Coiltronics DR Series

High power density, high efficiency, shielded inductors

Applications

- Computer, DVD players, and portable power devices
- LCD panels
- DC-DC converters
- Buck, boost, forward, and resonant converters
- Noise filtering and filter chokes

Environmental data

- Storage temperature range (Component): -40°C to +125°C
- Operating temperature range: -40°C to +125°C (ambient + self-temperature rise)
- Solder reflow temperature: J-STD-020D compliant

Product description

- Lead free, RoHS compliant
- 125°C maximum total operating temperature
- Four sizes of shielded drum core inductors
- Inductance range from 0.33µH to 1000µH
- Current range up to 56 amps peak
- Magnetic shielding
- Secure mounting
- Ferrite core material

Packaging:

- Supplied in tape and reel packaging (per reel):
  - DR73 1350
  - DR74 1100
  - DR125 600
  - DR127 350

Pb RoHS

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

Coiltronics is now part of Eaton
Same great products plus even more.

EATON
Powering Business Worldwide

Product specifications

Part Number	Rated Inductance (µH)	OCL[1] ±20% (µH)	I_{rms}[2] Amps	I_{sat}[3] Amps Peak	DCR[4] (Ω) Typ.	Volt-µSec[5] Typ.
DR73-R33-R	0.33	0.306	6.21	14.4	0.0073	1.98
DR73-1R0-R	1.00	0.992	5.28	7.97	0.0102	3.56
DR73-1R5-R	1.50	1.482	4.67	6.52	0.0130	4.36
DR73-2R2-R	2.20	2.070	4.15	5.52	0.0165	5.15
DR73-3R3-R	3.30	3.540	3.31	4.22	0.0259	6.73
DR73-4R7-R	4.70	4.422	3.09	3.78	0.0297	7.52
DR73-6R8-R	6.80	6.480	2.55	3.12	0.0435	9.11
DR73-8R2-R	8.20	8.930	2.19	2.66	0.0592	10.7
DR73-100-R	10.0	10.30	2.08	2.47	0.0656	11.5
DR73-150-R	15.0	15.01	1.83	2.05	0.0844	13.9
DR73-220-R	22.0	22.65	1.62	1.67	0.107	17.0
DR73-330-R	33.0	34.41	1.31	1.35	0.166	21.0
DR73-470-R	47.0	48.62	1.08	1.14	0.241	24.9
DR73-680-R	68.0	68.91	0.89	0.96	0.358	29.7
DR73-820-R	82.0	80.37	0.86	0.89	0.384	32.1
DR73-101-R	100	101.4	0.73	0.79	0.527	36.0
DR73-151-R	150	150.9	0.58	0.65	0.851	44.0
DR73-221-R	220	223.3	0.52	0.53	1.05	53.5
DR73-331-R	330	325.5	0.42	0.44	1.59	64.5
DR73-471-R	470	465.8	0.35	0.37	2.36	77.2
DR73-681-R	680	676.5	0.29	0.31	3.47	93.1
DR73-821-R	820	821.7	0.27	0.28	3.93	103
DR73-102-R	1000	995.0	0.26	0.25	4.34	113

1. Open Circuit Inductance Test Parameters: 100kHz, 0.25V_{rms}, 0.0Adc.
2. RMS current for an approximate DT of 40°C without core loss.
   It is recommended that the temperature of the part not exceed 125°C.
3. Peak current for approximate 30% roll off at 20°C.
4. DCR limits @ 20°C.
5. Applied Volt-Time product (V-µS) across the inductor. This value represent the applied V-µSat 100kHz necessary to generate a core loss equal to 10% of the total losses for 40°C temperature rise.
6. Part number definition: DRxxx-yyy-R
   - DRxxx = product code and size,
   - yyy = inductance value in µH,
   - R = decimal point. If no R is present, third character = # of zeros
   - "-R" suffix = RoHS compliant

Product specifications

Part Number	Rated Inductance (µH)	OCL[1] ±20% (µH)	I_{rms}[2] Amps	I_{sat}[3] Amps Peak	DCR[4] (Ω) Typ.	Volt-µSec[5] Typ.
DR74-R33-R	0.33	0.294	6.26	18.4	0.0074	1.71
DR74-1R0-R	1.00	0.952	5.39	10.2	0.0099	3.08
DR74-1R5-R	1.50	1.422	4.94	8.35	0.0118	3.76
DR74-2R2-R	2.20	1.986	4.76	7.06	0.0126	4.45
DR74-3R3-R	3.30	3.396	3.94	5.40	0.0183	5.81
DR74-4R7-R	4.70	5.182	3.34	4.37	0.0254	7.18
DR74-6R8-R	6.80	7.344	2.60	3.67	0.0418	8.55
DR74-8R2-R	8.20	8.566	2.53	3.40	0.0441	9.23
DR74-100-R	10.0	9.882	2.41	3.17	0.0489	9.92
DR74-150-R	15.0	16.09	2.11	2.48	0.0637	12.7
DR74-220-R	22.0	21.73	1.75	2.13	0.0925	14.7
DR74-330-R	33.0	33.01	1.41	1.73	0.143	18.1
DR74-470-R	47.0	49.64	1.15	1.41	0.216	22.2
DR74-680-R	68.0	69.67	1.03	1.19	0.265	26.3
DR74-820-R	82.0	80.95	0.91	1.11	0.345	28.4
DR74-101-R	100	101.6	0.86	0.99	0.383	31.8
DR74-151-R	150	150.0	0.69	0.81	0.591	38.6
DR74-221-R	220	227.0	0.56	0.66	0.907	47.5
DR74-331-R	330	335.6	0.45	0.54	1.41	57.8
DR74-471-R	470	465.3	0.40	0.46	1.74	68.1
DR74-681-R	680	671.2	0.33	0.38	2.58	81.7
DR74-821-R	820	812.7	0.31	0.35	2.93	89.9
DR74-102-R	1000	1009	0.27	0.31	3.89	100

1. Open Circuit Inductance Test Parameters: 100kHz, 0.25V_{rms}, 0.0Adc.
2. RMS current for an approximate DT of 40°C without core loss.
   It is recommended that the temperature of the part not exceed 125°C.
3. Peak current for approximate 30% roll off at 20°C.
4. DCR limits @ 20°C.
5. Applied Volt-Time product (V-µS) across the inductor. This value represent the applied V-µSat 100kHz necessary to generate a core loss equal to 10% of the total losses for 40°C temperature rise.
6. Part number definition: DRxxx-yyy-R
   - DRxxx = product code and size,
   - yyy = inductance value in µH,
   - R = decimal point. If no R is present, third character = # of zeros
   - "-R" suffix = RoHS compliant

Product specifications

Part Number	Rated Inductance (µH)	OCL[1] ±20% (µH)	I_{rms}[2] Amps	I_{sat}[3] Amps Peak	DCR[4] (Ω) Typ.	Volt-µSec[5] Typ.
DR125-R47-R	0.47	0.456	17.6	33.0	0.0018	3.17
DR125-1R0-R	1.00	0.894	15.0	23.6	0.0024	4.43
DR125-1R5-R	1.50	1.478	13.8	18.3	0.0029	5.70
DR125-2R2-R	2.20	2.208	10.9	15.0	0.0045	6.97
DR125-3R3-R	3.30	3.084	9.26	12.7	0.0063	8.23
DR125-4R7-R	4.70	5.274	7.18	9.71	0.0105	10.8
DR125-6R8-R	6.80	6.588	6.64	8.68	0.0123	12.0
DR125-8R2-R	8.20	8.048	5.54	7.86	0.0176	13.3
DR125-100-R	10.0	9.654	5.35	7.17	0.0189	14.6
DR125-150-R	15.0	15.35	4.27	5.69	0.0298	18.4
DR125-180-R	18.0	17.70	3.81	5.32	0.0377	19.6
DR125-220-R	22.0	22.36	3.70	4.71	0.0396	22.2
DR125-330-R	33.0	33.74	3.28	3.84	0.0505	27.2
DR125-470-R	47.0	47.47	2.71	3.24	0.0740	32.3
DR125-560-R	56.0	55.24	2.31	3.00	0.102	34.8
DR125-680-R	68.0	67.91	2.22	2.70	0.101	38.6
DR125-820-R	82.0	86.89	2.05	2.39	0.128	43.7
DR125-101-R	100	102.7	1.78	2.20	0.170	47.5
DR125-151-R	150	151.1	1.48	1.81	0.248	57.6
DR125-221-R	220	216.8	1.19	1.51	0.384	69.0
DR125-331-R	330	332.6	1.06	1.22	0.482	85.5
DR125-471-R	470	473.1	0.87	1.02	0.718	102
DR125-681-R	680	679.8	0.70	0.85	1.10	122
DR125-821-R	820	828.0	0.60	0.77	1.49	135
DR125-102-R	1000	1008	0.57	0.70	1.69	149
DR125-472-R	4700	4720	0.268	0.32	7.53	322.4
DR125-124-R	120000	120630	0.060	0.069	150	1521

1. Open Circuit Inductance Test Parameters: 100kHz, 0.25V_{rms}, 0.0Adc.
2. RMS current for an approximate DT of 40°C without core loss.
   It is recommended that the temperature of the part not exceed 125°C.
3. Peak current for approximate 30% roll off at 20°C.
4. DCR limits @ 20°C.
5. Applied Volt-Time product (V-µS) across the inductor. This value represent the applied V-µSat 100kHz necessary to generate a core loss equal to 10% of the total losses for 40°C temperature rise.
6. Part number definition: DRxxx-yyy-R
   - DRxxx = product code and size,
   - yyy = inductance value in µH,
   - R = decimal point. If no R is present, third character = # of zeros
   - "-R" suffix = RoHS compliant

Product specifications

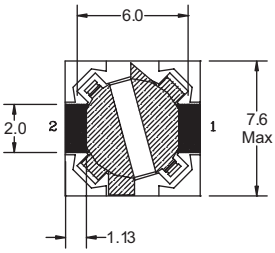
Part Number	Rated Inductance (µH)	OCL[1] ±20% (µH)	I_{rms}[2] Amps	I_{sat}[3] Amps Peak	DCR[4] (Ω) Typ.	Volt-µSec[5] Typ.
DR127-R47-R	0.47	0.419	17.9	56.0	0.00195	3.50
DR127-1R0-R	1.00	0.821	15.5	40.0	0.00313	4.90
DR127-1R5-R	1.50	1.357	13.5	31.1	0.00341	6.30
DR127-2R2-R	2.20	2.027	12.5	25.5	0.00402	7.70
DR127-3R3-R	3.30	2.831	10.5	21.5	0.00567	9.10
DR127-4R7-R	4.70	4.841	8.25	16.5	0.00917	11.9
DR127-6R8-R	6.80	7.387	7.34	13.3	0.0116	14.7
DR127-8R2-R	8.20	8.861	6.32	12.2	0.0157	16.1
DR127-100-R	10.0	10.47	6.04	11.2	0.0172	17.5
DR127-150-R	15.0	14.09	5.03	9.66	0.0247	20.3
DR127-220-R	22.0	22.93	4.00	7.57	0.0391	25.9
DR127-330-R	33.0	33.92	3.23	6.22	0.0600	31.5
DR127-470-R	47.0	47.05	2.95	5.28	0.0719	37.1
DR127-680-R	68.0	66.48	2.44	4.44	0.105	44.1
DR127-820-R	82.0	79.75	2.09	4.06	0.143	48.3
DR127-101-R	100	99.31	1.96	3.64	0.163	53.9
DR127-151-R	150	144.9	1.59	3.01	0.247	65.1
DR127-221-R	220	221.5	1.29	2.43	0.376	80.5
DR127-331-R	330	323.6	1.04	2.01	0.574	97.3
DR127-471-R	470	467.1	0.85	1.68	0.861	117
DR127-681-R	680	676.7	0.76	1.39	1.08	141
DR127-821-R	820	818.1	0.65	1.27	1.47	155
DR127-102-R	1000	1005	0.61	1.14	1.66	172

1. Open Circuit Inductance Test Parameters: 100kHz, 0.25V_{rms}, 0.0Adc.
2. RMS current for an approximate DT of 40°C without core loss.
   It is recommended that the temperature of the part not exceed 125°C.
3. Peak current for approximate 30% roll off at 20°C.
4. DCR limits @ 20°C.
5. Applied Volt-Time product (V-µS) across the inductor. This value represent the applied V-µSat 100kHz necessary to generate a core loss equal to 10% of the total losses for 40°C temperature rise.
6. Part number definition: DRxxx-yyy-R
   - DRxxx = product code and size,
   - yyy = inductance value in µH,
   - R = decimal point. If no R is present, third character = # of zeros
   - "-R" suffix = RoHS compliant

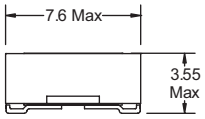
Dimensions - mm

DR73 Series

BOTTOM VIEW

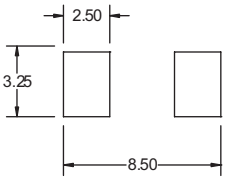


FRONT VIEW

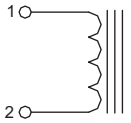


TOP VIEW

RECOMMENDED PAD LAYOUT

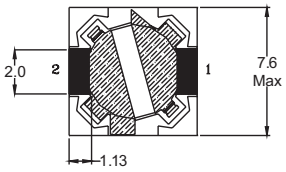


SCHEMATIC

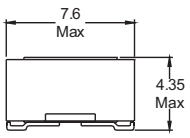


DR74 Series

BOTTOM VIEW

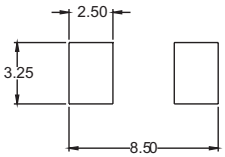


FRONT VIEW

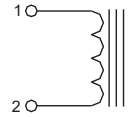


TOP VIEW

RECOMMENDED PAD LAYOUT

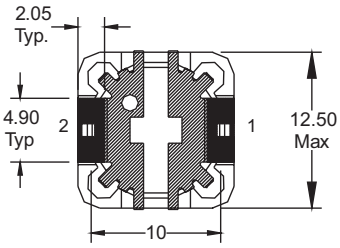


SCHEMATIC

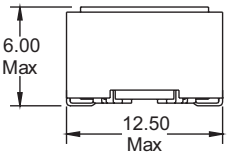


DR125 Series

BOTTOM VIEW

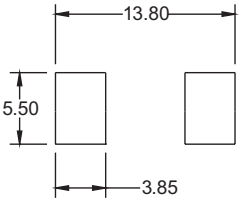


FRONT VIEW

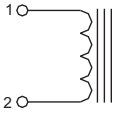


TOP VIEW

RECOMMENDED PAD LAYOUT

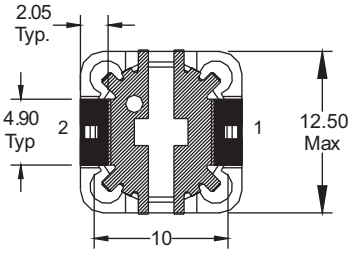


SCHEMATIC

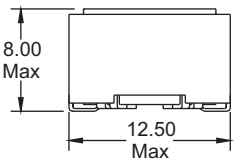


DR127 Series

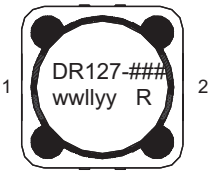
BOTTOM VIEW



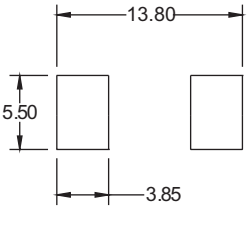
FRONT VIEW



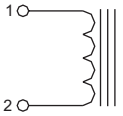
TOP VIEW



RECOMMENDED PAD LAYOUT



SCHEMATIC

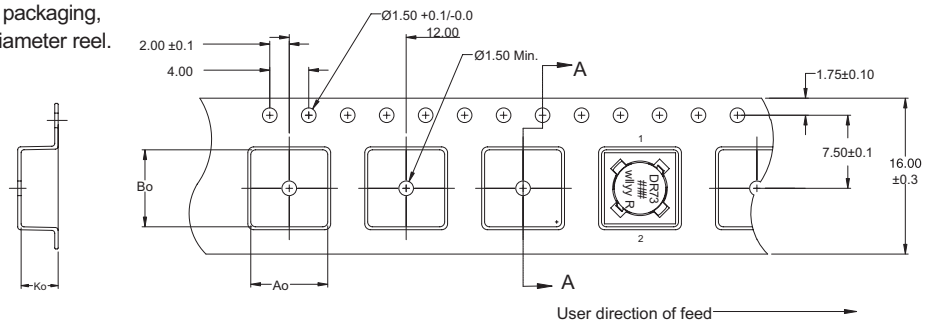


= Inductance value per family chart
wllyy and wwllyy = (date code) R = revision level

Packaging information - mm

DR73 Series

Supplied in tape and reel packaging,
1350 parts per reel, 13" diameter reel.



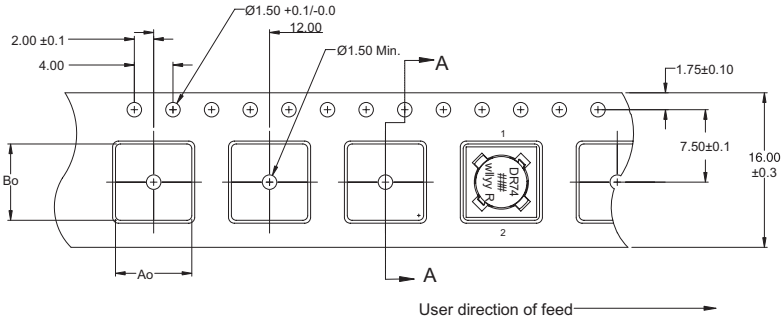
SECTION A-A

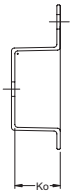
Ao=7.90mm
Bo=7.90mm
Ko=3.80mm

ACTUAL SIZE
DR73

DR74 Series

Supplied in tape and reel packaging,
1100 parts per reel, 13" diameter reel.





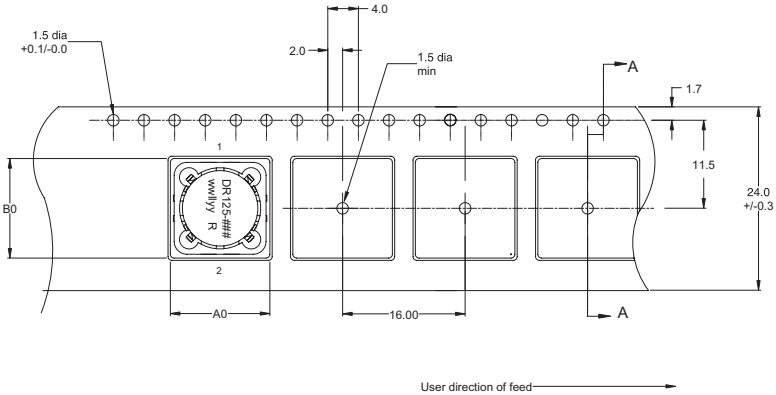
SECTION A-A

Ao=7.90mm
Bo=7.90mm
Ko=4.70mm

ACTUAL SIZE
DR74

DR125 Series

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



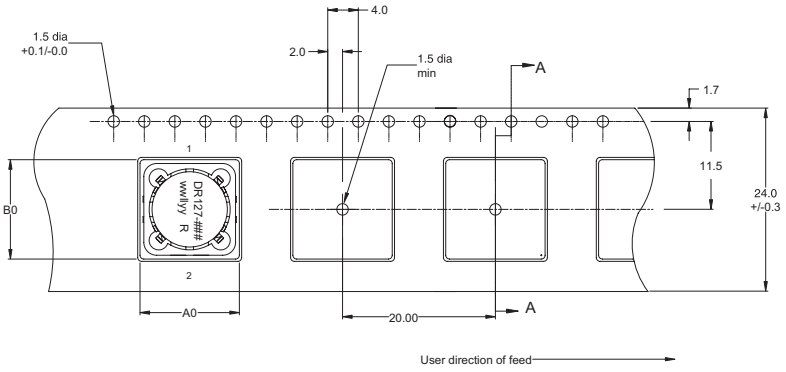
SECTION A-A

Ao=13.0mm
Bo=13.0mm
Ko=6.30mm

ACTUAL SIZE
DR125

DR127 Series

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



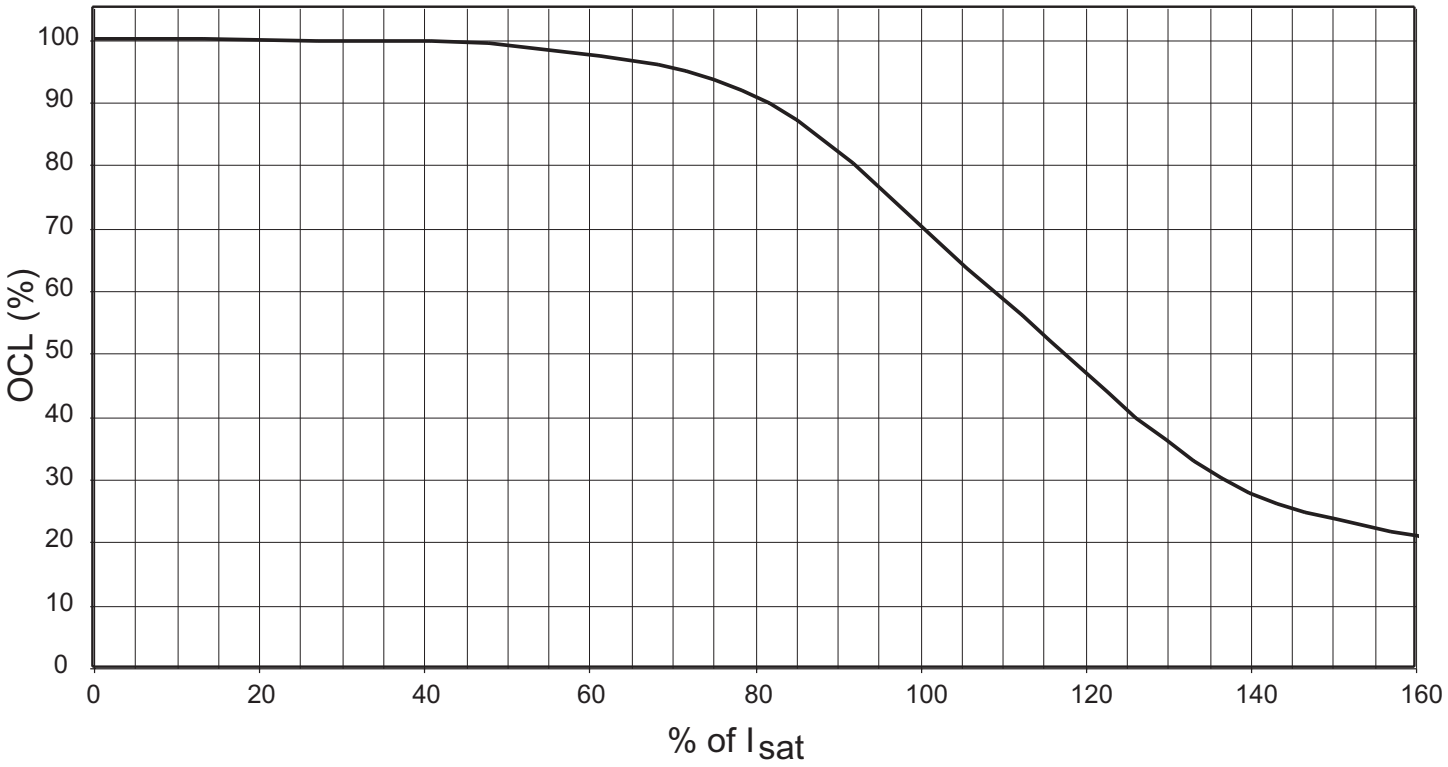
SECTION A-A

Ao=13.0mm
Bo=13.0mm
Ko=8.30mm

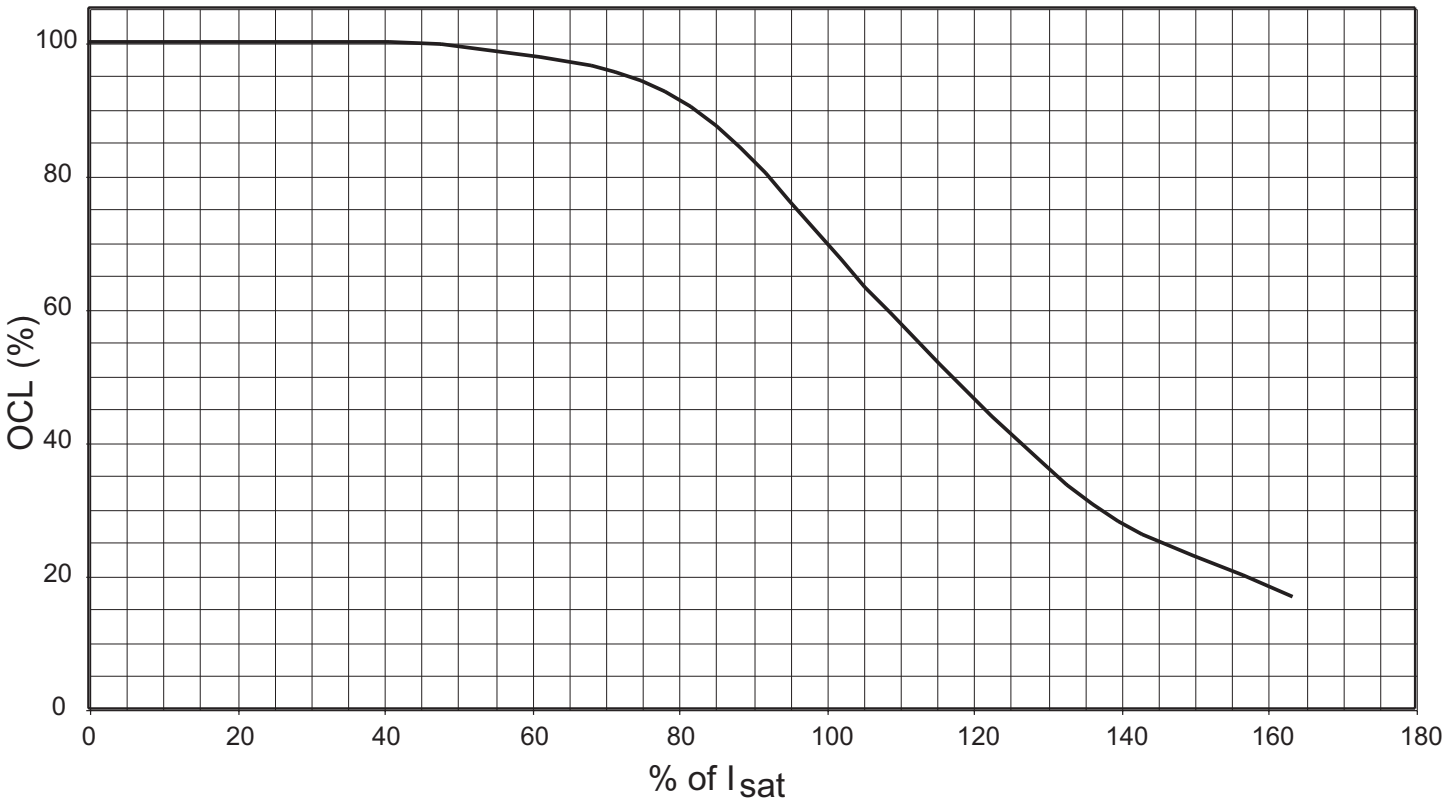
ACTUAL SIZE
DR127

Inductance characteristics

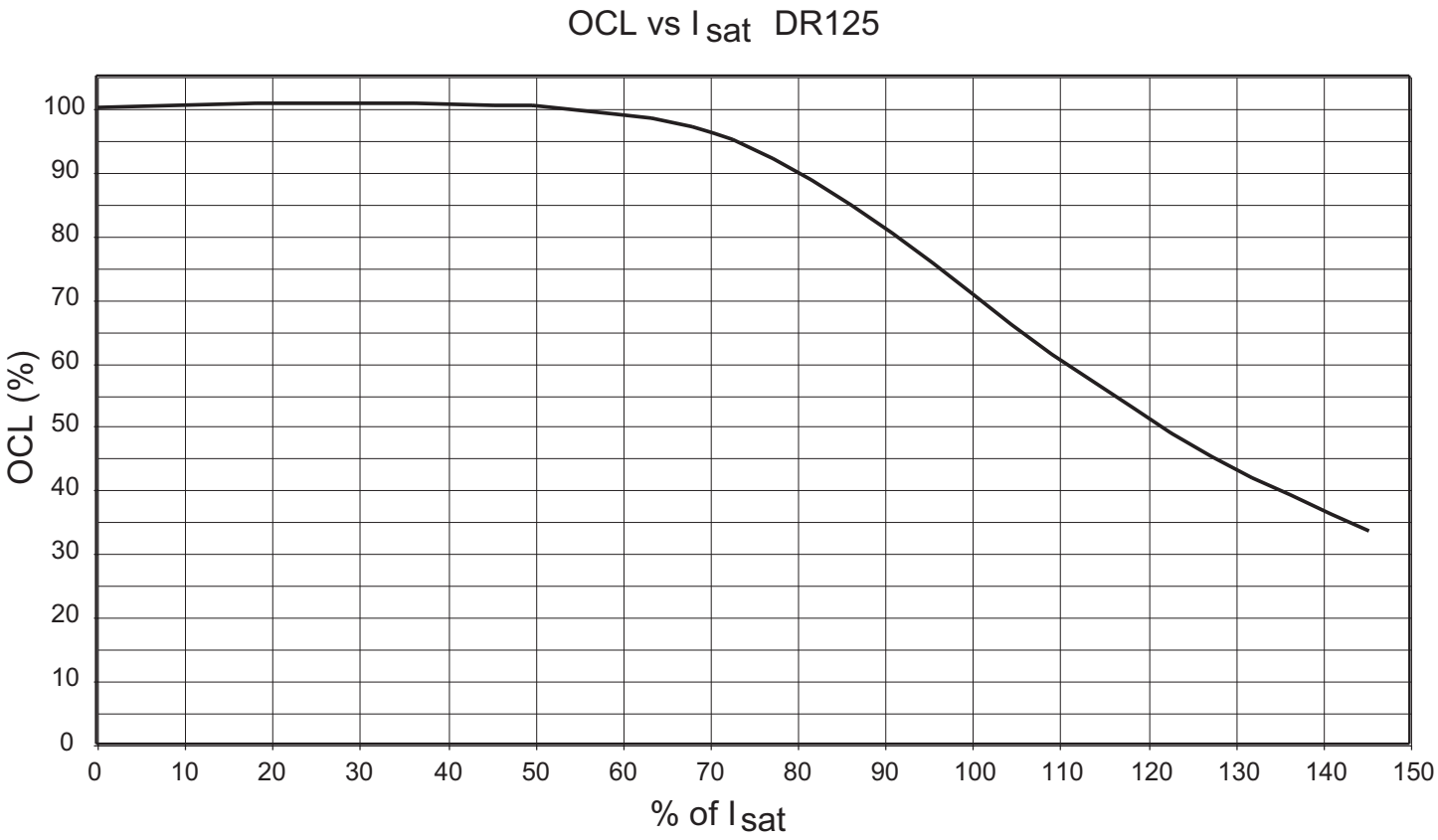
OCL vs I_{sat} DR73

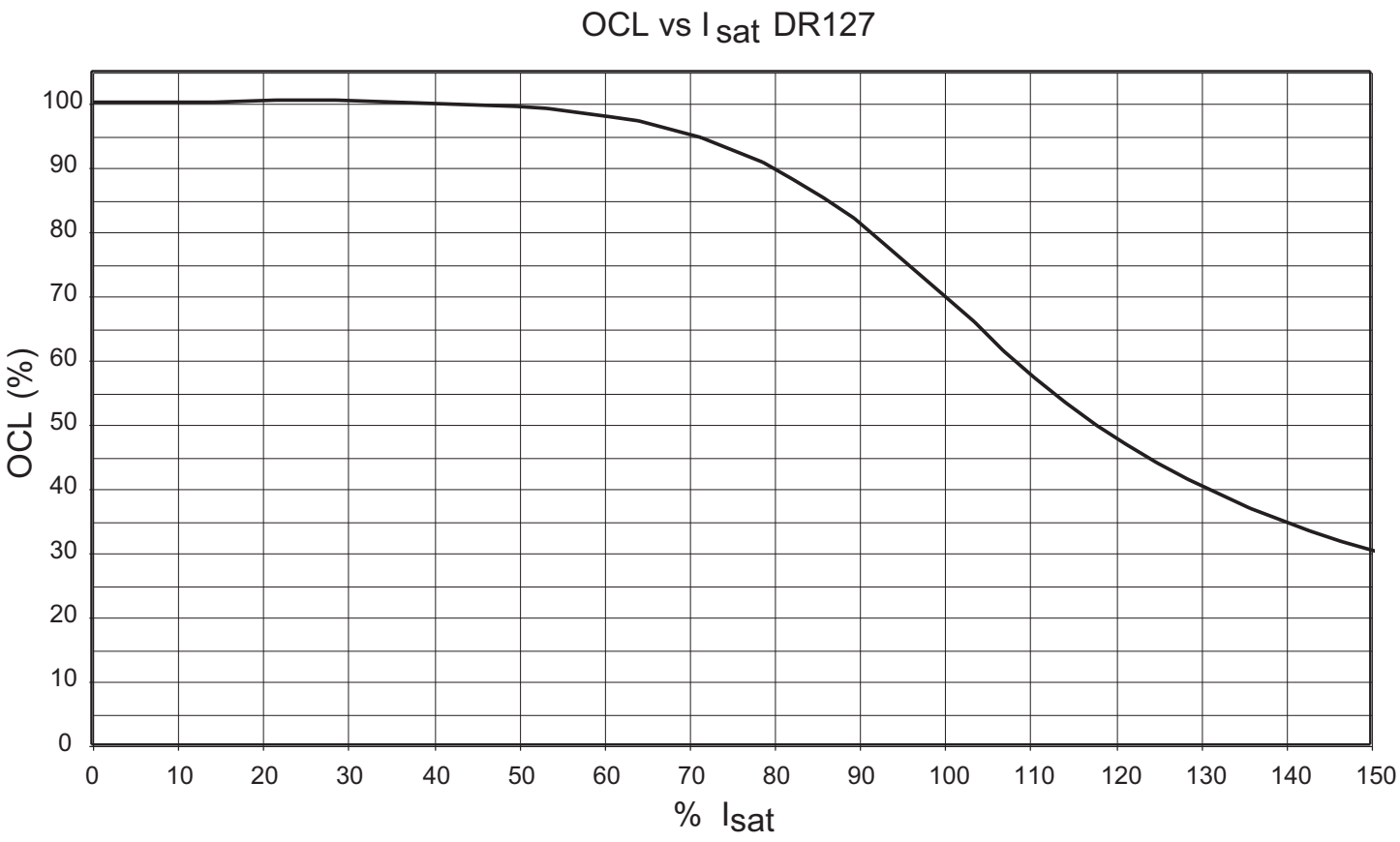


OCL vs I_{sat} DR74

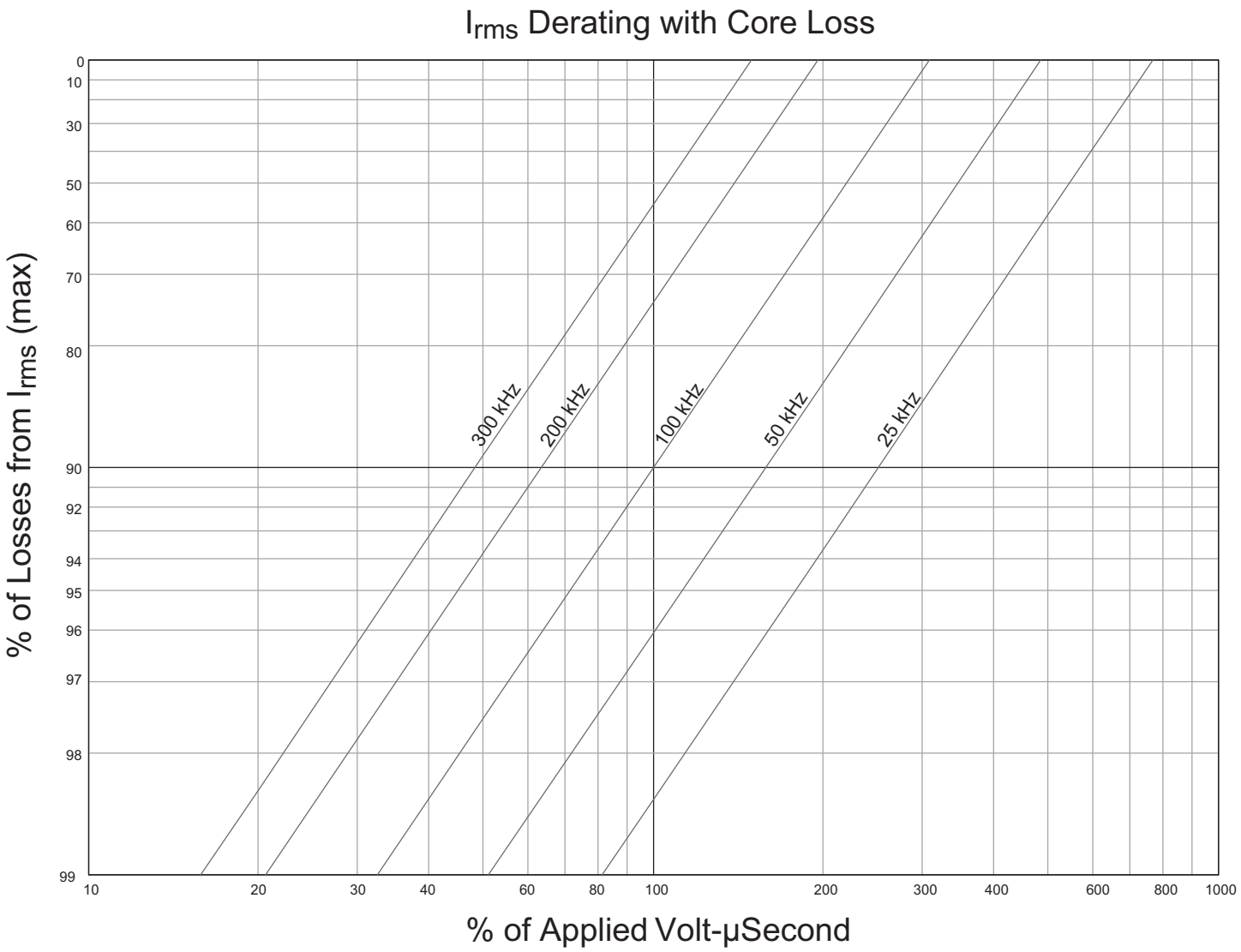


Inductance characteristics





Core loss


I_{rms} Derating with Core Loss
% of Losses from I_{rms} (max)
0
10
30
50
60
70
80
90
92
94
95
96
97
98
99
300 kHz
200 kHz
100 kHz
50 kHz
25 kHz
10
20
30
40
60
80
100
200
300
400
600
800
1000
% of Applied Volt-µSecond

Solder reflow profile

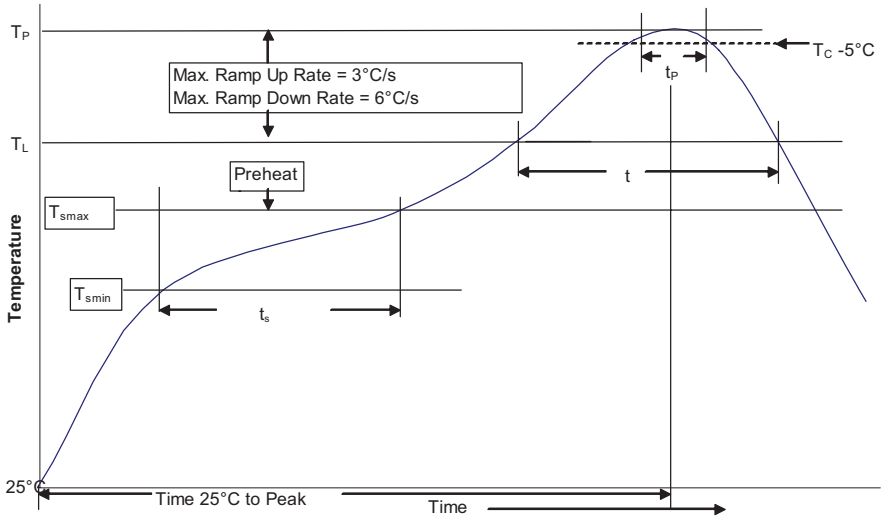


Table 1 - Standard SnPb Solder (T_C)

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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