

Surface Mount Type

## SP-Cap

Series: **S**

### Large Cap



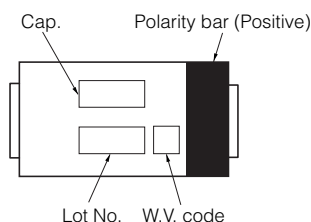
### ■ Features

- Super Low-ESR (4.5 mΩ to 9 mΩ)
- Lower ESR and Higher Capacitance at the same case size as conventional products.
- Excellent Noise-absorbent Characteristics
- High Ripple Current
- RoHS directive compliant

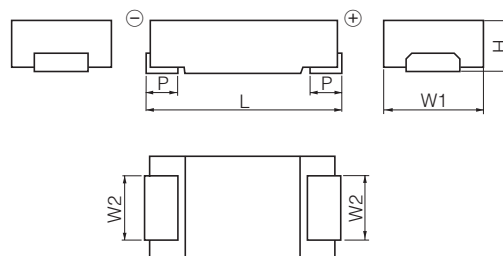
### ■ Specifications

|                       |                                                                                                                                                         |                                    |                 |            |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-----------------|------------|
| Series & Size Code    | SL                                                                                                                                                      |                                    | SX              |            |
| Category Temp. Range  | -40 °C to +105 °C                                                                                                                                       |                                    |                 |            |
| Rated W.V.Range       | 2 V.DC to 6.3 V.DC                                                                                                                                      |                                    |                 |            |
| Nominal Cap.Range     | 56 μF to 220 μF                                                                                                                                         |                                    | 82 μF to 560 μF |            |
| Capacitance Tolerance | ±20 %                                                                                                                                                   |                                    |                 |            |
| DC Leakage Current    | Reflow 240 °C : I ≤ 0.06 CV (μA) 2 minutes (2 V.DC to 4 V.DC)<br>I ≤ 0.04 CV (μA) 2 minutes (6.3 V.DC)<br><br>Reflow 260 °C : I ≤ 0.1 CV (μA) 2 minutes |                                    |                 |            |
| tan δ                 | ≤ 0.06 (120 Hz/+20 °C)                                                                                                                                  |                                    |                 |            |
| Surge Voltage         | Rated Working Voltage × 1.25 (15 °C to 35 °C)                                                                                                           |                                    |                 |            |
| Endurance             | After applying rated working voltage for 1000 hours at 105 °C±2 °C, and then being stabilized at +20 °C, capacitor shall meet the following limits.     |                                    |                 |            |
|                       | Capacitance change                                                                                                                                      | ±10% of initial measured value     |                 |            |
|                       | tan δ                                                                                                                                                   | ≤ Initial specified value          |                 |            |
|                       | DC leakage current                                                                                                                                      | ≤ Initial specified value          |                 |            |
| Moisture resistance   | After storing for 500 hours at 60 °C, 90 %                                                                                                              |                                    |                 |            |
|                       | Capacitance change of initial measurd value                                                                                                             | 2, 2.5 V.DC                        | 4 V.DC          | 6.3 V.DC   |
|                       |                                                                                                                                                         | +70, -20 %                         | +60, -20 %      | +50, -20 % |
|                       | tan δ                                                                                                                                                   | ≤ 200 % of initial specified value |                 |            |
|                       | DC leakage current                                                                                                                                      | ≤ Initial specified value          |                 |            |

### ■ Marking



### ■ Dimensions in mm(not to scale)



(mm)

| Series & Size Code | L±0.2 | W1±0.2 | W2±0.1 | H       | P±0.3 |
|--------------------|-------|--------|--------|---------|-------|
| SL                 | 7.3   | 4.3    | 2.4    | 1.8±0.1 | 1.3   |
| SX                 | 7.3   | 4.3    | 2.4    | 1.9±0.2 | 1.3   |

\* Externals of figure are the reference.

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.  
Should a safety concern arise regarding this product, please be sure to contact us immediately.

00 Sep. 2010

■ Low ESR Products

| Series & Size Code | Rated W.V. (V.DC) | Capacitance (±20 %) (μF) | Case Size |        |        | Specification                  |                     | Part number                     |                                            | Min. Packaging Q'ty (pcs) |
|--------------------|-------------------|--------------------------|-----------|--------|--------|--------------------------------|---------------------|---------------------------------|--------------------------------------------|---------------------------|
|                    |                   |                          | L (mm)    | W (mm) | H (mm) | *1<br>Ripple current (Ar.m.s.) | *2<br>ESR (mΩ max.) | *3<br>Reflow condition : 240 °C | *3<br>Reflow condition : 260 °C [Proposal] |                           |
| SL                 | 2                 | 100                      | 7.3       | 4.3    | 1.8    | 3.0                            | 9                   | EEFSL0D101R                     | EEFSL0D101ER                               | 3500                      |
|                    |                   | 120                      | 7.3       | 4.3    | 1.8    | 3.0                            | 9                   | EEFSL0D121R                     | EEFSL0D121ER                               | 3500                      |
|                    |                   | 150                      | 7.3       | 4.3    | 1.8    | 3.0                            | 9                   | EEFSL0D151R                     | EEFSL0D151ER                               | 3500                      |
|                    |                   | 180                      | 7.3       | 4.3    | 1.8    | 3.0                            | 9                   | EEFSL0D181R                     | EEFSL0D181ER                               | 3500                      |
|                    |                   | 220                      | 7.3       | 4.3    | 1.8    | 3.0                            | 9                   | EEFSL0D221R                     | EEFSL0D221ER                               | 3500                      |
|                    | 2.5               | 100                      | 7.3       | 4.3    | 1.8    | 3.0                            | 9                   | EEFSL0E101R                     | EEFSL0E101ER                               | 3500                      |
|                    |                   | 120                      | 7.3       | 4.3    | 1.8    | 3.0                            | 9                   | EEFSL0E121R                     | EEFSL0E121ER                               | 3500                      |
|                    |                   | 150                      | 7.3       | 4.3    | 1.8    | 3.0                            | 9                   | EEFSL0E151R                     | EEFSL0E151ER                               | 3500                      |
|                    | 4                 | 82                       | 7.3       | 4.3    | 1.8    | 3.0                            | 9                   | EEFSL0G820R                     | EEFSL0G820ER                               | 3500                      |
|                    | 6.3               | 56                       | 7.3       | 4.3    | 1.8    | 3.0                            | 9                   | EEFSL0J560R                     | —                                          | 3500                      |
| SX                 | 2                 | 180                      | 7.3       | 4.3    | 1.9    | 3.0                            | 9                   | EEFSX0D181R                     | EEFSX0D181ER                               | 3500                      |
|                    |                   | 220                      | 7.3       | 4.3    | 1.9    | 3.0                            | 9                   | EEFSX0D221R                     | EEFSX0D221ER                               | 3500                      |
|                    |                   | 270                      | 7.3       | 4.3    | 1.9    | 3.0                            | 9                   | EEFSX0D271R                     | EEFSX0D271ER                               | 3500                      |
|                    |                   |                          | 7.3       | 4.3    | 1.9    | 3.5                            | 6                   | EEFSX0D271XR                    | EEFSX0D271XE                               | 3500                      |
|                    |                   |                          | 7.3       | 4.3    | 1.9    | 3.8                            | 4.5                 | —                               | EEFSX0D271E4                               | 3500                      |
|                    |                   | 330                      | 7.3       | 4.3    | 1.9    | 3.0                            | 9                   | EEFSX0D331R                     | EEFSX0D331ER                               | 3500                      |
|                    |                   |                          | 7.3       | 4.3    | 1.9    | 3.5                            | 6                   | EEFSX0D331XR                    | EEFSX0D331XE                               | 3500                      |
|                    |                   |                          | 7.3       | 4.3    | 1.9    | 3.8                            | 4.5                 | —                               | EEFSX0D331E4                               | 3500                      |
|                    |                   | 390                      | 7.3       | 4.3    | 1.9    | 3.0                            | 9                   | EEFSX0D391R                     | EEFSX0D391ER                               | 3500                      |
|                    |                   |                          | 7.3       | 4.3    | 1.9    | 3.5                            | 6                   | EEFSX0D391XR                    | EEFSX0D391XE                               | 3500                      |
|                    |                   |                          | 7.3       | 4.3    | 1.9    | 3.8                            | 4.5                 | —                               | EEFSX0D391E4                               | 3500                      |
|                    |                   | 470                      | 7.3       | 4.3    | 1.9    | 3.0                            | 9                   | EEFSX0D471R                     | EEFSX0D471ER                               | 3500                      |
|                    |                   |                          | 7.3       | 4.3    | 1.9    | 3.5                            | 6                   | EEFSX0D471XR                    | EEFSX0D471XE                               | 3500                      |
|                    |                   |                          | 7.3       | 4.3    | 1.9    | 3.8                            | 4.5                 | —                               | EEFSX0D471E4                               | 3500                      |
|                    |                   | 560                      | 7.3       | 4.3    | 1.9    | 3.8                            | 4.5                 | —                               | EEFSX0D561E4                               | 3500                      |
|                    | 2.5               | 150                      | 7.3       | 4.3    | 1.9    | 3.0                            | 9                   | EEFSX0E151R                     | EEFSX0E151ER                               | 3500                      |
|                    |                   | 180                      | 7.3       | 4.3    | 1.9    | 3.0                            | 9                   | EEFSX0E181R                     | EEFSX0E181ER                               | 3500                      |
|                    |                   | 220                      | 7.3       | 4.3    | 1.9    | 3.0                            | 9                   | EEFSX0E221R                     | EEFSX0E221ER                               | 3500                      |
|                    |                   |                          | 7.3       | 4.3    | 1.9    | 3.5                            | 7                   | —                               | EEFSX0E221E7                               | 3500                      |
|                    |                   | 270                      | 7.3       | 4.3    | 1.9    | 3.5                            | 7                   | —                               | EEFSX0E271E7                               | 3500                      |
|                    |                   | 330                      | 7.3       | 4.3    | 1.9    | 3.0                            | 9                   | EEFSX0E331R                     | EEFSX0E331ER                               | 3500                      |
|                    |                   |                          | 7.3       | 4.3    | 1.9    | 3.5                            | 6                   | EEFSX0E331XR                    | EEFSX0E331XE                               | 3500                      |
|                    |                   |                          | 7.3       | 4.3    | 1.9    | 3.8                            | 4.5                 | —                               | EEFSX0E331E4                               | 3500                      |
|                    |                   | 390                      | 7.3       | 4.3    | 1.9    | 3.0                            | 9                   | EEFSX0E391R                     | EEFSX0E391ER                               | 3500                      |
|                    |                   |                          | 7.3       | 4.3    | 1.9    | 3.5                            | 6                   | EEFSX0E391XR                    | EEFSX0E391XE                               | 3500                      |
|                    |                   |                          | 7.3       | 4.3    | 1.9    | 3.8                            | 4.5                 | —                               | EEFSX0E391E4                               | 3500                      |
|                    | 4                 | 82                       | 7.3       | 4.3    | 1.9    | 3.0                            | 9                   | EEFSX0G820R                     | EEFSX0G820ER                               | 3500                      |
|                    |                   | 100                      | 7.3       | 4.3    | 1.9    | 3.0                            | 9                   | EEFSX0G101R                     | EEFSX0G101ER                               | 3500                      |
|                    |                   | 150                      | 7.3       | 4.3    | 1.9    | 3.0                            | 9                   | —                               | EEFSX0G151ER                               | 3500                      |
|                    |                   |                          | 7.3       | 4.3    | 1.9    | 3.5                            | 7                   | —                               | EEFSX0G151E7                               | 3500                      |
|                    |                   | 180                      | 7.3       | 4.3    | 1.9    | 3.0                            | 9                   | —                               | EEFSX0G181ER                               | 3500                      |
|                    |                   | 220                      | 7.3       | 4.3    | 1.9    | 3.0                            | 9                   | —                               | EEFSX0G221ER                               | 3500                      |
|                    | 6.3               | 120                      | 7.3       | 4.3    | 1.9    | 3.5                            | 7                   | —                               | EEFSX0J121E7                               | 3500                      |
|                    |                   | 150                      | 7.3       | 4.3    | 1.9    | 3.0                            | 9                   | —                               | EEFSX0J151ER                               | 3500                      |

\*1: Ripple current (100 kHz/ +20 to +105 °C ), \*2: ESR (100 kHz/+20 °C)

\*3: Please confirm EE25 in detail of the Mounting Specifications.