

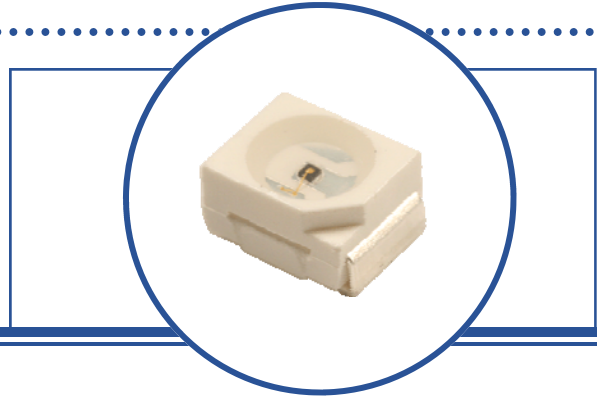
# Infrared Light Emitting Diode

## OP180 & OP280 Series



### Features:

- High power GaAs—OP180, 940 nm center wavelength
- High power GaAlAs—OP280K and OP280KT, 875 nm center wavelength
- VCSEL GaAlAs—OP280V, 850 nm center wavelength
- Point Source GaAlAs—OP280PS, 850 nm center wavelength
- PLCC-2 package style with silicon encapsulation
- Half Power Beam angle from 18° to 100°
- Suitable for single device or array applications



### Description:

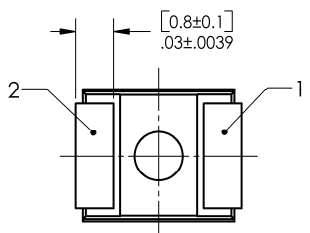
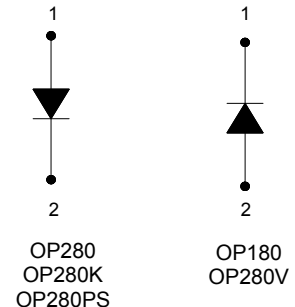
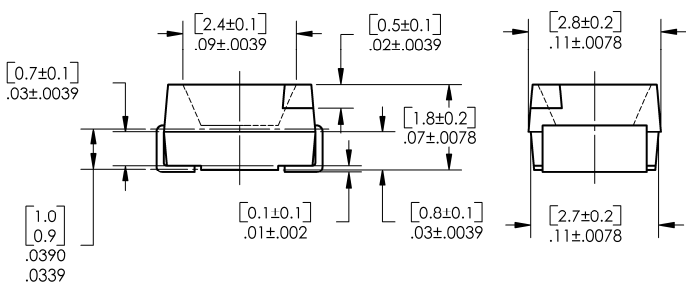
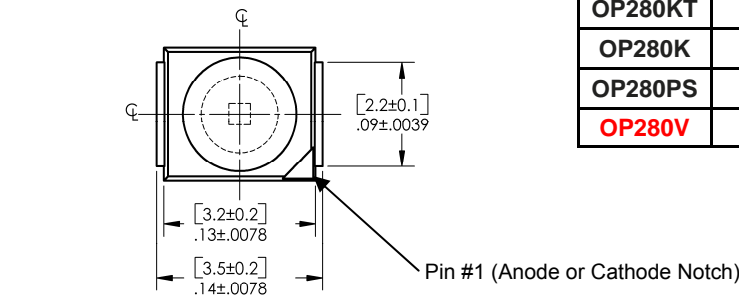
The **OP180** is a GaAs and the **OP280K**, **OP280KT** is a GaAlAs infrared LED mounted in plastic leadless PLCC-2 SMD package with a flat lens window that allows a wide beam angle. The major differentiator from the two High power GaAlAs LEDs is that **OP280KT** has reversed polarity terminals. The **OP280V** is incorporated into the group with a high performance 850nm invisible VCSEL (Class 1M) with silicon encapsulant. Its high speed, high output and narrow beam pattern (18°) makes it very suitable for high-speed data equipment applications. The **OP280PS** has a GaAlAs diode in a PLCC-2 package that features a narrow irradiance pattern. The PLCC-2 packaging is suitable for single device or array applications.

*The 180 and 280 Series LEDs are mechanically and spectrally matched to OP580 series phototransistors.*

### Applications:

- Non-contact position sensing
- Machine automation
- Datum detection
- Optical encoding

Ordering Information				
Part Number	Apertured Power (mW/cm <sup>2</sup> )	I <sub>F</sub> (mA)	LED Peak Wavelength	Half Power Angle
OP180	0.50	20	940 nm	100°
OP280KT	0.85	20	850 nm	90°
OP280K	0.85	20	875 nm	90°
OP280PS	0.15	20	850 nm	50°
OP280V	2.50	7	850 nm	18°



Pin #	OP180	OP280KT	OP280K	OP280PS	OP280V
1	Cathode	Cathode	Anode	Anode	Cathode
2	Anode	Anode	Cathode	Cathode	Anode



RoHS

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

DIMENSIONS ARE IN INCHES AND [MILLIMETERS].

# Infrared Light Emitting Diode

## OP180 & OP280 Series



### Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Storage Temperature Range	-40° C to +100° C
Operating Temperature Range—OP180, OP280K, OP280KT, OP280PS OP280V	-25° C to +85° C 0° C to +70° C
Reverse Voltage OP180, OP280PS, OP280V OP280K, OP280KT	5.0 V 4.0 V
Peak Forward Current [ 1µs pulse width, 300 pps]	1.0 A
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 seconds with soldering iron]	260° C <sup>(1)</sup>
Power Dissipation	130 mW <sup>(2)</sup>

### Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
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#### Input Diode

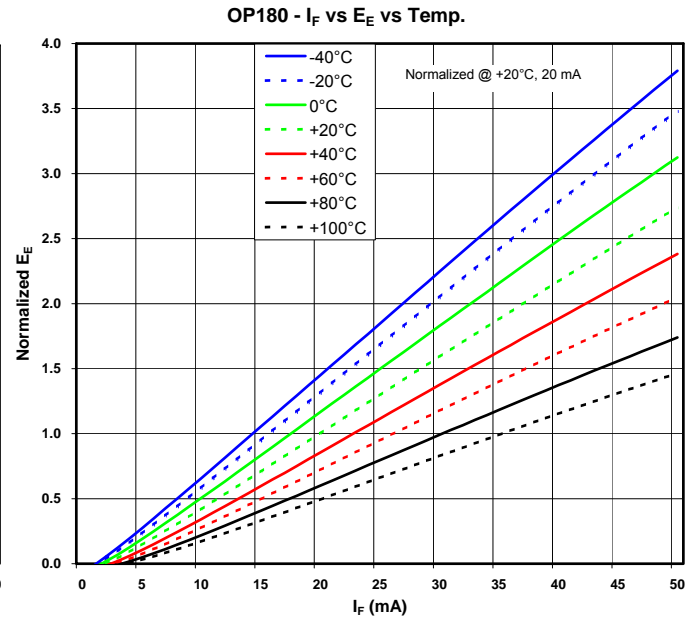
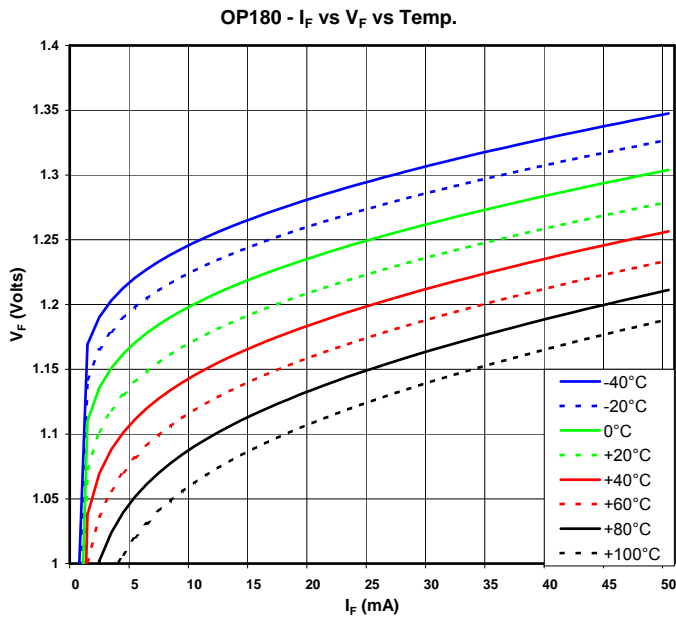
$E_{E(APT)}$	Radiant Incidence OP180 OP280 OP280K OP280PS OP280V	1.5 0.5 20.0 2.8 1.05	- - 24.0 3.5 -	- - - - -	mW/cm <sup>2</sup>	$I_F = 20\text{ mA}$ $I_F = 20\text{ mA}^{(3)}$ $I_F = 20\text{ mA}$ $I_F = 20\text{ mA}$ $I_F = 7\text{ mA}$
$V_F$	Forward Voltage OP180 OP280K OP280KT OP280V OP280PS	- - - - -	1.28 1.50 1.55 1.95 1.50	1.60 1.80 1.80 2.50 1.80	V	$I_F = 20\text{ mA}$ $I_F = 20\text{ mA}$ $I_F = 50\text{ mA}$ $I_F = 7\text{ mA}$ $I_F = 20\text{ mA}$
$I_R$	Reverse Current	-	-	100	µA	$V_R = 5.0\text{ V}$
$\lambda_P$	Wavelength at Peak Emission OP180 OP280KT OP280PS, OP280K OP280V	- - - -	940 875 850	- - -	nm	$I_F = 20\text{ mA}$ $I_F = 7\text{ mA}$
$\theta_{HP}$	Emission Angle at Half Power Points OP180, OP280K, OP280KT OP280PS OP280V	- - -	100 90 18	- - -	Degree	$I_F = 20\text{ mA}$ $I_F = 20\text{ mA}$ $I_F = 7\text{ mA}$
$t_r$	Output Rise Time OP180, OP280K, OP280KT, OP280PS	-	25	-	ns	$I_{F(PK)}=50\text{ mA}$ , $PW=10\text{ }\mu\text{s}$ , and D.C.=10.0%
$t_f$	Output Fall Time OP180, OP280K, OP280KT, OP280PS	-	25	-	ns	

#### Notes:

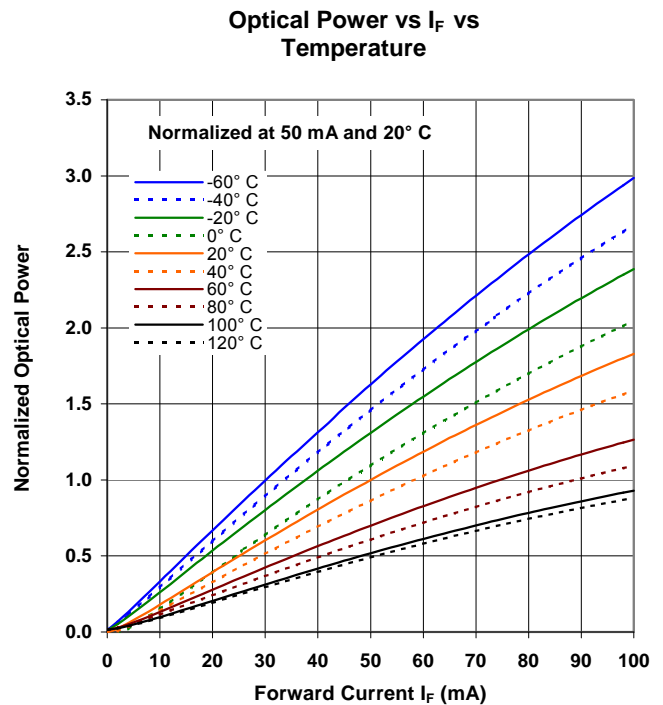
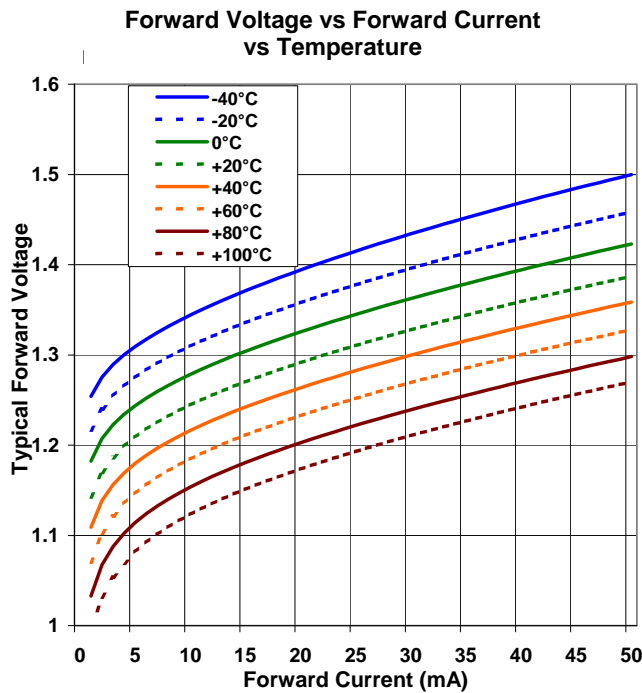
- Solder time less than 5 seconds at temperature extreme.
- Derate linearly at 2.17 mW/° C above 25° C.
- $E_{E(APT)}$  is a measurement of the apertured radiant incidence upon a sensing area 0.081" (2.06 mm) in diameter, perpendicular to and centered on the mechanical axis of the lens and 0.590" (14.99 mm) from the measurement surface.  $E_{E(APT)}$  is not necessarily uniform within the measured area.

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**OP180**



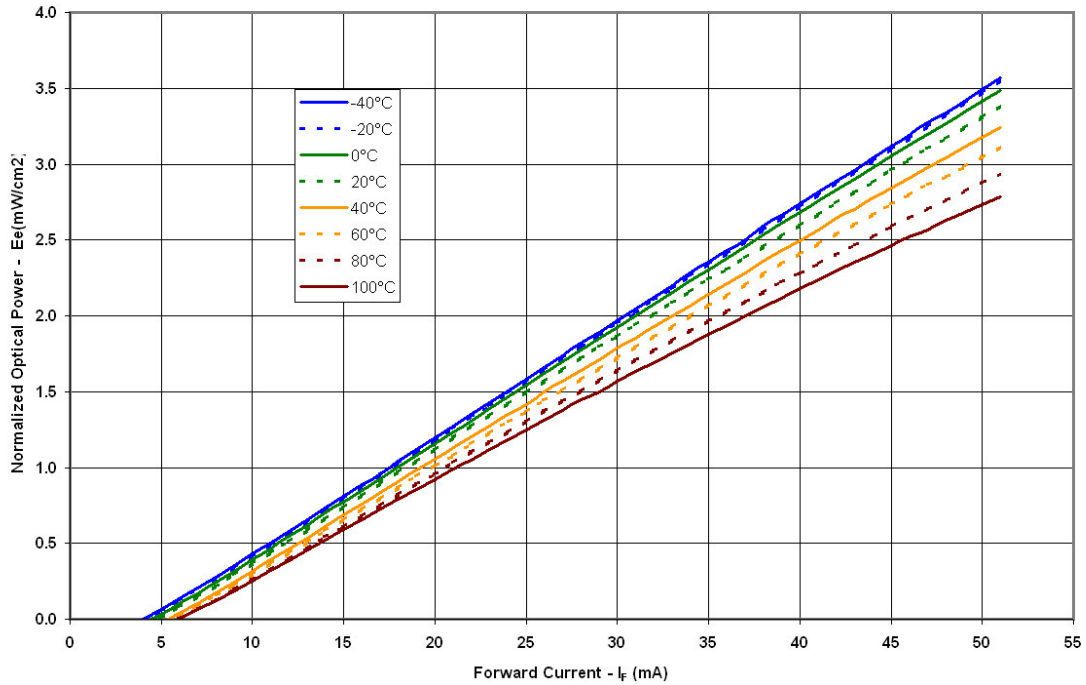
**OP280**



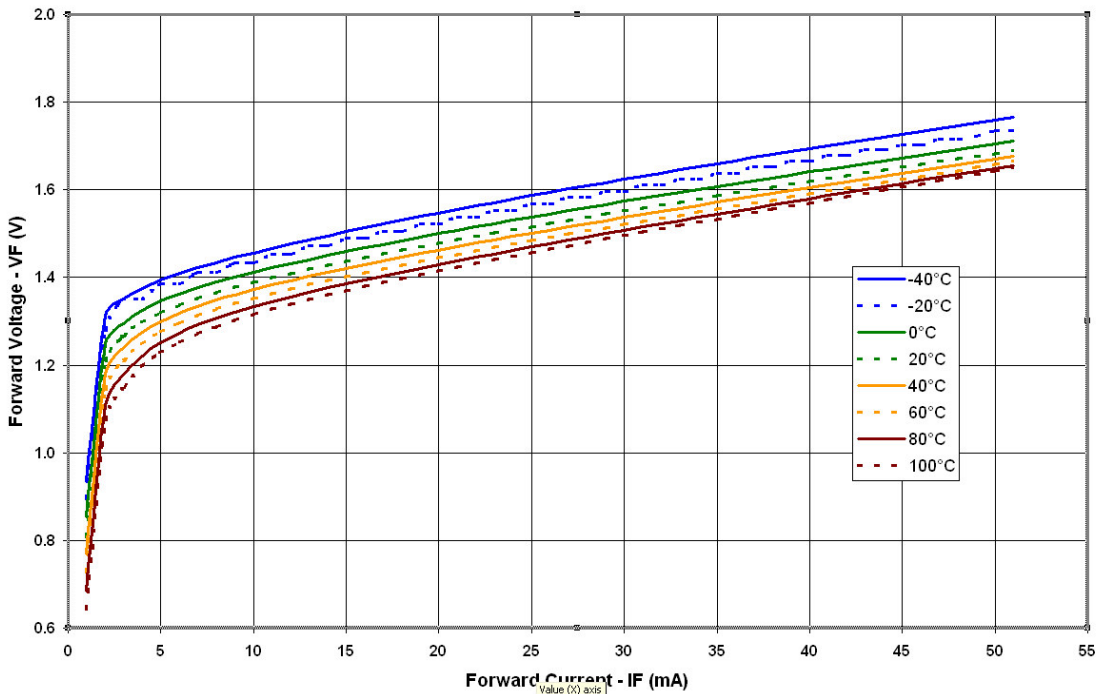
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**OP280K**

**Optical Power -  $E_e$ (mW/cm<sup>2</sup>) vs Forward Current -  $I_F$   
vs Temperature -  $T_A$**



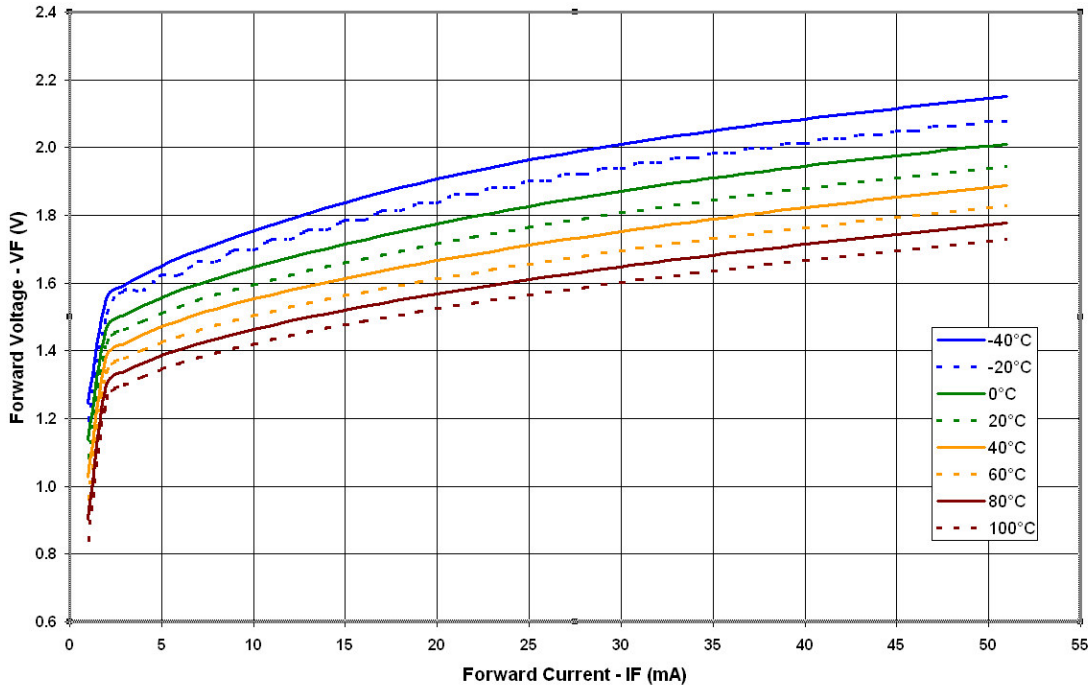
**Forward Voltage -  $V_F$  vs Forward Current -  $I_F$  vs  
Temperature -  $T_A$**



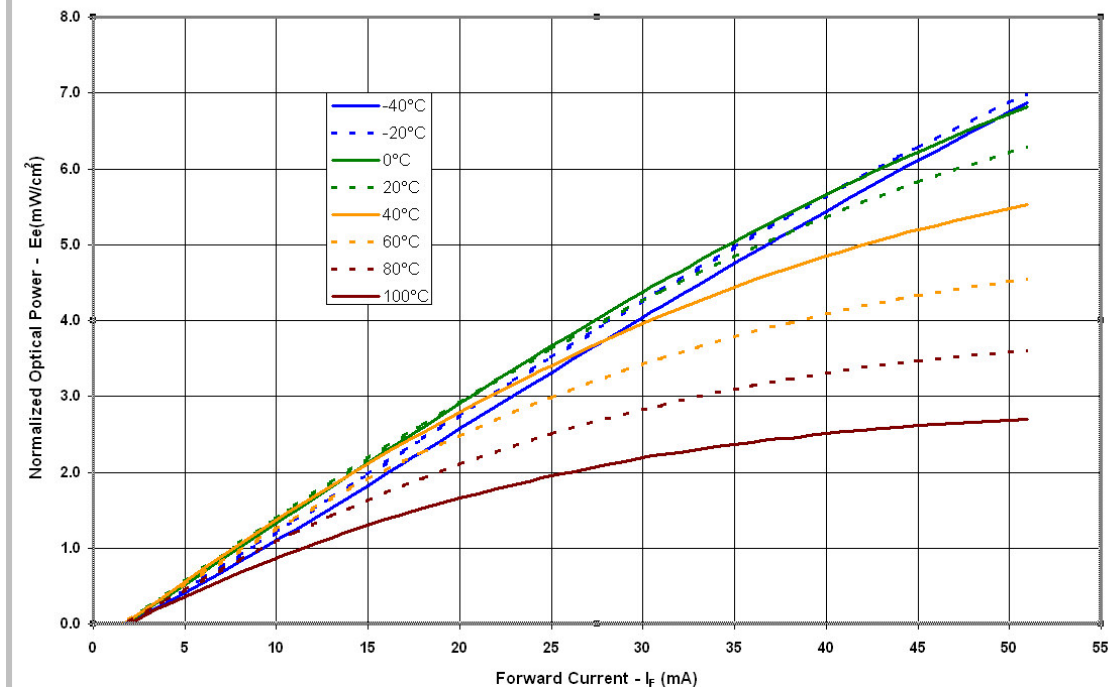
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**OP280KT**

**Forward Voltage -  $V_F$  vs Forward Current -  $I_F$  vs Temperature -  $T_A$**



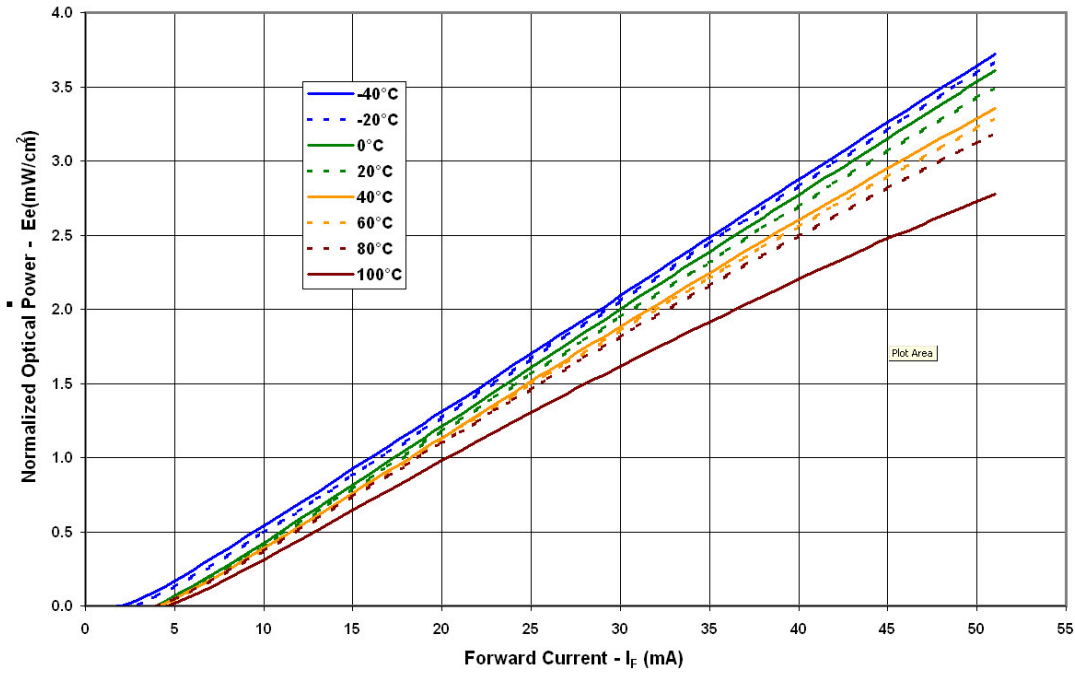
**Optical Power -  $E_e$ (mW/cm<sup>2</sup>) vs Forward Current -  $I_F$  vs Temperature -  $T_A$**



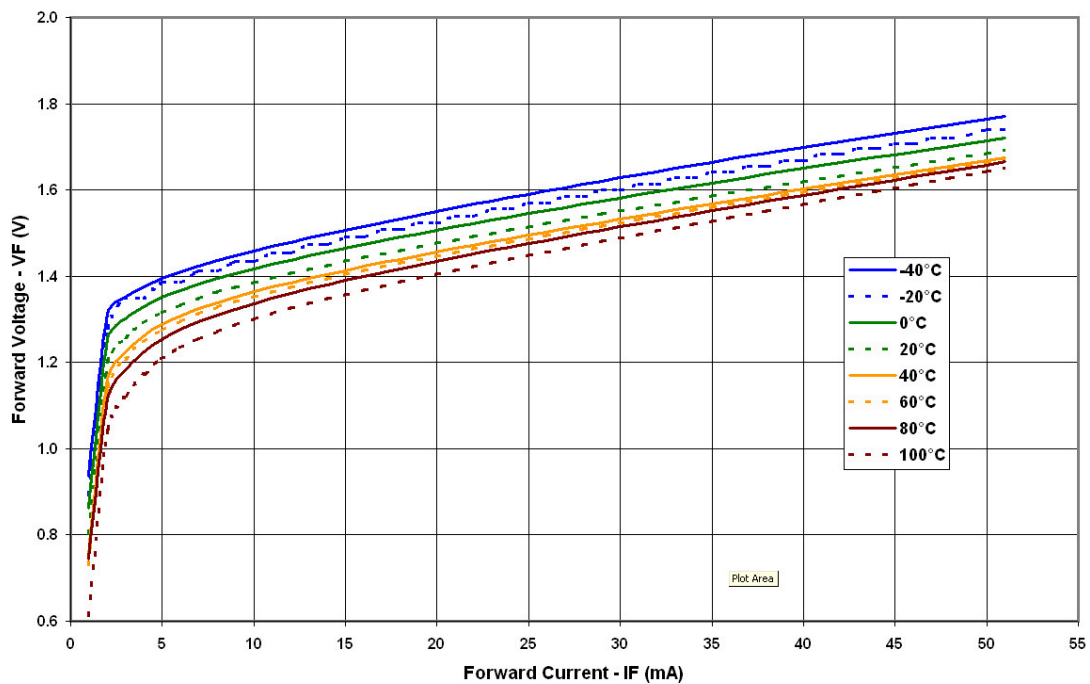
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OP280PS

Optical Power -  $E_e(\text{mW}/\text{cm}^2)$  vs Forward Current -  $I_F$   
vs Temperature -  $T_A$



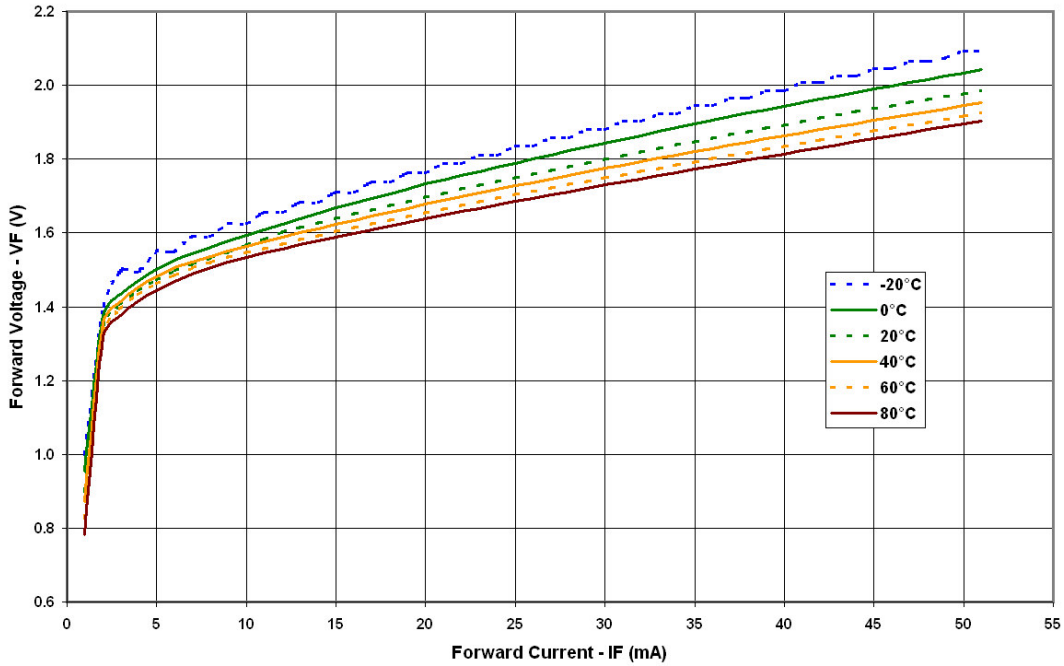
Forward Voltage -  $V_F$  vs Forward Current -  $I_F$  vs  
Temperature -  $T_A$



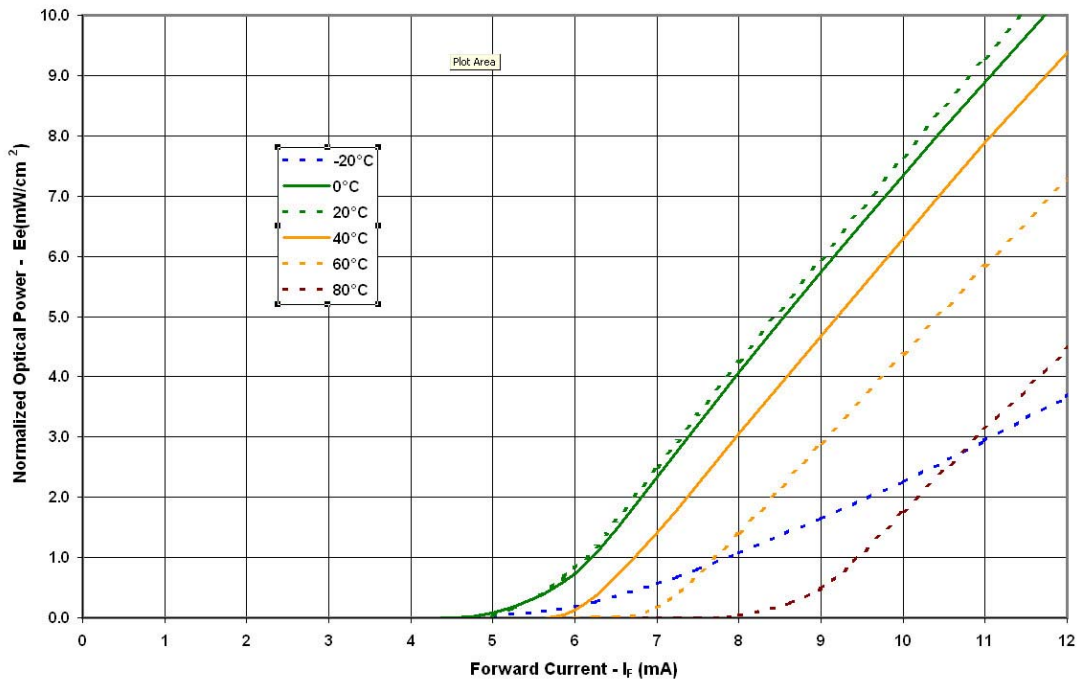
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**OP280V**

**Forward Voltage -  $V_F$  vs Forward Current -  $I_F$  vs Temperature -  $T_A$**



**Optical Power -  $E_e$ (mW/cm<sup>2</sup>) vs Forward Current -  $I_F$  vs Temperature -  $T_A$**



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