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# ER1A~ER1J

## SURFACE MOUNT SUPERFAST RECTIFIER

**VOLTAGE** 50 to 600 Volts **CURRENT** 1.0 Amperes

SMB / DO-214AA

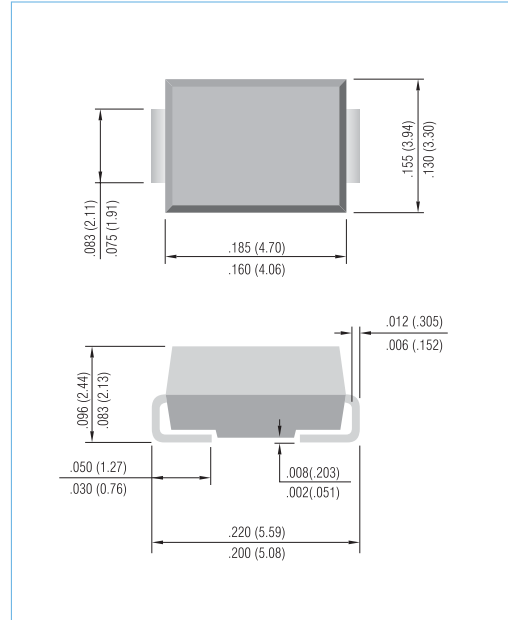
Unit: inch ( mm )

### FEATURES

- For surface mounted applications
- Low profile package
- Built-in strain relief
- Easy pick and place
- Superfast recovery times for high efficiency.
- Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- Glass passivated junction
- In compliance with EU RoHS 2002/95/EC directives

### MECHANICAL DATA

- Case: JEDEC DO-214AA molded plastic
- Terminals: Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity: Indicated by cathode band
- Standard packaging: 12mm tape (EIA-481)
- Weight: 0.0032 ounce, 0.092 gram



### MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified. Single phase, half wave, 60 Hz, resistive or inductive load. For capacitive load, derate current by 20%.

PARAMETER	SYMBOL	ER1A	ER1B	ER1C	ER1D	ER1E	ER1G	ER1J	UNITS
Maximum Recurrent Peak Reverse Voltage	$V_{RRM}$	50	100	150	200	300	400	600	V
Maximum RMS Voltage	$V_{RMS}$	35	70	105	140	210	280	420	V
Maximum DC Blocking Voltage	$V_{DC}$	50	100	150	200	300	400	600	V
Maximum Average Forward Current at $T_L=100^{\circ}C$	$I_{F(AV)}$	1.0							A
Peak Forward Surge Current : 8.3ms single half sine-wave superimposed on rated load(JEDEC method)	$I_{FSM}$	30							A
Maximum Forward Voltage at 1.0A	$V_F$	0.95				1.25		1.7	V
Maximum DC Reverse Current $T_J = 25^{\circ}C$ at Rated DC Blocking Voltage $T_J = 100^{\circ}C$	$I_R$	1.0				150			$\mu A$
Maximum Reverse Recovery Time (NOTE 1)	$t_{rr}$	35				ns			
Typical Junction capacitance (Note 2)	$C_J$	10.0				pF			
Maximum Thermal Resistance (Note 3)	$R_{\theta JL}$	34				$^{\circ}C / W$			
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150							$^{\circ}C$

#### NOTES:

- 1.Reverse Recovery Tset Conditions: $I_F=0.5A, I_R=1.0A, I_{rr}=0.25A$
- 2.Measured at 1.0MHz and applied reverse voltage of 4.0 volts.
- 3.8.0mm<sup>2</sup>(.013mm thick) land areas.



# ER1A~ER1J

## RATING AND CHARACTERISTIC CURVES

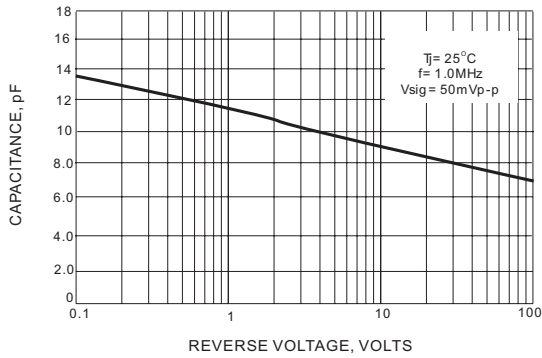


FIG.1 TYPICAL JUNCTION CAPACITANCE

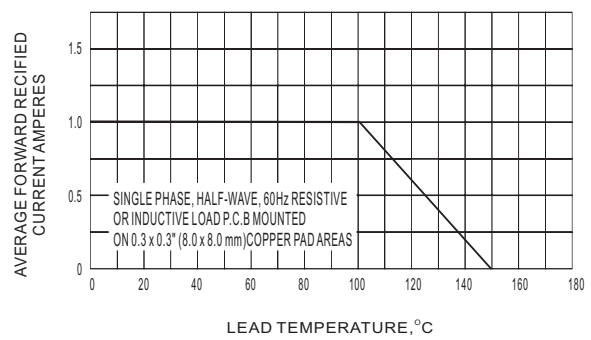


FIG.2 MAXIMUM AVERAGE FORWARD CURRENT DERATING

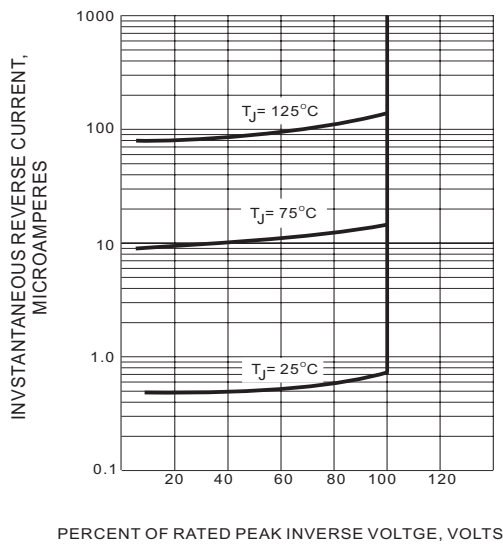


FIG.3 TYPICAL REVERSE CHARACTERISTICS

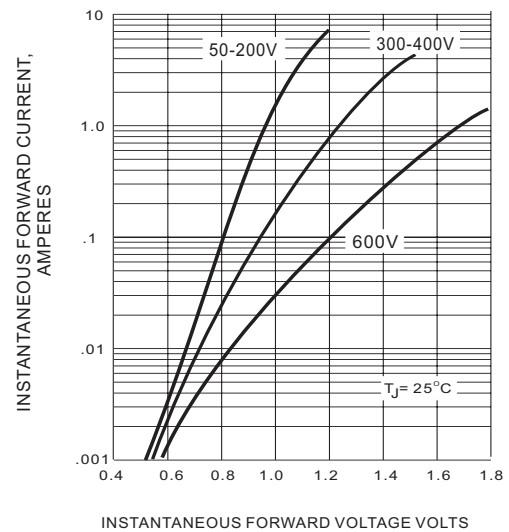


FIG.4 TYPICAL FORWARD CHARACTERISTICS

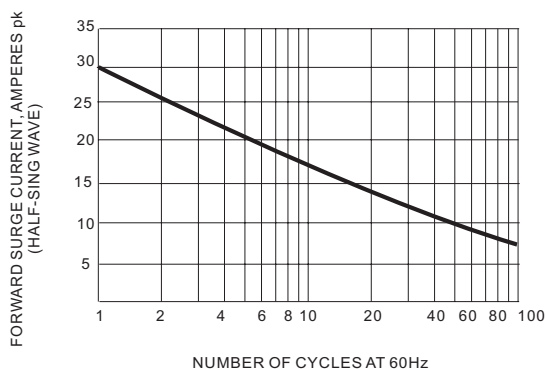
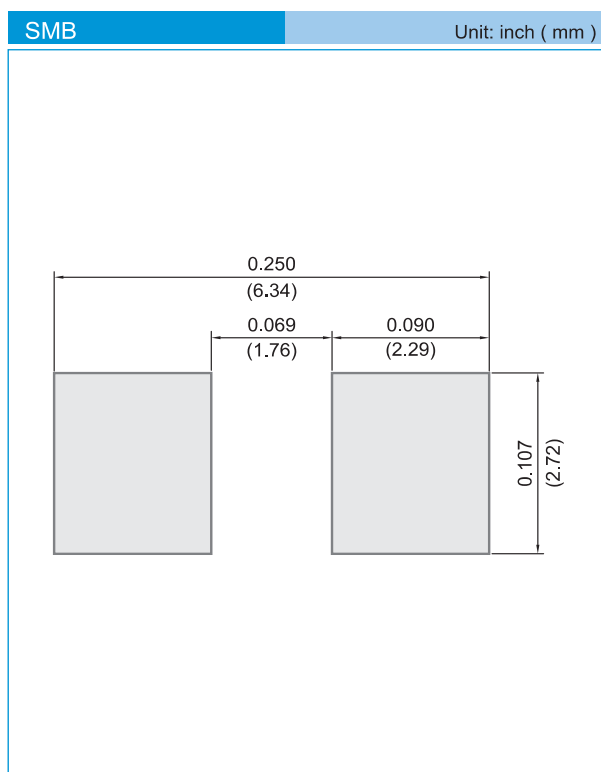


FIG.5 MAXIMUM NON-REPEITIVE SURGE CURRENT



# ER1A~ER1J

## MOUNTING PAD LAYOUT



## ORDER INFORMATION

- Packing information
  - T/R - 3K per 13" plastic Reel
  - T/R - 0.5Kper 7" plastic Reel

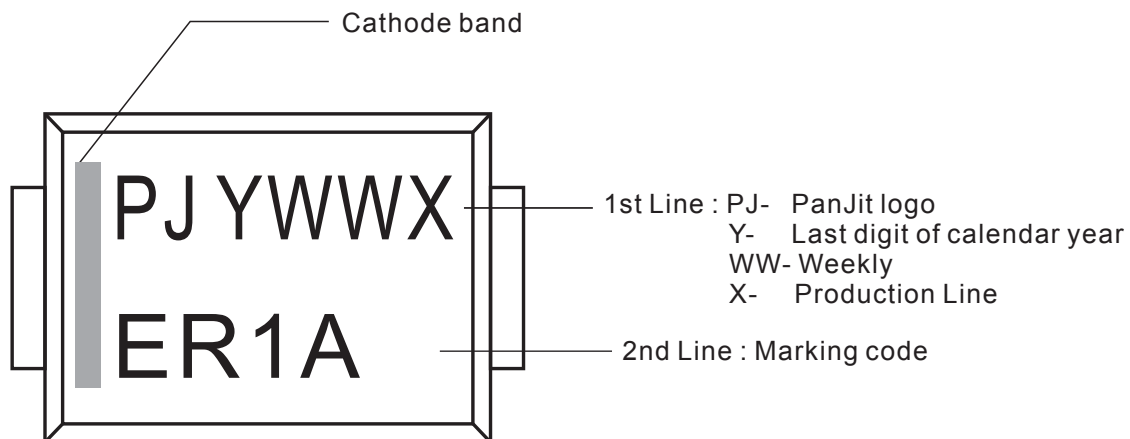
## LEGAL STATEMENT

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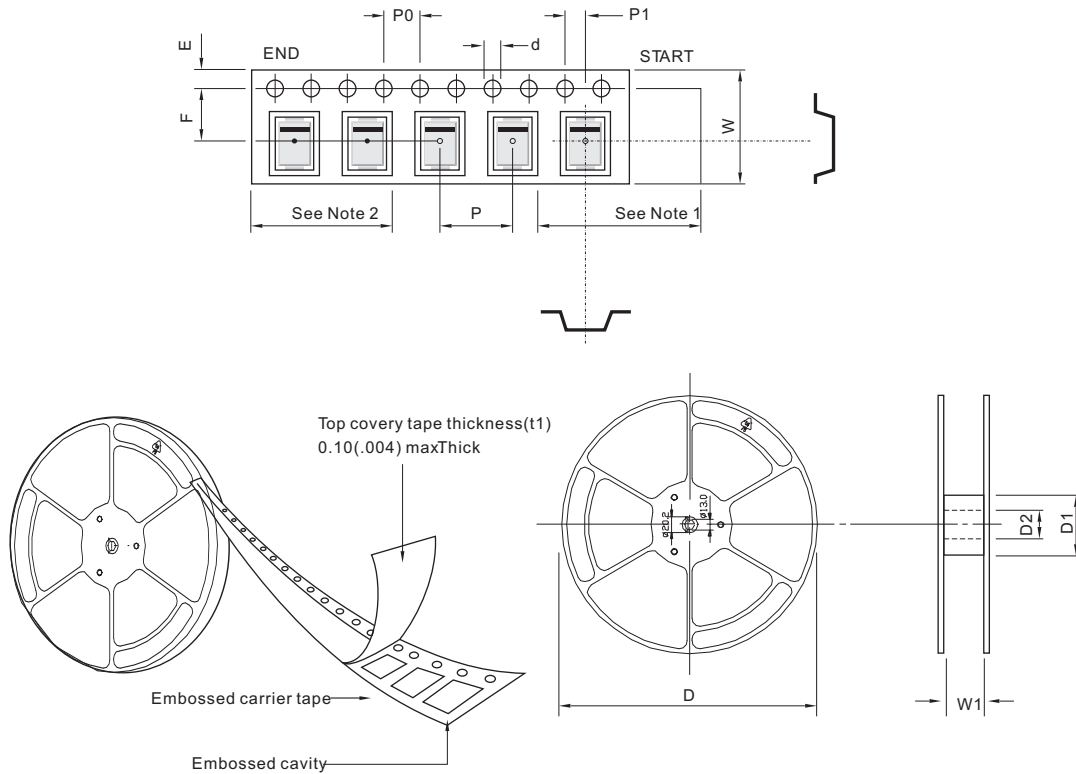
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## 2. MARKING



### 3. TAPING



SYMBOL	mm(inch)	SYMBOL	mm(inch)	SYMBOL	mm(inch)
TYPE SIZE	12.00 (0.472)	TYPE SIZE	12.00 (0.472)	TYPE SIZE	16.00 (0.629)
Package	SMA	Package	SMB	Package	SMC
d	1.55 ± 0.05 (0.06 ± 0.001)	d	1.55 ± 0.05 (0.06 ± 0.001)	d	1.55 ± 0.05 (0.06 ± 0.001)
D	178.0 ± 2.0 (7.0 ± 0.078)	D	178.0 ± 2.0 (13.0 ± 0.078)	D	178.0 ± 2.0 (13.0 ± 0.078)
D1	50.0 min (1.97 min)	D1	50.0 min (1.97 min)	D1	50.0 min (1.97 min)
D2	13.0 ± 0.2 (0.51 ± 0.007)	D2	13.0 ± 0.2 (0.51 ± 0.007)	D2	13.0 ± 0.5 (0.51 ± 0.019)
E	1.75 ± 0.10 (0.068 ± 0.003)	E	1.75 ± 0.10 (0.068 ± 0.003)	E	1.75 ± 0.10 (0.068 ± 0.003)
F	5.50 ± 0.1 (0.21 ± 0.003)	F	5.50 ± 0.05 (0.21 ± 0.001)	F	7.5 ± 0.10 (0.29 ± 0.003)
P	4.00 ± 0.10 (0.15 ± 0.003)	P	8.00 ± 0.10 (0.31 ± 0.003)	P	8.00 ± 0.10 (0.31 ± 0.003)
Po	4.00 ± 0.10 (0.15 ± 0.003)	Po	4.00 ± 0.10 (0.15 ± 0.003)	Po	4.00 ± 0.10 (0.15 ± 0.003)
P1	2.00 ± 0.1 (0.07 ± 0.003)	P1	2.00 ± 0.05 (0.07 ± 0.001)	P1	2.00 ± 0.10 (0.07 ± 0.003)
W	12.00 ± 0.3 (0.472 ± 0.118)	W	12.00 ± 0.3 (0.472 ± 0.118)	W	16.00 ± 0.3 (0.472 ± 0.118)
W1	12.40 ~ 14.40Maxmum (0.48 ~ 0.56)	W1	12.40 ~ 14.40Maxmum (0.48 ~ 0.56)	W1	16.40 ~ 18.40Maxmum (0.64 ~ 0.72)

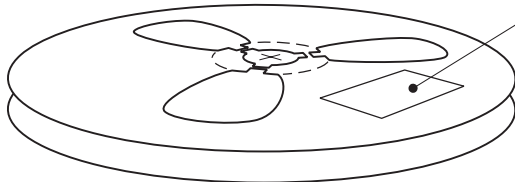
**Note:**

- There shall be leader of 230 mm minimum which may consist of carrier and or cover tape follower by a minimum of 160 mm of carrier tape sealed with cover tape.
- There shall be minimum of 160 mm of empty component pockets sealed with cover tape.
- Devices are packed in accordance whit EIA standard EIA-481-A and specifications given above.



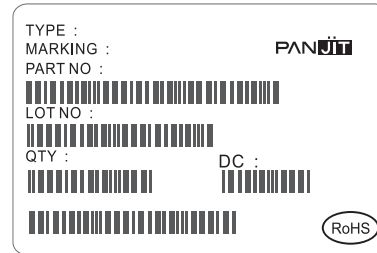
# 4. PACKING

## REEL PACKING

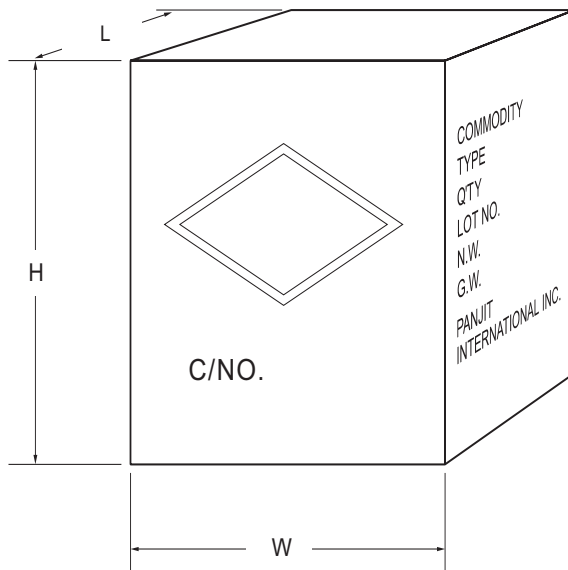


Quantity per Reel:

### LABEL TYPE

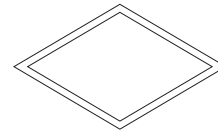


## CARTON



Box Dimensions : mm  
Quantity per Box:

### SHIPPING MARK



C/NO.  
PRODUCT COUNTRY

### SIDE MARK

COMMODITY:  
TYPE:  
Q'TY:  
LOT NO.  
N.W.  
G.W.  
PANJIT  
INTERNATIONAL INC.

Line	Package	Packing	Size	Quantity	Inner box size LxWxH (m/m)	Carton Quantity	Carton size LxWxH (m/m)
SMD	SMA	T/R	7"	1,800	188x188x67	10box/72K	390x240x420
	SMB	T/R		500	188x188x67	10box/20K	390x240x420
	SMC	T/R		500	188x188x67	10box/15K	390x240x420
	SMA(W)	T/R	13"	1,800	188x188x67	10box/72K	390x240x420
	SMA	T/R		7,500	350x337x44	8box/120K	375x360x390
	SMB	T/R		3,000	350x337x44	8box/48K	375x360x390
	SMC	T/R		3,000	350x337x44	7box/42K	375x360x390
	SMA(W)	T/R		7,500	350x337x44	8box/120K	375x360x390



## Bulk Packing

PACKAGE	INNER SIZE	BOX	CARTON SIZE	CARTON	APPROX. GROSS WEIGHT
	(m/m)	(EA)	(m/m)	(EA)	(Kg)
<b>Bulk Packing</b>					
A-405	198 x 84 x 20	1,000	459 x 214 x 256	50,000	12.7
AG / RB-10 ( WOB)	258 x 190 x 77	1,000	395 x 270 x 400	10,000	15
AM	258 x 190 x 77	1,000	395 x 270 x 400	10,000	15
CM / KBPC	193 x 193 x 46	50	405 x 210 x 265	500	17
CMW / KBPC-W	193 x 193 x 46	50	405 x 210 x 265	500	17
KBPC-P /CP	193 x 193 x 46	50	405 x 210 x 265	500	9.5
KBPC-PW /CPW	193 x 193 x 46	50	405 x 210 x 265	500	9.5
CP-3 / 6 (K-3 / K-6)	219 x 115 x 90	200	600 x 235 x 198	2,000	7.3/8.8
CP-8 / 10 (K-8)	219 x 115 x 90	200	600 x 235 x 198	2,000	13.8
DIP	-	-	459 x 214 x 256	12,000	6.5
DO-15	200 x 85 x 25	1,000	459 x 214 x 256	40,000	20.7
DO-201AD	200 x 85 x 40	500	459 x 214 x 256	12,500	16
DO-201AE	200 x 85 x 40	500	459 x 214 x 256	12,500	16
DO-34	240 x 100 x 90	2,000	406 x 335 x 257	120,000	14.5
DO-35	240 x 100 x 90	2,000	406 x 335 x 257	120,000	17.1
DO-41	198 x 84 x 20	1,000	459 x 214 x 265	50,000	19.3
DO-41G	240 x 100 x 90	1,000	406 x 335 x 257	60,000	18.5
FL	230 x 230 x 50	500	495 x 245 x 180	3,000	18.4
GBJ (TUBE)	556 x 150 x 100	800	578 x 340 x 235	3,200	25.5
GBJ (BOX)	350 x 337 x 44	600	375 x 360 x 213	2,400	14.3
GBL	350 x 337 x 44	960	375 x 360 x 213	3,840	13.1
GBP	350 x 337 x 44	1,120	375 x 360 x 213	4,480	10.6
GBPC	193 x 193 x 46	50	405 x 210 x 265	500	17
GBPCW	193 x 193 x 46	50	405 x 210 x 265	500	17
GBU (TUBE)	488 x 150 x 100	800	510 x 310 x 235	3,200	22.6
GBU (BOX)	350 x 337 x 44	800	375 x 360 x 213	3,200	15.2
KBJ	220 x 176 x 45	200	375 x 230 x 260	2,000	15
KBPF	242 x 208 x 35	500	426 x 252 x 365	10,000	19.2
KBU	276 x 158 x 59	200	493 x 287 x 320	3,000	24
P-600	208 x 90 x 83	500	459 x 214 x 256	5,000	11.3
R-1	198 x 84 x 20	1,000	459 x 214 x 256	50,000	12.7
TO-220	540 x 145 x 85	2,000	555 x 306 x 200	8,000	20.5
ITO-220	540 x 145 x 85	2,000	555 x 306 x 200	8,000	22.9
TO-251AB	555 x 145 x 85	8,400	555 x 306 x 200	33,600	22
TO-3P / TO-247AD	-	-	536 x 243 x 100	1,500	13.9
TO-3PS / TO-247S	-	-	511 x 243 x 107	1,500	12.2





# Reel Packing

PACKAGE	REEL SIZE	REEL	COMPONENT SPACE	TAPE SPACE	REEL DIA	CARTON SIZE	CARTON	APPROX. GROSS WEIGHT
	(inch)	(pcs)	(m/m)	(m/m)	(m/m)	(m/m)	(EA)	(Kg)
<b>Reel Packing</b>								
R-1	-	5,000	5.0	52	330	340 x 340 x 410	25,000	7.8
A-405	-	5,000	5.0	52	330	340 x 340 x 410	25,000	11
DO-15	-	4,000	5.0	52	330	340 x 340 x 410	20,000	11.4
DO-201AD	-	1,250	10.0	52	330	340 x 340 x 410	6,250	9.2
DO-201AE	-	1,250	10.0	52	330	340 x 340 x 410	6,250	9.2
DO-34	15	10,000	5.0	52	360	360 x 360 x 395	50,000	10.1
DO-35	15	10,000	5.0	52	360	360 x 360 x 395	50,000	11.2
DO-41	-	5,000	5.0	52	330	340 x 340 x 410	25,000	11.8
DO-41G	15	5,000	5.0	52	360	360 x 360 x 395	25,000	10.9
P-600	-	800	10.0	52	330	340 x 340 x 410	4,000	9.8
DPAK/TO-252	13	3,000	8.0	16	330	375 x 360 x 390	42,000	18.8
D2PAK/TO-263	13	800	16.0	24	330	375 x 360 x 390	6,400	14.4
MDI	13	3,000	8.0	12	330	375 x 360 x 390	48,000	14.7
SDIP	13	1,500	12.0	16	330	375 x 360 x 390	21,000	14.3
QUADRO-MELF	13	10,000	4.0	-	330	360 x 360 x 395	200,000	14.9
QUADRO-MELF	7	2,500	4.0	-	178	385 x 380 x 260	200,000	13.3
MELF/DL-41	13	5,000	4.0	-	330	360 x 360 x 395	100,000	23.5
MELF/DL-41	7	1,500	4.0	-	178	385 x 380 x 260	84,000	18.3
MICRO-MELF	13	10,000	4.0	-	330	360 x 360 x 395	200,000	11.5
MICRO-MELF	7	2,500	4.0	-	178	385 x 380 x 260	200,000	9.3
MINI-MELF	13	10,000	4.0	-	330	360 x 360 x 395	200,000	14.6
MINI-MELF	7	2500	4.0	-	178	385 x 380 x 260	200,000	12.7
SMA	13	7,500	4.0	12	330	375 x 360 x 390	120,000	17.3
SMA	7	1,800	4.0	12	178	390 x 240 x 420	72,000	10
SMB	13	3,000	8.0	12	330	375 x 360 x 390	48,000	13.2
SMB	7	500	8.0	12	178	390 x 240 x 420	20,000	6.5
SMC	13	3,000	8.0	16	330	375 x 360 x 390	42,000	18
SMC	7	500	8.0	16	178	390 x 240 x 420	15,000	8.3
SOD-123	13	10,000	4.0	8	330	375 x 360 x 213	120,000	6.5
SOD-123	7	3,000	4.0	8	178	390 x 270 x 400	240,000	9.9
SOD-123FL	13	10,000	4.0	8	330	375 x 360 x 213	120,000	7.2
SOD-123FL	7	3,000	4.0	8	178	390 x 270 x 400	240,000	10.6



# Reel Packing

PACKAGE	REEL SIZE	REEL	COMPONENT SPACE	TAPE SPACE	REEL DIA	CARTON SIZE	CARTON	APPROX. GROSS WEIGHT
	(inch)	(pcs)	(m/m)	(m/m)	(m/m)	(m/m)	(EA)	(Kg)
<b>Reel Packing</b>								
SOD-323	13	12,000	4.0	8	330	375 x 360 x 213	144,000	5.9
SOD-323	7	5,000	4.0	8	178	390 x 270 x 400	400,000	9.4
SOD-523	13	12,000	4.0	8	330	375 x 360 x 213	144,000	5.4
SOD-523	7	5,000	4.0	8	178	390 x 270 x 400	400,000	9.1
SOD-723	7	8,000	2.0	8	178	390 x 270 x 400	640,000	8.5
SOD-923	7	8,000	2.0	8	178	390 x 270 x 400	640,000	7.7
SOT-23	13	12,000	4.0	8	330	375 x 360 x 213	144,000	7
SOT-23	7	3,000	4.0	8	178	390 x 270 x 400	240,000	8.3
SOT-323	13	12,000	4.0	8	330	375 x 360 x 213	144,000	6.1
SOT-323	7	3,000	4.0	8	178	390 x 270 x 400	240,000	7.9
SOT-363	13	10,000	4.0	8	330	375 x 360 x 213	120,000	7.1
SOT-363	7	3,000	4.0	8	178	390 x 270 x 400	240,000	10.2
SOT-23 (ESD)	7	3,000	4.0	8	178	455 x 270 x 440	240,000	9.5
SOT-323 (ESD)	7	3,000	4.0	8	178	455 x 270 x 440	240,000	9.1
SOT-363 (ESD)	7	3,000	4.0	8	178	455 x 270 x 440	240,000	10
SOT-353	13	10,000	4.0	8	330	375 x 360 x 213	120,000	7.2
SOT-353	7	3,000	4.0	8	178	390 x 270 x 400	240,000	10
SOT-553	13	10,000	4.0	8	330	375 x 360 x 213	120,000	5.2
SOT-553	7	4,000	4.0	8	178	390 x 270 x 400	320,000	9.4
SOT-563	13	10,000	4.0	8	330	375 x 360 x 213	120,000	5.2
SOT-563	7	4,000	4.0	8	178	390 x 270 x 400	320,000	9.4
SOT23-5L	13	10,000	4.0	8	330	375 x 360 x 213	120,000	7.9
SOT23-5L	7	3,000	4.0	8	178	390 x 270 x 400	240,000	14.5
SOT23-6L	13	10,000	4.0	8	330	375 x 360 x 213	120,000	7.9
SOT23-6L	7	3,000	4.0	8	178	390 x 270 x 400	240,000	14.5
SOT-143	13	10,000	4.0	8	330	375 x 360 x 213	120,000	7
SOT-143	7	3,000	4.0	8	178	390 x 270 x 400	240,000	12.8
SOIC-08	13	3,000	8.0	12	330	375 x 360 x 213	48,000	14.2
QFN 1.2 x 1.5	7	3,000	4.0	8	178	390 x 270 x 400	240,000	7.1
QFN 1.6 x 1.6	7	4,000	4.0	8	178	390 x 240 x 420	200,000	7.8
QFN 2.0 x 2.0	7	3,000	4.0	8	178	390 x 270 x 400	240,000	7.1



# Ammunition Packing

PACKAGE	AMMO	COMPONENT SPACE	TAPE SPACE	BOX SIZE	CARTON	CARTON	APPROX. GROSS WEIGHT
	(PCS)	(m/m)	(m/m)	(m/m)	(m/m)	(E/A)	(Kg)
<b>Ammunition Packing</b>							
A-405	5,000	5	26	255 x 47 x 150	339 x 276 x 330	60,000	12.4
A-405	5,000	5	52	255 x 75 x 150	339 x 276 x 330	40,000	16
DO-15	3,000	5	52	255 x 75 x 150	339 x 276 x 330	24,000	13.3
DO-201AD	1,250	10	52	255 x 47 x 122	339 x 276 x 330	10,000	13.4
DO-201AE	1,250	10	52	255 x 47 x 122	339 x 276 x 330	10,000	13.4
DO-34	5,000	5	26	248 x 80 x 48	406 x 335 x 257	150,000	14.6
DO-34	5,000	5	52	248 x 80 x 75	406 x 335 x 257	100,000	12.7
DO-35	5,000	5	26	248 x 80 x 48	406 x 335 x 257	150,000	16.7
DO-35	5,000	5	52	248 x 80 x 75	406 x 335 x 257	100,000	15.2
DO-41	5,000	5	52	255 x 75 x 150	339 x 276 x 330	40,000	16
DO-41G	2,500	5	26	248 x 80 x 48	406 x 335 x 257	75,000	17.1
DO-41G	2,500	5	52	248 x 80 x 75	406 x 335 x 257	50,000	15.7
P-600	400	10	52	255 x 47 x 122	339 x 276 x 330	3,200	8.1
R-1	3,000	5	26	255 x 47 x 73	310 x 268 x 170	36,000	6.3
R-1	3,000	5	52	256 x 73 x 73	310 x 268 x 170	24,000	6.4
R-1	5,000	5	52	255 x 73 x 122	339 x 276 x 274	40,000	10.3



## 5. HIGH RELIABILITY TESTING SPEC.

NO	TEST ITEM	TEST CONDITION	REFERENCE DOCUMENT	LOT QUALITY LEVEL	REMARK
1	TEMPERATURE CYCLING (T.C.T)	Ta = -55 + 0, -3 °C 10min Ta = + 150 +/- °C 10min FOR 20 CYCLE	MIL-STD-750D METHOD-1051.5	LTPD 10 S.s. = 22 ACCEPT FOR 0 FAILURE ONLY.	
2	HIGH TEMPERATURE STORAGE LIFE (H.T.S.L)	Ta = 150 +/- 5 °C TESTING TIME: 168 HRS 500 HRS	MIL-STD-750D METHOD-1031.2	LTPD10 S.s. = 22 ACCEPT FOR 0 FAILURE ONLY.	
3	SOLDERABILITY TEST	TEMPERATURE OF SOLDER POT = 245 +/- 5 °C TIME FOR DIPPING FLUX = 5 -10 SEC TIME FOR DIPPING IN SOLDER = 5 +/- 0.5 SEC DIPPING DEPTH = 0.05 inch max FOR ONE CYCLE	MIL-STD-750D	METHOD-2026.10 LTPD 7 S.s. = 32 ACCEPT FOR 0 FAILURE ONLY.	
4	HIGH TEMPERATURE REVERSE BIAS (H.T.R.B)	Ta = 150 +/- 5 °C VR = 80 % VR (CUSTOM SECP) TESTING TIME: 168 HRS 500 HRS	MIL-STD-750D METHOD-1038.3	LTPD10 S.s. = 22 ACCEPT FOR 0 FAILURE ONLY.	
5	CONTINUE FORWARD OPERATING LIFE (C.F.O.L)	Ta = 55 °C I = IO +/- 10 % TESTING TIME: 168 HRS 500 HRS	MIL-STD-750D METHOD-1027.3	LTPD10 S.s. = 22 ACCEPT FOR 0 FAILURE ONLY.	
6	THERMAL SHOCK (T.S.T)	HOT TANK T = 100 °C + 10 / -2 °C t = 5 min COLD TANK T = 0 °C + 2 / -10 °C t = 5 min 15 CYCLE TIME BETWEEN TRANSFERRING DO'NOT EXCEED 10 SECOND.	MIL-STD-750D METHOD-1056.7	LTPD10 S.s. = 22 ACCEPT FOR 0 FAILURE ONLY.	
7	PRESSURE COOKER (P.C.T)	Ta = 121 °C P = 1.2 kg / cm <sup>2</sup> TIME = 96 HRS	JEDEC JESD22-A102-C	LTPD10 S.s. = 22 ACCEPT FOR 0 FAILURE ONLY.	
8	INTERMITTENT FORWARD OPERATING LIFE (I.F.O.L)	I = Io x 1.0 POWER ON : 30 SEC POWER OFF : 50 SEC TESTING TIME: 2000 CYCLES	MIL-STD-750D METHOD 1036.3	LTPD10 S.s. = 22 ACCEPT FOR 0 FAILURE ONLY.	
9	FORWARD SURGE CURRENT (I.F.S.M)	SQ WAVE OR SINE WAVE IFSM=DATE SHEET SPEC. TIME = 8.3 Msec T = 1 CYCLE	MIL-STD-750D METHOD 4066.3	LTPD10 S.s. = 22 ACCEPT FOR 0 FAILURE ONLY.	
10	HUMIDITY	Ta = 85 °C RH = 85 % TESTING TIME: 168 HRS 500 HRS	MIL-STD-750D METHOD 1021.1	LTPD10 S.s. = 22 ACCEPT FOR 0 FAILURE ONLY.	
11	SOLDERABILITY RESISTANCE	TEMPERATURE OF SOLDER POT = 260 +/- 5 °C TIME FOR DIPPING IN SOLDER = 10 + 2 / -0 SEC DIPPING DEPTH = 1.57 +/- 0.79 mm BELOW BODY FOR ONE CYCLE	MIL-STD-750D METHOD 2031.1	LTPD10 S.s. = 22 ACCEPT FOR 0 FAILURE ONLY.	

SCHOTTKY PRODUCT TESTING TEMPERATURE 100 °C +/- 5°C MAX(NORMAL)