

# 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)

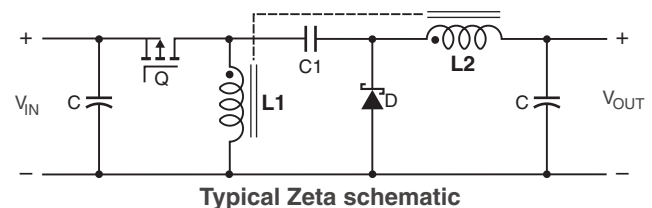
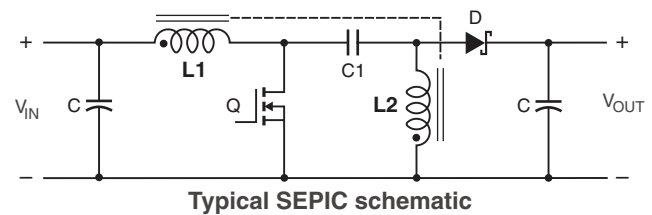
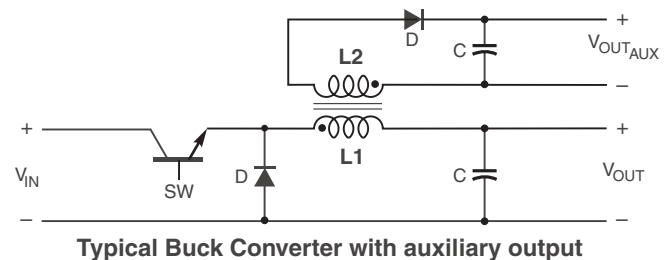
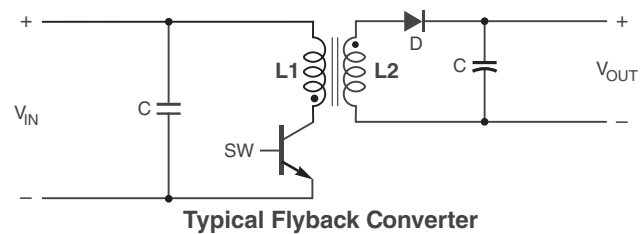
**Failures in Time (FIT) / Mean Time Between Failures (MTBF)**

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.





# MSD1514 Coupled Inductors

Part number <sup>1</sup>	Inductance <sup>2</sup> ( $\mu$ H)	DCR (Ohms) <sup>3</sup>		SRF typ <sup>4</sup> (MHz)	Coupling coefficient typ	Leakage inductance typ ( $\mu$ H)	Isat (A) <sup>5</sup>			Irms (A)	
		typ	max				10% drop	20% drop	30% drop	both windings <sup>6</sup>	one 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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