

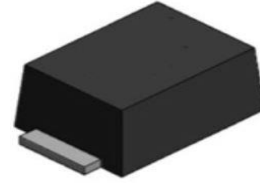
Transient Voltage Suppressor

Version: A1 2024/08/20

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

Exterior



6SMAF

Application Information

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

Agency Approvals

Icon	Description
RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003
	UL Certificated E232249

Schematic Symbol



BI-directional



UNI-directional

Part Number and Electrical Parameter

Part Number		Marking		V_R	V_{BR}	V_{BR}	I_t	$V_C@I_{PP}^{①}$	$I_{PP}^{①}$	$I_R@V_R$
BI	UNI	BI	UNI	(V)	min.(V)	max.(V)	(mA)	(V)	(A)	(uA)
BV-6SMAJ5CA-F	BV-6SMAJ5A-F	6A5CF	6A5F	5	6.4	7	10	9.2	65.3	800
BV-6SMAJ6CA-F	BV-6SMAJ6A-F	6A6CF	6A6F	6	6.67	7.37	10	10.3	58.3	800
BV-6SMAJ6.5CA-F	BV-6SMAJ6.5A-F	6A6.5CF	6A6.5F	6.5	7.22	7.98	10	11.2	53.6	500
BV-6SMAJ7CA-F	BV-6SMAJ7A-F	6A7CF	6A7F	7	7.78	8.6	10	12	50	200
BV-6SMAJ7.5CA-F	BV-6SMAJ7.5A-F	6A7.5CF	6A7.5F	7.5	8.33	9.21	1	12.9	46.6	100
BV-6SMAJ8CA-F	BV-6SMAJ8A-F	6A8CF	6A8F	8	8.89	9.83	1	13.6	44.2	50
BV-6SMAJ8.5CA-F	BV-6SMAJ8.5A-F	6A8.5CF	6A8.5F	8.5	9.44	10.4	1	14.4	41.7	20
BV-6SMAJ9CA-F	BV-6SMAJ9A-F	6A9CF	6A9F	9	10	11.1	1	15.4	39	10
BV-6SMAJ10CA-F	BV-6SMAJ10A-F	6A10CF	6A10F	10	11.1	12.3	1	17	35.3	5
BV-6SMAJ11CA-F	BV-6SMAJ11A-F	6A11CF	6A11F	11	12.2	13.5	1	18.2	33	1
BV-6SMAJ12CA-F	BV-6SMAJ12A-F	6A12CF	6A12F	12	13.3	14.7	1	19.9	30.2	1
BV-6SMAJ13CA-F	BV-6SMAJ13A-F	6A13CF	6A13F	13	14.4	15.9	1	21.5	28	1
BV-6SMAJ14CA-F	BV-6SMAJ14A-F	6A14CF	6A14F	14	15.6	17.2	1	23.2	25.9	1
BV-6SMAJ15CA-F	BV-6SMAJ15A-F	6A15CF	6A15F	15	16.7	18.5	1	24.4	24.6	1
BV-6SMAJ16CA-F	BV-6SMAJ16A-F	6A16CF	6A16F	16	17.8	19.7	1	26	23.1	1
BV-6SMAJ17CA-F	BV-6SMAJ17A-F	6A17CF	6A17F	17	18.9	20.9	1	27.6	21.8	1

Transient Voltage Suppressor

Version: A1 2024/08/20

Part Number		Marking		V _R	V _{BR}	V _{BR}	I _t	V _{C@I_{PP}} ^①	I _{PP} ^①	I _{R@V_R}
BI	UNI	BI	UNI	(V)	min.(V)	max.(V)	(mA)	(V)	(A)	(uA)
BV-6SMAJ18CA-F	BV-6SMAJ18A-F	6A18CF	6A18F	18	20	22.1	1	29.2	20.6	1
BV-6SMAJ20CA-F	BV-6SMAJ20A-F	6A20CF	6A20F	20	22.2	24.5	1	32.4	18.6	1
BV-6SMAJ22CA-F	BV-6SMAJ22A-F	6A22CF	6A22F	22	24.4	26.9	1	35.5	16.9	1
BV-6SMAJ24CA-F	BV-6SMAJ24A-F	6A24CF	6A24F	24	26.7	29.5	1	38.9	15.5	1
BV-6SMAJ26CA-F	BV-6SMAJ26A-F	6A26CF	6A26F	26	28.9	31.9	1	42.1	14.3	1
BV-6SMAJ28CA-F	BV-6SMAJ28A-F	6A28CF	6A28F	28	31.1	34.4	1	45.4	13.3	1
BV-6SMAJ30CA-F	BV-6SMAJ30A-F	6A30CF	6A30F	30	33.3	36.8	1	48.4	12.4	1
BV-6SMAJ33CA-F	BV-6SMAJ33A-F	6A33CF	6A33F	33	36.7	40.6	1	53.3	11.3	1
BV-6SMAJ36CA-F	BV-6SMAJ36A-F	6A36CF	6A36F	36	40	44.2	1	58.1	10.4	1
BV-6SMAJ40CA-F	BV-6SMAJ40A-F	6A40CF	6A40F	40	44.4	49.1	1	64.5	9.3	1
BV-6SMAJ43CA-F	BV-6SMAJ43A-F	6A43CF	6A43F	43	47.8	52.8	1	69.4	8.7	1
BV-6SMAJ45CA-F	BV-6SMAJ45A-F	6A45CF	6A45F	45	50	55.3	1	72.7	8.3	1
BV-6SMAJ48CA-F	BV-6SMAJ48A-F	6A48CF	6A48F	48	53.3	58.9	1	77.4	7.8	1
BV-6SMAJ51CA-F	BV-6SMAJ51A-F	6A51CF	6A51F	51	56.7	62.7	1	82.4	7.3	1
BV-6SMAJ54CA-F	BV-6SMAJ54A-F	6A54CF	6A54F	54	60	66.3	1	87.1	6.9	1
BV-6SMAJ58CA-F	BV-6SMAJ58A-F	6A58CF	6A58F	58	64.4	71.2	1	93.6	6.5	1
BV-6SMAJ60CA-F	BV-6SMAJ60A-F	6A60CF	6A60F	60	66.7	73.7	1	96.8	6.2	1
BV-6SMAJ64CA-F	BV-6SMAJ64A-F	6A64CF	6A64F	64	71.1	78.6	1	103	5.9	1
BV-6SMAJ70CA-F	BV-6SMAJ70A-F	6A70CF	6A70F	70	77.8	86	1	113	5.3	1
BV-6SMAJ75CA-F	BV-6SMAJ75A-F	6A75CF	6A75F	75	83.3	92.1	1	121	5	1
BV-6SMAJ78CA-F	BV-6SMAJ78A-F	6A78CF	6A78F	78	86.7	95.8	1	126	4.8	1
BV-6SMAJ85CA-F	BV-6SMAJ85A-F	6A85CF	6A85F	85	94.4	104	1	137	4.4	1
BV-6SMAJ90CA-F	BV-6SMAJ90A-F	6A90CF	6A90F	90	100	111	1	146	4.1	1
BV-6SMAJ100CA-F	BV-6SMAJ100A-F	6A100CF	6A100F	100	111	123	1	162	3.7	1
BV-6SMAJ110CA-F	BV-6SMAJ110A-F	6A110CF	6A110F	110	122	135	1	177	3.4	1
BV-6SMAJ120CA-F	BV-6SMAJ120A-F	6A120CF	6A120F	120	133	147	1	193	3.1	1
BV-6SMAJ130CA-F	BV-6SMAJ130A-F	6A130CF	6A130F	130	144	159	1	209	2.9	1
BV-6SMAJ150CA-F	BV-6SMAJ150A-F	6A150CF	6A150F	150	167	185	1	243	2.5	1
BV-6SMAJ160CA-F	BV-6SMAJ160A-F	6A160CF	6A160F	160	178	197	1	259	2.3	1
BV-6SMAJ170CA-F	BV-6SMAJ170A-F	6A170CF	6A170F	170	189	209	1	275	2.2	1
BV-6SMAJ180CA-F ^②	BV-6SMAJ180A-F ^②	6A180CF	6A180F	180	201	222	1	292	2.1	1
BV-6SMAJ200CA-F ^②	BV-6SMAJ200A-F ^②	6A200CF	6A200F	200	224	247	1	324	1.9	1
BV-6SMAJ220CA-F ^②	BV-6SMAJ220A-F ^②	6A220CF	6A220F	220	246	272	1	356	1.7	1
BV-6SMAJ250CA-F ^②	BV-6SMAJ250A-F ^②	6A250CF	6A250F	250	279	309	1	405	1.5	1
BV-6SMAJ300CA-F ^②	BV-6SMAJ300A-F ^②	6A300CF	6A300F	300	335	371	1	486	1.2	1
BV-6SMAJ350CA-F ^②	BV-6SMAJ350A-F ^②	6A350CF	6A350F	350	391	432	1	567	1.1	1
BV-6SMAJ400CA-F ^②	BV-6SMAJ400A-F ^②	6A400CF	6A400F	400	447	494	1	648	0.9	1
BV-6SMAJ440CA-F ^②	BV-6SMAJ440A-F ^②	6A440CF	6A440F	440	492	543	1	713	0.8	1

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

① Surge Waveform: 10/1000μs

② These part numbers do not have UL497b safety certification

Mark



BI:6AXXCF

cathode



UNI:6AXXF

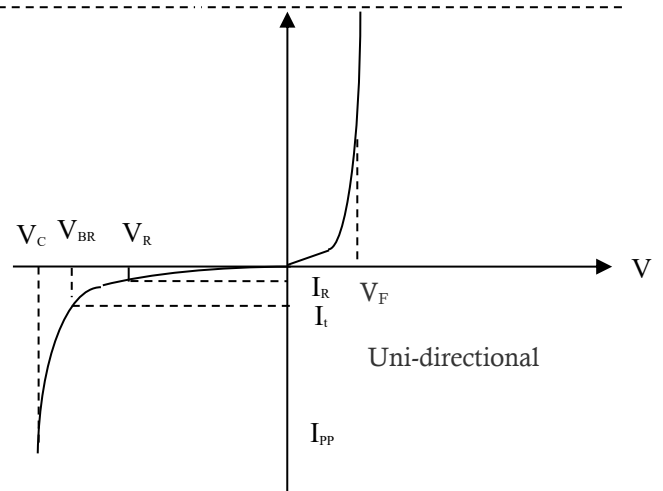
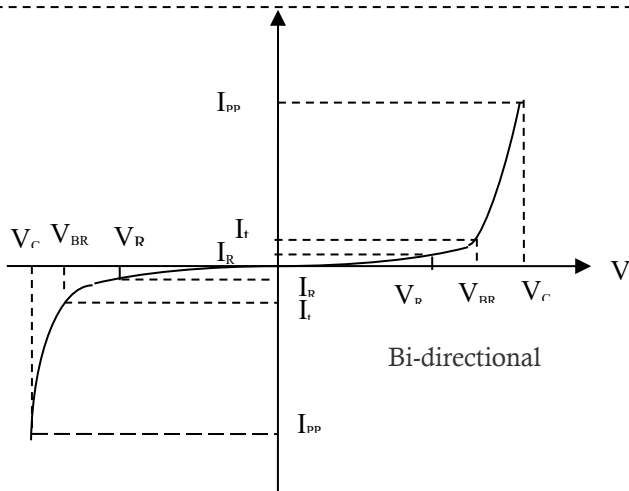
anode

Part Number System

BV —6SMAJ XX C A -F
(1) (2) (3) (4) (5) (6)

- | | |
|---|--------------------|
| (1) Bencent Transient Voltage Suppressor | (2) Series Code |
| (3) $V_R=XXV$ | (4) BI-directional |
| (5) Suffix 'A' denotes 5% tolerance devices | (6) Flat Feet |

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

Transient Voltage Suppressor

Version: A1 2024/08/20

Thermal Considerations

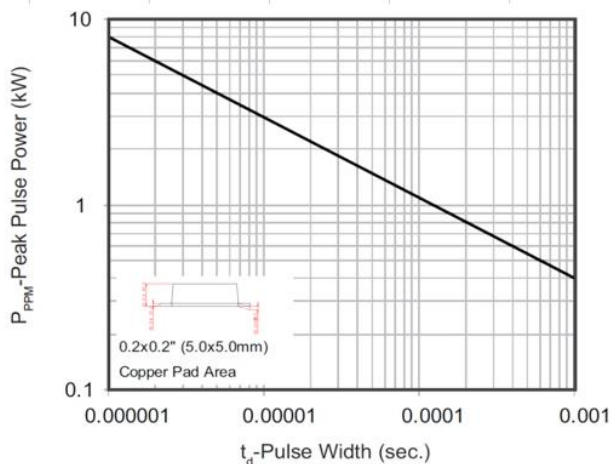
symbol	Parameter	Value	Unit
T_J	Operating Junction Temperature Range	-55 to +150	°C
T_S	Storage Temperature Range	-55 to +150	°C
V_F	Maximum Instantaneous Forward; Voltage at 25A for Unidirectional Only (Note 1)	3.5/5	V
I_{FSM}	Peak Forward Surge Current, 8.3ms;Single Half Sine Wave (Note 2)	40	A

Notes:

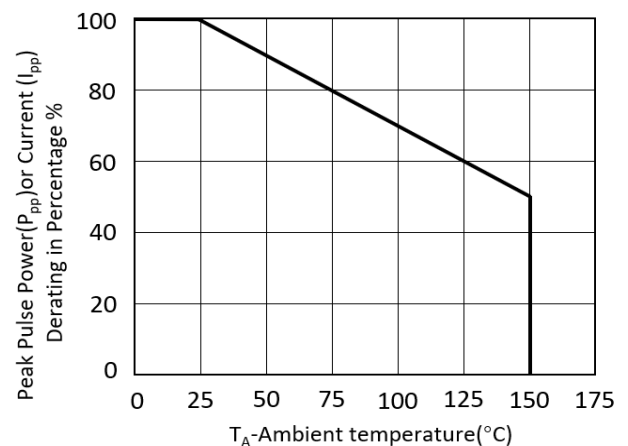
1. $V_F < 3.5V$ for single die parts and $V_F < 5.0V$ for stacked-die parts.
2. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only.

Typical Characteristics

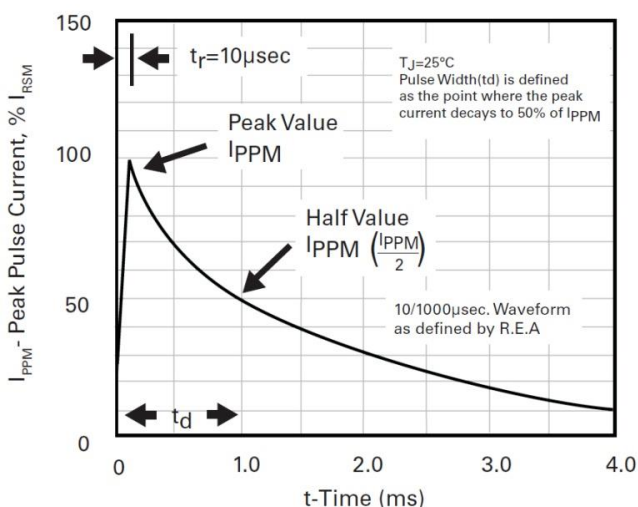
Peak Pulse Power Rating Curve



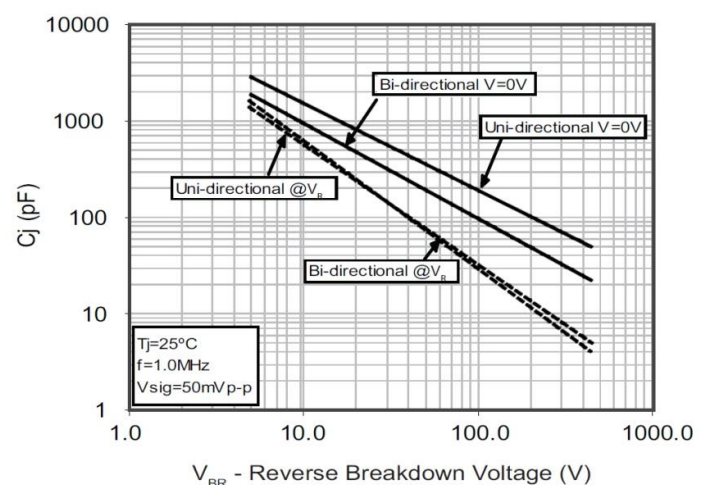
Pulse Derating Curve



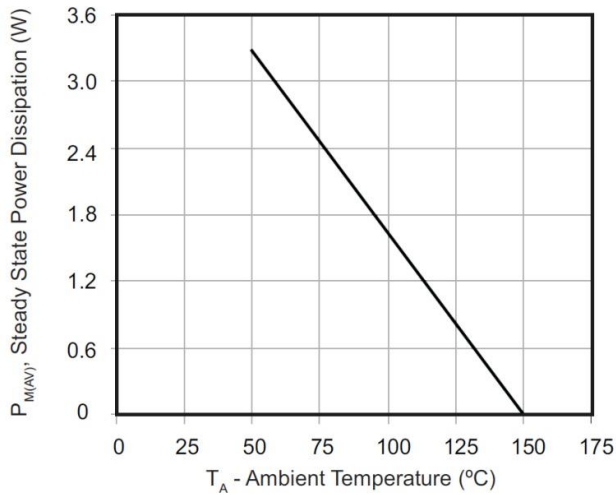
Pulse Waveform



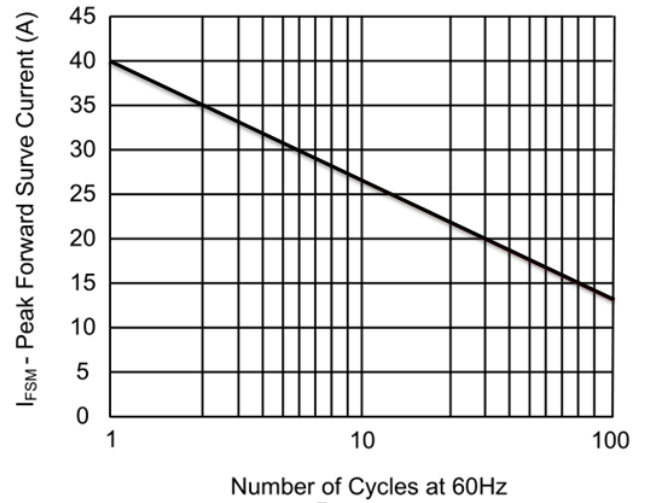
Typical Junction Capacitance



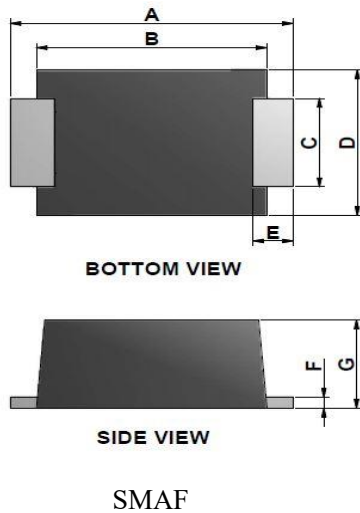
Steady State Power Dissipation Derating Curve



Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

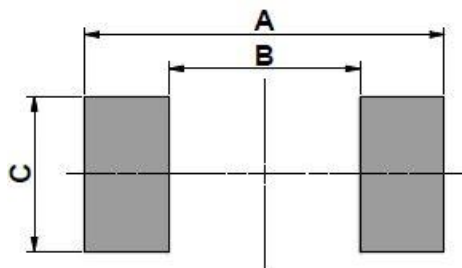


Product Dimensions



REF.	mm	inch
A	4.75 ± 0.2	0.187 ± 0.008
B	3.5 ± 0.15	0.138 ± 0.006
C	1.45 ± 0.15	0.057 ± 0.006
D	2.6 ± 0.15	0.102 ± 0.006
E	0.9 ± 0.3	0.035 ± 0.012
F	0.18 ± 0.05	0.007 ± 0.002
G	1.18 ± 0.15	0.046 ± 0.006

Recommended Soldering Pad



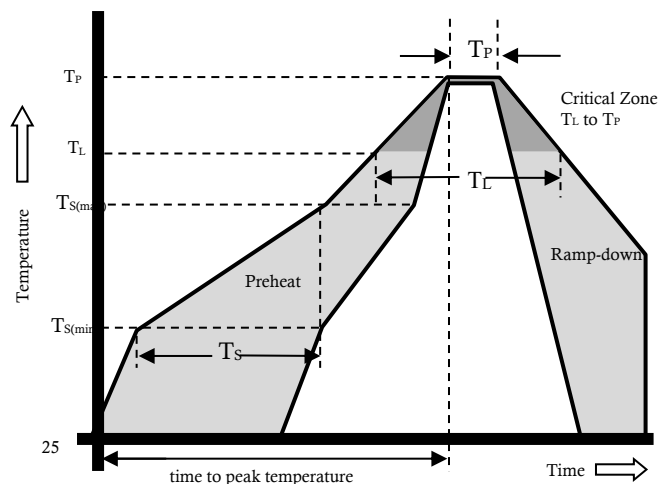
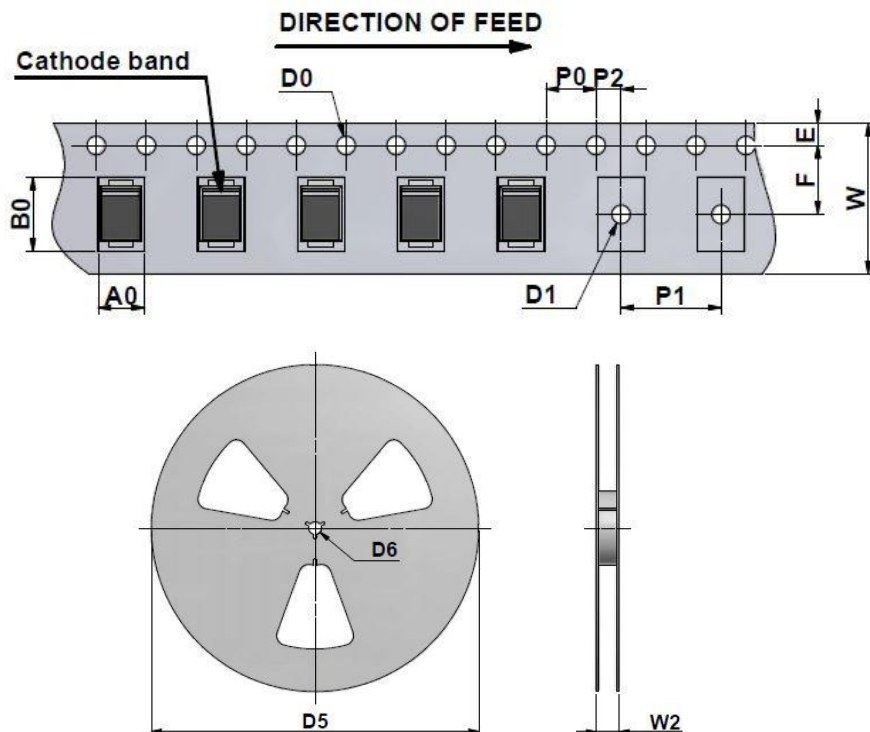
REF	mm	inch
A	6	0.236
B	2	0.079
C	2	0.079

Transient Voltage Suppressor

Version: A1 2024/08/20

Reflow Profile

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	1.55±0.15	0.061±0.006
D1	1.55±0.15	0.061±0.006
P0	4.0±0.2	0.157±0.008
P1	4.0±0.2	0.157±0.008
P2	2.0±0.2	0.079±0.008
A0	2.85±0.3	0.112±0.012
B0	5.4±0.3	0.213±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	5,000	80,000	330	360	360	385