

Features

- Junction passivation optimized design passivated anisotropic rectifier technology
- 12000W peak pulse power capability at 10×1000μs waveform.
- Very fast response time
- Meets MSL-1, per J-STD-020, LF maximum peak of 260°C
- Conform to AEC-Q101
- Compliant to RoHS directive 2002/96/EC

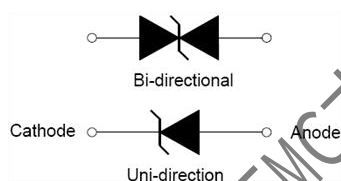
Mechanical Characteristics

- Case: P600
- Base P/NHE3-RoHS compliant
- Molding compound meets UL 94V-0 flammability rating
- Terminals: Matte tin plated leads, solderable per
- J-STD-002 and JESD22-B102

Schematic And Configuration



P600



Primary Characteristics

V_{RWM}	17 V to 280 V
P_{PPM}	12000 W
$P_{M(AV)}$	8.0 W
I_{FSM}	400A
$T_J \text{ max.}$	175 °C

Absolute Maximum Ratings ($T_C=25^\circ\text{C}$, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation at 10/1000μs waveform	P_{PPM}	12000	Watts
Peak pulse current of at 10/1000μs waveform	I_{PPM}	See Table	Amps
Steady state power dissipation at $T_L=75^\circ\text{C}$	$P_{M(AV)}$	8.0	Watts
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method)	I_{FSM}	400	Amps
Operating junction and Storage Temperature Range.	T_J, T_{STG}	-55 to +175	°C
Typical thermal resistance junction to lead	$R_{\theta JL}$	8	°C/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	40	°C/W

Notes:

- 1 Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum

Electrical Characteristics (Ta=25°C,unless otherwise noted)

Part Number (Uni)	Part Number (Bi)	Reverse Stand off Voltage V_R (Volts)	Breakdown Voltage V_{BR} (Volts)@ I_T		Test Current I_T (mA)	Maximum Reverse Leakage I_R @ V_R (μA)	Maximum Peak Pulse Current I_{pp} (A)	Maximum Clamping Voltage V_C @ I_{pp} (V)
			Min .V	Max .V				
12KP17A	12KP17CA	17	18.99	21.22	50	5000	409.6	29.3
12KP18A	12KP18CA	18	20.11	22.65	50	5000	388.3	30.9
12KP20A	12KP20CA	20	22.34	24.96	20	1500	349.9	34.3
12KP22A	12KP22CA	22	24.57	27.46	10	500	323.5	37.1
12KP24A	12KP24CA	24	26.81	29.95	5	150	294.8	40.7
12KP26A	12KP26CA	26	29.04	32.45	5	50	272.7	44.0
12KP28A	12KP28CA	28	31.28	34.95	5	25	252.6	47.5
12KP30A	12KP30CA	30	33.51	37.44	5	15	236.7	50.7
12KP33A	12KP33CA	33	36.90	41.19	5	2	219.4	54.7
12KP36A	12KP36CA	36	40.20	44.93	5	2	200.7	59.8
12KP40A	12KP40CA	40	44.70	49.92	5	2	182.4	65.8
12KP43A	12KP43CA	43	48.00	53.67	5	2	171.9	69.8
12KP45A	12KP45CA	45	50.30	56.16	5	2	164.8	72.8
12KP48A	12KP48CA	48	53.60	59.91	5	2	154.4	77.7
12KP51A	12KP51CA	51	57.00	63.65	5	2	144.8	82.9
12KP54A	12KP54CA	54	60.30	67.39	5	2	136.8	87.7
12KP58A	12KP58CA	58	64.80	72.39	5	2	127.9	93.8
12KP60A	12KP60CA	60	67.00	74.88	5	2	123.2	97.4
12KP64A	12KP64CA	64	71.50	79.87	5	2	115.2	104.2
12KP70A	12KP70CA	70	78.20	87.36	5	2	105.6	113.6
12KP75A	12KP75CA	75	83.80	93.60	5	2	98.4	122.0
12KP78A	12KP78CA	78	87.1	97.35	5	2	95.2	126.1
12KP85A	12KP85CA	85	94.90	106.08	5	2	87.2	137.6
12KP90A	12KP90CA	90	100.50	112.32	5	2	82.4	145.6
12KP100A	12KP100CA	100	111.70	124.80	5	2	74.4	161.3
12KP110A	12KP110CA	110	122.90	137.28	5	2	67.2	178.6
12KP120A	12KP120CA	120	134.00	149.76	5	2	62.4	192.3
12KP130A	12KP130CA	130	145.20	162.25	5	2	57.6	208.3
12KP150A	12KP150CA	150	167.60	187.21	5	2	49.6	241.9
12KP160A	12KP160CA	160	178.70	199.69	5	2	46.4	258.6
12KP170A	12KP170CA	170	189.90	212.17	5	2	44.0	272.7
12KP180A	12KP180CA	180	201.10	224.65	5	2	41.6	288.5
12KP200A	12KP200CA	200	223.40	249.61	5	2	37.6	319.1
12KP220A	12KP220CA	220	245.70	274.57	5	2	34.0	352.5
12KP240A	12KP240CA	240	268.10	299.53	5	2	31.2	384.6
12KP260A	12KP260CA	260	290.40	324.49	5	2	28.8	416.7
12KP280A	12KP280CA	280	312.80	349.45	5	2	26.4	454.5

Ordering Information

12KP	XX	(CA) A
<u>12000W@10/1000US</u>	<u>VR</u>	<u>bi-directional polarity</u> <u>uni-directional polarity</u>

Ratings And Characteristics Curves (TA=25°C, unless otherwise noted)

Figure 1- Peak Pulse Power Rating Curve

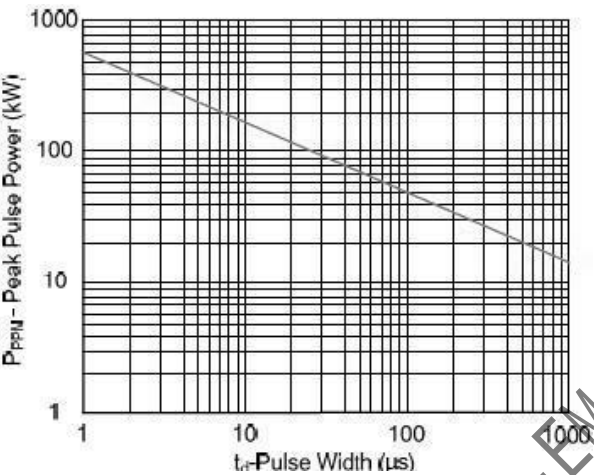


Figure 2- Pulse Derating Curve

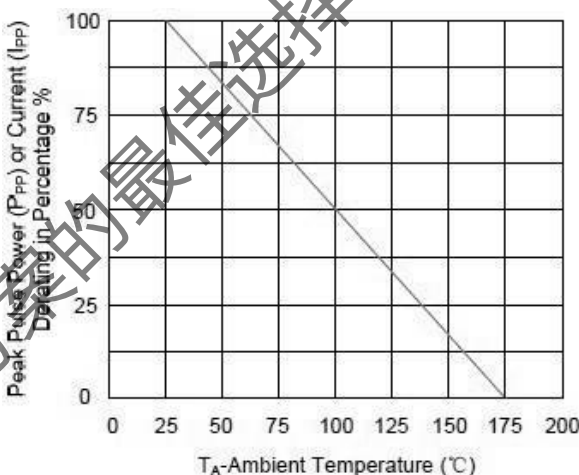


Figure 3- Pulse Waveform

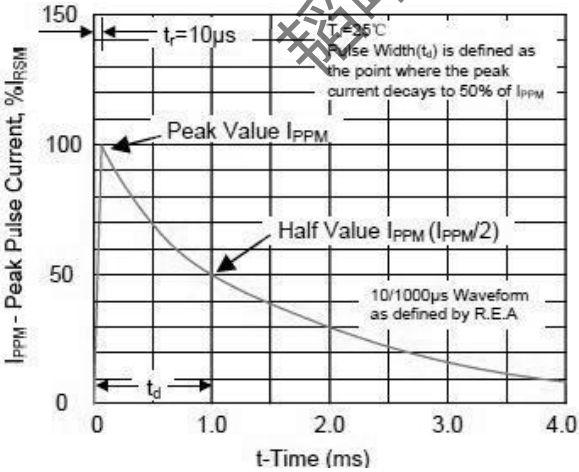


Figure 4- Typical Junction Capacitance

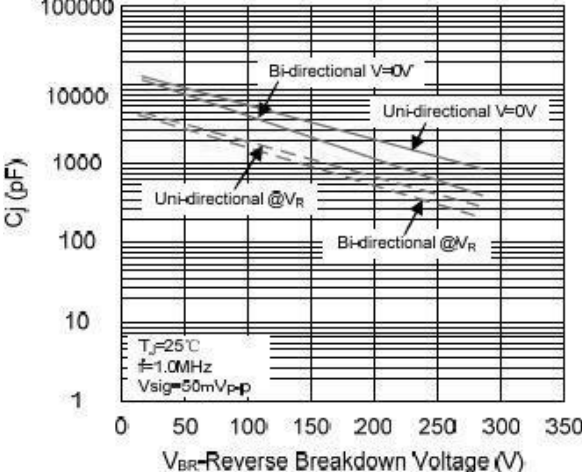


Figure 3- Steady State Power Dissipation Derating Curve

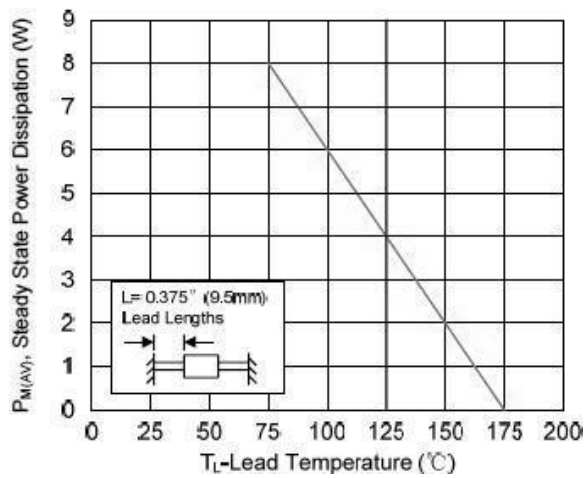
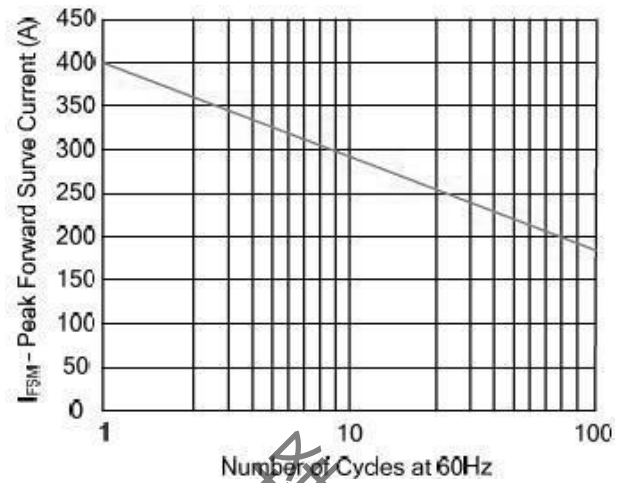
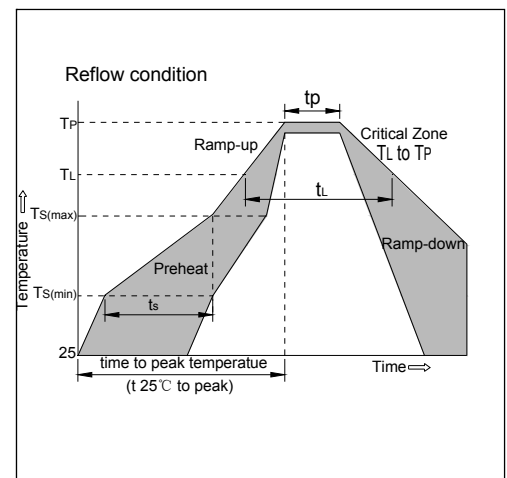


Figure 3- Maximum Non-Repetitive Forward Surge Current
Uni-Directional Only

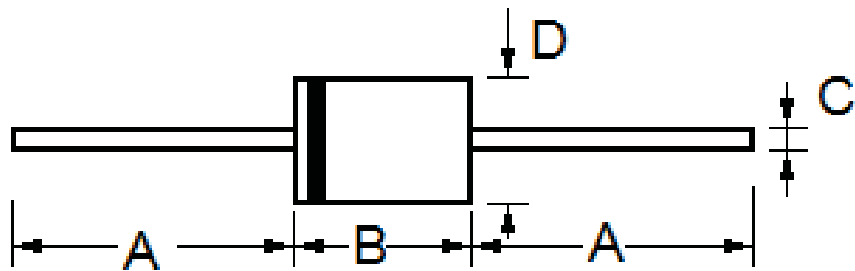


Soldering Parameters

Reflow Condition		Pb-Free assembly (see figure at right)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time (Min to Max) (t_s)	60-180 secs.
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature(T_L)(Liquidus)	+217°C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_P)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_P)		20-40secs.
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260°C



Package Mechanical Data



Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	25.4	---	1.000	---
B	8.6	9.1	0.340	0.360
C	1.22	1.32	0.048	0.052
D	8.6	9.1	0.340	0.360

Contact Information

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