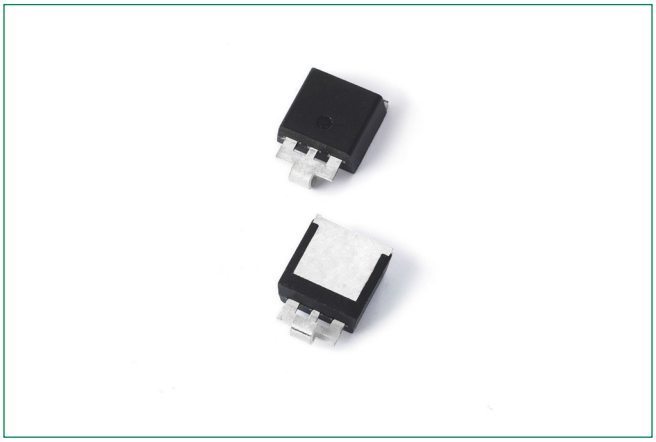
SMTOAK2 Series

Surface Mount – SMTO-263-2 kA



Agency Approvals

Agency	Agency file number
	E230531 (pending)

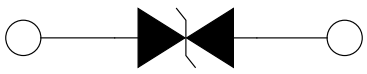
Maximum Ratings and Thermal Characteristics

(T_A=25 °C unless otherwise noted)

Parameter	Symbol	Value	Unit
Current Rating[1]	I_{PP}	2	kA
Steady State Power Dissipation on Infinite Heat Sink at T_L=75 °C	P_D	15	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C
Typical Thermal Resistance Junction to case	$R_{\theta JC}$	1.8	°C/W

Note:
1. Rated I_{PP} measured with 8/20 µs pulse.

Functional Diagram



Bi-direcctional

Description

The SMTOAK2 TVS Diode Series is housed in a modified SMTO-263 package , achieving a compact mechanical design and compatible with automated PCB assembly. The SMTOAK2 series is designed to protect sensitive electronics against surge events and inductive load switching voltage transient events.

Features & Benefits

- SMTO-263 package, footprint compatible with industry popular DO- 218AB package
- V_{BR} @ T_J= V_{BR}@25 °C x (1+ α T x (T_J - 25)) (α T:Temperature Coefficient, typical value is 0.1%
- Glass passivated chip junction in modified TO- 263 package
- ESD protection of data lines in accordance with IEC 61000-4-2, 30 kV(Air), 30 kV (Contact)
- Fast response time: typically less than 1.0 ps from 0 Volts to V_{BR} min
- Excellent clamping capability
- Low incremental surge resistance
- UL Recognized compound meeting flammability rating UL94 V-0
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Surface mount package to optimize board space
- High temperature reflow soldering guaranteed: 260 °C/10 sec at terminals
- Matte tin lead–free plated
- Halogen free and RoHS compliant
- Pb-free E3 means 2nd level interconnect is Pb-free and the terminal finish material is tin (Sn) (IPC/JEDEC J-STD-609A.01)

Applications

Designed to protect sensitive electronics from:

- Over voltage surge transients
- Inductive load switching voltage transients

Electrical Characteristics (T_A=25 °C unless otherwise noted)

Part Number	Part Marking	Stand off Voltage V_{SO}	Breakdown Voltage V_{BR} (Volts) @ I_T		Test Current I_T	Maximum Peak Pulse Current I_{PP} (10/350 µs)	Maximum Clamping Voltage V_C @ I_{PP} (8/20 µs)	Maximum Peak Pulse Current I_{PP} (8/20 µs)	Maximum Reverse Leakage I_R @ V_R	Maximum Temperature coefficient of V_{BR}
		(V)	Min	Max	(mA)	(A)	(V)	(A)	(µA)	(%/C)
SMTOAK2-070C	SM2K70C	70	78.20	86.02	5	250	130	2000	2	0.074

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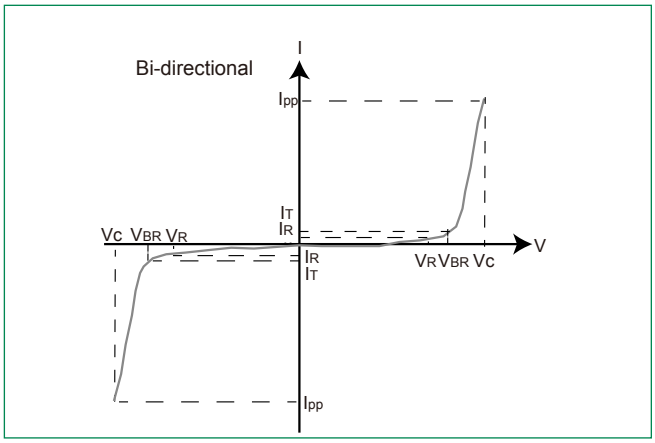
I-V Curve Characteristics



P_{PPM} Peak Pulse Power Dissipation – Max power dissipation

V_{SO} Stand-off Voltage – Maximum voltage that can be applied to the TVS without operation

V_{BR} Breakdown Voltage – Maximum voltage that flows though the TVS at a specified test 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

Ratings and Characteristic Curves (T_A=25 °C unless otherwise noted)

Figure 1 - Peak Pulse Power Rating Curve

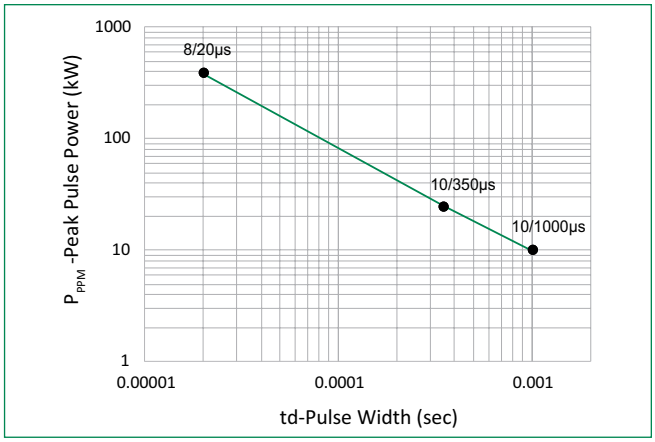
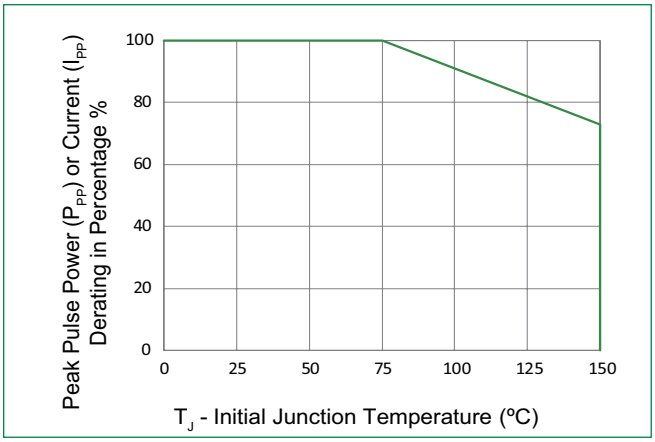


Figure 2 - Peak Pulse Power Derating Curve



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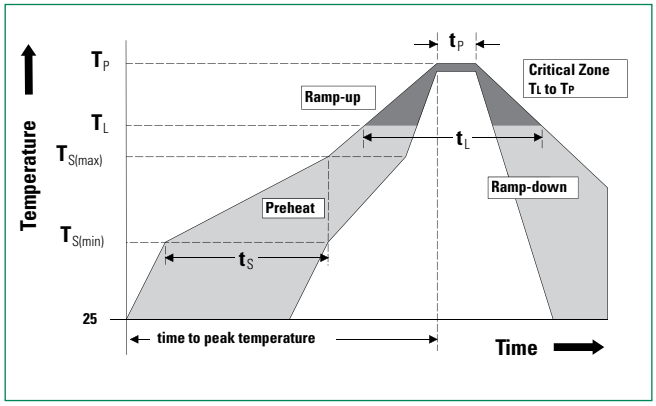
Soldering Parameters

Reflow Condition		Pb – Free assembly
Pre Heat	**- Temperature Min ($T_{s(min)}$)**	150 °C
	- Temperature Max ($T_{s(max)}$)	200 °C
	- Time (min to max) (t_s)	60 - 120 secs
Average ramp up rate (Liquidus Temp (T_L) to peak		5 °C/second max
$T_{S(max)}$ to T_A - Ramp-up Rate		5 °C/second max
Reflow	**- Temperature (T_L) (Liquidus)**	217 °C
	- Time (min to max) (T_S)	60 – 150 seconds
Peak Temperature (T_P)		$260^{+0/-5}$ °C
Time within 5 °C of actual peak Temperature (t_p)		30 seconds
Ramp-down Rate		5 °C/second max
Time 25 °C to peak Temperature (T_P)		8 minutes Max.
Do not exceed		260 °C



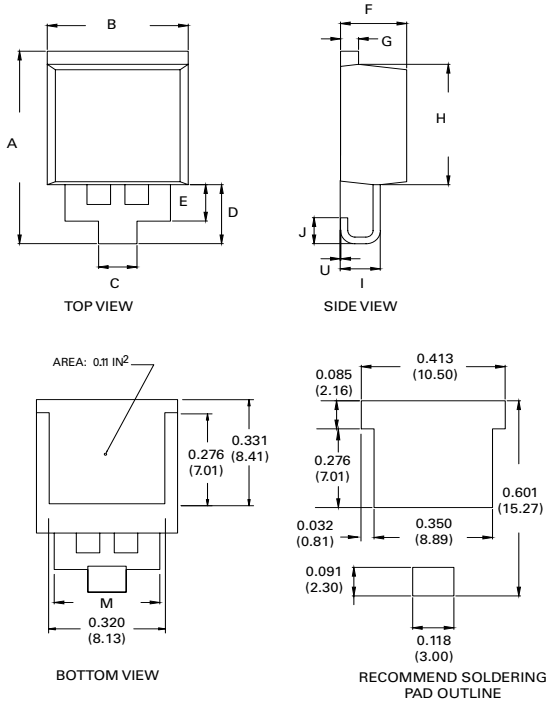
Physical Specifications

Terminal Finish	100% Matte Tin-plated
Body Material	UL Recognized compound meeting flammability classification 9UL94 V-0
Lead Material	Copper Alloy

Environmental Specifications

High Temp. Storage	JESD22-A103
HTRB	JESD22-A108
Temperature Cycling	JESD22-A104
MSL	JEDEC-J-STD-020, LEVEL 1
H3TRB	JESD22-A101
RSH	JESD22-A111

Dimensions



Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.568	0.600	14.44	15.24
B	0.380	0.420	9.65	10.67
C	0.098	0.114	2.50	2.90
D	0.169	0.189	4.30	4.80
E	0.102	0.118	2.60	3.00
F	0.178	0.188	4.52	4.78
G	0.045	0.060	1.14	1.52
H	0.360	0.370	9.14	9.40
I	0.106	0.122	2.69	3.09
J	0.069	0.089	1.75	2.25
M	0.284	0.300	7.22	7.62
U	0	0.010	0	0.25

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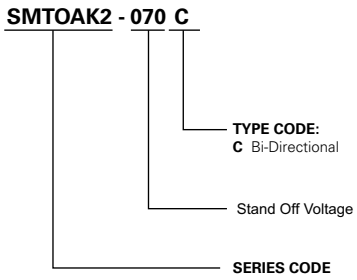
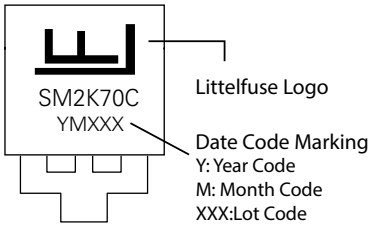
Part Numbering System



Part Marking System



Packing Option

Part Number	Component Package	Quantity	Packaging Option
SMTOAK2-070C	SMTO-263	500	Embossed Carrier

SMTO-263 Embossed Carrier Reel Pack (RP) Specifications

Meets all EIA-481-2 Standards