

# Dual Winding, High Power, Shielded Drum Inductor

## DRAQ127 Series



### Description

- 165°C Maximum total temperature operation
- Automotive grade shielded drum core
- 12.5 x 12.5 x 8.0mm maximum surface mount package
- Ferrite core material
- Dual winding inductors that can be used as a single inductor, SEPIC, Flyback, or other coupled inductor/transformer applications (1:1 turns ratio)
- Windings can be connected in series or parallel, offering a wide range of inductance and current ratings
- 200Vac isolation between windings
- Mechanical secure mounting for high shock and vibration environments
- RoHS compliant

### Applications

- Automotive electronics (under the hood, interior and exterior)
- Telematics
- LED Modules
- DC-DC Converters
- Transformer, 1:1 Flyback, SEPIC
- Inductor, buck, boost, forward and resonant converters
- Noise filtering and filter chokes

### Environmental Data

- Storage temperature range: -40°C to +165°C
- Operating temperature range: -40°C to +165°C (ambient plus self-temperature rise)
- Solder reflow temperature: J-STD-020D compliant
- Complies with AEC-Q200 standard

### Packaging

- Supplied in tape and reel packaging, 350 parts per 13" reel

### Product Specifications

Part Number <sup>6</sup>	OCL <sup>1</sup> ±25% (μH)	I <sub>rms</sub> <sup>2</sup> (Amps)	I <sub>sat1</sub> <sup>3</sup> @25°C (Amps)	I <sub>sat2</sub> <sup>4</sup> @125°C (Amps)	DCR (Ω) @20°C (Typical)	DCR (Ω) @20°C (Maximum)	K-Factor <sup>5</sup>
<b>Parallel Ratings</b>							
DRAQ127-100-R	9.63	6.02	11.2	8.96	0.018	0.022	24.0
DRAQ127-220-R	22.0	3.98	7.57	6.05	0.040	0.047	16.2
<b>Series Ratings</b>							
DRAQ127-100-R	38.52	3.01	5.60	4.48	0.072	0.089	12.0
DRAQ127-220-R	88.00	1.99	3.79	3.03	0.162	0.192	8.1

1. Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.25V<sub>rms</sub>, 0.0A<sub>dc</sub>

2. I<sub>rms</sub>: 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 165°C under worst case operating conditions verified in the end application.

3. I<sub>sat1</sub>: Peak current for approximately 30% rolloff at +25°C.

4. I<sub>sat2</sub>: Peak current for approximately 40% rolloff at +125°C.

5. K-factor: Used to determine B<sub>p-p</sub> for core loss (see graph). B<sub>p-p</sub> = K \* L \* ΔI. B<sub>p-p</sub>:(Gauss), K: (K-factor from table), L: (Inductance in μH), ΔI (Peak-to-peak ripple current in Amps).

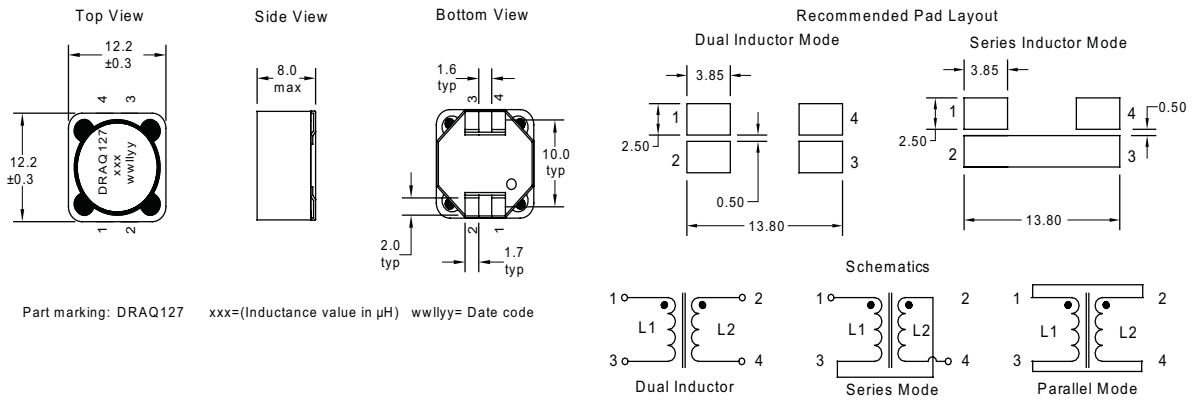
6. Part Number Definition: DRAQxxx-xxx-R

- DRAQxxx = Product code and size

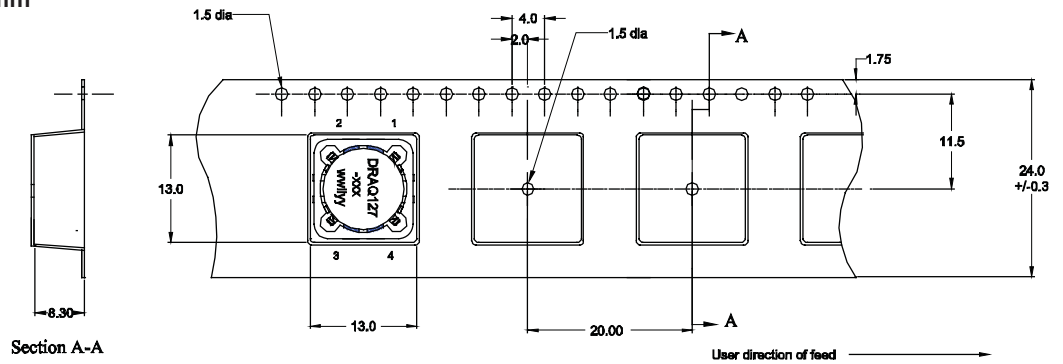
- xxx= Inductance value in μH, R = decimal point, If no R is present then 3rd digit equals number of zeros.

- "-R" suffix = RoHS compliant

## Dimensions - mm

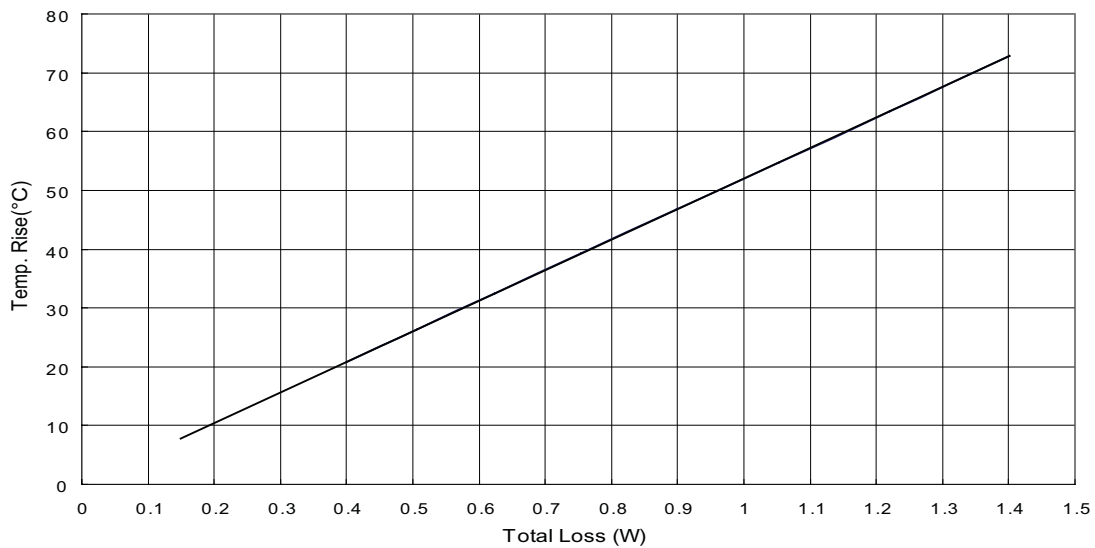


## Packaging Information - mm

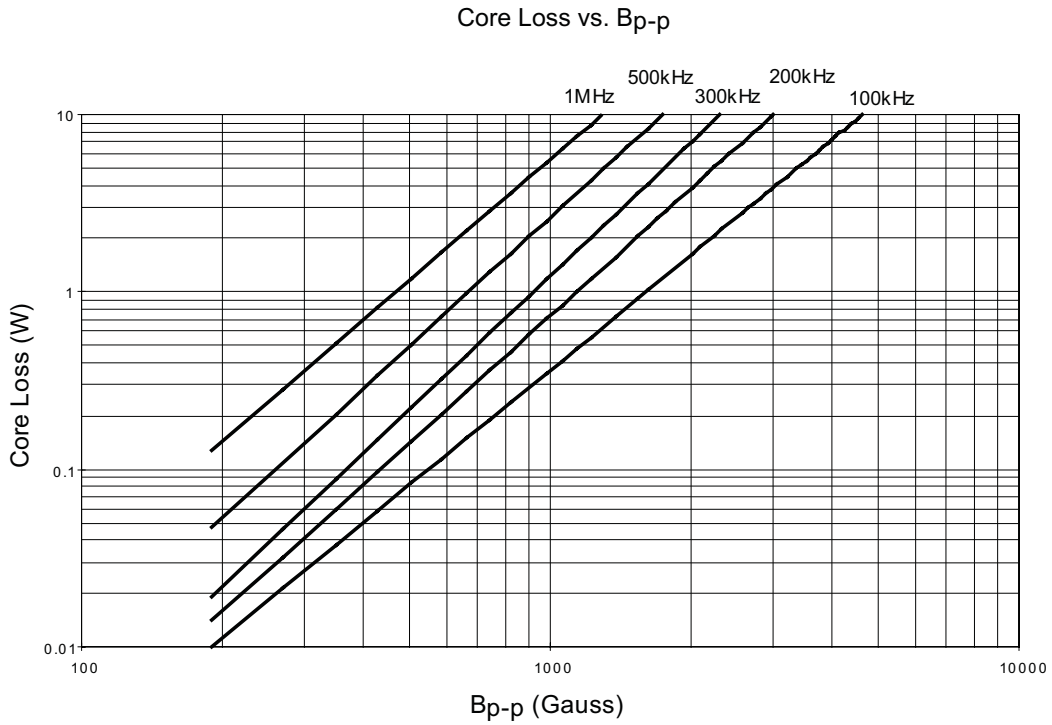


Supplied in tape and reel packaging, 350 parts per 13" diameter reel.

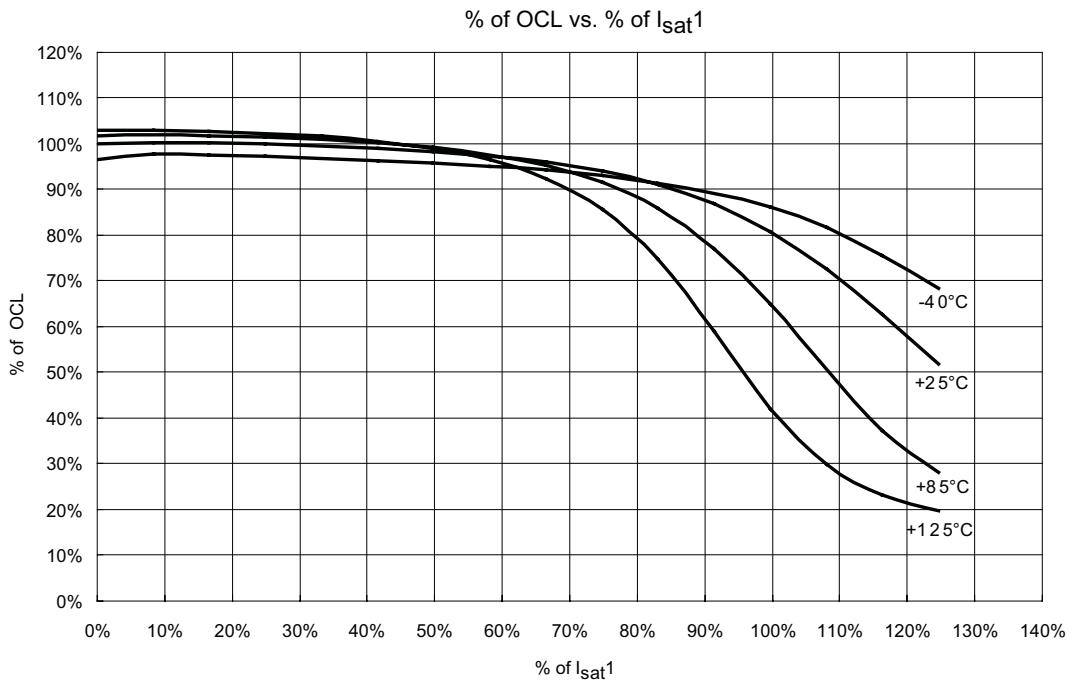
## Temperature Rise vs. Total Loss



Core Loss



Inductance Characteristics



## Solder Reflow Profile

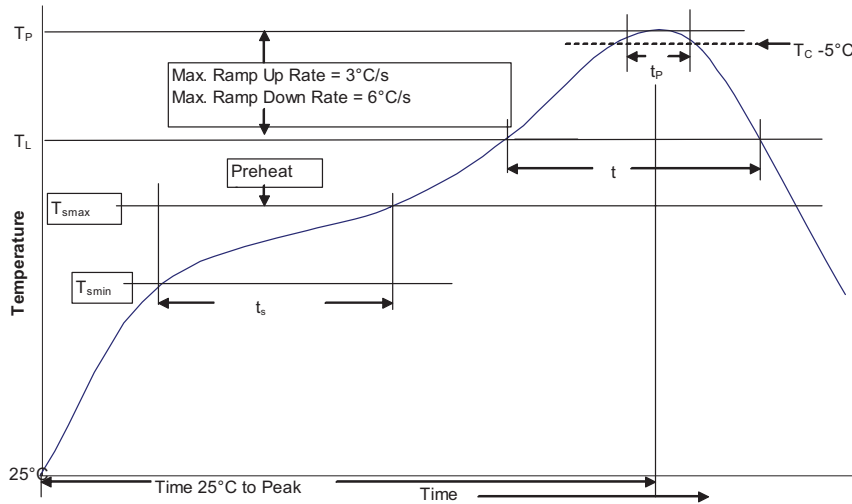


Table 1 - Standard SnPb Solder ( $T_C$ )

Package Thickness	Volume $\text{mm}^3$ <350	Volume $\text{mm}^3$ $\geq 350$
<2.5mm	235°C	220°C
$\geq 2.5\text{mm}$	220°C	220°C

Table 2 - Lead (Pb) Free Solder ( $T_C$ )

Package Thickness	Volume $\text{mm}^3$ <350	Volume $\text{mm}^3$ 350 - 2000	Volume $\text{mm}^3$ >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. ( $T_{smin}$ )	100°C	150°C
• Temperature max. ( $T_{smax}$ )	150°C	200°C
• Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )	60-120 Seconds	60-120 Seconds
Average ramp up rate $T_{smax}$ to $T_P$	3°C/ Second Max.	3°C/ Second Max.
Liquidous temperature ( $T_L$ )	183°C	217°C
Time at liquidous ( $t_L$ )	60-150 Seconds	60-150 Seconds
Peak package body temperature ( $T_P$ )*	Table 1	Table 2
Time ( $t_p$ )** within 5 °C of the specified classification temperature ( $T_C$ )	20 Seconds**	30 Seconds**
Average ramp-down rate ( $T_P$ to $T_{smax}$ )	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 ( $T_P$ ) is defined as a supplier minimum and a user maximum.

\*\* Tolerance for time at peak profile temperature ( $t_p$ ) is defined as a supplier minimum and a user maximum.