

# DR124

High power density, high efficiency, low profile shielded drum core power inductors



## Product features

- Low profile surface mount inductor
- 12.5 mm x 12.5 mm x 4.5 mm shielded drum core
- Inductance range from 0.47  $\mu$ H to 1000  $\mu$ H
- Current range from 0.44 A to 24.4 A
- Frequency range up to 1 MHz
- Ferrite core material

## Applications

- Notebook power
- LCD panels
- Desktop and servers
- DVD players and portable power devices
- DC-DC Converters
- Buck, boost, forward, and resonant converters
- Noise filtering and filter chokes

## Environmental Data

- Storage temperature range (Component): -40 °C to +125 °C
- Operating temperature range: -40 °C to +125 °C (ambient plus self-temperature rise)
- Solder reflow temperature: J-STD-020 (latest revision) compliant



Product specifications

Part Number	Rated Inductance (μH)	OCL <sup>1</sup> μH±20%	I <sub>rms</sub> <sup>2</sup> (A)	I <sub>sat</sub> <sup>3</sup> (A)	DCR mΩ @20°C Typ	DCR mΩ @ +20°C Max	K-factor <sup>4</sup>
DR124-R47-R	0.47	0.42	16.0	24.40	2.2	2.7	17.51
DR124-1R0-R	1.0	0.83	13.9	18.00	3.00	3.6	12.50
DR124-1R5-R	1.5	1.37	11.1	14.00	4.75	5.7	9.73
DR124-2R2-R	2.2	2.04	9.1	11.45	5.92	7.1	7.96
DR124-3R9-R	3.9	3.80	7.0	8.40	12.50	15.0	5.84
DR124-4R7-R	4.7	4.88	6.5	7.65	13.50	16.2	5.15
DR124-6R8-R	6.8	6.10	5.6	6.47	18.06	21.7	4.61
DR124-8R2-R	8.2	7.45	5.2	6.22	21.67	26.0	4.17
DR124-100-R	10	8.94	4.5	5.80	23.33	28.0	3.81
DR124-120-R	12	11.5	4.1	4.96	31.67	38.0	3.50
DR124-150-R	15	14.2	3.6	4.62	37.30	44.8	3.02
DR124-180-R	18	16.2	3.4	4.32	46.97	56.4	2.82
DR124-220-R	22	20.7	3.2	3.83	53.99	64.8	2.50
DR124-270-R	27	25.7	2.8	3.44	66.67	80.0	2.24
DR124-330-R	33	31.2	2.6	3.12	80.83	97.0	2.04
DR124-390-R	39	37.3	2.3	2.85	110.00	132.0	1.86
DR124-470-R	47	44.0	2.2	2.63	124.66	149.6	1.72
DR124-560-R	56	54.9	2.0	2.35	144.32	173.2	1.54
DR124-680-R	68	67.1	1.8	2.13	183.33	220.0	1.39
DR124-820-R	82	80.5	1.7	1.94	212.72	255.3	1.27
DR124-101-R	100	95.1	1.5	1.79	256.67	308.0	1.17
DR124-121-R	120	111	1.3	1.65	311.18	373.4	1.08
DR124-151-R	150	146	1.3	1.44	371.02	445.2	0.94
DR124-181-R	180	179	1.1	1.30	501.66	602.0	0.87
DR124-221-R	220	216	1.0	1.15	558.00	669.6	0.77
DR124-271-R	270	256	0.88	1.09	725.00	870.0	0.71
DR124-331-R	330	327	0.83	0.92	825.00	990.0	0.63
DR124-471-R	470	460	0.68	0.74	1242.50	1491.0	0.53
DR124-681-R	680	669	0.56	0.65	1845.83	2215.0	0.45
DR124-821-R	820	825	0.53	0.62	2109.17	2351.0	0.40
DR124-102-R	1000	998	0.44	0.53	2898.00	3477.00	0.37

1. Open Circuit Inductance Test Parameters: 100 kHz, 0.25 V, 0.0 Adc.
2. I<sub>rms</sub><sup>2</sup>: DC current for an approximate ΔT of 40 °C without core loss. Derating is necessary for AC currents. PCB layout, trace thickness and width, air-flow, and proximity of other heat generating components will affect the temperature rise. It is recommended that the temperature of the part not exceed +125 °C under worst case operating conditions verified in the end application.
3. I<sub>sat</sub><sup>3</sup>: Amps peak for approximately 25% rolloff (@ +25 °C).

4. K-factor: Used to determine B<sub>pp</sub> for core loss (see graph).  
B<sub>pp</sub> = K\*L\*ΔI, B<sub>pp</sub> (mT), K: (K factor from table), L: (Inductance in μH), ΔI (Peak to peak ripple current in Amps).
5. Part Number Definition: DR124-xxx-R  
- DR124 = Product code and size; -xxx = Inductance value in uH;  
- R = decimal point; If no R is present, third character = # of zeros.  
- "-R" suffix = RoHS compliant

**DR124**  
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 core power inductors

**Dimensions- mm**



Dimensions are in millimeters.  
 Do not route traces or vias underneath the inductor.

wwllyy = Date code, R = Revision level.

**Packaging- mm**



Parts packaged on 13" Diameter reel, 750 parts per reel.

**Temperature rise vs. total loss**



**Core loss vs. Bp-p**



**Inductance characteristics**



**Solder reflow profile**



**Table 1 - Standard SnPb Solder (T<sub>C</sub>)**

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

**Table 2 - Lead (Pb) Free Solder (T<sub>C</sub>)**

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

**Reference JEDEC J-STD-020**

Profile Feature	Standard SnPb Solder	Lead (Pb) Free Solder
Preheat and Soak		
• Temperature min. (T <sub>smin</sub> )	100°C	150°C
• Temperature max. (T <sub>smax</sub> )	150°C	200°C
• Time (T <sub>smin</sub> to T <sub>smax</sub> ) (t <sub>s</sub> )	60-120 Seconds	60-120 Seconds
Average ramp up rate T <sub>smax</sub> to T <sub>p</sub>	3°C/ Second Max.	3°C/ Second Max.
Liquidous temperature (T <sub>L</sub> )	183°C	217°C
Time at liquidous (t <sub>L</sub> )	60-150 Seconds	60-150 Seconds
Peak package body temperature (T <sub>p</sub> )*	Table 1	Table 2
Time (t <sub>p</sub> )** within 5 °C of the specified classification temperature (T <sub>C</sub> )	20 Seconds**	30 Seconds**
Average ramp-down rate (T <sub>p</sub> to T <sub>smax</sub> )	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<sub>p</sub>) is defined as a supplier minimum and a user maximum.  
 \*\* Tolerance for time at peak profile temperature (t<sub>p</sub>) is defined as a supplier minimum and a user maximum.

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**Eaton**  
**Electronics Division**  
 1000 Eaton Boulevard  
 Cleveland, OH 44122  
 United States  
[www.eaton.com/electronics](http://www.eaton.com/electronics)

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#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.