

# WCL2520

## Wire wound chip inductor



### Product features

- 1008 (2520 metric) package
- High Q value
- Tight inductance tolerance
- Inductance range from 0.12  $\mu$ H to 220  $\mu$ 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



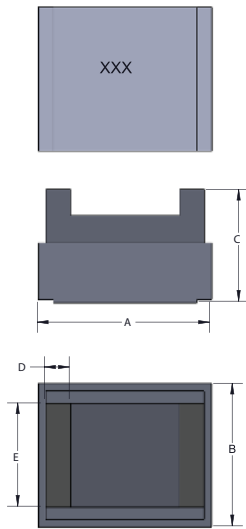
Product specifications

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)
WCL2520-R120-R	0.12	800	25.2	500	0.15	850	12	25.2
WCL2520-R390-R	0.39	600	25.2	500	0.29	480	12	25.2
WCL2520-R560-R	0.56	600	25.2	500	0.42	330	12	25.2
WCL2520-R680-R	0.68	600	25.2	500	0.45	330	12	25.2
WCL2520-R820-R	0.82	600	25.2	500	0.62	300	12	25.2
WCL2520-1R0-R	1.0	580	25.2	500	0.55	300	12	25.2
WCL2520-1R2-R	1.2	550	7.96	500	0.75	250	12	7.96
WCL2520-1R5-R	1.5	400	7.96	500	0.85	230	12	7.96
WCL2520-1R8-R	1.8	320	7.96	500	0.95	168	12	7.96
WCL2520-2R2-R	2.2	315	7.96	500	1.3	150	12	7.96
WCL2520-2R7-R	2.7	300	7.96	500	1.4	100	12	7.96
WCL2520-3R3-R	3.3	280	7.96	500	1.5	80	12	7.96
WCL2520-3R9-R	3.9	250	7.96	500	1.55	60	12	7.96
WCL2520-4R7-R	4.7	210	7.96	500	1.72	50	12	7.96
WCL2520-5R6-R	5.6	190	7.96	500	1.9	40	12	7.96
WCL2520-6R8-R	6.8	175	7.96	500	2.0	35	12	7.96
WCL2520-8R2-R	8.2	160	7.96	500	2.2	25	12	7.96
WCL2520-100-R	10	155	2.52	500	2.5	25	10	2.52
WCL2520-120-R	12	145	2.52	500	2.6	20	10	2.52
WCL2520-150-R	15	130	2.52	500	3.0	20	10	2.52
WCL2520-180-R	18	130	2.52	500	3.0	20	10	2.52
WCL2520-220-R	22	105	2.52	500	3.9	18	10	2.52
WCL2520-270-R	27	100	2.52	500	4.0	10	10	2.52
WCL2520-330-R	33	85	2.52	500	4.8	8	10	2.52
WCL2520-390-R	39	80	2.52	500	5.0	7	10	2.52
WCL2520-470-R	47	60	2.52	500	5.7	7	10	2.52
WCL2520-560-R	56	55	2.52	500	6.0	6.5	10	2.52
WCL2520-680-R	68	50	2.52	500	6.7	6.5	10	2.52
WCL2520-820-R	82	45	2.52	500	7.5	6.5	10	2.52
WCL2520-101-R	100	40	0.796	500	11	4.5	8	0.796
WCL2520-121-R	120	30	0.796	500	13	3	8	0.796
WCL2520-151-R	150	25	0.796	500	15	3	8	0.796
WCL2520-221-R	220	20	0.796	500	18	2.5	8	0.796

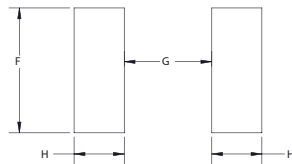
1. Test frequency and voltage at +25 °C. Test voltage is for both OCL and Q.
2. Resistance to soldering heat: +260 ±5 °C for 10 ± 1 second
3. At low temperature resistance (-40 ±2°C) the inductance change is within ±5% and the Q within ±10%
4. At high temperature resistance (+85 ±5°C) the inductance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

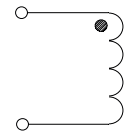
**Dimensions (mm)**



Recommended pad layout



Schematic



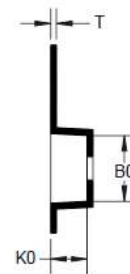
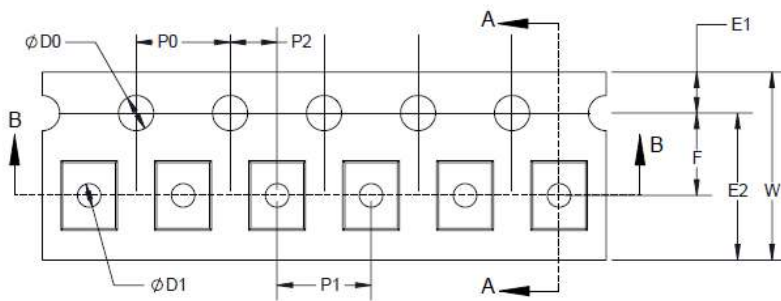
Part Number	A	B	C	D	E	F	G	H
WCL2520-xxx-R	2.92 max	2.79 max	2.10 max	0.50 ref	2.0 ref	2.54	1.27	1.02

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



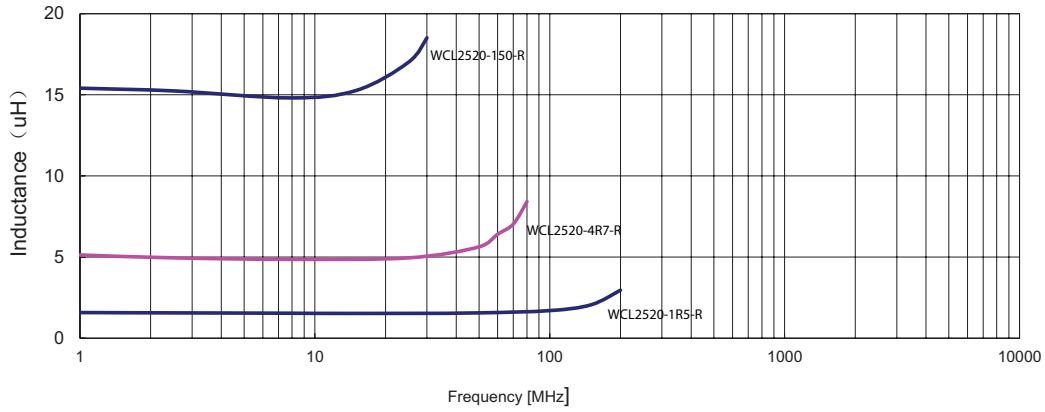
SECTION A-A

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	2.73 ±0.05
B0	2.9 ±0.10
K0	2.34 ±0.10
T Max	0.25

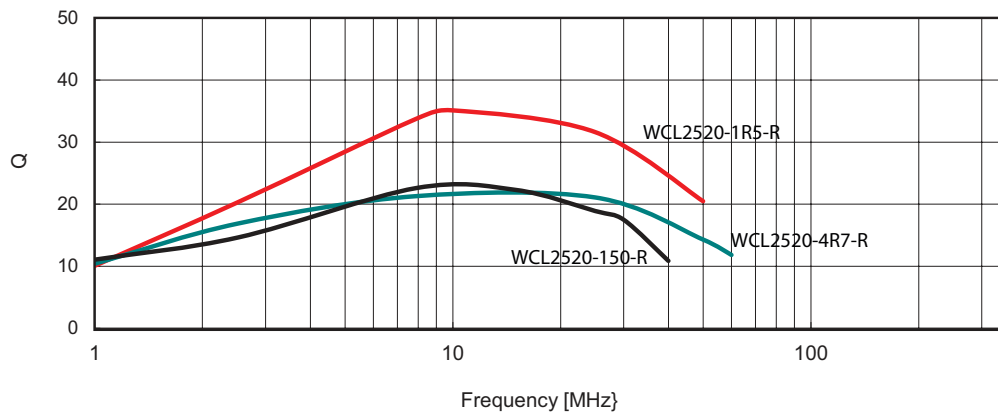


SECTION B-B

### Inductance vs frequency



### Q vs frequency



Solder reflow profile

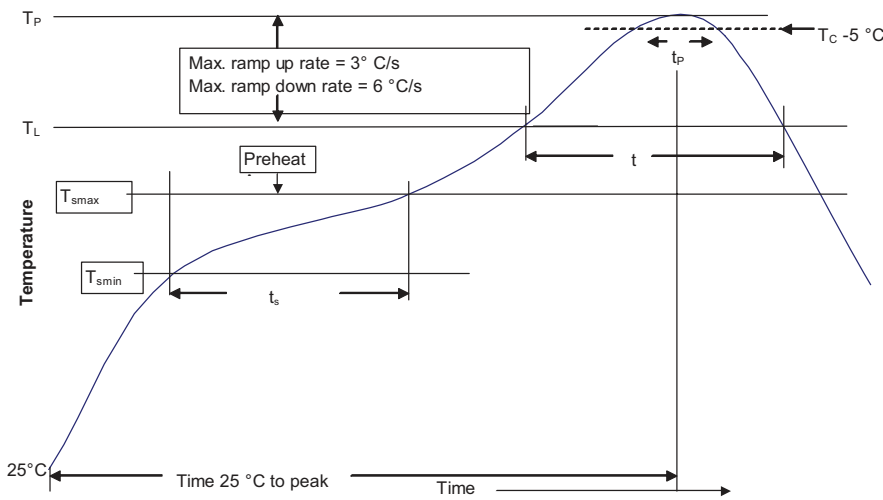


Table 1 - Standard SnPb solder ( $T_C$ )

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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Printed in USA  
Publication No. 10930 BU-MC19062  
July 2019

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