

Features

- IEC 61000-4-2(ESD) $\pm 30\text{KV}$ (air), $\pm 30\text{KV}$ (contact)
- 600Watts peak pulse power ($t_p=10/1000\mu\text{S}$)
- Quick response to surge voltage
- Low clamping voltage
- Moisture sensitivity level: level 1
- AEC-Q101 qualified.

Application Information

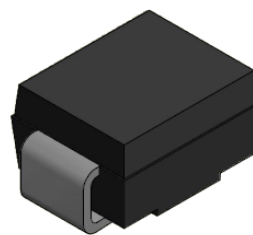
- DC Port
- RS485/232/422
- I/O Port

Schematic Symbol



BI-directional

Exterior



DO-214AA (SMB)

Agency Approvals

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



UNI-directional

Part Numbering and Electrical Parameter

Part Number		Marking		VR	VBR	VBR	It	Vc@IPP ^①	IPP ^①	IR@VR
BI	UNI	BI	UNI	(V)	min.(V)	max.(V)	(mA)	(V)	(A)	(uA)
BV-SMBJ5CAQ	BV-SMBJ5AQ	B5C	B5	5	6.4	7	10	9.2	65.3	800
BV-SMBJ6CAQ	BV-SMBJ6AQ	B6C	B6	6	6.67	7.37	10	10.3	58.3	800
BV-SMBJ6.5CAQ	BV-SMBJ6.5AQ	B6.5C	B6.5	6.5	7.22	7.98	10	11.2	53.6	500
BV-SMBJ7CAQ	BV-SMBJ7AQ	B7C	B7	7	7.78	8.6	10	12	50	200
BV-SMBJ7.5CAQ	BV-SMBJ7.5AQ	B7.5C	B7.5	7.5	8.33	9.21	1	12.9	46.6	100
BV-SMBJ8CAQ	BV-SMBJ8AQ	B8C	B8	8	8.89	9.83	1	13.6	44.2	50
BV-SMBJ8.5CAQ	BV-SMBJ8.5AQ	B8.5C	B8.5	8.5	9.44	10.4	1	14.4	41.7	20
BV-SMBJ9CAQ	BV-SMBJ9AQ	B9C	B9	9	10	11.1	1	15.4	39	10
BV-SMBJ10CAQ	BV-SMBJ10AQ	B10C	B10	10	11.1	12.3	1	17	35.3	5
BV-SMBJ11CAQ	BV-SMBJ11AQ	B11C	B11	11	12.2	13.5	1	18.2	33	1
BV-SMBJ12CAQ	BV-SMBJ12AQ	B12C	B12	12	13.3	14.7	1	19.9	30.2	1
BV-SMBJ13CAQ	BV-SMBJ13AQ	B13C	B13	13	14.4	15.9	1	21.5	28	1
BV-SMBJ14CAQ	BV-SMBJ14AQ	B14C	B14	14	15.6	17.2	1	23.2	25.9	1
BV-SMBJ15CAQ	BV-SMBJ15AQ	B15C	B15	15	16.7	18.5	1	24.4	24.6	1
BV-SMBJ16CAQ	BV-SMBJ16AQ	B16C	B16	16	17.8	19.7	1	26	23.1	1
BV-SMBJ17CAQ	BV-SMBJ17AQ	B17C	B17	17	18.9	20.9	1	27.6	21.8	1
BV-SMBJ18CAQ	BV-SMBJ18AQ	B18C	B18	18	20	22.1	1	29.2	20.6	1
BV-SMBJ20CAQ	BV-SMBJ20AQ	B20C	B20	20	22.2	24.5	1	32.4	18.6	1

Part Number		Marking		VR	VBR	VBR	It	Vc@Ipp ^①	IPP ^①	IR@VR
BI	UNI	BI	UNI	(V)	min.(V)	max.(V)	(mA)	(V)	(A)	(uA)
BV-SMBJ22CAQ	BV-SMBJ22AQ	B22C	B22	22	24.4	26.9	1	35.5	16.9	1
BV-SMBJ24CAQ	BV-SMBJ24AQ	B24C	B24	24	26.7	29.5	1	38.9	15.5	1
BV-SMBJ26CAQ	BV-SMBJ26AQ	B26C	B26	26	28.9	31.9	1	42.1	14.3	1
BV-SMBJ28CAQ	BV-SMBJ28AQ	B28C	B28	28	31.1	34.4	1	45.4	13.3	1
BV-SMBJ30CAQ	BV-SMBJ30AQ	B30C	B30	30	33.3	36.8	1	48.4	12.4	1
BV-SMBJ33CAQ	BV-SMBJ33AQ	B33C	B33	33	36.7	40.6	1	53.3	11.3	1
BV-SMBJ36CAQ	BV-SMBJ36AQ	B36C	B36	36	40	44.2	1	58.1	10.4	1
BV-SMBJ40CAQ	BV-SMBJ40AQ	B40C	B40	40	44.4	49.1	1	64.5	9.3	1
BV-SMBJ43CAQ	BV-SMBJ43AQ	B43C	B43	43	47.8	52.8	1	69.4	8.7	1
BV-SMBJ45CAQ	BV-SMBJ45AQ	B45C	B45	45	50	55.3	1	72.7	8.3	1
BV-SMBJ48CAQ	BV-SMBJ48AQ	B48C	B48	48	53.3	58.9	1	77.4	7.8	1
BV-SMBJ51CAQ	BV-SMBJ51AQ	B51C	B51	51	56.7	62.7	1	82.4	7.3	1
BV-SMBJ54CAQ	BV-SMBJ54AQ	B54C	B54	54	60	66.3	1	87.1	6.9	1
BV-SMBJ58CAQ	BV-SMBJ58AQ	B58C	B58	58	64.4	71.2	1	93.6	6.5	1
BV-SMBJ60CAQ	BV-SMBJ60AQ	B60C	B60	60	66.7	73.7	1	96.8	6.2	1
BV-SMBJ64CAQ	BV-SMBJ64AQ	B64C	B64	64	71.1	78.6	1	103	5.9	1
BV-SMBJ70CAQ	BV-SMBJ70AQ	B70C	B70	70	77.8	86	1	113	5.3	1
BV-SMBJ75CAQ	BV-SMBJ75AQ	B75C	B75	75	83.3	92.1	1	121	5	1
BV-SMBJ78CAQ	BV-SMBJ78AQ	B78C	B78	78	86.7	95.8	1	126	4.8	1
BV-SMBJ85CAQ	BV-SMBJ85AQ	B85C	B85	85	94.4	104	1	137	4.4	1
BV-SMBJ90CAQ	BV-SMBJ90AQ	B90C	B90	90	100	111	1	146	4.1	1
BV-SMBJ100CAQ	BV-SMBJ100AQ	B100C	B100	100	111	123	1	162	3.7	1
BV-SMBJ110CAQ	BV-SMBJ110AQ	B110C	B110	110	122	135	1	177	3.4	1
BV-SMBJ120CAQ	BV-SMBJ120AQ	B120C	B120	120	133	147	1	193	3.1	1
BV-SMBJ130CAQ	BV-SMBJ130AQ	B130C	B130	130	144	159	1	209	2.9	1
BV-SMBJ150CAQ	BV-SMBJ150AQ	B150C	B150	150	167	185	1	243	2.5	1
BV-SMBJ160CAQ	BV-SMBJ160AQ	B160C	B160	160	178	197	1	259	2.3	1
BV-SMBJ170CAQ	BV-SMBJ170AQ	B170C	B170	170	189	209	1	275	2.2	1
BV-SMBJ180CAQ	BV-SMBJ180AQ	B180C	B180	180	201	222	1	292	2.1	1
BV-SMBJ188CAQ	BV-SMBJ188AQ	B188C	B188	188	209	231	1	304	2.0	1
BV-SMBJ200CAQ	BV-SMBJ200AQ	B200C	B200	200	224	247	1	324	1.9	1
BV-SMBJ220CAQ	BV-SMBJ220AQ	B220C	B220	220	246	272	1	356	1.7	1
BV-SMBJ250CAQ	BV-SMBJ250AQ	B250C	B250	250	279	309	1	405	1.5	1
BV-SMBJ300CAQ	BV-SMBJ300AQ	B300C	B300	300	335	371	1	486	1.3	1
BV-SMBJ350CAQ	BV-SMBJ350AQ	B350C	B350	350	391	432	1	567	1.1	1
BV-SMBJ400CAQ	BV-SMBJ400AQ	B400C	B400	400	447	494	1	648	0.9	1
BV-SMBJ440CAQ	BV-SMBJ440AQ	B440C	B440	440	492	543	1	713	0.9	1
BV-SMBJ480CAQ	BV-SMBJ480AQ	B480C	B480	480	536	593	1	750	0.8	1

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

①Surge Waveform: 10/1000μS

Mark



BI: BXXC
1909:WEEK 9,2019

cathode



anode

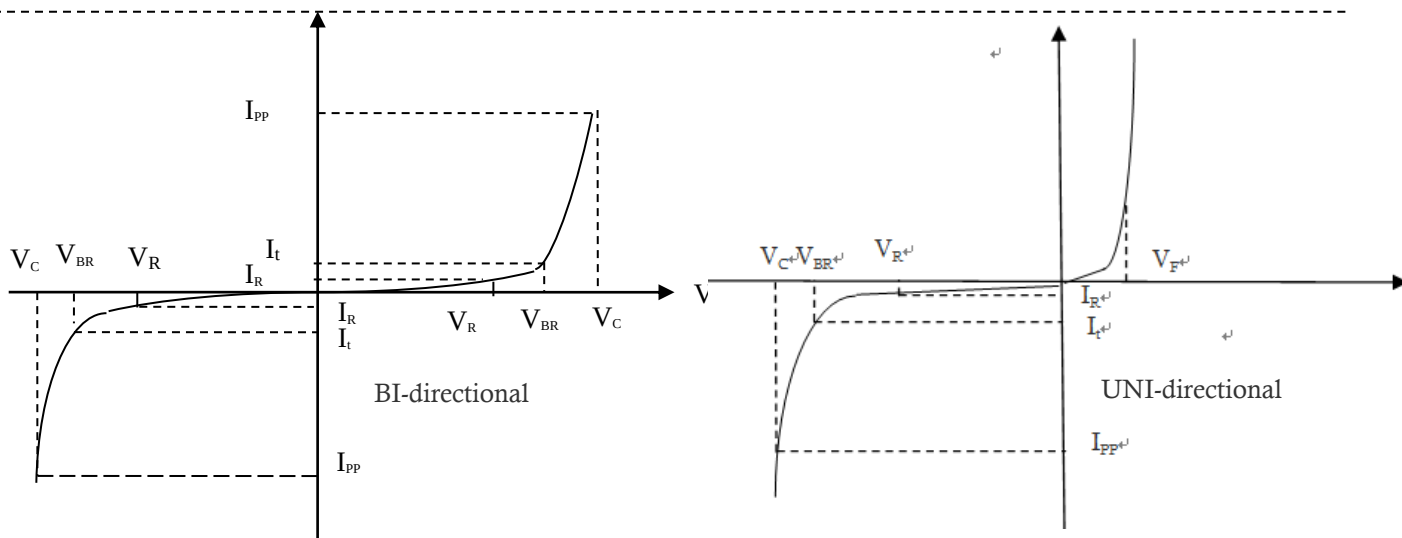
UNI: BXX
1909:WEEK 9,2019

Part Number System

BV SMBJ XX C A
(1) (2) (3) (4) (5)

- (1) Bencent Transient Voltage Suppressor (2) Series Code
(3) $V_R=XXV$ (4) BI-directional
(5) Suffix 'A' denotes 5% tolerance devices

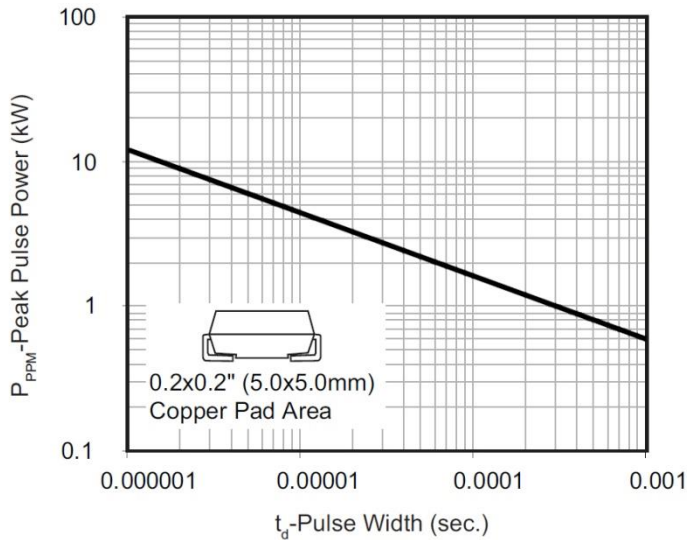
V-I Curve



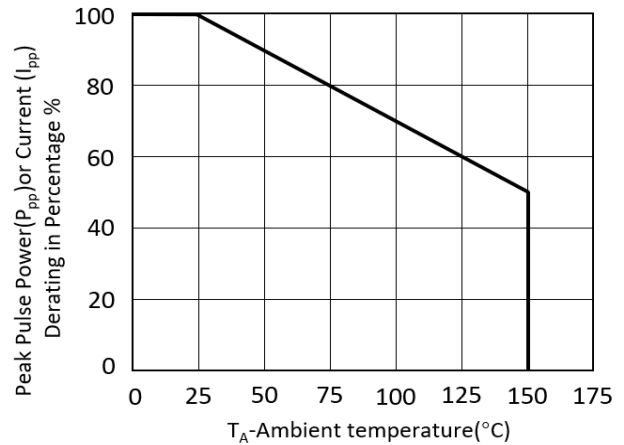
Parameters	Definition
V_F	Forward Voltage drop for UNI-directional
V_C	Clamping Voltage
I_{PP}	Surge Waveform 10/1000 μ s
V_R	Stand-off Voltage
V_{BR}	Breakdown Voltage
I_R	Reverse Leakage Current
I_t	Test Current
P_{pp}	Peak Pulse Power Dissipation

Typical Characteristics

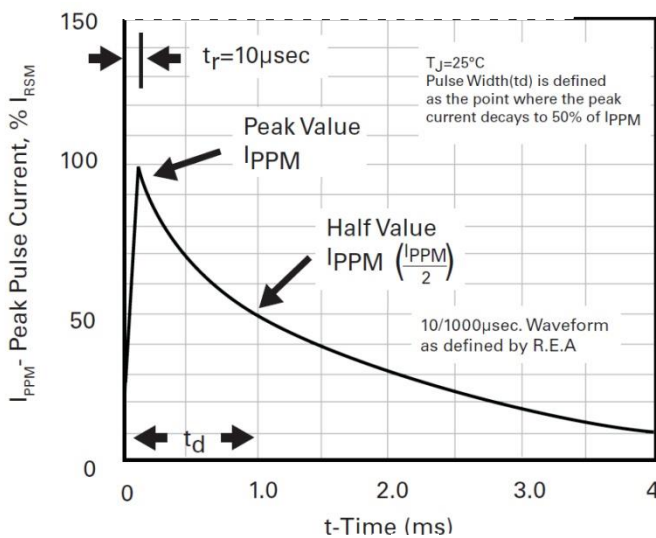
Peak Pulse Power Rating Curve



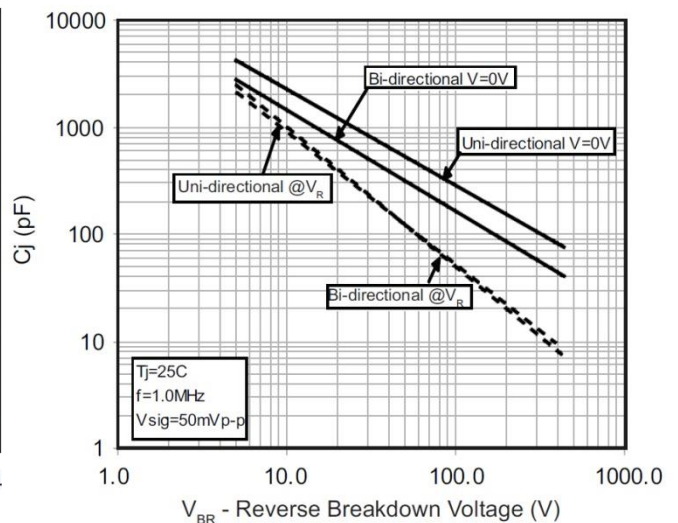
Pulse Derating Curve



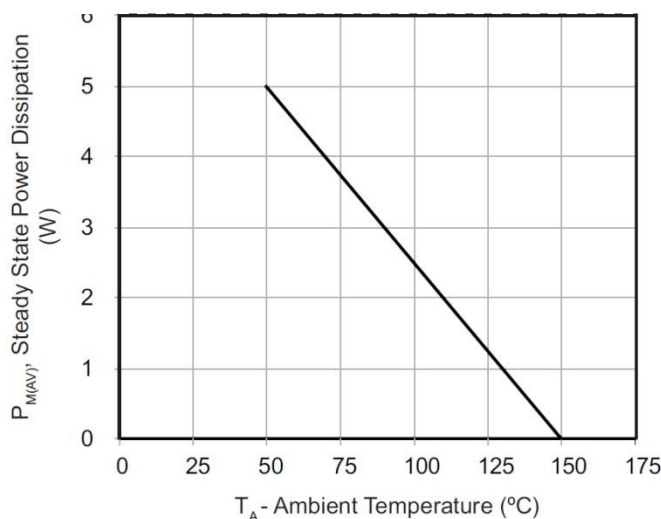
Pulse Waveform



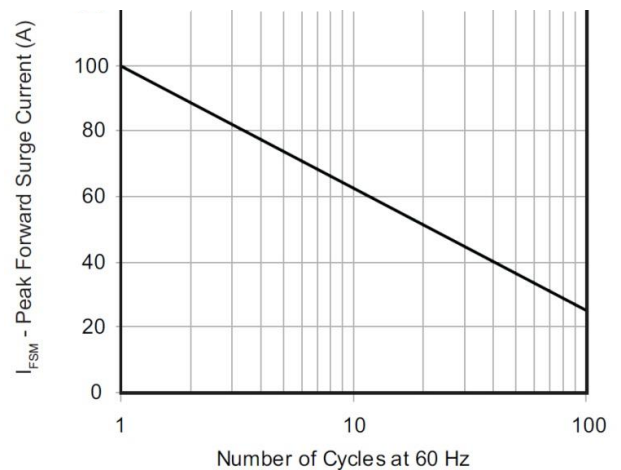
Typical Junction Capacitance



Steady State Power Dissipation Derating Curve



Maximum Non-Repetitive Forward Surge Current Uni-Directional Only



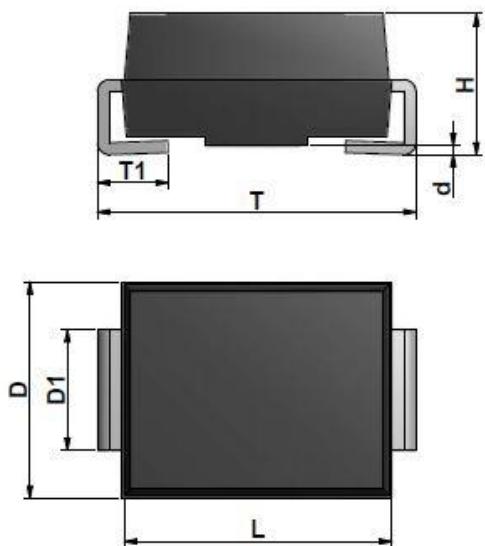
Thermal Considerations

symbol	Parameter	Value	Unit
T_J	Operating Junction Temperature Range	-55 to +150	°C
T_S	Storage Temperature Range	-55 to +150	°C
V_F	Maximum Instantaneous Forward; Voltage at 50A for Unidirectional Only (Note 1)	3.5/5	V
I_{FSM}	Peak Forward Surge Current, 8.3ms;Single Half Sine Wave (Note 2)	100	A

Notes:

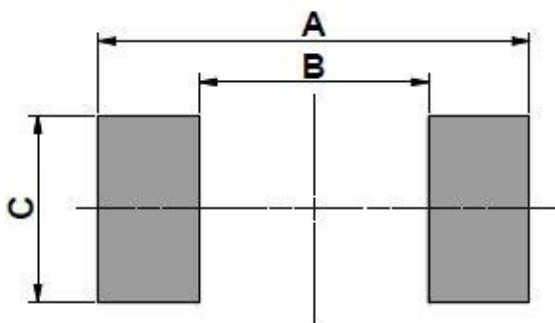
1. $V_F < 3.5V$ for single die parts and $V_F < 5.0V$ for stacked-die parts.
2. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only.

Product Dimensions



REF.	mm	inch
D	3.6 ± 0.3	0.142 ± 0.012
D1	2 ± 0.2	0.079 ± 0.008
L	4.6 ± 0.3	0.181 ± 0.012
T	5.4 ± 0.3	0.213 ± 0.012
T1	1.2 ± 0.3	0.047 ± 0.012
d	0~0.4	0~0.016
H	2.00~2.60	0.079~0.102

Recommended Soldering Pad

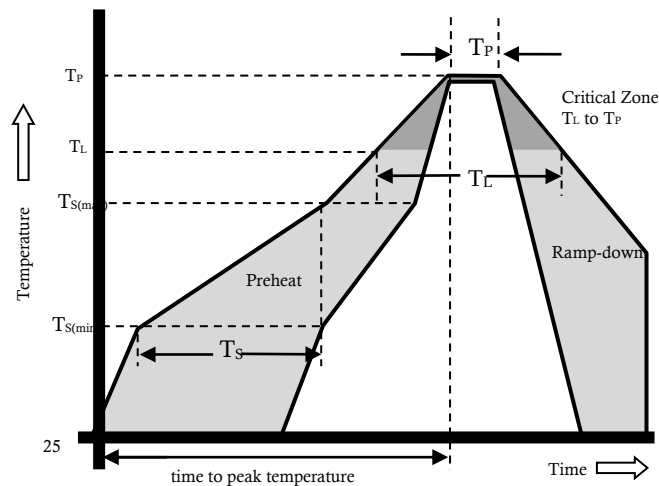


REF	mm	inch
A	5.45	0.215
B	2.45	0.096
C	2.15	0.085

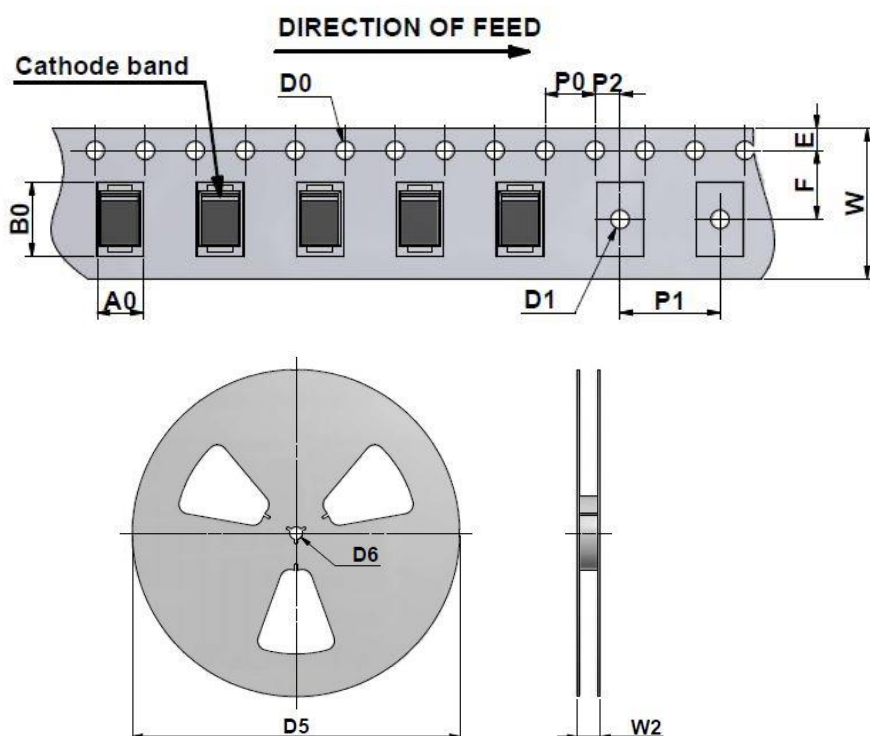
Transient Voltage Suppressor Reflow Profile

Version: A3 2022/7/15

Reflow Condition		Pb-Free Assembly
Pre Heat	Temperature Min.	+150°C
	Temperature Max.	+200°C
	Time (Min to Max)	60 – 180 seconds
Average ramp up rate (Liquidus Temp (T _L) to peak)		3°C/second max
Ts(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 Temp (T _P)		260±0/-5 °C
Time within 5°C of actual Peak Temp (T _P)		8-15 seconds
Ramp-down Rate		6°C/s max
Time 25°C to peak Temp (T _P)		8 min max.
Do not exceed		260°C



Package Reel Information



REF.	mm	inch
W	12±1	0.472±0.039
E	1.75±0.3	0.069±0.012
F	5.5±0.3	0.217±0.012
D0	1.5±0.2	0.059±0.008
D1	1.5±0.2	0.059±0.008
P0	4.0±0.3	0.157±0.012
P1	8.0±0.3	0.315±0.012
P2	2.0±0.3	0.079±0.012
A0	3.6±0.3	0.142±0.012
B0	5.7±0.3	0.224±0.012
D5	Ø330	Ø13
D6	Ø13.5±1.0	Ø0.531±0.039
W2	18±2.0	0.709±0.079

Outline	Reel (pcs)	Per Carton (pcs)	Reel Diameters (mm)	Carton Size(mm)		
				L	W	H
Taping	3,000	48,000	330	360	360	385