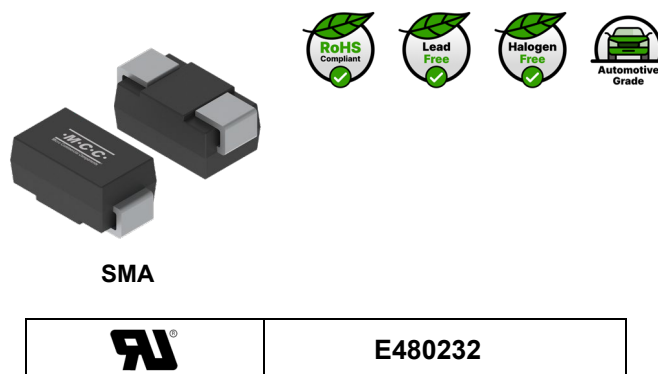


400W Transient Voltage Suppression Diode

Features

- 400W peak pulse power capability at 10/1000µs waveform, repetition rate (duty cycles):0.01%
- Transient protection to:
 - IEC 61000-4-2 (ESD) ±30 kV (Air), ±30 kV (Contact)
- AEC-Q101 Qualified
- Excellent clamping capability
- Low leakage current
- Both Uni-directional and Bi-directional are available
- Glass passivated chip junction
- Low profile package



Applications

- Used to protect I/O interfaces, VCC bus, and other sensitive circuits from voltage transients in consumer electronics, computers, industrial equipment, and telecommunication systems.

Mechanical Data

- Package: SMA
- Moisture Sensitivity: Level 1, per J-STD-020
- Halogen Free. "Green" Device ^(Note1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)
- Weight: 0.06 g (approximate)

Body Marking and Pin Layout

Description	Simplified Outline	Functional Diagram
Uni-directional		
Bi-directional		

XXXX= Marking code

Ordering Information

Product Name	Packing info
Product name-TP	5 kpcs/reel

For packaging details, visit our website at <https://www.mccsemi.com/Package/List>

400W Transient Voltage Suppression Diode

Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Rating	Unit
Peak Pulse Power Surge Current with a 10/1000 μs Waveform ^(Note 2)	I_{PPM}	See Next Table	A
Peak Pulse Power Dissipation ^(Note 2)	P_{PPM}	400	W
Power Dissipation on Infinite Heatsink	P_D	1.25	W
Peak Forward Surge Current (Unidirectional Only) ^(Note3)	I_{FSM}	40	A
Operating Junction Temperature Range	T_J	-55 to 175	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to 175	$^\circ\text{C}$

- Note:
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 2. Non-repetitive current pulse per Fig.3 and derated above $T_A=25^\circ\text{C}$ per Fig.4
 3. Measured on 8.3ms single half sinewave or equivalent square wave, duty cycle = 4 pulses per minute maximum

Thermal characteristics ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Rating	Unit
Thermal Resistance from Junction to Ambient ^(Note 4)	$R_{\theta JA}$	120	$^\circ\text{C}/\text{W}$
Thermal Resistance from Junction to Lead	$R_{\theta JL}$	30	$^\circ\text{C}/\text{W}$
Thermal Resistance from Junction to Case	$R_{\theta JC}$	15	$^\circ\text{C}/\text{W}$

- Note:
4. Mounted on 0.2 x 0.2" (5.0 x 5.0 mm) copper pads to each terminal.

400W Transient Voltage Suppression Diode

 Electrical Characteristics (T_A=25°C unless otherwise specified)

MCC Part Number		Reverse Stand-off Voltage	Breakdown Voltage V _{BR} @ I _T		Test Current	Maximum Clamping Voltage @ I _{PP}	Maximum Peak Pulse Current	Maximum Reverse Leakage @ V _R	Marking Code	
Uni	Bi	V _{RMW} (V)	Min (V)	Max (V)	I _T (mA)	V _C (V)	I _{PP} (A)	I _R (μA)	Uni	Bi
SMAJ5.0AQ	SMAJ5.0CAQ	5.0	6.40	7.07	10	9.2	43.4	800	AE	WE
SMAJ6.0AQ	SMAJ6.0CAQ	6.0	6.67	7.37	10	10.3	38.8	800	AG	WG
SMAJ6.5AQ	SMAJ6.5CAQ	6.5	7.22	7.98	10	11.2	35.7	500	AK	WK
SMAJ7.0AQ	SMAJ7.0CAQ	7.0	7.78	8.60	10	12.0	33.3	200	AM	WM
SMAJ7.5AQ	SMAJ7.5CAQ	7.5	8.33	9.21	1	12.9	31.0	100	AP	WP
SMAJ8.0AQ	SMAJ8.0CAQ	8.0	8.89	9.83	1	13.6	29.4	50	AR	WR
SMAJ8.5AQ	SMAJ8.5CAQ	8.5	9.44	10.40	1	14.4	27.8	10	AT	WT
SMAJ9.0AQ	SMAJ9.0CAQ	9.0	10.00	11.10	1	15.4	26.0	5	AV	WV
SMAJ10AQ	SMAJ10CAQ	10.0	11.10	12.30	1	17.0	23.5	5	AX	WX
SMAJ11AQ	SMAJ11CAQ	11.0	12.20	13.50	1	18.2	22.0	1	AZ	WZ
SMAJ12AQ	SMAJ12CAQ	12.0	13.30	14.70	1	19.9	20.1	1	BE	XE
SMAJ13AQ	SMAJ13CAQ	13.0	14.40	15.90	1	21.5	18.6	1	BG	XG
SMAJ14AQ	SMAJ14CAQ	14.0	15.60	17.20	1	23.2	17.2	1	BK	XK
SMAJ15AQ	SMAJ15CAQ	15.0	16.70	18.50	1	24.4	16.4	1	BM	XM
SMAJ16AQ	SMAJ16CAQ	16.0	17.80	19.70	1	26.0	15.4	1	BP	XP
SMAJ17AQ	SMAJ17CAQ	17.0	18.90	20.90	1	27.6	14.5	1	BR	XR
SMAJ18AQ	SMAJ18CAQ	18.0	20.00	22.10	1	29.2	13.7	1	BT	XT
SMAJ19AQ	SMAJ19CAQ	19.0	21.10	23.30	1	30.8	13.0	1	BU	XU
SMAJ20AQ	SMAJ20CAQ	20.0	22.20	24.50	1	32.4	12.4	1	BV	XV
SMAJ22AQ	SMAJ22CAQ	22.0	24.40	26.90	1	35.5	11.3	1	BX	XX
SMAJ24AQ	SMAJ24CAQ	24.0	26.70	29.50	1	38.9	10.3	1	BZ	XZ
SMAJ26AQ	SMAJ26CAQ	26.0	28.90	31.90	1	42.1	9.5	1	CE	YE
SMAJ28AQ	SMAJ28CAQ	28.0	31.10	34.40	1	45.4	8.8	1	CG	YG
SMAJ30AQ	SMAJ30CAQ	30.0	33.30	36.80	1	48.4	8.3	1	CK	YK
SMAJ33AQ	SMAJ33CAQ	33.0	36.70	40.60	1	53.3	7.5	1	CM	YM
SMAJ36AQ	SMAJ36CAQ	36.0	40.00	44.20	1	58.1	6.9	1	CP	YP
SMAJ40AQ	SMAJ40CAQ	40.0	44.40	49.10	1	64.5	6.2	1	CR	YR
SMAJ43AQ	SMAJ43CAQ	43.0	47.80	52.80	1	69.4	5.8	1	CT	YT
SMAJ45AQ	SMAJ45CAQ	45.0	50.00	55.30	1	72.7	5.5	1	CV	YV
SMAJ48AQ	SMAJ48CAQ	48.0	53.30	58.90	1	77.4	5.2	1	CX	YX
SMAJ51AQ	SMAJ51CAQ	51.0	56.70	62.70	1	82.4	4.9	1	CZ	YZ
SMAJ54AQ	SMAJ54CAQ	54.0	60.00	66.30	1	87.1	4.6	1	RE	ZE
SMAJ58AQ	SMAJ58CAQ	58.0	64.40	71.20	1	93.6	4.3	1	RG	ZG
SMAJ60AQ	SMAJ60CAQ	60.0	66.70	73.70	1	96.8	4.1	1	RK	ZK
SMAJ64AQ	SMAJ64CAQ	64.0	71.10	78.60	1	103.0	3.9	1	RM	ZM
SMAJ70AQ	SMAJ70CAQ	70.0	77.80	86.00	1	113.0	3.5	1	RP	ZP
SMAJ75AQ	SMAJ75CAQ	75.0	83.30	92.10	1	121.0	3.3	1	RR	ZR
SMAJ78AQ	SMAJ78CAQ	78.0	86.70	95.80	1	126.0	3.2	1	RT	ZT
SMAJ80AQ	SMAJ80CAQ	80.0	88.80	97.60	1	129.0	3.1	1	RB	ZB
SMAJ85AQ	SMAJ85CAQ	85.0	94.40	104.00	1	137.0	2.9	1	RV	ZV
SMAJ90AQ	SMAJ90CAQ	90.0	100.00	111.00	1	146.0	2.7	1	RX	ZX
SMAJ100AQ	SMAJ100CAQ	100.0	111.00	123.00	1	162.0	2.5	1	RZ	ZZ
SMAJ110AQ	SMAJ110CAQ	110.0	122.00	135.00	1	177.0	2.3	1	SE	VE
SMAJ120AQ	SMAJ120CAQ	120.0	133.00	147.00	1	193.0	2.1	1	SG	VG
SMAJ130AQ	SMAJ130CAQ	130.0	144.00	159.00	1	209.0	1.9	1	SK	VK
SMAJ140AQ	SMAJ140CAQ	140.0	155.00	171.00	1	226.8	1.8	1	SL	VL
SMAJ150AQ	SMAJ150CAQ	150.0	167.00	185.00	1	243.0	1.7	1	SM	VM
SMAJ160AQ	SMAJ160CAQ	160.0	178.00	197.00	1	259.0	1.5	1	SP	VP
SMAJ170AQ	SMAJ170CAQ	170.0	189.00	209.00	1	275.0	1.5	1	SR	VR
SMAJ180AQ	SMAJ180CAQ	180.0	200.00	220.00	1	291.6	1.4	1	ST	VT
SMAJ190AQ	SMAJ190CAQ	190.0	211.00	232.00	1	307.8	1.3	1	SU	VU

Curve Characteristics

Fig. 1 - Peak Pulse Power Rating Curve

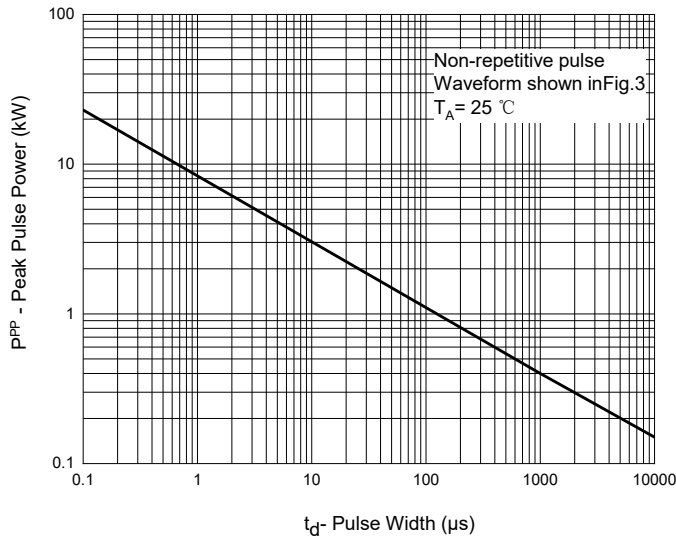


Fig. 2 - Typical Junction Capacitance

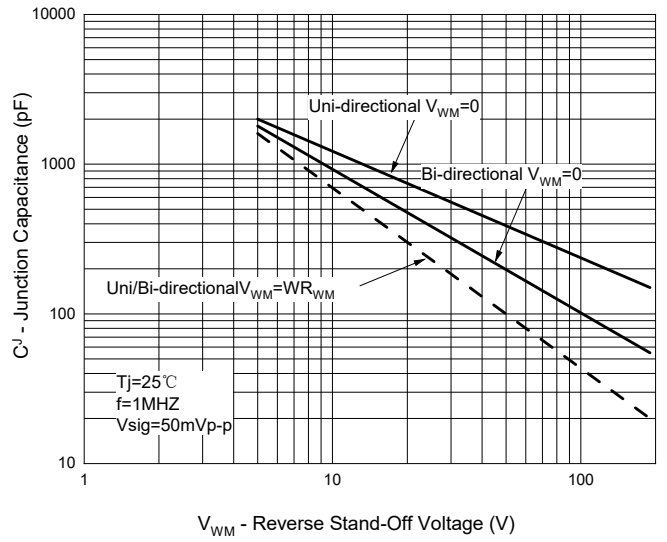


Fig. 3 - Pulse Waveform

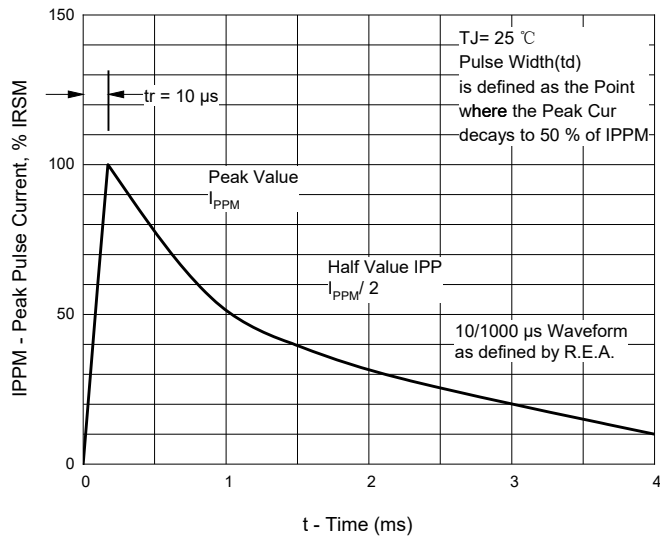
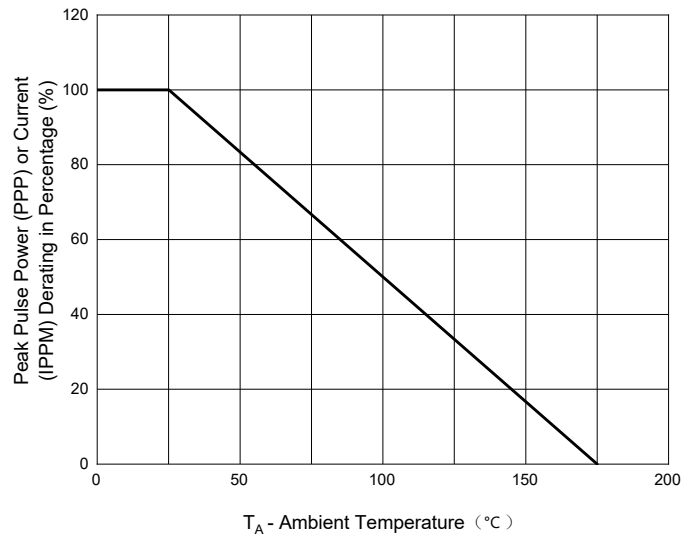


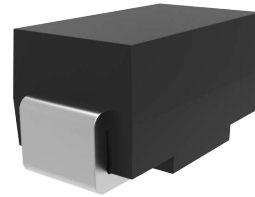
Fig. 4 - Pulse Derating Curve



Mechanical Data

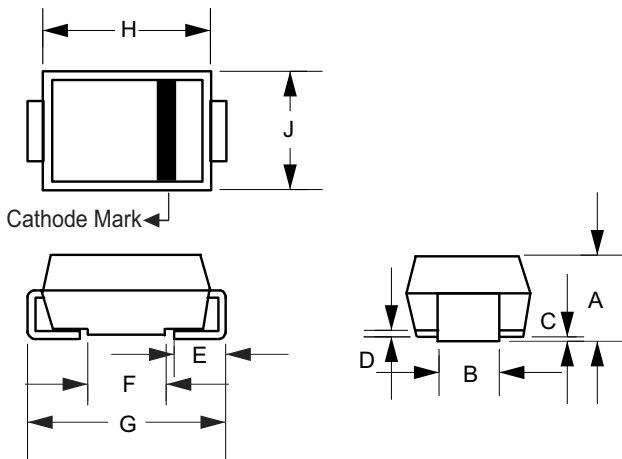
- Surface Mount Package
- Weight: 0.060 grams (Approximate)
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device (Note 1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant (Note 2) ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Package 3D Photo



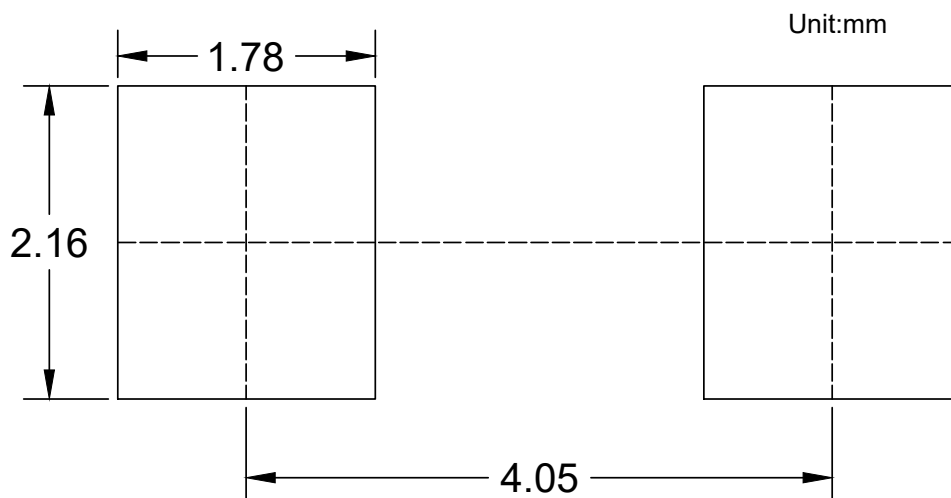
Note:1. free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. High Temperature Solder Exemption Applied, see EU Directive Annex 7a.

Package Outline Dimensions



DIM	DIMENSIONS				NOTE
	INCHES		MM		
	MIN	MAX	MIN	MAX	
A	0.075	0.096	1.90	2.44	
B	0.050	0.064	1.27	1.63	
C	0.002	0.008	0.051	0.203	
D	---	0.020	---	0.51	
E	0.030	0.060	0.76	1.52	
F	0.065	0.091	1.65	2.32	
G	0.189	0.220	4.80	5.59	
H	0.157	0.187	4.00	4.75	
J	0.090	0.115	2.25	2.92	

Suggested Solder Pad Layout



Notes:

- 1.The suggested land pattern dimensions have been provided for reference only.
- 2.For further information,please reference document IPC-7351A.

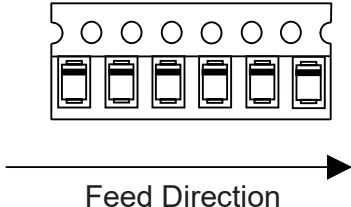
Packing Quantity

Package	Tape Width (mm)	Reel Size (inch)	Reel Quantity	Carton Quantity	Remark
SMA	12	13	7500	120K	for Zener & GS-L
			5000	80K	for Others

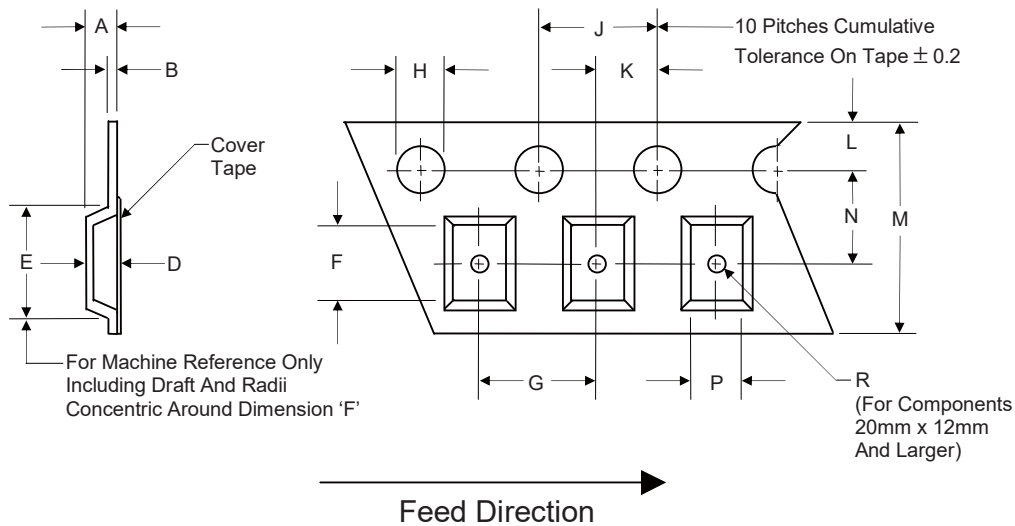
Note 1: These are minimum package quantities only. Minimum orders will differ. Contact the factory for more information on minimum order quantities.

Note 2: MCC Tape&reel products meets EIA-481 REV D specification.

Device Tape Orientation

Package	Tape Width (mm)	Tape Orientation
SMA	12	

Embossed Carrier Tape Specifications

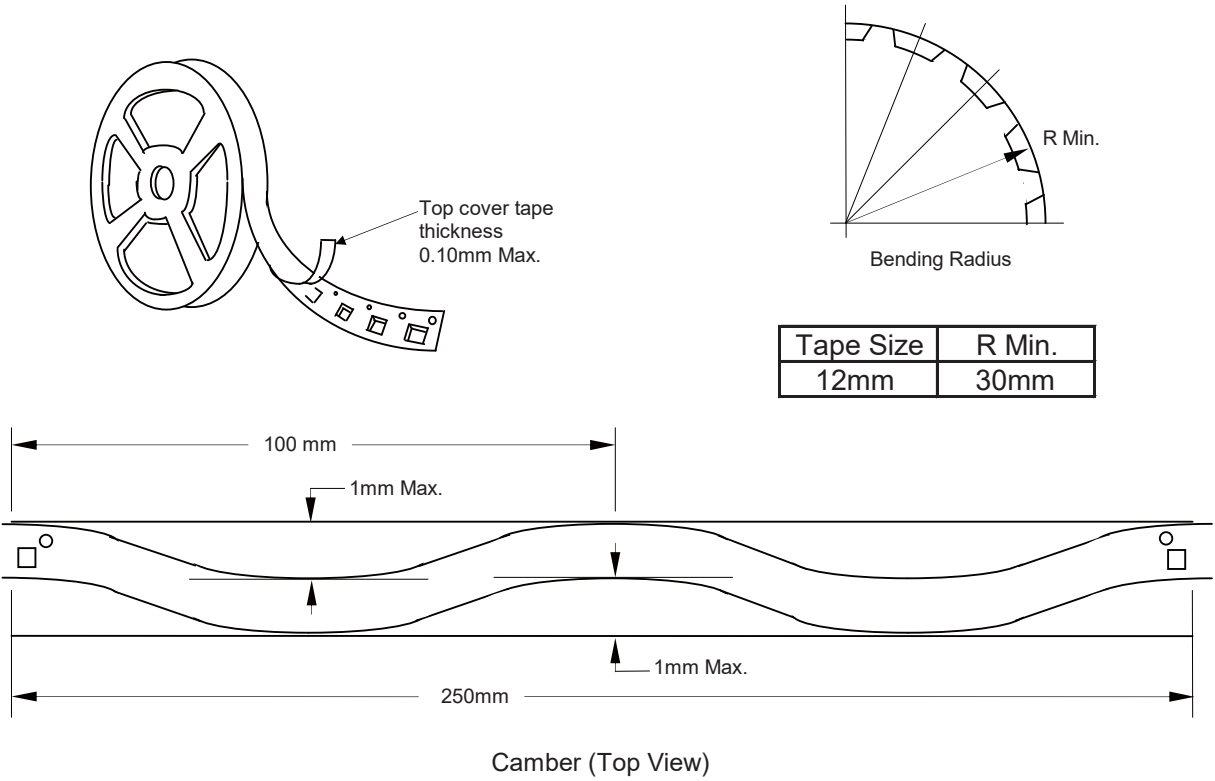


Tape Width	H	L	J	B	D	F	P
12mm	1.5	1.75	4.0	0.6	See Note 3		
(Tolerance)	+0.1/-0	±0.1	±0.1	Max			

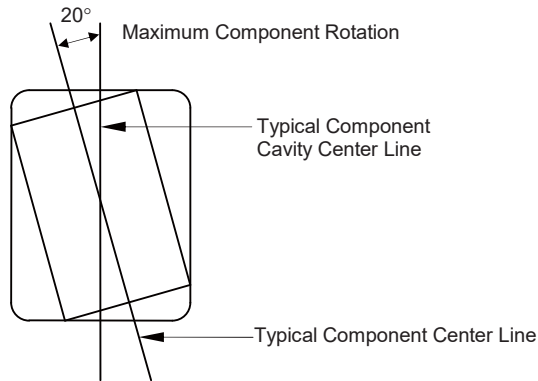
Tape Width	E	R	N	A	K	M	G
12mm	8.2	1.5	5.5	4.5	2.0	12.0	4.0
(Tolerance)	Max	Min	±0.05	Max	±0.05	±0.3	±0.1

Note 3: D,E,F are determined by constant size. The clearance between the part and the tape cavity must be within 0.05mm min. to 0.65mm max. for 12mm tape.

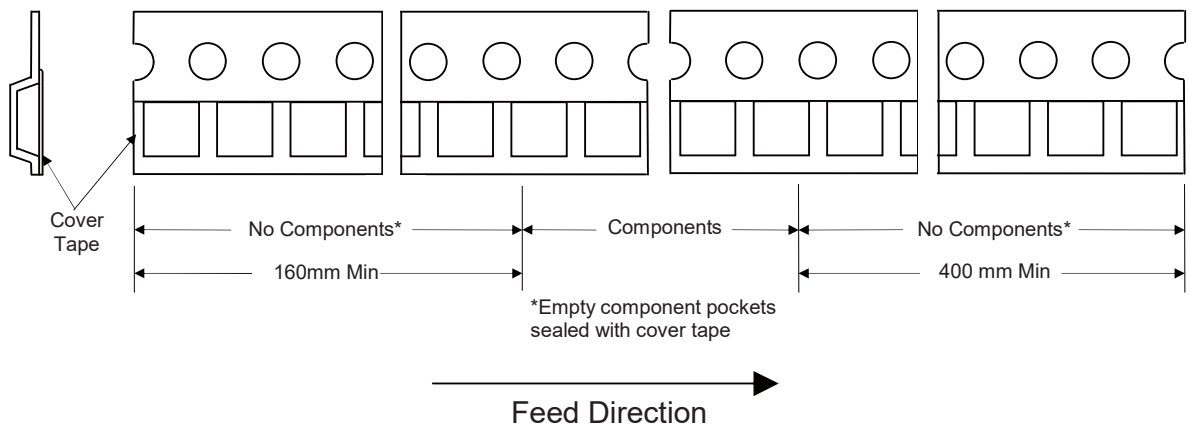
Embossed Carrier Tape Specifications



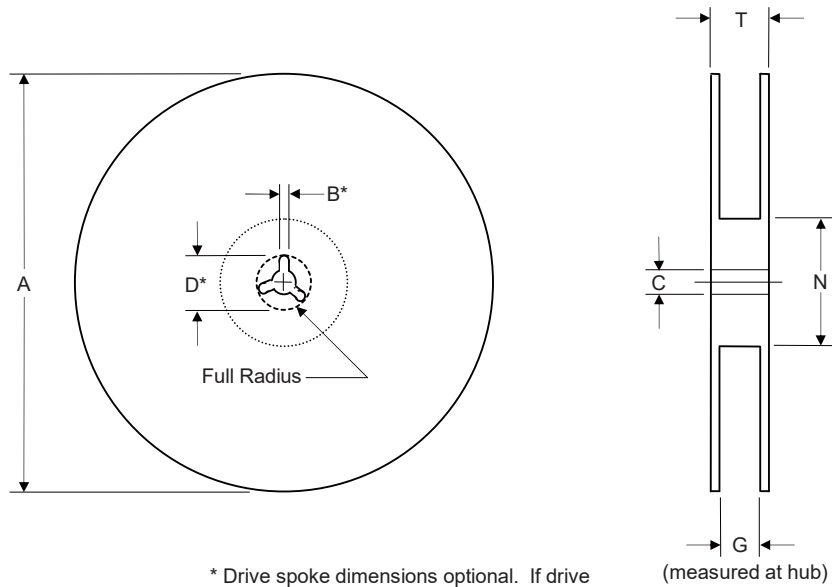
Allowable camber to be 1mm/100mm non-accumulative over 250mm



Start and Finish Specification



Surface Mount Reel Specifications

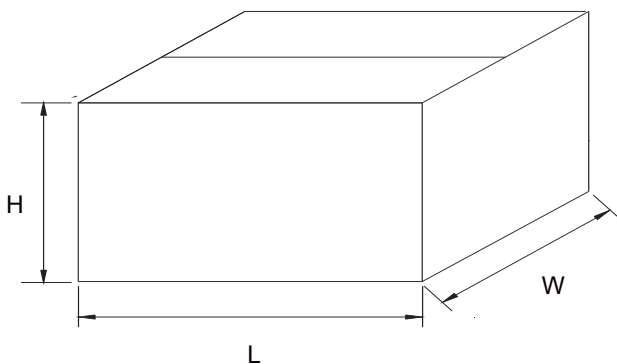


* Drive spoke dimensions optional. If drive spoke is used then asterisked dimensions apply.

Tape Width	A	B	C	D	N	G	T
12mm	330	1.5	13.0	20.2	55	12.4	18.4
(Tolerance)	±2.0	Min	±0.2	Min	Min	+2.0	Max

Dimensions

Carton Size



Description	Dimension	Specification(mm typical)
Length	L	355
Width	W	345
Height	H	290

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