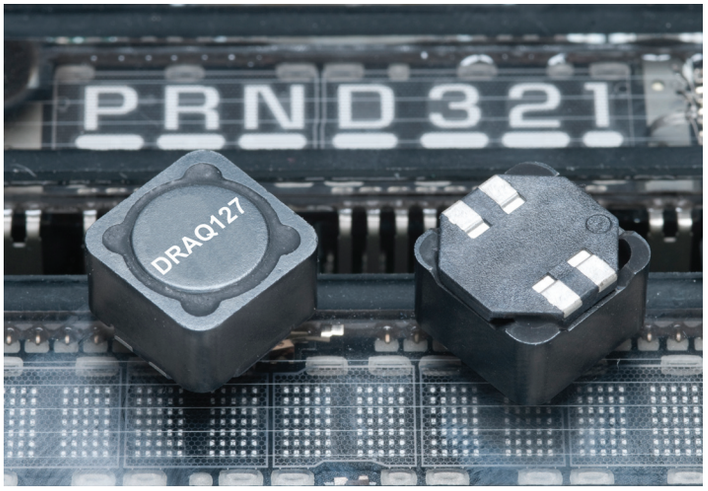
Technical Data 4372

Effective September 2014
Supersedes May 2014

Coiltronics DRAQ127 Series

Automotive grade
dual winding, high power, shielded drum inductors



Product description

- AEC-Q200 Grade 1 qualified
- 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
- Ferrite core material
- 12.5 x 12.5 x 8.0mm maximum surface mount package
- Halogen free, lead free, RoHS compliant

Applications

- Body electronics
  - Headlamps, tail lamps and interior lighting
  - Heating Ventilation and Air Conditioning controllers (HVAC)
  - Doors, window lift and seat control
- Advanced driver assistance systems
  - Adaptive cruise control (ACC)
  - Collision avoidance system
  - Car black box system
- Infotainment and cluster electronics
  - Audio subsystem: head unit and trunk amp
  - Digital instrument cluster
  - In-Vehicle Infotainment (IVI) and navigation
- Chassis and safety electronics
  - Electronic Stability Control system (ESC)
  - Electric parking brake
  - Electronic Power Steering (EPS)
- Engine and powertrain systems
  - Diesel/gasoline engine management
  - Powertrain Control Module (PCM)/Engine Control Unit (ECU)
  - Transmission Control Unit (TCU)

Environmental data

- Storage temperature range (Component): -40°C to +165 °C
- Operating temperature range: -40°C to +165°C (ambient + self-temperature rise)
- Solder reflow temperature: J-STD-020D compliant

Pb HALOGEN HF FREE RoHS

Coiltronics

The Coiltronics brand of magnetics (formerly of the Bussmann Division of Cooper Industries) is now part of Eaton's Electrical Group, Electronics Division.

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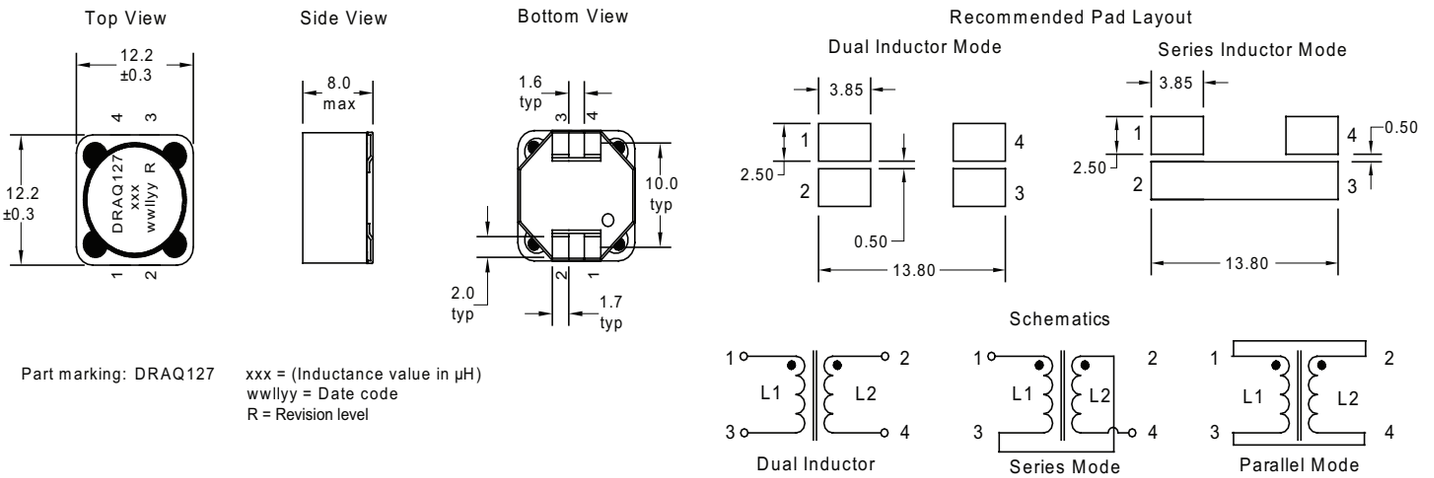
Product specifications

Part Number[6]	Parallel Ratings							Series Ratings						
	OCL[1] ±25% (µH)	I_{rms}[2] (Amps)	$I_{sat}1$[3] @ 25°C (Amps)	$I_{sat}2$[4] @ 125°C (Amps)	DCR (Ω) @ 20°C (Typ.)	DCR (Ω) @ 20°C (Max.)	K-Factor[5]	OCL[1] ±25% (µH)	I_{rms}[2] (Amps)	$I_{sat}1$[3] @ 25°C (Amps)	$I_{sat}2$[4] @ 125°C (Amps)	DCR (Ω) @ 20°C (Typ.)	DCR (Ω) @ 20°C (Max.)	K-Factor[5]
DRAQ127-100-R	9.63	6.02	11.2	8.96	0.018	0.022	24.0	38.5	3.01	5.60	4.48	0.072	0.089	12.0
DRAQ127-150-R	14.9	4.83	9.03	7.23	0.027	0.032	19.4	59.6	2.41	4.52	3.61	0.108	0.128	9.70
DRAQ127-220-R	22.0	3.98	7.57	6.05	0.040	0.047	16.2	88.0	1.99	3.79	3.03	0.162	0.192	8.10
DRAQ127-330-R	32.0	3.22	6.22	4.98	0.060	0.072	13.3	128.0	1.61	3.11	2.49	0.240	0.288	6.65
DRAQ127-470-R	47.9	2.62	5.09	4.07	0.091	0.110	10.9	192.0	1.31	2.54	2.03	0.364	0.440	5.45

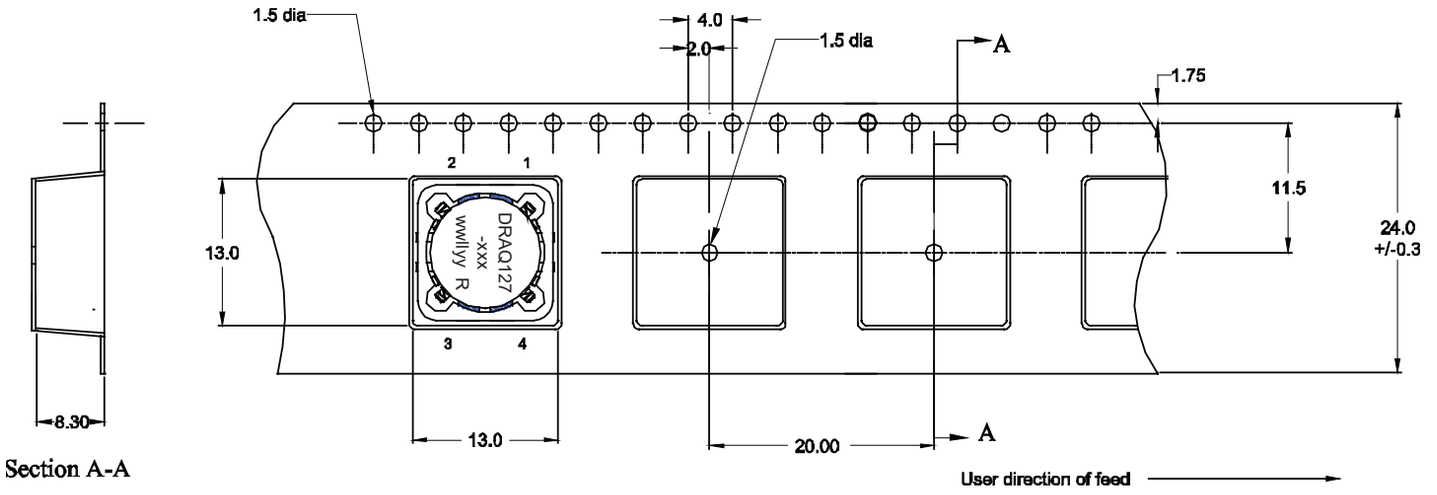
1. Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.25V_{rms}, 0.0Adc
2. I_{rms}: DC current for an approximate temperature rise of 40°C without core loss. Derating is necessary for AC currents. PCB layout, trace thickness and width, air-flow and proximity of other heat generating components will affect the temperature rise. It is recommended that the temperature of the part not exceed 165°C under worst case operating conditions verified in the end application.
3. $I_{sat}1$: Peak current for approximately 30% rolloff at +25°C.
4. $I_{sat}2$: Peak current for approximately 40% rolloff at +125°C.
5. K-factor: Used to determine B_{p-p} for core loss (see graph). $B_{p-p} = K * L * \Delta I$. B_{p-p}:(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 uH, R = decimal point, If no R is present then 3rd digit equals number of zeros.
   - "-R" suffix = RoHS compliant

Dimensions - mm



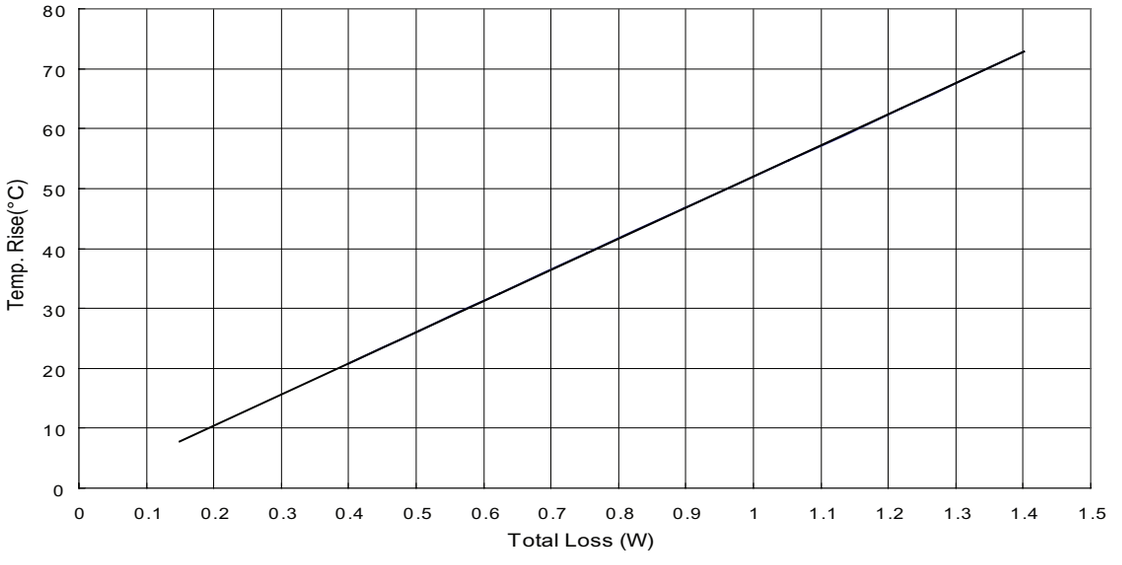
Part marking: DRAQ127 xxx = (Inductance value in µH)
wwllyy = Date code
R = Revision level

Packaging information - mm

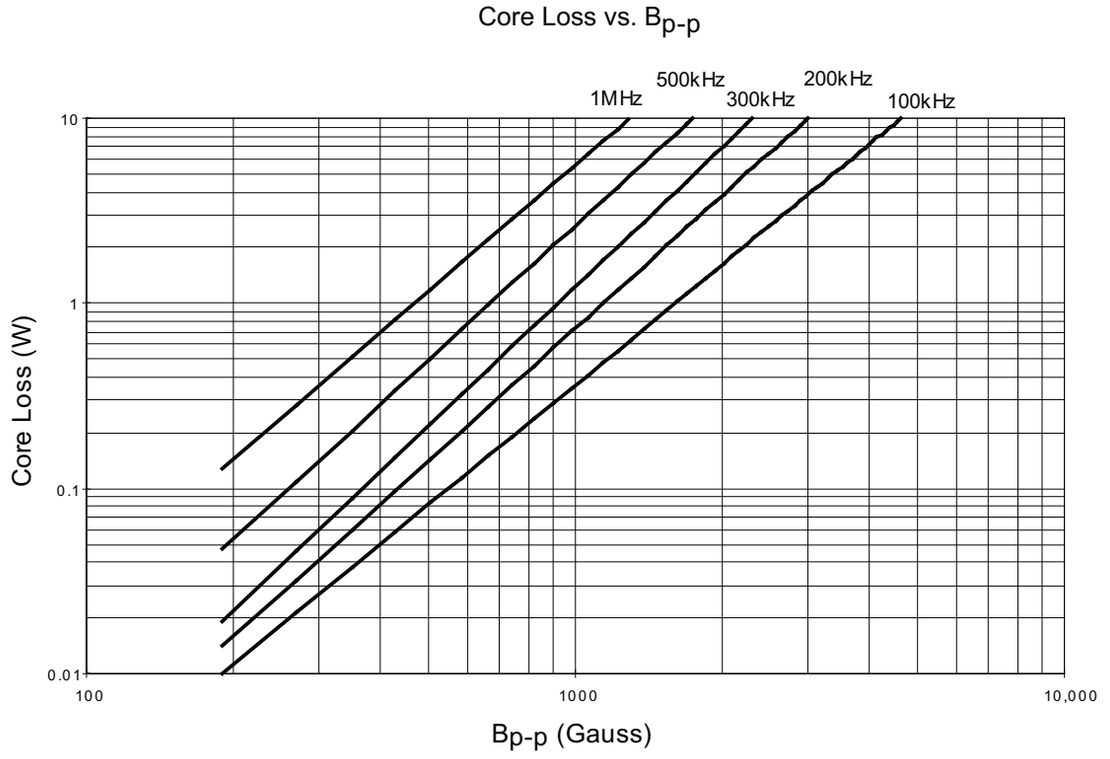


Supplied in tape and reel packaging, 350 parts per 13" diameter reel.

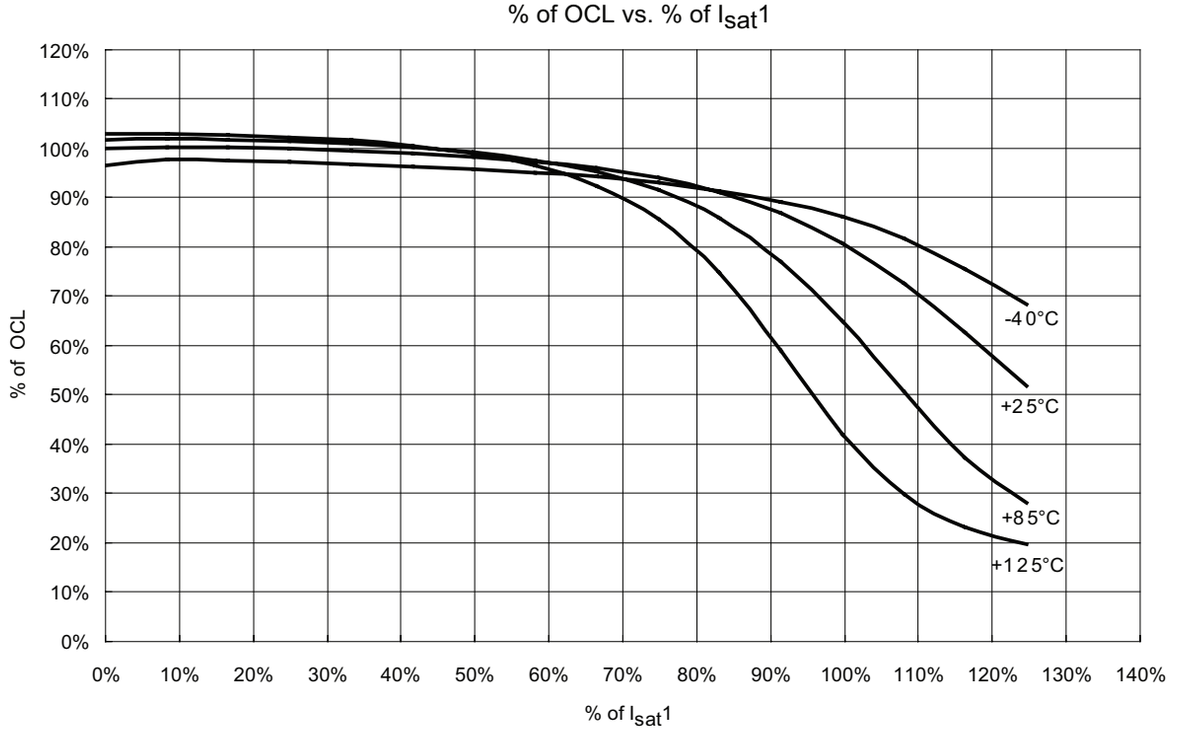
Temperature rise vs. total loss



Core loss



Inductance characteristics



Solder reflow profile

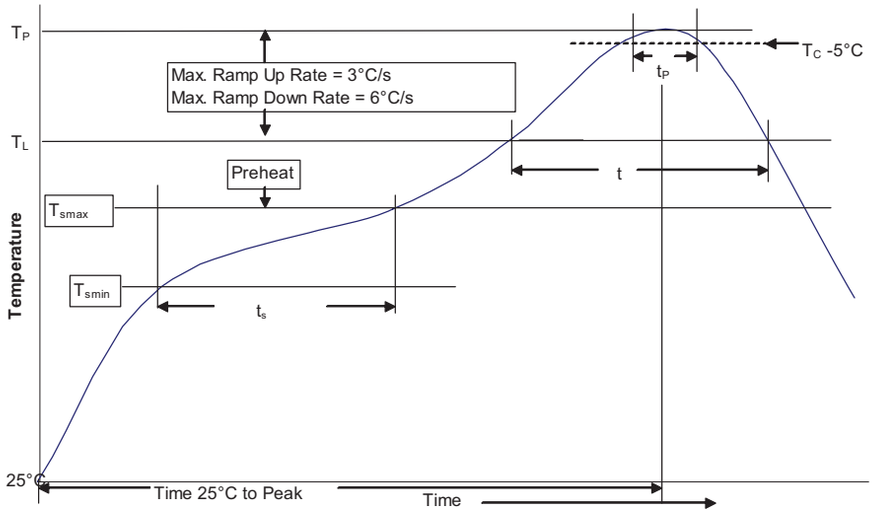


Table 1 - Standard SnPb Solder (T_C)

Package Thickness	Volume mm³ <350	Volume mm³ ≥350
<2.5mm	235°C	220°C
≥2.5mm	220°C	220°C

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

Package Thickness	Volume mm³ <350	Volume mm³ 350 - 2000	Volume mm³ >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) Time at liquidous (t_L)		183°C 60-150 Seconds	217°C 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.

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