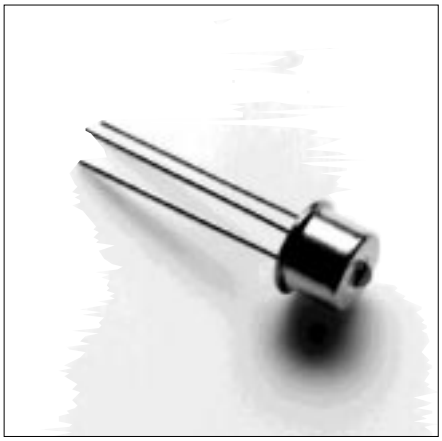
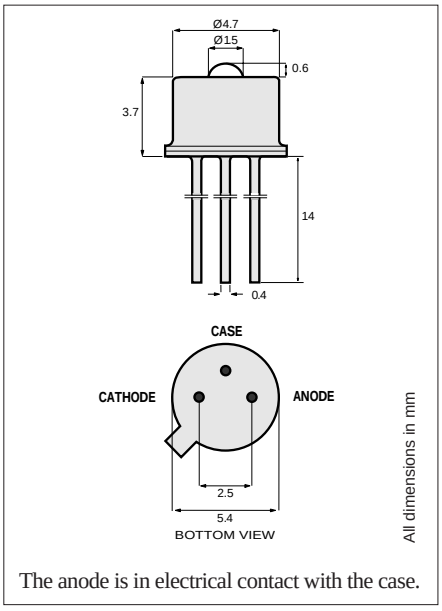
# 870nm 1A184A High-Performance LED

**FM Video**

The low harmonic distortion makes this device ideal for subcarrier FM video applications. Video transmission can be accomplished with minimum distortion. The double-lens optical system provides for optimum coupling of power into the fiber.






The anode is in electrical contact with the case.

**TO-46 Package With Lens**

## Optical and Electrical Characteristics (25° C Case Temperature)

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST CONDITION | |
|---|---|---|---|---|---|---|---|
| Fiber-Coupled Power (Fig. 1,2,&3) (Table 1) | $P_{fiber}$ | 40 | 55 | | µW | $I_F$=100 mA | Fiber: 50/125µm Graded Index NA=0.20 |
| Rise and Fall Time (10-90%) | $t_r, t_f$ | | 2.5 | 3 | ns | $I_F$=100 mA (no bias) | |
| Bandwidth ($3dB_{el}$) | $f_c$ | | 140 | | MHz | $I_F$=100 mA | |
| Harmonic Distortion (nonlinearity) | $-H_2$ | | 40 | | dB | $I_F$=80 mA m=0.8 f=10 MHz | |
| | $-H_3$ | | 45 | | dB | | |
| Peak Wavelength | $\lambda_p$ | 850 | 870 | 890 | nm | $I_F$=100 mA | |
| Spectral Width (FWHM) | $\Delta\lambda$ | | 60 | | nm | $I_F$=100 mA | |
| Forward Voltage (Fig.5) | $V_F$ | | 1.8 | 2.2 | V | $I_F$=100 mA | |
| Reverse Current | $I_R$ | | | 20 | µA | $V_R$=1V | |
| Capacitance | $C$ | | 250 | | pF | $V_R$=0V, f=1 MHz | |

**Note 1:** Measured at the exit of 100 meters of fiber.

## Absolute Maximum Ratings

| PARAMETER | SYMBOL | LIMIT |
|---|---|---|
| Storage Temperature | $T_{stg}$ | -55 to +125° C |
| Operating Temperature see (derating: Fig.4) | $Top$ | -55 to +125° C |
| Electrical Power Dissipation (derating: Fig.4) | $P_{tot}$ | 250 mW |
| Continuous Forward Current (f≤10 kHz) | $I_F$ | 110 mA |
| Peak Forward Current (duty cycle≤50%s, f≥1 MHz) | $I_{FRM}$ | 180 mA |
| Reverse Voltage | $V_R$ | 1.5 V |
| Soldering Temperature (2mm from the case for 10 sec) | $T_{sld}$ | 260° C |

## Thermal Characteristics

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|
| Thermal Resistance - Infinite Heat Sink | $R_{thjc}$ | | | 100 | °C/W |
| Thermal Resistance - No Heat Sink | $R_{thja}$ | | | 400 | °C/W |
| Temperature Coefficient - Optical Power | $dP/dT_j$ | | -0.6 | | %/°C |
| Temperature Coefficient - Wavelength | $d\lambda/dT_j$ | | 0.3 | | nm/°C |

11705.12 1995-09-01

MITEL SEMICONDUCTOR

**Europe:** Tel **(46) 8 58 02 45 00** Fax **(46) 8 58 02 01 10**
Tel **(44) 1291 436180** Fax **(44) 1291 436771**

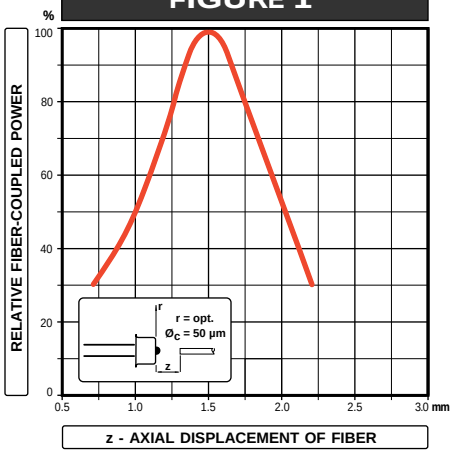
**America:** Tel **1-800-96MITEL** Fax **(613) 592-6909**
**Asia:** Tel **(65) 293 5312** Fax **(65) 293 8527**

## Typical Fiber-Coupled Power

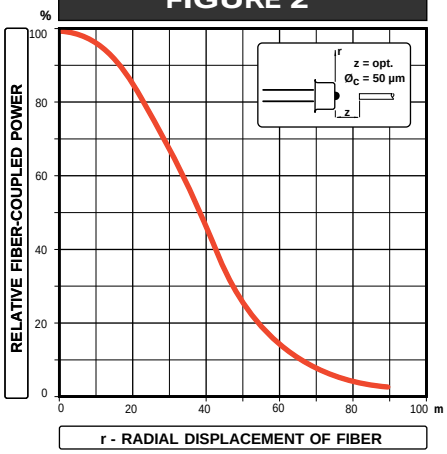
| CORE DIAMETER/CLADDING DIAMETER NUMERICAL APERTURE | | | |
|---|---|---|---|
| 50/125 µm 0.20 | 62.5/125 µm 0.275 | 100/140 µm 0.29 | 200/230 µm 0.37 |
| 55 µW | 150 µW | 300 µW | 390 µW |

Table 1

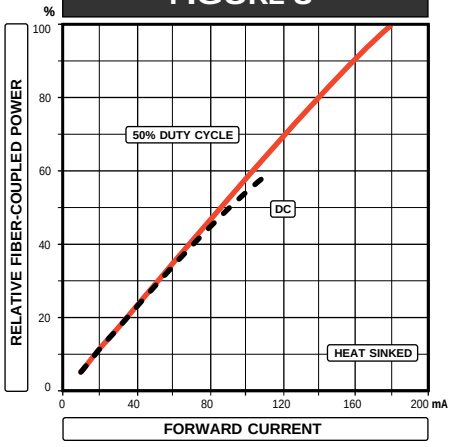
### FIGURE 1



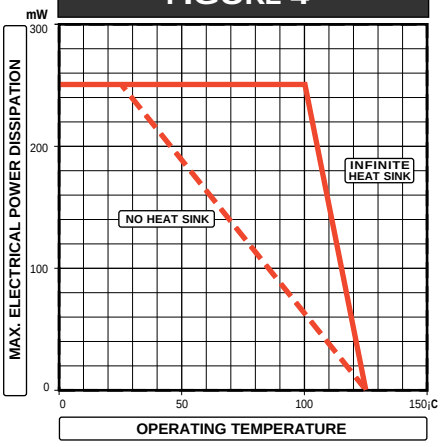

### FIGURE 2



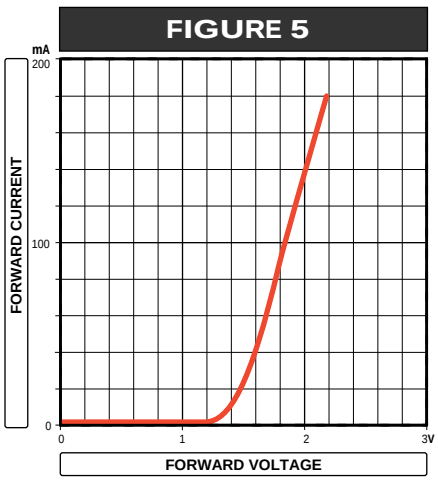

### FIGURE 3



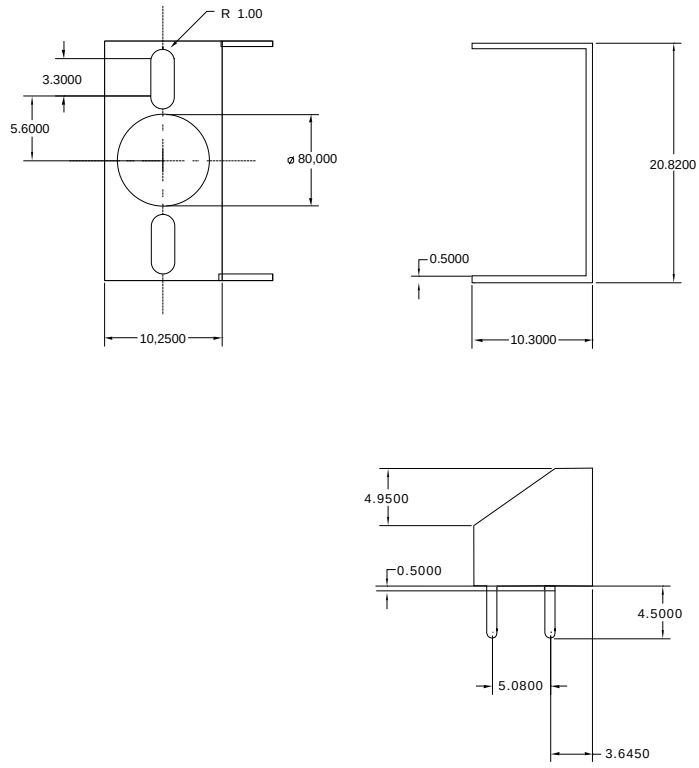

### FIGURE 4



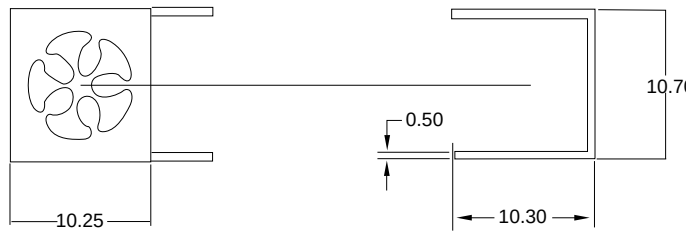

### FIGURE 5

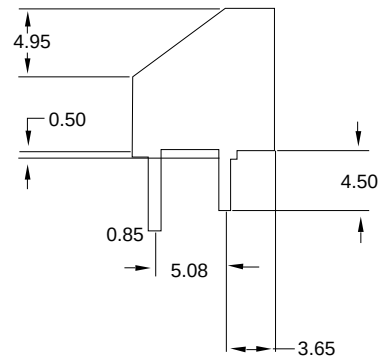


# Clip for SC-2A



# Clip for Pigtail-3A

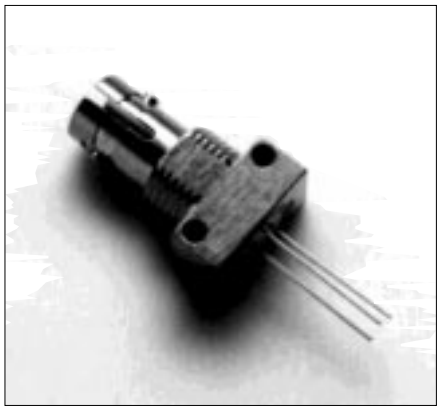


# ST-2A
**Package**

## Emitter or Detector in ST® Package

Mitel emitters and detectors can be provided in this low-profile ST® package. The device is electrically isolated from the ST® receptacle to facilitate electrical connection. And optimum fiber-coupled power or responsivity is ensured by active alignment against the fiber.



### Absolute Maximum Ratings

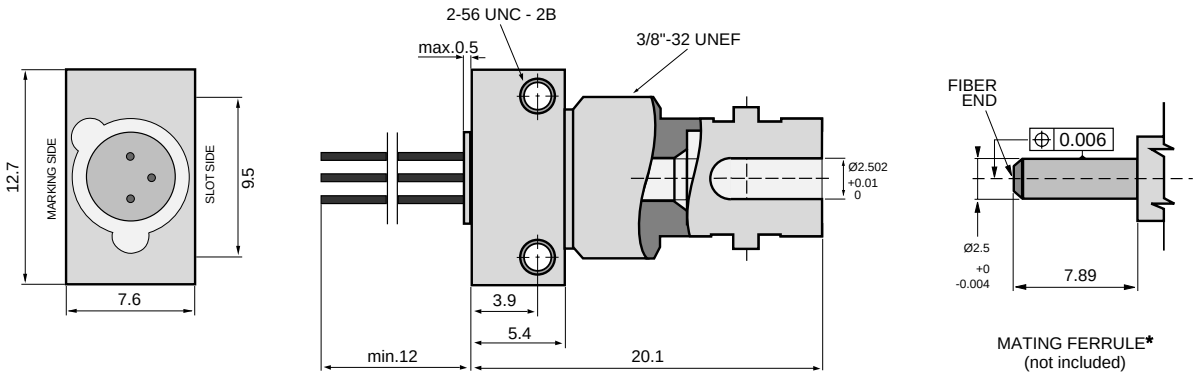
| PARAMETER | SYMBOL | LIMIT |
|---|---|---|
| Operating & Storage Temperature ST-2A (Note 1) | $T_{stg}$, $T_{op}$ | -40 to +85°C |

**Note 1:** Temperature range can be extended to -55° to +125°C on request.

### Thermal Characteristics

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|
| Thermal Resistance - Infinite Heat Sink (Note 2) | $R_{thcc}$ | | | 40 | °C/W |
| Thermal Resistance - No Heat Sink (Note 2) | $R_{thca}$ | | | 200 | °C/W |
| Thermal Resistance - On PC Board (Note 2) | Rthca | | 80 | | °C/W |

**Note 2:** Add $R_{thjc}$ for emitter or detector to estimate the total thermal resistance.




All Dimensions in mm

*The fiber-coupled power/responsivity is guaranteed to meet the LED/PIN data sheet - provided a ferrule meeting this specification is used.

**Mechanical Outline of Diode in ST-2A Housing**

(ST is a registered trademark of AT&T)

103326 1994-09-20

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**Europe:** Tel **(46) 8 58 02 45 00** Fax **(46) 8 58 02 01 10**
Tel **(44) 1291 436180** Fax **(44) 1291 436771**

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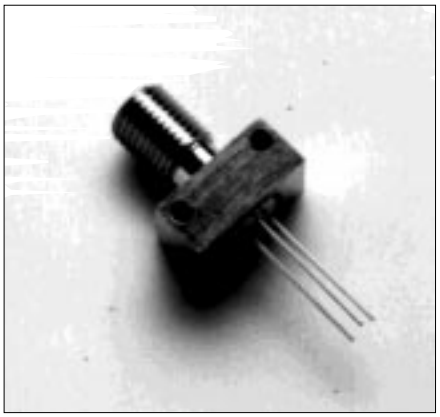
**Asia:** Tel **(65) 293 5312** Fax **(65) 293 8527**

# SMA-2A
**Package**

**Emitter or Detector in SMA Package**

Mitel emitters and detectors can be provided in this low-profile SMA package. The device is electrically isolated from the SMA receptacle to facilitate electrical connection. And optimum fiber-coupled power or responsivity is ensured by active alignment against the fiber.



## Absolute Maximum Ratings

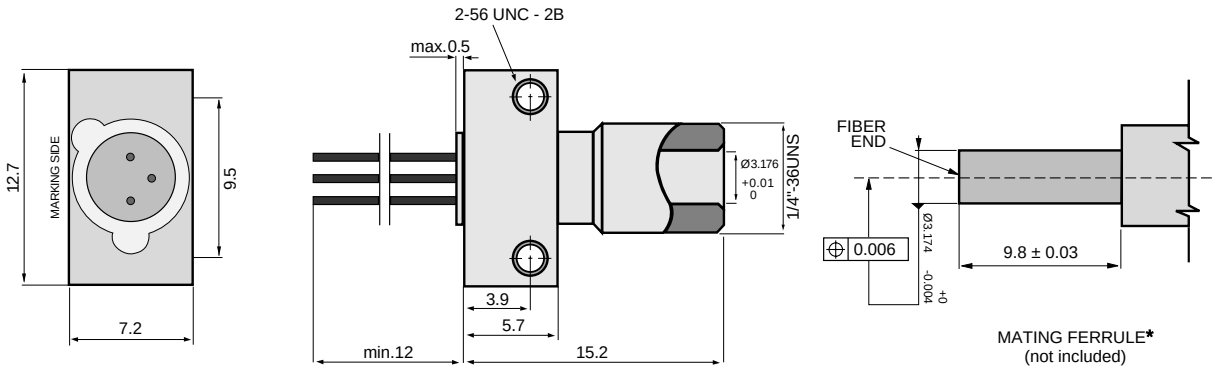
| PARAMETER | SYMBOL | LIMIT |
|---|---|---|
| Operating & Storage Temperature SMA-2A (Note 1) | $T_{stg}$, $T_{op}$ | -40 to +85°C |

**Note 1:** Temperature range can be extended to -55° to +125°C on request.

## Thermal Characteristics

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|
| Thermal Resistance - Infinite Heat Sink (Note 2) | $R_{thcc}$ | | | 40 | °C/W |
| Thermal Resistance - No Heat Sink (Note 2) | $R_{thca}$ | | | 200 | °C/W |
| Thermal Resistance - On PC Board (Note 2) | Rthca | | 80 | | °C/W |

**Note 2:** Add $R_{thjc}$ for emitter or detector to estimate the total thermal resistance.




All Dimensions in mm

*The fiber-coupled power/responsivity is guaranteed to meet the LED/PIN data sheet - provided a ferrule meeting this specification is used.

**Mechanical Outline of Diode in SMA-2A Housing**

103325 1994-09-20

MITEL SEMICONDUCTOR

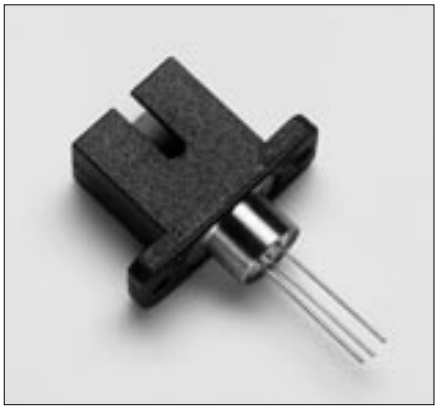
**Europe:** Tel **(46) 8 58 02 45 00** Fax **(46) 8 58 02 01 10**
Tel **(44) 1291 436180** Fax **(44) 1291 436771**

**America:** Tel **1-800-96MITEL** Fax **(613) 592-6909**
**Asia:** Tel **(65) 293 5312** Fax **(65) 293 8527**

# SC-2A Package

**Emitter or Detector in SC Package**

Mitel emitters and detectors can be provided in this low-profile SC package. The device is electrically isolated from the SC receptacle to facilitate electrical connection. And optimum fiber-coupled power or responsivity is ensured by active alignment against the fiber..



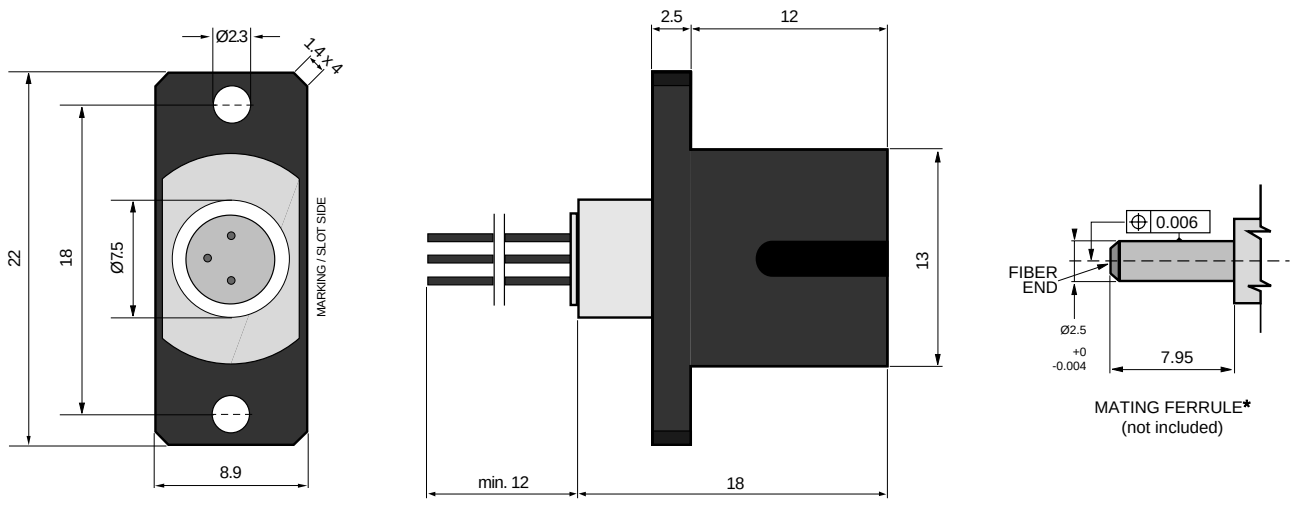
## Absolute Maximum Ratings

| PARAMETER | SYMBOL | LIMIT |
|---|---|---|
| Operating & Storage Temperature | $T_{stg}$, $T_{op}$ | -40 to +85°C |

## Thermal Characteristics

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|
| Thermal Resistance - Infinite Heat Sink (Note 1) | $R_{thcc}$ | | | 40 | °C/W |
| Thermal Resistance - No Heat Sink (Note 1) | $R_{thca}$ | | | 200 | °C/W |
| Thermal Resistance - On PC Board (Note 1) | Rthca | | 125 | | °C/W |

**Note 1:** Add $R_{thjc}$ for emitter or detector to estimate the total thermal resistance.




All Dimensions in mm

* The fiber-coupled power/responsivity is guaranteed to meet the LED/PIN data sheet - provided a ferrule meeting this specification is used.

**Mechanical Outline of Diode in SC-2A Housing**

105967 1994-09-20

MITEL SEMICONDUCTOR

**Europe:** Tel **(46) 8 58 02 45 00** Fax **(46) 8 58 02 01 10**
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**America:** Tel **1-800-96MITEL** Fax **(613) 592-6909**
**Asia:** Tel **(65) 293 5312** Fax **(65) 293 8527**

# Pigtail-3A Package

**Emitter or Detector in Pigtail Package**

Mitel emitters and detectors can be provided in this pigtail package with a wide selection of fiber types. The device is electrically isolated from the pigtail receptacle to facilitate electrical connection. And optimum fiber-coupled power or responsivity is ensured by active alignment against the fiber. A special design maximizes the return loss for detectors in this package.

## Absolute Maximum Ratings

| PARAMETER | SYMBOL | LIMIT |
|---|---|---|
| Operating & Storage Temperature (Note 1 & 2) | $T_{stg}$, $T_{op}$ | -40 to +85°C |

**Note 1:** Temperature range can be extended to -55/+125°C on request.
**Note 2:** Temperature range may be limited by the specification of the fiber.

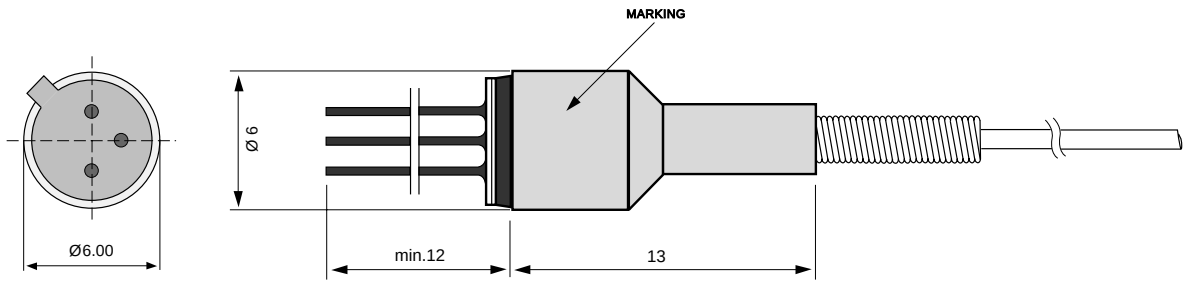
## Thermal Characteristics

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|
| Thermal Resistance - Infinite Heat Sink (Note 3) | $R_{thcc}$ | | | 25 | °C/W |
| Thermal Resistance - No Heat Sink (Note 3) | $R_{thca}$ | | | 250 | °C/W |
| Thermal Resistance - On PC-Board (Note 3) | $R_{thca}$ | | 120 | | °C/W |

**Note 3:** Add $R_{thjc}$ for LED to estimate the total thermal resistance.

## Optical Characteristics

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|
| Return Loss 10/125µm fiber (PIN only) | RL | 40 | 55 | | dB |




All Dimensions in mm

**Mechanical Outline of Diode in PIGTAIL-3A Housing**

105429 1997-07-03

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**Europe:** Tel **(46) 8 58 02 45 00** Fax **(46) 8 58 02 01 10**
Tel **(44) 1291 436180** Fax **(44) 1291 436771**

**America:** Tel **1-800-96MITEL** Fax **(613) 592-6909**
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# FC-2A Package

## Emitter or Detector in FC Package

Mitel emitters and detectors can be provided in this low-profile FC package. The device is electrically isolated from the FC receptacle to facilitate electrical connection. And optimum fiber-coupled power or responsivity is ensured by active alignment against the fiber.

## Absolute Maximum Ratings

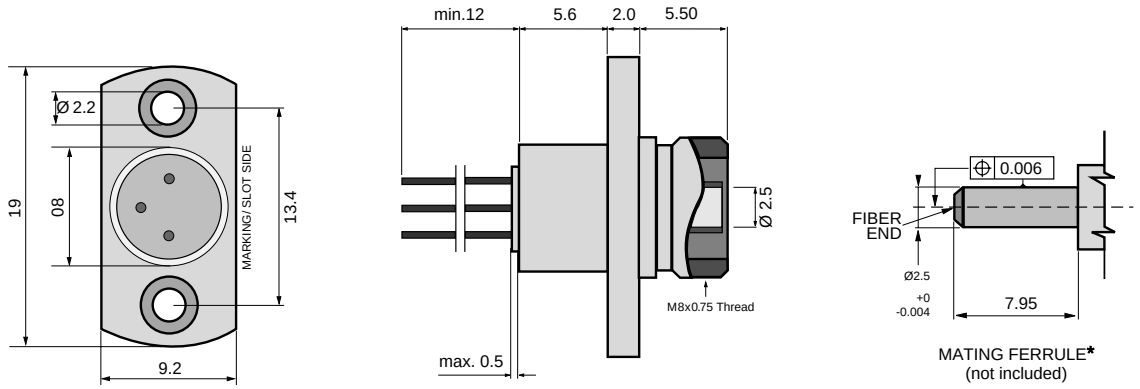
| PARAMETER | SYMBOL | LIMIT |
|---|---|---|
| Operating & Storage Temperature FC-2A (Note 1) | $T_{stg}$, $T_{op}$ | -40 to +85°C |

**Note 1:** Temperature range can be extended to -55° to +125°C on request.

## Thermal Characteristics

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|
| Thermal Resistance - Infinite Heat Sink (Note 2) | $R_{thcc}$ | | | 40 | °C/W |
| Thermal Resistance - No Heat Sink (Note 2) | $R_{thca}$ | | | 200 | °C/W |
| Thermal Resistance - On PC Board (Note 2) | Rthca | | 80 | | °C/W |

**Note 2:** Add $R_{thjc}$ for emitter or detector to estimate the total thermal resistance.




All Dimensions in mm

* The fiber-coupled power/responsivity is guaranteed to meet the LED/PIN data sheet - provided a ferrule meeting this specification is used.

**Mechanical Outline of Diode in FC-2A Housing**

105515 1994-09-20

MITEL SEMICONDUCTOR

**Europe:** Tel **(46) 8 58 02 45 00** Fax **(46) 8 58 02 01 10**
Tel **(44) 1291 436180** Fax **(44) 1291 436771**

**America:** Tel **1-800-96MITEL** Fax **(613) 592-6909**
**Asia:** Tel **(65) 293 5312** Fax **(65) 293 8527**


**http://www.mitelsemi.com**

**World Headquarters - Canada**
Tel: +1 (613) 592 2122
Fax: +1 (613) 592 6909

**North America**
Tel: +1 (770) 486 0194
Fax: +1 (770) 631 8213

**Asia/Pacific**
Tel: +65 333 6193
Fax: +65 333 6192

**Europe, Middle East, and Africa (EMEA)**
Tel: +44 (0) 1793 518528
Fax: +44 (0) 1793 518581