Chip Power Inductors

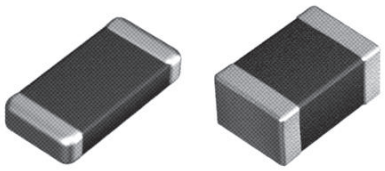
Features

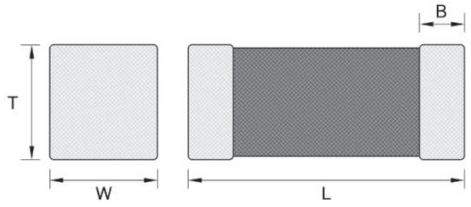
- Low DC resistance and High DC Biased products in the class.
- Completely lead-free product and support lead-free solders.
- Low thickness and high current density products.
- Complex products of co-fired ceramic and magnetic materials.

Applications

- DC-DC converters and power modules used for the following equipments.
- Compact electrical instruments such as cellular phones, PDA, DVC, DSC and HDD.

Shape & Dimensions





(Unit : mm)

Size	L	W	T	B
1608	1.6±0.15	0.8±0.15	1.0max	0.3±0.2
2012	2.0±0.20	1.25±0.2	1.0max	0.5±0.3
2016	2.0±0.20	1.6±0.2	1.0max	0.5±0.3
2520	2.5±0.20	2.0±0.2	1.0max	0.5±0.3
3216	3.2±0.20	1.6±0.20	0.6max	0.5±0.3
3225	3.2±0.20	2.5±0.20	1.0max	0.5±0.3

How to Order(Product Identification)

CPI 2520 N H L 4R7 M E

1 2 3 4 5 6 7 8

Measurement Equipments

- Agilent 4284A(Precision LCR Meter)
- Agilent 42841A(Bias Current Source)

Temperature Range

- Operating Temp. -40 ~ +125℃
- Storage Temp. -10 ~ +40℃

1 Series Code
CPI : Chip Power Inductors

2 Dimensions Code
The First two digits : length (mm)
The Last two digits : Width (mm)

3 Thickness (max.)
S : 0.6mm D : 0.8mm
N : 1.0mm T : 1.2mm

4 Application Code
L : Low DCR type
H : High Current type
U : Very High Current type

5 Material Code

6 Inductance Value Code
2R2 : 2.2μH 4R7 : 4.7μH
100 : 10.0μH

7 Tolerancd Code
K : ±10% M : ±20% N : ±30%

8 Packaging Code
T : Real paper packaging
E : Real embossed tape packaging
B : BulK packaging

Characteristics - High Current Type

CPI2012NHL Series - High Current Type

Part No.	Thickness (mm)	Inductance at 1 MHz	DC Resistance (Ω)	Rated Current(A)
CPI2012NHL1R0MT	1.0 max	1.0±20%	0.20±30%	1.0
CPI2012NHL1R5MT	1.0 max	1.5±20%	0.23±30%	0.9
CPI2012NHL2R2MT	1.0 max	2.2±20%	0.23±30%	0.9
CPI2012NHL3R3MT	1.0 max	3.3±20%	0.25±30%	0.8
CPI2012NHL4R7MT	1.0 max	4.7±20%	0.30±30%	0.6

CPI2012SHL Series - Low Profile Type (T=0.6 max.)

Part No.	Thickness (mm)	Inductance at 1 MHz	DC Resistance (Ω)	Rated Current(A)
CPI2012SHL1R0MT	0.6 max	1.0±20%	0.30±30%	0.60
CPI2012SHL1R5MT	0.6 max	1.5±20%	0.35±30%	0.55
CPI2012SHL2R2MT	0.6 max.	2.2±20%	0.40±30%	0.50
CPI2012SHL3R3MT	0.6 max.	3.3±20%	0.45±30%	0.40
CPI2012SHL4R7MT	0.6 max.	4.7±20%	0.55±30%	0.30

CPI2016NHL Series - High Current Type

Part No.	Thickness (mm)	Inductance at 1 MHz	DC Resistance (Ω)	Rated Current(A)
CPI2016NHL1R0ME	1.0 max	1.0±20%	0.12±30%	1.30
CPI2016NHL1R5ME	1.0 max	1.5±20%	0.12±30%	1.30
CPI2016NHL2R2ME	1.0 max	2.2±20%	0.14±30%	1.20
CPI2016NHL3R3ME	1.0 max	3.3 ±20%	0.18±30%	1.00
CPI2016NHL4R7ME	1.0 max	4.7±20%	0.23±30%	0.90

Characteristics - High Current Type

CPI2520NHL Series - High Current Type

Part No.	Thickness (mm)	Inductance at 1 MHz	DC Resistance (Ω)	Rated Current(A)
CPI2520NHL1R0ME	1.0 max	1.0 ±20%	0.11 ±30%	1.50
CPI2520NHL1R5ME	1.0 max	1.5±20%	0.12±30%	1.40
CPI2520NHL2R2ME	1.0 max	2.2±20%	0.14±30%	1.30
CPI2520NHL3R3ME	1.0 max	3.3±20%	0.18±30%	1.20
CPI2520NHL4R7ME	1.0 max	4.7±20%	0.23±30%	1.00
CPI2520NHL6R8ME	1.0 max	6.8±20%	0.20±30%	1.20
CPI2520NHL100ME	1.0 max	10.0±20%	0.30±30%	0.80

CPI3225NHL Series - High Current Type

Part No.	Thickness (mm)	Inductance at 1 MHz	DC Resistance (Ω)	Rated Current(A)
CPI3225NHL1R0ME	1.0 max	1.0 ±20%	0.10 ±30%	1.30
CPI3225NHL1R5ME	1.0 max	1.5±20%	0.12±30%	1.30
CPI3225NHL2R2ME	1.0 max	2.2±20%	0.15±30%	1.20
CPI3225NHL3R3ME	1.0 max	3.3±20%	0.17±30%	1.10
CPI3225NHL4R7ME	1.0 max	4.7±20%	0.20±30%	1.00
CPI3225NHL6R8ME	1.0 max	6.8±20%	0.28±30%	0.90
CPI3225NHL100ME	1.0 max	10.0±20%	0.35±30%	0.80

Characteristics - Low DC Resistance Type

CPI1608NLL Series - Low Profile Type

Part No.	Thickness (mm)	Inductance at 1 MHz	DC Resistance (Ω)	Rated Current(A)
CPI1608NLLR47MT	1.0 max	0.47±20%	0.15±30%	1.10
CPI1608NLLR68MT	1.0 max	0.68±20%	0.17±30%	1.05
CPI1608NLL1R0MT	1.0 max	1.0±20%	0.20±30%	1.00
CPI1608NLL1R5MT	1.0 max	1.5±20%	0.25±30%	0.90
CPI1608NLL2R2MT	1.0 max	2.2±20%	0.30±30%	0.80

CPI2012NLL Series - Low DCR Typeies

Part No.	Thickness (mm)	Inductance at 1 MHz	DC Resistance (Ω)	Rated Current(A)
CPI2012NLLR47MT	1.0 max	0.47±20%	0.08±30%	1.30
CPI2012NLL1R0MT	1.0 max	1.0±20%	0.11±30%	1.20
CPI2012NLL1R5MT	1.0 max	1.5±20%	0.14±30%	1.10
CPI2012NLL2R2MT	1.0 max	2.2±20%	0.16±30%	1.00
CPI2012NLL3R3MT	1.0 max	3.3± 20%	0.22±30%	0.80
CPI2012NLL4R7MT	1.0 max	4.7±20%	0.26±30%	0.70

CPI2520NLL Series - Low DCR Type

Part No.	Thickness (mm)	Inductance at 1 MHz	DC Resistance (Ω)	Rated Current(A)
CPI2520NLL1R0ME	1.0 max	1.0±20%	0.07±30%	1.50
CPI2520NLL1R5ME	1.0 max	1.5±20%	0.07±30%	1.50
CPI2520NLL2R2ME	1.0 max	2.2±20%	0.08±30%	1.30
CPI2520NLL3R3ME	1.0 max	3.3±20%	0.10±30%	1.20
CPI2520NLL4R7ME	1.0 max	4.7±20%	0.12±30%	1.10

CPI3225NLL Series - Low DCR Type

Part No.	Thickness (mm)	Inductance at 1 MHz	DC Resistance (Ω)	Rated Current(A)
CPI3225NLL4R7ME	1.0 max	4.7±20%	0.10±30%	1.10
CPI3225NLL100ME	1.0 max	10.0±20%	0.23±30%	0.90

Characteristics - High Efficiency Type

EPI2012NLY Series - High Efficiency Type

Part No.	Thickness (mm)	Inductance at 1 MHz	DC Resistance (Ω)	Rated Current(A)
EPI2012NLYR24MT	1.0 max	0.24±20%	0.027±30%	3.2
EPI2012NLYR33MT	1.0 max	0.33±20%	0.032±30%	3.0
EPI2012NLYR47MT	1.0 max	0.47±20%	0.040±30%	2.6
EPI2012NLYR56MT	1.0 max	0.56±20%	0.050±30%	2.2

EPI2016NLY Series - High Efficiency Type

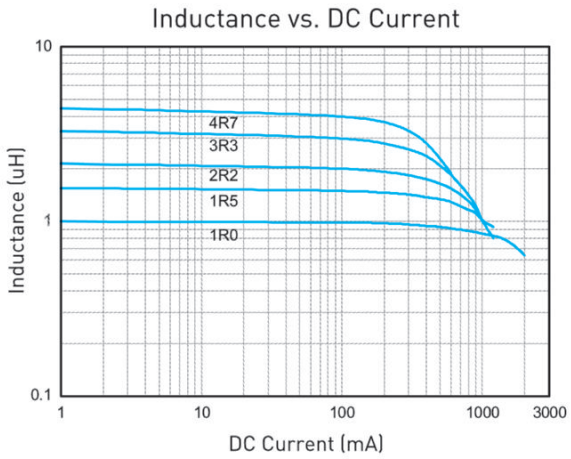
Part No.	Thickness (mm)	Inductance at 1 MHz	DC Resistance (Ω)	Rated Current(A)
EPI2016NLYR15ME	1.0 max	0.15±20%	0.020±30%	3.5
EPI2016NLYR24ME	1.0 max	0.24±20%	0.025±30%	3.2
EPI2016NLYR33ME	1.0 max	0.33±20%	0.030±30%	3.0
EPI2016NLYR47ME	1.0 max	0.47±20%	0.040±30%	2.6
EPI2016NLYR56ME	1.0 max	0.56±20%	0.045±30%	2.5

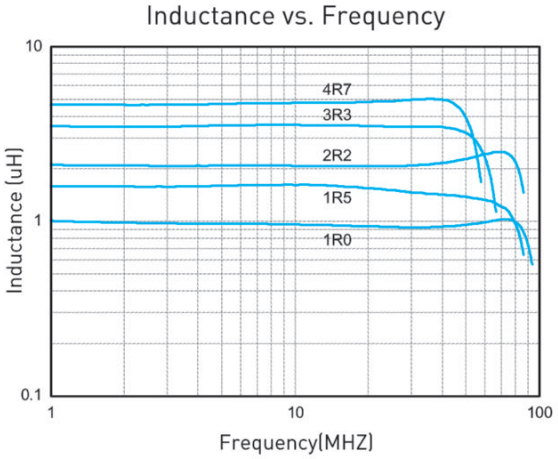
EPI2520NLY Series - High Efficiency Type

Part No.	Thickness (mm)	Inductance at 1 MHz	DC Resistance (Ω)	Rated Current(A)
EPI2520NLYR47ME	1.0 max	0.47±20%	0.04±30%	3.2
EPI2520NLYR68ME	1.0 max	0.68±20%	0.05±30%	3.0
EPI2520NLY1R0ME	1.0 max	1.00±20%	0.07±30%	2.7

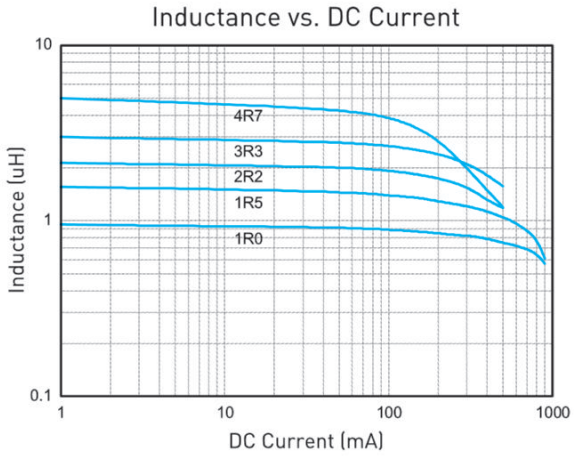
Characteristics - High Current Type

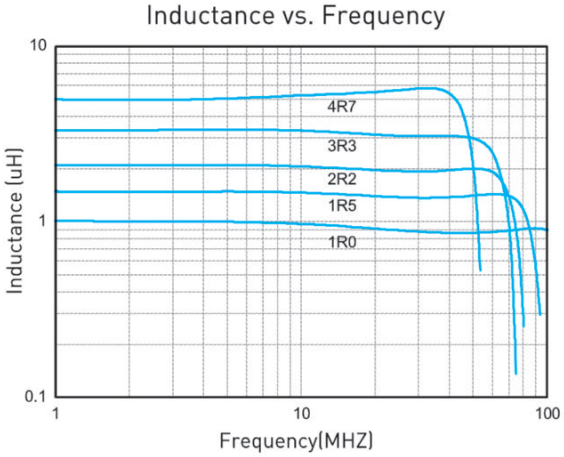
CPI2012NHL Series



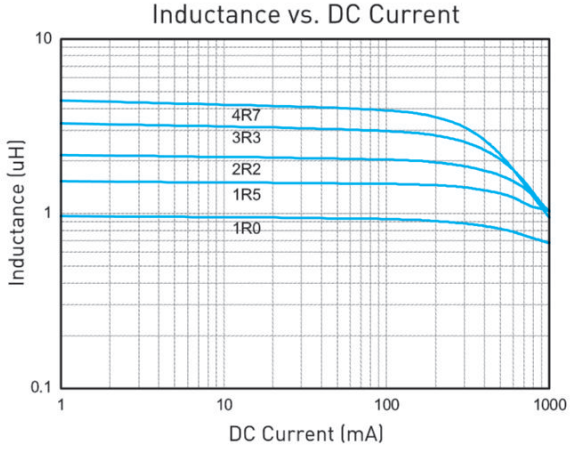


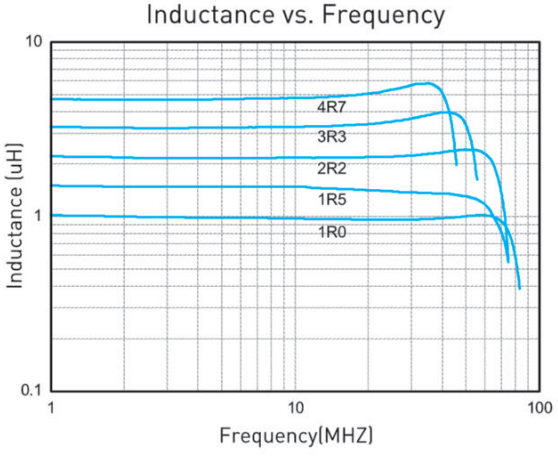
CPI2012SHL Series





CPI2016NHL Series

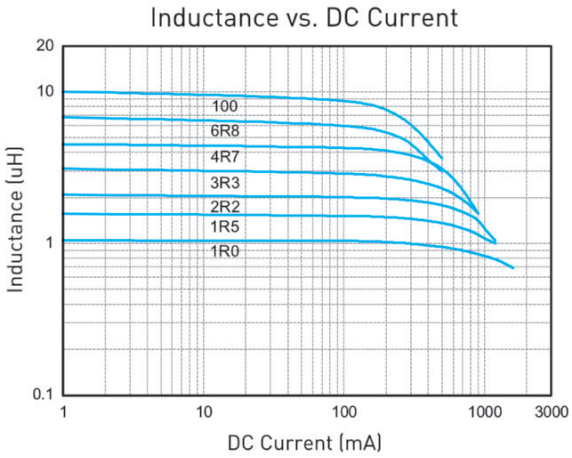


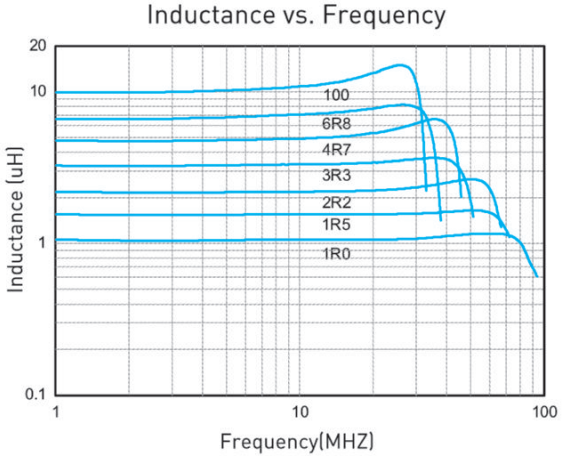


**This description in the this catalogue is subject to change without notice*

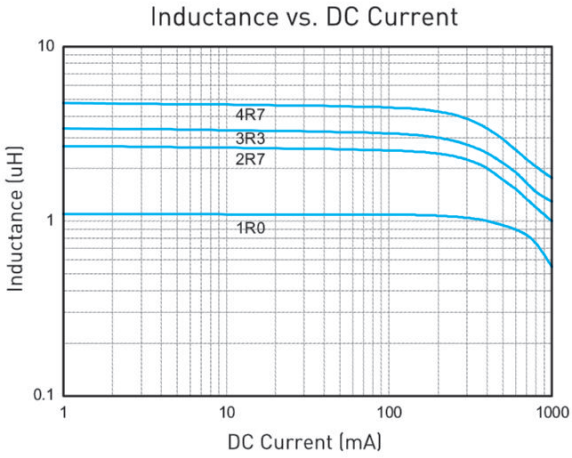
Characteristics - High Current Type

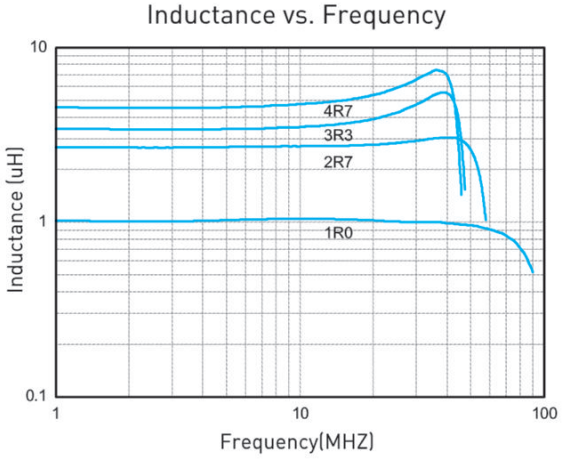
CPI2520NHL Series



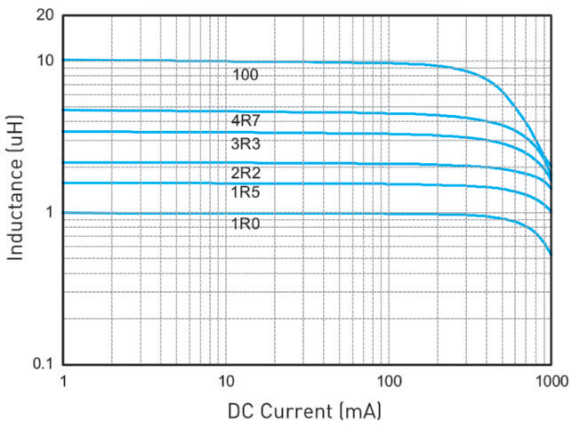


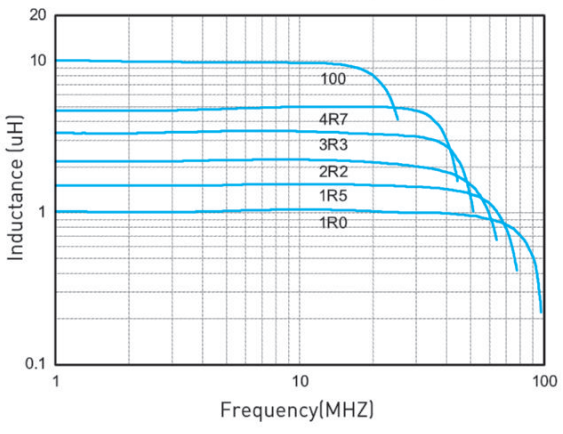
CPI3216SHL Series





CPI3225NHL Series



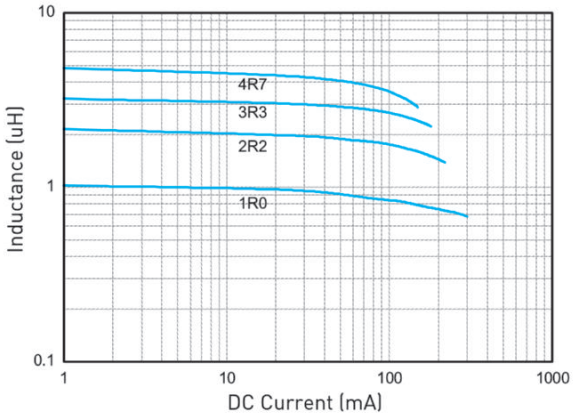


**This description in the this catalogue is subject to change without notice*

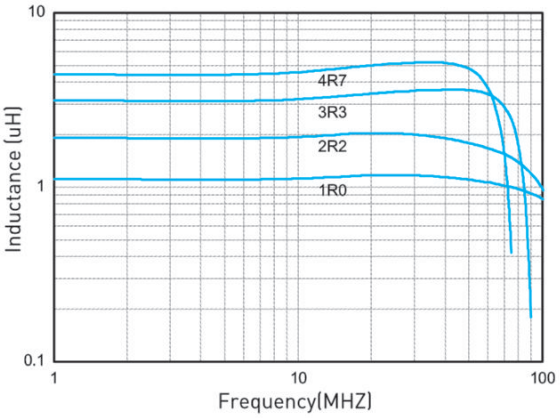
Characteristics - Low DC Resistance Type

CPI1608NLL Series

Inductance vs. DC Current

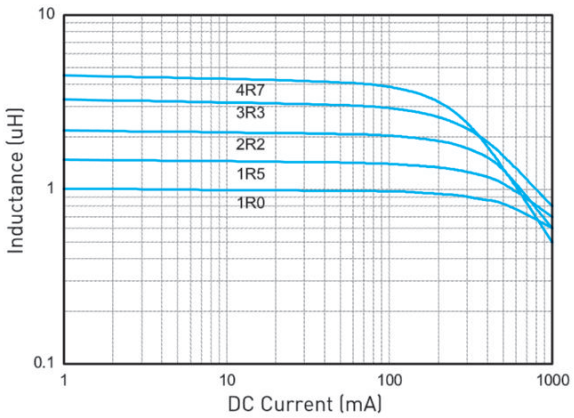


Inductance vs. Frequency

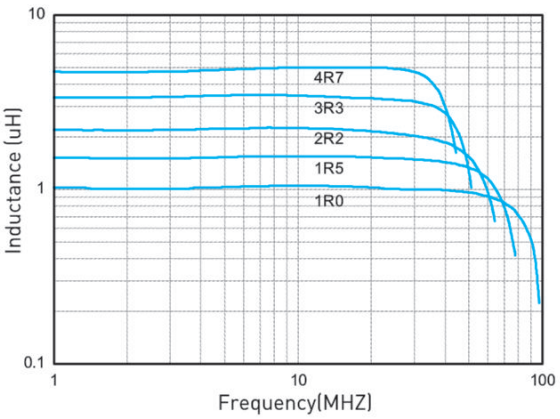


CPI2520NLL Series

Inductance vs. DC Current

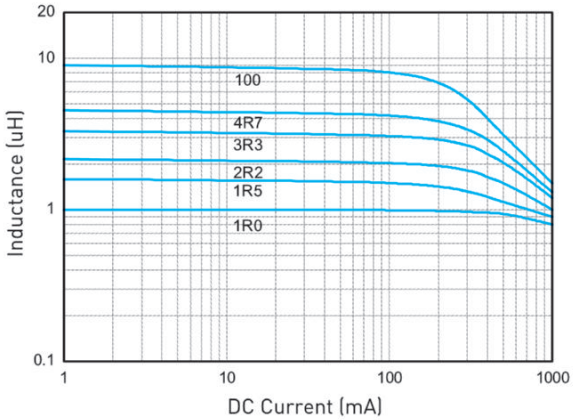


Inductance vs. Frequency

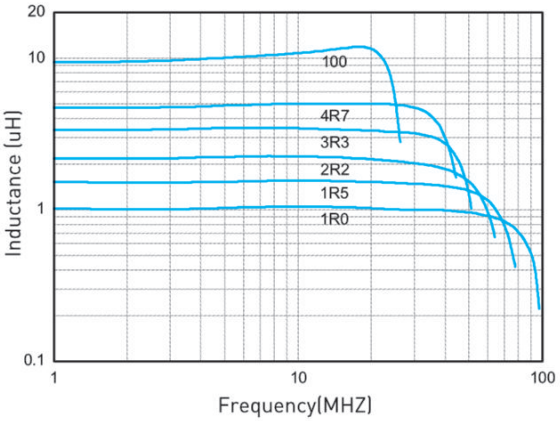


CPI3225NLL Series

Inductance vs. DC Current



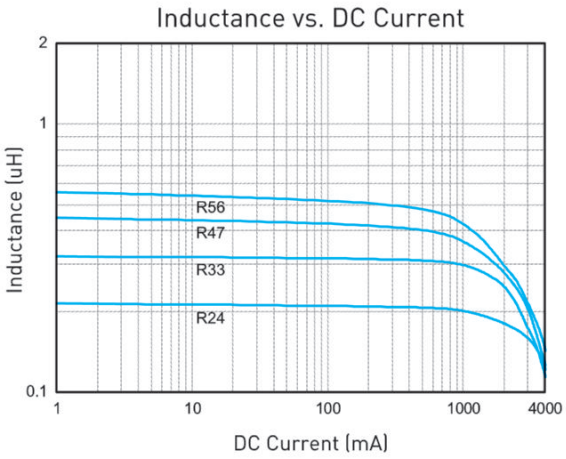
Inductance vs. Frequency

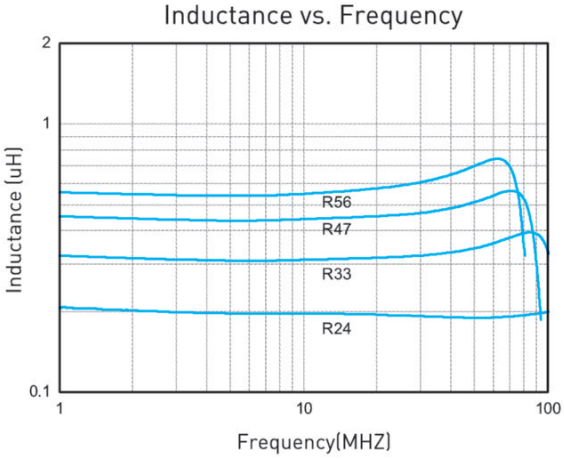


**This description in the this catalogue is subject to change without notice*

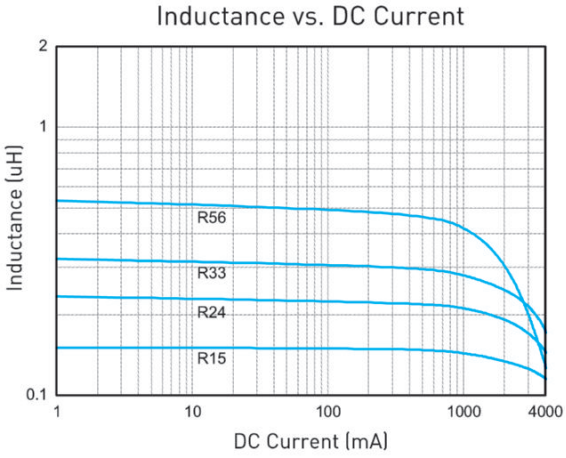
Characteristics - High Efficiency Type

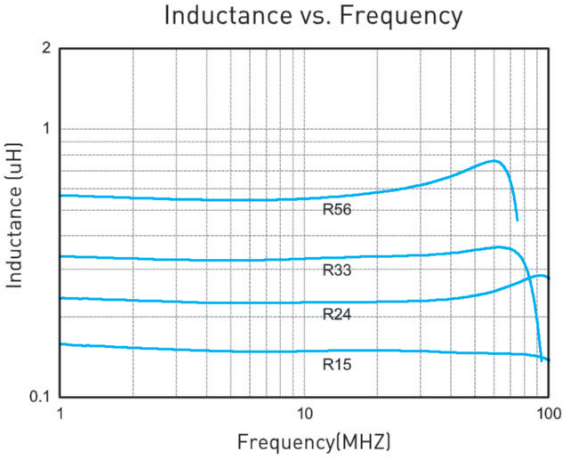
EPI2012 Series



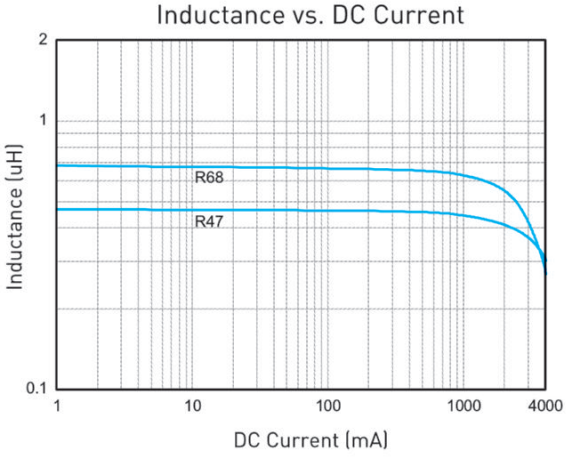


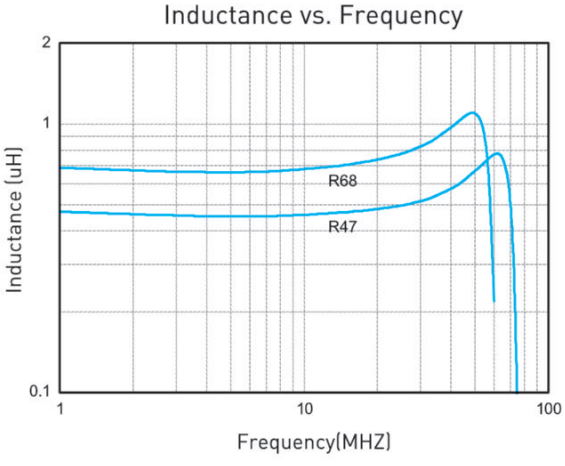
EPI2016 Series





EPI2520 Series





**This description in the this catalogue is subject to change without notice*

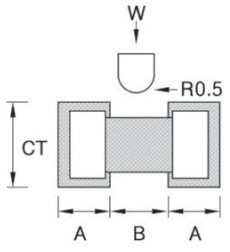
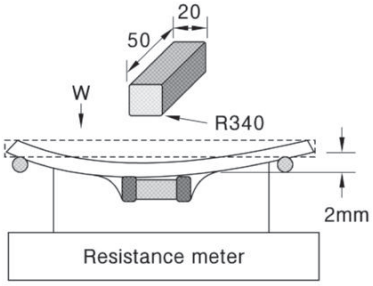
Reliability and Test Conditions

Chip Beads & Inductors

○ Chip Beads ● Chip Inductors

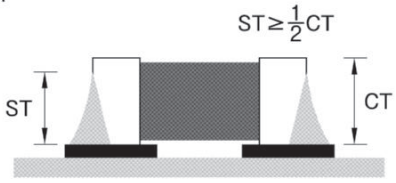
Item	Requirements	Test Conditions
Operating Temperature Range	−55℃~+125℃ ○ −40℃~+85℃ ●	
Storage Temperature Range	40℃ Max., 70% RH Max.	at Packing Condition
Solderability	More than 90% of the terminal electrode shall be covered with new solder	- Preheat Temperature : 100~150℃ - Preheat Time : 60sec. - Solder Temperature : 245±5℃ ○ 260±5℃ ● - Soldering Time : 10±1sec.
Resistance to Soldering Heat	1. No damage such as cracks should be caused in chip element 2. More than 75% of the terminal electrode shall be covered with new solder 3. Impedance shall not change more than ±30 % ○ 4. Inductance shall not change more than ±10 % ● 5. Q shall not change more than ±20 % ●	- Preheat Temperature : 100~150℃ - Preheat Time : 60sec. - Solder Temperature : 270±10℃ - Soldering Time : 10±0.5sec.
Reflow Soldering	More than 50% of the terminal electrode shall be covered with new solder $ST \geq \frac{1}{2}CT$ 	- Preheat Temperature : 150℃ - Preheat Time : 60sec. - Solder Temperature : 245±5℃ ○ 260±5℃ ● - Soldering Time : 10sec. Max. (Reflow Soldering Profile)
High Temperature Resistance		- Temperature : 125±3℃ ○ 85±3℃ ● - Time : 500±12hours - Measurement at room ambient temperature after placing for 24 hours
High Temperature Load Resistance	1. No mechanical damage 2. Impedance shall not change more than ±30 % ○ 3. Inductance shall not change more than ±10 % ● 4. Q shall not change more than ±20 % ●	- Temperature : 125±3℃ ○ 85±3℃ ● - Applied Current : Rated Current - Time : 1000±12hours - Measurement at room ambient temperature after placing for 24 hours
Humidity Resistance		- Temperature : 40±2℃ - Humidity : 90±2%RH - Time : 500±12hours - Measurement at room ambient temperature after placing for 24 hours

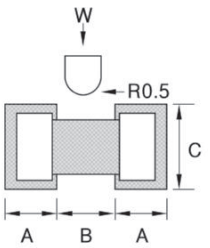
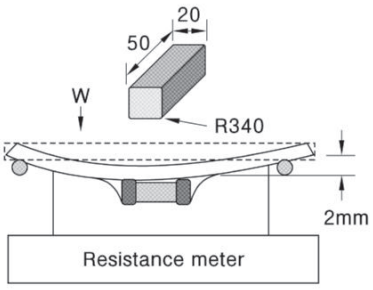
○ Chip Beads ● Chip Inductors

Item	Requirements	Test Conditions
Humidity Load Resistance		- Temperature : 40±2℃ - Humidity : 90±2% RH - Applied Current : Rated Current - Time : 500±12 hours - Measurement at room ambient temperature after placing for 24 hours
Low Temperature Resistance	1. No mechanical damage 2. Impedance shall not change more than ±30 % ○ 3. Inductance shall not change more than ±10 % ● 4. Q shall not change more than ±20 % ●	- Temperature : −55±3℃ ○ −40±3℃ ● - Time : 1000±12 hours - Measurement at room ambient temperature after placing for 24 hours
Thermal Shock		1. −55±3℃ for 30minutes ○ 40±3℃ for 30minutes ● 2. 125±3℃ for 30minutes ○ 85±3℃ for 30minutes ● 3. Repeat 100 Cycle
Vibration		- Frequency : 10~55Hz - Amplitude : 1.5mm - Direction : X, Y, Z - Sweep Time : 2hours for each axis
Drop		Drop 10 times on a concrete floor from a height of 100cm
Flexure Strength	No Mechanical Damage	
Bending Strength	The terminal electrode shall be neither break off nor the chip damage	

Type	1005	1608	2012	3216	4516○	4532○
A(mm)	0.7	1.0	1.0	1.3	1.5	1.5
B(mm)	0.5	0.8	1.0	1.5	3.6	3.6
C(mm)	0.7	1.3	1.3	3.0	3.0	3.0
W(kgf)	0.7	2.0	4.0	5.0	5.0	5.0

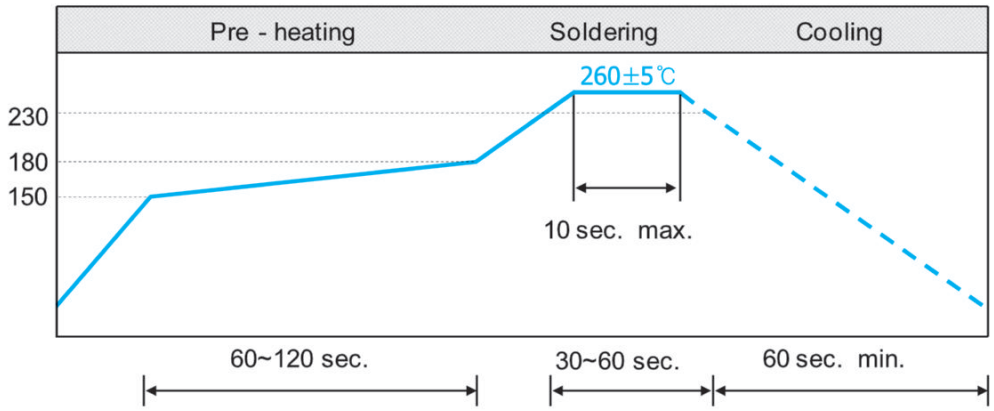
Chip Power Inductors

Item	Requirements	Test Conditions
Operating Temperature Range	−40℃~+125℃	Including self-temperature rise
Storage Temperature Range	−10~40℃ Max., 70% RH Max.	at Packing Condition
Solderability	More than 90% of the terminal electrode shall be covered with new solder	- Preheat Temperature : 100~150℃ - Preheat Time : 60sec. - Solder Temperature : 245±5℃ - Soldering Time : 10±1sec.
Resistance to Soldering heat	1. No damage such as cracks should be caused in chip element 2. More than 75% of the terminal electrode shall be covered with new solder 3. Impedance shall not change more than ±20 %	- Preheat Temperature : 100~150℃ - Preheat Time : 60sec. - Solder Temperature : 270±10℃ - Soldering Time : 10±0.5sec.
Reflow Soldering	More than 50% of the terminal electrode shall be covered with new solder 	- Preheat Temperature : 150℃ - Preheat Time : 60sec. - Solder Temperature : 245±5℃ - Soldering Time : 10sec. Max. (Reflow Soldering Profile)
High Temperature Resistance	1. No mechanical damage 2. Impedance shall not change more than ±20 %	- Temperature : 85±3℃ - Time : 500±12hours - Measurement at room ambient temperature after placing for 24 hours
High Temperature Load Resistance		- Temperature : 85±3℃ - Applied Current : Rated Current - Time : 500±12hours - Measurement at room ambient temperature after placing for 24 hours
Humidity Resistance		- Temperature : 40±2℃ - Humidity : 90±2% RH - Time : 500±12hours - Measurement at room ambient temperature after placing for 24 hours

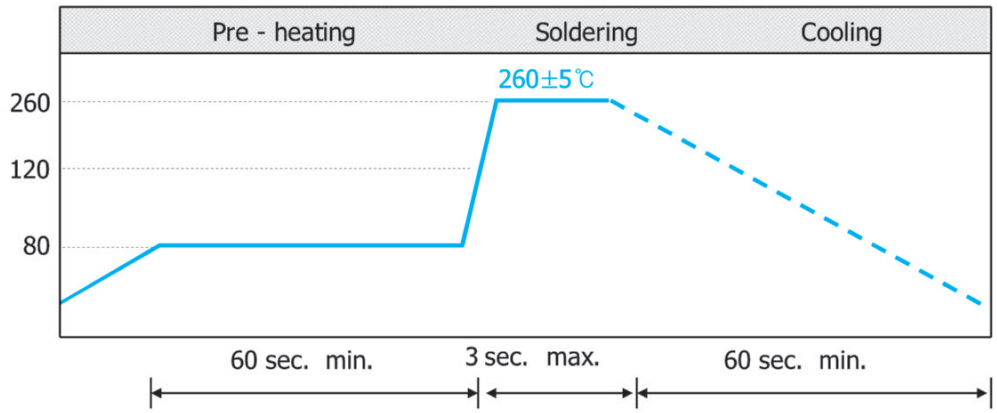
<table>
<tr><th>Item</th><th>Requirements</th><th>Test Conditions</th></tr>
<tr><td>Humidity
Load Resistance</td><td rowspan="5">1. No mechanical damage
2. Inductance shall not change more than ±20 %</td><td>- Temperature : 40±2℃
- Humidity : 90±2% RH
- Applied Current : rated Current
- Time : 500±12 hours
- Measurement at room ambient temperature after placing for 24 hours</td></tr>
<tr><td>Low Temperature Resistance</td><td>- Temperature : −40±3℃
- Time : 1000±12 hours
- Measurement at room ambient temperature after placing for 24 hours</td></tr>
<tr><td>Thermal Shock</td><td>1. −40±3℃ for 30minutes
2. 85±3 ℃ for 30minutes
3. repeat 100 Cycle</td></tr>
<tr><td>Vibration</td><td>- Frequency : 10~55Hz
- Amplitude : 1.5mm
- Direction : X, Y, Z
- Sweep Time : 2hours for each axis</td></tr>
<tr><td>Drop</td><td>Drop 10 times on a concrete floor from a height of 100cm</td></tr>
<tr><td>Flexure Strength</td><td>No Mechanical Damage
<table>
<tr><th>Item</th><th>A(mm)</th><th>B(mm)</th><th>C(mm)</th></tr>
<tr><td>1005</td><td>0.7</td><td>0.5</td><td>0.7</td></tr>
<tr><td>1608</td><td>1.0</td><td>0.8</td><td>1.3</td></tr>
<tr><td>2012</td><td>1.0</td><td>1.0</td><td>1.3</td></tr>
<tr><td>3216</td><td>1.3</td><td>1.5</td><td>3.0</td></tr>
<tr><td>4516</td><td>1.5</td><td>3.6</td><td>3.0</td></tr>
<tr><td>4532</td><td>1.5</td><td>3.6</td><td>3.8</td></tr>
</table></td><td>Applying force (F) : 1.8kg
Applying time : 60 ±1sec
 
</td></tr>
<tr><td>Bending Strength</td><td>The terminal electrode shall be neither break off nor the chip damage</td><td> 
</td></tr>
</table>

Soldering Profile

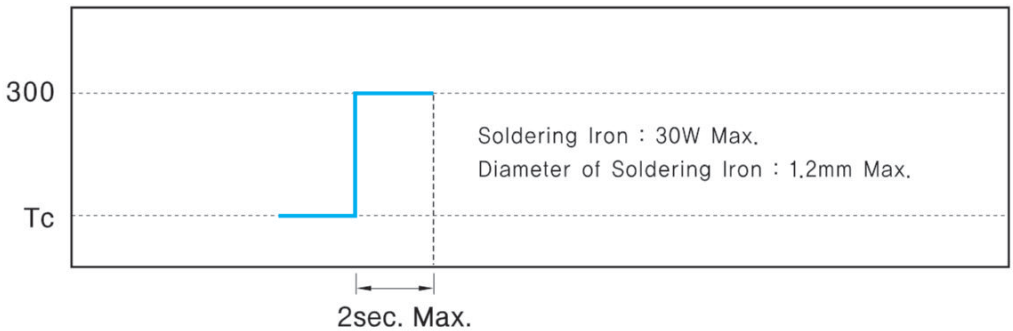
Reflow Soldering



Flow Soldering



Manual Soldering



⚠ Specifications which provide more details for the proper and safe use described product are available upon request.
All specifications are subject to change without notice.