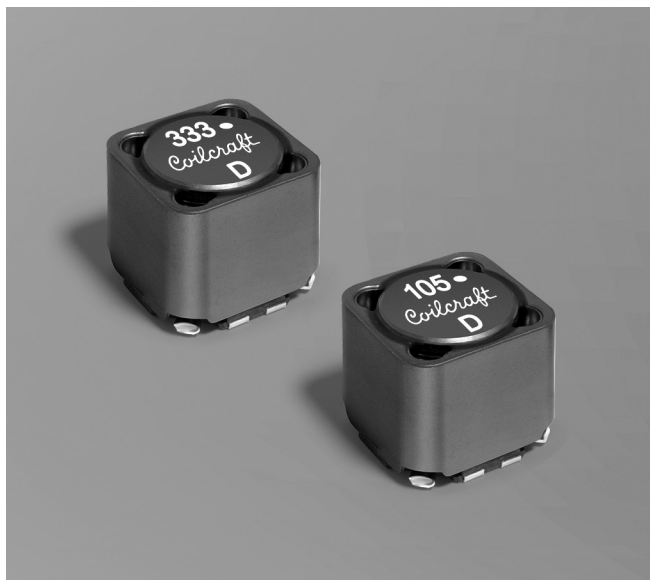




# Coupled Inductors MSD1514



**Core material** Ferrite

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

**Environmental** RoHS compliant, halogen free

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

**Weight:** 9.0 – 11.8 g

**Ambient temperature**  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  with  $(40^{\circ}\text{C}$  rise) Irms current.

**Maximum part temperature**  $+125^{\circ}\text{C}$  (ambient + temp rise).

**Storage temperature** Component:  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ .

Tape and reel packaging:  $-40^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$

**Winding-to-winding isolation** 500 Vrms, one minute

**Resistance to soldering heat** Max three 40 second reflows at  $+260^{\circ}\text{C}$ , parts cooled to room temperature between cycles

**Moisture Sensitivity Level (MSL)** 1 (unlimited floor life at  $<30^{\circ}\text{C}$  / 85% relative humidity)

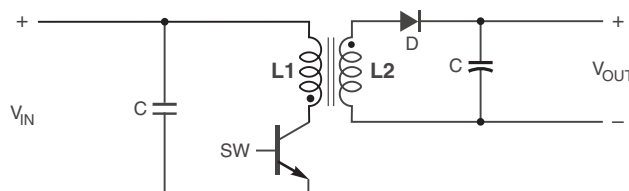
**Failures in Time (FIT) / Mean Time Between Failures (MTBF)**

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

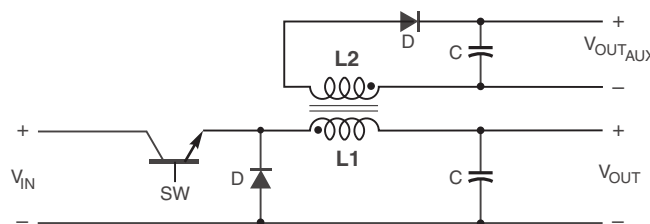
**Packaging** 175/13" reel; Plastic tape: 32 mm wide, 0.5 mm thick, 24 mm pocket spacing, 14.3 mm pocket depth

**PCB washing** Tested with pure water or alcohol only. For other solvents, see [Doc787\\_PCB\\_Washing.pdf](#).

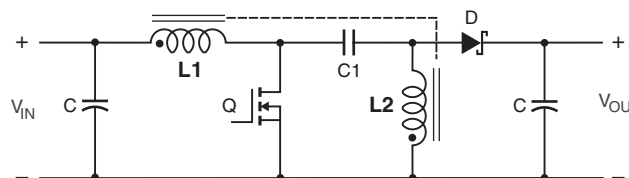
- Excellent coupling coefficient ( $k \geq 0.97$ )
- Ideal for use in a variety of circuits including flyback, multi-output buck, SEPIC, Zeta, and Ćuk.
- High inductance, high efficiency and excellent current handling.
- In SEPIC topologies, the required inductance for each winding is half the value needed for two separate inductors, allowing selection of a part with lower DCR and higher current handling.



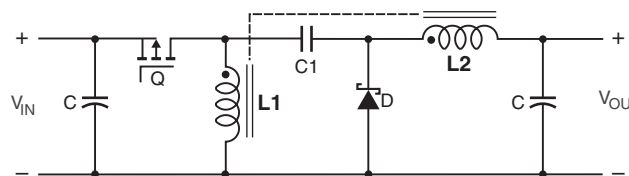
Typical Flyback Converter



Typical Buck Converter with auxiliary output



Typical SEPIC schematic



Typical Zeta schematic



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# MSD1514 Coupled Inductors

| Part number <sup>1</sup> | Inductance <sup>2</sup><br>( $\mu$ H) | DCR (Ohms) <sup>3</sup> |       | SRF<br>typ <sup>4</sup><br>(MHz) | Coupling<br>coefficient<br>typ | Leakage<br>inductance<br>typ ( $\mu$ H) | Isat (A) <sup>5</sup> |             |             | Irms (A)                      |                             |
|--------------------------|---------------------------------------|-------------------------|-------|----------------------------------|--------------------------------|-----------------------------------------|-----------------------|-------------|-------------|-------------------------------|-----------------------------|
|                          |                                       | typ                     | max   |                                  |                                |                                         | 10%<br>drop           | 20%<br>drop | 30%<br>drop | both<br>windings <sup>6</sup> | one<br>winding <sup>7</sup> |
| MSD1514-252ME_           | 2.5 $\pm$ 20%                         | 0.010                   | 0.012 | 34.0                             | 0.97                           | 0.20                                    | 25.0                  | 28.0        | 30.5        | 5.1                           | 7.8                         |
| MSD1514-472ME_           | 4.7 $\pm$ 20%                         | 0.012                   | 0.014 | 25.0                             | 0.98                           | 0.20                                    | 19.5                  | 21.8        | 23.7        | 4.5                           | 7.6                         |
| MSD1514-103ME_           | 10 $\pm$ 20%                          | 0.015                   | 0.018 | 16.5                             | 0.99                           | 0.40                                    | 13.4                  | 15.0        | 16.2        | 4.0                           | 6.8                         |
| MSD1514-123ME_           | 12 $\pm$ 20%                          | 0.018                   | 0.022 | 14.5                             | 0.99                           | 0.40                                    | 12.2                  | 13.7        | 14.8        | 3.7                           | 6.6                         |
| MSD1514-153ME_           | 15 $\pm$ 20%                          | 0.024                   | 0.028 | 11.0                             | >0.99                          | 0.42                                    | 10.9                  | 12.2        | 13.3        | 3.4                           | 5.8                         |
| MSD1514-223ME_           | 22 $\pm$ 20%                          | 0.031                   | 0.036 | 10.0                             | >0.99                          | 0.45                                    | 9.00                  | 10.1        | 11.0        | 3.0                           | 5.1                         |
| MSD1514-273ME_           | 27 $\pm$ 20%                          | 0.034                   | 0.039 | 8.50                             | >0.99                          | 0.45                                    | 8.14                  | 9.13        | 9.90        | 2.95                          | 4.7                         |
| MSD1514-333ME_           | 33 $\pm$ 20%                          | 0.045                   | 0.052 | 7.20                             | >0.99                          | 0.45                                    | 7.40                  | 8.20        | 9.00        | 2.55                          | 3.9                         |
| MSD1514-473ME_           | 47 $\pm$ 20%                          | 0.065                   | 0.075 | 5.60                             | >0.99                          | 0.55                                    | 6.20                  | 6.90        | 7.50        | 2.20                          | 3.45                        |
| MSD1514-683ME_           | 68 $\pm$ 20%                          | 0.078                   | 0.090 | 5.20                             | >0.99                          | 0.55                                    | 5.10                  | 5.70        | 6.20        | 2.00                          | 3.20                        |
| MSD1514-104KE_           | 100 $\pm$ 10%                         | 0.115                   | 0.126 | 3.80                             | >0.99                          | 0.55                                    | 4.20                  | 4.75        | 5.15        | 1.65                          | 2.50                        |
| MSD1514-224KE_           | 220 $\pm$ 10%                         | 0.261                   | 0.287 | 2.30                             | >0.99                          | 0.70                                    | 2.85                  | 3.20        | 3.50        | 1.10                          | 1.70                        |
| MSD1514-334KE_           | 330 $\pm$ 10%                         | 0.334                   | 0.367 | 2.10                             | >0.99                          | 0.80                                    | 2.33                  | 2.61        | 2.83        | 0.98                          | 1.55                        |
| MSD1514-474KE_           | 470 $\pm$ 10%                         | 0.500                   | 0.550 | 1.65                             | >0.99                          | 1.2                                     | 1.95                  | 2.20        | 2.40        | 0.77                          | 1.30                        |
| MSD1514-105KE_           | 1000 $\pm$ 10%                        | 1.12                    | 1.25  | 1.10                             | >0.99                          | 2.0                                     | 1.34                  | 1.50        | 1.63        | 0.55                          | 0.77                        |

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

## MSD1514-105KED

**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 (175 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.
- DC current at which the inductance drops the specified amount 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.  
[Click for temperature derating information.](#)
- 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.  
[Click for temperature derating information.](#)
- 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.

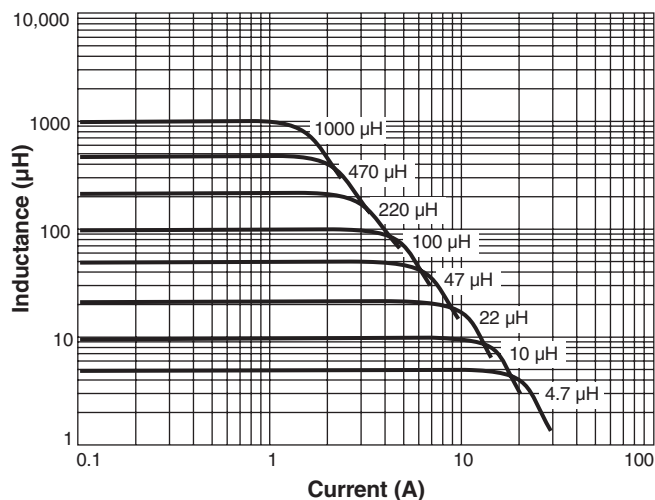
## Coupled Inductor Core and Winding Loss Calculator

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.](#)

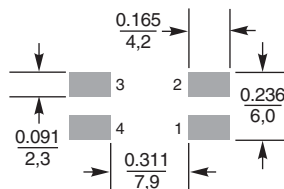
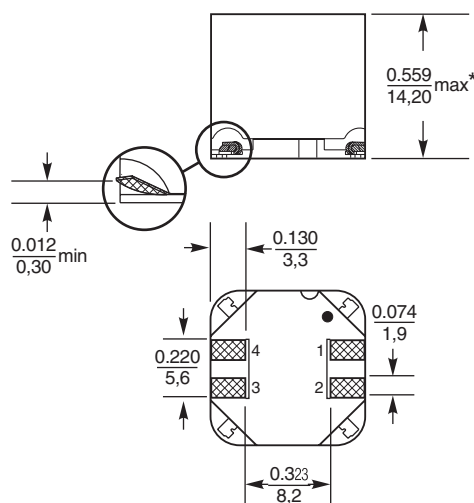
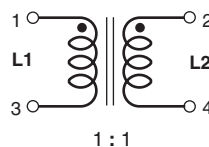
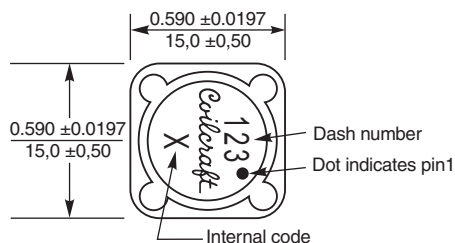
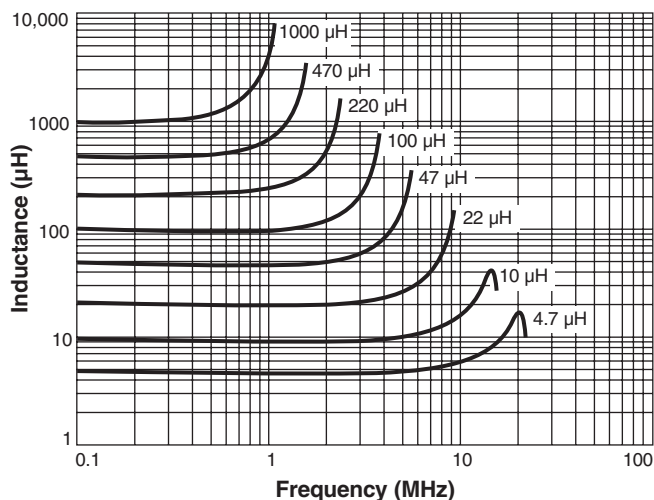


# MSD1514 Coupled Inductors

## Typical L vs Current



## Typical L vs Frequency



**Recommended Land Pattern**

\* 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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