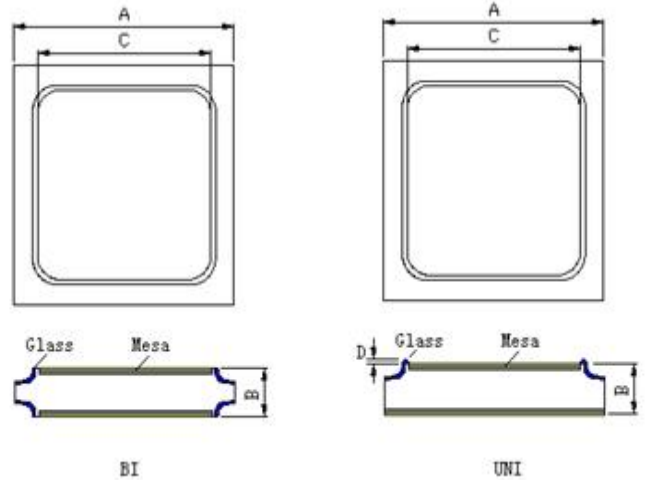


**Features**

- Glass passivated chip
- Low inductance
- Excellent clamping capability
- Very fast response time
- 600 W peak pulse power capability with a 10/1000  $\mu$ s waveform
- Compatible with soldering

**Devices for Bidirectional Applications**

- For bi-directional devices, use suffix C or CA  
Electrical characteristics apply in both directions.



**Process Details**

Chip Type	PDPW (pcs/4"wafer)	Size (mil)				Surface Metalization
		A (+1/-2)	B ( $\pm$ 2)	C ( $\pm$ 2)	D ( $\pm$ 1)	
GDTP6KE/SMBJ/P6SMB/SA	1,601	80	13	54	1.5	Ni(0.6~1um)/ Au(0.05um)

**Notes:** "A" is 88mil when Breakdown Voltage is 250 Volts and more.

**Maximum Ratings & Thermal Characteristics**

(TA = 25 °C unless otherwise noted)

Parameter	Symbol	VALUE	UNIT
Peak pulse power dissipation with a 10/1000 $\mu$ s waveform (see fig. 1)	P <sub>PPM</sub>	600 (P6KE/SMBJ/P6SMB)	W
		500 (SA)	
Peak pulse current with a waveform (see fig. 3 , single pulse)	I <sub>PPM</sub>	See Next Table	A

1. Non-repetitive current pulse, per Fig.3 and derated above T<sub>A</sub>=25°C per Fig. 2

**GDTSMBJ5.0 thru GDTSMBJ440CA**

Type	Breakdown Voltage at $I_T^{(1)}$ $V_{(BR)}$ (V)		Test Current	Stand-off Voltage	Maximum Reverse Leakage at $V_{WM}$	Maximum Peak Pulse Surge	Maximum Clamping Voltage at $I_{PPM}$
	Min	Max	$I_T$ (mA)	$V_{WM}$ (V)	$I_D$ ( $\mu$ A)	$I_{PPM}$ (A)	$V_C$ (V)
GDTSMBJ5.0A	6.4	7.07	10	5	800	65.2	9.2
GDTSMBJ6.0A	6.67	7.37	10	6	800	58.3	10.3
GDTSMBJ6.5A	7.22	7.98	10	6.5	500	53.6	11.2
GDTSMBJ7.0A	7.78	8.6	10	7	200	50	12
GDTSMBJ7.5A	8.33	9.21	1	7.5	100	46.5	12.9
GDTSMBJ8.0A	8.89	9.83	1	8	50	44.1	13.6
GDTSMBJ8.5A	9.44	10.4	1	8.5	10	41.7	14.4
GDTSMBJ9.0A	10	11.1	1	9	5	39	15.4
GDTSMBJ10A	11.1	12.3	1	10	1	35.3	17
GDTSMBJ11A	12.2	13.5	1	11	1	33	18.2
GDTSMBJ12A	13.3	14.7	1	12	1	30.2	19.9
GDTSMBJ13A	14.4	15.9	1	13	1	27.9	21.5
GDTSMBJ14A	15.6	17.2	1	14	1	25.9	23.2
GDTSMBJ15A	16.7	18.5	1	15	1	24.6	24.4
GDTSMBJ16A	17.8	19.7	1	16	1	23.1	26
GDTSMBJ17A	18.9	20.9	1	17	1	21.7	27.6
GDTSMBJ18A	20	22.1	1	18	1	20.5	29.2
GDTSMBJ20A	22.2	24.5	1	20	1	18.5	32.4
GDTSMBJ22A	24.4	26.9	1	22	1	16.9	35.5
GDTSMBJ24A	26.7	29.5	1	24	1	15.4	38.9
GDTSMBJ26A	28.9	31.9	1	26	1	14.3	42.1
GDTSMBJ28A	31.1	34.4	1	28	1	13.2	45.4
GDTSMBJ30A	33.3	36.8	1	30	1	12.4	48.4
GDTSMBJ33A	36.7	40.6	1	33	1	11.3	53.3
GDTSMBJ36A	40	44.2	1	36	1	10.3	58.1
GDTSMBJ40A	44.4	49.1	1	40	1	9.3	64.5
GDTSMBJ43A	47.8	52.8	1	43	1	8.6	69.4
GDTSMBJ45A	50	55.3	1	45	1	8.3	72.7
GDTSMBJ48A	53.3	58.9	1	48	1	7.8	77.4
GDTSMBJ51A	56.7	62.7	1	51	1	7.3	82.4
GDTSMBJ54A	60	66.3	1	54	1	6.9	87.1
GDTSMBJ58A	64.4	71.2	1	58	1	6.4	93.6
GDTSMBJ60A	66.7	73.7	1	60	1	6.2	96.8
GDTSMBJ64A	71.1	78.6	1	64	1	5.8	103
GDTSMBJ70A	77.8	86	1	70	1	5.3	113
GDTSMBJ75A	83.3	92.1	1	75	1	5	121
GDTSMBJ78A	86.7	95.8	1	78	1	4.8	126
GDTSMBJ85A	94.4	104	1	85	1	4.4	137
GDTSMBJ90A	100	111	1	90	1	4.1	146
GDTSMBJ100A	111	123	1	100	1	3.7	162
GDTSMBJ110A	122	135	1	110	1	3.4	177
GDTSMBJ120A	133	147	1	120	1	3.1	193
GDTSMBJ130A	144	159	1	130	1	2.9	209
GDTSMBJ150A	167	185	1	150	1	2.5	243
GDTSMBJ160A	178	197	1	160	1	2.3	259
GDTSMBJ170A	189	209	1	170	1	2.2	275

Type	Breakdown Voltage at $I_T^{(1)}$ $V_{(BR)}$ (V)		Test Current $I_T$ (mA)	Stand-off Voltage $V_{WM}$ (V)	Maximum Reverse Leakage at $V_{WM}$ $I_D$ ( $\mu$ A)	Maximum Peak Pulse Surge Current <sup>(2)</sup> $I_{PPM}$ (A)	Maximum Clamping Voltage at $I_{PPM}$ $V_C$ (V)
	Min	Max					
GDTSMBJ180A	201	222	1	180	1	2.1	292
GDTSMBJ200A	224	247	1	200	1	1.9	324
GDTSMBJ220A	246	272	1	220	1	1.7	356
GDTSMBJ250A	279	309	1	250	1	1.5	405
GDTSMBJ300A	335	371	1	300	1	1.3	486
GDTSMBJ350A	391	432	1	350	1	1.1	567
GDTSMBJ400A	447	494	1	400	1	0.9	648
GDTSMBJ440A	492	543	1	440	1	0.9	713

**Notes:** (1)  $V_{(BR)}$  measured after  $I_T$  applied for 300us square wave pulse or equivalent

(2) Surge current waveform Per Fig. 3 and derate Per Fig. 2

(3) For bi-directional types having  $V_{WM}$  of 10 Volts and less, the  $I_D$  limit is doubled

(4) Ratings at 25°C ambient temperature unless otherwise specified.

**GDTP6KE6.8 thru GDTP6KE550CA**

Type	Breakdown Voltage at $I_T^{(1)}$ $V_{(BR)}$ (V)		Test Current $I_T$ (mA)	Stand-off Voltage $V_{WM}$ (V)	Maximum Reverse Leakage at $V_{WM}$ $I_D$ ( $\mu$ A)	Maximum Peak Pulse Surge Current <sup>(2)</sup> $I_{PPM}$ (A)	Maximum Clamping Voltage at $I_{PPM}$ $V_C$ (V)
	Min	Max					
GDTP6KE6.8A	6.45	7.14	10	5.8	1000	57.1	10.5
GDTP6KE7.5A	7.13	7.88	10	6.4	500	53.1	11.3
GDTP6KE8.2A	7.79	8.61	10	7.02	200	49.6	12.1
GDTP6KE9.1A	8.65	9.55	1	7.78	50	44.8	13.4
GDTP6KE10A	9.5	10.5	1	8.55	10	41.4	14.5
GDTP6KE11A	10.5	11.6	1	9.4	5	38.5	15.6
GDTP6KE12A	11.4	12.6	1	10.2	1	35.9	16.7
GDTP6KE13A	12.4	13.7	1	11.1	1	33	18.2
GDTP6KE15A	14.3	15.8	1	12.8	1	28.3	21.2
GDTP6KE16A	15.2	16.8	1	13.6	1	26.7	22.5
GDTP6KE18A	17.1	18.9	1	15.3	1	23.8	25.2
GDTP6KE20A	19	21	1	17.1	1	21.7	27.7
GDTP6KE22A	20.9	23.1	1	18.8	1	19.6	30.6
GDTP6KE24A	22.8	25.2	1	20.5	1	18.1	33.2
GDTP6KE27A	25.7	28.4	1	23.1	1	16	37.5
GDTP6KE30A	28.5	31.5	1	25.6	1	14.5	41.4
GDTP6KE33A	31.4	34.7	1	28.2	1	13.1	45.7
GDTP6KE36A	34.2	37.8	1	30.8	1	12	49.9
GDTP6KE39A	37.1	41	1	33.3	1	11.1	53.9
GDTP6KE43A	40.9	45.2	1	36.8	1	10.1	59.3
GDTP6KE47A	44.7	49.4	1	40.2	1	9.3	64.8
GDTP6KE51A	48.5	53.6	1	43.6	1	8.6	70.1
GDTP6KE56A	53.2	58.8	1	47.8	1	7.8	77
GDTP6KE62A	58.9	65.1	1	53	1	7.1	85
GDTP6KE68A	64.6	71.4	1	58.1	1	6.5	92
GDTP6KE75A	71.3	78.8	1	64.1	1	5.8	103

Type	Breakdown Voltage at $I_T^{(1)}$ $V_{(BR)}$ (V)		Test Current $I_T$ (mA)	Stand-off Voltage $V_{WM}$ (V)	Maximum Reverse Leakage at $V_{WM}$ $I_D$ ( $\mu$ A)	Maximum Peak Pulse Surge Current <sup>(2)</sup> $I_{PPM}$ (A)	Maximum Clamping Voltage at $I_{PPM}$ $V_C$ (V)
	Min	Max					
GDTP6KE82A	77.9	86.1	1	70.1	1	5.3	113
GDTP6KE91A	86.5	95.5	1	77.8	1	4.8	125
GDTP6KE100A	95	105	1	85.5	1	4.4	137
GDTP6KE110A	105	116	1	94	1	3.9	152
GDTP6KE120A	114	126	1	102	1	3.6	165
GDTP6KE130A	124	137	1	111	1	3.4	179
GDTP6KE150A	143	158	1	128	1	2.9	207
GDTP6KE160A	152	168	1	136	1	2.7	219
GDTP6KE170A	162	179	1	145	1	2.6	234
GDTP6KE180A	171	189	1	154	1	2.4	246
GDTP6KE200A	190	210	1	171	1	2.2	274
GDTP6KE220A	209	231	1	185	1	1.8	328
GDTP6KE250A	237	263	1	214	1	1.7	344
GDTP6KE300A	285	315	1	256	1	1.4	414
GDTP6KE350A	333	368	1	300	1	1.2	482
GDTP6KE400A	380	420	1	342	1	1.1	548
GDTP6KE440A	418	462	1	376	1	1	602
GDTP6KE480A	456	504	1	408	1	0.9	658
GDTP6KE510A	485	535	1	434	1	0.9	698
GDTP6KE530A	503.5	556.5	1	450	1	0.8	725
GDTP6KE540A	513	567	1	459	1	0.8	740
GDTP6KE550A	522.5	577.5	1	467	1	0.8	760

**Notes:** (1)  $V_{(BR)}$  measured after  $I_T$  applied for 300us square wave pulse or equivalent

(2) Surge current waveform Per Fig. 3 and derate Per Fig. 2

(3) For bi-directional types having  $V_{WM}$  of 10 Volts and less, the  $I_D$  limit is doubled

(4) Ratings at 25°C ambient temperature unless otherwise specified.

(5) Sameness with P6SMBX

**GD TSA5.0 thru GD TSA180CA**

Type	Breakdown Voltage at $I_T^{(1)}$ $V_{(BR)}$ (V)		Test Current $I_T$ (mA)	Stand-off Voltage $V_{WM}$ (V)	Maximum Reverse Leakage at $V_{WM}$ $I_D$ ( $\mu$ A)	Maximum Peak Pulse Surge Current <sup>(2)</sup> $I_{PPM}$ (A)	Maximum Clamping Voltage at $I_{PPM}$ $V_C$ (V)
	Min	Max					
GD TSA5.0A	6.4	7.07	10	5	600	54.3	9.2
GD TSA6.0A	6.67	7.37	10	6	600	48.5	10.3
GD TSA6.5A	7.22	7.98	10	6.5	400	44.7	11.2
GD TSA7.0A	7.78	8.6	10	7	150	41.7	12
GD TSA7.5A	8.33	9.21	1	7.5	50	38.8	12.9
GD TSA8.0A	8.89	9.83	1	8	25	36.8	13.6
GD TSA8.5A	9.44	10.4	1	8.5	10	34.7	14.4
GD TSA9.0A	10	11.1	1	9	5	32.5	15.4
GD TSA10A	11.1	12.3	1	10	1	29.4	17
GD TSA11A	12.2	13.5	1	11	1	27.5	18.2
GD TSA12A	13.3	14.7	1	12	1	25.1	19.9
GD TSA13A	14.4	15.9	1	13	1	23.3	21.5

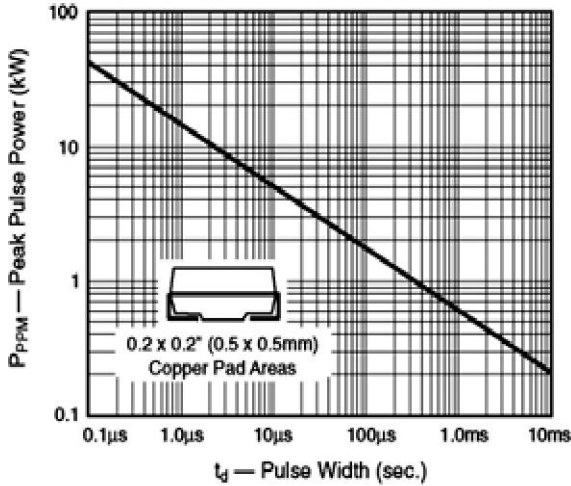
Type	Breakdown Voltage at $I_T^{(1)}$ $V_{(BR)}$ (V)		Test Current	Stand-off Voltage	Maximum Reverse Leakage at $V_{WM}$	Maximum Peak Pulse Surge Current <sup>(2)</sup>	Maximum Clamping Voltage at $I_{PPM}$
	Min	Max	$I_T$ (mA)	$V_{WM}$ (V)	$I_D$ ( $\mu$ A)	$I_{PPM}$ (A)	$V_C$ (V)
GDTSA14A	15.6	17.2	1	14	1	21.6	23.2
GDTSA15A	16.7	18.5	1	15	1	20.5	24.4
GDTSA16A	17.8	19.7	1	16	1	19.2	26
GDTSA17A	18.9	20.9	1	17	1	18.1	27.6
GDTSA18A	20	22.1	1	18	1	17.1	29.2
GDTSA20A	22.2	24.5	1	20	1	15.4	32.4
GDTSA22A	24.4	26.9	1	22	1	14.1	35.5
GDTSA24A	26.7	29.5	1	24	1	12.9	38.9
GDTSA26A	28.9	31.9	1	26	1	11.9	42.1
GDTSA28A	31.1	34.4	1	28	1	11	45.4
GDTSA30A	33.3	36.8	1	30	1	10	48.4
GDTSA33A	36.7	40.6	1	33	1	9.4	53.3
GDTSA36A	40	44.2	1	36	1	8.6	58.1
GDTSA40A	44.4	49.1	1	40	1	7.8	64.5
GDTSA43A	47.8	52.8	1	43	1	7.2	69.4
GDTSA45A	50	55.3	1	45	1	6.9	72.7
GDTSA48A	53.3	58.9	1	48	1	6.5	77.4
GDTSA51A	56.7	62.7	1	51	1	6.1	82.4
GDTSA54A	60	66.3	1	54	1	5.7	87.1
GDTSA58A	64.4	71.2	1	58	1	5.3	93.6
GDTSA60A	66.7	73.7	1	60	1	5.2	96.8
GDTSA64A	71.1	78.6	1	64	1	4.9	103
GDTSA70A	77.8	86	1	70	1	4.4	113
GDTSA75A	83.3	92.1	1	75	1	4.1	121
GDTSA78A	86.7	95.8	1	78	1	4	126
GDTSA85A	94.4	104	1	85	1	3.6	137
GDTSA90A	100	111	1	90	1	3.4	146
GDTSA100A	111	123	1	100	1	3.1	162
GDTSA110A	122	135	1	110	1	2.8	177
GDTSA120A	133	147	1	120	1	2.6	193
GDTSA130A	144	159	1	130	1	2.4	209
GDTSA150A	167	185	1	150	1	2.1	243
GDTSA160A	178	197	1	160	1	1.9	259
GDTSA170A	189	209	1	170	1	1.8	275
GDTSA180A	200	233	1	180	1	1.7	289

- Notes:** (1)  $V_{(BR)}$  measured after  $I_T$  applied for 300us square wave pulse or equivalent  
(2) Surge current waveform Per Fig. 3 and derate Per Fig. 2  
(3) For bi-directional types having  $V_{WM}$  of 10 Volts and less, the  $I_D$  limit is doubled  
(4) Ratings at 25°C ambient temperature unless otherwise specified.

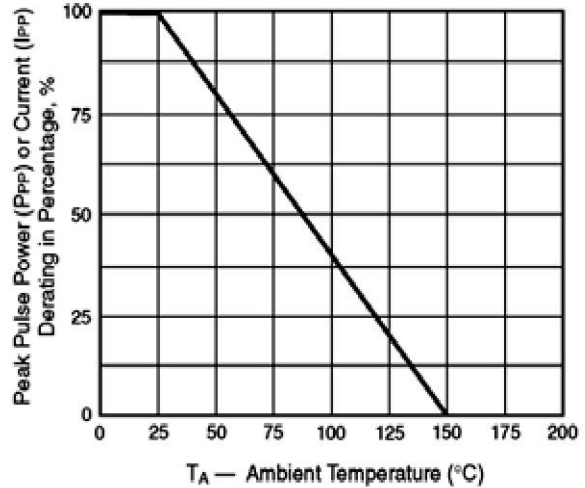
**Characteristic Curves ( $T_A=25^\circ\text{C}$  unless otherwise noted)**

GDTSMBJ5.0 thru GDTSMBJ440CA / GDTP6SMB6.8 thru GDT P6SMB550CA

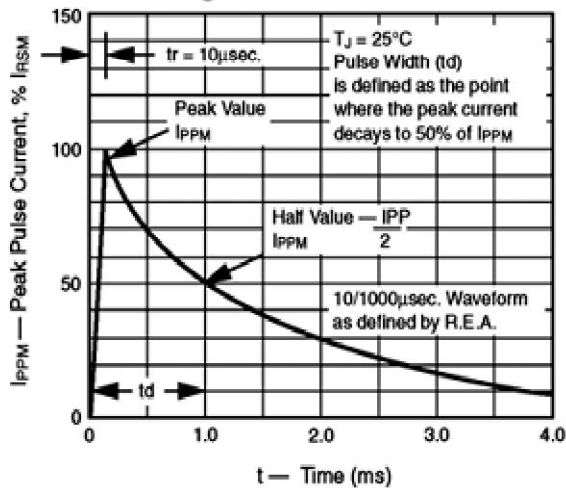
**Fig. 1 – Peak Pulse Power Rating Curve**



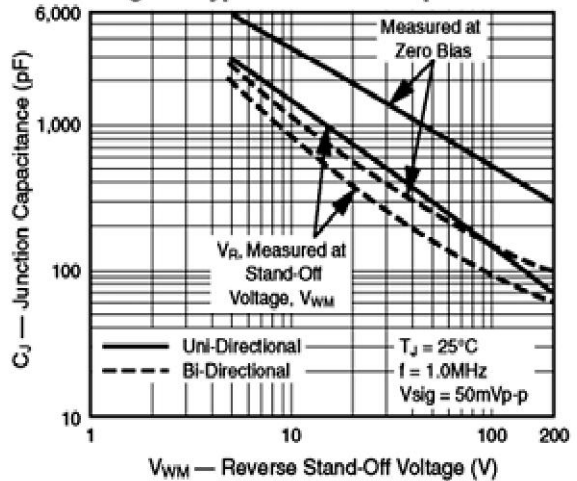
**Fig. 2 – Pulse Derating Curve**



**Fig. 3 – Pulse Waveform**

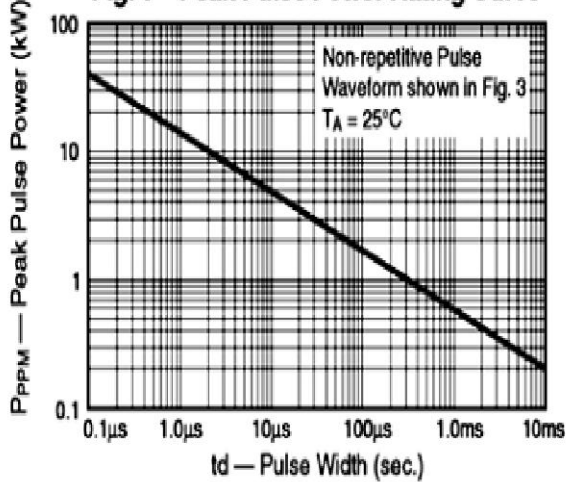


**Fig. 4 – Typical Junction Capacitance**

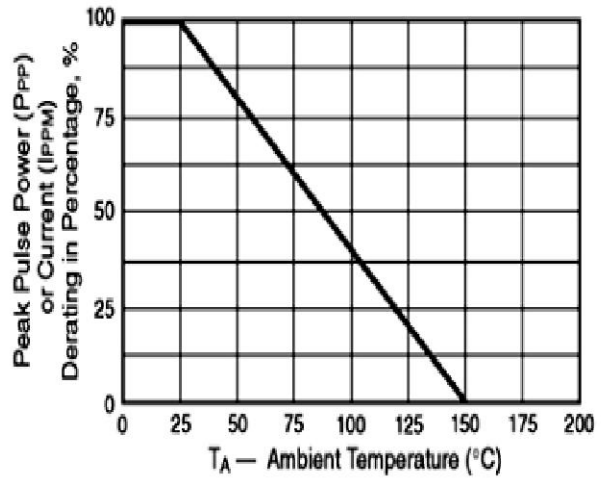


GDP6KE6.8 thru GDP6KE550CA

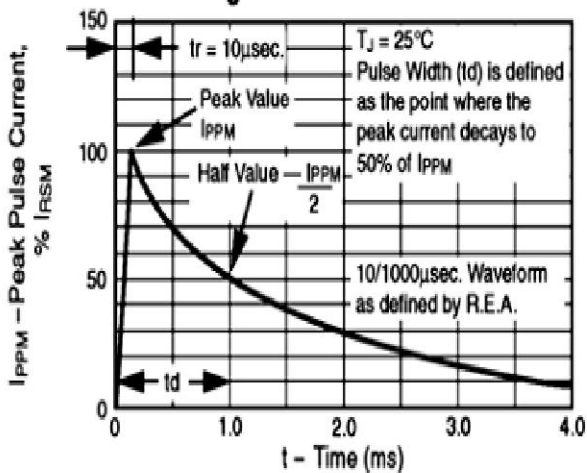
**Fig. 1 – Peak Pulse Power Rating Curve**



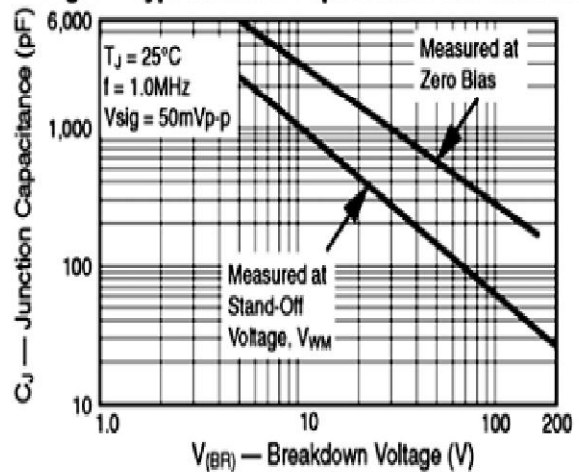
**Fig. 2 – Pulse Derating Curve**



**Fig. 3 – Pulse Waveform**

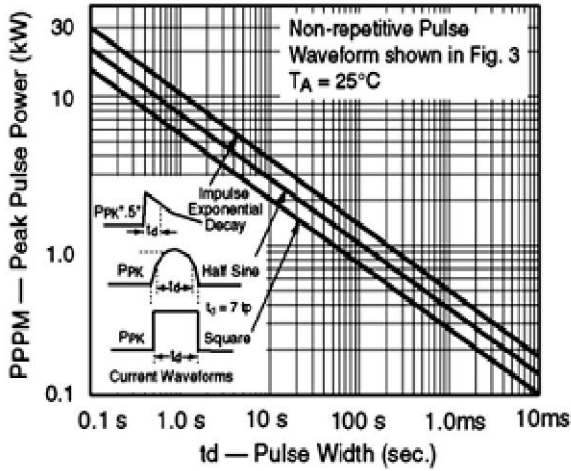


**Fig. 4 – Typ. Junction Capacitance Uni-Directional**

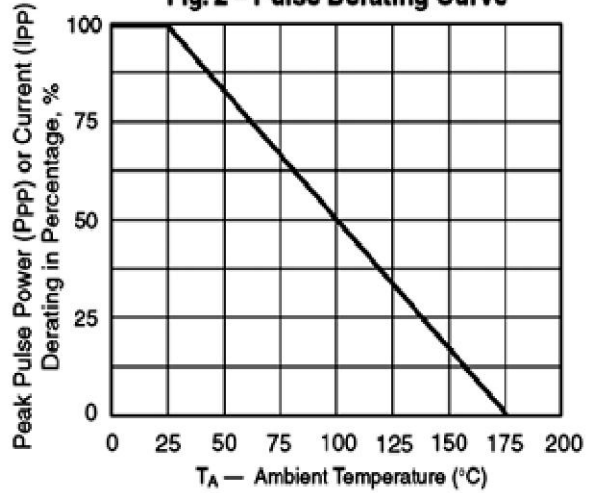


GDTSA5.0 thru GDTSA180CA

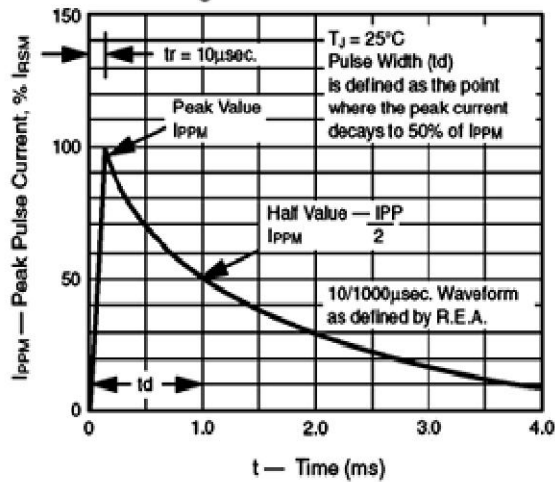
**Fig. 1 – Peak Pulse Power Rating Curve**



**Fig. 2 – Pulse Derating Curve**



**Fig. 3 – Pulse Waveform**



**Fig. 4 – Capacitance**

