

# DR1030

## Shielded power inductors



### Description

- Shielded drum core
- Inductance range from 1.1  $\mu$ H to 155  $\mu$ H
- Current range from 0.68 A to 9.5 A
- 10.5 mm x 10.3 mm footprint surface mount package in a 3.0 mm height
- Ferrite core material
- Halogen free, lead free, RoHS compliant

### Applications

- LED/LCD backlighting
- High definition televisions (HDTV)
- Server and desktop power supplies
- Portable electronics
- Notebook and laptop regulators
- Graphics cards and battery powered systems
- Point-of-load (POL) modules
- Printers and peripherals

### 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-020D compliant



Product Specifications

| Part Number <sup>5</sup> | OCL <sup>1</sup><br>( $\mu\text{H}$ ) $\pm 30\%$ | $I_{\text{rms}}^2$<br>(A) | $I_{\text{sat}}^3$<br>(A) | DCR (m $\Omega$ )<br>typical<br>@ 20°C | DCR (m $\Omega$ )<br>maximum<br>@ 20°C | K-factor <sup>4</sup> |
|--------------------------|--|---------------------------|---------------------------|--|--|-----------------------|
| DR1030-1R1-R             | 1.1  | 7.0                       | 9.5                       | 6.5                                    | 7.9                                    | 22                    |
| DR1030-1R8-R             | 1.9  | 5.9                       | 7.4                       | 9.1                                    | 11.0                                   | 17                    |
| DR1030-2R8-R             | 2.8  | 5.1                       | 6.08                      | 12.1                                   | 14.5                                   | 14                    |
| DR1030-3R9-R             | 4.0  | 4.3                       | 5.1                       | 16.4                                   | 20.0                                   | 12                    |
| DR1030-5R2-R             | 5.2  | 3.7                       | 4.75                      | 22.9                                   | 27.5                                   | 10                    |
| DR1030-6R8-R             | 6.8  | 3.5                       | 3.9                       | 24.9                                   | 30.0                                   | 9                     |
| DR1030-8R2-R             | 8.4  | 3.3                       | 3.54                      | 28.4                                   | 34.1                                   | 8                     |
| DR1030-100-R             | 10.4   | 2.8                       | 3.18                      | 40.2                                   | 48.0                                   | 7                     |
| DR1030-150-R             | 14.8   | 2.3                       | 2.66                      | 57.3                                   | 68.8                                   | 6                     |
| DR1030-220-R             | 22.8   | 1.8                       | 2.19                      | 95.5                                   | 115                                    | 5                     |
| DR1030-330-R             | 32.4   | 1.6                       | 1.81                      | 114                                    | 136                                    | 4                     |
| DR1030-470-R             | 47.9   | 1.3                       | 1.52                      | 167                                    | 200                                    | 3.4                   |
| DR1030-680-R             | 67   | 1.1                       | 1.24                      | 253                                    | 304                                    | 2.9                   |
| DR1030-820-R             | 82   | 1.0                       | 1.14                      | 332                                    | 382                                    | 2.6                   |
| DR1030-101-R             | 100  | 0.86                      | 1.05                      | 375                                    | 450                                    | 2.4                   |
| DR1030-121-R             | 119  | 0.80                      | 0.95                      | 523                                    | 602                                    | 1.9                   |
| DR1030-151-R             | 155  | 0.68                      | 0.86                      | 590                                    | 700                                    | 1.4                   |

1. Open Circuit Inductance (OCL) Test Parameters: 100 kHz, 0.1 Vrms, 0.0 Adc, +25 °C

2.  $I_{\text{rms}}$ : DC current for an approximate temperature rise 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.

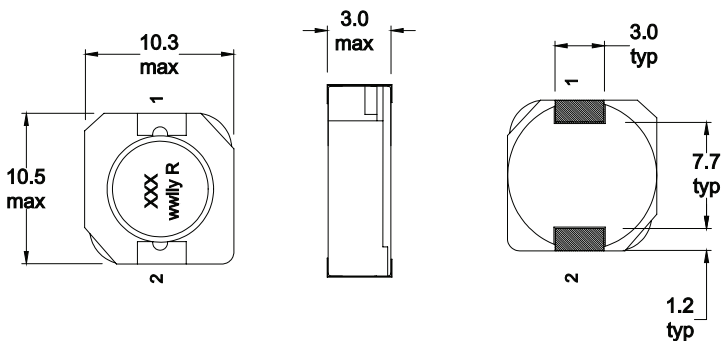
3.  $I_{\text{sat}}$ : Peak current for approximately 35% rolloff @ +25 °C

4. K-factor: K-factor: Used to determine Bp-p for core loss (see graph).  $Bp-p = K * L * \Delta I$ . Bp-p: (mT), K: (K-factor from table), L: (Inductance in  $\mu\text{H}$ ),  $\Delta I$  (Peak to peak ripple current in Amps).

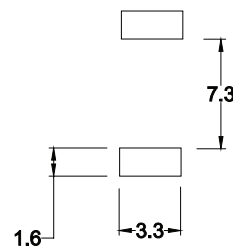
5. Part Number Definition: DR1030-xxx-R

DR1030 = Product code and size  
-xxx= inductance value in  $\mu\text{H}$ , R= decimal point,  
If no R is present then last character equals number of zeros  
-R suffix = RoHS compliant

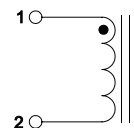
Dimensions (mm)



Recommended Pad Layout



Schematic



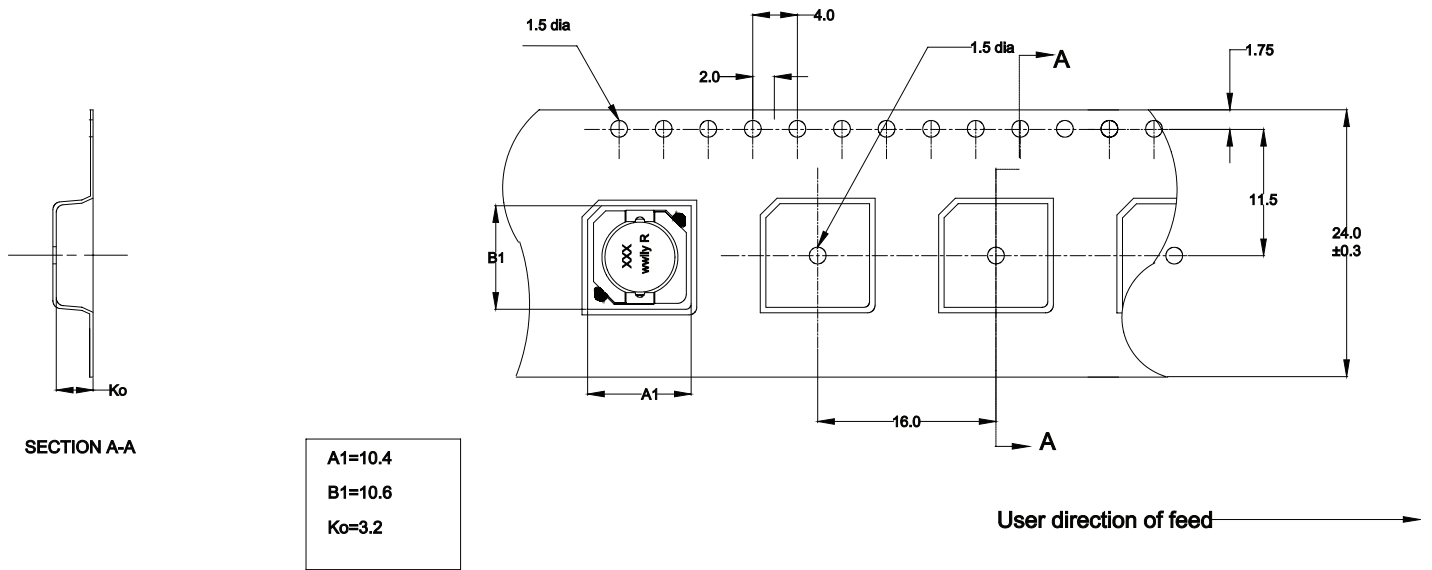
Part marking: inductance value in  $\mu\text{H}$ . R = decimal point. If no R is present then last character equals number of zeroes.

wwly = date code, R = revision level

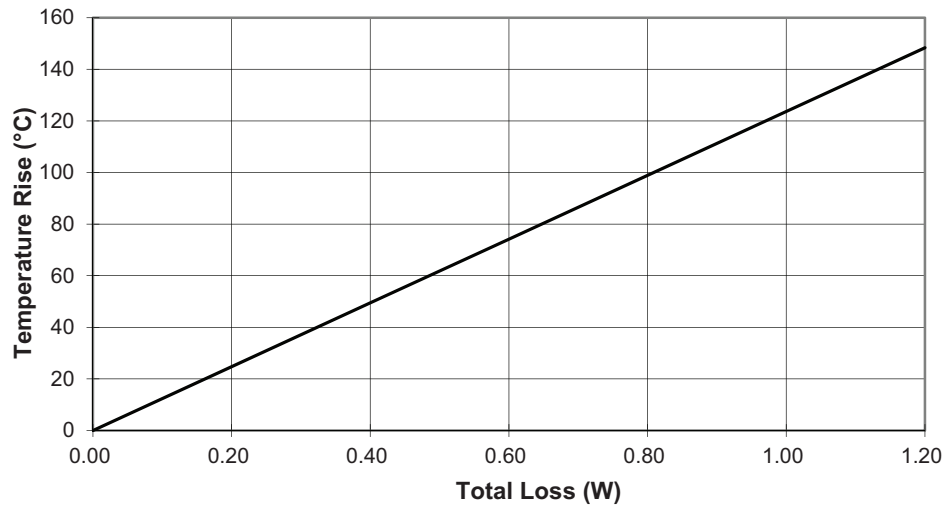
Do not route traces or vias underneath the inductor

**Packaging information (mm)**

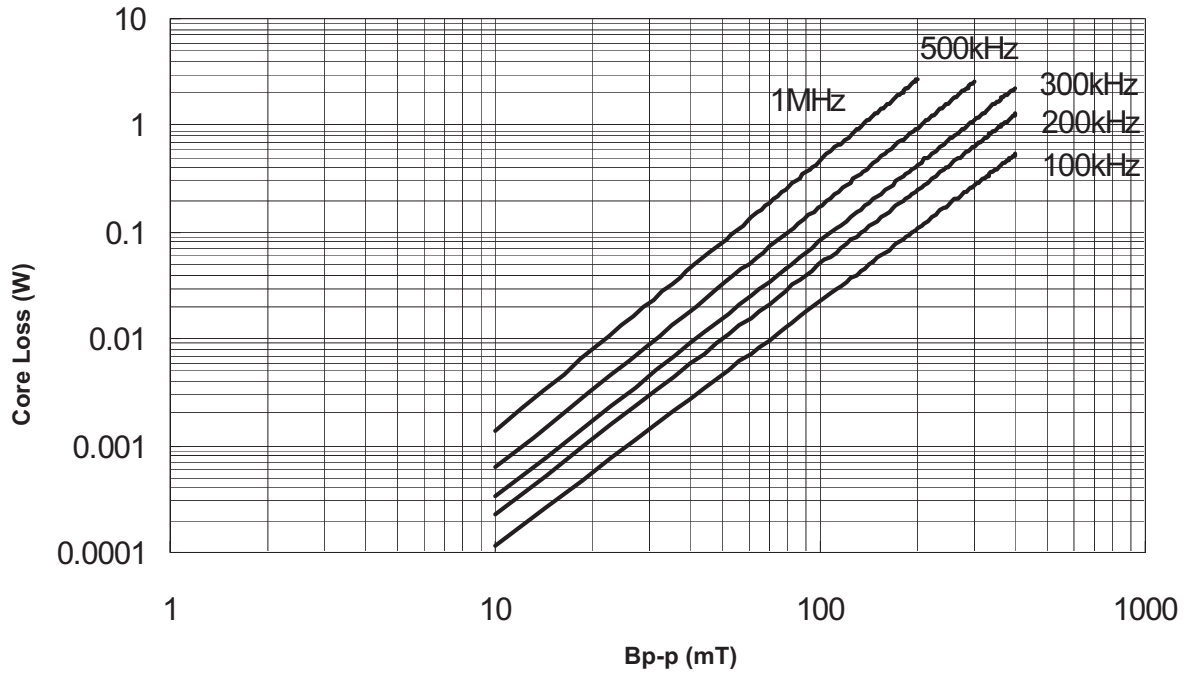
Supplied in tape and reel packaging , 1000 parts per 13" diameter reel



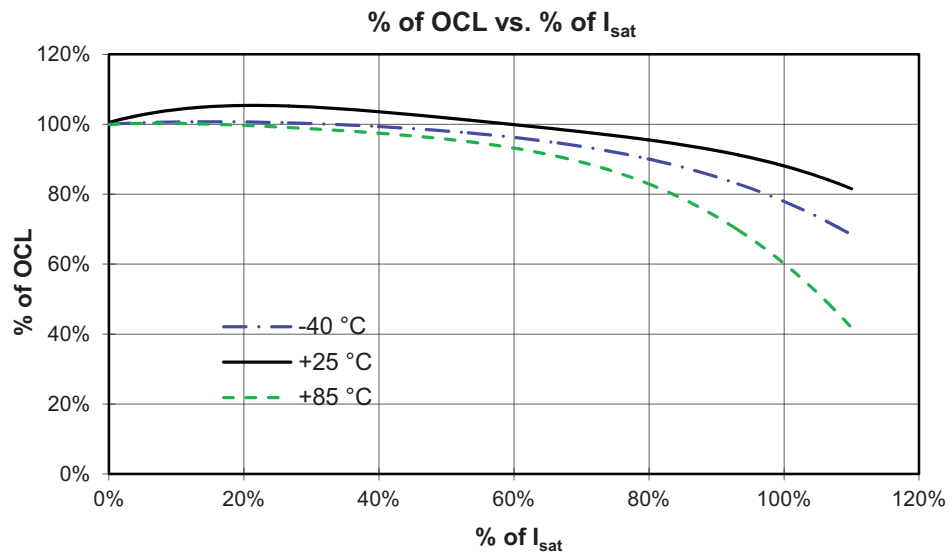
**Temperature rise vs. total loss**



Core loss vs.  $B_{p-p}$



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 JDEC J-STD-020D**

| 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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