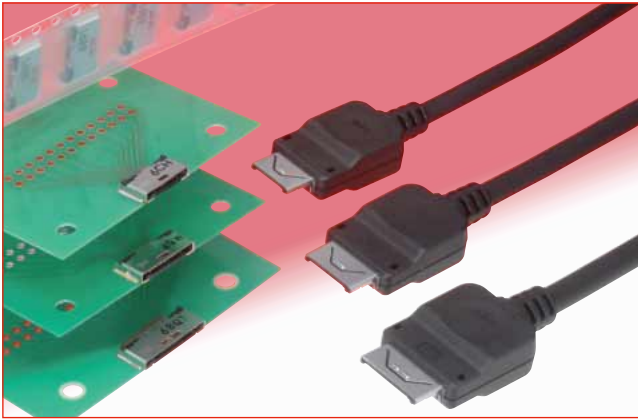


# Ultra Low-profile Interface Connectors with 2.0 mm Mounting Height

## LX Series



### ■ Overview

LX Series is a super low profile interface connector with sequential mating design and friction lock, which has been developed for low profile mobile terminals.

This connector features ESD problem prevention in 0.5 mm terminal pitch and 2.0 mm small and low profile design, which makes it suitable to small mobile devices.

### ■ Features

#### 1. Low profile on the PCB

When mounted on the PCB surface the receptacle height is 2.0 mm.(Fig.1)

#### 2. Strong Construction

Use of metal shell guarantees that fully mated connectors will withstand 30 N max. force applied on the plug in any direction.(Fig.2)

#### 3. High contact reliability

Bellows contact with long mating stroke provides highly reliable mating as well as soft insertion feeling.

Mating durability is up to 5,000 times long.

#### 4. Sequenced contact mating

The protection of the circuit is assured by having the 2 contact at each end of the receptacle are longer by 0.5 mm, with electrical wipe of 1.45 mm. Location of the circuit protection contacts can be changed as required.

Remaining contacts electrical wipe is 0.95 mm.

#### 5. Incorrect Insertion Prevention

Connectors will not be damaged when angled or reverse plug insertion is attempted.(Fig.3)

#### 6. Safety plug release

Plug will release when an excessive pull force is applied to the cable.

#### 7. RoHS Compliant

All materials and substances used to produce this product comply with RoHS standards.

### ■ Applications

DSC, PDA, thin electronic equipment, mobile phones and other portable devices requiring high durability interface connectors.

#### Lower Profile



Fig.1

#### Strong Construction

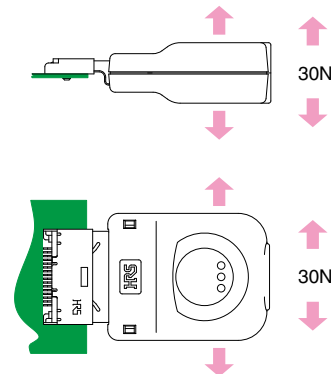


Fig.2

#### Incorrect insertion prevention

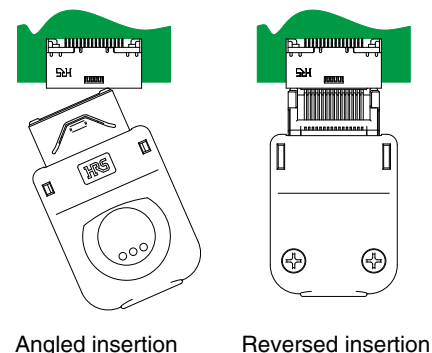


Fig.3

## ■Product specifications

|         |                |                                                        |                                              |
|---------|----------------|--------------------------------------------------------|----------------------------------------------|
| Ratings | Current rating | 0.5A<br>(1A max. can be carried via 2 random contacts) | Operating temperature range : -40°C to +70°C |
|         | Voltage rating | 50V AC                                                 | Storage temperature range : -55°C to +85°C   |

| Characteristic                     | Specification                                                                | Conditions                                                                                                     |
|------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| 1.Contact resistance               | 70mΩ max.                                                                    | 100mA DC                                                                                                       |
| 2.Insulation resistance            | 1000 MΩ min. (dry)<br>10 MΩ min. (high humidity)                             | 100V DC                                                                                                        |
| 3.Withstanding voltage             | No flashover or insulation breakdown.                                        | 250V AC / one minute                                                                                           |
| 4.Mating/un-mating forces          | Mating: 10N max., un-mating: 4N min.                                         | With corresponding connector.                                                                                  |
| 5. Durability<br>(mating/n-mating) | Amount of change of contact resistance: 20mΩ max.                            | 5,000 times                                                                                                    |
| 6. Shock                           | No electrical discontinuity of 1μ sec. Max.<br>Contact resistance: 20mΩ max. | Acceleration of 490 m/s <sup>2</sup> , 11 ms duration,<br>sine half-wave waveform, 3 cycles, 3 axis.           |
| 7. Vibration                       | Contact resistance: 20mΩ max.<br>Insulation resistance: 10MΩ min.            | Frequency: 10 to 55 Hz, single amplitude of 0.75 mm,<br>acceleration of 98 m/s <sup>2</sup> , 2 hours, 3 axis. |
| 8. Temperature cycle               | Contact resistance: 20mΩ max.<br>Insulation resistance: 10MΩ min.            | Temperature: -55°C → +5°C → +35°C → +85°C → +5°C → +35°C<br>Time : 30 → 2 to 3 → 30 → 2 to 3 min               |
| 9. Salt spray                      | No heavy corrosions                                                          | 5% water solution at 35°C for 48 hours                                                                         |

## ■Materials / Finish

### ●Receptacles

| Component | Material        | Finish/Color                                                  | Remarks |
|-----------|-----------------|---------------------------------------------------------------|---------|
| Insulator | Synthetic resin | Black                                                         | UL94V-0 |
| Contacts  | Copper alloy    | Contact area: Gold plated<br>Mounting area: Gold flash plated | ———     |
| Shell     | Stainless steel | Soldering area: Gold flash plated                             | ———     |

### ●Plugs

| Component           | Material        | Finish/Color                                                     | Remarks        |
|---------------------|-----------------|------------------------------------------------------------------|----------------|
| Insulator           | Synthetic resin | Black                                                            | UL94V-0        |
| Contacts            | Copper alloy    | Contact area: Gold plated<br>Termination area: Gold flash plated | ———            |
| Metal shield        | Stainless steel | ———                                                              | ———            |
| Covers              | Synthetic resin | Black                                                            | UL94V-0        |
| Strain relief clamp | Copper alloy    | ———                                                              | ———            |
| Self tapping screws | Steel           | Trivalent black chromate                                         | Screw size: M2 |

## ■Ordering information

### ●Receptacles

**LX 60 - 16 S**

① ② ③ ④

### ●Plugs

**LX 40 - 16 P**

① ② ③ ④

### ●Bushing

**LX 40 - 16 BS(4.5)**

① ② ③ ⑤

|   |                                                                                                   |
|---|---------------------------------------------------------------------------------------------------|
| ① | Series number : LX                                                                                |
| ② | Termination type<br>40 : Solder type<br>60 : Right angle SMT                                      |
| ③ | Number of contacts : 12, 16, 20                                                                   |
| ④ | Contact type<br>P : Male contact (Plug)<br>S : Female contact (Receptacle)                        |
| ⑤ | Bushing<br>BS(4.0) : Dia. 4.0mm cable<br>BS(4.5) : Dia. 4.5mm cable<br>BS(5.0) : Dia. 5.0mm cable |

## Two different types of electronic connectors are shown against a red background. The top connector is a rectangular, silver-colored component with a series of gold-plated pins on one side and a small red rectangular mark on its top surface. The bottom connector is a similar rectangular component, also silver-colored, with gold-plated pins on one side and a small red rectangular mark on its top surface. Both connectors appear to be designed for high-reliability applications, such as those found in automotive systems.

| Part No. | HRS No.    | Packaging      | RoHS |
|----------|------------|----------------|------|
| LX60-12S | 245-0018-3 | 2,000 pcs/reel | ○    |
| LX60-16S | 245-0001-0 |                |      |
| LX60-20S | 245-0016-8 |                |      |

Figure 1 is a technical drawing of a PCB layout for a 2-phi 1.1 Hole. The drawing shows a central square area with a cross-hatched pattern, surrounded by a white area, which is further surrounded by a hatched 'Land area'. Dimensions are provided in millimeters. The central square has a side length of 4 mm. The white area has a width of 1.5 mm on the left and 0.35 mm on the right. The hatched land area has a width of 1.9 mm on the left and 1.2 mm on the right. The overall dimensions are 7.8 mm by 5.7 mm. A 2-phi 1.1 Hole is indicated in the top-left corner. A legend at the bottom identifies the cross-hatched area as 'No conductive traces in this area' and the hatched area as 'Land area'.

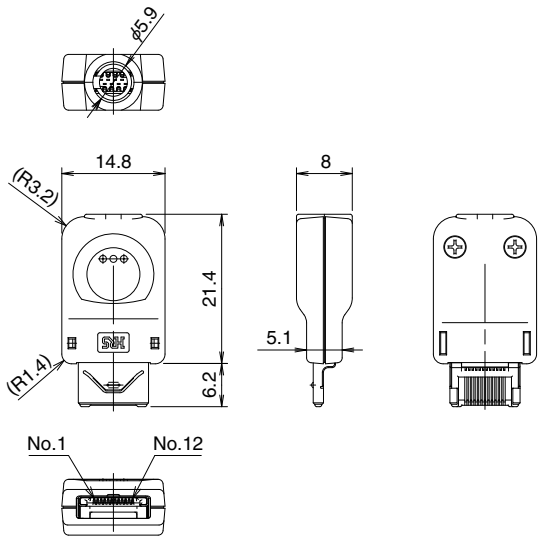
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Plugs

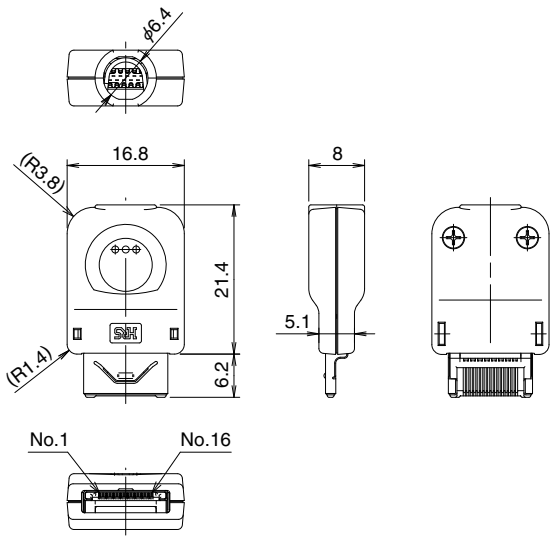


| Part No. | HRS No.    | Packaging | RoHS |
|----------|------------|-----------|------|
| LX40-12P | 245-0019-6 | 1         |      |
| LX40-16P | 245-0002-3 |           |      |
| LX40-20P | 245-0017-0 |           |      |

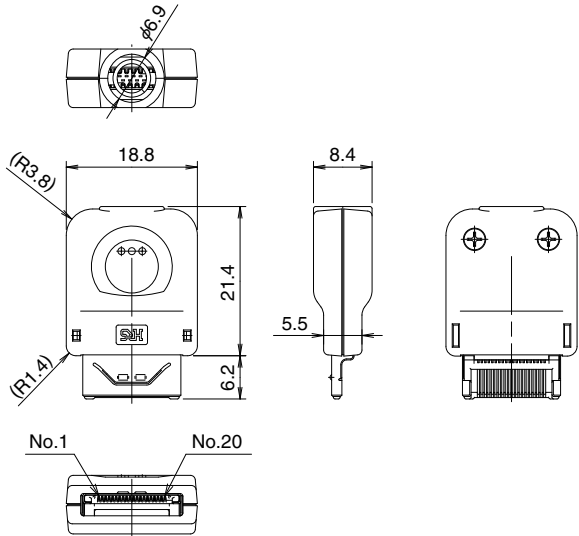
●12 pos.



●16 pos.



●20 pos.



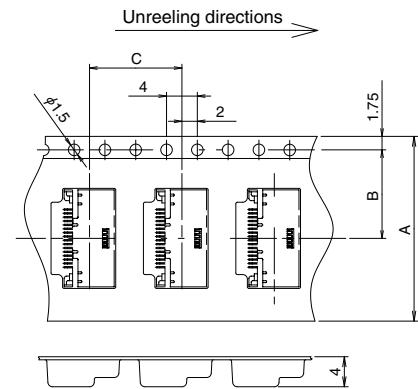
Bushing



| Part No.       | HRS No.    | Packaging    | RoHS |
|----------------|------------|--------------|------|
| LX40-12BS(4.0) | 245-0020-5 | 100 pcs/pack |      |
| LX40-16BS(4.5) | 245-0021-8 |              |      |
| LX40-20BS(5.0) | 245-0022-0 |              |      |

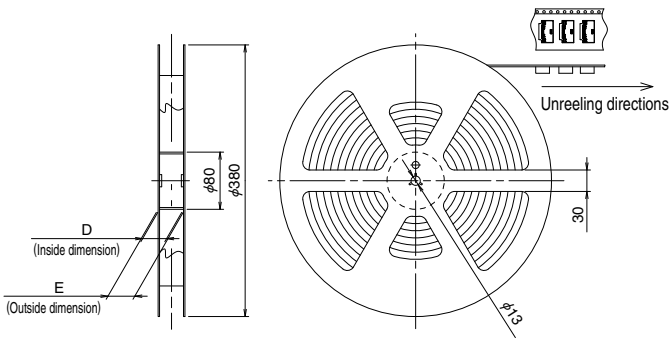
◆Receptacle Packaging Specifications

●Embossed carrier tape dimensions



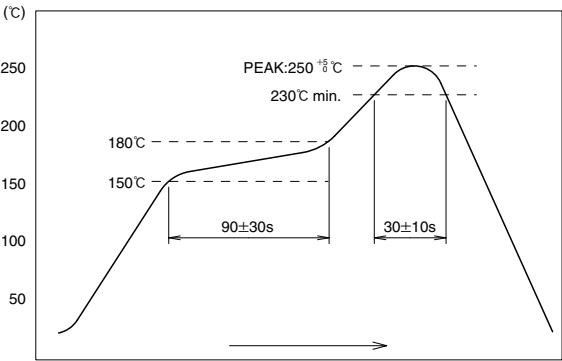
| Part No. | A  | B    | C  |
|----------|----|------|----|
| LX60-12S | 24 | 11.5 | 12 |
| LX60-16S |    |      |    |
| LX60-20S |    |      |    |

●Reel dimensions



| Part No. | D    | E    |
|----------|------|------|
| LX60-12S | 25.5 | 29.5 |
| LX60-16S |      |      |
| LX60-20S |      |      |

◆Receptacles Recommended Temperature Profile



This measurement is performed on the contact lead section.

The temperature profile may vary due to external conditions such as the type of cream solder, manufacturer, and board size. Please contact the solder manufacturer for their specifications.

◆Applicable Plug Cable

| Part No. | Cable diameter  | Wire size                                       |
|----------|-----------------|-------------------------------------------------|
| LX40-12P | $\phi 4$ max.   | $\phi 0.6$ mm max. (AWG#30 to 32 or equivalent) |
| LX40-16P | $\phi 4.5$ max. |                                                 |
| LX40-20P | $\phi 5$ max.   |                                                 |

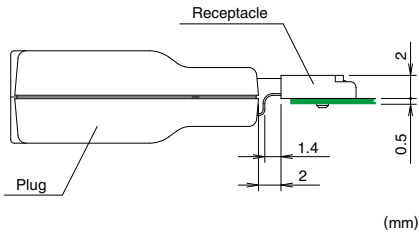
Note 1: Applicable cable sizes are guidelines. (There may be slight differences depending on the cable outer insulation)

Note 2: Cables must be attached using single piece overmolded bushings on the cable.

Note 3: Please refer to applicable Cable Termination Procedures Manual for correct plug assembly and cable termination.

Note 4: Contact HRS for cable assemblies.

◆Mated Condition Dimensions



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