, per UL 746A/ASTM D 3638" or equivalent.

Marking: Company name or E173444 and catalog designation printed on carton, wrapper and/or

E17344

2/2

core.

Last Updated on 2005-01-12

[Page Top](#)[Notice of Disclaimer](#)[Questions?](#)[Previous Page](#)[UL Listed and Classified
Products](#)[UL Recognized
Components](#)[Products Certified
for Canada](#)

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OANZ2.E148410

Insulating Tape - Component

Page Bottom

Print-friendly version

Questions?

Previous Page

Insulating Tape - Component

See General Information for Insulating Tape - Component

POLIMER CHEMICAL (SINGAPORE) PTE LTD

E148410

17B TUAS RD

SINGAPORE, 637815 SINGAPORE

Polyethylene-Terapthalate (PET) film insulating tape with acrylic adhesive, Cat. Nos. 363S, 365S rated 130 C.

Polyethylene-terapthalate (PET) film insulating tape with acrylic adhesive, Cat. Nos. 366F*, 367F@, 368F* rated 130 C.

Polyimide film insulating tape, with silicone based adhesive, Cat. Nos. 310F*, 311F*, 312F*, rated 180 C.

Flame retardant acetate cloth tape with rubber-based adhesive, Cat. No. 800F.

* - Complies with flame retardant requirements when so marked.

Glass cloth insulating tape with silicone-based adhesive, Cat. No. 820F*, rated 180C.

Aramid "Nomex" paper insulating tape with silicone-based adhesive, Cat. No. 301F*, rated 180C.

Aramid "Nomex" paper insulating tape with acrylic adhesive, Cat. No. 300F* rated 155C.

Wooven glass cloth insulating tape with rubber-based adhesive, Cat. No. 821S*, rated 130C.

Flame retardant aluminum foil tape with acrylic adhesive, Cat. No. 890F.

Flame retardant copper foil tape with acrylic adhesive, Cat. No. 880F.

* - Complies with flame retardant requirements when so marked.

Polyethylene-terapthalate (PET) film insulating tape with acrylic adhesive, Cat. No. 376F*, 377F*, 378F*\$, rated 130C.

Polyester film with nonwoven polyester fabric reinforcement, rubber adhesive, Cat. Nos.

860F& and 865F&, rated 130 C.

* - Complies with flame retardant requirements when so marked.

& - "Film/adhesive side CTI Performance Level Category PLC=0, Voltage 600 , per UL 746A/ASTM D 3638" , and/or "Film/adhesive side CTI 600 per IEC112" and/or "Film/adhesive side CTI Material Group I per UL 1950/IEC950" or equivalent.

\$ - "Film side CTI Performance Level Category PLC=1, Voltage 400 , per UL 746A/ASTM D 3638", and/or "Film side CTI 400(360) per IEC112" and/or "Film side CTI Material Group II per UL 1950/IEC950" or equivalent. "Adhesive side CTI Performance Level Category PLC=0, Voltage 600 , per UL 746A/ASTM D 3638" , and/or "Adhesive side CTI 600 per IEC112" and/or "Film side CTI Material Group I per UL 1950/IEC950" or equivalent.

@ - "Film side CTI Performance Level Category PLC=2, Voltage 360 or less, per UL 746A/ASTM D3638".

Marking: Company name, or "E148410", or trademark
catalog designation printed on carton, wrapper or core.

TECHNOL

, and

Last Updated on 2002-01-22

Page Top	Notice of Disclaimer	Questions?	Previous Page
UL Listed and Classified Products	UL Recognized Components	Products Certified for Canada	

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UL Online Certifications Directory

OAN22.E300797 Insulating Tape - Component

Page Bottom

Insulating Tape - Component

[See General Information for Insulating Tape - Component](#)

CHANGSHU CHANGJIANG TAPE CO LTD

ZHITANG

CHANGSHU, JIANGSU 215531 CHINA

E300797

Polyimide film insulating tape with silicone adhesive, Cat. No. K-CJ01*® rated 260C, Amber color.

* - May be marked "Flame Retardant".

@ - May be marked "Cold Resistant".

Marking: Company name or file number "E300797" and catalog number printed on carton, wrapper or central paper core.
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[Questions?](#)

[Notice of Disclaimer](#)

[Page Top](#)

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OBOR2

January 31, 1994

Component - Varnishes

JOHN C DOLPH CO

BC-348-A
PDR-1839
BC-352
BC-354
BC-356,
-359
BC-358,
-359
B-362

MW35 180
— —
MW35 180
MW28 130
MW24 155
MW36 —
MW36 180
MW# 180
MW36 180
MW16 220

E51047 (M)
(B-cont. from A005 card)

200 —
— 180
— —
130 —
155 —
200 —
— —
180 —
200 —
180 —

Report: June 20, 1980.

Replaces E51047B dated January 4, 1990.

452548001 N0767 Underwriters Laboratories, Inc.®

(Cont. on B005 card)
01/0077433



QMFZ2.E105888 Plastics - Component

[Page Bottom](#)
[Questions?](#)
[Previous Page](#)

Plastics - Component

[Guide Information](#)

SHAW HUOW ENTERPRISE CO LTD
E105888

1ST FL

12 CHANGSHU 2 RD

HSICHU CHEN

TAIPEI HSIEN, TAIWAN

									H	D	
		Min.		H	H	R T I			V	4	C
		Thk	Flame	W	A	Elec	Mech		T	9	T
Material Dsg	Color	mm	Class	I	I		Imp	Str	R	5	I
Eposy Resin Adhesive Compound (EP), furnished as paste.											
S-9001A-ADHESIVE											
	ALL	1.0-1.1	V-0	0	0	90	90	90	3	7	1
Epoxy Casting Compound (EP - Casting), furnished as two liquid components.											
9001A-87/9001B-87											
	ALL	1.1-1.2	V-0	0	0	90	90	90	0	6	0
9001A-SYD/9001B-SYD											
	ALL	1.3-1.4	V-0	-	-	90	90	90			
9001A/9001B	ALL	1.0-1.1	V-0	0	3	90	90	90	0	5	0
9002GA/9002GB											
	ALL	6.0-6.6	V-0	0	3	90	90	90	0	5	0
9053A/9053B	ALL	6.0-6.6	V-0	-	-	90	90	90			
Epoxy Coating Compound (EP - Coating), furnished as two liquid components.											
8030A-V0/8030B-V0											

	ALL	1.0-1.1	V-0	2	0	90	90	90	0	5	0
Polyurethane (PUR), furnished as two liquid components.											
4500A/4500B	ALL	1.6-1.76	V-0	-	-	50	50	50			

Marking: Company name and material designation on container, wrapper or finished part.

[Page Top](#)

[Notice of Disclaimer](#)

[Questions?](#)

[Previous Page](#)

[UL Listed and Classified Products](#)

[UL Recognized Components](#)

[Products Certified for Canada](#)

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QMFZ8.E105888

Plastics Certified For Canada - Component

[Page Bottom](#)
[Print-friendly version](#)
[Questions?](#)
[Previous Page](#)

Plastics Certified For Canada - Component

[Guide Information](#)

SHAW HUOW ENTERPRISE CO LTD

E105888

1ST FL

12 CHANGSHU 2 RD

HSICHU CHEN

TAIPEI HSIEN, TAIWAN

		Min.		H	H	H	R T I			C
		Thk	Flame	W	A	V	Elec	Mech		T
Mtl Dsg	Color	mm	Class	I	I	A		Imp	Str	I
Eposy Resin Adhesive Compound (EP), furnished as paste.										
S-9001A-ADHESIVE										
	ALL	1.0-1.1	V-0	0	0	-	90	90	90	1
Epoxy Coating Compound (EP - Coating), furnished as two liquid components.										
8030A-V0/8030B-V0										
	ALL	1.0-1.1	V-0	2	0	-	90	90	90	0

Marking: Company name and material designation, generic polymer identification, color number where appropriate and batch or lot number or date of manufacture on container, wrapper or molded on finished part.

[Page Top](#)
[Notice of Disclaimer](#)
[Questions?](#)
[Previous Page](#)
[UL Listed and Classified Products](#)
[UL Recognized Components](#)
[Products Certified for Canada](#)

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Online Certifications Directory

Plastics - Component

FLYING DRAGONS MATERIAL INDUSTRIAL CO LTD

E101381

TU CHEN INDUSTRIAL PARK

3 MIN TSU ST

TU CHEN

TAIPEI HSIEN, TAIWAN

Mtl Dsg	Col	Min Thk (mm)	Flame Class	Elec	RTI			H W I	H A I	C T I	V A R
					Mech		w/o Imp				
					w/Imp						
Epoxy Casting Compound, furnished as liquid.											
K1408	BK	2.5-2.7	V-0	90	90	90	—	—	—	—	—

Marking: Company name, material designation, generic polymer identification, color number where appropriate, and batch or lot number or date of manufacture on container, wrapper or molded on finished part.

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CONTENTS

SolidMatrix[®] Surface Mount Fuses	2
1206 FA Series	2
0603 FA Series	5
0402 FA Series	8
1206 SB Series	11
0603 SB Series	14
1206 HI Series	17
0603 HI Series	20
Product Identification	23
Reliability Tests	23
Fuse Selection and Temperature De-rating Guideline	23
Soldering Temperature Profiles	24
Surface Mount Multilayer Varistors	25
ES Series	25
NA Series	26
HA Series	29
Product Identification	30
Shape and Dimensions	31
Recommended Land Patterns	31
Terms and Definitions	32
Operating Temperatures	32
Reliability Tests	33
Soldering Temperature Profiles	34
Packaging and Storage	35
Packaging	35
Storage	36

SolidMatrix® 1206 Fast Acting Surface Mount Fuses



Features:

- Multilayer monolithic structure with glass ceramic body and silver fusing element
- Silver termination with nickel and pure-tin solder plating, providing excellent solderability
- Compatible with both wave and reflow soldering processes
- Operating temperature range: -55°C to +125°C (with de-rating)
- RoHS compliant



Clear-Time Characteristics (Fast Acting):

% of current rating	Clear-time at 25 °C
100%	4 hours min.
250%	5 seconds max.
400%	0.05 seconds max.

Agency Approval: Recognized Under the Components Program of Underwriters Laboratories, File Number: E232989

Patents: U.S. Patent numbers 6,034,589, 6,228,230, 6,602,766, and other pending patents

Interrupting Ratings:

0.25A—3A 50A at rated voltage
4A—8A 45A at rated voltage

Marking(Optional): Black Marking Character Code
0.5A:C, 0.75A:D, 1A:E, 1.5A:G, 1.75A:H, 2A:I, 2.5A:J, 3A:K, 4A:M,
5A:N, 6A:O, 7A:P, 8A:R

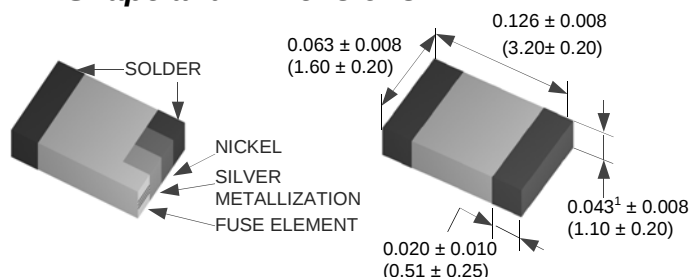
Ordering Information:

Part Number	Current Rating (A)	Voltage Rating (VDC)	Nominal Cold DCR (Ω) ²
F1206FA0500V063T	0.5	63	0.500
F1206FA0750V063T	0.75	63	0.330
F1206FA1000V063T	1.0	63	0.220
F1206FA1500V063T	1.5	63	0.120
F1206FA1750V063T	1.75	63	0.100
F1206FA2000V063T	2.0	63	0.050
F1206FA2500V032T	2.5	32	0.035
F1206FA3000V032T	3.0	32	0.031
F1206FA4000V032T	4.0	32	0.022
F1206FA5000V032T	5.0	32	0.015
F1206FA6000V024T	6.0	24	0.013
F1206FA7000V024T	7.0	24	0.011
F1206FA8000V024T	8.0	24	0.008

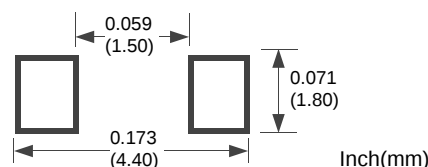
1. Nominal height of 0.023" is available.

2. Measured at $\leq 10\%$ rated current and 25°C ambient.

Shape and Dimensions:



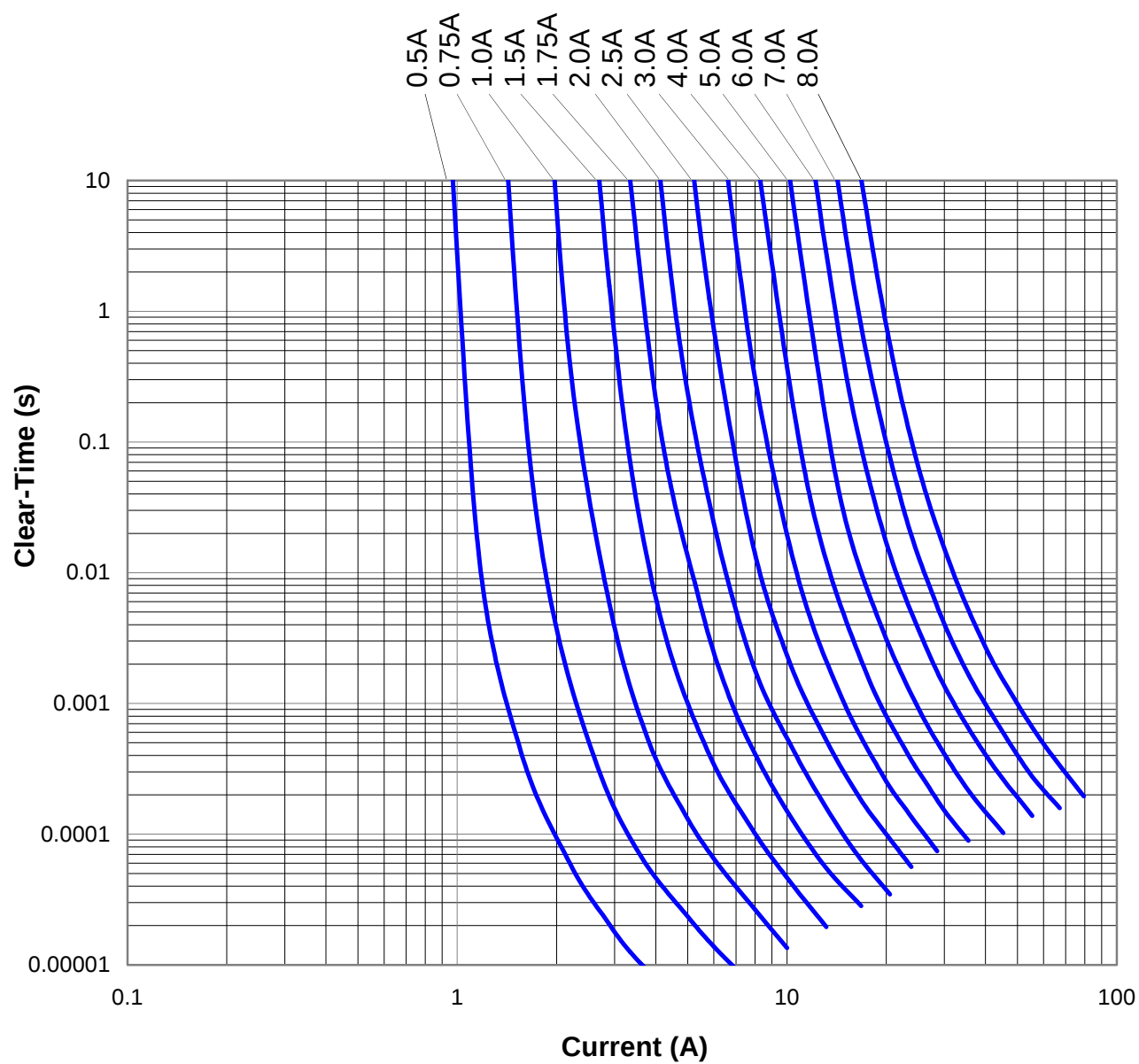
Recommended Land Pattern:



SolidMatrix® 1206 Fast Acting Surface Mount Fuses



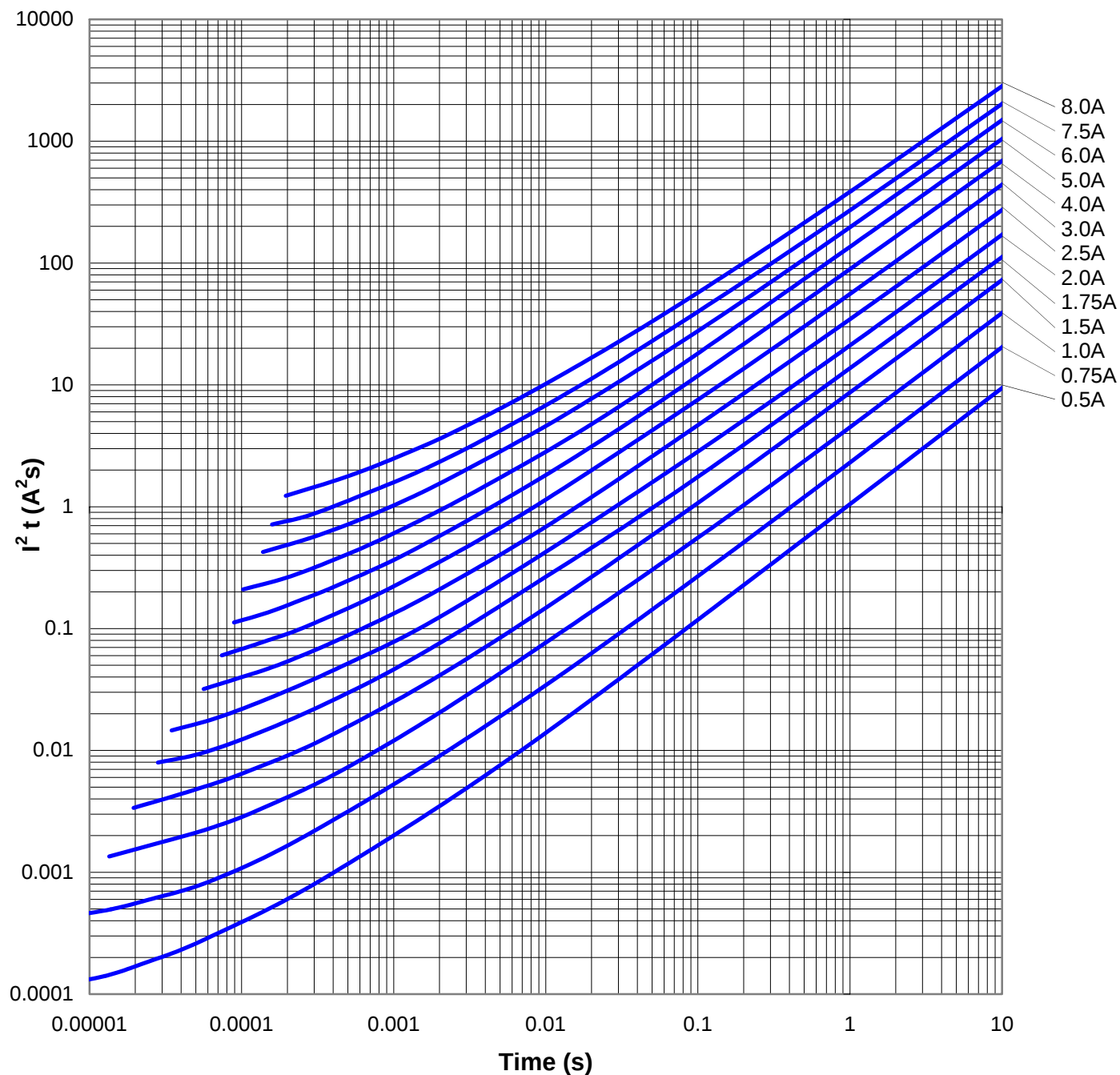
Average Clear-Time Curves



SolidMatrix® 1206 Fast Acting Surface Mount Fuses



I^2t vs. t Curves



SolidMatrix® 0603 Fast Acting Surface Mount Fuses



Features:

- Multilayer monolithic structure with glass ceramic body and silver fusing element
- Silver termination with nickel and pure-tin solder plating, providing excellent solderability
- Compatible with both wave and reflow soldering processes
- Operating temperature range: -55°C to +125°C (with de-rating)
- RoHS compliant



Clear-Time Characteristics (Fast Acting):

% of current rating	Clear-time at 25 °C
100%	4 hours min.
250%	5 seconds max.
400%	0.05 seconds max.

Agency Approval: Recognized Under the Components Program of Underwriters Laboratories, File Number: E232989.

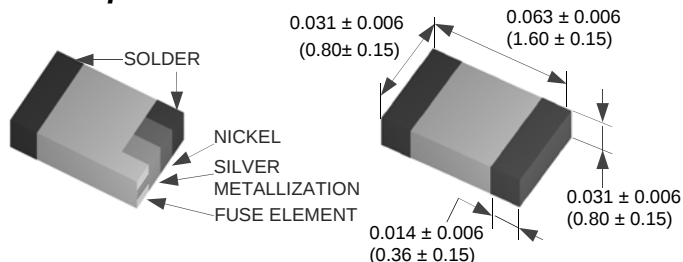
Patents: U.S. Patent numbers 6,034,589, 6,228,230, 6,602,766, and other pending patents

Interrupting Ratings:

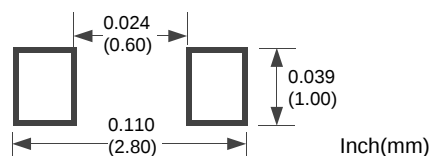
0.25A—1A 50A at rated voltage
1.5A—6A 35A at rated voltage

Marking(Optional): Black Marking Character Code
0.5A:C, 0.75A:D, 1A:E, 1.5A:G, 2A:I, 2.5A:J, 3A:K, 3.5A:L, 4A:M, 5A:N, 6A:O

Shape and Dimensions:



Recommended Land Pattern:



Ordering Information:

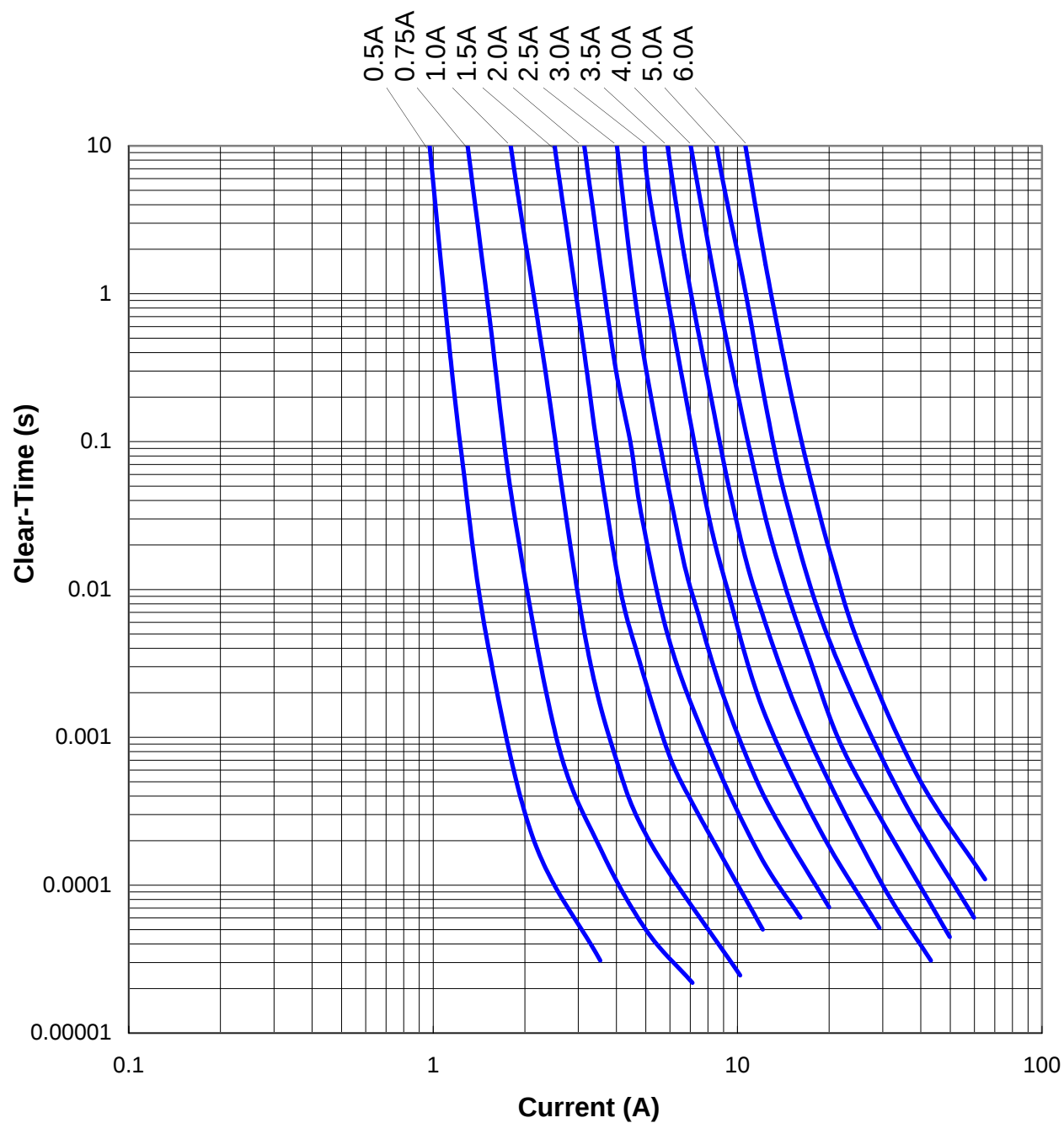
Part Number	Current Rating (A)	Voltage Rating (VDC)	Nominal Cold DCR (Ω) ¹
F0603FA0500V032T	0.5	32	0.485
F0603FA0750V032T	0.75	32	0.254
F0603FA1000V032T	1.0	32	0.131
F0603FA1500V032T	1.5	32	0.059
F0603FA2000V032T	2.0	32	0.044
F0603FA2500V032T	2.5	32	0.032
F0603FA3000V032T	3.0	32	0.025
F0603FA3500V032T	3.5	32	0.024
F0603FA4000V032T	4.0	32	0.018
F0603FA5000V032T	5.0	32	0.013
F0603FA6000V024T	6.0	24	0.010

1. Measured at ≤ 10% rated current and 25°C ambient .

SolidMatrix® 0603 Fast Acting Surface Mount Fuses



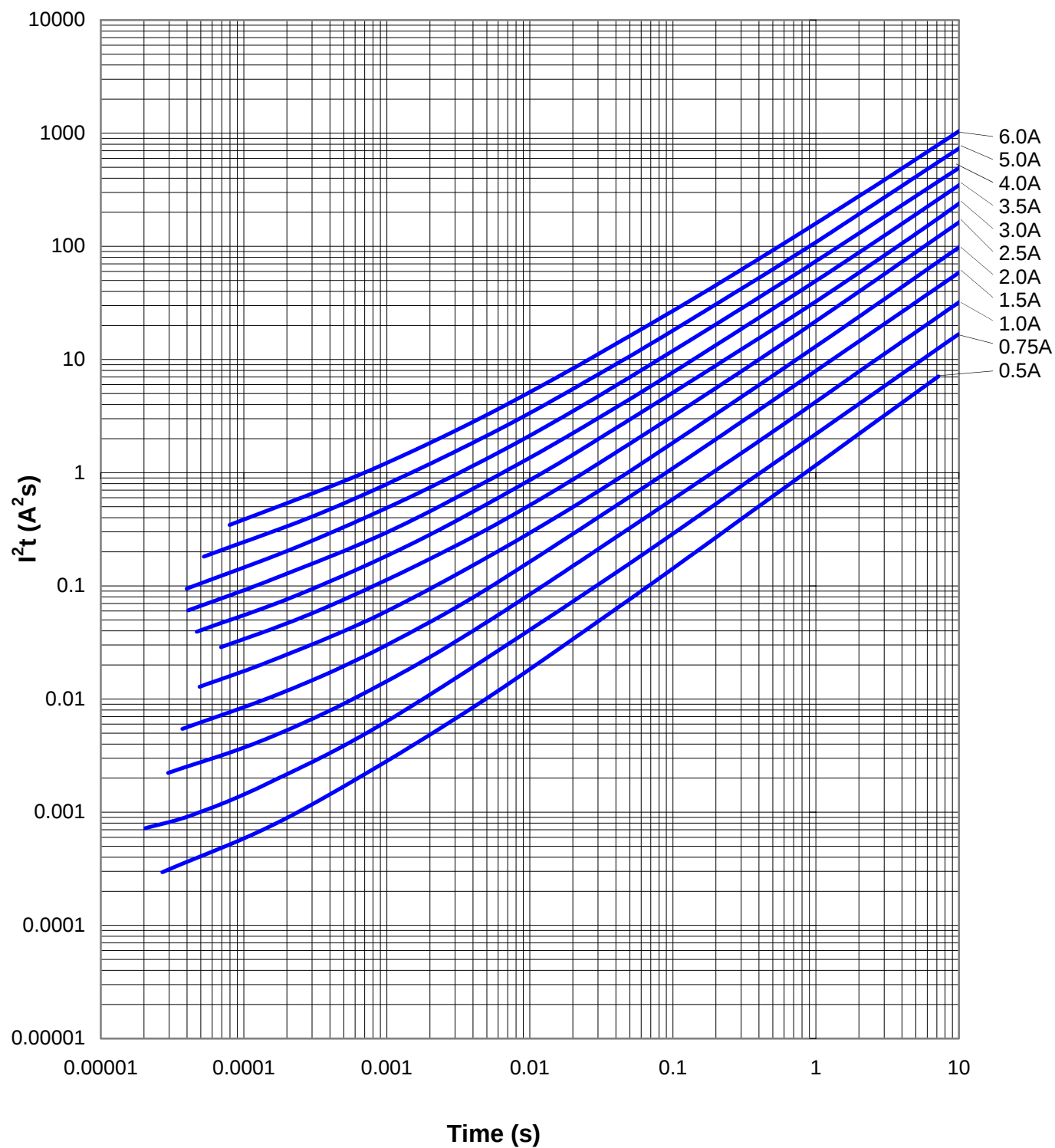
Average Clear-Time Curves



SolidMatrix® 0603 Fast Acting Surface Mount Fuses



I^2t vs. t Curves



SolidMatrix® 0402 Fast Acting Surface Mount Fuses



Features:

- Multilayer monolithic structure with glass ceramic body and silver fusing element
- Silver termination with nickel and pure-tin solder plating, providing excellent solderability
- Compatible with both wave and reflow soldering processes
- Operating temperature range: -55°C to +125°C (with de-rating)
- RoHS compliant



Clear-Time Characteristics (Fast Acting):

% of current rating	Clear-time at 25 °C
100%	4 hours min.
250%	5 seconds max.
400%	0.05 seconds max.

Agency Approval: Recognized Under the Components Program of Underwriters Laboratories, File Number: E232989

Patents: U.S. Patent numbers 6,034,589, 6,228,230, 6,602,766, and other pending patents

Interrupting Ratings:

35A at rated voltage

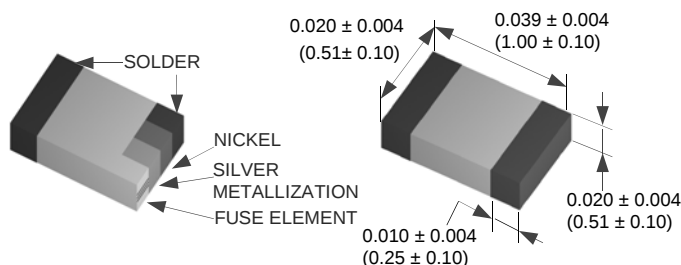
Marking(Optional): Black Marking Character Code
0.5A:C, 0.75A:D, 1A:E, 1.5A:G, 2A:I, 3A:K, 4A:M

Ordering Information:

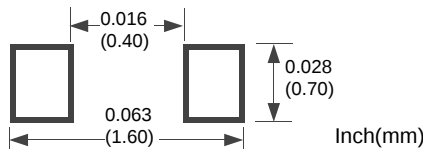
Part Number	Current Rating (A)	Voltage Rating (VDC)	Nominal Cold DCR (Ω) ¹
F0402FA0500V024T	0.5	24	0.380
F0402FA0750V024T	0.75	24	0.210
F0402FA1000V024T	1.0	24	0.120
F0402FA1500V024T	1.5	24	0.056
F0402FA2000V024T	2.0	24	0.035
F0402FA3000V024T	3.0	24	0.021
F0402FA4000V024T	4.0	24	0.014

1. Measured at $\leq 10\%$ rated current and 25°C ambient.

Shape and Dimensions:



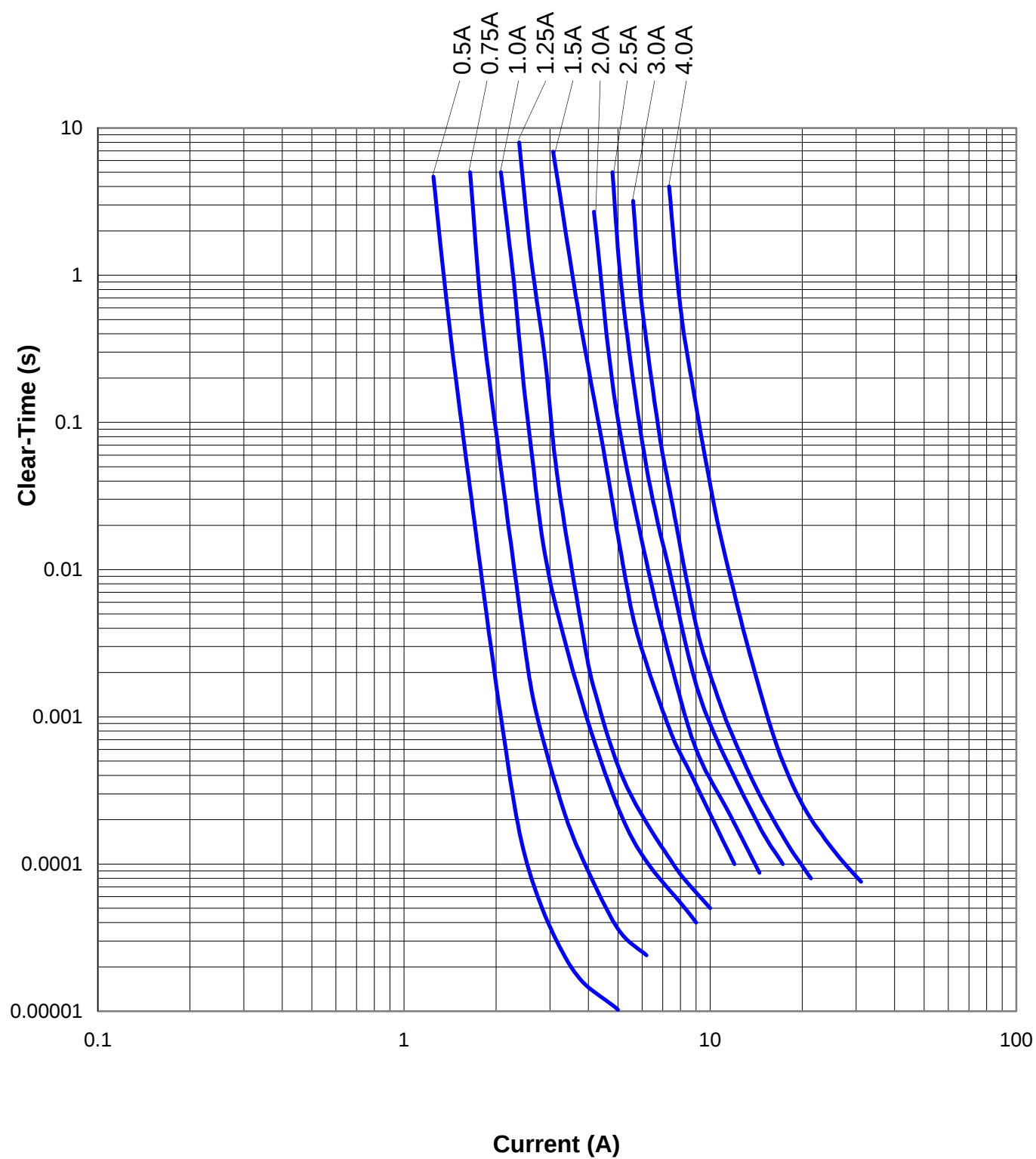
Recommended Land Pattern:



SolidMatrix® 0402 Fast Acting Surface Mount Fuses



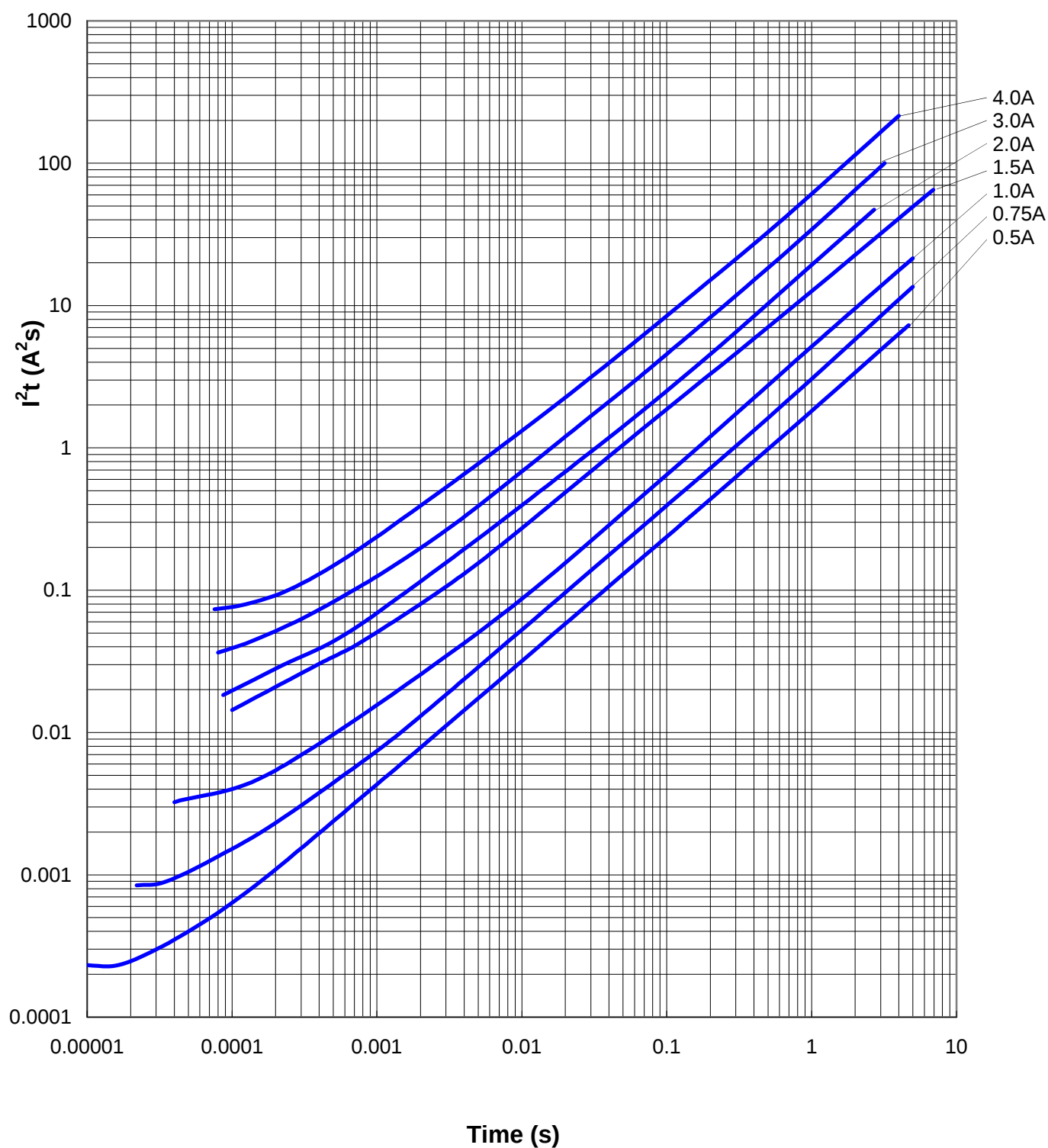
Average Clear-Time Curves



SolidMatrix® 0402 Fast Acting Surface Mount Fuses



I^2t vs. t Curves



SolidMatrix® 1206 Slow Blow Surface Mount Fuses

NEW!


Features:

- High inrush current withstanding capability
- Multilayer monolithic structure with glass ceramic body and silver fusing element
- Silver termination with nickel and pure-tin solder plating, providing excellent solderability
- Compatible with both wave and reflow soldering processes
- Operating temperature range: -55°C + 125°C (with de-rating)
- RoHS compliant



Clear-Time Characteristics (Slow Blow):

% of current rating	Clear-time at 25 °C	
100%	4 hours (Min)	
200%	1 second (Min)	120 seconds (Max)
300%	0.1 seconds (Min)	3 seconds (Max)
800%	0.002 seconds (Min)	0.05 seconds (Max)

Agency Approval: Recognized Under the Components Program of Underwriters Laboratories, File Number: **E232989**

Patents: U.S. Patent numbers 6,034,589, 6,228,230, 6,602,766, and other pending patents

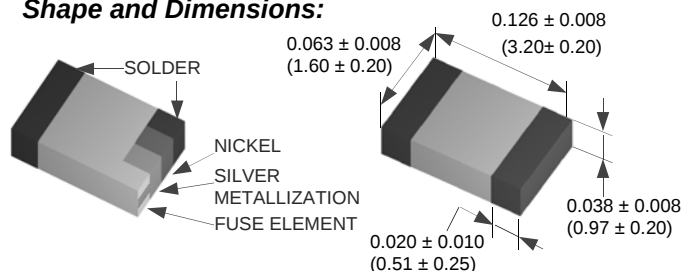
Interrupting Ratings:

1A-5.5A 50A at rated voltage
6A-8A 60A at rated voltage

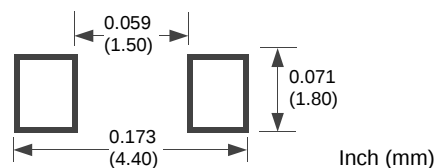
Marking(Optional):

Red Marking Character Code
1A:E, 1.25A:F, 1.5A:G, 2A:I, 2.5A:J, 3A:K, 3.5A:L, 4A:M, 4.5A:T, 5A:N, 5.5A:U, 6A:O, 7A:P, 8A:R

Shape and Dimensions:



Recommended Land Pattern:



Ordering Information:

Part Number	Current Rating (A)	Voltage Rating (VDC)	Nominal Cold DCR (Ω) ¹	Nominal I ² t (A ² s) ²
F1206SB1000V063T	1.0	63	0.360	0.11
F1206SB1250V063T	1.25	63	0.200	0.22
F1206SB1500V063T	1.5	63	0.150	0.23
F1206SB2000V063T	2.0	63	0.082	0.63
F1206SB2500V032T	2.5	32	0.070	0.90
F1206SB3000V032T	3.0	32	0.032	1.20
F1206SB3500V032T	3.5	32	0.028	1.60
F1206SB4000V032T	4.0	32	0.024	2.20
F1206SB4500V032T	4.5	32	0.020	3.60
F1206SB5000V032T	5.0	32	0.016	5.30
F1206SB5500V024T	5.5	24	0.014	6.40
F1206SB6000V024T	6.0	24	0.011	8.50
F1206SB7000V024T	7.0	24	0.010	10.0
F1206SB8000V024T	8.0	24	0.009	16.9

1. Measured at $\leq 10\%$ of rated current and 25°C ambient

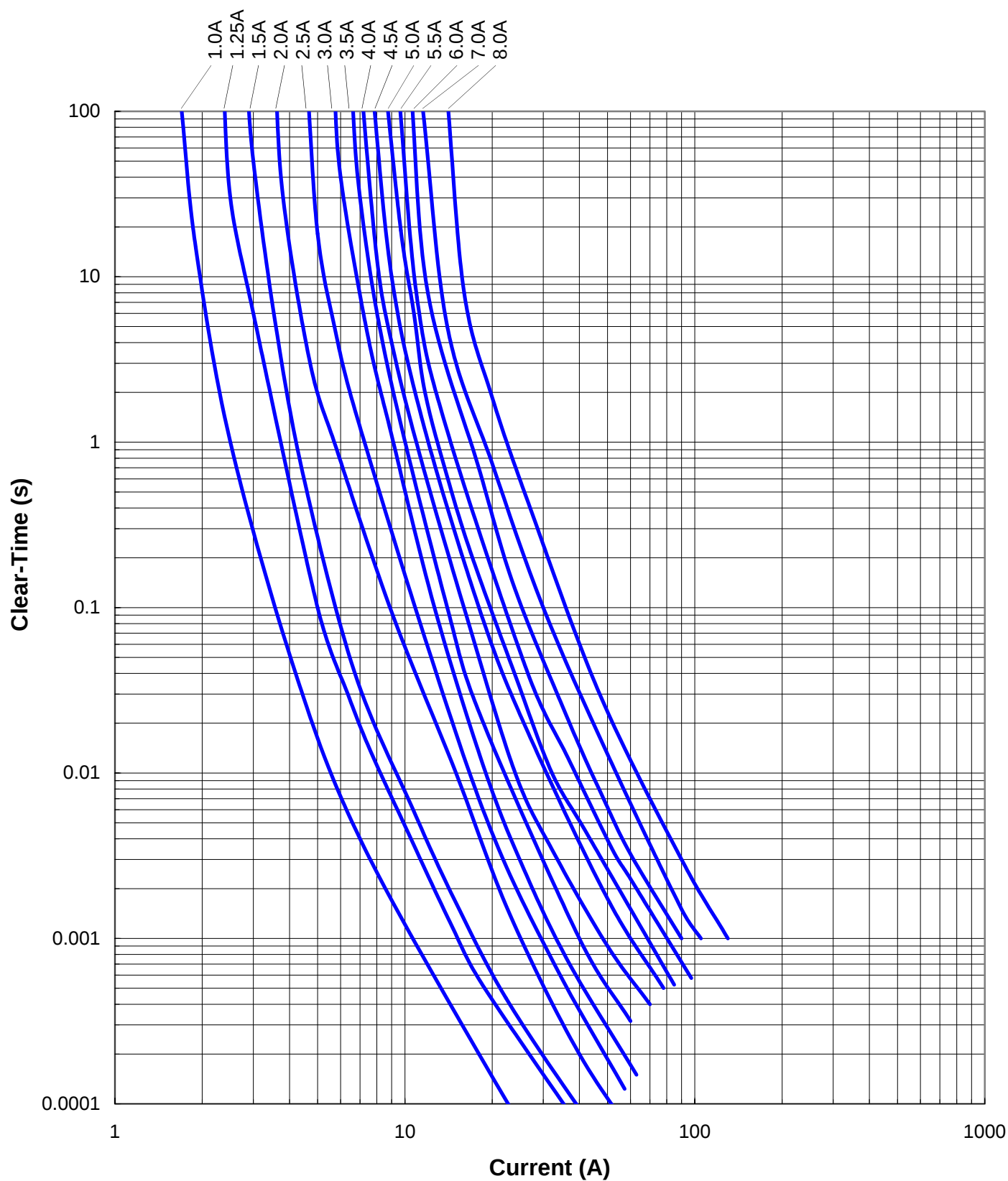
2. Melting I²t at 0.001 sec clear-time

SolidMatrix® 1206 Slow Blow Surface Mount Fuses

NEW!



Average

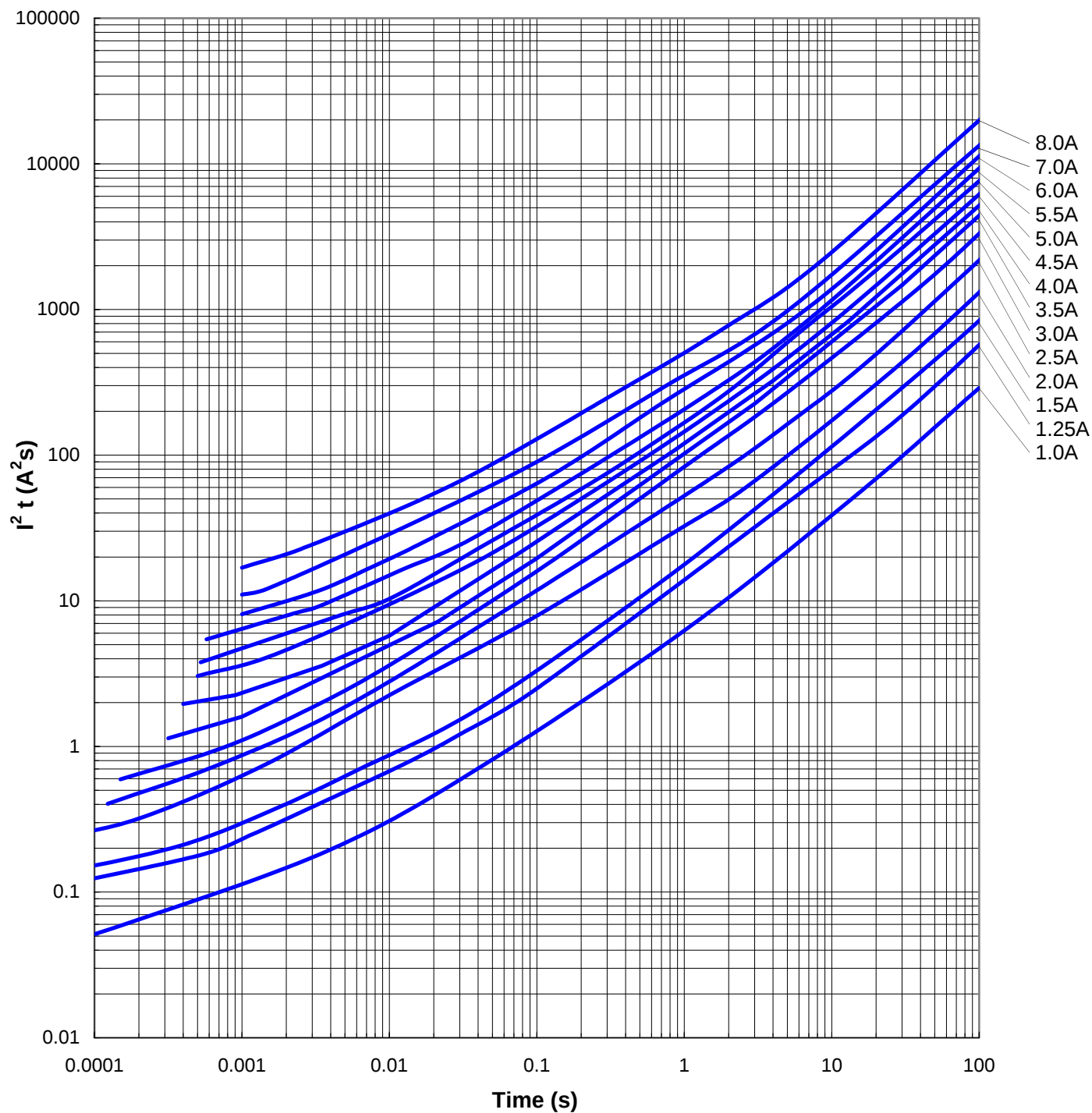


SolidMatrix® 1206 Slow Blow Surface Mount Fuses

NEW!



I^2t vs. t Curves



SolidMatrix® 0603 Slow Blow Surface Mount Fuses

NEW!


Features:

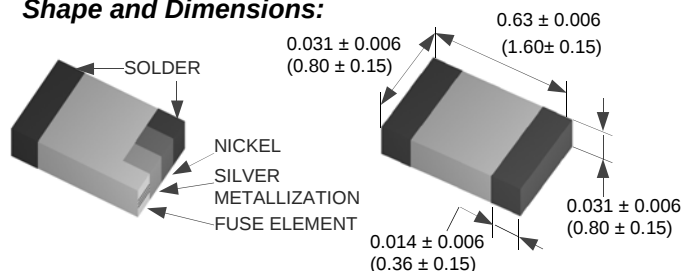
- High inrush current withstanding capability
- Ceramic Monolithic structure
- Silver fusing element and silver termination with nickel and tin plating
- RoHS compliant materials
- Standard EIA0603 / EIAJ(1608) size
- Symmetrical design with marking on both sides (optional)
- Operating temperature: -55°C to 125°C (with de-rating)



Clear-Time Characteristics:

% of Current Rating	Opening Time at 25°C	
	Min.	Max.
100%	4 hours	
200%	1 sec	120 sec
300%	0.1 sec	3 sec
800% (1-1.5A)	0.0005 sec	0.05 sec
800% (2-5A)	0.001 sec	0.05 sec

Shape and Dimensions:



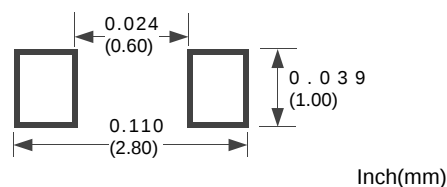
Agency Approval: UL Recognition Pending

Patents: U.S. Patent numbers 6,034,589, 6,228,230,

Interrupting Ratings:

1A-5A 40A at 32VDC

Recommended Land Pattern:



Marking(Optional): Red Marking Character Code

1A:E, 1.5A:G, 2A:I, 2.5A:J, 3A:K, 3.5A:L, 4A:M, 4.5A:T, 5A:N

Ordering Information:

Part Number	Current Rating (A)	Voltage Rating (VDC)	Nominal Cold DCR (Ω) ¹	Nominal I^2t (A ² s) ²
F0603SB1000V032T	1.00	32	0.200	0.093
F0603SB1500V032T	1.50	32	0.100	0.18
F0603SB2000V032T	2.00	32	0.052	0.32
F0603SB2500V032T	2.50	32	0.041	0.63
F0603SB3000V032T	3.00	32	0.031	0.87
F0603SB3500V032T	3.50	32	0.021	1.20
F0603SB4000V032T	4.00	32	0.017	2.30
F0603SB4500V032T	4.50	32	0.015	2.70
F0603SB5000V032T	5.00	32	0.013	3.20

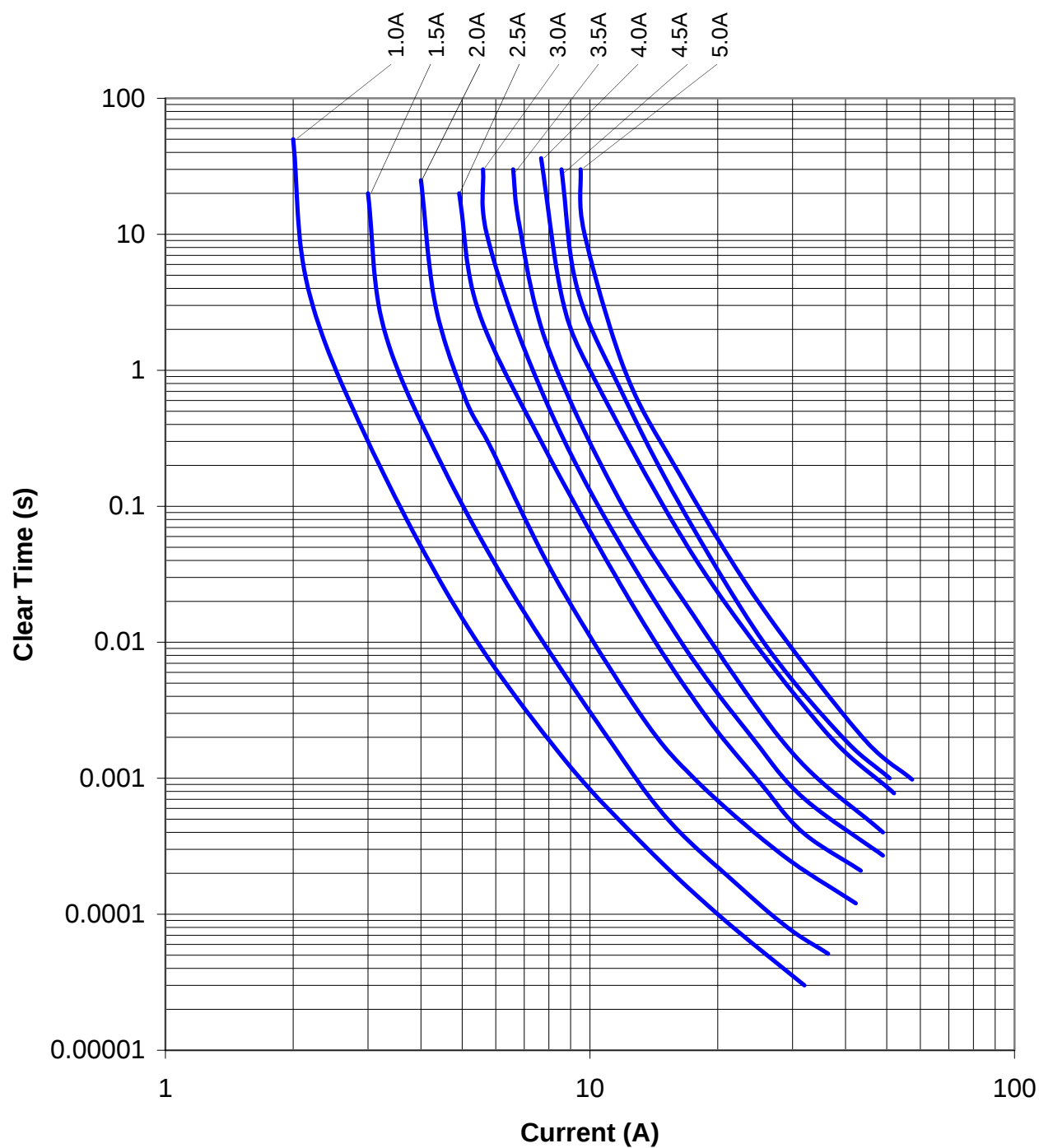
1. Measured at $\leq 10\%$ of rated current and 25°C ambient

2. Melting I^2t at 0.001 sec clear-time

SolidMatrix® 0603 Slow Blow Surface Mount Fuses

NEW!


Average Clear-Time Curves

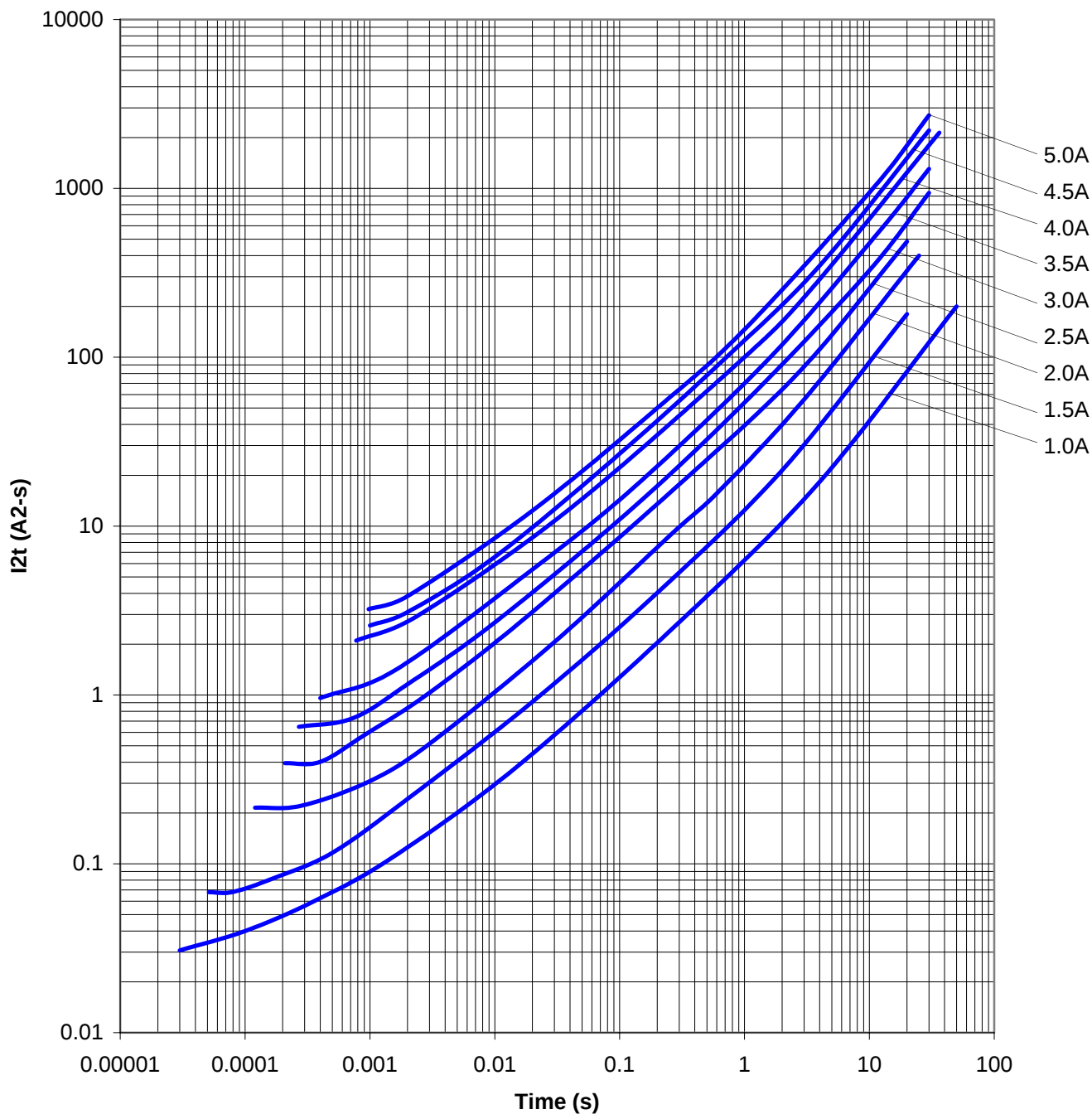


SolidMatrix® 0603 Slow Blow Surface Mount Fuses

NEW!



I^2t vs. t Curves



SolidMatrix 1206 High Inrush Current Surface Mount Fuses

Features:

- High inrush current withstanding capability
- Ceramic Monolithic structure
- Silver fusing element and silver termination with nickel and tin plating
- RoHS compliant materials
- Standard EIA 1206/EIAJ(3216) size
- Symmetrical design with marking on both sides (optional)
- Operating temperature: -55°C to 125 °C (with de-rating)



Clear-Time Characteristics:

% of Current Rating	Opening Time at 25°C	
	Min.	Max.
100%	4 hours	
200%	1 sec	60 sec
1000%	0.0002 sec	0.02 sec

Agency Approval: UL Recognition pending

Patents: US Patent numbers 6,034,589, 6,228,230, 6,602,766, and other pending patents

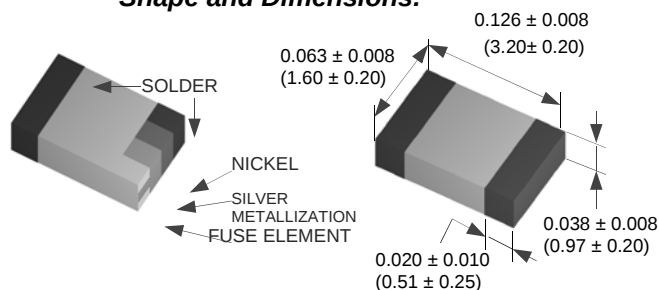
Interrupting Ratings

1A - 5A: 50A at rating voltage

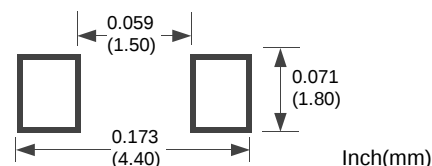
Marking(Optional): Green Marking Character Code

1A:E, 1.5A:G, 2A:I, 2.5A:J, 3A:K, 3.5A:L, 4A:M, 4.5A:T, 5A:N

Shape and Dimensions:



Recommended Land Pattern:



Ordering Information:

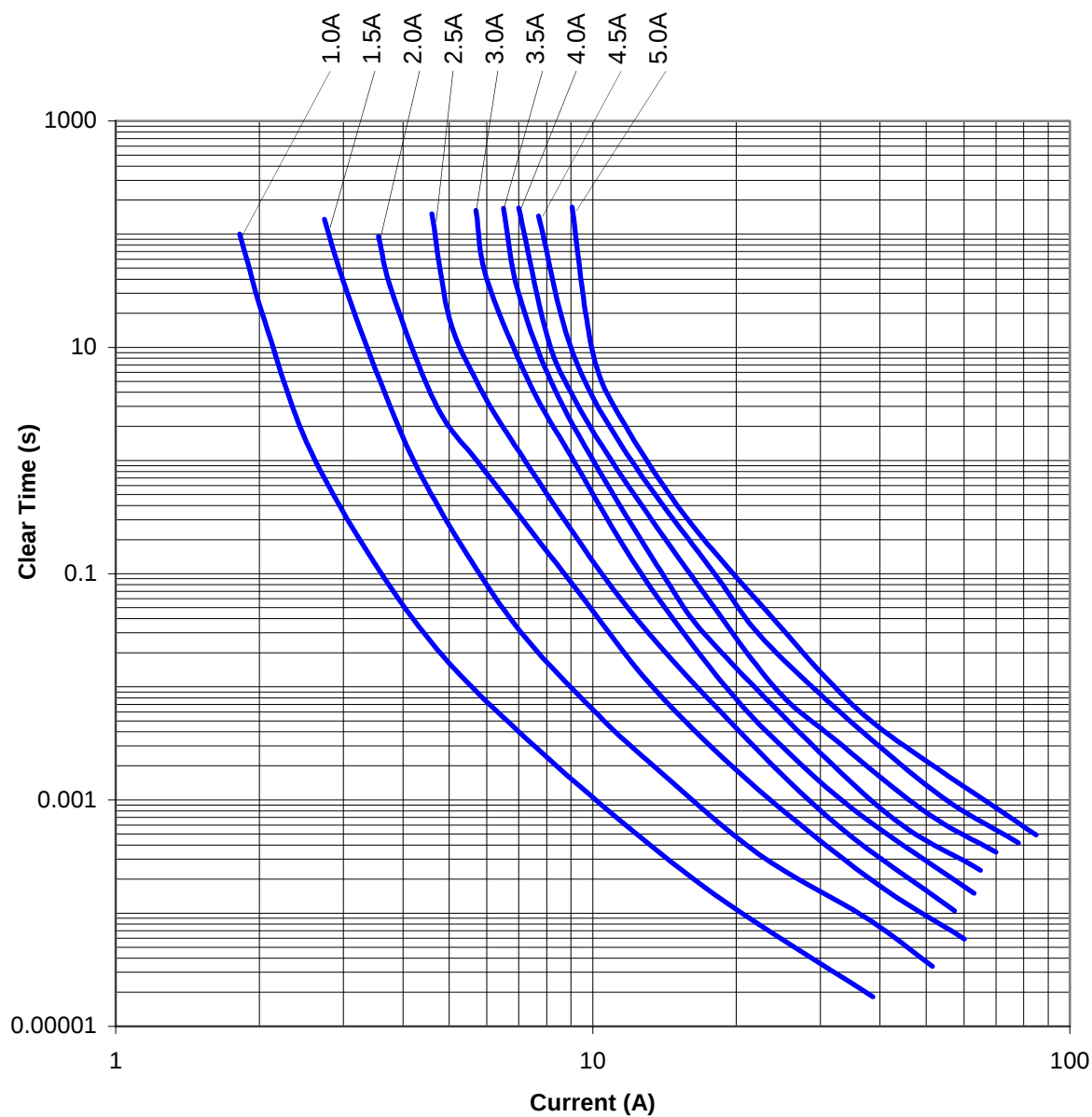
Part Number	Current Rating (A)	Voltage Rating (VDC)	Nominal Cold DCR (Ω) ¹	Nominal I^2t (A ² s) ²
F1206HI1000V063T	1.00	63	0.340	0.11
F1206HI1500V063T	1.50	63	0.150	0.33
F1206HI2000V063T	2.00	63	0.090	0.80
F1206HI2500V032T	2.50	32	0.070	1.19
F1206HI3000V032T	3.00	32	0.035	1.35
F1206HI3500V032T	3.50	32	0.029	1.84
F1206HI4000V032T	4.00	32	0.023	2.74
F1206HI4500V032T	4.50	32	0.021	3.20
F1206HI5000V032T	5.00	32	0.017	5.50

1. Measured at $\leq 10\%$ of rated current and 25°C ambient

2. Melting I^2t at 1000% of current rating

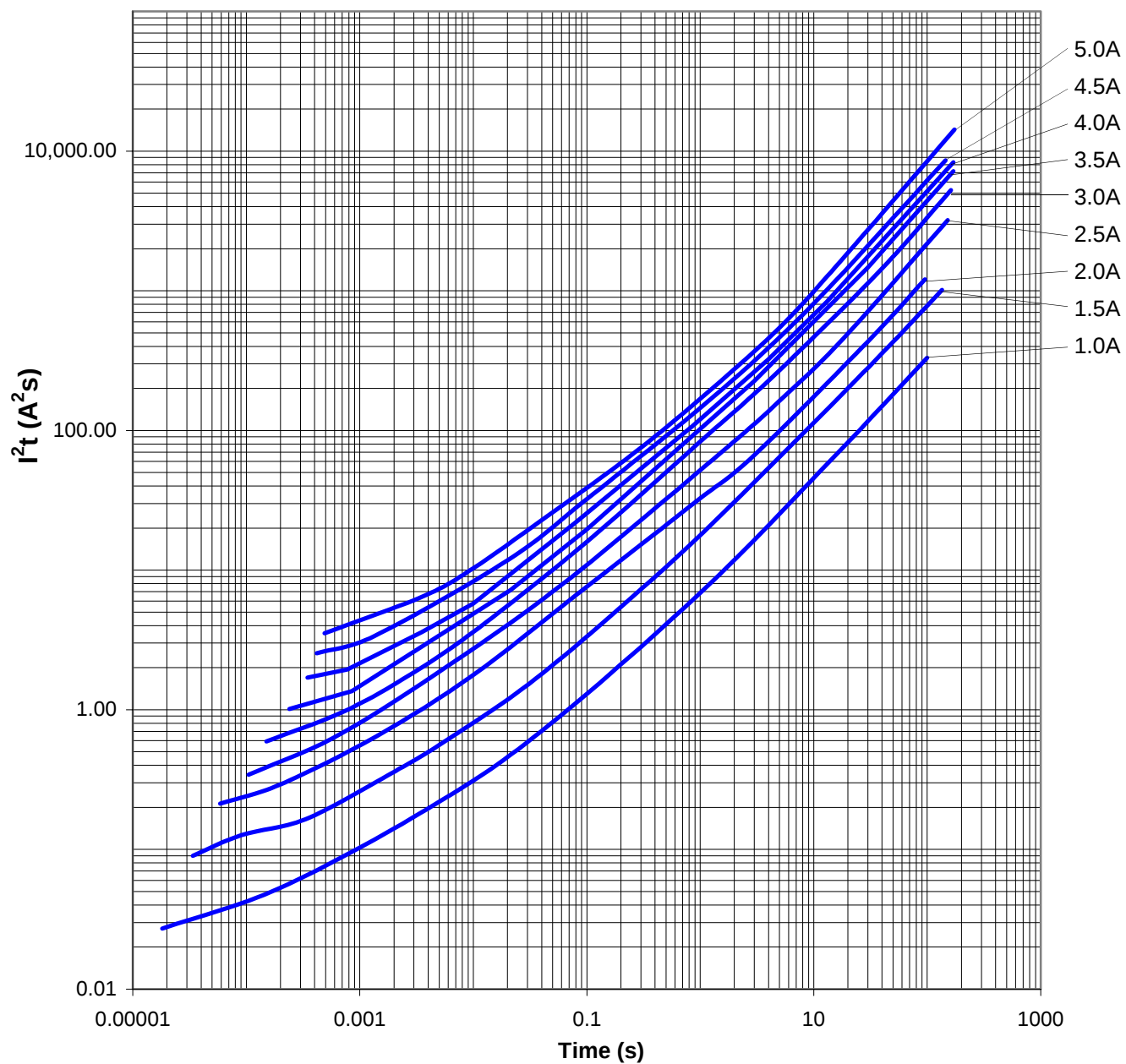
SolidMatrix 1206 High Inrush Current Surface Mount Fuses

Average Clear-Time Curves



SolidMatrix 1206 High Inrush Current Surface Mount Fuses

I^2t vs. t Curves



SolidMatrix 0603 High Inrush Current Surface Mount Fuses

Features:

- High inrush current withstanding capability
- Ceramic Monolithic structure
- Silver fusing element and silver termination with nickel and tin plating
- RoHS compliant materials
- Standard EIA 0603/EIAJ(32161608) size
- Symmetrical design with marking on both sides (optional)
- Operating temperature: -55°C to 125 °C (with de-rating)



Clear-Time Characteristics:

% of Current Rating	Opening Time at 25°C	
	Min.	Max.
100%	4 hours	
200%	1 sec	60 sec
1000%	0.0002 sec	0.02 sec

Agency Approval: UL Recognition pending

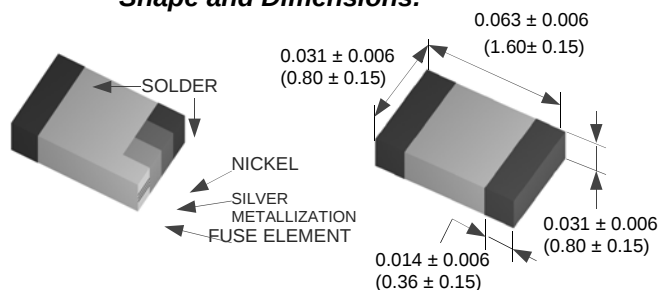
Patents: US Patent numbers 6,034,589, 6,228,230, 6,602,766, and other pending patents

Interrupting Ratings

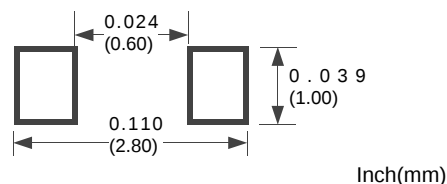
1A - 5A: 50A at rating voltage

Marking(Optional): Green Marking Character Code
1A:E, 1.5A:G, 2A:I, 2.5A:J, 3A:K, 3.5A:L, 4A:M, 4.5A:T, 5A:N

Shape and Dimensions:



Recommended Land Pattern:



Ordering Information:

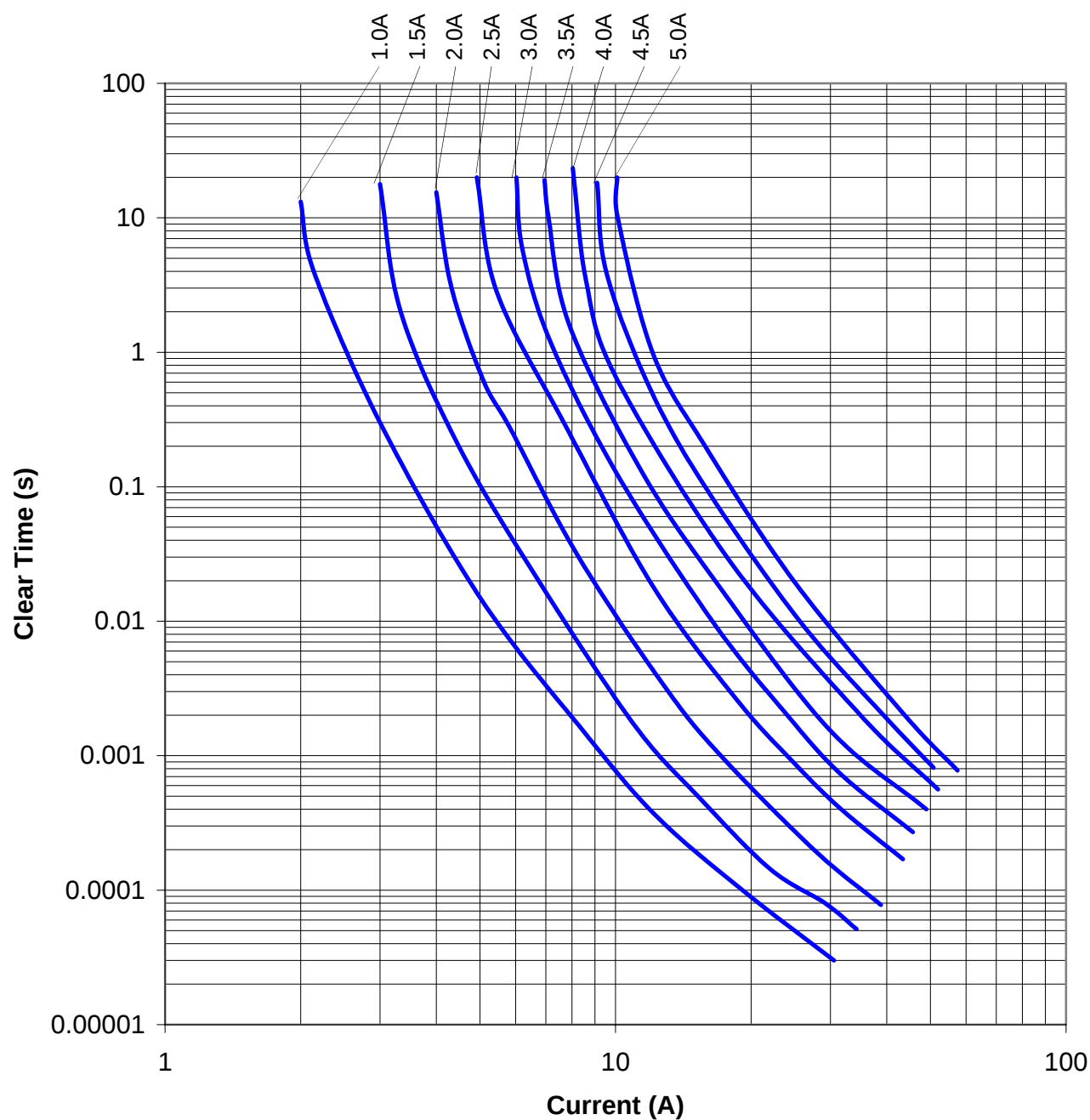
Part Number	Current Rating (A)	Voltage Rating (VDC)	Nominal Cold DCR (Ω) ¹	Nominal I^2t (A^2s) ²
F0603HI1000V032T	1.00	32	0.190	0.08
F0603HI1500V032T	1.50	32	0.101	0.11
F0603HI2000V032T	2.00	32	0.057	0.24
F0603HI2500V032T	2.50	32	0.042	0.56
F0603HI3000V032T	3.00	32	0.030	0.72
F0603HI3500V032T	3.50	32	0.022	1.10
F0603HI4000V032T	4.00	32	0.018	2.08
F0603HI4500V032T	4.50	32	0.014	2.63
F0603HI5000V032T	5.00	32	0.013	3.25

1. Measured at $\leq 10\%$ of rated current and 25°C ambient

2. Melting I^2t at 1000% of current rating

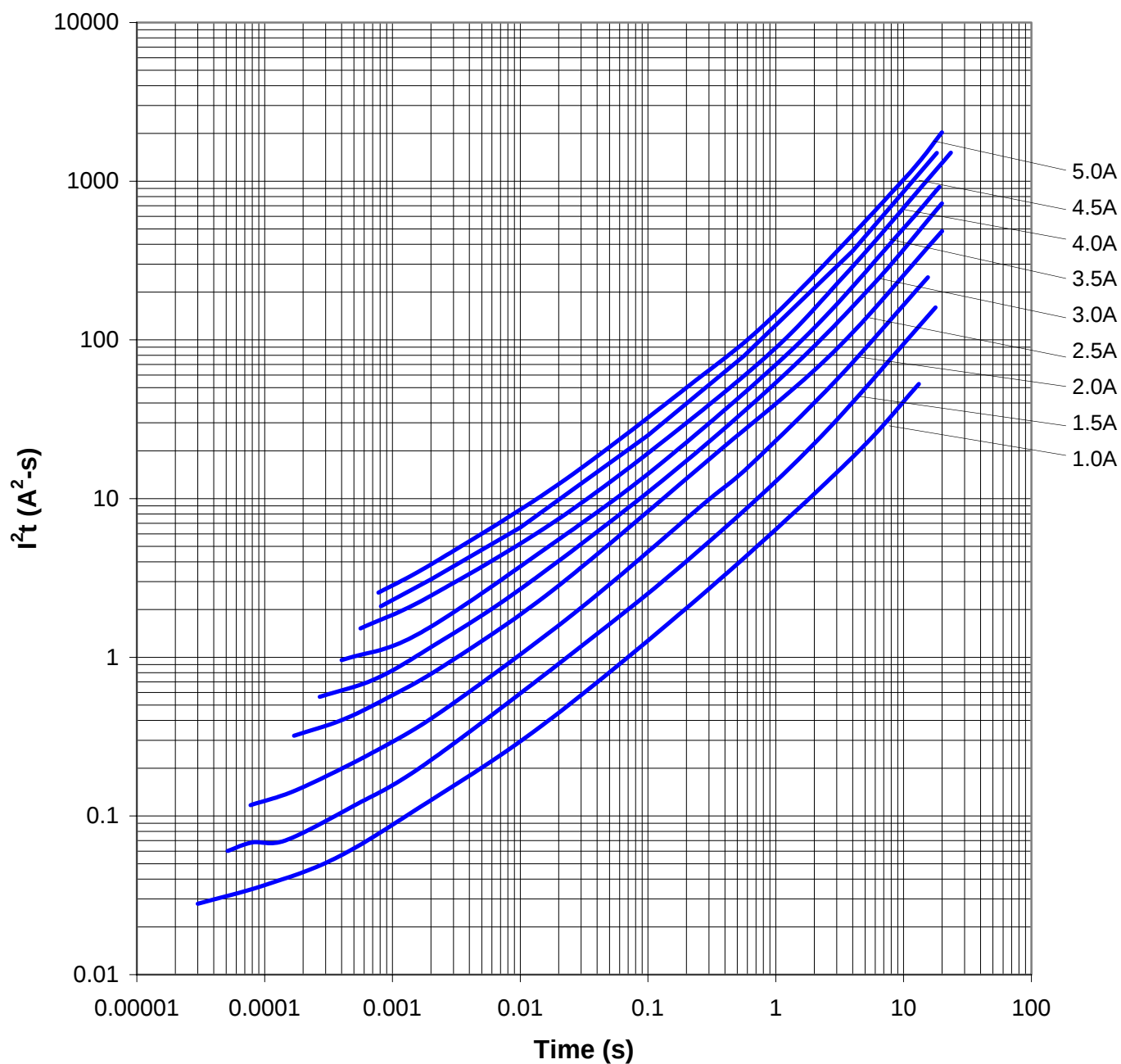
SolidMatrix 0603 High Inrush Current Surface Mount Fuses

Average Clear-Time Curves



SolidMatrix 0603 High Inrush Current Surface Mount Fuses

I^2t vs. t Curves



SolidMatrix® Surface Mount Fuses



Product Identification:

F 0402 FA 1000 V024 T
(1) (2) (3) (4) (5) (6)

- (1) **Series code:** F — Chip Fuse
(2) **Size code:** Standard EIA Chip Size
(3) **Action code:** FA — Fast Acting; SB — Slow Blow; HI — High Inrush
(4) **Current rating code:** 1000 — 1000 mA
(5) **Voltage rating code:** V024 — 24 VDC
(6) **Package code:** T — Tape & Reel, B — Bulk

Reliability Tests:

No.	Test	Requirement	Test condition	Test reference
1	Soldering heat resistance	DCR change $\leq \pm 10\%$ No mechanical damage	One dip at 260°C for 60 sec.	MIL-STD-202 Method 210
2	Solderability	Minimum 95% coverage	One dip at 235°C for 5 sec.	MIL-STD-202 Method 208
3	Thermal shock	DCR change $\leq \pm 10\%$ No mechanical damage	100 cycles between -65°C and +125°C	MIL-STD-202 Method 107
4	Moisture resistance	DCR change $\leq \pm 15\%$ No excessive corrosion	10 cycles	MIL-STD-202 Method 106
5	Salt spray	DCR change $\leq \pm 10\%$ No excessive corrosion	48 hour exposure	MIL-STD-202 Method 101
6	Mechanical vibration	DCR change $\leq \pm 10\%$ No mechanical damage	0.4" D.A. or 30 G between 5 – 3000 Hz	MIL-STD-202 Method 204
7	Mechanical shock	DCR change $\leq \pm 10\%$ No mechanical damage	1500 G, 0.5 ms, half-sine shocks	MIL-STD-202 Method 213
8	Terminal strength	DCR change $\leq \pm 10\%$ No mechanical damage	30 sec. hanging for 1206 (1.5kg) and 0603 (0.5kg) 2 lb pushing for 0402	Refer to AEM IQ007
9	Life	No electrical "opens" during testing voltage drop change shall be less than $\pm 20\%$ of initial value	80% rated current ambient temperature +25°C to +28°C ,2000 hours	Refer to AEM Engrep 498
10	Bending	No electrical "opens" during testing	2mm bending, more than 5 seconds	Refer to AEM IQ034

Electrical Specifications:

Clear-Time Characteristics: Same as specified on the Short Form Data Sheet

Insulation Resistance after Opening: 20,000 ohms minimum when cleared with rated voltage applied. Fuse clearing under low voltage conditions may result in lower after clearing insulation resistance values. (Note: Under normal fault conditions (low or rated voltage conditions), AEM SolidMatrix fuses provide sufficient after clearing insulation resistance values for circuit protection.)

Current Carrying Capacity: 100% rated current at +25°C ambient for 4 hours minimum when evaluated per MIL-PRF-23419

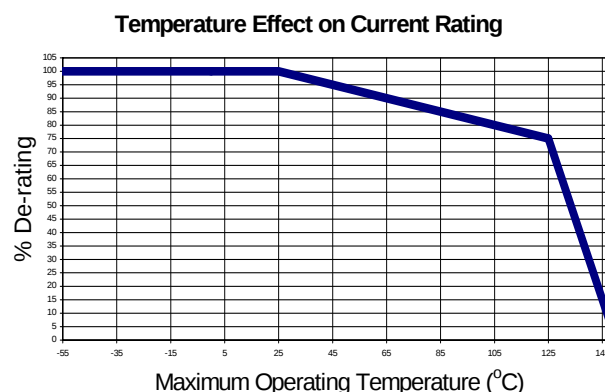
Interrupt Ratings: Same as specified on the Short Form Data Sheet

Fuse Selection and Temperature De-rating Guideline:

The ambient temperature affects the current carrying capacity of fuses. When a fuse is operating at a temperature higher than 25°C, the fuse shall be "de-rated".

To select a fuse from the catalog, the following rule may be followed:
Catalog Fuse Current Rating = Nominal Operating Current / 0.75 / % De-rating at the maximum operating temperature.

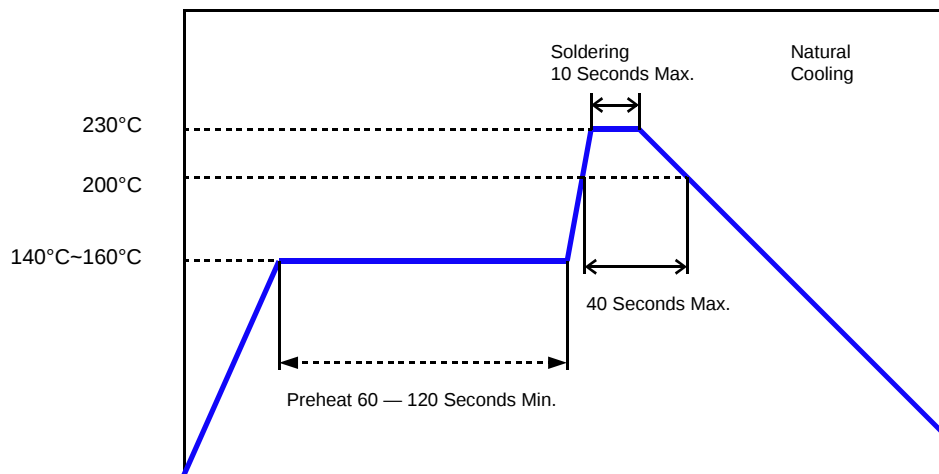
Example: At maximum operating temperature of 65°C, % De-rating is 90%. The nominal operating current is 4A. The current rating for fuse selected from the catalog shall be:
 $4 / 0.75 / 90\% = 5.9$ or 6A.



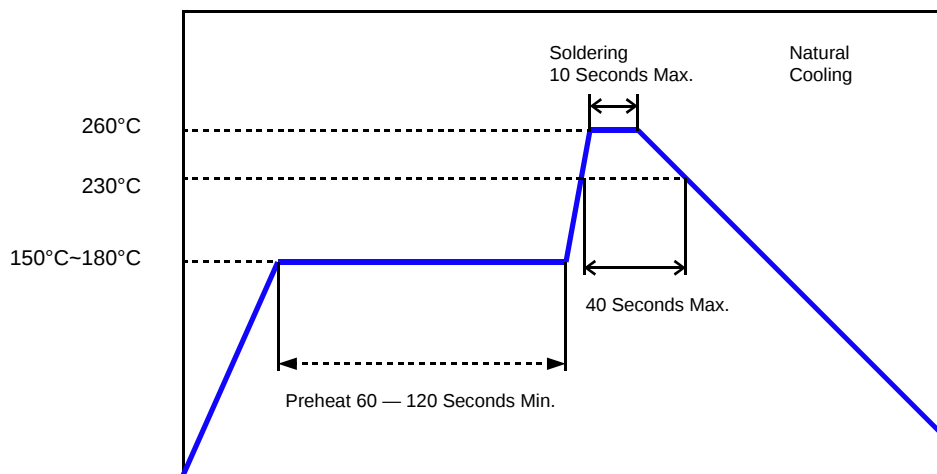
SolidMatrix® Surface Mount Fuses

Soldering Temperature Profiles

**Recommended Temperature Profile
for Sn/Pb Solder**



**Recommended Temperature Profile
for Lead-free Solder**



Maximum peak temperature 260°C for maximum 60 seconds

Recommended conditions for hand soldering:

1. Preheating: 150°C, 60s (min)
Appropriate temperature (max) of soldering iron tip/soldering time (max): 280°C /10s or 350°C / 3s
Maximum temperature of soldering iron tip/soldering time : 350°C /9s or 400°C / 8s
2. Using hot air rework station with tip that can melt the solder on both terminations of the same time is strongly recommended, don't directly contact the chip termination with the tip of soldering iron

ES Series of Surface Mount Multilayer Varistors

Features:

- Fast Response < 0.5ns
- Low Working Voltage 3.3V
- Low Capacitance
- Low Leakage Current < 0.1 μ A
- Low Clamping Voltage

Applications:

- Cell Phones
- Digital Cameras
- PDAs
- MP3
- Notebooks

Part Number	Working Voltage (max)	Clamping Voltage (max)	Leakage Current	Cap.	Tolerance of Cap.
	DC (V)	(V)	I _{LDC} (μ A)	(pF)	(%)
MLV0402ES005V0100N	5	28	0.1	100	± 30
MLV0402ES005V0082N	5	35	0.1	82	± 30
MLV0402ES005V0056N	5	35	0.1	56	± 30
MLV0402ES005V0033N	5	35	0.1	33	± 30
MLV0402ES005V0022N	5	35	0.1	22	± 30
MLV0402ES005V0010N	5	50	0.1	10	± 30
MLV0402ES005V0005P	5	45	0.1	5	+80 / -20
MLV0402ES012V0100N	12	35	0.1	100	± 30
MLV0402ES012V0082N	12	45	0.1	82	± 30
MLV0402ES012V0056N	12	45	0.1	56	± 30
MLV0402ES012V0033N	12	45	0.1	33	± 30
MLV0402ES012V0022N	12	45	0.1	22	± 30
MLV0402ES012V0010N	12	60	0.1	10	± 30
MLV0402ES012V0005P	12	65	0.1	5	+80 / -20
MLV0402ES024V02R5P	24	200	0.1	2.5	+80 / -20
MLV0603ES005V0100N	5	28	0.1	100	± 30
MLV0603ES005V0082N	5	35	0.1	82	± 30
MLV0603ES005V0056N	5	35	0.1	56	± 30
MLV0603ES005V0033N	5	35	0.1	33	± 30
MLV0603ES005V0022N	5	35	0.1	22	± 30
MLV0603ES005V0010N	5	50	0.1	10	± 30
MLV0603ES005V0005P	5	50	0.1	5	+80 / -20
MLV0603ES012V0100N	12	40	0.1	100	± 30
MLV0603ES012V0082N	12	45	0.1	82	± 30
MLV0603ES012V0056N	12	45	0.1	56	± 30
MLV0603ES012V0033N	12	45	0.1	33	± 30
MLV0603ES012V0022N	12	45	0.1	22	± 30
MLV0603ES012V0010N	12	60	0.1	10	± 30
MLV0603ES012V0005P	12	72	0.1	5	+80 / -20
MLV0603ES024V02R5P	24	200	0.1	2.5	+80 / -20

NA Series of Surface Mount Multilayer Varistors

Features:

- Fast Response < 0.5ns
- Low Capacitance
- Low Clamping Voltage and High Energy Absorption

Applications:

- Telecommunications
- Automotive Systems
- Data Systems
- Power Supplies

Part Number	Working Voltage (max)		Breakdown Voltage	Peak Current (max)	Clamping Voltage (max)		Energy Absorption (max)	Typical Capacitance
	AC (V_{RMS})	DC (V)	1mA (V)	8/20 μ s (A)	(A)	(V)	10/1000 μ s (J)	1KHz (pF)
MLV0402NA003V0020	2.5	3.3	5(4.0~6.0)	20	1	10	0.05	390
MLV0402NA006V0020	4	5.5	8(6.4~9.6)	20	1	16	0.05	295
MLV0402NA009V0020	6	9	12(10.2~13.8)	20	1	20	0.05	190
MLV0402NA011V0020	8	11	15(12.8~17.3)	20	1	25	0.05	160
MLV0402NA014V0020	11	14	18(16.2~19.8)	20	1	30	0.05	135
MLV0402NA017V0020	12	16.5	22(19.8~24.2)	20	1	36	0.05	105
MLV0402NA018V0020	14	18	24(21.6~26.4)	20	1	40	0.05	93
MLV0402NA022V0020	17	22	27(24.3~29.7)	20	1	45	0.05	75
MLV0402NA026V0020	20	26	33(29.7~36.3)	20	1	54	0.05	54
MLV0402NA030V0020	25	30	39(35.1~42.9)	20	1	65	0.05	45
MLV0402NA038V0020	30	38	47(42.3~51.7)	20	1	77	0.05	27
MLV0603NA003V0030	2.5	3.3	5(4.0~6.0)	30	1	10	0.1	1250
MLV0603NA006V0030	4	5.5	8(6.4~9.6)	30	1	16	0.1	800
MLV0603NA009V0030	6	9	12(10.2~13.8)	30	1	20	0.1	680
MLV0603NA011V0030	8	11	15(12.8~17.3)	30	1	25	0.1	460
MLV0603NA014V0030	11	14	18(16.2~19.8)	30	1	30	0.1	350
MLV0603NA017V0030	12	16.5	22(19.8~24.2)	30	1	36	0.1	300
MLV0603NA018V0030	14	18	24(21.6~26.4)	30	1	39	0.1	270
MLV0603NA022V0030	17	22	27(24.3~29.7)	30	1	44	0.1	235
MLV0603NA026V0030	20	26	33(29.7~36.3)	30	1	54	0.1	200
MLV0603NA030V0030	25	30	39(35.1~42.9)	30	1	65	0.1	120
MLV0603NA038V0030	30	38	47(42.3~51.7)	30	1	77	0.1	100
MLV0603NA045V0030	35	45	56(50.4~61.6)	30	1	90	0.1	80
MLV0805NA003V0040	2.5	3.3	5(4.0~6.0)	40	1	10	0.1	2450
MLV0805NA006V0080	4	5.5	8(6.4~9.6)	80	1	16	0.1	1600
MLV0805NA009V0080	6	9	12(10.2~13.8)	80	1	20	0.1	1180
MLV0805NA011V0100	8	11	15(12.8~17.3)	100	1	25	0.1	1050
MLV0805NA014V0100	11	14	18(16.2~19.8)	100	1	30	0.1	750
MLV0805NA017V0100	12	16.5	22(19.8~24.2)	100	1	36	0.2	680
MLV0805NA018V0100	14	18	24(21.6~26.4)	100	1	39	0.2	550

NA Series of Surface Mount Multilayer Varistors

Part Number	Working Voltage (max)		Breakdown Voltage	Peak Current (max)	Clamping Voltage (max)		Energy Absorption (max)	Typical Capacitance
	AC (V _{RMS})	DC (V)	1mA (V)	8/20μs (A)	(A)	(V)	10/1000μs (J)	1KHz (pF)
MLV0805NA022V0100	17	22	27(24.3~29.7)	100	1	44	0.2	400
MLV0805NA026V0100	20	26	33(29.7~36.3)	100	1	54	0.3	350
MLV0805NA030V0100	25	30	39(35.1~42.9)	100	1	65	0.3	310
MLV0805NA038V0100	30	38	47(42.3~51.7)	100	1	77	0.3	280
MLV0805NA045V0080	35	45	56(50.4~61.6)	80	1	90	0.3	195
MLV0805NA056V0080	40	56	68(61.2~74.8)	80	1	110	0.3	145
MLV0805NA065V0060	50	65	82(73.8~90.2)	60	1	135	0.3	85
MLV1206NA003V0060	2.5	3.3	5(4.0~6.0)	60	1	10	0.1	3850
MLV1206NA006V0100	4	5.5	8(6.4~9.6)	100	1	16	0.2	3200
MLV1206NA009V0100	6	9	12(10.2~13.8)	100	1	20	0.2	2200
MLV1206NA011V0100	8	11	15(12.8~17.3)	100	1	25	0.2	1300
MLV1206NA014V0100	11	14	18(16.2~19.8)	100	1	30	0.3	1150
MLV1206NA017V0100	12	16.5	22(19.8~24.2)	100	1	36	0.3	1000
MLV1206NA018V0100	14	18	24(21.6~26.4)	100	1	38	0.3	900
MLV1206NA022V0100	17	22	27(24.3~29.7)	100	1	44	0.4	840
MLV1206NA026V0100	20	26	33(29.7~36.3)	100	1	54	0.5	490
MLV1206NA030V0100	25	30	39(35.1~42.9)	100	1	65	0.6	440
MLV1206NA038V0100	30	38	47(42.3~51.7)	100	1	77	0.7	400
MLV1206NA045V0100	35	45	56(50.4~61.6)	100	1	90	0.8	310
MLV1206NA056V0100	40	56	68(61.2~74.8)	100	1	110	1.0	280
MLV1206NA065V0100	50	65	82(73.8~90.2)	100	1	135	0.5	240
MLV1206NA085V0100	60	85	100(90.0~110.0)	100	1	165	0.6	160
MLV1206NA090V0100	70	90	110(99.0~121.0)	100	1	180	0.6	120
MLV1210NA006V0250	4	5.5	8(6.4~9.6)	250	2.5	16	0.4	6200
MLV1210NA009V0250	6	9	12(10.2~13.8)	250	2.5	20	0.5	4400
MLV1210NA011V0250	8	11	15(12.8~17.3)	250	2.5	25	0.6	3520
MLV1210NA014V0250	11	14	18(16.2~19.8)	250	2.5	30	0.7	3260
MLV1210NA017V0250	12	16.5	22(19.8~24.2)	250	2.5	36	0.8	2100
MLV1210NA018V0250	14	18	24(21.6~26.4)	250	2.5	38	0.8	1950
MLV1210NA022V0250	17	22	27(24.3~29.7)	250	2.5	44	1.0	1720
MLV1210NA026V0250	20	26	33(29.7~36.3)	250	2.5	54	1.2	1090
MLV1210NA030V0250	25	30	39(35.1~42.9)	250	2.5	65	1.4	920
MLV1210NA038V0250	30	38	47(42.3~51.7)	250	2.5	77	1.6	780
MLV1210NA045V0250	35	45	56(50.4~61.6)	250	2.5	90	2.0	470

NA Series of Surface Mount Multilayer Varistors

Part Number	Working Voltage (max)		Breakdown Voltage	Peak Current (max)	Clamping Voltage (max)		Energy Absorption (max)	Typical Capacitance
	AC (V _{RMS})	DC (V)	1mA (V)	8/20μs (A)	(A)	(V)	10/1000μs (J)	1KHz (pF)
MLV1210NA056V0250	40	56	68(61.2~74.8)	250	2.5	110	2.3	390
MLV1210NA065V0250	50	65	82(73.8~90.2)	250	2.5	135	1.2	320
MLV1210NA085V0200	60	85	100(90.0~110.0)	200	2.5	165	1.4	220
MLV1210NA090V0200	70	90	110(99.0~121.0)	200	2.5	180	1.4	200
MLV1812NA009V0500	6	9	12(10.2~13.8)	500	5	20	0.9	9150
MLV1812NA011V0500	8	11	15(12.8~17.3)	500	5	25	1.2	7320
MLV1812NA014V0500	11	14	18(16.2~19.8)	500	5	30	1.4	6100
MLV1812NA017V0500	12	16.5	22(19.8~24.2)	500	5	36	1.6	4300
MLV1812NA018V0500	14	18	24(21.6~26.4)	500	5	38	1.7	3930
MLV1812NA022V0500	17	22	27(24.3~29.7)	500	5	44	2.0	3500
MLV1812NA026V0500	20	26	33(29.7~36.3)	500	5	54	2.5	2900
MLV1812NA030V0500	25	30	39(35.1~42.9)	500	5	65	2.9	2500
MLV1812NA038V0500	30	38	47(42.3~51.7)	500	5	77	3.5	2200
MLV1812NA045V0500	35	45	56(50.4~61.6)	500	5	90	4.2	1950
MLV1812NA056V0500	40	56	68(61.2~74.8)	500	5	110	4.8	1650
MLV1812NA065V0400	50	65	82(73.8~90.2)	400	5	135	4.5	1060
MLV1812NA085V0400	60	85	100(90.0~110.0)	400	5	165	5.8	870
MLV1812NA090V0400	70	90	110(99.0~121.0)	400	5	180	5.8	790
MLV1812NA127V0300	95	127	150(135.0~165.0)	300	5	248	5.8	420
MLV2220NA009V1000	6	9	12(10.2~13.8)	1000	10	20	1.9	36500
MLV2220NA011V1000	8	11	15(12.8~17.3)	1000	10	25	2.3	18400
MLV2220NA014V1000	11	14	18(16.2~19.8)	1000	10	30	2.7	15300
MLV2220NA017V1000	12	16.5	22(19.8~24.2)	1000	10	36	2.9	12500
MLV2220NA018V1000	14	18	24(21.6~26.4)	1000	10	38	3.1	11800
MLV2220NA022V1000	17	22	27(24.3~29.7)	1000	10	44	3.8	10400
MLV2220NA026V1000	20	26	33(29.7~36.3)	1000	10	54	4.3	8900
MLV2220NA030V1000	25	30	39(35.1~42.9)	1000	10	65	5.5	7500
MLV2220NA038V1000	30	38	47(42.3~51.7)	1000	10	77	6.3	4600
MLV2220NA045V1000	35	45	56(50.4~61.6)	1000	10	90	7.7	4000
MLV2220NA056V1000	40	56	68(61.2~74.8)	1000	10	110	8.8	3500
MLV2220NA065V0800	50	65	82(73.8~90.2)	800	10	135	5.6	2850
MLV2220NA085V0800	60	85	100(90.0~110.0)	800	10	165	6.8	1800
MLV2220NA090V0800	70	90	110(99.0~121.0)	800	10	180	6.8	1500

HA Series of Surface Mount Multilayer Varistors

Features:

- Fast Response < 0.5ns
- Low Capacitance
- Low Clamping Voltage and High Energy Absorption

Applications:

- Telecommunications
- Automotive Systems
- Data Systems
- Power Supplies

Part Number	Working Voltage (max)		Breakdown Voltage	Peak Current (max)	Clamping Voltage (max)		Energy Absorption (max)	Typical Capacitance
	AC (V _{RMS})	DC (V)	1mA (V)	8/20μs (A)	(A)	(V)	10/1000μs (J)	1KHz (pF)
MLV1206HA014V0200	11	14	18(15.3~20.7)	200	1	30	0.5	1500
MLV1206HA018V0200	14	18	24(21.6~26.4)	200	1	39	0.5	1160
MLV1206HA022V0200	17	22	27(24.3~29.7)	200	1	44	0.6	1080
MLV1206HA026V0200	20	26	33(29.7~36.3)	200	1	54	0.7	680
MLV1206HA030V0200	25	30	39(35.1~42.9)	200	1	65	1.0	620
MLV1206HA038V0200	30	38	47(42.3~51.7)	200	1	77	1.1	550
MLV1206HA045V0200	35	45	56(50.4~61.6)	200	1	90	0.8	400
MLV1210HA011V0400	8	11	15(12.8~17.3)	400	2.5	25	1.0	4050
MLV1210HA014V0400	11	14	18(15.3~20.7)	400	2.5	30	1.2	3860
MLV1210HA017V0400	12	16.5	22(19.8~24.2)	400	2.5	36	1.4	2600
MLV1210HA018V0400	14	18	24(21.6~26.4)	400	2.5	39	1.4	2380
MLV1210HA022V0400	17	22	27(24.3~29.7)	400	2.5	44	1.7	2100
MLV1210HA026V0400	20	26	33(29.7~36.3)	400	2.5	54	1.9	1400
MLV1210HA030V0400	25	30	39(35.1~42.9)	400	2.5	65	1.7	1180
MLV1210HA038V0400	30	38	47(42.3~51.7)	400	2.5	77	2.0	1000
MLV1210HA045V0400	35	45	56(50.4~61.6)	400	2.5	90	2.0	660
MLV1812HA014V0800	11	14	18(15.3~20.7)	800	5	30	1.9	7030
MLV1812HA018V0800	14	18	24(21.6~26.4)	800	5	38	2.3	4650
MLV1812HA022V0800	17	22	27(24.3~29.7)	800	5	44	2.7	4150
MLV1812HA026V0800	20	26	33(29.7~36.3)	800	5	54	3.0	3400
MLV1812HA030V0800	25	30	39(35.1~42.9)	800	5	65	3.7	2950
MLV1812HA038V0800	30	38	47(42.3~51.7)	800	5	77	4.2	2550
MLV1812HA045V0800	35	45	56(50.4~61.6)	800	5	90	4.2	2400
MLV2220HA011V1200	8	11	15(12.8~17.3)	1200	10	25	4.2	21200
MLV2220HA014V1200	11	14	18(15.3~20.7)	1200	10	30	5.4	17700

HA Series of Surface Mount Multilayer Varistors

Part Number	Working Voltage (max)		Breakdown Voltage	Peak Current (max)	Clamping Voltage (max)		Energy Absorption (max)	Typical Capacitance
	AC (V _{RMS})	DC (V)	1mA (V)	8/20μs (A)	(A)	(V)	10/1000μs (J)	1KHz (pF)
MLV2220HA017V1200	12	16.5	22(19.8~24.2)	1200	10	36	5.8	14500
MLV2220HA018V1200	14	18	24(21.6~26.4)	1200	10	39	5.8	13600
MLV2220HA022V1200	17	22	27(24.3~29.7)	1200	10	44	7.2	12000
MLV2220HA026V1200	20	26	33(29.7~36.3)	1200	10	54	7.8	10500
MLV2220HA030V1200	25	30	39(35.1~42.9)	1200	10	65	9.6	8900
MLV2220HA038V1200	30	38	47(42.3~51.7)	1200	10	77	12.0	5700
MLV2220HA045V1200	35	45	56(50.4~61.6)	1200	10	90	7.7	4800

Product Identification

MLV 0402 ES 012V 0100 N P
 (1) (2) (3) (4) (5) (6) (7)

(1) Series Code:

MLV – Surface Mount Multilayer Varistor

(2) Size Code:

Standard EIA Chip Size

(3) Application Code:

ES – Electro-static Discharge Protection

NA – Normal Surge Protection

HA – High Surge Protection

(4) Max. Working Voltage:

012V – 12V

(5) Capacitance for ES Series:

0100 – 100pF

02R5 – 2.5pF

Peak Current for HA/NA Series:

0100 – 100A

(6) Capacitance Tolerance for ES Series:

N – ±30%

P – +80% / -20%

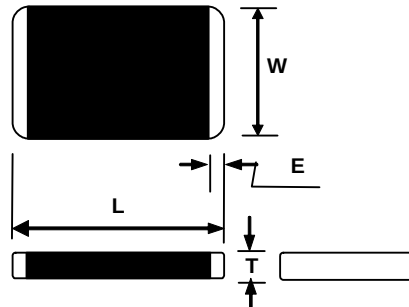
(7) Packaging Code:

T – Tape & Reel

B – Bulk

Surface Mount Multilayer Varistors

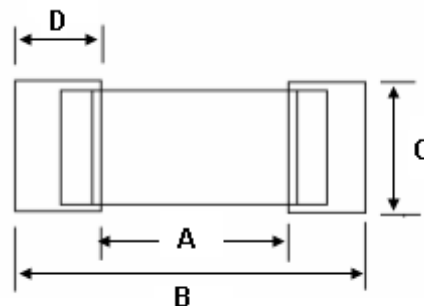
Shape and Dimensions



Size	L (mm)	W (mm)	T (mm)	E (mm)
0402	1.00 ± 0.10	0.50 ± 0.10	0.60 max.	$0.25 +0.10/-0.10$
0603	1.60 ± 0.15	0.80 ± 0.10	0.90 max.	$0.30 +0.10/-0.10$
0805	2.00 ± 0.20	1.25 ± 0.15	1.00 max.	$0.30 +0.10/-0.10$
1206	3.20 ± 0.20	1.60 ± 0.15	1.50 max.	$0.50 +0.20/-0.20$
1210	3.20 ± 0.20	2.50 ± 0.20	1.50 max.	$0.50 +0.20/-0.20$
1812	4.50 ± 0.20	3.20 ± 0.20	2.00 max.	$0.50 +0.30/-0.10$
2220	5.70 ± 0.20	5.00 ± 0.20	2.50 max.	$0.50 +0.30/-0.10$

Recommended Land Patterns

Size	Solder pad layout			
	A (mm)	B (mm)	C (mm)	D (mm)
0402	0.4~0.6	1.4~1.8	0.5~0.6	0.6~1.2
0603	0.8~1.2	2.2~2.8	0.6~1.0	0.9~1.5
0805	1.0~1.5	2.6~3.2	1.2~1.5	1.1~1.8
1206	1.8~2.5	4.2~5.2	1.2~1.8	1.2~1.8
1210	1.8~2.5	4.2~5.2	2.2~3.0	1.3~2.0
1812	2.5~3.3	5.5~6.7	2.8~3.6	1.3~2.2
2220	3.8~4.6	6.6~7.8	4.8~5.5	1.3~2.2



Surface Mount Multilayer Varistors

Terms and Definitions

Term	Definition
Max. Working Voltage	Maximum steady-state DC operating voltage with typical leakage current less than 50 μ A at 25
Varistor Voltage (BDV)	Breakdown DC voltage measured at current of 1mA
Max. Clamping Voltage	Maximum peak voltage across the part, measured at a specified pulse current and waveform
Surge Current	Maximum peak current with the specified 8/20 μ s waveform without damage
Surge Shift V/V	The change of varistor voltage after applying the specified surge current
Energy Absorption	Maximum energy dissipated with a specified 10/1000 μ s waveform without damage
Typical Capacitance	Capacitance measured with voltage bias less than 0.5V _{RMS} at 1KHz
Nonlinear Exponent α	$\alpha = \{ \log (V_{1mA} / V_{0.1mA}) / \log (I_{V1mA} / I_{V0.1mA}) \}$
Leakage Current	Measured at working voltage

Operating Temperatures:

-55°C to +85°C for size 0603 or smaller

-55°C to +125°C for size 0805 or larger

Surface Mount Multilayer Varistors

Reliability Tests

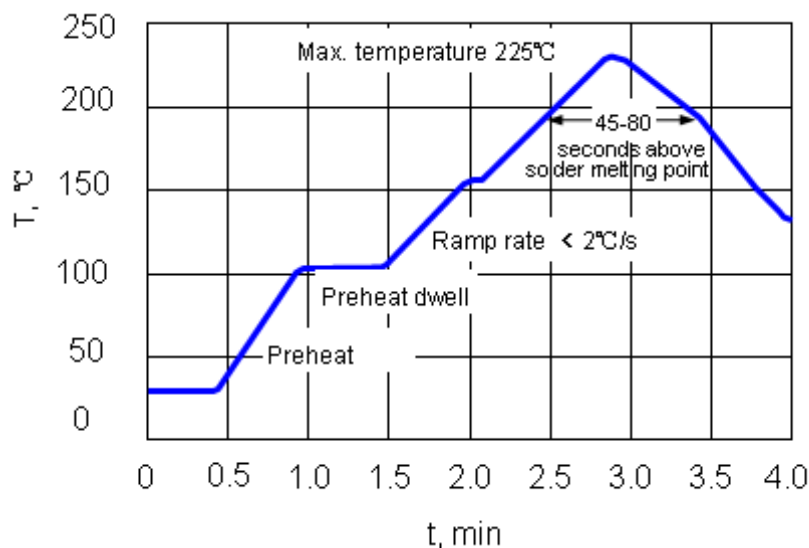
No.	Test	Requirement	Test condition	Test reference
1	Soldering heat resistance	BDV change $\leq \pm 10\%$ No mechanical damage	One dip at 260 for 5 sec.	MIL-STD-202 Method 210 IEC 60068-2-20
2	Solderability	New solder coverage $\geq 75\%$	One dip at 235 for 5 sec. Non-active flux	MIL-STD-202 Method 208 IEC 60068-2-20
3	Maximum surge current	BDV change $\leq \pm 10\%$ No mechanical damage	100 pulses of 8/20 μ s with maximum surge current and 30 sec. interval at 25 and 30~65% RH	CECC 42000 IEC 1051-1 Test 4.5
4	Maximum surge energy	BDV change $\leq \pm 10\%$ No mechanical damage	100 pulses of 10/1000 μ s with maximum surge current and 90 sec. interval at 25 and 30~65% RH	CECC 42000
5	Thermal cycling	BDV change $\leq \pm 10\%$ No mechanical damage Leakage current $\leq 200 \mu$ A	5 cycles between -40 and 125 with 30 min. dwell time at the temperature extremes and 60 min. dwell time at 25	CECC 42000 IEC 60068-2-14
6	Low temperature resistance	BDV change $\leq \pm 10\%$ No mechanical damage Leakage current $\leq 200 \mu$ A	1000 hr at -50	IEC 60068-2-1
7	Low temperature load resistance	BDV change $\leq \pm 10\%$ No mechanical damage Leakage current $\leq 200 \mu$ A	1000 hr at -50 with working voltage applied	IEC 60068-2-1
8	High temperature resistance	BDV change $\leq \pm 10\%$ No mechanical damage Leakage current $\leq 200 \mu$ A	1000 hr at 150	MIL-STD-202 Method 108 CECC 42000
9	High temperature load resistance	BDV change $\leq \pm 10\%$ No mechanical damage Leakage current $\leq 200 \mu$ A	1000 hr at 85 with working voltage applied	CECC 42000
10	Humidity resistance	BDV change $\leq \pm 10\%$ No mechanical damage Leakage current $\leq 200 \mu$ A	500 hr at 40 and 90~95% RH	MIL-STD-202 Method 103 IEC 60068-2-3 CECC 42000;
11	Humidity load resistance	BDV change $\leq \pm 10\%$ No mechanical damage Leakage current $\leq 200 \mu$ A	500 hr at 40°C and 90~95% RH with working voltage applied	MIL-STD-202 Method 103 IEC 60068-2-3 CECC 42000
12	ESD contact test*	Varistor voltage change >115% working voltage	Contact electrostatic discharge 100 times with 1 second intervals at 8KV (Level 4) and polarity: +,-	IEC 61000-4-2
13	ESD air test*	Varistor voltage change >115% working voltage	Air contact electrostatic discharge 100 times with 1 second intervals at 15KV (Level 4) and polarity: +,-	IEC 61000-4-2

* For ES series only.

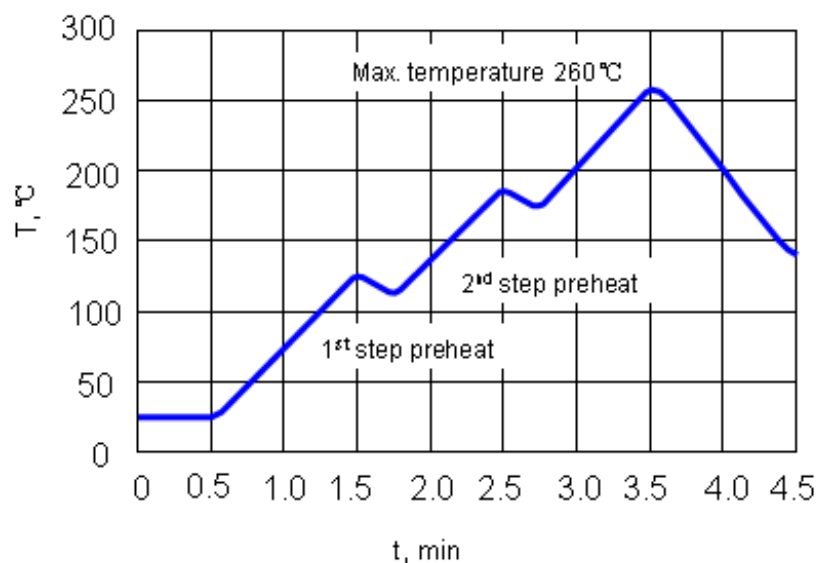
Surface Mount Multilayer Varistors

Soldering Temperature Profiles

Recommended Temperature Profile
for Reflow Soldering



Recommended Temperature Profile
for Wave Soldering



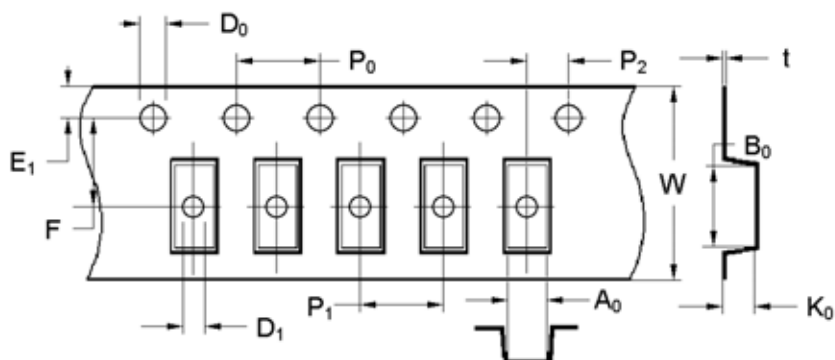
Packaging and Storage

Packaging

AEM's multilayer components are provided on tape-and-reel for use in pick-and-place machines or in bulk for special applications. Both tape-and-reel and bulk products are sealed in plastic bags with desiccant. The reel size can be 7 inches or 13 inches, depending on customers' preference.

Dimensions of Tape in Inches (mm)

Size	Ao	Bo	Ko	Type
0402 (1005)	0.026 ± 0.004 (0.67 ± 0.10)	0.046 ± 0.004 (1.17 ± 0.10)	0.025 ± 0.004 (0.63 ± 0.10)	Paper
	0.026 ± 0.004 (0.67 ± 0.10)	0.045 ± 0.004 (1.15 ± 0.10)	0.031 ± 0.004 (0.80 ± 0.10)	Plastic
0603 (1608)	0.045 ± 0.004 (1.15 ± 0.10)	0.07 ± 0.004 (1.85 ± 0.10)	0.043 ± 0.004 (0.93 ± 0.10)	Paper
	0.043 ± 0.004 (1.10 ± 0.10)	0.075 ± 0.004 (1.90 ± 0.10)	0.043 ± 0.004 (1.10 ± 0.10)	Plastic
0805 (2012)	0.063 ± 0.004 (1.60 ± 0.10)	0.093 ± 0.004 (2.40 ± 0.10)	0.046 ± 0.004 (1.20 ± 0.10)	Plastic
1206 (3216)	0.071 ± 0.004 (1.80 ± 0.10)	0.138 ± 0.004 (3.50 ± 0.10)	0.048 ± .004 (1.20 ± 0.10)	Plastic
1210 (3225)	0.106 ± 0.004 (2.69 ± 0.10)	0.137 ± 0.004 (3.48 ± 0.10)	0.056 ± 0.004 (1.43 ± 0.10)	Plastic
1812 (4532)	0.144 ± 0.004 (3.66 ± 0.10)	0.195 ± 0.004 (4.95 ± 0.10)	0.072 ± 0.004 (1.83 ± 0.10)	Plastic
2220 (5750)	0.201 ± 0.004 (5.10 ± 0.10)	0.235 ± 0.004 (5.97 ± 0.10)	0.110 ± 0.004 (2.80 ± 0.10)	Plastic



Size	E_1	F	W	P_1	P_o	P_2	D_o	D_1	t
0402(1005)	0.069 ± 0.004 (1.75 $\pm$ 0.10)	0.138 ± 0.002 (3.50 $\pm$ 0.05)	0.318 ± 0.004 (8.00 $\pm$ 0.10)	0.079 ± 0.004 (2.00 $\pm$ 0.10)	0.157 ± 0.004 (4.00 $\pm$ 0.10)	0.040 ± 0.002 (1.00 $\pm$ 0.05)	0.059 ± 0.004 (1.50 $\pm$ 0.10/-0.00)	N/A	0.009 ± 0.001 (0.23 $\pm$ 0.02)
0603(1608)				0.157 ± 0.004 (4.00 $\pm$ 0.10)		0.079 ± 0.002 (2.00 $\pm$ 0.05)		0.039 max (1.00 max)	
0805(2012)									
1206(3216)									
1210(3225)									
1812(4532)									
2220(5750)			0.059 max (1.50 max)						

Packaging Data

Chip Size	Parts on 7 inch (178 mm) Reel
0402(1005)	10,000
0603(1608)	4,000
0805(2012)	3,000
1206(3216)	3,000
1210(3225)	2,000
1812(4532)	1,000
2220(5750)	1,000

Packaging and Storage

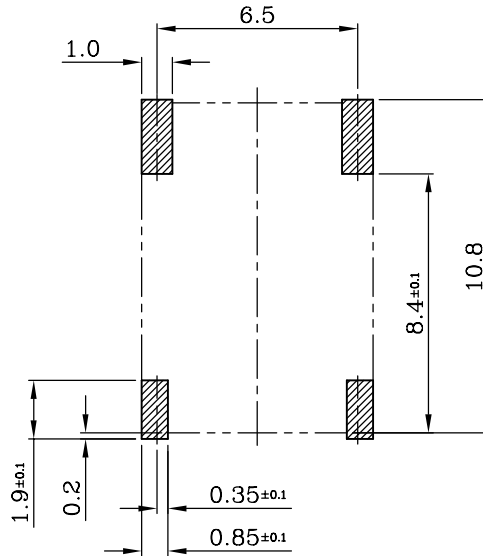
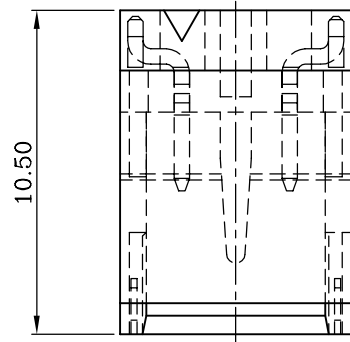
Storage

The maximum ambient temperature shall not exceed 40°C. Storage temperatures higher than 40°C could result in the deformation of packaging materials. The maximum relative humidity recommended for storage is 70%. High humidity with high temperature can accelerate the oxidation of the solder plating on the termination and reduce the solderability of the components. Sealed plastic bags with desiccant shall be used to reduce the oxidation of the termination and shall only be opened prior to use. The products shall not be stored in areas where harmful gases containing sulfur or chlorine are present.

P/N LEGEND

87210-02 X8

08:TAPE & REEL PACKAGE
38:TUBE PACKAGE



PC. BOARD LAYOUT

NOTES:

1. MATERIALS:

HOUSING:Nylon 46 Or PPA UL 94V-0

TERMINAL: PHOSPHOR BRONZE,
TIN-PLTED(t=0.5)

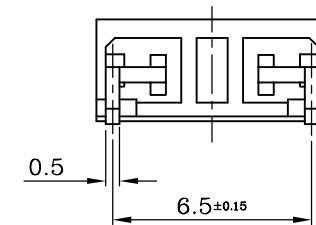
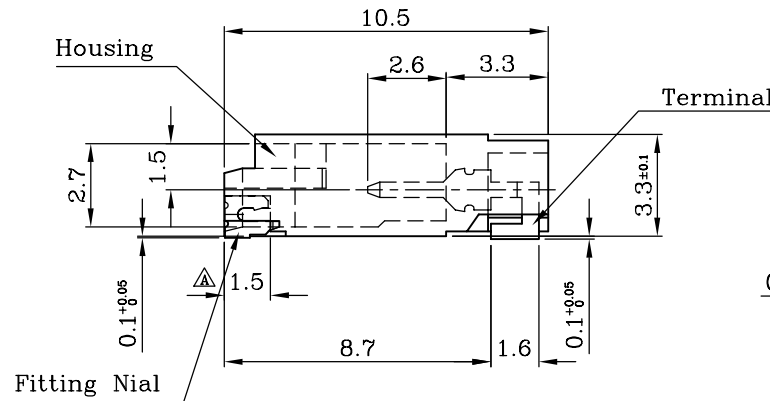
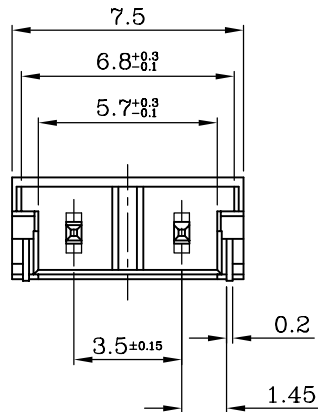
FITTING NAIL:PHOSPHOR BRONZE,
TIN-PLTED(t=0.2)

CARRIER TAPE:BLACK CONDUCTIVE POLYSTYRENE

AIIOY TOP TAPE: PET .PE .PEF

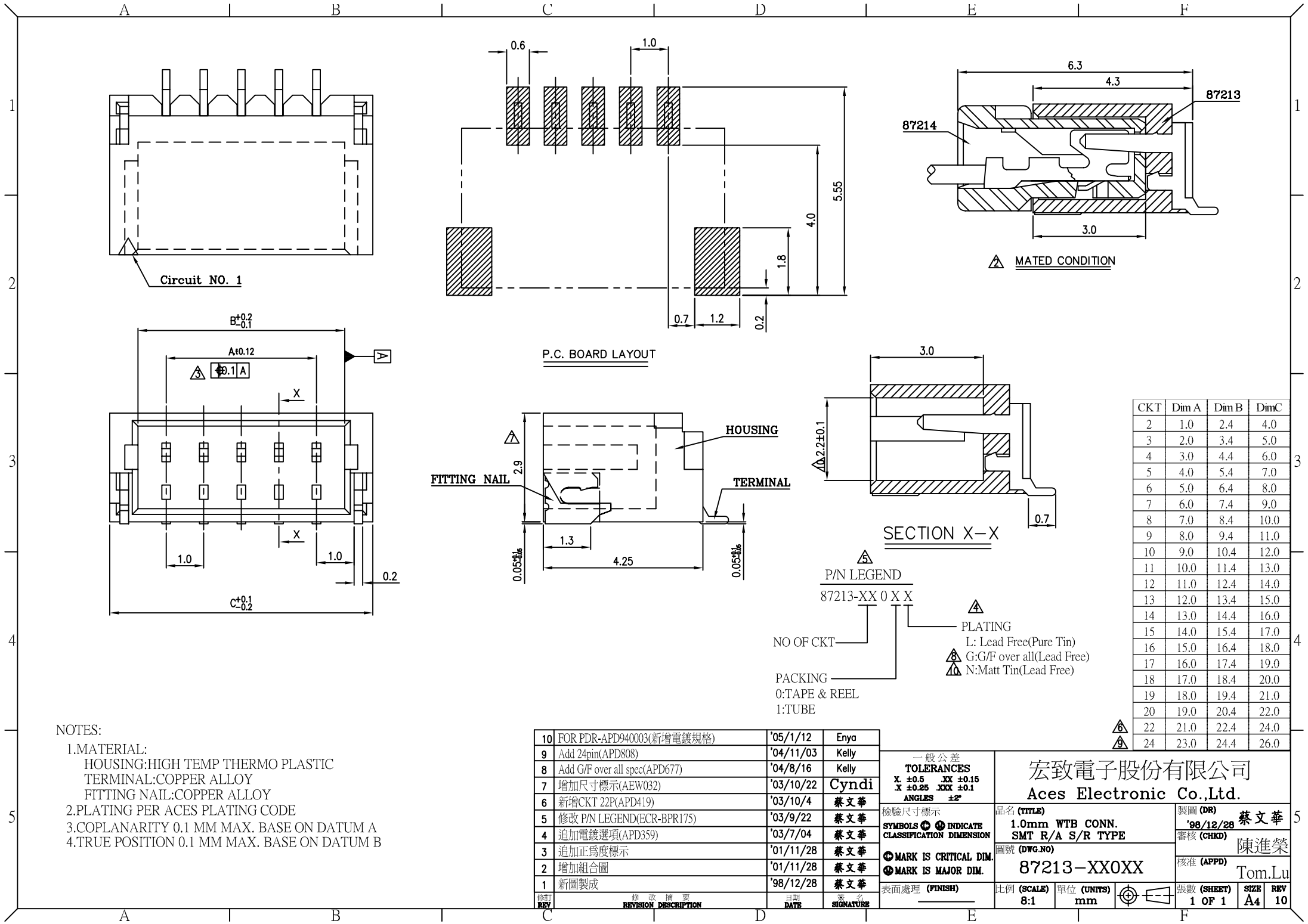
REEL: CARD BOARD

2. NUMBER OF CONNECTOR: 1000 PCS/REEL



一般公差 TOLERANCES X ±.3 XX ±.08 X ±.15 XXX ±.03 ANGLES ±1°		宏致電子股份有限公司 Aces Electronic Co.,Ltd.		
數量 (Q'TY)	圖名 (TITLE)	製圖 (DR)		
	3.5mm 2P WIRE TO BOARD CONN	98/8/25 蔡文華		
材質 (MAT'L)	圖號 (DWG.NO)	校對 (CHKD)		
SEE NOTES	87210-02X8	審核 (APPD)		
熱處理 (HT)	比例 (SCALE)	單位 (UNITS)	張數 (SHEET)	SIZE
HRc	5:1	mm	1 OF 1	A4
表面處理 (FINISH)			REV	A

REV	修改摘要	日期	簽名
A	膠體修改	00/11/09	蔡文華
O	新圖製成	00/7/20	蔡文華



Circuit NO. 1

P.C. BOARD LAYOUT

SECTION X-X

MATED CONDITION

NOTES:

- 1.MATERIAL:
HOUSING:HIGH TEMP THERMO PLASTIC
TERMINAL:COPPER ALLOY
FITTING NAIL:COPPER ALLOY
- 2.PLATING PER ACES PLATING CODE
- 3.COPLANARITY 0.1 MM MAX. BASE ON DATUM A
- 4.TRUE POSITION 0.1 MM MAX. BASE ON DATUM B

10	FOR PDR-APD940003(新增電鍍規格)	'05/1/12	Enya
9	Add 24pin(APD808)	'04/11/03	Kelly
8	Add G/F over all spec(APD677)	'04/8/16	Kelly
7	增加尺寸標示(AEW032)	'03/10/22	Cyndi
6	新增CKT 22P(APD419)	'03/10/4	蔡文華
5	修改 P/N LEGEND(ECR-BPR175)	'03/9/22	蔡文華
4	追加電鍍選項(APD359)	'03/7/04	蔡文華
3	追加正為度標示	'01/11/28	蔡文華
2	增加組合圖	'01/11/28	蔡文華
1	新圖製成	'98/12/28	蔡文華
修訂 REV	修改摘要 REVISION DESCRIPTION	日期 DATE	簽名 SIGNATURE

一般公差 TOLERANCES X ±0.5 XX ±0.15 X ±0.25 XXX ±0.1 ANGLES ±2°		宏致電子股份有限公司 Aces Electronic Co.,Ltd.	
檢驗尺寸標示 SYMBOLS ⊕ ⊗ INDICATE CLASSIFICATION DIMENSION		品名 (TITLE) 1.0mm WTB CONN. SMT R/A S/R TYPE	製圖 (DR) '98/12/28 蔡文華
⊕ MARK IS CRITICAL DIM. ⊗ MARK IS MAJOR DIM.		圖號 (DWG.NO) 87213-XX0XX	審核 (CHKD) 陳進榮
表面處理 (FINISH)		比例 (SCALE) 單位 (UNITS) 8:1 mm	核准 (APPD) Tom.Lu
		張數 (SHEET) 1 OF 1	SIZE A4
		REV 10	

Aces Electronic Co., Ltd.

Product Specification

Title : 3.5 mm Wire to Board Wafer

Product Specification

PS - 87210-02X8

Sheet

1 of 4

Rev

O

This specification contains Aces Electronic Co., Ltd's proprietary information and should not to be used without written permission.

Aces Electronic Co., Ltd.

Product Specification

PS - 87210-02X8

1. Scope

This specification covers a 3.5mm wire to board 2 pin wafer SMT Type,
Aces's P/N : 87210-02*8

2. Application Documents

The following documents from a part of this specification to the extent specified herewith. In the event of conflict between the requirements of the specification and the product drawing, the product drawing shall take precedence.

In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence

MIL-STD-202 Test methods for Electronic and Electrical component parts.

MIL-STD-1344 Test methods for Electrical Connectors.

3. Requirements

3.1 Design and Construction

Connector shall be of the design, construction and physical dimensions specified on the applicable sales drawing. Aces's P/N : 87210 Series

3.2 Materials :

Housing : Nylon 46 or PPA, UL94V-0

Contacts : Phosphor Bronze

Contact Plating : 100 u" min. Tin plated

Fitting Nail : Phosphor Bronze, Tin plated

Carrier : Black conductive polystyrene alloy

Cover Tape : PET, PE, PEF

Reel : Card Board

4. Rating

4.1 Current Rating : 1.0A AC, DC (When applied wire of AWG #24)

4.2 Voltage Rating : 1400 V AC, DC

4.3 Operating Temperature -25°C to +85°C

Aces Electronic Co., Ltd.

Product Specification

PS - 87210-02X8

4. Performance and Test Description

ELECTRICAL

Contact Resistance	10 m Ω max Initial 20 m Ω max final	A applied voltage 20 m V DC max.at a current of 10 m V DC per Mil-Std-1344A Method 3002.1
Dielectric withstanding voltage	No Breakdown	500 V DC (rms) min,between adjacent contacts and between metal shell
Insulation Resistance	1000 Mega Ω min.	Test between adjacent contact at 3800 V AC for 2 minutes, per Mil-Std-1344 method 3003.1
Capacitance	1 picofarad max	Test between adjacent circuit to 1 Megahertz max. per Mil-Std-202 Method 305

MECHANICAL

Insertion Force	25 N max.	When Connector is mating to it's counterpart
Withdrawal Force	5 N min.	When Connector is mating to it's counterpart
Contact Retention Force	10 N min.	The end of a post (mating end)shall be pushed in a perpendicular to wafer
Durability	No degradation of mechanical & electrical performance	The connector shall be mated & unmated with a socket on the same axis.
Solderbility	Contact solder tail shall have 95% solder coverage	Test per MIL-STD-202 with mildly activated rosin flux.

Aces Electronic Co., Ltd.

Product Specification

PS - 87210-02X8

ENVIRONMENTAL

Temperature Cycling	No mechanical & electrical deterioration	Tested per MIL-STD-1344 condition A method 1003.
Physical Shock	No discontinuities greater than 1 u second	Tester per MIL-STD-202F,method 213
Vibration	No mechanical damage and no discontinuities greater than 1 u second	Tested per MIL-STD-202F,method 201
Humidity	No mechanical & electrical deterioration Contact resistance shall be 20 m Ω max. Insulator resistance shall be 500 M Ω min.	A mated connector shall be placed in a humidity chamber of the following codition Temperature : 40 $\pm$ 2 $^{\circ}$ C Relative humidity : between 90 and 95% Period : 240 hours
Salt Spray	No exposure of the base metal due to corrosion No mechanical or electrical deterioration	A mated connector shall be subjected to a salt spray test of the following codition Temperature : 35 $\pm$ 2 $^{\circ}$ C Concentration : 5% in weight Period : 48 hours



QMFZ8.E47960

Plastics Certified For Canada - Component

[Page Bottom](#)
[Questions?](#)
[Previous Page](#)

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[Guide Information](#)

DSM ENGINEERING PLASTICS B V

E47960

POSTBUS 43
6130 AA SITTARD, THE NETHERLANDS

		Min.		H	H	H	R T I			C
		Thk	Flame	W	A	V	Elec	Mech		T
Mtl Dsg	Color	mm	Class	I	I	A		Imp	Str	I
Acrylonitrile Butadiene Styrene/Polycarbonate (ABS/PC), "Stapron C", furnished as pellets.										
CF 102	ALL	1.5	V-0	2	0	-	60	60	60	1
		2.1	V-0, 5VB	2	0	-	60	60	60	
		3.0	V-0	1	0	-	60	60	60	
CF 202	ALL	1.5	V-0	3	0	-	60	60	60	0
		2.1	V-0, 5VB	3	0	-	60	60	60	
		3.0	V-0	2	0	-	60	60	60	
CF 203	ALL	1.5	V-0	-	-	-	60	60	60	
		3.0	V-0	-	-	-	60	60	60	
CM 204	ALL	1.5	-	4	0	-	60	60	60	1
		3.0	HB	3	0	-	60	60	60	
CM 205	ALL	1.5	-	4	0	-	60	60	60	1
		3.0	HB	3	0	-	60	60	60	
CM 205 U	ALL	1.5	-	4	0	-	60	60	60	1
		3.0	HB	3	0	-	60	60	60	

CM 404	ALL	1.5	-	3	0	-	60	60	60	2
		3.0	HB	3	0	-	60	60	60	
CM 405	ALL	1.5	-	3	0	-	60	60	60	2
		3.0	HB	3	0	-	60	60	60	
CM 405 U	ALL	1.5	-	3	0	-	60	60	60	2
		3.0	HB	3	0	-	60	60	60	
CM 504	ALL	1.5	-	4	0	-	60	60	60	2
		3.0	HB	2	0	-	60	60	60	
CM 505	ALL	1.5	-	4	0	-	60	60	60	2
		3.0	HB	2	0	-	60	60	60	
CM 505 U	ALL	1.5	-	4	0	-	60	60	60	2
		3.0	HB	2	0	-	60	60	60	
Acrylonitrile Butadiene Styrene/Polycarbonate (ABS/PC), high impact, very high flow, "Xantar C", furnished as pellets.										
CM 206	ALL	1.5	-	4	0	-	60	60	60	0
		3.0	HB	3	0	-	60	60	60	
Polyamide (PA), glass reinforced, "Akulon", furnished as pellets.										
IG-S250F6	NC, BK	0.4	V-0	-	-	-	-	-	-	2
		0.75	V-0	0	0	-	140	110	120	
		1.5	V-0	0	0	-	140	125	125	
		3.0	V-0	0	0	-	140	130	130	
Polyamide 4/6 (PA4/6), flame retardant, "Stanyl", furnished as pellets.										
TE350	NC, BK	0.75	V-0	4	0	0	130	110	110	2
		1.5	V-0	2	0	0	130	110	120	
		3.0	V-0	1	0	0	130	110	120	
Polyamide 4/6 (PA4/6), glass reinforced, "Stanyl", furnished as pellets.										
TE200F6	NC	0.9	HB	3	0	-	-	-	-	1
		1.5	HB	3	0	-	-	-	-	
		3.0	HB	0	0	-	-	-	-	
TW200F6	NC, BK	0.90	HB	3	0	-	140	120	120	2
		1.5	HB	3	0	-	140	125	130	
		3.0	HB	0	0	0	140	140	140	
TW241F10	NC, BK	0.75	HB	-	-	-	65	65	65	

TW241F6, 46HF4130										
	NC, BK	0.75	HB	-	-	-	65	65	65	2
		0.9	HB	3	0	-	140	120	120	
		1.5	HB	3	0	-	140	125	130	
		3.0	HB	0	0	-	140	140	140	
TW271F6	NC, BK	0.75	HB	3	0	-	-	-	-	2
		1.5	HB	0	0	-	-	-	-	
		3.0	HB	0	0	-	-	-	-	
Polyamide 4/6 (PA4/6), glass reinforced, flame retardant, "Stanyl", furnished as pellets.										
46HF5040(h1)(j)										
	ALL	0.35	V-0	-	-	-	65	65	65	2
		0.75	V-0	0	0	-	140	110	120	
		1.5	V-0	0	1	-	140	125	125	
		3.0	V-0	0	0	-	140	130	130	
TE250F3(h4)(h5)										
	NC, BK	0.9	V-0	4	0	0	130	110	110	3
		1.5	V-0	2	0	0	130	110	120	
		3.0	V-0	1	0	0	130	110	120	
TE250F6(h1)(j)										
	ALL	0.35	V-0	-	-	0	-	-	-	2
		0.75	V-0	0	0	0	140	110	120	
		1.5	V-0	0	0	0	140	125	125	
		3.0	V-0	0	0	0	140	130	130	
TE250F8(h1)(j)										
	ALL	0.35	V-0	-	-	-	65	65	65	2
		0.75	V-0	0	0	-	140	110	120	
		1.5	V-0	0	1	-	140	125	125	
		3.0	V-0	0	0	-	140	130	130	
TE250F9	ALL	0.75	V-0	0	0	-	140	110	120	2
		1.5	V-0	0	1	-	140	125	125	
		3.0	V-0	0	0	-	140	130	130	
TS250F6D(h1)(j)										

	ALL	0.67	V-0	-	-	-	140	110	120	2
		0.75	V-0	0	0	-	140	110	120	
		1.5	V-0	0	0	-	140	125	125	
		3.0	V-0	0	0	-	140	130	130	
TS250F8(h1)	ALL	0.75	V-0	0	0	-	140	110	120	2
		1.5	V-0	0	1	-	140	125	125	
		3.0	V-0	0	0	-	140	130	130	
TW250F6	NC, BK	0.75	V-0	0	0	0	140	120	130	3
		1.5	V-0	0	0	0	140	130	140	
		3.0	V-0	0	0	0	140	140	140	
Polyamide 4/6 (PA4/6), glass reinforced, flame retardant, high flow, "Stanyl", furnished as pellets.										
46HF5041LW	NC, BK	0.4	V-0	-	-	-	65	65	65	2
		0.75	V-0	0	0	-	140	110	120	
		1.5	V-0	0	0	-	140	125	125	
		3.0	V-0	0	0	-	140	130	130	
46HF5050	NC, BK	0.4	V-0	-	-	-	65	65	65	2
		0.75	V-0	0	0	-	140	110	120	
		1.5	V-0	0	0	-	140	125	125	
		3.0	V-0	0	0	-	140	130	130	
Polyamide 4/6 (PA4/6), mineral reinforced, flame retardant, "Stanyl", furnished as pellets.										
TS250FK33	NC, BK	0.75	V-0	-	-	-	65	65	65	
		1.5	V-0	-	-	-	65	65	65	
		3.0	V-0	-	-	-	65	65	65	
Polyamide 4/6 (PA4/6), "Stanyl", furnished as pellets.										
TE300	NC	0.90	V-2	4	0	0	130	-	-	0
		1.5	V-2	4	0	0	130	-	-	
		3.0	V-2	3	0	0	130	-	-	
TE341	NC, BK	0.75	V-2	4	0	-	130	-	-	0
		1.5	V-2	4	0	-	130	-	-	
		3.0	V-2	3	0	-	130	-	-	
TE351	NC, BK	1.5	V-0	2	0	-	130	-	-	2

		3.0	V-0	0	0	-	130	-	-		
TS250F(h)(g1)											
	ALL	0.75	V-0	-	-	-	65	65	65		
TW300	NC	0.75	V-2	4	0	0	150	115	120	1	
		1.5	V-2	3	0	0	150	115	130		
		3.0	V-2	3	0	0	150	115	130		
TW341	NC, BK	0.75	V-2	4	0	0	150	115	120	2	
		1.5	V-2	3	0	0	150	115	130		
		3.0	V-2	3	0	0	150	115	130		
TW371	NC	1.5	-	-	-	-	-	-	-		
		3.0	HB	-	-	-	-	-	-		
TW441	NC	0.75	V-2	-	-	-	-	-	-		
		1.5	V-2	-	-	-	-	-	-		
		3.0	V-2	-	-	-	-	-	-		
Polyamide 4/6 (PA4/6), furnished as pellets.											
TS 256F(g)(h)											
	ALL	0.75	V-0	-	-	-	65	65	65		
TW241F8	NC, BK	0.75	HB	-	-	-	65	65	65		
Polyamide 6 (PA6), glass reinforced, "Akulon", furnished as pellets.											
K222-KGV4	ALL	0.80	V-2	3	0	-	140	-	130	0	
		1.2	V-2	2	0	-	140	-	130		
		1.5	V-2	2	0	-	140	-	130		
		3.0	V-2	1	0	-	140	-	130		
K224-G(a)	ALL	0.75	HB	-	0	-	65	65	65		
		1.5	HB	4	0	-	65	65	65		
		3.0	HB	4	0	-	65	65	65		
K224-G(b), K224-TG(b)											
		ALL	0.75	HB	-	0	-	65	65	65	
		1.5	HB	4	0	-	65	65	65		
		3.0	HB	4	0	-	65	65	65		
K224-G0, K224-TG0											
	ALL	0.75	HB	3	0	0	65	65	65	0	

		1.5	HB	2	0	0	65	65	65	
		3.0	HB	0	0	0	65	65	65	
K224-G3	ALL	0.75	HB	4	0	0	65	65	65	0
		1.5	HB	3	0	0	65	65	65	
		3.0	HB	3	0	0	65	65	65	
K224-G6	ALL	0.75	HB	-	0	0	65	65	65	0
		1.5	HB	4	0	0	65	65	65	
		3.0	HB	4	0	0	65	65	65	
K224-HG(a)	ALL	0.71	HB	3	0	0	140	120	140	1
		1.5	HB	1	0	0	140	125	150	
		3.0	HB	0	0	0	140	130	150	
K224-HG(b)	ALL	0.71	HB	3	0	-	140	120	140	1
		1.5	HB	1	0	-	140	125	150	
		3.0	HB	0	0	0	140	130	150	
K224-HG3	ALL	0.71	HB	4	0	0	150	120	150	1
		1.5	HB	4	0	0	150	125	150	
		3.0	HB	4	0	0	150	130	150	
K224-HG6	ALL	0.75	HB	2	0	0	140	120	140	1
		1.5	HB	1	0	0	140	125	150	
		3.0	HB	0	0	0	140	130	150	
K224-HGR24	BK	0.75	HB	-	-	-	65	65	65	2
		1.5	HB	-	-	-	65	65	65	
		3.0	HB	-	-	-	65	65	65	
Polyamide 6 (PA6), glass reinforced, high flow, "Akulon", furnished as pellets.										
K-FG6	ALL	0.75	HB	4	-	-	65	65	65	1
		1.5	HB	4	-	-	65	65	65	
		3.0	HB	4	-	-	65	65	65	
Polyamide 6 (PA6), heat stabilized, "Akulon", furnished as pellets.										
F136-DH	ALL	1.5	HB	4	0	-	65	65	65	1
		3.0	HB	3	0	-	65	65	65	
Polyamide 6 (PA6), heat stabilized, flame retardant, "Akulon", furnished as pellets.										
K225-KS	NC	0.38	V-0	-	-	-	65	65	65	0

	ALL	0.75	V-0	3	0	0	150	75	95	
		1.5	V-0	3	0	0	150	75	95	
		3.0	V-0	2	0	0	150	80	95	
Polyamide 6 (PA6), heat stabilized, laser writable, flame retardant, "Akulon", furnished as pellets.										
K225-KWS	ALL	0.75	V-0	4	0	-	150	75	95	0
		1.5	V-0	2	0	-	150	75	95	
		3.0	V-0	0	0	-	150	80	95	
Polyamide 6 (PA6), mineral reinforced, "Akulon", furnished as pellets.										
K222-KGMV14	GY	0.75	V-2	3	0	-	65	65	65	1
		1.5	V-2	2	0	-	65	65	65	
		3.0	V-2	1	0	-	65	65	65	
K222-KMV5	ALL	0.75	V-2	4	0	-	65	65	65	0
		1.5	V-2	4	0	-	65	65	65	
		3.0	V-2	3	0	-	65	65	65	
K223-HM6	ALL	0.71	HB	4	0	0	140	100	140	1
		1.5	HB	4	0	0	140	110	140	
		3.0	HB	3	0	0	140	120	140	
K223-HMS6	ALL	0.74	V-2	3	0	0	140	100	140	2
		1.5	V-0	2	0	0	140	110	140	
		3.0	V-0	1	0	0	140	120	140	
K223-KMV6	ALL	0.75 - 0.8	V-2	3	0	-	140	110	140	2
	GY	1.5	V-2	2	0	-	140	110	140	
		3.0	V-0	1	0	-	140	110	140	
Polyamide 6 (PA6), "Akulon", furnished as pellets.										
F150-CZ	NC	1.5	-	4	0	-	65	65	65	0
		3.0	HB	4	0	-	65	65	65	
F223-D	NC	0.75	V-2	-	-	-	120	65	85	0
	ALL	1.5	V-2	4	0	0	120	65	85	
		3.0	V-2	3	0	0	120	70	85	
F232-D	ALL	1.5	-	4	0	0	65	65	65	0
		3.0	HB	4	0	0	65	65	65	

F236-C	NC	1.5	-	4	0	-	65	65	65	0
		3.0	HB	4	0	-	65	65	65	
K222-D	ALL	0.71	-	-	-	-	130	65	85	0
		1.5	V-2	4	0	0	130	70	85	
		3.0	V-2	4	0	0	130	70	85	
K222-KWGV4	GY	0.75	V-2	3	0	-	140	-	130	1
		1.2	V-2	2	0	-	140	-	130	
		1.5	V-2	2	0	-	140	-	130	
		3.0	V-2	1	0	-	140	-	130	
Polyamide 6 (PA6), "Akulon Ultraflow", furnished as pellets.										
K-FKGS6	ALL	0.75	V-0	2	0	-	140	65	65	1
		1.5	V-0	1	0	-	140	65	65	
		3.0	V-0	0	0	-	140	65	65	
Polyamide 66 (PA66), glass reinforced, "Akulon", furnished as pellets.										
S223-G(a)	ALL	0.71	-	4	0	0	65	65	65	1
		1.5	HB	3	0	0	65	65	65	
		3.0	HB	3	0	0	65	65	65	
S223-G(b)	ALL	0.71	-	2	0	0	65	65	65	0
		1.5	HB	1	0	0	65	65	65	
		3.0	HB	0	0	0	65	65	65	
S223-G6	ALL	0.71	-	4	0	0	65	65	65	1
		1.5	HB	3	0	0	65	65	65	
		3.0	HB	3	0	0	65	65	65	
S223-HG(g3)	ALL	0.71	HB	4	0	0	140	120	120	1
		1.5	HB	4	0	0	140	125	130	
		3.0	HB	4	0	0	140	130	130	
S223-HG6	ALL	0.71	HB	4	0	0	140	130	130	1
		1.5	HB	4	0	0	140	130	130	
		3.0	HB	3	0	0	140	130	130	
Polyamide 66 (PA66), heat stabilized, "Akulon", furnished as pellets.										
S240-CH	NC	3.0	V-2	-	-	-	65	65	65	
Polyamide 66 (PA66), mineral reinforced, "Akulon", furnished as pellets.										

S223-HM8	ALL	0.71	HB	3	0	0	140	130	130	0
		1.5	HB	3	0	0	140	130	130	
		3.0	HB	2	0	0	140	130	140	
S224-KMV7	GY	0.75	V-2	0	0	-	150	115	140	1
		1.5	V-1	0	0	-	150	120	140	
		3.0	V-0	0	0	-	150	125	140	
Polyamide 66 (PA66), "Akulon", furnished as pellets.										
S223-DH, S223-EH, S223-FH										
	ALL	0.71	HB	4	0	0	130	100	130	0
		1.5	V-2	4	0	0	130	100	130	
		3.0	V-2	2	0	0	130	100	130	
S223-E	ALL	0.4	V-2	-	-	-	65	65	65	0
		1.5	V-2	4	0	0	65	65	65	
		3.0	V-2	3	0	0	65	65	65	
S223-F	ALL	1.5	V-2	4	0	0	65	65	65	0
		3.0	V-2	3	0	0	65	65	65	
S225-KS (h2) (j1)										
	ALL	0.38	V-0	-	-	0	65	65	65	0
		0.75	V-0	4	0	0	130	90	120	
		1.5	V-0	4	0	0	130	90	120	
		3.0	V-0	3	0	0	130	90	120	
S240-C	NC	3.0	V-2	2	0	-	65	65	65	0
Polyamide 66 (PA66), "Nylatron", furnished as granular material.										
GS-51	GY	1.5	-	-	-	-	65	65	65	
Polyamide 66 (PA66), "NYLATRON", furnished as pellets.										
GS-S	GY	1.5	-	-	-	-	65	65	65	
Polybutylene Terephthalate (PBT), 15% glass filled, 12% flame retardant, "Arnite", furnished as pellets.										
TV4 230 S	ALL	0.75	V-2	3	1	-	140	130	140	2
		1.5	V-0	3	2	-	140	130	140	
		3.0	V-0	2	2	-	140	130	140	
Polybutylene Terephthalate (PBT), glass reinforced, "Arnite", furnished as pellets.										
TV4 240	ALL	0.75	HB	3	1	0	140	130	130	1

		1.5	HB	2	2	0	140	130	130	
		3.0	HB	1	2	0	140	130	130	
TV4 240 S	ALL	0.75	V-2	3	1	-	140	130	140	2
		1.5	V-0	2	2	-	140	130	140	
		3.0	V-0	2	2	-	140	130	140	
Polybutylene Terephthalate (PBT), glass reinforced, flame retardant, "Arnite", furnished as pellets.										
TV4 241 SL	NC	1.5	V-0	-	-	-	145	120	140	
Polybutylene Terephthalate (PBT), glass reinforced, flame retardant, high flow, "Arnite", furnished as pellets.										
TV4 230 SF (h6)										
	NC, BK	0.4	V-2	4	0	-	75	75	75	2
	ALL	0.75	V-0	3	0	-	130	140	130	
		1.5	V-0, 5VB	2	0	-	130	140	130	
		2.0	V-0, 5VA	2	0	-	130	140	130	
		3.0	V-0, 5VA	1	0	-	130	140	130	
TV4 260 SF(h3)										
	NC, BK	0.4	V-2	4	0	-	130	75	75	2
	ALL	0.75	V-0	3	0	-	140	150	140	
		1.5	V-0	2	0	-	140	150	140	
		3.0	V-0	1	0	-	140	150	140	
Polybutylene Terephthalate (PBT), mineral reinforced, "Arnite", furnished as pellets.										
TM4 250	NC	0.75	HB	4	0	-	150	115	140	1
		1.5	HB	3	0	-	150	130	140	
		3.0	HB	3	0	-	150	130	140	
Polybutylene Terephthalate (PBT), "Arnite", furnished as pellets.										
T06 200 SN	ALL	0.75	V-0	-	-	-	75	75	75	0
		3.00	V-0	-	-	-	75	75	75	
Polybutylene Terephthalate (PBT), "ARNITE", furnished as pellets.										
T06 200 SNF(h)										
	ALL	0.75	V-0	4	0	-	140	110	130	0

		1.5	V-0	3	0	-	140	110	130	
		3.0	V-0	2	0	-	140	110	130	
Polybutylene Terephthalate (PBT), "Arnite", furnished as pellets.										
T06 200, T06 202										
	ALL	0.75	HB	4	0	0	130	95	125	0
		1.5	HB	4	0	0	130	110	130	
		3.0	HB	3	0	0	130	110	130	
T06 204 SN	ALL	0.75	V-0	-	-	-	75	75	75	3
		3.0	V-0	-	-	-	75	75	75	
T08 200	ALL	0.75	HB	4	0	-	130	95	125	0
		1.5	HB	4	0	-	130	110	130	
		3.0	HB	3	0	-	130	110	130	
TV4 241 SN	ALL	0.75	V-2	4	0	-	140	130	140	3
		1.5	V-0	3	0	-	140	130	140	
		3.0	V-0	2	0	-	140	130	140	
TV4 260 S	ALL	0.50	V-2	-	-	0	75	75	75	2
		0.75	V-2	3	0	0	140	130	140	
		1.5	V-0	3	0	0	140	130	140	
		3.0	V-0	2	0	0	140	130	140	
TV4 260 SN	ALL	0.75	V-2	3	4	-	140	130	140	2
		1.6	V-0	2	4	-	140	130	140	
		3.0	V-0	1	4	-	140	140	140	
TV4 260 SY	GY	0.75	V-2	3	1	-	130	120	130	2
		1.5	V-0	3	1	-	130	120	130	
		3.0	V-0	0	1	-	130	120	140	
TV4 261	ALL	0.71	HB	3	1	0	140	130	140	1
		1.5	HB	2	2	0	140	130	140	
		3.0	HB	2	2	0	140	130	140	
TV4 264 SN (i)										
	ALL	0.4	V-2	-	-	-	75	75	75	3
		0.75	V-0	4	2	-	140	110	120	
		1.5	V-0	2	0	-	140	110	130	

		3.0	V-0	0	0	-	140	110	140		
TV4 270	ALL	0.75	-	3	2	0	140	130	140	1	
		1.5	HB	1	2	0	140	130	140		
		3.0	HB	1	2	0	140	130	140		
TV6 240	ALL	0.75	-	3	2	0	140	130	140	1	
		1.5	HB	2	2	0	140	130	140		
		3.0	HB	1	2	0	140	130	140		
TV6 241 S	ALL	0.75	V-2	4	1	0	140	130	140	2	
		1.0	V-0	4	2	0	140	130	140		
		1.5	V-0	4	2	0	140	130	140		
		2.0	V-0	1	2	2	140	130	140		
		3.0	V-0	1	2	2	140	130	140		
TV6 260 T	GY	1.5	-	-	-	-	75	75	75		
TV6 264 SN	BK	0.38	V-0	-	-	-	75	75	75	3	
		ALL	0.75	V-0	4	2	0	140	110	120	
		1.5	V-0	2	0	0	140	110	130		
		3.0	V-0	0	0	0	140	110	140		
Polybutylene Terephthalate (PBT), furnished as granular material.											
TV6 241 SN	ALL	0.75	V-2	4	2	0	140	130	140	2	
		1.0	V-0	4	2	0	140	130	140		
		1.5	V-0	4	2	0	140	130	130		
		3.0	V-0	1	2	2	140	130	140		
Polybutylene Terephthalate/Polycarbonate (PBT/PC), glass reinforced, flame retardant, "Arnite", furnished as pellets.											
TV4 660 SN (r1)											
		ALL	0.75	V-0	-	-	-	75	75	75	3
		1.5	V-0	2	0	-	75	75	75		
		3.0	V-0	1	0	-	75	75	75		
Polycarbonate (PC), glass reinforced, flame retardant, "Xantar", furnished as pellets.											
MX 1094	ALL	1.5	V-0	3	3	-	130	125	125	3	
		3.0	V-0	2	1	-	130	130	130		
Polycarbonate (PC), impact modified, flame retardant, "Xantar", furnished as pellets.											

MX 1004	GY, BK	1.5	V-0	2	0	-	80	80	80	0
		3.0	V-0	1	0	-	80	80	80	
Polycarbonate (PC), "Xantar", furnished as pellets.										
15(x)(f1), 25(x)(f1), 27(x)(f1), 30(x)(f1)										
	ALL	1.5	V-2	3	0	-	130	125	125	2
		3.0	V-2	2	0	-	130	130	130	
18(x)(f1), 19(x)(f1), 22(x)(f1), 24(x)(f1)										
	ALL	0.75	V-2	-	-	-	130	125	125	2
		1.5	V-2	3	0	-	130	125	125	
		3.0	V-2	2	0	-	130	130	130	
F 22 (y)(f1), F 23 (y)(f1), F 25 (y)(f1)										
	ALL	1.5	V-2	2	0	-	130	125	125	2
		3.0	V-0	3	1	-	130	125	130	
FC 19 (y)(f1), FC 22 (y)(f1)										
	ALL	1.5	V-0	2	1	-	130	125	125	2
		3.0	V-0	2	0	-	130	125	130	
MX 2042 FD(f1)										
	NC	1.5	V-2	3	0	-	130	125	125	2
		3.0	V-2	2	0	-	130	130	130	
Polycarbonate (PC), structural foam, "Xantar ", furnished as pellets.										
MX 1056(a1) (foamed)										
	GY	6.0	V-0, 5VA	-	-	-	80	80	80	
SF 22(a1)	ALL	4.8	V-0, 5VA	-	-	-	80	80	80	4
		6.0	V-0, 5VA	2	4	-	80	80	80	
SF 2220 (b1)										
	ALL	4.8	V-0, 5VA	-	-	-	80	80	80	
SF 2230 (d1)										
	ALL	4.8	V-0, 5VA	-	-	-	80	80	80	
Polycarbonate (PC), "Xantar ", furnished as pellets.										

FC 23 (y)(f1), FC 25 (y)(f1)										
	ALL	1.5	V-0	2	1	-	130	125	125	2
		3.0	V-0, 5VA	2	0	-	130	125	130	
G2F 23 (y)(f1), G2F 25 (y)(f1)										
	ALL	1.5	V-0	3	3	-	130	125	125	3
		3.0	V-0, 5VA	2	1	-	130	130	130	
G4F 22 (y)(f1), G4F 23 (y)(f1), G4F 25 (y)(f1)										
	ALL	1.2	V-0	-	-	-	80	80	80	3
		1.5	V-0	3	3	-	130	125	125	
		3.0	V-0	2	1	-	130	130	130	
G6F 23 (y)(f1)										
	ALL	1.5	V-0	3	4	-	130	125	125	3
		3.0	V-0	2	1	-	130	130	130	
G8F 23 (y)(f1)										
	ALL	1.5	V-0	2	4	-	130	125	125	3
		3.0	V-0	2	0	-	130	130	130	
MX 1000	ALL	1.5	V-0	2	1	-	110	85	105	2
		2.0	5VB	2	1	-	110	85	105	
		3.0	V-0	0	1	-	110	105	110	
MX 1001	ALL	0.75	V-0	3	0	-	80	80	80	2
		1.5	V-0	2	0	-	80	80	80	
		3.0	V-0	2	0	-	80	80	80	
MX 1002	BK	1.2	V-1	-	-	-	80	80	80	2
	ALL	1.5	V-0	2	1	-	110	85	105	
		2.0	5VB	2	1	-	110	85	105	
		3.0	V-0	0	1	-	110	105	110	
MX 1056	GY	4.0	V-0, 5VA	-	-	-	80	80	80	
MX 1060(f1), MX 1061(f1)										
	ALL	1.5	V-2	3	0	-	130	125	125	2
		3.0	V-2	2	0	-	130	130	130	
MX 1080	ALL	1.5	V-0	3	4	-	80	80	80	3

		3.0	V-0	2	1	-	80	80	80	
MX 1081(f1)	ALL	1.5	V-0	3	3	-	130	125	125	3
		3.0	V-0, 5VA	2	1	-	130	130	130	
MX 1082(f1)	ALL	1.2	V-0	-	-	-	80	80	80	3
		1.5	V-0	3	3	-	130	125	125	
		3.0	V-0	2	1	-	130	130	130	
MX 1092	ALL	0.75	V-0	3	0	-	80	80	80	3
		1.5	V-0	2	3	-	80	80	80	
		3.0	V-0	2	3	-	80	80	80	
MX 2003(f1)	ALL	1.5	V-2	3	0	-	130	125	125	2
		3.0	V-2	2	0	-	130	130	130	
MX 2007(f1)	ALL	1.5	V-2	3	0	-	130	125	125	2
		3.0	V-2	2	0	-	130	130	130	
MX 2015(f1)	ALL	1.5	V-0	3	1	-	130	125	125	2
		3.0	V-0	2	0	-	130	125	130	
Polycarbonate/Acrylonitrile Butadiene Styrene (PC/ABS), flame retardant, "Xantar C", furnished as pellets.										
CF 407	ALL	1.5	V-0	3	-	-	60	60	60	0
		3.0	V-0	2	-	-	60	60	60	
Polycarbonate/Acrylonitrile Butadiene Styrene (PC/ABS), high impact, very high flow, "Xantar C", furnished as pellets.										
CM 206 U	ALL	1.5	-	4	0	-	60	60	60	0
		3.0	HB	3	0	-	60	60	60	
CM 406	ALL	1.5	-	4	0	-	60	60	60	2
		3.0	HB	3	0	-	60	60	60	
CM 406 U	ALL	1.5	-	4	0	-	60	60	60	2
		3.0	HB	3	0	-	60	60	60	
CM 506	ALL	1.5	-	3	0	-	60	60	60	2
		3.0	HB	3	0	-	60	60	60	
CM 506 U	ALL	1.5	-	3	0	-	60	60	60	2
		3.0	HB	3	0	-	60	60	60	
Polycarbonate/Acrylonitrile Butadiene Styrene (PC/ABS), "Xantar C", furnished as pellets.										

CE 407	ALL	1.5	V-0	2	0	-	60	60	60	0
		3.0	V-0	1	0	-	60	60	60	
CF 107	ALL	1.5	V-0	2	0	-	60	60	60	1
		2.0	V-0, 5VB	2	0	-	60	60	60	
		3.0	V-0, 5VB	1	0	-	60	60	60	
MC 3433	ALL	1.5	V-0	3	0	-	60	60	60	2
		3.0	V-0	2	0	-	60	60	60	
Polyester Elastomer, "Arnitel", furnished as pellets.										
PL380	NC	1.5	-	-	-	-	50	50	50	
		3.0	HB	-	-	-	50	50	50	
PL460-S	ALL	1.5	V-0	-	-	-	50	50	50	
UM551, UM552										
	ALL	0.75	HB	4	1	-	160	120	150	0
		1.5	HB	3	0	0	160	120	150	
		3.0	HB	2	0	0	160	120	150	
Polyester Elastomer, furnished as pellets.										
EL740-S	ALL	1.5	V-0	-	-	-	50	50	50	
		3.0	V-0	-	-	-	50	50	50	
Polyethylene Terephthalate (PET), glass reinforced, "Arnite", furnished as pellets.										
AV2 343	ALL	0.75	HB	4	3	0	130	120	125	2
		1.5	HB	3	3	0	130	120	125	
		3.0	HB	3	3	0	130	120	125	
AV2 360 S	ALL	0.71	V-2	3	0	-	150	125	140	
		1.5	V-0	0	3	0	150	130	140	
		3.0	V-0	0	3	0	150	130	140	
AV2 365 SN	ALL	0.75	V-0	-	-	-	130	120	125	3
		1.5	V-0	0	0	-	130	120	125	
		3.0	V-0	0	0	-	130	120	125	
	NC	0.4	V-0	-	-	-	130	120	125	
		2.1	5VA	0	0	-	130	120	125	
AV2 370, AV2 372										

	ALL	0.75	HB	2	3	0	150	120	130	2
		1.5	HB	1	3	0	150	125	130	
		3.0	HB	0	3	0	150	130	130	
AV2 390	ALL	0.81	HB	2	4	-	150	120	140	2
		1.5	HB	1	4	-	150	120	140	
		3.0	HB	0	4	-	150	120	140	
Polyethylene Terephthalate (PET), unfilled, very high viscosity, extrusion, "Arnite", furnished as pellets.										
A06 101	NC	0.93	HB	-	-	-	75	75	75	0
		1.5	HB	3	0	-	75	75	75	
		3.0	HB	3	0	-	75	75	75	
Polyethylene Terephthalate (PET), "Arnite", furnished as pellets.										
A04 900	ALL	0.75	HB	4	0	-	75	75	75	1
		1.5	HB	3	0	-	75	75	75	
		3.0	HB	3	0	-	75	75	75	
Thermoplastic Elastomer (TPE), polyester, "Arnitel", furnished as pellets.										
EL550, EM550										
	NC, BK	1.5	-	-	-	-	50	50	50	
Thermoplastic Elastomer (TPE), Polyester, "Arnitel", furnished as pellets.										
EL630, EM630										
	NC, BK	1.5	-	-	-	-	-	-	-	
Thermoplastic Elastomer (TPE), polyester -ester, flame retarded, "Arnitel", furnished as pellets.										
UM551-V	NC	1.5	V-2	-	-	-	50	50	50	
Thermoplastic Elastomer (TPE), polyether-ester elastomer, "Arnitel", furnished as pellets.										
EL740, EM740										
	NC, BK	1.5	-	-	-	-	50	50	50	
EM460	NC, BK	1.5	-	-	-	-	50	50	50	
PL650	NC, BK	1.5	-	-	-	-	50	50	50	

(a) - Represents 16-29% range.

(a1) - Density range 0.92 - 1.27g/cc.

(b) - Represents 31-49% range.

(b1) - Density range 1.0 - 1.35g/cc.

(d1) - Density range 1.07 - 1.27g/cc.

(f1) - Suitable for outdoor use with respect to exposure to Ultraviolet Light, Water Exposure and Immersion in accordance with UL 746C.

(g) - Denotes a single digit 4-8 incl.

(g1) - Represents a number 2-10 inclusive, denoting glass content range 10 - 50%.

(g3) - May be replaced by a one digit number [3-8, excluding 6] representing a 31-49% glass content range.

(h) - Virgin and regrind up to 50% by weight inclusive, have the same basic material characteristics.

(h1) - Virgin and regrind, up to 50% by weight inclusive, in thicknesses of 0.75mm and greater, have the same basic material characteristics, except for CTI.

(h2) - Virgin and regrind up to 50% by weight inclusive, have the same basic material characteristics, except for HWI

(h3) - Virgin and regrind up to 50% by weight inclusive, have the same basic material characteristics in the 0.75 mm thickness and greater, and with respect to Flammability in the 0.4 mm thickness and greater.

(h4) - Virgin and regrind, from 0 to 50% by weight inclusive, have the same basic material characteristics, except for RTI

(h5) - Virgin and regrind, from 0 to 100% by weight inclusive, have the same basic material characteristics, with respect to Flammability.

(h6) - Virgin and regrind up to 50% by weight have the same flammability characteristics (>0.4 mm only) and the same basic material characteristics (>0.75 mm only) except with respect to 5VA/5VB.

(i) - Virgin and regrind up to 50% by weight inclusive, have the same basic material characteristics with respect to flammability (GY, 0.75-3.0 mm only)

(j) - Virgin and regrind, up to 100% by weight inclusive, have the same basic material characteristics with respect to Flammability in the 0.75mm thickness and greater.

(j1) - Virgin and regrind, up to 100% by weight inclusive, have the same basic material characteristics with respect to flammability.

(r1) - Virgin and regrind, up to 50% by weight, have the same basic material characteristics in unpigmented (NC) and black (BK) only.

(x) - Represents one or two letters to specify the additive package, xx can be B, R, U, UR, SR, FD

(y) - One or two letters B, R, U, UR specifying additive package.

Marking: Company name or tradename "APSCOM" , "Akulon" , "Akulon Ultraflow" , "Arnite" ,

"Arnitel" , material designation, generic polymer identification, color number where appropriate and batch or lot number or date of manufacture on container, wrapper or molded on finished part.

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PRE REPORT

MODEL A-1A08-CO01A2L Inver

DATE : 2007-7-4

REFERENCE DOCUMENT : Reliability Prediction

TECHNICAL REFERENCE : SR-332

TEST CONDITION :

INPUT VOLTAGE : 20V
TEMPERATURE : 25°C
LOAD CONDITION : LCD Panel

APPROVED BY : Jp.wei

CHECKED BY : ke.xie

TESTED BY : Jackson.luo

ITEM 1 : MICROELECTRONIC DEVICES

$$\begin{aligned}\lambda_{SS} &= \pi_E \sum_{i=1}^m N_i \lambda_{SSi} \\ &= 26.861 \quad \text{FAILURES}/10^9 \text{ HOURS}\end{aligned}$$

ITEM 2 : MOSFET

$$\begin{aligned}\lambda_{SS} &= \pi_E \sum_{i=1}^m N_i \lambda_{SSi} \\ &= 16.224 \quad \text{FAILURES}/10^9 \text{ HOURS}\end{aligned}$$

ITEM 3 : TRANSISTORS

$$\begin{aligned}\lambda_{SS} &= \pi_E \sum_{i=1}^m N_i \lambda_{SSi} \\ &= 19.974 \quad \text{FAILURES}/10^9 \text{ HOURS}\end{aligned}$$

ITEM 4 : RESISTORS

$$\begin{aligned}\lambda_{SS} &= \pi_E \sum_{i=1}^m N_i \lambda_{SSi} \\ &= 13.623 \quad \text{FAILURES}/10^9 \text{ HOURS}\end{aligned}$$

ITEM 5 : CAPACITORS (EXCEPT AL)

$$\begin{aligned}\lambda_{SS} &= \pi_E \sum_{i=1}^m N_i \lambda_{SSi} \\ &= 14.701 \quad \text{FAILURES}/10^9 \text{ HOURS}\end{aligned}$$

ITEM 6 : INDUCTIVE DEVICES

$$\begin{aligned}\lambda_{SS} &= \pi_E \sum_{i=1}^m N_i \lambda_{SSi} \\ &= 9.839 \quad \text{FAILURES}/10^9 \text{ HOURS}\end{aligned}$$

ITEM 7 : FUSE

$$\begin{aligned}\lambda_{SS} &= \pi_E \sum_{i=1}^m N_i \lambda_{SSi} \\ &= 4.680 \quad \text{FAILURES}/10^9 \text{ HOURS}\end{aligned}$$

PRE REPORT

MODEL A-1A08-CO01A2L Inver

DATE : 2007-7-4

REFERENCE DOCUMENT : Reliability Prediction

TECHNICAL REFERENCE : SR-332

TEST CONDITION :

INPUT VOLTAGE : 20V
TEMPERATURE : 25°C
LOAD CONDITION : LCD Panel

APPROVED BY : Jp.wei

CHECKED BY : ke.xie

TESTED BY : Jackson.luo

ITEM 8 : PCB

$$\begin{aligned}\lambda_{SS} &= \pi_E \sum_{i=1}^m N_i \lambda_{SSi} \\ &= 7.347 \quad \text{FAILURES}/10^9 \text{ HOURS}\end{aligned}$$

ITEM 9 : DIODE

$$\begin{aligned}\lambda_{SS} &= \pi_E \sum_{i=1}^m N_i \lambda_{SSi} \\ &= 47.016 \quad \text{FAILURES}/10^9 \text{ HOURS}\end{aligned}$$

TOTAL	160.265	FAILURES/10⁹ HOURS
MTBF	623965.45	HOURS

REMARK : $\lambda_{SSi} = \lambda_{Gi} \pi_{Qi} \pi_{Si} \pi_{Ti}$

λ_{SSi} : FAILURE RATE FOR DEVICE

λ_{Gi} : BASE FAILURE RATE FOR DEVICE

π_{Qi} : QUALITY FACTOR

π_{Si} : ELECTRICAL STRESS FACTOR

π_{Ti} : THERMAL ACCELERATION FACTOR

$$\lambda_{SSi} = \pi_E \sum_{i=1}^m N_i \lambda_{SSi}$$

λ_{SSi} : FAILURE RATE FOR UNIT

π_E : UNIT ENVIRONMENT FACTOR

N_i : QUANTITY OF DEVICE TYPE

m : NUMBER OF DIFFERENT DEVICE TYPES IN THE UNIT

MICROELECTRONIC DEVICES

MODEL : DA-1A08-CO01A2L Inverter

TEMPERATURE : 25°C

TESTED BY : Jackson.luo

DATE: 2007-7-4

REFERENCE : BELLCORE

Desc.	Part No.	λ_{Gi}	π_{Qi}	T_C	π_{Ti}	π_E	λ_{SSi}
IC	0Z9910SN-B5	19	1	45.31	1.41375	1	26.861

TOTAL λ_{SSi}	26.861
-----------------------	--------

MOSFET

MODEL : v-1A08-CO01A2L Inve

TESTED BY : Jackson.luo

REFERENCE : BELLCORE

TEMPERATURE : 25°C

DATE : 2007-7-4

Desc.	Part No.	P _D (rated)	I _D	R _{DS} (ON)	λ _{Gi}	π _{Qi}	π _{Si}	T _C	π _{Ti}	π _E	λ _{SSi}
U1	P5003QVG	2	5	45	20	1	0.30167	52.02	1.35196	1	8.157
U3	P5004QVG	2	5	45	20	1	0.30167	51.56	1.33700	1	8.067

TOTAL λ _{SSi}	16.224
------------------------	--------

TRANSISTORS

MODEL : A-1A08-CO01A2L Invert

TEMPERATURE : 25°C

TESTED BY : Jackson.luo

DATE : 2007-7-4

REFERENCE : BELLCORE

Desc.	Part No.	V_{ce0} (rated)	P (rated)	V_{ce0} (operate)	λ_{Gi}	π_{Qi}	π_{Si}	T_C	π_{Ti}	π_E	λ_{SSi}
Q1	2N4403	40	24	1.05	10	1	0.32078	54.5	1.43411	1	4.600
Q2	PMBT4403	40	24	1.03	10	1	0.32040	52.7	1.37331	1	4.400
Q3	PMBT4401	40	24	0.95	10	1	0.32016	53.2	1.39091	1	5.487
Q7	2N4403	40	24	1.05	10	1	0.32078	53.7	1.40733	1	5.487

TOTAL λ_{SSi}	19.974
-----------------------	--------

RESISTORS

MODEL : A-1A08-CO01A2L Inver

TEMPERATURE : 25°C

TESTED BY : Jackson.luo

DATE : 2007-7-4

REFERENCE : BELLCORE

Desc.	Type	Value	P (rated)	W (operate)	λ_{Gi}	π_{Qi}	π_{Si}	T_C	π_{Ti}	π_E	λ_{SSi}
R1	CH	47000	0.0625	0	1	1	0.38674	38.6	1.41467	1	0.547
R2	CH	75000	0.0625	0	1	1	0.38674	38.8	0.95130	1	0.368
R3A	CH	10000	0.0625	0.0012	1	1	0.38674	39.6	0.98354	1	5.055
R4	CH	10000	0.0625	0	1	1	0.38674	38.9	0.95528	1	1.431
R5	CH	24000	0.0625	0	1	1	0.38674	38.8	0.95130	1	0.368
R6	CH	3300000	0.0625	0	1	1	0.38674	38.2	0.95393	1	0.369
R7	CH	698000	0.0625	0	1	1	0.38674	38.9	0.95528	1	0.369
R8	CH	1000000	0.0625	0.0055	1	1	0.38674	37.3	0.89326	1	0.345
R9	CH	499000	0.1	0.00435	1	1	0.38674	39.5	0.97946	1	0.379
R10	CH	680	0.1	0	1	1	0.38674	39.2	0.96731	1	0.374
R11	CH	1400	0.0625	0	1	1	0.38674	36.4	0.85990	1	0.333
R12	CH	120000	0.1	0	1	1	0.38674	37.3	0.89326	1	0.345
R13	CH	56000	0.0625	0	1	1	0.38674	39.2	0.96731	1	0.374
R15	CH	3300000	0.0625	0	1	1	0.38674	39.3	0.98189	1	0.380
R16	CH	47000	0.0625	0	1	1	0.38674	38.9	0.95528	1	0.369
R17	CH	100000	0.0625	0	1	1	0.38674	39.5	0.97946	1	0.379
R18	CH	15000	0.0625	0	1	1	0.38674	38.1	0.92383	1	0.357
R19	CH	499000	0.1	0.018	1	1	0.38674	38.2	0.92771	1	0.359
R20	CH	15000	0.0625	0	1	1	0.38674	39.7	0.98763	1	0.382
R23	CH	160	0.0625	0	1	1	0.38674	38.6	0.94338	1	0.365
R25	CH	100000	0.0625	0	1	1	0.38674	39.2	0.96731	1	0.374

TOTAL λ_{SSi}	13.623
-----------------------	--------

CAPACITORS (Except AL)

MODEL : A08-CO01A2L Ir

TEMPERATURE : 25°C

TESTED E Jackson.luo

DATE : 2007-7-4

REFEREN BELLCORE

Desc.	Type	Value	(rate	V (operate)	λ_{Gi}	π_{Qi}	π_{Si}	T_C	π_{Ti}	π_E	λ_{SSi}
C1	MC	10u	25	20.86	1	1	5.08709	45.3	1.09699	1	5.580
C2	MC	1u	25	4.92	1	1	0.05234	38.1	0.96662	1	0.051
C3	MC	18pF	3000	712	1	1	0.21230	39.9	0.99822	1	0.212
C5	MC	1500pF	25	0.57	1	1	0.05234	38.1	0.96662	1	0.051
C6	MC	1uF	25	20.99	1	1	7.41600	39.7	0.99468	1	7.377
C8	MC	0.1uF	10	4.97	1	1	0.06611	37.2	1.17204	1	0.077
C10	MC	220pF	50	4.97	1	1	0.09409	39.2	0.98585	1	0.093
C11	MC	3900pF	50	0.7	1	2	0.07460	31.1	1.22989	1	0.092
C12	MC	1uF	16	4.99	1	1	0.32958	32.1	0.86593	1	0.285
C13	MC	0.047u	16	0.56	1	1	0.06434	30.8	0.84505	1	0.054
C14	MC	4700pF	50	4.98	1	1	0.09420	30.3	0.83711	1	0.079
C15	MC	0.022u	25	1.6	1	1	0.07635	39.2	0.98585	1	0.075
C16	MC	100pF	2000	702	1	1	0.41516	39.3	0.98762	1	0.410
C21	MC	4.7uF	25	2.43	1	1	0.09287	38.9	0.98058	1	0.091
C26	MC	2.2uF	6.3	2.33	1	1	0.46397	36.5	1.78450	1	0.174

TOTAL λ_{SSi}	14.701
-----------------------	--------

INDUCTIVE DEVICES

MODEL : A-1A08-CO01A2L Inve

TEMPERATURE : 25°C

TESTED BY : Jackson.luo

DATE : 2007-7-4

REFERENCE : BELLCORE

Desc.	λ_{Gi}	π_{Qi}	T_C	π_{Ti}	π_E	λ_{SSi}
T1	8	1	52.1	1.22989	1	9.839

TOTAL λ_{SSi}	9.839
-----------------------	-------

FUSE

MODEL : A-1A08-CO01A2L Inve

TEMPERATURE : 25°C

TESTED BY : Jackson.luo

DATE : 2007-7-4

REFERENCE : BELLCORE

Desc.	Part No.	I (rated)	I (operate)	λ_{Gi}	π_{Qi}	π_{Si}	T_C	π_{Ti}	π_E	λ_{SSi}
FI	FUSE	2.5	0.58	9	1	0.525608	39.4	0.98938	1	4.680

TOTAL λ_{SSi}	4.680
-----------------------	-------

PCB

MODEL : Λ-1A08-CO01A2L Inve

TEMPERATURE : 25°C

TESTED BY : Jackson.luo

DATE : 2007-7-4

REFERENCE : BELLCORE

Desc.	Part No.	λ_{Gi}	π_{Qi}	π_{Si}	T_C	π_{Ti}	π_E	λ_{SSi}
PCB	PCB	2	1	3.320117	45.8	1.10644	1	7.347

TOTAL λ_{SSi}	7.347
-----------------------	-------

DIODES

MODEL : A-1A08-CO01A2L Inve
TESTED BY : Jackson.luo
REFERENCE : BELLCORE

TEMPERATURE : 25°C
DATE : 2007-7-4

Desc.	Part No.	Vr (rated)	I (rated)	Vr (operate)	λ_{Gi}	π_{Qi}	π_{Si}	T_C	π_{Ti}	π_E	λ_{SSi}
D1	BAV99W	75	0.2	49.4	6	1	0.92164	35.2	3.24449	1	17.942
D2	BAV70LT1	70	0.225	49.4	6	1	0.89763	36.8	2.69916	1	14.537
D3	1N4148WS	70	0.2	0.56	6	1	0.89763	34.4	2.69916	1	14.537

TOTAL λ_{SSi}	47.016
-----------------------	--------

Inverter BD A-Test Report

Revision: R0A

GTK Description: DA-1A08-CO01A2L

GTK Part Number: 541380001009

DQA Prepared by: _____



Checked by: _____



Approved by: JP, Wen 7/4, 2007

Date: 2007/07/04

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Document Change Sheet

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Table of Content

A. SCOPE	4
B. PURPOSE	4
C. REFERENCE DOCUMENT	4
D. TEST SUMMARY	4
E. BUG LIST	4
1. DOCUMENT CHECK	5
2. VISUAL INSPECTION.....	5
3. BURN IN TEST.....	6
4. ELECTRICAL CHARACTERISTICS TEST	6
4.1 LAMP VOLTAGE AND FREQUENCY	6
4.2 OPEN VOLTAGE AND SHUTDOWN TIME.....	7
4.3 BACK LIGHT ON/OFF SEQUENCE	8
4.4 OUTPUT SHORT TEST	9
4.5 OPEN LAMP TEST	10
4.6 LAMP CURRENT AND EFFICIENCY	10
4.7 ACOUSTIC NOISE FROM CHOKE OR TRANSFORMER	11
4.8 DC VOLTAGE MARGIN TEST.....	11
4.9 PWM DYNAMIC TEST.....	12
4.10 LIMITED CURRENT CIRCUIT TEST	12
5. ENVIRONMENT SIMULATIVE TEST	13
5.1 HIGH TEMP	13
5.2 LOW TEMP	13
5.3 HIGH TEMP & HIGH HUMIDITY	14
5.4 THERMAL SHOCK TEST.....	14
5.5 RF NOISE IMMUNITY TEST	14
5.6 ABNORMAL (STRESS) TEST-OUTPUT OPEN AND SHORT 300 TIMES	15
5.7 ENABLE ON/OFF TEST	15
6. COMPONENT APPLIED TEST.....	16
6.1 DERATING	16
6.2 ABNORMAL SMOKE TEST.....	16
6.3 THERMAL TEST	17
6.4 STRESS LOAD TEST	17
6.5 IC RIPPLE NOISE.....	18

6.6	FUSE INRUSH CURRENT TEST	18
6.7	Hot Side Current Waveform Test.....	18
6.8	Working Voltage Test.....	19
6.9	Power On Initial Current Waveform Test.....	20
6.10	Output Waveform Balance Rate Test.....	21
6.11	Dynamic Surge Input Current Test.....	22
6.12	ON/OFF Current Overshoot Test.....	23
6.13	Layout DFX.....	32

A. Scope

The report describes the test result for the product on Design stage.

B. Purpose

The purpose of this procedure is to find design bug before the product phase in DVT stage, prove the product to meet the specification, assures product quality to meet customers' requirements.

C. Reference Document

BOM

Specification

PCB

D. Test Summary

Item	Content	Result	Mark
1	Document Check	PASS	
2	Visual Inspection	PASS	
3	Burn In	PASS	
4	Electrical Characteristics Test	PASS	
5	Component Applied Test	PASS	
6	Environment. simulative Test	PASS	

E. Bug List

Bug Total: 0 Open bugs: 0 Closed bugs: 0

Item	symptom	Countermeasure	Analysis	Verification	Status
1					
2					

1. Document Check

1.1 Specification check

REV: R0A

Result: PASS

1.2 BOM check

Result: PASS

1.3 PCB Check

REV: R0A

Result: PASS

2. Visual Inspection

Item	Check Content	Result	Mark
1	No less than 0.5mm interval reserved from the rim of the PCB to the component	PASS	
2	If have list the check list for easy happen US component	PASS	
3	Correct mark the component pole on the PCB	PASS	
4	PCB must mark the UL code, date code, vendor mark	PASS	
5	Filter CAP and ceramic CAP Connect with IC or MOS must possible place near IC or MOS	PASS	
6	SMD component Location place upright with PCB width	PASS	
7	Reserve 20mil interval from power to ground	PASS	
8	Reserve 3mm interval from high voltage component to another component	PASS	
9	The SMD CAP must use X7R or X5R (no Y5V)	PASS	
10	More than 3mm reserved from the rim of Test-PAD to PCB edge	PASS	
11	The ground layout to avoid a circle	PASS	
12	Location reference number of the component should be arranged in order	PASS	
13	Location reference number should be printed at the place, where is easy to found an not hidden by component	PASS	

<Test Parameter & Condition>

Vin (min) = 9.0 V : Vin (max) = 20.0 V

PWM (min) = 30% : PWM (max) = 100% DAC_BRIG:0V

Venable (on) = 3.3 V : Venable (off) = 0 V

Iout (min) = 2.7~3.3 mArms : Iout (max) = 5.7~6.3 mArms

Ta (min) = 0°C : Ta (typ) = 25°C : Ta (max) = 50°C

LCD Panel: HSD150PX14 (Vender: HSD)

Dummy Load: 75 Kohm

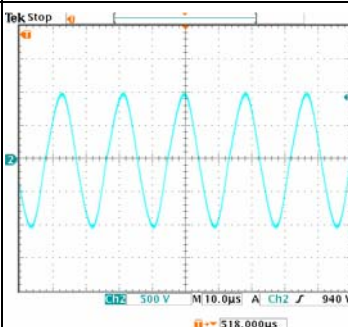
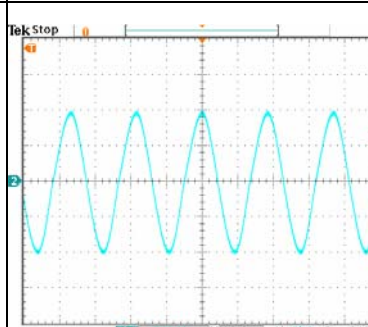
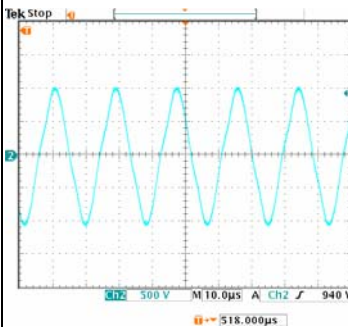
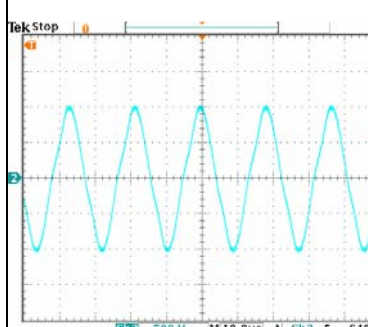
3. Burn In test

1. Test defines: to test component quality and life.
2. Test equipment: DUMMY LOAD; DC POWER SUPPLY.
3. Test condition: $V_{in} = V_{in(min)} \& V_{in(max)}$; PWM= 100 %; Venable(on); The all Sample should be burn-in 48 hours 50°C with Dummy load
4. Test quantity: 5set
5. Pass/fail: output voltage and frequency meet spec
6. Test result: **PASS**

4. Electrical Characteristics Test

4.1. Lamp Voltage And Frequency

1. Test define: test inverter board work accorded with frequency and voltage of the panel
2. Test equipment: TDS3032; DC POWER SUPPLY; LCD panel; Topward 8120
3. Test condition: $V_{in} = 9.0V(min) \& 20.0V(max)$; PWM= 100 % & 30 %; Venable=3.3V;
4. Test quantity: 5set
5. Pass/fail: the result of test accord with the specification
6. Test table:

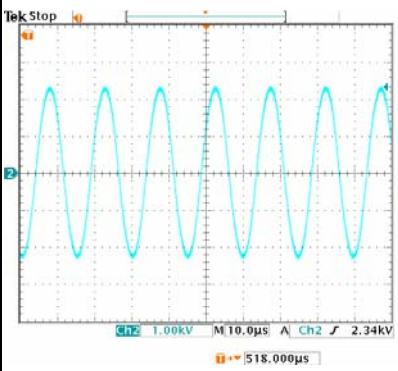
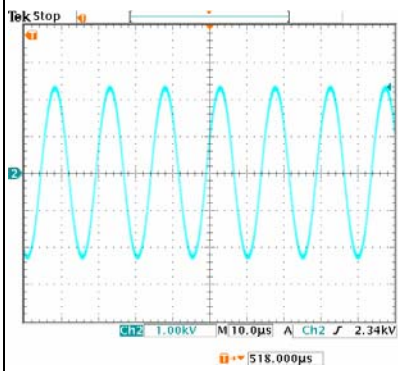
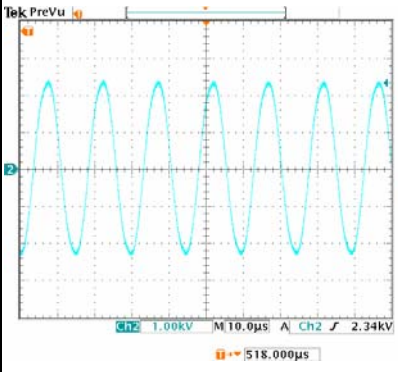
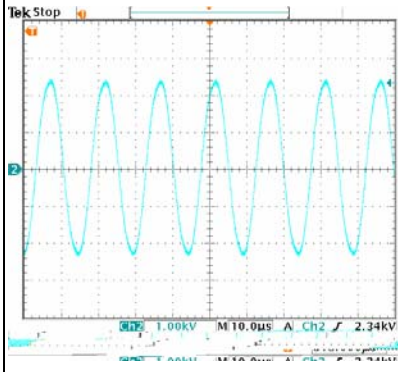
ITEM Vin	Spec		PWM:100%			PWM:30%			Result
	Voltage	Frequency	Voltage	Frequency	Figure	Voltage	Frequency	Figure	
Vin=9.0V	No spec	45~65 KHz	693V	54.17KHz	1	679V	54.11KHz	2	PASS
Vin=20.0V			683V	54.09KHz	3	675V	54.46KHz	4	PASS
CONDITION			PWM:100%			PWM:30%			
Vin=9.0V									
			Figure1						
Vin=20.0V									
			Figure3						

7. Test result: **PASS**

4.2. Open Voltage And Shutdown Time

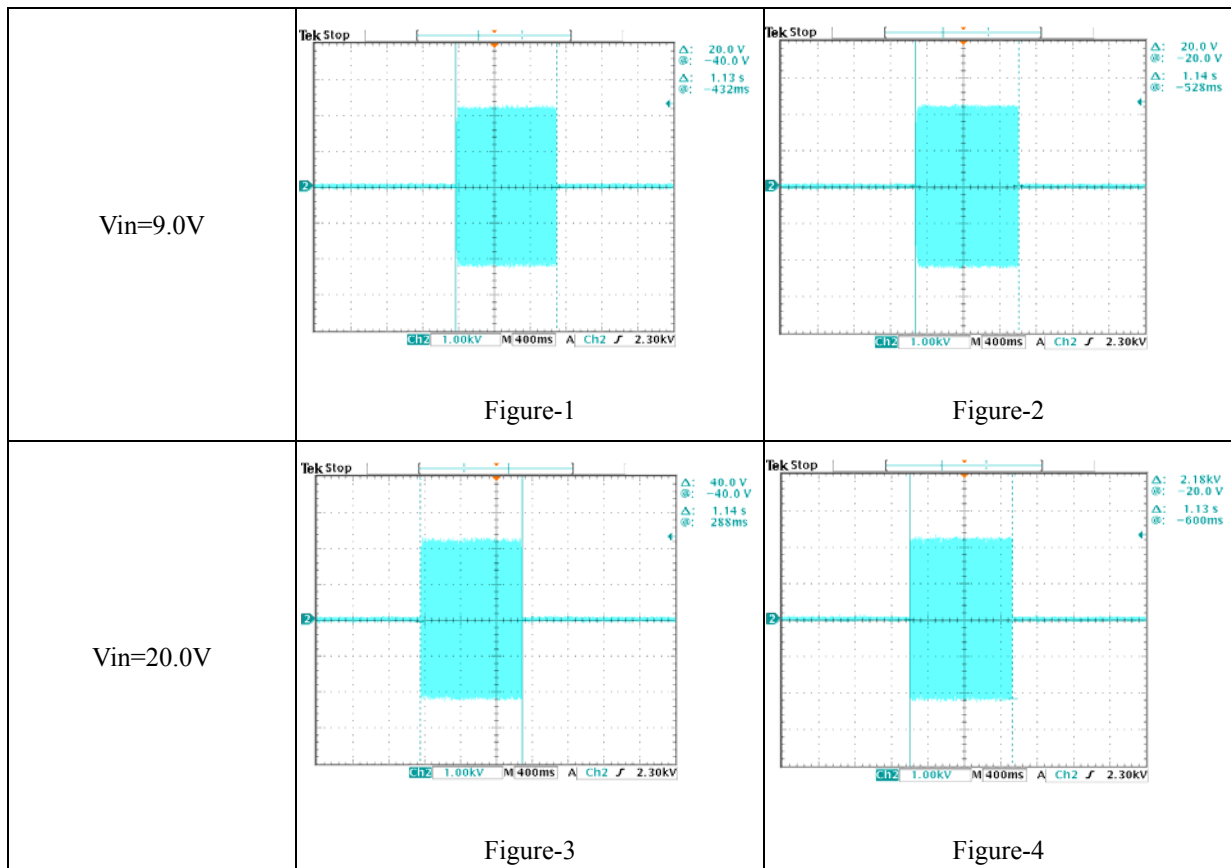
1. Test define: It should be protected when testing open lamp
2. Test equipment: TDS3032; DC POWER SUPPLY; Topward 8120.
3. Test condition: $V_{in}=V_{in(min)}\&V_{in(max)}$; PWM= 100%& 30%; $V_{enable}=3.3V$;
Resistor of output is set up infinite test the output voltage and shutdown time.
4. Test quantity: 5sets
5. Pass/fail: the result of test accord with the specification
6. Test table:

A. Open lamp Voltage

ITEM	Spec	PWM:100%		PWM:30%		Result
	Voltage(rms)	Voltage(rms)	Figure	Voltage(rms)	Figure	
$V_{in}=9.0V$	$\geq 1600V$	1.64KV	1	1.65KV	2	PASS
$V_{in}=20.0V$	At 0℃	1.67KV	3	1.68KV	4	PASS
CONDITION		PWM:100%		PWM:30%		
$V_{in}=9.0V$		 Figure1		 Figure2		
$V_{in}=20.0V$		 Figure3		 Figure4		

B. Shutdown time

ITEM Vin	Spec	PWM:100%		PWM:30%		Result
	Shutdown time	Shutdown time	Figure	Shutdown time	Figure	
Vin=9.0V	1.0~1.5S	1.13S	1	1.14S	2	PASS
Vin=20.0V		1.14S	3	1.13S	4	PASS
CONDITION		PWM:100%		PWM:30%		

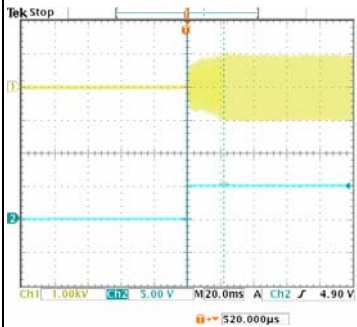
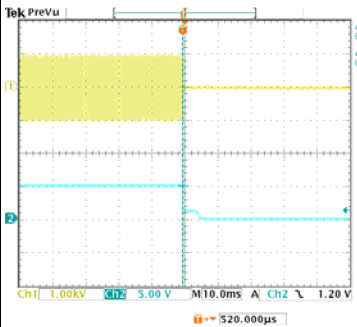
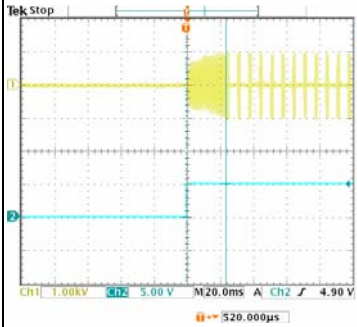
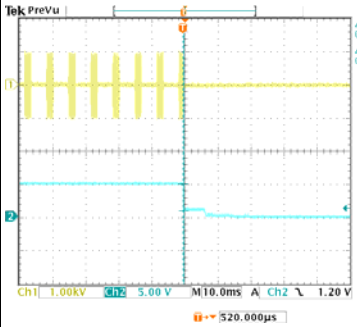
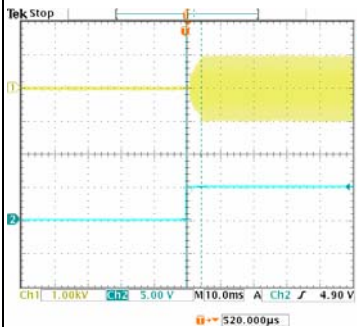
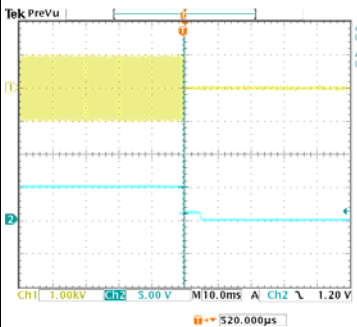
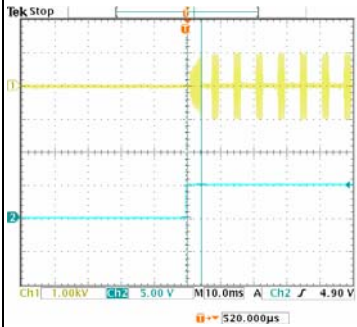
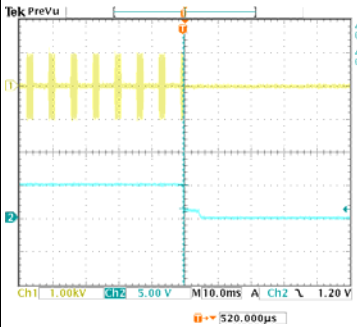


7. Test result: **PASS**

4.3. Back Light On/Off Sequence

1. Test defines: test the start time from Venable turning on to normal output and test the off time form normal Venable to turning off when the main voltage on.
2. Test equipment: TDS3032; DC POWER SUPPLY; LCD panel; Topward 8120.
3. Test condition: Vin=Vin(min) and Vin(max); PWM= 100%& 30%;
4. Test quantity: 2set
5. Pass/fail: the result of test accord with the specification.
6. Test table:

ITEM Vin	spec	Venable(on)→B/L on				Venable(off)→B/L off				Result
		time	Figure	time	Figure	time	Figure	time	Figure	
	NA	22.4ms	1	24.0ms	2	0.20ms	5	0.20ms	6	-----
		4.6ms	3	4.6ms	4	0.20ms	7	0.20ms	8	-----
CONDITION		Venable(on)				Venable(off)				

Vin=9.0V	PWM:100%	 Figure-1	 Figure-5
	PWM:30%	 Figure-2	 Figure-6
Vin=20.0V	PWM:100%	 Figure-3	 Figure-7
	PWM:30%	 Figure-4	 Figure-8

7. Test result: **PASS**

4.4. Output Short Test

1. Test defines: to test protection function when output short
2. Test equipment: FLUKE45; TDS3032; DC POWER SUPPLY; LCD panel
3. Test condition: Vin=Vin (min) & Vin (max); PWM= 100%; Venable (on);

Test1: Output short →start up(1min)

Test2 : Start up→Output short(1min)

4. Test quantity: 1set

5. Pass/fail: no component damaged & output shutdown

6. Test table:

Condition	Vin	Spec	Meas	Result
Output short →start up (1min)	Vin(min)	No component damaged & output shutdown	OK	PASS
	Vin(max)		OK	PASS
Start up→ Output short (1min)	Vin(min)		OK	PASS
	Vin(max)		OK	PASS

7. Test result: **PASS**

4.5. Open Lamp Test

1. Test defines: to test protection function when open lamp

2. Test equipment: TDS3032; DC POWER SUPPLY; LCD panel; Topward 8120

3. Test condition: Vin=Vin(min) & Vin(max); PWM= 100% & 30%; Venable (on);

Start up without panel & Start up with panel, and then pull out the panel.

4. Test quantity: 5set

5. Pass/fail: function must shut down when lamp

6. Test table:

ITEM Vin		Spec	Start up without panel		Start up with panel, then pull out the panel		Result
			PWM= 30% (OK/NG)	PWM= 100% (OK/NG)	PWM= 30% (OK/NG)	PWM= 100% (OK/NG)	
Sample 1	Vin(min)	Shut down	OK	OK	OK	OK	PASS
	Vin(max)		OK	OK	OK	OK	PASS
Sample 2	Vin(min)		OK	OK	OK	OK	PASS
	Vin(max)		OK	OK	OK	OK	PASS
Sample 3	Vin(min)		OK	OK	OK	OK	PASS
	Vin(max)		OK	OK	OK	OK	PASS
Sample 4	Vin(min)		OK	OK	OK	OK	PASS
	Vin(max)		OK	OK	OK	OK	PASS
Sample 5	Vin(min)		OK	OK	OK	OK	PASS
	Vin(max)		OK	OK	OK	OK	PASS

7. Test result: **PASS**

4.6. Lamp Current And Efficiency

1. Test defines: to test lamp current and efficiency

2. Test equipment: FLUKE45; TDS3032; DC POWER SUPPLY; LCD panel and Dummy load;
Topward 8120

3. Test condition: Vin=Vin (min) & Vin(max); PWM=100% & 30%; Venable (on);

4. Test quantity: 1set

5. Pass/fail: lamp current and efficiency meet spec.

6. Test table:

Load	Test condition		Spec	I in (A)	Pout (W)	Efficiency (%)	Result
LCD PANEL	Vin min	PWM=100%	≥83%	0.539	4.222	87.03	PASS
	Vin max			0.247	4.179	84.60	PASS

PWM	spec	Lamp Output Current (AC R.M.S)		Result
		Vin(min)	Vin(max)	
PWM =30%; DAC_BRIG:0V	2.7mA~3.3mA	3.041	3.010	PASS
PWM =100%; DAC_BRIG:0V	5.7mA~6.3mA	6.093	6.118	PASS

7. Test result: **PASS**

4.7. Acoustic Noise From Choke or Transformer

1. Test defines: to test acoustic noise from choke or transformer
2. Test equipment: FLUKE45; DC POWER SUPPLY; LCD panel; Topward 8120
3. Test condition: Vin=Vin(min)(max); PWM= 100% & 30%; Venable (on);
Ear near inverter board transformer 5cm

4. Test quantity: 2set
5. Pass/fail: no acoustic noise
6. Test table:

Condition	spec	Meas	Result
LCD PANEL	No acoustic noise	Y	PASS
OUTPUT OPEN		Y	PASS

7. Test result: **PASS**

4.8. DC Voltage Margin Test

1. Test defines: test lowest and highest input voltage, the inverter functions ok.
2. Test equipment: FLUKE45; TDS3032; DC POWER SUPPLY; LCD panel
3. Test condition: adjust Vin; PWM= 100%; Venable(on); Test temperature is 25°C
4. Test quantity: 1set
5. Pass/fail: The result not exceed ±5% of normal operation when highest Vin voltage shall be larger than 5% Vin or lowest Vin voltage shall be smaller than 5% Vin.

6. Test table:

Item	Vin	Spec	NORMAL		MEAS		RESULT
			Voltage (V)	Frequency (KHz)	Voltage (V)	Frequency (KHz)	
PWM= 30%	Vin min	<±5%	680	55.28	683	55.36	PASS
	Vin max		663	55.40	669	55.62	PASS
PWM= 100%	Vin min		695	55.44	700	55.41	PASS
	Vin max		684	55.99	686	55.71	PASS

7. Test result: **PASS**

4.9. PWM Dynamic Test

1. Test define: test inverter board when adjust Vadj from min to max
2. Test equipment: FLUKE45; DC POWER SUPPLY; LCD panel; Topward 8120
3. Test condition: Vin=Vin(min); PWM= from 30% to 100%; Venable (on);

Test temperature is 25°C Test times: 50 times.

4. Test quantity: 2set
5. Pass/fail: no shutdown and damage.
6. Test table:

CONDITION	SPEC	Meas-1(OK/NG)	Meas-2(OK/NG)	RESULT
PWM Dynamic Test	No shut down; No damage	OK	OK	PASS

7. Test result: **PASS**

4.10. Limited Current Circuit test

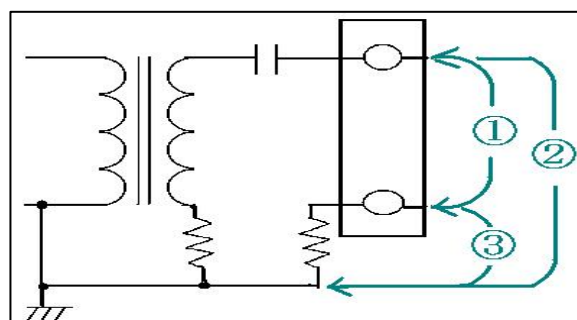
1. Test objective: to test component safety.
2. Test equipment: DC POWER SUPPLY.
LCD panel or Dummy load
3. Test condition: Vin=Vin(max); PWM= 100%
Venable=Venable(on);

Connect 2Kohm to (1)(2)(3) points

4. Test quantity: 1set

Pass/fail: For Safety requirements,

If the Test Point's frequency was over 1KHz, the test point should be follow formula
 $I_{p-0} < (\text{frequency} * 0.7) \text{mA}$. The limit current should not exceed 70mA.



5. Test table:

Point	Output	Test Mode	Measurement			Limit (f x 0.7)mA	Result
			Ip-0 [mA]	f [KHz]	Status		
(1)	Lamp	Normal	---	---	Shutdown	---	Pass
	Open	1fail (a): Lamp disconnect	---	---	Shutdown	---	Pass
	Lamp	1fail (b): Short HV-cap	---	---	Shutdown	---	Pass
	Lamp	1fail (c): Short Input-cap	---	---	Shutdown	---	Pass
(2)	Lamp	Normal	---	---	Shutdown	---	Pass
	Open	1fail (a): Lamp disconnect	---	---	Shutdown	---	Pass
	Lamp	1fail (b): Short HV-cap	---	---	Shutdown	---	Pass
	Lamp	1fail (c): Short Input-cap	---	---	Shutdown	---	Pass
(3)	Lamp	Normal	2.10	56.37	Normal	39.46	Pass
	Open	1fail (a): Lamp disconnect	---	---	Shutdown	---	Pass
	Lamp	1fail (b): Short HV-cap	2.10	56.42	Normal	39.49	Pass
	Lamp	1fail (c): Short Input-cap	---	---	Shutdown	---	Pass

Abnormal test:

Fault	Output Volts (Vrms)	Volts, dc	OutputCurrent (mArms)	Current, dc	Frequency	Limit(mA)
-------	---------------------------	-----------	--------------------------	----------------	-----------	-----------

NormalLoad (15" LCD)	679	20.0	6.183	0.250	52.69	36.88
Normal Load(+)-Short	shutdown	20.0	shutdown	---	shutdown	---
Normal Load(++)-Open	shutdown	20.0	shutdown	---	shutdown	---
Normal Load(+)-2Kohm	12.4	20.0	shutdown	0.03	56.40	39.48
Normal Load(+)-2Kohm	Output Volts(Vrms)	Volts, dc	Output Current(mArms)	Current, dc)	Frequency	Limit(mA)
U1 (3-4) Short	shutdown	20.0	shutdown	0.01	shutdown	shutdown
D1 (1-3) Short	U1 bad	20.0	shutdown	0.01	shutdown	shutdown
D1 (1-2) Short	U1 bad	20.0	shutdown	0.01	shutdown	shutdown
U3 (3-4) Short	shutdown	20.0	shutdown	0.01	shutdown	shutdown
D2 (1-3) Short	12.4	20.0	shutdown	0.03	56.33	39.43
D2 (1-2) Short	12.4	20.0	shutdown	0.03	56.37	39.46
C16 Short	12.6	20.0	shutdown	0.03	56.34	39.44
C1 Short	shutdown	20.0	shutdown	---	shutdown	shutdown

Reference:-Input Voltage: 20.0V

-Brightness Control: Maximum (100%)

(+):Pin1-2 of CN2 Short –Transformer output

(++):Pin1-2 of CN2 Open

6. Test result: **PASS**

5. Environment Simulative Test

5.1 High temp

1. Test objective: to test function at 50°C
2. Test equipment: FLUKE45; TDS3032; DC POWER SUPPLY; Environment chamber; LCD panel
3. Test condition: Vin=Vin(min); PWM= 100%; Venable=Venable(on) ; Test time is 8 hours 50°C
4. Test quantity: 2sets
5. Pass/fail: Before value and after value difference < ±5%.
6. Test table:

Sample No	Pass /Fail Criteria	Before test		After test		Result
		Vout (V)	Frequency (KHz)	Vout (V)	Frequency (KHz)	
1	< ±5%	697	56.37	700	56.53	Pass
2		700	54.29	692	54.53	Pass

7. Test result: **PASS**

5.2 Low temp

1. Test objective: to test that the inverter board works at 0°C after 6 hours
2. Test equipment: FLUKE45; DC POWER SUPPLY; chamber; LCD panel; Topward 8120.
3. Test condition: Vin=Vin(min), PWM= 100% & 30%; Venable=Venable (on); Power on for 5 secs

Power on/off for 5 sec, repeat 5times

4. Test quantity: 2set

5. Pass/fail: 1. Before value and after value difference $< \pm 5\%$. ***2. CCFT turns on properly with no Flicking**
(Visual inspection)

6. Test table:

Sample No	Condition		Before test		After test			Result
			Vout (V)	Frequency (KHz)	Vout (V)	Frequency (KHz)	*2 Vis.ins.	
1	Vin (min)	PWM (30%)	688	56.05	684	56.33	Ok	Pass
		PWM (100%)	698	56.49	701	56.40	Ok	Pass
2	Vin (min)	PWM (30%)	673	55.28	678	55.34	Ok	Pass
		PWM (100%)	699	55.59	704	55.54	Ok	Pass

7. Test result: **PASS**

5.3 High temp & High humidity

1. Test objective: It is to verify that the Sample can operate normally after high temperature and High humidity storage.

2. Test Conditions: Vin=Vin(max), PWM= 100%, Ta= 50±2°C (humidity: 95% RH) ;
Storage time: 96 hours; Power: off

3. Test quantity: 2sets

4. Pass/fail: Before value and after value difference $< \pm 5\%$.

5. Test table

Sample No	Pass /Fail Criteria	Before test		After test		Result
		Vout (V)	Frequency (KHz)	Vout (V)	Frequency (KHz)	
1	$< \pm 5\%$	681	55.56	685	55.52	Pass
2		685	55.40	688	55.00	Pass

6. Test result: **PASS**

5.4 Thermal Shock Test

1. Test define: Check inverter thermal shock

2. Test equipment: TDS3032; DC POWER SUPPLY; Environment Chamber; LCD panel.

3. Test condition: Vin=Vin(max); PWM= 100%; Venable (on),

Temperature rise from -30 °C to 100 °C in 5 minute.

4. Test quantity: 2set

5. Pass/fail: output voltage meet spec, Before value and After value difference $< \pm 5\%$

6. Test table:

Sample No	Pass /Fail Criteria	Before test		After test		Result
		Vout (V)	Frequency (KHz)	Vout (V)	Frequency (KHz)	
1	$< \pm 5\%$	690	55.68	686	55.65	Pass
2		682	54.53	679	54.62	Pass

7. Test result: **PASS**

5.5 RF Noise Immunity Test

1. Test defines: to test RF Noise Immunity

2. Test equipment: DC POWER SUPPLY; LCD panel; Topward 8120.

- Test condition: Vin=Vin(min)(max); PWM= 100% & 30%; Venable(on); Test temperature is 25°C; Test distance 5cm. Inverter board direction same with LCD panel forward. Antenna direction has six directions (upper, lower, left, right, forward, rear)
- Test quantity: 2set
- Pass/fail: no shut down
- Test table:

CONDITION	distance	SPEC	Meas-1(OK/NG)	Meas-2(OK/NG)	RESULT
Upper	5cm	No shut down	OK	OK	PASS
Lower	5cm		OK	OK	PASS
Left	5cm		OK	OK	PASS
Right	5cm		OK	OK	PASS
Forward	5cm		OK	OK	PASS
Rear	5cm		OK	OK	PASS

- Test result: **PASS**

5.6 Abnormal (stress) test-output Open and Short 300 times

- Test objective: to test component reliability under abnormal conditions.
- Test equipment: DC POWER SUPPLY;
- Test condition: Vin=Vin(min),(max); PWM= 100%; Venable=Venable (on);
 A) Output (HV&LV) open; Vin turned on/off 300times. (On=5sec, Off=5sec)
 B) Output (HV&LV) short; Vin turned on/off 300times. (On=5sec, Off=5sec)
 C) Output (HV&GND) short; Vin turned on/off 300times. (On=5sec, Off=5sec)
- Test quantity: **1set x A) B) C)**
- Pass/fail: **1. before value and after value difference < ±5%. *2. No damage to the components.**
 (Visual inspection)
- Test table

Test Item	Condition	Before test		After test			Result
		Vout (V)	Frequency (KHz)	Vout (V)	Frequency (KHz)	^{*2} Vis. Ins.	
A)	Vin (min)	703	54.28	700	54.38	Ok	Pass
	Vin (max)	684	54.61	680	54.43	Ok	Pass
B)	Vin (min)	699	54.32	701	54.14	Ok	Pass
	Vin (max)	682	54.30	679	54.59	Ok	Pass
C)	Vin (min)	705	54.13	700	54.20	Ok	Pass
	Vin (max)	680	54.62	683	54.61	Ok	Pass

- Test result: **PASS**

5.7 Enable On/Off Test

- Test define: Check inverter Enable On/Off
- Test equipment: CHROMA3000; DC POWER SUPPLY; LCD panel
- Test condition: Vin=Vin (min), PWM= 100%; Venable (on); Cycle the Vin On/Off for 5000 times (5sec on 5sec off)
- Test quantity: 2set

5. Pass/fail: 1. before value and after value difference $< \pm 5\%$. *2. No damage to the component.
(Visual inspection)

6. Test table:

Sample No	Condition	Before test		After test			Result
		Vout (V)	Frequency (KHz)	Vout (V)	Frequency (KHz)	*2 Vis.ins.	
1	Vin (min)	695	54.40	699	54.74	Ok	Pass
	Vin (max)	685	54.61	681	54.24	Ok	Pass
2	Vin (min)	702	56.31	700	56.56	Ok	Pass
	Vin (max)	688	56.07	693	56.54	Ok	Pass

7. Test result: **PASS**

6. Component Applied Test

6.1 Derating

1. Test objective: test component derating. To measure how close to the spec and components operating.
2. Test equipment: FLUKE45; TDS3032; DC POWER SUPPLY; LCD panel
3. Test condition: Vin=Vin(min)(max); PWM= 100%; Venable=Venable(on);
Test temperature is 25°C; Adjust PWM to keep output current maximum.
4. Test quantity: 1set
5. Pass/fail: derating meet with parts spec
6. Test table: (Refer to attachment “# Derating Data” for details of the results.)

Item	Confirmation Item	Check Done or not
Vin (max)	Test condition of all components	Done
Vin (min)	Test condition of all components	Done
Capacitor	Voltage is less than 85% of the component spec	Done
Resister	Wattage is less than 50% of the component spec (#1)	Done
FET,Tr	Vds(Vce), Ids(Ice)= is less than the min FET spec, Pd is less than 50% of spec(#1)	Done
Diode	P (If*Vf) = less than 50% of spec (#1)	Done
Transformer	Open lamp voltage & continuous running Voltage is less than spec	Done

#1 if the result is over 50% it should be judged by the actual temperature and component spec.

7. Test result: **PASS**

6.2 Abnormal Smoke Test

1. Test objective: to test component open and short
2. Test equipment: FLUKE45; TDS3032; DC POWER SUPPLY; LCD panel
3. Test condition: Vin=Vin(min); PWM= 100%; Venable=Venable (on);
Turned-on and then open or short. Adjust PWM to keep output current maximum
4. Test quantity: 1set
5. Pass/fail: There shall be no smoke, electric arc, abnormal temp or other user's shock mode.
6. Test table: (Refer to attachment “# Abnormal Data” for details of the results)

Test Mode	Condition	Confirmation Item	Check Done or not
Vin (min)	Open	All component (include input connector)	Done
	Short	All component (include input connector)	Done
ALL	ALL	Value of the Iin / Iout measurement	Done
ALL	ALL	Must measure value of the saturation temperature of damaged component if the abnormal happen.	Done

7. Test result: **PASS**

6.3 Thermal Test

1. Test defines: to test component temperature
2. Test equipment: FLUKE45; TDS3032; DC POWER SUPPLY; LCD panel;
3. Test condition: Vin =Vin (max); Venable (on); Test need assembly chassis and cover; Ambient Temperature: 50℃ ;Adjust PWM to keep output current maximum; Loading: Use LCD panel
4. Test quantity: 1 set
5. Pass/fail: temperatures meet with spec.
6. Test table:

NUM	CCT	Description	Spec	Meas	Result
				LCD Panel	
1	T1	Transformer	105℃	74.90℃	PASS
2	U1	P5003Q	150℃	70.13℃	PASS
3	U2	ICOZ9910ASN-B5	85℃	63.71℃	PASS
4	U3	P5003Q	150℃	73.14℃	PASS
5	C1	Input cap	85℃	66.95℃	PASS
6	PCB	Under MOS	105℃	63.68℃	PASS
7	Ta	---	---	51.80℃	---

7. Test result: **PASS**

6.4 Stress Load Test

1. Test define: Test inverter stress load
2. Test equipment: FLUKE45; TDS3032; DC POWER SUPPLY;
3. Test condition: Vin=Vin(min); PWM= 100%; Venable(on); Test temperature is 55℃
Test time: 72hours; Load: 150% of Max load.
4. Test quantity: 1set
5. Pass/fail: No component damage.
6. Test table:

TEST CONDITION	SPEC	MEAS	RESULT
STRESS LOAD TEST	No component damage	OK	PASS

7. Test result: **PASS**

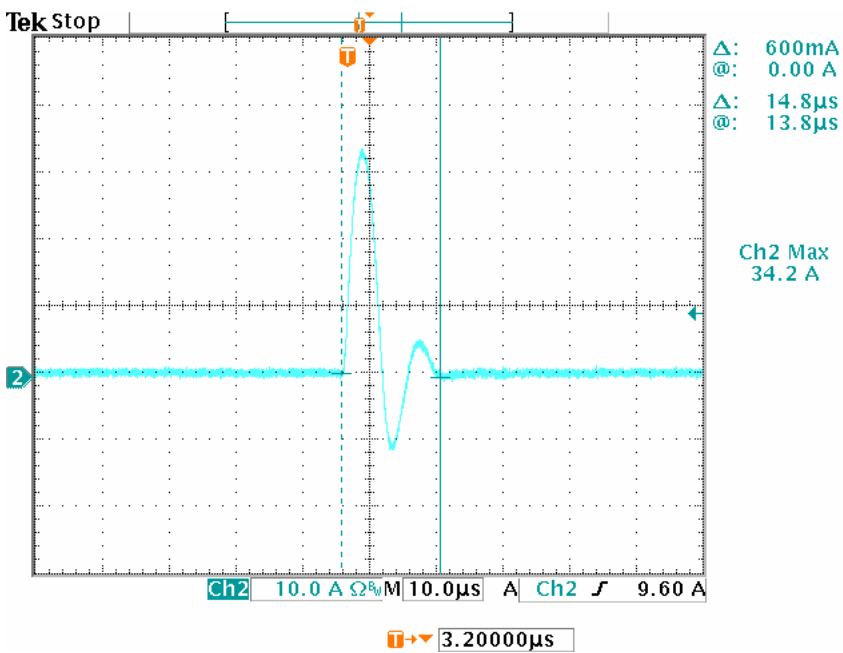
6.5 IC Ripple Noise test

1. Test define: test inverter board Ripple Noise
2. Test equipment: FLUKE45; TDS3032; DC POWER SUPPLY.
3. Test condition: $V_{in}=V_{in(max)}$; PWM= 100%; Venable(on); IC Vcc Ripple Noise
4. Test quantity: 2set
5. Pass/fail: the result of test accord with the specification,
6. Test table:

Test condition	spec	Meas		Result
$V_{in}=V_{in(max)}$; PWM= 100%; Venable(on)	-----	Sample 1	Sample 2	
		728mV	756mV	-----

6.6 Fuse Inrush Current test

1. Test define: to test the inverter inrush current
2. Test equipment: TDS3032; DCPOWER SUPPLY; AM503S; LCD PANEL
3. Test condition : $V_{in}=V_{in(max)}$; PWM= 100%; Venable(on);
4. Test quantity: 1set
5. Pass/fail: The I_{max}^2t should be meet spec
6. Test table:

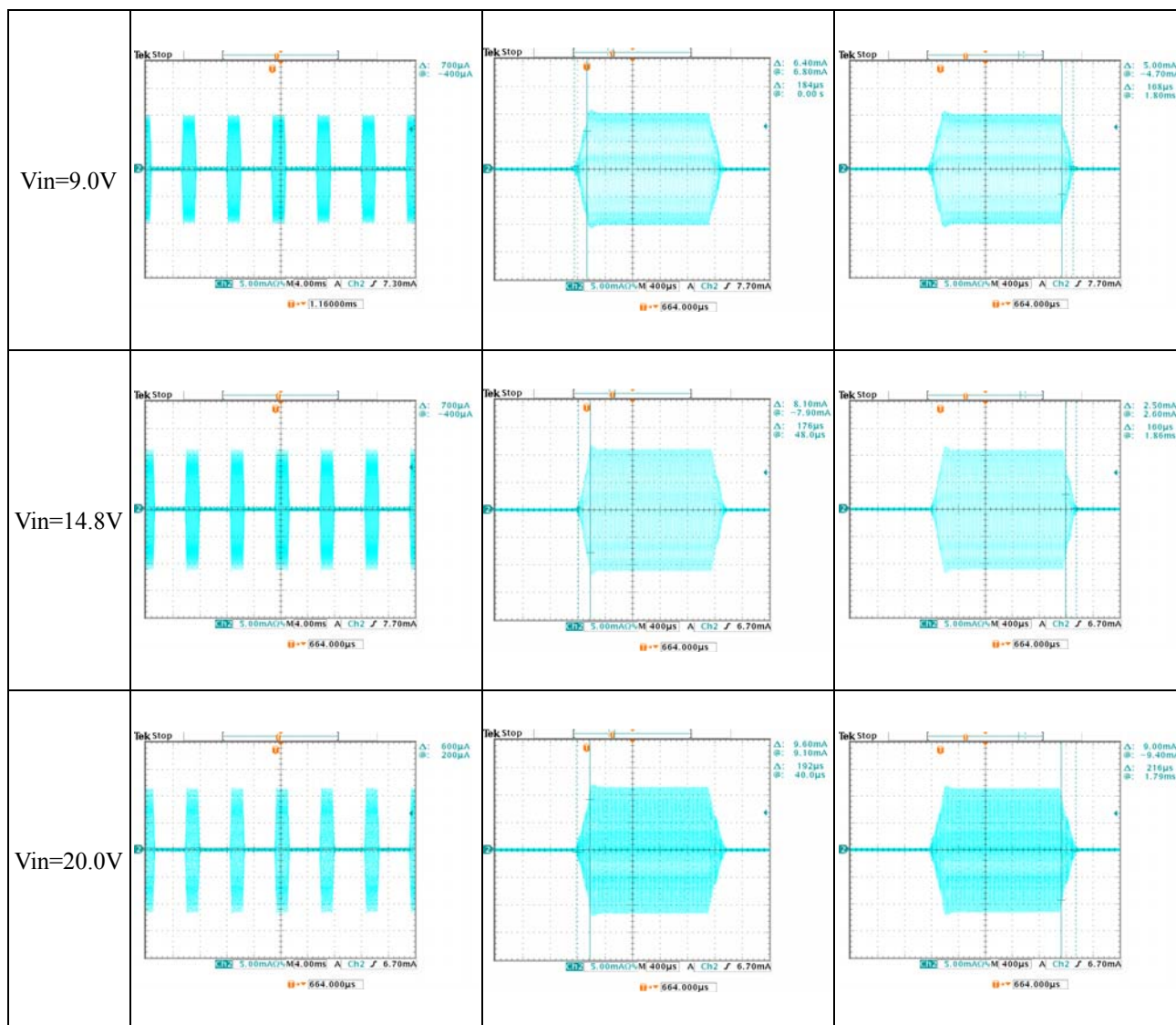
ITEM Vin	Spec	Inrush current	Time	I_{max}^2t	Result
Vin(max)	$0.112A^2s$	34.2A	14.8us	$0.01731A^2s$	PASS
condition	Venbale on				
Vin(max) PWM= 100%					

7. Test result: **PASS**

6.7 Hot side current waveform test

1. Test defines: to test the inverter current waveform
2. Test equipment: TDS3032; DCPOWER SUPPLY; AM503S; LCD PANEL; Topward 8120.
3. Test condition: $V_{in}=V_{in}(\min)& V_{in}(\max)$; PWM= 30 %;
4. Test quantity: 2set
5. Pass/fail: the result of test accord with the specification.
6. Test table:

CONDITION	Test Item	SPEC	Vin=9V	Vin=14.8V	Vin=20.0V	Result
PWM= 30 %	Turn off time Ipp value	N/A	Ipp=700uA	Ipp=700uA	Ipp=600uA	-----
	Rising time	<250us	Rising=184us	Rising=176us	Rising=192us	PASS
	Falling time	<250us	Falling=168us	Falling=160us	Falling=216us	PASS

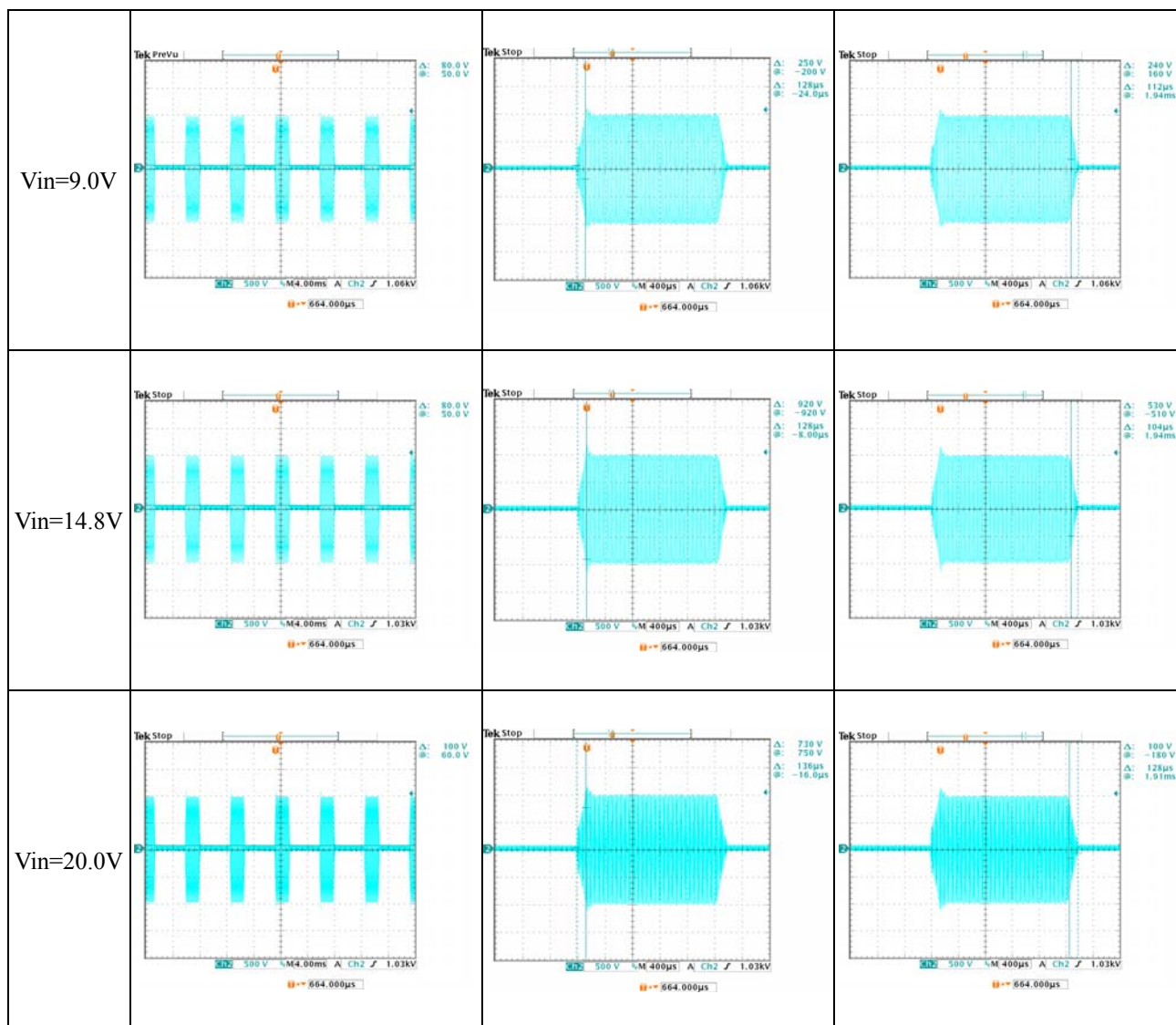


7. Test result: **PASS**

6.8 Working voltage test

1. Test defines: to test the inverter working voltage
2. Test equipment: TDS3032; DCPOWER SUPPLY; AM503S; LCD PANEL; Topward 8120.
3. Test condition: $V_{in}=V_{in}(\min)\& V_{in}(\max)$; PWM= 30 %;
4. Test quantity: 1set
5. Pass/fail: the result of test accord with the specification.
6. Test table:

CONDITION	Test Item	SPEC	Vin=9.0V	Vin=14.8V	Vin=20.0V	Result
PWM= 30%	Turn off time Vpp value	N/A	Vpp= 80V	Vpp= 80V	Vpp= 100V	PASS
	Rising time	<250us	Rising=128us	Rising=128us	Rising=136us	PASS
	Falling time	<250us	Falling=112us	Falling =104us	Falling =128us	PASS

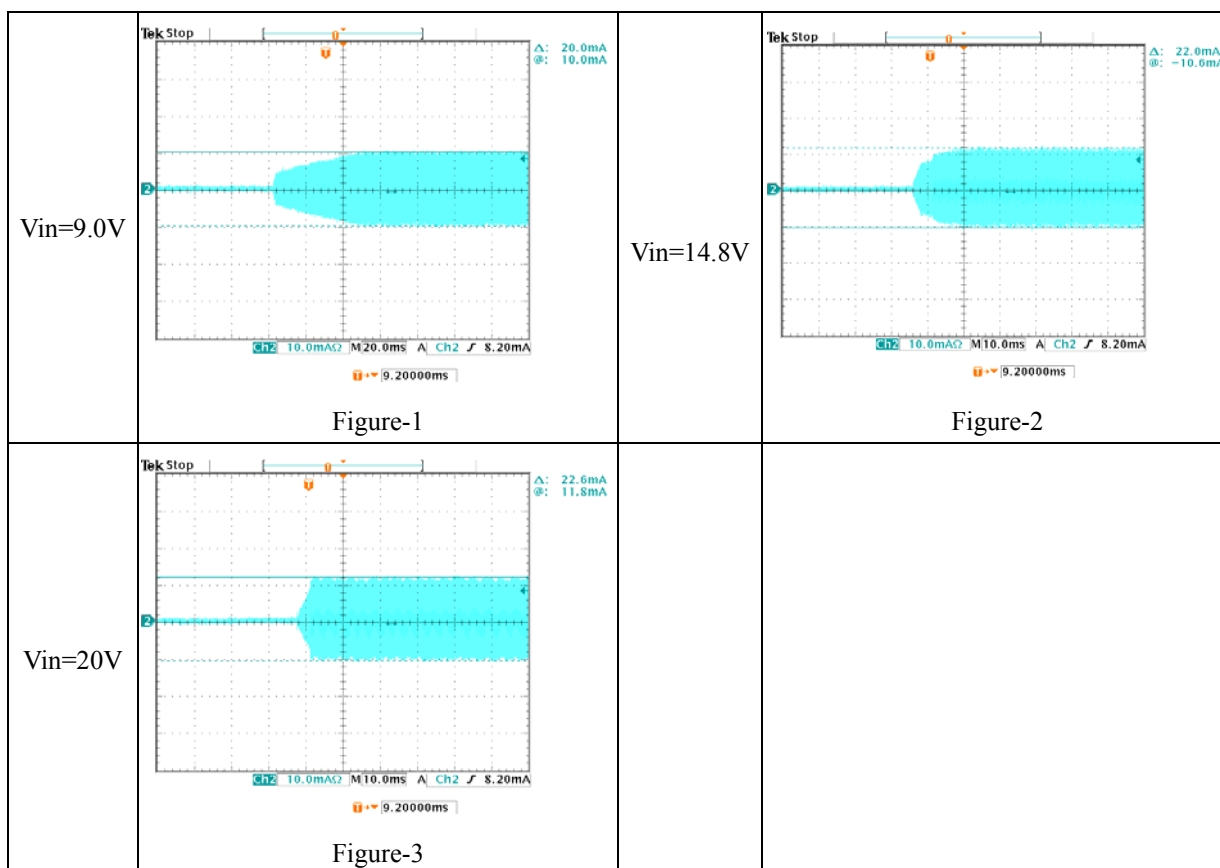


7. Test result: **PASS**

6.9 Power on initial current waveform test

1. Test defines: to test the inverter Power on current waveform
2. Test equipment: TDS3032; DCPOWER SUPPLY; AM503S; LCD PANEL
3. Test condition: Vin=Vin(min)& Vin (max); PWM= 100% ;
4. Test quantity: 1set
5. Pass/fail: the result of test accord with the specification.
6. Test table:

CONDITION	Test Item	SPEC	Vin=9.0V	Vin=14.8V	Vin=20.0V	Result
PWM= 100%	Overshoot check (%)	A/b<10%	OK	OK	OK	PASS
	Waveform	N/A	Figure-1	Figure-2	Figure-3	PASS



7. Test result: **PASS**

6.10 Output waveform balance rate test

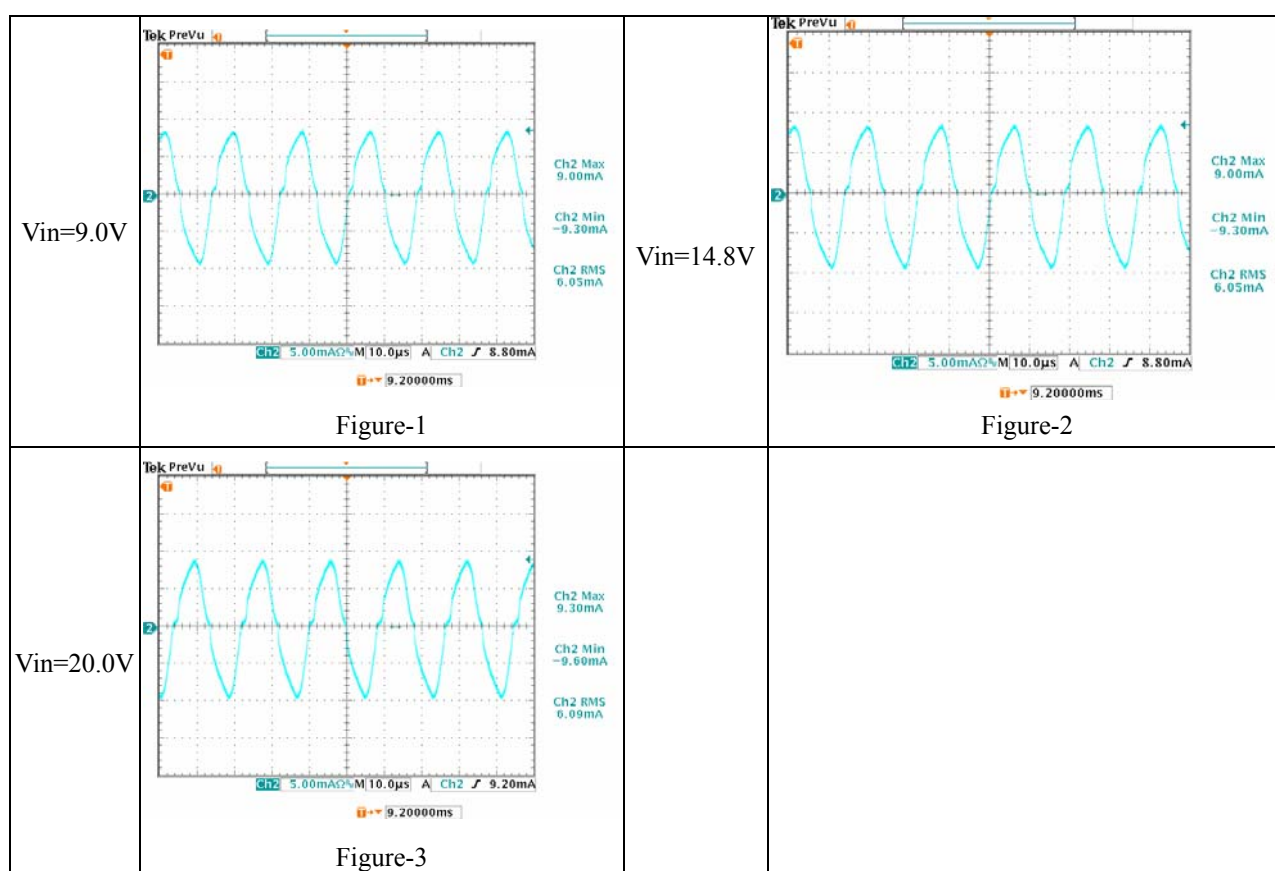
1. Test defines: to test output waveform balance rate
2. Test equipment: FLUKE45; TDS3032; DC POWER SUPPLY. LCD Panel
3. Test condition: Vin=Vin(min)(max); PWM= 100% ;
4. Test quantity: 1 sets
5. Pass/fail: Output waveforms meet **Spec A and B**.

Spec A: The degree of unbalance = $|V_{pH} - V_{pL}| / V_{rms} \times 100(\%)$: $\pm 10\%$

Spec B: The ratio of wave height = V_{pH} (or V_{pL}) / V_{rms} : less than 1.414 +/-10% (1.27~1.60)

7. Test table:

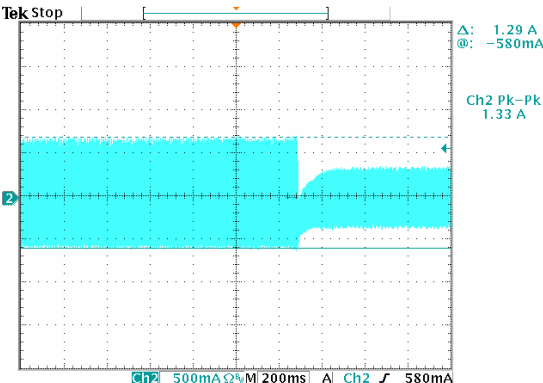
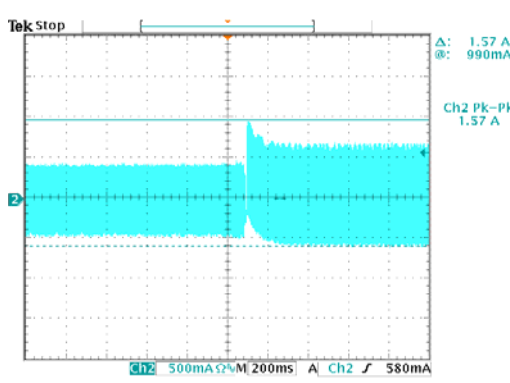
Condition		Vin=9.0V	Vin=14.8V	Vin=20.0V
Measurement	IpH	9.00mA	9.20mA	9.30mA
	IpL	9.30mA	9.60mA	9.60mA
	Irms	6.05mA	6.09mA	6.09mA
Spec A	Unbalance±10%	4.96	6.57	4.93
Spec B	High: 1.27~1.60	1.49	1.40	1.53
	Low : 1.27~1.60	1.54	1.58	1.58



7. Test result: **PASS**

6.11 Dynamic surge input current test

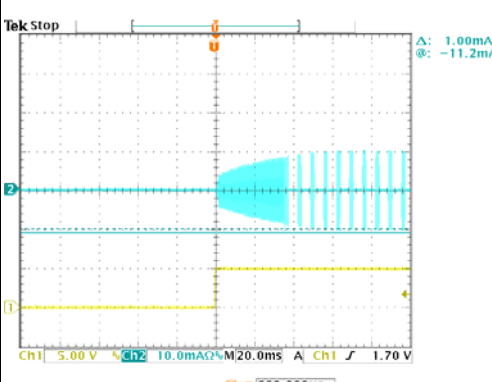
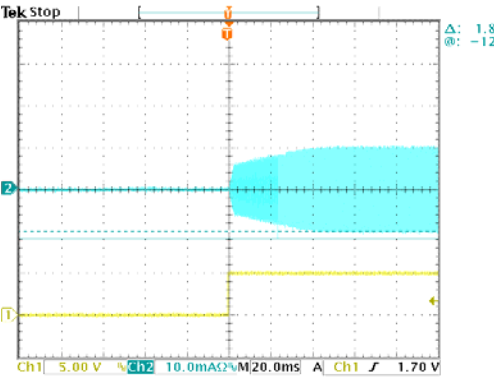
1. Test defines: to test the inverter Surge current.
2. Test equipment: TDS3032; DCPOWER SUPPLY; AM503S; LCD PANEL
3. Test condition: Vin=Vin (min) & Vin (max); PWM=100%; Venable (on)
4. Test quantity: 1set
5. Pass/fail: The Surge current should be meet spec
6. Test table:

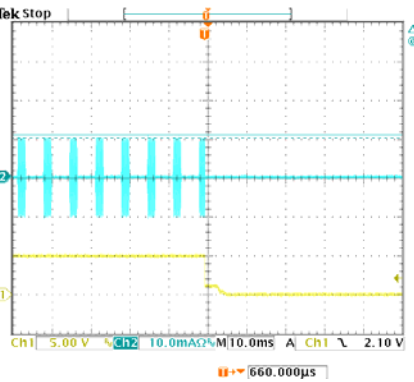
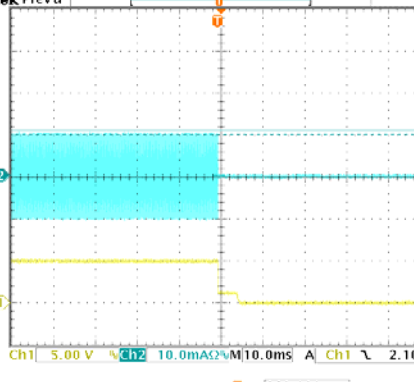
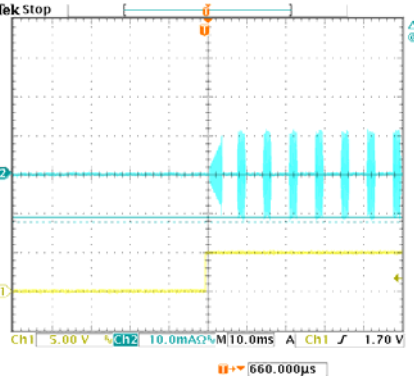
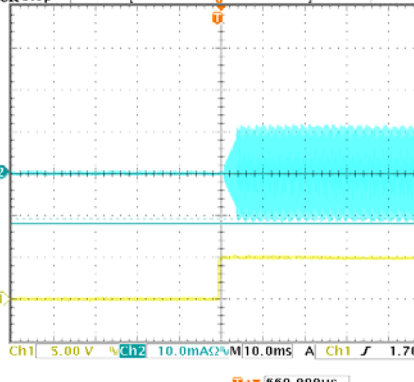
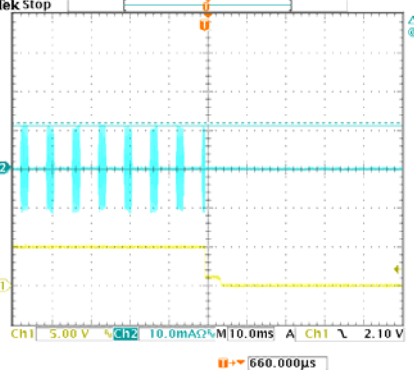
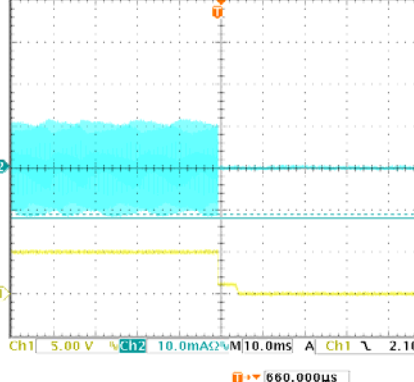
Vin= 9.0v↔20.0 v	Vin= 20v↔9.0 v
Surge input Current	Surge input Current
 Δ: 1.29 A @: -580mA Ch2 Pk-Pk 1.33 A Ch2 500mA Ω M 200ms A Ch2 580mA	 Δ: 1.57 A @: 990mA Ch2 Pk-Pk 1.57 A Ch2 500mA Ω M 200ms A Ch2 580mA

7. Test result: **PASS**

6.12 ON/OFF current overshoot test

1. Test defines: to test ON/OFF output Current overshoot.
2. Test equipment: FLUKE45; TDS3032; DC POWER SUPPLY. LCD Panel
3. Test condition: Vin=Vin (min) (max); PWM = 100% & 30%;
Only turn ON/OFF the Venable
4. Test quantity: 1 sets
5. Pass/fail: the inverter board output current overshoot under 10%.
6. Test table:

	Vin=Vin (min); PWM = 30%	Vin=Vin (min); PWM = 100%
On Seq	 Δ: 1.00mA @: -11.2mA Ch1 5.00 V Ch2 10.0mA Ω M 20.0ms A Ch1 1.70 V 660.000μs Figure-1	 Δ: 1.80mA @: -12.2mA Ch1 5.00 V Ch2 10.0mA Ω M 20.0ms A Ch1 1.70 V 660.000μs Figure-5

Off Seq	 Figure-2	 Figure-6
	Vin=Vin (max); PWM = 30%	Vin=Vin (max); PWM = 100%
On Seq	 Figure-3	 Figure-7
Off Seq	 Figure-4	 Figure-8

7. Test result: **PASS**

Derating Data

a. CAPACITOR

Part Information			Input Voltage	Rated Voltage			Result
NO	Location	Type		Rated V	Measured V	Stress < 85%	
1	C1	10uF	Vin(min)	25	8.72	34.88	PASS
			Vin(max)		20.86	83.44	PASS

2	C2	1uF	Vin(min)	25	4.91	19.64	PASS
			Vin(max)		4.92	19.68	PASS
3	C3	18PF	Vin(min)	3K	699	23.27	PASS
			Vin(max)		712	23.73	PASS
4	C5	1500PF	Vin(min)	25	0.54	2.16	PASS
			Vin(max)		0.57	2.28	PASS
5	C6	1uF	Vin(min)	25	8.91	35.6	PASS
			Vin(max)		20.99	83.96	PASS
6	C8	0.1uF	Vin(min)	10	1.130	2.26	PASS
			Vin(max)		1.125	2.25	PASS
7	C10	220pF	Vin(min)	50	0.705	2.82	PASS
			Vin(max)		0.704	2.81	PASS
8	C11	3900pF	Vin(min)	50	4.98	19.92	PASS
			Vin(max)		4.99	19.96	PASS
9	C12	1uF	Vin(min)	16	1.30	5.20	PASS
			Vin(max)		0.56	2.24	PASS
10	C13	0.047uF	Vin(min)	16	4.99	19.96	PASS
			Vin(max)		4.98	19.95	PASS
11	C14	4700pF	Vin(min)	50	1.58	6.32	PASS
			Vin(max)		1.60	6.40	PASS
12	C15	0.022uF	Vin(min)	25	698	34.90	PASS
			Vin(max)		685	34.25	PASS
13	C16	100pF	Vin(min)	2K	2.43	9.72	PASS
			Vin(max)		2.43	9.72	PASS
14	C21	4.7uF	Vin(min)	25	2.32	9.28	PASS
			Vin(max)		2.33	9.29	PASS
15	C26	2.2uF	Vin(min)	6.3	2.02	32.06	PASS
			Vin(max)		2.02	32.06	PASS

b. RESISTOR

Part Information			Input Voltage	Power Rating AT 70℃			Result
NO	Location	Type(Ω)		Rated	Measured	Stress	
				W	W	< 50%	
1	R1	47K	Vin(min)	1/16	0.00	0	PASS
			Vin(max)		0.00	0	PASS
2	R2	75K	Vin(min)	1/16	0.00	0	PASS
			Vin(max)		0.00	0	PASS
3	R3A	1K	Vin(min)	1/16	0.00	0	PASS
			Vin(max)		0.00	0	PASS
4	R4	10K	Vin(min)	1/16	0.0012	0.019	PASS
			Vin(max)		0.0012	0.019	PASS
5	R5	24K	Vin(min)	1/16	0.00	0	PASS
			Vin(max)		0.00	0	PASS
6	R6	3.3M	Vin(min)	1/16	0	0	PASS
			Vin(max)		0	0	PASS
7	R7	698K	Vin(min)	1/16	0.00	0	PASS
			Vin(max)		0.00	0	PASS
8	R8	1M	Vin(min)	1/16	0.00	0	PASS
			Vin(max)		0.00	0	PASS
9	R9	499K	Vin(min)	1/16	0.00032	0.512	PASS
			Vin(max)		0.00191	3.056	PASS

10	R10	680	Vin(min)	1/16	0.00319	5.104	PASS
			Vin(max)		0.00327	5.232	PASS
11	R11	1.4K	Vin(min)	1/16	0.00058	0.58	PASS
			Vin(max)		0.00060	0.96	PASS
12	R12	120K	Vin(min)	1/16	0.00	0	PASS
			Vin(max)		0.00	0	PASS
13	R13	56K	Vin(min)	1/16	0.00	0	PASS
			Vin(max)		0.00	0	PASS
14	R15	3.3M	Vin(min)	1/16	0.00	0	PASS
			Vin(max)		0.00	0	PASS
15	R16	47K	Vin(min)	1/16	0.00	0	PASS
			Vin(max)		0.00	0	PASS
16	R17	100K	Vin(min)	1/16	0.00	0	PASS
			Vin(max)		0.00	0	PASS
17	R18	15K	Vin(min)	1/16	0.00	0	PASS
			Vin(max)		0.00	0	PASS
18	R19	499K	Vin(min)	1/16	0.00	0	PASS
			Vin(max)		0.00	0	PASS
19	R20	15K	Vin(min)	1/16	0.00315	3.15	PASS
			Vin(max)		0.01695	16.95	PASS
20	R23	160	Vin(min)	1/10	0.00	0	PASS
			Vin(max)		0.00	0	PASS
21	R25	100K	Vin(min)	1/16	0.00	0	PASS
			Vin(max)		0.00	0	PASS
22	R26	18K	Vin(min)	1/16	0.00	0	PASS
			Vin(max)		0.00	0	PASS

c. FET and TRANSISTOR

Part Information			Input Voltage		Part Spec		Max value Measured	Stress		Result
NO	Location	Part name			parameter	value		Judgment	actual	
1	U1	P5003QVG	N-Channel	Vin(min)	V _{DS} , V _{CE} (min)	30V	6.20V(rms)	< Spec	-----	PASS
					I _{DS} , I _{CE} (min)	7A	0.674(rms)	< Spec	-----	PASS
					P _D , P _C (min)	2W	12.49mW(rms)	< 50%	0.625%	PASS
					R _{DS}	27.5mΩ				
				Vin(max)	V _{DS} , V _{CE} (min)	30V	13.5V(rms)	< Spec	-----	PASS
					I _{DS} , I _{CE} (min)	7A	0.671(rms)	< Spec	-----	PASS
					P _D , P _C (min)	2W	12.49mW(rms)	< 50%	0.625%	PASS
					R _{DS}	27.5mΩ				
			P-Channel	Vin(min)	V _{DS} , V _{CE} (min)	30V	6.32V(rms)	< Spec	-----	PASS
					I _{DS} , I _{CE} (min)	5A	0.690(rms)	< Spec	-----	PASS
					P _D , P _C (min)	2W	21.43mW(rms)	< 50%	1.07%	PASS
					R _{DS}	45mΩ				
				Vin(max)	V _{DS} , V _{CE} (min)	30V	14.4V(rms)	< Spec	-----	PASS
					I _{DS} , I _{CE} (min)	5A	0.715(rms)	< Spec	-----	PASS
					P _D , P _C (min)	2W	21.43mW(rms)	< 50%	1.07%	PASS

					R _{DS}	45mΩ						
2	U3	P5003QVG	N-Channel	Vin(min)	V _{DS} ,V _{CE} (min)	30V	6.20V(rms)	<Spec	-----	PASS		
					I _{DS} , I _{CE} (min)	7A	0.674(rms)	<Spec	-----	PASS		
					P _D , P _C (min)	2W	12.49mW(rms)	<50%	0.625%	PASS		
					R _{DS}	27.5mΩ						
				Vin(max)	V _{DS} ,V _{CE} (min)	30V	13.5V(rms)	<Spec	-----	PASS		
					I _{DS} , I _{CE} (min)	7A	0.671(rms)	<Spec	-----	PASS		
					P _D , P _C (min)	2W	12.49mW(rms)	<50%	0.625%	PASS		
					R _{DS}	27.5mΩ						
			P-Channel	Vin(min)	V _{DS} ,V _{CE} (min)	30V	6.32V(rms)	<Spec	-----	PASS		
					I _{DS} , I _{CE} (min)	5A	0.690(rms)	<Spec	-----	PASS		
					P _D , P _C (min)	2W	21.43mW(rms)	<50%	1.07%	PASS		
					R _{DS}	45mΩ						
				Vin(max)	V _{DS} ,V _{CE} (min)	30V	14.4V(rms)	<Spec	-----	PASS		
					I _{DS} , I _{CE} (min)	5A	0.715(rms)	<Spec	-----	PASS		
					P _D , P _C (min)	2W	21.43mW(rms)	<50%	1.07%	PASS		
					R _{DS}	45mΩ						
3	Q1	2N4403	Vin(min)	V _{DS} ,V _{CE} (min)	40V	0.94V(max)	<Spec	-----	PASS			
				I _{DS} , I _{CE} (min)	0.6A	0.43mA(max)	<Spec	-----	PASS			
				P _D , P _C (min)	200mW	0.404mW(max)	<50%	0.202%	PASS			
			Vin(max)	V _{DS} ,V _{CE} (min)	40V	0.95V(max)	<Spec	-----	PASS			
				I _{DS} , I _{CE} (min)	0.6A	0.43mA(max)	<Spec	-----	PASS			
				P _D , P _C (min)	200mW	0.408mW(max)	<50%	0.204%	PASS			
			4	Q7	2N4403	Vin(min)	V _{DS} ,V _{CE} (min)	40V	0.92V(max)	<Spec	-----	PASS
							I _{DS} , I _{CE} (min)	0.6A	0.003mA(max)	<Spec	-----	PASS
							P _D , P _C (min)	200mW	0.0028mW(max)	<50%	0.0014%	PASS
Vin(max)	V _{DS} ,V _{CE} (min)	40V				0.94V(max)	<Spec	-----	PASS			
	I _{DS} , I _{CE} (min)	0.6A				0.003mA(max)	<Spec	-----	PASS			
	P _D , P _C (min)	200mW				0.0028mW(max)	<50%	0.0014%	PASS			
5	Q2	PMBT4403	Vin(min)	V _{DS} ,V _{CE} (min)	40V	60.3mV(max)	<Spec	-----	PASS			
				I _{DS} , I _{CE} (min)	0.6A	8.482mA(max)	<Spec	-----	PASS			
				P _D , P _C (min)	250mW	0.511mW(max)	<50%	0.204%	PASS			
			Vin(max)	V _{DS} ,V _{CE} (min)	40V	42.8mV(max)	<Spec	-----	PASS			
				I _{DS} , I _{CE} (min)	0.6A	8.750mA(max)	<Spec	-----	PASS			
				P _D , P _C (min)	250mW	0.375mW(max)	<50%	0.15%	PASS			
6	Q3	MMBT4401	Vin(min)	V _{DS} ,V _{CE} (max)	40V	34.6mV(max)	<Spec	-----	PASS			
				I _{DS} , I _{CE} (min)	100mA	0.85mA(max)	<Spec	-----	PASS			
				P _D , P _C (min)	250mW	0.03mW(max)	<50%	0.012%	PASS			
			Vin(max)	V _{DS} ,V _{CE} (min)	40V	56.5mV(max)	<Spec	-----	PASS			
				I _{DS} , I _{CE} (min)	100mA	1.92mA(max)	<Spec	-----	PASS			
				P _D , P _C (min)	250mW	0.108mW(max)	<50%	0.043%	PASS			

d. DIODE

Part Information			Input Voltage		Rated Voltage			Result
NO	Location	Part name			Rated	Measured	Stress	
					mW	mW	< 50%	
1	D1	BAV99W	1-3	Vin(min)	200	0	0	PASS
				Vin(max)		0	0	PASS
			2-3	Vin(min)		14.6	4.17	PASS
				Vin(max)		15.8	4.51	PASS
2	D2	BAV70LT	1-3	Vin(min)	225	0	0	PASS
				Vin(max)		0	0	PASS
			2-3	Vin(min)		12.3	3.51	PASS
				Vin(max)		13.5	3.86	PASS

e. TRANSFORMER

Part Information			Input Voltage	Output Mode	Rated V	Rated Voltage		Result
NO	Location	Part name				Measured	Stress	
						V	< spec	
1	T1	CI-8.5	Vin(min)	Kick-off	2100Vrms	1630Vrms	< spec	PASS
				Running	2100Vrms	820Vrms	< spec	PASS
			Vin(max)	Kick-off	2100Vrms	1650Vrms	< spec	PASS
				Running	2100Vrms	803Vrms	< spec	PASS

#Abnormal Data

(Test condition: Turned on and then Open or Short)

Location No.	Type or name	Test mode	Damaged component	Smoke Y/N	Meas		Comment	Result
		Open/Short			Iin (A)	Iout (mArms)		Pass/Fail
U2	OZ9910SN-B5	Open-1	F1&U1	Y	0	0	Shutdown	Pass
		Open-2	No damaged	N	0	0	Shutdown	Pass
		Open-3	F1&U3	Y	0	0	Shutdown	Pass
		Open-4	No damaged	N	0	0	Shutdown	Pass
		Open-5	No damaged	N	0	0	Shutdown	Pass
		Open-6	No damaged	N	0	0	Shutdown	Pass
		Open-7	No damaged	N	0	0	Shutdown	Pass
		Open-8	No damaged	N	0	0	Shutdown	Pass
		Open-9	No damaged	N	0	0	Shutdown	Pass
		Open-10	No damaged	N	0	0	Shutdown	Pass
		Open-11	No damaged	N	0	0	Shutdown	Pass
		Open-12	No damaged	N	0	0	Shutdown	Pass
		Open-13	No damaged	N	0	0	Shutdown	Pass
		Open-14	No damaged	N	0	0	Shutdown	Pass
		Open-15	F1&U3	Y	0	0	Shutdown	Pass
		Open-16	F1&U1	Y	0	0	Shutdown	Pass
		Short-1,2	No damaged	N	0	0	Shutdown	Pass
		Short-2,3	No damaged	N	0	0	Shutdown	Pass
		Short-3,4	No damaged	N	0	0	Shutdown	Pass
		Short-4,5	No damaged	N	0	0	Shutdown	Pass
		Short-5,6	No damaged	N	0	0	Shutdown	Pass
		Short-6,7	No damaged	N	0.60	6.411		Pass
		Short-7,8	No damaged	N	0.60	6.402		Pass
		Short-8,9	No damaged	N	0	0	Shutdown	Pass
		Short-9,10	No damaged	N	0	0	Shutdown	Pass
		Short-11,12	No damaged	N	0	0	Shutdown	Pass
		Short-12,13	No damaged	N	0	0	Shutdown	Pass
		Short-13,14	No damaged	N	0	0	Shutdown	Pass
		Short-14,15	No damaged	N	0	0	Shutdown	Pass
		Short-15,16	No damaged	N	0	0	Shutdown	Pass
F1	2.5A/40V	Open	No damaged	N	0	0	Shutdown	Pass
		Short	No damaged	N	0.60	6.421		Pass
C1	10uF	Open	No damaged	N	0.60	6.368		Pass
		Short	F1	N	0	0	Shutdown	Pass
C2	1uF	Open	No damaged	N	0.60	6.404		Pass
		Short	No damaged	N	0	0	Shutdown	Pass
C3	18PF	Open	No damaged	N	0	0	Shutdown	Pass
		Short	No damaged	N	0	0	Shutdown	Pass
C5	1500PF	Open	No damaged	N	0	0	Shutdown	Pass
		Short	No damaged	N	0	0	Shutdown	Pass
C6	1uF	Open	No damaged	N	0.60	6.382		Pass
		Short	F1	N	0	0	Shutdown	Pass

C8	0.1uF	Open	No damaged	N	0	0	Shutdown	Pass
		Short	No damaged	N	0	0	Shutdown	Pass
C10	220pF	Open	No damaged	N	0	0	Shutdown	Pass
		Short	No damaged	N	0.60	6.402		Pass
C11	3900pF	Open	No damaged	N	0	0	Shutdown	Pass
		Short	No damaged	N	0	0	Shutdown	Pass
C12	1uF	Open	No damaged	N	0	0	Shutdown	Pass
		Short	No damaged	N	0	0	Shutdown	Pass
C13	0.047uF	Open	No damaged	N	0.60	6.459		Pass
		Short	No damaged	N	0	0	Shutdown	Pass
C14	4700pF	Open	No damaged	N	0.60	6.438		Pass
		Short	F1	N	0	0	Shutdown	Pass
C15	0.022uF	Open	No damaged	N	0.60	6.445		Pass
		Short	No damaged	N	0.60	6.436		Pass
C16	100pF	Open	No damaged	N	0	0	Shutdown	Pass
		Short	No damaged	N	0.60	6.448		Pass
C21	4.7uF	Open	No damaged	N	0	0	Shutdown	Pass
		Short	No damaged	N	0.60	6.457		Pass
C26	2.2uF	Open	No damaged	N	0.60	6.457		Pass
		Short	No damaged	N	0.60	6.457		Pass
R1	47K	Open	No damaged	N	0.60	3.106		Pass
		Short	No damaged	N	0	0	Shutdown	Pass
R2	75K	Open	No damaged	N	0	0	Shutdown	Pass
		Short	No damaged	N	0.60	6.505		Pass
R3A	1K	Open	No damaged	N	0	0	Shutdown	Pass
		Short	No damaged	N	0.60	6.468		Pass
R4	10K	Open	No damaged	N	0	0	Shutdown	Pass
		Short	No damaged	N	0.60	6.442		Pass
R5	24K	Open	No damaged	N	0	0	Shutdown	Pass
		Short	No damaged	N	0	0	Shutdown	Pass
R6	3.3M	Open	No damaged	N	0	0	Shutdown	Pass
		Short	No damaged	N	0.60	6.415		Pass
R7	698K	Open	No damaged	N	0.60	6.501		Pass
		Short	No damaged	N	0	0	Shutdown	Pass
R8	1M	Open	No damaged	N	0.60	6.455		Pass
		Short	No damaged	N	0	0	Shutdown	Pass
R9	499K	Open	No damaged	N	0	0	Shutdown	Pass
		Short	No damaged	N	0.33	6.201		Pass
R10	680	Open	No damaged	N	0	0	Shutdown	Pass
		Short	No damaged	N	0	0	Shutdown	Pass
R11	1.4K	Open	No damaged	N	0.60	6.334		Pass
		Short	No damaged	N	0.60	6.356		Pass
R12	120K	Open	No damaged	N	0.60	6.482		Pass
		Short	No damaged	N	0.60	6.429		Pass
R13	56K	Open	No damaged	N	0.60	6.425		Pass
		Short	No damaged	N	0.60	6.425		Pass

R15	3.3M	Open	No damaged	N	0.60	6.388		Pass
		Short	No damaged	N	0.60	6.351		Pass
R16	47K	Open	No damaged	N	0.60	6.250		Pass
		Short	No damaged	N	0.60	6.216		Pass
R17	100K	Open	No damaged	N	0.60	6.219		Pass
		Short	No damaged	N	0.60	6.218		Pass
R18	15K	Open	No damaged	N	0		Shutdown	Pass
		Short	No damaged	N	0		Shutdown	Pass
R19	499K	Open	No damaged	N	0	0	Shutdown	Pass
		Short	No damaged	N	0.60	6.312		Pass
R20	15K	Open	No damaged	N	0.60	6.286		Pass
		Short	No damaged	N	0.60	6.291		Pass
R23	160	Open	No damaged	N	0	0	Shutdown	Pass
		Short	No damaged	N	0.60	6.326		Pass
R25	100K	Open	No damaged	N	0.60	6.312		Pass
		Short	No damaged	N	0	0	Shutdown	Pass
R26	18K	Open	No damaged	N	0.60	6.286		Pass
		Short	No damaged	N	0	0	Shutdown	Pass
Q1	2N4403	Open1	No damaged	N	0.60	6.429		Pass
		Open2	No damaged	N	0.60	6.429		Pass
		Open3	No damaged	N	0.60	6.429		Pass
		Short1-2	No damaged	N	0.60	6.429		Pass
		Short2-3	No damaged	N	0.60	6.429		Pass
		Short3-1	No damaged	N	0.60	6.429		Pass
Q7	2N4403	Open1	No damaged	N	0.60	6.429		Pass
		Open2	No damaged	N	0.60	6.429		Pass
		Open3	No damaged	N	0.60	6.429		Pass
		Short1-2	No damaged	N	0.60	6.429		Pass
		Short2-3	No damaged	N	0.60	6.429		Pass
		Short3-1	No damaged	N	0.60	6.429		Pass
Q2	PMBT4403	Open1	No damaged	N	0	0	Shutdown	Pass
		Open2	No damaged	N	0.60	6.429		Pass
		Open3	No damaged	N	0	0	Shutdown	Pass
		Short1-2	No damaged	N	0	0	Shutdown	Pass
		Short2-3	No damaged	N	0.60	6.429		Pass
		Short3-1	No damaged	N	0.60	6.429		Pass
Q3	MMBT4401	Open1	No damaged	N	0	0	Shutdown	Pass
		Open2	No damaged	N	0	0	Shutdown	Pass
		Open3	No damaged	N	0	0	Shutdown	Pass
		Short1-2	No damaged	N	0.60	6.001		Pass
		Short2-3	No damaged	N	0	0	Shutdown	Pass
		Short3-1	No damaged	N	0.60	6.001		Pass
U1	AO6602L	Open1	No damaged	N	0.37	1.954		Pass
		Open2	No damaged	N	0.37	1.954		Pass
		Open3	No damaged	N	0.37	1.954		Pass
		Open4	No damaged	N	0.37	1.954		Pass

		Open5	No damaged	N	0.60	6.429		Pass
		Open6	No damaged	N	0.60	6.429		Pass
		Open7	No damaged	N	0.60	6.429		Pass
		Open8	No damaged	N	0.60	6.429		Pass
		Short1-2	No damaged	N	0	0	Shutdown	Pass
		Short2-3	No damaged	N	0	0	Shutdown	Pass
		Short4-5	No damaged	N	0	0	Shutdown	Pass
		Short5-6	No damaged	N	0.58	6.523		Pass
U3	AO6602L	Open1	No damaged	Y	0.37	1.954		Pass
		Open2	No damaged	N	0.37	1.954		Pass
		Open3	No damaged	Y	0.37	1.954		Pass
		Open4	No damaged	N	0.37	1.954		Pass
		Open5	No damaged	N	0.60	6.429		Pass
		Open6	No damaged	N	0.60	6.429		Pass
		Open7	No damaged	N	0.60	6.429		Pass
		Open8	No damaged	N	0.60	6.429		Pass
		Short1-2	No damaged	N	0	0	Shutdown	Pass
		Short2-3	No damaged	N	0	0	Shutdown	Pass
		Short3-4	No damaged	N	0	0	Shutdown	Pass
		Short5-6	No damaged	N	0.60	6.429		Pass
		Open1	No damaged	N	0.37	1.954		Pass
D1	BAV99	Open1	No damaged	N	0.60	6.422		Pass
		Open2	No damaged	N	0	0	Shutdown	Pass
		Open3	No damaged	N	0	0	Shutdown	Pass
		Short1-3	No damaged	N	0	0	Shutdown	Pass
		Short2-3	No damaged	N	0.60	6.432		Pass
D2	BAV99	Open1	No damaged	N	0.60	6.422		Pass
		Open2	No damaged	N	0	0	Shutdown	Pass
		Open3	No damaged	N	0	0	Shutdown	Pass
		Short1-3	No damaged	N	0	0	Shutdown	Pass
		Short2-3	No damaged	N	0.60	6.432		Pass
T1	CI-8.5	Open1	No damage	N	0	0	Shutdown	Pass
		Open 2	No damage	N	0.60	6.442		Pass
		Open 3	No damage	N	0	0	Shutdown	Pass
		Open 4	No damage	N	0	0	Shutdown	Pass
		Open 5	No damage	N	0	0	Shutdown	Pass
		Short1-2	No damage	N	0	0	Shutdown	Pass
		Short3-4	No damage	N	0	0	Shutdown	Pass
		Short4-5	No damage	N	0	0	Shutdown	Pass
CN1	Input Connector	Open1	No damage	N	0.60	6.442		Pass
		Open2	No damage	N	0.60	6.442		Pass
		Open3	No damage	N	0.25	3.628		Pass
		Open4	No damage	N	0	0	Shutdown	Pass
		Open5	No damage	N	0.60	6.298		Pass
		Open6	No damage	N	0.60	6.442		Pass
		Open7	No damage	N	0.60	6.442		Pass

		Short1-2	No damage	N	0.60	6.442		Pass
		Short2-3	No damage	N	0	0	Shutdown	Pass
		Short3-4	No damage	N	0.60	6.508		Pass
		Short4-5	No damage	N	0.60	6.021	Shutdown	Pass
		Short5-6	No damage	N	0.60	6.421		Pass
		Short6-7	No damage	N	0.60	6.425		Pass
CN2	Output Connector	Open1	No damage	N	0	0	Shutdown	Pass
		Open2	No damage	N	0	0	Shutdown	Pass
		Short1-2	No damage	N	0	0	Shutdown	Pass

6.14 Layout DFX Check List

<u>Layout Check List for DFX</u>					
Item	Check Items	Goals	Checked	Status	Approved
1	Layout	1. 元件極性是否有標示,標示是否正確 --- 需列舉實際零件做確認 Whether polarity of the component is remarked or remarked correctly or not --- need to list practical component to confirm	nikki.liu (廖寶瑩)	NA	shao (邵芳)
		2. 料號 &機種名是否標示正確---- 需標出 PCB 上 P/N 和 Model name Whether part number and model name are remarked correctly or not ---need show P/N and Model name on PCB	nikki.liu (廖寶瑩)	P/N:316800000106-R0A DA-1A08-CO01A2 L	shao (邵芳)
		3. reference 標識正確 - --- Yes or No Reference identification should be correct	nikki.liu (廖寶瑩)	YES	shao (邵芳)
		4. PCB 上是否有 UL,GP 標誌---- Yes or No Whether PCB board is signed UL ,GP or not	nikki.liu (廖寶瑩)	TF041	shao (邵芳)
		5. 零件本體與板邊至少有 0.5 mm 距離---需列出最小距離(單位 mm) no less than 0.5mm between component and PCB edge---Need to list minimum distance	nikki.liu (廖寶瑩)	除 CN1 外(機構局限), 其它零件 keep 0.5mm	shao (邵芳)
		6. 避免在 插座與插座之間放置 SMT 零件----Yes or No Avoid to lay SMT component between connector and connector	nikki.liu (廖寶瑩)	NA	shao (邵芳)
		7. 導向孔距離板邊距離 至少 0.5mm----需標出最小距離(單位 mm) no less than 0.5mm Between rim of the guide-hole and PCB edge-----Need to list minimum distance	nikki.liu (廖寶瑩)	YES	shao (邵芳)
		8.測點與SMD PAD 在 Bottom 至少 30mil, Top 至少 35mil---需要列出最小距離(單位 mil) Interval between test PAD and SMD PAD is at least 30 mil at button side,35mil at top side--Need to list minimum distance	nikki.liu (廖寶瑩)	YES	shao (邵芳)
		9.兩測點之間距至少 60 mil(邊緣到邊緣)---需列出最小距離(單位 mm) reserve interval at least 60mil between Test-PAD and Test-PAD (edge to edge)---Need to list minimum distance	nikki.liu (廖寶瑩)	YES	shao (邵芳)
		10.-測點距離板邊至少 1mm---需列出最小距離(單位 mm) At least 1mm between Test-PAD and PCB edge---Need to list the	nikki.liu	0.7MM	shao

(廖寶瑩)

(邵芳)

	minimum distance			
	11.測點距離 DIP 零件 至少 6 mm---需列出最小距離(單位 mm) At least 6 mm between Test-PAD and DIP component---Need to list minimum distance	nikki.liu (廖寶瑩)	NA	shao (邵芳)
	12. 零件和線路距離螺絲孔至少 0.5mm---需列出最小距離(單位 mm), 若無螺絲孔寫 NA Reserve interval no less than 0.5mm between component& circuit and screw hole---Need to list minimum distance, if no screw hole need to sign with NA	nikki.liu (廖寶瑩)	YES	shao (邵芳)
	13.每顆零件是否都有位號---Yes or No Whether each component has location number	nikki.liu (廖寶瑩)	YES	shao (邵芳)
	14.零件位號是否都排在零件本體外---Yes or No Whether location number of the component is all ranked outside the component noumenonn---Yes or No	nikki.liu (廖寶瑩)	YES	shao (邵芳)
	15.IC 或 MOS 濾波及陶瓷電容必須盡可能靠近 IC 或 MOS---Yes or No Filter CAP and ceramic CAP need to near IC or MOS	nikki.liu (廖寶瑩)	YES	shao (邵芳)
	16.平行板邊的零件距離板邊 至少 1 mm 以上---需列出最小距離(單位 mm) At least 1mm between the component that parallel PCB edge and PCB edge---Need to list minimum distance	nikki.liu (廖寶瑩)	0.5MM	shao (邵芳)
	17. 高壓元件須與其它零件至少 3mm 距離---需列出最小距離(單位 mm) At least 3mm between high voltage component and other---Need to list minimum distance	nikki.liu (廖寶瑩)	YES	shao (邵芳)
	18.變壓器本体下方不可走線以免有短路的隱患---Yes or No Do not place trace under transformer to avoid short circuit	nikki.liu (廖寶瑩)	YES	shao (邵芳)
	19.高壓部分應該有高壓危險的文字和圖形標識---Yes or No Have characters and figure identification of dangerous high voltage in high-voltage side	nikki.liu (廖寶瑩)	YES	shao (邵芳)
	20.会发热的元件例 0.05 电阻及 MOS 附近要尽可能铺铜箔---Yes or No Spread the copper screen nearby the component which can generate heat as much as possible(Such as 0.05RES and MOS)	nikki.liu (廖寶瑩)	YES	shao (邵芳)
	21.雙面板銅箔厚度最小 1 oz(Inverter)----Yes or No Thickness of copper screen for double-sides PCB is minimum 1oz	nikki.liu (廖寶瑩)	NA	shao (邵芳)
	22.CONNECTOR/IC/MOS 相鄰焊盤間是否有用白漆隔離---需列出具體零件位號 Adjoint pad among CONNECTOR, IC and MOS whether isolated by white paint ---Need to list concrete component location number	nikki.liu (廖寶瑩)	NA	shao (邵芳)

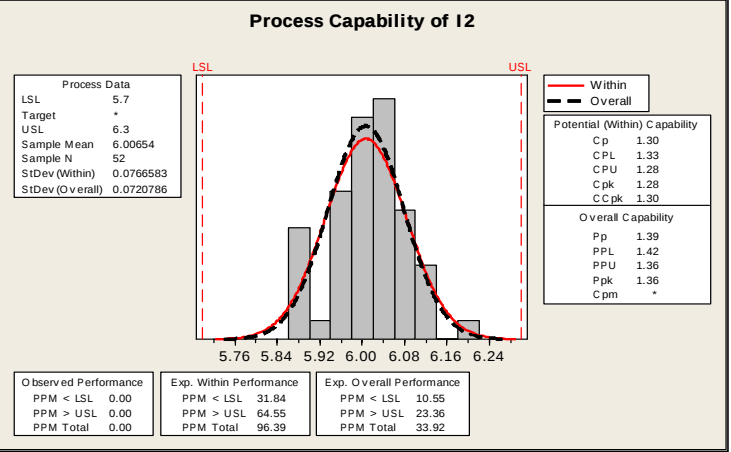
23.inverter 輸出 CONNECTOR 下方須挖槽以避免有錫渣---Yes or No Must dig the trough below output CONNECTOR end so as to avoid having tin and dreg ---Yes or No	nikki.liu (廖寶瑩)	NA	shao (邵芳)
24. 地的走線避免形成回路---Yes or No The ground circuit line should avoid forming the return circuit---Yes or No	nikki.liu (廖寶瑩)	YES	shao (邵芳)
25.Inverter BD 的輸入插座和回授端和變壓器端須加測點---Yes or No Add Test -PAD on input connector ,regaining and offering side and voltage transformer end	nikki.liu (廖寶瑩)	YES	shao (邵芳)
26. 測試點大小尺寸至少 1mm, ---Yes or No Size of test -pads is at least 1mm	nikki.liu (廖寶瑩)	YES	shao (邵芳)
27.inverter BD 變壓器之 Float PIN 須加大且加貫穿孔---Yes or No Float PIN of the inverter voltage transformer must strengthen and add VIA- holes	nikki.liu (廖寶瑩)	YES	shao (邵芳)
28.拼板時只在寬邊方向加兩個折斷邊，折斷邊定位孔尺寸大小為 4.0mm---Yes or No Add two rupture in wide direction while combining PCB board , and the size of orient hole in the rupture is 4.0mm	nikki.liu (廖寶瑩)	NA	shao (邵芳)
29. 過孔邊緣與邊緣距離至少 15 mil --- 需列出最小距離(單位 mil) At least 15 mil between the VIA-hole edge to edge --- Need to list minimum distance	nikki.liu (廖寶瑩)	NA	shao (邵芳)
30.Chip IC 的 PAD 是否符合 Ic spec ----列出實際 IC PAD Whether PAD of Chip IC accords with Ic spec ----list IC actual PAD	nikki.liu (廖寶瑩)	NA	shao (邵芳)
31.螺絲孔的位置,孔徑是否正確---Yes or No whether the position and the aperture of the screw hole is correct	nikki.liu (廖寶瑩)	YES	shao (邵芳)
32.螺絲孔孔徑為 NPTH or PTH The screw hole aperture is NPTH or PTH	nikki.liu (廖寶瑩)	YES	shao (邵芳)
33.任何 PCB 上面之修改，版本是否有進階---列出最新版本 any PCB update whether check version is update or not----list final PCB version	nikki.liu (廖寶瑩)	R0A	shao (邵芳)
34.機構限制區是否有請 ME 確認 -----Yes or No any ME RD check mechanical limit area	nikki.liu (廖寶瑩)	YES	shao (邵芳)
35.機構尺寸及 Connector PIN 定義需要台北 R&D 做再次確認 ----- Yes or N0 ME dimension and connector pin defined need to TW's R&D double check	nikki.liu (廖寶瑩)	YES	shao (邵芳)
36.零件需要垂直擺放 ----- Yes or N0 All the component need to be placed vertically	nikki.liu (廖寶瑩)	YES	shao (邵芳)
37. Power GND 和 Signal GND 需要先獨立拉線，然後再共接 ----- Yes or N0 Power GND and Signal GND need to route alone, then connect them	nikki.liu (廖寶瑩)	YES	shao (邵芳)

		together.			
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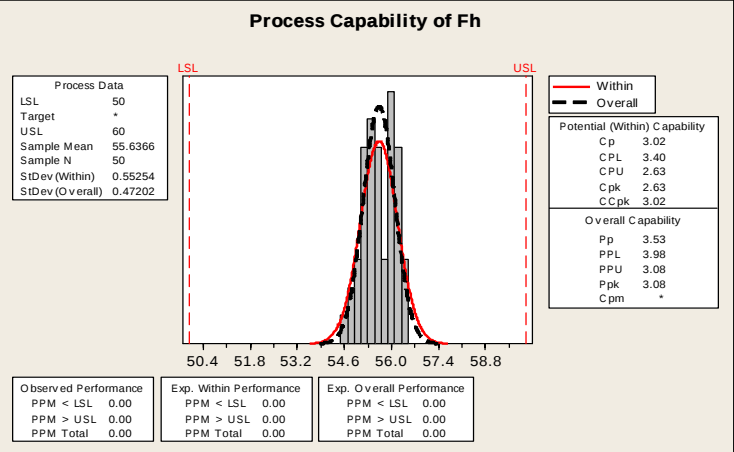
Part Number	541380001009	Supplier	GTK PDC
Description	GP CO01A2(DA-1A08-CO01A2)	QC Manager	Milan
Tool Number	Fluke	Unit	mA; KHz
Cavity	NA	Material	Inverter
Revision	DA	Date	2007/8/27

Dim. Designator	High light Current (PWM=100% Vin=20V)	High light Frequency (PWM=100% Vin=20V)	Low light Current (PWM=30% Vin=20V)
Nominal	6.50	55.00	3.30
+ Tolerance	0.30	5.00	0.30
- Tolerance	-0.30	-5.00	-0.30
Upper Limit	6.80	60.00	3.60
Lower Limit	6.20	50.00	3.00
1	6.36	55.34	3.21
2	6.52	56.10	3.22
3	6.58	55.17	3.20
4	6.49	56.08	3.33
5	6.49	55.61	3.29
6	6.49	55.53	3.24
7	6.46	56.24	3.21
8	6.44	55.93	3.26
9	6.41	55.06	3.29
10	6.52	56.09	3.22
11	6.45	55.43	3.24
12	6.48	55.26	3.21
13	6.50	56.40	3.24
14	6.44	56.28	3.24
15	6.48	55.65	3.27
16	6.44	56.07	3.20
17	6.48	55.04	3.22
18	6.56	56.09	3.22
19	6.44	55.21	3.31
20	6.53	55.69	3.28
21	6.42	54.91	3.29
22	6.47	55.16	3.27
23	6.52	56.25	3.21
24	6.56	55.20	3.22
25	6.51	56.31	3.31
26	6.41	55.33	3.28
27	6.59	55.79	3.30
28	6.58	56.30	3.24
29	6.48	54.70	3.23
30	6.42	54.60	3.29
31	6.50	55.83	3.20
32	6.64	55.93	3.24
33	6.55	54.86	3.22
34	6.42	55.52	3.22
35	6.60	55.45	3.22
36	6.43	55.31	3.17
37	6.43	56.16	3.22
38	6.39	55.33	3.20
39	6.43	56.16	3.24
40	6.66	55.62	3.25
41	6.61	55.22	3.19
42	6.43	55.46	3.23
43	6.42	56.13	3.33
44	6.51	56.08	3.29
45	6.58	55.98	3.35
46	6.40	55.54	3.21
47	6.59	55.19	3.27
48	6.59	56.02	3.25
49	6.59	55.76	3.20
50	6.60	55.46	3.19
MAX.	6.6600	56.3990	3.3490
MIN.	6.3600	54.5970	3.1700
AVERAGE	6.4978	55.6371	3.2446
STDEV	0.0735	0.4704	0.0413
CP	1.3597	3.5433	2.4197
Cpk	1.3497	3.0918	1.9727

1.High light Current
(PWM=100% Vin=20V)



2.High light Frequency
(PWM=100% Vin=20V)



3.Low light Current
(PWM=30% Vin=20V)

