

ESDH3Z12C

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ESDH3Z12C

240W Bi-Directional TVS For ESD Protection : 12V

Features

- Protects one I/O or power line.
- 240 Watts peak pulse power per line ($t_p=8/20\mu s$).
- Operating voltage: 12V.
- Complies with following standards:
 - IEC 61000-4-2 (ESD) $\pm 30kV$ (Air).
 - IEC 61000-4-2 (ESD) $\pm 30kV$ (Contact).
 - IEC 61000-4-4 (EFT) 40A (5/50ns).
 - IEC 61000-4-5 (Lightning) 12A (8/20 μs).
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.ESDH3Z12C-H.

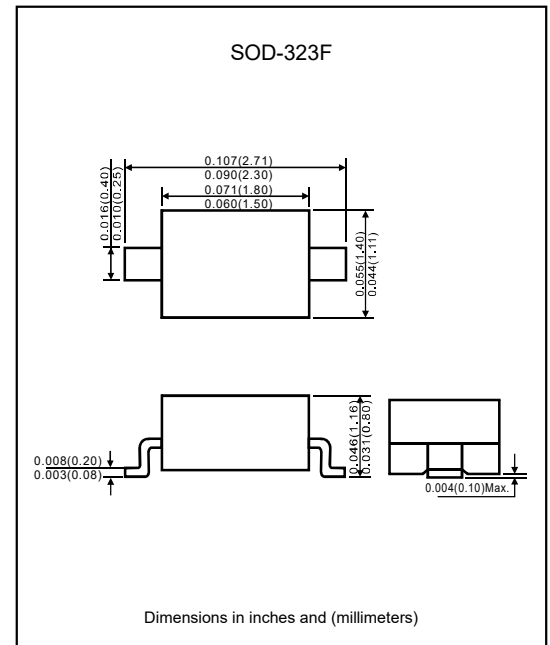
Applications

- Laptop computers.
- Cellular phones.
- Digital cameras.
- Personal digital assistants (PDA's).

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, SOD-323F.
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026.
- Mounting Position : Any.

Package outline



Maximum ratings (At $T_A=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power (8/20 μs)	P_{PK}	240	W
Peak Pulse Current (8/20 μs)	I_{PP}	12	A
Operating temperature	T_J	+125	$^\circ C$
Storage temperature range	T_{STG}	-55 to +150	$^\circ C$

Electrical characteristics (At $T_A=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse working voltage	V_{RWM}				12	V
Breakdown voltage	V_{BR}	$I_T = 1mA$	13.3			V
Reverse leakage current	I_R	$V_{RWM} = 12V$ ($T_A=25^\circ C$)			0.5	μA
Clamping voltage	V_C	$I_{PP} = 12A$ ($t_p=8/20\mu s$)		16	20	V
ESD Clamping voltage (Note1)	V_C	$I_{PP} = 4A$ ($t_p=0.2/0.1\mu s$) (T_{LP})		13.4		V
		$I_{PP} = 16A$ ($t_p=0.2/0.1\mu s$) (T_{LP})		14.2		
Dynamic resistance (Note1,2)	R_{DYN}	$T_{LP} = 0.2/0.1\mu s$		0.07		Ω
Junction capacitance	C_J	$V_R = 0V, f=1.0MHz$		30	40	pF

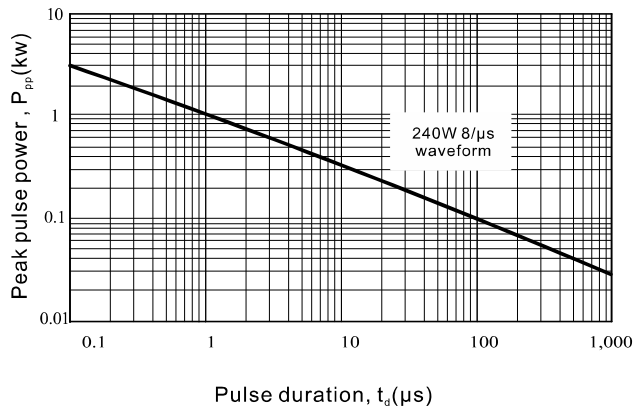
Note : 1. TLP setting: $t_p=100ns$, $t_i=0.2ns$, I_{TLP} and V_{TLP} sample window: $t_i=70ns$ to $t_s=90ns$.

2. Dynamic resistance calculated from $I_{pp}=4A$ to $I_{pp}=16A$ using "Best fit".

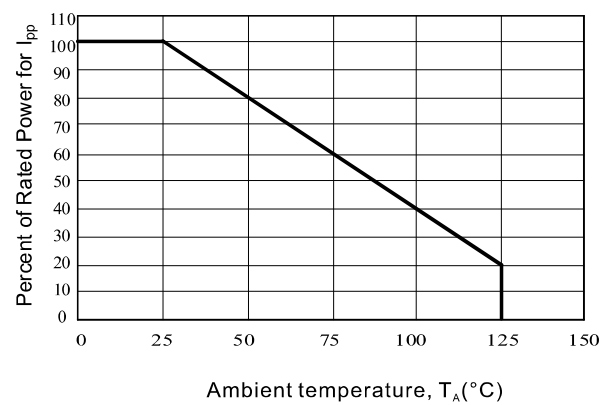
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Rating and characteristic curves

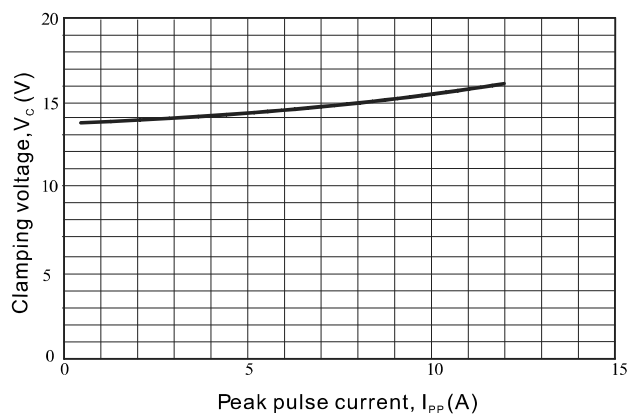
Peak pulse power vs. Pulse time



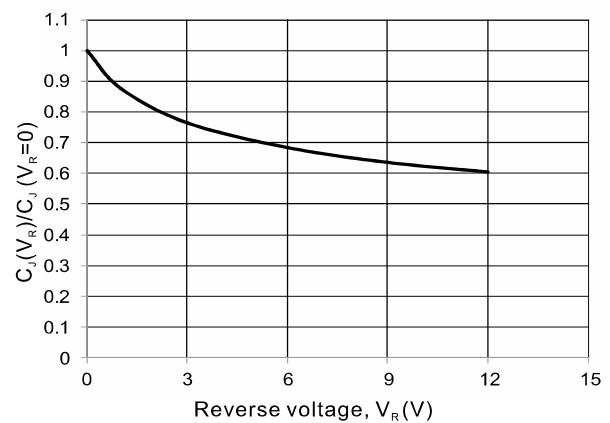
Power derating curve



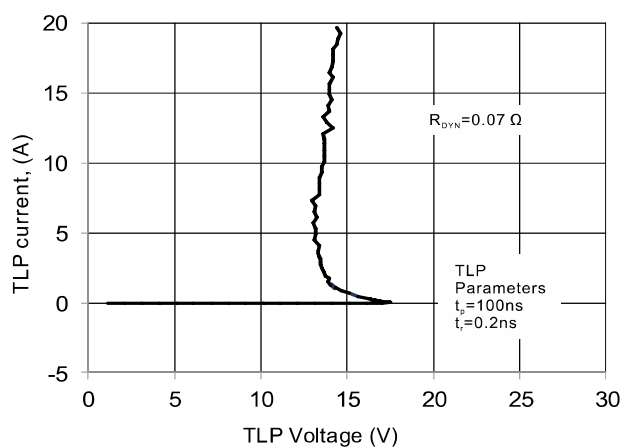
Clamping voltage vs. Peak pulse current



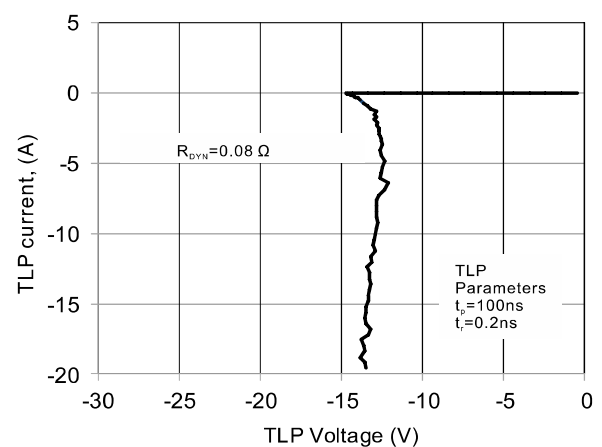
Normalized junction capacitance vs. reverse voltage



TLP positive I-V curve



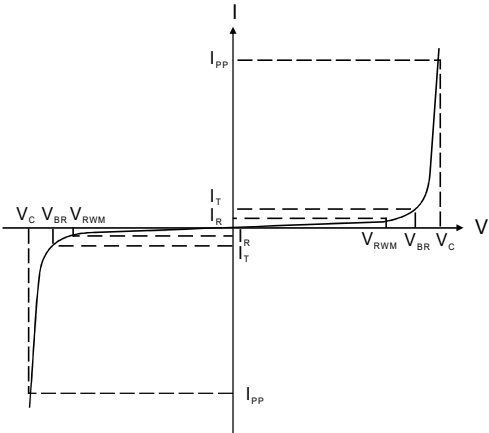
TLP negative I-V curve



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Electrical Parameters

Symbol	Parameter
I_{PP}	Reverse peak pulse current
V_C	Clamping voltage @ I_{PP}
V_{RWM}	Reverse stand-off voltage
I_R	Reverse leakage current @ V_{RWM}
V_{BR}	Reverse leakage current @ V_{RWM}
I_T	Test current



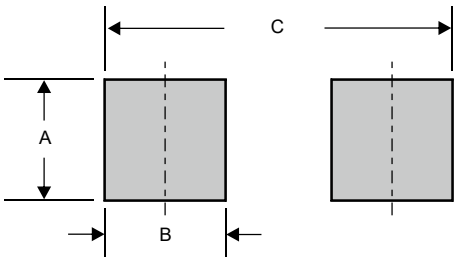
Pinning information

Pin	Simplified outline	Symbol
Bi-directional		

Marking

Type number	Marking code
ESDH3Z12C	12B

Suggested solder pad layout

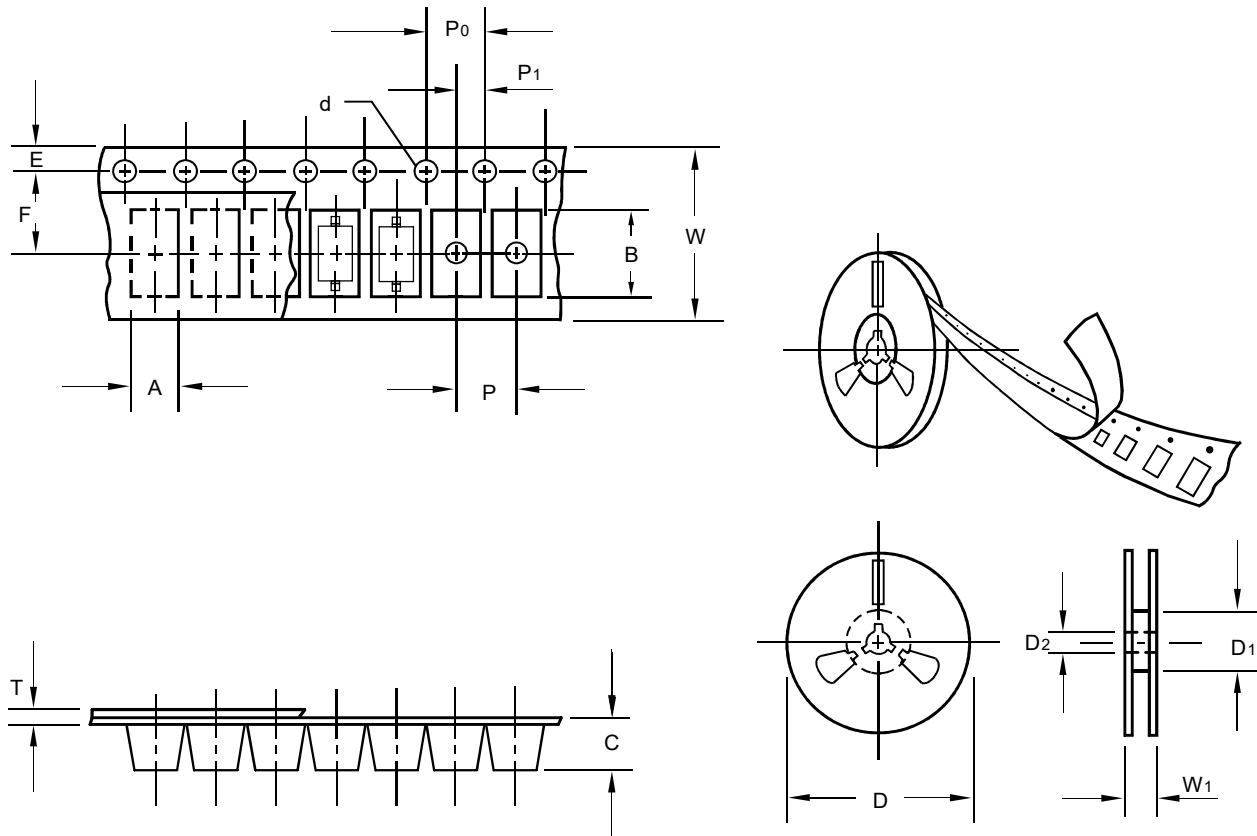


Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SOD-323F	0.031 (0.80)	0.031 (0.80)	0.118 (3.00)

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Packing information



unit:mm

Item	Symbol	Tolerance	SOD-323F
Carrier width	A	0.1	1.48
Carrier length	B	0.1	3.30
Carrier depth	C	0.1	1.25
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D ₁	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D ₁	min	55.00
Feed hole diameter	D ₂	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P ₀	0.1	4.00
Embossment center	P ₁	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W ₁	1.0	9.50

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

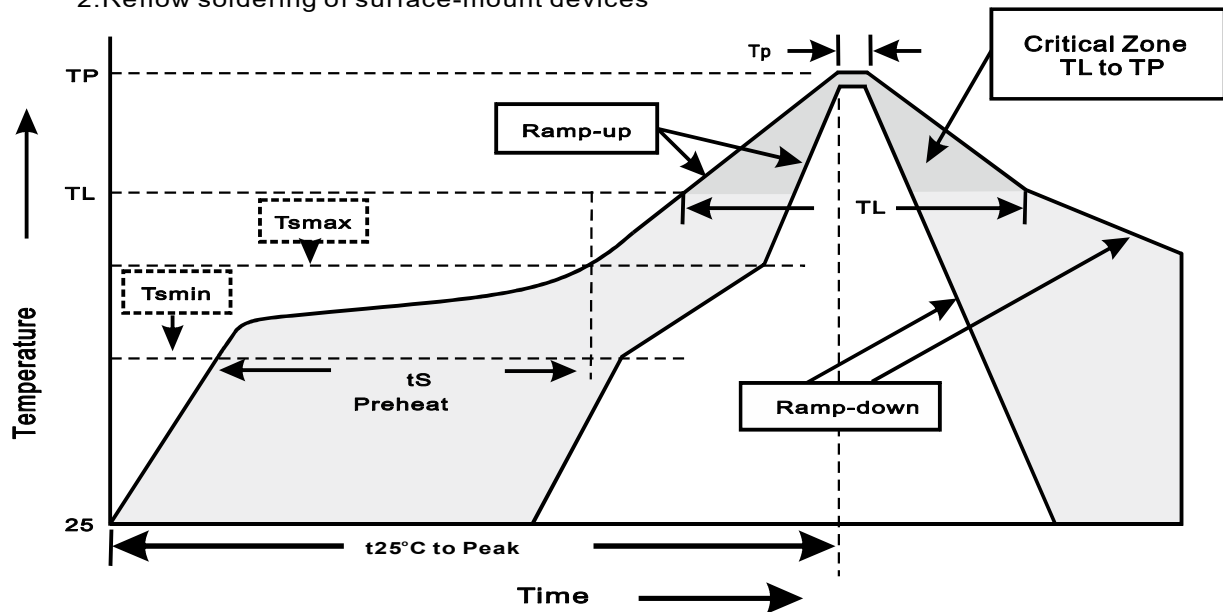
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Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)
SOD-323F	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000

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 _{sm}) -Temperature Max(T _{smax}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smax} to T _L -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T _L) -Time(t _L)	217°C 60~260sec
Peak Temperature(T _P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t _P)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes