THE DATASHEET OF

DRA127-680-R

COOPER Bussmann

Magnetics Solutions For Automotive Applications

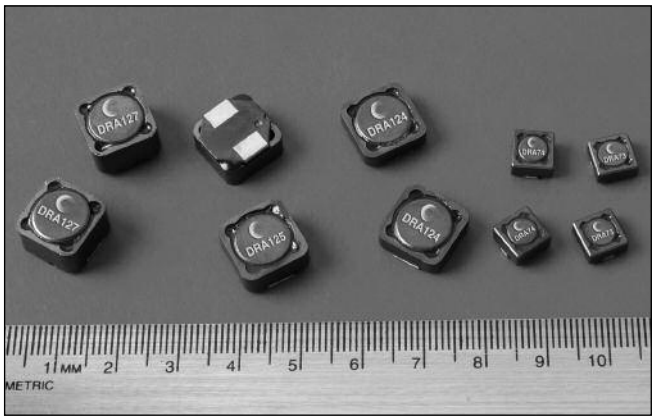
COOPER COILTRONICS®

DRA Series
High Power Density, High Efficiency, Shielded Inductors

RoHS 2002/95/EC

Description

- 165°C maximum total temperature operation
- Five sizes of Automotive grade shielded drum core inductors
- Inductance range from 0.28uH to 1000uH
- Current range up to 56 Amps
- Mechanical secure mounting for high shock and vibration environments
- Good thermal dispersion with thermal conductive epoxy
- Customized dual winding versions available upon request for SEPIC or Flyback configurations



Applications

- Automotive Electronics (under the hood, interior/exterior)
- Telematics
- DC-DC converters
- 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 (range is application specific)
- Solder reflow temperature: +260°C max. for 10 seconds max.
- Complies with AEC-Q200 standard

Packaging

- Supplied in tape and reel packaging, 1350 (DRA73), 1100 (DRA74), 750 (DRA124), 600 (DRA125), and 350 (DRA127) per reel

Part Number	Rated Inductance	OCL (1) µH +/-20%	Irms (2) Amperes	Isat (3) Amperes	Isat (4) Amperes	DCR (5) (Ω) Typ.	K-factor (6)
DRA73-R33-R	0.33	0.29	8.42	14.80	11.84	0.0040	60.6
DRA73-1R0-R	1.00	0.91	6.50	8.22	6.58	0.0067	33.7
DRA73-1R5-R	1.50	1.36	5.39	6.73	5.38	0.0097	27.5
DRA73-2R2-R	2.20	2.52	4.18	4.93	3.95	0.016	20.2
DRA73-3R3-R	3.30	3.18	3.59	4.35	3.48	0.022	17.8
DRA73-4R7-R	4.70	4.86	2.92	3.52	2.82	0.033	14.4
DRA73-6R8-R	6.80	6.63	2.62	2.96	2.37	0.041	12.1
DRA73-8R2-R	8.20	8.06	2.30	2.74	2.19	0.053	11.2
DRA73-100-R	10.0	10.27	2.11	2.39	1.91	0.064	9.8
DRA73-150-R	15.0	14.98	1.74	2.00	1.60	0.094	8.2
DRA73-220-R	22.0	22.39	1.42	1.64	1.32	0.141	6.7
DRA73-330-R	33.0	31.84	1.25	1.35	1.08	0.183	5.5
DRA73-470-R	47.0	47.83	1.02	1.10	0.884	0.275	4.5
DRA73-680-R	68.0	66.89	0.845	0.937	0.749	0.397	3.8
DRA73-820-R	82.0	83.77	0.731	0.851	0.680	0.530	3.5
DRA73-101-R	100	101.7	0.682	0.763	0.610	0.609	3.1
DRA73-151-R	150	151.1	0.551	0.632	0.506	0.932	2.6
DRA73-221-R	220	218.8	0.479	0.510	0.408	1.23	2.1
DRA73-331-R	330	326.4	0.391	0.423	0.338	1.85	1.7
DRA73-471-R	470	472.6	0.326	0.354	0.283	2.67	1.4
DRA73-681-R	680	682.9	0.270	0.297	0.238	3.89	1.2
DRA73-821-R	820	825.3	0.252	0.267	0.214	4.46	1.1
DRA73-102-R	1000	991.9	0.235	0.239	0.192	5.15	1.0

(1) Open Circuit Inductance test parameters: 100kHz, 0.25V, 0.0Adc, tolerance is ±20%
(2) Irms: DC current for an approximate ΔT 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) Isat Amperes peak for approximately 30% rolloff (@25°C)
(4) Isat Amperes peak for approximately 40% rolloff (@125°C)
(5) DCR limits @ 25°C
(6) K-factor: Used to determine B p-p for core loss (see graph).
B p-p = K*L*ΔI, B p-p(mT), K: (K factor from table), L: (Inductance in µH), ΔI (Peak to peak ripple current in Amps).
(7) Part Number Definition: DRAxxx-xxx-R
DRAxxx = Product code and size; -xxx = Inductance value in uH;
R = decimal point; If no R is present, third character = # of zeros.
-R suffix = RoHS compliant

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Part Number	Rated Inductance	OCL (1) µH +/-20%	Irms (2) Amperes	Isat (3) Amperes	Isat (4) Amperes	DCR (5) (Ω) Typ.	K-factor (6)
DRA74-R33-R	0.33	0.288	7.26	18.40	14.72	0.0054	52.6
DRA74-1R0-R	1.00	0.897	6.01	10.22	8.18	0.0078	29.2
DRA74-1R5-R	1.50	1.31	5.55	8.36	6.69	0.0092	23.9
DRA74-2R2-R	2.20	2.33	4.82	6.13	4.91	0.012	17.5
DRA74-3R3-R	3.30	3.05	4.16	5.41	4.33	0.016	15.5
DRA74-4R7-R	4.70	4.68	3.41	4.38	3.50	0.024	12.5
DRA74-6R8-R	6.80	6.51	2.91	3.68	2.94	0.034	10.5
DRA74-8R2-R	8.20	8.51	2.66	3.17	2.54	0.040	9.1
DRA74-100-R	10.0	9.62	2.56	2.97	2.37	0.043	8.5
DRA74-150-R	15.0	15.14	2.06	2.36	1.89	0.067	6.7
DRA74-220-R	22.0	22.25	1.68	1.96	1.57	0.100	5.6
DRA74-330-R	33.0	33.21	1.37	1.61	1.29	0.151	4.6
DRA74-470-R	47.0	46.56	1.14	1.37	1.099	0.219	3.9
DRA74-680-R	68.0	68.37	0.996	1.108	0.887	0.286	3.2
DRA74-820-R	82.0	81.45	0.879	1.034	0.827	0.367	3.0
DRA74-101-R	100	98.5	0.822	0.929	0.743	0.419	2.7
DRA74-151-R	150	150.9	0.661	0.748	0.598	0.648	2.1
DRA74-221-R	220	218.9	0.544	0.626	0.501	0.96	1.8
DRA74-331-R	330	328.9	0.435	0.514	0.411	1.50	1.5
DRA74-471-R	470	471.5	0.383	0.420	0.336	1.93	1.2
DRA74-681-R	680	682.8	0.315	0.352	0.282	2.86	1.0
DRA74-821-R	820	815.0	0.279	0.327	0.262	3.63	0.9
DRA74-102-R	1000	1001.7	0.260	0.292	0.234	4.19	0.8
DRA124-R47-R	0.47	0.423	15.15	30.80	24.6	0.0019	16.7
DRA124-1R0-R	1.00	0.821	11.65	22.00	17.6	0.0031	12.0
DRA124-1R5-R	1.50	1.36	9.36	17.11	13.7	0.0049	9.3
DRA124-2R2-R	2.20	2.04	7.64	14.00	11.2	0.007	7.6
DRA124-3R3-R	3.30	2.79	6.94	11.85	9.48	0.009	6.4
DRA124-4R7-R	4.70	4.74	5.47	9.06	7.25	0.014	4.9
DRA124-6R8-R	6.80	7.28	4.46	7.33	5.87	0.021	4.0
DRA124-8R2-R	8.20	8.88	3.87	6.70	5.36	0.028	3.6
DRA124-100-R	10.0	10.37	3.67	6.16	4.93	0.031	3.3
DRA124-150-R	15.0	14.10	3.10	5.31	4.25	0.044	2.9
DRA124-220-R	22.0	23.00	2.44	4.16	3.33	0.071	2.3
DRA124-330-R	33.0	34.13	1.98	3.42	2.74	0.108	1.9
DRA124-470-R	47.0	46.27	1.78	2.91	2.325	0.134	1.6
DRA124-680-R	68.0	69.77	1.454	2.369	1.895	0.201	1.3
DRA124-820-R	82.0	80.57	1.285	2.232	1.786	0.257	1.2
DRA124-101-R	100	98.8	1.199	2.000	1.600	0.296	1.1
DRA124-151-R	150	151.7	0.967	1.621	1.297	0.454	0.9
DRA124-221-R	220	209.6	0.865	1.363	1.090	0.568	0.7
DRA124-331-R	330	326.9	0.690	1.092	0.874	0.892	0.6
DRA124-471-R	470	473.0	0.568	0.911	0.729	1.32	0.5
DRA124-681-R	680	682.1	0.466	0.759	0.607	1.96	0.4
DRA124-821-R	820	826.7	0.406	0.697	0.557	2.57	0.4
DRA124-102-R	1000	1001.0	0.380	0.629	0.503	2.94	0.3
DRA125-R47-R	0.47	0.453	18.47	33.20	26.56	0.0016	16.7
DRA125-1R0-R	1.00	0.854	15.94	23.71	18.97	0.0021	12.0
DRA125-1R5-R	1.50	1.41	12.89	18.44	14.76	0.0033	9.3
DRA125-2R2-R	2.20	2.12	10.61	15.09	12.07	0.0048	7.6
DRA125-3R3-R	3.30	2.89	9.69	12.77	10.22	0.0058	6.4
DRA125-4R7-R	4.70	4.90	7.67	9.76	7.81	0.0092	4.9
DRA125-6R8-R	6.80	6.23	6.81	8.74	6.99	0.012	4.4
DRA125-8R2-R	8.20	7.49	6.41	7.90	6.32	0.013	4.0
DRA125-100-R	10.0	9.22	5.57	7.22	5.77	0.017	3.6

(1) Open Circuit Inductance test parameters: 100kHz, 0.25V, 0.0Adc, tolerance is ±20%

(2) Irms: DC current for an approximate ΔT 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) Isat Amperes peak for approximately 30% rolloff (@25°C)

(4) Isat Amperes peak for approximately 40% rolloff (@125°C)

(5) DCR limits @ 25°C

(6) K-factor: Used to determine B p-p for core loss (see graph).
B p-p = K*L*ΔI, B p-p(mT), K: (K factor from table), L: (Inductance in µH), ΔI (Peak to peak ripple current in Amps).

(7) Part Number Definition: DRAxxx-xxx-R
DRAxxx = Product code and size; -xxx = Inductance value in uH;
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DRA125-150-R	15.0	14.67	4.45	5.72	4.58	0.027	2.9
DRA125-220-R	22.0	20.65	3.95	4.74	3.79	0.035	2.4
DRA125-330-R	33.0	31.47	3.19	3.86	3.09	0.053	1.9
DRA125-470-R	47.0	47.83	2.59	3.13	2.506	0.081	1.6
DRA125-680-R	68.0	68.48	2.125	2.635	2.108	0.120	1.3
DRA125-820-R	82.0	80.86	2.005	2.406	1.925	0.135	1.2
DRA125-101-R	100	97.6	1.745	2.213	1.771	0.178	1.1
DRA125-151-R	150	150.0	1.409	1.785	1.428	0.273	0.9
DRA125-221-R	220	222.8	1.142	1.469	1.175	0.416	0.7
DRA125-331-R	330	325.1	0.998	1.194	0.955	0.543	0.6
DRA125-471-R	470	466.3	0.826	1.006	0.805	0.79	0.5
DRA125-681-R	680	683.3	0.673	0.834	0.667	1.20	0.4
DRA125-821-R	820	813.6	0.632	0.758	0.606	1.36	0.4
DRA125-102-R	1000	992.8	0.552	0.695	0.556	1.78	0.4
DRA127-R47-R	0.47	0.413	22.50	56.0	44.8	0.0012	14.3
DRA127-1R0-R	1.00	0.772	19.22	40.0	32.0	0.0017	10.2
DRA127-1R5-R	1.50	1.27	15.32	31.1	24.9	0.0027	7.9
DRA127-2R2-R	2.20	1.92	12.52	25.5	20.4	0.0040	6.5
DRA127-3R3-R	3.30	3.51	9.59	18.7	14.93	0.0068	4.8
DRA127-4R7-R	4.70	4.58	8.14	16.5	13.18	0.0094	4.2
DRA127-6R8-R	6.80	6.72	7.32	13.3	10.67	0.012	3.4
DRA127-8R2-R	8.20	8.33	6.33	12.2	9.74	0.016	3.1
DRA127-100-R	10.0	9.63	6.02	11.2	8.96	0.017	2.9
DRA127-150-R	15.0	14.90	4.83	9.03	7.23	0.027	2.3
DRA127-220-R	22.0	21.47	3.98	7.57	6.05	0.040	1.9
DRA127-330-R	33.0	32.01	3.22	6.22	4.98	0.060	1.6
DRA127-470-R	47.0	47.91	2.62	5.09	4.07	0.091	1.3
DRA127-680-R	68.0	68.22	2.333	4.18	3.34	0.115	1.1
DRA127-820-R	82.0	83.91	2.008	3.84	3.07	0.155	1.0
DRA127-101-R	100	100.8	1.888	3.46	2.77	0.175	0.9
DRA127-151-R	150	151.2	1.524	2.83	2.26	0.269	0.7
DRA127-221-R	220	219.8	1.253	2.35	1.88	0.398	0.6
DRA127-331-R	330	328.3	1.011	1.93	1.54	0.612	0.5
DRA127-471-R	470	474.5	0.827	1.62	1.29	0.91	0.4
DRA127-681-R	680	676.6	0.736	1.33	1.06	1.15	0.3
DRA127-821-R	820	824.6	0.637	1.22	0.978	1.54	0.3
DRA127-102-R	1000	998.7	0.598	1.10	0.878	1.75	0.3

(1) Open Circuit Inductance test parameters: 100kHz, 0.25V, 0.0Adc, tolerance is ±20%
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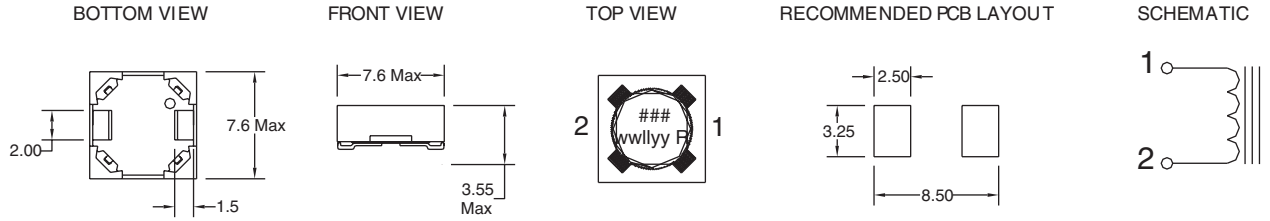
(3) Isat Amperes peak for approximately 30% rolloff (@25°C)
(4) Isat Amperes peak for approximately 40% rolloff (@125°C)
(5) DCR limits @ 25°C
(6) K-factor: Used to determine B p-p for core loss (see graph).
B p-p = K*L*ΔI, B p-p(mT), K: (K factor from table), L: (Inductance in µH), ΔI (Peak to peak ripple current in Amps).
(7) Part Number Definition: DRAxxx-xxx-R
DRAxxx = Product code and size; -xxx = Inductance value in uH;
R = decimal point; If no R is present, third character = # of zeros.
-R suffix = RoHS compliant

Mechanical Diagrams

DRA73 Series

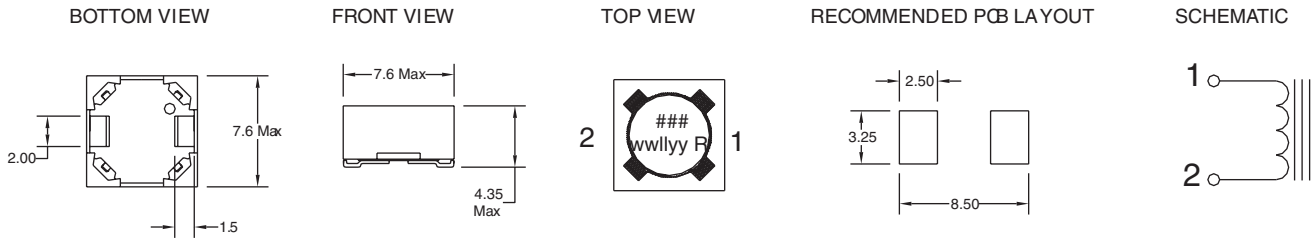


Dimensions in Millimeters.

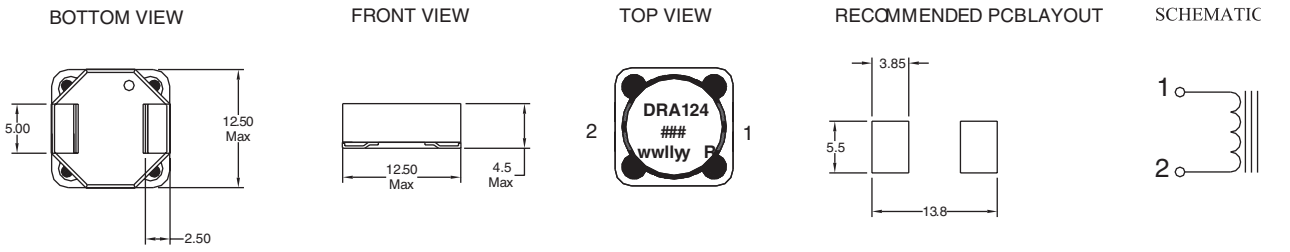
= Inductance value in uH. R = decimal point.
If no R is present third character = # of zeros
wwllyy = (date code) R = revision level

Mechanical Diagrams

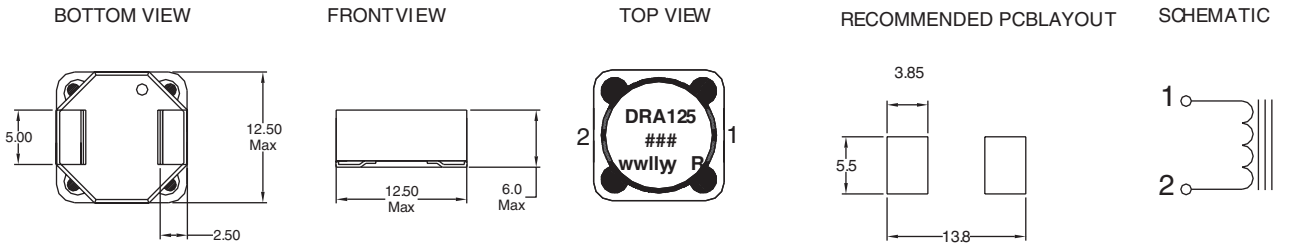
DRA74 Series



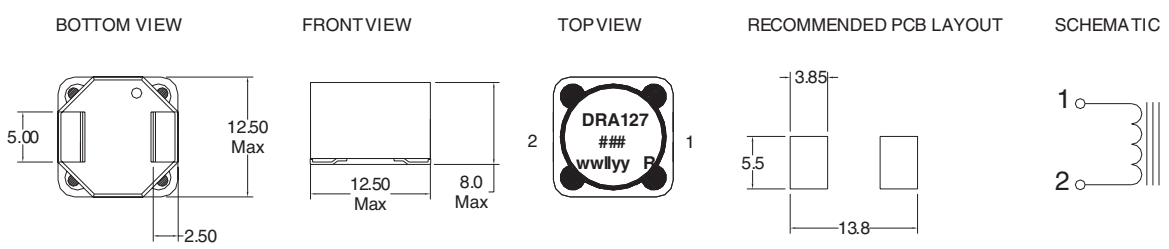
DRA124 Series



DRA125 Series



DRA127 Series

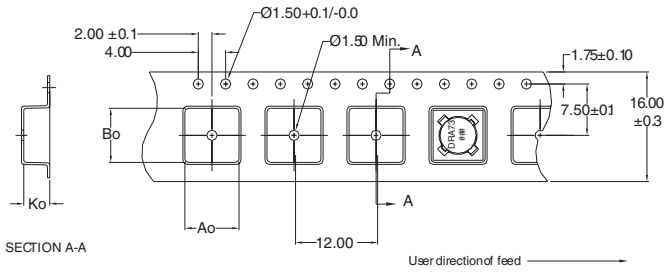


Dimensions in Millimeters.

= Inductance value in uH. R = decimal point.
If no R is present third character = # of zeros
wwllyy = (date code) R = revision level

Packaging Information

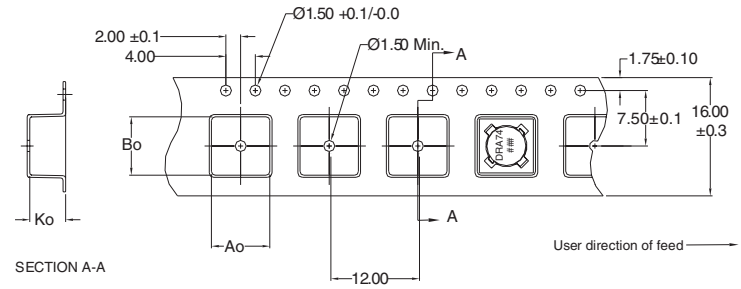
DRA73 Series



A0= 7.90mm
B0= 7.90 mm
K0= 3.80mm

Parts packaged on 13" Diameter reel,
1,350 parts per reel.

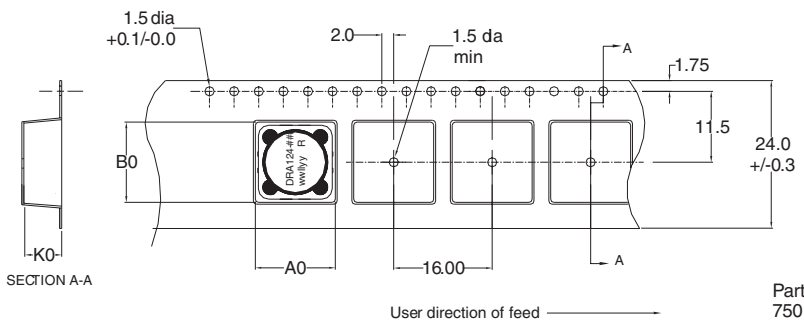
DRA74 Series



A0= 7.90 mm
B0= 7.90 mm
K0= 4.70 mm

Parts packaged on 13" Diameter reel,
1,100 parts per reel.

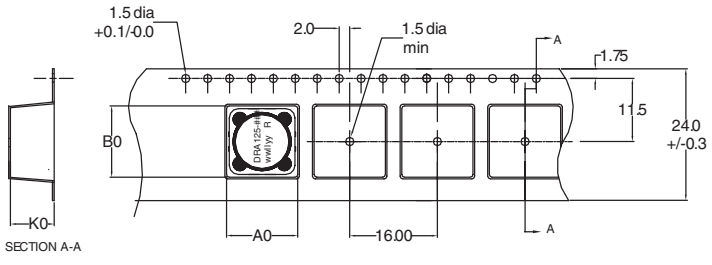
DRA124 Series



A0= 13.00 mm
B0= 13.00 mm
K0= 4.90 mm

Parts packaged on 13" Diameter reel,
750 parts per reel.

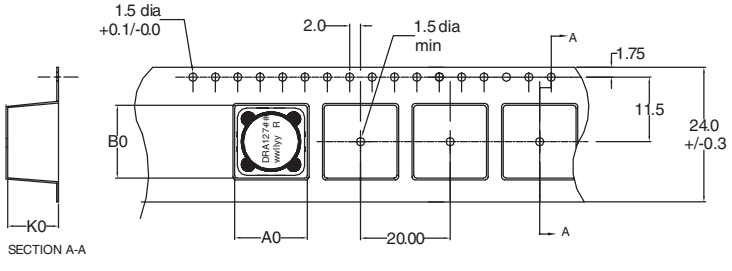
DRA125 Series



A0= 13.00 mm
B0= 13.00 mm
K0= 6.30 mm

Parts packaged on 13" Diameter reel,
600 parts per reel.

DRA127 Series



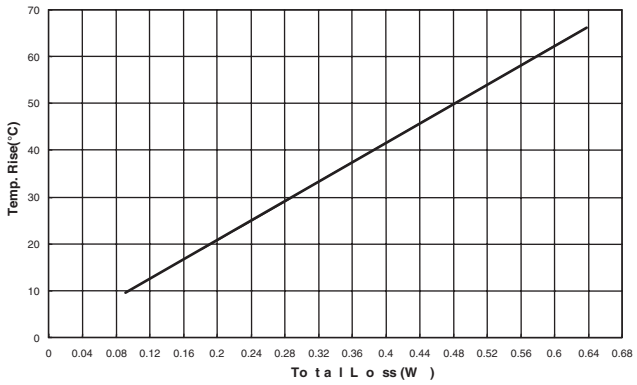
A0= 13.00mm
B0= 13.00 mm
K0= 8.30mm

Parts packaged on 13" Diameter reel,
350 parts per reel.

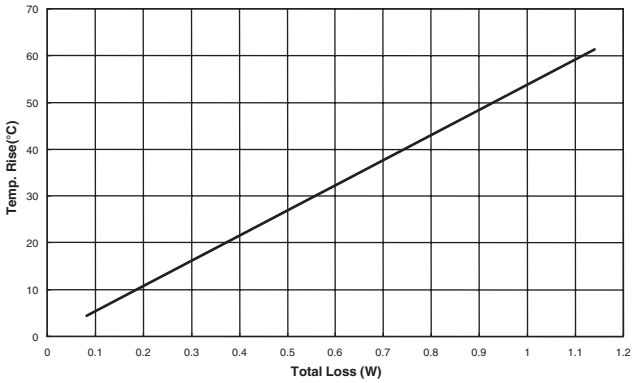
Dimensions are in millimeters.

Temperature Rise vs. Watt Loss

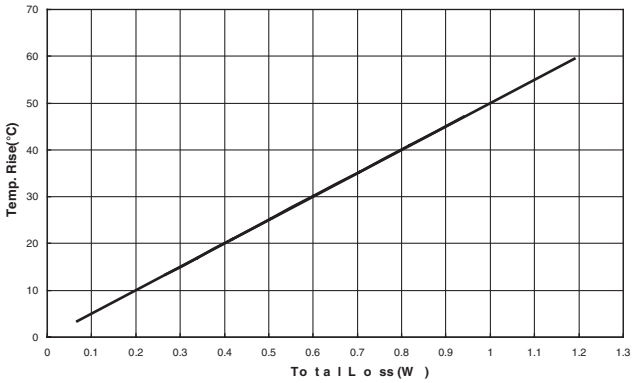
DRA 73 series



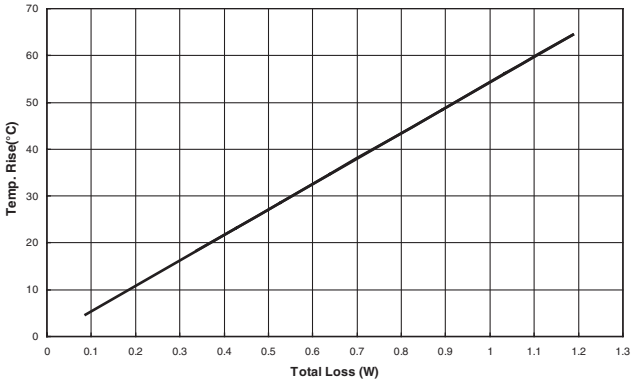
DRA 74 series



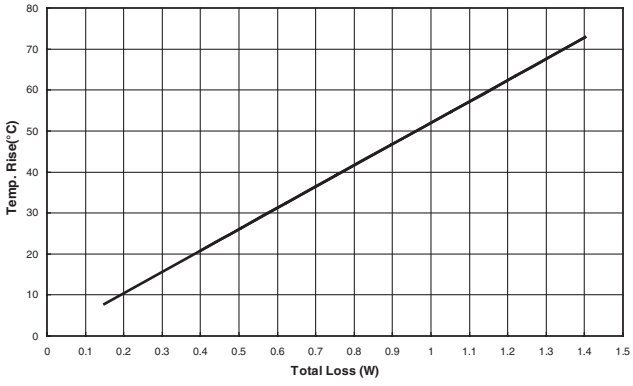
DRA 124 series



DRA 125 series

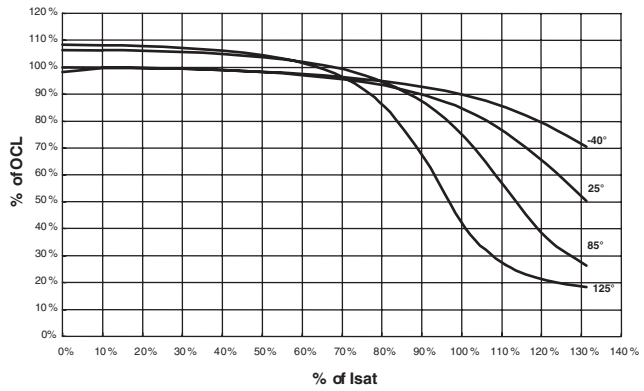


DRA 127 series

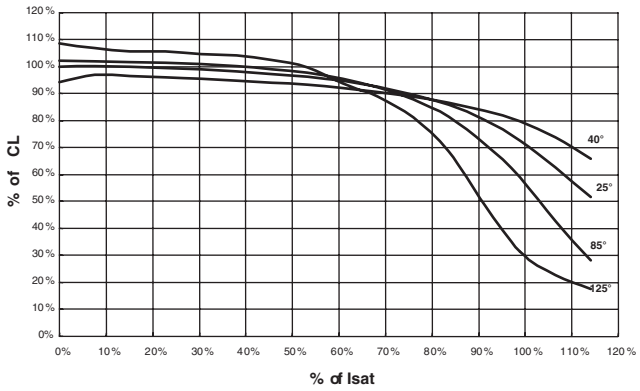


Inductance Characteristics

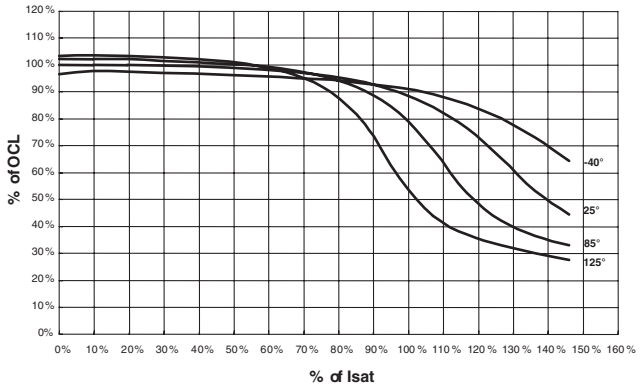
OCL vs Isat/DRA 73 series



OCL vs Isat/DRA 74 series



OCL vs Isat/DRA 124 series



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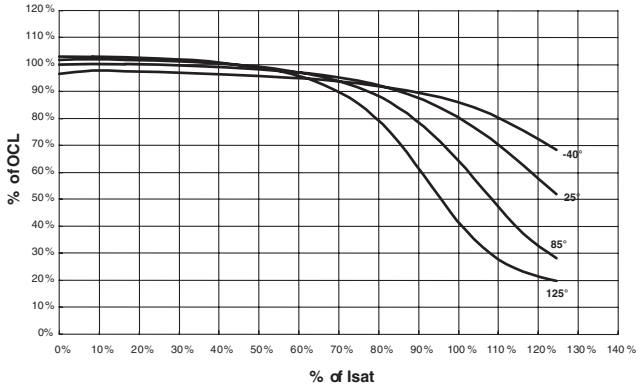
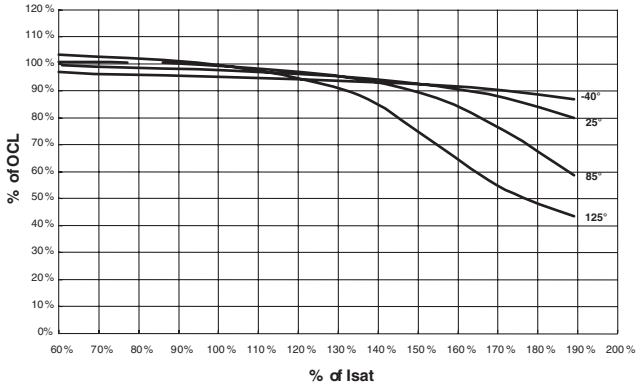
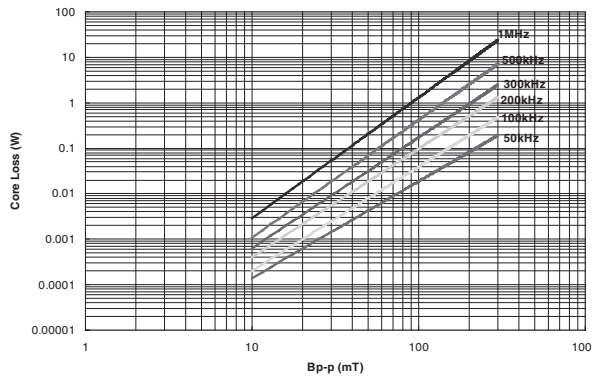


OCL vs Isat/DRA 127 series



Inductance Characteristics

DRA 73 series



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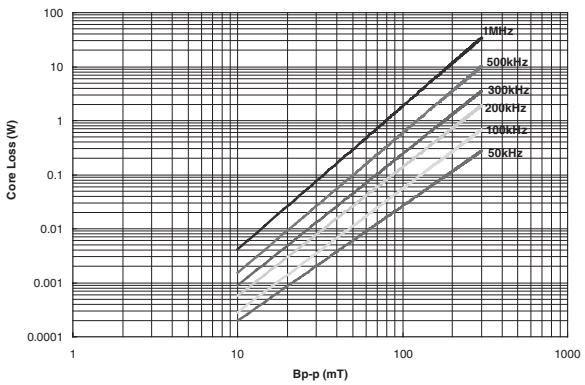

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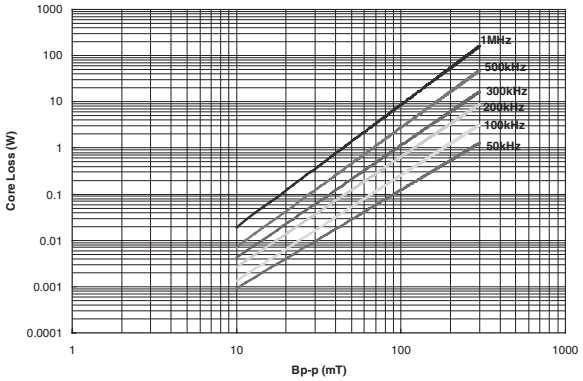

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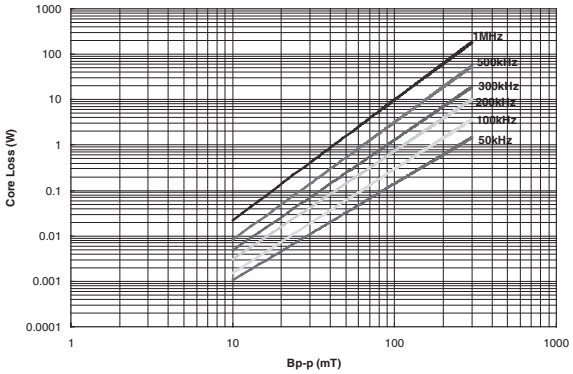

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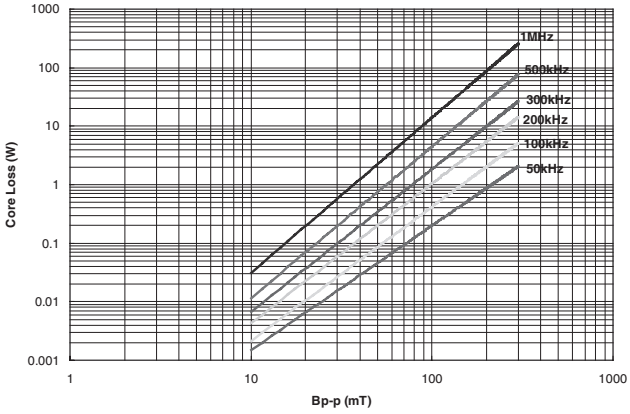

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