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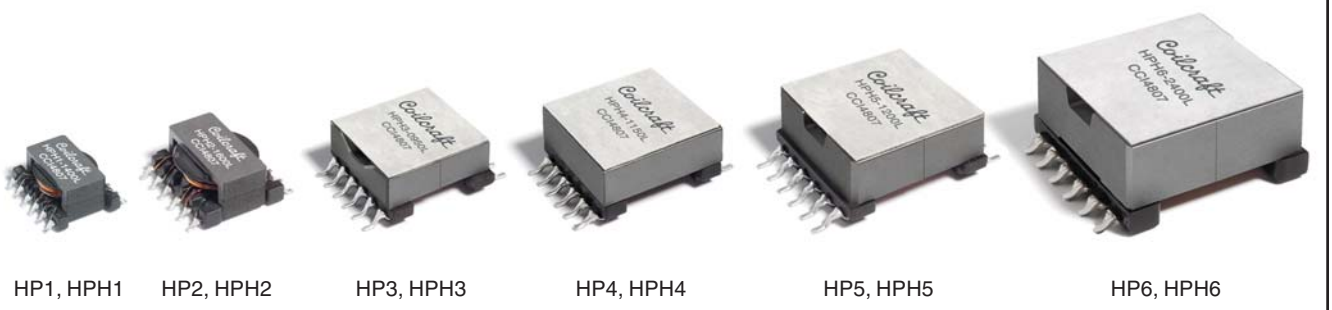
# Hexa-Path Magnetics



HP1, HPH1 HP2, HPH2 HP3, HPH3 HP4, HPH4 HP5, HPH5 HP6, HPH6

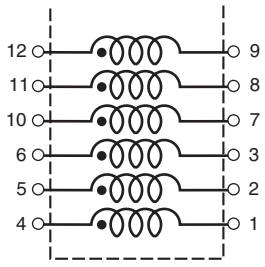
- Six 1:1 isolated windings that can be connected in series or parallel
- Tightly coupled windings
- 500 Vrms isolation between each winding
- Power range: 5 – 50 Watts as inductor and flyback transformer; up to 150 Watts as forward transformer
- Frequency range up to 1 MHz

These off-the shelf parts can be used to create thousands of configurations, providing a convenient method for designers to create custom magnetics. By connecting the windings in series or parallel, the Hexa-Path components can be configured as inductors, coupled inductors and transformers for use in virtually any application: flyback, buck/boost, push-pull, forward, full and half bridge, Cuk, and SEPIC.

There are six different sizes available with five HP parts and five HPH parts in each size. The HP offers lower DCR and higher Irms ratings. The HPH offers higher inductance and greater energy storage capabilities.

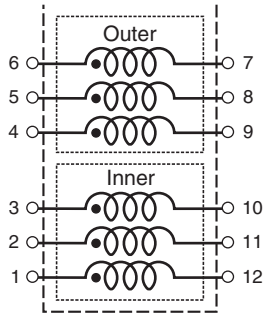
## Winding Layouts

**HP1, HP2, HPH1, HPH2**



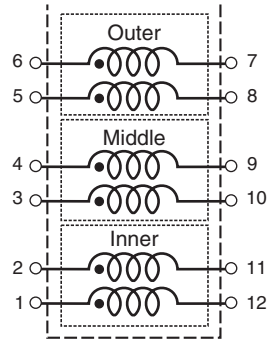

One 6-filar winding

**HP3, HP4, HP5, HP6**



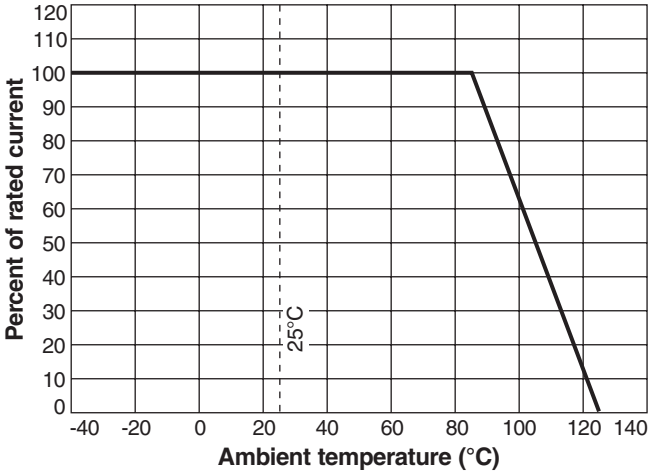

Two trifilar windings

**HPH3, HPH4, HPH5, HPH6**




Three bifilar windings

## Current Derating

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| Part number[1] | Inductance[2] (µH) | DCR max[3] (Ohms) | Volt-time product[4] (V-µsec) | Peak energy storage[5] (µJ) | Isat[6] (A) | Irms[7] (A) |
|---|---|---|---|---|---|---|
| HP1-1400L_ | 89.6 ±25% | 0.130 | 23.4 | Note 8 | Note 8 | 0.74 |
| HP1-0190L_ | 12.2 ±20% | 0.130 | 23.4 | 29.8 | 0.440 | 0.74 |
| HP1-0102L_ | 6.5 ±15% | 0.130 | 23.4 | 55.1 | 0.820 | 0.74 |
| HP1-0076L_ | 4.9 ±10% | 0.130 | 23.4 | 74.7 | 1.10 | 0.74 |
| HP1-0059L_ | 3.8 ±5% | 0.130 | 23.4 | 93.8 | 1.40 | 0.74 |
| HP2-1600L_ | 78.4 ±25% | 0.085 | 44.0 | Note 8 | Note 8 | 1.13 |
| HP2-0216L_ | 10.6 ±20% | 0.085 | 44.0 | 79.2 | 0.770 | 1.13 |
| HP2-0116L_ | 5.7 ±15% | 0.085 | 44.0 | 184 | 1.60 | 1.13 |
| HP2-0083L_ | 4.1 ±10% | 0.085 | 44.0 | 228 | 2.10 | 1.13 |
| HP2-0066L_ | 3.2 ±5% | 0.085 | 44.0 | 252 | 2.50 | 1.13 |
| HP3-0950L_ | 77.0 ±25% | 0.055 | 30.4 | Note 8 | Note 8 | 1.73 |
| HP3-0138L_ | 11.2 ±20% | 0.055 | 30.4 | 59.6 | 0.650 | 1.73 |
| HP3-0084L_ | 6.8 ±15% | 0.055 | 30.4 | 111 | 1.14 | 1.73 |
| HP3-0055L_ | 4.5 ±10% | 0.055 | 30.4 | 156 | 1.66 | 1.73 |
| HP3-0047L_ | 3.8 ±5% | 0.055 | 30.4 | 173 | 1.90 | 1.73 |
| HP4-1150L_ | 93.2 ±25% | 0.055 | 47.3 | Note 8 | Note 8 | 1.88 |
| HP4-0140L_ | 11.3 ±20% | 0.055 | 47.3 | 142 | 1.00 | 1.88 |
| HP4-0075L_ | 6.1 ±15% | 0.055 | 47.3 | 307 | 2.00 | 1.88 |
| HP4-0060L_ | 4.9 ±10% | 0.055 | 47.3 | 386 | 2.50 | 1.88 |
| HP4-0047L_ | 3.8 ±5% | 0.055 | 47.3 | 490 | 3.20 | 1.88 |
| HP5-1200L_ | 76.8 ±25% | 0.045 | 62.8 | Note 8 | Note 8 | 2.25 |
| HP5-0155L_ | 9.9 ±20% | 0.045 | 62.8 | 281 | 1.50 | 2.25 |
| HP5-0083L_ | 5.3 ±15% | 0.045 | 62.8 | 562 | 2.90 | 2.25 |
| HP5-0067L_ | 4.3 ±10% | 0.045 | 62.8 | 626 | 3.40 | 2.25 |
| HP5-0053L_ | 3.4 ±5% | 0.045 | 62.8 | 946 | 4.70 | 2.25 |
| HP6-2400L | 86.4 ±25% | 0.020 | 87.9 | Note 8 | Note 8 | 3.50 |
| HP6-0325L | 11.7 ±20% | 0.020 | 87.9 | 332 | 1.50 | 3.50 |
| HP6-0158L | 5.69 ±15% | 0.020 | 87.9 | 981 | 3.70 | 3.50 |
| HP6-0121L | 4.36 ±10% | 0.020 | 87.9 | 1485 | 5.20 | 3.50 |
| HP6-0090L | 3.24 ±5% | 0.020 | 87.9 | 1833 | 6.70 | 3.50 |
| HPH1-1400L_ | 202 ±25% | 0.340 | 35.1 | Note 8 | Note 8 | 0.62 |
| HPH1-0190L_ | 27.4 ±20% | 0.340 | 35.1 | 31.1 | 0.300 | 0.62 |
| HPH1-0102L_ | 14.7 ±15% | 0.340 | 35.1 | 60.2 | 0.570 | 0.62 |
| HPH1-0076L_ | 10.9 ±10% | 0.340 | 35.1 | 99.2 | 0.850 | 0.62 |
| HPH1-0059L_ | 8.5 ±5% | 0.340 | 35.1 | 107 | 1.00 | 0.62 |
| HPH2-1600L_ | 160 ±25% | 0.155 | 30.8 | Note 8 | Note 8 | 0.83 |
| HPH2-0216L_ | 21.6 ±20% | 0.155 | 30.8 | 82.3 | 0.550 | 0.83 |
| HPH2-0116L_ | 11.6 ±15% | 0.155 | 30.8 | 177 | 1.10 | 0.83 |
| HPH2-0083L_ | 8.3 ±10% | 0.155 | 30.8 | 302 | 1.70 | 0.83 |
| HPH2-0066L_ | 6.6 ±5% | 0.155 | 30.8 | 333 | 2.00 | 0.83 |
| HPH3-0950L_ | 160 ±25% | 0.125 | 43.9 | Note 8 | Note 8 | 1.13 |
| HPH3-0138L_ | 23.6 ±20% | 0.125 | 43.9 | 52.5 | 0.420 | 1.13 |
| HPH3-0084L_ | 14.2 ±15% | 0.125 | 43.9 | 98.0 | 0.740 | 1.13 |
| HPH3-0055L_ | 9.3 ±10% | 0.125 | 43.9 | 169 | 1.20 | 1.13 |
| HPH3-0047L_ | 7.94 ±5% | 0.125 | 43.9 | 196 | 1.40 | 1.13 |
| HPH4-1150L_ | 194 ±25% | 0.078 | 68.3 | Note 8 | Note 8 | 1.65 |
| HPH4-0140L_ | 23.7 ±20% | 0.078 | 68.3 | 138 | 0.680 | 1.65 |
| HPH4-0075L_ | 12.7 ±15% | 0.078 | 68.3 | 314 | 1.40 | 1.65 |
| HPH4-0060L_ | 10.1 ±10% | 0.078 | 68.3 | 368 | 1.70 | 1.65 |
| HPH4-0047L_ | 7.94 ±5% | 0.078 | 68.3 | 529 | 2.30 | 1.65 |
| HPH5-1200L_ | 173 ±25% | 0.070 | 94.2 | Note 8 | Note 8 | 1.95 |
| HPH5-0155L_ | 22.3 ±20% | 0.070 | 94.2 | 248 | 0.940 | 1.95 |
| HPH5-0083L_ | 12.0 ±15% | 0.070 | 94.2 | 546 | 1.90 | 1.95 |
| HPH5-0067L_ | 9.65 ±10% | 0.070 | 94.2 | 700 | 2.40 | 1.95 |
| HPH5-0053L_ | 7.63 ±5% | 0.070 | 94.2 | 809 | 2.90 | 1.95 |
| HPH6-2400L | 194 ±25% | 0.030 | 131.9 | Note 8 | Note 8 | 2.90 |
| HPH6-0325L | 26.3 ±20% | 0.030 | 131.9 | 477 | 1.20 | 2.90 |
| HPH6-0158L | 12.8 ±15% | 0.030 | 131.9 | 1176 | 2.70 | 2.90 |
| HPH6-0121L | 9.8 ±10% | 0.030 | 131.9 | 1783 | 3.80 | 2.90 |
| HPH6-0090L | 7.29 ±5% | 0.030 | 131.9 | 1944 | 4.60 | 2.90 |

1. Please specify **termination** and **packaging** codes:

   **HPH1-1400 L D**

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

   **Packaging:** **All but HP6 and HPH6:**
   **D** = 13″ machine-ready reel. EIA-481 embossed plastic tape
   **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.
   **HP6 and HPH6:** 24 per tray (no code)
2. Inductance is per winding, measured at 100 kHz, 0.1 Vrms, 0 Adc.
3. DCR is per winding, measured on Cambridge Technology micro-ohmmeter or equivalent.
4. Volt-time product is for a single winding or multiple windings connected in parallel. To calculate volt-time product for windings connected in series, multiply the value specified in the table by the number of windings connected in series.
5. Peak energy storage is for any combination of windings, assuming saturation current applied. See note 6 for definition of saturation current.
6. DC current at which the inductance drops 30% typ from its value without current, based on current applied to all six windings connected in series. For applications where all windings are not connected in series, use the following equation to calculate Isat: $Isat = Isat_{table} \times 6 \div$ number of windings in series.
7. Current that causes a 40°C rise from 25°C ambient due to self heating, tested with continuous current flow through all windings connected in series. Application temperature rise will depend on the operating current, duty cycle, and winding connection.
8. Part is designed exclusively for use as a forward converter transformer and was not tested for energy storage and saturation current.
9. Electrical specifications at 25°C.

**Core material** Ferrite

**Terminations** RoHS tin-silver over tin over nickel over phos bronze. Other terminations available at additional cost.

**Ambient temperature** –40°C to +85°C with Irms current, +85°C to +125°C with derated current

**Storage temperature** Component: –40°C to +125°C. Packaging: –40°C to +80°C

**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)

**Mean Time Between Failures (MTBF)** 26,315,789 hours

**PCB washing** Only pure water or alcohol recommended

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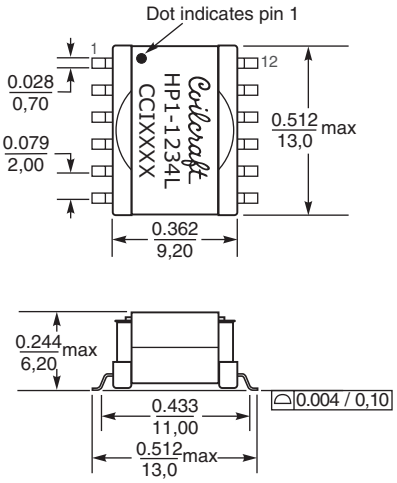
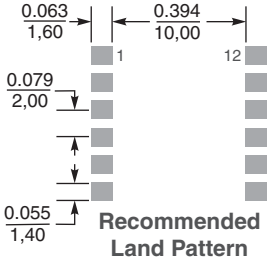
## HP1, HPH1





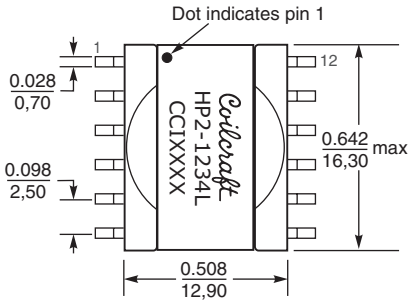


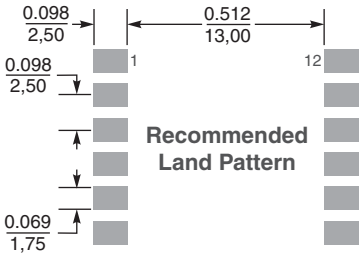
Dimensions are in inches / mm

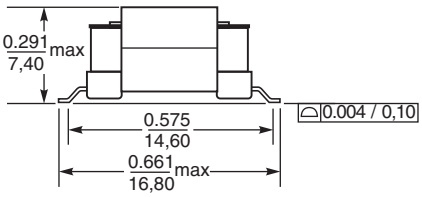
**Weight:** 1.4 g

**Packaging** 500 per 13″ reel Plastic tape: 24 mm wide, 0.5 mm thick, 20 mm pocket spacing, 6.6 mm pocket depth

## HP2, HPH2




Dimensions are in inches / mm

**Weight:** 2.7 – 2.8 g

**Packaging** 400 per 13″ reel Plastic tape: 32 mm wide, 0.4 mm thick, 20 mm pocket spacing, 7.6 mm pocket depth



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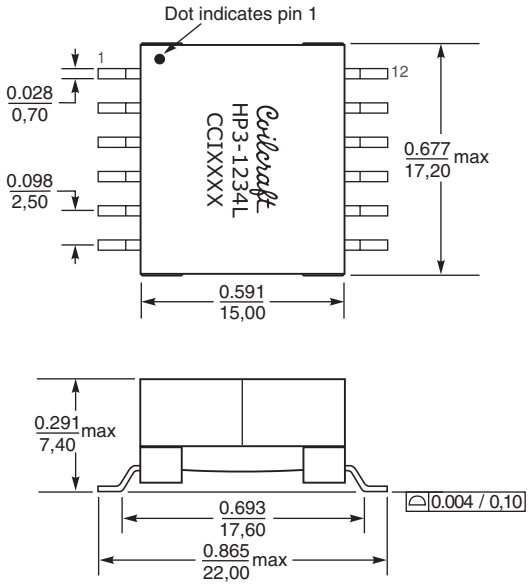
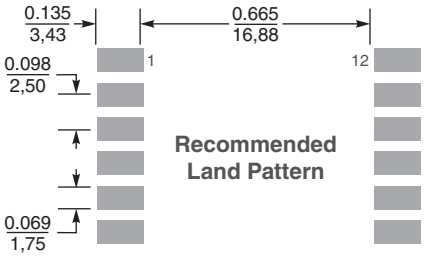
## HP3, HPH3



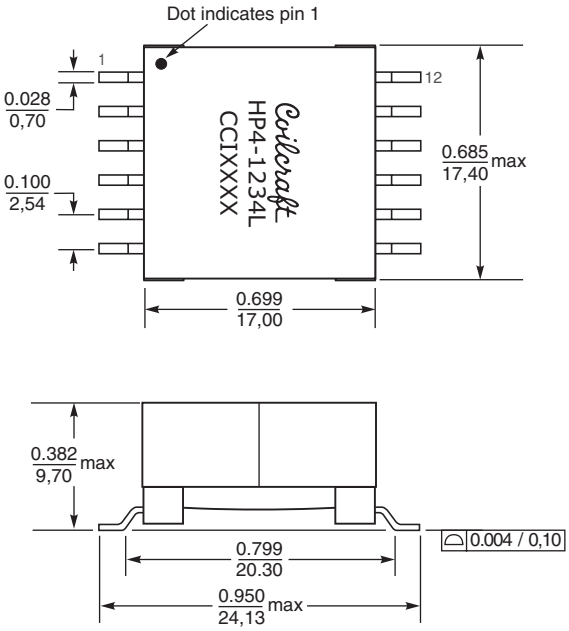



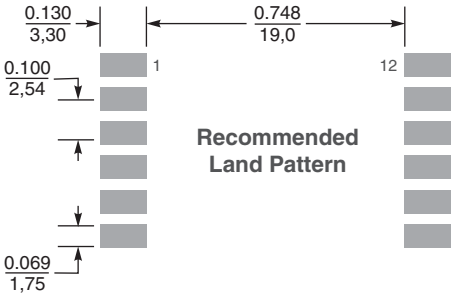

Dimensions are in inches / mm

**Weight:** 4.2 – 4.6 g

**Packaging** 200 per 13″ reel Plastic tape: 44 mm wide, 0.4 mm thick, 28 mm pocket spacing, 9.6 mm pocket depth

## HP4, HPH4




Dimensions are in inches / mm

**Weight:** 6.8 – 7.5 g

**Packaging** 200 per 13″ reel Plastic tape: 44 mm wide, 0.4 mm thick, 24 mm pocket spacing, 11.5 mm pocket depth



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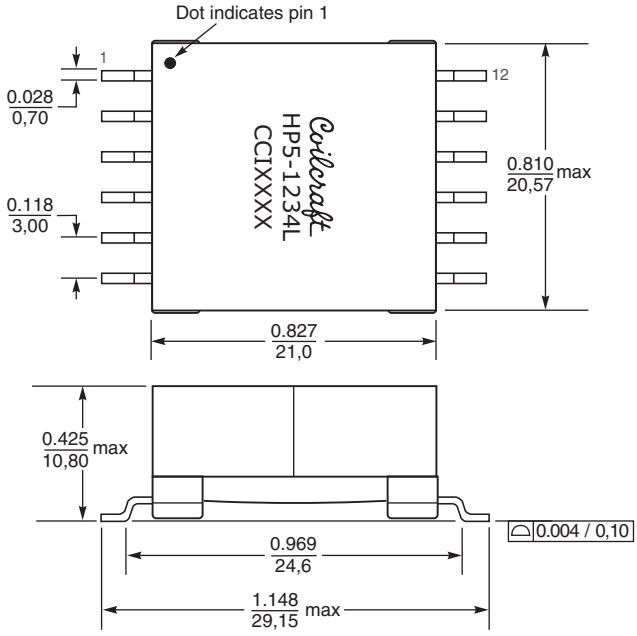
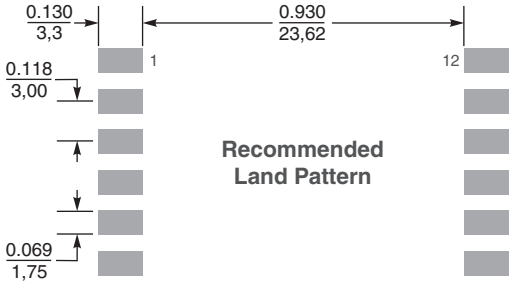
## HP5, HPH5



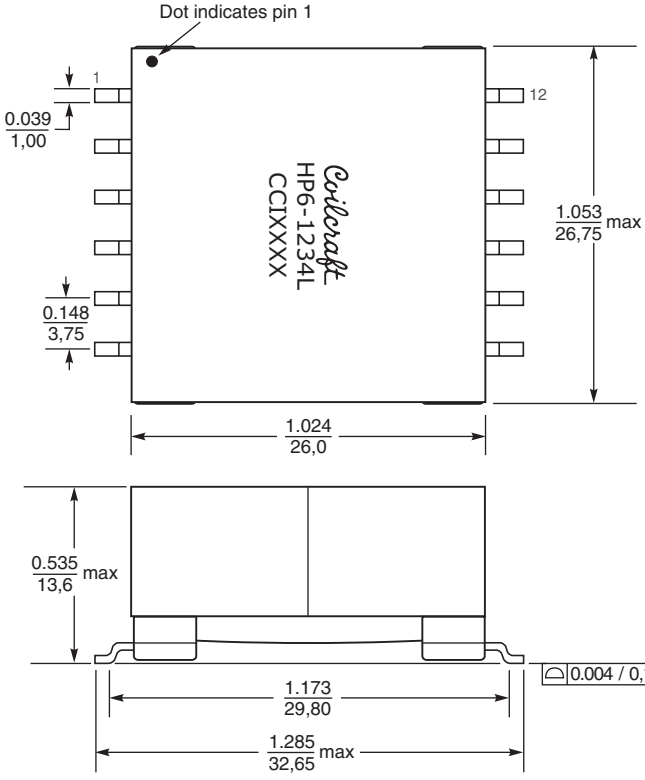



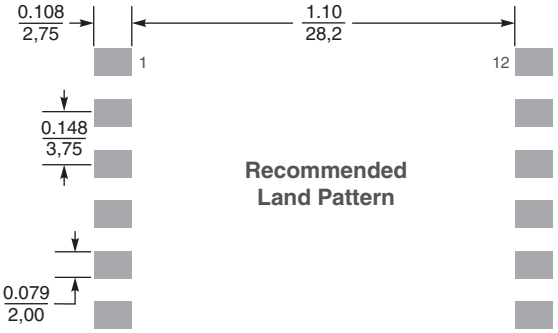

Dimensions are in inches / mm

**Weight:** 10.6 – 11.5 g

**Packaging** 175 per 13″ reel Plastic tape: 44 mm wide, 0.4 mm thick, 28 mm pocket spacing, 12.0 mm pocket depth

## HP6, HPH6




Dimensions are in inches / mm

**Weight:** 22.4 – 24.3 g

**Packaging** 24 per tray



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# Hexa-Path Magnetics

## Formulas used to calculate electrical characteristics

### Connecting windings in series

Inductance = $Inductance_{table} \times (number\ of\ windings)^2$
DCR = $DCR_{table} \times number\ of\ windings$
Isat = $(Isat_{table} \times 6) \div number\ of\ windings\ connected\ in\ series$
Irms = $Irms_{table}$

### Connecting windings in parallel

Inductance = $Inductance_{table}$
DCR = $1 \div [number\ of\ windings \times (1 \div DCR_{table})]$
Isat = $(Isat_{table} \times 6) \div number\ of\ windings\ connected\ in\ series$
Irms = $Irms_{table} \times number\ of\ windings$

---

## Inductors – using multiple windings

| Part number | Inductance (µH) | DCR max (Ohms) | Volt-time product (V-µsec) | Peak energy storage (µJ) | Isat (A) | Irms (A) |
|---|---|---|---|---|---|---|
| HP3-0138L_ | 11.2 ±20% | 0.055 | 30.4 | 1.656 | 0.650 | 1.73 |

### Connecting windings in series

For higher inductance, the windings can be connected in series. As inductance increases, energy storage and Irms remain the same, but DCR increases and Isat decreases.

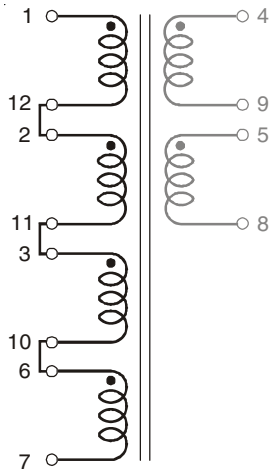
**Example:** Calculate new electricals for HP3-0138L with four windings ($W_n$) connected in series:

Inductance = $Inductance_{table} \times W_n^2$
= $11.2 \times 4^2 = 179.2$ µH

DCR = $DCR_{table} \times W_n$
= $0.055 \times 4 = 0.22$ Ohms

Isat = $(Isat_{table}) \times 6 \div W_n$
= $(0.65 \times 6) \div 4 = 0.975$ A

Irms = $Irms_{table}$ = 1.73 A




L = 179.2 µH
DCR = 0.22 Ω
Isat = 0.975 A
Irms = 1.73 A

### Connecting windings in parallel

To increase current ratings, the windings ($W_n$) can be connected in parallel. DCR decreases, current ratings increase, and inductance remains the same.

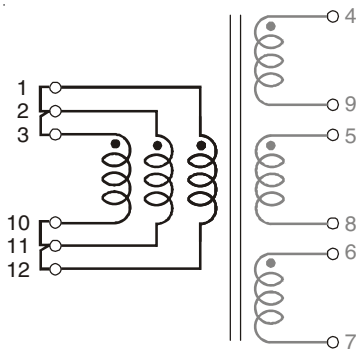
**Example:** Calculate new electricals for HP5-0083L, with three ($W_n$) windings connected in parallel (equivalent to one winding in series):

Inductance = $Inductance_{table}$
= 11.2 µH

DCR = $1 \div [W_n \times (1 \div DCR_{table})]$
= $1 \div [3 \times (1 \div 0.045)] = 0.015$ Ohms

Isat = $(Isat_{table} \times 6) \div W_n$
= $(0.65 \times 6) \div 1 = 3.9$ A

Irms = $Irms_{table} \times W_n$
= $1.73 \times 3 = 5.19$ A




L = 11.2 µH
DCR = 0.015Ω
Isat = 3.9 A
Irms = 5.19 A

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## Formulas used to calculate electrical characteristics

### Connecting windings in series

Inductance = $Inductance_{table} \times (number\ of\ windings)^2$
DCR = $DCR_{table} \times$ number of windings
Isat = $(Isat_{table} \times 6) \div$ number of windings connected in series
Irms = $Irms_{table}$

### Connecting windings in parallel

Inductance = $Inductance_{table}$
DCR = $1 \div [number\ of\ windings \times (1 \div DCR_{table})]$
Isat = $(Isat_{table} \times 6) \div$ number of windings connected in series
Irms = $Irms_{table} \times$ number of windings

---

## Create a 13 Watt 2 : 1 : 1 flyback transformer with a bias winding

Choose HPH3-0138L

Vin = 36 – 57 Vdc; Vout = 12 V, 1.1 A

| Part number | Inductance (µH) | DCR max (Ohms) | Volt-time product (V-µsec) | Peak energy storage (µJ) | Isat (A) | Irms (A) |
|---|---|---|---|---|---|---|
| HPH3-0138L | 23.6 ±20% | 0.125 | 43.9 | 1.457 | 0.420 | 1.13 |

### Connecting primary windings in series

When primary windings ($W_{pri}$) are connected in series, inductance increases, energy storage and Irms remain the same, but DCR increases and Isat decreases.

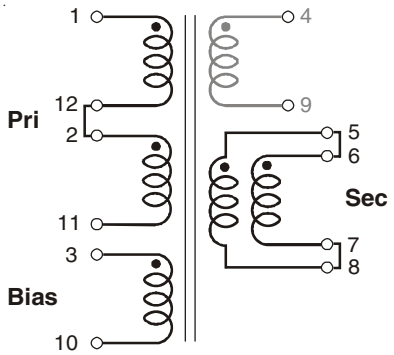
**Example:** For HPH3-0138L, connect two primary windings in series:

Inductance = $Inductance_{table} \times W_{pri}^2$
= $23.6 \times 2^2 = 94.4$ µH

DCR = $DCR_{table} \times W_{pri}$
= $0.125 \times 2 = 0.25$ Ohms

Isat = $(Isat_{table} \times 6) \div W_{pri}$
= $(0.42 \times 6) \div 2 = 1.26$ A

Irms = $Irms_{table} = 1.13$ A




**Primary:**
L = 94.4 µH
DCR = 0.25Ω
Isat = 1.26 A
Irms = 1.13 A

**Secondary:**
DCR = 0.0625Ω
Irms = 2.26 A

### Connecting secondary windings in parallel

When secondary windings ($W_{sec}$) are connected in parallel, DCR decreases and Irms increases.

**Example:** For HPH3-0083L, connect two secondary windings in parallel:

DCR = $1 \div [W_{sec} \times (1 \div DCR_{table})]$
= $1 \div [(2 \times (1 \div 0.125)] = 0.0625$ Ohms

Irms = $Irms_{table} \times W_{sec} = 1.13 \times 2 = 2.26$ A



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# Hexa-Path Magnetics

## Formulas used to calculate electrical characteristics

### Connecting windings in series

Inductance = $Inductance_{table} \times (number\ of\ windings)^2$
DCR = $DCR_{table} \times$ number of windings
Isat = $(Isat_{table} \times 6) \div$ number of windings connected in series
Irms = $Irms_{table}$

### Connecting windings in parallel

Inductance = $Inductance_{table}$
DCR = $1 \div [number\ of\ windings \times (1 \div DCR_{table})]$
Isat = $(Isat_{table} \times 6) \div$ number of windings connected in series
Irms = $Irms_{table} \times$ number of windings

---

## Create a 130 Watt, 1 : 1, two switch forward converter transformer

Choose HPH6-2400L

Vin = 36 – 57 Vdc; Vout = 12 V, 10.8 A

| Part number | Inductance (µH) | DCR max (Ohms) | Volt-time product (V-µsec) | Peak energy storage (µJ) | Isat (A) | Irms (A) |
|---|---|---|---|---|---|---|
| HPH6-2400L | 194 ±25% | 0.030 | 131.9 | N/A | N/A | 2.90 |

### Connecting primary windings in parallel

When primary windings ($W_{pri}$) are connected in parallel, DCR decreases, Irms increases, and inductance and volt-time product remain the same.

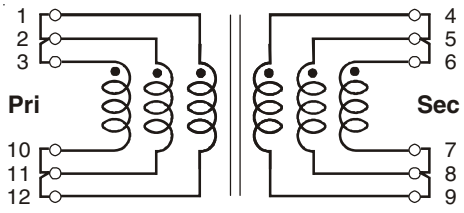
**Example:** For HPH6-2400L, connect three primary windings in parallel:

Inductance = $Inductance_{table}$
= 194 µH

DCR = $1 \div [W_{pri} \times (1 \div DCR_{table})]$
= $1 \div [(3 \times (1 \div 0.030])$ = 0.010 Ohms

VT = $VT_{table}$
= 131.9 V-µsec

Irms = $Irms_{table} \times W_{pri}$
= $2.90 \times 3$ = 8.70 A




**Primary:**
L = 194 µH
DCR = 0.01Ω
Irms = 8.7 A
VT = 131.9 V-µsec

**Secondary:**
DCR = 0.01Ω
Irms = 8.7 A

### Connecting secondary windings in parallel

When secondary windings ($W_{sec}$) are connected in parallel, DCR decreases and Irms increases.

**Example:** For HPH6-2400L, connect three secondary windings in parallel:

DCR = $1 \div [W_{sec} \times (1 \div DCR_{table})]$
= $1 \div [(3 \times (1 \div 0.030)]$ = 0.010 Ohms

Irms = $Irms_{table} \times W_{sec}$
= $2.90 \times 3$ = 8.70 A



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## Formulas used to calculate electrical characteristics

### Connecting windings in series

Inductance = $Inductance_{table} \times (number\ of\ windings)^2$
DCR = $DCR_{table} \times number\ of\ windings$
Isat = $(Isat_{table} \times 6) \div number\ of\ windings\ connected\ in\ series$
Irms = $Irms_{table}$

### Connecting windings in parallel

Inductance = $Inductance_{table}$
DCR = $1 \div [number\ of\ windings \times (1 \div DCR_{table})]$
Isat = $(Isat_{table} \times 6) \div number\ of\ windings\ connected\ in\ series$
Irms = $Irms_{table} \times number\ of\ windings$

---

## Create a 100 Watt, 1 : 2, half bridge forward converter transformer with center tapped secondary

Choose HP6-2400L

Vin = 36 – 57 Vdc; Vout = 24 V, 4.2 A

| Part number | Inductance (µH) | DCR max (Ohms) | Volt-time product (V-µsec) | Peak energy storage (µJ) | Isat (A) | Irms (A) |
|---|---|---|---|---|---|---|
| HPH6-2400L | 194 ±25% | 0.030 | 131.9 | N/A | N/A | 2.90 |

### Connecting primary windings in parallel

When primary windings ($W_{pri}$) are connected in parallel, DCR decreases, current ratings increase, and inductance and volt-time product remain the same.

**Example:** For HPH-2400L, connect two primary windings in parallel:

Inductance = $Inductance_{table}$
= 194 µH

DCR = $1 \div [W_{pri} \times (1 \div DCR_{table})]$
= $1 \div [(2 \times (1 \div 0.030)]$ = 0.015 Ohms

VT = $VT_{table}$
= 131.9 V-µsec

Irms = $Irms_{table} \times W_{pri}$
= $2.90 \times 2$ = 5.8 A

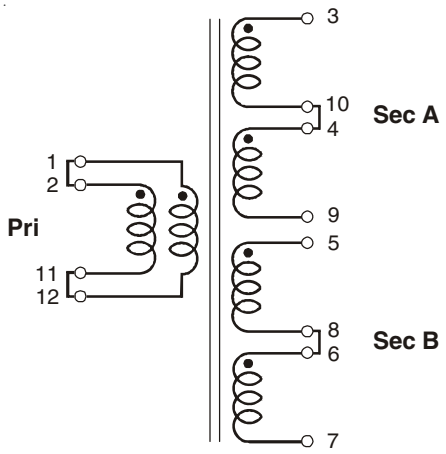
### Connecting secondary windings in series

When secondary windings ($W_{sec}$) are connected in series, Irms remains the same, but DCR increases.

**Example:** For HP6-2400L, connect four secondary windings in series, creating a center tap at pins 9 and 5. For each half of the secondary:

DCR = $DCR_{table} \times W_{sec}$
= $0.030 \times 2$ = 0.060 Ohms

Irms = $Irms_{table}$
= 2.9 A




**Primary:**
L = 194 µH
DCR = 0.015Ω
Irms = 5.8 A
VT = 131.9 V-µsec

**Each half secondary; Sec A (3-9), Sec B5-7):**
DCR = 0.06Ω
Irms = 2.9 A



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# Hexa-Path Magnetics

## Formulas used to calculate electrical characteristics

### Connecting windings in series

Inductance = $Inductance_{table} \times (number\ of\ windings)^2$
DCR = $DCR_{table} \times number\ of\ windings$
Isat = $(Isat_{table} \times 6) \div number\ of\ windings\ connected\ in\ series$
Irms = $Irms_{table}$

### Connecting windings in parallel

Inductance = $Inductance_{table}$
DCR = $1 \div [number\ of\ windings \times (1 \div DCR_{table})]$
Isat = $(Isat_{table} \times 6) \div number\ of\ windings\ connected\ in\ series$
Irms = $Irms_{table} \times number\ of\ windings$

---

## Create a 1 : 1 gate drive transformer

Choose HP1-1400L

| Part number | Inductance (µH) | DCR max (Ohms) | Volt-time product (V-µsec) | Peak energy storage (µJ) | Isat (A) | Irms (A) |
|---|---|---|---|---|---|---|
| HP1-1400L | 89.6 ±25% | 0.130 | 23.4 | N/A | N/A | 0.74 |

### Connecting primary windings in series

When primary windings ($W_{pri}$) are connected in series, inductance and volt-time product increase, energy storage and Irms remain the same, but DCR increases.

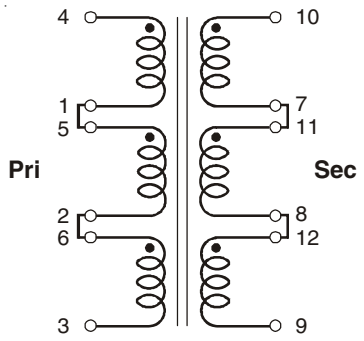
**Example:** For HPH1-1400L, connect three primary windings in series:

Inductance = $Inductance_{table} \times W_{pri}^2$
= $89.6 \times 3^2 = 806.4$ µH

DCR = $DCR_{table} \times W_{pri}$
= $0.130 \times 3 = 0.39$ Ohms

VT = $VT_{table} \times W_{pri}$
= 70.2 V-µsec

Irms = $Irms_{table}$
= 0.74




**Primary:**
L = 806.4 µH
DCR = 0.39Ω
Irms = 0.74 A
VT = 70.2 V-µsec

**Secondary:**
DCR = 0.39Ω
Irms = 0.74 A

### Connecting secondary windings in series

When secondary windings ($W_{sec}$) are connected in series, Irms remains the same, but DCR increases.

**Example:** For HP1-1400L, connect three secondary windings in series:

DCR = $DCR_{table} \times W_{sec}$
= $0.130 \times 3 = 0.39$ Ohms

Irms = $Irms_{table}$
= 0.74



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