TPSMA-EVR Series

Surface Mount – 400 W

AUTOMOTIVE GRADE RoHS

Description

Littelfuse TPSMA-EVR Series of Transient Voltage Suppression (TVS) Diodes can provide secondary transient voltage protection from transients induced by load dump and other transient voltage events for sensitive electronics. The TPSMA-EVR Series offers superior electrical performance in a small footprint DO-214AC package, allowing designers to upgrade their circuit protection without altering their existing design footprint or provide more robust protection in new circuit layouts.

Features

- AEC-Q101 qualified
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Meets ESD HBM: 8 kV and M4 machine model: 400 V
- Low profile package
- Ideal for automated placement
- 400 W peak pulse power capability with a 10/1000 µs waveform, repetitive rate (duty cycle): 0.01 %
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- Available in uni-directional and bi-directional
- Solder dip 260 °C, 10s
- Component in accordance to RoHS 2011/65/EU and WEEE 2002/96/EC
- Halogen-free avalaible according to IEC 61249-2-21 denifition
- Manufacturing Location: This product is manufactured, assembled, and tested outside mainland China and Taiwan.

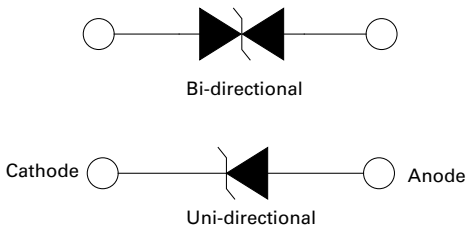
Maximum Ratings and Thermal Characteristics

(T_A=25 °C unless otherwise noted)

Parameter		Symbol	Value	Unit
Peak Pulse Power Dissipation with 10/1000 µs exponential pulse		P_{PPM}	400	W
Peak Forward Surge Current 8.3 ms. (Jedec Method) (Note 1)		I_{FSM}	40	A
Max. Forward Voltage Drop at I_F = 50 A (JEDEC Method)(Note 1)		V_F	3.5	V
Operating Junction Temperature Range	$V_{BR} \leq 43$ V	T_J	-65 to 175	°C
	$V_{BR} > 43$ V		-65 to 150	
Storage Temperature Range		T_{STG}	-65 to 175	°C

Notes:
1. Only for Unidorectional

Functional Diagram



Applications

Used in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for industrial, automotive and telecommunication.

Physical Specifications

Case	DO-214AC (SMA). Epoxy meets UL 94V-0 flammability rating.
Polarity	For unidirectional types color band denotes cathode end. No marking on bidirectional types.
Terminal	Matte tin plated leads, solderable per MIL-STD-750 Method 2026, J-STD-002 and JESD22-B102. Consumer grade, meets JESD 201 class 1A whisker test.

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

Part Number (Uni)	Part Number (Bi)	Marking		Maximum Reverse Leakage Current[2] I_{RM} at V_{RM}		Breakdown Voltage V_{BR} at I_R (V) [1]			Max. Clamping Voltage V_{CL} at I_{PP} max. 1ms. Expo.	
		Uni	Bi	(µA)	(V)	Min.	Max.	(mA)	(V)	(A)
TPSMA5.0A-EVR	TPSMA5.0CA-EVR	XA	Y4	800	5.0	6.40	7.07	10	9.2	43.50
TPSMA6.0A-EVR	TPSMA6.0CA-EVR	XB	Y5	800	6.0	6.67	7.37	10	10.3	38.80
TPSMA6.5A-EVR	TPSMA6.5CA-EVR	XC	Y6	500	6.5	7.22	7.98	10	11.2	35.70
TPSMA7.0A-EVR	TPSMA7.0CA-EVR	XD	Y7	200	7.0	7.78	8.60	10	12.0	33.30
TPSMA7.5A-EVR	TPSMA7.5CA-EVR	XE	Y8	100	7.5	8.33	9.21	1	12.9	31.00
TPSMA8.0A-EVR	TPSMA8.0CA-EVR	XF	Y9	50	8.0	8.89	9.83	1	13.6	29.40
TPSMA8.5A-EVR	TPSMA8.5CA-EVR	XG	Z1	20	8.5	9.44	10.4	1	14.4	27.80
TPSMA9.0A-EVR	TPSMA9.0CA-EVR	XH	Z2	5	9.0	10.0	11.1	1	15.4	26.00
TPSMA10A-EVR	TPSMA10CA-EVR	XI	Z3	5	10	11.1	12.3	1	17.0	23.50
TPSMA11A-EVR	TPSMA11CA-EVR	XJ	YD	5	11	12.2	13.5	1	18.2	22.00
TPSMA12A-EVR	TPSMA12CA-EVR	HB	YM	5	12	13.3	14.7	1	19.9	20.10
TPSMA13A-EVR	TPSMA13CA-EVR	HC	HM	1	13	14.4	15.9	1	21.5	18.60
TPSMA14A-EVR	TPSMA14CA-EVR	XK	Z4	1	14	15.6	17.2	1	23.2	17.20
TPSMA15A-EVR	TPSMA15CA-EVR	HD	HN	1	15	16.7	18.5	1	24.4	16.40
TPSMA16A-EVR	TPSMA16CA-EVR	XL	Z5	1	16	17.8	19.7	1	26.0	15.40
TPSMA17A-EVR	TPSMA17CA-EVR	XM	Z6	1	17	18.9	20.9	1	27.6	14.50
TPSMA18A-EVR	TPSMA18CA-EVR	XN	Z7	1	18	20.0	22.1	1	29.2	13.70
TPSMA20A-EVR	TPSMA20CA-EVR	XO	Z8	1	20	22.2	24.5	1	32.4	12.30
TPSMA22A-EVR	TPSMA22CA-EVR	YR	Z9	1	22	24.4	26.9	1	35.5	11.30
TPSMA24A-EVR	TPSMA24CA-EVR	HE	HO	1	24	26.7	29.5	1	38.9	10.30
TPSMA26A-EVR	TPSMA26CA-EVR	YN	YI	1	26	28.9	31.9	1	42.1	9.50
TPSMA28A-EVR	TPSMA28CA-EVR	HG	YO	1	28	31.1	34.4	1	45.4	8.80
TPSMA30A-EVR	TPSMA30CA-EVR	HH	YF	1	30	33.3	36.8	1	48.4	8.30
TPSMA33A-EVR	TPSMA33CA-EVR	HI	YG	1	33	36.7	40.6	1	53.3	7.50
TPSMA36A-EVR	TPSMA36CA-EVR	HJ	HT	1	36	40.0	44.2	1	58.1	6.90
TPSMA40A-EVR	TPSMA40CA-EVR	HK	HU	1	40	44.4	49.1	1	64.5	6.20
TPSMA43A-EVR	TPSMA43CA-EVR	XP	YE	1	43	47.8	52.8	1	69.4	5.80
TPSMA45A-EVR	TPSMA45CA-EVR	XR	C1	1	45	50.0	55.3	1	72.7	5.50
TPSMA48A-EVR	TPSMA48CA-EVR	XS	C2	1	48	53.3	58.9	1	77.4	5.20
TPSMA51A-EVR	TPSMA51CA-EVR	XT	C3	1	51	56.7	62.7	1	82.4	4.90
TPSMA54A-EVR	TPSMA54CA-EVR	XV	C4	1	54	60.0	66.3	1	87.1	4.60
TPSMA58A-EVR	TPSMA58CA-EVR	XX	C5	1	58	64.4	71.2	1	93.6	4.30
TPSMA60A-EVR	TPSMA60CA-EVR	XY	C6	1	60	66.7	73.7	1	96.8	4.10
TPSMA64A-EVR	TPSMA64CA-EVR	XZ	C7	1	64	71.1	78.6	1	103	3.90
TPSMA70A-EVR	TPSMA70CA-EVR	X1	C8	1	70	77.8	86.0	1	113	3.50
TPSMA75A-EVR	TPSMA75CA-EVR	X2	C9	1	75	83.3	92.1	1	121	3.30
TPSMA78A-EVR	TPSMA78CA-EVR	X3	B1	1	78	86.7	95.8	1	126	3.20
TPSMA85A-EVR	TPSMA85CA-EVR	X4	B2	1	85	94.4	104	1	137	2.90
TPSMA90A-EVR	TPSMA90CA-EVR	X5	B3	1	90	100	111	1	146	2.70
TPSMA100A-EVR	TPSMA100CA-EVR	X6	B4	1	100	111	123	1	162	2.50
TPSMA110A-EVR	TPSMA110CA-EVR	X7	B5	1	110	122	135	1	177	2.30
TPSMA120A-EVR	TPSMA120CA-EVR	YV	B6	1	120	133	147	1	193	2.10
TPSMA130A-EVR	TPSMA130CA-EVR	X8	B7	1	130	144	159	1	209	1.90
TPSMA150A-EVR	TPSMA150CA-EVR	X9	B8	1	150	167	185	1	243	1.60
TPSMA160A-EVR	TPSMA160CA-EVR	Y1	B9	1	160	178	197	1	259	1.55
TPSMA170A-EVR	TPSMA170CA-EVR	Y2	D1	1	170	189	209	1	275	1.50
TPSMA188A-EVR	TPSMA188CA-EVR	Y3	D2	1	188	209	231	1	328	1.40

Notes:
1. Tested with pulses Pulse test: tp ≤ 50 ms; δ < 2%
2. For bidirectional types having V_{RM} of 10 V and less, the I_{RM} limit is doubled

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

Figure 1 - Pulse Waveform

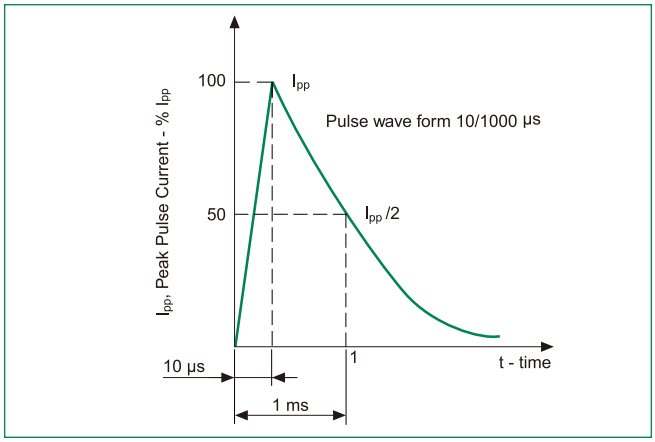


Figure 2 - Pulse Power or Current vs. Initial Junction Temperature

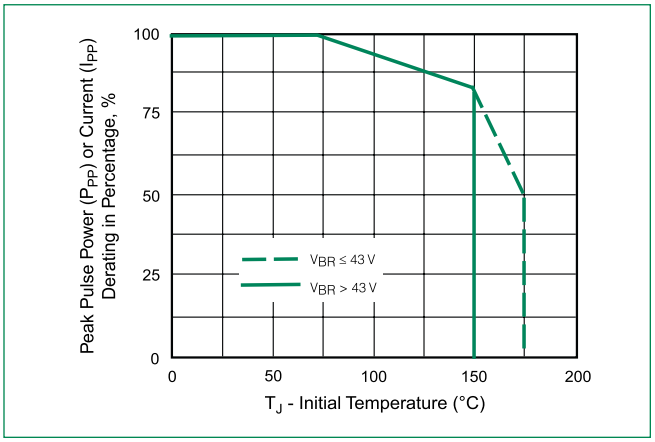
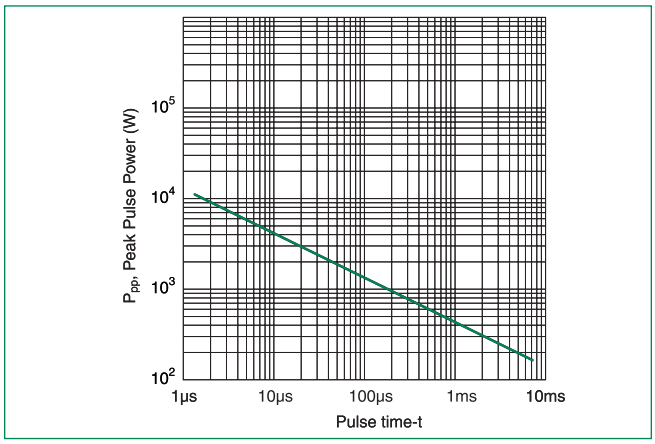
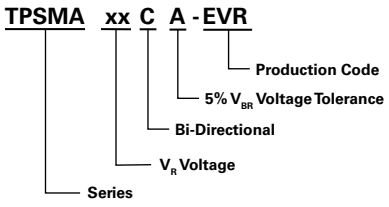


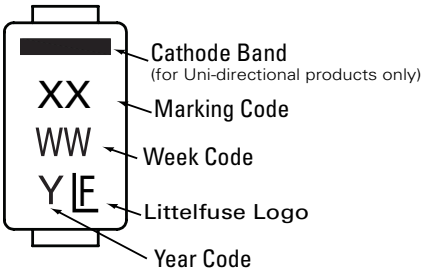
Figure 3 - Peak Pulse Power Rating Curve



Part Numbering System



Part Marking System



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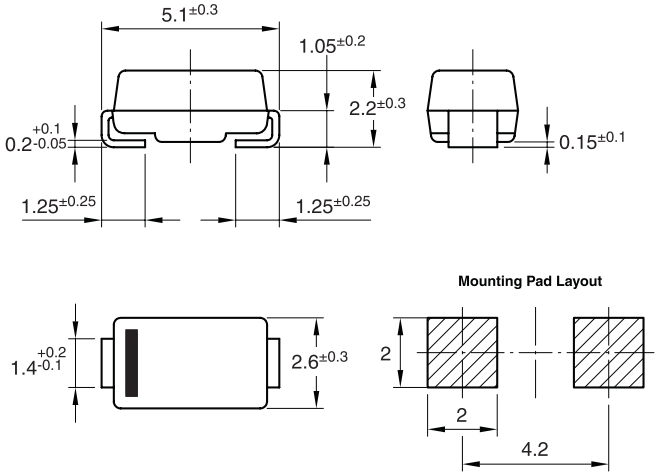
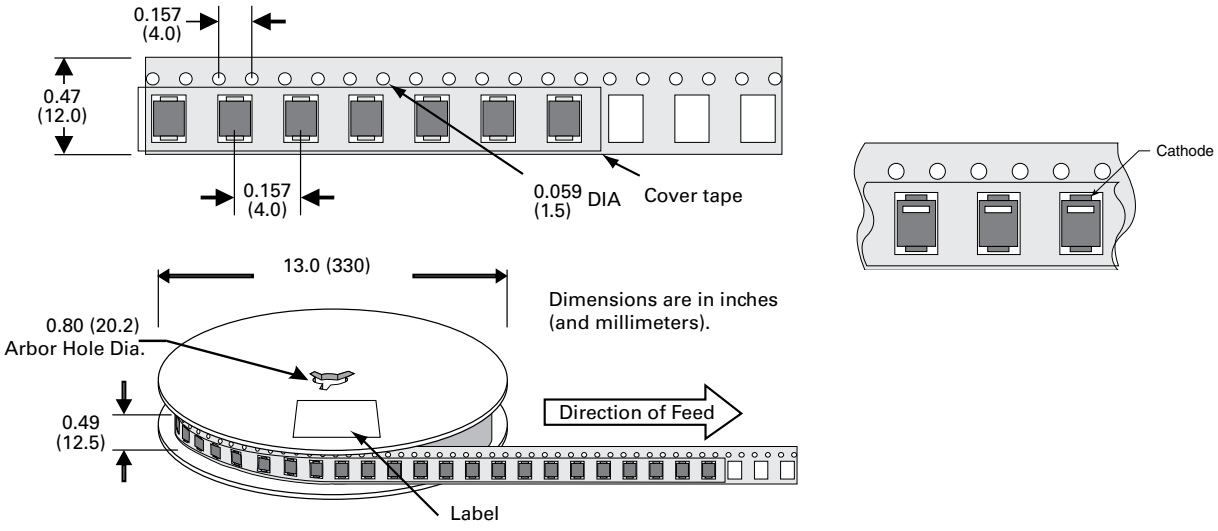
Dimensions - DO-214AC Package



Packaging Options

Part number	Component Package	Quantity	Packaging Option	Packaging Specification
TPSMAxxXX-EVR	DO-214AC	7500	13" diameter tape and reel	EIA RS-481

Tape and Reel Specification



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