

DR

High power density, high efficiency, shielded drum core power inductors



Product features

- Four sizes of shielded drum core inductors
- Inductance range from 0.33 μ H to 1000 μ H
- Current range up to 56 A peak
- Magnetically shielded
- Secure mounting
- Ferrite core material

Applications

- Desktop and servers
- DVD and media players
- Portable and handheld 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 plus self-temperature rise)
- Solder reflow temperature:
J-STD-020 (latest revision) compliant



Product specifications

Part Number	Rated Inductance (μH)	OCL ¹ ±20% (μH)	I_{rms}^2 (A)	I_{sat}^3 (A) 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: 100 kHz, 0.25 V_{rms}, 0.0 Adc.
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-μsec 100 kHz 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 (A)	I _{sat} ³ (A) 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: 100 kHz, 0.25 V_{rms}, 0.0 Adc.
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-μsec 100 kHz 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 (A)	I _{sat} ³ (A) 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: 100 kHz, 0.25 V_{rms}, 0.0 Adc.
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-μsec 100 kHz 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

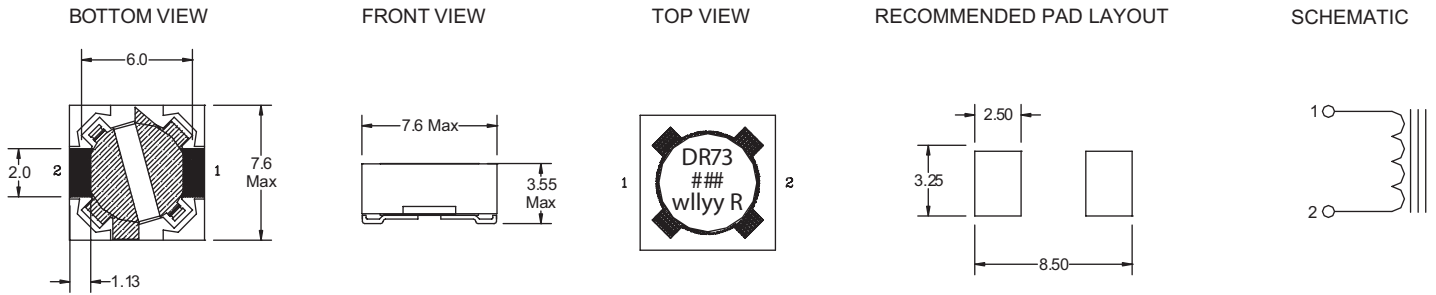
Part Number	Rated Inductance (μH)	OCL ¹ ±20% (μH)	I_{rms}^2 (A)	I_{sat}^3 (A) Peak	DCR ⁴ (Ω) Typ.	Volt-μsec ⁵ Typ.
DR127-R47-R	0.47	0.419	17.9	56.0	0.00195	3.50
DR127-1R0-R	1.00	0.821	15.5	40.0	0.00313	4.90
DR127-1R5-R	1.50	1.357	13.5	31.1	0.00341	6.30
DR127-2R2-R	2.20	2.027	12.5	25.5	0.00402	7.70
DR127-3R3-R	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: 100 kHz, 0.25 V_{rms}, 0.0 Adc.
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-μsec 100 kHz necessary to generate a core loss equal to 10% of the total losses for 40 °C temperature rise.

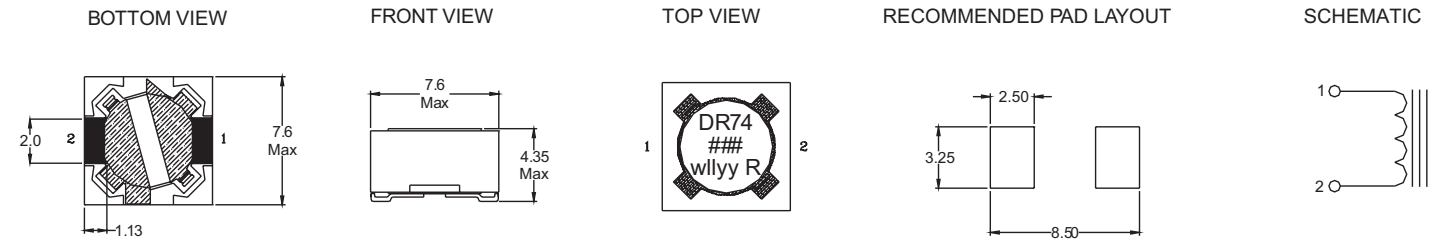
6. Part number definition: DRxxx-yyy-R
 - DRxxx = product code and size,
 - yyy = inductance value in μH,
 - R = decimal point. If no R is present, third character = # of zeros
 - "-R" suffix = RoHS compliant

Dimensions - mm

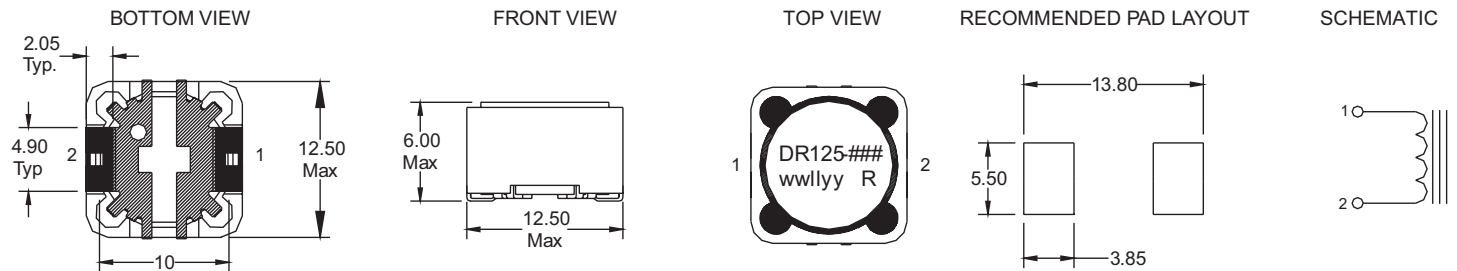
DR73



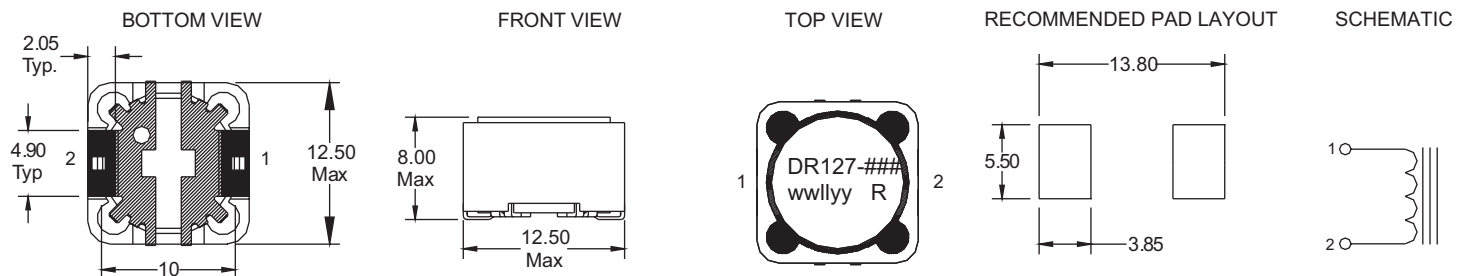
DR74



DR125



DR127

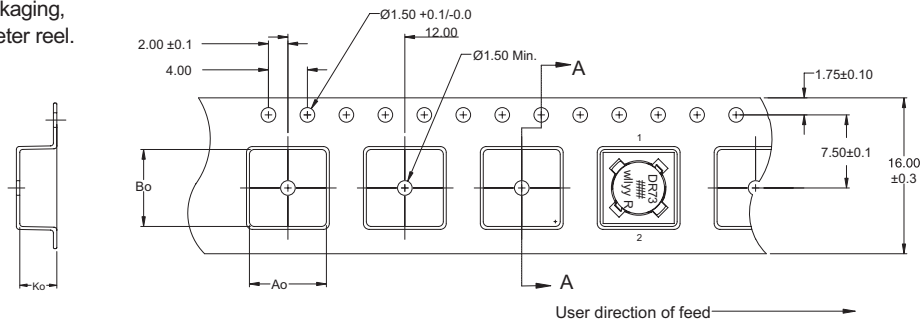


= Inductance value per family chart
wlyy and wwlyy = (date code) R = revision level

Packaging information - mm

DR73

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



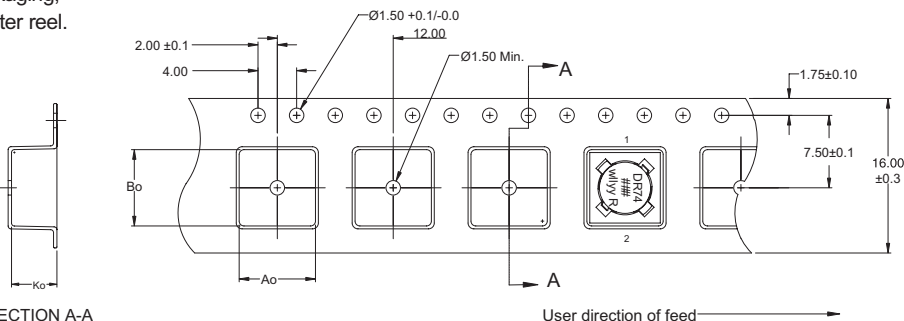
Ao=7.90mm
Bo=7.90mm
Ko=3.80mm

SECTION A-A



DR74

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



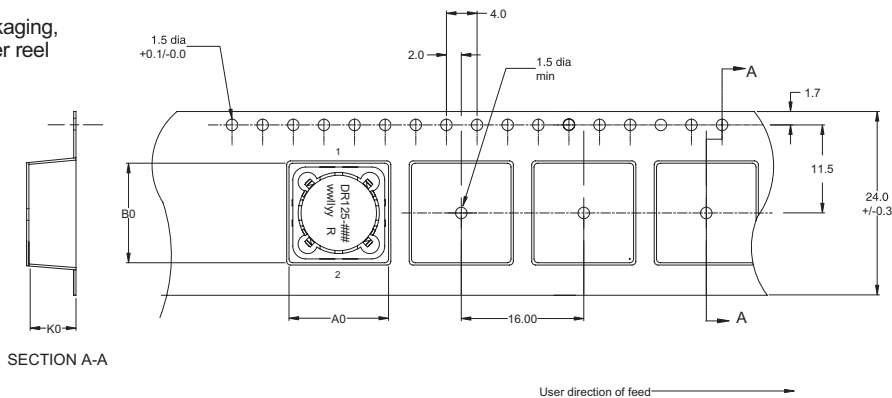
Ao=7.90mm
Bo=7.90mm
Ko=4.70mm

SECTION A-A



DR125

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



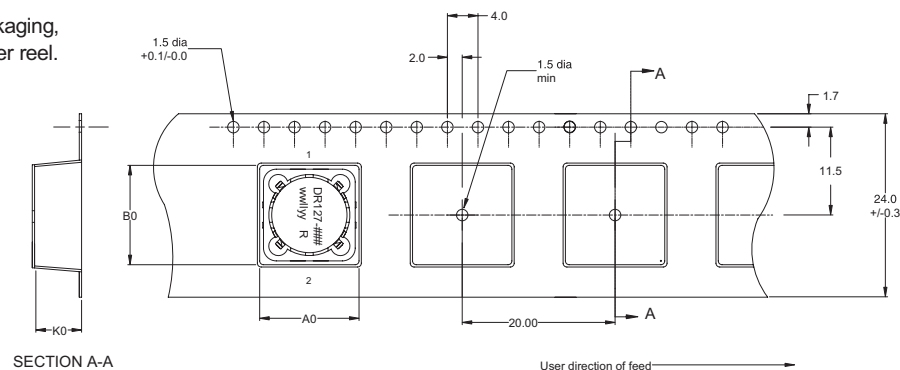
Ao=13.0mm
Bo=13.0mm
Ko=6.30mm

SECTION A-A



DR127

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



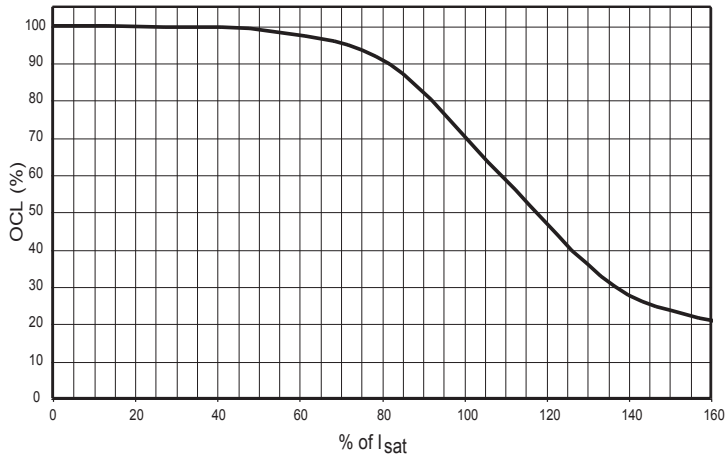
Ao=13.0mm
Bo=13.0mm
Ko=8.30mm

SECTION A-A

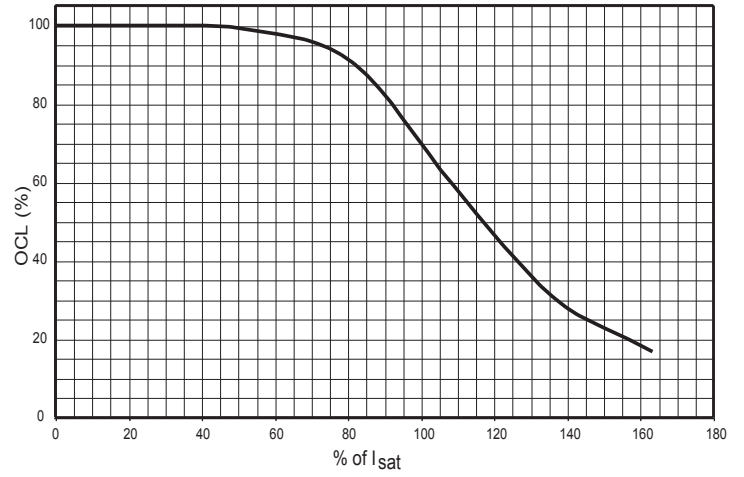


Inductance characteristics

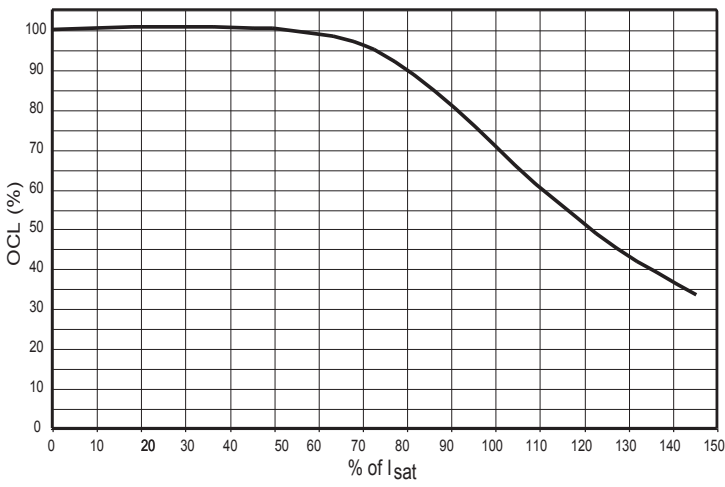
OCL vs I_{sat} DR73



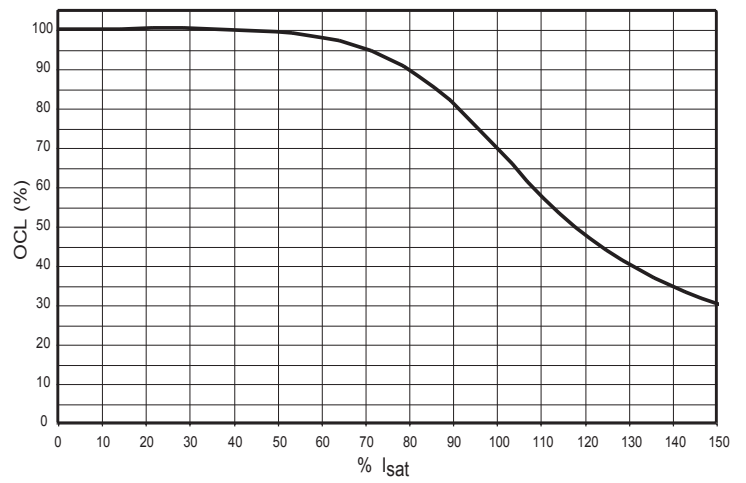
OCL vs I_{sat} DR74



OCL vs I_{sat} DR125

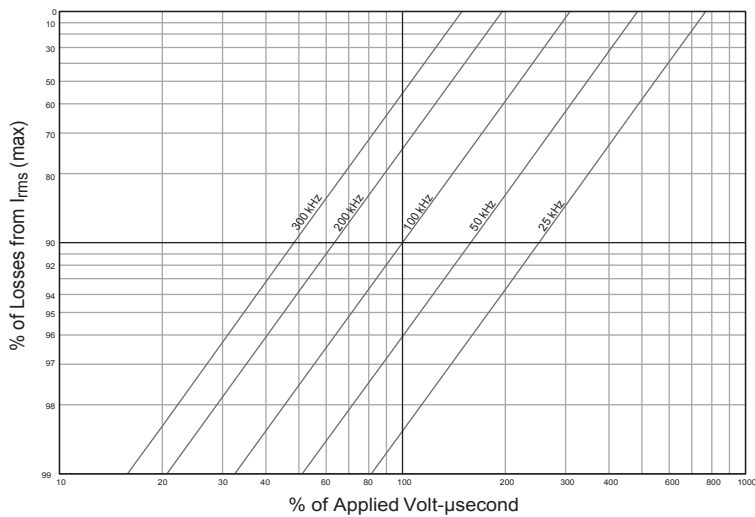


OCL vs I_{sat} DR127



Core loss

I_{rms} Derating with Core Loss



Solder Reflow Profile

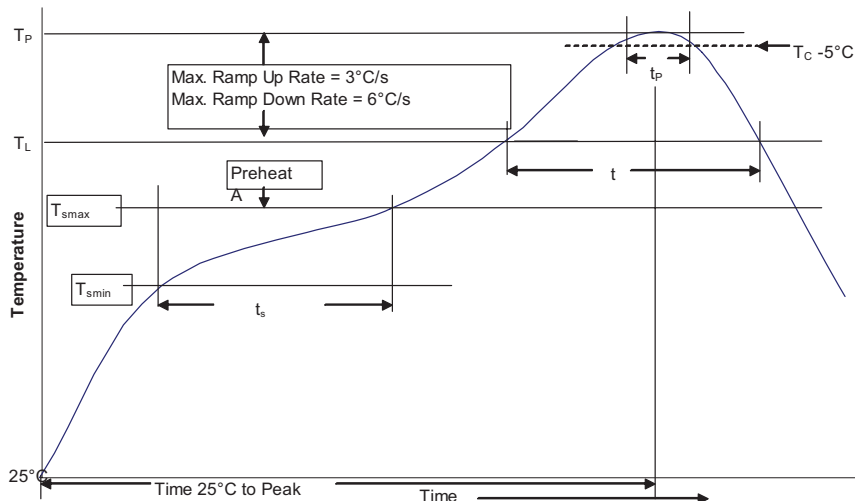


Table 1 - Standard SnPb Solder (T_c)

Package Thickness	Volume mm^3 <350	Volume mm^3 ≥ 350
<2.5mm	235°C	220°C
$\geq 2.5\text{mm}$	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
<1.6mm	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-020

Profile Feature	Standard SnPb Solder	Lead (Pb) Free Solder
Preheat and Soak	• Temperature min. (T_{smin})	100°C
	• Temperature max. (T_{smax})	150°C
	• Time (T_{smin} to T_{smax}) (t_s)	60-120 Seconds
Average ramp up rate T_{smax} to T_p	3°C/ Second Max.	3°C/ Second Max.
Liquidous temperature (T_L)	183°C	217°C
Time at liquidous (t_L)	60-150 Seconds	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.

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
www.eaton.com/electronics

© 2017 Eaton
All Rights Reserved Printed in USA
Publication No. 4315 BU-SB14112
September 2017