

## Low Profile, High Current Coupled Inductor



### LINKS TO ADDITIONAL RESOURCES



### FEATURES

- High temperature, up to 155 °C
- Shielded construction
- Frequency range up to 5.0 MHz
- Lowest DCR/ $\mu$ H in this package size
- Handles high transient current spikes without saturation
- Ultra low buzz noise, due to composite construction
- Coupling is > 90 % - optimized for SEPIC converters
- AEC-Q200 qualified
- IHCL design; PATENT(S): [www.vishay.com/patents](http://www.vishay.com/patents)
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

### APPLICATIONS

- SEPIC converters
- DC/DC converters
- Common mode applications
- LED lighting

| STANDARD ELECTRICAL SPECIFICATIONS                            |                                                                               |                                       |                                       |                                                            |                                                        |
|---------------------------------------------------------------|-------------------------------------------------------------------------------|---------------------------------------|---------------------------------------|------------------------------------------------------------|--------------------------------------------------------|
|                                                               | $L_0$<br>INDUCTANCE<br>$\pm 20\%$ AT<br>100 kHz,<br>0.25 V, 0 A<br>( $\mu$ H) | DCR<br>NOM.<br>25 °C<br>(m $\Omega$ ) | DCR<br>MAX.<br>25 °C<br>(m $\Omega$ ) | HEAT<br>RATING<br>CURRENT<br>DC TYP.<br>(A) <sup>(1)</sup> | SATURATION<br>CURRENT<br>DC TYP.<br>(A) <sup>(2)</sup> |
| $L_{1-2}$                                                     | 10                                                                            | 90.6                                  | 97.0                                  | 4.3                                                        | 8.0                                                    |
| $L_{3-4}$                                                     | 10                                                                            | 86.0                                  | 92.0                                  | 4.2                                                        | 9.0                                                    |
| $L_{1-4}$<br>( $L_{2-3}$ shorted)                             | 36                                                                            | 176.0                                 | 189.0                                 | 2.9                                                        | 4.0                                                    |
| $L_{1-3}$<br>( $L_{2-4}$ shorted)                             | 1.0                                                                           | 176.0                                 | 189.0                                 | 2.9                                                        | See note <sup>(3)</sup>                                |
| $L_{\text{Common Mode}}$<br>(1-3 and<br>2-4 shorted)          | 10                                                                            | 33.0                                  | 34.6                                  | 7.5                                                        | 7.5                                                    |
| $L_{\text{Differential}}$<br>Mode<br>(1-4 and<br>2-3 shorted) | 0.0                                                                           | 33.0                                  | 34.6                                  | 7.5                                                        | See note <sup>(3)</sup>                                |

#### Notes

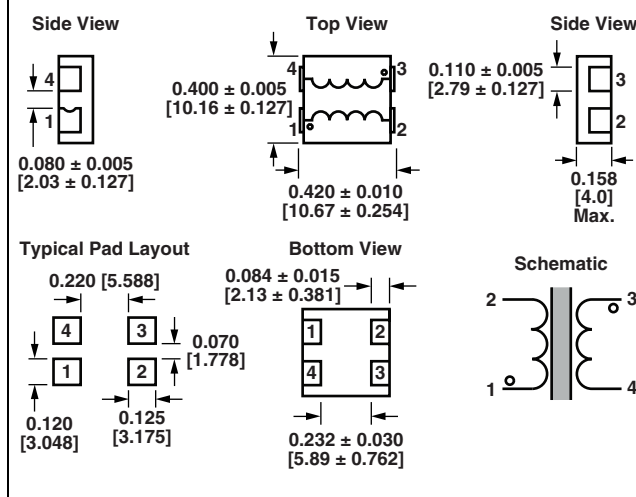
- All test data is referenced to 25 °C ambient
- Operating temperature range -55 °C to +155 °C
- The part temperature (ambient + temp. rise) should not exceed 155 °C under worst case operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application
- Rated operating voltage (across inductor) = 50 V
- SEPIC operation can generate up to 2x the input or output voltage across the inductor. Please limit  $V_{IN}$  and  $V_{OUT}$  to 25 V max. for SEPIC operation

<sup>(1)</sup> DC current (A) that will cause an approximate  $\Delta T$  of 40 °C

<sup>(2)</sup> DC current (A) that will cause  $L_0$  to drop approximately 20 %

<sup>(3)</sup> In this configuration, current flowing opposite directions through coils cancels and the 1.0  $\mu$ H inductance is very stable with varying current. Observe the heat rating current to avoid excessive temperature rise in this configuration

### DIMENSIONS in inches [millimeters]



PATENT(S): [www.vishay.com/patents](http://www.vishay.com/patents)

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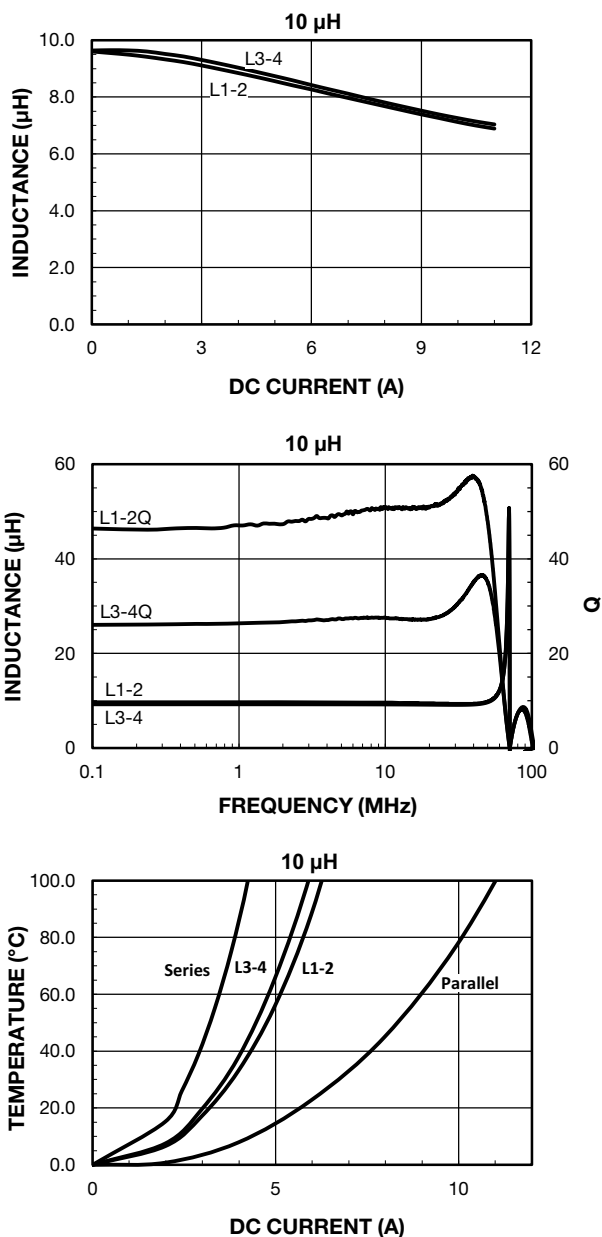
### DESCRIPTION

|                |                  |                      |              |                                |
|----------------|------------------|----------------------|--------------|--------------------------------|
| IHCL-4040DZ-5A | 10 $\mu$ H       | $\pm 20\%$           | ER           | e3                             |
| MODEL          | INDUCTANCE VALUE | INDUCTANCE TOLERANCE | PACKAGE CODE | JEDEC® LEAD (Pb)-FREE STANDARD |

### GLOBAL PART NUMBER

|                |   |   |   |      |   |   |   |              |   |                  |   |   |      |        |   |   |   |
|----------------|---|---|---|------|---|---|---|--------------|---|------------------|---|---|------|--------|---|---|---|
| I              | H | C | L | 4    | 0 | 4 | 0 | D            | Z | E                | R | 1 | 0    | 0      | M | 5 | A |
| PRODUCT FAMILY |   |   |   | SIZE |   |   |   | PACKAGE CODE |   | INDUCTANCE VALUE |   |   | TOL. | SERIES |   |   |   |

### PERFORMANCE GRAPHS





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