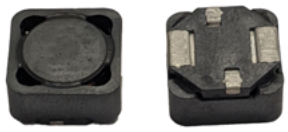
DRAP125

Automotive grade high power density, shielded drum core power inductors



Product features

- AEC-Q200 qualified
- Secure four terminal mounting ideal for severe vibration environments up to 30 g.
- Rugged construction for high shock conditions
- Magnetically shielded-reduces EMI
- Inductance range from 0.45 µH to 992.8 µH
- Current range from 0.55 A to 33.2 A
- 12.5 mm x 12.5 mm x 6.1 mm surface mount package
- Ferrite core material
- Weight: 3.22 grams typical
- Moisture Sensitivity Level: 1

Applications

- Body electronics
  - LED lighting (interior and exterior)
  - Central body control module
  - Vehicle access control module
  - 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)
  - Automatic parking control
  - 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) / Anti-locking braking system (ABS)
- Engine and powertrain systems
  - Electric pumps, motor control and auxiliaries
  - Powertrain control module (PCU)/ Engine control unit (ECU)
  - Transmission control unit (TCU)

Environmental compliance and general specifications

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

Pb HALOGEN HF FREE RoHS

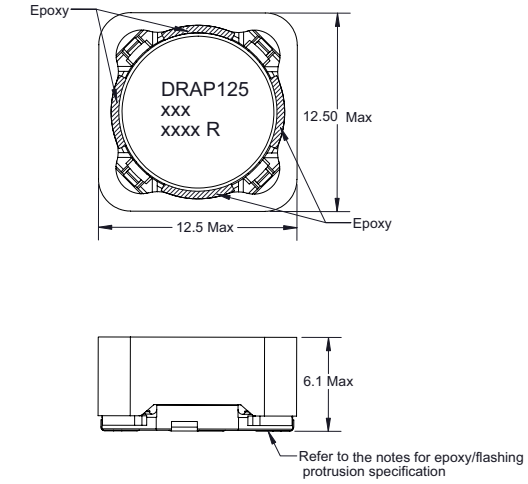
Powering Business Worldwide

Product specifications

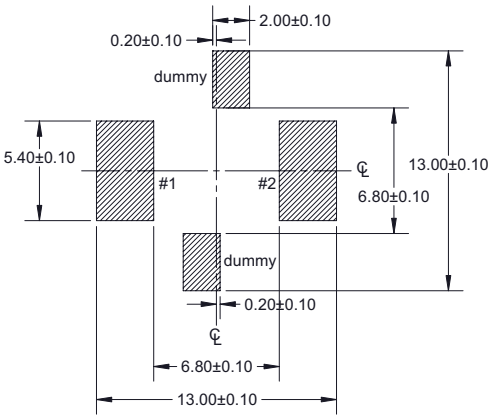
Part number[6]	OCL[1] (µH) ±20%	I_{rms}[2] (A)	$I_{sat}1$[3] (A)	$I_{sat}2$[4] (A)	DCR (Ω) typical @ +25 °C	DCR (Ω) maximum @ +25 °C	K Factor[5]
DRAP125-R47-R	0.45	14.66	33.2	26.6	0.0025	0.0030	176.9
DRAP125-1R0-R	0.85	12.65	23.7	19.0	0.0034	0.0042	126.4
DRAP125-1R5-R	1.41	12.89	18.4	14.8	0.0033	0.0039	98.3
DRAP125-2R2-R	2.12	10.61	15.1	12.1	0.0048	0.0058	80.4
DRAP125-3R3-R	2.89	8.63	12.8	10.2	0.0073	0.0087	68.0
DRAP125-4R7-R	4.90	7.67	9.76	7.81	0.0092	0.011	52.0
DRAP125-6R8-R	6.23	6.81	8.74	6.99	0.012	0.014	46.6
DRAP125-8R2-R	7.49	6.41	7.90	6.32	0.013	0.016	42.1
DRAP125-100-R	9.22	5.57	7.22	5.77	0.017	0.021	38.5
DRAP125-150-R	14.67	4.45	5.72	4.58	0.027	0.033	30.5
DRAP125-220-R	20.65	3.95	4.74	3.79	0.035	0.042	25.3
DRAP125-330-R	31.47	3.19	3.86	3.09	0.053	0.064	20.6
DRAP125-470-R	47.83	2.59	3.13	2.51	0.081	0.097	16.7
DRAP125-680-R	68.48	2.13	2.64	2.11	0.120	0.144	14.0
DRAP125-820-R	80.86	2.01	2.41	1.93	0.135	0.162	12.8
DRAP125-101-R	97.60	1.75	2.21	1.77	0.178	0.214	11.8
DRAP125-151-R	150.0	1.41	1.79	1.43	0.273	0.330	9.5
DRAP125-221-R	222.8	1.14	1.47	1.18	0.416	0.500	7.8
DRAP125-331-R	325.1	0.998	1.19	0.96	0.543	0.650	6.4
DRAP125-471-R	466.3	0.826	1.01	0.805	0.790	0.950	5.4
DRAP125-681-R	683.3	0.673	0.834	0.667	1.200	1.44	4.4
DRAP125-821-R	813.6	0.632	0.758	0.606	1.360	1.63	4.0
DRAP125-102-R	992.8	0.552	0.695	0.556	1.780	2.13	3.7

1. Open circuit inductance (OCL) test parameters: 100 kHz, 0.25 Vrms, 0.0 Adc, +25 °C
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 @ +25 °C
4. $I_{sat}2$: Peak current for approximately 40% rolloff @ +125 °C
5. K-factor: Used to determine Bp-p for core loss (see graph). Bp-p = K * L * ΔI. Bp-p:(Gauss), K: (K-factor from table), L: (Inductance in µH), ΔI (Peak-to-peak ripple current in Amps).
6. Part Number Definition: DRAP125-xxx-R
   DRAP125= Product code and size
   xxx= Inductance value in µH, R= decimal point, If no R is present last character equals number of zeros
   -R suffix = RoHS compliant

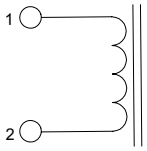
Dimensions (mm)

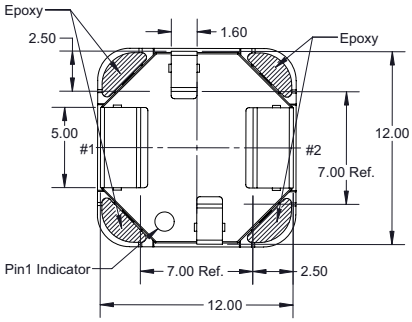


Recommended pad layout



Schematic

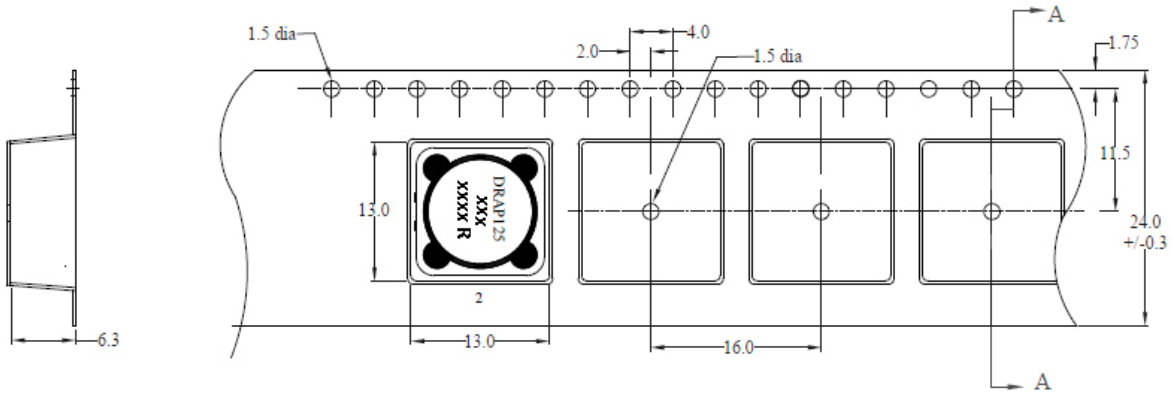




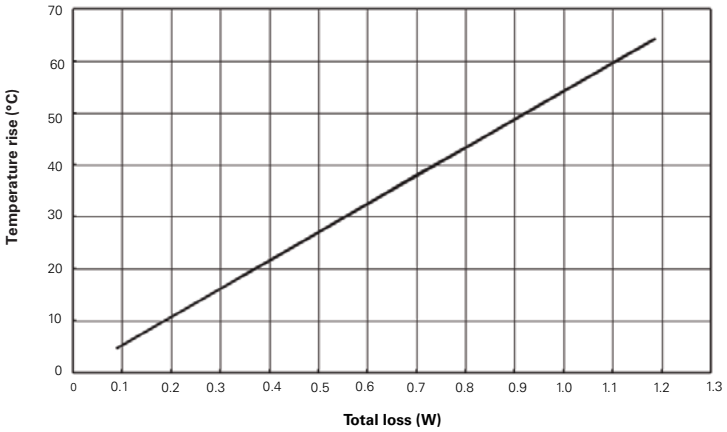
Part marking: DRAP125, xxx= inductance value in uH, R= decimal point,
if no R is present last character equals number of zeros
xxxx=lot code, R= Revision level
All soldering surface to be coplanar within 0.1 millimeters
Tolerances are ±0.2 millimeters unless stated otherwise
Special Characteristic epoxy protrusion or any flashing from the plastic on the header/base can be below the terminal surface and must not exceed 0.08 mm beyond the bottom surface of the terminal.
Terminal pads shall protrude the plastic base 0.00~0.08 mm
Traces or vias underneath the inductor is not recommended

Packaging information (mm)

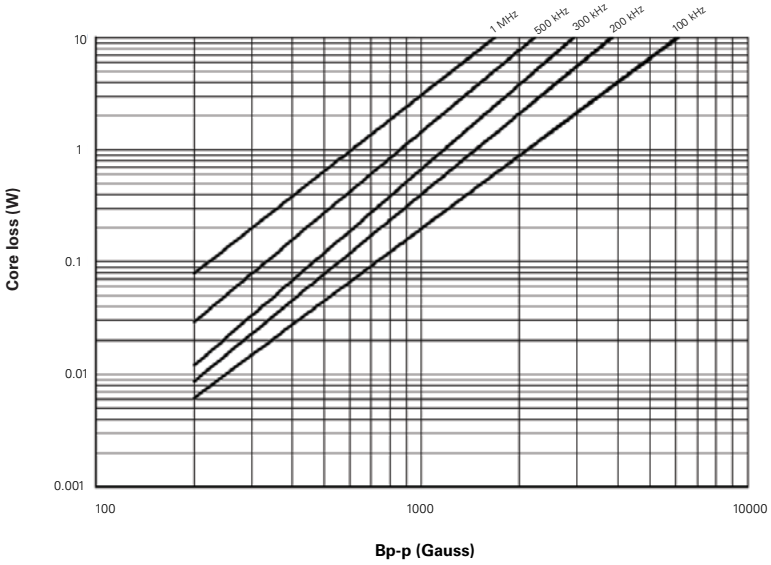
Supplied in tape and reel packaging , 600 parts per 13" diameter reel



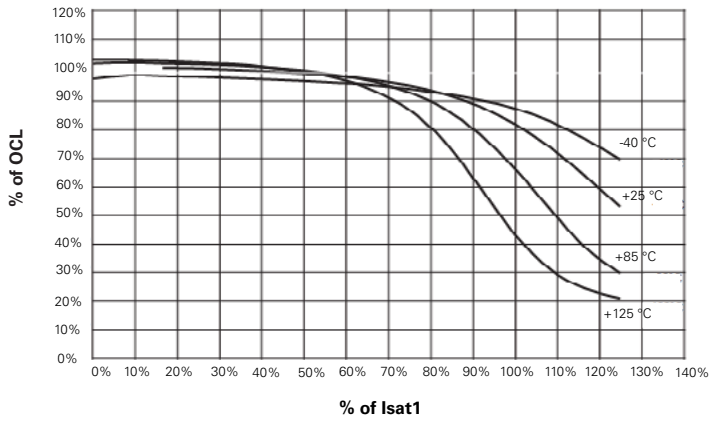
Temperature rise vs. total loss



Core loss vs. Bp-p



Inductance characteristics



Solder reflow profile

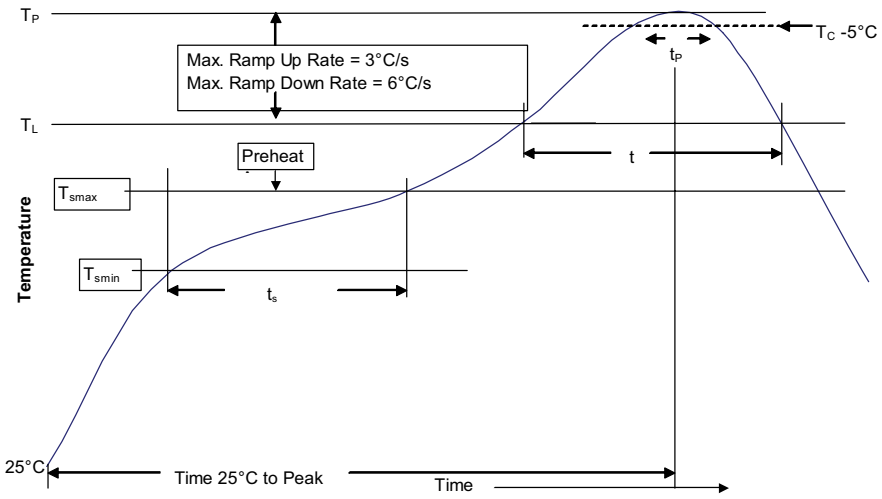


Table 1 - Standard SnPb solder (T_C)

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

Table 2 - Lead (Pb) free solder (T_C)

Package thickness	Volume mm³ <350	Volume mm³ 350 - 2000	Volume mm³ >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 – 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Reference J-STD-020

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
Ramp up rate T_L to T_p		3 °C/ second max.	3 °C/ second max.
Liquidous temperature (T_L) Time (t_L) maintained above T_L		183 °C 60-150 seconds	217 °C 60-150 seconds
Peak package body temperature (Tp)*		Table 1	Table 2
Time (t_p)* within 5 °C of the specified classification temperature (T_C)		20 seconds*	30 seconds*
Ramp-down rate (T_p to T_L)		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.

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