



# Power Inductor ENR40 V series Product Specifications

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## Power Inductor — ENR40 V Series



## Parts Number Explanation

Example:

<b>ENR</b>	<b>4012</b>	<b>V</b>	<b>R47</b>	<b>M</b>	<b>T</b>	<b>W</b>	<b>Z</b>
<b>Product Type</b>	<b>Size (mm)</b>	<b>Application</b>	<b>Inductance (uH)</b>	<b>Tolerance</b>	<b>Package</b>	<b>Internal Code</b>	<b>Optional</b>
Wire-wound Power Inductor	4012 4020		R47 : 0.47uH R68 : 0.68uH	N : ±30% M : ±20% K : ±10%	T : Taping		Z : Default Code



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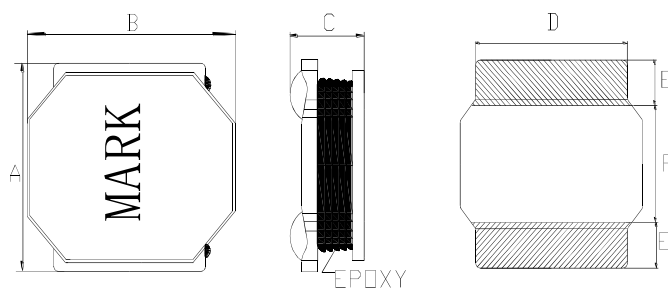
### ■ Standard Electrical Specifications

Part No.	Inductance	DCR (mΩ)	DCR (mΩ)	Isat (A)
	L (μH)	MAX	TYP	$\Delta L/L_0 \leq 30\%$
ENR4012V-R33N-TWZ	0.33	32	26	8.00
ENR4012V-R47N-TWZ	0.47	40	32	7.50
ENR4012V-R68N-TWZ	0.68	40	32	5.00
ENR4012V-1R0M-TWZ	1.0	58	48	4.50
ENR4012V-1R2M-TWZ	1.2	64	56	4.00
ENR4012V-1R5M-TWZ	1.5	70	60	3.90
ENR4012V-2R2M-TWZ	2.2	79	70	2.80
ENR4012V-3R3M-TWZ	3.3	125	110	2.00
ENR4012V-4R7M-TWZ	4.7	166	150	1.80
ENR4012V-6R8M-TWZ	6.8	226	200	1.60
ENR4012V-100M-TWZ	10	335	300	1.50
ENR4012V-220M-TWZ	22	679	620	0.90
ENR4020V-R47N-TWZ	0.47	22	16	10.00
ENR4020V-1R0M-TWZ	1.0	26	22	8.50
ENR4020V-1R5M-TWZ	1.5	36	32	7.20
ENR4020V-2R2M-TWZ	2.2	48	44	6.10
ENR4020V-3R3M-TWZ	3.3	72	64	4.20
ENR4020V-4R7M-TWZ	4.7	108	95	4.00
ENR4020V-6R8M-TWZ	6.8	156	135	3.00
ENR4020V-100M-TWZ	10	216	180	2.80

#### Notes :

1. Test Frequency : 1MHz/1V
2. Tolerance : N:  $\pm 30\%$  ; M:  $\pm 20\%$ ; K:  $\pm 10\%$

### ■ Dimensions for ENR3012V



Note : Using Ink for marking

Recommend Land Pattern

**Unit: mm**

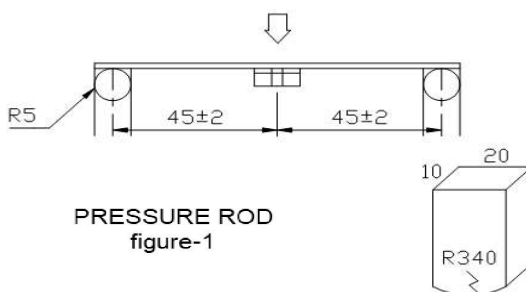
Type	A	B	C	D	E	F
ENR4012V	4.0 ±0.2	4.0 ±0.2	1.35 Max.	3.5 Ref.	1.3 Ref.	1.4 Ref.
ENR4020V	4.0 ±0.2	4.0 ±0.2	2.0 Max.	3.5 Ref.	1.0 Ref.	2.0 Ref.

### ■ Marking

- The inductor is marked with a 3-digit code

Nominal Inductance	
Example	Nominal Value
1R0	1.0 μH
100	10 μH
101	100 μH

● **Reliability test and requirement**

Mechanical		
Item	Specification and Requirement	Test Method
Substrate bending	$\Delta L/L_0 \leq \pm 5\%$ There shall be no mechanical damage or electrical damage.	The sample shall be soldered onto the printed circuit board in figure 1 and a load applied until the figure in the arrow direction is made approximately 3 mm. (keep time 30 seconds).  F(Pressurization)   <p align="center">PRESSURE ROD figure-1</p>
Vibration	$\Delta L/L_0 \leq \pm 5\%$ There shall be no mechanical damage.	The sample shall be soldered onto the printed circuit board and when a vibration having an amplitude of 1.52mm and a frequency of from 10 to 55Hz/1 minute repeated. Should be applied to the 3 directions (X, Y, Z) for 2 hours each. (A total of 6 hours)
Solderability	New solder More than 90%.	Flux (rosin, isopropyl alcohol {JIS-K-1522}) shall be coated over the whole of the sample before hard, the sample shall then be preheated for about 2 minutes in a temperature of 130~150°C and after it has been immersed to a depth 0.5mm below for 3±0.2 seconds fully in molten solder M705 with a temperature of 245±2°C.  More than 90% of the electrode sections shall be covered with new solder smoothly when the sample is taken out of the solder bath.



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Mechanical		
Item	Specification and Requirement	Test Method
Resistance to soldering heat. (reflow soldering)	There shall be no damage or problems.	<p>Temperature profile of reflow soldering</p> <p>Soldering (Peak temperature 260±3°C 10 sec)</p> <p>30 sec Min 230 (230<sup>+0</sup> °C)</p> <p>Pre-heating 150 ~ 180°C</p> <p>2 min</p> <p>10sec</p> <p>2 min. or more</p> <p>Slow cooling (Stored at room temperature)</p> <p>The specimen shall be passed through the reflow oven with the condition shown in the above profile for 1 time. The specimen shall be stored at standard atmospheric conditions for 1 hour, after which the measurement shall be made.</p>
ELECTRICAL		
Item	Specification and Requirement	Test Method
Insulation resistance	There shall be no other damage or problems.	DC 100V voltage shall be applied across this sample of top surface and the terminal. The insulation resistance shall be more than $1 \times 10^8 \Omega$ .
Dielectric withstand voltage	There shall be no other damage or problems.	AC 100V voltage shall be applied for 1minute across set the top surface and the terminal of this sample.
Temperature characteristics	$\Delta L / L 20^\circ C \leq \pm 10\%$ 0 ~ 2000 ppm/°C	The test shall be performed after the sample has stabilized in an ambient temperature of - 40 to + 125°C, and the value calculated based on the value applicable in a normal temperature and normal humidity shall be $\Delta L / L 20^\circ C \leq \pm 10\%$ .



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**ENVIROMENT CHARACTERISTICS**

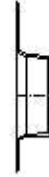
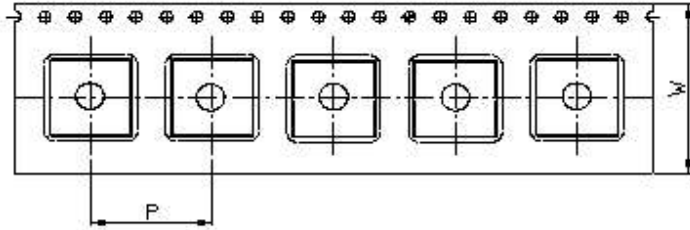
Item	Specification and Requirement	Test Method															
High temperature storage.	$\Delta L/Lo \leq \pm 5\%$ There shall be no mechanical damage.	The sample shall be left for 500 hours in an atmosphere with a temperature of $125 \pm 2^\circ\text{C}$ and a normal humidity. Upon completion of the measurement shall be made after the sample has been left in a normal temperature and normal humidity for 1 hour.															
Low temperature storage.	$\Delta L/Lo \leq \pm 5\%$ There shall be no mechanical damage.	The sample shall be left for 500 hours in an atmosphere with a temperature of $-40 \pm 3^\circ\text{C}$ . Upon completion of the test, the measurement shall be made after the sample has been left in a normal temperature and normal humidity for 1 hour.															
Change of temperature.	$\Delta L/Lo \leq \pm 5\%$ There shall be no other damage of problems.	The sample shall be subject to 5 continuous cycles, such as shown in the table 2 below and then it shall be subjected to standard atmospheric conditions for 1 hour, after which measurement shall be made.  Table 2 <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Duration</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><math>-40 \pm 3^\circ\text{C}</math> (Thermostat No.1)</td> <td>10 min.</td> </tr> <tr> <td>2</td> <td>Standard atmospheric</td> <td>5 sec. or less No.1→No.2</td> </tr> <tr> <td>3</td> <td><math>125 \pm 2^\circ\text{C}</math> (Thermostat No.2)</td> <td>30 min.</td> </tr> <tr> <td>4</td> <td>Standard atmospheric</td> <td>5 sec. or less No.2→No.1</td> </tr> </tbody> </table>	Step	Temperature	Duration	1	$-40 \pm 3^\circ\text{C}$ (Thermostat No.1)	10 min.	2	Standard atmospheric	5 sec. or less No.1→No.2	3	$125 \pm 2^\circ\text{C}$ (Thermostat No.2)	30 min.	4	Standard atmospheric	5 sec. or less No.2→No.1
Step	Temperature	Duration															
1	$-40 \pm 3^\circ\text{C}$ (Thermostat No.1)	10 min.															
2	Standard atmospheric	5 sec. or less No.1→No.2															
3	$125 \pm 2^\circ\text{C}$ (Thermostat No.2)	30 min.															
4	Standard atmospheric	5 sec. or less No.2→No.1															
Moisture storage.	$\Delta L/Lo \leq \pm 5\%$ There shall be no mechanical damage.	The sample shall be left for 500 hours in a temperature of $40 \pm 2^\circ\text{C}$ and a humidity(RH) of 90~95%. Upon completion of the test, the measurement shall be made after the sample has been left in a normal temperature and normal humidity more than 1 hour.															

Test conditions :

The sample shall be reflow soldered onto the printed circuit board in every test.

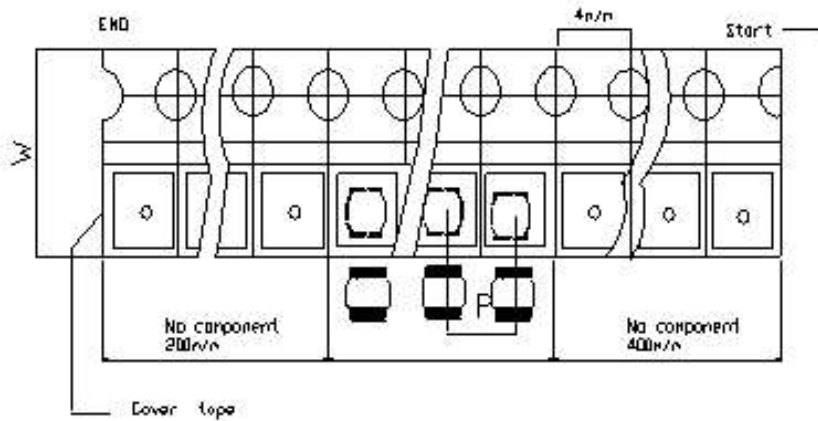
## ■ Packaging

### (1) CARRIER TAPE DIMENSIONS (Unit : mm)



<b>W</b>	12
<b>P</b>	8

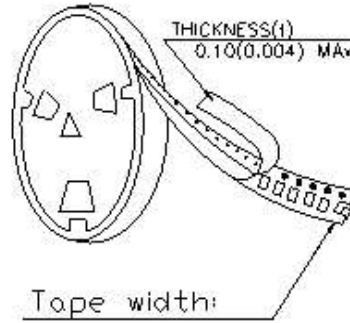
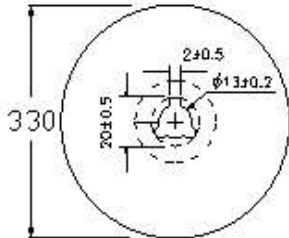
### (2) TAPING DIMENSIONS (Unit : mm)



**Note :** After the product is ready, the outermost layer and the innermost layer of the reel.

Type	Outermost Layer	Innermost Layer
ENR4012V	400	200
ENR4020V	400	400

**(3) REEL DIMENSIONS (Unit : mm)**



**Tape Width : 12mm**

**(4) Quantity (PCS)**

Type	pcs / Reel
ENR4012V	4500
ENR4020V	3000