

ESDH3Z15C-Q1

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Surface Mount Bi-Directional TVS For ESD Protection Diode : 15V

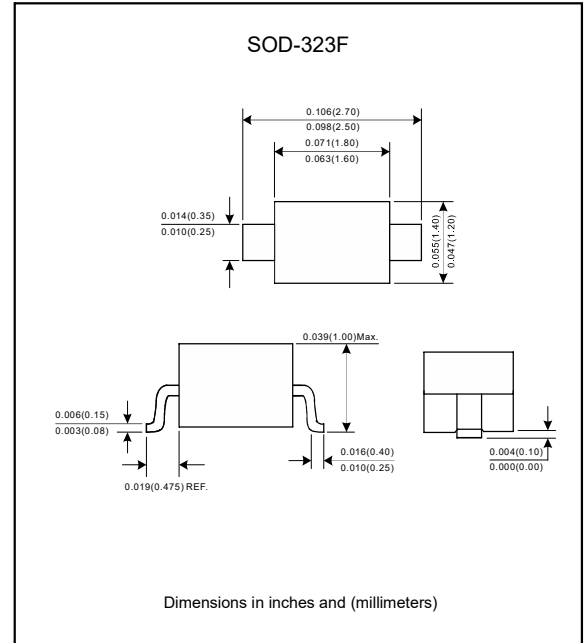
Features

- 420 Watts Peak Pulse Power per Line (8/20 μ s).
- Replacement for MLV (0805).
- Protects one I/O or power line.
- Complies with following standards:
- IEC 61000-4-2 (ESD) immunity test : Air discharge: ± 30 kV.
Contact discharge: ± 30 kV.
- IEC61000-4-5 (Lightning) 12A (8/20 μ s).
- IEC 61000-4-4 (EFT) 40A (5/50ns).
- AEC-Q101 Qualified.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.ESDH3Z15C-Q1-H.

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.
- Weight : Approximated 0.005 gram.

Package outline



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

Parameter	Symbol	Value	Unit
Peak pulse power ($t_p = 8/20\mu\text{s}$)	P_{PK}	420	W
Peak Pulse Current ($t_p = 8/20\mu\text{s}$), (Pin 1 to Pin 2)	I_{PP}	12	A
ESD Per IEC 61000-4-2 (Air)	V_{ESD}	± 30	KV
ESD Per IEC 61000-4-2 (Contact)		± 30	
Operating temperature range	T_J	-55 to +125	$^{\circ}\text{C}$
Storage temperature range	T_{STG}	-55 to +150	$^{\circ}\text{C}$

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse working voltage	V_{RWM}				15	V
Breakdown voltage	V_{BR}	$I_T = 1\text{mA}$	16.7		20	V
Reverse leakage current	I_R	$V_{RWM} = 15\text{V}$			200	nA
Clamping voltage	V_C	$I_{PP} = 12\text{A}$ ($t_p = 8/20\mu\text{s}$)		30	35	V
Dynamic resistance (Note 1, 2)	R_{DYN}	TLP=0.2/100ns		0.4		Ω
ESD Clamping Voltage (Note 1)	V_{ESD}	$I_{PP} = 4\text{A}$, $t_p = 0.2/100\text{ns}$ (TLP)		19.8		V
		$I_{PP} = 16\text{A}$, $t_p = 0.2/100\text{ns}$ (TLP)		25		
Junction capacitance	C_J	$V_R = 0\text{V}$, $f = 1\text{MHz}$		30	40	pF

Note : 1. TLP Setting : $t_p=100\text{ns}$, $t_r=0.2\text{ns}$, I_{TLp} and V_{TLp} sample window : $t_1=70\text{ns}$ to $t_2=90\text{ns}$.
2. Dynamic resistance calculated from $I_{PP}=4\text{A}$ to $I_{PP}=16\text{A}$ using "Best Fit".

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Rating and characteristic curves

Figure 1: Peak Pulse Power vs. Pulse Time

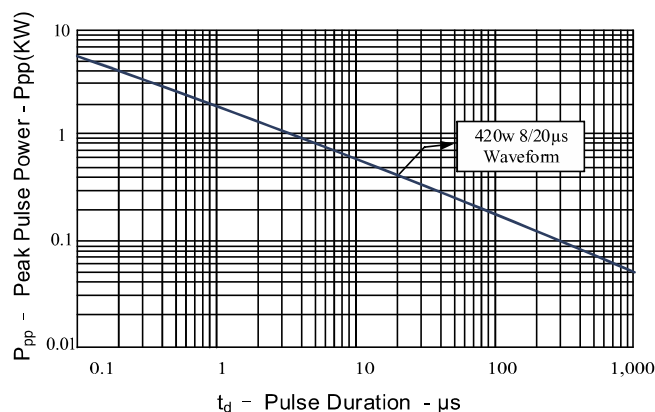


Figure 2: Power Derating Curve

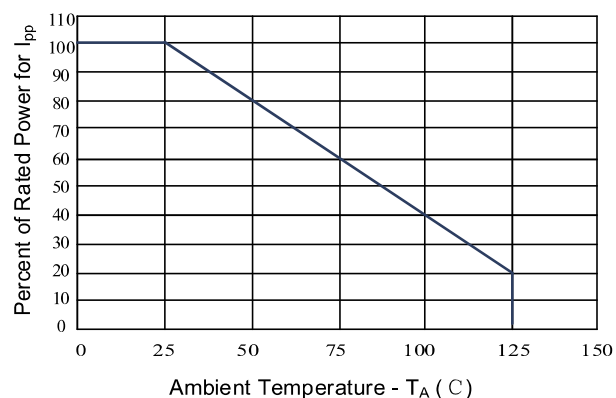


Figure 3: Clamping Voltage vs. Peak Pulse Current

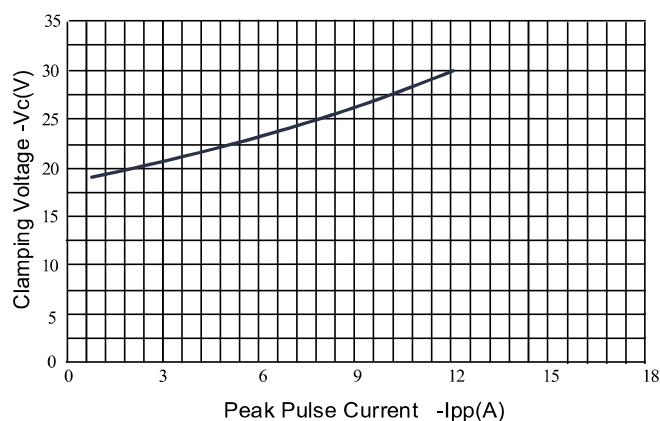


Figure 4: Normalized Junction Capacitance vs. Reverse Voltage

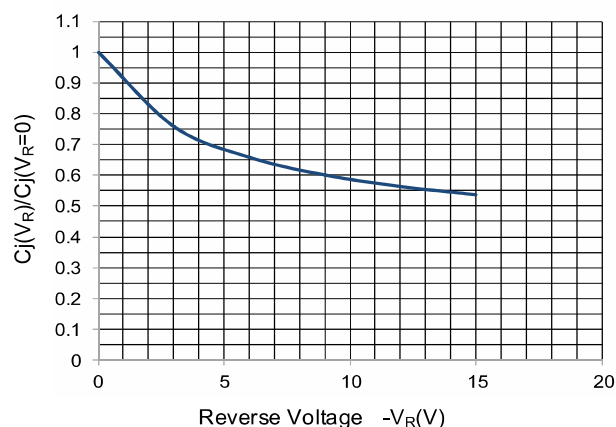


Figure 5: TLP Positive I-V Curve

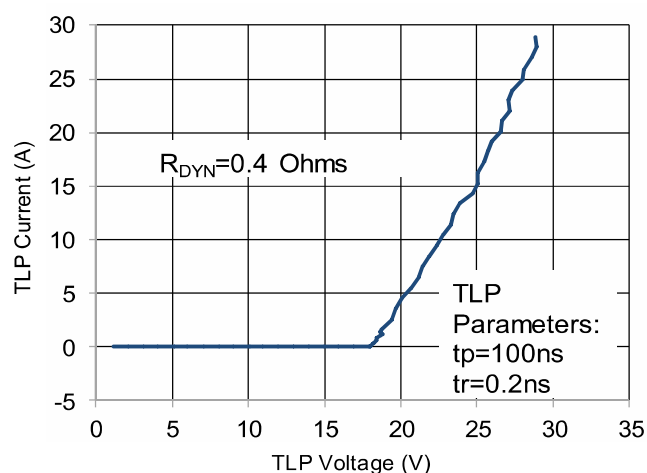
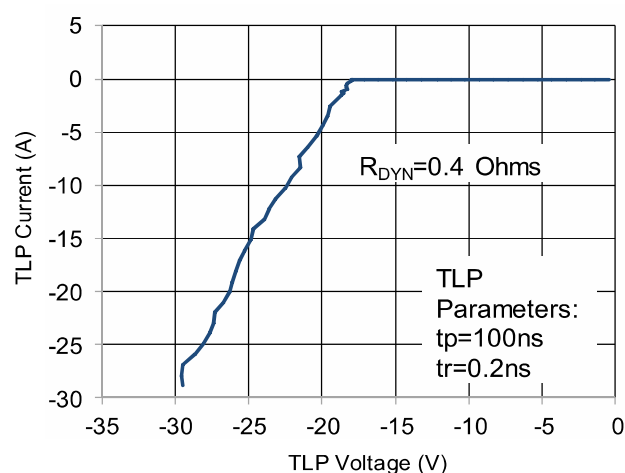


Figure 6: TLP Negative I-V Curve

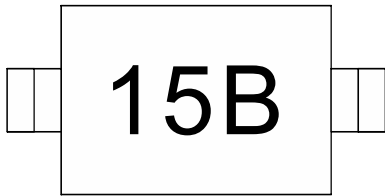


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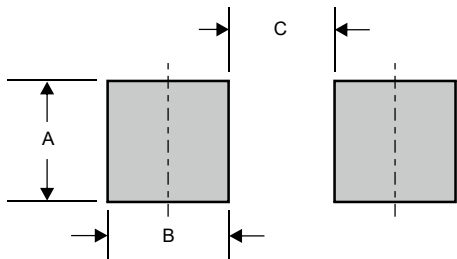
Pinning information

Simplified outline	Symbol
	

Marking



Suggested solder pad layout

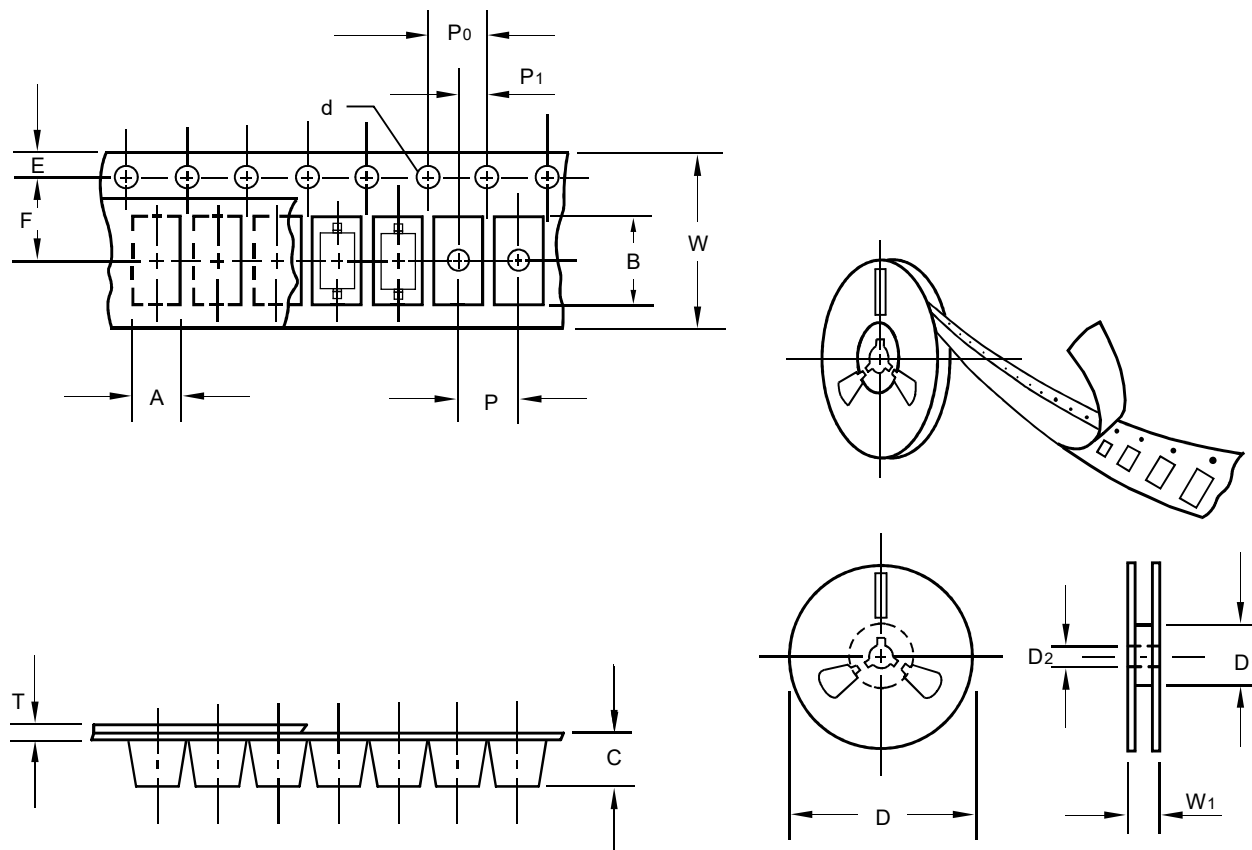


Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SOD-323F	0.031 (0.80)	0.031 (0.80)	0.056 (1.40)

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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.

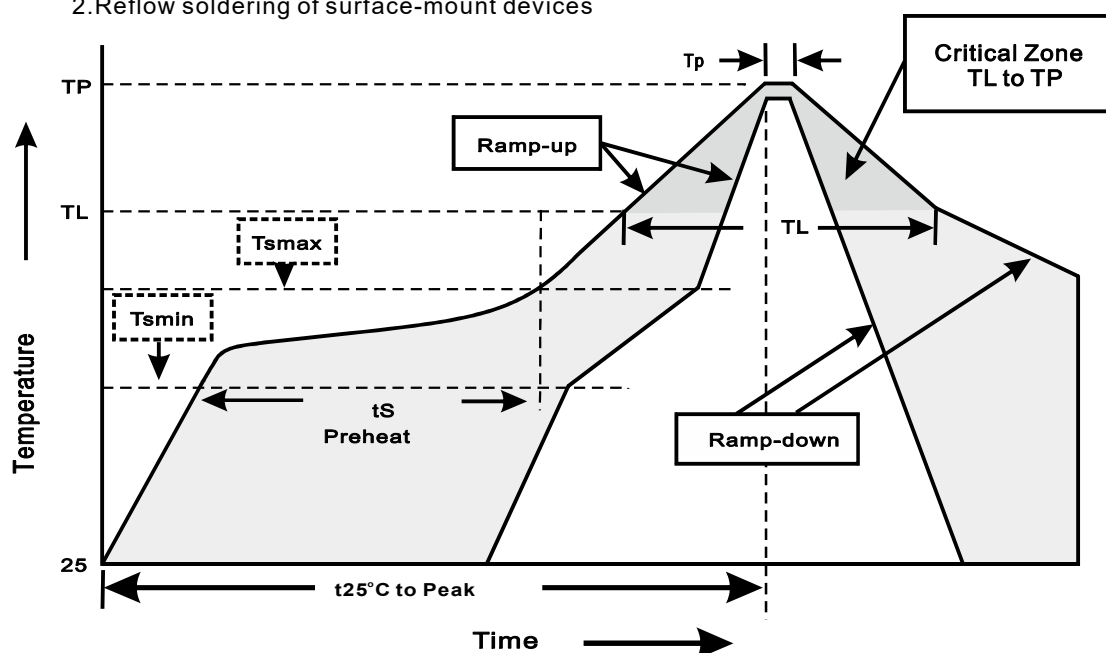
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Reel packing

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)	APPROX. GROSS WEIGHT (kg)
SOD-323F	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	8.0

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}) -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