

**PRELIMINARY**

# Aerospace Grade Chip Inductors AE413RAF

- Low-profile inductors are 60% the height of other 1008 parts.
- High SRFs and very high Q factors
- Inductance values from 3.3 nH – 560 nH

This robust version of Coilcraft's standard 1008HT series features high temperature materials that pass NASA low outgassing specifications and allow operation in ambient temperatures up to 155°C. The leach-resistant base metalization with tin-lead (Sn-Pb) terminations ensures the best possible board adhesion.

Part number <sup>1</sup>	Inductance <sup>2</sup> (nH)	Percent tolerance	Q min <sup>3</sup>	SRF min <sup>4</sup> (MHz)	DCR max <sup>5</sup> (Ohms)	I <sub>max</sub> (mA)
AE413RAF3N3_SZ	3.3 @ 250 MHz	5	65 @ 1500 MHz	7900	0.025	1000
AE413RAF6N8_SZ	6.8 @ 250 MHz	5	70 @ 1500 MHz	5500	0.05	1000
AE413RAF7N2_SZ	7.2 @ 250 MHz	5	70 @ 1500 MHz	4800	0.05	1000
AE413RAF12N_SZ	12 @ 250 MHz	5	55 @ 700 MHz	3800	0.065	1000
AE413RAF15N_SZ	15 @ 250 MHz	5	55 @ 700 MHz	2800	0.08	1000
AE413RAF18N_SZ	18 @ 250 MHz	5	55 @ 500 MHz	3000	0.09	1000
AE413RAF22N_SZ	22 @ 250 MHz	5	55 @ 500 MHz	2600	0.11	950
AE413RAF27N_SZ	27 @ 250 MHz	5,2	55 @ 500 MHz	2400	0.13	850
AE413RAF33N_SZ	33 @ 200 MHz	5,2	55 @ 350 MHz	2000	0.135	760
AE413RAF39N_SZ	39 @ 200 MHz	5,2	55 @ 350 MHz	1900	0.17	700
AE413RAF47N_SZ	47 @ 200 MHz	5,2,1	55 @ 350 MHz	1500	0.18	660
AE413RAF56N_SZ	56 @ 150 MHz	5,2,1	50 @ 300 MHz	1500	0.18	620
AE413RAF68N_SZ	68 @ 150 MHz	5,2,1	50 @ 300 MHz	1500	0.23	550
AE413RAF82N_SZ	82 @ 150 MHz	5,2,1	40 @ 250 MHz	1300	0.35	500
AE413RAFR10_SZ	100 @ 100 MHz	5,2,1	40 @ 250 MHz	1200	0.64	420
AE413RAFR12_SZ	120 @ 100 MHz	5,2,1	40 @ 200 MHz	1090	0.55	350
AE413RAFR14_SZ	140 @ 100 MHz	5,2,1	40 @ 200 MHz	1100	0.70	320
AE413RAFR15_SZ	150 @ 100 MHz	5,2,1	40 @ 200 MHz	960	0.75	300
AE413RAFR18_SZ	180 @ 50 MHz	5,2,1	40 @ 200 MHz	920	1.02	250
AE413RAFR22_SZ	220 @ 50 MHz	5,2,1	34 @ 100 MHz	750	1.15	250
AE413RAFR24_SZ	240 @ 50 MHz	5,2	32 @ 100 MHz	800	1.15	250
AE413RAFR27_SZ	270 @ 50 MHz	5,2	32 @ 100 MHz	770	1.25	250
AE413RAFR33_SZ	330 @ 25 MHz	5,2	32 @ 100 MHz	635	1.35	250
AE413RAFR39_SZ	390 @ 25 MHz	5,2	32 @ 100 MHz	555	1.45	250
AE413RAFR47_SZ	470 @ 25 MHz	5,2	32 @ 100 MHz	530	1.65	240
AE413RAFR56_SZ	560 @ 25 MHz	5,2	32 @ 100 MHz	485	1.90	240

1. When ordering, please specify **tolerance** and **testing** codes:

**AE413RAFR56 G SZ**

**Tolerance:** F = 1% G = 2% J = 5%

**Testing:** Z = Coilcraft Critical Products Environmental Stress Conditions Testing.

H = Coilcraft Qual + Coilcraft Hi-Rel Burn-in

P = Coilcraft Qual + MIL-STD-981 Class S Group A screening

N = Coilcraft Qual + MIL-STD-981 Class B Group A screening

C = Coilcraft Qual + MIL-STD-981 Class S Group A screening + MIL-STD-981 Class S Group B qualification

W = Coilcraft Qual + MIL-STD-981 Class B Group A screening + MIL-STD-981 Class S Group B qualification

2. Inductance measured using a Coilcraft SMD-A fixture in an Agilent/HP 4286A impedance analyzer with Coilcraft-provided correlation pieces.

3. Q measured using an Agilent/HP 4291A with an Agilent/HP 16193 test fixture.

4. SRF measured using an Agilent/HP 8720D network analyzer and a Coilcraft SMD-D test fixture.

5. DCR measured on a Cambridge Technology micro-ohmmeter and a Coilcraft CCF840 test fixture.

6. Electrical specifications at 25°C.

Refer to Doc 362 "Soldering Surface Mount Components" before soldering.

**COILCRAFT** ACCURATE  
**PRECISION** REPEATABLE  
MEASUREMENTS  
SEE INDEX **TEST FIXTURES**



These parts are preproduction products for electrical evaluation only.  
Specification subject to change without notice.

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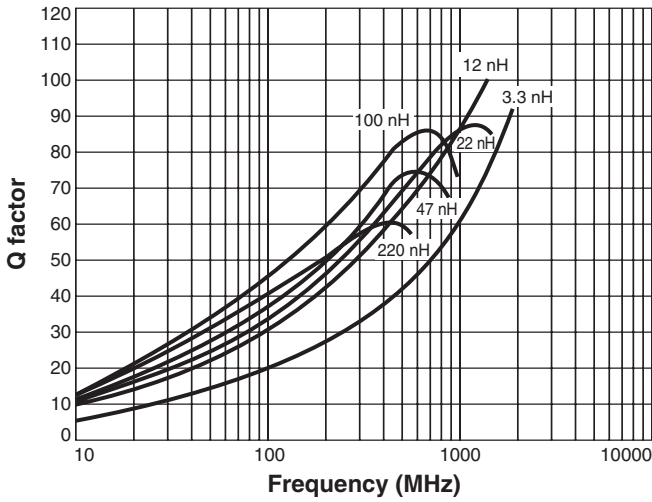
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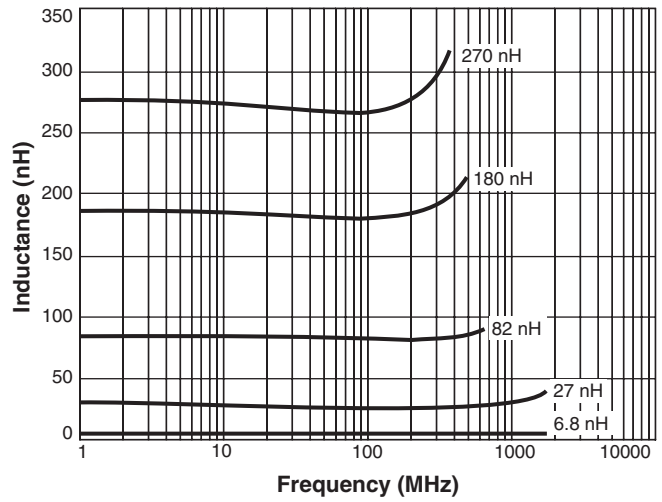
**PRELIMINARY**

# AE413RAF Series (1008)

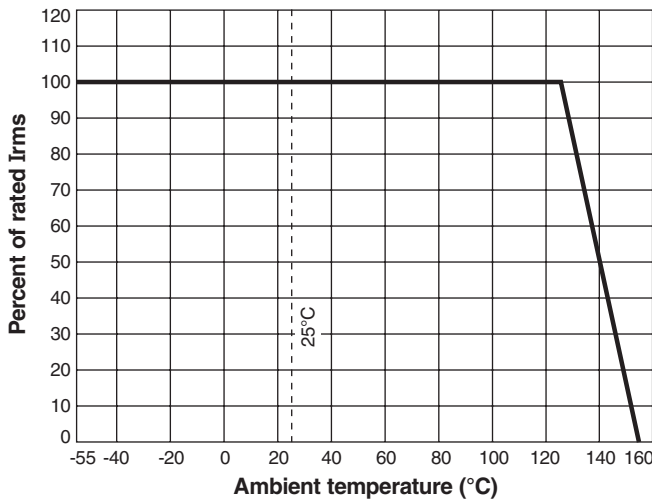
## Typical Q vs Frequency



## Typical L vs Frequency



## Current Derating



**Core material** Ceramic

**Terminations** Tin-lead (63/37) over silver-platinum-glass frit

**Ambient temperature** -55°C to +125°C with I<sub>max</sub> current, +125°C to +155°C with derated current

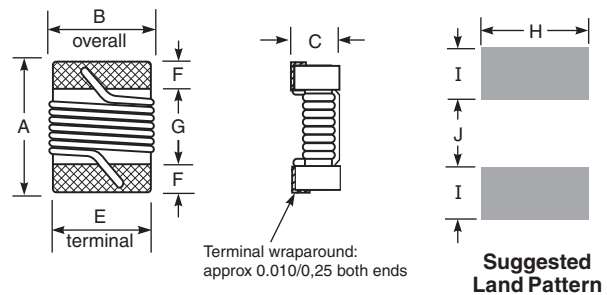
**Storage temperature** Component: -55°C to +155°C. Packaging: -55°C to +80°C

**Resistance to soldering heat** Max three 40 second reflows at +260°C, parts cooled to room temperature between cycles

**Temperature Coefficient of Inductance (TCL)** +25 to +155 ppm/°C

**Moisture Sensitivity Level (MSL)** 1 (unlimited floor life at <30°C / 85% relative humidity)

**Enhanced crush-resistant packaging** Plastic tape: 8 mm wide, 0.23 mm thick, 4 mm pocket spacing, 1.14 mm pocket depth



A max	B max	C max	E	F	G	H	I	J	
0.105	0.095	0.045	0.080	0.020	0.060	0.100	0.040	0.050	inches
2,67	2,41	1,14	2,03	0,51	1,52	2,54	1,02	1,27	mm

All dimensions are without solder applied to the terminations. For maximum dimensions with solder, add 0.006 inches / 0,152 mm.