VOLTAGE RANGE

5.0 to 440 Volts

400 Watts Peak Power

FEATURES

* For surface mount application
* Built-in strain relief
* Excellent clamping capability
* Low profile package
* Fast response time: Typically less than 1.0ps from 0 volt to BV min.
* Typical I_R less than 1 A above 10V
* High temperature soldering guaranteed: 260°C / 10 seconds at terminals

- "GK" represents the brand name
- "XXX" represents the periodic code
- "YY" represents the product type marking

MECHANICAL DATA

* Case: Molded plastic
* Epoxy: UL 94V-0 rate flame retardant
* Lead: Solderable per MIL-STD-202, method 208 guranteed
* Polarity: Color band denotes cathode end except Bidirectional
* Mounting position: Any
* Weight: 0.063 grams

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Rating 25°C ambient temperature uniess otherwies specified.
Single phase half wave, 60Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

RATINGS	SYMBOL	VALUE	UNITS
Peak Power Dissipation at T_A=25°C, T_P=1ms(NOTE 1)	P_{PK}	Minimum 400	Watts
Peak Forward Surge Current at 8.3ms Single Half Sine-Wave superimposed on rated load (JEDEC method) (NOTE 3)	I_{FSM}	60	Amps
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

NOTES:
1. Non-repetitive current pulse per Fig. 3 and derated above T_A=25°C per Fig. 2.
2. Mounted on Copper Pad area of 5.0mm^2(.013mm Thick) to each terminal.
3. 8.3ms single half sine-wave, duty cycle = 4 pulses per minute maximum.

DEVICES FOR BIDIRECTIONAL APPLICATIONS

- 1. For bi-directional use C suffix for Types .
- 2. Electrical characteristics apply in both directions.

RATING AND CHARACTERISTIC CURVES

FIG.1-PEAK PULSE POWER DERATING CURVE

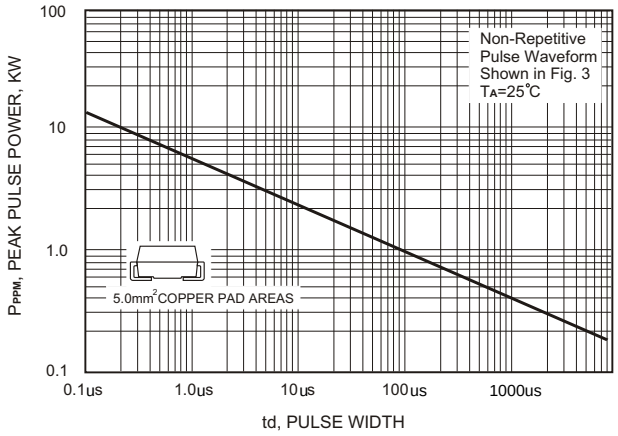


FIG.2-PULSE DERATING CURVE

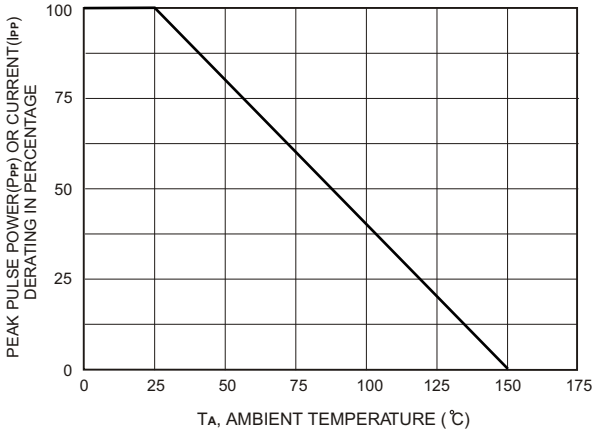


FIG.3-PULSE WAVE FORM

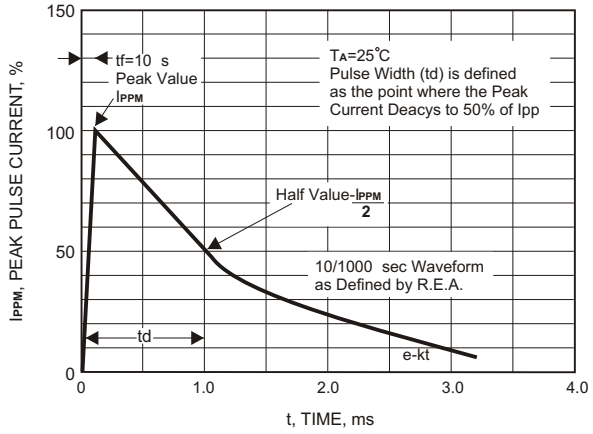


FIG .4 MAXIMUM NON REPETITIVE PEAK FORWARD SURGE CURRENT

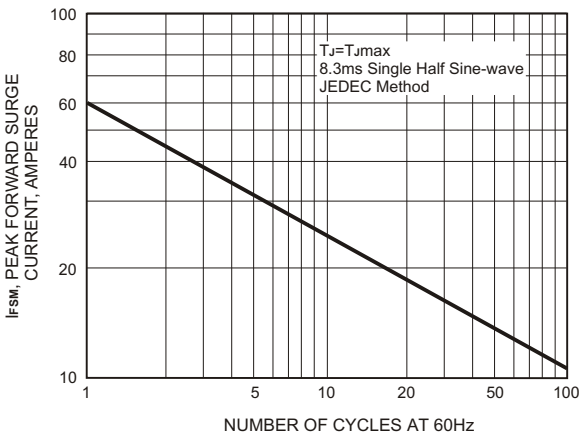
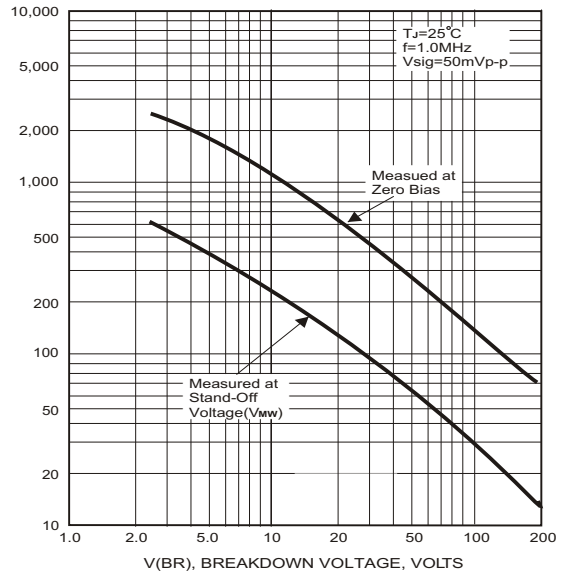


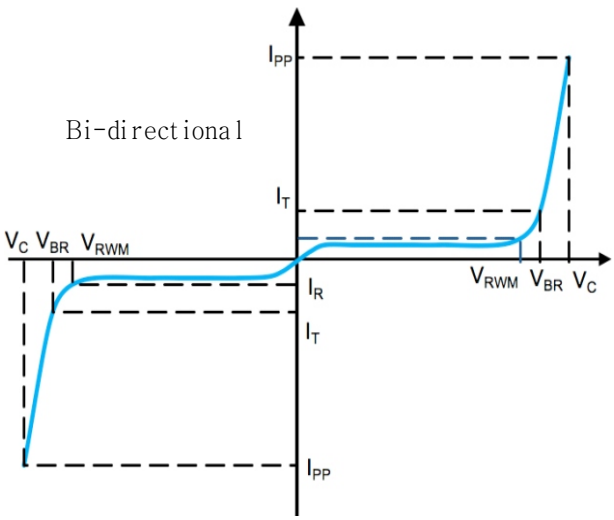
FIG. 5-TYPICAL JUNCTION CAPACITANCE

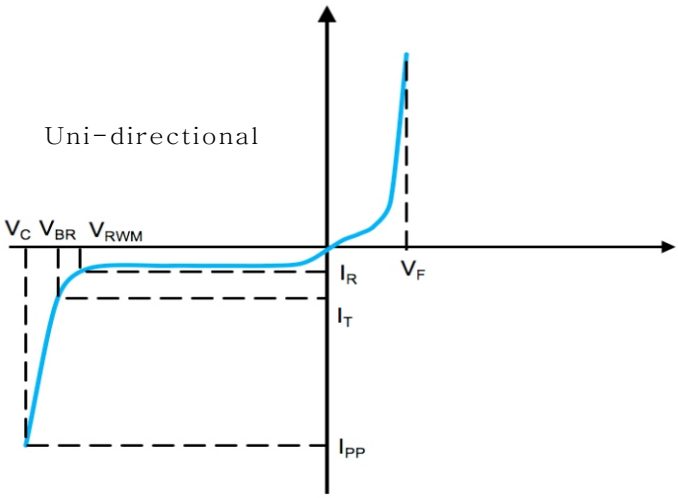


PART NUMBER ADD C FOR BI-DIRECTIONAL	REVERSE STAND-OFF VOLTAGE	BREAKDOWN VOLTAGE VBR (V)	BREAKDOWN VOLTAGE VBR (V)	TEST CURRENT IT	MAXIMUM CLAMPING VOLTAGE	PEAK PULSE CURRENT	REVERSE LEAKAGE @ VRWM	MARKING CODE	
See Note 1	VRWM (V)	MIN. @IT	MAX. @IT	(mA)	@Ipp Vc (V)	Ipp (A)	IR(μA)	UNI	BI
SMAJ5.0(C)A	5.0	6.40	7.25	10	9.2	43.5	800	AE	WE
SMAJ6.0(C)A	6.0	6.67	7.67	10	10.3	38.8	800	AG	WG
SMAJ6.5(C)A	6.5	7.22	8.30	10	11.2	35.7	500	AK	WK
SMAJ7.0(C)A	7.0	7.78	8.95	10	12.0	33.3	200	AM	WM
SMAJ7.5(C)A	7.5	8.33	9.58	1	12.9	31.0	100	AP	WP
SMAJ8.0(C)A	8.0	8.89	10.23	1	13.6	29.4	50	AR	WR
SMAJ8.5(C)A	8.5	9.44	10.82	1	14.4	27.7	10	AT	WT
SMAJ9.0(C)A	9.0	10.0	11.50	1	15.4	26.0	5	AV	WV
SMAJ10(C)A	10	11.1	12.80	1	17.0	23.5	5	AX	WX
SMAJ11(C)A	11	12.2	14.00	1	18.2	22.0	5	AZ	WZ
SMAJ12(C)A	12	13.3	15.30	1	19.9	20.1	5	BE	XE
SMAJ13(C)A	13	14.4	16.50	1	21.5	18.6	5	BG	XG
SMAJ14(C)A	14	15.6	17.90	1	23.2	17.2	5	BK	XK
SMAJ15(C)A	15	16.7	19.20	1	24.4	16.4	5	BM	XM
SMAJ16(C)A	16	17.8	20.50	1	26.0	15.3	5	BP	XP
SMAJ17(C)A	17	18.9	21.70	1	27.6	14.5	5	BR	XR
SMAJ18(C)A	18	20.0	23.30	1	29.2	13.7	5	BT	XT
SMAJ20(C)A	20	22.2	25.50	1	32.4	12.3	5	BV	XV
SMAJ22(C)A	22	24.4	28.00	1	35.5	11.2	5	BX	XX
SMAJ24(C)A	24	26.7	30.70	1	38.9	10.3	5	BZ	XZ
SMAJ26(C)A	26	28.9	33.20	1	42.1	9.5	5	CE	YE
SMAJ28(C)A	28	31.1	35.80	1	45.4	8.8	5	CG	YG
SMAJ30(C)A	30	33.3	38.30	1	48.4	8.3	5	CK	YK
SMAJ33(C)A	33	36.7	42.20	1	53.3	7.5	5	CM	YM
SMAJ36(C)A	36	40.0	46.00	1	58.1	6.9	5	CP	YP
SMAJ40(C)A	40	44.4	51.10	1	64.5	6.2	5	CR	YR
SMAJ43(C)A	43	47.8	54.90	1	69.4	5.7	5	CT	YT
SMAJ45(C)A	45	50.0	57.50	1	72.7	5.5	5	CV	YV
SMAJ48(C)A	48	53.3	61.30	1	77.4	5.2	5	CX	YX
SMAJ51(C)A	51	56.7	65.20	1	82.4	4.9	5	CZ	YZ
SMAJ54(C)A	54	60.0	69.00	1	87.1	4.6	5	RE	ZE
SMAJ58(C)A	58	64.4	74.10	1	93.6	4.3	5	RG	ZG

PART NUMBER ADD C FOR BI-DIRECTIONAL	REVERSE STAND-OFF VOLTAGE	BREAKDOWN VOLTAGE VBR (V)	BREAKDOWN VOLTAGE VBR (V)	TEST CURRENT IT	MAXIMUM CLAMPING VOLTAGE	PEAK PULSE CURRENT	REVERSE LEAKAGE @ VRWM	MARKING CODE	
See Note 1	VRWM (V)	MIN. @IT	MAX. @IT	(mA)	@Ipp Vc (V)	Ipp (A)	IR(μA)	UNI	BI
SMAJ60(C)A	60	66.7	76.7	1	96.8	4.1	5	RK	ZK
SMAJ64(C)A	64	71.1	81.8	1	103	3.9	5	RM	ZM
SMAJ70(C)A	70	77.8	89.5	1	113	3.5	5	RP	ZP
SMAJ75(C)A	75	83.3	95.8	1	121	3.3	5	RR	ZR
SMAJ78(C)A	78	86.7	99.7	1	126	3.2	5	RT	ZT
SMAJ85(C)A	85	94.4	108.2	1	137	2.2	5	RV	ZV
SMAJ90(C)A	90	100	115.5	1	146	2.1	5	RX	ZX
SMAJ100(C)A	100	111	128.0	1	162	1.9	5	RZ	ZZ
SMAJ110(C)A	110	122	140.5	1	177	1,7	5	SE	VE
SMAJ120(C)A	120	133	153.0	1	193	1.6	5	VG	VG
SMAJ130(C)A	130	144	165.5	1	209	1.4	5	VK	VK
SMAJ150(C)A	150	167	192.5	1	243	1.2	5	VM	VM
SMAJ160(C)A	160	178	205.0	1	259	1.2	5	SP	VP
SMAJ170(C)A	170	189	217.5	1	275	1.09	5	SR	VR
SMAJ188(C)A	188	209	231.0	1	328	0.91	5	SS	VS
SMAJ200(C)A	200	224	247.0	1	332	0.89	5	SV	VV
SMAJ210(C)A	210	237	263.0	1	340	0.86	5	SW	VW
SMAJ220(C)A	220	246	272	1	352	0.8	5	SZ	VZ
SMAJ250(C)A	250	279	309	1	405	0.75	5	VM	VM
SMAJ300(C)A	300	335	371	1	486	0.7	5	TE	UE
SMAJ400(C)A	400	447	494	1	648	0.6	5	TK	UK
SMAJ440(C)A	440	492	543	1	713	0.6	5	TM	UM

I-V Curve Characteristics



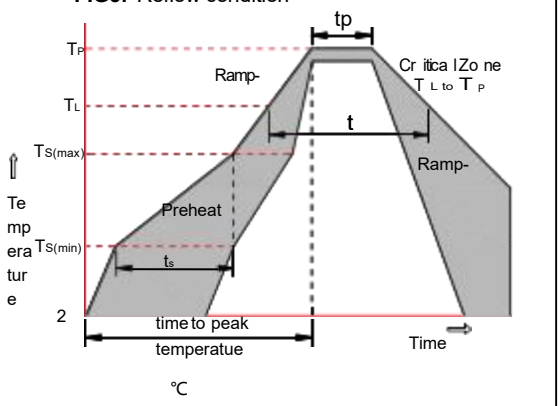


P_{PPM}	Peak Pulse Power Dissipation - Max power dissipation
V_{RWM}	Reverse Stand-off Voltage - Maximum voltage that can be applied to TVS without operation
V_{BR}	Breakdown Voltage – Maximum voltage that flows though the TVS at a specified current (I_T)
V_C	Clamping Voltage – Peak voltage measured across the TVS at a specified I_{PPM} (peak impulse current)
I_R	Reverse Leakage Current – Current measured at V_R
V_F	Forward Voltage Drop for Uni-directional

Soldering parameters

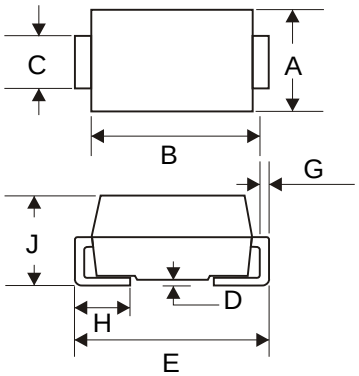
Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃ of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃

FIG5: Reflow condition

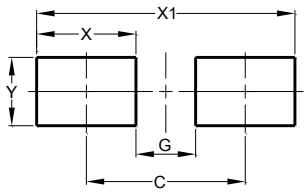


Package Dimensions & Suggested Pad Layout

SMA



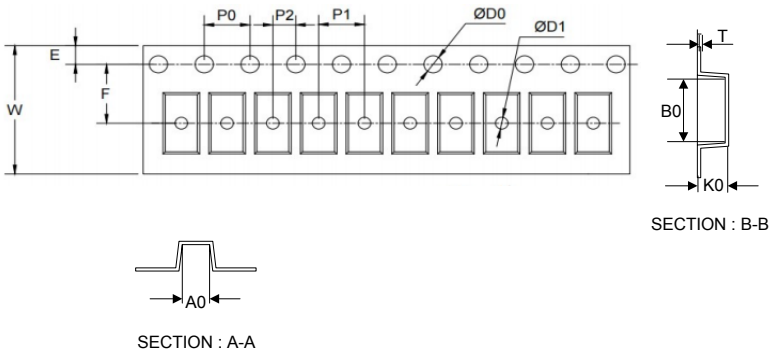
SMA		
Dim	**Min**	**Max**
A	2.40	2.79
B	3.99	4.50
C	1.32	1.47
D	-	0.20
E	4.93	5.28
G	0.15	0.31
H	0.76	1.52
J	1.98	2.29
All Dimensions in mm		



Dimensions	Value (in mm)
C	4.20
G	1.90
X	2.30
X1	6.50
Y	2.00

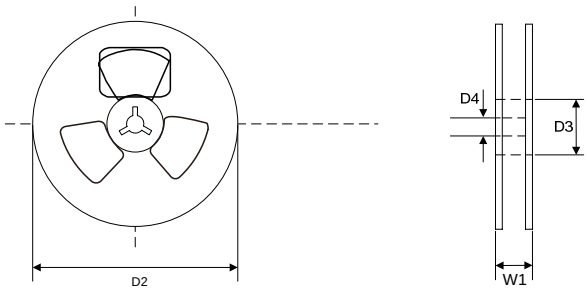
Tape & rell specification

Tape



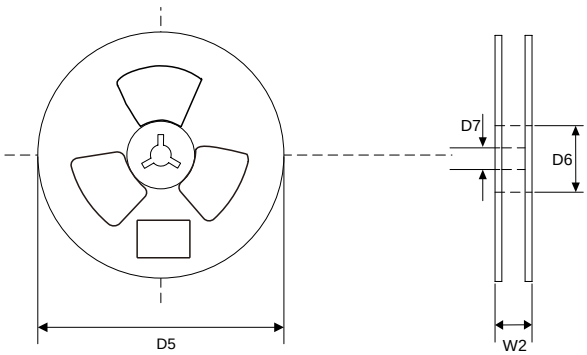
Symbol	Dimension (mm)
P0	4.00±0.20
P1	4.00±0.20
P2	2.00±0.20
D0	1.60±0.20
D1	1.60±0.20
E	1.75±0.20
F	5.50±0.15
W	12.00±0.25
A0	2.75±0.20
B0	5.25±0.20
K0	2.45±0.25
T	0.20±0.10

7” Reel



D2	176.0±5.0
D3	55.0Min.
D4	14.0±2.5
W1	14.0±2.5
Quantity: 2000PCS	

13” Reel



D5	330.0±5.0
D6	73.0Min.
D7	14.0±2.5
W2	14.0±2.5
Quantity: 5000PCS	