



# NEW!

# Coupled Chip Inductors – PFD3215

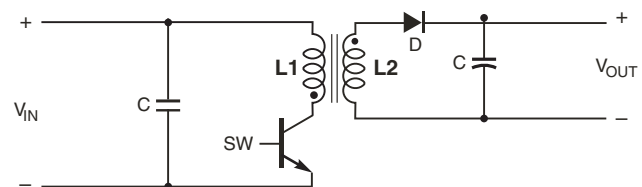
For Flyback, SEPIC and other applications



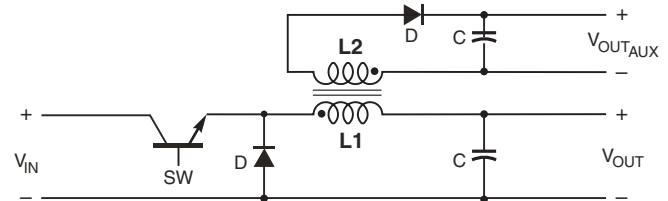
Dimensions are in  $\frac{\text{inches}}{\text{mm}}$

The PFD3215 has a footprint less than  $3.2 \times 2.3$  mm, making this shielded coupled inductor ideal for applications with limited board space. It is designed for use in a variety of circuits including flyback, multi-output buck and SEPIC. These inductors provide high efficiency and excellent current handling in a rugged, low cost part.

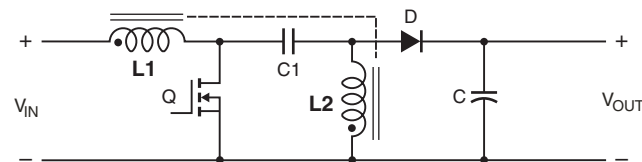
They can also be used as two single inductors connected in series or parallel, as a wideband transformers or as a common mode choke.



Typical Flyback Converter



Typical Buck Converter with auxiliary output



Typical SEPIC schematic

Refer to Application Note, Document 639, "Selecting Coupled Inductors for SEPIC Applications"

**Core material** Ferrite

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

**Environmental** RoHS compliant, halogen free

**Weight** 18 – 28 mg

**Terminations** RoHS compliant silver-palladium-platinum-glass frit.

**Ambient temperature**  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  with Irms current,  $+85^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$  with derated current

**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** 250 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** 2000/7" reel; 7500/13" reel Plastic tape: 8 mm wide, 0.20 mm thick, 4 mm pocket spacing, 1.21 mm pocket depth

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



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## PFD3215 Coupled Inductors for SEPIC applications

| Part number <sup>1</sup> | Inductance <sup>2</sup><br>±20% (µH) | DCR<br>max <sup>3</sup><br>(Ohms) | SRF<br>typ <sup>4</sup><br>(MHz) | Coupling<br>coefficient<br>typ | Leakage<br>inductance <sup>5</sup><br>typ (µH) | 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> |
| PFD3215-391ME_           | 0.39                                 | 0.070                             | 600                              | 0.89                           | 0.08   | 2.10                  | 2.30        | 2.40        | 0.98                          | 1.39                        |
| PFD3215-102ME_           | 1.0                                  | 0.123                             | 400                              | 0.95                           | 0.09   | 1.35                  | 1.55        | 1.65        | 0.85                          | 1.20                        |
| PFD3215-182ME_           | 1.8                                  | 0.250                             | 230                              | 0.97                           | 0.11   | 1.00                  | 1.20        | 1.30        | 0.60                          | 0.85                        |
| PFD3215-222ME_           | 2.2                                  | 0.265                             | 270                              | 0.97                           | 0.13   | 0.95                  | 1.05        | 1.15        | 0.57                          | 0.81                        |
| PFD3215-332ME_           | 3.3                                  | 0.360                             | 190                              | 0.98                           | 0.14   | 0.75                  | 0.83        | 0.90        | 0.55                          | 0.78                        |
| PFD3215-472ME_           | 4.7                                  | 0.450                             | 175                              | 0.98                           | 0.17   | 0.65                  | 0.75        | 0.80        | 0.51                          | 0.72                        |
| PFD3215-682ME_           | 6.8                                  | 0.630                             | 155                              | 0.98                           | 0.25   | 0.55                  | 0.65        | 0.70        | 0.40                          | 0.57                        |
| PFD3215-103ME_           | 10                                   | 1.25                              | 110                              | 0.98                           | 0.31   | 0.45                  | 0.50        | 0.55        | 0.27                          | 0.38                        |

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

### PFD3215-103MEC

**Packaging:** **C** = 7" machine-ready reel. EIA-481 embossed plastic tape (2000 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 C instead.

**D** = 13" machine-ready reel. EIA-481 embossed plastic tape. Factory order only, not stocked (7500 parts per full reel).

- 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 the primary winding with the secondary windings shorted.
- DC current, at which the inductance drops the specified amount from its value without current. It is the current flowing in one winding.
- 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.](#)

## PFD3215 Coupled Inductors for Flyback applications

| Part number <sup>1</sup> | Inductance<br>at 0 A <sup>2</sup><br>±20% (µH) | Inductance<br>at Ipk A <sup>3</sup><br>±20% (µH) | DCR<br>max<br>(Ohms) | Leakage<br>inductance <sup>4</sup><br>typ (µH) | Turns<br>ratio | Ipk <sup>3</sup><br>(A) |
|--------------------------|--|--|----------------------|--|----------------|-------------------------|
| PFD3215-391ME_           | 0.39   | 0.27   | 0.070                | 0.08   | 1 : 1          | 2.40                    |
| PFD3215-102ME_           | 1.0  | 0.70   | 0.123                | 0.09   | 1 : 1          | 1.65                    |
| PFD3215-182ME_           | 1.8  | 1.26   | 0.250                | 0.11   | 1 : 1          | 1.30                    |
| PFD3215-222ME_           | 2.2  | 1.54   | 0.265                | 0.13   | 1 : 1          | 1.15                    |
| PFD3215-332ME_           | 3.3  | 2.31   | 0.335                | 0.14   | 1 : 1          | 0.90                    |
| PFD3215-472ME_           | 4.7  | 3.29   | 0.442                | 0.17   | 1 : 1          | 0.80                    |
| PFD3215-682ME_           | 6.8  | 4.76   | 0.600                | 0.25   | 1 : 1          | 0.70                    |
| PFD3215-103ME_           | 10   | 7.00   | 1.22                 | 0.31   | 1 : 1          | 0.55                    |

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

### PFD3215-103MEC

**Packaging:** **C** = 7" machine-ready reel. EIA-481 embossed plastic tape (2000 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.

**D** = 13" machine-ready reel. EIA-481 embossed plastic tape. Factory order only, not stocked (7500 parts per full reel).

2. Inductance is for the primary, measured at 100 kHz, 0.1 Vrms, 0 Adc on an Agilent/HP 4284A LCR meter or equivalent.

3. Peak primary current drawn at minimum input voltage.

4. Leakage inductance is for the primary winding with the secondary windings shorted.

5. Electrical specifications at 25°C.

Refer to Doc 362 "Soldering Surface Mount Components" before soldering.



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# PFD3215 Coupled Inductors for Flyback, SEPIC and other applications

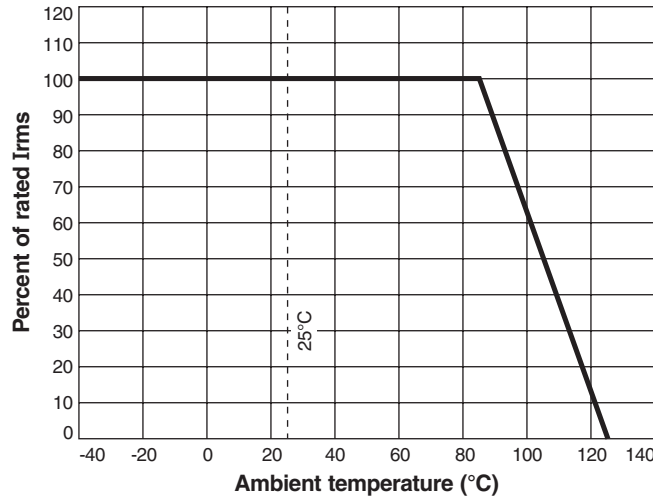
## L vs Current



## L vs Frequency



## Typical Current Derating



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