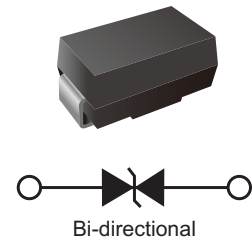
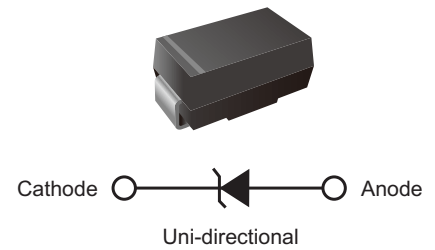


Transient Voltage Suppressors (TVS) Data Sheet

Features

- 400W peak pulse power capability at 10/1000 μ s waveform, repetition rate (duty cycle): 0.01%
- Plastic package has underwriters laboratory flammability 94V-0 Meets
- MSL level 1, per J-STD-020
- Typical I_R less than 1 μ A above 10V
- For surface mounted applications in order to optimize board space
- Low inductance
- Fast response time
- Low profile package
- Glass passivated junction
- Excellent clamping capability
- Lead free in comply with EU RoHS 2011/65/EU directives



Mechanical Data

- Case: SMA
- Terminal: Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity: For uni-directional types the band denotes cathode end, no marking on bi-directional types

Applications

- I/O interface ■ AC/DC power supply ■ Vcc bus
- Low frequency signal transmission line (RS232, RS485, etc.)

Ordering Information

Part Number	Shipping	Reel
LTVAxxA(C)G-TR5	5000PCS Tape&Reel	13 inches
LTVAxxA(C)G-TR7K5	7500PCS Tape&Reel	13 inches

Maximum Ratings and Characteristics

Ratings at 25 $^{\circ}$ C ambient temperature unless otherwise specified.

Rating	Symbol	Value	Units
Peak pulse power dissipation at 10/1000 μ s waveform (Note1, Note2, Fig.1)	P_{PPM}	Minimum 400	W
Peak pulse current of at 10/1000 μ s waveform (Note 1, Fig.3)	I_{PPM}	See Table	A
Steady state power dissipation at $T_A=50^{\circ}$ C (Fig.5)	$P_{M(AV)}$	3.3	W
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method) (Note3, Fig.6)	I_{FSM}	40	A
Operating junction and Storage Temperature Range.	T_J, T_{STG}	-55 to +150	$^{\circ}$ C
Typical thermal resistance junction to lead	$R_{\theta JL}$	30	$^{\circ}$ C/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	120	$^{\circ}$ C/W

Notes: 1. Non-repetitive current pulse, per Fig.3 and derated above $T_A=25^{\circ}$ C per Fig.2.

2. Mounted on 5.0mmx5.0mm (0.03mm thick) copper pads to each terminal.

3. 8.3ms single half sine-wave, or equivalent square wave, duty cycle=4 pulses per minutes maximum, unidirectional only.



Electrical Characteristics (T_A=25°C)

Part Number (Uni)	Part Number (Bi)	Marking		Reverse Stand off Voltage V _R (Volts)	Breakdown Voltage V _{BR} (Volts)@ I _T		Test Current I _T (mA)	Maximum Clamping Voltage V _C @I _{FP} (V)	Maximum Peak Pulse Current I _{FP} (A)	Maximum Reverse Leakage I _R @V _R (µA)
		Uni	Bi		Min	Max				
LTV45.0AG	LTV45.0CG	AE or 5G	WE or 5G	5.0	6.40	7.00	10	9.2	43.5	500
LTV46.0AG	LTV46.0CG	AG or 6G	WG or 6G	6.0	6.67	7.37	10	10.3	38.8	500
LTV46.5AG	LTV46.5CG	AK or 6G5	WK or 6G5	6.5	7.22	7.98	10	11.2	35.7	300
LTV47.0AG	LTV47.0CG	AM or 7G	WM or 7G	7.0	7.78	8.60	10	12.0	33.3	200
LTV47.5AG	LTV47.5CG	AP or 7G5	WP or 7G5	7.5	8.33	9.21	1	12.9	31.0	100
LTV48.0AG	LTV48.0CG	AR or 8G	WR or 8G	8.0	8.89	9.83	1	13.6	29.4	50
LTV48.5AG	LTV48.5CG	AT or 8G5	WT or 8G5	8.5	9.44	10.40	1	14.4	27.8	20
LTV49.0AG	LTV49.0CG	AV or 9G	WV or 9G	9.0	10.0	11.10	1	15.4	26.0	10
LTV410AG	LTV410CG	AX or 10G	WX or 10G	10.0	11.10	12.30	1	17.0	23.5	5
LTV411AG	LTV411CG	AZ or 11G	WZ or 11G	11.0	12.20	13.50	1	18.2	22.0	1
LTV412AG	LTV412CG	BE or 12G	XE or 12G	12.0	13.30	14.70	1	19.9	20.1	1
LTV413AG	LTV413CG	BG or 13G	XG or 13G	13.0	14.40	15.90	1	21.5	18.6	1
LTV414AG	LTV414CG	BK or 14G	XK or 14G	14.0	15.60	17.20	1	23.2	17.2	1
LTV415AG	LTV415CG	BM or 15G	XM or 15G	15.0	16.70	18.50	1	24.4	16.4	1
LTV416AG	LTV416CG	BP or 16G	XP or 16G	16.0	17.80	19.70	1	26.0	15.4	1
LTV417AG	LTV417CG	BR or 17G	XR or 17G	17.0	18.90	20.90	1	27.6	14.5	1
LTV418AG	LTV418CG	BT or 18G	XT or 18G	18.0	20.00	22.10	1	29.2	13.7	1
LTV420AG	LTV420CG	BV or 20G	XV or 20G	20.0	22.20	24.50	1	32.4	12.3	1
LTV422AG	LTV422CG	BX or 22G	XX or 22G	22.0	24.40	26.90	1	35.5	11.3	1
LTV424AG	LTV424CG	BZ or 24G	XZ or 24G	24.0	26.70	29.50	1	38.9	10.3	1
LTV426AG	LTV426CG	CE or 26G	YE or 26G	26.0	28.90	31.90	1	42.1	9.5	1
LTV428AG	LTV428CG	CG or 28G	YG or 28G	28.0	31.10	34.40	1	45.4	8.8	1
LTV430AG	LTV430CG	CK or 30G	YK or 30G	30.0	33.30	36.80	1	48.4	8.3	1
LTV433AG	LTV433CG	CM or 33G	YM or 33G	33.0	36.70	40.60	1	53.3	7.5	1
LTV436AG	LTV436CG	CP or 36G	YP or 36G	36.0	40.00	44.20	1	58.1	6.9	1
LTV440AG	LTV440CG	CR or 40G	YR or 40G	40.0	44.40	49.10	1	64.5	6.2	1
LTV443AG	LTV443CG	CT or 43G	YT or 43G	43.0	47.80	52.80	1	69.4	5.8	1
LTV445AG	LTV445CG	CV or 45G	YV or 45G	45.0	50.00	55.30	1	72.7	5.5	1
LTV448AG	LTV448CG	CX or 48G	YX or 48G	48.0	53.30	58.9	1	77.4	5.2	1
LTV451AG	LTV451CG	CZ or 51G	YZ or 51G	51.0	56.70	62.70	1	82.4	4.9	1
LTV454AG	LTV454CG	RE or 54G	ZE or 54G	54.0	60.00	66.30	1	87.1	4.6	1
LTV458AG	LTV458CG	RG or 58G	ZG or 58G	58.0	64.40	71.20	1	93.6	4.3	1
LTV460AG	LTV460CG	RK or 60G	ZK or 60G	60.0	66.70	73.70	1	96.8	4.1	1
LTV464AG	LTV464CG	RM or 64G	ZM or 64G	64.0	71.10	78.60	1	103.0	3.9	1
LTV470AG	LTV470CG	RP or 70G	ZP or 70G	70.0	77.80	86.00	1	113.0	3.5	1
LTV475AG	LTV475CG	RR or 75G	ZR or 75G	75.0	83.30	92.10	1	121.0	3.3	1
LTV478AG	LTV478CG	RT or 78G	ZT or 78G	78.0	86.70	95.80	1	126.0	3.2	1
LTV485AG	LTV485CG	RV or 85G	ZV or 85G	85.0	94.40	104.00	1	137.0	2.9	1
LTV490AG	LTV490CG	RX or 90G	ZX or 90G	90.0	100.00	111.00	1	146.0	2.7	1
LTV4100AG	LTV4100CG	RZ or 100G	ZZ or 100G	100.0	111.00	123.00	1	162.0	2.5	1
LTV4110AG	LTV4110CG	SE or 110G	VE or 110G	110.0	122.00	135.00	1	177.0	2.3	1
LTV4120AG	LTV4120CG	SG or 120G	VG or 120G	120.0	133.00	147.00	1	193.0	2.1	1
LTV4130AG	LTV4130CG	SK or 130G	VK or 130G	130.0	144.00	159.00	1	209.0	1.9	1
LTV4150AG	LTV4150CG	SM or 150G	VM or 150G	150.0	167.00	185.00	1	243.0	1.6	1
LTV4160AG	LTV4160CG	SP or 160G	VP or 160G	160.0	178.00	197.00	1	259.0	1.5	1
LTV4170AG	LTV4170CG	SR or 170G	VR or 170G	170.0	189.00	209.00	1	275.0	1.5	1
LTV4180AG	LTV4180CG	ST or 180G	VT or 180G	180.0	201.00	222.00	1	292.0	1.4	1
LTV4190AG	LTV4190CG	SU or 190G	YU or 190G	190.0	211.00	233.00	1	308.0	1.3	1
LTV4200AG	LTV4200CG	SV or 200G	YX or 200G	200.0	224.00	247.00	1	324.0	1.2	1
LTV4210AG	LTV4210CG	SW or 210G	YW or 210G	210.0	237.00	263.00	1	340.0	1.2	1
LTV4220AG	LTV4220CG	GE or 220G	VX or 220G	220.0	246.00	272.00	1	356.0	1.1	1
LTV4250AG	LTV4250CG	SZ or 250G	VZ or 250G	250.0	279.00	309.00	1	405.0	1.0	1
LTV4300AG	LTV4300CG	TE or 300G	UE or 300G	300.0	335.00	371.00	1	486.0	0.8	1
LTV4350AG	LTV4350CG	TG or 350G	UG or 350G	350.0	391.00	432.00	1	567.0	0.7	1
LTV4400AG	LTV4400CG	TK or 400G	UK or 400G	400.0	447.00	494.00	1	648.0	0.6	1
LTV4440AG	LTV4440CG	TM or 440G	UM or 440G	440.0	492.00	543.00	1	713.0	0.6	1

Notes: For bidirectional type having V_R of 10V and less, the I_R limit is double.



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

FIG.1 PEAK PULSE POWER RATING CURVE

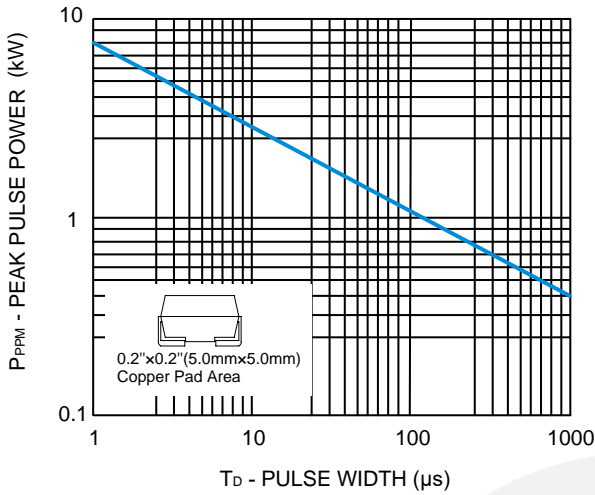


FIG.2 PULSE DERATING CURVE

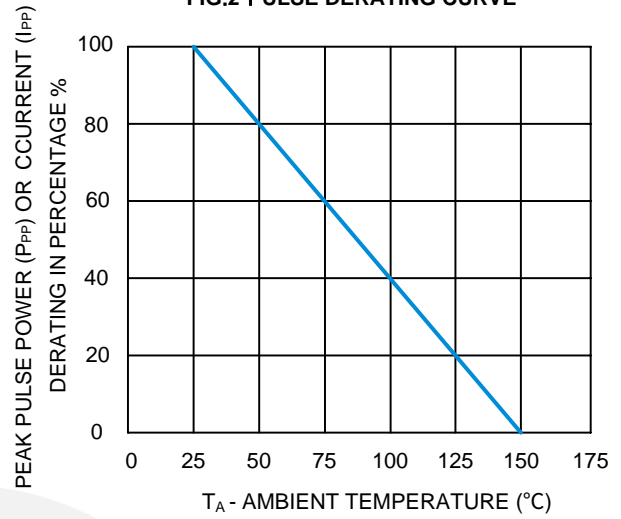


FIG.3 PULSE WAVEFORM

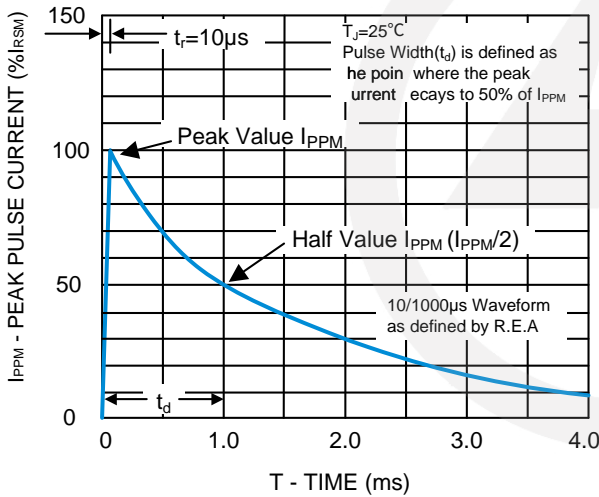


FIG.4 TYPICAL JUNCTION CAPACITANCE

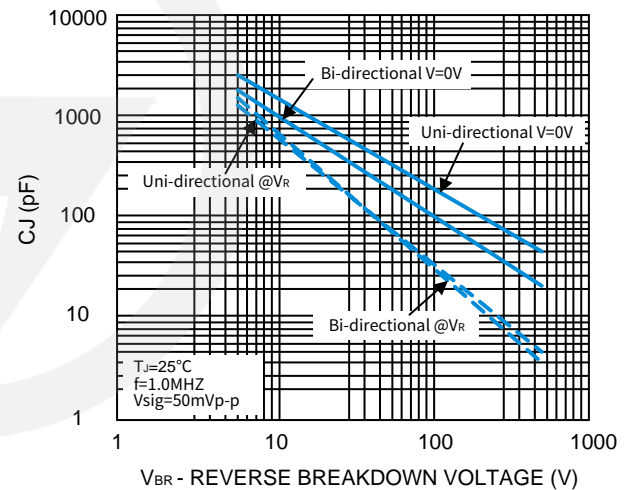


FIG.5 STEADY STATE POWER DISSIPATION DERATING CURVE

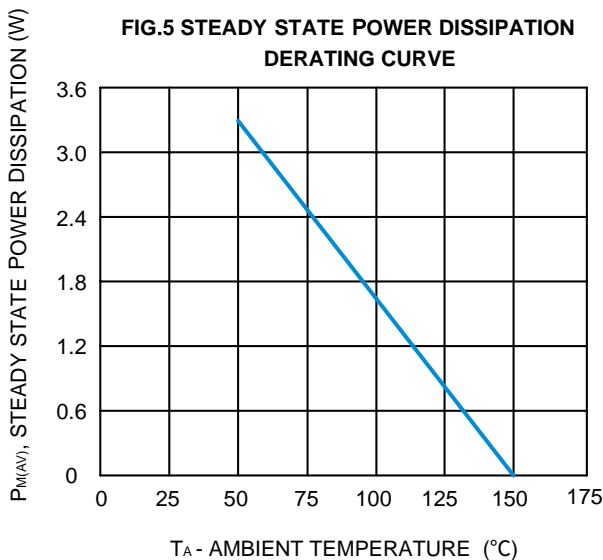
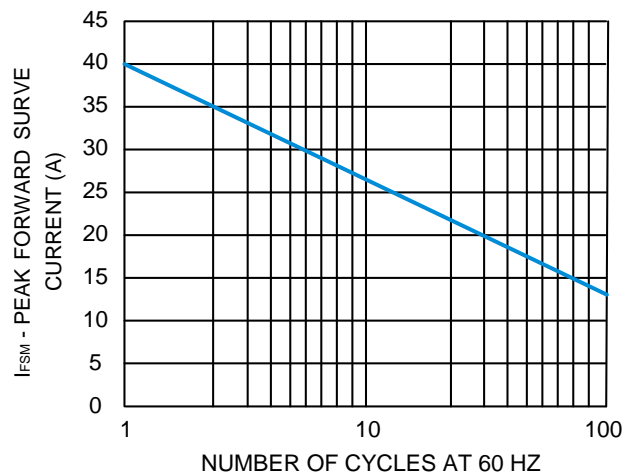
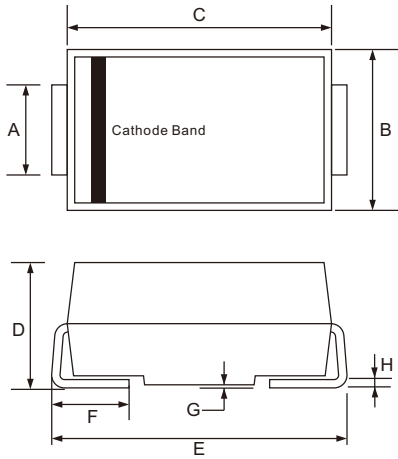


FIG.6 MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNI-DIRECTIONAL ONLY



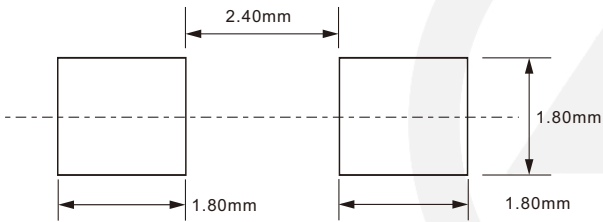
SMA Package Outline



Unit: mm

SYMBOL	DIMENSIONS	
	MIN.	MAX.
A	1.25	1.65
B	2.30	2.79
C	4.00	4.75
D	1.90	2.50
E	4.70	5.28
F	0.76	1.52
G	0.203 TYP.	
H	0.15	0.31

SMA Suggested Pad Layout

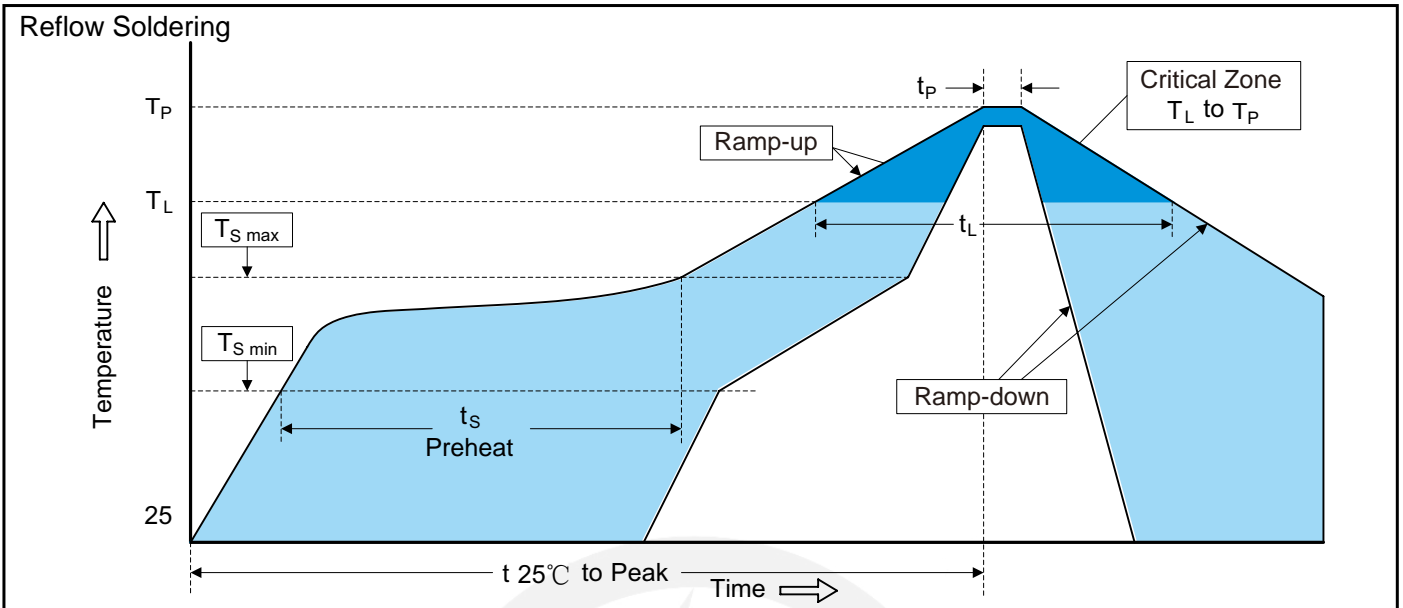


Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$
3. The pad layout is for reference purpose only.



Recommended Soldering Conditions



Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate (T _L to T _P)	3°C/second max.
Preheat	
-Temperature Min (T _{S min})	150°C
-Temperature Max (T _{S max})	200°C
-Time (min to max) (t _s)	60-180 seconds
T _{S max} to T _L	
-Ramp-up Rate	3°C/second max.
Time maintained above:	
-Temperature (T _L)	217°C
-Time (t _L)	60-150 seconds
Peak Temperature (T _P)	260°C
Time within 5°C of actual Peak Temperature (t _p)	20-40 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.

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Version Update Information

Series NO.	Enactment/Revision Date	Effective Date	Version	Revision content	Revision Reason	Revision Person	Note
01	2024.4.14	2024.4.14	3.0	New File	/	Ding	
02	2025.06.11	2025.06.11	3.1	Update packaging information	/	Ding	