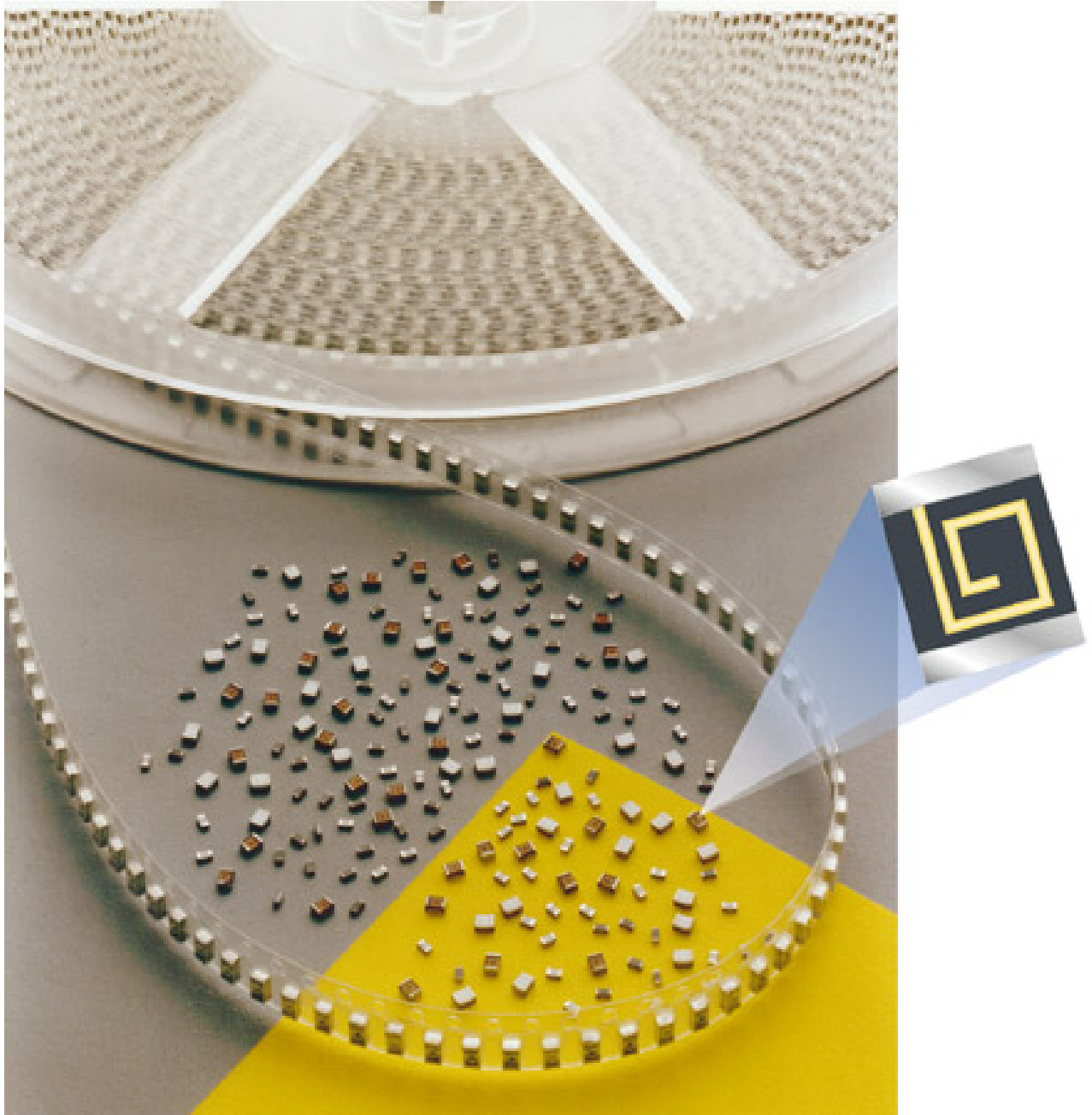


Accu-L

SMD High-Q RF Inductor



AVX



Accu-L[®] SMD High-Q RF Inductor

ACCU-L[®] TECHNOLOGY

The ACCU-L[®] SMD Inductor is based on thin-film multi-layer technology. This technology provides a level of control on the electrical and physical characteristics of the component which gives consistent characteristics within a lot and lot-to-lot.

The original design provides small size, excellent high-frequency performance and rugged construction for reliable automatic assembly.

The ACCU-L[®] inductor is particularly suited for the telecommunications industry where there is a continuing trend towards miniaturization (0603 and 0805 sizes now standard) and increasing frequencies. The ACCU-L[®] inductor meets both the performance and tolerance requirements of present cellular frequencies (450MHz and 900MHz) and of future frequencies, such as 1700MHz, 1900MHz and 2400MHz.

FEATURES:

- RF Power capability
- High SRF
- High Q
- Low DC resistance
- Tight tolerance on inductance
- Standard 0603 and 0805 chip sizes
- Low profile
- Rugged construction
- Taped and reeled

APPLICATIONS:

- Mobile communications
- Satellite TV receivers
- GPS
- Vehicle locations systems
- Filters
- Matching networks

TERMINATION:

Nickel/Solder coated (Sn63, Pb37) compatible with automatic soldering technologies: reflow, wave solder, vapor phase, and manual.

HOW TO ORDER

L 0805 4R7 D E W TR

Product Code: _____
Inductor

Size: _____
0805/0603

Inductance: _____
Inductance expressed in nH
2 significant digits + number of zeros
For values <10nH, letter R denotes decimal point.
e.g. 22nH = 220
4.7nH = 4R7

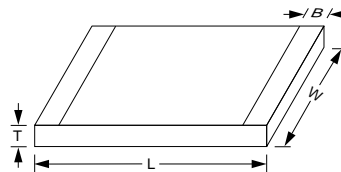
Tolerance: _____
For L < 10nH C = ±0.2nH
D = ±0.5nH
For L ≥ 10nH G = ±2%
J = ±5%

Specification Code: _____
E=Accu-L[®] 0805 Technology
F=Accu-L[®] 0603 Technology

Termination Code: _____
W = Nickel/solder coated
(Sn63, Pb37)

Packaging Code: _____
TR=Tape And Reel

DIMENSIONS - mm (inches)



		0603	0805
L		1.6±0.15 (0.063±0.006)	2.11±0.1 (0.083±0.004)
W		0.81±0.1 (0.032±0.004)	1.5±0.1 (0.059±0.004)
T		0.61±0.1 (0.024±0.004)	0.91±0.13 (0.036±0.005)
B	top:	0.0+0.3/-0.0 (0.0±0.012/-0.0)	0.25±0.1 (0.010±0.006)
	bottom:	0.35±0.15 (0.014±0.006)	

ELECTRICAL SPECIFICATIONS:

Operating/Storage Temp. Range: -55°C to +125°C
L, Q, SRF measured on HP 4291A, Boonton 34A and Wiltron 360 Vector Analyzer. R_{DC} measured on Keithley 580 micro-ohmmeter.



Accu-L[®] 0805 SMD High-Q RF Inductor

ELECTRICAL SPECIFICATIONS TABLE

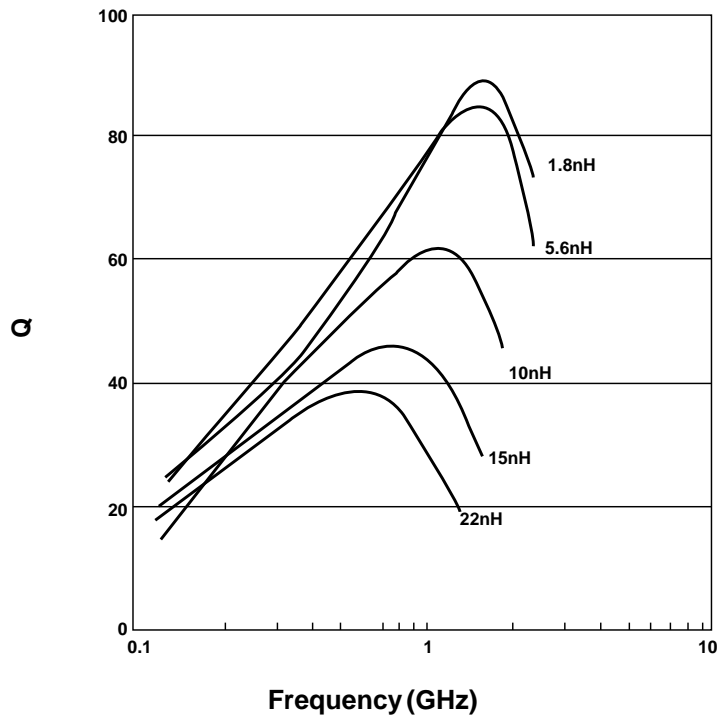
450 MHz Test Frequency			900 MHz Test Frequency		1700 MHz Test Frequency		2400 MHz Test Frequency		SRF min (MHz)	R _{DC} max (Ω)	I _{DC} max (mA)	
Inductance L (nH)	Available Inductance Tolerance	Q Typical	L (nH)	Q Typical	L (nH)	Q Typical	L (nH)	Q Typical			ΔT = 15°C (1)	ΔT = 70°C (2)
1.8	±0.2nH, ±0.5nH	50	1.8	72	1.8	88	1.9	73	10000	0.06	1000	2000
2.2	±0.2nH, ±0.5nH	42	2.2	62	2.2	82	2.3	72	10000	0.07	1000	2000
2.7	±0.2nH, ±0.5nH	42	2.7	62	2.8	80	2.9	70	10000	0.08	1000	2000
3.3	±0.2nH, ±0.5nH	38	3.3	46	3.4	48	3.5	57	10000	0.11	750	1500
3.9	±0.2nH, ±0.5nH	27	3.9	36	4.0	38	4.1	42	10000	0.20	750	1500
4.7	±0.2nH, ±0.5nH	43	4.8	62	5.3	76	5.8	60	5500	0.10	750	1500
5.6	±0.2nH, ±0.5nH	50	5.7	68	6.3	73	7.6	62	4600	0.10	750	1500
6.8	±0.2nH, ±0.5nH	43	7.0	62	7.7	71	9.4	50	4500	0.11	750	1500
8.2	±0.2nH, ±0.5nH	43	8.5	56	10.0	55	15.2	32	3500	0.12	750	1500
10	±2%, ±5%	46	10.6	60	13.4	52	–	–	2500	0.13	750	1500
12	±2%, ±5%	40	12.9	50	17.3	40	–	–	2400	0.20	750	1500
15	±2%, ±5%	36	16.7	46	27	23	–	–	2200	0.20	750	1000
18	±2%, ±5%	36	18.8	37	–	–	–	–	1700	0.35	500	1000
22	±2%, ±5%	36	23.5	33	–	–	–	–	1400	0.40	500	1000

(1) I_{DC} measured for 15°C rise at 25°C ambient temperature

(2) I_{DC} measured for 70°C rise at 25°C ambient temperature

NOTICE: Specifications are subject to change without notice. Contact your nearest AVX Sales Office for the latest specifications. All statements, information and data given herein are believed to be accurate and reliable, but are presented without guaranty, warranty, or responsibility of any kind, expressed or implied. Statements or suggestions concerning possible use of our products are made without representation or warranty that any such use is free of patent infringement and are not recommendations to infringe any patent. The user should not assume that all safety measures are indicated or that other measures may not be required. Specifications are typical and may not apply to all applications.

Q vs. Frequency (Typical)
for 0805

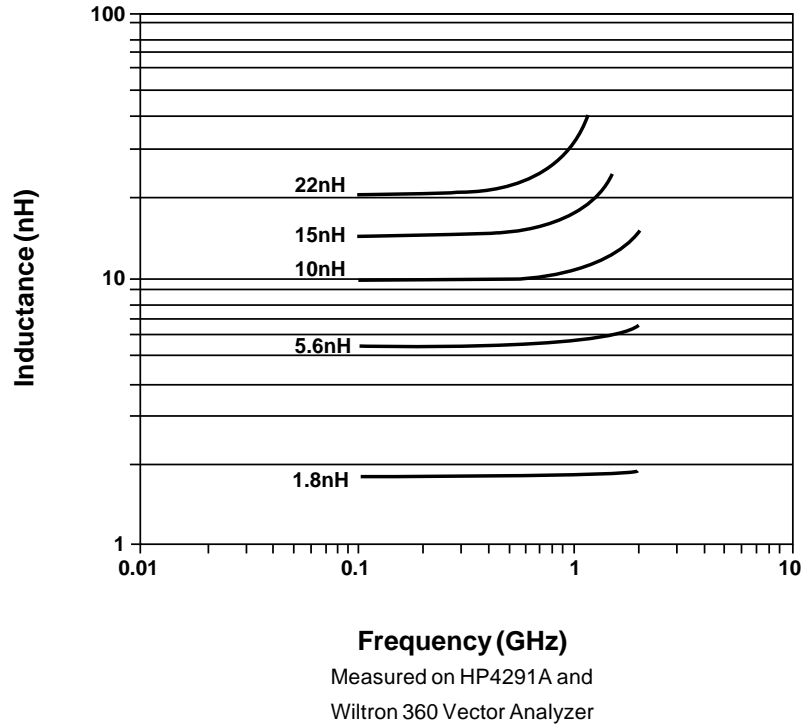


Measured on HP4291A and
Boonton 34A Coaxial Line

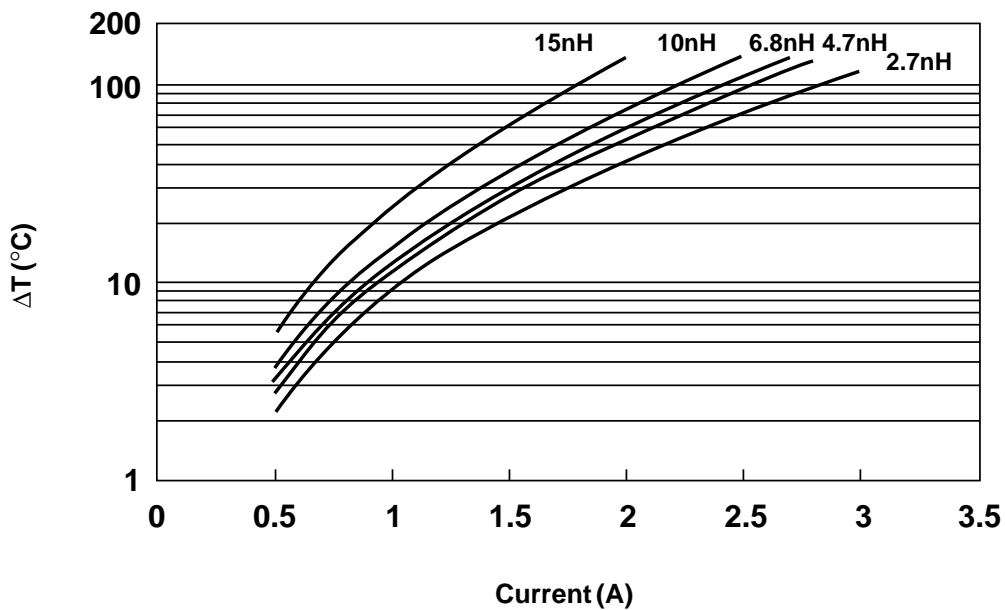


Accu-L[®] 0805 SMD High-Q RF Inductor

Inductance vs. Frequency (Typical) for 0805
for 0805



Maximum Temperature Rise
at 25°C ambient temperature (on FR-4)
for 0805





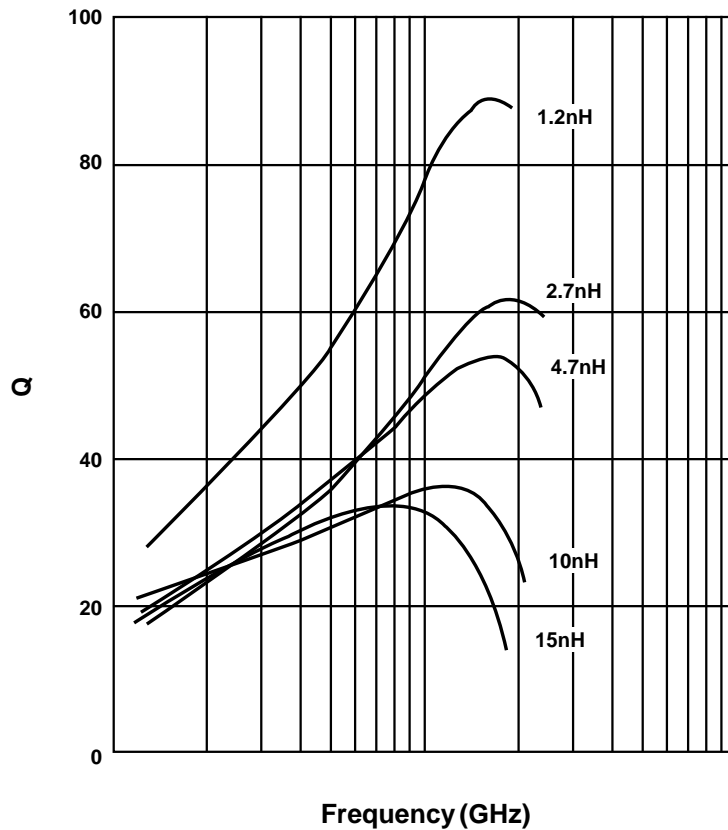
Accu-L[®] 0603 SMD High-Q RF Inductor

ELECTRICAL SPECIFICATIONS TABLE

450 MHz. Test Freq.			900 MHz Test Freq.		1900 MHz Test Freq.		2400MHz Test Freq.		SRF min (MHz)	Rdc max (Ω)	Idc max (mA) (1)
Inductance (nH)	Inductance Tol.	Q Typical	L(nH)	Q Typical	L(nH)	Q Typical	L(nH)	Q Typical			
1.2	±0.2,±0.5 nH	31	1.2	48	1.2	68	1.3	65	10000	0.04	1000
1.5	±0.2,±0.5 nH	30	1.5	46	1.6	62	1.6	64	10000	0.05	1000
1.8	±0.2,±0.5 nH	27	1.8	42	1.9	54	1.9	52	10000	0.06	1000
2.2	±0.2,±0.5 nH	34	2.2	50	2.3	58	2.3	46	10000	0.06	1000
2.7	±0.2,±0.5 nH	30	2.7	45	2.8	54	2.9	50	10000	0.08	1000
3.3	±0.2,±0.5 nH	26	3.3	39	3.5	42	3.6	48	8800	0.10	750
3.9	±0.2,±0.5 nH	28	3.9	40	4.1	51	4.2	47	8400	0.12	750
4.7	±0.2,±0.5 nH	32	4.8	44	5.2	55	5.5	48	6200	0.15	500
5.6	±0.2,±0.5 nH	24	5.7	34	6.3	38	6.9	32	5500	0.18	500
6.8	±0.2,±0.5 nH	29	7.0	37	8.2	38	9.4	30	4500	0.30	300
8.2	±0.2,±0.5 nH	29	8.5	36	10.5	37	12.7	27	4000	0.35	300
10.0	±2,±5%	28	10.5	35	13.9	34	18.6	24	3500	0.40	300
12.0	±2,±5%	27	12.9	34	19.6	29	32.6	15	3000	0.45	300
15.0	±2,±5%	26	16.7	34	34.4	25	—	—	2500	0.50	300

(1) I_{dc} measured for 15°C rise at 25°C ambient temperature

Q vs. Frequency (Typical)
for 0603



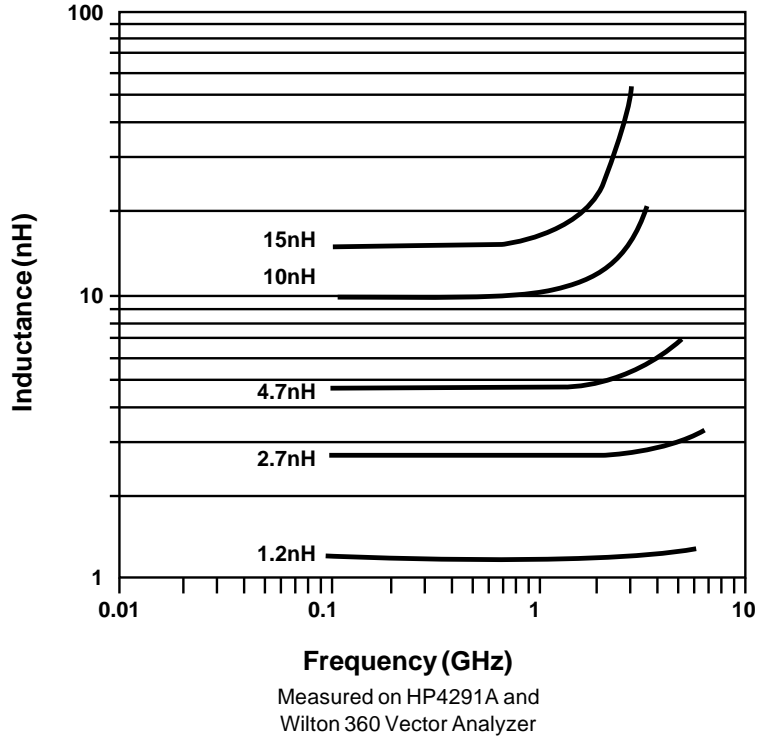
Measured on HP4291A and
Boonton 34A Coaxial Line



Accu-L[®] 0603 SMD High-Q RF Inductor

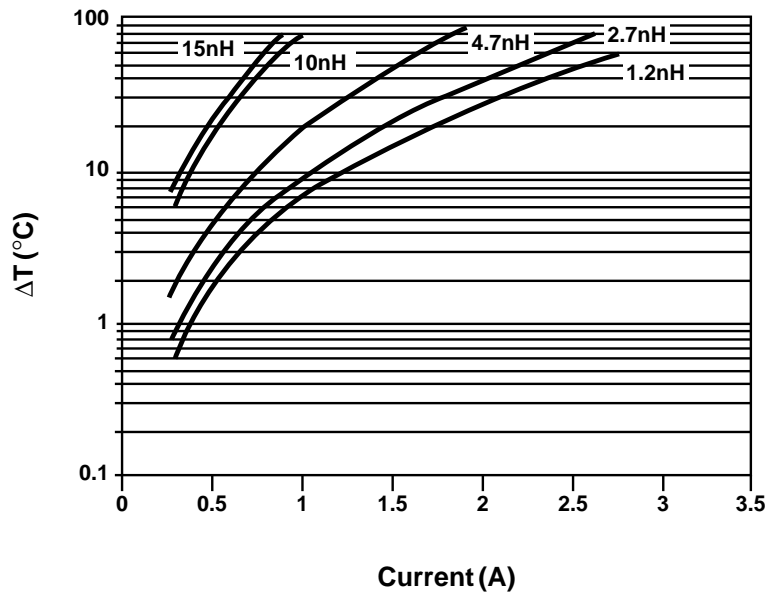
Inductance vs. Frequency (Typical)

for 0603



Maximum Temperature Rise

at 25°C ambient temperature (on FR-4)
for 0603



Temperature rise will typically be no higher than shown by the graph

FINAL QUALITY INSPECTION:

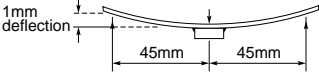
Finished parts are tested for electrical parameters and visual/mechanical characteristics.

Parts are 100% tested for Inductance at 450MHz and R_{DC}.

Each production lot is evaluated on a sample basis for:

- Q at test frequency
- R_{DC}
- Static Humidity resistance: 85°C, 85% RH, 160 hours
- Endurance: 125°C, I_R, 4 hours

ENVIRONMENTAL CHARACTERISTICS:

TEST	CONDITIONS	REQUIREMENT
Solderability	Components completely immersed in a solder bath at 235 ±5°C for 2 seconds.	Terminations to be well tinned. No visible damage.
Leach Resistance	Completely immersed in a solder bath at 260 ±5°C for 60 seconds.	Dissolution of termination faces ≤ 15% of area. Dissolution of termination edges ≤ 25% of length.
Storage	12 months minimum with components stored in “as received” packaging.	Good solderability
Shear	Components mounted to a substrate. A force of 5N applied normal to the line joining the terminations and in a line parallel to the substrate.	No visible damage.
Rapid Change of Temperature	Components mounted to a substrate. 5 cycles -55°C to +125°C.	No visible damage.
Bend Strength	Tested as shown in diagram 	No visible damage.
Temperature Coefficient of Inductance (TCL)	Component placed in environmental chamber -55°C to +125°C.	+0 to +125 ppm/°C (typical) $TCL = \frac{L_2 - L_1}{L_1 (T_2 - T_1)} \cdot 10^6$ $T_1 = 25^\circ C$

Handling

SMD chips should be handled with care to avoid damage or contamination from perspiration and skin oils. The use of plastic tipped tweezers or vacuum pick-ups is strongly recommended for individual components. Bulk handling should ensure that abrasion and mechanical shock are minimized. For automatic equipment, taped and reeled product is the ideal medium for direct presentation to the placement machine.

Circuit Board Type

All flexible types of circuit boards may be used (e.g. FR-4, G-10) and also alumina. For other circuit board materials please consult factory.

Component Pad Design

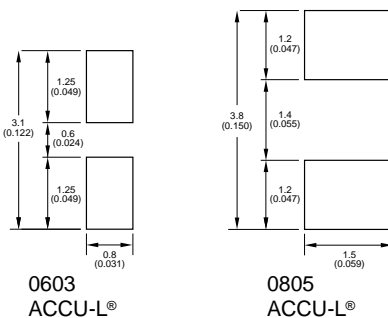
Component pads must be designed to achieve good joints and minimize component movement during soldering. Pad designs are given below for both wave and reflow soldering.

The basis of these designs is:

- Pad width equal to component width. It is permissible to decrease this to as low as 85% of component width but it is not advisable to go below this.
- Pad overlap about 0.3mm.
- Pad extension about 0.3mm for reflow.
Pad extension about 0.8mm for wave soldering.

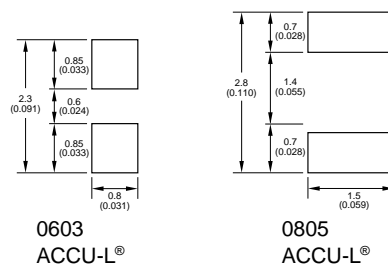
Wave Soldering

Dimensions in mm. (inches)



Reflow Soldering

Dimensions in mm. (inches)



Preheat & Soldering

The rate of preheat in production should not exceed 4°C/second. It is recommended not to exceed 2°C/second.

Temperature differential from preheat to soldering should not exceed 150°C.

For further specific application or process advice, please consult AVX.

Hand Soldering & Rework

Hand soldering is permissible. Preheat of the PCB to 100°C is required. The most preferable technique is to use hot air soldering tools. Where a soldering iron is used, a temperature controlled model not exceeding 30 watts should be used and set to not more than 260°C. Maximum allowed time at temperature is 1 minute. When hand soldering, the base side (white side) must be soldered to the board.

Cooling

After soldering, the assembly should preferably be allowed to cool naturally. In the event of assisted cooling, similar conditions to those recommended for preheating should be used.

Cleaning Recommendations

Care should be taken to ensure that the devices are thoroughly cleaned of flux residues, especially the space beneath the device. Such residues may otherwise become conductive and effectively offer a lossy bypass to the device. Various recommended cleaning conditions (which must be optimized for the flux system being used) are as follows:

- Cleaning liquids i-propanol, ethanol, acetylacetone, water, and other standard PCB cleaning liquids.
- Ultrasonic conditions power – 20w/liter max. frequency – 20kHz to 45kHz.
- Temperature 80°C maximum (if not otherwise limited by chosen solvent system).
- Time 5 minutes max.

Storage Conditions

Recommended storage conditions for Accu-L[®] prior to use are as follows:

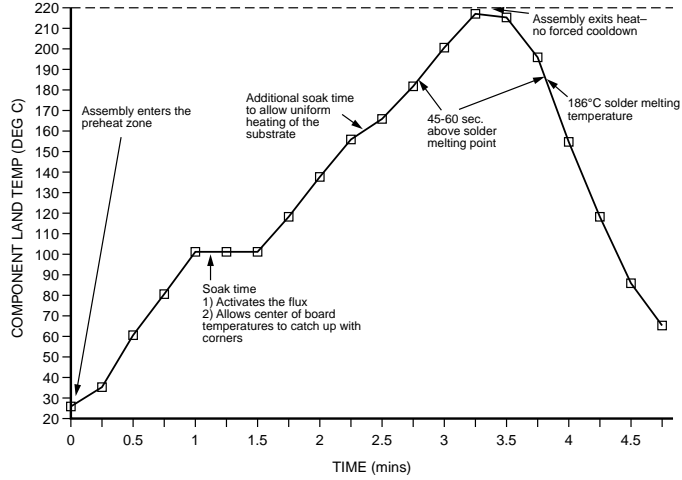
- Temperature 15°C to 35°C
- Humidity ≤65%
- Air Pressure 860mbar to 1060mbar



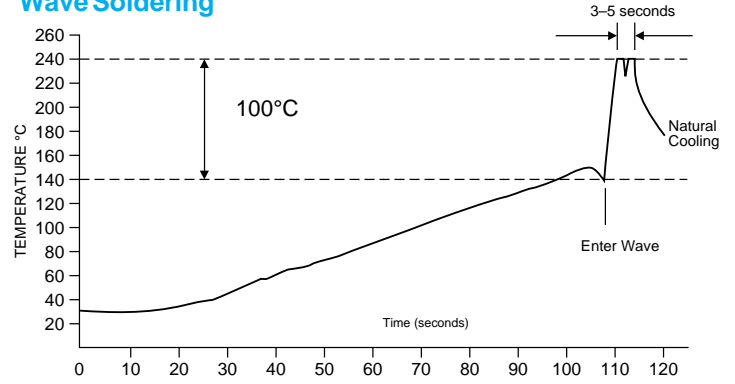
Accu-L[®] SMD High-Q RF Inductor

Recommended Soldering Profiles

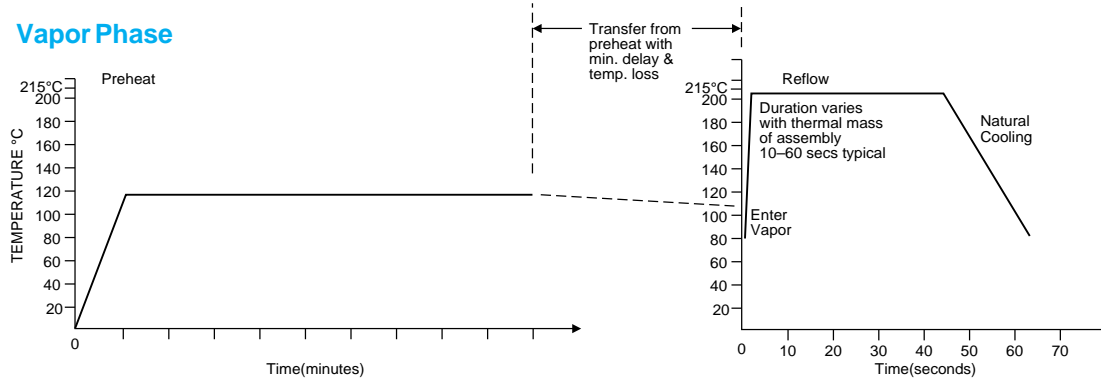
IR Reflow



Wave Soldering



Vapor Phase



Accu-L[®] Designer Kits

Design Kit Type 1200

Order Number: ACCU-L[®] 0603KIT01

Inductance Value (nH)	Tolerance
1.2	±0.2nH
1.5	±0.2nH
1.8	±0.2nH
2.2	±0.2nH
2.7	±0.2nH
3.3	±0.2nH
3.9	±0.2nH
4.7	±0.2nH
5.6	±0.2nH
6.8	±0.2nH
8.2	±0.2nH
10	±2%
12	±2%
15	±2%

280 Inductors. 20 each of 14 values
Tolerance: C = ±0.2nH, G = ±2%

Accu-L[®] Designer Kits

Design Kit Type 1100

Order Number: ACCU-L[®] 0805KIT01

Inductance Value (nH)	Tolerance
1.8	±0.2nH
2.2	±0.2nH
2.7	±0.2nH
3.3	±0.2nH
3.9	±0.2nH
4.7	±0.2nH
5.6	±0.2nH
6.8	±0.2nH
8.2	±0.2nH
10	±2%
12	±2%
15	±2%
18	±2%
22	±2%

280 Inductors. 20 each of 14 values
Tolerance: C = ±0.2nH, G = ±2%



PACKAGING:

Automatic Insertion Packaging

TAPE & REEL: All tape and reel specifications are in compliance with EIA 481A.

- 8mm carrier
- Reeled quantities: Reels of 3,000 or 10,000 pieces

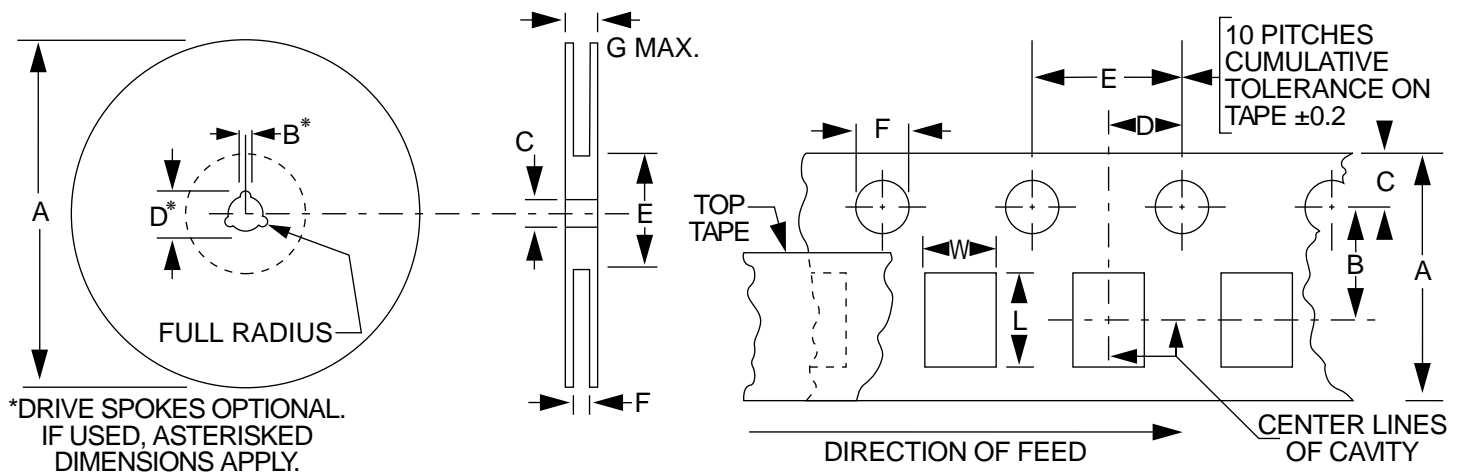
REEL DIMENSIONS mm (inches)

A ⁽¹⁾	B	C	D	E	F	G
180 ± 1.0 (7.087 ± 0.039)	1.5 min (0.059 min)	13 ± 0.2 (0.512 ± 0.008)	20.2 min (0.795 min)	50 min (1.969 min)	9.6 ± 1.5 (0.370 ± 0.050)	14.4 max (0.567 max)
Metric dimensions will govern. Inch measurements rounded for reference only.						

(1) 330mm (13 inch) reels are available

CARRIER DIMENSIONS mm (inches)

A	B	C	D	E	F
8.0 ± 0.3 (0.315 ± 0.012)	3.5 ± 0.05 (0.138 ± 0.002)	1.75 ± 0.1 (0.069 ± 0.004)	2.0 ± 0.05 (0.079 ± 0.002)	4.0 ± 0.1 (0.157 ± 0.004)	1.5 ^{+0.1} _{-0.0} (0.059 ^{+0.004} _{-0.000})
Note: The nominal dimensions of the component compartment (W,L) are derived from the component size.					



Note: AVX reserves the right to change the information published herein without notice.

For more information regarding AVX's Accu Series of SMD Thin Film Products:

Accu-Guard[®] Accu-F[®]/Accu-P[®] Accu-L[®]

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