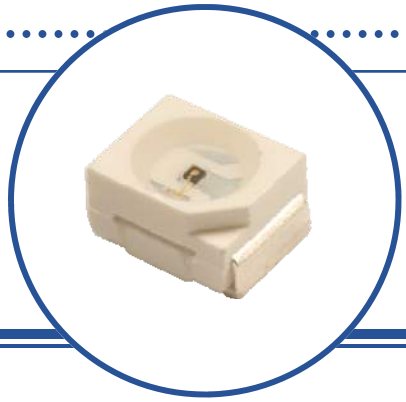
Infrared Light Emitting Diode

OP180 & OP280 Series

TT electronics
OPTEK Technology

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:

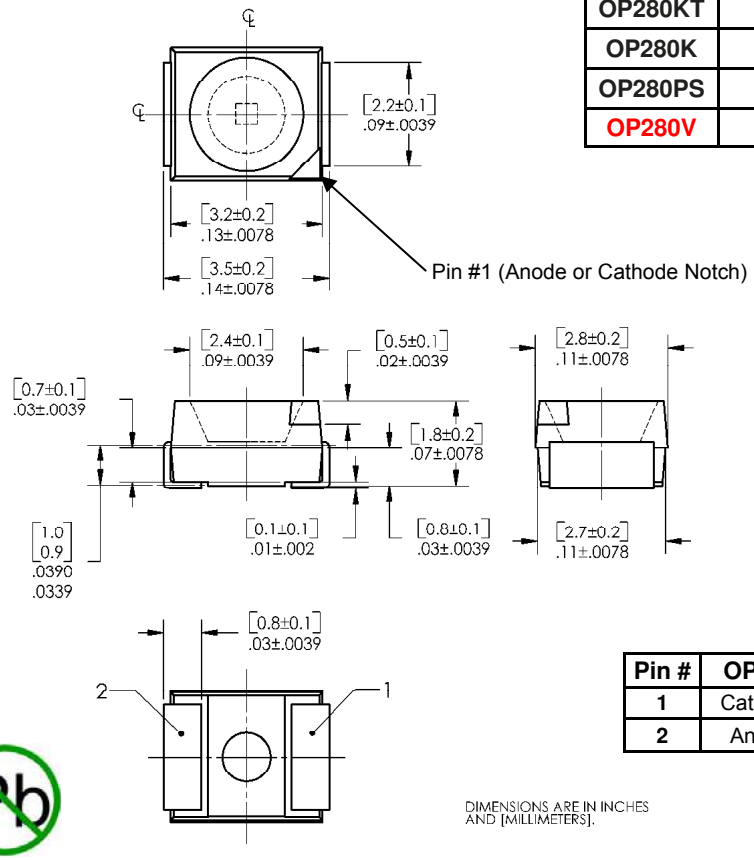
The **OP180** is a GaAs and the **OP280K, OP280KT** is a GaAlAs infrared LED mounted in plastic leadless PLCC-2 SMD package with a flat lens window that allows a wide beam angle. The major differentiator from the two High power GaAlAs LEDs is that **OP280KT** has reversed polarity terminals. The **OP280V** 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.

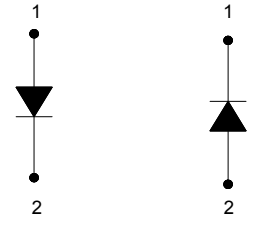
The 180 and 280 Series LEDs are mechanically and spectrally matched to OP580 series phototransistors.

Applications:

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

Ordering Information				
Part Number	**Apertured Power (mW/cm²)**	**I_F (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

DIMENSIONS ARE IN INCHES AND [MILLIMETERS].

Pb
RoHS

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

Absolute Maximum Ratings (T_A=25° 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(1)
Power Dissipation	130 mW(2)

Electrical Characteristics (T_A = 25° C unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
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^2	 I_F = 20 mA I_F = 20 mA(3) I_F = 20 mA I_F = 20 mA I_F = 7 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 mA I_F = 20 mA I_F = 50 mA I_F = 7 mA I_F = 20 mA
I_R	Reverse Current	-	-	100	µA	V_R= 5.0 V
λ_P	Wavelength at Peak Emission OP180 OP280KT OP280PS, OP280K OP280V	 - - -	 940 875 850	 - - -	nm	 I_F = 20 mA I_F = 7 mA
θ_{HP}	Emission Angle at Half Power Points OP180, OP280K, OP280KT OP280PS OP280V	 - - -	 100 90 18	 - - -	Degree	 I_F = 20 mA I_F = 20 mA I_F = 7 mA
t_r	Output Rise Time OP180, OP280K, OP280KT, OP280PS	-	25	-	ns	$I_{F(PK)}$=50 mA, PW=10 µs, and D.C.=10.0%
t_f	Output Fall Time OP180, OP280K, OP280KT, OP280PS	-	25	-	ns	

Notes:
1. Solder time less than 5 seconds at temperature extreme.
2. Derate linearly at 2.17 mW/° C above 25° C.
3. $E_{E(APT)}$ 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.

OPTEK Technology Inc. — 1645 Wallace Drive, Carrollton, Texas 75006
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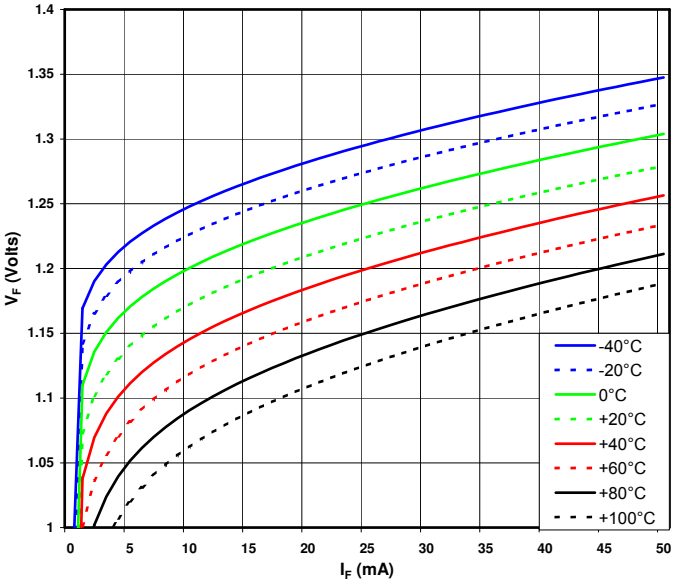
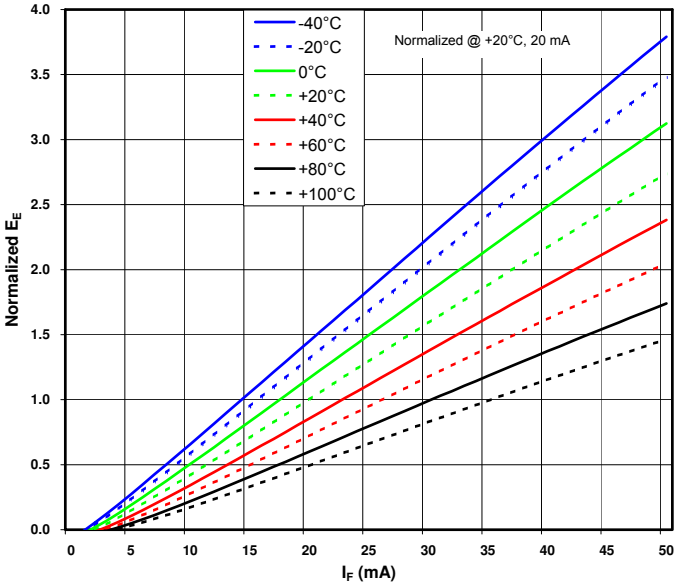
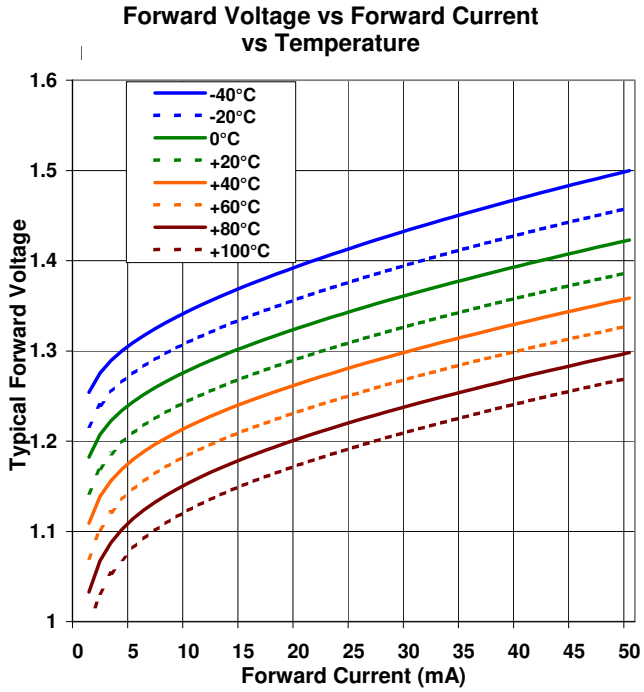
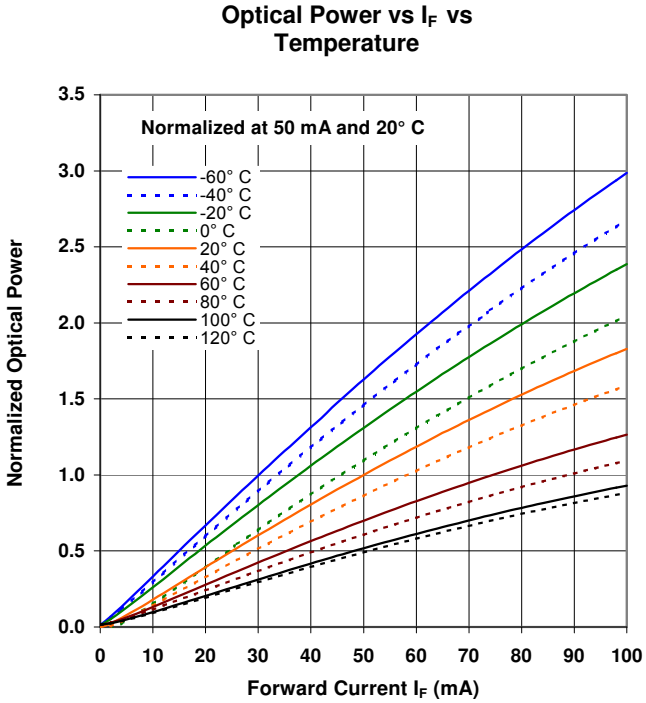
OP180



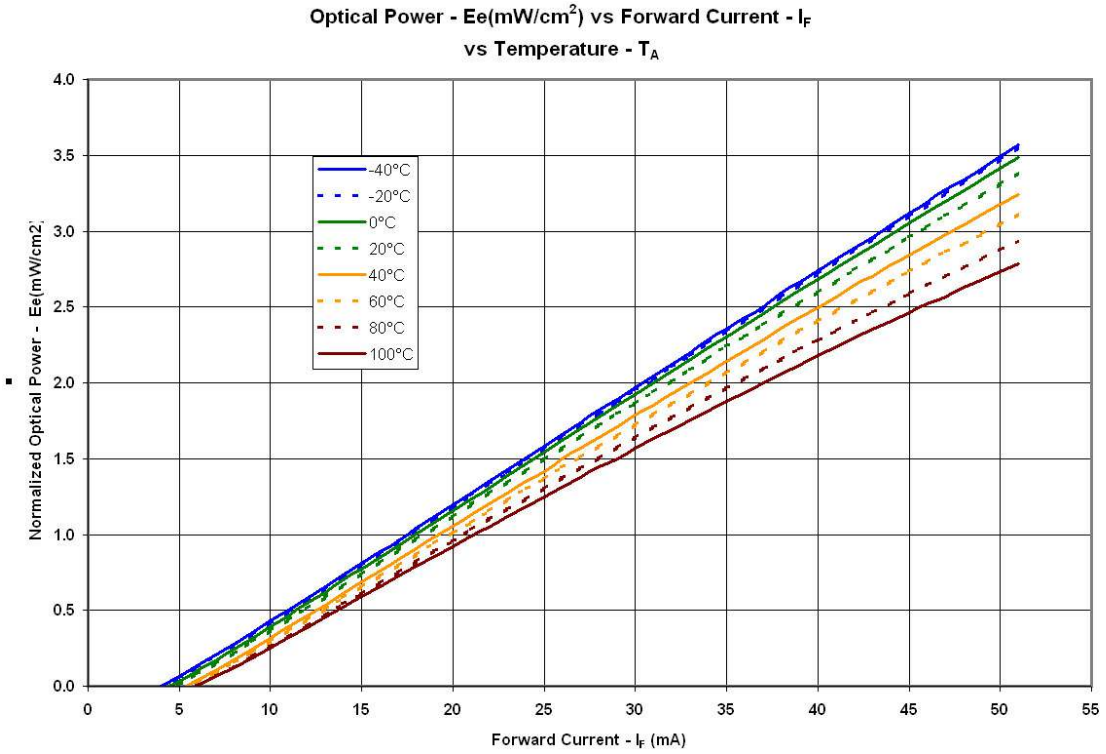


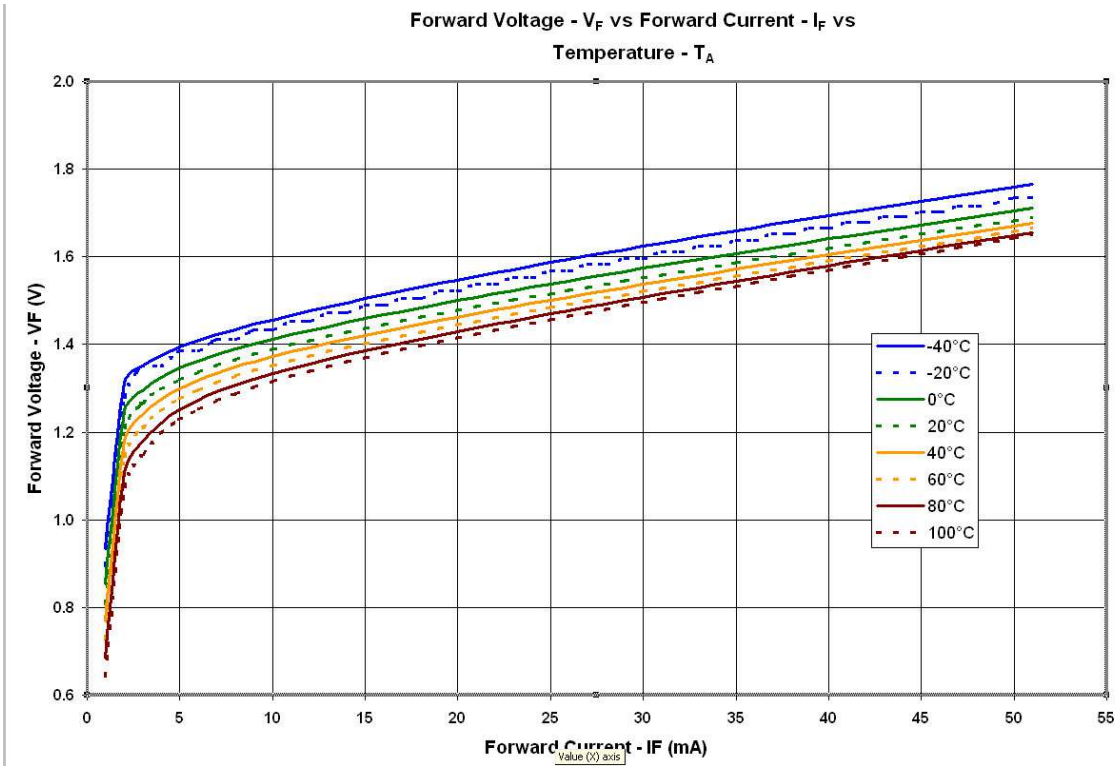
OP280





OP280K





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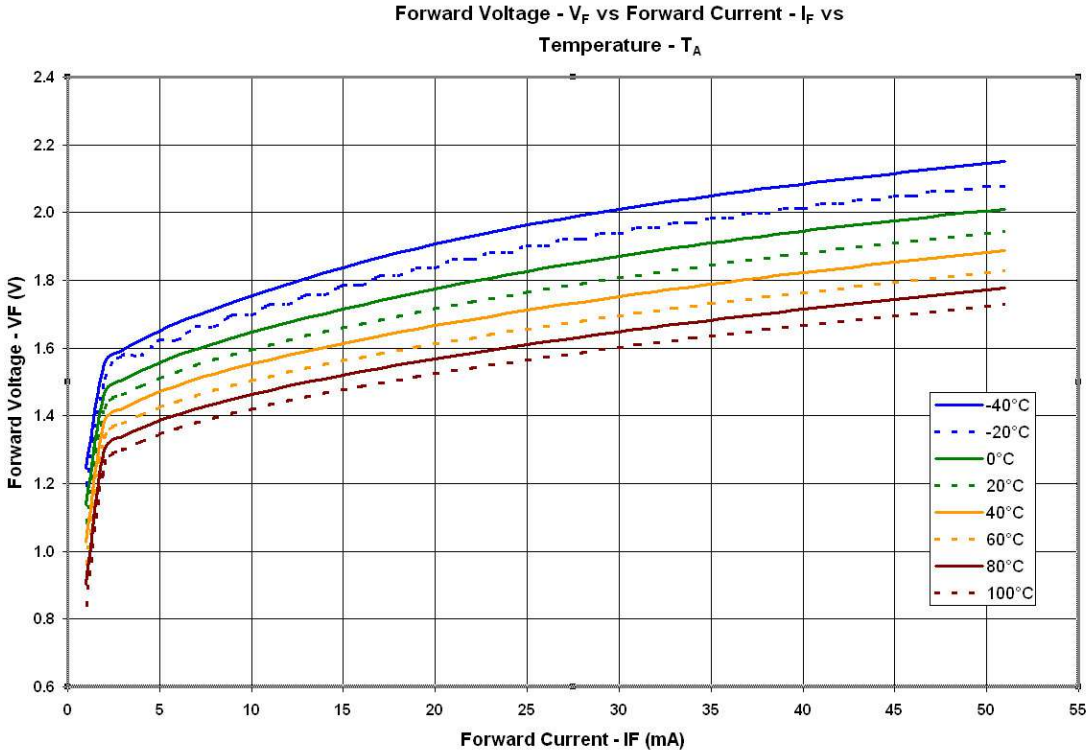
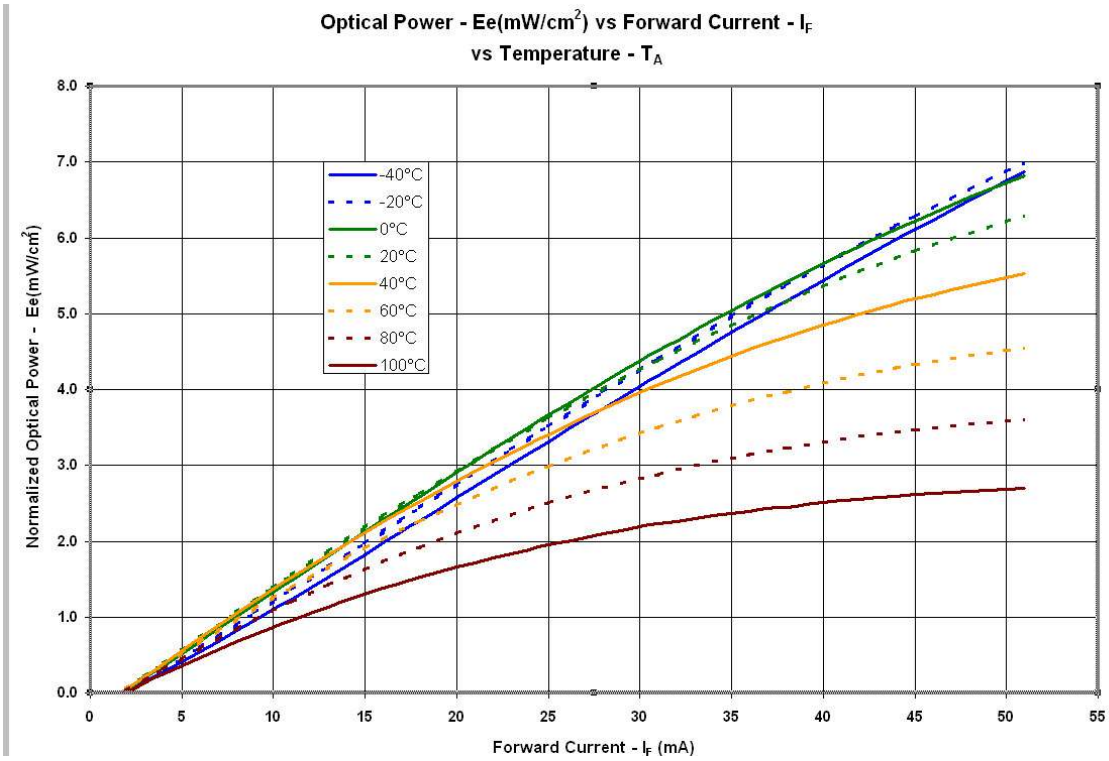
OP280KT





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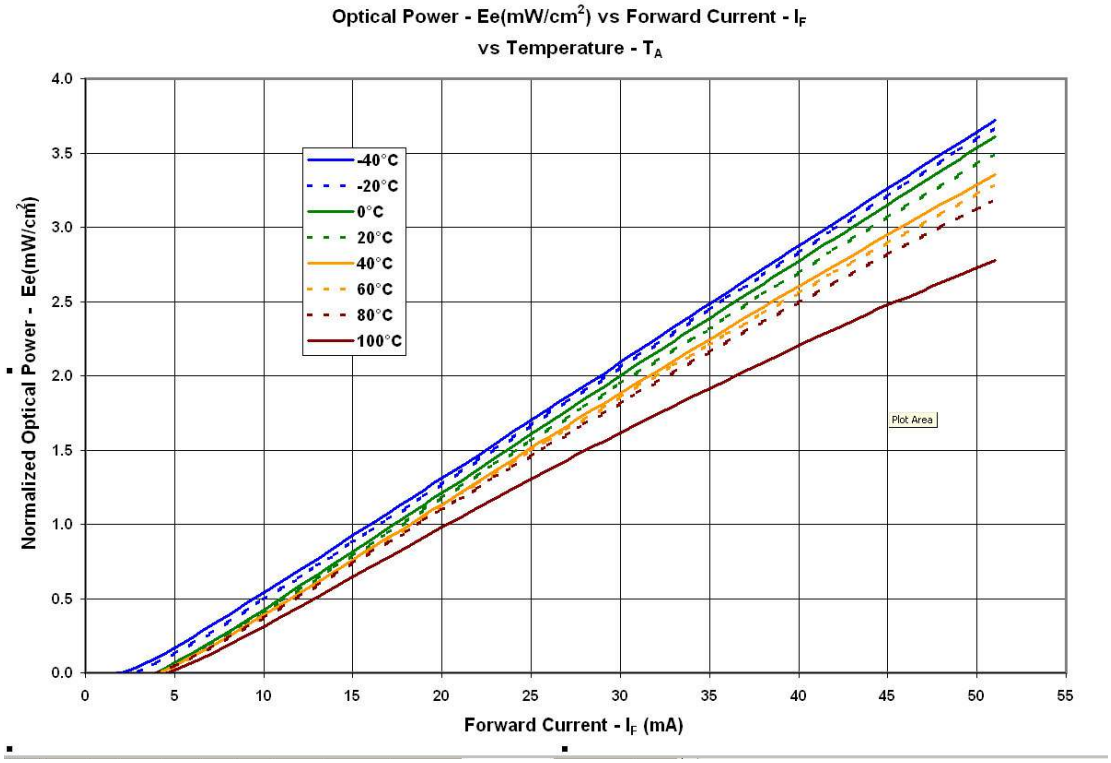
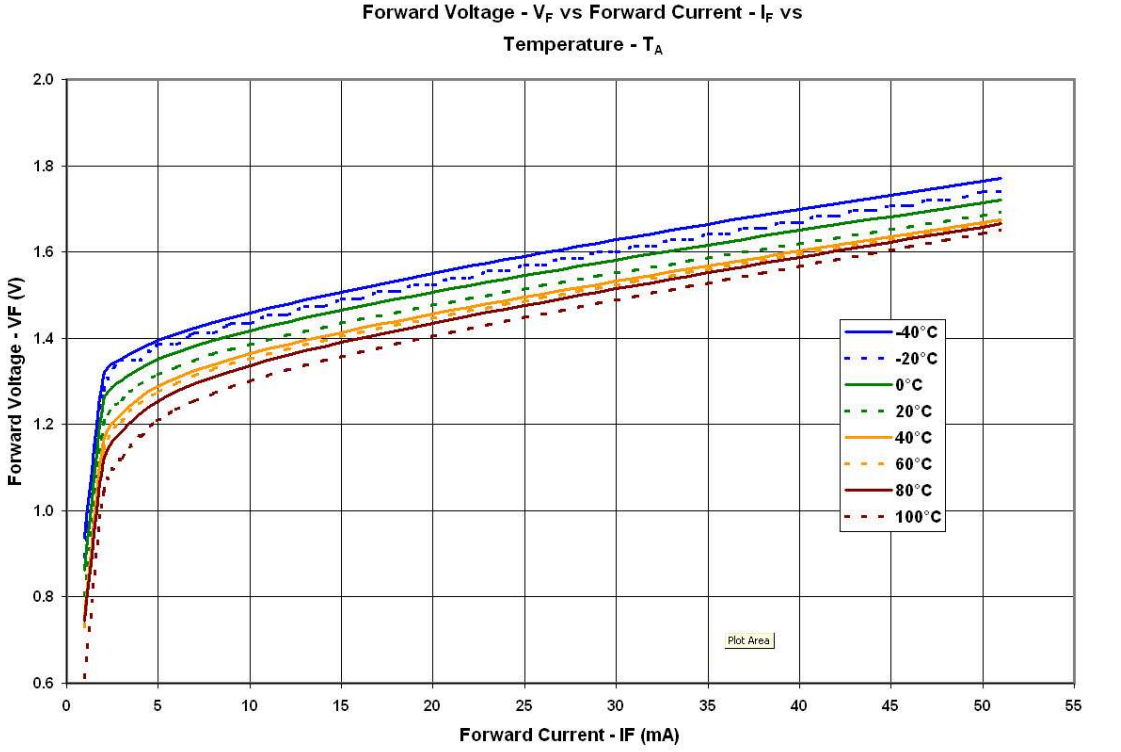
OP280PS





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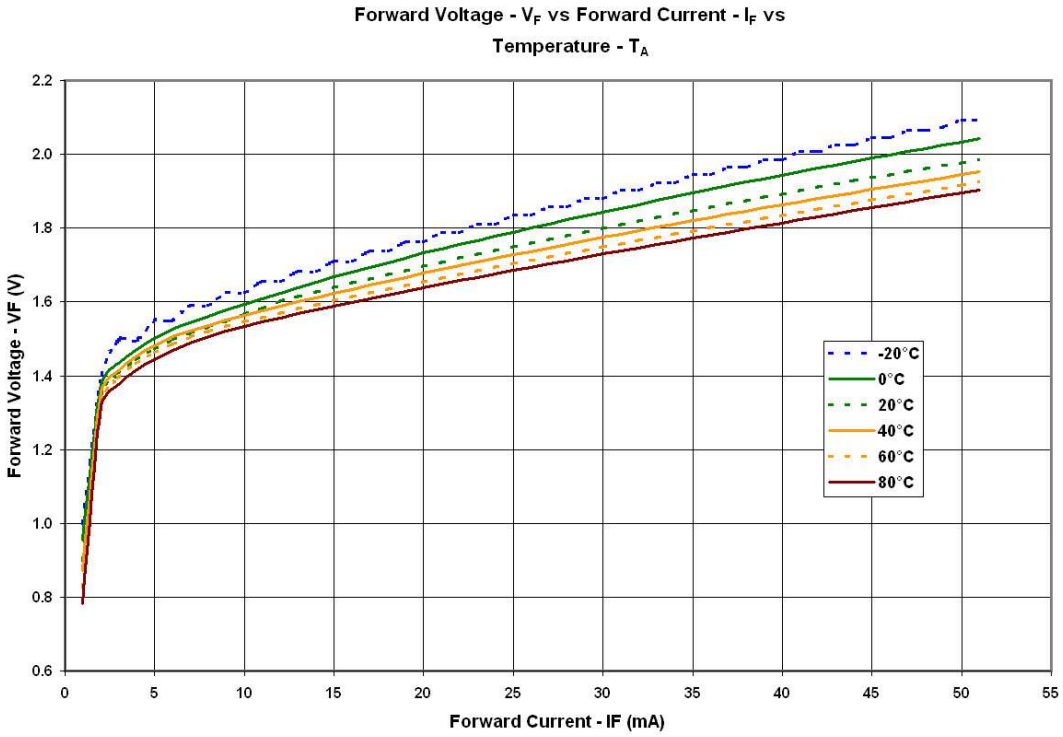
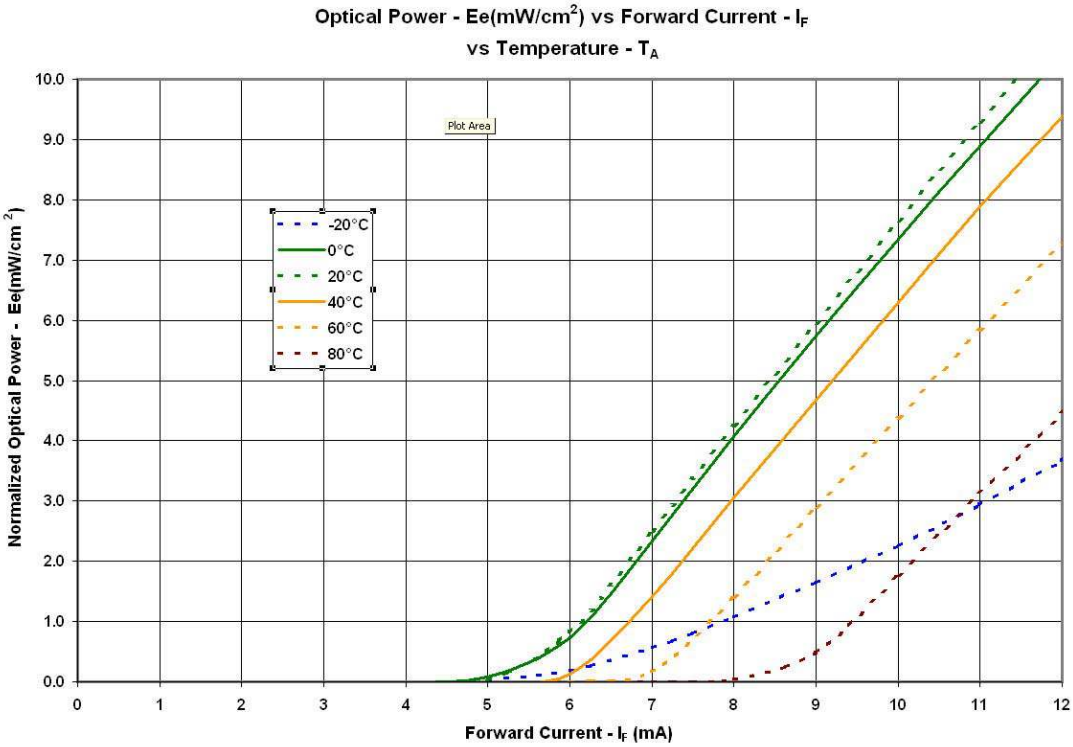
OP280V





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Issue	Change Description	Approval	Date
1.1			07/05
A	Taken from PDF Catalog: OP280 (Issue 1.1, dated 07/05). Added INF226 charts.	Trevor Schelp	05/25/06
A.1	Moved 1st and 2nd charts to page 2. Removed 3rd and 4th charts. Removed polysulfone warning box from page 1. Repositioned items on page 1. Changed Forward Voltage to 50 mA in Electrical Characteristics table on page 2. Removed page 3. Removed comma from line 1 under Description, page 1.	Trevor Schelp	06/01/06
A.2	Added OP180 with Charts.	Chima Ehiem	08/01/07
A.3		Chima Ehiem	08/01/07

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