

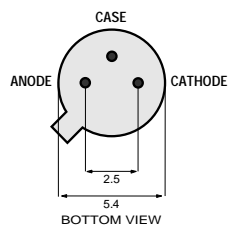
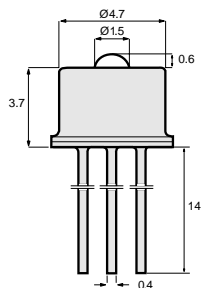
# PRODUCT INFORMATION

840nm

**1A444**  
VCSEL Laser Diode

Datacom, General Purpose

This Vertical Cavity Surface-Emitting Laser is designed for Fibre Channel, Gigabit Ethernet, ATM and general applications. It operates in multiple transverse and single longitudinal mode, ensuring stable coupling of power and low noise.



All dimensions in mm

The chip is isolated from the case.

**TO-46 Package With Lens**

**WARNING:** Laser Radiation, avoid exposure to beam. Class 3B laser product, potential eye hazard. Warning labels in each box.

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

| PARAMETER                        | SYMBOL             | MIN. | TYP. | MAX. | UNIT  | TEST CONDITION                      |
|----------------------------------|--------------------|------|------|------|-------|-------------------------------------|
| Fiber-Coupled Power              | $P_{\text{fiber}}$ |      | 1.3  |      | mW    | $I_F=12\text{mA}$ (Note 1)          |
| Optical Power                    | $P_O$              | 0.9  | 1.7  | 3.0  | mW    | $I_F=12\text{mA}$                   |
| Slope Efficiency ( $dP_O/dI_F$ ) | $\eta$             |      | 200  |      | mW/A  | $I_F=12\text{mA}$                   |
| Bandwidth (3dB <sub>e1</sub> )   | $f_C$              |      | 2    |      | GHz   | $I_F=12\text{mA}$                   |
| Peak Wavelength                  | $\lambda_p$        | 830  | 840  | 860  | nm    | $I_F=12\text{mA}$                   |
| Spectral Width (FWHM)            | $\Delta\lambda$    |      | 0.5  | 1    | nm    | $I_F=12\text{mA}$                   |
| Forward Voltage                  | $V_F$              |      | 1.9  | 2.2  | V     | $I_F=12\text{mA}$                   |
| Threshold Current                | $I_{th}$           |      | 3.5  | 6    | mA    |                                     |
| Relative Intensity Noise         | RIN                |      | -130 |      | dB/Hz | $I_F=12\text{mA}$ , $f=1\text{GHz}$ |

Note 1: Fiber: 50/125 Graded Index, NA=0.2 or 62.5/125 Graded Index, NA=0.275.

## Absolute Maximum Ratings

| PARAMETER   | SYMBOL           | LIMIT         |
|---|------------------|---------------|
| Storage Temperature   | $T_{\text{stg}}$ | -55 to +125°C |
| Operating Temperature   | $T_{\text{op}}$  | 0 to +70°C    |
| Electrical Power Dissipation  | $P_{\text{tot}}$ | 35 mW         |
| Continuous Forward Current ( $f \leq 10\text{kHz}$ )                  | $I_F$            | 15 mA         |
| Peak Forward Current (duty cycle $\leq 50\%$ , $f \geq 1\text{MHz}$ ) | $I_{\text{FRM}}$ | 25 mA         |
| Reverse Voltage   | $V_R$            | 1.5 V         |
| Soldering Temperature (2mm from the case for 10 sec)                  | $T_{\text{sld}}$ | 260°C         |

## Thermal Characteristics

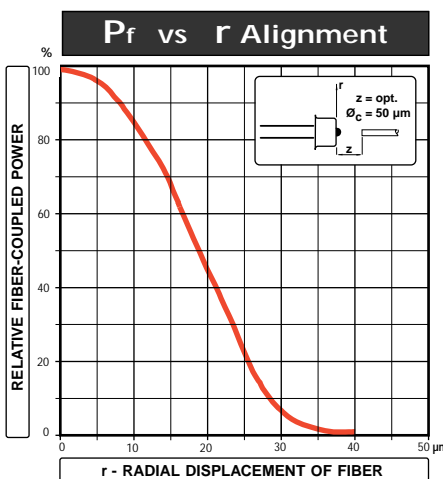
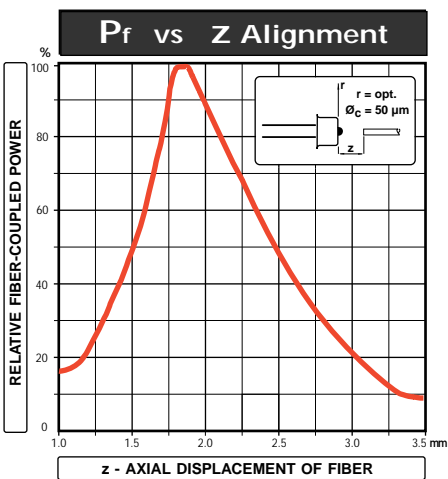
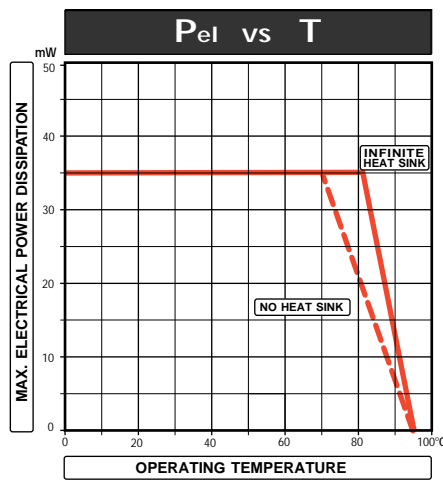
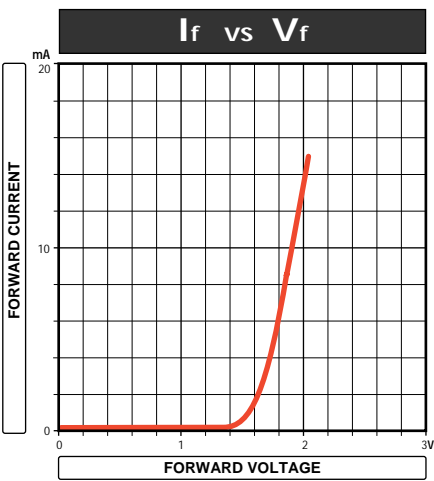
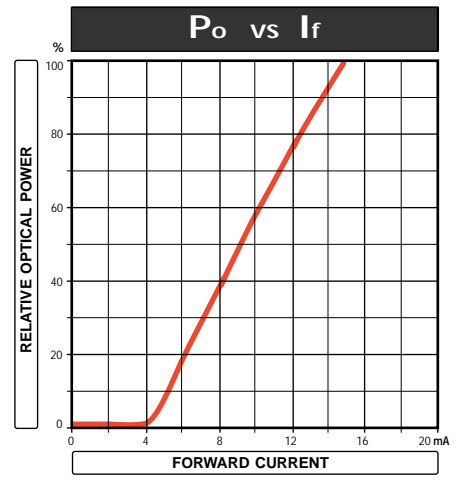
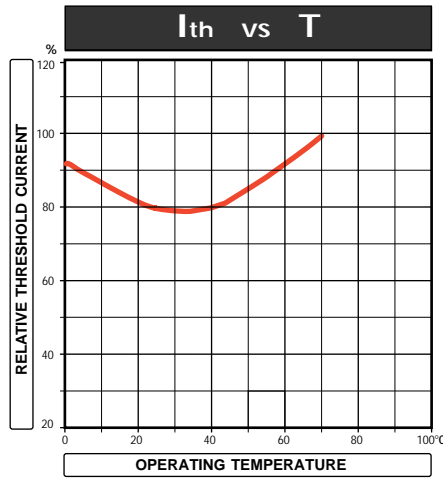
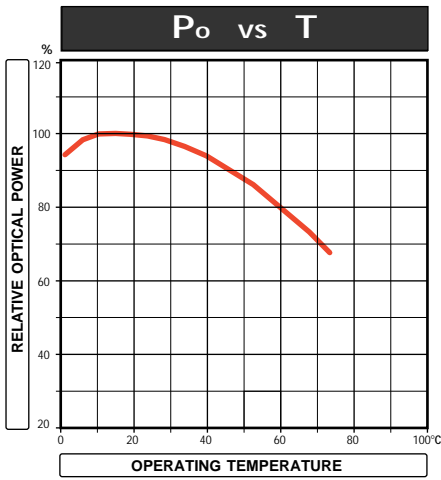
| PARAMETER                               | SYMBOL            | MIN. | TYP.      | MAX. | UNIT  |
|---|-------------------|------|-----------|------|-------|
| Thermal Resistance - Infinite Heat Sink | $R_{\text{thjc}}$ |      | 400       |      | °C/W  |
| Thermal Resistance - No Heat Sink       | $R_{\text{thja}}$ |      | 700       |      | °C/W  |
| Temp. Coefficient - Wavelength          | $d\lambda/dT_j$   |      | 0.06      |      | nm/°C |
| Optical Power - Variation 0 to 70°C     | $\Delta P$        |      | $\pm 0.7$ |      | dB    |
| Threshold Current - Variation 0 to 70°C | $\Delta I_{th}$   |      | $\pm 0.6$ |      | mA    |

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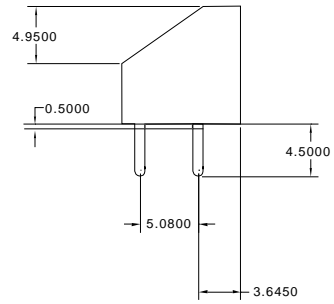
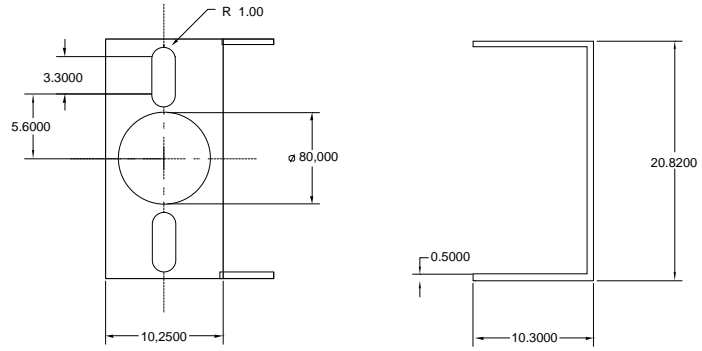


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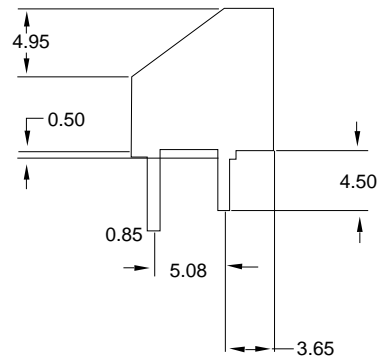
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# Clip for SC-2A



# Clip for Pigtail-3A



# PRODUCT INFORMATION

## 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

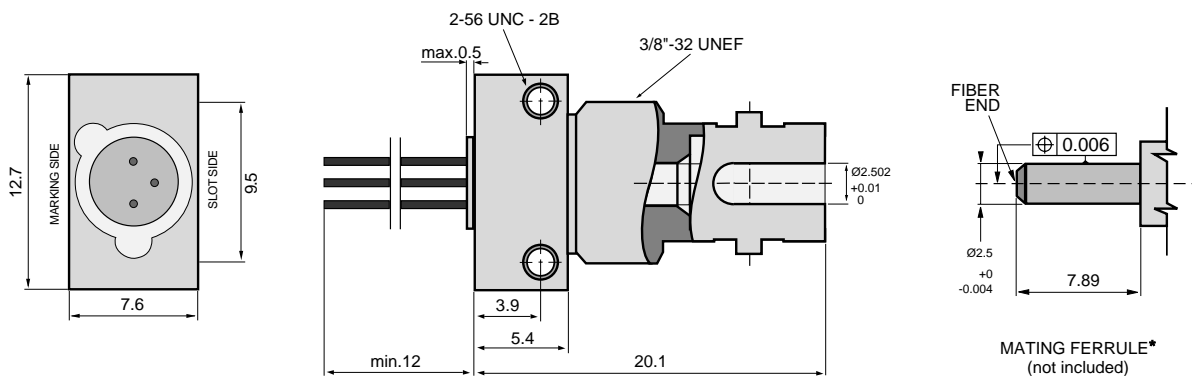
| PARAMETER   | SYMBOL            | LIMIT        |
|---|-------------------|--------------|
| Operating & Storage Temperature<br>ST-2A (Note 1) | $T_{stg}, T_{op}$ | -40 to +85°C |

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<br>(Note 2) | $R_{thcc}$ |      |      | 40   | °C/W |
| Thermal Resistance - No Heat Sink<br>(Note 2)       | $R_{thca}$ |      |      | 200  | °C/W |
| Thermal Resistance - On PC Board<br>(Note 2)        | $R_{thca}$ |      | 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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Asia: Tel (65) 293 5312 Fax (65) 293 8527

# PRODUCT INFORMATION

## 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<br>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<br>(Note 2) | $R_{thcc}$ |      |      | 40   | °C/W |
| Thermal Resistance - No Heat Sink<br>(Note 2)       | $R_{thca}$ |      |      | 200  | °C/W |
| Thermal Resistance - On PC Board<br>(Note 2)        | $R_{thca}$ |      | 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



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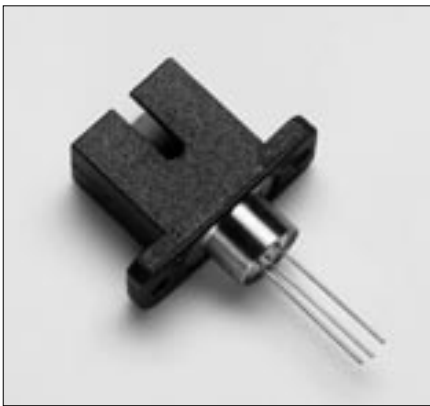
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# PRODUCT INFORMATION

## 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.



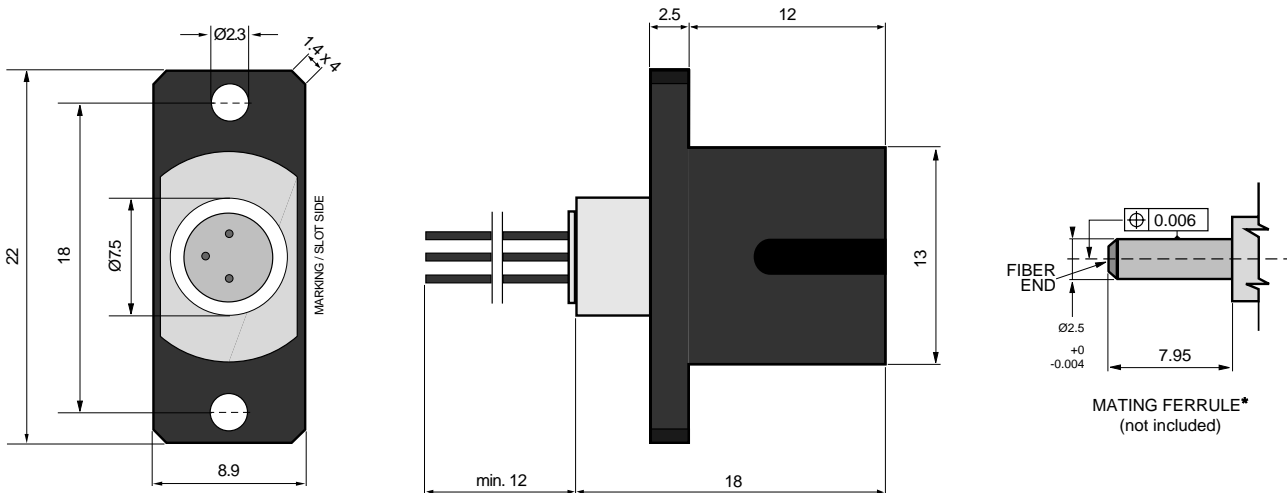
### Absolute Maximum Ratings

| 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)        | $R_{thca}$ |      | 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



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# PRODUCT INFORMATION

## 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.

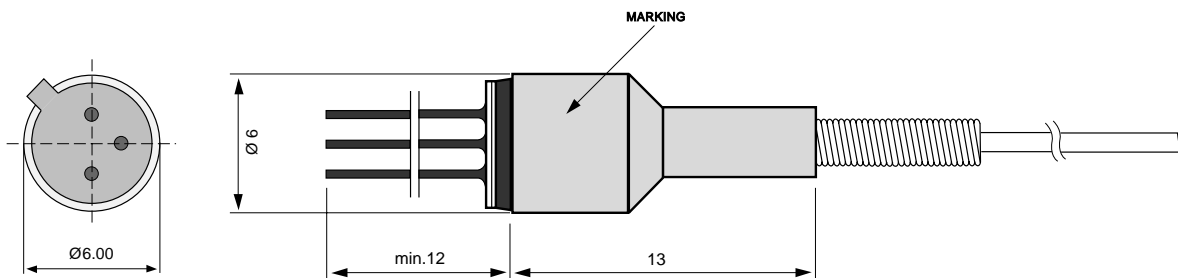
### Thermal Characteristics

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



# PRODUCT INFORMATION

## 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

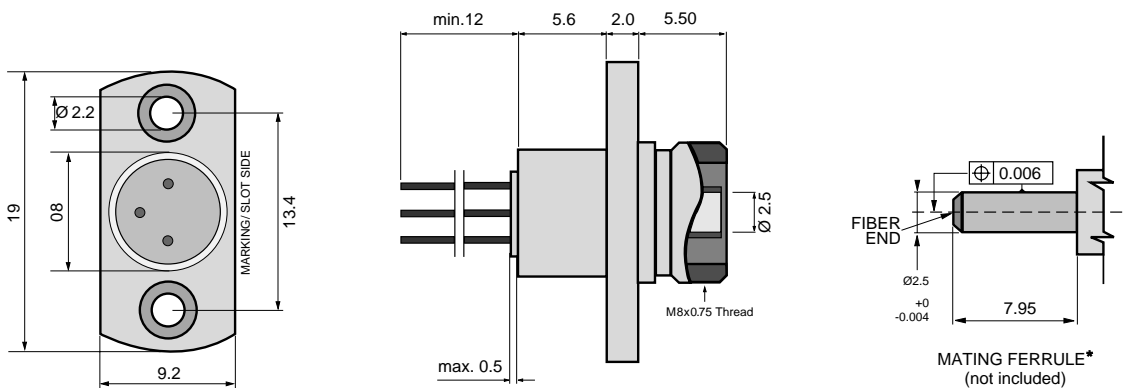
| PARAMETER   | SYMBOL            | LIMIT        |
|---|-------------------|--------------|
| Operating & Storage Temperature<br>FC-2A (Note 1) | $T_{stg}, T_{op}$ | -40 to +85°C |

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<br>(Note 2) | $R_{thcc}$ |      |      | 40   | °C/W |
| Thermal Resistance - No Heat Sink<br>(Note 2)       | $R_{thca}$ |      |      | 200  | °C/W |
| Thermal Resistance - On PC Board<br>(Note 2)        | $R_{thca}$ |      | 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



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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,  
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Tel: +44 (0) 1793 518528  
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