

DRAQ75

Automotive grade dual winding, high power density, shielded drum core power inductors



Product features

- AEC-Q200 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
- 500 Vdc isolation between windings
- 7.6 mm x 7.6 mm x 4.5 mm surface mount package
- Ferrite core material
- Moisture Sensitivity Level: 1

Applications

- Body electronics
 - LED lighting
 - 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
 - 77 GHz radar system
 - Adaptive cruise control (ACC)
 - Automatic parking control
 - Collision avoidance system/ Car black box system
- Infotainment and cluster electronics
 - Active noise cancellation (ANC)
 - Audio subsystem: head unit and trunk amp
 - Digital instrument cluster
 - In-vehicle infotainment (IVI) and navigation
- Engine and powertrain systems
 - Electric pumps, motor control and auxiliaries
 - Powertrain control module (PCU)/ 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 plus self-temperature rise)
- Solder reflow temperature: J-STD-020 (latest revision) compliant

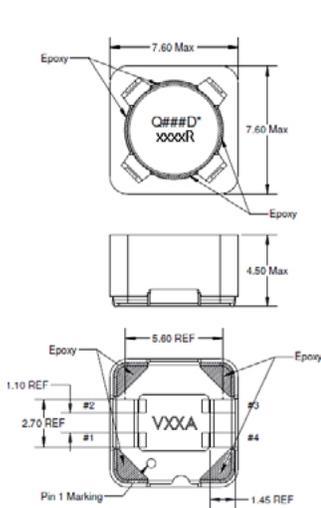


Product specifications

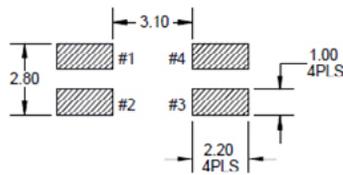
Part Number ⁸	Parallel ratings				Series ratings				DCR (Ω) maximum ⁷ @ +25 °C	K Factor ⁶		
	OCL ¹ (μH) ±25%	I _{rms} ² (A)	I _{sat} ^{1,3} (A)	I _{sat} ^{2,4} (A)	OCL ¹ (μH) ±25%	I _{rms} ² (A)	I _{sat} ^{1,3} (A)	I _{sat} ^{2,4} (A)				
DRAQ75-4R5-R	4.48	4.53	4.38	3.50	0.031	125.3	17.93	2.26	2.19	1.75	0.122	62.7
DRAQ75-6R4-R	6.41	4.14	3.68	2.94	0.037	105.3	24.95	2.07	1.84	1.47	0.146	52.6
DRAQ75-8R5-R	8.47	3.57	3.17	2.54	0.049	90.7	33.86	1.79	1.59	1.27	0.196	45.4
DRAQ75-100-R	9.59	3.47	2.97	2.38	0.052	84.9	38.34	1.73	1.48	1.18	0.208	42.4
DRAQ75-150-R	15.14	2.80	2.36	1.89	0.080	67.5	60.56	1.40	1.18	0.95	0.320	33.8
DRAQ75-170-R	18.7	2.48	2.14	1.71	0.102	61.2	68.55	1.24	1.12	0.86	0.408	30.6
DRAQ75-220-R	22.1	2.33	1.96	1.57	0.116	56.0	88.52	1.16	0.98	0.78	0.462	28.0
DRAQ75-270-R	28.3	2.02	1.74	1.39	0.153	49.7	106.60	1.01	0.87	0.70	0.610	24.8
DRAQ75-330-R	32.8	1.88	1.61	1.29	0.177	46.2	131.39	0.94	0.81	0.65	0.708	23.1
DRAQ75-570-R	56.6	1.49	1.23	0.98	0.283	35.1	226.31	0.74	0.61	0.49	1.13	17.5
DRAQ75-680-R	68.3	1.39	1.11	0.89	0.324	31.7	273.21	0.69	0.55	0.44	1.30	15.9
DRAQ75-810-R	80.9	1.20	1.01	0.81	0.431	28.9	323.78	0.60	0.51	0.41	1.72	14.5
DRAQ75-101-R	98.3	1.14	0.91	0.72	0.478	25.5	393.23	0.57	0.46	0.37	1.91	12.8
DRAQ75-221-R	217	0.76	0.63	0.50	1.09	17.4	866.26	0.38	0.31	0.25	4.36	8.7

- Open circuit inductance (OCL) test parameters: 100 kHz, 0.25 Vrms, 0.0 Adc, +25 °C
 - I_{rms}²: 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.
 - I_{sat}¹: Peak current for approximately 30% rolloff @ +25 °C
 - I_{sat}²: Peak current for approximately 40% rolloff @ +125 °C
 - Parallel DCR test pins (1,2 - 3,4)
 - 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).
 - Series DCR test pins (1 - 4) short pins (2 - 3)
 - Part Number Definition: DRAQ75-xxx-R
DRAQ75= 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
- Single winding ratings: OCL= Parallel OCL rating, DCR= Series DCR divided by 2, Isat and Irms= Series Isat and Irms rating

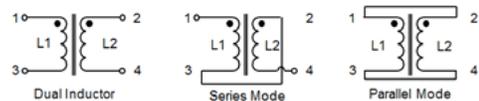
Dimensions (mm)



Recommended pad layout



Schematic



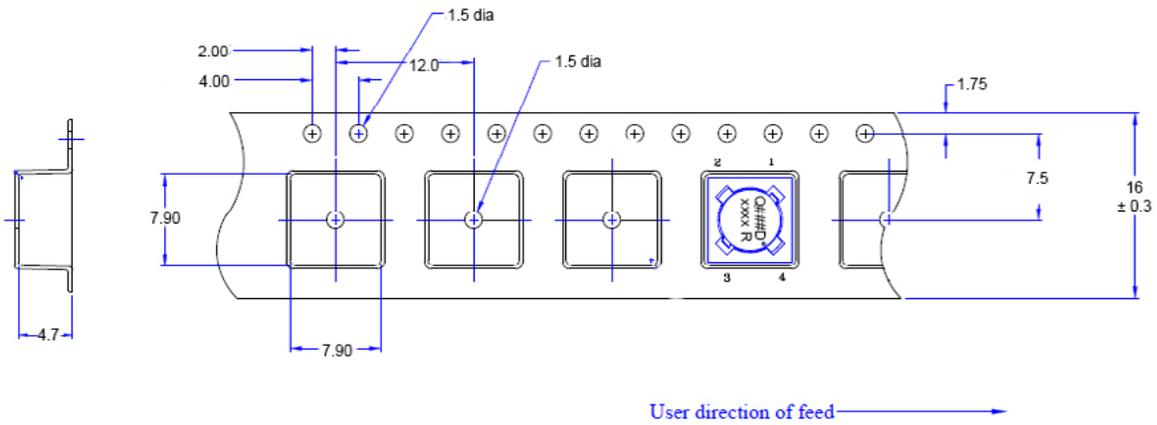
Part marking: Q###D*, ###= inductance value in uH, R= decimal point, if no R is present last character equals number of zeros, D= shift number, *= production line number
xxxx=lot code, R= revision level
All soldering surface to be coplanar within 0.1 millimeters
Tolerances are ±0.2 millimeters unless stated otherwise
The characters on the bottom of the part are part of the header mold and shown for reference only
Pad layout tolerances are ±0.2 millimeters unless stated otherwise
Do not route traces or vias underneath the inductor

DRAQ75
 Automotive grade dual winding, high power density,
 shielded drum core power inductors

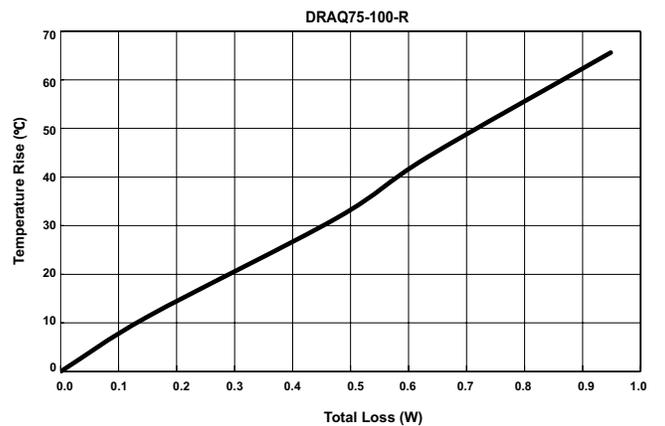
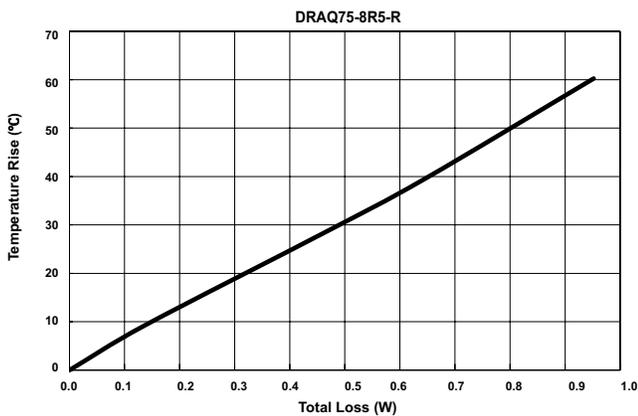
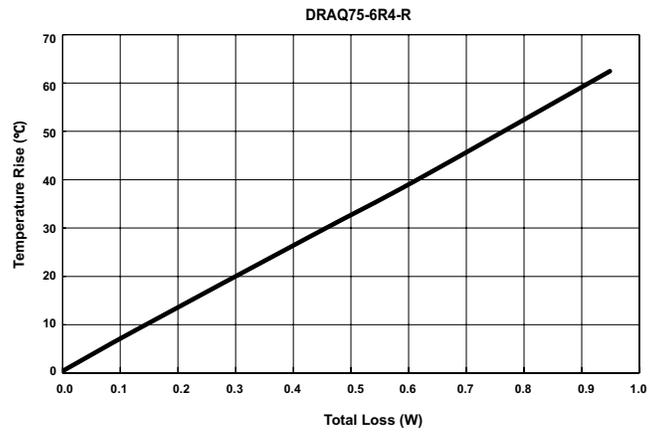
Technical Data 11017
 Effective November 2019

Packaging information (mm)

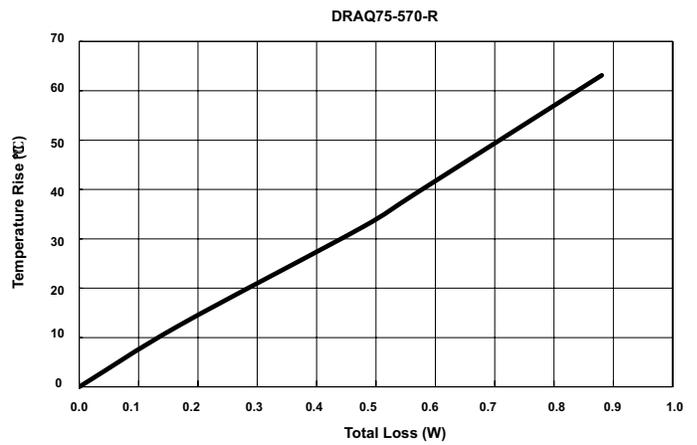
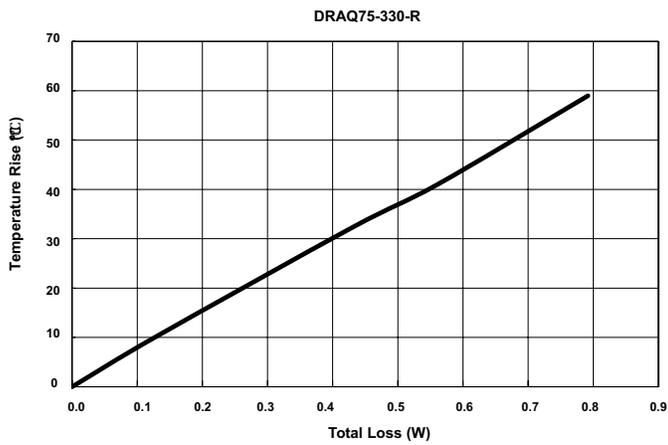
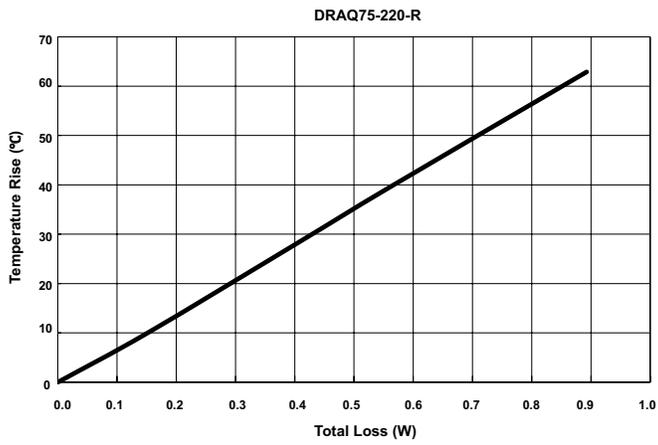
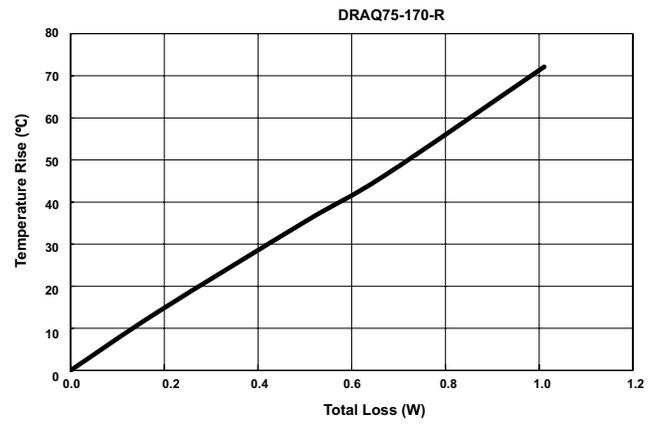
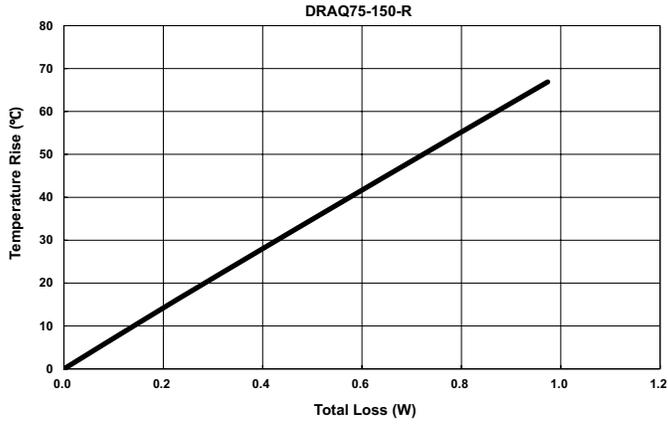
Supplied in tape and reel packaging , 1,100 parts per 13" diameter reel



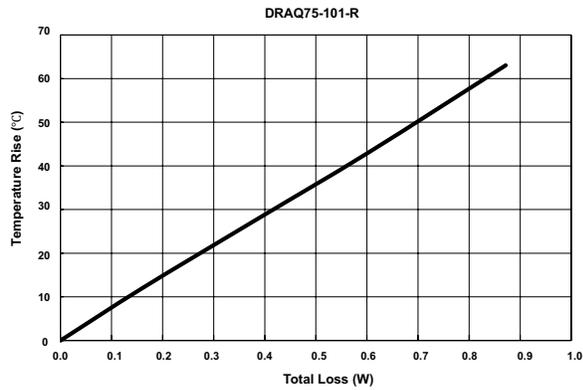
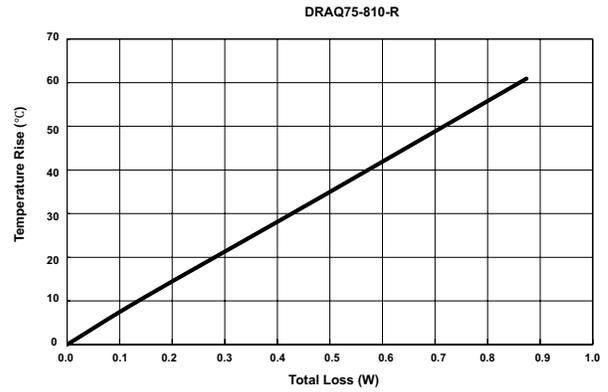
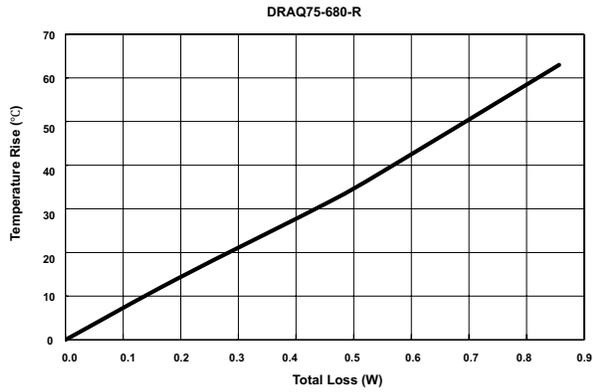
Temperature rise vs. total loss



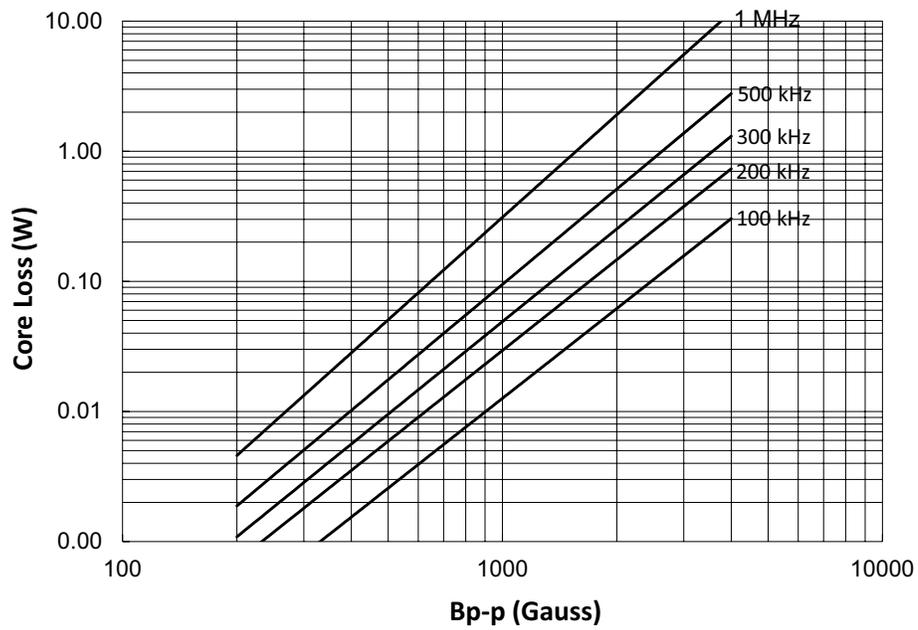
Temperature rise vs. total loss



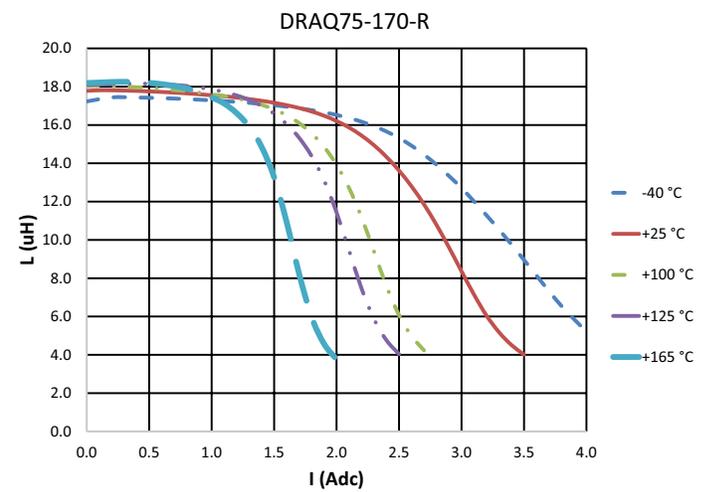
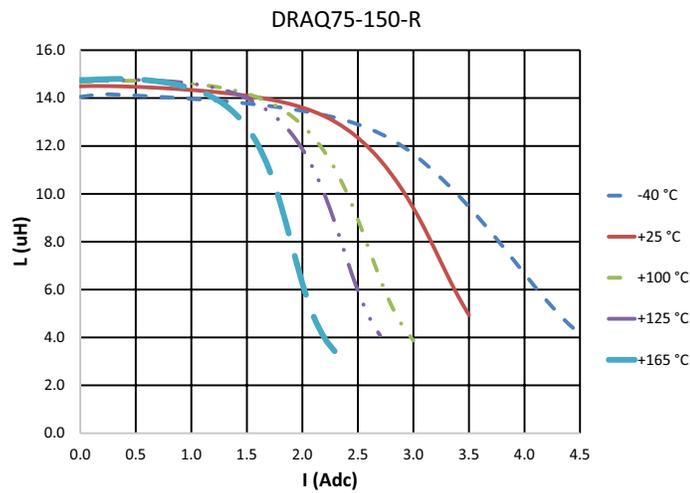
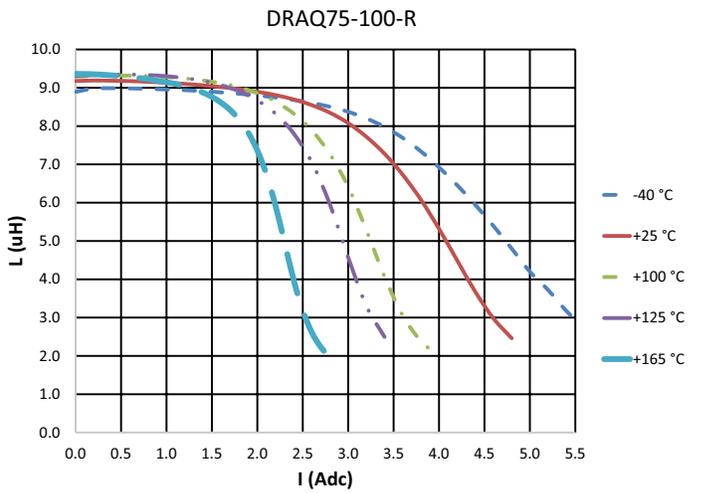
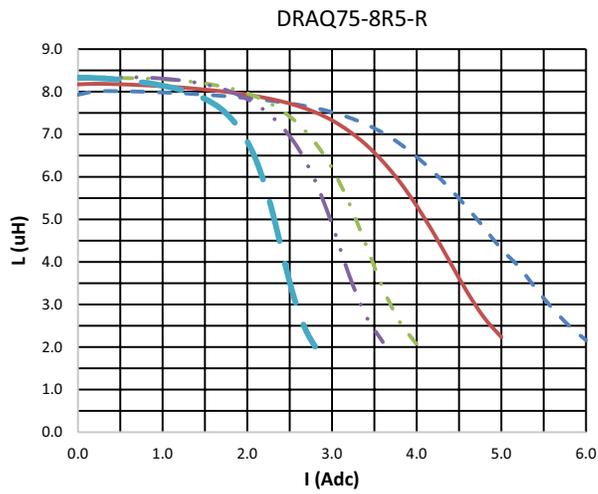
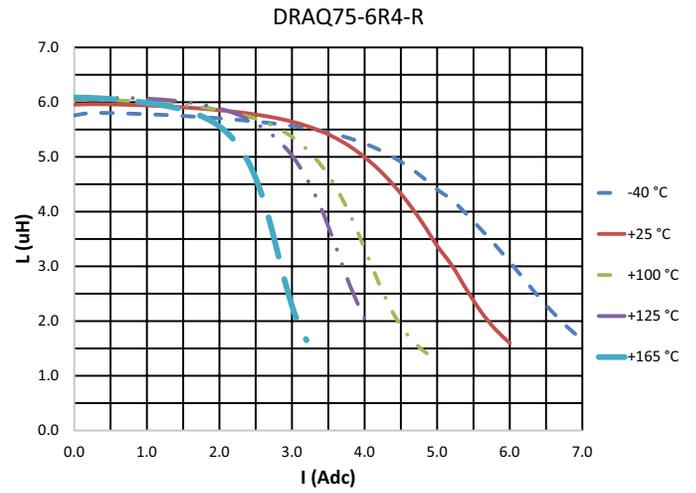
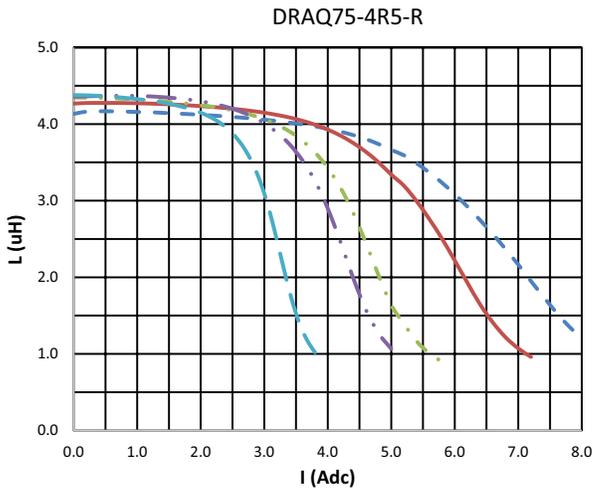
Temperature rise vs. total loss



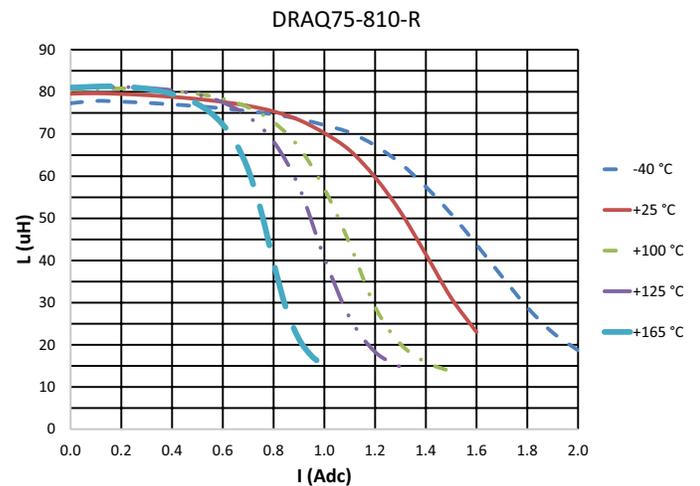
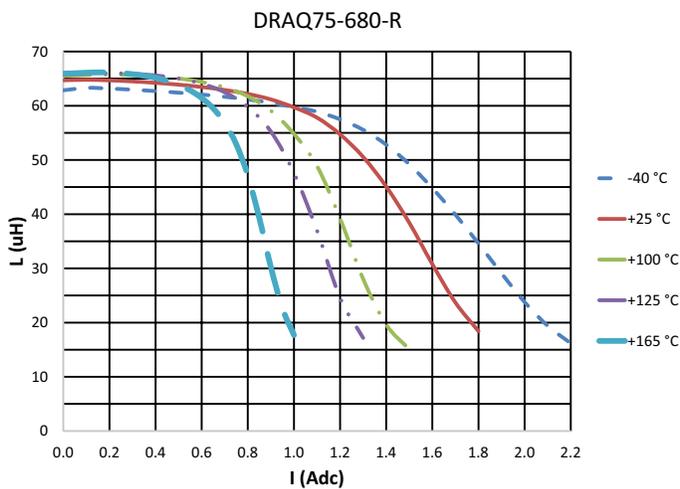
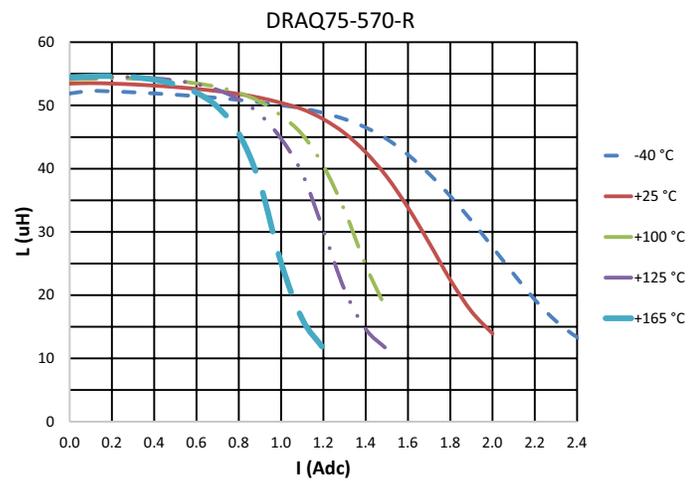
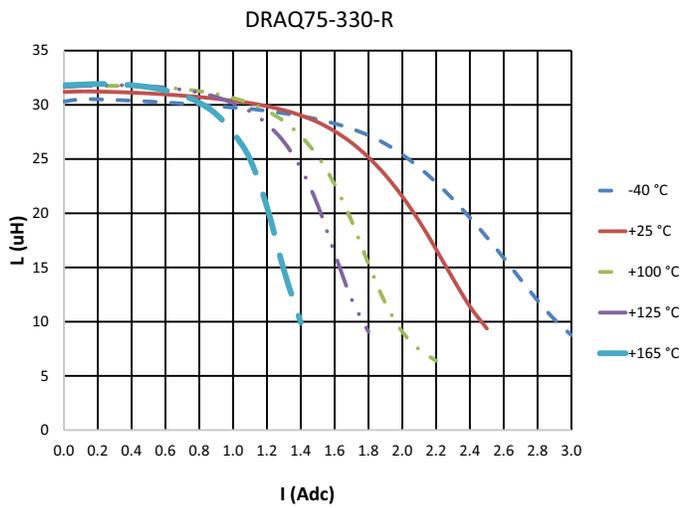
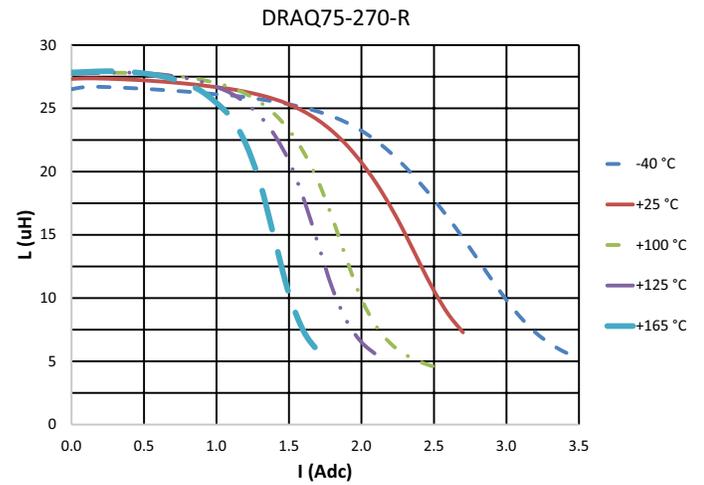
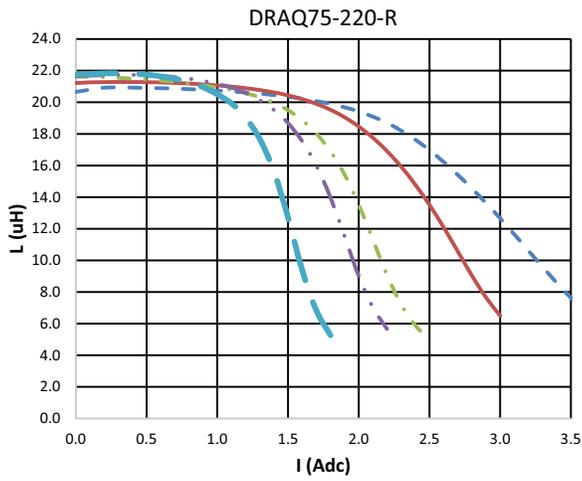
Core loss vs. Bp-p



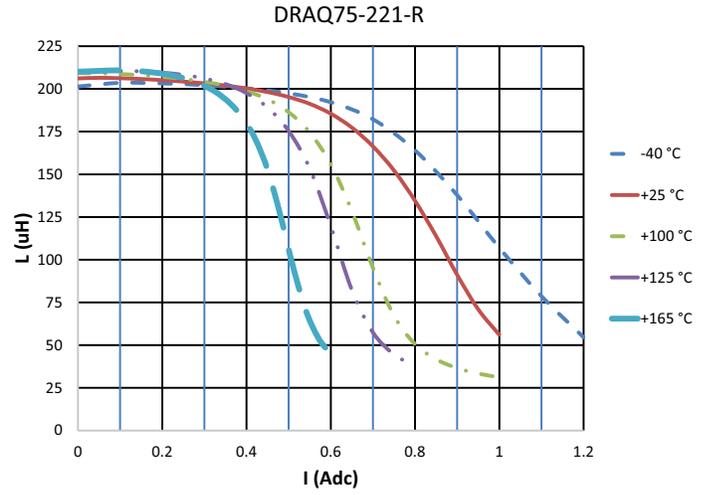
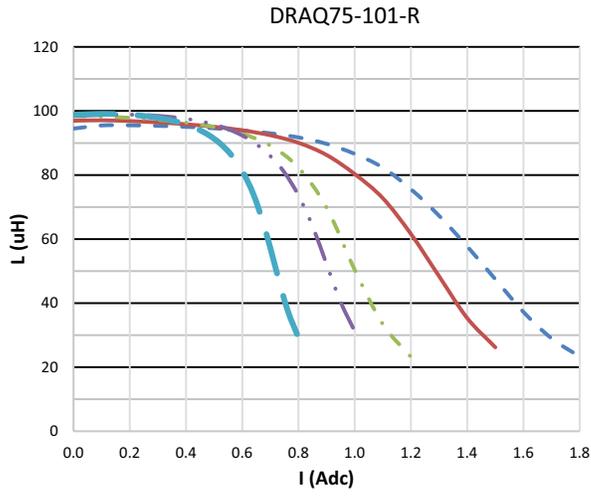
Inductance characteristics



Inductance characteristics



Inductance characteristics



Solder reflow profile

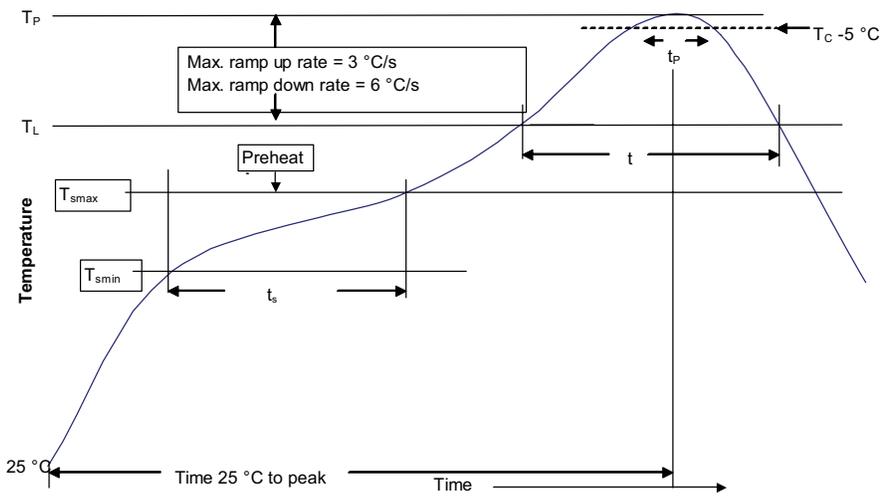


Table 1 - Standard SnPb solder (T_C)

Package thickness	Volume mm ³ <350	Volume mm ³ ≥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 mm ³ <350	Volume mm ³ 350 - 2000	Volume mm ³ >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	<ul style="list-style-type: none"> Temperature min. (T_{smin}) Temperature max. (T_{smax}) Time (T_{smin} to T_{smax}) (t_s) 	<ul style="list-style-type: none"> 100 °C 150 °C 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	<ul style="list-style-type: none"> 183 °C 60-150 seconds 	<ul style="list-style-type: none"> 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*
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.

Life Support Policy: Eaton does not authorize the use of any of its products for use in life support devices or systems without the express written approval of an officer of the Company. Life support systems are devices which support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.

Eaton reserves the right, without notice, to change design or construction of any products and to discontinue or limit distribution of any products. Eaton also reserves the right to change or update, without notice, any technical information contained in this bulletin.

Eaton
Electronics Division
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com/electronics

© 2019 Eaton
All Rights Reserved
Printed in USA
Publication No. 11017 BU-MC19145
November 2019

Eaton is a registered trademark.

All other trademarks are property of their respective owners.

Follow us on social media to get the latest product and support information.



Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Eaton:

[DRAQ75-150-R](#) [DRAQ75-470-R](#) [DRAQ75-6R4-R](#) [DRAQ75-570-R](#) [DRAQ75-330-R](#) [DRAQ75-810-R](#) [DRAQ75-270-R](#) [DRAQ75-680-R](#) [DRAQ75-220-R](#) [DRAQ75-100-R](#) [DRAQ75-8R5-R](#) [DRAQ75-170-R](#) [DRAQ75-221-R](#) [DRAQ75-101-R](#) [DRAQ75-4R5-R](#)