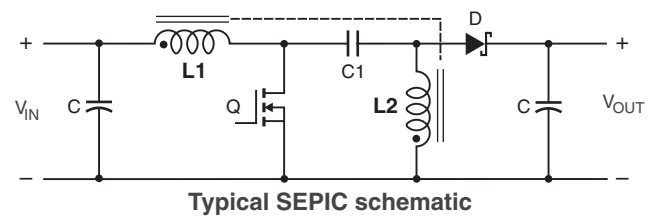


# Shielded Coupled Inductors MSD1048



- Tight coupling ( $k \geq 0.97$ )
- 200 V isolation
- Ideal for use in a variety of circuits including flyback, multi-output buck, SEPIC, Cuk and Zeta.
- High efficiency and excellent current handling
- Can also be used as two single inductors connected in series or parallel, as a common mode choke or as a 1 : 1 transformer.



\* For optional tin-lead and tin-silver-copper terminations, dimensions are for the mounted part. Dimensions before mounting can be an additional 0.012 inch (0,3 mm).

Dimensions are in  $\frac{\text{inches}}{\text{mm}}$



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# Shielded Coupled Inductors – MSD1048 Series

| Part number <sup>1</sup> | Inductance <sup>2</sup><br>( $\mu$ H) | DCR max <sup>3</sup><br>(Ohms) | SRF typ <sup>4</sup><br>(MHz) | Coupling coefficient typ | Leakage Inductance <sup>5</sup><br>typ ( $\mu$ H) | Isat <sup>6</sup><br>(A) | Irms (A)                   |                          |
|--------------------------|---------------------------------------|--------------------------------|-------------------------------|--------------------------|---|--------------------------|----------------------------|--------------------------|
|                          |                                       |                                |                               |                          |   |                          | both windings <sup>7</sup> | one winding <sup>8</sup> |
| MSD1048-222NE_           | 2.2 $\pm$ 30%                         | 0.019                          | 65                            | 0.97                     | 0.30  | 9.1                      | 2.4                        | 3.4                      |
| MSD1048-103ME_           | 10 $\pm$ 20%                          | 0.053                          | 27                            | >0.99                    | 0.40  | 4.3                      | 1.5                        | 2.1                      |
| MSD1048-223ME_           | 22 $\pm$ 20%                          | 0.098                          | 17                            | >0.99                    | 0.45  | 2.9                      | 1.3                        | 1.9                      |
| MSD1048-473ME_           | 47 $\pm$ 20%                          | 0.208                          | 12                            | >0.99                    | 0.50  | 2.0                      | 1.1                        | 1.6                      |
| MSD1048-683ME_           | 68 $\pm$ 20%                          | 0.297                          | 9.0                           | >0.99                    | 0.55  | 1.7                      | 1.0                        | 1.4                      |
| MSD1048-104ME_           | 100 $\pm$ 20%                         | 0.387                          | 7.3                           | >0.99                    | 0.80  | 1.3                      | 0.85                       | 1.2                      |
| MSD1048-224KE_           | 220 $\pm$ 10%                         | 0.840                          | 4.8                           | >0.99                    | 1.0   | 0.90                     | 0.62                       | 0.87                     |

1. When ordering, please specify **termination** and **packaging** codes:

**MSD1048-224KED**

**Termination:** **E** = RoHS compliant matte tin over nickel over phos bronze. Special order: **Q** = RoHS tin-silver-copper (95.5/4/0.5) or **P** = non-RoHS tin-lead (63/37).

**Packaging:** **D** = 13" machine-ready reel. EIA-481 embossed plastic tape. (800 parts per full reel).

**B** = Less than full reel. In tape, but not machine ready. To have a leader and trailer added (\$25 charge), use code letter D instead.

- Inductance shown for each winding, measured at 100 kHz, 0.1 Vrms, 0 Adc on an Agilent/HP 4284A LCR meter or equivalent. When leads are connected in parallel, inductance is the same value. When leads are connected in series, inductance is four times the value.
- DCR is for each winding. When leads are connected in parallel, DCR is half the value. When leads are connected in series, DCR is twice the value.
- SRF measured using an Agilent/HP 4191A or equivalent. When leads are connected in parallel, SRF is the same value.
- Leakage Inductance is for L1 and is measured with L2 shorted.
- DC current at 25°C that causes a 30% (typ) inductance drop from its value without current. It is the sum of the current flowing in both windings.
- Equal current when applied to each winding simultaneously that causes a 40°C temperature rise from 25°C ambient. This information is for reference only and does not represent absolute maximum ratings. To predict temperature rise [go to online calculator](#).
- Maximum current when applied to one winding that causes a 40°C temperature rise from 25°C ambient. This information is for reference only and does not represent absolute maximum ratings. To predict temperature rise [go to online calculator](#).
- Electrical specifications at 25°C. Refer to Doc 639 "Selecting Coupled Inductors for SEPIC Applications." Refer to Doc 362 "Soldering Surface Mount Components" before soldering.

## Coupled Inductor Core and Winding Loss Calculator

This web-based utility allows you to enter frequency, peak-to-peak (ripple) current, and Irms current to predict temperature rise and overall losses, including core loss. [Go to online calculator](#).

**Core material** Ferrite

**Core and winding loss** [Go to online calculator](#)

**Terminations** RoHS compliant matte tin over nickel over phos bronze. Other terminations available at additional cost.

**Weight:** 1.5– 1.8 g

**Ambient temperature** –40°C to +85°C with (40°C rise) Irms current.

**Maximum part temperature** +125°C (ambient + temp rise).

**Storage temperature** Component: –40°C to +125°C. Tape and reel packaging: –40°C to +80°C

**Winding-to-winding isolation** 200 Vrms, one minute

**Resistance to soldering heat** Max three 40 second reflows at +260°C, parts cooled to room temperature between cycles

**Moisture Sensitivity Level (MSL)** 1 (unlimited floor life at <30°C / 85% relative humidity)

**Failures in Time (FIT) / Mean Time Between Failures (MTBF)**

38 per billion hours / 26,315,789 hours, calculated per Telcordia SR-332

**Packaging** 800/13" reel Plastic tape: 24 mm wide, 0.35 mm thick, 16 mm pocket spacing, 5.1 mm pocket depth

**PCB washing** Tested to MIL-STD-202 Method 215 plus an additional aqueous wash. See [Doc787\\_PCB\\_Washing.pdf](#).



# Shielded Coupled Inductors – MSD1048 Series

## L vs Current



## L vs Frequency

