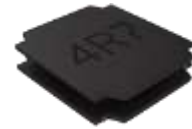


# Wire Wound SMD Power Inductors – SPH Series

Operating Temp. : -40°C~+125°C (Including self-heating)



## FEATURES

- Magnetic-resin shielded construction reduces buzz noise to ultra-low levels
- Metallization on ferrite core results in excellent shock resistance and damage-free durability
- Closed magnetic circuit design reduces leakage flux and Electro Magnetic Interference (EMI)
- Takes up less PCB real estate and save more power
- 30% lower DCR than SWPA series and larger current

## APPLICATIONS

- Smart phone, set top box, VR, AR
- Notebooks, desktop computers, servers
- Portable gaming devices, personal navigation systems, personal multimedia devices

## PRODUCT IDENTIFICATION

**SPH**

①

**252012**

②

**H**

③

**2R2**

④

**M**

⑤

**I**

⑥

□□□

⑦

| ① Type |                               |
|--------|-------------------------------|
| SPH    | Wire Wound SMD Power Inductor |

| ③ Material Code |                 |
|-----------------|-----------------|
| U               | U Type Material |
| H               | H Type Material |

| ④ Nominal Inductance |               |
|----------------------|---------------|
| Example              | Nominal Value |
| R47                  | 0.47μH        |
| 2R2                  | 2.2μH         |

| ⑥ Packing |             |
|-----------|-------------|
| T         | Tape & Reel |

| ② External Dimensions (LxWxH) [mm] |             |
|------------------------------------|-------------|
| 201610                             | 2.0x1.6x1.0 |
| 252010                             | 2.5x2.0x1.0 |
| 252012                             | 2.5x2.0x1.2 |
| 3010                               | 3.0x3.0x1.0 |
| 3012                               | 3.0x3.0x1.2 |
| 3015                               | 3.0x3.0x1.5 |
| 4012                               | 4.0x4.0x1.2 |
| 4018                               | 4.0x4.0x1.8 |
| 4020                               | 4.0x4.0x2.0 |
| 4030                               | 4.0x4.0x3.0 |

| ⑤ Inductance Tolerance |      |
|------------------------|------|
| M                      | ±20% |
| N                      | ±30% |

| ⑦ Design Code               |             |
|-----------------------------|-------------|
| □□□                         | Design Code |
| * Standard product is blank |             |

# SHAPE AND DIMENSIONS

Fig.1

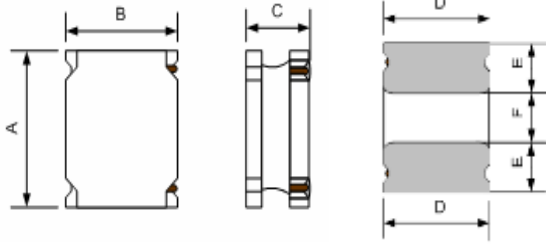


Fig.2

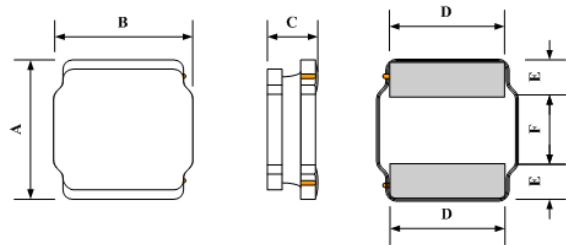


Fig.3

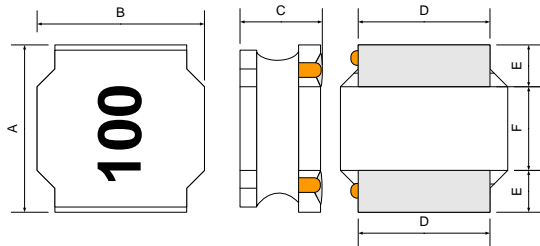
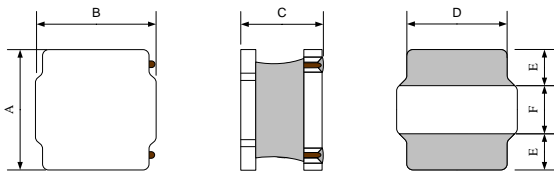
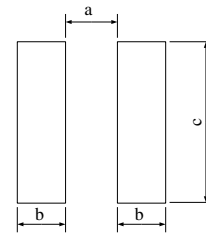


Fig.4



Recommended Land Pattern



Unit: mm

| Series     | Shape | A       | B       | C        | D       | E        | F        | a Typ. | b Typ. | c Typ. |
|------------|-------|---------|---------|----------|---------|----------|----------|--------|--------|--------|
| SPH201610H | Fig.1 | 2.0±0.2 | 1.6±0.2 | 1.0 Max. | 1.2±0.2 | 0.60±0.2 | 0.80±0.2 | 0.70   | 0.70   | 1.7    |
| SPH201610U | Fig.4 | 2.0±0.2 | 1.6±0.2 | 1.0 Max. | 1.6±0.2 | 0.60±0.2 | 0.80±0.2 | 0.70   | 0.70   | 1.7    |
| SPH252010  | Fig.1 | 2.5±0.2 | 2.0±0.2 | 1.0 Max. | 2.0±0.2 | 0.80±0.2 | 0.80±0.2 | 0.80   | 0.85   | 2.0    |
| SPH252012  | Fig.1 | 2.5±0.2 | 2.0±0.2 | 1.2 Max. | 2.0±0.2 | 0.80±0.2 | 0.80±0.2 | 0.80   | 0.85   | 2.0    |
| SPH3010    | Fig.2 | 3.0±0.2 | 3.0±0.2 | 1.0 Max. | 2.5±0.2 | 0.75±0.2 | 1.5±0.2  | 1.5    | 0.8    | 2.7    |
| SPH3012    | Fig.2 | 3.0±0.2 | 3.0±0.2 | 1.2 Max. | 2.5±0.2 | 0.75±0.2 | 1.5±0.2  | 1.5    | 0.8    | 2.7    |
| SPH3015    | Fig.2 | 3.0±0.2 | 3.0±0.2 | 1.5 Max. | 2.5±0.2 | 0.75±0.2 | 1.5±0.2  | 1.5    | 0.8    | 2.7    |
| SPH4012    | Fig.3 | 4.0±0.2 | 4.0±0.2 | 1.2 Max. | 3.3±0.2 | 0.95±0.2 | 2.1±0.2  | 1.9    | 1.1    | 3.7    |
| SPH4018    | Fig.3 | 4.0±0.2 | 4.0±0.2 | 1.8 Max. | 3.3±0.2 | 0.95±0.2 | 2.1±0.2  | 1.9    | 1.1    | 3.7    |
| SPH4020    | Fig.3 | 4.0±0.2 | 4.0±0.2 | 2.0 Max. | 3.3±0.2 | 0.95±0.2 | 2.1±0.2  | 1.9    | 1.1    | 3.7    |
| SPH4030    | Fig.3 | 4.0±0.2 | 4.0±0.2 | 3.0 Max. | 3.3±0.2 | 0.95±0.2 | 2.1±0.2  | 1.9    | 1.1    | 3.7    |

## SPECIFICATIONS

### SPH201610H Series

| Part Number     | Inductance | DC Resistance |       | Saturation Current |      | Heat Rating Current |      |
|-----------------|------------|---------------|-------|--------------------|------|---------------------|------|
|                 | @1MHz,1V   | Max.          | Typ.  | Max.               | Typ. | Max.                | Typ. |
| Units           | μH         | Ω             |       | A                  |      | A                   |      |
| Symbol          | L          | DCR           |       | Isat               |      | Irms                |      |
| SPH201610HR16MT | 0.16±20%   | 0.031         | 0.026 | 4.30               | 4.80 | 3.20                | 3.50 |
| SPH201610HR24MT | 0.24±20%   | 0.040         | 0.033 | 3.70               | 4.10 | 2.90                | 3.20 |
| SPH201610HR33MT | 0.33±20%   | 0.040         | 0.033 | 2.50               | 3.10 | 2.90                | 3.20 |
| SPH201610HR47MT | 0.47±20%   | 0.059         | 0.049 | 2.30               | 2.85 | 2.35                | 2.60 |
| SPH201610HR68MT | 0.68±20%   | 0.076         | 0.063 | 1.95               | 2.45 | 2.05                | 2.25 |
| SPH201610H1R0MT | 1.0±20%    | 0.114         | 0.095 | 1.65               | 1.85 | 1.45                | 1.60 |
| SPH201610H1R5MT | 1.5±20%    | 0.174         | 0.145 | 1.35               | 1.65 | 1.25                | 1.40 |
| SPH201610H2R2MT | 2.2±20%    | 0.264         | 0.220 | 1.20               | 1.45 | 1.10                | 1.20 |
| SPH201610H3R3MT | 3.3±20%    | 0.335         | 0.279 | 0.90               | 1.05 | 0.88                | 0.98 |
| SPH201610H4R7MT | 4.7±20%    | 0.479         | 0.399 | 0.70               | 0.85 | 0.74                | 0.82 |
| SPH201610H6R8MT | 6.8±20%    | 0.816         | 0.680 | 0.60               | 0.70 | 0.52                | 0.58 |
| SPH201610H100MT | 10±20%     | 1.020         | 0.850 | 0.50               | 0.55 | 0.45                | 0.50 |

### SPH201610U Series

| Part Number        | Inductance | DC Resistance |       | Saturation Current |      | Heat Rating Current |      |
|--------------------|------------|---------------|-------|--------------------|------|---------------------|------|
|                    | @1MHz,1V   | Max.          | Typ.  | Max.               | Typ. | Max.                | Typ. |
| Units              | μH         | Ω             |       | A                  |      | A                   |      |
| Symbol             | L          | DCR           |       | Isat               |      | Irms                |      |
| SPH201610U50NMT    | 0.05±20%   | 0.022         | 0.018 | 7.50               | 8.00 | 3.65                | 4.25 |
| SPH201610UR10MT    | 0.10±20%   | 0.022         | 0.018 | 4.80               | 5.70 | 3.65                | 4.25 |
| SPH201610UR16MT    | 0.16±20%   | 0.031         | 0.026 | 4.70               | 5.40 | 3.20                | 3.50 |
| SPH201610UR24MT    | 0.24±20%   | 0.040         | 0.033 | 4.50               | 5.00 | 2.90                | 3.20 |
| SPH201610UR33MT    | 0.33±20%   | 0.040         | 0.033 | 3.00               | 3.60 | 2.90                | 3.20 |
| SPH201610UR47MT    | 0.47±20%   | 0.052         | 0.043 | 2.90               | 3.40 | 2.35                | 2.60 |
| SPH201610UR47MTY01 | 0.47±20%   | 0.040         | 0.033 | 2.00               | 2.40 | 2.90                | 3.20 |
| SPH201610UR68MT    | 0.68±20%   | 0.072         | 0.060 | 2.50               | 2.70 | 2.05                | 2.25 |
| SPH201610U1R0MT    | 1.0±20%    | 0.072         | 0.060 | 1.30               | 1.50 | 2.05                | 2.25 |
| SPH201610U2R2MT    | 2.2±20%    | 0.171         | 0.143 | 1.10               | 1.20 | 1.23                | 1.40 |

### SPH252010H Series

| Part Number        | Inductance | DC Resistance |       | Saturation Current |      | Heat Rating Current |      |
|--------------------|------------|---------------|-------|--------------------|------|---------------------|------|
|                    | @1MHz,1V   | Max.          | Typ.  | Max.               | Typ. | Max.                | Typ. |
| Units              | μH         | Ω             |       | A                  |      | A                   |      |
| Symbol             | L          | DCR           |       | Isat               |      | Irms                |      |
| SPH252010HR24MT    | 0.24±20%   | 0.034         | 0.028 | 3.60               | 4.40 | 2.75                | 3.00 |
| SPH252010HR33MT    | 0.33±20%   | 0.043         | 0.036 | 3.80               | 4.60 | 2.40                | 2.65 |
| SPH252010HR47MT    | 0.47±20%   | 0.044         | 0.037 | 2.40               | 2.80 | 2.40                | 2.65 |
| SPH252010HR68MT    | 0.68±20%   | 0.061         | 0.051 | 2.75               | 3.10 | 2.10                | 2.35 |
| SPH252010HR68MTY01 | 0.68±20%   | 0.061         | 0.051 | 2.75               | 3.10 | 2.10                | 2.35 |
| SPH252010HR68MTY02 | 0.68±20%   | 0.065         | 0.055 | 3.20               | 3.50 | 2.10                | 2.30 |
| SPH252010H1R0MT    | 1.0±20%    | 0.080         | 0.067 | 2.05               | 2.45 | 1.80                | 2.00 |
| SPH252010H1R5MT    | 1.5±20%    | 0.108         | 0.090 | 1.70               | 2.05 | 1.55                | 1.70 |
| SPH252010H2R2MT    | 2.2±20%    | 0.137         | 0.114 | 1.55               | 1.80 | 1.40                | 1.55 |
| SPH252010H3R3MT    | 3.3±20%    | 0.228         | 0.170 | 1.10               | 1.40 | 1.10                | 1.20 |
| SPH252010H4R7MT    | 4.7±20%    | 0.323         | 0.269 | 1.00               | 1.15 | 0.91                | 1.00 |
| SPH252010H6R8MT    | 6.8±20%    | 0.451         | 0.376 | 0.82               | 0.95 | 0.76                | 0.84 |

## SPECIFICATIONS

### SPH252010H Series

| Part Number     | Inductance | DC Resistance |       | Saturation Current |      | Heat Rating Current |      |
|-----------------|------------|---------------|-------|--------------------|------|---------------------|------|
|                 | @1MHz,1V   | Max.          | Typ.  | Max.               | Typ. | Max.                | Typ. |
| Units           | μH         | Ω             |       | A                  |      | A                   |      |
| Symbol          | L          | DCR           |       | Isat               |      | Irms                |      |
| SPH252010H100MT | 10±20%     | 0.584         | 0.487 | 0.65               | 0.75 | 0.67                | 0.74 |
| SPH252010H150MT | 15±20%     | 0.954         | 0.795 | 0.55               | 0.65 | 0.50                | 0.55 |
| SPH252010H220MT | 22±20%     | 1.548         | 1.290 | 0.45               | 0.55 | 0.40                | 0.45 |
| SPH252010H330MT | 33±20%     | 1.548         | 1.290 | 0.25               | 0.30 | 0.40                | 0.45 |

### SPH252012H Series

| Part Number        | Inductance | DC Resistance |       | Saturation Current |      | Heat Rating Current |      |
|--------------------|------------|---------------|-------|--------------------|------|---------------------|------|
|                    | @1MHz,1V   | Max.          | Typ.  | Max.               | Typ. | @1MHz,1V            | Max. |
| Units              | μH         | Ω             |       | A                  |      | A                   |      |
| Symbol             | L          | DCR           |       | Isat               |      | Irms                |      |
| SPH252012HR16MT    | 0.16±20%   | 0.022         | 0.018 | 6.50               | 7.20 | 4.05                | 4.50 |
| SPH252012HR24MT    | 0.24±20%   | 0.022         | 0.018 | 4.00               | 4.75 | 4.05                | 4.50 |
| SPH252012HR33MT    | 0.33±20%   | 0.029         | 0.024 | 4.00               | 4.70 | 3.35                | 3.70 |
| SPH252012HR47MT    | 0.47±20%   | 0.036         | 0.030 | 3.70               | 4.10 | 3.00                | 3.30 |
| SPH252012HR47MTY01 | 0.47±20%   | 0.038         | 0.032 | 4.90               | 5.20 | 2.90                | 3.20 |
| SPH252012HR68MT    | 0.68±20%   | 0.061         | 0.051 | 3.00               | 3.30 | 2.10                | 2.30 |
| SPH252012HR68MTY01 | 0.68±20%   | 0.042         | 0.035 | 3.20               | 3.50 | 2.50                | 2.70 |
| SPH252012HR68MTY02 | 0.68±20%   | 0.060         | 0.051 | 3.80               | 4.20 | 2.10                | 2.30 |
| SPH252012H1R0MT    | 1.0±20%    | 0.044         | 0.037 | 1.70               | 1.90 | 2.20                | 2.40 |
| SPH252012H1R2MT    | 1.2±20%    | 0.078         | 0.065 | 2.20               | 2.50 | 1.95                | 2.10 |
| SPH252012H1R5MT    | 1.5±20%    | 0.078         | 0.065 | 2.00               | 2.35 | 1.95                | 2.10 |
| SPH252012H2R2MT    | 2.2±20%    | 0.096         | 0.080 | 1.80               | 1.95 | 1.80                | 1.95 |
| SPH252012H3R3MT    | 3.3±20%    | 0.144         | 0.120 | 1.15               | 1.25 | 1.40                | 1.50 |
| SPH252012H4R7MT    | 4.7±20%    | 0.210         | 0.175 | 1.10               | 1.20 | 1.12                | 1.25 |
| SPH252012H6R8MT    | 6.8±20%    | 0.360         | 0.300 | 0.80               | 1.00 | 0.95                | 1.05 |
| SPH252012H100MT    | 10±20%     | 0.522         | 0.435 | 0.70               | 0.85 | 0.79                | 0.87 |
| SPH252012H150MT    | 15±20%     | 1.000         | 0.830 | 0.65               | 0.75 | 0.57                | 0.63 |
| SPH252012H180MT    | 18±20%     | 1.000         | 0.830 | 0.50               | 0.65 | 0.57                | 0.63 |
| SPH252012H220MT    | 22±20%     | 1.090         | 0.910 | 0.45               | 0.55 | 0.54                | 0.60 |
| SPH252012H330MT    | 33±20%     | 1.840         | 1.530 | 0.35               | 0.40 | 0.42                | 0.46 |
| SPH252012H470MT    | 47±20%     | 2.220         | 1.850 | 0.25               | 0.30 | 0.30                | 0.35 |
| SPH252012H680MT    | 68±20%     | 3.000         | 2.500 | 0.30               | 0.35 | 0.28                | 0.32 |
| SPH252012H101MT    | 100±20%    | 5.400         | 4.500 | 0.22               | 0.25 | 0.25                | 0.24 |

### SPH3010H Series

| Part Number   | Inductance | DC Resistance |      | Saturation Current |      | Heat Rating Current |      |
|---------------|------------|---------------|------|--------------------|------|---------------------|------|
|               | @1MHz,1V   | Max.          | Typ. | Max.               | Typ. | @1MHz,1V            | Max. |
| Units         | μH         | Ω             |      | A                  |      | A                   |      |
| Symbol        | L          | DCR           |      | Isat               |      | Irms                |      |
| SPH3010H4R7MT | 4.7±20%    | 0.18          | 0.15 | 0.85               | 0.95 | 1.10                | 1.25 |
| SPH3010H100MT | 10±20%     | 0.42          | 0.35 | 0.60               | 0.70 | 0.62                | 0.80 |
| SPH3010H220MT | 22±20%     | 0.92          | 0.77 | 0.40               | 0.50 | 0.48                | 0.56 |

## SPECIFICATIONS

### SPH3012H Series

| Part Number      | Inductance    | DC Resistance |       | Saturation Current |      | Heat Rating Current |      |
|------------------|---------------|---------------|-------|--------------------|------|---------------------|------|
|                  | @1MHz,1V      | Max.          | Typ.  | Max.               | Typ. | Max.                | Typ. |
| Units            | $\mu$ H       | $\Omega$      |       | A                  |      | A                   |      |
| Symbol           | L             | DCR           |       | Isat               |      | Irms                |      |
| SPH3012H1R0MT    | 1.0 $\pm$ 20% | 0.040         | 0.032 | 2.20               | 2.50 | 2.30                | 2.50 |
| SPH3012H1R0MTY02 | 1.0 $\pm$ 20% | 0.056         | 0.047 | 2.80               | 3.20 | 1.90                | 2.00 |
| SPH3012H2R2MT    | 2.2 $\pm$ 20% | 0.090         | 0.075 | 1.50               | 1.80 | 1.40                | 1.60 |
| SPH3012H3R3MT    | 3.3 $\pm$ 20% | 0.134         | 0.112 | 1.23               | 1.55 | 1.40                | 1.60 |
| SPH3012H100MT    | 10 $\pm$ 20%  | 0.372         | 0.310 | 0.75               | 0.90 | 0.75                | 0.80 |
| SPH3012H100MTY01 | 10 $\pm$ 20%  | 0.495         | 0.413 | 1.00               | 1.10 | 0.90                | 1.00 |
| SPH3012H100MTY02 | 10 $\pm$ 20%  | 0.324         | 0.270 | 0.73               | 0.85 | 0.78                | 0.85 |
| SPH3012H220MT    | 22 $\pm$ 20%  | 0.840         | 0.700 | 0.50               | 0.60 | 0.50                | 0.55 |
| SPH3012H220MTY01 | 22 $\pm$ 20%  | 0.756         | 0.630 | 0.50               | 0.60 | 0.50                | 0.60 |

### SPH3015H Series

| Part Number   | Inductance     | DC Resistance |       | Saturation Current |      | Heat Rating Current |      |
|---------------|----------------|---------------|-------|--------------------|------|---------------------|------|
|               | @1MHz,1V       | Max.          | Typ.  | Max.               | Typ. | Max.                | Typ. |
| Units         | $\mu$ H        | $\Omega$      |       | A                  |      | A                   |      |
| Symbol        | L              | DCR           |       | Isat               |      | Irms                |      |
| SPH3015HR22MT | 0.22 $\pm$ 20% | 0.022         | 0.018 | 6.00               | 6.80 | 3.00                | 3.50 |
| SPH3015HR24MT | 0.24 $\pm$ 20% | 0.022         | 0.018 | 5.50               | 5.50 | 3.00                | 3.50 |
| SPH3015HR47MT | 0.47 $\pm$ 20% | 0.022         | 0.018 | 2.40               | 2.80 | 3.00                | 3.50 |
| SPH3015HR22MT | 0.22 $\pm$ 20% | 0.022         | 0.018 | 6.00               | 6.80 | 3.00                | 3.50 |
| SPH3015HR24MT | 0.24 $\pm$ 20% | 0.022         | 0.018 | 5.50               | 5.50 | 3.00                | 3.50 |
| SPH3015HR47MT | 0.47 $\pm$ 20% | 0.022         | 0.018 | 2.40               | 2.80 | 3.00                | 3.50 |
| SPH3015HR55MT | 0.55 $\pm$ 20% | 0.019         | 0.016 | 2.40               | 2.70 | 3.05                | 3.55 |
| SPH3015H1R0MT | 1.0 $\pm$ 20%  | 0.040         | 0.033 | 2.70               | 3.00 | 2.20                | 2.50 |
| SPH3015H1R5MT | 1.5 $\pm$ 20%  | 0.048         | 0.040 | 2.00               | 2.30 | 2.00                | 2.30 |
| SPH3015H2R2MT | 2.2 $\pm$ 20%  | 0.060         | 0.050 | 1.50               | 1.70 | 1.80                | 2.05 |
| SPH3015H3R3MT | 3.3 $\pm$ 20%  | 0.084         | 0.070 | 1.30               | 1.50 | 1.50                | 1.70 |
| SPH3015H3R9MT | 3.9 $\pm$ 20%  | 0.115         | 0.096 | 1.30               | 1.60 | 1.30                | 1.50 |
| SPH3015H4R7MT | 4.7 $\pm$ 20%  | 0.115         | 0.096 | 1.10               | 1.20 | 1.30                | 1.50 |
| SPH3015H6R8MT | 6.8 $\pm$ 20%  | 0.144         | 0.120 | 0.80               | 0.90 | 1.16                | 1.35 |
| SPH3015H100MT | 10 $\pm$ 20%   | 0.276         | 0.230 | 0.75               | 0.90 | 0.84                | 0.97 |
| SPH3015H150MT | 15 $\pm$ 20%   | 0.360         | 0.300 | 0.60               | 0.70 | 0.73                | 0.84 |
| SPH3015H220MT | 22 $\pm$ 20%   | 0.540         | 0.450 | 0.52               | 0.60 | 0.60                | 0.70 |
| SPH3015H260MT | 26 $\pm$ 20%   | 0.768         | 0.640 | 0.40               | 0.50 | 0.45                | 0.55 |
| SPH3015H330MT | 33 $\pm$ 20%   | 1.090         | 0.910 | 0.50               | 0.55 | 0.50                | 0.55 |
| SPH3015H470MT | 47 $\pm$ 20%   | 1.250         | 1.040 | 0.35               | 0.42 | 0.45                | 0.50 |

### SPH4012H Series

| Part Number   | Inductance     | DC Resistance |       | Saturation Current |      | Heat Rating Current |      |
|---------------|----------------|---------------|-------|--------------------|------|---------------------|------|
|               | @0.1MHz,1V     | Max.          | Typ.  | Max.               | Typ. | Max.                | Typ. |
| Units         | $\mu$ H        | $\Omega$      |       | A                  |      | A                   |      |
| Symbol        | L              | DCR           |       | Isat               |      | Irms                |      |
| SPH4012HR33NT | 0.33 $\pm$ 30% | 0.031         | 0.026 | 5.50               | 6.30 | 2.90                | 3.35 |
| SPH4012HR47NT | 0.47 $\pm$ 30% | 0.032         | 0.027 | 3.50               | 4.20 | 2.90                | 3.20 |
| SPH4012HR82NT | 0.82 $\pm$ 30% | 0.042         | 0.035 | 3.00               | 3.50 | 2.50                | 2.50 |
| SPH4012H1R0NT | 1.0 $\pm$ 30%  | 0.050         | 0.042 | 2.80               | 3.30 | 2.20                | 2.90 |
| SPH4012H1R5NT | 1.5 $\pm$ 30%  | 0.050         | 0.042 | 2.10               | 2.20 | 2.20                | 2.50 |
| SPH4012H1R8NT | 1.8 $\pm$ 30%  | 0.066         | 0.055 | 2.10               | 2.40 | 2.00                | 2.30 |

## SPECIFICATIONS

### SPH4012H Series

| Part Number      | Inductance | DC Resistance |       | Saturation Current |      | Heat Rating Current |      |
|------------------|------------|---------------|-------|--------------------|------|---------------------|------|
|                  | @0.1MHz,1V | Max.          | Typ.  | Max.               | Typ. | Max.                | Typ. |
| Units            | $\mu$ H    | $\Omega$      |       | A                  |      | A                   |      |
| Symbol           | L          | DCR           |       | Isat               |      | Irms                |      |
| SPH4012H2R2MT    | 2.2±20%    | 0.066         | 0.055 | 1.70               | 1.80 | 2.00                | 2.30 |
| SPH4012H2R7MT    | 2.7±20%    | 0.084         | 0.070 | 1.90               | 2.20 | 1.70                | 2.00 |
| SPH4012H3R3MT    | 3.3±20%    | 0.084         | 0.070 | 1.40               | 1.70 | 1.70                | 2.00 |
| SPH4012H3R6MT    | 3.6±20%    | 0.090         | 0.075 | 1.20               | 1.60 | 1.70                | 2.00 |
| SPH4012H4R3MT    | 4.3±20%    | 0.108         | 0.090 | 1.20               | 1.50 | 1.50                | 1.80 |
| SPH4012H4R7MT    | 4.7±20%    | 0.108         | 0.090 | 1.20               | 1.30 | 1.50                | 1.80 |
| SPH4012H5R1MT    | 5.1±20%    | 0.132         | 0.110 | 1.20               | 1.40 | 1.40                | 1.60 |
| SPH4012H5R6MT    | 5.6±20%    | 0.132         | 0.110 | 1.10               | 1.40 | 1.40                | 1.60 |
| SPH4012H6R8MT    | 6.8±20%    | 0.150         | 0.125 | 0.90               | 1.10 | 1.30                | 1.60 |
| SPH4012H100MT    | 10±20%     | 0.204         | 0.170 | 0.80               | 0.90 | 1.10                | 1.30 |
| SPH4012H100MTY01 | 10±20%     | 0.240         | 0.200 | 0.90               | 1.10 | 1.00                | 1.10 |
| SPH4012H120MT    | 12±20%     | 0.312         | 0.260 | 0.85               | 1.00 | 0.90                | 1.00 |
| SPH4012H150MT    | 15±20%     | 0.312         | 0.260 | 0.65               | 0.80 | 0.90                | 1.00 |
| SPH4012H180MT    | 18±20%     | 0.432         | 0.360 | 0.65               | 0.80 | 0.78                | 0.90 |
| SPH4012H220MT    | 22±20%     | 0.460         | 0.380 | 0.50               | 0.65 | 0.78                | 0.90 |
| SPH4012H270MT    | 27±20%     | 0.672         | 0.560 | 0.50               | 0.60 | 0.63                | 0.73 |
| SPH4012H330MT    | 33±20%     | 0.756         | 0.630 | 0.45               | 0.55 | 0.57                | 0.68 |
| SPH4012H360MT    | 36±20%     | 0.756         | 0.630 | 0.40               | 0.50 | 0.57                | 0.68 |
| SPH4012H390MT    | 39±20%     | 1.188         | 0.990 | 0.55               | 0.62 | 0.47                | 0.54 |
| SPH4012H470MT    | 47±20%     | 1.188         | 0.990 | 0.40               | 0.50 | 0.47                | 0.54 |
| SPH4012H560MT    | 56±20%     | 1.320         | 1.100 | 0.35               | 0.45 | 0.45                | 0.52 |
| SPH4012H680MT    | 68±20%     | 1.800         | 1.500 | 0.38               | 0.45 | 0.38                | 0.44 |
| SPH4012H820MT    | 82±20%     | 2.040         | 1.700 | 0.30               | 0.38 | 0.36                | 0.42 |
| SPH4012H101MT    | 100±20%    | 2.040         | 1.700 | 0.25               | 0.31 | 0.36                | 0.42 |

### SPH4018H Series

| Part Number   | Inductance | DC Resistance |       | Saturation Current |      | Heat Rating Current |      |
|---------------|------------|---------------|-------|--------------------|------|---------------------|------|
|               | @0.1MHz,1V | Max.          | Typ.  | Max.               | Typ. | Max.                | Typ. |
| Units         | $\mu$ H    | $\Omega$      |       | A                  |      | A                   |      |
| Symbol        | L          | DCR           |       | Isat               |      | Irms                |      |
| SPH4018HR33NT | 0.33±30%   | 0.016         | 0.012 | 6.50               | 8.00 | 4.20                | 4.70 |
| SPH4018HR47NT | 0.47±30%   | 0.020         | 0.017 | 6.50               | 7.20 | 3.50                | 4.00 |
| SPH4018H1R0NT | 1.0±30%    | 0.032         | 0.027 | 4.00               | 4.80 | 3.20                | 3.70 |
| SPH4018H1R5NT | 1.5±30%    | 0.037         | 0.031 | 3.60               | 4.30 | 2.95                | 3.30 |
| SPH4018H2R2MT | 2.2±20%    | 0.050         | 0.042 | 3.00               | 3.40 | 2.20                | 2.90 |
| SPH4018H3R3MT | 3.3±20%    | 0.066         | 0.055 | 2.30               | 2.90 | 2.00                | 2.50 |
| SPH4018H4R7MT | 4.7±20%    | 0.084         | 0.070 | 2.00               | 2.20 | 1.70                | 2.10 |
| SPH4018H6R8MT | 6.8±20%    | 0.118         | 0.098 | 1.60               | 1.80 | 1.45                | 1.70 |
| SPH4018H100MT | 10±20%     | 0.180         | 0.150 | 1.30               | 1.50 | 1.20                | 1.50 |
| SPH4018H150MT | 15±20%     | 0.252         | 0.210 | 1.10               | 1.20 | 0.85                | 1.20 |
| SPH4018H220MT | 22±20%     | 0.348         | 0.290 | 0.90               | 1.10 | 0.70                | 1.00 |
| SPH4018H330MT | 33±20%     | 0.552         | 0.460 | 0.70               | 0.90 | 0.55                | 0.82 |
| SPH4018H470MT | 47±20%     | 0.744         | 0.620 | 0.57               | 0.70 | 0.50                | 0.66 |
| SPH4018H680MT | 68±20%     | 0.972         | 0.810 | 0.53               | 0.62 | 0.40                | 0.60 |
| SPH4018H101MT | 100±20%    | 1.560         | 1.300 | 0.49               | 0.57 | 0.40                | 0.47 |
| SPH4018H151MT | 150±20%    | 3.120         | 2.600 | 0.41               | 0.47 | 0.28                | 0.33 |
| SPH4018H221MT | 220±20%    | 3.840         | 3.200 | 0.33               | 0.38 | 0.25                | 0.29 |
| SPH4018H331MT | 330±20%    | 5.880         | 4.900 | 0.26               | 0.31 | 0.20                | 0.23 |

## SPECIFICATIONS

### SPH4020H Series

| Part Number   | Inductance     | DC Resistance |       | Saturation Current |      | Heat Rating Current |      |
|---------------|----------------|---------------|-------|--------------------|------|---------------------|------|
|               | @0.1MHz,1V     | Max.          | Typ.  | Max.               | Typ. | Max.                | Typ. |
| Units         | $\mu\text{H}$  | $\Omega$      |       | A                  |      | A                   |      |
| Symbol        | L              | DCR           |       | Isat               |      | Irms                |      |
| SPH4020HR33NT | 0.33 $\pm$ 30% | 0.016         | 0.013 | 7.50               | 8.50 | 3.30                | 4.90 |

### SPH4030H Series

| Part Number   | Inductance     | DC Resistance |       | Saturation Current |       | Heat Rating Current |      |
|---------------|----------------|---------------|-------|--------------------|-------|---------------------|------|
|               | @0.1MHz,1V     | Max.          | Typ.  | Max.               | Typ.  | Max.                | Typ. |
| Units         | $\mu\text{H}$  | $\Omega$      |       | A                  |       | A                   |      |
| Symbol        | L              | DCR           |       | Isat               |       | Irms                |      |
| SPH4030HR10NT | 0.10 $\pm$ 30% | 0.006         | 0.005 | 17.00              | 18.50 | 4.60                | 6.30 |
| SPH4030HR22NT | 0.22 $\pm$ 30% | 0.007         | 0.006 | 11.50              | 12.50 | 3.90                | 5.20 |
| SPH4030HR47NT | 0.47 $\pm$ 30% | 0.013         | 0.011 | 8.20               | 9.20  | 4.50                | 5.20 |

※1: All test data is referenced to 20°C ambient;

※2: Rated current: Isat or Irms, whichever is smaller;

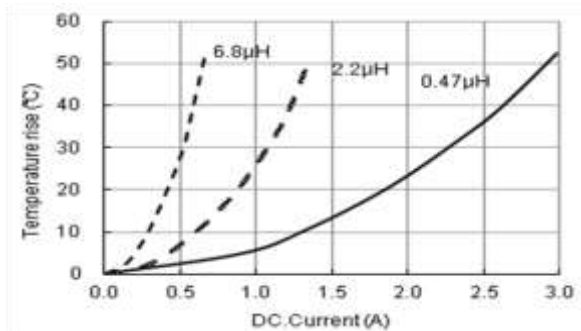
※Isat: DC current at which the inductance drops approximate 30% from its value without current;

※Irms: DC current that causes the temperature rise ( $\Delta T = 40^\circ\text{C}$ ) from 20°C ambient.

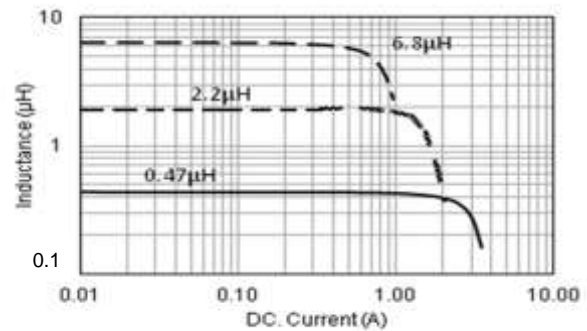
## TYPICAL ELECTRICAL CHARACTERISTICS

### SPH201610H Series

Temperature vs. DC Current Characteristics

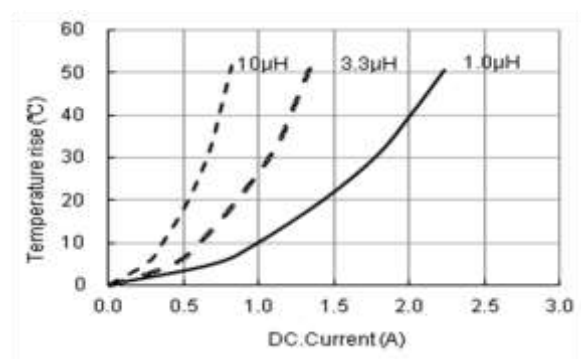


Inductance vs. DC Current Characteristics

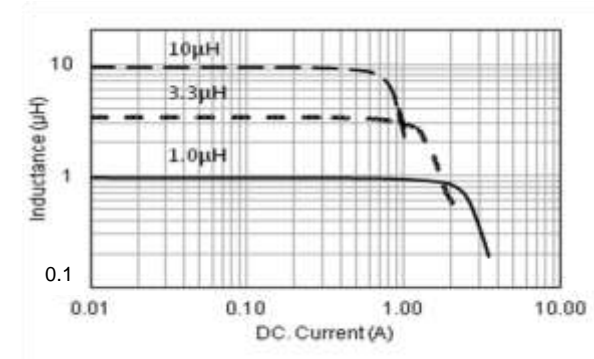


### SPH252010H Series

Temperature vs. DC Current Characteristics



Inductance vs. DC Current Characteristics

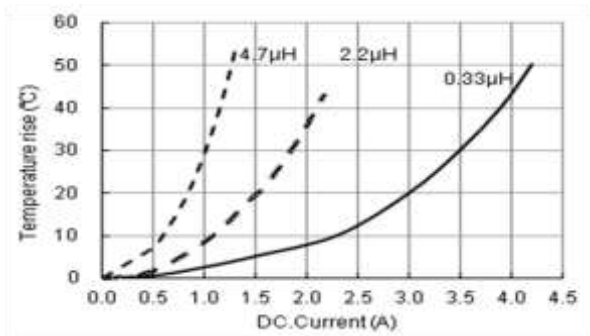




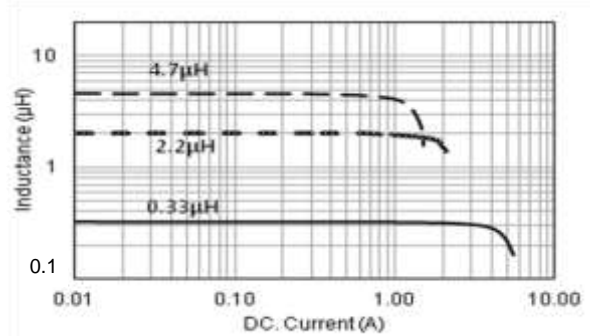
# TYPICAL ELECTRICAL CHARACTERISTICS

## SPH252012H Series

Temperature vs. DC Current Characteristics

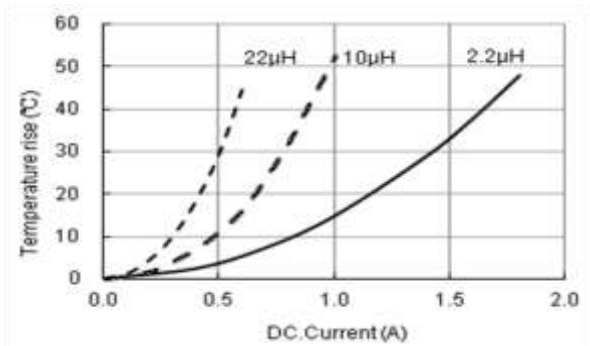


Inductance vs. DC Current Characteristics

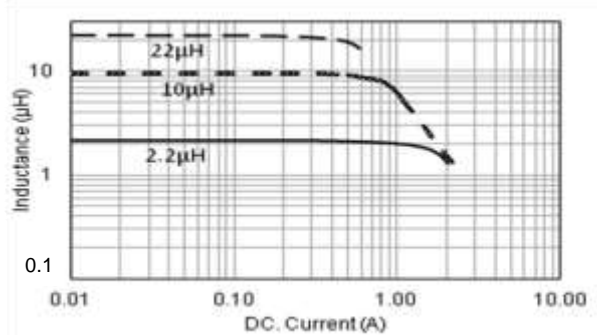


## SPH3012H Series

Temperature vs. DC Current Characteristics

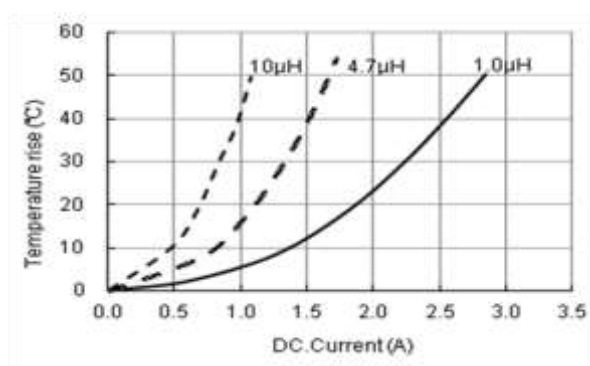


Inductance vs. DC Current Characteristics

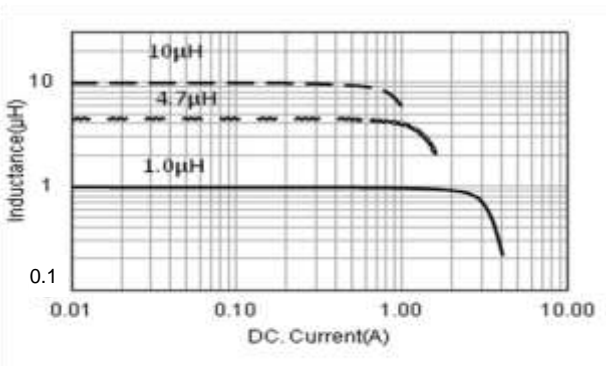


## SPH3015H Series

Temperature vs. DC Current Characteristics

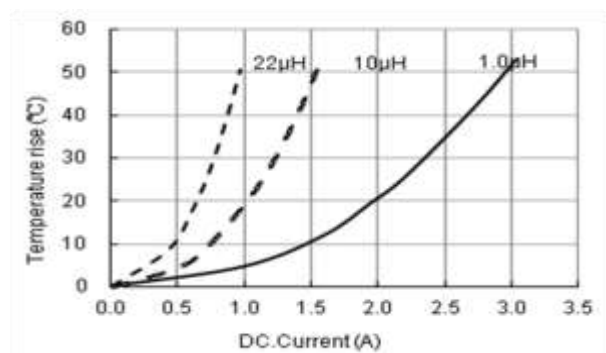


Inductance vs. DC Current Characteristics

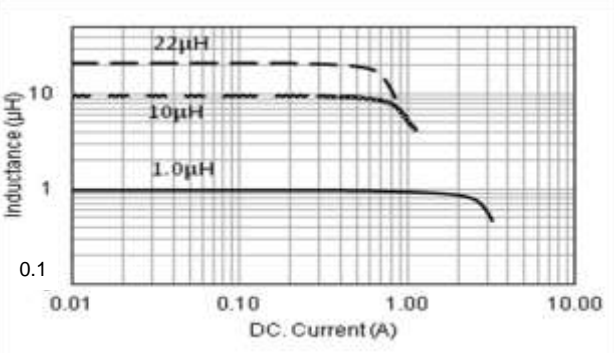


## SPH4012H Series

Temperature vs. DC Current Characteristics



Inductance vs. DC Current Characteristics

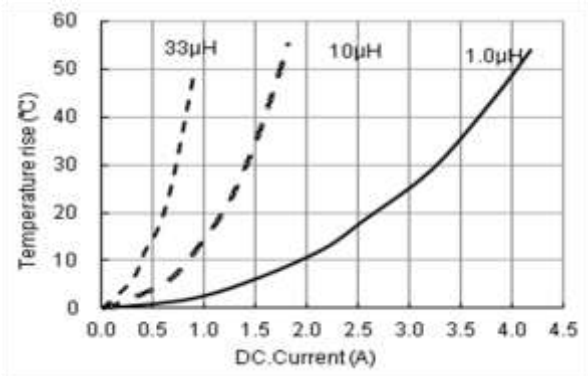




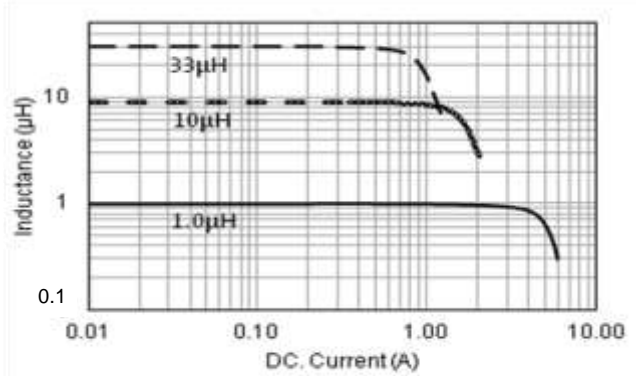
# TYPICAL ELECTRICAL CHARACTERISTICS

## SPH4018H Series

Temperature vs. DC Current Characteristics

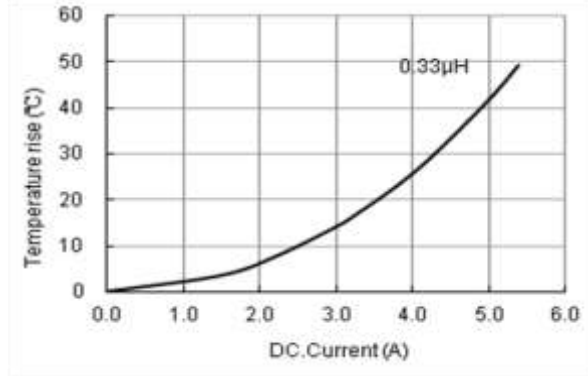


Inductance vs. DC Current Characteristics

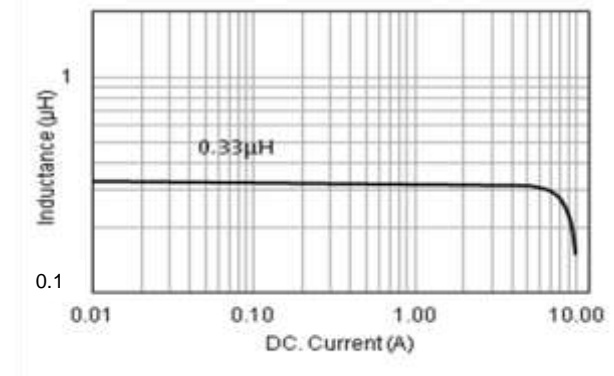


## SPH4020H Series

Temperature vs. DC Current Characteristics

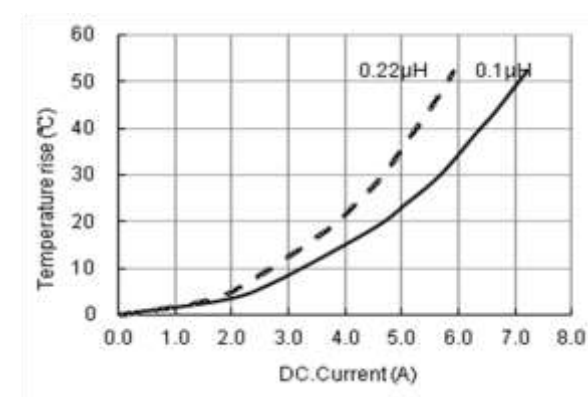


Inductance vs. DC Current Characteristics

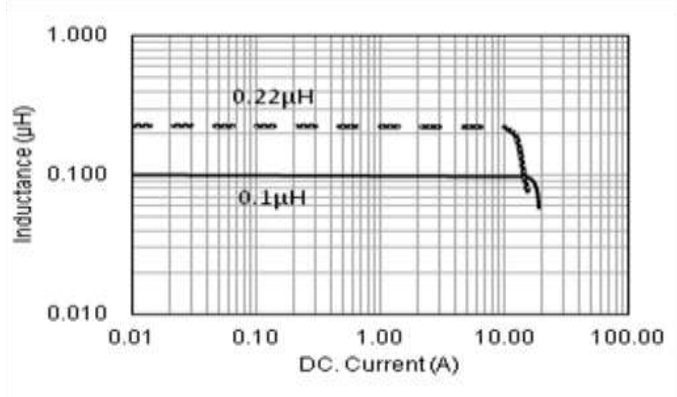


## SPH4030H Series

Temperature vs. DC Current Characteristics



Inductance vs. DC Current Characteristics



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