



The Multilayer Organic Inductor is a low profile organic based inductor that can support mobile communications, satellite applications, GPS, matching networks, and collision avoidance. The MLO™ Inductor series of components are based on AVX's patented multilayer organic technology (US patent 6,987,307). MLO™ Inductors incorporate very low loss organic materials which allow for high Q and high stability over frequency. MLO™ inductors are surface mountable and are expansion matched to FR4 printed wiring boards. MLO™ Inductors utilize fine line high density interconnect technology thereby allowing for tight tolerance control and high repeatability. Reliability testing is performed to JEDEC and mil standards. Finishes are available in RoHS compliant Sn.

## APPLICATIONS

- Mobile communications
- Satellite Applications
- GPS
- Collision Avoidance
- Wireless LAN's

## FEATURES

- High Q
- High SRF
- High Frequency
- High Withstanding Voltage
- Low DC Resistance
- Expansion Matched to PCB
- Surface Mountable
- 0402 Case Size
- RoHS Compliant Finishes
- Available in Tape and Reel

## SURFACE MOUNT ADVANTAGES

- Inherent Low Profile
- Excellent Solderability
- Low Parasitics
- Better Heat Dissipation

## HOW TO ORDER

**HL02**



Style

**XXX**



Inductance

Expressed in nH  
(2 significant digits + number of zeros)  
**for values <10nH,**  
letter R denotes decimal point.  
Example:  
22nH = 220  
4.7nH = 4R7

**X**



Tolerance

**T**



Termination  
Sn100

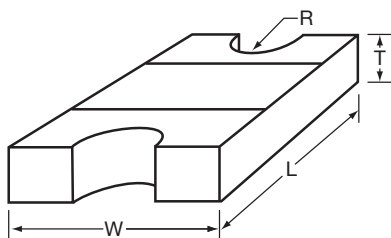
**TR**



Packaging  
Tape & Reel

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## DIMENSIONS



mm (inches)

L	W	T	R
1.00±0.10 (0.039±0.004)	0.58±0.075 (0.023±0.003)	0.35±0.10 (0.014±0.004)	0.008±0.002 (0.023±0.051)

## QUALITY INSPECTION

Finished parts are 100% tested for electrical parameters and visual characteristics.

## TERMINATION

Immersion Sn Finishes.

## OPERATING TEMPERATURE

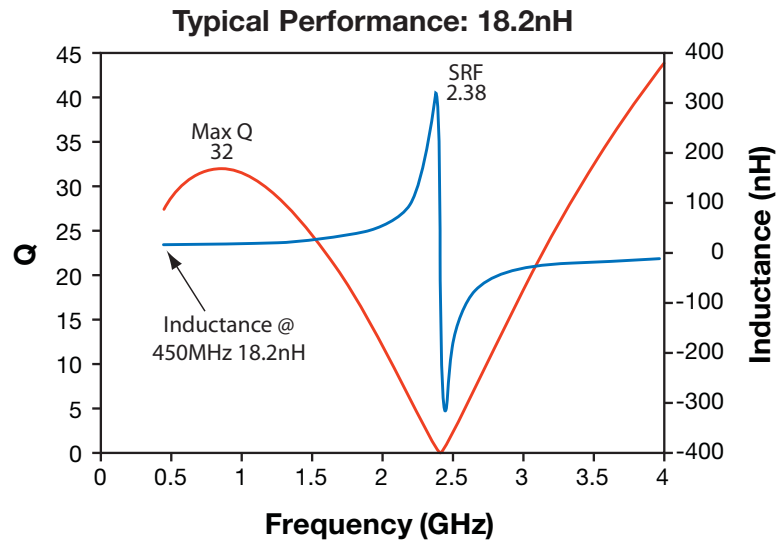
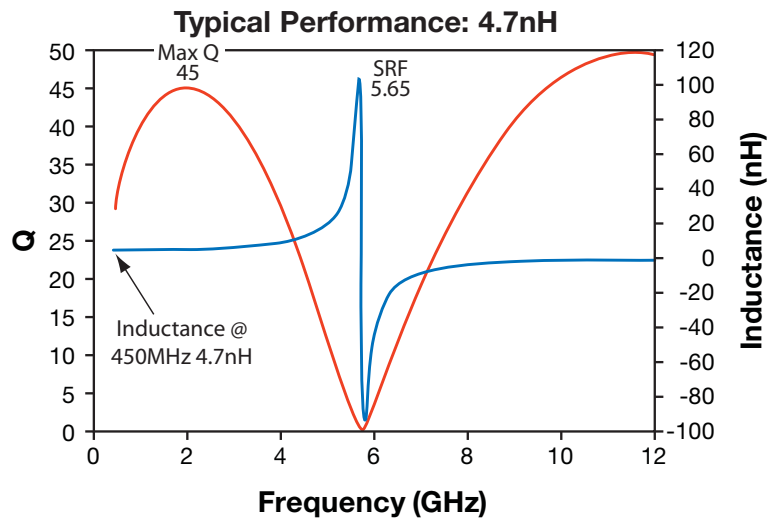
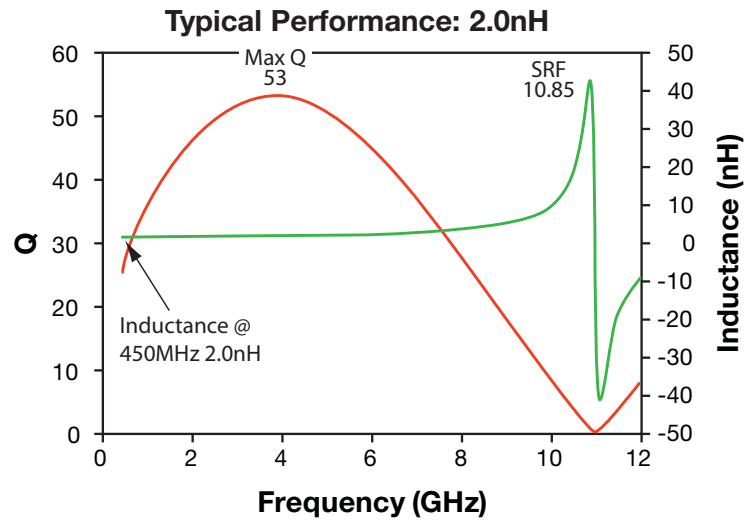
-55°C to +125°C

## 0402 ELECTRICAL SPECIFICATIONS

L (nH) 450 MHz	450 MHz Test Frequency		900 MHz Test Frequency		1900 MHz Test Frequency		2400 MHz Test Frequency		SRF Min (GHz)	Rdc Max (Ω)	Idc Max (mA)
	Available Inductance Tolerance A = ±0.05nH, B = ±0.1nH C = ±0.2nH, D = ±0.5nH G = ±2%, H = ±3% J = ±5%, K = ±10%	Q 450 MHz	L (nH) 900 MHz	Q 900 MHz	L (nH) 1900 MHz	Q 1900 MHz	L (nH) 2400 MHz	Q 2400 MHz			
1.0	A, B, C, D ↓	25	0.994	34	0.984	45	0.981	50	18.3	0.095	346
1.1		24	1.088	33	1.077	43	1.074	48	17.45	0.099	345
1.2		24	1.188	33	1.177	44	1.174	48	16.35	0.107	343
1.3		25	1.291	34	1.279	44	1.276	49	15.55	0.113	342
1.5		25	1.499	35	1.487	45	1.484	50	14	0.128	340
1.6		25	1.599	35	1.587	45	1.586	49	13.4	0.137	339
1.8		25	1.792	35	1.782	45	1.782	49	12.1	0.154	337
2.0		26	2.000	35	2.033	45	2.063	49	10.85	0.168	335
2.2		27	2.188	36	2.187	46	2.196	50	10.15	0.178	334
2.4		27	2.396	37	2.401	47	2.416	50	9.4	0.192	330
2.7		27	2.707	36	2.723	46	2.748	48	8.55	0.219	327
3.0		27	2.988	36	3.017	44	3.054	46	7.9	0.245	324
3.3		27	3.287	36	3.335	44	3.389	46	7.35	0.265	321
3.6		27	3.607	37	3.679	45	3.754	46	6.85	0.28	311
3.9		28	3.926	38	4.025	46	4.123	47	6.5	0.294	314
4.7	B, C, D ↓	29	4.711	39	4.894	45	5.069	44	5.65	0.342	294
5.6		30	5.655	40	5.976	44	6.282	42	5.08	0.394	295
6.8		30	6.895	39	7.463	41	8.015	37	4.45	0.47	274
8.2		29	8.374	37	9.362	37	10.371	31	3.95	0.57	255
10	G, H, J, K ↓	30	10.253	38	11.982	35	13.882	27	3.53	0.674	235
12		32	12.509	40	15.715	31	19.792	19	3.08	0.756	210
15		32	15.919	38	22.349	24	13.037	9	2.68	0.904	200
18		28	19.397	32	31.06	15	59.996	0.3	2.38	1.213	190
22		30	24.033	34	44.693	11	n/a	n/a	2.2	1.317	180
27		29	30.48	30	n/a	n/a	n/a	n/a	1.94	1.621	160
32		28	37.742	27	n/a	n/a	n/a	n/a	1.73	1.935	150

Specifications based on performance of component assembled properly on printed circuit board with 50Ω nominal impedance.

## MLO™ INDUCTOR SIMULATIONS 0402 CASE SIZE



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## AUTOMATED SMT ASSEMBLY

The following section describes the guidelines for automated SMT assembly of MLO™ RF devices which are typically Land Grid Array (LGA) packages or side termination SMT packages. Control of solder and solder paste volume is critical for surface mount assembly of MLO™ RF devices onto the PCB.

Stencil thickness and aperture openings should be adjusted according to the optimal solder volume. The following are general recommendations for SMT mounting of MLO™ devices onto the PCB.

## SMT REFLOW PROFILE

Common IR or convection reflow SMT processes shall be used for the assembly. Standard SMT reflow profiles, for eutectic and Pb free solders, can be used to surface mount the MLO™ devices onto the PCB. In all cases, a temperature gradient of 3°C/sec, or less, should be maintained to prevent warpage of the package and to ensure that all joints reflow properly. Additional soak time and slower preheating time

may be required to improve the out-gassing of solder paste. In addition, the reflow profile depends on the PCB density and the type of solder paste used. Standard no-clean solder paste is generally recommended. If another type of flux is used, complete removal of flux residual may be necessary. Example of a typical lead free reflow profile is shown below.

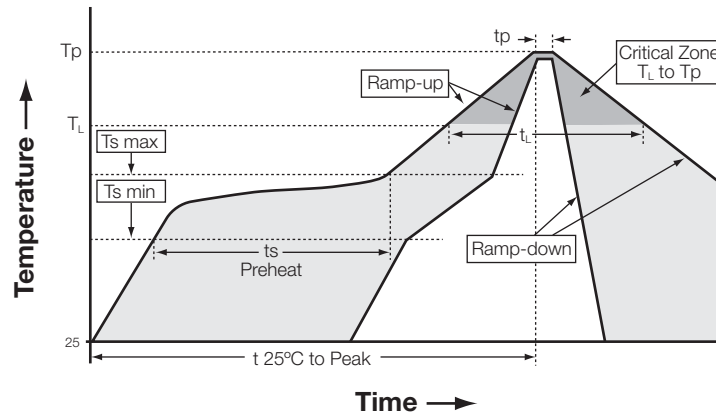


Figure A. Typical Lead Free Profile and Parameters

Profile Parameter	Pb free, Convection, IR/Convection
Ramp-up rate (T <sub>s</sub> max to T <sub>p</sub> )	3°C/second max.
Preheat temperature (T <sub>s</sub> min to T <sub>s</sub> max)	150°C to 200°C
Preheat time (t <sub>s</sub> )	60 – 180 seconds
Time above T <sub>L</sub> , 217°C (t <sub>L</sub> )	60 – 120 seconds
Peak temperature (T <sub>p</sub> )	260°C
Time within 5°C of peak temperature (t <sub>p</sub> )	10 – 20 seconds
Ramp-down rate	4°C/second max.
Time 25°C to peak temperature	6 minutes max.