



Power Inductor ENR50 F Series Product Specifications

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Power Inductor — ENR50 F Series



ENR5020 series



ENR5040 series



Parts Number Explanation

Example:

ENR	5020	F	R47	M	T	W	Z
Product Type	Size (mm)	Application	Inductance (uH)	Tolerance	Package	Internal Code	Optional
Wire-wound Power Inductor	5020 5040		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)	Irms (A)
	L (μH)	MAX	TYP	$\Delta L/L_0 \leq 30\%$	$\Delta T \leq 40^\circ\text{C}$
ENR5020F-1R0N-TWZ	1.0	26	23	4.40	4.20
ENR5020F-1R5N-TWZ	1.5	34	28	4.20	4.10
ENR5020F-2R2N-TWZ	2.2	49	40	3.80	3.20
ENR5020F-3R3M-TWZ	3.3	58	50	3.20	3.10
ENR5020F-4R7M-TWZ	4.7	78	68	2.50	2.40
ENR5020F-6R8M-TWZ	6.8	106	86	2.20	2.10
ENR5020F-100M-TWZ	10	150	124	1.50	1.40
ENR5020F-150M-TWZ	15	220	180	1.40	1.30
ENR5020F-220M-TWZ	22	294	260	1.15	1.10
ENR5020F-270M-TWZ	27	390	330	1.10	1.00
ENR5020F-330M-TWZ	33	462	390	1.00	0.60
ENR5020F-470M-TWZ	47	630	525	0.85	0.80
ENR5020F-680M-TWZ	68	800	630	0.60	0.55
ENR5020F-101M-TWZ	100	1320	1110	0.55	0.50
ENR5020F-221M-TWZ	220	2860	2400	0.35	0.30
ENR5020F-102M-TWZ	1000	18000	12500	0.15	0.14
ENR5040F-1R0N-TWZ	1.0	18	14	7.50	6.00
ENR5040F-1R5N-TWZ	1.5	25	20	5.50	5.40
ENR5040F-2R2M-TWZ	2.2	26	22	4.90	4.80
ENR5040F-3R3M-TWZ	3.3	33	26	4.00	3.60
ENR5040F-4R7M-TWZ	4.7	42	35	3.50	3.40
ENR5040F-6R8M-TWZ	6.8	56	46	2.90	2.80
ENR5040F-100M-TWZ	10	78	63	2.30	2.20
ENR5040F-150M-TWZ	15	104	95	2.00	1.90
ENR5040F-220M-TWZ	22	166	138	1.60	1.50
ENR5040F-270M-TWZ	27	200	165	1.40	1.30
ENR5040F-330M-TWZ	33	228	190	1.30	1.20



**Power Inductor ENR50 F Series
Product Specifications**

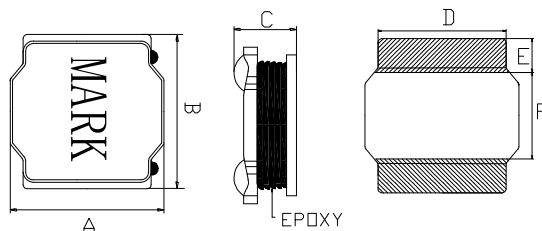
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Part No.	Inductance	DCR (mΩ)	DCR (mΩ)	Isat (A)	Irms (A)
	L (μH)	MAX	TYP	$\Delta L/L_0 \leq 30\%$	$\Delta T \leq 40^\circ\text{C}$
ENR5040F-330M-TWZ	33	228	190	1.30	1.20
ENR5040F-470M-TWZ	47	370	305	1.10	1.00
ENR5040F-560M-TWZ	56	410	340	1.00	0.95
ENR5040F-680M-TWZ	68	600	435	0.85	0.80
ENR5040F-101M-TWZ	100	700	550	0.70	0.60
ENR5040F-221M-TWZ	220	2250	1800	0.40	0.35

Notes :

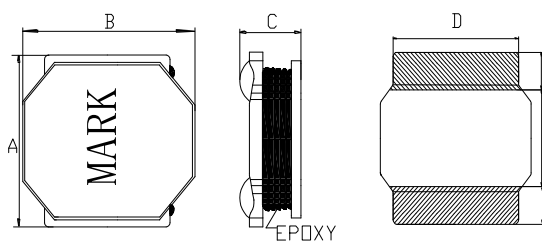
1. Test Frequency : 100KHZ/0.25V
2. Tolerance : N: $\pm 30\%$; M: $\pm 20\%$; K: $\pm 10\%$

■ Dimensions



ENR5020 : Using Ink for marking

Recommend Land Pattern



ENR5040 : Using Ink for marking

Recommend Land Pattern

Unit: mm

Type	A	B	C	D	E	F
ENR5020F	5.0 ±0.2	5.0 ±0.2	2.0 Max.	4.0 Ref.	1.35 Ref.	2.3 Ref.
ENR5040F	5.0 ±0.2	5.0 ±0.2	4.1 Max.	4.0 Ref.	1.5 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



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● **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.	<p>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).</p> <p style="text-align: center;">F(Pressurization)</p> <p style="text-align: center;">PRESSURE ROD figure-1</p>
Vibration	$\Delta L/L_0 \leq \pm 5\%$ There shall be no mechanical damage.	<p>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)</p>
Solderability	New solder More than 90%.	<p>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.</p> <p>More than 90% of the electrode sections shall be covered with new solder smoothly when the sample is taken out of the solder bath.</p>



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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>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	$\Delta L / L 20^\circ\text{C} \leq \pm 10\%$ $0 \sim 2000 \text{ ppm}/^\circ\text{C}$	The test shall be performed after the sample has stabilized in an ambient temperature of $- 40$ to $+ 125^\circ\text{C}$, and the value calculated based on the value applicable in a normal temperature and normal humidity shall be $\Delta L / L 20^\circ\text{C} \leq \pm 10\%$.



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ENVIROMENT CHARACTERISTICS

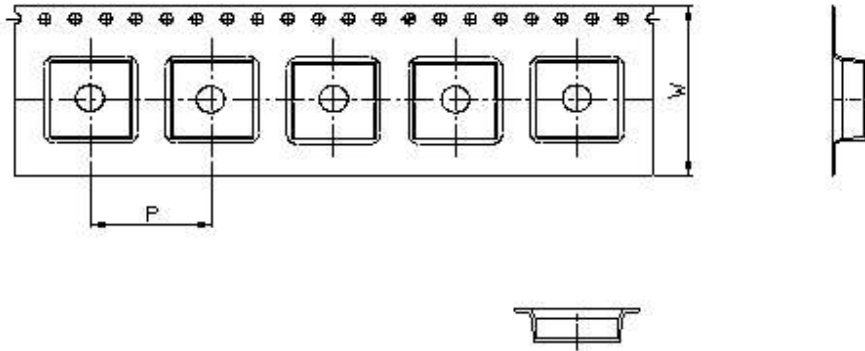
Item	Specification and Requirement	Test Method															
High temperature storage.	$\Delta L/Lo \leq \pm 5\%$ There shall be no mechanical damage.	The sample shall be left for 500 hours in an atmosphere with a temperature of $125 \pm 2^\circ\text{C}$ and a normal humidity. Upon completion of the 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. <div style="text-align: center;">Table 2</div> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;"></th> <th style="width: 30%;">Temperature</th> <th style="width: 65%;">Duration</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">$-40 \pm 3^\circ\text{C}$ (Thermostat No.1)</td> <td style="text-align: center;">10 min.</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">Standard atmospheric</td> <td style="text-align: center;">5 sec. or less No.1→No.2</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">$125 \pm 2^\circ\text{C}$ (Thermostat No.2)</td> <td style="text-align: center;">30 min.</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">Standard atmospheric</td> <td style="text-align: center;">5 sec. or less No.2→No.1</td> </tr> </tbody> </table>		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
	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.

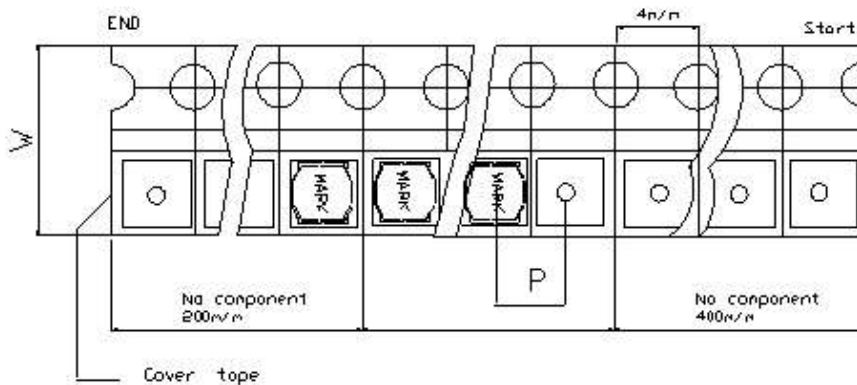
■ Packaging

(1) CARRIER TAPE DIMENSIONS (Unit : mm)



W	12
P	8

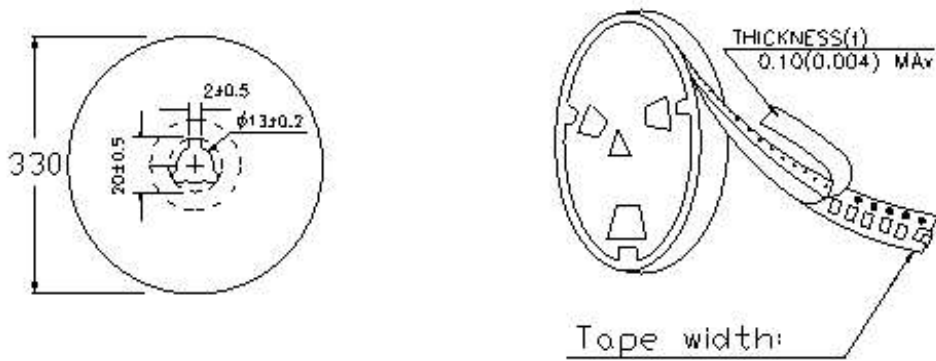
(2) TAPING DIMENSIONS (Unit : mm)



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

Type	Outermost Layer	Innermost Layer
ENR5020F	400	400
ENR5040F	400	400

(3) REEL DIMENSIONS (Unit : mm)



Type	Tape Width
ENR5020F	12mm
ENR5040F	12mm

(4) Quantity (PCS)

Type	pcs / Reel
ENR5020F	2500
ENR5040F	1500