

12V Power Transient Voltage Suppressor

Features

- Bidirectional Protection
- Fast Response Time : Typically < 1ns
- Excellent Clamping Capability
- Low clamping voltage
- Built-in Strain relief
- Low inductance
- Low profile package
- IEC 61000-4-2 (ESD) $\pm 30\text{kV}(\text{air})$, $\pm 30\text{kV}(\text{contact})$

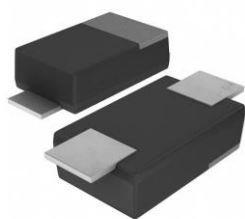
Mechanical Characteristics

- SOD-123FL package
- Matte tin lead - free plated
- Marking: Marking Code
- RoHS Compliant

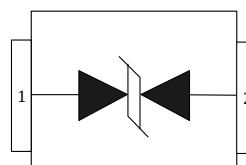
Applications

- I/O Interfaces
- Power lines
- Telecommunication
- Consumer Electronics

Schematic & PIN Configuration



SOD-123FL



TOP VIEW

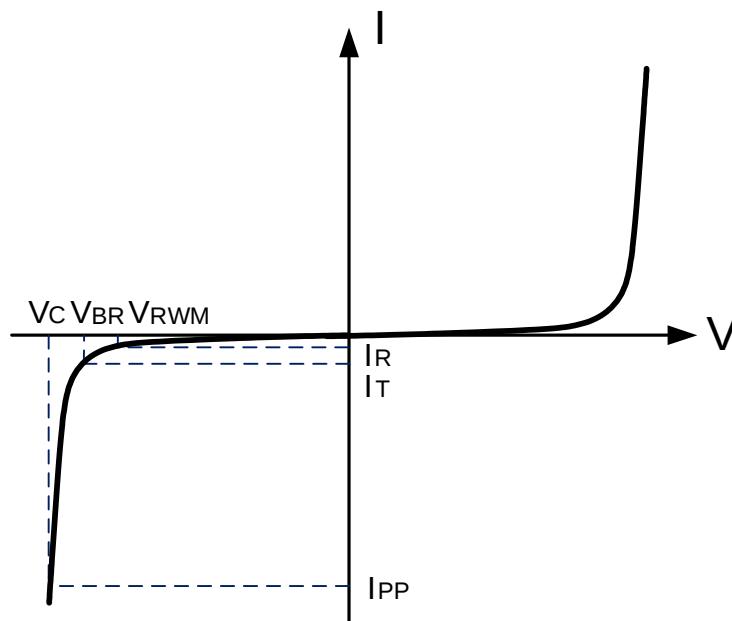
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Absolute Maximum Rating

Parameter	Symbol	Value	Unit
Peak Pulse Power ($t_p = 8/20\mu s$)	P_{PPM}	3800	Watts
Peak Pulse Current ($t_p = 8/20\mu s$)	I_{PPM}	160	A
Operating Junction Temperature range	T_J	-40 to +125	°C
Storage Temperature range	T_{STG}	-55 to +150	°C

Electrical Parameters

Symbol	Parameter
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Working Peak Reverse Voltage
I_R	Maximum Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current



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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Stand-Off Voltage	V_{RWM}				12	V
Reverse Breakdown Voltage	V_{BR}	$I_T=1mA$	13.3		14.7	V
Reverse Leakage Current	I_R	$V_{RWM}=12V$			1	μA
Clamping Voltage	V_C	$I_{PP}=160A, t_p=8/20\mu s$			24	V
Junction Capacitance	C_j	$V_{BIAS} = 0V, f = 1MHz$		490		pF

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Typical Characteristics

Figure 1: Peak Pulse Power Rating Curve

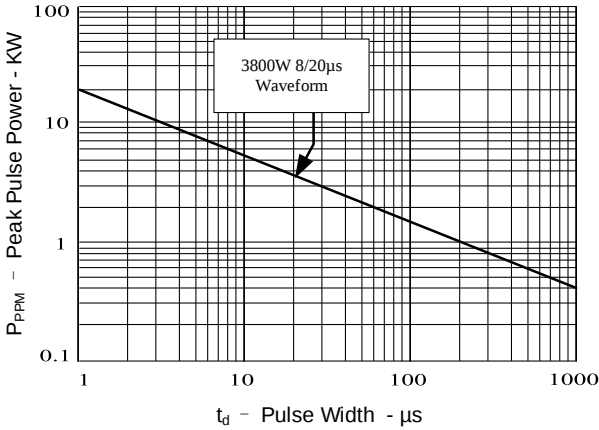


Figure 2: Pulse Derating Curve

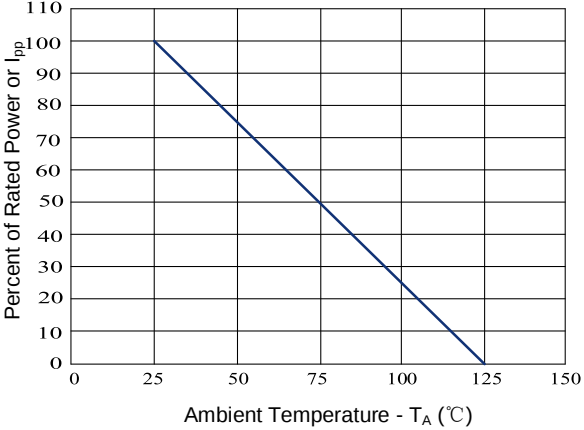
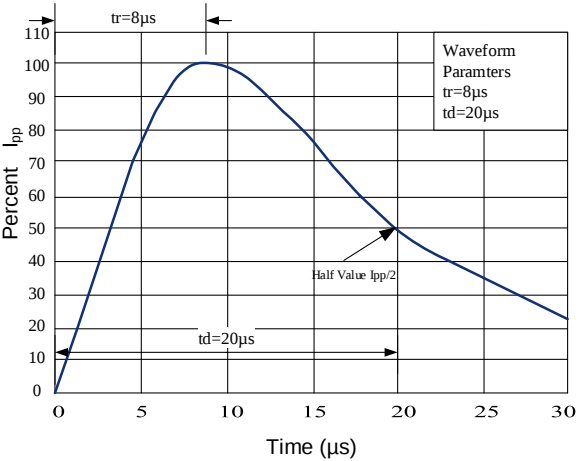


Figure 3: 8/20 μs Pulse Waveform

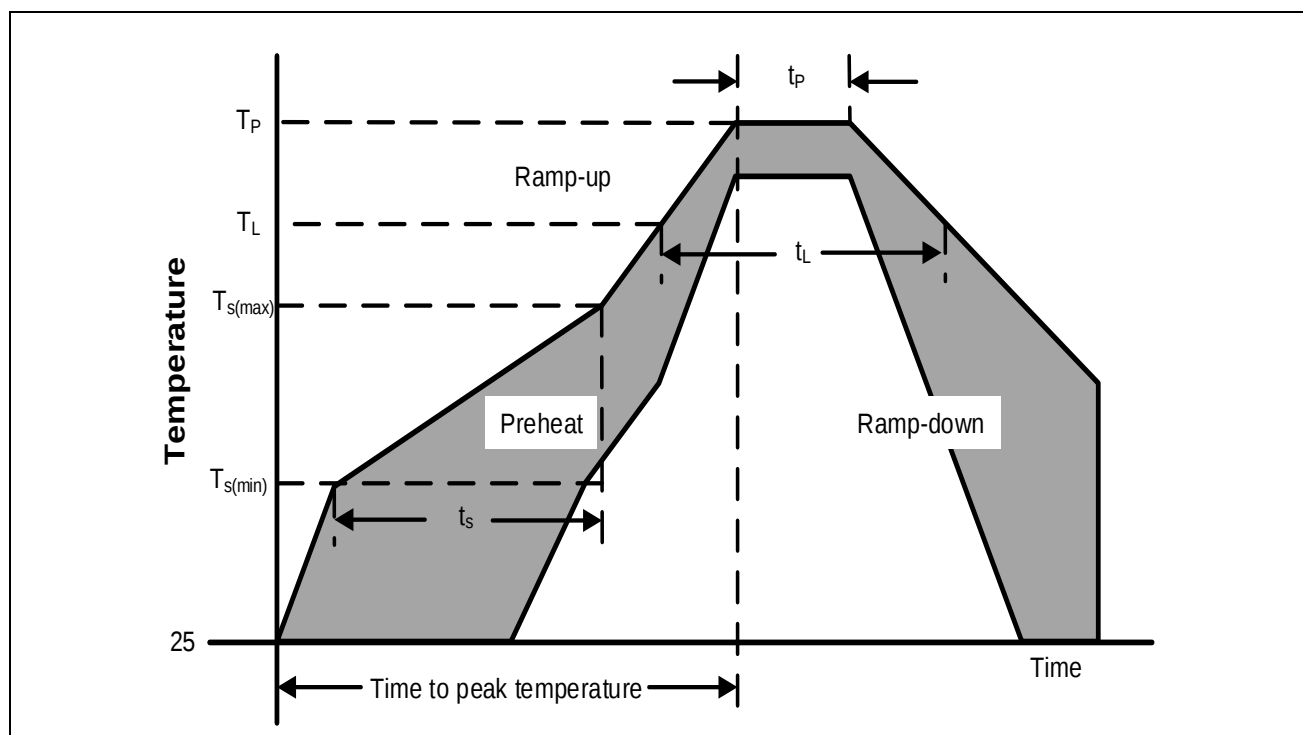


Note: The above typical parameters or typical characteristics are only indicative and do not make specific guarantees. If detailed values are required, additional communication and provision are required.

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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 - 190 secs
Average ramp up rate (Liquidus Temp) (T_L) to peak		3°C/second max
$T_{S(max)}$ to T_L ——Ramp-up Rate		3°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Temperature (t_L)	60 - 150 seconds
Peak Temperature (T_P)		260+0/-5 °C
Time within actual peak Temperature (t_P)		20 - 40 seconds
Ramp-down Rate		5°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max
Do not exceed		260°C

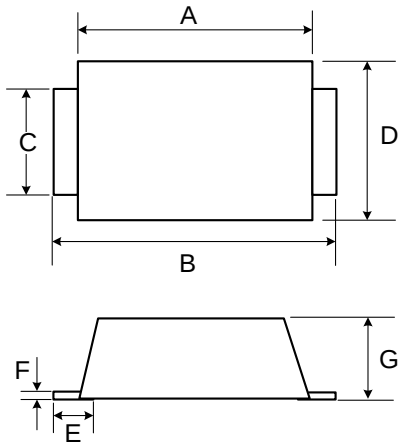


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Package Dimension

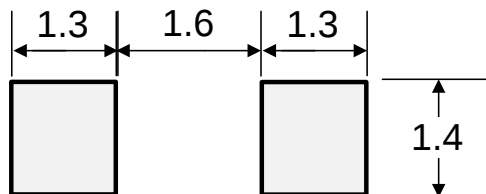
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PACKAGE OUTLINE



SYMBOL	MILLIMETERS	
	MIN	MAX
A	2.50	2.95
B	3.40	3.95
C	0.70	1.10
D	1.50	1.90
E	0.45	0.95
F	0.05	0.26
G	0.90	1.05

Land Pattern



Dimensions in mm

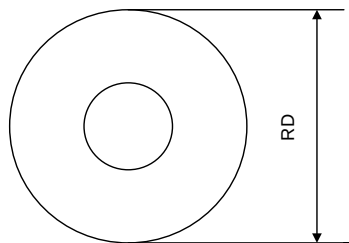
Ordering Information

Part	Package	Marking	Packing method	MPQ
ES12P4S1B	SOD-123FL	EUE	Tape and Reel	3k/Reel

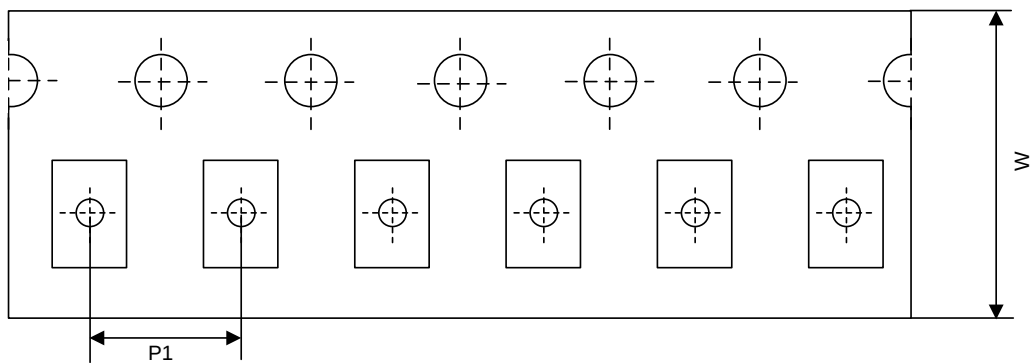
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Tape And Reel Information

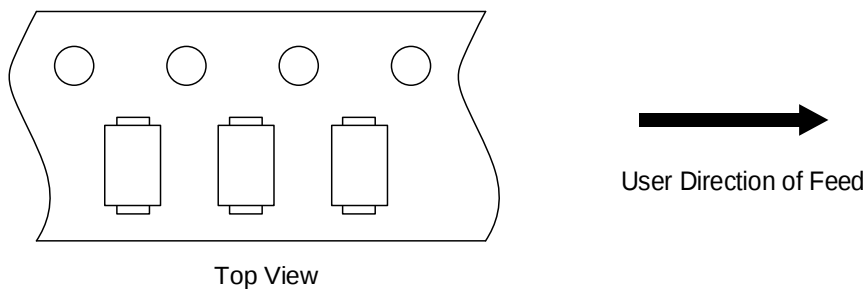
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape



RD	Reel Dimensions	7 inch
W	Overall width of the carrier tape	8 mm
P1	Pitch between successive cavity centers	4 mm

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Revision History and Checking Table

Version	Date	Revision Item	Modifier	Function & Spec Checking	Package & Tape Checking
1.0	2016-04-14	Original Version	Qi Shu Kun	Qi Shu Kun	Liu Jia Ying
1.1	2017-07-05	Released Version	Qi Shu Kun	Qi Shu Kun	Liu Jia Ying
1.2	2022-09-13	Update Typeset	Yin Peng	Qi Shu Kun	Liu Jia Ying