



Traditional High Q (>10,000) Low ESR
Multi-Layer Ceramic Capacitors

2225C/P (0.220" x 0.250")

Product Features

- High Q
- High RF Current/Voltage
- Ultra Stable Performance
- Capacitance Range:
0.5pF to 2700pF
- Working Voltage: 2500V
- Extended Voltage: 3600V

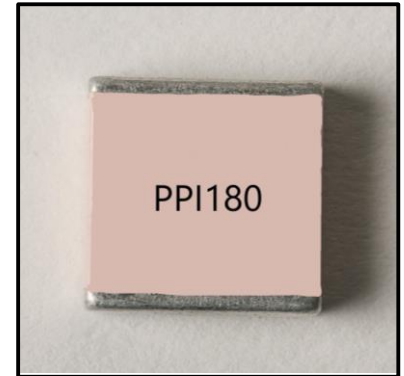
Product Applications

Typical Functional Applications:

- Tuning • Bypass • Coupling
- Feedback • D.C. Blocking
- Impedance Matching

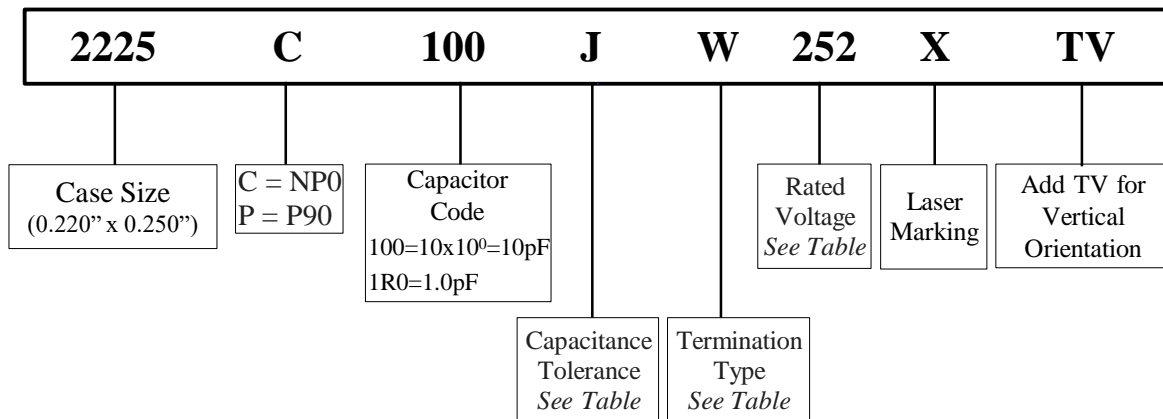
Typical Circuit Applications:

- UHF/Microwave RF Power Amplifiers
- Antenna Tuning • Plasma Chambers
- Medical Equipment



Marking shown for illustration purposes only.
Actual marking may differ.

Part Numbering



Capacitance Tolerance Codes

Code	A	B	C	D	F	G	J	K
Tol.	±0.05pF	±0.1pF	±0.25pF	±0.5pF	±1%	±2%	±5%	±10%

Voltage Codes

Voltage	Code	Voltage	Code
500V	501	2500V	252
1000V	102	3000V	302
1500V	152	3600V	362
2000V	202		

Please note that the contents of this document are subject to change at any time at PPI's sole discretion.
The most up-to-date version of this document is available at www.passiveplus.com.



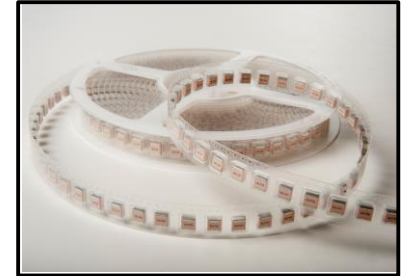
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≠ 2225C/P Capacitance Values

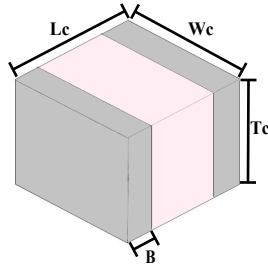
- NP0=C; P90=P

Special capacitances, tolerances and WVDC are available. Please contact PPI.

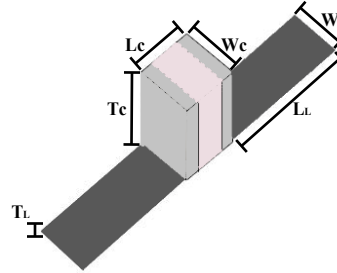


Cap. pF	Cap Code	Tol.	Rated WVDC		Cap. pF	Cap Code	Tol.	Rated WVDC		Cap. pF	Cap Code	Tol.	Rated WVDC		Cap. pF	Cap Code	Tol.	Rated WVDC	
			Std.	Ext.				Std.	Ext.				Std.	Ext.				Std.	Ext.
0.5	0R5				4.3	4R3				43	430				430	431	F,G, J,K	1500V	2000V
0.6	0R6				4.7	4R7				47	470				470	471			
0.7	0R7				5.1	5R1				51	510				510	511			
0.8	0R8				5.6	5R6				56	560				560	561			
0.9	0R9				6.2	6R2	B,C, D	2500V	3600V	62	620	F,G, J,K	2500V	3600V	620	621			
1.0	1R0				6.8	6R8				68	680				680	681			
1.1	1R1				7.5	7R5				75	750				750	751	F,G, J,K	1000V	1500V
1.2	1R2				8.2	8R2				82	820				820	821			
1.3	1R3				9.1	9R1				91	910				910	911			
1.4	1R4				10	100				100	101				1000	102			
1.5	1R5				11	110				110	111				1100	112			
1.6	1R6	B,C, D	2500V	3600V	12	120				120	121				1200	122			
1.7	1R7				13	130				130	131				1500	152			
1.8	1R8				15	150				150	151				1800	182	F,G, J,K	500V	N/A
1.9	1R9				16	160				160	161	F,G, J,K	2500V	3000V	2200	222			
2.0	2R0				18	180				180	181				2700	272			
2.1	2R1				20	200	F,G, J,K	2500V	3600V	200	201								
2.2	2R2				22	220				220	221								
2.4	2R4				24	240				240	241								
2.7	2R7				27	270				270	271								
3.0	3R0				30	300				300	301								
3.3	3R3				33	330				330	331	F,G, J,K	1500V	2000V					
3.6	3R6				36	360				360	361								
3.9	3R9				39	390				390	391								

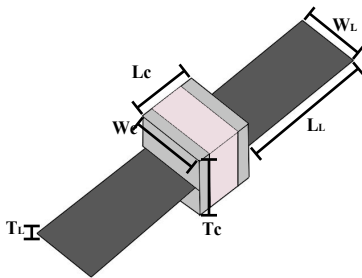
≠ Termination Types and Codes



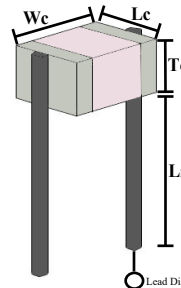
Chip Termination:
Codes: W, L, P



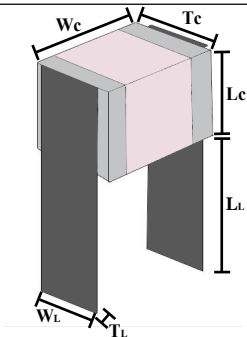
Microstrip Termination:
Codes: MS, MN



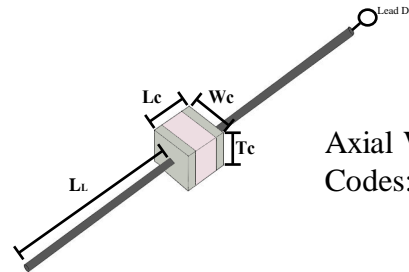
Axial Ribbon Termination:
Code: AR, AN



Radial Wire Termination:
Codes: RW, RN



Radial Ribbon Termination:
Code: RR, FN



Axial Wire Termination:
Codes: AW, BN

Termination Code	Magnetic Termination	Termination Code	Non-Magnetic Termination
W	100% Tin Solder over Nickel Barrier	P	100% Tin Solder over Copper Barrier
L	90%Tin/10%Lead Solder over Nickel Barrier	MN	
MS		AN	
AR		FN	Silver-Plated Copper
RR	Silver-Plated Copper	RN	
RW		BN	
AW			

Note: "Non-Magnetic" means no magnetic materials.



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≠ **Dimensions** - For Termination Types images, see previous page Unit: inch (millimeter)

Magnetic Termination								
Code		Capacitor Dimensions				Lead Dimensions		
		Length	Width	Thickness	Overlap	Length	Width	Thickness
		Lc	Wc	Tc	B	LL	WL	TL
W/L	Chip	0.225 (5.72)	0.250 ± 0.015 (6.35 ± 0.38)	0.165 max (4.19 max)	0.020 ~ 0.047 (0.50 ~ 1.20)	-	-	-
MS	Microstrip					0.500 min (12.70 min)	0.240 ± 0.005 (6.1 ± 0.13)	0.008 ± 0.001 (0.2 ± 0.025)
AR	Axial Ribbon							
RR	Radial Ribbon	0.245 ± 0.025 (6.22 ± 0.64)	0.250 ± 0.015 (6.35 ± 0.38)	0.150 max (3.81 max)	-	0.354 min (9.00 min)	0.118 ± 0.005 (3.00 ± 0.13)	0.012 ± 0.001 (0.3 ± 0.025)
RW	Radio Wire					0.709 min (18.00 min)		Dia. = 0.031 ± 0.004
AW	Axial Wire					0.906 min (23.00 min)		Dia. = (0.80 ± 0.10)

Non-Magnetic Termination								
Code		Capacitor Dimensions				Lead Dimensions		
		Length	Width	Thickness	Overlap	Length	Width	Thickness
		Lc	Wc	Tc	B	LL	WL	TL
P	Chip	0.225 (5.72)	0.250 ± 0.015 (6.35 ± 0.38)	0.165 max (4.19 max)	0.020 ~ 0.047 (0.50 ~ 1.20)	-	-	-
MN	Microstrip					0.500 min (12.70 min)	0.240 ± 0.005 (6.1 ± 0.13)	0.008 ± 0.001 (0.2 ± 0.025)
AN	Axial Ribbon							
FN	Radial Ribbon	0.245 ± 0.025 (6.22 ± 0.64)	0.250 ± 0.015 (6.35 ± 0.38)	0.150 max (3.81 max)	-	0.354 min (9.00 min)	0.118 ± 0.005 (3.00 ± 0.13)	0.012 ± 0.001 (0.3 ± 0.025)
RN	Radio Wire					0.709 min (18.00 min)		Dia. = 0.031 ± 0.004
BN	Axial Wire					0.906 min (23.00 min)		Dia. = (0.80 ± 0.10)

⊗ Note: Non-Magnetic means no magnetic materials. All leads are attached with high temperature solder and parts are RoHS Compliant.



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⚡ Electrical Specifications

Quality Factor (Q)	No less than 1000pF, Q value more than 2000, Test Frequency 1MHz More than 1000pF, Q value more than 2000, Test Frequency 1kHz
Insulation Resistance (IR)	Test Voltage: 500V 10 ⁵ Megaohms min. @ +25°C 10 ⁴ Megaohms min. @ +125°C
Rated Voltage	See Rated Voltage in Capacitance Table
Dielectric Withstanding Voltage (DWV)	250% of Rated Voltage of 5 seconds, Rated Voltage ≤ 500VDC 150% of Voltage for 5 seconds, 500VDC < Rated Voltage ≤ 1250VDC 120% of Voltage for 5 seconds, Rated Voltage > 1250VDC
Operating Temperature Range	-55°C to 200°C
Temperature Coefficient (TC)	C: -55°C to 125°C 0±30ppm/°C; >125°C to 200°C 0±60ppm/°C P: -55°C to 200°C +90±20ppm/°C
Capacitance Drift	±0.02% or ±0.02pF, whichever is greater
Piezoelectric Effects	None
Termination Type	See Termination Type Table

Capacitors are designed and manufactured to meet the requirements of MIL-PRF-55681 and MIL-PRF-123.

⚡ Environmental Specifications

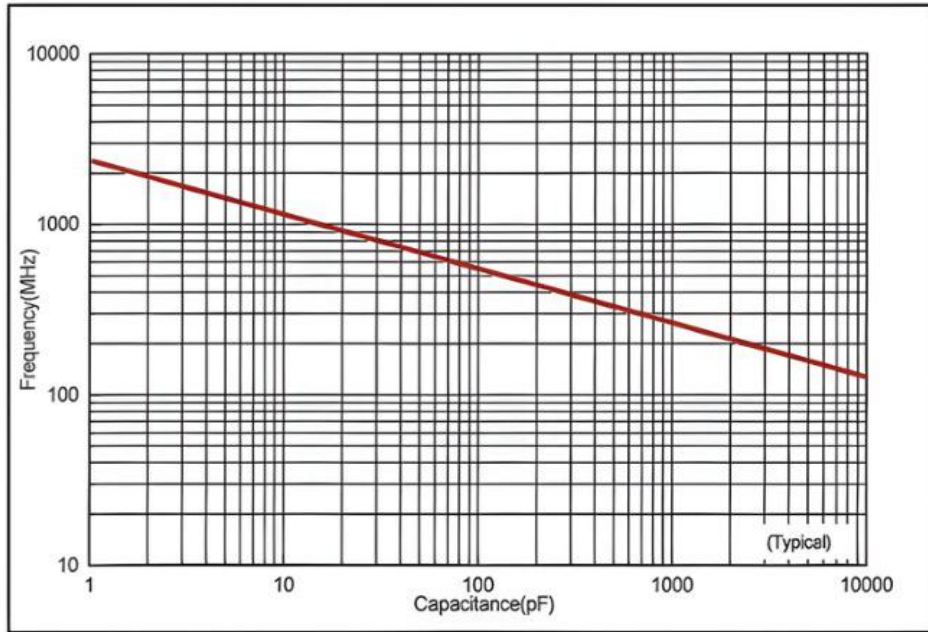
	Specification	Test Parameters
Thermal Shock	DWV: The initial Value IR: Shall not be less than 30% of the initial value. Capacitance Change:	MIL-STD-202, Method 107, Condition A. At the maximum rated temperature (-55°C and 200°C) stay 30 minutes, the time of removing shall not be more than 3 minutes. Perform five cycles.
Moisture Resistance	No more than 0.5% or 0.5pF, whichever is greater.	MIL-STD-202, Method 106
Humidity (Steady State)	DWV: The initial Value IR: The initial value. Capacitance Change: No more than 0.3% or 0.3pF, whichever is greater.	MIL-STD-202, Method 103, Condition A With 1.5Volts DC applied while subjected to an environment of 85°C with 85% relative humidity for 240 hours minimum.
Life	IR: Shall not be less than 30% of the initial value. Capacitance Change: No more than 2.0% or 0.5pF, whichever is greater.	MIL-STD-202, Method 108. For 2000 hours, at 200°C. 200% of Voltage for Capacitors, Rated Voltage ≤ 500VDC; 120% of Voltage for Capacitors, 500VDC < Rated Voltage ≤ 1250VDC; 100% for Voltage for Capacitors, Rated Voltage > 1250VDC
Terminal Strength	Force: 20lbs typical, 10lbs. Minimum. Duration Time: 5 to 10 seconds	MIL-STD-202, Method 211A, Test Condition A. Applied a force and maintained for a period of 5 to 10 seconds. The force shall be in the direction of the axes of the terminations.



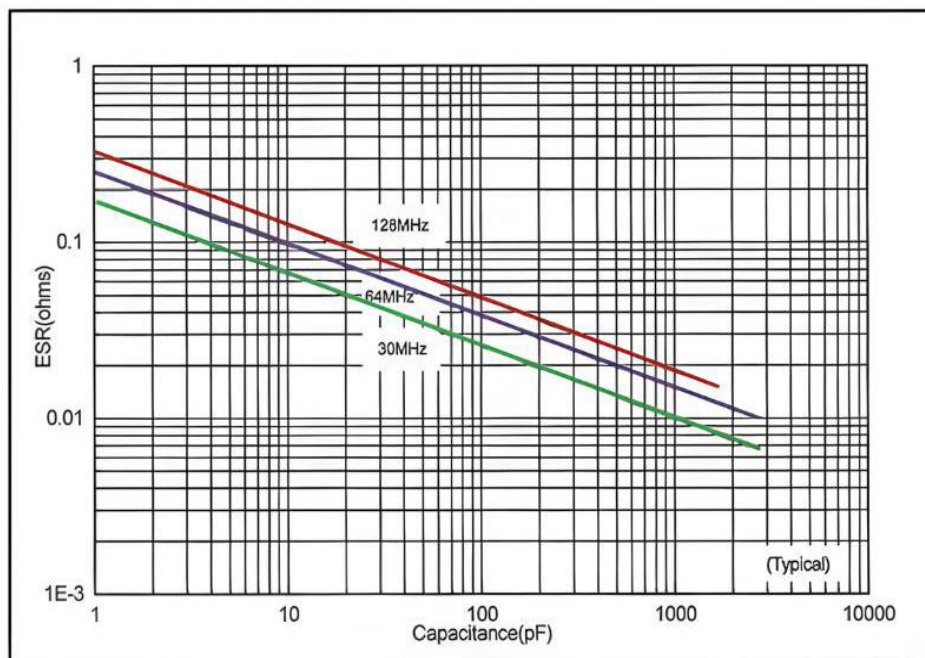
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≠ Series Resonance vs. Capacitance



≠ ESR vs. Frequency

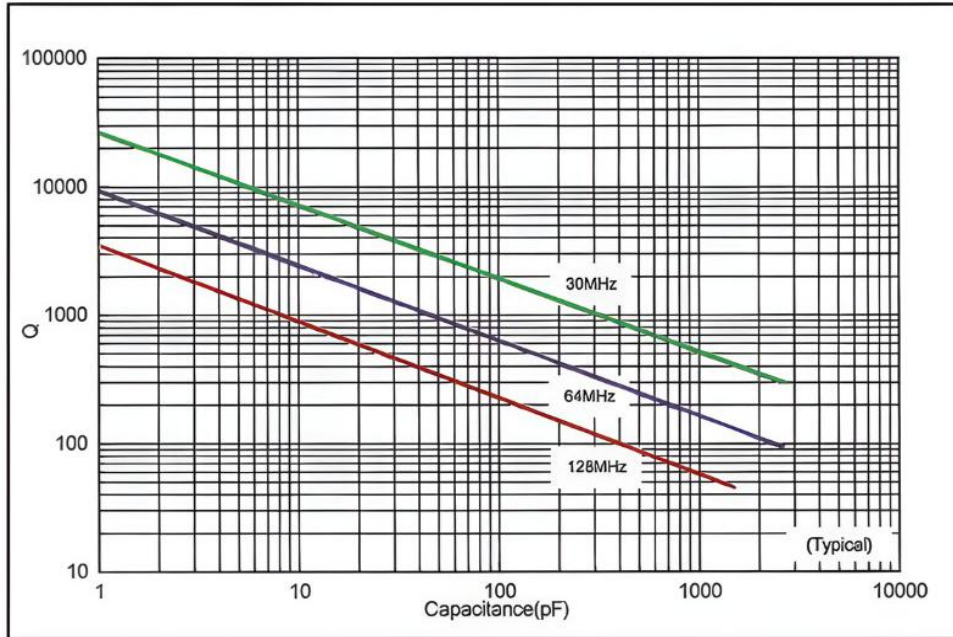




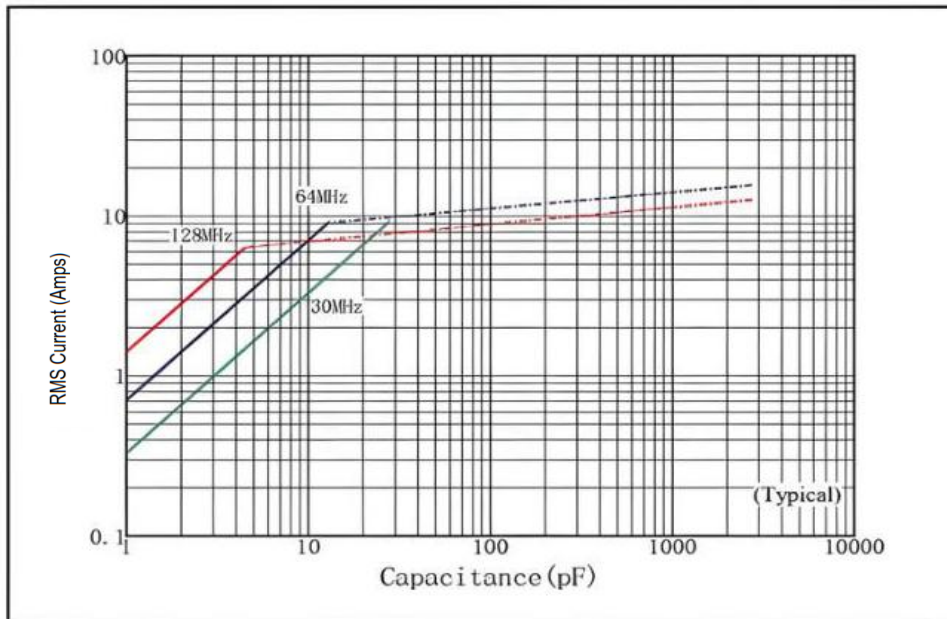
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Q vs. Capacitance



Current Rating vs. Capacitance



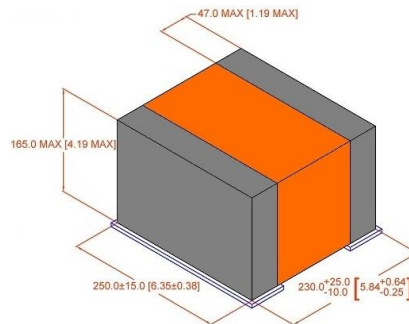
Current limits can depend on two different criteria. The first Voltage Limited Current ($I_{\text{volt lim}}$, represented by the solid line), the second is Power Dissipation Limited Current ($I_{\text{pow diss}}$).

$$I_{\text{volt lim}} = \frac{\sqrt{2}}{2} I_{\text{peak}} = \frac{\sqrt{2}}{2} \times \frac{V_{\text{rated}}}{X_C} = \sqrt{2} \pi F C V_{\text{rated}}$$

$I_{\text{pow diss}} = \sqrt{\frac{P_{\text{dissipation}}}{\text{ESR}}}$ (If the thermal resistance of the mounting surface is 15°C/W, then you will reach the power dissipated limit of 4W)

≠ Capacitor Application Program

PPI's brand new online Capacitor Application Program (C.A.P.) helps Engineers and Designers select capacitors according to parameters such as cap value and frequency. C.A.P. allows engineers to insert capacitors requirements (Cap value, Frequency), producing Scattering Matrices (S2P) Charts while providing options (Case Size, Terminations, Mounting), and parameters (ESR, Q, Impedance) along with Datasheets. Once engineers have determined their capacitor requirements, C.A.P. also includes online Requests For Quotes (RFQs) and/or sample requests.





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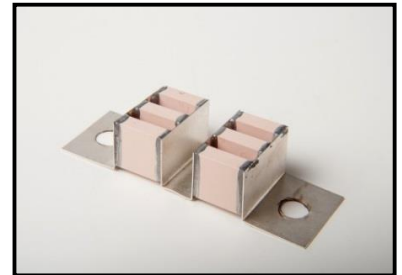
⚡ Recommended Land Pattern Dimensions

Regarding Landing Patterns, please refer to IPC-7351B (table 3-5, 3-6).

⚡ Custom Assemblies

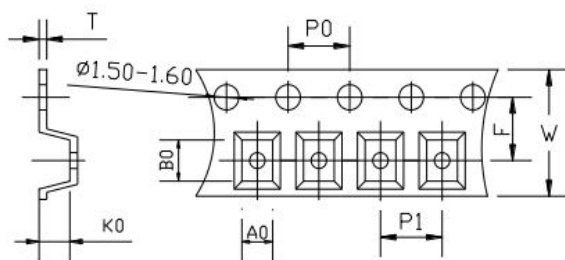
Passive Plus offers Capacitor Assemblies for high power requirements. Typical assemblies are configured in series and/or parallel combinations, producing higher voltage/current handling capabilities, extended capacitance range and tighter tolerances.

To get started, simply send us either a mechanical drawing or circuit conditions and we can recommend a solution. All components are 100% up-screened for Partial Discharge and Sonoscanned. All assemblies include a 100hr Military burn in.



Tape & Reel Specifications (mm)

Orientation	Measurement Unit	W	P0	P1	T	F	Minimum Qty per Reel	Std Qty per Reel	Tape Material
H	in.	0.630	0.157	0.472	0.012	0.295	500	500	Plastic
	mm	16.00	4.00	12.00	0.30	7.50			
V	in.	0.630	0.157	0.315	0.020	0.295	500	500	Plastic
	mm	16.00	4.00	8.00	0.50	7.50			



A₀B₀K₀

- Determined by component size. Typical clearance between the cavity and the component is: .50 (.002) min to .65 (.026) max for 12mm tape.
- The component cannot rotate more than 20° within the determined cavity.