LASERTRIM® SMT TUNER CAPACITORS

KEY FEATURES

- RoHS Compliant Parts Available
- 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 0603 to 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.

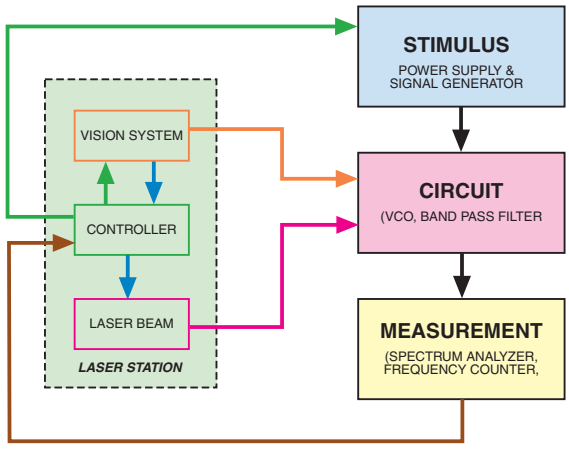
MODEL SELECTION

			CAPACITANCE		QUALITY FACTOR	
Part Number	RoHS P/N	EIACase Size	Initial	Tuning Range	200 MHz	900 MHz
500L14N6R0XG4	500L14N6R0XG4	0603	6.0 pF	6.0 - 1.00 pF	> 40	---
500L14N100XG4	500L14N100XG4	0603	10.0 pF	10.0 - 2.00 pF	> 125	---
500L14N120XG4	500L14N120XG4	0603	12.0 pF	12.0 - 2.00 pF	> 125	---
500L15L6R0XG4	500L15M6R0XG4	0805	6.0 pF	6.0 - 1.00 pF	> 300	> 35
500L15N100XG4	500L15N100XG4	0805	10.0 pF	10.0 - 1.20 pF	> 75	---
500L15N200XG4	500L15N200XG4	0805	20.0 pF	20.0 - 1.50 pF	> 50	---
500L18C2R0XG4	500L18S2R0XG4	1206	2.0 pF	2.0 - 0.50 pF	> 600	> 100
500L18L3R0XG4	500L18M3R0XG4	1206	3.0 pF	3.0 - 1.0 pF	> 500	---
500L18L4R0XG4	500L18M4R0XG4	1206	4.0 pF	4.0 - 1.00 pF	> 500	---
500L18L6R5XG4	500L18M6R5XG4	1206	6.5 pF	6.5 - 1.20 pF	> 300	> 40
500L18N100XG4	500L18N100XG4	1206	10.0 pF	10.0 - 2.00 pF	> 125	---
500L41C2R5XG4	500L41S2R5XG4	1210	2.5 pF	2.5 - 0.50 pF	> 600	> 125
500L41C3R2XG4	500L41S3R2XG4	1210	3.2 pF	3.2 - 0.50 pF	> 450	> 125
500L41L7R0XG4	500L41M7R0XG4	1210	7.0 pF	7.0 - 1.50 pF	> 400	---
101L41L7R0XG4	101L41M7R0XG4	1210	7.0 pF	7.0 - 1.50 pF	> 400	---
500L41L120XG4	500L41M120XG4	1210	12.0 pF	12.0 - 2.00 pF	> 200	> 25
500L41N210XG4	500L41N210XG4	1210	21.0 pF	21.0 - 3.00 pF	> 75	---

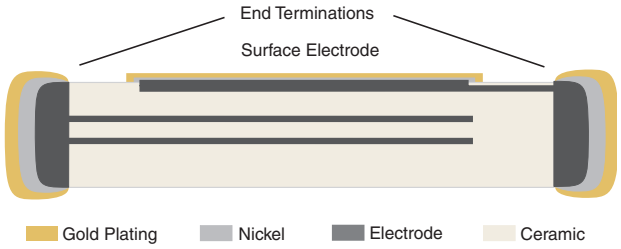
Initial capacitance has a tolerance of + 25% - 0%. Trim ranges are approximate and vary with laser settings and trim pattern.
Custom LASERtrims® with features and performance tailored for specific applications are available.

TUNING DESCRIPTION

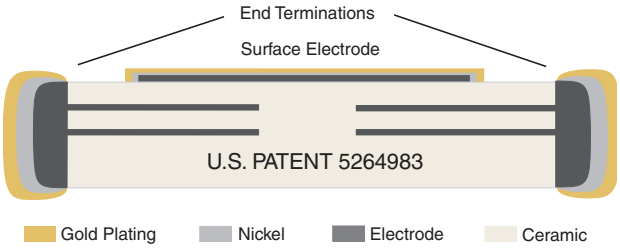
LASERtrim® tuning capacitors are used to provide functional RF circuitry tuning. The tuning is normally performed at a laser station integrated into the automated assembly line at a point beyond any operations that may significantly alter the circuit's RF characteristics. Tuning is performed by a computer controlled YAG laser beam which removes or "trims" the top electrode material of the LASERtrim® thereby decreasing it's 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.



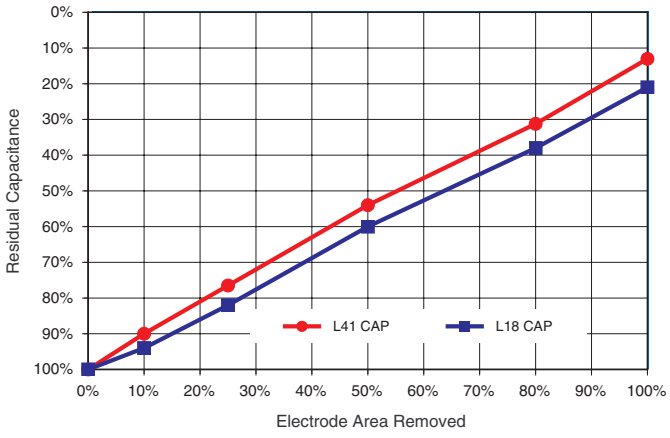
Sectional Diagram: Sizes L14 & L15



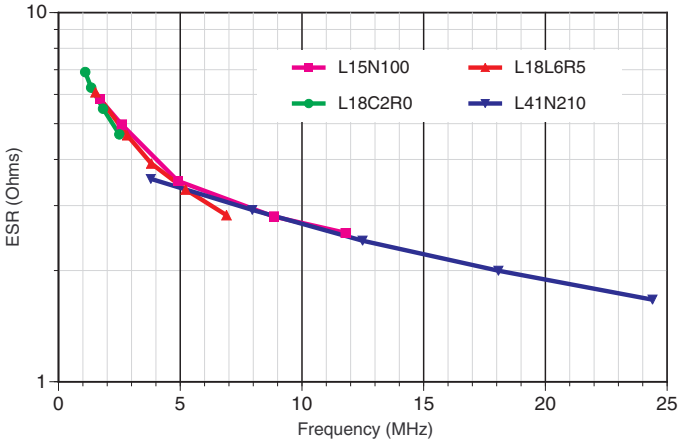
Sectional Diagram: Sizes L18 & L41



Trimming Effect on Capacitance

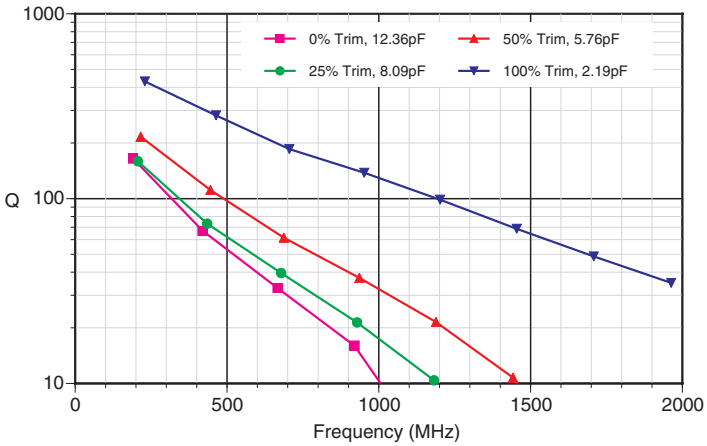


Typical Series Resonant Frequency

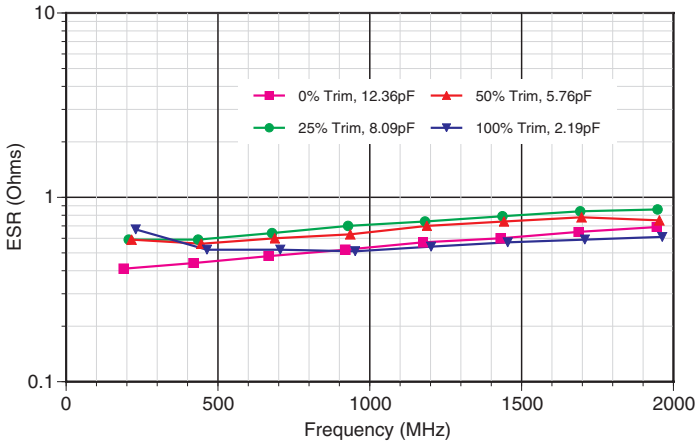


LASERTRIM® TYPICAL RF CHARACTERISTICS

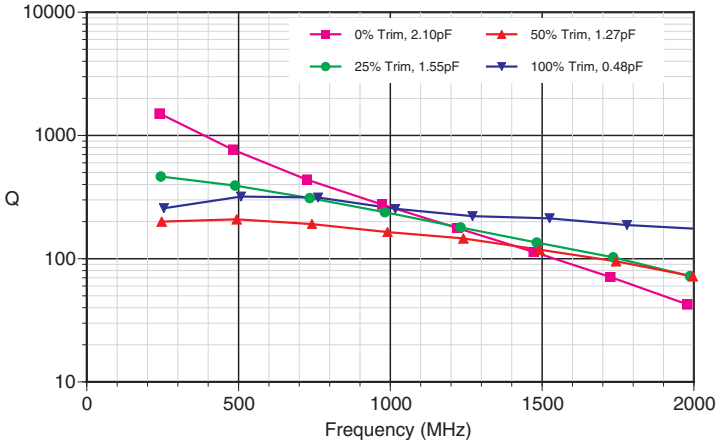
TYPICAL QUALTIY FACTOR: L15N100



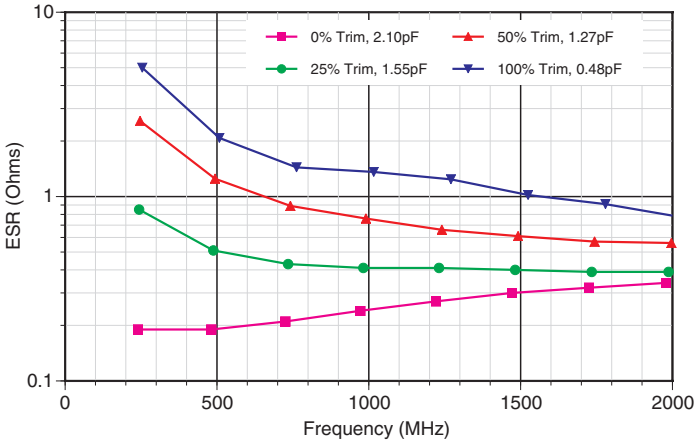
TYPICAL ESR: L15N100



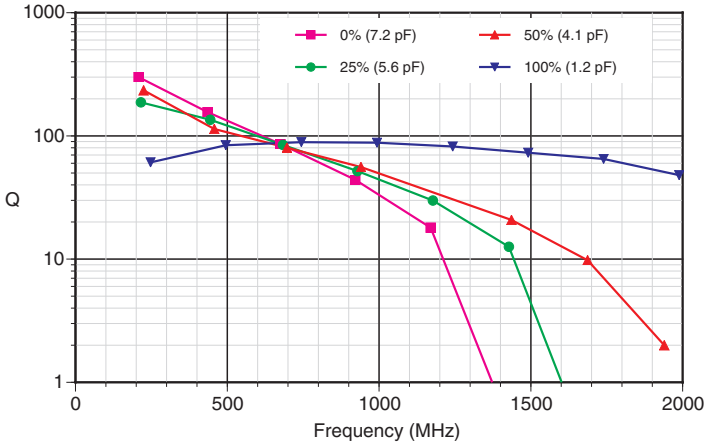
TYPICAL QUALTIY FACTOR: L18C2R0



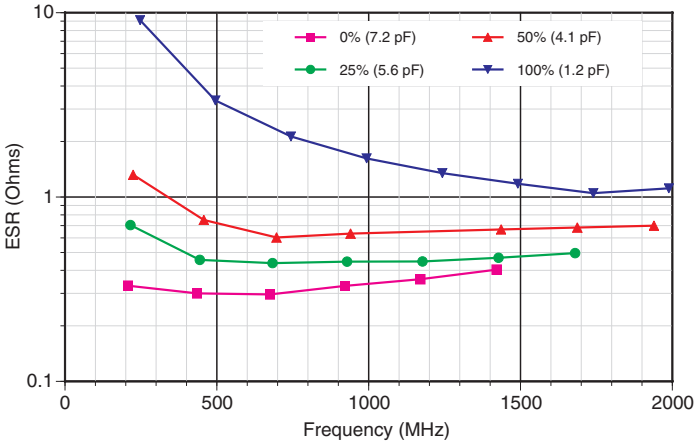
TYPICAL ESR: L18C2R0



TYPICAL QUALTIY FACTOR: L18L6R5



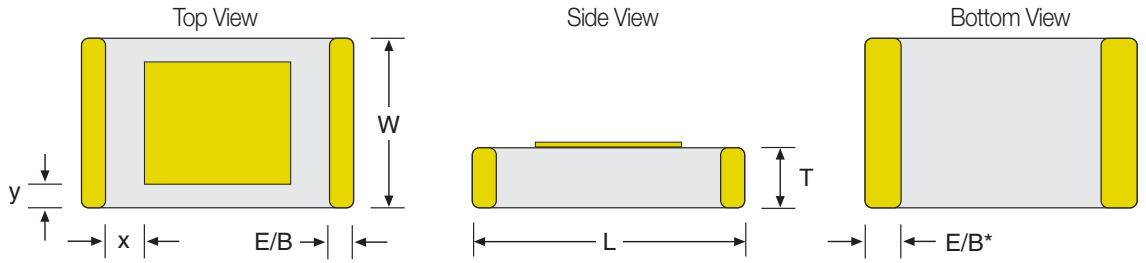
TYPICAL ESR: L18L6R5



For L41 size electrical characteristics and graphs, please contact the factory.

MECHANICAL CHARACTERISTICS

SIZE	L14 (EIA 0603)		L15 (EIA 0805)		L18 (EIA 1206)		L41 (EIA 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)	



ELECTRICAL CHARACTERISTICS

WORKING VOLTAGE: 50 Volts DC

TEMPERATURE COEFFICIENT: 0 ± 30ppm /°C, -55 to 125°C

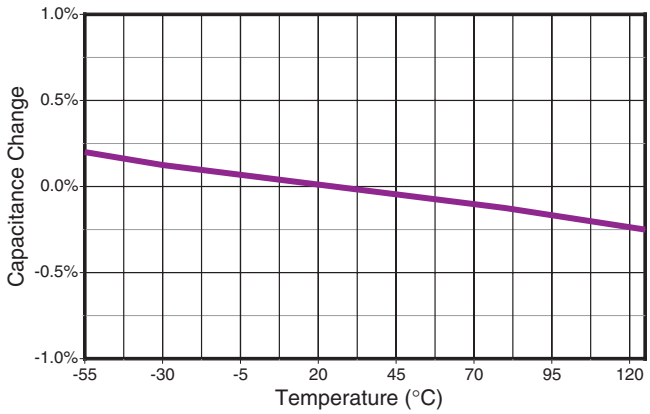
DISSIPATION FACTOR: .001 (0.1%) max, 25°C

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 the mechanical & environmental characteristics as given for the JTI S-Series capacitors (see second page of S-Series specification sheet), except terminal adhesion for all sizes is > 2.0 lbs.



HOW TO ORDER

500	L41	N	210	X	G	4	T

VOLTAGE
Standard Voltage:
500 = 50 V

CASE SIZE
See Chart

DIELECTRIC
L = NPO
C = HI-Q NPO
N, M = RoHS NPO
S = RoHS Hi-Q NPO

PRE-TRIM CAPACITANCE
1st two digits are significant; third digit denotes number of zeros, R = decimal point.
2R0 = 2.0 pF
210 = 21 pF

TOLERANCE
Initial capacitance tolerance is +25% -0%

TERMINATION
G = Gold flashed

MARKING
Part marking not available this series

TAPE MODIFIER

Tape Code	Tape Type	Reel Size
T	Paper	7"
R	Paper	13"

Tape specs. per EIA RS481.