

### Description

- Six sizes of shielded drum core inductors with low profiles (as low as 1.0mm) and high power density
- Inductance range from .47uH to 1000uH
- Current range from 6.00 to 0.088 Amps
- Ferrite shielded, low EMI
- Ferrite core material

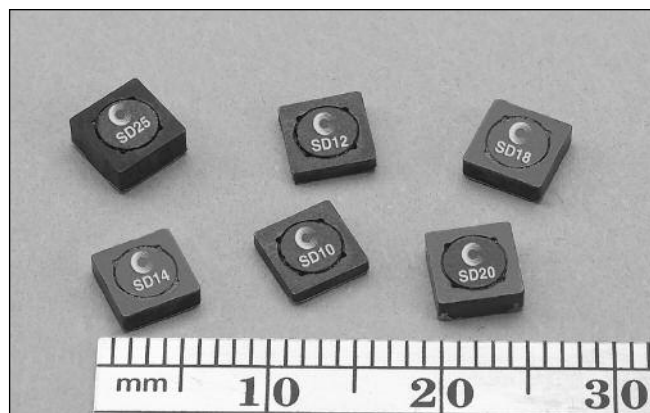


### Applications

- Digital cameras, CD players, cellular phones, and PDAs
- PCMCIA cards
- GPS systems

### Environmental Data

- Storage temperature range: -40°C to +125°C
- Operating ambient temperature range: -40°C to +85°C (range is application specific). Temperature rise is approximately 40°C at rated rms current
- Solder reflow temperature: +260°C max. for 10 seconds max.



### Packaging

- Supplied in tape and reel packaging, 3800 (SD10, SD12, SD14 and SD18), 2900 (SD20 and SD25) per reel

| Part Number | Rated Inductance (μH) | OCL (1) +/-20% (μH) | Part Marking | Irms (2) Amperes | Isat (3) Amperes | DCR (4) (Ω) Typ. | Volt u-sec Typ. |
|-------------|-----------------------|---------------------|--------------|------------------|------------------|------------------|-----------------|
| SD10-R47-R  | 0.470                 | 0.453               | A            | 2.59             | 3.54             | 0.0249           | 2.1             |
| SD10-1R0-R  | 1.00                  | 1.119               | B            | 1.93             | 2.25             | 0.0448           | 3.3             |
| SD10-1R5-R  | 1.50                  | 1.563               | C            | 1.60             | 1.91             | 0.0653           | 3.9             |
| SD10-2R2-R  | 2.20                  | 2.081               | D            | 1.35             | 1.65             | 0.0912           | 4.5             |
| SD10-3R3-R  | 3.30                  | 3.339               | E            | 1.24             | 1.31             | 0.1078           | 5.7             |
| SD10-4R7-R  | 4.70                  | 4.893               | F            | 1.04             | 1.08             | 0.1535           | 6.9             |
| SD10-6R2-R  | 6.20                  | 6.743               | G            | 0.94             | 0.92             | 0.218            | 8.1             |
| SD10-8R2-R  | 8.20                  | 8.889               | H            | 0.800            | 0.800            | 0.2607           | 9.3             |
| SD10-100-R  | 10.0                  | 10.07               | J            | 0.760            | 0.752            | 0.336            | 9.9             |
| SD10-150-R  | 15.0                  | 15.55               | K            | 0.613            | 0.605            | 0.4429           | 12.3            |
| SD10-220-R  | 22.0                  | 22.21               | L            | 0.498            | 0.506            | 0.6718           | 14.7            |
| SD10-330-R  | 33.0                  | 32.20               | M            | 0.412            | 0.420            | 0.9807           | 17.7            |
| SD10-470-R  | 47.0                  | 46.63               | N            | 0.337            | 0.349            | 1.47             | 21.3            |
| SD10-680-R  | 68.0                  | 70.01               | O            | 0.301            | 0.285            | 1.84             | 26.1            |
| SD10-820-R  | 82.0                  | 83.48               | P            | 0.258            | 0.261            | 2.50             | 28.5            |
| SD10-101-R  | 100                   | 102.0               | Q            | 0.225            | 0.236            | 3.29             | 31.5            |
| SD10-151-R  | 150                   | 149.2               | R            | 0.200            | 0.195            | 4.15             | 38.1            |
| SD10-221-R  | 220                   | 222.2               | S            | 0.161            | 0.160            | 6.41             | 46.5            |
| SD10-331-R  | 330                   | 330.4               | T            | 0.130            | 0.131            | 9.83             | 56.7            |
| SD10-471-R  | 470                   | 468.3               | U            | 0.117            | 0.110            | 12.10            | 67.5            |
| SD12-R47-R  | 0.470                 | 0.490               | A            | 3.19             | 3.86             | 0.0246           | 2.84            |
| SD12-1R2-R  | 1.20                  | 1.21                | B            | 2.62             | 2.45             | 0.0366           | 4.47            |
| SD12-1R5-R  | 1.50                  | 1.69                | C            | 2.19             | 2.08             | 0.0521           | 5.28            |
| SD12-2R2-R  | 2.20                  | 2.25                | D            | 1.83             | 1.80             | 0.0747           | 6.09            |
| SD12-3R3-R  | 3.30                  | 3.61                | E            | 1.55             | 1.42             | 0.1043           | 7.71            |
| SD12-4R7-R  | 4.70                  | 4.41                | F            | 1.46             | 1.29             | 0.1177           | 8.53            |
| SD12-6R2-R  | 6.20                  | 6.25                | G            | 1.21             | 1.08             | 0.1699           | 10.15           |
| SD12-8R2-R  | 8.20                  | 8.41                | H            | 1.02             | 0.931            | 0.2399           | 11.77           |
| SD12-100-R  | 10.0                  | 10.89               | J            | 0.938            | 0.818            | 0.2844           | 13.40           |
| SD12-150-R  | 15.0                  | 15.21               | K            | 0.782            | 0.692            | 0.4089           | 15.83           |
| SD12-220-R  | 22.0                  | 22.09               | L            | 0.628            | 0.574            | 0.6338           | 19.08           |
| SD12-330-R  | 33.0                  | 32.49               | M            | 0.519            | 0.474            | 0.9289           | 23.14           |
| SD12-470-R  | 47.0                  | 47.61               | N            | 0.428            | 0.391            | 1.37             | 28.01           |
| SD12-680-R  | 68.0                  | 68.89               | O            | 0.341            | 0.325            | 2.16             | 33.70           |

(1) Open Circuit Inductance Test Parameters: 100kHz, 0.25Vrms, 0.0Adc.

(2) RMS current for an approximate ΔT of 40°C without core loss. It is recommended that the temperature of the part not exceed 125°C.

(3) SD10,12,18,25 Peak current for approximate 30% roll off at 20°C.  
SD14 Peak current for approximate 20% roll off at 20°C.

(4) DCR limits @ 20°C.

(5) Applied Volt-Time product (V-uS) across the inductor at 100kHz necessary to generate a core loss equal to 10% of the total losses for 40°C temperature rise.

| Part Number | Rated Inductance (μH) | OCL (1) +/-20% (μH) | Part Marking | I <sub>rms</sub> (2) Amperes | I <sub>sat</sub> (3) Amperes | DCR (4) (Ω) Typ. | Volt u-sec Typ. |
|-------------|-----------------------|---------------------|--------------|------------------------------|------------------------------|------------------|-----------------|
| SD12-820-R  | 82.0                  | 82.81               | P            | 0.326                        | 0.297                        | 2.36             | 36.95           |
| SD12-101-R  | 100                   | 98.0                | Q            | 0.308                        | 0.273                        | 2.64             | 40.19           |
| SD12-151-R  | 150                   | 151.3               | R            | 0.251                        | 0.220                        | 3.96             | 49.94           |
| SD12-221-R  | 220                   | 222.0               | S            | 0.229                        | 0.181                        | 4.76             | 60.49           |
| SD12-331-R  | 330                   | 334.9               | T            | 0.186                        | 0.148                        | 7.25             | 74.30           |
| SD12-471-R  | 470                   | 462.3               | U            | 0.167                        | 0.126                        | 8.95             | 87.29           |
| SD12-681-R  | 680                   | 670.8               | V            | 0.149                        | 0.104                        | 11.30            | 105             |
| SD12-821-R  | 820                   | 800.9               | W            | 0.129                        | 0.095                        | 14.93            | 115             |
| SD12-102-R  | 1000                  | 992.3               | X            | 0.121                        | 0.086                        | 17.20            | 128             |
| SD14-R58-R  | 0.58                  | 0.61                | A            | 3.52                         | 4.84                         | 0.0220           | 3.38            |
| SD14-R87-R  | 0.87                  | 0.88                | B            | 3.2                          | 3.96                         | 0.0243           | 4.13            |
| SD14-1R2-R  | 1.2                   | 1.23                | C            | 2.7                          | 3.35                         | 0.0344           | 4.88            |
| SD14-1R5-R  | 1.5                   | 1.63                | D            | 2.53                         | 2.91                         | 0.0390           | 5.63            |
| SD14-2R0-R  | 2                     | 2.09                | E            | 2.37                         | 2.56                         | 0.0445           | 6.38            |
| SD14-2R5-R  | 2.5                   | 2.62                | F            | 2.05                         | 2.29                         | 0.0595           | 7.1             |
| SD14-3R2-R  | 3.2                   | 3.19                | G            | 1.94                         | 2.08                         | 0.0663           | 7.9             |
| SD14-4R5-R  | 4.5                   | 4.53                | H            | 1.64                         | 1.74                         | 0.0935           | 9.4             |
| SD14-6R9-R  | 6.9                   | 6.98                | J            | 1.35                         | 1.41                         | 0.1363           | 11.6            |
| SD14-8R8-R  | 8.8                   | 8.88                | K            | 1.14                         | 1.25                         | 0.1913           | 13.1            |
| SD14-100-R  | 10                    | 9.93                | L            | 1.1                          | 1.18                         | 0.2058           | 13.9            |
| SD14-150-R  | 15                    | 14.68               | M            | 0.98                         | 0.969                        | 0.2609           | 16.9            |
| SD14-220-R  | 22                    | 21.93               | N            | 0.806                        | 0.793                        | 0.3853           | 20.6            |
| SD14-330-R  | 33                    | 32.55               | O            | 0.654                        | 0.651                        | 0.5852           | 25.1            |
| SD14-470-R  | 47                    | 47.57               | P            | 0.525                        | 0.538                        | 0.9055           | 30.4            |
| SD14-680-R  | 68                    | 68.21               | Q            | 0.474                        | 0.449                        | 1.11             | 36              |
| SD14-820-R  | 82                    | 83                  | R            | 0.408                        | 0.407                        | 1.50             | 40              |
| SD14-101-R  | 100                   | 99.25               | S            | 0.386                        | 0.373                        | 1.68             | 44              |
| SD14-151-R  | 150                   | 152.4               | T            | 0.315                        | 0.301                        | 2.52             | 54              |
| SD14-221-R  | 220                   | 222                 | U            | 0.258                        | 0.249                        | 3.77             | 66              |
| SD14-331-R  | 330                   | 335.1               | V            | 0.206                        | 0.203                        | 5.92             | 81              |
| SD14-471-R  | 470                   | 471.4               | W            | 0.173                        | 0.171                        | 8.34             | 96              |
| SD14-681-R  | 680                   | 683.3               | X            | 0.156                        | 0.142                        | 10.3             | 115             |
| SD14-821-R  | 820                   | 823.4               | Y            | 0.134                        | 0.129                        | 13.9             | 126             |
| SD14-102-R  | 1000                  | 1008                | Z            | 0.126                        | 0.117                        | 15.8             | 140             |
| SD18-R47-R  | 0.47                  | 0.49                | A            | 3.58                         | 4.63                         | 0.0201           | 2.35            |
| SD18-R82-R  | 0.82                  | 0.81                | B            | 3.24                         | 3.60                         | 0.0247           | 3.02            |
| SD18-1R2-R  | 1.20                  | 1.21                | C            | 2.97                         | 2.95                         | 0.0294           | 3.70            |
| SD18-1R5-R  | 1.50                  | 1.69                | D            | 2.73                         | 2.49                         | 0.0345           | 4.37            |
| SD18-2R2-R  | 2.20                  | 2.25                | E            | 2.55                         | 2.16                         | 0.0398           | 5.04            |
| SD18-3R3-R  | 3.30                  | 3.61                | F            | 2.07                         | 1.71                         | 0.0605           | 6.38            |
| SD18-4R7-R  | 4.70                  | 4.41                | G            | 1.77                         | 1.54                         | 0.0824           | 7.06            |
| SD18-6R2-R  | 6.20                  | 6.25                | H            | 1.61                         | 1.30                         | 0.1000           | 8.40            |
| SD18-8R2-R  | 8.20                  | 8.41                | J            | 1.38                         | 1.12                         | 0.1351           | 9.74            |
| SD18-100-R  | 10.0                  | 10.89               | K            | 1.28                         | 0.982                        | 0.1584           | 11.09           |
| SD18-150-R  | 15.0                  | 15.21               | L            | 1.06                         | 0.831                        | 0.2278           | 13.10           |
| SD18-220-R  | 22.0                  | 22.09               | M            | 0.876                        | 0.689                        | 0.3366           | 15.79           |
| SD18-330-R  | 33.0                  | 32.49               | N            | 0.715                        | 0.568                        | 0.5057           | 19.15           |
| SD18-470-R  | 47.0                  | 47.61               | O            | 0.578                        | 0.470                        | 0.7732           | 23.18           |
| SD18-680-R  | 68.0                  | 68.89               | P            | 0.514                        | 0.390                        | 0.9798           | 27.89           |
| SD18-820-R  | 82.0                  | 82.81               | Q            | 0.446                        | 0.356                        | 1.30             | 30.58           |
| SD18-101-R  | 100                   | 102.01              | R            | 0.419                        | 0.321                        | 1.47             | 33.94           |
| SD18-151-R  | 150                   | 151.29              | S            | 0.345                        | 0.263                        | 2.18             | 41.33           |
| SD18-221-R  | 220                   | 222.01              | T            | 0.296                        | 0.217                        | 2.95             | 50.06           |
| SD18-331-R  | 330                   | 334.89              | U            | 0.248                        | 0.177                        | 4.20             | 61.49           |
| SD18-471-R  | 470                   | 479.61              | V            | 0.201                        | 0.148                        | 6.39             | 73.58           |
| SD18-681-R  | 680                   | 681.21              | W            | 0.167                        | 0.124                        | 9.28             | 87.70           |
| SD18-821-R  | 820                   | 823.69              | X            | 0.145                        | 0.113                        | 12.35            | 96.43           |
| SD18-102-R  | 1000                  | 1004                | Y            | 0.136                        | 0.102                        | 14.01            | 107             |

(1) Open Circuit Inductance Test Parameters: 100KHz, 0.25Vrms, 0.0Adc.

(2) RMS current for an approximate ΔT of 40°C without core loss. It is recommended that the temperature of the part not exceed 125°C.

(3) SD10,12,18,25 Peak current for approximate 30% roll off at 20°C. SD14 Peak current for approximate 20% roll off at 20°C.

(4) DCR limits @ 20°C.

5) Applied Volt-Time product (V-uS) across the inductor at 100KHz necessary to generate a core loss equal to 10% of the total losses for 40°C temperature rise.

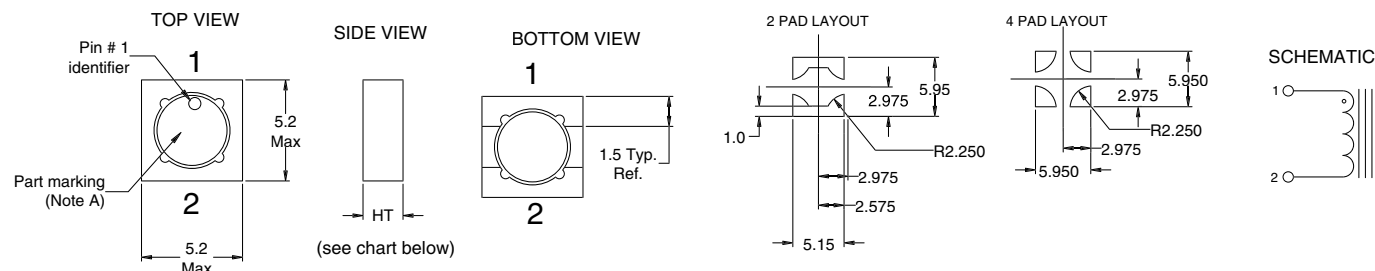
| Part Number | Rated Inductance (μH) | OCL (1) +/-20% (μH) | Part Marking | I <sub>rms</sub> (2) Amperes | I <sub>sat</sub> (3) Amperes | DCR (4) (Ω) Typ. | Volt u-sec Typ. |
|-------------|-----------------------|---------------------|--------------|------------------------------|------------------------------|------------------|-----------------|
| SD20-R47-R  | 0.47                  | 0.490               | A            | 3.59                         | 4.00                         | 0.0200           | 2.28            |
| SD20-1R2-R  | 1.20                  | 1.21                | B            | 3.07                         | 2.55                         | 0.0275           | 3.58            |
| SD20-1R5-R  | 1.50                  | 1.69                | C            | 2.88                         | 2.15                         | 0.0312           | 4.23            |
| SD20-2R2-R  | 2.20                  | 2.25                | D            | 2.45                         | 1.87                         | 0.0429           | 4.88            |
| SD20-3R3-R  | 3.30                  | 3.61                | E            | 2.17                         | 1.47                         | 0.0547           | 6.18            |
| SD20-4R7-R  | 4.70                  | 4.41                | F            | 2.05                         | 1.33                         | 0.0612           | 6.83            |
| SD20-6R2-R  | 6.20                  | 6.25                | G            | 1.89                         | 1.12                         | 0.0720           | 8.13            |
| SD20-8R2-R  | 8.20                  | 8.41                | H            | 1.61                         | 0.966                        | 0.1000           | 9.43            |
| SD20-100-R  | 10.0                  | 9.61                | J            | 1.53                         | 0.903                        | 0.1100           | 10.08           |
| SD20-150-R  | 15.0                  | 15.21               | K            | 1.25                         | 0.718                        | 0.1655           | 12.68           |
| SD20-220-R  | 22.0                  | 22.09               | L            | 1.12                         | 0.596                        | 0.2053           | 15.28           |
| SD20-330-R  | 33.0                  | 32.49               | M            | 0.913                        | 0.491                        | 0.3100           | 18.53           |
| SD20-470-R  | 47.0                  | 47.61               | N            | 0.745                        | 0.406                        | 0.4650           | 22.43           |
| SD20-680-R  | 68.0                  | 68.89               | O            | 0.610                        | 0.337                        | 0.6947           | 26.98           |
| SD20-820-R  | 82.0                  | 82.81               | P            | 0.576                        | 0.308                        | 0.7785           | 29.58           |
| SD20-101-R  | 100                   | 98.01               | Q            | 0.495                        | 0.283                        | 1.06             | 32.18           |
| SD20-151-R  | 150                   | 151.3               | R            | 0.435                        | 0.228                        | 1.37             | 39.98           |
| SD20-221-R  | 220                   | 222.0               | S            | 0.356                        | 0.188                        | 2.04             | 48.43           |
| SD20-331-R  | 330                   | 327.6               | T            | 0.294                        | 0.155                        | 2.99             | 58.83           |
| SD20-471-R  | 470                   | 470.9               | U            | 0.263                        | 0.129                        | 3.74             | 70.53           |
| SD20-681-R  | 680                   | 681.2               | V            | 0.216                        | 0.107                        | 5.56             | 84.83           |
| SD20-821-R  | 820                   | 823.7               | W            | 0.204                        | 0.098                        | 6.22             | 93.28           |
| SD20-102-R  | 1000                  | 1004.9              | X            | 0.172                        | 0.088                        | 8.73             | 103             |
| SD25-R47-R  | 0.47                  | 0.466               | A            | 3.88                         | 6.00                         | 0.0177           | 2.13            |
| SD25-R82-R  | 0.82                  | 0.770               | B            | 3.58                         | 4.67                         | 0.0208           | 2.74            |
| SD25-1R2-R  | 1.20                  | 1.15                | C            | 3.33                         | 3.81                         | 0.0240           | 3.34            |
| SD25-1R5-R  | 1.50                  | 1.61                | D            | 3.12                         | 3.23                         | 0.0274           | 3.95            |
| SD25-2R2-R  | 2.20                  | 2.14                | E            | 2.93                         | 2.80                         | 0.0311           | 4.56            |
| SD25-3R3-R  | 3.30                  | 3.43                | F            | 2.64                         | 2.21                         | 0.0384           | 5.78            |
| SD25-4R7-R  | 4.70                  | 5.03                | G            | 2.39                         | 1.83                         | 0.0467           | 6.99            |
| SD25-6R8-R  | 6.80                  | 6.93                | H            | 2.19                         | 1.56                         | 0.0556           | 8.21            |
| SD25-8R2-R  | 8.20                  | 7.99                | J            | 1.92                         | 1.45                         | 0.0724           | 8.82            |
| SD25-100-R  | 10.0                  | 10.35               | K            | 1.80                         | 1.27                         | 0.0824           | 10.03           |
| SD25-150-R  | 15.0                  | 14.45               | L            | 1.67                         | 1.08                         | 0.0956           | 11.86           |
| SD25-220-R  | 22.0                  | 22.81               | M            | 1.34                         | 0.857                        | 0.1478           | 14.90           |
| SD25-330-R  | 33.0                  | 33.07               | N            | 1.11                         | 0.711                        | 0.2149           | 17.94           |
| SD25-470-R  | 47.0                  | 47.89               | O            | 0.919                        | 0.592                        | 0.3156           | 21.58           |
| SD25-680-R  | 68.0                  | 68.64               | P            | 0.741                        | 0.482                        | 0.4850           | 25.84           |
| SD25-820-R  | 82.0                  | 82.17               | Q            | 0.713                        | 0.441                        | 0.5242           | 28.27           |
| SD25-101-R  | 100                   | 100.79              | R            | 0.670                        | 0.398                        | 0.5937           | 31.31           |
| SD25-151-R  | 150                   | 148.4               | S            | 0.553                        | 0.328                        | 0.8723           | 38.00           |
| SD25-221-R  | 220                   | 222.4               | T            | 0.446                        | 0.268                        | 1.34             | 46.51           |
| SD25-331-R  | 330                   | 332.2               | U            | 0.359                        | 0.219                        | 2.07             | 56.85           |
| SD25-471-R  | 470                   | 472.4               | V            | 0.293                        | 0.184                        | 3.10             | 67.79           |
| SD25-681-R  | 680                   | 677.2               | W            | 0.262                        | 0.154                        | 3.88             | 81.17           |
| SD25-821-R  | 820                   | 826.7               | X            | 0.230                        | 0.139                        | 5.04             | 89.68           |
| SD25-102-R  | 1000                  | 1003.4              | Y            | 0.216                        | 0.126                        | 5.70             | 98.80           |

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(2) RMS current for an approximate ΔT of 40°C without core loss. It is recommended that the temperature of the part not exceed 125°C.  
(3) SD10,12,18,25 Peak current for approximate 30% roll off at 20°C.  
SD14 Peak current for approximate 20% roll off at 20°C.

- (4) DCR limits @ 20°C.  
5) Applied Volt-Time product (V-uS) across the inductor at 100kHz necessary to generate a core loss equal to 10% of the total losses for 40°C temperature rise.

### Mechanical Diagrams

#### SD Series



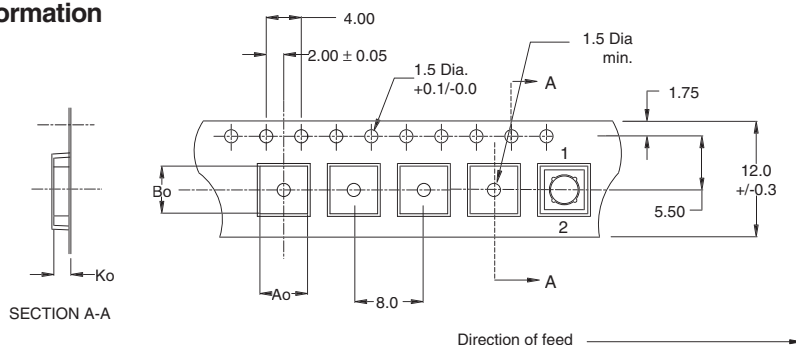
| Series | HT         |
|--------|------------|
| SD10   | 1.0mm max  |
| SD12   | 1.2mm max  |
| SD14   | 1.45mm max |
| SD18   | 1.8mm max  |
| SD20   | 2.0mm max  |
| SD25   | 2.5mm max  |

A) Part Marking: Line 1: (1st digit indicates the inductance value per part marking designator in chart above)  
(2nd digit is a bi-weekly production date code)  
(3rd digit is the last digit of the year produced)  
Line 2: XX (indicates the product size code)

### Packaging Information

#### SD10 Series

Ao=5.45mm  
Bo=5.45mm  
Ko=1.20mm

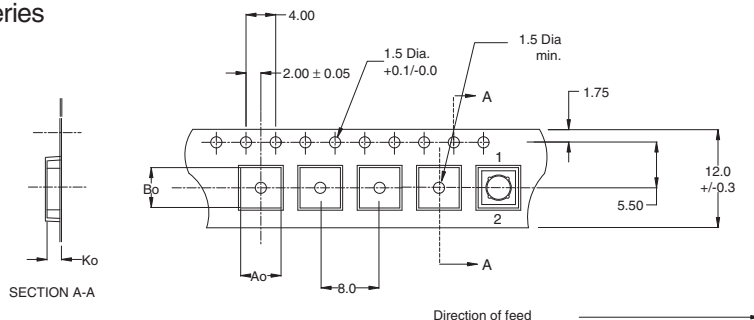


ACTUAL SIZE  
SD10

Parts packaged on 13" Diameter reel,  
3,800 parts per reel.

#### SD12/14/18 Series

Ao=5.45mm  
Bo=5.45mm  
Ko=2.00mm



ACTUAL SIZE  
SD12

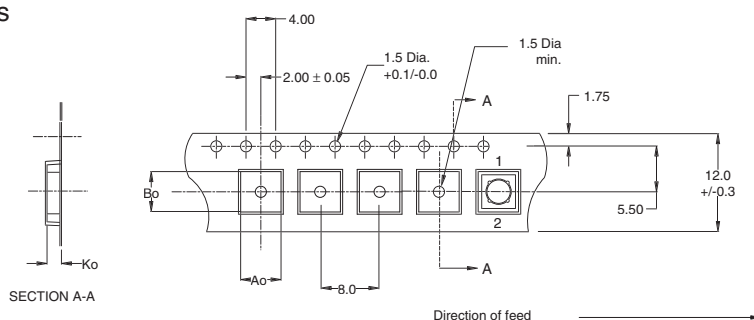
ACTUAL SIZE  
SD14

ACTUAL SIZE  
SD18

Parts packaged on 13" Diameter reel,  
3,800 parts per reel.

#### SD20/25 Series

Ao=5.45mm  
Bo=5.45mm  
Ko=2.70mm

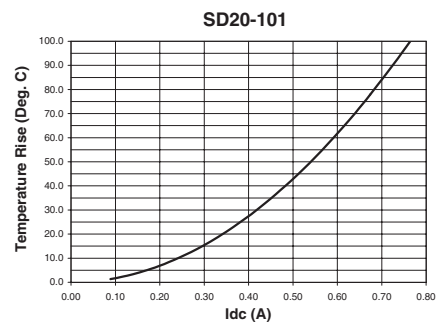
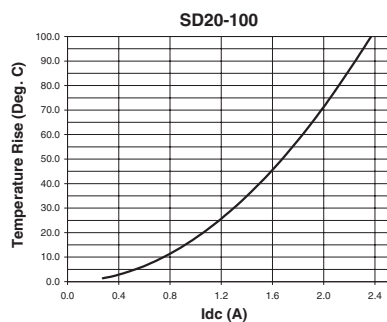
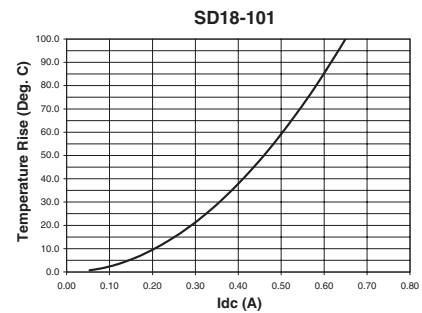
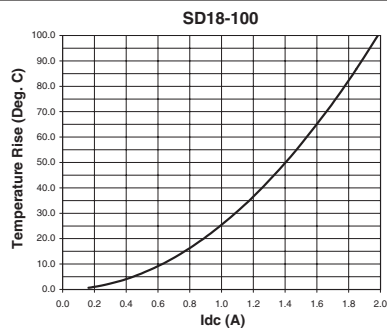
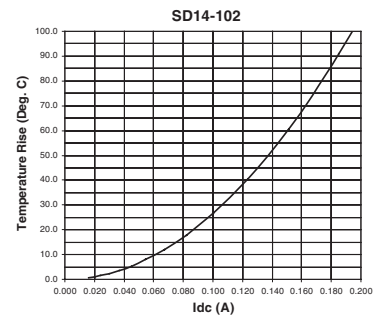
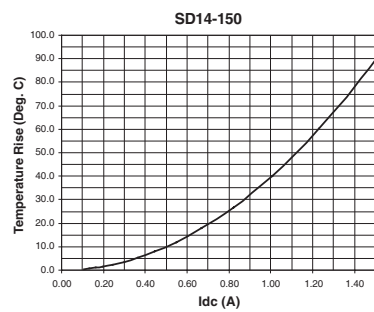
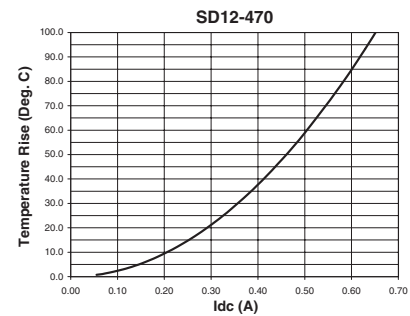
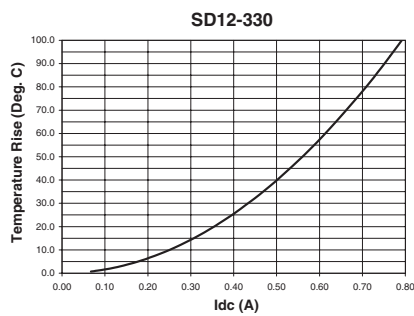
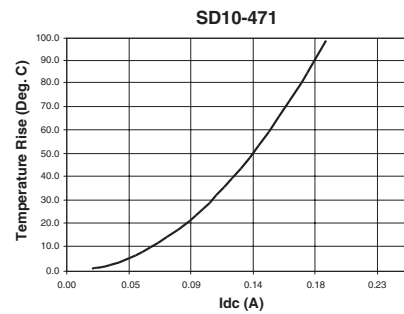
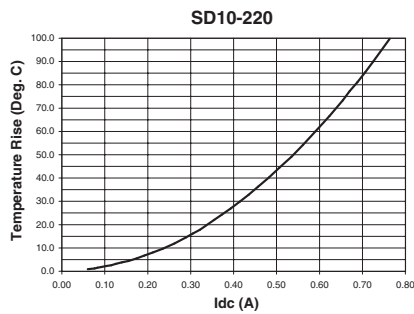


ACTUAL SIZE  
SD20

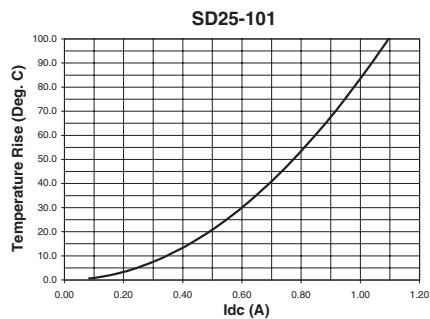
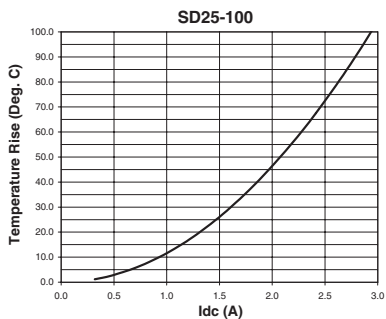
ACTUAL SIZE  
SD25

Parts packaged on 13" Diameter reel,  
2,900 parts per reel.

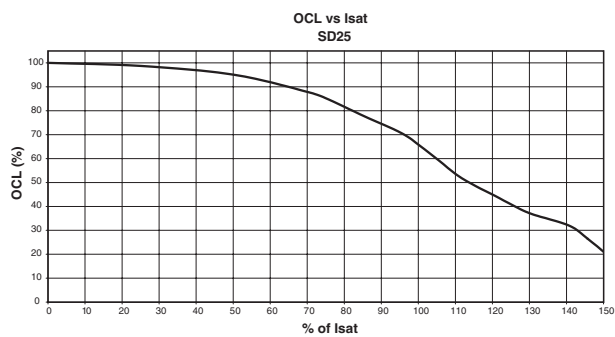
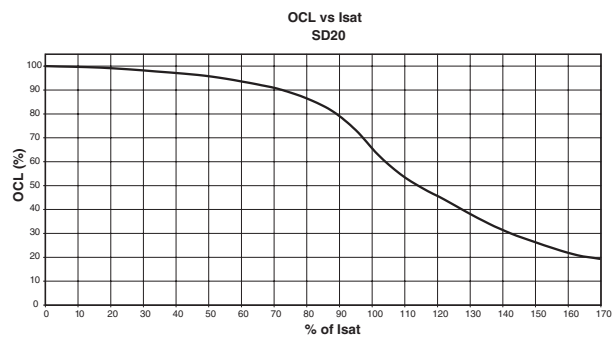
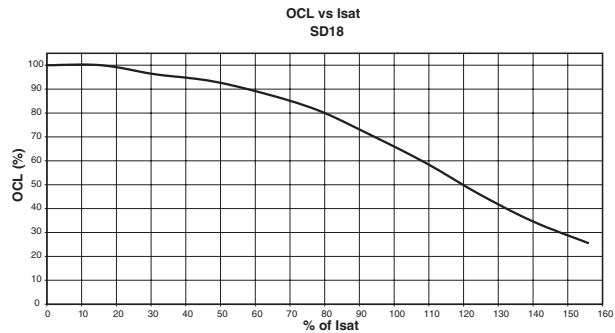
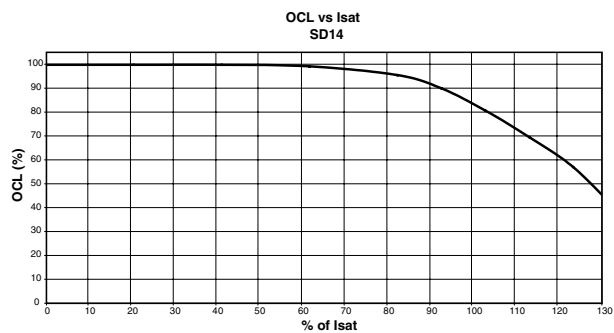
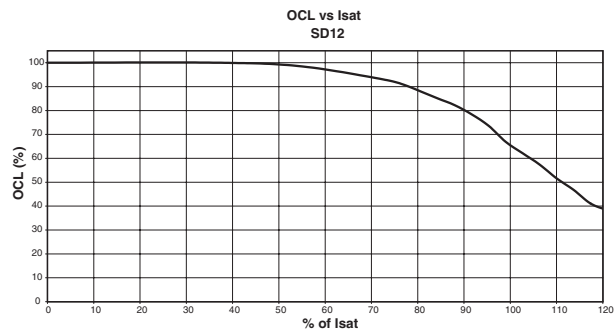
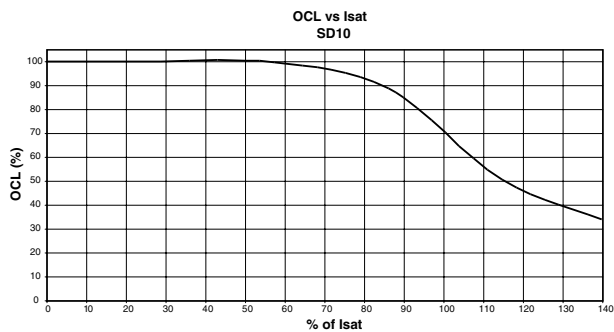
**DC Current vs. Temperature**



## DC Current vs. Temperature



## Inductance Characteristics



## Core Loss

