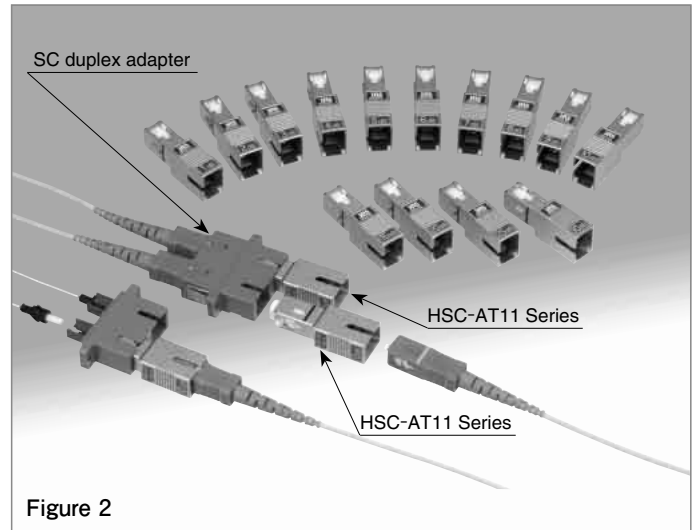
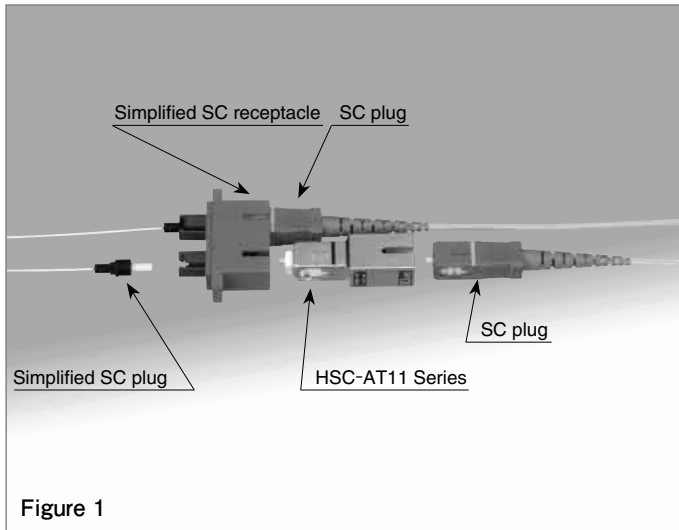


# SC Type Fixed Attenuators (for single mode)

## HSC-AT11 Series



### ■ Features

1. SC Type : IEC 61754-4 (JIS C 5973)
2. For high input power : 250mW max
3. Ensure mating with simplified SC plug / receptacle. (figure 1).
4. Enables adjacently connection with horizontal duplex adapter. (figure 2)
5. AdPC, UPC and APC (Angled PC) polishing types are available.
6. Wide attenuation lineup. Both wavelength 1310nm & 1550nm are available.

### ■ Applications

Power level adjustment of optical fiber communication networks.

## Product Specifications

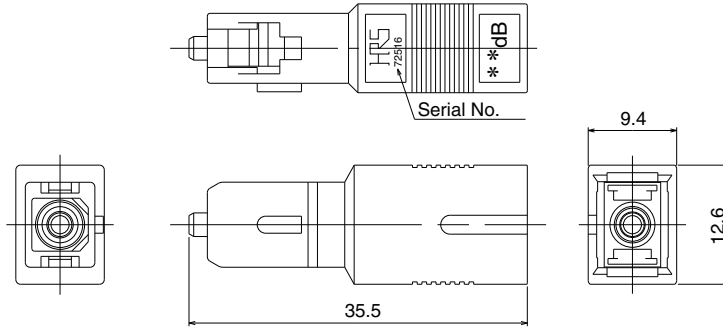
### AdPC (Advanced PC) Polishing type: Return Loss $\geq$ 40dB

|         |                             |                |                           |                |
|---------|-----------------------------|----------------|---------------------------|----------------|
| Ratings | Operating temperature range | -40°C to +75°C | Storage temperature range | -40°C to +85°C |
|         | Max. Input Power            | 250mW          | Fiber type                | SM             |

| Item                          |                                  | Test Method   | Requirements  |
|-------------------------------|----------------------------------|---|---|
| Optical Characteristics       | Attenuation                      | Measurement at a point within wavelength of 1310 $\pm$ 30 nm and a point within wavelength of 1550 $\pm$ 30 nm. | See the attenuation table on the next page  |
|                               | Return Loss                      |   | $\geq$ 40dB   |
| Mechanical Characteristics    | Engagement and Separation forces | Engagement and separation forces at 50mm/s.   | Engagement force $\leq$ 19.6N<br>Separation force $\leq$ 19.6N  |
|                               | Gauge retention force            | Zirconia gauge at $\phi$ 2.499 $\pm$ 0.0005mm.  | 2.0N to 3.9N  |
|                               | Durability                       | 500 times   | 1)Attenuation and return loss shall be satisfied before and after the test.<br>2)No breakage, crack or looseness on components. |
|                               | Flex test                        | 8.82N load, 100 cycles<br>Telcordia GR-910-CORE   |   |
|                               | Twist test                       | 13.23N load, 10 cycles<br>Telcordia GR-910-CORE   |   |
|                               | Side test                        | 12.25 N load, 90° angle<br>Telcordia GR-910-CORE  |   |
|                               | Vibration                        | Frequency: 10 to 55 Hz, single amplitude of 0.75 mm, 3 hours in each of the 3 axis.                             |   |
|                               | Impact test                      | Acceleration of 981 m/s <sup>2</sup> , 6 ms duration, half sine shock pulse, 3 cycles in each of the 3 axis.    |   |
| Environmental Characteristics | Heat/humidity cycles             | Humidity : 90% to 96%<br>Temperature : -10°C to 65°C<br>Time : 480 hours(20 Cycles)                             | 1)Attenuation and return loss shall be satisfied before and after the test.<br>2)No breakage, crack or looseness on components. |
|                               | Heat cycles                      | Temperature : -40°C to +80°C, 100 cycles  |   |
|                               | Dray heat                        | 500 hours at 85°C.  |   |
|                               | Cold                             | 500 hours at -40°C.   |   |
|                               | Salt mist                        | 48 hours in a 5% concentration of salt mist   | No significant corrosion.   |

## Materials

| Part         | Material   |
|--------------|------------|
| Body         | Zinc alloy |
| Ferrule      | Zirconia   |
| Split sleeve | Zirconia   |



| Part Number   | CL No.     | Attenuation | Attenuation Tolerance | Return Loss | Wavelength       | Split Sleeve | Fiber type | Label color |
|---------------|------------|-------------|-----------------------|-------------|------------------|--------------|------------|-------------|
| HSC-AT11K-A00 | 820-6001-6 | 0dB         | +0.4dB                | ≥40dB       | 1310nm<br>1550nm | Zirconia     | SM         | mauve       |
| HSC-AT11K-A01 | 820-6002-9 | 1dB         | ±0.5dB                |             |                  |              |            |             |
| HSC-AT11K-A02 | 820-6003-1 | 2dB         | ±0.5dB                |             |                  |              |            |             |
| HSC-AT11K-A03 | 820-6004-4 | 3dB         | ±0.6dB                |             |                  |              |            |             |
| HSC-AT11K-A04 | 820-6005-7 | 4dB         | ±0.6dB                |             |                  |              |            |             |
| HSC-AT11K-A05 | 820-6006-0 | 5dB         | ±0.6dB                |             |                  |              |            |             |
| HSC-AT11K-A06 | 820-6007-2 | 6dB         | ±0.6dB                |             |                  |              |            |             |
| HSC-AT11K-A07 | 820-6013-5 | 7dB         | ±0.7dB                |             |                  |              |            |             |
| HSC-AT11K-A08 | 820-6014-8 | 8dB         | ±0.8dB                |             |                  |              |            |             |
| HSC-AT11K-A09 | 820-6015-0 | 9dB         | ±0.9dB                |             |                  |              |            |             |
| HSC-AT11K-A10 | 820-6008-5 | 10dB        | ±1.0dB                |             |                  |              |            |             |
| HSC-AT11K-A11 | 820-6016-3 | 11dB        | ±1.1dB                |             |                  |              |            |             |
| HSC-AT11K-A12 | 820-6017-6 | 12dB        | ±1.2dB                |             |                  |              |            |             |
| HSC-AT11K-A13 | 820-6018-9 | 13dB        | ±1.3dB                |             |                  |              |            |             |
| HSC-AT11K-A14 | 820-6019-1 | 14dB        | ±1.4dB                |             |                  |              |            |             |
| HSC-AT11K-A15 | 820-6009-8 | 15dB        | ±1.5dB                |             |                  |              |            |             |
| HSC-AT11K-A16 | 820-6020-0 | 16dB        | ±1.5dB                |             |                  |              |            |             |
| HSC-AT11K-A20 | 820-6010-7 | 20dB        | ±1.5dB                |             |                  |              |            |             |
| HSC-AT11K-A25 | 820-6011-0 | 25dB        | ±1.5dB                |             |                  |              |            |             |
| HSC-AT11K-A30 | 820-6012-2 | 30dB        | ±2.5dB                |             |                  |              |            |             |

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SC

FC

MU

Harsh Environment

Attenuators

Terminators

POF / PCF

## Product Specifications

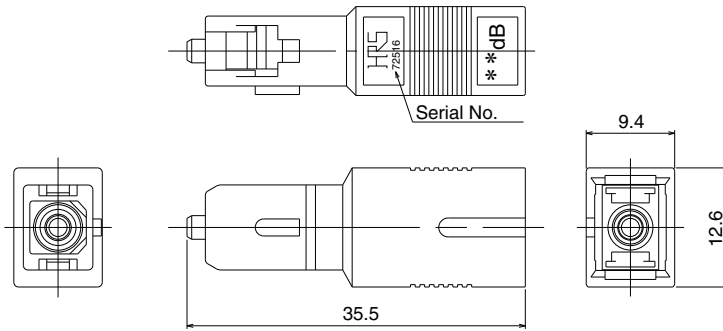
●UPC Polishing type : Return Loss  $\geq$  50dB

●APC Polishing type : Return Loss  $\geq$  60dB

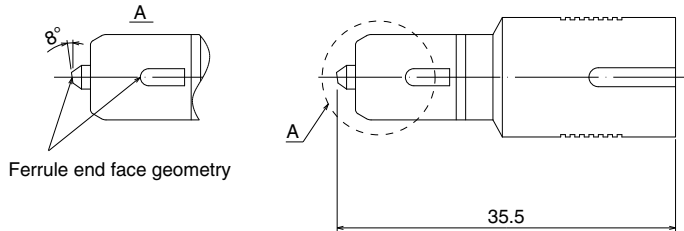
|         |                             |                |                           |                |
|---------|-----------------------------|----------------|---------------------------|----------------|
| Ratings | Operating temperature range | -40°C to +75°C | Storage temperature range | -40°C to +85°C |
|         | Max. Input Power            | 250mW          | Fiber type                | SMF            |

| Item                          |   | Test Method (Telcordia GR-910-CORE)   | Specifications   |             |
|-------------------------------|---|---|--|-------------|
|                               | Polishing type  |   | UPC  | APC         |
| Optical characteristics       | Attenuation   | Measurement at a point within wavelength of 1310±30 nm and a point within wavelength of 1550±30 nm.                 | See the attenuation table on the next page   |             |
|                               | Return Loss   |   | $\geq$ 50dB  | $\geq$ 60dB |
|                               | Input power   | Input power : 250mW(LD)<br>Wavelength : 1470nm<br>Time : 100 hours  | <p>1)After test, change in attenuation (fluctuation) and return loss shall be as follows.<br/>attenuation : <math>\leq</math>0.5dB<br/>return loss <math>\geq</math>50dB</p> <p>2)No distortion, package cracks, hardening or softening of materials, and also no damage to the attenuation element.</p>         |             |
| Environmental characteristics | Controlled Operating Environment                      | Temperature : -5 to 50 °C<br>Time : 182.5 hours<br>Humidity : 15 to 90 %  |  |             |
|                               | Uncontrolled Operating Environment                    | Temperature : -40 to 75 °C<br>Cycles : 21 cycles ( 8h/cycle)  |  |             |
|                               | Non-Operating Environment                             | Low-Temperature Exposure and Thermal Shock<br>Temperature : 23 → -40 → -40 → 23<br>Time : 2.1h 72h 4min             |  |             |
|                               |   | High-Temperature Exposure and Thermal Shock<br>Temperature : 23 → 70 → 70 → 23<br>Time : 1.6h 72h 5min              |  |             |
|                               |   | High Relative Humidity Exposure<br>Temperature : 23 → 40 → 40 → 23<br>Time : 0.6h 96h 0.6h<br>Humidity : 90 to 95 % |  |             |
|                               | Humidity/Condensation Cycling Test                    | Temperature : -10 to 65 °C<br>Humidity : 90 to 100 %<br>Cycles : 14 cycles(12h/cycle)                               |  |             |
| Water Immersion               | Temperature : 43 °C<br>Time : 168 h<br>Water : PH 5.5 |   |  |             |
| Mechanical characteristics    | Vibration Test  | Frequency range : 10 to 55 Hz<br>Amplitude : 1.52mm<br>Time : 2 hours in each 3 axis                                | <p>1)During, after test, change in attenuation (fluctuation) and return loss shall be as follows.<br/>attenuation : <math>\leq</math>0.5dB<br/>return loss <math>\geq</math>50dB</p> <p>2)No distortion, package cracks, hardening or softening of materials, and also no damage to the attenuation element.</p> |             |
|                               | Side Pull Load  | Angle : 90 °<br>Load : 12.25 N  | <p>1)After test, change in attenuation (fluctuation) and return loss shall be as follows.<br/>attenuation : <math>\leq</math>0.5dB<br/>return loss <math>\geq</math>50dB</p> <p>2)No distortion, package cracks, hardening or softening of materials, and also no damage to the attenuation element.</p>         |             |
|                               | Cable Retention                                       | Load : 19.6N  | <p>1)After test, change in attenuation (fluctuation) and return loss shall be as follows.<br/>attenuation : <math>\leq</math>0.5dB<br/>return loss <math>\geq</math>50dB</p>   |             |
|                               | Durability  | 200 times   |  |             |
|                               | Impact Test   | Drop the tested components from 1.8 m high to the concrete floor.<br>8 times in each 3 axis                         | <p>2)No distortion, package cracks, hardening or softening of materials, and also no damage to the attenuation element.</p>  |             |

Note) APC polishing type isn't compatible with UPC polishing type.



(APC Polishing type)



**UPC Polishing type : Return Loss  $\geq$  50dB**

| Part Number   | CL No.     | Attenuation | Attenuation Tolerance | Return Loss | Wavelength       | Split Sleeve | Fiber type | Label color |
|---------------|------------|-------------|-----------------------|-------------|------------------|--------------|------------|-------------|
| HSC-AT11U-A00 | 820-9500-2 | 0dB         | +0.4dB                | $\geq$ 50dB | 1310nm<br>1550nm | Zirconia     | SM         | Dark blue   |
| HSC-AT11U-A01 | 820-9501-5 | 1dB         | $\pm$ 0.5dB           |             |                  |              |            |             |
| HSC-AT11U-A02 | 820-9502-8 | 2dB         | $\pm$ 0.5dB           |             |                  |              |            |             |
| HSC-AT11U-A03 | 820-9503-0 | 3dB         | $\pm$ 0.6dB           |             |                  |              |            |             |
| HSC-AT11U-A04 | 820-9504-3 | 4dB         | $\pm$ 0.6dB           |             |                  |              |            |             |
| HSC-AT11U-A05 | 820-9505-6 | 5dB         | $\pm$ 0.6dB           |             |                  |              |            |             |
| HSC-AT11U-A06 | 820-9506-9 | 6dB         | $\pm$ 0.6dB           |             |                  |              |            |             |
| HSC-AT11U-A07 | 820-9507-1 | 7dB         | $\pm$ 0.7dB           |             |                  |              |            |             |
| HSC-AT11U-A08 | 820-9508-4 | 8dB         | $\pm$ 0.8dB           |             |                  |              |            |             |
| HSC-AT11U-A09 | 820-9509-7 | 9dB         | $\pm$ 0.9dB           |             |                  |              |            |             |
| HSC-AT11U-A10 | 820-9510-6 | 10dB        | $\pm$ 1.0dB           |             |                  |              |            |             |
| HSC-AT11U-A11 | 820-9511-9 | 11dB        | $\pm$ 1.1dB           |             |                  |              |            |             |
| HSC-AT11U-A12 | 820-9512-1 | 12dB        | $\pm$ 1.2dB           |             |                  |              |            |             |
| HSC-AT11U-A13 | 820-9513-4 | 13dB        | $\pm$ 1.3dB           |             |                  |              |            |             |
| HSC-AT11U-A14 | 820-9514-7 | 14dB        | $\pm$ 1.4dB           |             |                  |              |            |             |
| HSC-AT11U-A15 | 820-9515-0 | 15dB        | $\pm$ 1.5dB           |             |                  |              |            |             |
| HSC-AT11U-A16 | 820-9516-2 | 16dB        | $\pm$ 1.5dB           |             |                  |              |            |             |
| HSC-AT11U-A20 | 820-9517-5 | 20dB        | $\pm$ 1.5dB           |             |                  |              |            |             |
| HSC-AT11U-A25 | 820-9518-8 | 25dB        | $\pm$ 1.5dB           |             |                  |              |            |             |
| HSC-AT11U-A30 | 820-9519-0 | 30dB        | $\pm$ 2.5dB           |             |                  |              |            |             |

**APC Polishing type : Return Loss  $\geq$  60dB**

| Part Number    | CL No.     | Attenuation | Attenuation Tolerance | Return Loss | Wavelength       | Split Sleeve | Fiber type | Label color |
|----------------|------------|-------------|-----------------------|-------------|------------------|--------------|------------|-------------|
| HSC-AT11CS-A01 | 820-9001-2 | 1dB         | +0.8dB                | $\geq$ 60dB | 1310nm<br>1550nm | Zirconia     | SM         | Green       |
| HSC-AT11CS-A02 | 820-9002-5 | 2dB         | $\pm$ 0.8dB           |             |                  |              |            |             |
| HSC-AT11CS-A03 | 820-9003-8 | 3dB         | $\pm$ 0.8dB           |             |                  |              |            |             |
| HSC-AT11CS-A04 | 820-9004-0 | 4dB         | $\pm$ 0.8dB           |             |                  |              |            |             |
| HSC-AT11CS-A05 | 820-9005-3 | 5dB         | $\pm$ 0.8dB           |             |                  |              |            |             |
| HSC-AT11CS-A06 | 820-9006-6 | 6dB         | $\pm$ 0.8dB           |             |                  |              |            |             |
| HSC-AT11CS-A07 | 820-9007-9 | 7dB         | $\pm$ 0.8dB           |             |                  |              |            |             |
| HSC-AT11CS-A08 | 820-9008-1 | 8dB         | $\pm$ 0.8dB           |             |                  |              |            |             |
| HSC-AT11CS-A09 | 820-9009-4 | 9dB         | $\pm$ 0.9dB           |             |                  |              |            |             |
| HSC-AT11CS-A10 | 820-9010-3 | 10dB        | $\pm$ 1.0dB           |             |                  |              |            |             |
| HSC-AT11CS-A11 | 820-9011-6 | 11dB        | $\pm$ 1.1dB           |             |                  |              |            |             |
| HSC-AT11CS-A12 | 820-9012-9 | 12dB        | $\pm$ 1.2dB           |             |                  |              |            |             |
| HSC-AT11CS-A13 | 820-9013-1 | 13dB        | $\pm$ 1.3dB           |             |                  |              |            |             |
| HSC-AT11CS-A14 | 820-9014-4 | 14dB        | $\pm$ 1.4dB           |             |                  |              |            |             |
| HSC-AT11CS-A15 | 820-9015-7 | 15dB        | $\pm$ 1.5dB           |             |                  |              |            |             |
| HSC-AT11CS-A16 | 820-9016-0 | 16dB        | $\pm$ 1.5dB           |             |                  |              |            |             |
| HSC-AT11CS-A20 | 820-9017-2 | 20dB        | $\pm$ 1.5dB           |             |                  |              |            |             |
| HSC-AT11CS-A25 | 820-9018-5 | 25dB        | $\pm$ 1.5dB           |             |                  |              |            |             |
| HSC-AT11CS-A30 | 820-9019-8 | 30dB        | $\pm$ 2.5dB           |             |                  |              |            |             |