

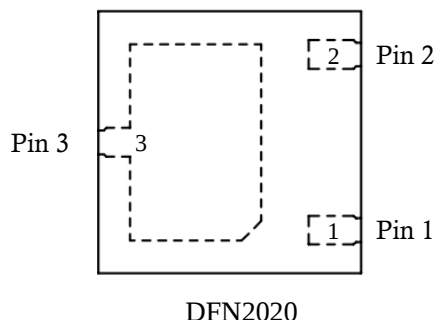
Transient Voltage Suppressor

Version: A2 2024-8-8

Features

- IEC 61000-4-2(ESD)±30KV(air), ±30KV(contact)
- IEC61000-4-5(Lightning) 200A (8/20μS)
- IEC61000-4-4(EFT) 40A (5/50nS)
- 6600 Watts peak pulse power (tp=8/20μS)
- Low clamping voltage
- Package: DFN2020
- Weight 8.0 mg (Approximate)
- Moisture sensitivity level: Level 1

Exterior (top view)



Application information

- Cellular Phones
- Parallel & Serial Port Protection
- Personal Digital Assistant (PDA)
- Microcontroller Input Protection
- Charger Protection

Package (top view)



Agency Approvals

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

Schematic



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Part Number and Electrical Parameter

Part Number	$I_{DRM}@V_{DRM}$		$V_{BR}^{①}@I_R$		$V_C@I_{PP}^{②}$		$RDYN@TLP^{③}$	$V_C@I_{PP} TLP^{③}$		$C_O^{④}$
	μA	V	V	mA	V	A	Ω	V	A	pF
	MAX		MIN		MAX		TYP	TYP		TYP
BV-FM12ZS	1	12	13	1	33	200	0.018	15	16	1500

Absolute maximum ratings measured at $T = 25^{\circ}C$ RH = 45%-75% (unless otherwise noted).

- ① V_{BR} is measured at $I_R=1mA$, pin3 to pin1 and pin2.
 ② Surge Waveform: 8/20 μ S, pin3 to pin1 and pin2.
 ③ TLP parameter: $Z_0 = 50\Omega$, $t_p = 100ns$, $t_r = 1ns$, $RDYN$ is calculated from 4A to 16A.
 ④ Off-state capacitance is measured in $V_{DC}=0V, V_{RMS}=0.3V, f=1MHz$

Part Numbering System

BV FM 12 Z S
(1) (2) (3) (4) (5)

- (1) Bencent Transient Voltage Suppressor
 (2) Package:DFN2020
 (3) Off-state Voltage: 12V
 (4) Normal Capacitance (Unidirectional Polarity omitted)
 (5) Bencent internal code

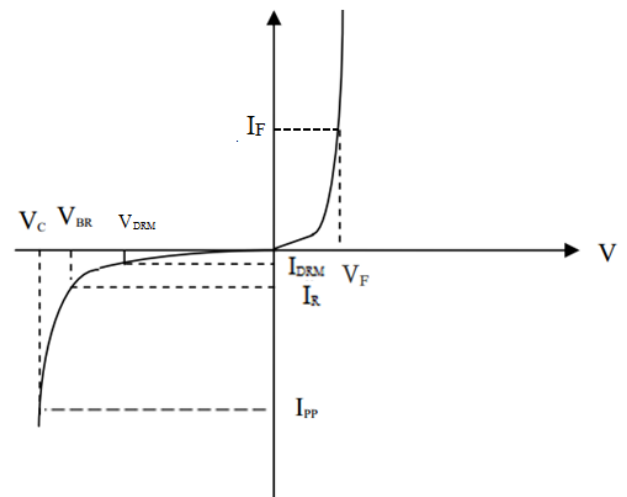
Mark



U12Z: Part Number

V-I Curve

Parameters	Definition
V_C	Clamping voltage
I_{PP}	Surge waveform 8/20 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



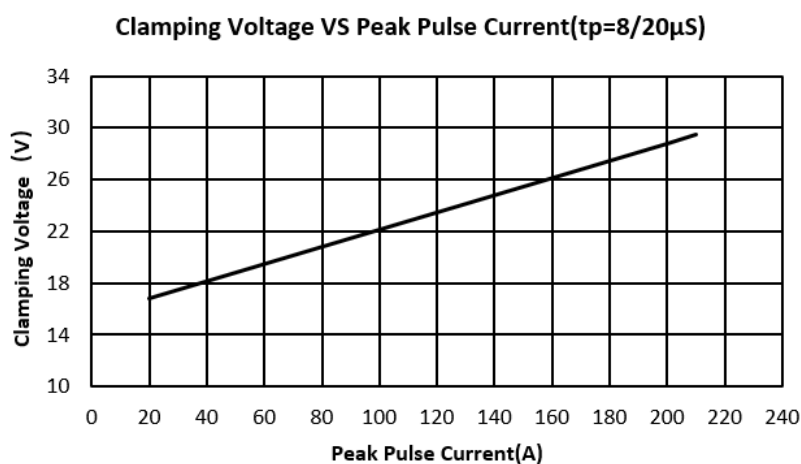
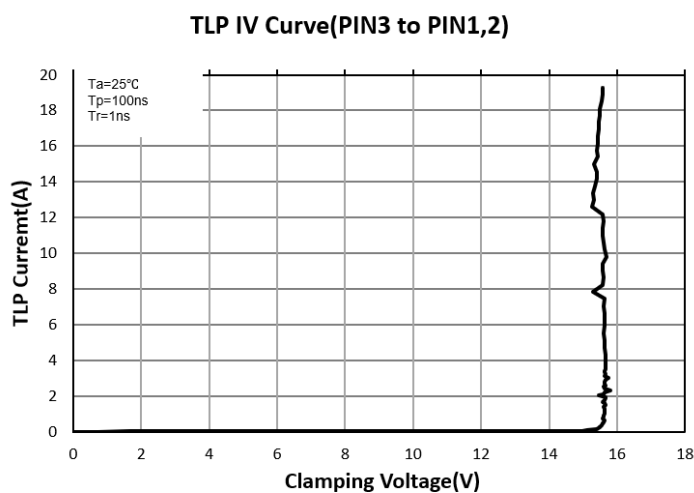
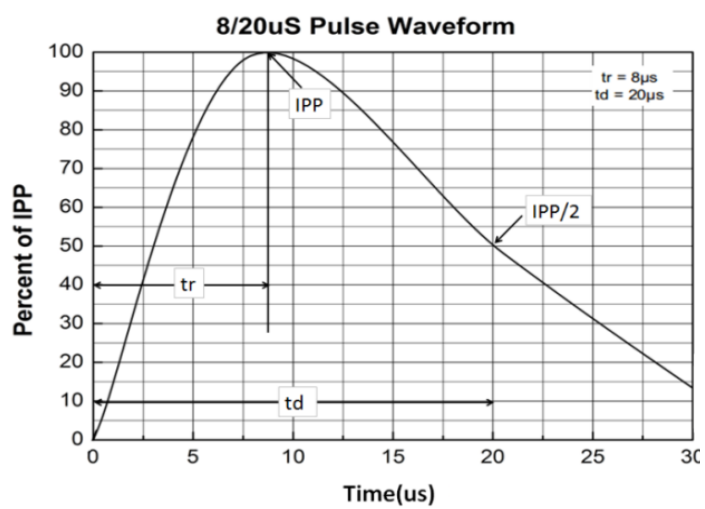
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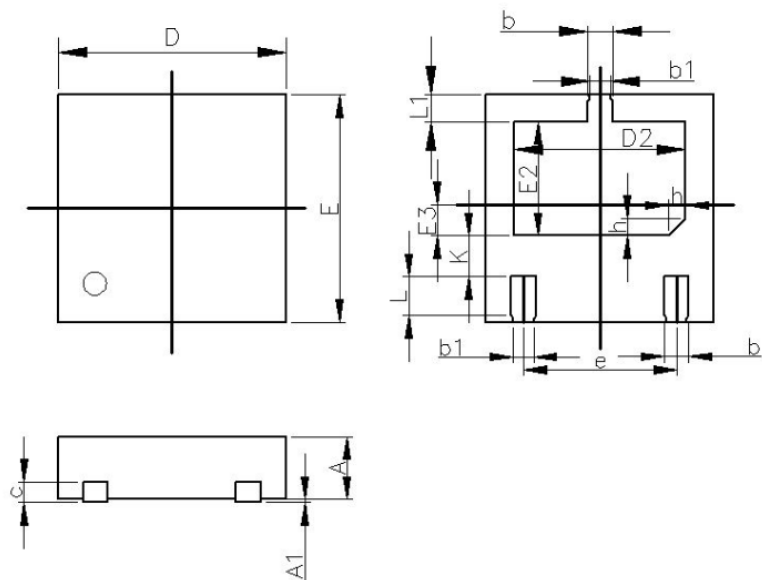
Thermal Considerations

symbol	Parameter	Value	Unit
T_J	Operating Junction Temperature Range	-40 to +125	°C
T_S	Storage Temperature Range	-55 to +150	°C

Typical Characteristics

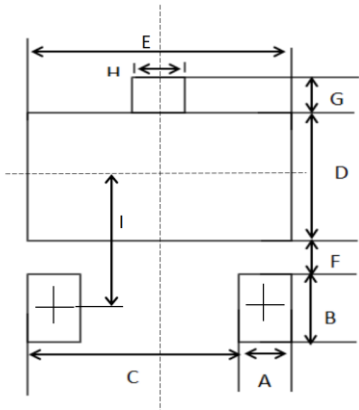


Product Dimensions



REF	mm	inch
A	0.50~0.60	0.020~0.024
A1	0.00~0.05	0.000~0.002
b	0.25~0.35	0.010~0.014
b1	0.20REF	0.008REF
c	0.152REF	0.006REF
D	1.90~2.10	0.075~0.083
D2	1.40~1.60	0.055~0.063
e	1.3BSC	0.051BSC
E	1.90~2.10	0.075~0.083
E2	0.95~1.15	0.037~0.045
E3	0.20~0.40	0.008~0.016
L	0.35~0.45	0.014~0.018
L1	0.20~0.30	0.008~0.012
h	0.20REF	0.008REF
K	0.20~0.40	0.008~0.016

Recommended Soldering Pad



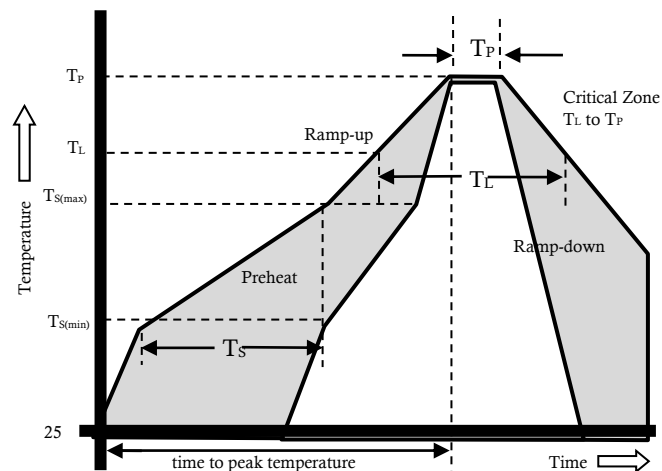
REF	mm	inch
A	0.4	0.016
B	0.6	0.024
C	1.3	0.051
D	1.1	0.043
E	1.7	0.067
F	0.15	0.006
G	0.25	0.010
H	0.4	0.016
I	1.0	0.039

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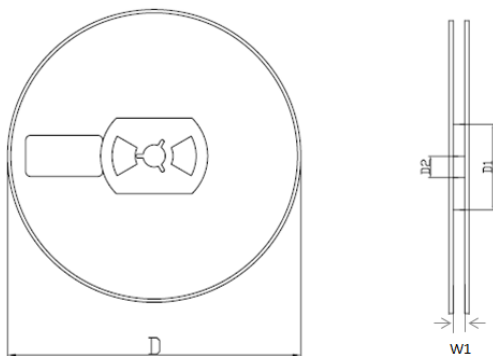
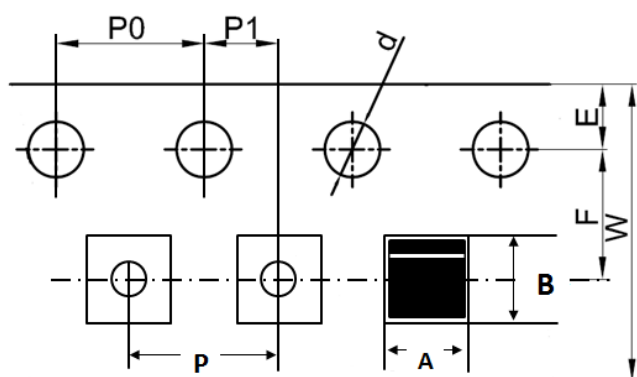
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Reflow Profile

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) T _{amp} (T _L) to peak		3°C/s max
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	2.25+/-0.10	0.089+/-0.004
B	2.25+/-0.10	0.089+/-0.004
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	380	220	205