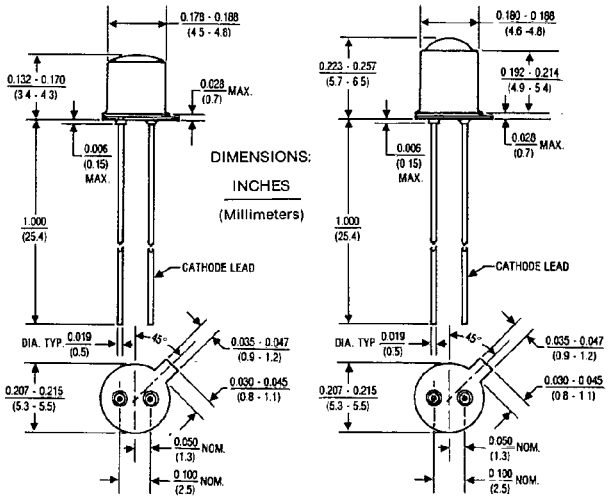
THREE-FIVE SYSTEMS, INC.

# HIGH OUTPUT INFRARED EMITTERS 880nm—TO46 PACKAGE

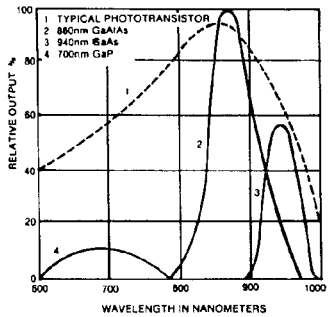
## TEMT88F/88P/88XX SERIES

## PACKAGE OUTLINES




TEMT88F

TEMT88P, TEMT8830, TEMT8850




The 880nm wavelength significantly improves the coupling efficiency to typical phototransistors.

**Spectral Matching Comparison**

## TOTAL RADIANT OUTPUT POWER

| Part Number | Minimum Output | Half Angle |
|---|---|---|
| **TEMT88FA** | 7.0mW @ 100mA | 32.5° |
| **TEMT88FB** | 9.0mW @ 100mA | 32.5° |
| **TEMT88FC** | 10.5mW @ 100mA | 32.5° |
| **TEMT88FD** | 12.0mW @ 100mA | 32.5° |
| **TEMT88PA** | 7.0mW @ 100mA | 10° |
| **TEMT88PB** | 9.0mW @ 100mA | 10° |
| **TEMT88PC** | 10.5mW @ 100mA | 10° |
| **TEMT88PD** | 12.0mW @ 100mA | 10° |
| **TEMT8830** | 30mW/SR @ 100mA | 10° |
| **TEMT8850** | 50mW/SR @ 100mA | 10° |

## FEATURES

- GaAlAs heterostructure material. Emits at 880nm
- Super High Conversion Efficiency/Maximum power output
- 2X Total Radiant Power output of 940nm product
- Increased coupling efficiency to Silicon phototransistors
- TO46 Hermetic Package
- Two Beam angles available
  - —Narrow 10° half angle — Dome Lens
  - —Wide 32.5° half angle — Flat Lens

## APPLICATIONS

- Disk Drives
- Tape Drives
- Printers
- Optical Encoders
- Remote Actuators
- Photoelectric Controls
- Slotted Switches
- Reflective Switches
- Intrusion Alarms
- Smoke Detectors

## DESCRIPTION

The TEMT88F/88P/88XX series is Gallium Aluminum Arsenide high output infrared emitting diodes in TO46 hermetic packages. They emit non-coherent, infrared energy at 880nm and provide significantly improved coupling efficiency to silicon phototransistors. These devices are constructed with (LPE) solution grown diodes for the highest conversion efficiency and long, useful operating life span.

## ABSOLUTE MAXIMUM RATINGS

| | |
|---|---|
| Average Power Dissipation: | **200mW** |
| Derate Linearly from 25°C: | **-1.6mW/°C** |
| Average Forward Current: | **100mA** |
| Reverse Voltage: | **3.0V** |
| Operating & Storage Temp.: | **-65 to +125°C** |
| Soldering Time @ 260°C 1/16" From Case: | **5 seconds** |
| Peak Pulse Current 100*u*sec Pulse, 10pps: | **3.0A** |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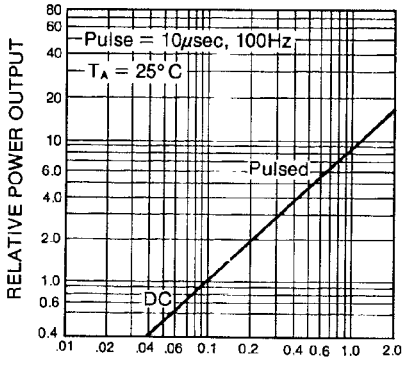
# HIGH OUTPUT INFRARED EMITTERS 880nm—TO46 PACKAGE
## TEMT88F/88P/88XX SERIES

### ELECTRO-OPTICAL CHARACTERISTICS

| Symbol | Parameter | Conditions ($T_A$ = 25°C) | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| $\Delta P_O/\Delta T$ | Temp. Coef. of Power Output | $I_F$ = 100mA | | -0.53 | | %/°C |
| $\Delta V_F/\Delta T$ | Temp. Coef. of Forward Voltage | $I_F$ = 100mA | | -1.8 | | mV/°C |
| $V_F$ | Forward Voltage | $I_F$ = 100mA | | 1.6 | 1.9 | V |
| $R_d$ | Dynamic Resistance | $I_F$ = 100mA | | 1.2 | | Ω |
| $\theta^1/_2$ | Half Angle Between Half Radiant Intensity Points* | | | | | |
| | TEMT88P, TEMT8830/50 | | | 10 | | Deg. |
| | TEMT88F | | | 32.5 | | Deg. |
| $\lambda_{peak}$ | Peak Wavelength | $I_F$ = 100mA | | 880 | | nm |
| $\Delta\lambda$ | Line Halfwidth | $I_F$ = 100mA | | 80 | | nm |
| $I_R$ | Reverse Current | $V_R$ = -3.0V | | | 10 | μA |
| $t_r$ | Rise Time | | | 0.6 | | μsec |
| $t_f$ | Fall Time | | | 0.75 | | μsec |

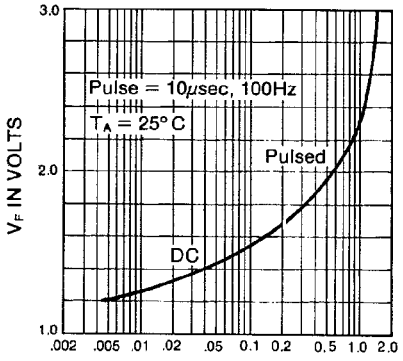
*Typical off-axis angle at which the radiant intensity is half the axial radiant intensity.

### TYPICAL CHARACTERISTICS



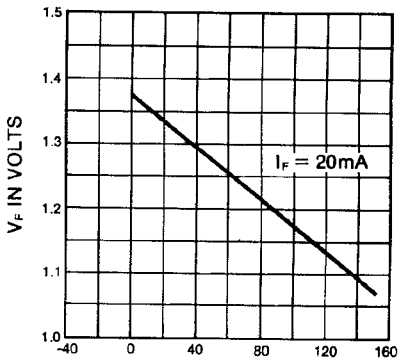

$I_F$ IN AMPS

**$I_F$ versus Normalized Power Out**



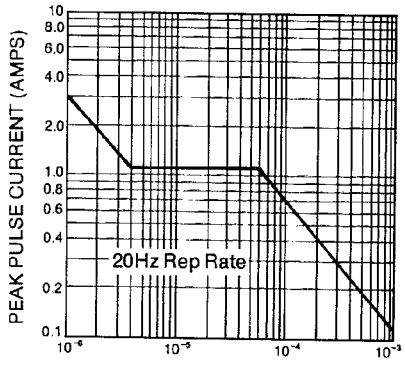

$I_F$ IN AMPS

**Forward Voltage versus $I_F$**



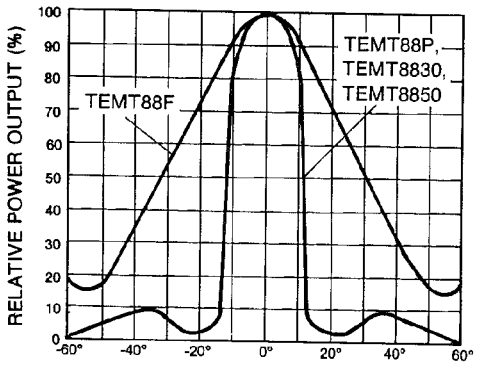

TEMPERATURE, °C

**Forward Voltage versus Temperature**




PULSE WIDTH (SECONDS)

**Max. Peak Pulse Current versus Pulse Width**




ANGULAR DISPLACEMENT FROM OPTICAL AXIS

**Typical Radiation Pattern**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Form IE 1105 3/88