

DRQ

Dual winding, high power density, shielded drum core power inductors



Product features

- Dual winding inductors that can be used as either a single inductor, or in coupled inductor/transformer applications (1:1 turns ratio)
- Four sizes of shielded drum core inductors
- Windings can be connected in series or parallel, offering a broad range of inductance and current ratings
- Peak current ratings from 0.13 A to 56 A
- RMS current ratings from 0.128 A to 17.9 A
- Inductance ratings from 0.33 μ H to 4.02 mH
- 200 Vac Isolation between windings
- Ferrite core material

Applications

- Desktop and servers
- DVD and media players
- Portable and handheld devices
- LCD panels
- As a transformer: SEPIC, flyback
- As an inductor: buck, boost, coupled inductor
- DC-DC Converters
- VRM inductor for CPU and DDR power supplies
- Input and output 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) | Parallel Ratings | | | | | Series Ratings | | | | |
|-------------|-----------------------|----------------------------|-----------------------------------|--|-------------------------|-------------------------|----------------------------|-----------------------------------|--|-------------------------|-------------------------|
| | | OCL ¹ ±20% (μH) | I _{rms} ² (A) | I _{sat} ³ (A) Peak | DCR Ω ⁴ typ. | Volt ⁵ μ-sec | OCL ¹ ±20% (μH) | I _{rms} ² (A) | I _{sat} ³ (A) Peak | DCR Ω ⁴ typ. | Volt ⁵ μ-sec |
| DRQ73-R33-R | 0.33 | 0.306 | 6.19 | 14.4 | 0.0074 | 1.98 | 1.224 | 3.10 | 7.18 | 0.0296 | 3.96 |
| DRQ73-1R0-R | 1.00 | 0.992 | 5.25 | 7.97 | 0.0103 | 3.56 | 3.968 | 2.63 | 3.99 | 0.0411 | 7.12 |
| DRQ73-1R5-R | 1.50 | 1.482 | 4.64 | 6.52 | 0.0132 | 4.36 | 5.928 | 2.32 | 3.26 | 0.0527 | 8.72 |
| DRQ73-2R2-R | 2.20 | 2.070 | 4.11 | 5.52 | 0.0167 | 5.15 | 8.280 | 2.06 | 2.76 | 0.0669 | 10.3 |
| DRQ73-3R3-R | 3.30 | 3.540 | 3.31 | 4.22 | 0.0259 | 6.73 | 14.16 | 1.66 | 2.11 | 0.1035 | 13.5 |
| DRQ73-4R7-R | 4.70 | 4.422 | 3.09 | 3.78 | 0.0297 | 7.52 | 17.69 | 1.55 | 1.89 | 0.1188 | 15.0 |
| DRQ73-6R8-R | 6.80 | 6.480 | 2.55 | 3.12 | 0.0435 | 9.11 | 25.92 | 1.28 | 1.56 | 0.1742 | 18.2 |
| DRQ73-8R2-R | 8.20 | 8.930 | 2.19 | 2.66 | 0.0592 | 10.7 | 35.72 | 1.10 | 1.33 | 0.2368 | 21.4 |
| DRQ73-100-R | 10.0 | 10.30 | 2.08 | 2.47 | 0.0656 | 11.5 | 41.20 | 1.04 | 1.24 | 0.2623 | 23.0 |
| DRQ73-150-R | 15.0 | 15.01 | 1.83 | 2.05 | 0.0844 | 13.9 | 60.04 | 0.916 | 1.03 | 0.339 | 27.8 |
| DRQ73-220-R | 22.0 | 22.65 | 1.62 | 1.67 | 0.107 | 17.0 | 90.60 | 0.811 | 0.83 | 0.429 | 34.0 |
| DRQ73-330-R | 33.0 | 34.41 | 1.31 | 1.35 | 0.166 | 21.0 | 137.6 | 0.653 | 0.68 | 0.665 | 42.0 |
| DRQ73-470-R | 47.0 | 48.62 | 1.08 | 1.14 | 0.241 | 24.9 | 194.5 | 0.542 | 0.57 | 0.965 | 49.8 |
| DRQ73-680-R | 68.0 | 68.91 | 0.89 | 0.96 | 0.358 | 29.7 | 275.6 | 0.444 | 0.48 | 1.43 | 59.4 |
| DRQ73-820-R | 82.0 | 80.37 | 0.86 | 0.89 | 0.384 | 32.1 | 321.5 | 0.430 | 0.44 | 1.54 | 64.2 |
| DRQ73-101-R | 100 | 101.4 | 0.73 | 0.79 | 0.527 | 36.0 | 405.6 | 0.367 | 0.39 | 2.11 | 72.0 |
| DRQ73-151-R | 150 | 150.9 | 0.58 | 0.65 | 0.851 | 44.0 | 603.6 | 0.289 | 0.32 | 3.41 | 88.0 |
| DRQ73-221-R | 220 | 223.3 | 0.52 | 0.53 | 1.05 | 53.5 | 893.2 | 0.260 | 0.27 | 4.20 | 107 |
| DRQ73-331-R | 330 | 325.5 | 0.42 | 0.44 | 1.59 | 64.5 | 1302 | 0.211 | 0.22 | 6.36 | 129 |
| DRQ73-471-R | 470 | 465.8 | 0.35 | 0.37 | 2.36 | 77.2 | 1863 | 0.173 | 0.18 | 9.44 | 154 |
| DRQ73-681-R | 680 | 676.5 | 0.29 | 0.31 | 3.47 | 93.1 | 2706 | 0.143 | 0.15 | 13.88 | 186 |
| DRQ73-821-R | 820 | 821.7 | 0.27 | 0.28 | 3.93 | 103 | 3287 | 0.134 | 0.14 | 15.72 | 206 |
| DRQ73-102-R | 1000 | 995.0 | 0.26 | 0.25 | 4.34 | 113 | 3980 | 0.128 | 0.13 | 17.36 | 226 |

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It is recommended that the temperature of the part not exceed +125 °C.
- Peak current for approximately 30% roll-off at +20 °C
- DCR limits @ +20 °C
- Applied Volt-Time product (V-μs) across the inductor. This value represents the applied V-μs at 100 kHz necessary to generate a core loss equal to 10% of the total losses for a 40 °C temperature rise.

- Turns Ratio (1:3):(2-4) 1:1
- Part number definition: DRQxxx-yyy-
- DRQxxx = 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) | Parallel Ratings | | | | | Series Ratings | | | | |
|-------------|-----------------------|----------------------------|-----------------------------------|--|-------------------------|-------------------------|----------------------------|-----------------------------------|--|-------------------------|-------------------------|
| | | OCL ¹ ±20% (μH) | I _{rms} ² (A) | I _{sat} ³ (A) Peak | DCR Ω ⁴ Typ. | Volt ⁵ μ-sec | OCL ¹ ±20% (μH) | I _{rms} ² (A) | I _{sat} ³ (A) Peak | DCR Ω ⁴ Typ. | Volt ⁵ μ-sec |
| DRQ74-R33-R | 0.33 | 0.294 | 6.20 | 18.4 | 0.0074 | 1.71 | 1.176 | 3.10 | 9.18 | 0.0295 | 3.42 |
| DRQ74-1R0-R | 1.00 | 0.952 | 5.33 | 10.2 | 0.0100 | 3.08 | 3.808 | 2.66 | 5.10 | 0.0400 | 6.16 |
| DRQ74-1R5-R | 1.50 | 1.422 | 4.96 | 8.35 | 0.0115 | 3.76 | 5.688 | 2.48 | 4.17 | 0.0461 | 7.52 |
| DRQ74-2R2-R | 2.20 | 1.986 | 4.66 | 7.06 | 0.0130 | 4.45 | 7.944 | 2.33 | 3.53 | 0.0521 | 8.9 |
| DRQ74-3R3-R | 3.30 | 3.396 | 3.94 | 5.40 | 0.0183 | 5.81 | 13.58 | 1.97 | 2.70 | 0.0732 | 11.6 |
| DRQ74-4R7-R | 4.70 | 5.182 | 3.34 | 4.37 | 0.0254 | 7.18 | 20.73 | 1.67 | 2.19 | 0.102 | 14.4 |
| DRQ74-6R8-R | 6.80 | 7.344 | 2.60 | 3.67 | 0.0418 | 8.55 | 29.38 | 1.30 | 1.84 | 0.167 | 17.1 |
| DRQ74-8R2-R | 8.20 | 8.566 | 2.53 | 3.40 | 0.0441 | 9.23 | 34.26 | 1.27 | 1.70 | 0.177 | 18.5 |
| DRQ74-100-R | 10.0 | 9.882 | 2.41 | 3.17 | 0.0489 | 9.92 | 39.53 | 1.20 | 1.58 | 0.196 | 19.8 |
| DRQ74-150-R | 15.0 | 16.09 | 2.11 | 2.48 | 0.0637 | 12.7 | 64.36 | 1.05 | 1.24 | 0.255 | 25.4 |
| DRQ74-220-R | 22.0 | 21.73 | 1.75 | 2.13 | 0.0925 | 14.7 | 86.92 | 0.874 | 1.07 | 0.371 | 29.4 |
| DRQ74-330-R | 33.0 | 33.01 | 1.41 | 1.73 | 0.143 | 18.1 | 132.0 | 0.702 | 0.87 | 0.574 | 36.2 |
| DRQ74-470-R | 47.0 | 49.64 | 1.15 | 1.41 | 0.216 | 22.2 | 198.6 | 0.573 | 0.71 | 0.865 | 44.4 |
| DRQ74-680-R | 68.0 | 69.67 | 1.03 | 1.19 | 0.265 | 26.3 | 278.7 | 0.517 | 0.60 | 1.06 | 52.6 |
| DRQ74-820-R | 82.0 | 80.95 | 0.91 | 1.11 | 0.345 | 28.4 | 323.8 | 0.453 | 0.55 | 1.38 | 56.8 |
| DRQ74-101-R | 100 | 101.6 | 0.86 | 0.99 | 0.383 | 31.8 | 406.4 | 0.430 | 0.49 | 1.53 | 63.6 |
| DRQ74-151-R | 150 | 150.0 | 0.69 | 0.81 | 0.591 | 38.6 | 600.0 | 0.346 | 0.41 | 2.37 | 77.2 |
| DRQ74-221-R | 220 | 227.0 | 0.56 | 0.66 | 0.907 | 47.5 | 908.0 | 0.279 | 0.33 | 3.63 | 95 |
| DRQ74-331-R | 330 | 335.6 | 0.45 | 0.54 | 1.41 | 57.8 | 1342 | 0.224 | 0.27 | 5.66 | 116 |
| DRQ74-471-R | 470 | 465.3 | 0.40 | 0.46 | 1.74 | 68.1 | 1861 | 0.202 | 0.23 | 6.97 | 136 |
| DRQ74-681-R | 680 | 671.2 | 0.33 | 0.38 | 2.58 | 81.7 | 2685 | 0.166 | 0.19 | 10.3 | 163 |
| DRQ74-821-R | 820 | 812.7 | 0.31 | 0.35 | 2.93 | 89.9 | 3251 | 0.156 | 0.17 | 11.7 | 180 |
| DRQ74-102-R | 1000 | 1009 | 0.27 | 0.31 | 3.89 | 100 | 4036 | 0.135 | 0.16 | 15.6 | 200 |

1. Open Circuit Inductance Test Parameters: 100 kHz, 0.25 V_{rms}, 0.0 Adc
Parallel: (1,2 -4,3) Series: (1-4) tie (2-3)
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 approximately 30% roll-off at +20 °C
4. DCR limits @ +20 °C
5. Applied Volt-Time product (V-μs) across the inductor. This value represents the applied V-μs at 100 kHz necessary to generate a core loss equal to 10% of the total losses for a 40 °C temperature rise.

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7. Part number definition: DRQxxx-yyy-
- DRQxxx = product code and size,
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Product specifications

| Part Number | Rated Inductance (μH) | Parallel Ratings | | | | | Series Ratings | | | | |
|--------------|-----------------------|----------------------------|-----------------------------------|--|-------------------------|-------------------------|----------------------------|-----------------------------------|--|-------------------------|-------------------------|
| | | OCL ¹ ±20% (μH) | I _{rms} ² (A) | I _{sat} ³ (A) Peak | DCR Ω ⁴ typ. | Volt ⁵ μ-sec | OCL ¹ ±20% (μH) | I _{rms} ² (A) | I _{sat} ³ (A) Peak | DCR Ω ⁴ typ. | Volt ⁵ μ-sec |
| DRQ125-R47-R | 0.47 | 0.456 | 17.6 | 33.0 | 0.0018 | 3.17 | 1.824 | 8.80 | 16.5 | 0.0078 | 6.34 |
| DRQ125-1R0-R | 1.00 | 0.894 | 15.0 | 23.6 | 0.0024 | 4.43 | 3.576 | 7.51 | 11.8 | 0.0096 | 8.86 |
| DRQ125-1R5-R | 1.50 | 1.478 | 13.8 | 18.3 | 0.0029 | 5.70 | 5.912 | 6.89 | 9.15 | 0.0114 | 11.40 |
| DRQ125-2R2-R | 2.20 | 2.208 | 10.9 | 15.0 | 0.0045 | 6.97 | 8.832 | 5.46 | 7.50 | 0.0182 | 13.9 |
| DRQ125-3R3-R | 3.30 | 3.084 | 9.26 | 12.7 | 0.0063 | 8.23 | 12.34 | 4.63 | 6.35 | 0.0253 | 16.5 |
| DRQ125-4R7-R | 4.70 | 5.274 | 7.18 | 9.71 | 0.0105 | 10.8 | 21.10 | 3.59 | 4.86 | 0.0420 | 21.6 |
| DRQ125-6R8-R | 6.80 | 6.588 | 6.64 | 8.68 | 0.0123 | 12.0 | 26.35 | 3.32 | 4.34 | 0.0492 | 24.0 |
| DRQ125-8R2-R | 8.20 | 8.048 | 5.54 | 7.86 | 0.0176 | 13.3 | 32.19 | 2.77 | 3.93 | 0.0705 | 26.6 |
| DRQ125-100-R | 10.0 | 9.654 | 5.35 | 7.17 | 0.0189 | 14.6 | 38.62 | 2.67 | 3.59 | 0.0757 | 29.2 |
| DRQ125-150-R | 15.0 | 15.35 | 4.27 | 5.69 | 0.0298 | 18.4 | 61.40 | 2.13 | 2.85 | 0.120 | 36.8 |
| DRQ125-220-R | 22.0 | 22.36 | 3.70 | 4.71 | 0.0396 | 22.2 | 89.44 | 1.84 | 2.36 | 0.159 | 44.4 |
| DRQ125-330-R | 33.0 | 33.74 | 3.28 | 3.84 | 0.0505 | 27.2 | 135.0 | 1.64 | 1.92 | 0.203 | 54.4 |
| DRQ125-470-R | 47.0 | 47.47 | 2.71 | 3.24 | 0.0740 | 32.3 | 189.9 | 1.35 | 1.62 | 0.297 | 64.6 |
| DRQ125-680-R | 68.0 | 67.91 | 2.22 | 2.70 | 0.101 | 38.6 | 271.6 | 1.11 | 1.35 | 0.440 | 77.2 |
| DRQ125-820-R | 82.0 | 86.89 | 2.05 | 2.39 | 0.128 | 43.7 | 347.6 | 1.03 | 1.20 | 0.515 | 87.4 |
| DRQ125-101-R | 100 | 102.7 | 1.78 | 2.20 | 0.170 | 47.5 | 410.8 | 0.892 | 1.10 | 0.682 | 95.0 |
| DRQ125-151-R | 150 | 151.1 | 1.48 | 1.81 | 0.248 | 57.6 | 604.4 | 0.739 | 0.905 | 0.991 | 115.2 |
| DRQ125-221-R | 220 | 216.8 | 1.19 | 1.51 | 0.384 | 69.0 | 867.2 | 0.594 | 0.755 | 1.54 | 138 |
| DRQ125-331-R | 330 | 332.6 | 1.06 | 1.22 | 0.482 | 85.5 | 1330 | 0.530 | 0.610 | 1.93 | 171 |
| DRQ125-471-R | 470 | 473.1 | 0.87 | 1.02 | 0.718 | 102 | 1892 | 0.434 | 0.510 | 2.87 | 204 |
| DRQ125-681-R | 680 | 679.8 | 0.70 | 0.85 | 1.10 | 122 | 2719 | 0.350 | 0.425 | 4.42 | 244 |
| DRQ125-821-R | 820 | 828.0 | 0.60 | 0.77 | 1.49 | 135 | 3312 | 0.301 | 0.385 | 5.96 | 270 |
| DRQ125-102-R | 1000 | 1008 | 0.57 | 0.70 | 1.69 | 149 | 4032 | 0.283 | 0.350 | 6.76 | 298 |

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Product specifications

| Part Number | Rated Inductance (μH) | Parallel Ratings | | | | | Series Ratings | | | | |
|--------------|-----------------------|----------------------------|-----------------------------------|--|-------------------------|-------------------------|----------------------------|-----------------------------------|--|-------------------------|-------------------------|
| | | OCL ¹ ±20% (μH) | I _{rms} ² (A) | I _{sat} ³ (A) Peak | DCR Ω ⁴ typ. | Volt ⁵ μ-sec | OCL ¹ ±20% (μH) | I _{rms} ² (A) | I _{sat} ³ (A) Peak | DCR Ω ⁴ typ. | Volt ⁵ μ-sec |
| DRQ127-R47-R | 0.47 | 0.419 | 17.9 | 56.0 | 0.00195 | 3.50 | 1.676 | 8.94 | 28 | 0.0078 | 7.00 |
| DRQ127-1R0-R | 1.00 | 0.821 | 15.5 | 40.0 | 0.00261 | 4.90 | 3.284 | 7.74 | 20 | 0.0104 | 9.80 |
| DRQ127-1R5-R | 1.50 | 1.357 | 13.5 | 31.1 | 0.00341 | 6.30 | 5.428 | 6.77 | 15.6 | 0.0137 | 12.60 |
| DRQ127-2R2-R | 2.20 | 2.027 | 12.5 | 25.5 | 0.00373 | 7.70 | 8.108 | 6.23 | 12.7 | 0.0161 | 15.4 |
| DRQ127-3R3-R | 3.30 | 2.831 | 10.4 | 21.5 | 0.00567 | 9.10 | 11.32 | 5.23 | 10.8 | 0.0229 | 18.2 |
| DRQ127-4R7-R | 4.70 | 4.841 | 8.25 | 16.5 | 0.00917 | 11.9 | 19.36 | 4.13 | 8.24 | 0.0367 | 23.8 |
| DRQ127-6R8-R | 6.80 | 7.387 | 7.34 | 13.3 | 0.0116 | 14.7 | 29.55 | 3.67 | 6.67 | 0.0465 | 29.4 |
| DRQ127-8R2-R | 8.20 | 8.861 | 6.32 | 12.2 | 0.0157 | 16.1 | 35.44 | 3.16 | 6.09 | 0.0627 | 32.2 |
| DRQ127-100-R | 10.0 | 10.47 | 6.04 | 11.2 | 0.0172 | 17.5 | 41.88 | 3.02 | 5.60 | 0.0686 | 35.0 |
| DRQ127-150-R | 15.0 | 14.09 | 5.03 | 9.66 | 0.0247 | 20.3 | 56.36 | 2.51 | 4.83 | 0.0990 | 40.6 |
| DRQ127-220-R | 22.0 | 22.93 | 4.00 | 7.57 | 0.0391 | 25.9 | 91.72 | 2.00 | 3.78 | 0.157 | 51.8 |
| DRQ127-330-R | 33.0 | 33.92 | 3.23 | 6.22 | 0.0600 | 31.5 | 135.7 | 1.61 | 3.11 | 0.241 | 63.0 |
| DRQ127-470-R | 47.0 | 47.05 | 2.95 | 5.28 | 0.0719 | 37.1 | 188.2 | 1.47 | 2.64 | 0.288 | 74.2 |
| DRQ127-680-R | 68.0 | 66.48 | 2.44 | 4.44 | 0.105 | 44.1 | 265.9 | 1.22 | 2.22 | 0.421 | 88.2 |
| DRQ127-820-R | 82.0 | 79.75 | 2.09 | 4.06 | 0.143 | 48.3 | 319.0 | 1.04 | 2.03 | 0.573 | 96.6 |
| DRQ127-101-R | 100 | 99.31 | 1.96 | 3.64 | 0.163 | 53.9 | 397.2 | 0.980 | 1.82 | 0.653 | 107.8 |
| DRQ127-151-R | 150 | 144.9 | 1.59 | 3.01 | 0.247 | 65.1 | 579.6 | 0.796 | 1.51 | 0.989 | 130.2 |
| DRQ127-221-R | 220 | 221.5 | 1.29 | 2.43 | 0.376 | 80.5 | 886.0 | 0.645 | 1.22 | 1.50 | 161 |
| DRQ127-331-R | 330 | 323.6 | 1.04 | 2.01 | 0.574 | 97.3 | 1294 | 0.522 | 1.01 | 2.30 | 195 |
| DRQ127-471-R | 470 | 467.1 | 0.85 | 1.68 | 0.861 | 117 | 1868 | 0.427 | 0.838 | 3.44 | 234 |
| DRQ127-681-R | 680 | 676.7 | 0.76 | 1.39 | 1.08 | 141 | 2707 | 0.380 | 0.697 | 4.32 | 282 |
| DRQ127-821-R | 820 | 818.1 | 0.65 | 1.27 | 1.47 | 155 | 3272 | 0.325 | 0.633 | 5.88 | 310 |
| DRQ127-102-R | 1000 | 1005 | 0.61 | 1.14 | 1.66 | 172 | 4020 | 0.307 | 0.571 | 6.64 | 344 |

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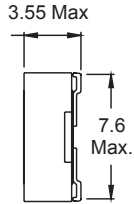
Dimensions - mm

DRQ73

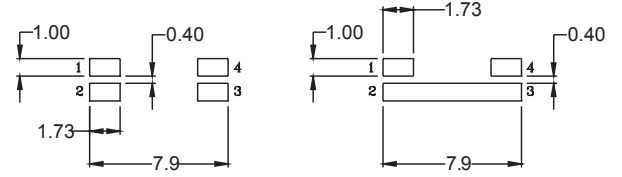
Top View



Side View



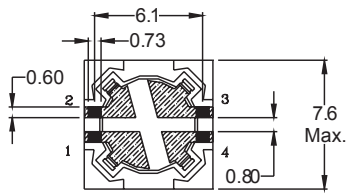
Recommended Pad Layout



Dual Inductor Mode

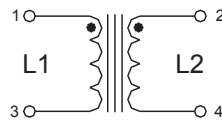
Series Mode

Bottom View

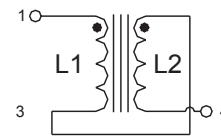


Schematic

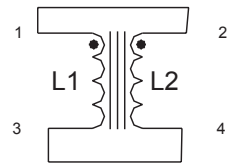
Dual Inductor



Series Mode



Parallel Mode

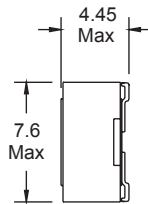


DRQ74

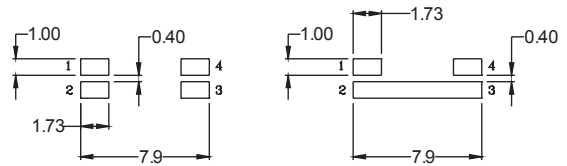
Top View



Side View



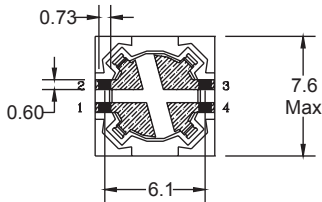
Recommended Pad Layout



Dual Inductor Mode

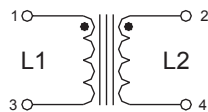
Series Mode

Bottom View

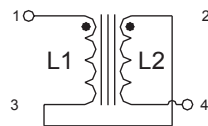


Schematic

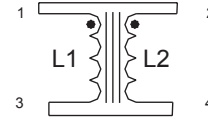
Dual Inductor



Series Mode



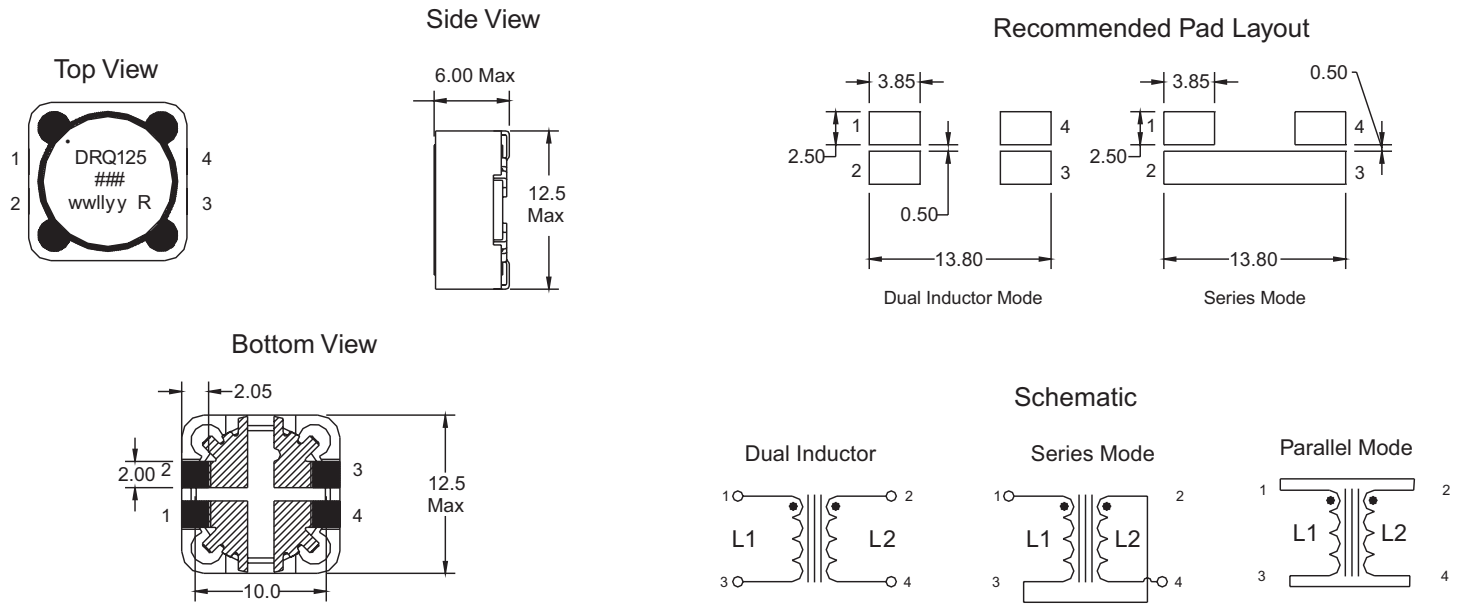
Parallel Mode



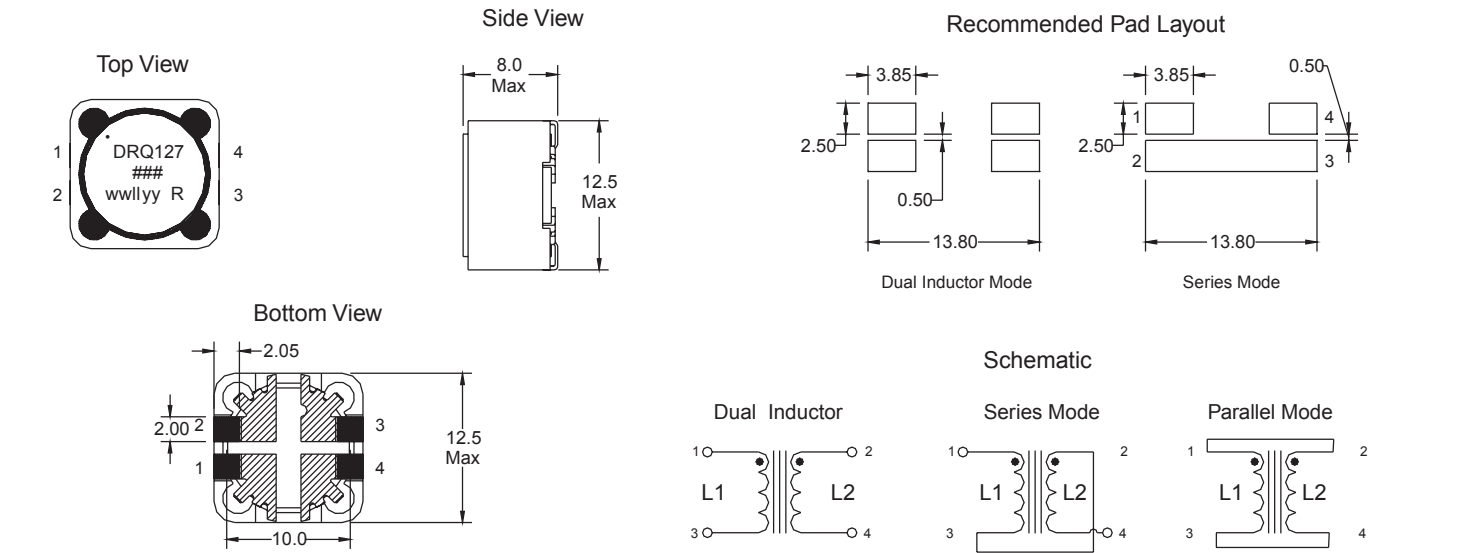
= Inductance value per family chart
wlyy = Date code
R = Revision level
Dot indicates pin #1
Do not route traces or vias underneath the inductor

Dimensions - mm

DRQ125



DRQ127



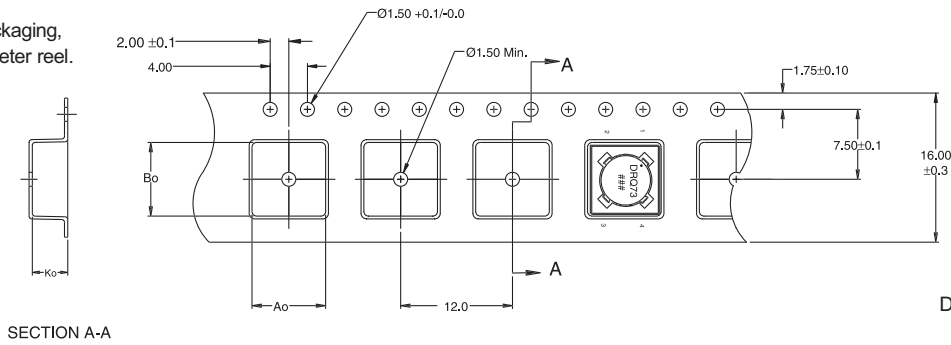
= Inductance value per family chart
 wwllly = (date code)
 R = revision level
 Dot indicates pin #1
 Do not route traces or vias underneath the inductor

Packaging information- mm

DRQ73

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

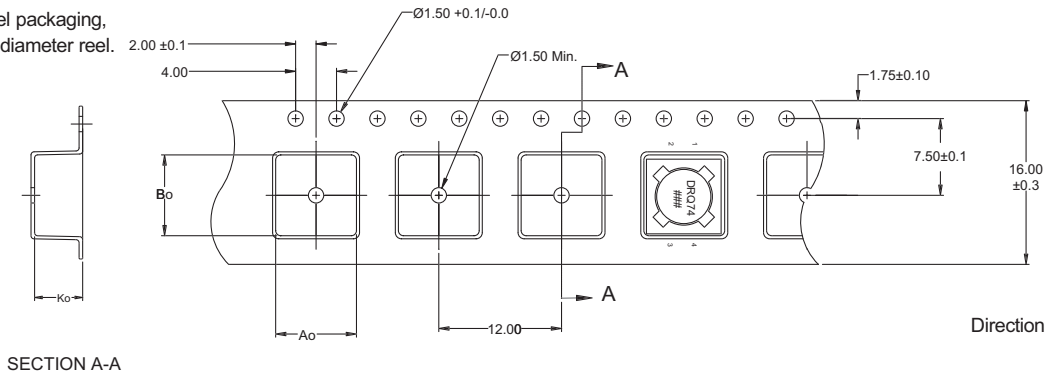
Ao=7.90mm
Bo=7.90mm
Ko=3.80mm



DRQ74

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

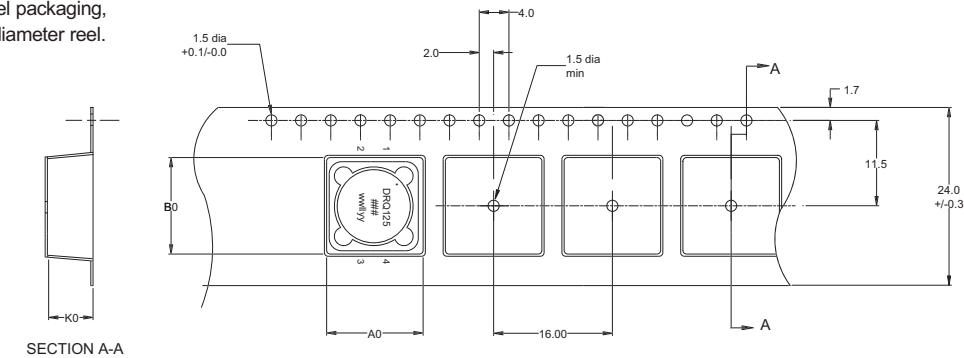
Ao=7.90mm
Bo=7.90mm
Ko=4.70mm



DRQ125

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

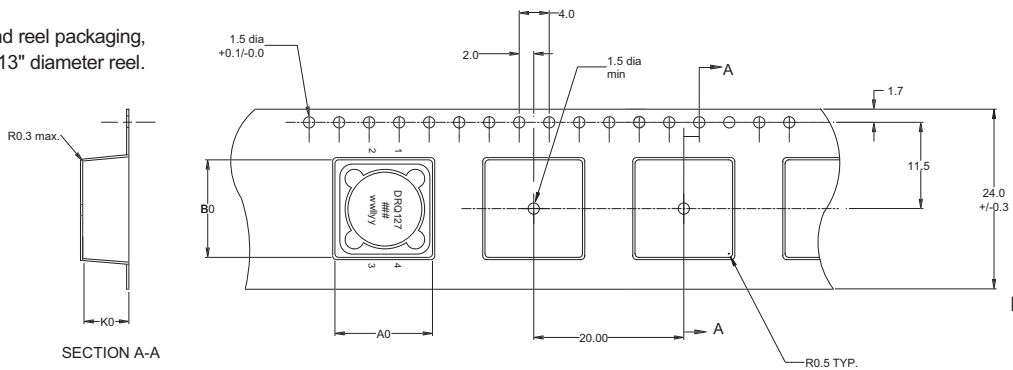
Ao=13.00mm
Bo=13.00mm
Ko=6.30mm



DRQ127

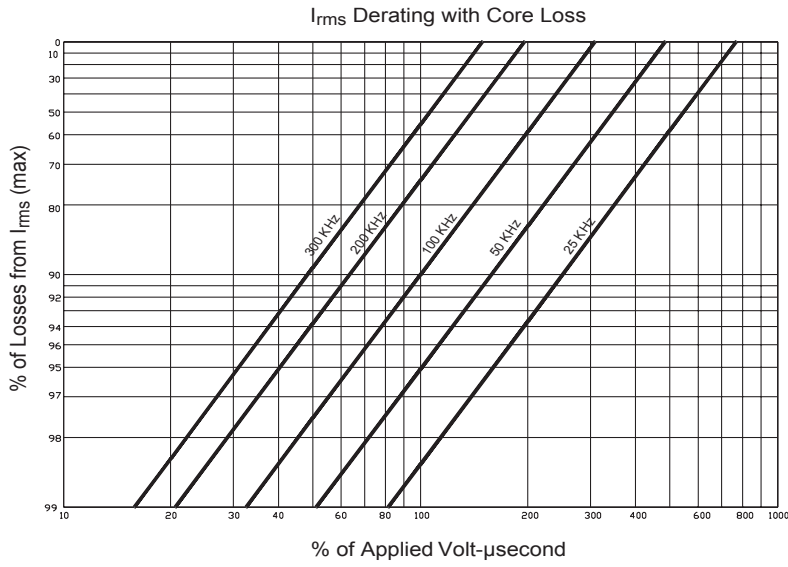
Supplied in tape and reel packaging,
350 parts per reel, 13" diameter reel.

Ao=13.00mm
Bo=13.00mm
Ko=8.30mm



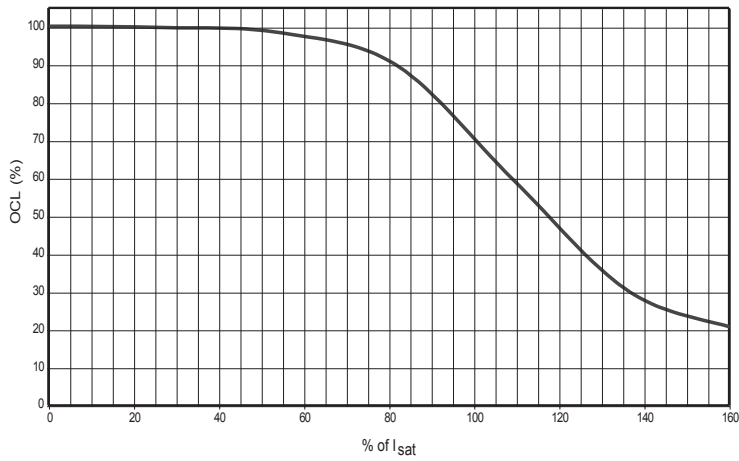
Dimensions are in millimeters.

Core loss

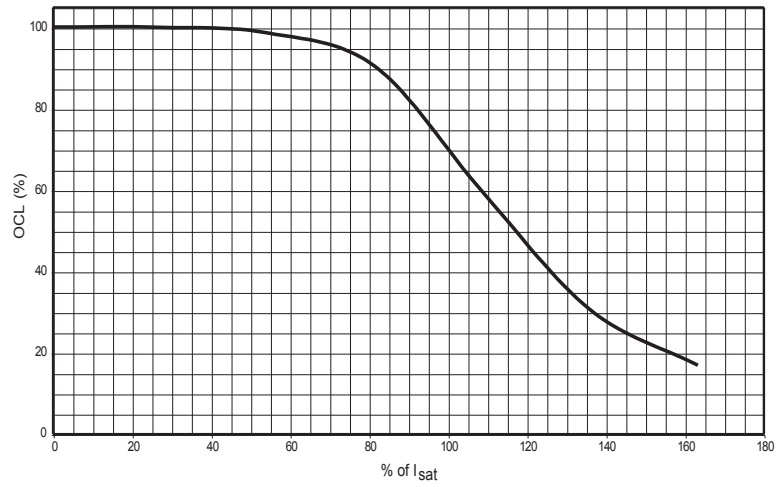


Inductance characteristics

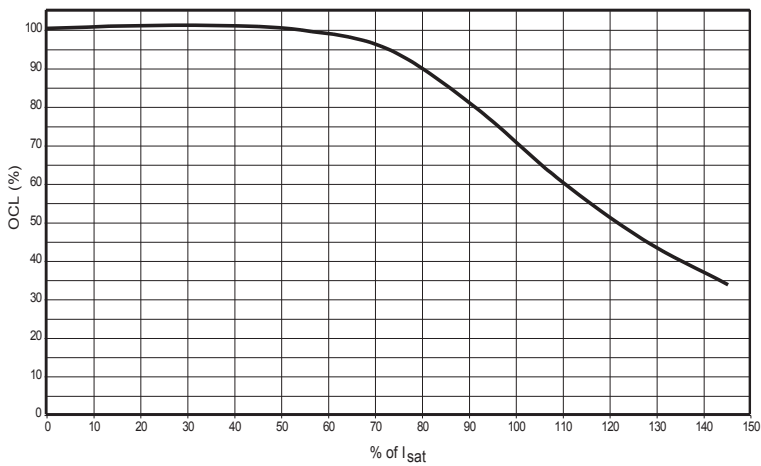
DRQ73



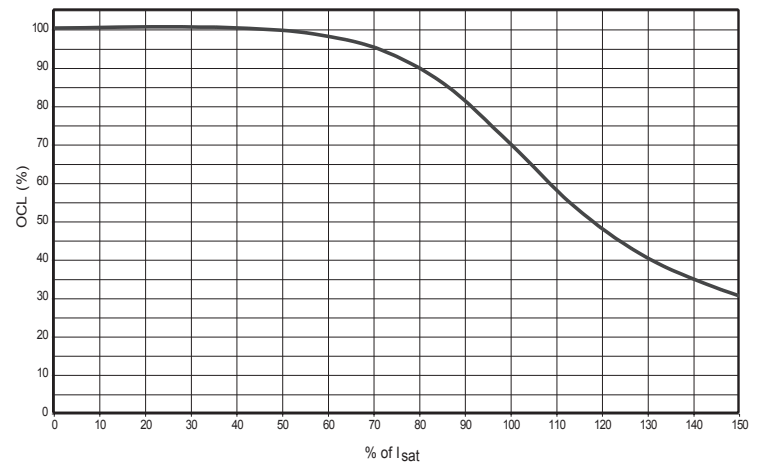
DRQ74



DRQ125



DRQ127



Solder Reflow Profile

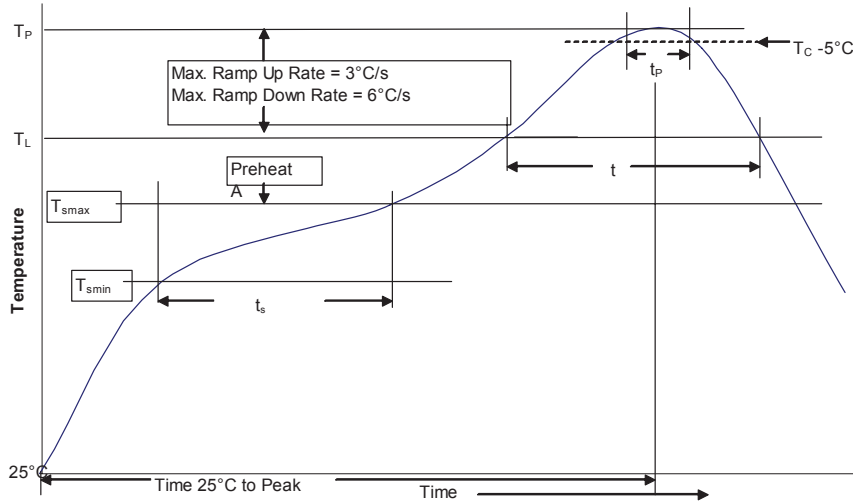


Table 1 - Standard SnPb Solder (T_c)

| Package Thickness | Volume ≤ 350 mm ³ | Volume ≥ 350 mm ³ |
|-------------------|-----------------------------------|-----------------------------------|
| <2.5mm | 235°C | 220°C |
| ≥ 2.5 mm | 220°C | 220°C |

Table 2 - Lead (Pb) Free Solder (T_c)

| Package Thickness | Volume ≤ 350 mm ³ | Volume 350 - 2000 mm ³ | Volume > 2000 mm ³ |
|-------------------|-----------------------------------|-----------------------------------|---------------------------------|
| <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 | 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) | 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.

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