

# WCL3225

## Wire wound chip inductor



### Product features

- 1210 (3225 metric) package
- High Q value
- Tight inductance tolerance
- Inductance range from 0.12  $\mu$ H to 560  $\mu$ H
- Moisture sensitivity level (MSL): 1

### Applications

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

### Environmental data

- Operating temperature range: -40 °C to +85 °C
- Solder reflow temperature:  
J-STD-020 (latest revision) compliant



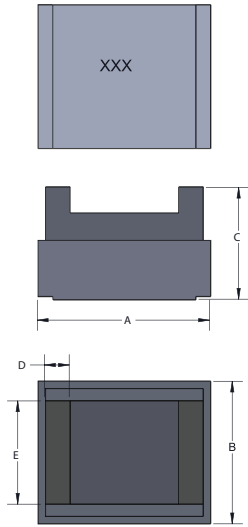
Product specifications

Part number	OCL (uH) ±5%	I Rated (mA) maximum	OCL Test frequency (MHz)	Test voltage (mV)	DCR (Ω) maximum @ +25°C	SRF (MHz) minimum	Q minimum	Q Test frequency (MHz)
WCL3225-R12-R	0.12	450	25.2	500	0.20	850	20	25.2
WCL3225-R27-R	0.27	450	25.2	500	0.20	700	20	25.2
WCL3225-R33-R	0.33	450	25.2	500	0.30	520	20	25.2
WCL3225-R47-R	0.47	450	25.2	500	0.30	480	20	25.2
WCL3225-R82-R	0.82	450	25.2	500	0.30	350	20	25.2
WCL3225-1R0-R	1.0	450	7.96	500	0.30	320	12	7.96
WCL3225-1R2-R	1.2	450	7.96	500	0.30	210	12	7.96
WCL3225-1R5-R	1.5	450	7.96	500	0.40	200	12	7.96
WCL3225-1R8-R	1.8	450	7.96	500	0.50	195	12	7.96
WCL3225-2R2-R	2.2	450	7.96	500	0.60	175	12	7.96
WCL3225-2R7-R	2.7	420	7.96	500	0.70	120	12	7.96
WCL3225-3R3-R	3.3	380	7.96	500	1.10	80	12	7.96
WCL3225-3R9-R	3.9	360	7.96	500	1.20	75	12	7.96
WCL3225-4R7-R	4.7	350	7.96	500	1.30	60	12	7.96
WCL3225-5R6-R	5.6	320	7.96	500	2.00	50	12	7.96
WCL3225-6R8-R	6.8	310	7.96	500	1.50	35	12	7.96
WCL3225-8R2-R	8.2	305	7.96	500	1.60	35	12	7.96
WCL3225-100-R	10	300	2.52	500	1.00	30	10	2.52
WCL3225-120-R	12	265	2.52	500	1.20	25	10	2.52
WCL3225-150-R	15	225	2.52	500	2.00	22	10	2.52
WCL3225-180-R	18	210	2.52	500	2.10	22	10	2.52
WCL3225-220-R	22	200	2.52	500	2.40	20	10	2.52
WCL3225-270-R	27	180	2.52	500	2.70	18	10	2.52
WCL3225-330-R	33	160	2.52	500	2.90	15	10	2.52
WCL3225-390-R	39	150	2.52	500	4.70	16	10	2.52
WCL3225-470-R	47	140	2.52	500	5.20	10	10	2.52
WCL3225-560-R	56	125	2.52	500	5.60	8.0	10	2.52
WCL3225-680-R	68	110	2.52	500	4.70	5.0	10	2.52
WCL3225-820-R	82	100	2.52	500	5.60	5.0	10	2.52
WCL3225-101-R	100	95	0.796	500	6.80	5.0	8	0.796
WCL3225-121-R	120	85	0.796	500	7.90	4.0	8	0.796
WCL3225-151-R	150	80	0.796	500	9.00	4.0	8	0.796
WCL3225-181-R	180	70	0.796	500	14.5	3.0	8	0.796
WCL3225-221-R	220	65	0.796	500	16.5	2.6	8	0.796
WCL3225-271-R	270	60	0.796	500	18.0	2.5	8	0.796
WCL3225-331-R	330	55	0.796	500	19.0	2.3	8	0.796
WCL3225-391-R	390	45	0.796	500	21.5	2.2	8	0.796
WCL3225-471-R	470	40	0.796	500	22.5	2.0	8	0.796
WCL3225-561-R	560	30	0.796	500	28.0	1.5	8	0.796

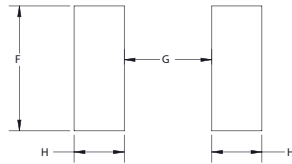
1. Test frequency and voltage at +25 °C. Test voltage is for both OCL and Q.
2. Resistance to soldering heat: +260 ±5 °C for 10 ± 1 second
3. At low temperature resistance (-40 ±2°C) the inductance change is within ±5% and the Q within ±10%
4. At high temperature resistance (+85 ±5°C) the inductance change is within ±5% and the Q within ±10%
5. At high temperature load (+85 ±2°C) the inductance change is within ±5% and the Q within ±10%

6. Insulation Resistance: ≥ 500 MΩ with an input voltage of 100 V ±15 Vdc
- 7 Temperature Characteristics: From -40 °C to +85 °C the inductance is within ±5%
8. Rated I: When rated I is applied to the product, self-temperature rise will be 20 °C or less.
9. Part Number Definition: WCL2520-xxx-R  
WCL2520 = Product code and size  
xxx= inductance value in uH, R= decimal point,  
If no R is present then last character equals number of zeros  
-R suffix = RoHS compliant

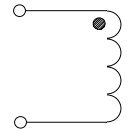
**Dimensions (mm)**



Recommended pad layout



Schematic



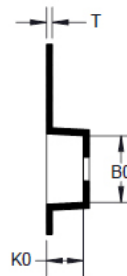
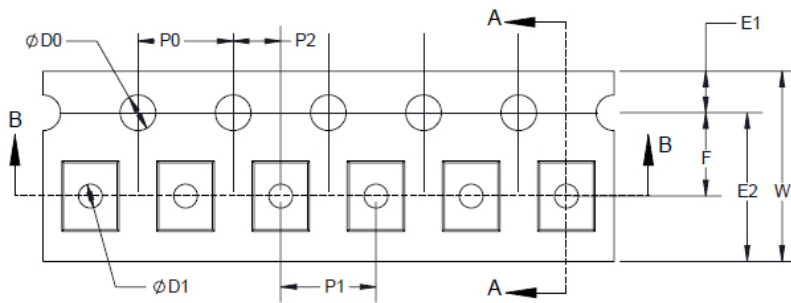
Part Number	A	B	C	D	E	F	G	H
WCL3225-xxx-R	3.5 max	2.9 max	2.25 max	0.50 ref	2.1 ref	2.54	1.78	1.02

Part marking: xxx= Inductance value in uH, R=decimal point. If no R is present then last character equals number of zeros  
 All soldering surfaces to be coplanar within 0.1 millimeters  
 Tolerances are ±0.2 millimeters unless stated otherwise  
 Pad layout tolerances are ±0.1 millimeters unless stated otherwise  
 Do not route traces or vias underneath the inductor

**Packaging information (mm)**

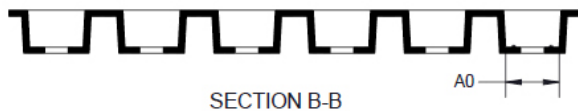
Drawing not to scale

Supplied in tape and reel packaging, 2000 parts per 7" diameter reel



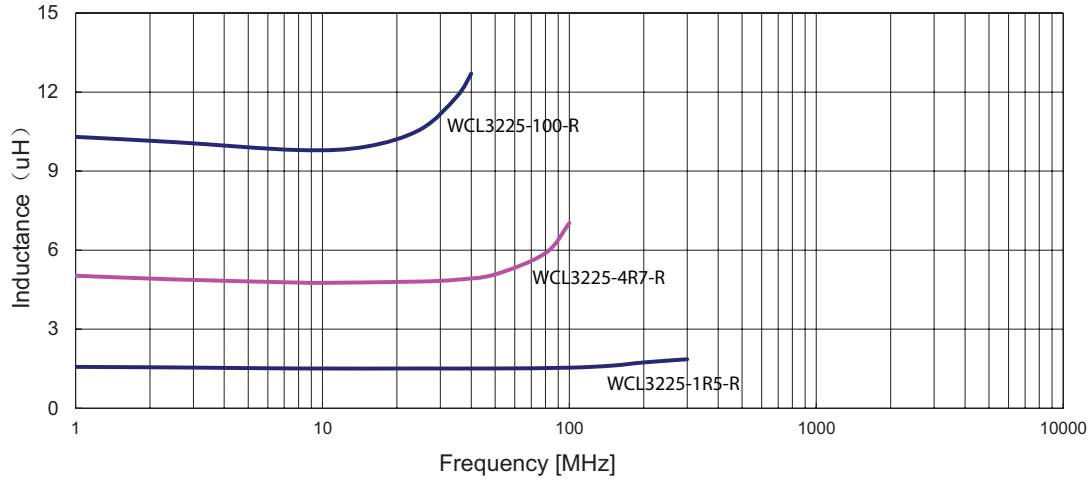
SECTION A-A

W ±0.30	8.00
F ±0.05	3.50
E1 ±0.10	1.75
E2 Min	6.25
P0 ±0.10	4.00
P1 ±0.10	4.00
P2 ±0.05	2.00
D0 +0.10/-0	1.50
D1 +0.10/-0	0.65
A0	2.96 ±0.05
B0	3.60 ±0.10
K0	2.4 ±0.10
T Max	0.23

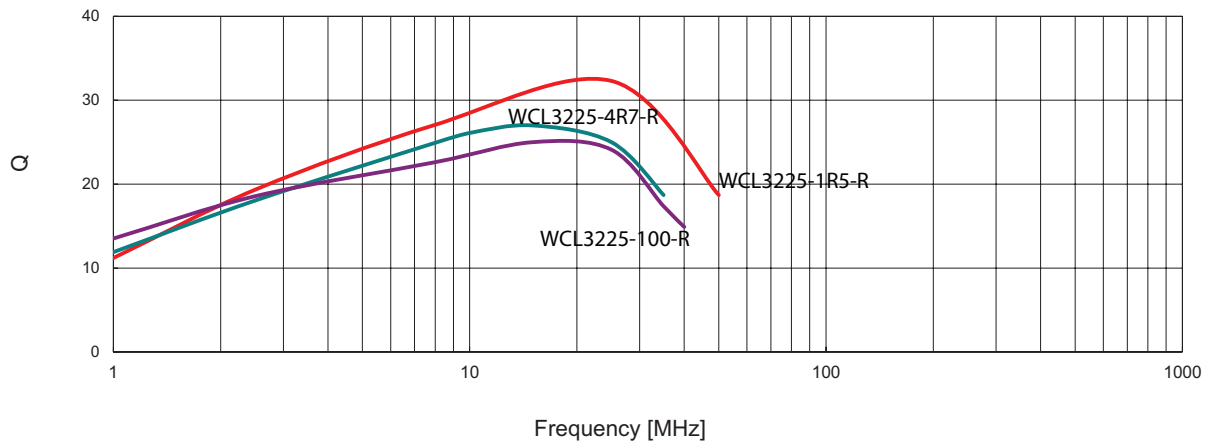


SECTION B-B

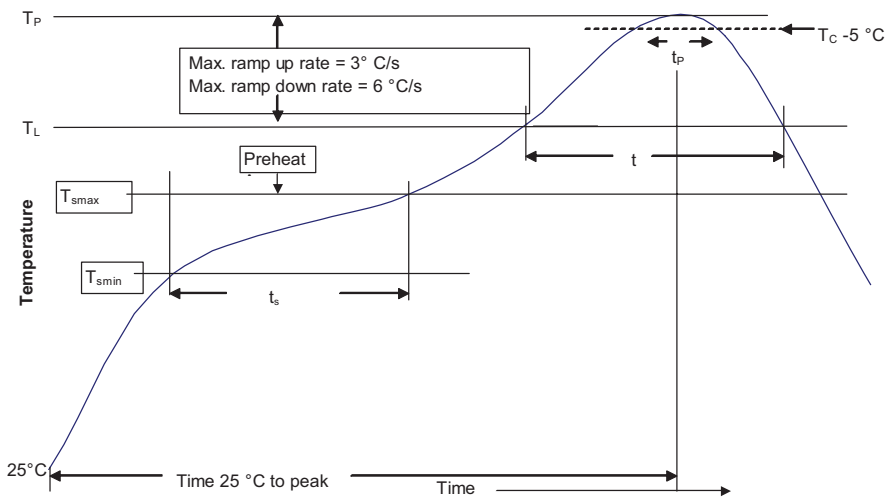
**Inductance vs frequency**



**Q vs frequency**



**Solder reflow profile**



**Table 1 - Standard SnPb solder ( $T_C$ )**

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5 mm)	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

**Table 2 - Lead (Pb) free solder ( $T_C$ )**

Package thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350 - 2000	Volume mm <sup>3</sup> >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 – 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

**Reference J-STD-020**

Profile feature	Standard SnPb solder	Lead (Pb) free solder
Preheat and soak		
• Temperature min. ( $T_{smin}$ )	100 °C	150 °C
• Temperature max. ( $T_{smax}$ )	150 °C	200 °C
• Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )	60-120 seconds	60-120 seconds
Average ramp up rate $T_{smax}$ to $T_p$	3 °C/ second max.	3 °C/ second max.
Liquidous temperature ( $T_L$ )	183 °C	217 °C
Time at liquidous ( $t_L$ )	60-150 seconds	60-150 seconds
Peak package body temperature ( $T_p$ )*	Table 1	Table 2
Time ( $t_p$ )** within 5 °C of the specified classification temperature ( $T_C$ )	10 seconds**	10 seconds**
Average ramp-down rate ( $T_p$ to $T_{smax}$ )	6 °C/ second max.	6 °C/ second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

\* Tolerance for peak profile temperature ( $T_p$ ) is defined as a supplier minimum and a user maximum.  
 \*\* Tolerance for time at peak profile temperature ( $t_p$ ) is defined as a supplier minimum and a user maximum.

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