

# MCQ1V3216

## Multilayer high Q chip inductor



### Product features

- 1206 (3216 metric) package
- Multilayer monolithic construction yields high reliability
- Inductance range from 0.047  $\mu\text{H}$  to 4.7  $\mu\text{H}$
- Moisture sensitivity level (MSL): 1

### Applications

- Industrial connectivity (IoT)
- Wireless communications
- Bluetooth
- WiFi
- Antenna
- Machine-to-machine (M2M)
- Mobile phones
- Wearable devices
- Wireless LAN
- Computing/gaming consoles
- Broadband components
- RF transceiver modules

### Environmental compliance and general specifications

- Operating temperature range: -40 °C to +85 °C (ambient plus self-temperature rise)



Product specifications

Part number <sup>4</sup>	Ls Tolerance (%)	Ls <sup>1</sup> (μH)	Q minimum	DCR (Ω) @ +25 °C maximum	Test frequency <sup>2</sup> (MHz)	Test voltage <sup>2</sup> (mV)	SRF (MHz) minimum	Rated I <sup>3</sup> maximum (mA)
MCQ1V3216-R047-R	±10	0.047	30	0.15	50	50	320	300
MCQ1V3216-R056-R	±10	0.056	30	0.2	50	50	320	300
MCQ1V3216-R068-R	±10	0.068	30	0.25	50	50	280	300
MCQ1V3216-R082-R	±10	0.082	30	0.25	50	50	280	300
MCQ1V3216-R100-R	±10	0.10	25	0.25	25	50	235	250
MCQ1V3216-R120-R	±10	0.12	25	0.25	25	50	220	250
MCQ1V3216-R150-R	±10	0.15	25	0.25	25	50	200	250
MCQ1V3216-R180-R	±10	0.18	25	0.3	25	50	185	250
MCQ1V3216-R220-R	±10	0.22	25	0.3	25	50	170	250
MCQ1V3216-R270-R	±10	0.27	25	0.3	25	50	150	250
MCQ1V3216-R330-R	±10	0.33	25	0.3	25	50	145	250
MCQ1V3216-R390-R	±10	0.39	30	0.5	25	50	135	200
MCQ1V3216-R470-R	±10	0.47	30	0.5	25	50	125	200
MCQ1V3216-R560-R	±10	0.56	30	0.5	25	50	115	150
MCQ1V3216-R680-R	±10	0.68	30	0.5	25	50	105	150
MCQ1V3216-R820-R	±10	0.82	30	0.6	25	50	100	150
MCQ1V3216-1R0-R	±10	1.0	35	0.3	10	50	75	100
MCQ1V3216-1R2-R	±10	1.2	35	0.4	10	50	65	100
MCQ1V3216-1R5-R	±10	1.5	35	0.4	10	50	60	50
MCQ1V3216-1R8-R	±10	1.8	35	0.4	10	50	55	50
MCQ1V3216-2R2-R	±10	2.2	35	0.5	10	50	50	50
MCQ1V3216-2R7-R	±10	2.7	35	0.5	10	50	45	50
MCQ1V3216-3R3-R	±10	3.3	35	0.5	10	50	41	50
MCQ1V3216-3R9-R	±10	3.9	35	0.6	10	50	38	50
MCQ1V3216-4R7-R	±10	4.7	35	0.65	10	50	35	25

1. Ls = Inductance

2. Ls and Q test voltage and frequency

3. Rated I: Current rating for an approximate self-temperature rise of 40 °C or less.

4. Part Number Definition: MCQ1V3216-xxx-R

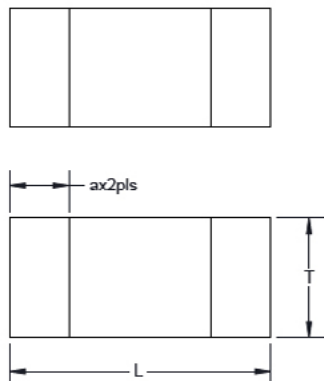
MCQ1V3216 = Product code and size

xxx= inductance value in μH, R= decimal point,

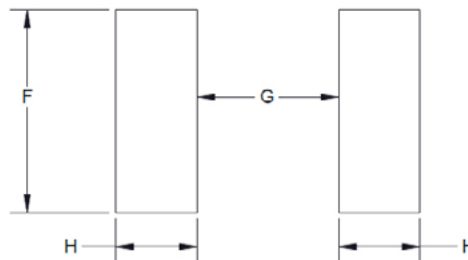
If no R is present then last character equals number of zeros

-R suffix = RoHS compliant

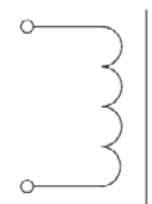
**Mechanical parameters, schematic, pad layout (mm)**



**Recommended pad layout**



**Schematic**



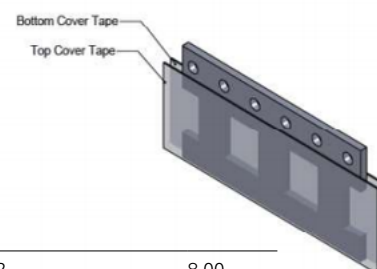
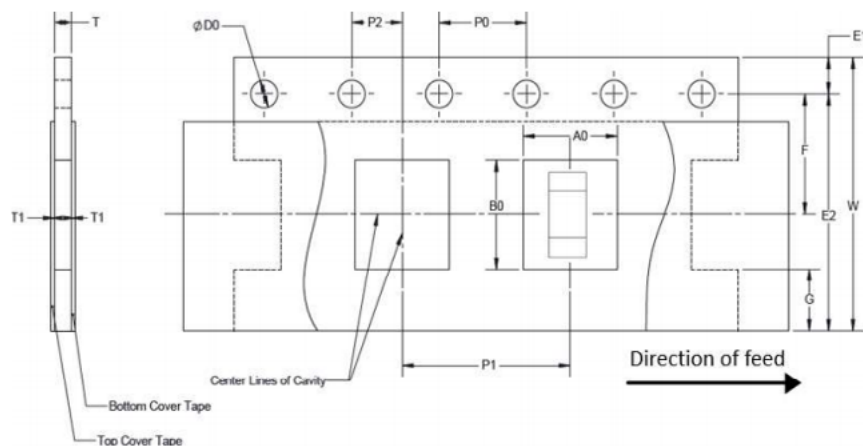
Part Number	L	W	T	a	F	G	H
MCQ1V3216-xxx-R	3.20 ±0.20	1.60 ±0.20	0.90 ±0.20	0.50 ±0.30	2.00 ref	1.40 ref	1.20 ref

Part marking: No marking  
All soldering surfaces to be coplanar within 0.1 millimeters  
Tolerances are ±0.1 millimeters unless stated otherwise  
Pad layout dimensions are reference only  
Traces or vias underneath the inductor is not recommended

**Packaging information (mm)**

Drawing not to scale

Supplied in tape and reel packaging, 4000 parts per 7" diameter reel

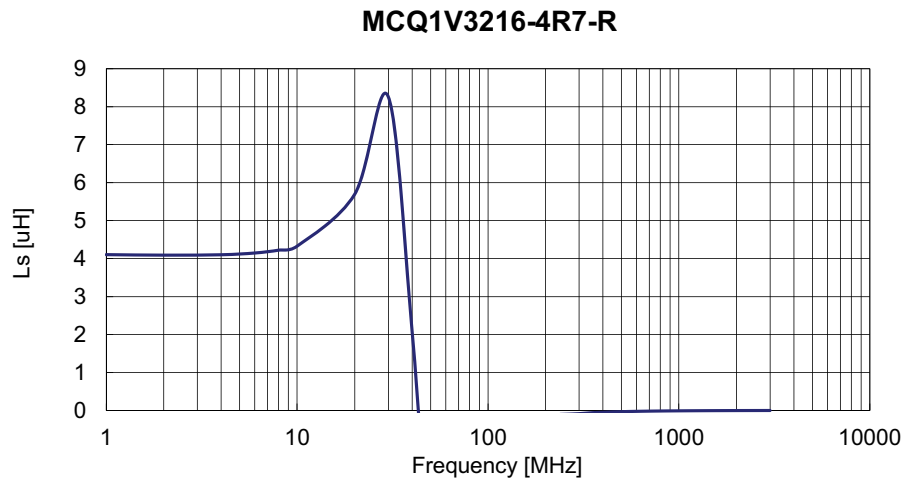
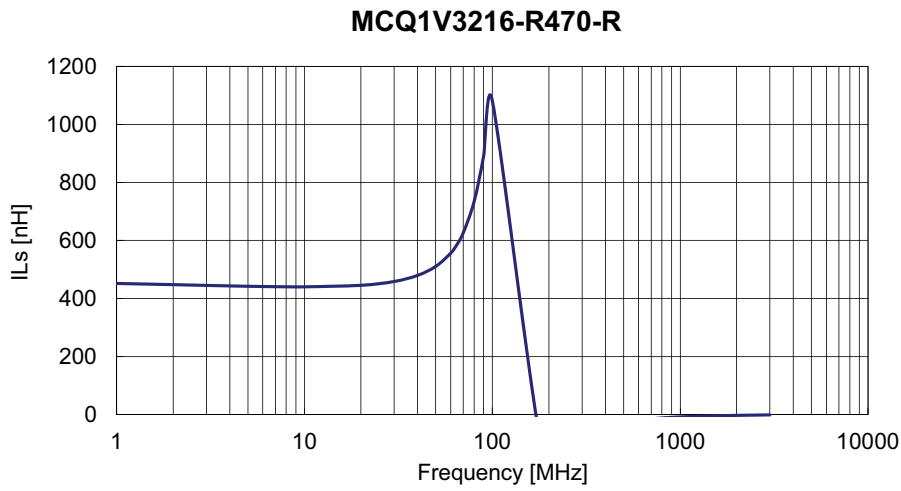
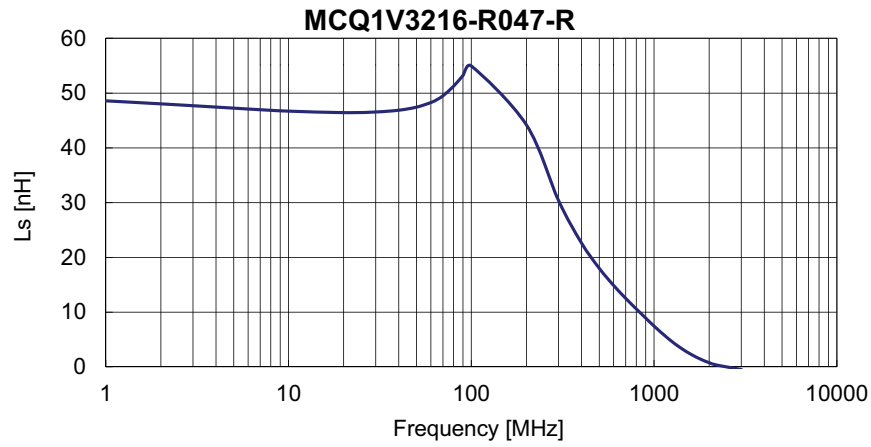


W±0.2	8.00
F±0.1	3.50
E1±0.2	1.75
E2 Min	na
P0±0.2	4.00
P1±0.2	4.00
P2±0.1	2.00
D0±0.1	1.55
A0	1.9±0.2
B0	3.5±0.2
T	0.95±0.1
T1 Max	na

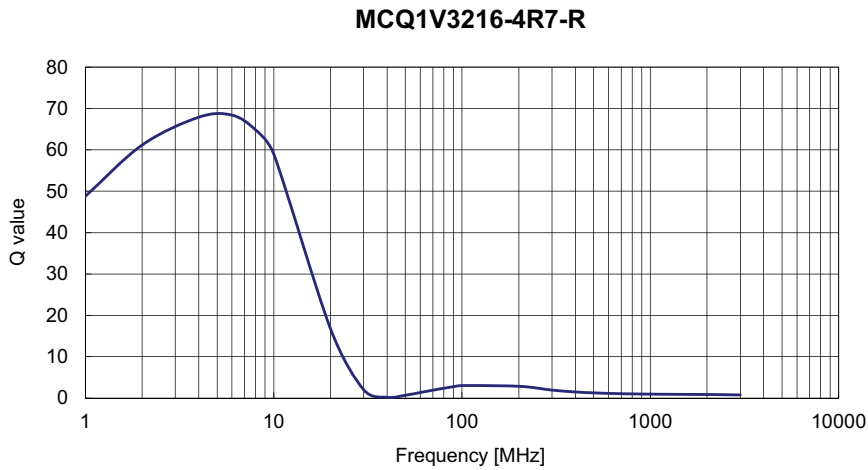
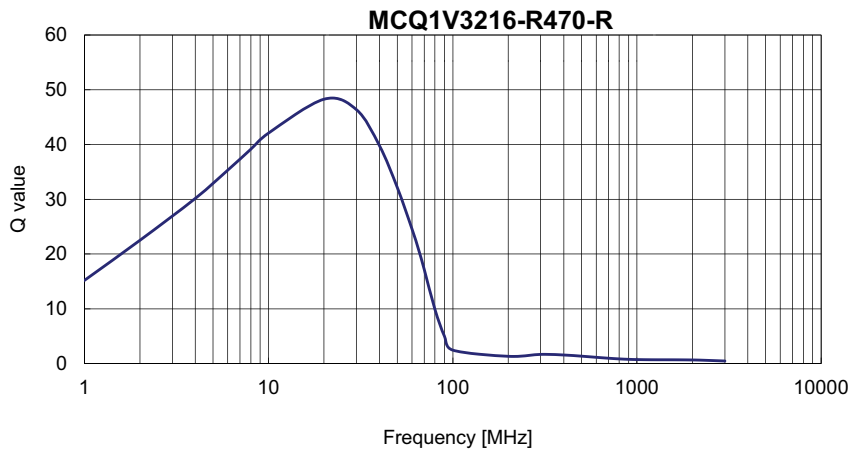
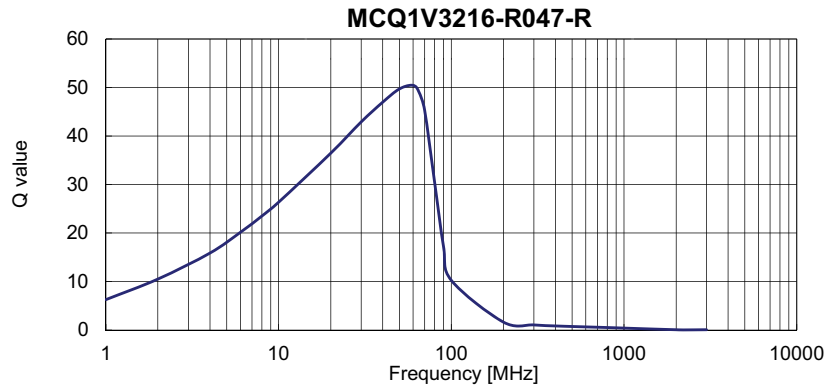
**Qualification testing**

No.	Test item	Sample size (pcs)	Test condition	Acceptable value/range
1	External visual	72		No physical damage
2	Physical dimension	72	Specification	Specification
3	Initial electrical test	72	Specification	User spec
4	Solderability	6	+245 °C ±5 °C, dipping 5 ±1 s	>95% solder coverage
5	Resistance to soldering heat	6	+260 ±5 °C for 10±1 s	1. $\Delta L/L < \pm 20\%$ 2. $\Delta Q/Q < \pm 30\%$ 3. No physical damage
6	Terminal strength (SMD)	6	Force of 10N for 10 ±1 s	No physical damage No electrical performance test
7	Low temperature exposure	6	-40 °C for 1000 hours	1. $\Delta L/L < \pm 10\%$ 2. $\Delta Q/Q < \pm 30\%$ 3. No physical damage
8	Bending strength	6	Appendix 2 note: 2 mm, hold time 30 s (minimum)	No physical damage No electrical performance test
9	Drop	6	Drop 10 times to a concrete floor from a height of 1 m	1. $\Delta L/L < \pm 10\%$ 2. $\Delta Q/Q < \pm 30\%$ 3. No physical damage
10	Vibration	6	Amplitude modulation: 1.5 mm Test time: A period of 2 hours in each of 3 mutually perpendicular directions Test from 10 Hz to 55 Hz to 10 Hz for 1 minute	1. $\Delta L/L < \pm 10\%$ 2. $\Delta Q/Q < \pm 30\%$ 3. No physical damage
11	High temperature exposure	6	+85 °C for 1000 hours	1. $\Delta L/L < \pm 10\%$ 2. $\Delta Q/Q < \pm 30\%$ 3. No physical damage
12	Biased humidity	6	1000 hours +60 °C/90% to 95%RH unpowered	1. $\Delta L/L < \pm 10\%$ 2. $\Delta Q/Q < \pm 30\%$ 3. No physical damage
13	Operational life	12	+85 °C at Rated current for 1000 hours	1. $\Delta L/L < \pm 10\%$ 2. $\Delta Q/Q < \pm 30\%$ 3. No physical damage
14	Temperature cycling	6	32 cycles (-40 °C to +85 °C), dwell time 30 minutes	1. $\Delta L/L < \pm 10\%$ 2. $\Delta Q/Q < \pm 30\%$ 3. No physical damage

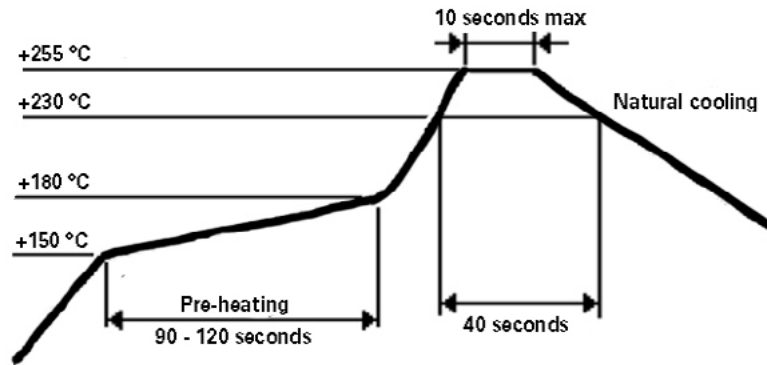
**Ls (Inductance) vs frequency**



**Q vs frequency**



Solder reflow profile



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