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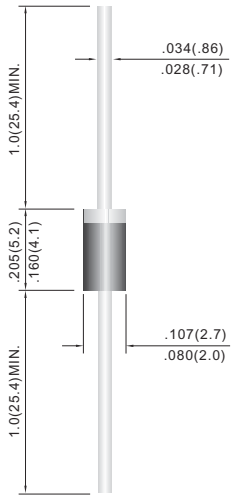
1. DATA SHEET

P4KE SERIES

GLASS PASSIVATED JUNCTION TRANSIENT VOLTAGE SUPPRESSOR

VOLTAGE 6.8 to 440 Volts **POWER** 400 Watts

DO-41 Unit: inch(mm)



FEATURES

- Plastic package has Underwriters Laboratory Flammability Classification 94V-O
- Excellent clamping capability
- Low zener impedance
- Fast response time: typically less than 1.0 ps from 0 volts to BV min
- Typical IR less than 1μA above 10V
- Both normal and Pb free product are available :

  Normal : 80~95% Sn, 5~20% Pb

  Pb free: 98.5% Sn above

MECHANICALDATA

Case: JEDEC DO-41 Molded plastic

Terminals: Axial leads, solderable per MIL-STD-202, Method 208

Polarity: Color band denoted cathode except Bipolar

Mounting Position: Any

Weight: 0.012 ounce, 0.34 gram

MAXIMUM RATINGS AND CHARACTERISTICS

Rating at 25°Cambient temperature unless otherwise specified. Resistive or inductive load, 60Hz.
For Capacitive load derate current by 20%.

DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA Suffix for types
Electrical characteristics apply in both directions.

Rating	Symbol	Value	Units
Peak Power Dissipation at TA=25 °C, Tp=1ms (Note 1)	P_{PK}	400	Watts
Steady State Power Dissipation at TL=75CLead Lengths .375",(9.5mm) (Note 2)	P_D	1.0	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load(JECED Method) (Note 3)	I_{PPM}	40	Amps
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-65 to +175	°C

NOTES:

1. Non-repetitive current pulse, per Fig. 3 and derated above T_A=25°C **per Fig.** 2.
2. Mounted on Copper Leaf area of 1.57 in^2 (40mm^2).
3. 8.3ms single half sine-wave, duty cycle= 4 pulses per minutes maximum.

Part Number		V_{RWM}	V_{BR} @ I_T			I_R @ V_{RWM}		V_C @ I_{PP}	
			Min.	Max.	I_T	UNI-	Bi-		
UNI-	Bi-	V	V	V	mA	uA	uA	V	A
400W Transient Voltage Suppressor									
P4KE6.8	P4KE6.8C	5.50	6.12	7.48	10	1000	2000	10.8	38.0
P4KE6.8A	P4KE6.8CA	5.80	6.45	7.14	10	1000	2000	10.5	40.0
P4KE7.5	P4KE7.5C	6.05	6.75	8.25	10	500	1000	11.7	36.0
P4KE7.5A	P4KE7.5CA	6.40	7.13	7.88	10	500	1000	11.3	37.0
P4KE8.2	P4KE8.2C	6.63	7.38	9.02	10	200	400	12.5	33.0
P4KE8.2A	P4KE8.2CA	7.02	7.79	8.61	10	200	400	12.1	35.0
P4KE9.1	P4KE9.1C	7.37	8.19	10.0	1.0	50	100	13.8	30.0
P4KE9.1A	P4KE9.1CA	7.78	8.65	9.50	1.0	50	100	13.4	31.0
P4KE10	P4KE10C	8.10	9.00	11.0	1.0	10	20	15.0	28.0
P4KE10A	P4KE10CA	8.55	9.50	10.5	1.0	10	20	14.5	29.0
P4KE11	P4KE11C	8.92	9.90	12.1	1.0	5	10	16.2	26.0
P4KE11A	P4KE11CA	9.40	10.5	11.6	1.0	5	10	15.6	27.0
P4KE12	P4KE12C	9.72	10.8	13.2	1.0	1	1	17.3	24.0
P4KE12A	P4KE12CA	10.2	11.4	12.6	1.0	1	1	16.7	25.0
P4KE13	P4KE13C	10.5	11.7	14.3	1.0	1	1	19.0	22.0
P4KE13A	P4KE13CA	11.1	12.4	13.7	1.0	1	1	18.2	23.0
P4KE15	P4KE15C	12.1	13.5	16.5	1.0	1	1	22.0	19.0
P4KE15A	P4KE15CA	12.8	14.3	1.58	1.0	1	1	21.2	20.0
P4KE16	P4KE16C	12.9	14.4	17.6	1.0	1	1	23.5	18.0
P4KE16A	P4KE16CA	13.6	15.2	16.8	1.0	1	1	22.5	19.0
P4KE18	P4KE18C	14.5	16.2	19.8	1.0	1	1	26.5	16.0
P4KE18A	P4KE18CA	15.3	17.1	18.9	1.0	1	1	25.2	17.0
P4KE20	P4KE20C	16.2	18.0	22.0	1.0	1	1	29.1	14.0
P4KE20A	P4KE20CA	17.1	19.0	21.0	1.0	1	1	27.7	15.0
P4KE22	P4KE22C	17.8	19.8	24.2	1.0	1	1	31.9	13.0
P4KE22A	P4KE22CA	18.8	20.9	23.1	1.0	1	1	30.6	14.0
P4KE24	P4KE24C	19.4	21.6	26.4	1.0	1	1	34.7	12.0
P4KE24A	P4KE24CA	20.5	22.8	25.2	1.0	1	1	33.2	13.0
P4KE27	P4KE27C	21.8	24.3	29.7	1.0	1	1	39.1	11.0
P4KE27A	P4KE27CA	23.1	25.7	28.4	1.0	1	1	37.5	11.2
P4KE30	P4KE30C	24.3	27.0	33.0	1.0	1	1	43.5	10
P4KE30A	P4KE30CA	25.6	28.5	31.5	1.0	1	1	41.4	10
P4KE33	P4KE33C	26.8	29.7	36.3	1.0	1	1	47.7	9.0
P4KE33A	P4KE33CA	28.2	31.4	34.7	1.0	1	1	45.7	9.0
P4KE36	P4KE36C	29.1	32.4	39.6	1.0	1	1	52.0	8.0
P4KE36A	P4KE36CA	30.8	34.2	37.8	1.0	1	1	49.9	8.4
P4KE39	P4KE39C	31.6	35.1	42.9	1.0	1	1	56.4	7.4
P4KE39A	P4KE39CA	33.3	37.1	41.0	1.0	1	1	53.9	7.8
P4KE43	P4KE43C	34.8	38.7	47.3	1.0	1	1	61.9	6.8
P4KE43A	P4KE43CA	36.8	40.9	45.2	1.0	1	1	59.3	7.1
P4KE47	P4KE47C	38.1	42.3	51.7	1.0	1	1	67.8	6.2
P4KE47A	P4KE47CA	40.2	44.7	49.4	1.0	1	1	64.8	5.0

Part Number		V_{RWM}	V_{BR} @ I_T			I_R @ V_{RWM}		V_C @ I_{PP}	
			Min.	Max.	I_T	UNI-	Bi-		
UNI-	Bi-	V	V	V	mA	uA	uA	V	A
400W Transient Voltage Suppressor									
P4KE51	P4KE51C	41.3	45.9	56.1	1.0	1	1	73.5	5.7
P4KE51A	P4KE51CA	43.6	48.5	53.6	1.0	1	1	70.1	6.0
P4KE56	P4KE56C	45.6	50.4	61.6	1.0	1	1	80.5	5.2
P4KE56A	P4KE56CA	47.8	53.2	58.8	1.0	1	1	77.0	5.5
P4KE62	P4KE62C	50.2	55.8	68.2	1.0	1	1	89.0	4.7
P4KE62A	P4KE62CA	53.0	58.9	65.1	1.0	1	1	85.0	5.0
P4KE68	P4KE68C	55.1	61.2	74.8	1.0	1	1	98.0	4.3
P4KE68A	P4KE68CA	58.1	64.6	71.4	1.0	1	1	92.0	4.6
P4KE75	P4KE75C	60.7	67.5	82.5	1.0	1	1	108	3.9
P4KE75A	P4KE75CA	64.1	71.3	78.8	1.0	1	1	103	4.1
P4KE82	P4KE82C	66.4	73.8	90.2	1.0	1	1	118	3.6
P4KE82A	P4KE82CA	70.1	77.9	86.1	1.0	1	1	113	3.7
P4KE91	P4KE91C	73.7	81.9	100	1.0	1	1	131	3.2
P4KE91A	P4KE91CA	77.8	86.5	95.5	1.0	1	1	125	3.4
P4KE100	P4KE100C	81.0	90.0	110	1.0	1	1	144	2.9
P4KE100A	P4KE100CA	85.5	95.0	105	1.0	1	1	137	3.1
P4KE110	P4KE110C	89.2	99.0	121	1.0	1	1	158	2.7
P4KE110A	P4KE110CA	94.0	105	116	1.0	1	1	152	2.8
P4KE120	P4KE120C	97.2	108	132	1.0	1	1	173	2.4
P4KE120A	P4KE120CA	102	114	126	1.0	1	1	165	2.5
P4KE130	P4KE130C	105	117	143	1.0	1	1	187	2.2
P4KE130A	P4KE130CA	111	124	137	1.0	1	1	179	2.3
P4KE150	P4KE150C	121	135	165	1.0	1	1	215	2.0
P4KE150A	P4KE150CA	128	143	158	1.0	1	1	207	2.0
P4KE160	P4KE160C	130	144	176	1.0	1	1	230	1.8
P4KE160A	P4KE160CA	136	152	168	1.0	1	1	219	1.9
P4KE170	P4KE170C	138	153	187	1.0	1	1	244	1.7
P4KE170A	P4KE170CA	145	162	179	1.0	1	1	234	1.8
P4KE180	P4KE180C	146	162	198	1.0	1	1	258	1.6
P4KE180A	P4KE180CA	154	171	189	1.0	1	1	246	1.7
P4KE200	P4KE200C	162	180	220	1.0	1	1	287	1.5
P4KE200A	P4KE200CA	171	190	210	1.0	1	1	274	1.53
P4KE220	P4KE220C	175	198	242	1.0	1	1	344	1.16
P4KE220A	P4KE220CA	185	209	231	1.0	1	1	328	1.22
P4KE250	P4KE250C	202	225	275	1.0	1	1	360	1.11
P4KE250A	P4KE250CA	214	237	263	1.0	1	1	344	1.16
P4KE300	P4KE300C	243	270	330	1.0	1	1	430	0.93
P4KE300A	P4KE300CA	256	285	315	1.0	1	1	414	0.97
P4KE350	P4KE350C	284	315	385	1.0	1	1	504	0.79
P4KE350A	P4KE350CA	300	332	368	1.0	1	1	482	0.83
P4KE400	P4KE400C	324	360	440	1.0	1	1	574	0.70
P4KE400A	P4KE400CA	342	380	420	1.0	1	1	548	0.73
P4KE440	P4KE440C	356	396	484	1.0	1	1	631	0.66
P4KE440A	P4KE440CA	376	418	462	1.0	1	1	600	0.69

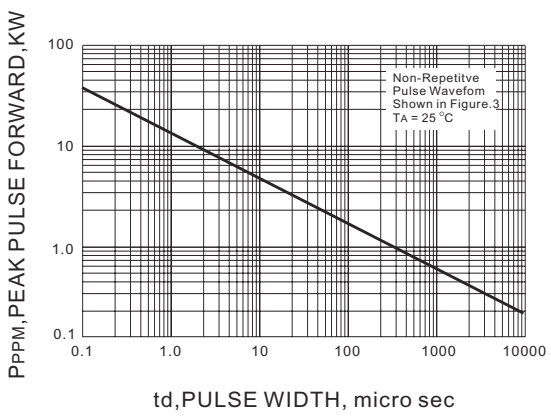


Fig.1 PEAK PULSE POWER RATING PULSE TIME CURVE

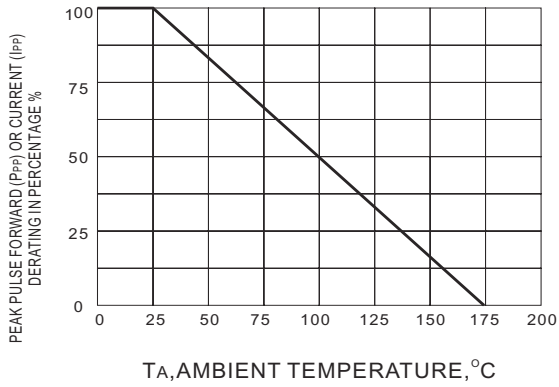


Fig.2 PULSE DERATING CURVE

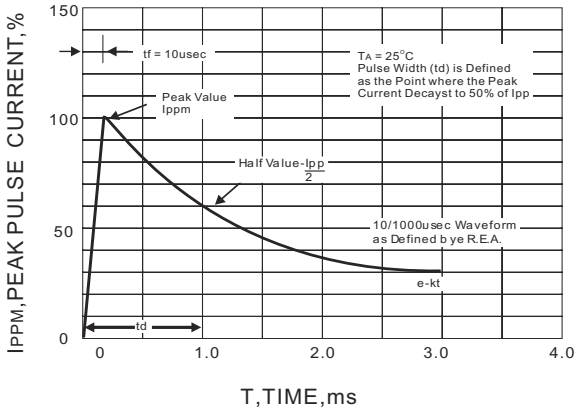


Fig.3 PULSE WAVEFORM

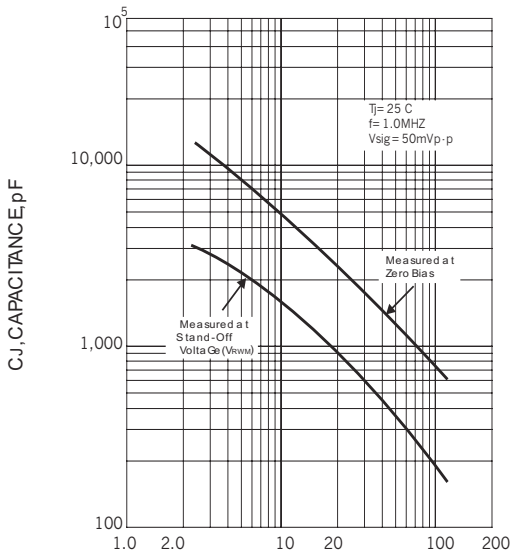


Fig.4 TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL

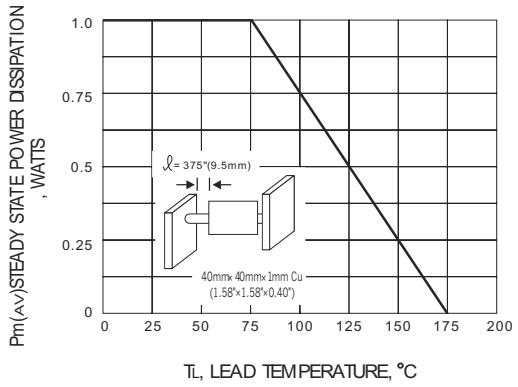


Fig.5 STEADY STATE POWER DERATING CURVE

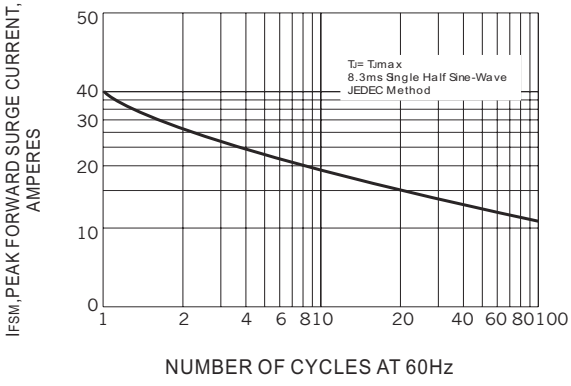
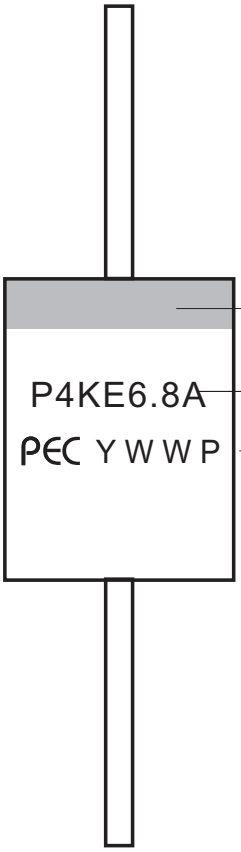


Fig.6 MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

2. MARKING



Cathode band

1st line: Marking code

2nd line: PEC PanJit logo

Y- Last digit of calendar year

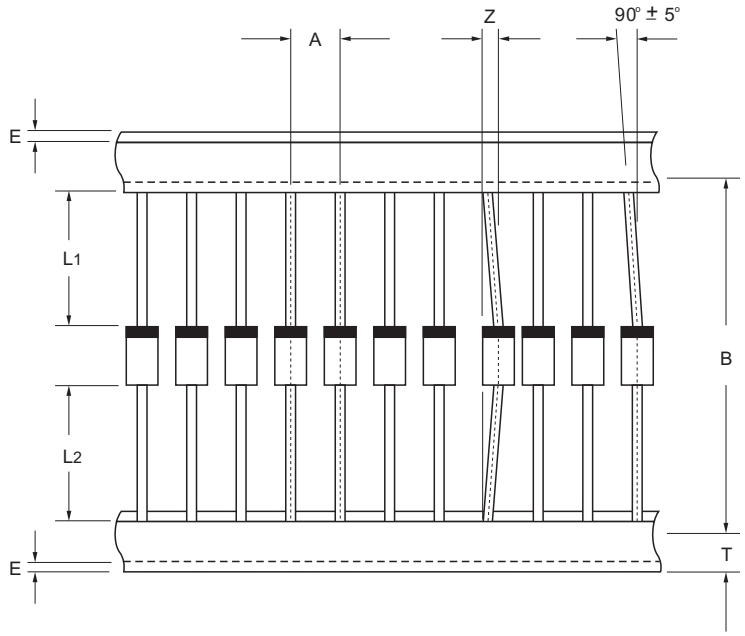
WW- Weekly

P- Production line

3. TAPING

Axial lead devices are packed in accordance with EIA standard RS-296-E and specifications given below.

COMPONENT OUTLINE	COMPONENT PITCH A ± 0.5mm	INTER TAPE PITCH B ± 1.0mm	CUMULATIVE PITCH TOLERANCE
DO-41	5.0mm	52.0mm	1.0mm/20pitch

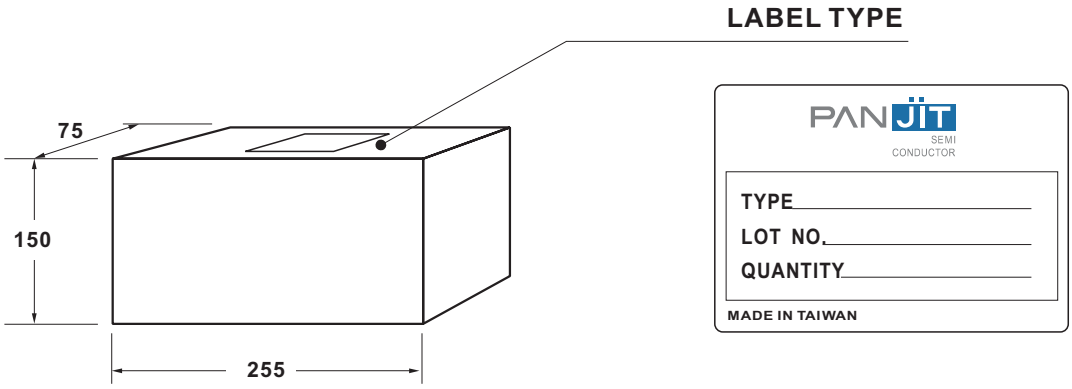


ITEM	SYMBOL	SPECIFICATIONS(mm)	SPECIFICATIONS(inch)
Component alignment	Z	1.2max	0.048max
Tape width	T	6.0±0.4	0.236±0.016
Exposed adhesive	E	0.8max	0.032max
Body eccentricity	L1-L2	1.0max	0.040max

NOTES: Each component lead shall be sandwiched between tapes for a minimum of 3.2mm (0.126")

4. PACKING

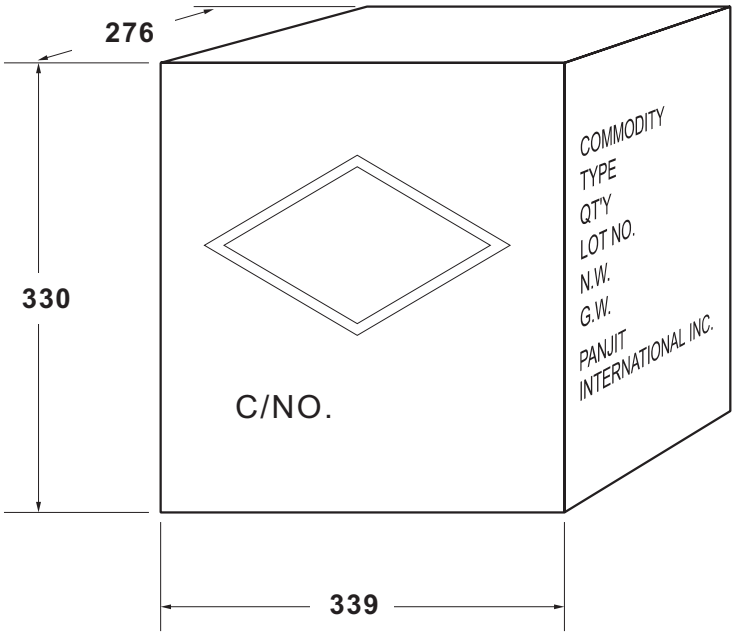
AMMUNITION PACKING



Box Dimensions :mm

Quantity per Box: 5,000 pcs

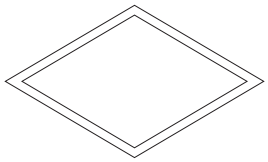
CARTON



Box Dimensions :mm

Quantity per Box:40,000 pcs

SHIPPING MARK



C/NO.
PRODUCT COUNTRY

SIDE MARK

COMMODITY:
TYPE:
QT'Y:
LOT NO.
N.W.
G.W.

PANJIT
INTERNATIONAL INC.

Bulk Packing

PACKAGE	INNER SIZE (m/m)	BOX (EA)	CARTON SIZE (m/m)	CARTON (EA)	APPROX. GROSS WEIGHT (Kg)
Bulk Packing					
R-1	198 x 84 x 20	1,000	459 x 214 x 256	50,000	12.4
A-405	198 x 84 x 20	1,000	459 x 214 x 256	50,000	13.4
DO-35	96 x 80 x 42	10,000	410 x 350 x 275	120,000	21.5
DO-41G	240 x 100 x 100	5,000	410 x 350 x 275	60,000	26.5
DO-41	198 x 84 x 20	1,000	459 x 214 x 256	50,000	19.1
DO-15	200 x 85 x 25	1,000	459 x 214 x 256	40,000	17.5
DO-201AE	200 x 85 x 40	500	459 x 214 x 256	12,500	17.0
DO-201AD	200 x 85 x 40	500	459 x 214 x 256	12,500	17.3
P600	208 x 90 x 83	500	459 x 214 x 256	5,000	11.3
AM	195 x 195 x 40	1,000	400 x 273 x 415	10,000	16.8
DIP	-	-	459 x 214 x 256	12,000	10.2
SDIP	-	-	459 x 214 x 256	24,000	15.5
FL	230 x 230 x 50	500	495 x 245 x 180	3,000	25.0
GBU	350 x 337 x 44	800	510 x 340 x 235	3,200	18.9
ITO/TO-220	555 x 145 x 95	2,000	570 x 306 x 218	8,000	13.4
GL	260 x 190 x 75	72	460 x 215 x 260	864	15.8
KBU	230 x 230 x 50	400	495 x 245 x 180	2,400	21.5
GBJ	352 x 337 x 44	600	375 x 360 x 213	2,400	13.1
TO-251AB	560 x 210 x 79	8,000	577 x 226 x 196	16,000	6.5
GBL	352 x 337 x 44	960	375 x 360 x 213	3,840	13.0
GBP	352 x 337 x 44	1,120	375 x 360 x 213	4,480	11.3
TO-3P	-	-	536 x 243 x 100	1,500	12.7
GBPC/W	195 x 195 x 41	50	460 x 215 x 260	500	9.8 / 8.8

Ammunition Packing

PACKAGE	AMMO (PCS)	COMPONENT SPACE (m/m)	TAPE SPACE (m/m)	BOX SIZE (m/m)	CARTON (m/m)	CARTON (E/A)	APPROX. GROSS WEIGHT (Kg)
Ammunition Packing							
R-1	5,000	5.0	26	255 x 50 x 150	339 x 276 x 330	60,000	12.4
R-1	5,000	5.0	52	255 x 75 x 150	339 x 276 x 330	40,000	12.4
A-405	5,000	5.0	26	255 x 50 x 150	339 x 276 x 330	60,000	13.4
A-405	5,000	5.0	52	255 x 75 x 150	339 x 276 x 330	40,000	13.4
DO-35	5,000	5.0	52	255 x 80 x 80	410 x 350 x 275	100,000	20.0
DO-41G	2,500	5.0	52	255 x 80 x 80	410 x 350 x 275	50,000	22.0
DO-41	5,000	5.0	52	255 x 75 x 150	339 x 276 x 330	40,000	19.1
DO-15	3,000	5.0	52	255 x 75 x 150	339 x 276 x 330	24,000	17.5
DO-201AE	1,250	10.0	52	255 x 75 x 150	339 x 276 x 330	10,000	17.0
DO-201AD	1,250	10.0	52	255 x 75 x 150	339 x 276 x 330	10,000	17.3
P600	400	10.0	52	255 x 75 x 150	339 x 276 x 330	3,200	11.3

Reel Packing

PACKAGE	REEL	COMPONENT SPACE	TAPE SPACE	REEL DIA	CARTON SIZE	CARTON	APPROX. GROSS WEIGHT
	(pcs)	(m/m)	(m/m)	(EA)	(EA)	(EA)	(Kg)
Reel Packing							
R-1	5,000	5.0	52	330	340 x 340 x 410	25,000	9.0
A-405	5,000	5.0	52	330	340 x 340 x 410	25,000	9.1
DO-35	10,000	5.0	52	360	380 x 380 x 420	50,000	13.0
DO-41G	5,000	5.0	52	360	380 x 380 x 420	25,000	14.5
DO-41	5,000	5.0	52	330	340 x 340 x 410	25,000	12.4
DO-15	4,000	5.0	52	330	340 x 340 x 410	20,000	11.8
DO-201AE	1,250	10.0	52	330	340 x 340 x 410	6,250	11.0
DO-201AD	1,250	10.0	52	330	340 x 340 x 410	6,250	11.6
P600	800	10.0	52	330	340 x 340 x 410	4,000	11.4
SMA	7,500 / 1,800	4.0	-	330 / 178	375 x 360 x 390 / 390 x 240 x 420	120,000 / 72,000	17.5 / 8.3
SMB	3,000 / 500	4.0	-	330 / 178	375 x 360 x 390 / 390 x 240 x 420	48,000 / 20,000	13.6 / 7.5
SMC	3,000 / 500	12.0	-	330 / 178	375 x 360 x 390 / 390 x 240 x 420	42,000 / 15,000	16.2 / 7.3
SDIP	1,500	12.0	-	330	375 x 360 x 390	21,000	16.3
MDI	3,000 / 500	8.0	-	330 / 178	375 x 360 x 390	48,000 / 30,000	14.4
D^2PCK	800	16.0	-	330	375 x 360 x 390	6,400	15.6
TO-252	3,000	8.0	-	330 / 178	375 x 360 x 390	42,000	16.5
SOD-123	10,000 / 3,000	4.0	-	330 / 178	375 x 360 x 213 / 390 x 240 x 420	120,000 / 150,000	8.0 / 10.0
SOD-323	12,000 / 5,000	4.0	-	330 / 178	375 x 360 x 213 / 390 x 240 x 420	144,000 / 250,000	9.6 / 10.0
SOT-23	12,000 / 3,000	4.0	-	330 / 178	375 x 360 x 213 / 390 x 240 x 420	144,000 / 150,000	9.6 / 10.0
SOT-323	12,000 / 3,000	4.0	-	330 / 178	375 x 360 x 213 / 390 x 240 x 420	144,000 / 150,000	9.6 / 10.0
SOT-363	3,000	4.0	-	178	438 x 438 x 220	120,000	-
SOT-23-6L	3,000	4.0	-	178	438 x 438 x 220	120,000	-
MICRO-MELF	2,500	4.0	-	178	640 x 405 x 150	200,000	15.7
QUADRO-MELF	2,500	4.0	-	178	640 x 405 x 150	200,000	15.7
MINI-MELF	2,500	4.0	-	178	640 x 405 x 150	200,000	15.7
DL-41	5,000	4.0	-	330	350 x 350 x 350	100,000	22.0

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: 168HRS 250HRS 500HRS	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=5-10SEC TIME FOR DIPPING IN SOLDER=5+/-0.5SEC 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: 48HRS 96HRS 168HRS 250HRS 500HRS	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: 168HRS 250HRS 500HRS	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=5min COLD TANK T=0°C+2/-10°C t=5min 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=1.2kg/cm^2 TIME=96HRS	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 : 30SEC POWER OFF : 50SEC 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=8.3Msec 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: 168HRS 250HRS 500HRS	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 125 °C MAX(NORMAL)					