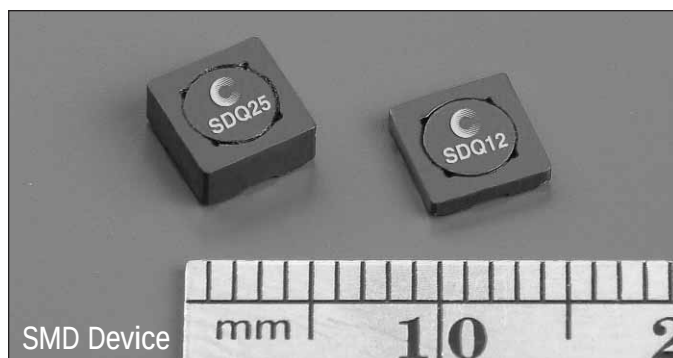


# Low-Profile Dual Winding Shielded Inductor/Transformer

## SDQ Series



### Description

- 125°C maximum total temperature operation
- Dual winding inductors that can be used as either a single inductor, or in coupled inductor/transformer applications (1:1 turns ratio)
- Windings can be connected in series or parallel, offering a broad range of inductance and current ratings
- Current range from 6.43 to 0.063 Amps
- Inductance range from 0.47μH to 4.03mH

- Ferrite shielded, low EMI
- Ferrite core material
- 500Vdc isolation between windings
- RoHS compliant

RoHS  
2002/95/EC

### Applications

- As a transformer: SEPIC, flyback
- As an inductor: Buck, boost, coupled inductor
- Digital cameras, CD players, cellular phones, and PDA's
- PCMCIA cards
- GPS systems

### Environmental Data

- Storage temperature: -40°C to +125°C
- Operating temperature range: -40°C to +125°C (Range is application specific).
- Solder reflow temperature: 260°C max. for 10 seconds max.

### Packaging

- Supplied in tape and reel packaging, SDQ12-3800, SDQ25-2900 parts per reel, 13" diameter reel

| Part Number | Rated Inductance (μH) | Part Marking | Parallel Ratings                   |                                         |                                         |                                |                                    | Series Ratings                     |                                         |                                         |                   |                                    |
|-------------|-----------------------|--------------|------------------------------------|-----------------------------------------|-----------------------------------------|--------------------------------|------------------------------------|------------------------------------|-----------------------------------------|-----------------------------------------|-------------------|------------------------------------|
|             |                       |              | OCL <sup>(1)</sup><br>±20%<br>(μH) | I <sub>rms</sub> <sup>(2)</sup><br>Amps | I <sub>sat</sub> <sup>(3)</sup><br>Amps | DCR <sup>(4)</sup><br>(Ω) typ. | Volts <sup>(5)</sup><br>μ-Sec typ. | OCL <sup>(1)</sup><br>±20%<br>(μH) | I <sub>rms</sub> <sup>(2)</sup><br>Amps | I <sub>sat</sub> <sup>(3)</sup><br>Amps | DCR Ω (4)<br>typ. | Volts <sup>(5)</sup><br>μ-Sec typ. |
| SDQ12-R47-R | 0.47                  | A            | 0.49±30%                           | 2.78                                    | 4.34                                    | 0.0325                         | 2.45                               | 1.96±30%                           | 1.39                                    | 2.17                                    | 0.1298            | 4.90                               |
| SDQ12-1R0-R | 1                     | B            | 0.81                               | 2.49                                    | 3.38                                    | 0.0403                         | 3.15                               | 3.24                               | 1.25                                    | 1.69                                    | 0.1611            | 6.30                               |
| SDQ12-1R5-R | 1.5                   | C            | 1.69                               | 1.69                                    | 2.34                                    | 0.0870                         | 4.55                               | 6.76                               | 0.847                                   | 1.17                                    | 0.3481            | 9.10                               |
| SDQ12-2R2-R | 2.2                   | D            | 2.25                               | 1.60                                    | 2.03                                    | 0.0977                         | 5.25                               | 9.00                               | 0.800                                   | 1.01                                    | 0.3908            | 10.5                               |
| SDQ12-3R3-R | 3.3                   | E            | 3.61                               | 1.28                                    | 1.60                                    | 0.1527                         | 6.65                               | 14.44                              | 0.640                                   | 0.800                                   | 0.6106            | 13.3                               |
| SDQ12-4R7-R | 4.7                   | F            | 4.41                               | 1.12                                    | 1.45                                    | 0.1990                         | 7.35                               | 17.64                              | 0.560                                   | 0.724                                   | 0.7959            | 14.7                               |
| SDQ12-6R2-R | 6.2                   | G            | 6.25                               | 1.02                                    | 1.22                                    | 0.2387                         | 8.75                               | 25.00                              | 0.512                                   | 0.608                                   | 0.9548            | 17.5                               |
| SDQ12-8R2-R | 8.2                   | H            | 8.41                               | 0.868                                   | 1.05                                    | 0.3318                         | 10.15                              | 33.64                              | 0.434                                   | 0.524                                   | 1.33              | 20.3                               |
| SDQ12-100-R | 10                    | J            | 9.61                               | 0.831                                   | 0.981                                   | 0.3620                         | 10.85                              | 38.44                              | 0.416                                   | 0.490                                   | 1.45              | 21.7                               |
| SDQ12-150-R | 15                    | K            | 15.21                              | 0.658                                   | 0.779                                   | 0.5766                         | 13.65                              | 60.84                              | 0.329                                   | 0.390                                   | 2.31              | 27.3                               |
| SDQ12-220-R | 22                    | L            | 22.09                              | 0.548                                   | 0.647                                   | 0.8332                         | 16.45                              | 88.36                              | 0.274                                   | 0.323                                   | 3.33              | 32.9                               |
| SDQ12-330-R | 33                    | M            | 32.49                              | 0.439                                   | 0.533                                   | 1.29                           | 19.95                              | 130.0                              | 0.220                                   | 0.267                                   | 5.18              | 39.9                               |
| SDQ12-470-R | 47                    | N            | 47.61                              | 0.401                                   | 0.441                                   | 1.55                           | 24.15                              | 190.4                              | 0.201                                   | 0.220                                   | 6.21              | 48.3                               |
| SDQ12-680-R | 68                    | O            | 68.89                              | 0.326                                   | 0.366                                   | 2.36                           | 29.05                              | 275.6                              | 0.163                                   | 0.183                                   | 9.43              | 58.1                               |
| SDQ12-820-R | 82                    | P            | 82.81                              | 0.309                                   | 0.334                                   | 2.62                           | 31.85                              | 331.2                              | 0.154                                   | 0.167                                   | 10.49             | 63.7                               |

(1) Test Parameters: 100kHz, 0.25 Vrms 0.0Adc

(2) I<sub>rms</sub>: DC current for approximately ΔT of 40°C without core loss. It is recommended that the temperature of the part not to exceed 125°C. Derating is necessary for AC currents

(3) I<sub>sat</sub>: Peak current for approximately 30% rolloff @20°C

(4) DCR limits @20°C

(5) Applied Volt-Time product (V-μs) across the inductor at 100kHz necessary to generate a core loss equal to 10% of the total losses for a 40°C temperature rise. Derating of the I<sub>rms</sub> is required to prevent excessive temperature rise.

Part Number Definition:

SDQ12-XXX-R

SDQ12 = Product code and Size

XXX = Inductance in uH, R = Decimal point

If no R is present, third character = # of zeros.

-R suffix indicated RoHS compliant

| Part Number | Rated Inductance (μH) | Part Marking | Parallel Ratings                   |                                         |                                         |                                |                                    | Series Ratings                     |                                         |                                         |                   |                                    |
|-------------|-----------------------|--------------|------------------------------------|-----------------------------------------|-----------------------------------------|--------------------------------|------------------------------------|------------------------------------|-----------------------------------------|-----------------------------------------|-------------------|------------------------------------|
|             |                       |              | OCL <sup>(1)</sup><br>±20%<br>(μH) | I <sub>rms</sub> <sup>(2)</sup><br>Amps | I <sub>sat</sub> <sup>(3)</sup><br>Amps | DCR <sup>(4)</sup><br>(Ω) typ. | Volts <sup>(5)</sup><br>μ-Sec typ. | OCL <sup>(1)</sup><br>±20%<br>(μH) | I <sub>rms</sub> <sup>(2)</sup><br>Amps | I <sub>sat</sub> <sup>(3)</sup><br>Amps | DCR Ω (4)<br>typ. | Volts <sup>(5)</sup><br>μ-Sec typ. |
| SDQ25-R47-R | 0.47                  | A            | 0.392±30%                          | 3.71                                    | 6.43                                    | 0.0181                         | 2.31                               | 1.57±30%                           | 1.86                                    | 3.21                                    | 0.0725            | 4.62                               |
| SDQ25-R82-R | 0.82                  | B            | 0.648±30%                          | 3.37                                    | 5.00                                    | 0.0221                         | 2.97                               | 2.59±30%                           | 1.68                                    | 2.50                                    | 0.0883            | 5.94                               |
| SDQ25-1R0-R | 1                     | C            | 0.97                               | 3.15                                    | 4.09                                    | 0.0252                         | 3.63                               | 3.87                               | 1.58                                    | 2.05                                    | 0.1007            | 7.26                               |
| SDQ25-1R5-R | 1.5                   | D            | 1.35                               | 2.97                                    | 3.46                                    | 0.0283                         | 4.29                               | 5.41                               | 1.49                                    | 1.73                                    | 0.1130            | 8.58                               |
| SDQ25-2R2-R | 2.2                   | E            | 2.31                               | 2.67                                    | 2.65                                    | 0.0351                         | 5.61                               | 9.25                               | 1.34                                    | 1.32                                    | 0.1402            | 11.2                               |
| SDQ25-3R3-R | 3.3                   | F            | 2.89                               | 2.50                                    | 2.37                                    | 0.0399                         | 6.27                               | 11.55                              | 1.25                                    | 1.18                                    | 0.1595            | 12.5                               |
| SDQ25-4R7-R | 4.7                   | G            | 5                                  | 1.96                                    | 1.80                                    | 0.0653                         | 8.25                               | 20.00                              | 0.98                                    | 0.900                                   | 0.2612            | 16.5                               |
| SDQ25-6R8-R | 6.8                   | H            | 6.73                               | 1.84                                    | 1.55                                    | 0.0741                         | 9.57                               | 26.91                              | 0.918                                   | 0.776                                   | 0.2964            | 19.1                               |
| SDQ25-8R2-R | 8.2                   | J            | 8.71                               | 1.57                                    | 1.36                                    | 0.1015                         | 10.9                               | 34.85                              | 0.785                                   | 0.682                                   | 0.4059            | 21.8                               |
| SDQ25-100-R | 10                    | K            | 9.8                                | 1.53                                    | 1.29                                    | 0.1068                         | 11.6                               | 39.20                              | 0.765                                   | 0.643                                   | 0.4273            | 23.1                               |
| SDQ25-150-R | 15                    | L            | 14.79                              | 1.24                                    | 1.05                                    | 0.1632                         | 14.2                               | 59.17                              | 0.619                                   | 0.523                                   | 0.6526            | 28.4                               |
| SDQ25-220-R | 22                    | M            | 22.47                              | 1.01                                    | 0.849                                   | 0.2431                         | 17.5                               | 89.89                              | 0.507                                   | 0.425                                   | 0.9724            | 35.0                               |
| SDQ25-330-R | 33                    | N            | 33.8                               | 0.812                                   | 0.692                                   | 0.3795                         | 21.5                               | 135.2                              | 0.406                                   | 0.346                                   | 1.52              | 42.9                               |
| SDQ25-470-R | 47                    | O            | 47.43                              | 0.749                                   | 0.584                                   | 0.4461                         | 25.4                               | 189.7                              | 0.374                                   | 0.292                                   | 1.78              | 50.8                               |
| SDQ25-680-R | 68                    | P            | 69.19                              | 0.603                                   | 0.484                                   | 0.6865                         | 30.7                               | 276.8                              | 0.302                                   | 0.242                                   | 2.75              | 61.4                               |
| SDQ25-820-R | 82                    | Q            | 81.61                              | 0.580                                   | 0.446                                   | 0.7435                         | 33.3                               | 326.4                              | 0.290                                   | 0.223                                   | 2.97              | 66.7                               |
| SDQ25-101-R | 100                   | R            | 98.57                              | 0.499                                   | 0.405                                   | 1.00                           | 36.6                               | 394.3                              | 0.249                                   | 0.203                                   | 4.02              | 73.3                               |
| SDQ25-151-R | 150                   | S            | 150.2                              | 0.408                                   | 0.328                                   | 1.50                           | 45.2                               | 600.6                              | 0.204                                   | 0.164                                   | 6.00              | 90.4                               |
| SDQ25-221-R | 220                   | T            | 223.1                              | 0.326                                   | 0.269                                   | 2.36                           | 55.1                               | 892.4                              | 0.163                                   | 0.135                                   | 9.42              | 110                                |
| SDQ25-331-R | 330                   | U            | 329.7                              | 0.292                                   | 0.222                                   | 2.93                           | 67.0                               | 1318.7                             | 0.146                                   | 0.111                                   | 11.71             | 134                                |
| SDQ25-471-R | 470                   | V            | 472.4                              | 0.243                                   | 0.185                                   | 4.25                           | 80.2                               | 1889.6                             | 0.121                                   | 0.093                                   | 16.99             | 160                                |
| SDQ25-681-R | 680                   | W            | 677.4                              | 0.197                                   | 0.155                                   | 6.45                           | 96.0                               | 2709.8                             | 0.098                                   | 0.077                                   | 25.78             | 192                                |
| SDQ25-821-R | 820                   | X            | 824.3                              | 0.186                                   | 0.140                                   | 7.25                           | 106                                | 3297.3                             | 0.093                                   | 0.070                                   | 28.99             | 212                                |
| SDQ25-102-R | 1000                  | Y            | 1008.2                             | 0.160                                   | 0.127                                   | 9.82                           | 117                                | 4032.8                             | 0.080                                   | 0.063                                   | 39.26             | 234                                |

(1) Test Parameters: 100kHz, 0.25 Vrms 0.0Adc

(2) I<sub>rms</sub>: DC current for approximately ΔT of 40°C without core loss. It is recommended that the temperature of the part not to exceed 125°C. Derating is necessary for AC currents

(3) I<sub>sat</sub>: Peak current for approximately 30% rolloff @20°C

(4) DCR limits @20°C

(5) Applied Volt-Time product (V-μs) across the inductor at 100kHz necessary to generate a core loss equal to 10% of the total losses for a 40°C temperature rise. Derating of the I<sub>rms</sub> is required to prevent excessive temperature rise.

Part Number Definition:

SDQ12-XXX-R

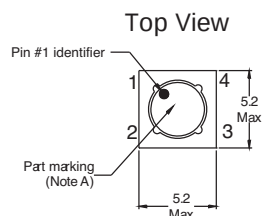
SDQ12 = Product code and Size

XXX = Inductance in uH, R = Decimal point

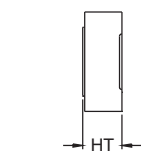
If no R is present, third character = # of zeros.

-R suffix indicated RoHS compliant

## Dimensions - mm

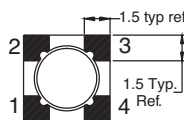


Side View

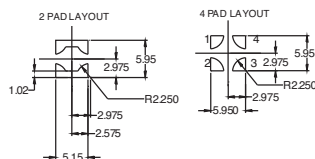


SDQ12 = 1.2mm max.  
SDQ25 = 2.5mm max.

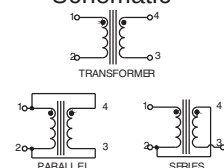
Bottom View



Recommended Pad Layout



Schematic



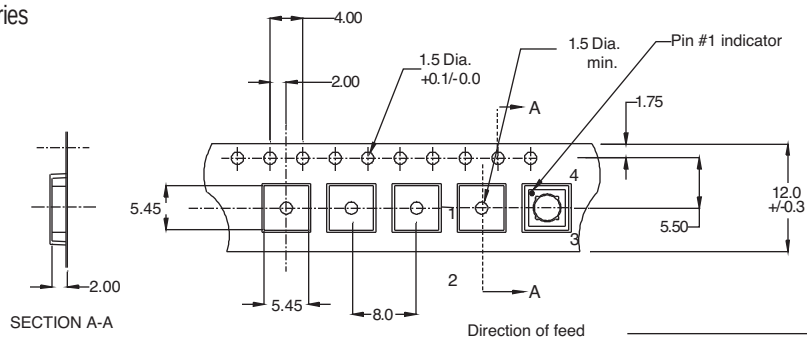
Part marking: Line 1 (1st digit inductance value per part marking designator in chart above)  
Line 2: xx (indicates the product size code)

(2nd digit is a bi-weekly production date code)

(3rd digit is the last digit of the year produced)

## Packaging Information - mm

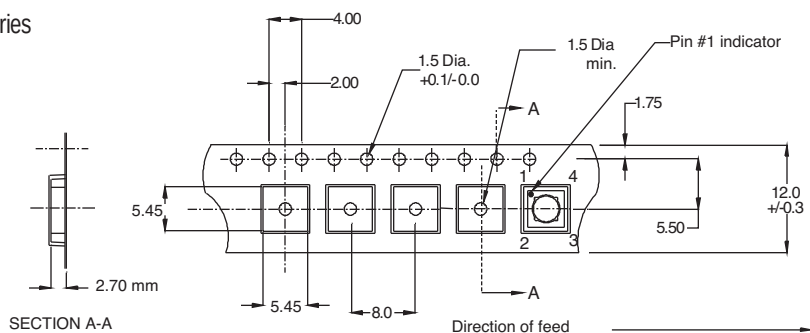
### SDQ12 Series



Actual Size  
SDQ12

Supplied in tape-and-reel packaging, 3800 parts per reel, 13" diameter reel.

### SDQ25 Series

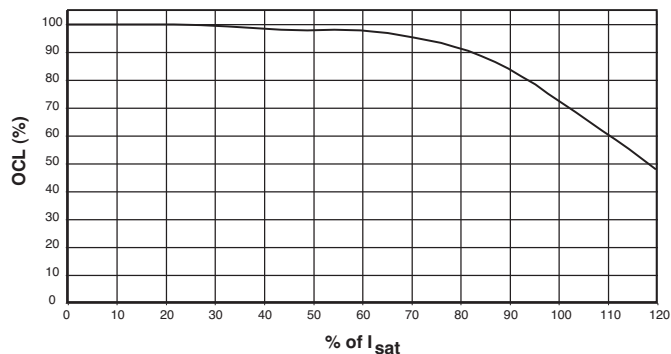


Actual Size  
SDQ25

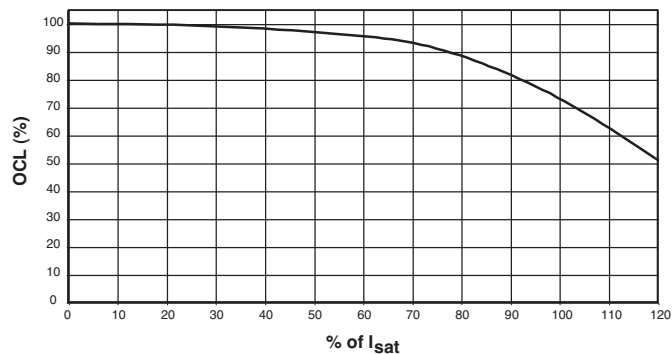
Supplied in tape-and-reel packaging, 2900 parts per reel, 13" diameter reel.

## Inductance Characteristics

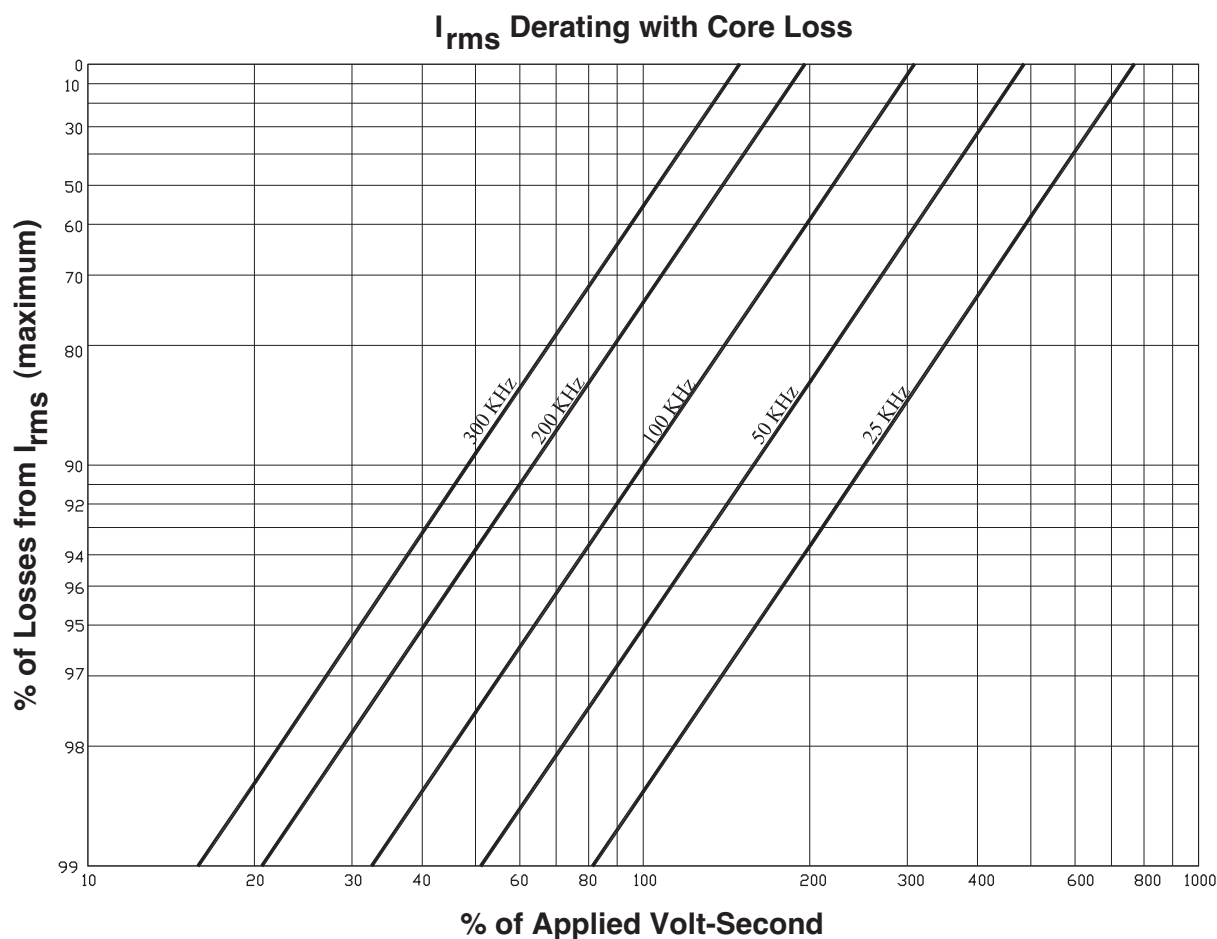
OCL vs  $I_{sat}$   
SDQ12



OCL vs  $I_{sat}$   
SDQ25



## Core Loss



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