

## SMD Power Inductors

## SSL I 306 Series

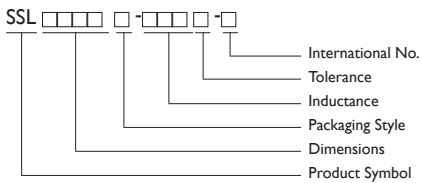


## FEATURES

High energy storage and very low resistance.

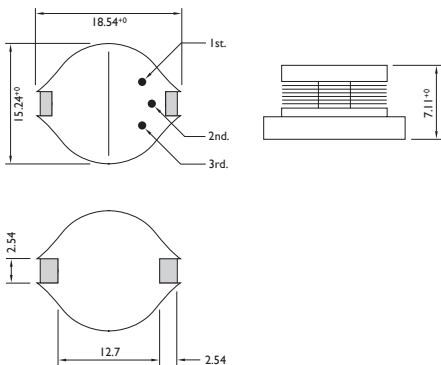
Smallest size and high performance

## PRODUCT IDENTIFICATION



- Packaging: T : Tape and Reel
- Tolerance: M:  $\pm 20\%$
- Note: YAGEO will start to release SSL Series inductors with lead-free terminals which meet SONY SS-00259's criteria for lead-free product in Q2 of 2004, and YAGEO Internal No will be changed to "N" as identification. Ex. SSL04LP-1R2M-N

## SHAPES AND DIMENSIONS



Dimensions : mm

For SSL series provide excellent current carrying capabilities in a small footprint. They have a flat top for reliable pick and place operations and features robust temperature deflection. In addition to the standard versions shown here, custom inductors are available to meet your exact requirement.

## APPLICATIONS

Notebook computers, Sep-up and step-down converters

Flash, memory programmers. Etc...

## ELECTRICAL CHARACTERISTICS

| PART NO.        | INDUCTANCE<br>( $\mu\text{H} \pm 20\%$ )* | SRF<br>(MHz) | DC<br>RESISTANCE<br>( $\Omega^{\text{th}}$ ) | Isat**<br>(A) | Irms***<br>(A) |
|-----------------|---|--------------|--|---------------|----------------|
| SSLI306T-1R0M-S | 1.0                                       | 80           | 0.011  | 20            | 8.6            |
| SSLI306T-2R2M-S | 2.2                                       | 80           | 0.014  | 16            | 7.1            |
| SSLI306T-3R3M-S | 3.3                                       | 60           | 0.016  | 14            | 6.2            |
| SSLI306T-5R6M-S | 5.6                                       | 40           | 0.022  | 12            | 5.3            |
| SSLI306T-100M-S | 10  | 30           | 0.032  | 10            | 4.3            |
| SSLI306T-150M-S | 15  | 22           | 0.036  | 8.0           | 4.0            |
| SSLI306T-220M-S | 22  | 20           | 0.047  | 7.0           | 3.5            |
| SSLI306T-330M-S | 33  | 15           | 0.066  | 5.5           | 3.0            |
| SSLI306T-470M-S | 47  | 9            | 0.087  | 4.5           | 2.6            |
| SSLI306T-680M-S | 68  | 8            | 0.13   | 3.5           | 2.3            |
| SSLI306T-101M-S | 100                                       | 7            | 0.19   | 3.0           | 1.8            |
| SSLI306T-151M-S | 150                                       | 6            | 0.25   | 2.6           | 1.5            |
| SSLI306T-221M-S | 220                                       | 5            | 0.38   | 2.4           | 1.2            |
| SSLI306T-331M-S | 330                                       | 4            | 0.56   | 1.9           | 1.0            |
| SSLI306T-471M-S | 470                                       | 3            | 0.85   | 1.4           | 0.82           |
| SSLI306T-681M-S | 680                                       | 2.5          | 1.2  | 1.2           | 0.72           |
| SSLI306T-102M-S | 1000                                      | 2            | 1.8  | 1.0           | 0.56           |

\* Inductance Tested at 0.1 Vrms, 100 KHz

\*\* Inductance Drop = 10% Typ. at Isat.

\*\*\*  $\Delta T = 40^\circ\text{C}$  Rise Typ at I rms.

Operating Temperature Range  $-40^\circ\text{C}$  to  $+85^\circ\text{C}$



## ELECTRICAL CHARACTERISTICS : LEAD-FREE & ROHS COMPLIANCE

| PART NO.          | INDUCTANCE<br>(nH) | TEST<br>FREQUENCY<br>(MHZ) | R <sub>dc</sub><br>(Ω) | I <sub>sat</sub><br>(A) | I <sub>rms</sub><br>(A) | SRF<br>(KHz)Typ. |
|-------------------|--------------------|----------------------------|------------------------|-------------------------|-------------------------|------------------|
| SSLI306T-1R0 □ -N | 1                  | 100KHz,0.1V                | 0.011+15%              | 20                      | 8.6                     | 80               |
| SSLI306T-2R2 □ -N | 2.2                | 100KHz,0.1V                | 0.014+15%              | 16                      | 7.1                     | 80               |
| SSLI306T-3R3 □ -N | 3.3                | 100KHz,0.1V                | 0.016+15%              | 14                      | 6.2                     | 60               |
| SSLI306T-5R6 □ -N | 5.6                | 100KHz,0.1V                | 0.022+15%              | 12                      | 5.3                     | 40               |
| SSLI306T-100 □ -N | 10                 | 100KHz,0.1V                | 0.032+15%              | 10                      | 4.3                     | 30               |
| SSLI306T-150 □ -N | 15                 | 100KHz,0.1V                | 0.036+15%              | 8                       | 4                       | 22               |
| SSLI306T-220 □ -N | 22                 | 100KHz,0.1V                | 0.047+15%              | 7                       | 3.5                     | 20               |
| SSLI306T-330 □ -N | 33                 | 100KHz,0.1V                | 0.066+15%              | 5.5                     | 3                       | 15               |
| SSLI306T-470 □ -N | 47                 | 100KHz,0.1V                | 0.087+15%              | 4.5                     | 2.6                     | 9                |
| SSLI306T-680 □ -N | 68                 | 100KHz,0.1V                | 0.13+15%               | 3.5                     | 2.3                     | 8                |
| SSLI306T-101 □ -N | 100                | 100KHz,0.1V                | 0.19+15%               | 3                       | 1.8                     | 7                |
| SSLI306T-151 □ -N | 150                | 100KHz,0.1V                | 0.25+15%               | 2.6                     | 1.5                     | 6                |
| SSLI306T-221 □ -N | 220                | 100KHz,0.1V                | 0.38+15%               | 2.4                     | 1.2                     | 5                |
| SSLI306T-331 □ -N | 330                | 100KHz,0.1V                | 0.56+15%               | 1.9                     | 1                       | 4                |
| SSLI306T-471 □ -N | 470                | 100KHz,0.1V                | 0.85+15%               | 1.4                     | 0.82                    | 3                |
| SSLI306T-681 □ -N | 680                | 100KHz,0.1V                | 1.2+15%                | 1.2                     | 0.72                    | 2.5              |
| SSLI306T-102 □ -N | 1000               | 100KHz,0.1V                | 1.8+15%                | 1                       | 0.56                    | 2                |

NOTE : □ -tolerance M=±20%

1.Operating temperature range -40°C~85°C

2.Inductance drop 20% typ. at last

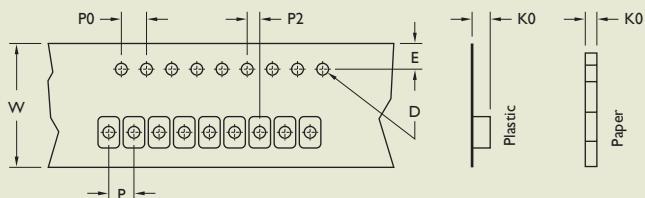
4. ΔT=40°C rise typ.at I<sub>rms</sub>.

"-N"FOR COMPLETELY LEAD FREETYPE(INCLUDING FERRITE BODY & SOLDER)



## TAPE DIMENSIONS

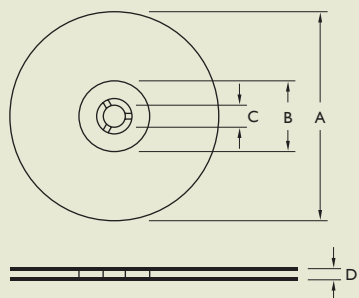
Dimensions : mm



| TYPE    | TAPE DIMENSIONS |      |      |    |    |    |    |
|---------|-----------------|------|------|----|----|----|----|
|         | K0              | D    | E    | W  | P  | P0 | P2 |
| SSL0402 | 3.2             | 1.55 | 1.75 | 12 | 8  | 4  | 2  |
| SSL0802 | 3.75            | 1.55 | 1.75 | 24 | 16 | 4  | 2  |
| SSL0804 | 5.4             | 1.55 | 1.75 | 24 | 16 | 4  | 2  |
| SSL0810 | 11.5            | 1.55 | 1.75 | 24 | 20 | 4  | 2  |
| SSL1306 | 7.5             | 1.55 | 1.75 | 32 | 20 | 4  | 2  |

## REEL DIMENSIONS

Dimensions : mm

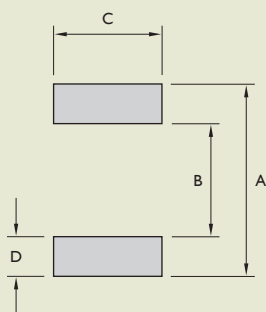


| TYPE    | REEL DIMENSIONS |     |    |      | QUANTITY /REEL |      |
|---------|-----------------|-----|----|------|----------------|------|
|         | A               | B   | C  | D    | 178            | 330  |
| SSL0402 | 330             | 100 | 13 | 13.4 | -              | 2500 |
|         | 178             | 60  |    | 13.2 | 750            | -    |
| SSL0802 | 330             | 100 | 13 | 24.4 | -              | 1000 |
| SSL0804 | 330             | 100 | 13 | 24.4 | -              | 750  |
| SSL0810 | 330             | 100 | 13 | 24.4 | -              | 225  |
| SSL1306 | 330             | 100 | 13 | 33.4 | -              | 250  |

## RECOMMENDED PATTERN

Dimensions : mm

Land Pattern



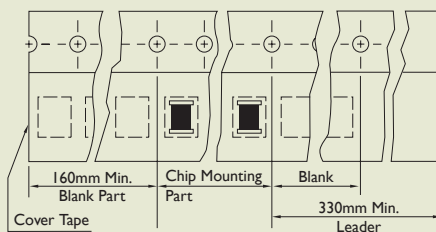
### RECOMMENDED PATTERN

|         | A     | B     | C    | D    |
|---------|-------|-------|------|------|
| SSL0402 | 6.86  | 4.06  | 3.58 | 1.40 |
| SSL0802 | 13.21 | 7.37  | 2.79 | 2.92 |
| SSL0804 | 13.21 | 7.37  | 2.79 | 2.92 |
| SSL0810 | 13.21 | 7.37  | 2.79 | 2.92 |
| SSL1306 | 18.29 | 12.45 | 2.79 | 2.92 |

## TAPE MATERIAL

Carrier Tape : Polystyrene

Cover Type : Polyethylene





## SSL SERIES RELIABILITY TEST

### I-1 MECHANICAL PERFORMANCE

| NO.   | ITEM                         | SPECIFICATION  | TEST CONDITIONS   |
|-------|------------------------------|--|---|
| I-1-1 | Vibration                    | Appearance : No Damage<br>L Change : within $\pm 10\%$<br>Q Change : within $\pm 30\%$<br>RDC : within Specification | Test device shall be soldered on the substrate.<br>Oscillation Frequency : 10 to 55 to 10Hz for 1Min.<br>Amplitude : 1.5mm<br>Time : 2Hrs. for each Axis (X,Y & Z), Total 6Hrs. |
| I-1-2 | Resistance to Soldering Heat | Appearance : No Damage   | Pre-heating : 150°C, 1Min.<br>Solder Composition : Sn/Pb = 63/37<br>Solder Temperature : 260 $\pm$ 5°C<br>Immersion Time : 10 $\pm$ 1Sec.                                       |
| I-1-3 | Solderability                | The electrodes shall be at least 90% covered with new solder coating.  | Pre-heating : 150°C, 1Min.<br>Solder Composition : Sn/Pb = 63/37<br>Solder Temperature : 230 $\pm$ 5°C<br>Immersion Time : 4 $\pm$ 1Sec.  |

### I-2 ENVIRONMENTAL PERFORMANCE

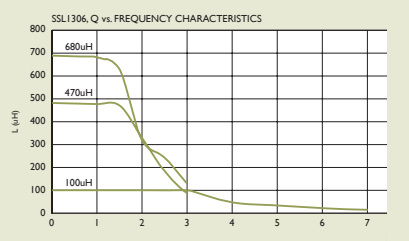
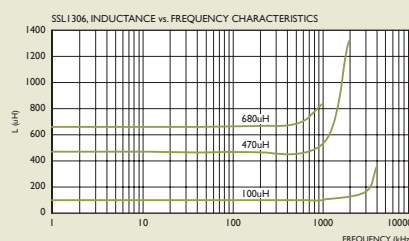
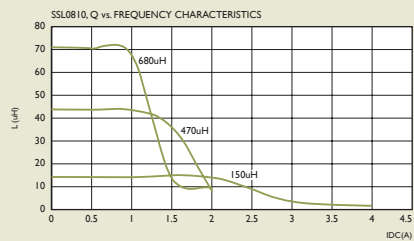
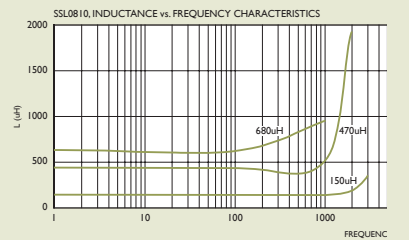
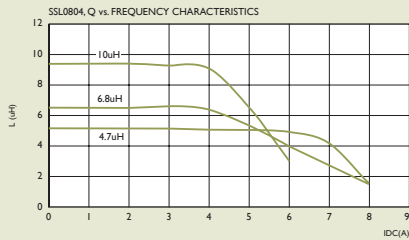
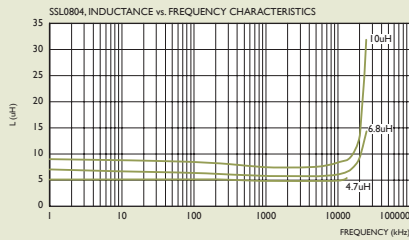
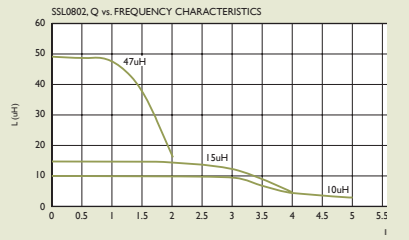
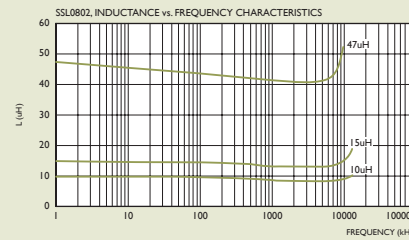
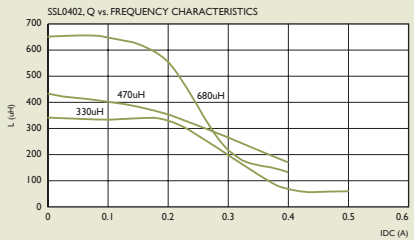
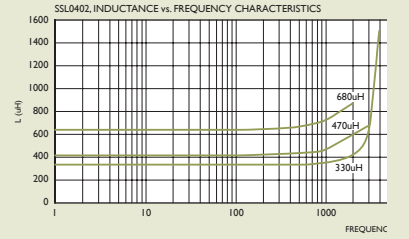
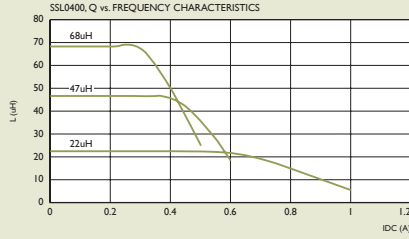
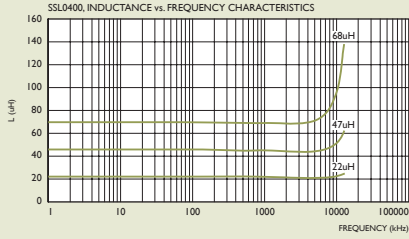
| NO.   | ITEM                        | SPECIFICATION  | TEST CONDITIONS  |      |                  |             |   |             |    |   |            |   |   |            |    |   |            |   |
|-------|-----------------------------|--|--|------|------------------|-------------|---|-------------|----|---|------------|---|---|------------|----|---|------------|---|
| I-2-1 | Temperature Shock           | Appearance : No Damage<br>L Change : within $\pm 10\%$<br>L Change : within $\pm 30\%$<br>RDC : within Specification | 10 Cycles (Air to Air)   Cycles shall Consist of :<br>30Min. Exposure to -55°C<br>30Min. Exposure to 125 $\pm$ C<br>15Sec. Max. Transition between Temperatures<br>Measured after Exposure in the Room Condition for 24Hrs.  |      |                  |             |   |             |    |   |            |   |   |            |    |   |            |   |
| I-2-2 | Temperature Cycle           |  | One Cycle <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Time (Min.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-25 <math>\pm</math> 3</td> <td>30</td> </tr> <tr> <td>2</td> <td>25 <math>\pm</math> 2</td> <td>3</td> </tr> <tr> <td>3</td> <td>85 <math>\pm</math> 3</td> <td>30</td> </tr> <tr> <td>4</td> <td>25 <math>\pm</math> 2</td> <td>3</td> </tr> </tbody> </table> Total : 100 Cycles<br>Measured after Exposure in the Room Condition for 24Hrs. | Step | Temperature (°C) | Time (Min.) | 1 | -25 $\pm$ 3 | 30 | 2 | 25 $\pm$ 2 | 3 | 3 | 85 $\pm$ 3 | 30 | 4 | 25 $\pm$ 2 | 3 |
| Step  | Temperature (°C)            | Time (Min.)  |  |      |                  |             |   |             |    |   |            |   |   |            |    |   |            |   |
| 1     | -25 $\pm$ 3                 | 30   |  |      |                  |             |   |             |    |   |            |   |   |            |    |   |            |   |
| 2     | 25 $\pm$ 2                  | 3  |  |      |                  |             |   |             |    |   |            |   |   |            |    |   |            |   |
| 3     | 85 $\pm$ 3                  | 30   |  |      |                  |             |   |             |    |   |            |   |   |            |    |   |            |   |
| 4     | 25 $\pm$ 2                  | 3  |  |      |                  |             |   |             |    |   |            |   |   |            |    |   |            |   |
| I-2-3 | Humidity Resistance         |  | Temperature : 40 $\pm$ 2°C<br>Relative Humidity : 90 ~ 95%<br>Time : 1000Hrs.<br>Measured after Exposure in the Room Condition for 24Hrs.  |      |                  |             |   |             |    |   |            |   |   |            |    |   |            |   |
| I-2-4 | High Temperature Resistance |  | Temperature : 85 $\pm$ 3°C<br>Relative Humidity : 20%<br>Applied Current : Rated Current<br>Time : 1000Hrs.<br>Measured after Exposure in the Room Condition for 24Hrs.  |      |                  |             |   |             |    |   |            |   |   |            |    |   |            |   |
| I-2-5 | Low Temperature Resistance  |  | Temperature : -25 $\pm$ 3°C<br>Relative Humidity : 0%<br>Time : 1000Hrs.<br>Measured after Exposure in the Room Condition for 24Hrs.   |      |                  |             |   |             |    |   |            |   |   |            |    |   |            |   |



# TYPICAL ELECTRICAL CHARACTERISTICS

Curves of SSL Series

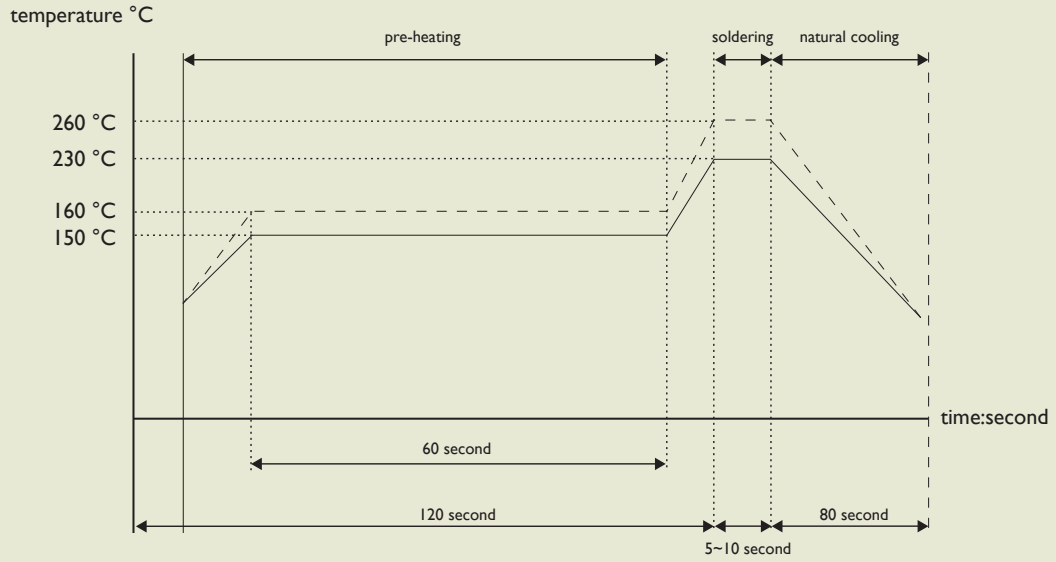
Test Instruments :





## RECOMMEND SOLDERING CONDITIONS

for: CL/ CLH/ SQV/ SMD power inductors/ SMD Chip Beads/ SMD Filters, Transformers, Current Sensors



|                       |       |
|-----------------------|-------|
| for: lead solder      | ————— |
| for: lead-free solder | ..... |