

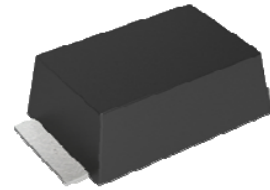
Transient Voltage Suppressor

Version: A6 2023-8-22

Features

- IEC 61000-4-2(ESD) $\pm 30\text{KV}$ (air), $\pm 30\text{KV}$ (contact)
- 200 Watts peak pulse power ($t_p=10/1000\mu\text{S}$)
- 1000 Watts peak pulse power ($t_p=8/20\mu\text{S}$)
- Low clamping voltage
- Weight 15mg (Approximate)
- Moisture sensitivity level: Level 1
- Small package: SOD123-F
- Working voltage: 5-220V

Exterior



SOD123-F

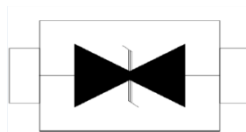
Application information

- DC power port

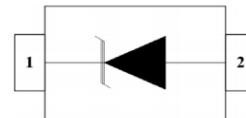
Agency Approvals

Icon	Description
RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003

Schematic



BI-directional



UNI-directional

Part Number and Electrical Parameter

Part Number		Marking		V_{DRM}	V_{BR}	V_{BR}	I_{R}	$V_{\text{C}}@I_{\text{PP}}^{\text{①}}$	$I_{\text{PP}}^{\text{①}}$	$I_{\text{DRM}}@$
BI	UNI	BI	UNI	(V)	min.(V)	max.(V)	(mA)	(V)	(A)	V_{DRM}
BV-D105ZCF	BV-D105ZF	AE	AE	5	6.4	7	10	9.2	21.8	800
BV-D106ZCF	BV-D106ZF	AG	AG	6	6.67	7.37	10	10.3	19.4	800
BV-D16.5ZCF	BV-D16.5ZF	AK	AK	6.5	7.22	7.98	10	11.2	17.9	300
BV-D107ZCF	BV-D107ZF	AM	AM	7	7.78	8.6	10	12	16.7	200
BV-D17.5ZCF	BV-D17.5ZF	AP	AP	7.5	8.33	9.21	1	12.9	15.5	100
BV-D108ZCF	BV-D108ZF	AR	AR	8	8.89	9.83	1	13.6	14.7	50
BV-D18.5ZCF	BV-D18.5ZF	AT	AT	8.5	9.44	10.4	1	14.4	13.9	20
BV-D109ZCF	BV-D109ZF	AV	AV	9	10	11.1	1	15.4	13	10
BV-D110ZCF	BV-D110ZF	AX	AX	10	11.1	12.3	1	17	11.8	5
BV-D111ZCF	BV-D111ZF	AZ	AZ	11	12.2	13.5	1	18.2	11	3
BV-D112ZCF	BV-D112ZF	BE	BE	12	13.3	14.7	1	19.9	10.1	1
BV-D113ZCF	BV-D113ZF	BG	BG	13	14.4	15.9	1	21.5	9.3	1
BV-D114ZCF	BV-D114ZF	BK	BK	14	15.6	17.2	1	23.2	8.6	1
BV-D115ZCF	BV-D115ZF	BM	BM	15	16.7	18.5	1	24.4	8.2	1

Part Number		Marking		V _{DRM} (V)	V _{BR} min.(V)	V _{BR} max.(V)	I _R (mA)	V _{C@I_{PP}} ^① (V)	I _{PP} ^① (A)	I _{DRM@} V _{DRM} (uA)
BI	UNI	BI	UNI							
BV-D116ZCF	BV-D116ZF	BP	BP	16	17.8	19.7	1	26	7.7	1
BV-D117ZCF	BV-D117ZF	BR	BR	17	18.9	20.9	1	27.6	7.3	1
BV-D118ZCF	BV-D118ZF	BT	BT	18	20	22.1	1	29.2	6.9	1
BV-D120ZCF	BV-D120ZF	BV	BV	20	22.2	24.5	1	32.4	6.2	1
BV-D122ZCF	BV-D122ZF	BX	BX	22	24.4	26.9	1	35.5	5.7	1
BV-D124ZCF	BV-D124ZF	BZ	BZ	24	26.7	29.5	1	38.9	5.2	1
BV-D126ZCF	BV-D126ZF	CE	CE	26	28.9	31.9	1	42.1	4.8	1
BV-D128ZCF	BV-D128ZF	CG	CG	28	31.1	34.4	1	45.4	4.4	1
BV-D130ZCF	BV-D130ZF	CK	CK	30	33.3	36.8	1	48.4	4.2	1
BV-D133ZCF	BV-D133ZF	CM	CM	33	36.7	40.6	1	53.3	3.8	1
BV-D136ZCF	BV-D136ZF	CP	CP	36	40	44.2	1	58.1	3.5	1
BV-D140ZCF	BV-D140ZF	CR	CR	40	44.4	49.1	1	64.5	3.1	1
BV-D143ZCF	BV-D143ZF	CT	CT	43	47.8	52.8	1	69.4	2.9	1
BV-D145ZCF	BV-D145ZF	CV	CV	45	50	55.3	1	72.7	2.8	1
BV-D148ZCF	BV-D148ZF	CX	CX	48	53.3	58.9	1	77.4	2.6	1
BV-D151ZCF	BV-D151ZF	CZ	CZ	51	56.7	62.7	1	82.4	2.5	1
BV-D154ZCF	BV-D154ZF	DE	DE	54	60	66.3	1	87.1	2.3	1
BV-D158ZCF	BV-D158ZF	DG	DG	58	64.4	71.2	1	93.6	2.3	1
BV-D160ZCF	BV-D160ZF	DK	DK	60	66.7	73.7	1	96.8	2.1	1
BV-D164ZCF	BV-D164ZF	DM	DM	64	71.1	78.6	1	103	2	1
BV-D170ZCF	BV-D170ZF	DP	DP	70	77.8	86	1	113	1.8	1
BV-D175ZCF	BV-D175ZF	DR	DR	75	83.3	92.1	1	121	1.7	1
BV-D178ZCF	BV-D178ZF	DT	DT	78	86.7	95.8	1	126	1.6	1
BV-D185ZCF	BV-D185ZF	DV	DV	85	94.4	104	1	137	1.5	1
BV-D190ZCF	BV-D190ZF	DX	DX	90	100	111	1	146	1.4	1
BV-D1100ZCF	BV-D1100ZF	DZ	DZ	100	111	123	1	162	1.3	1
BV-D1110ZCF	BV-D1110ZF	EE	EE	110	122	135	1	177	1.2	1
BV-D1120ZCF	BV-D1120ZF	EG	EG	120	133	147	1	193	1.1	1
BV-D1130ZCF	BV-D1130ZF	EK	EK	130	144	159	1	209	1	1
BV-D1150ZCF	BV-D1150ZF	EM	EM	150	167	185	1	243	0.8	1
BV-D1160ZCF	BV-D1160ZF	EP	EP	160	178	197	1	259	0.8	1
BV-D1170ZCF	BV-D1170ZF	ER	ER	170	189	209	1	275	0.8	1
BV-D1220ZCF	BV-D1220ZF	FE	FE	220	246	272	1	356	0.56	1

Absolute maximum ratings measured at T= 25°C RH = 45%-75% (unless otherwise noted).

① Surge Waveform: 10/1000μS

Transient Voltage Suppressor

Part Numbering System

BV D1 XX Z C F

(1) (2) (3) (4) (5) (6)

(1) Bencent Transient Voltage Suppressor

(2) Package: SOD123-F

(3) Off-state Voltage: 5-220V

(4) Normal Capacitance

(5) Bidirectional, Unidirectional Polarity omitted

(6) Bencent internal code

Mark

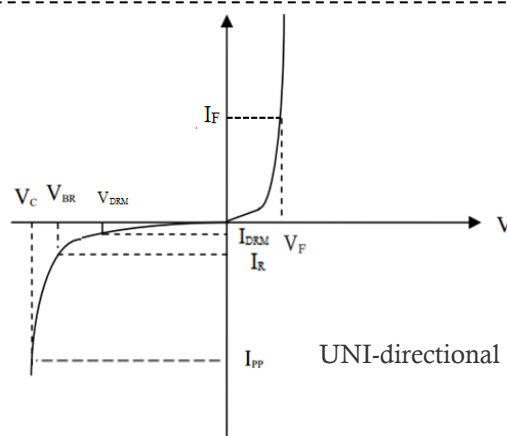
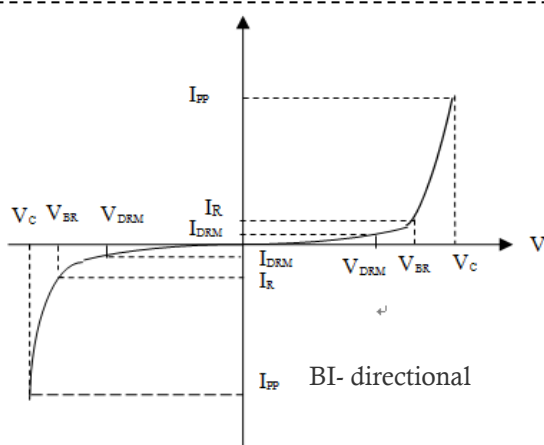


BI-directional



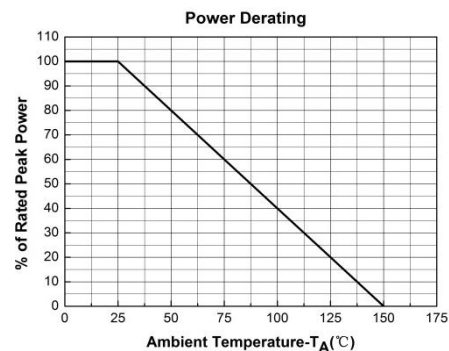
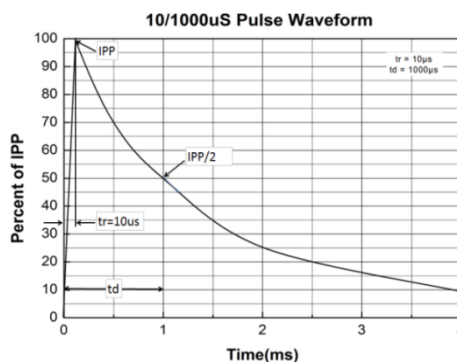
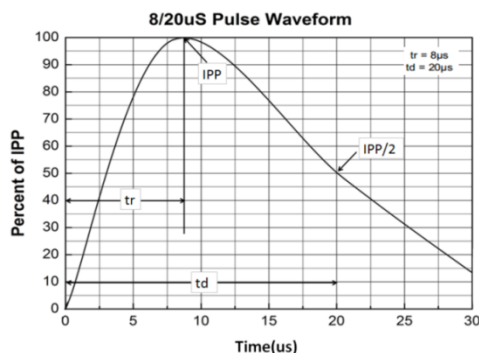
UNI-directional

V-I Curve



Parameters	Definition
V_C	Clamping voltage
I_{PP}	Surge waveform 10/1000 μ s
V_{DRM}	Stand-off Voltage
V_{BR}	Breakdown Voltage
I_{DRM}	Reverse Leakage Current
I_R	Test current
P_{PP}	Peak Pulse Power Dissipation
V_F	Forward on-state voltage
I_F	Forward current

Typical Characteristics



Transient Voltage Suppressor

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Thermal Considerations

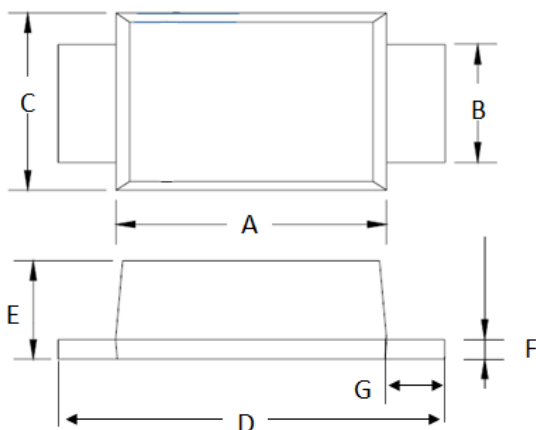
symbol	Parameter	Value	Unit
T_J	Operating Junction Temperature Range	-55to +150	°C
T_S	Storage Temperature Range	-55 to +150	°C

Environmental Characteristics

Testing items	Technical standards
High temperature Reverse Bias Test	Temperature: $125\pm3^{\circ}\text{C}$ Bias= $80\%V_{\text{DRM}}$ Time:168H
High Temperature Life Test	Temperature: 150°C Time:168H
High-low Temperature Cycle test	Temperature: From -40°C to 125°C Dwell time : 30min,10cycles
High Temperature &High Humidity Test	Temperature: 85°C Humidity:85% Time:168H
Pressure cooker Test	Temperature: 121°C , 2atm. Humidity:100% Time:24H
Resistance of soldering heat	Temperature: $260\pm5^{\circ}\text{C}$ Time of dip soldering: 10s, 3times

Note: The above testing items can be specified by customer's special request

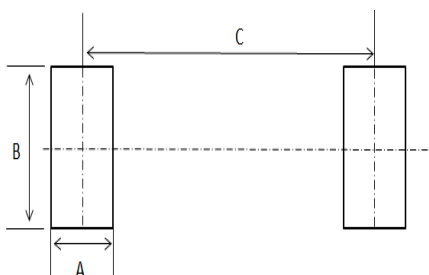
Product Dimensions



SOD123-F

REF	mm	inch
A	2.50~2.90	0.098~0.114
B	0.80~1.20	0.031~0.047
C	1.70~1.90	0.067~0.075
D	3.50~3.90	0.138~0.154
E	0.80~1.20	0.031~0.047
F	0.10~0.30	0.004~0.012
G	0.50TYP	0.020TYP

Recommended Soldering Pad



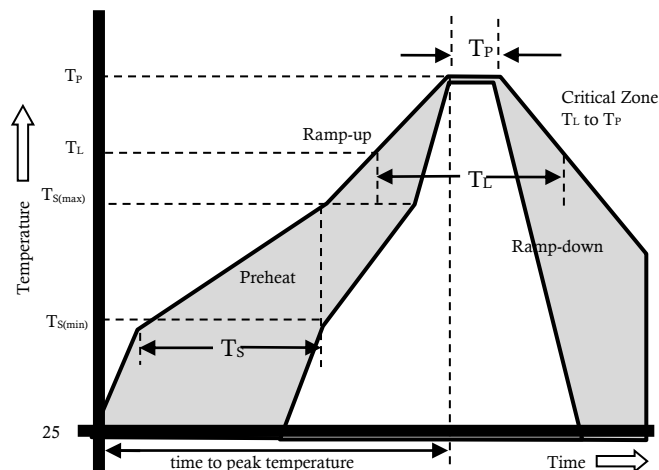
REF	mm	inch
A	1.3	0.051
B	1.6	0.063
C	3	0.118

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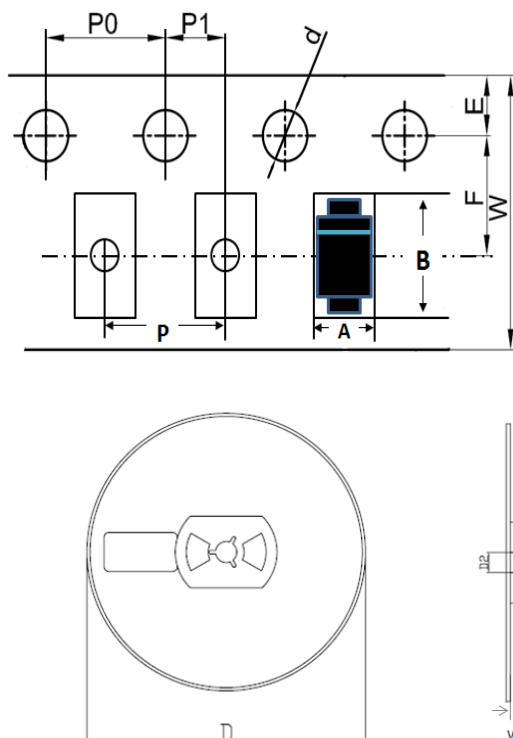
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Reflow Profile

Reflow Condition		Pb-Free assembly
Pre Heat	Temperature Min	150°C
	Temperature Max	200°C
	Time (min to max)	60 – 180 secs
Average ramp up rate (Liquid)		3°C/s max
Tamp (T _L) to peal		
T _S (max) to T _L - Ramp-up Rate		3°C/s max
Reflow	- Temperature (T _L) (Liquid)	217°C
	- Temperature (T _L)	60 – 150 secs
Peak Temperature (T _P)		260+0/-5 °C
Time within 5°C of actual peak Temperature (T _P)		30secs
Ramp-down Rate		6°C/s max
Time 25°C to peak Temperature (T _P)		8 mins max.
Do not exceed		260°C



Package Reel Information



REF	mm	inch
A	2.10+/-0.30	0.083+/-0.012
B	4.10+/-0.30	0.161+/-0.012
d	1.50+0.1/-0	0.059+0.004/-0
D	178.00+/-2.00	7.008+/-0.079
D1	55.00+/-3.00	2.165+/-0.118
D2	13.00+/-0.50	0.512+/-0.020
E	1.75+/-0.10	0.069+/-0.004
F	3.50+/-0.20	0.138+/-0.008
P	4.00+/-0.20	0.157+/-0.008
P0	4.00+/-0.20	0.157+/-0.008
P1	2.00+/-0.20	0.079+/-0.008
W	8.00+/-0.20	0.315+/-0.008
W1	9.50+/-1.00	0.374+/-0.039

OUTLINE	REEL (PCS)	PER CARTON (PCS)	REEL DIAMETERS (mm)	CARTON SIZE(mm)		
				L	W	H
TAPING	3,000	90,000	178	390	370	220