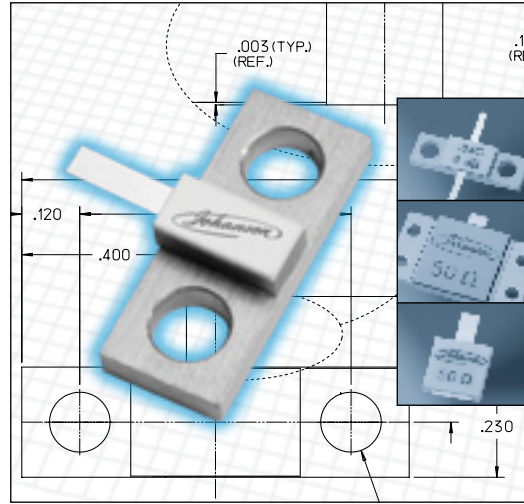


## HIGH POWERED RESISTIVE PRODUCTS



### TERMINATION

Package	Material	Power [max]	Capacitance [pF]	Frequency [GHz]	VSWR Range
SMD TS Series	AlN	800	.3 to 2.0	DC - 6.0	1.01:1 - 1.25:1
	BeO	1000	.3 to 2.0	DC - 6.0	1.01:1 - 1.25:1
	Al <sub>2</sub> O <sub>3</sub>	100	.3 to 2.0	DC - 6.0	1.01:1 - 1.25:1
Flangeless TL Series	AlN	800	.9 to 4.2	DC - 6.0	1.01:1 - 1.25:1
	BeO	1000	.25 to 3.5	DC - 6.0	1.01:1 - 1.25:1
Flanged TF Series	AlN	800	.9 to 4.2	DC - 6.0	1.01:1 - 1.25:1
	BeO	1500	.75 to 9.0	DC - 6.0	1.01:1 - 1.25:1
Chip CT Series	AlN	800	.75 to 9.0	DC - 6.0	1.07:1
	BeO	1000	.75 to 9.0	DC - 6.0	1.07:1

### PRODUCT TYPES

- Resistors
- Terminations
- Attenuators

### PRODUCT STYLES

- Surface Mount
- High Power Flangeless
- High Power Flanged
- Coaxial

### PROCESS

- Thick Film (Standard)
- Thin Film

### ELEMENT

- Proprietary Thick Film
- Nitride Tantalum

### SUBSTRATE

- AlN
- BeO
- Al<sub>2</sub>O<sub>3</sub>

### POWER

- Up to 1000 W

### FREQUENCY

- DC to 6 GHz

### APPLICATIONS

- Power Amplifiers
- Circulators
- Isolators
- Power Dividers / Combiners
- Couplers

### RESISTOR

Package	Material	Power [max]	Resistance [Ohm]	Frequency [GHz]	Max Derating Temp [max C°]
Chip CR Series	BeO	1000	5 - 1000	DC - 6.0	250
SMD RS Series	AlN	800	5 - 1000	DC - 6.0	250
	BeO	1000	5 - 1000	DC - 6.0	250
	Alumina	100	5 - 1000	DC - 6.0	250
Flangeless RL Series	AlN	800	5 - 1000	DC - 6.0	250
	BeO	1000	5 - 1000	DC - 6.0	250
Flanged RF Series	AlN	800	5 - 1000	DC - 6.0	250
	BeO	1000	5 - 1000	DC - 6.0	250

### ATTENUATOR

Package	Material	Power [CW]	Attenuation [dB]	Frequency [GHz]	VSWR Range
SMD SA Series	Al <sub>2</sub> O <sub>3</sub>	25 - 200	1 - 30	DC - 3.5	1.20 : 1
Chip CA Series	AlN	25 - 200	0.5 - 35	DC - 2.5	1.20 : 1
Flanged AF Series	AlN	25 - 200	0.5 - 30	DC - 2.0	1.20 : 1
	BeO	30 - 200	1 - 30	DC - 3.5	1.20 : 1

### CERAMIC PROCESSING

- Pressing
- Metalization
- Lapping
- Screen Printing

### PRECISION SWISS MACHINING

- Phosphor Bronze, Aluminum, Brass, Stainless Steel, Copper, Beryllium Copper, Titanium, Invar, Steel, Teflon, Delrin, Plastics
- Tolerance to .0002

### PLATING

- 60+ years of plating experience
- Gold, Copper, Silver, Bright Tin, 60/40 Tin Lead, Nickel, Electroless Nickel
- Surface Finishes: Passivation, Chromate, Anodizing, Chemical Etching
- 80/20 90/10 ml spec
- Meets all ASTM and Military Specifications

### SCREEN PRINTING

- Thick Film Pastes
- Refractory Metals Pastes



### CONTRACT MANUFACTURING

- Competitive Offshore Assembly
- Medical and Commercial Contract Manufacturing
- 20+ years
- Class 100K Equivalent Clean Room
- High volume/cost effective
- Fully environmentally controlled

### MASTER TOOL & DIE MAKERS

- 35+ years of experience
- Wire EDM
- CNC milling
- Tolerances to .0002

### BRAZING

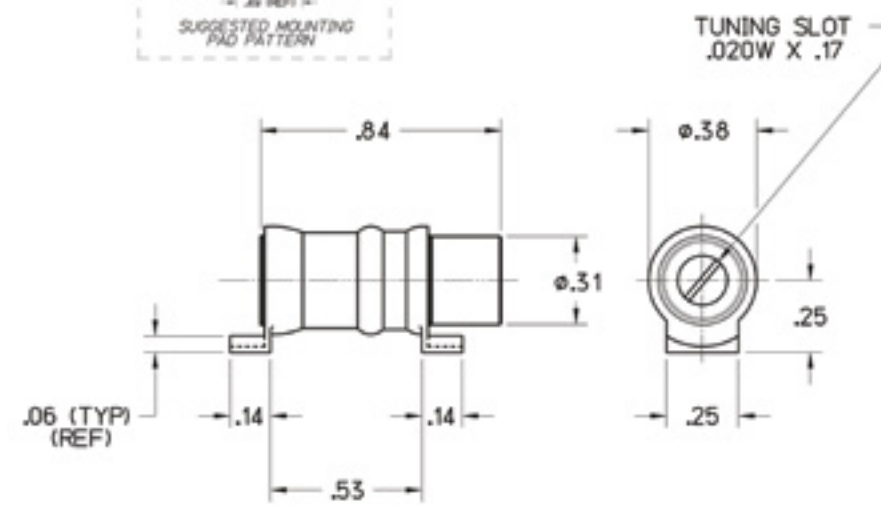
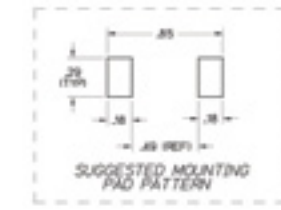
- Precious metals
- High temp to 1400° C

### ISO 9001-2008

## ELECTRONIC ACCURACY THROUGH MECHANICAL PRECISION



## NON-MAGNETIC TRIMMERS



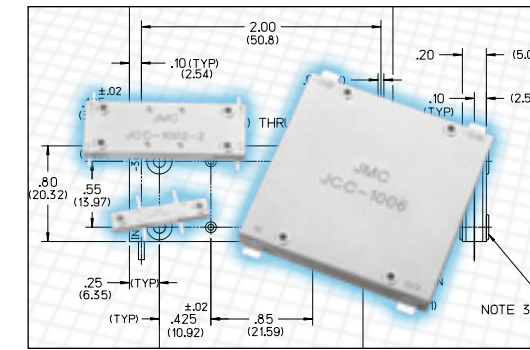
### SPECIFICATIONS (53H18NM)

- Capacity Range • 3.0pF to 55pF (>17 Turns)
- Working Voltage • 1000 VDC (Test Volt. 2000 VDC)
- Q @ 175 MHz - >800
- Insulation Resistance • >10<sup>9</sup> MEGOHMS
- Temperature Range • -65° C to +125° C
- Tuning Torque • 1.0 to 6.0 OZ. IN

### UNIT CONSTRUCTION NONMAGNETIC STRUCTURE WITH PTFE DIELECTRIC

- Brass Structure
- Glazed Alumina Insulation
- 574° F Solder Used in Assembly
- Gold, Silver, & Chromate Finish

## COUPLERS



### APPLICATIONS

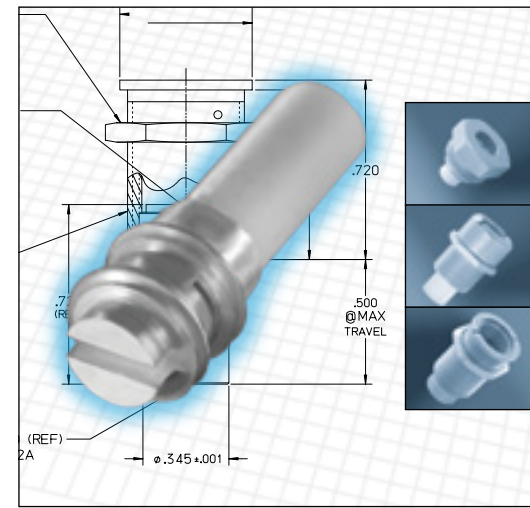
- Power Amplifiers
- Broadcast VHF / UHF DVB-T
- Divider / Combiner Networks
- Switch Networks
- Antenna Feeds
- Microstrip Circuits
- IED (Improvised Explosive Devices)
- Radar

### CHARACTERISTICS

- 3dB Hybrid, Directional and Bidirectional available
- Ultra Broadband performance DC - 6GHz
- High Power >= 1KW [CW]
- Low Insertion Loss (IL) Typically 0.15 - 2dB
- Tight Amplitude & Phase balance
- VSWR typically 1.2:1 or lower
- 55°C to +85°C
- Custom Design available

Part no. (PDF File)	Frequency	Power [W]	Size LxW (inches)	Part Impedance	VSWR	Insertion Loss [dB]	Amplitude Balance [dB]	Phase Balance (degrees)	Isolation [dB]	Coupling [dB]	Directivity [dB]	Coupled Flatness [dB]
JCC-1001	0.8 - 1.0 GHz	400	1.5 x 0.6	50	< 1.15:1	< .2	+/- 0.15	90 +/- 1.0	> 24	3	N/A	N/A
JCC-1002	120-230 MHz	400	2.20 x .80	50	< 1.2:1	< .15	+/- 0.15	90 +/- 3	> 20	3	N/A	N/A
JCC-1002-2	0.5 - 2.5 GHz	300	2.20 x .80	50	< 1.30:1	< 0.50	+/- 0.65	90 +/- 5	> 18	3	N/A	N/A
JCC-1002-3	1.0 - 4.2 GHz	300	2.20 x .80	50	< 1.30:1	< 0.50	+/- 0.50	90 +/- 5	> 18	3	N/A	N/A
JCC-1003	.225 - 0.4 GHz	400	1.62 x .57	50	< 1.2:1	< .15	+/- 0.5	90 +/- 2	> 21	3	N/A	N/A
JCC-1004	301 - 500 MHz	400	1.35 x .51	50	< 1.2:1	< .2	+/- 0.4	90 +/- 5	> 21	3	N/A	N/A
JCC-1004-1	0.8 - 2.1 GHz	300	1.35 x .50	50	< 1.25:1	< 0.25	+/- 0.75	90 +/- 5	> 18	3	N/A	N/A
JCC-1005	470 - 860 MHz	1000	2.65 x 2.40	50	< 1.25:1	< 0.20	+/- 0.65	90 +/- 5	> 18	3	N/A	N/A
JCC-1006-1	470 - 860 MHz	200	2.65 x 2.65	50	< 1.25:1	< .3	+/- 0.15	90 +/- 5	> 18	3	N/A	N/A
JCC-1006-2	30 - 88 MHz	450	2.65 x 2.65	50	< 1.30:1	< 0.25	+/- .95	90 +/- 5	> 18	3	N/A	N/A
JCC-1007	2 - 6 GHz	200	1.30 x .25	50	< 1.30:1	< 0.3	+/- 1.0	90 +/- 5	> 18	3	N/A	N/A
JCC-1008	200 - 1.0 GHz	300	3.20 x .90	50	< 1.30:1	< 0.50	+/- 0.75	90 +/- 5	> 16	3	N/A	N/A
JCC-1009	225 - 520 MHz	450	2.00 x .50	50	< 1.25:1	< 0.25	+/- 0.70	90 +/- 5	> 20	3	N/A	N/A
JCC-1009	225 - 520 MHz	450	2.00 x .50	50	< 1.25:1	< 0.25	+/- 0.70	90 +/- 5	> 20	3	N/A	N/A
JCC-1010	225-400 MHz	500	1.19 x 1.09	50	< 1.20:1	< 0.15	+/- 0.5	90 +/- 5	> 21	3	N/A	N/A
JDC-1000	136-174 MHz	250	2.5 x 1.5	50	< 1.25:1	< 0.25	N/A	N/A	N/A	40.0 +/- 1.0	> 20	+/- 0.25
JDC-1000-1	136-174 MHz	550	2.5 x 1.5	50	< 1.25:1	< 0.25	N/A	N/A	N/A	40.0 +/- 1.0	> 20	+/- 0.25
JDC-1000-2	500-2500 MHz	500	2.5 x 1.3	50	< 1.25:1	< 0.25	N/A	N/A	N/A	40.0 +/- 1.0	> 18	+/- .50
JDC-1001	2 - 8 GHz	400	2.1 x 1.1	50	< 1.20:1	< 0.20	N/A	N/A	N/A	40.0 +/- 1.0	> 18	+/- 0.5

## TUNING ELEMENTS



### FEATURES

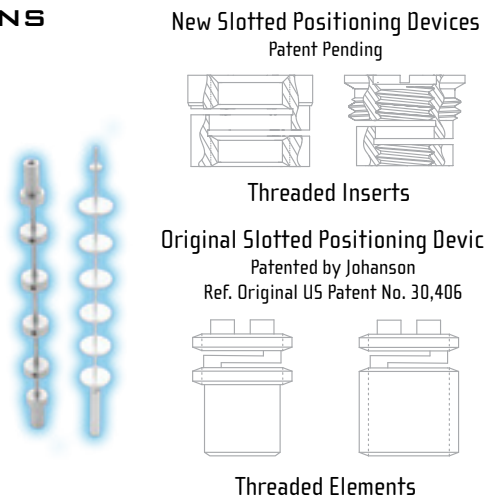
- One handed adjusting/tuning
- Self-Locking/Constant torque mechanism
- Eliminates need for "jam" nuts
- Produced with fine-pitched threads for high resolution zero back lash positioning from 24 TPI to 108 TPI
- Basic thread diameters available from 0.060" to 1.00", SI & US customary threads
- Excellent electrical conduction (Contact resistance < 0.01 )
- Capable of re-tuning/re-positioning
- Available with Gold, Silver, Nickel Plating and Chromate Finish
- Can be assembled with other materials, (Ceramic, Ferrites, Sapphire, Glass, etc.)
- Available as a set, to provide a positive stop or extended travel range
- Available in copper or ferrous alloys
- Custom torque designs available

### TYPICAL APPLICATIONS

- Microwave Filter Positioning
- Fiber Optic Alignment
- Metering Valve Adjustment
- X Y Z Stage Positioning
- Self Locking Fastener
- Limit Switch/Sensor Positioning

### OTHER PRODUCTS AVAILABLE

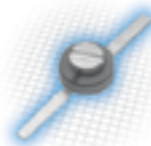
- Posi-Torque®
- Taps
- Tuning Rotors
- DynaTrim / Tuners
- Comb Line Filters



## VALUE PRICED CERAMIC TRIMMERS

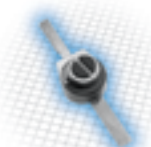
### 9350 SERIES

- Working Voltage: 100VDC
- Insulation Resistance: > 10<sup>4</sup> M
- Temperature Range: -25°C to +85°C
- Tuning Tool: 2194
- Packaging: 1000 Pieces in a 7" Reel
- RoHS Compliant



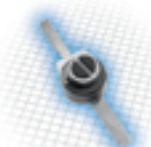
### 9341 SERIES

- Working Voltage: 50 VDC (110 VDC Test)
- Insulation Resistance: > 10<sup>4</sup> M
- Temperature Range: -25°C to +85°C
- Tuning Tool: 8766
- RoHS Compliant



### 9344 SERIES

- Working Voltage: 100 VDC (220 VDC Test)
- Insulation Resistance: > 10<sup>4</sup> M
- Temperature Range: -25°C to +85°C
- Tuning Tool: 8764
- Packaging: 1000 Pieces in a 7" Reel
- RoHS Compliant



### 9343 SERIES

- Working Voltage: 50 VDC (110 VDC Test)
- Insulation Resistance: > 10<sup>4</sup> M
- Temperature Range: -25°C to +85°C
- Tuning Tool: 2191
- Packaging: 1000 Pieces in a 7" Reel
- RoHS Compliant



### 9385 SERIES

- Working Voltage: 50 VDC (110 VDC Test)
- Insulation Resistance: > 10<sup>4</sup> M
- Temperature Range: -30°C to +85°C
- Tuning Tool: 8777
- RoHS Compliant

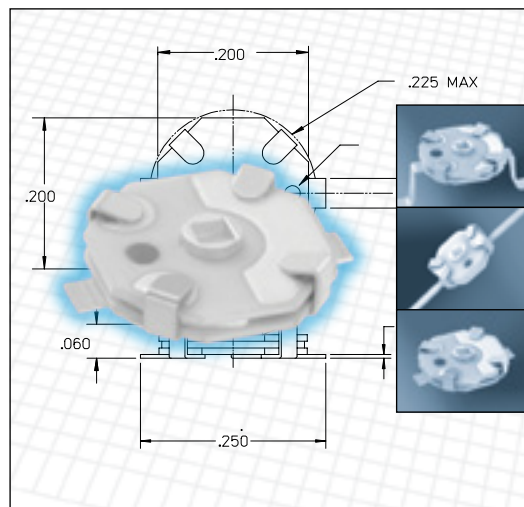


### 9300 SERIES

- Working Voltage: 250 VDC (500 VDC Test)
- Insulation Resistance: > 10<sup>4</sup> M
- Temperature Range: -55°C to +85°C
- Tuning Tool: 8764
- Packaging: Bulk
- RoHS Compliant

Specifications subject to change without notice.

## THIN-TRIM



### APPLICATIONS

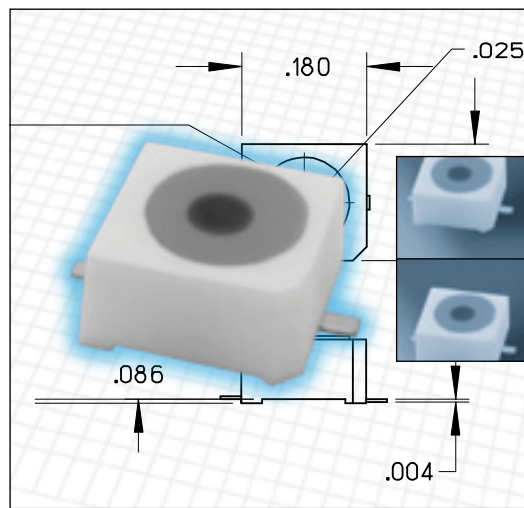
- RF amplifier
- LC Filters and Networks
- Broadband Wireless LAN
- Medical Devices
- Cordless and Cellular phones
- DR/Crystal Oscillator

### CHARACTERISTICS

- Working Voltage: 250 VDC (500 VDC Test)
- Insulation Resistance: > 10<sup>4</sup> M
- Temperature Range: -55°C to +125°C
- RoHS Compliant parts available
- Non-Magnetic

Series	Disk Size	Capacitance Available	Tuning Resolution
9401	.140" (3.56 mm)	.25 to 4.0 pF	90°
9402	.125" (3.18 mm)	.5 to 25 pF	180°
9410	.200" (5.08 mm)	1 to 50 pF	180°

## CERA-TRIM



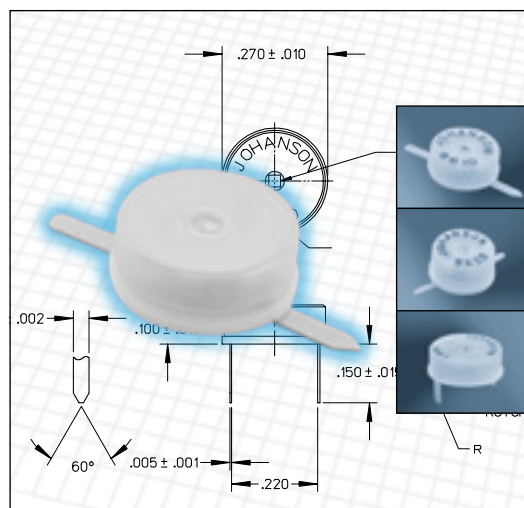
### APPLICATIONS

- RF amplifier
- LC Filters and Networks
- Broadband Wireless LAN
- Medical Devices
- Cordless and Cellular phones
- DR/Crystal Oscillator
- Microstrip line filters

### CHARACTERISTICS

- Working Voltage: 250 VDC (500 VDC Test)
- Insulation Resistance: > 10<sup>4</sup> M
- Temperature Range: -55°C to +125°C
- Tuning Tool: 4192
- RoHS Compliant parts available
- Non-Magnetic

## SEAL-TRIM



### APPLICATIONS

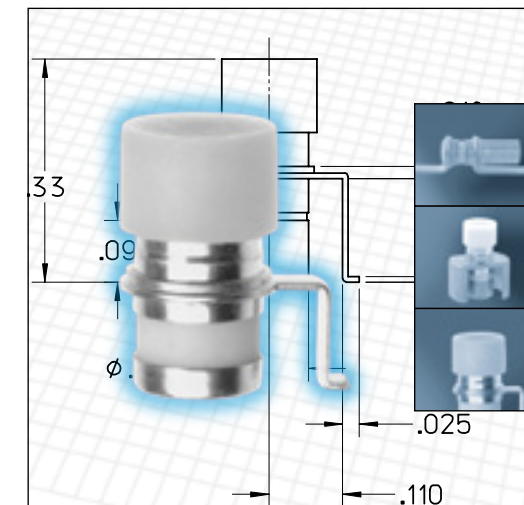
- RF amplifier
- LC Filters and Networks
- Broadband Wireless LAN
- Medical Devices
- Cordless and Cellular phones
- DR/Crystal Oscillator
- Microstrip line filters

### CHARACTERISTICS

- Working Voltage: 250 VDC (500 VDC Test)
- Long Rotational life
- Insulation Resistance: > 10<sup>4</sup> M
- Temperature Range: -55°C to +125°C
- RoHS Compliant parts available
- Non-Magnetic

Series	Disk Size	Capacitance Available	Tuning Resolution
9610/9810	.270" (6.86 mm)	1 to 50 pF	180°
9620/9820	.180" (4.57 mm)	.5 to 25 pF	180°

## GIGA-TRIM®



### APPLICATIONS

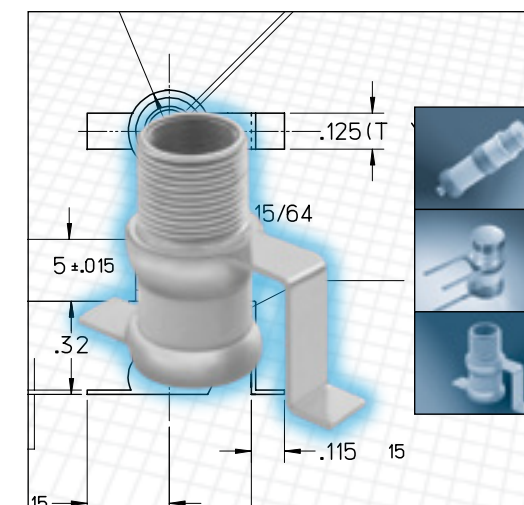
- RF amplifier
- Impedance matching
- Crystal trimming
- Interstage coupling
- Filter tuning

### CHARACTERISTICS

- Working Voltage: 500 VDC (1000 VDC Test)
- Long rotational life
- Insulation resistance: > 10<sup>6</sup> M
- Temperature range: -65°C to +125°C
- RoHS Compliant parts available

Capacitance Rng	Series	Q @ 250 MHz
0.3 to 1.2 pF	27260	> 5000
0.4 to 2.5 pF	27280	> 4000
	47280	> 4000
	47480	> 2000
0.3 to 2.3 pF	17270	> 2000
	27270	> 3000
	47270	> 3000
0.6 to 4.5 pF	57280	> 1000
	27290	> 3000
	57270	> 1000
2.0 to 6.0 pF	47470	> 1500

## AIR CAPACITORS



### APPLICATIONS

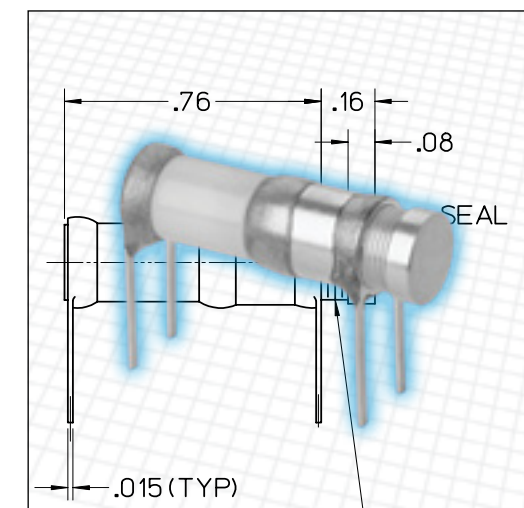
- RF amplifier and oscillators
- Impedance matching
- Interstage coupling
- Filter tuning
- Crystal trimming

### CHARACTERISTICS

- Working Voltage: 250 VDC (500 VDC Test)
- Long Rotational life
- Insulation resistance: > 10<sup>6</sup> M
- Temperature range: -65°C to +125°C
- RoHS Compliant parts available

Capacitance Rng	Series	Q @ 250 MHz
0.35 to 3.5 pF	5800	> 10000
0.5 to 5 pF	5850	> 7500
0.6 to 6 pF	5700	> 10000
1.0 to 10 pF	1500	> 4000 @195MHz
.8 to 10 pF	5200	> 5000
.8 to 10 pF	5750	> 7500
1 to 10 pF	5300	> 2000
1 to 14 pF	5400	> 3000
1 to 16 pF	5450	> 3000
1 to 20 pF	5500	> 1500
1 to 30 pF	5600	> 800

## NON-MAGNETIC TRIMMER CAPACITORS

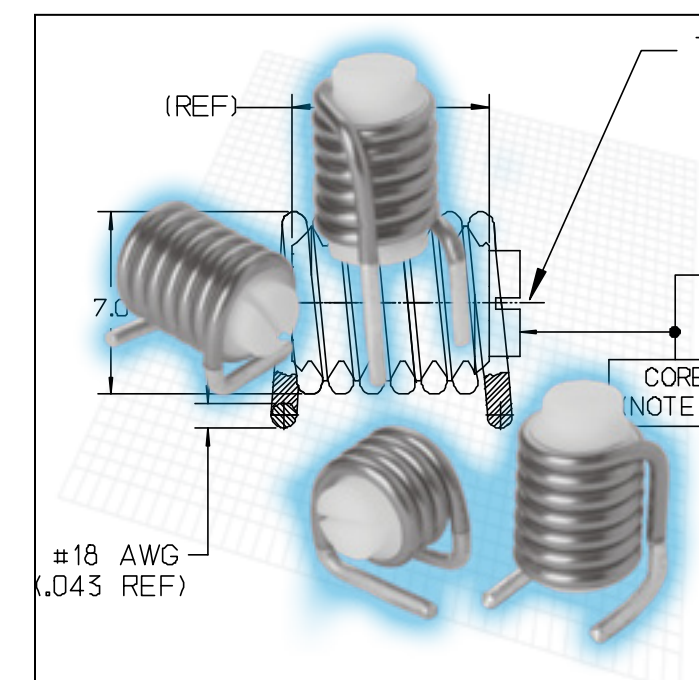


### CHARACTERISTICS

- Working Voltage: From 250 VDC to 5000 VDC
- Long Rotational life
- Insulation Resistance: > 10<sup>6</sup> M
- Temperature range: -65°C to +125°C
- RoHS Compliant parts available

Working Voltage	Capacit. Range	Series	Q
5000 VDC	1 to 7.5 pF	5610	>1000 @100MHz
1250 VDC	1.5 to 10 pF	52H	>1400 @195MHz
	1.5 to 19 pF	55H	>1000 @175MHz
1000 VDC	1 to 25 pF	59H	>1000 @175MHz
	2 to 30 pF	56H	>1000 @175MHz
250 VDC	.4 to 3.5 pF	5860	>10000 @100MHz
	.6 to 6.0 pF	5760	>10000 @100MHz
	.8 to 10 pF	5240	>4000 @100MHz
	1 to 30 pF	5640	>800 @100MHz

## NON-MAGNETIC VARIABLE INDUCTORS



### APPLICATIONS

- MRI / NMR Systems
- Radios / Jammers
- Power Amplifiers
- Radar
- Avionics Instrumentation
- Test Equipment

### CHARACTERISTICS

- Patent pending, precision machined design
- 7mm high in SMD, Vertical SMD and thru-hole versions
- Nominal values of 32 to 118nH, 2 to 7 turns
- Q as high as 121 @ 100MHz, 5RF 0.7 – 1.5 GHz
- Superb shock, vibration and thermal tolerances
- -40°C to +85°C
- Customized version requests welcomed

Part No.	L [nH]				Q @100MHz	SRF [GHz]	Turns	Thread Length [mm]
	Min	Nom	Max	No Core				
JLC02E030TRSM	32	33	34	39	90	1.2	2	6
JLC03E048TRSM	46	49	52	59	95	1	3	6
JLC04E065TRSM	60	64	68	78	101	0.9	4	6
JLC05E088TRSM	74	81	87	99	114	0.9	5	8
JLC06E110TRSM	94	107	119	123	119	0.7	6	8
JLC07E130TRSM	104	118	133	142	121	0.7	7	10
JLC09E160TRSM	122	130	170	191	162	0.58	9	13
JLC13E250TRSM	185	219	270	294	199	0.43	13	18
JLC19E375TRSM	281	345	436	457	171	0.31	19	25

Part No.	L [nH]				Q @100MHz	SRF [GHz]	Turns	Thread Length [mm]
	Min	Nom	Max	No Core				
JLC02E030TRSM	32	33	34	39	90	1.2	2	6
JLC03E048TRSM	46	49	52	59	95	1	3	6
JLC04E065TRSM	60	64	68	78	101	0.9	4	6
JLC05E088TRSM	74	81	87	99	114	0.9	5	8
JLC06E110TRSM	94	107	119	123	119	0.7	6	8
JLC07E130TRSM	104	118	133	142	121	0.7	7	10

Part No.	L [nH]				Q @100MHz	SRF [GHz]	Turns	Thread Length [mm]
	Min	Nom	Max	No Core				
JLC02E030TRSM	32	33	34	39	90	1.2	2	6
JLC03E048TRSM	46	49	52	59	95	1	3	6
JLC04E065TRSM	60	64	68	78	101	0.9	4	6
JLC05E088TRSM	74	81	87	99	114	0.9	5	8
JLC06E110TRSM	94	107	119	123	119	0.7	6	8
JLC07E130TRSM	104	118	133	142	121	0.7	7	10