

# Coupled Inductors MSD1278T For high temperature applications



The MSD1278T series of shielded coupled inductors was designed specifically for high temperature applications – up to 125°C ambient.

Tight coupling ( $k \geq 0.98$ ) and 500 V isolation make them ideal for use in a variety of circuits including flyback, multi-output buck, SEPIC and Zeta. These parts provide high inductance, high efficiency and excellent current handling. They can also be used as two single inductors connected in series or parallel or as a common mode choke.

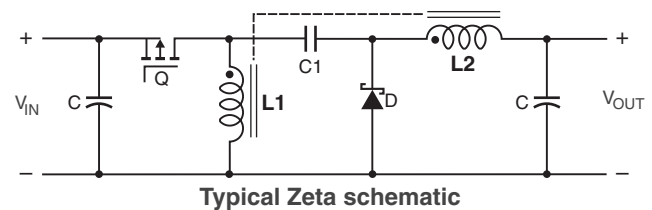
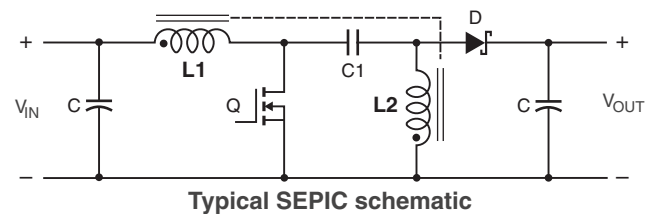


### Recommended Land Pattern



\* 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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# High Temperature Coupled Inductors – MSD1278T

| Part number <sup>1</sup> | Inductance <sup>2</sup><br>( $\mu$ H) | DCR<br>max <sup>3</sup><br>(Ohms) | SRF<br>typ <sup>4</sup><br>(MHz) | Coupling<br>coefficient<br>typ | Leakage<br>L typ <sup>5</sup><br>( $\mu$ H) | Isat (A) <sup>6</sup> |             |             | Irms (A)                      |                             |
|--------------------------|---------------------------------------|-----------------------------------|----------------------------------|--------------------------------|---|-----------------------|-------------|-------------|-------------------------------|-----------------------------|
|                          |                                       |                                   |                                  |                                |   | 10%<br>drop           | 20%<br>drop | 30%<br>drop | both<br>windings <sup>7</sup> | one<br>winding <sup>8</sup> |
| MSD1278T-472ML_          | 4.7 $\pm$ 20%                         | 0.040                             | 33.0                             | 0.98                           | 0.22  | 13.90                 | 15.20       | 16.36       | 3.16                          | 4.47                        |
| MSD1278T-562ML_          | 5.6 $\pm$ 20%                         | 0.046                             | 30.0                             | 0.98                           | 0.23  | 13.38                 | 14.86       | 15.74       | 2.87                          | 4.06                        |
| MSD1278T-682ML_          | 6.8 $\pm$ 20%                         | 0.048                             | 23.0                             | 0.98                           | 0.22  | 12.10                 | 13.56       | 14.20       | 2.81                          | 3.98                        |
| MSD1278T-822ML_          | 8.2 $\pm$ 20%                         | 0.055                             | 20.0                             | 0.98                           | 0.34  | 10.30                 | 11.52       | 12.20       | 2.76                          | 3.90                        |
| MSD1278T-103ML_          | 10 $\pm$ 20%                          | 0.058                             | 17.0                             | 0.98                           | 0.34  | 8.80                  | 10.00       | 10.66       | 2.56                          | 3.62                        |
| MSD1278T-123ML_          | 12 $\pm$ 20%                          | 0.062                             | 15.0                             | 0.98                           | 0.36  | 8.20                  | 9.18        | 9.74        | 2.48                          | 3.50                        |
| MSD1278T-153ML_          | 15 $\pm$ 20%                          | 0.072                             | 13.0                             | 0.99                           | 0.41  | 7.40                  | 8.36        | 9.03        | 2.30                          | 3.25                        |
| MSD1278T-183ML_          | 18 $\pm$ 20%                          | 0.080                             | 12.0                             | 0.99                           | 0.37  | 6.50                  | 7.38        | 7.86        | 2.18                          | 3.08                        |
| MSD1278T-223ML_          | 22 $\pm$ 20%                          | 0.096                             | 11.0                             | 0.99                           | 0.41  | 6.00                  | 6.80        | 7.26        | 1.99                          | 2.81                        |
| MSD1278T-273ML_          | 27 $\pm$ 20%                          | 0.120                             | 10.0                             | 0.99                           | 0.43  | 5.80                  | 6.56        | 7.02        | 1.78                          | 2.52                        |
| MSD1278T-333ML_          | 33 $\pm$ 20%                          | 0.150                             | 9.5                              | 0.99                           | 0.56  | 5.50                  | 6.10        | 6.52        | 1.59                          | 2.25                        |
| MSD1278T-393ML_          | 39 $\pm$ 20%                          | 0.161                             | 8.5                              | 0.99                           | 0.64  | 4.70                  | 5.26        | 5.60        | 1.54                          | 2.18                        |
| MSD1278T-473ML_          | 47 $\pm$ 20%                          | 0.180                             | 7.5                              | 0.99                           | 0.70  | 3.70                  | 4.34        | 4.60        | 1.45                          | 2.05                        |
| MSD1278T-563ML_          | 56 $\pm$ 20%                          | 0.190                             | 7.0                              | 0.99                           | 0.76  | 3.60                  | 4.18        | 4.50        | 1.41                          | 2.00                        |
| MSD1278T-683ML_          | 68 $\pm$ 20%                          | 0.210                             | 6.5                              | 0.99                           | 0.88  | 3.50                  | 4.04        | 4.32        | 1.35                          | 1.90                        |
| MSD1278T-823ML_          | 82 $\pm$ 20%                          | 0.280                             | 5.0                              | 0.99                           | 0.85  | 3.30                  | 3.72        | 4.02        | 1.16                          | 1.65                        |
| MSD1278T-104ML_          | 100 $\pm$ 20%                         | 0.300                             | 4.5                              | >0.99                          | 0.90  | 2.80                  | 3.24        | 3.46        | 1.13                          | 1.59                        |
| MSD1278T-124KL_          | 120 $\pm$ 10%                         | 0.410                             | 4.3                              | 0.99                           | 1.31  | 2.60                  | 2.94        | 3.16        | 0.96                          | 1.36                        |
| MSD1278T-154KL_          | 150 $\pm$ 10%                         | 0.460                             | 4.1                              | >0.99                          | 1.46  | 2.20                  | 2.54        | 2.70        | 0.91                          | 1.29                        |
| MSD1278T-184KL_          | 180 $\pm$ 10%                         | 0.510                             | 4.0                              | >0.99                          | 0.93  | 2.10                  | 2.42        | 2.58        | 0.86                          | 1.22                        |
| MSD1278T-224KL_          | 220 $\pm$ 10%                         | 0.690                             | 3.4                              | >0.99                          | 1.54  | 1.90                  | 2.16        | 2.28        | 0.74                          | 1.05                        |
| MSD1278T-274KL_          | 270 $\pm$ 10%                         | 0.900                             | 3.1                              | >0.99                          | 1.17  | 1.70                  | 1.94        | 2.10        | 0.65                          | 0.92                        |
| MSD1278T-334KL_          | 330 $\pm$ 10%                         | 1.02                              | 2.9                              | 0.99                           | 4.14  | 1.50                  | 1.70        | 1.84        | 0.61                          | 0.86                        |
| MSD1278T-394KL_          | 390 $\pm$ 10%                         | 1.12                              | 2.7                              | >0.99                          | 1.64  | 1.40                  | 1.60        | 1.70        | 0.58                          | 0.82                        |
| MSD1278T-474KL_          | 470 $\pm$ 10%                         | 1.53                              | 2.2                              | >0.99                          | 0.25  | 1.30                  | 1.50        | 1.60        | 0.50                          | 0.70                        |
| MSD1278T-564KL_          | 560 $\pm$ 10%                         | 1.69                              | 2.0                              | >0.99                          | 2.68  | 1.20                  | 1.34        | 1.46        | 0.47                          | 0.67                        |
| MSD1278T-684KL_          | 680 $\pm$ 10%                         | 2.29                              | 1.7                              | >0.99                          | 2.11  | 1.00                  | 1.08        | 1.22        | 0.41                          | 0.58                        |
| MSD1278T-824KL_          | 820 $\pm$ 10%                         | 2.55                              | 1.4                              | >0.99                          | 2.39  | 0.900                 | 1.04        | 1.18        | 0.39                          | 0.55                        |
| MSD1278T-105KL_          | 1000 $\pm$ 10%                        | 2.87                              | 1.3                              | >0.99                          | 4.28  | 0.850                 | 0.948       | 1.05        | 0.37                          | 0.52                        |

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

## MSD1278T-105KLD

**Termination:** L = RoHS compliant matte tin over nickel over phosphorus bronze  
Special order: T = RoHS tin-silver-copper (95.5/4/0.5) or S = non-RoHS tin-lead (63/37).

**Packaging:** D = 13" machine-ready reel. EIA-481 embossed plastic tape (500 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 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. See temperature rise calculation.
- Maximum current when applied to one winding that causes a 40°C temperature rise from 25°C ambient. See temperature rise calculation.
- 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 phosphorus bronze. Other terminations available at additional cost.

**Weight:** 3.7 – 4.4 g

**Ambient temperature** –40°C to +125°C with Irms current, +125°C to +165°C with derated current

**Storage temperature** Component: –40°C to +165°C.

Tape and reel packaging: –40°C to +80°C

**Winding-to-winding and winding-to-core isolation** 500 Vrms

**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** 500/13" reel; Plastic tape: 24 mm wide, 0.5 mm thick, 16 mm pocket spacing, 8.7 mm pocket depth

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



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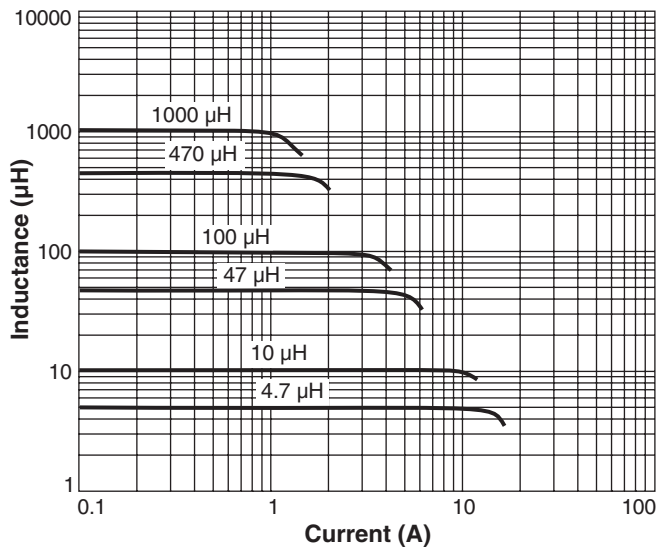
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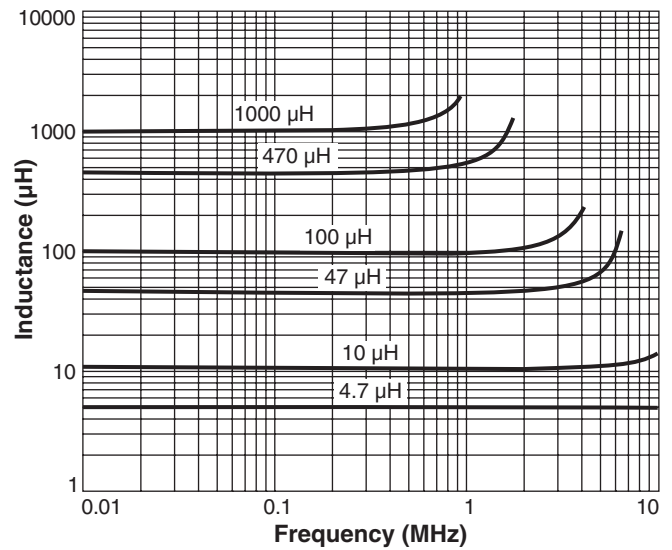


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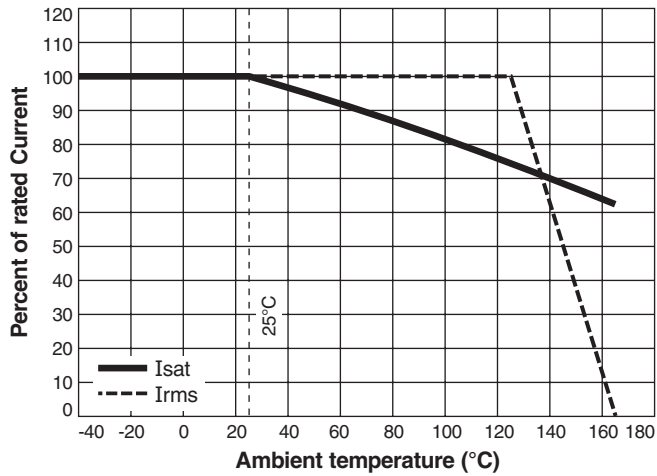
## Typical L vs Current



## Typical L vs Frequency



## Current Derating



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С конца 2013 года компания активно расширяет линейку поставок компонентов по направлению коаксиальный кабель, кварцевые генераторы и конденсаторы (керамические, пленочные, электролитические), за счёт заключения дистрибьюторских договоров

Мы предлагаем:

- Конкурентоспособные цены и скидки постоянным клиентам.
- Специальные условия для постоянных клиентов.
- Подбор аналогов.
- Поставку компонентов в любых объемах, удовлетворяющих вашим потребностям.
- Приемлемые сроки поставки, возможна ускоренная поставка.
- Доставку товара в любую точку России и стран СНГ.
- Комплексную поставку.
- Работу по проектам и поставку образцов.
- Формирование склада под заказчика.
- Сертификаты соответствия на поставляемую продукцию (по желанию клиента).
- Тестирование поставляемой продукции.
- Поставку компонентов, требующих военную и космическую приемку.
- Входной контроль качества.
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- Изготовление тестовой платы монтаж и пусконаладочные работы.



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