



KEY FEATURES

- Automates Functional Tuning
- High Resolution, High Accuracy Tuning Capability
- Highly Stable and Reliable After Adjustment
- Small, Standard SMD Chip Sizes
- Lower Placement Cost vs Mechanical

APPLICATIONS

- Portable Cellular Products
- Cable Modems
- Wireless Transceivers
- Wireless LAN
- RFID
- Custom Applications

LASERtrim[®] tuning capacitors are laser adjustable monolithic ceramic surface mount devices for precise functional tuning of RF circuits. LASERtrims[®] have the high reliability expected of conventional multi-layer chip capacitors and do not experience capacitance drift, flux entrapment and other reliability concerns associated with mechanical trimmers. Excellent post-trim Q and ESR performance are exhibited at frequencies of 100 - 2000 MHz. Offered in chip sizes 1206 and 1210 with nickel barrier terminations and tape and reel packaging, LASERtrims[®] are compatible with high volume SMT auto-placement and reflow techniques. These high quality, drift-free devices are ideally suited for functional tuning applications in oscillator, filter, and antenna circuits in a variety of wireless RF products.

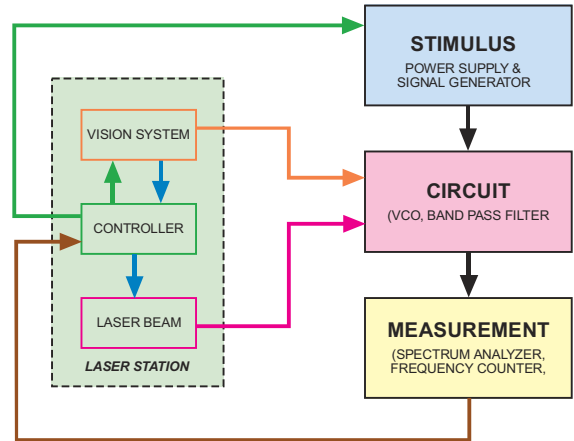
MODEL SELECTION

JOHANSON PART NUMBER	CASE SIZE	CAPACITANCE		QUALITY FACTOR	
		INITIAL	TUNING RANGE	200 MHz	900 MHz
500L07LxxxXG4	0402	<i>COMING Q2, 2000!</i>			
500L14N120XG4	NEW! 0603	12.0 pF	12.0 - 2.00 pF	> 125	-----
500L15L6R0XG4	0805	6.0 pF	6.0 - 1.00 pF	> 300	> 35
500L15N100XG4	0805	10.0 pF	10.0 - 1.20 pF	> 75	-----
500L15N200XG4	0805	20.0 pF	20.0 - 1.50 pF	> 50	-----
500L18C2R0XG4	1206	2.0 pF	2.0 - 0.50 pF	> 600	> 100
500L18L4R0XG4	1206	4.0 pF	4.0 - 1.00 pF	> 500	
500L18L6R5XG4	1206	6.5 pF	6.5 - 1.20 pF	> 300	> 40
500L18N100XG4	1206	10.0 pF	10.0 - 2.00 pF	> 125	
500L41C2R5XG4	1210	2.5 pF	2.5 - 0.50 pF	> 600	> 125
500L41C3R2XG4	1210	3.2 pF	3.2 - 0.50 pF	> 450	> 125
500L41L7R0XG4	1210	7.0 pF	7.0 - 1.50 pF	> 400	
500L41L120XG4	1210	12.0 pF	12.0 - 2.00 pF	> 200	> 25
500L41N210XG4	1210	21.0 pF	21.0 - 3.00 pF	> 75	-----

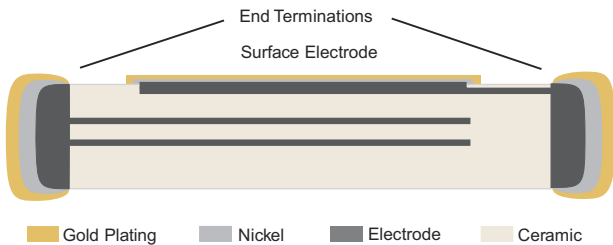
Initial capacitance has a tolerance of + 25% - 0%. Trim ranges are approximate and vary with laser settings and trim pattern. Custom LASERtrims[®] with features and performance tailored for specific applications are available.

TUNING DESCRIPTION

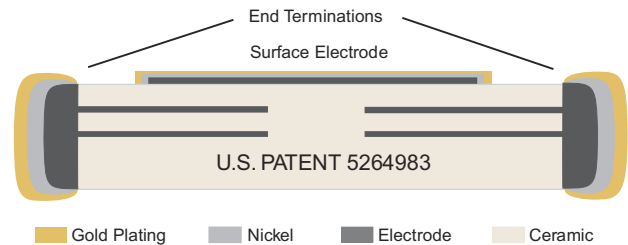
LASERtrim® tuning capacitors are used to provide functional RF circuitry tuning. The tuning is normally performed at a laser station integrated into the automated assembly line at a point beyond any operations that may significantly alter the circuit's RF characteristics. Tuning is performed by a computer controlled YAG laser beam which removes or "trims" the top electrode material of the LASERtrim® thereby decreasing its capacitance. Circuit parameters such as frequency or voltage are monitored during tuning and fed back to the laser controller achieving extremely precise results. Typical capacitance change in relation to the amount of electrode removal is shown in the graphs below.



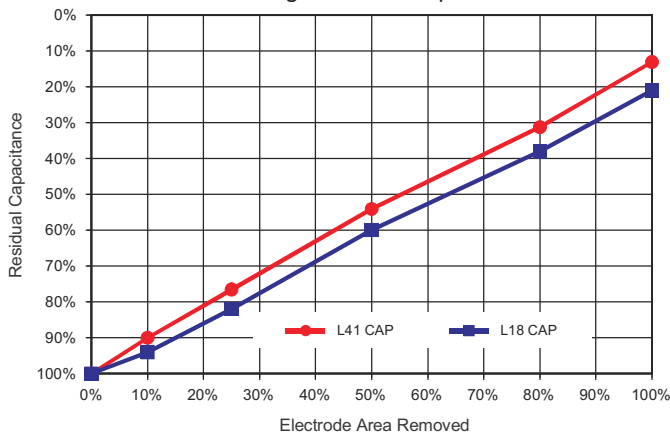
Sectional Diagram: Sizes L14 & L15



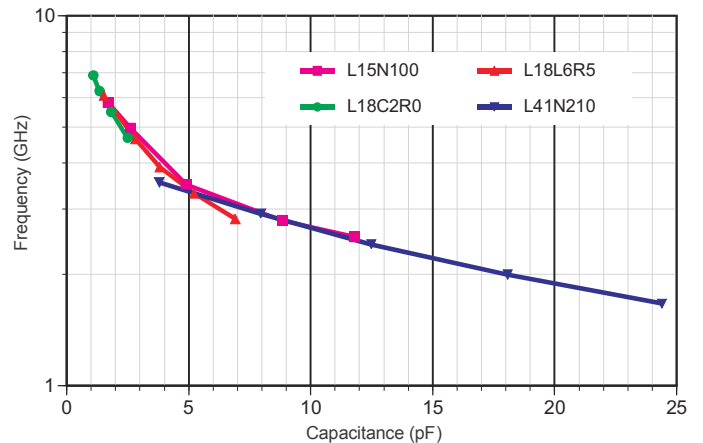
Sectional Diagram: Sizes L18 & L41



Trimming Effect on Capacitance

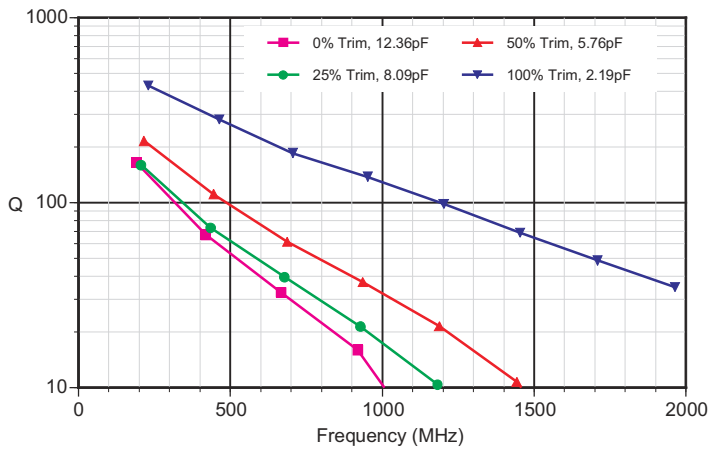


Typical Series Resonant Frequency

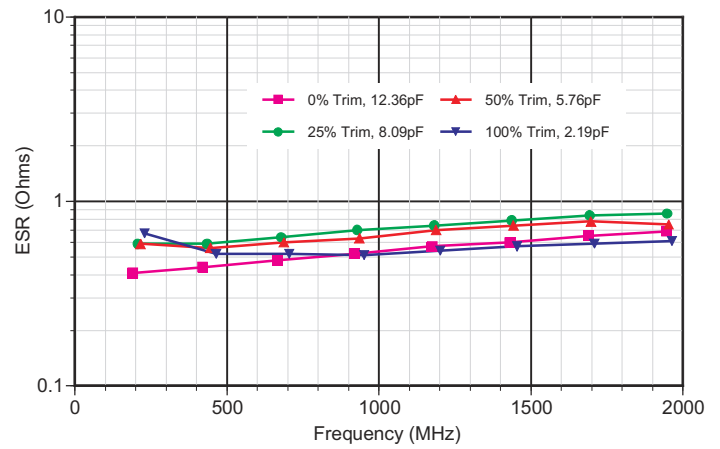


LASERTRIM® TYPICAL RF CHARACTERISTICS

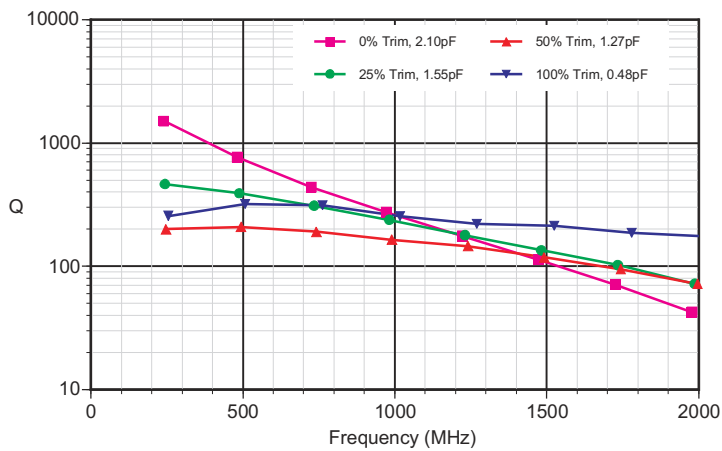
TYPICAL QUALITY FACTOR: L15N100



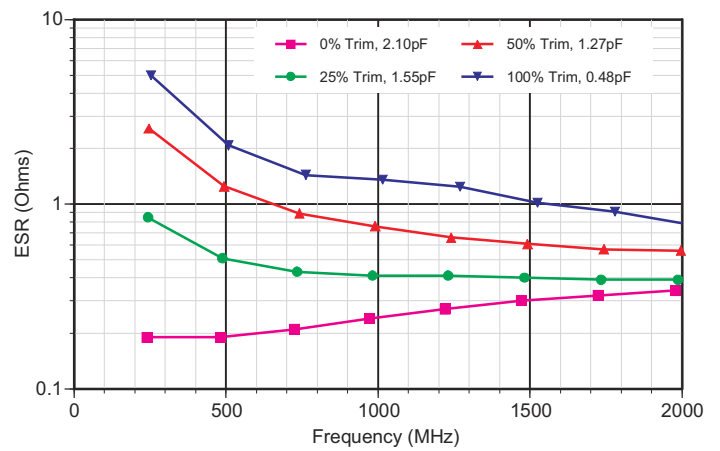
TYPICAL ESR: L15N100



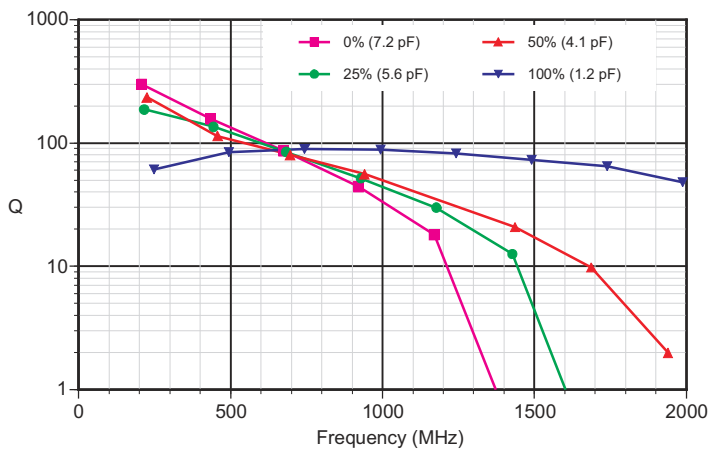
TYPICAL QUALITY FACTOR: L18C2R0



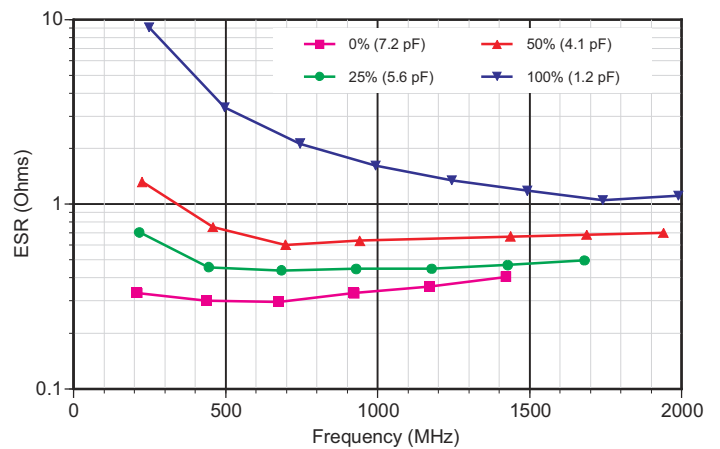
TYPICAL ESR: L18C2R0



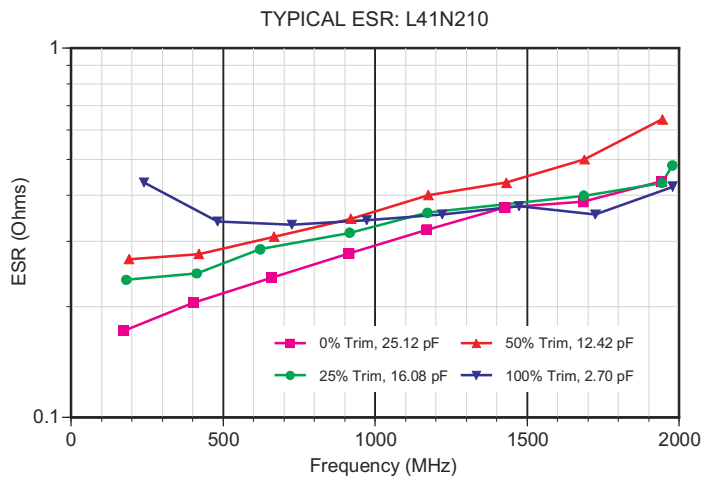
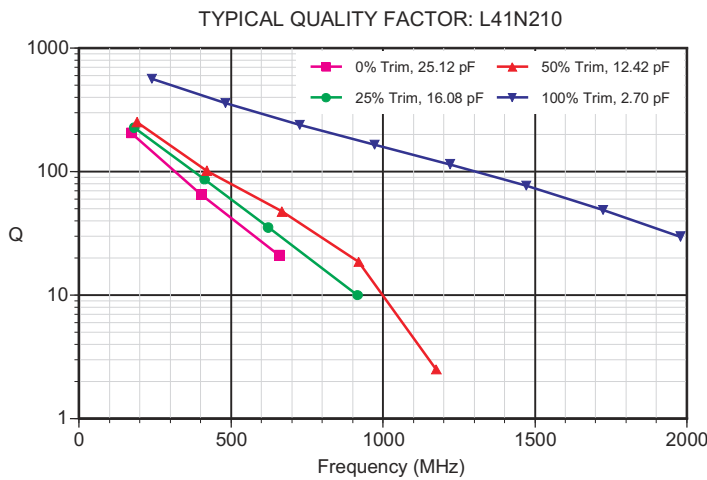
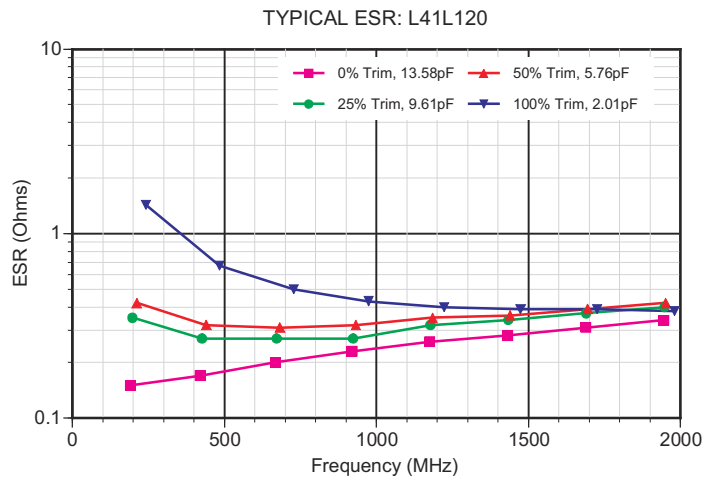
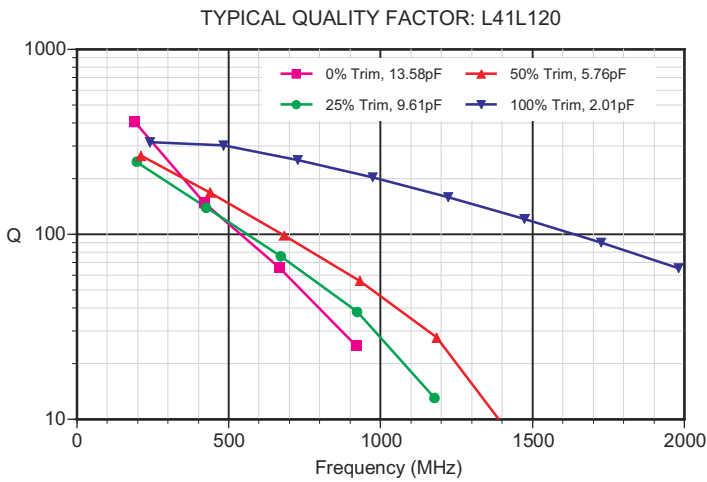
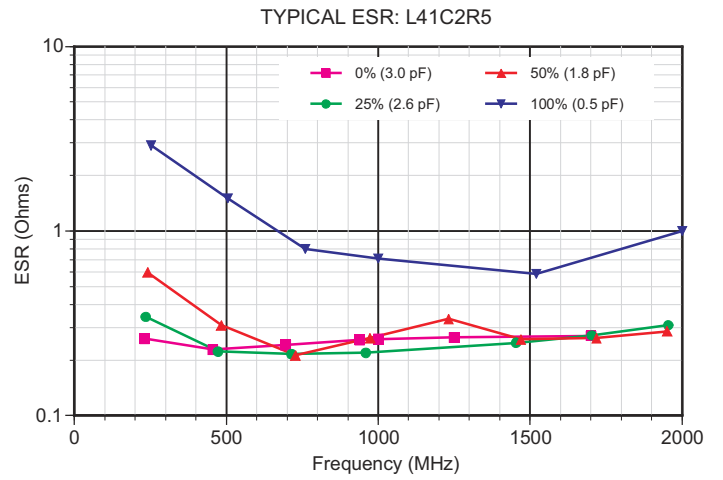
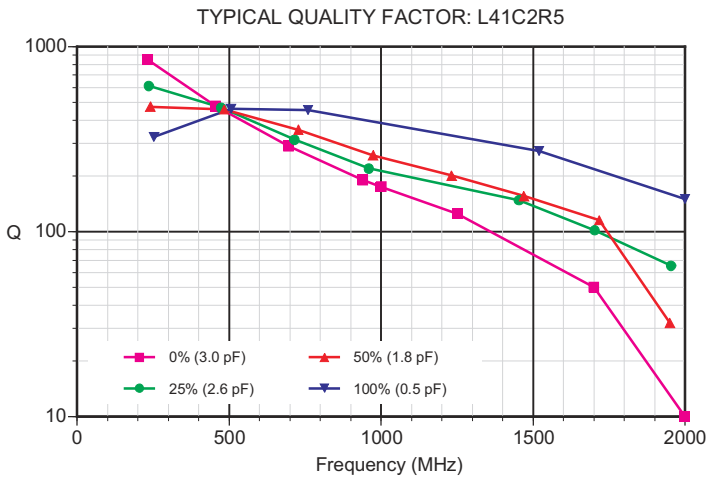
TYPICAL QUALITY FACTOR: L18L6R5



TYPICAL ESR: L18L6R5



LASERTRIM® TYPICAL RF CHARACTERISTICS



MECHANICAL CHARACTERISTICS

SIZE	L14 (0603)		L15 (0805)		L18 (1206)		L41 (1210)	
	Inches	(mm)	Inches	(mm)	Inches	(mm)	Inches	(mm)
L	.058 ±.008	(1.47 ±.20)	.080 ±.008	(2.00 ±.20)	.122 ±.008	(3.09 ±.20)	.130 ±.008	(3.30 ±.20)
W	.032 ±.008	(0.81 ±.20)	.050 ±.008	(1.27 ±.20)	.060 ±.008	(1.52 ±.20)	.100 ±.008	(2.54 ±.20)
T	.025 MAX	(0.64 MAX)	.025 ±.005	(0.64 ±.13)	.025 ±.005	(0.64 ±.13)	.025 ±.005	(0.64 ±.13)
x & y	.004 MIN	(0.10 MIN)	.004 MIN	(0.10 MIN)	.004 MIN	(0.10 MIN)	.004 MIN	(0.10 MIN)
E/B	.005 MAX	(0.13 MAX)	.005 MIN	(0.13 MIN)	.005 MIN	(0.13 MIN)	.005 MIN	(0.13 MIN)
E/B*	.012 MAX	(0.30 MAX)	N/A (L14 Only)		N/A (L14 Only)		N/A (L14 Only)	

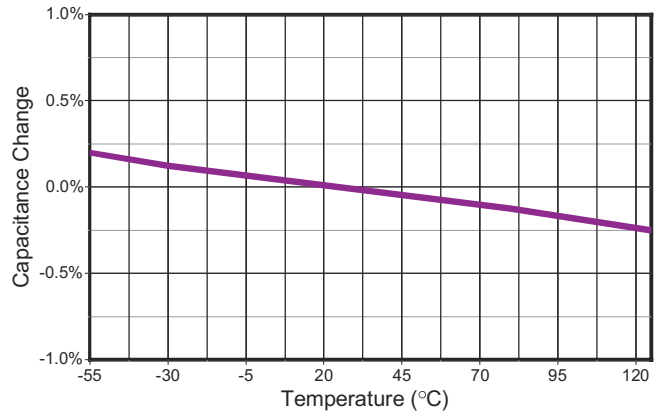
Top View

Side View

Bottom View

ELECTRICAL CHARACTERISTICS

WORKING VOLTAGE:	50 Volts DC
TEMPERATURE COEFFICIENT:	0 ± 30ppm /°C, -55 to 125°C
DISSIPATION FACTOR:	.001 (0.1%) max, 25°C
INSULATION RESISTANCE:	> 10 GΩ @ 25°C, WVDC; 125°C IR is 10% of 25°C rating.
DIELECTRIC STRENGTH:	2.5 X WVDC, 25°C, 50 mA max
TEST PARAMETERS:	1MHz ±50kHz, 1.0±0.2 VRMS, 25°C
ENVIRONMENTAL:	Meets M&E characteristics on page 7 except Terminal Adhesion as follows: L14: ≥2.0Lbs, L15: ≥5.0Lbs, L18: ≥2.0Lbs, L41: ≥4.0Lbs



HOW TO ORDER

