

SURFACE MOUNT 400W TVS

DESCRIPTION:



The ALPSMF4LXXA / CA Series is TVS devices are ideal for the transient voltage clamp protection of I/O Interfaces and many other applications

FEATURES:

- 400W peak pulse power capability at 10/1000μs waveform, repetition rate (duty cycles):0.01%
- Excellent clamping capability
- Typical failure mode is a short circuit condition for current events exceeding component rating
- Meet MSL level1, per J-STD-020, lead-free maximum peak of 260°C
- High reliability application and automotive grade AEC-Q101 qualified
- IEC 61000-4-2 ESD 30kV(Air), 30kV (Contact)
- Lead-free parts meet RoHS requirements

APPLICATIONS:

- I/O Interfaces
- DC power line bus
- Other circuits used in Telecom, Computer, Industrial
- Automotive electronic applications

MECHANICAL CHARACTERISTICS

- Epoxy: UL94-V0 rated flame retardant.
- Case: Molded plastic, SOD-123.
- Polarity: Color band denotes cathode
- Mounting Position: Any.

ORDERING PART NUMBER

PART NUMBER	ORDERING PART NUMBER
ALPSMF4LXXA / CA	ALPSMF4LXXA / CA -SC



beyond boundaries...

ALPSMF4LXXA / CA SERIES

SOD-123

TYPICAL DEVICE CHARACTERISTICS

MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Power Dissipation at $T_A=25^\circ\text{C}$ by 10/1000 μs Waveform (Fig.2)	P_{PPM}	400	W
Peak Pulse Power Dissipation at $T_A=25^\circ\text{C}$ by 10/1000 μs Waveform (26CA THRU 36CA is 200W)	P_{PPM}	200	W
Power Dissipation on Infinite Heat Sink at $T_L=50^\circ\text{C}$	P_D	1	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 1)	I_{FSM}	30	A
Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only	V_F	3.5	V
Operating Temperature Range	T_J	-55 to +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

Part Number	Reverse Standoff Voltage V _R	Breakdown Voltage V _{BR} @ I _T		Test Current I _T	Maximum Clamping Voltage V _C @ I _{pp}	Maximum Peak Pulse Current I _{pp}	Maximum Reverse Leakage I _R @ V _R
		(Volts)					
	(Volts)	MIN	MAX	(mA)	(Volts)	(Amps)	(μA)
ALPSMF4L3.3A	3.3	5.20	6.00	10	7.3	54.8	50
ALPSMF4L3.3CA	3.3	5.70	6.50	10	8.0	50.0	50
ALPSMF4L5.0A / CA	5.0	6.40	7.00	10	9.2	40.1	800
ALPSMF4L6.0A / CA	6.0	6.67	7.37	10	10.3	35.9	800
ALPSMF4L6.5A / CA	6.5	7.22	7.98	10	11.2	33.1	500
ALPSMF4L7.0A / CA	7.0	7.78	8.60	10	12.0	30.9	200
ALPSMF4L7.5A / CA	7.5	8.33	9.21	1	12.9	28.7	100
ALPSMF4L8.0A / CA	8.0	8.89	9.83	1	13.6	27.2	50
ALPSMF4L8.5A / CA	8.5	9.44	10.40	1	14.4	25.7	20
ALPSMF4L9.0A / CA	9.0	10.00	11.10	1	15.4	26.4	5
ALPSMF4L10A / CA	10.0	11.10	12.30	1	17.0	23.5	5
ALPSMF4L11A / CA	11.0	12.20	13.50	1	18.2	22.0	1
ALPSMF4L12A / CA	12.0	13.30	14.70	1	19.9	20.1	1
ALPSMF4L13A / CA	13.0	14.40	15.90	1	21.5	18.6	1
ALPSMF4L14A / CA	14.0	15.60	17.20	1	23.2	17.2	1
ALPSMF4L15A / CA	15.0	16.70	18.50	1	24.4	16.4	1
ALPSMF4L16A / CA	16.0	17.80	19.70	1	26.0	15.4	1
ALPSMF4L17A / CA	17.0	18.90	20.90	1	27.6	14.5	1
ALPSMF4L18A / CA	18.0	20.00	22.10	1	29.2	13.7	1
ALPSMF4L20A / CA	20.0	22.20	24.50	1	32.4	12.3	1
ALPSMF4L22A / CA	22.0	24.40	26.90	1	35.5	11.3	1

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

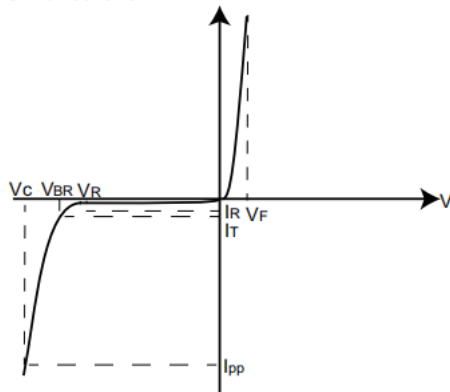
Part Number	Reverse Standoff Voltage V _R	Breakdown Voltage V _{BR} @ I _T		Test Current I _T	Maximum Clamping Voltage V _C @ I _{pp}	Maximum Peak Pulse Current I _{pp}	Maximum Reverse Leakage I _R @ V _R
		(Volts)					
	(Volts)	MIN	MAX	(mA)	(Volts)	(Amps)	(μA)
ALPSMF4L24A / CA	24.0	26.70	29.50	1	38.9	10.3	1
ALPSMF4L26A / CA*	26.0	28.90	31.90	1	42.1	9.5 / 4.75*	1
ALPSMF4L28A / CA*	28.0	31.10	34.40	1	45.4	8.8 / 44*	1
ALPSMF4L30A / CA*	30.0	33.30	36.80	1	48.4	8.3 / 4.15*	1
ALPSMF4L33A / CA*	33.0	36.70	40.60	1	53.3	7.5 / 3.75*	1
ALPSMF4L36A / CA*	36.0	40.00	44.20	1	58.1	6.9 / 3.44*	1
ALPSMF4L40A	40.0	44.40	49.10	1	64.5	6.2	1
ALPSMF4L43A	43.0	47.80	52.80	1	69.4	5.8	1
ALPSMF4L45A	45.0	50.00	55.30	1	72.7	5.5	1
ALPSMF4L48A	48.0	53.30	58.90	1	77.4	5.2	1
ALPSMF4L51A	51.0	56.70	62.70	1	82.4	4.9	1
ALPSMF54A	54.0	60.00	66.30	1	87.1	4.6	1
ALPSMF4L58A	58.0	64.40	71.20	1	93.6	4.3	1
ALPSMF4L60A	60.0	66.70	73.70	1	96.8	4.1	1
ALPSMF4L64A	64.0	71.10	78.60	1	103.0	3.9	1
ALPSMF4L70A	70.0	77.80	86.00	1	113.0	3.5	1
ALPSMF4L75A	75.0	83.30	92.10	1	121.0	3.3	1
ALPSMF4L78A	78.0	86.70	95.80	1	126.0	3.2	1
ALPSMF4L85A	85.0	94.40	104.0	1	137.0	2.9	1

Note:

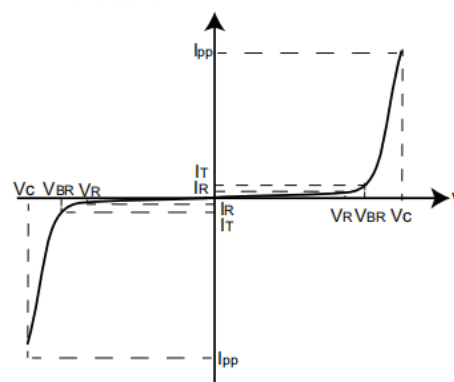
- * - on first two digit marking to show 400W
- ALPSMF4L3.3A and ALPSMF3.3CA is planar process
- ALPSMF4L26CA THRU ALPSMF4L36CA is 200W
- Part numbers with "CA" suffix are bidirectional devices, i.e., ALPSMF4L24CA.

I-V CURVE CHARACTERISTICS

Uni-directional



Bi-directional



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

V_R - Stand-off Voltage -- Maximum voltage that can be applied to the TVS without operation

V_{BR} - Breakdown Voltage -- Maximum voltage that flows through 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

V_F - Forward Voltage Drop for Uni-directional

TYPICAL DEVICE CHARACTERISTICS CURVES

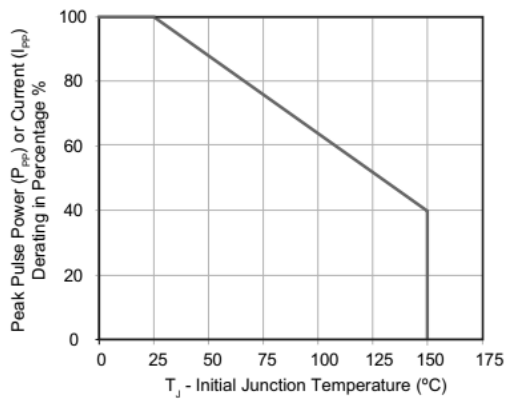


Fig1. PEAK PULSE POWER DERATING CURVE

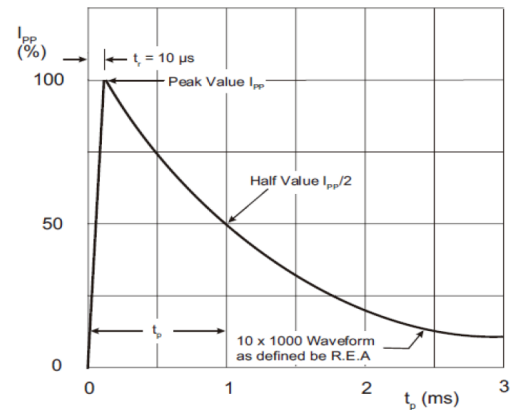


Fig2. PULSE WAVEFORM

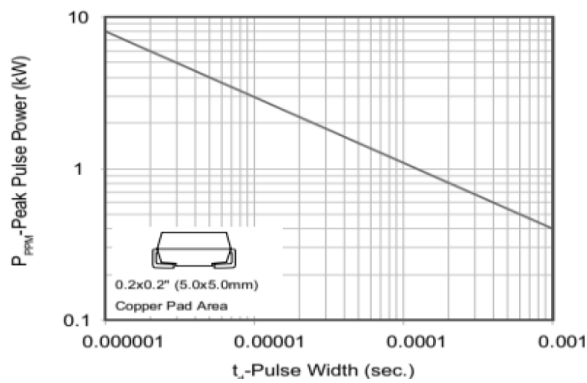


Fig3. PEAK PULSE POWER RATING CURVE

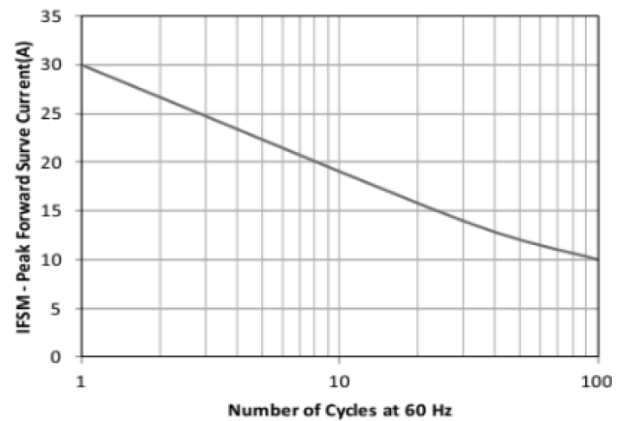


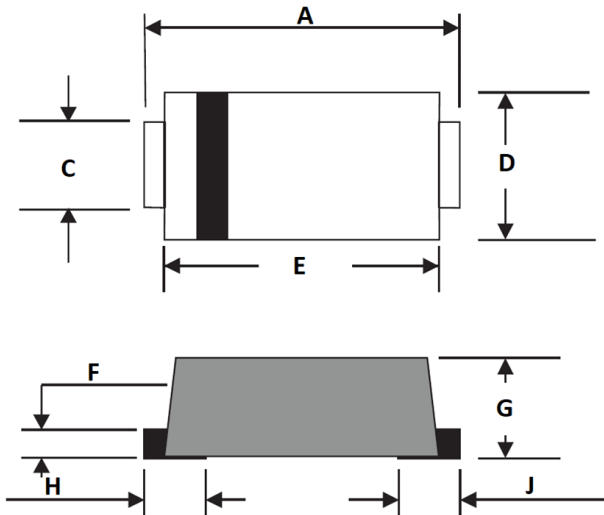
Fig4. MAXIMUM NON-REPETITIVE SURGE CURRENT

PINNING INFORMATION

PIN	SIMPLIFIED OUTLINE	SYMBOL
Pin1 Cathode Pin2 Anode		 Bi-directional  Cathode Anode Uni-directional

PACKAGE INFORMATION

SOD-123



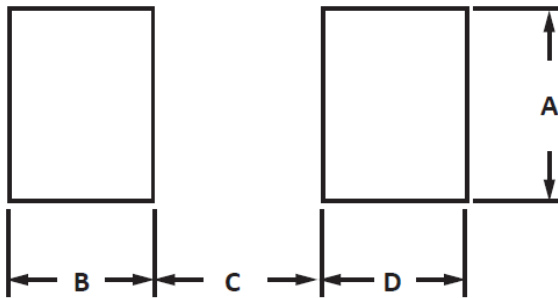
OUTLINE DIMENSIONS

DIM	MILLIMETERS			INCHES		
	MIN	TYP.	MAX	MIN	TYP.	MAX
A	3.35	3.70	4.05	0.132	0.146	0.159
C	0.70	0.85	0.90	0.028	0.033	0.035
D	1.65	1.85	1.95	0.065	0.073	0.077
E	2.55	2.80	3.05	0.100	0.110	0.120
F	0.15	0.20	0.25	0.006	0.008	0.010
G	1.10	1.30	1.35	0.043	0.051	0.053
H	0.35	0.65	0.95	0.014	0.026	0.037
J	0.35	0.65	0.95	0.014	0.026	0.037

NOTES

1. Dimensions are exclusive of mold flash and metal burrs.

MOUNTING PAD LAYOUT

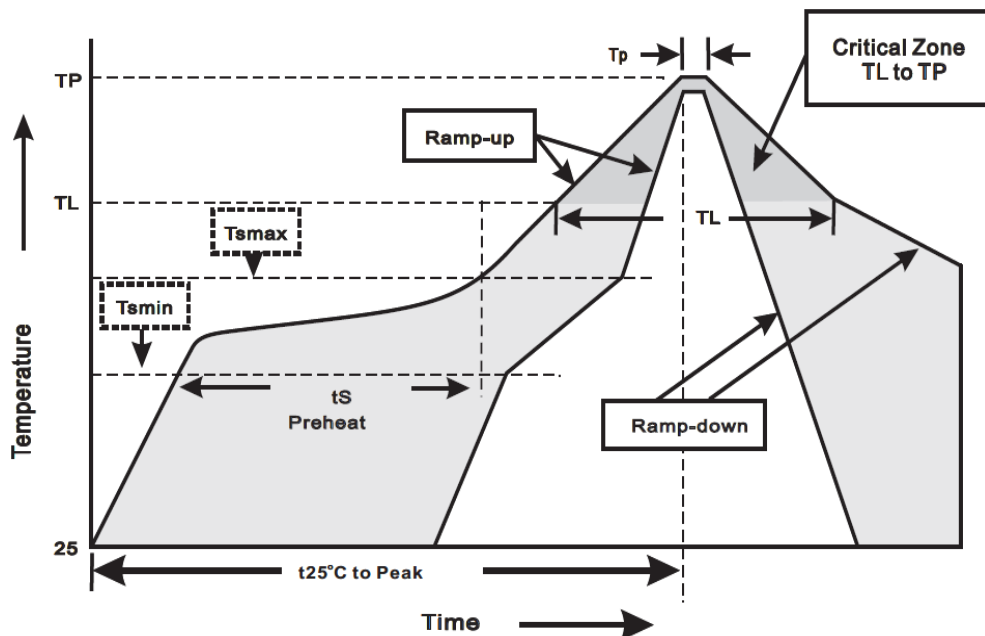


MOUNTING PAD LAYOUT DIMENSIONS

DIM	MILLIMETERS	INCHES
	Typ.	Typ.
A	0.85	0.033
B	0.65	0.026
C	2.40	0.094
D	0.65	0.026

SOLDERING PARAMETERS
SUGGESTED THERMAL PROFILES FOR SOLDERING PROCESSES

1. Storage environment: Temperature=5 °C~40 °C Humidity=55% ±25%
2. Reflow soldering of surface-mount devices



3. Reflow soldering

PROFILE FEATURE	SOLDERING CONDITION
Average ramp-up rate (T_L to T_P)	<3 °C/sec
Preheat	
- Temperature Min (T_{smin})	150 °C
- Temperature Max (T_{smax})	200 °C
- Time (min to max) (t_s)	60 ~ 180 sec
T_{smax} to T_A	
- Ramp-upRate	<3 °C/sec
Time maintained above:	
- Temperature (T_A)	217 °C
- Time (min to max) (t_s)	60 ~ 150 sec
Peak Temperature (T_P)	255 °C-0/+5 °C
Time within 5 °C of actual Peak Temperature(t_P)	10 ~ 30 sec
Ramp-down Rate	<6 °C/sec
Time 25 °C to Peak Temperature	<8 minutes
Do not exceed	260 °C



beyond boundaries...

ALPSMF4LXXA / CA SERIES

SOD-123

CUSTOMER NOTE:

DISCLAIMER

The product information and the selection guide facilitates the selection of the ALPINESEMI™'s Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review the Data sheet(s) so as to confirm that the Device(s) meets functionality parameters for your application. The information furnished on the Data Sheet and the ALPINESEMI™'s Web Site is believed to be accurate and reliable at the time of preparation of this document. ALPINESEMI™ however, does not assume any inaccuracies that may arise when the components are mounted and removed. Furthermore, ALPINESEMI™ does not assume liability whatsoever, arising out of the application or the use of any of ALPINESEMI™'s product(s). Neither, does it convey any license under its patent rights nor the rights of others. These products are not guaranteed for use in life saving/support appliances or systems. ALPINESEMI™'s customers using these products (either as individual Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and ALPINESEMI™ will not be responsible in any way(s) for any damage(s) resulting from such use.

Please check the website www.alpinesemi.com for continues updates and revision of datasheets.

DESIGN CHANGES: ALPINESEMI™ strives for continuous improvement and reserves the right to change the specifications of its products without prior notice. ALPINESEMI™ reserves the right to discontinue product lines without prior notice. Any product selection is a recommendation based on best understanding of such product(s) by our engineers. However, buyers are advised to rely on their own judgment for such selection of the products.

ALPINESEMI™ makes no warranty, representation or guarantee regarding the suitability of its products for any particular applications. Neither does ALPINESEMI™ assume any liability arising out of the applications nor the use of such products. ALPINESEMI™ specifically disclaims all liabilities either consequential or incidental.

All rights of the product and datasheet are reserved to ALPINESEMI™.

All logos and information provided in the datasheets are for reference only. Any registered and/or trademark/logos belonging to respective companies be the property of those companies. ALPINESEMI™ extends the courtesy to them, if any of the information found in its datasheet.

Component Disposal Instructions

1. ALPINESEMI™ Semiconductor Devices are RoHS compliant and hence customers are requested to dispose as per the prevailing Environmental Legislation put forth in their specific country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).



sales@alpinesemi.com
www.alpinesemi.com