

QED221, QED222, QED223 Plastic Infrared Light Emitting Diode

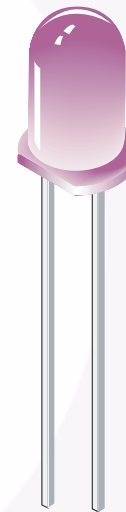
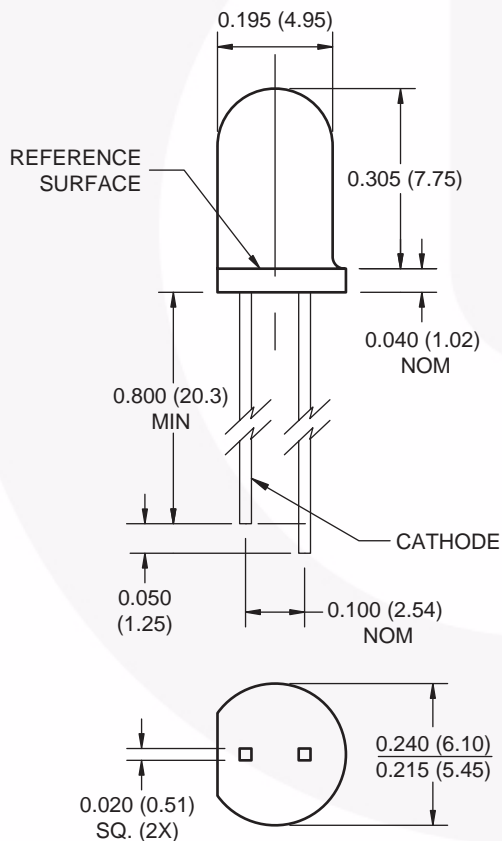
Features

- $\lambda = 880\text{nm}$
- Chip material = AlGaAs
- Package type: T-1 3/4 (5mm lens diameter)
- Matched photosensor: QSD122/QSD123/QSD124
- Medium wide emission angle, 40°
- High output power
- Package material and color: clear, purple tinted, plastic

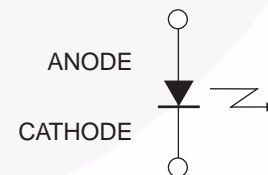
Description

The QED221, QED222 and QED223 are 880nm AlGaAs LEDs encapsulated in a clear purple tinted, plastic T-1 3/4 package.

Package Dimensions



Schematic



Notes:

1. Dimensions of all drawings are in inches (mm).
2. Tolerance is ± 0.010 (0.25) on all non-nominal dimensions unless otherwise specified.

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

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Parameter	Rating	Units
T_{OPR}	Operating Temperature	-40 to +100	$^\circ\text{C}$
T_{STG}	Storage Temperature	-40 to +100	$^\circ\text{C}$
$T_{\text{SOL-I}}$	Soldering Temperature (Iron) ⁽²⁾⁽³⁾⁽⁴⁾	240 for 5 sec	$^\circ\text{C}$
$T_{\text{SOL-F}}$	Soldering Temperature (Flow) ⁽²⁾⁽³⁾	260 for 10 sec	$^\circ\text{C}$
I_F	Continuous Forward Current	100	mA
V_R	Reverse Voltage	5	V
P_D	Power Dissipation ⁽¹⁾	200	mW
$I_{F(\text{Peak})}$	Peak Forward Current ⁽⁵⁾	1.5	A

Notes:

- Derate power dissipation linearly 2.67mW/ $^\circ\text{C}$ above 25 $^\circ\text{C}$.
- RMA flux is recommended.
- Methanol or isopropyl alcohols are recommended as cleaning agents.
- Soldering iron 1/16" (1.6mm) minimum from housing.
- Pulse conditions; $t_p = 100\mu\text{s}$, $T = 10\text{ms}$.

Electrical / Optical Characteristics ($T_A = 25^\circ\text{C}$)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
λ_{PE}	Peak Emission Wavelength	$I_F = 20\text{mA}$		890		nm
TC_λ	Temperature Coefficient			0.2		nm/ $^\circ\text{C}$
$2\theta^{1/2}$	Emission Angle	$I_F = 100\text{mA}$		40		$^\circ$
V_F	Forward Voltage	$I_F = 100\text{mA}$, $t_p = 20\text{ms}$			1.7	V
TC_{V_F}	Temperature Coefficient			-6		mV/ $^\circ\text{C}$
I_R	Reverse Current	$V_R = 5\text{V}$			10	μA
I_E	Radiant Intensity QED221	$I_F = 100\text{mA}$, $t_p = 20\text{ms}$	10		20	mW/sr
I_E	Radiant Intensity QED222	$I_F = 100\text{mA}$, $t_p = 20\text{ms}$	16		32	mW/sr
I_E	Radiant Intensity QED223	$I_F = 100\text{mA}$, $t_p = 20\text{ms}$	25			mW/sr
TC_{I_E}	Temperature Coefficient			-0.3		%/ $^\circ\text{C}$
t_r	Rise Time	$I_F = 100\text{mA}$		900		ns
t_f	Fall Time			800		ns
C_j	Junction Capacitance	$V_R = 0\text{V}$		11		pF

Typical Performance Curves

Figure 1. Normalized Intensity vs. Wavelength

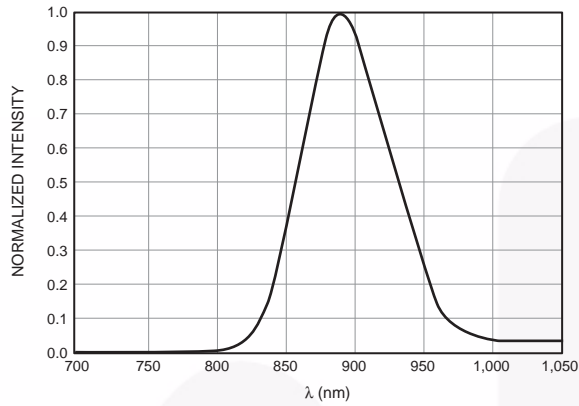


Figure 2. Peak Wavelength vs. Ambient Temperature

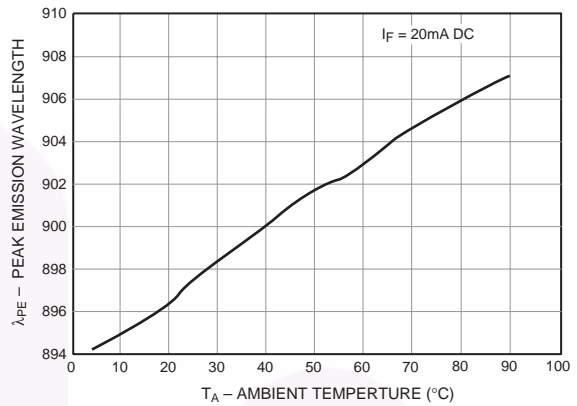


Figure 3. Normalized Radiant Intensity vs. Forward Current

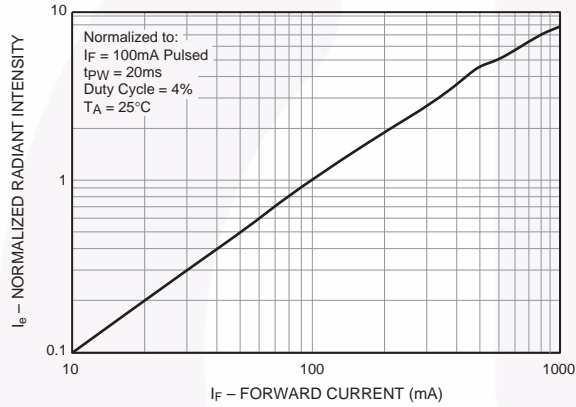


Figure 4. Normalized Radiant Intensity vs. Ambient Temperature

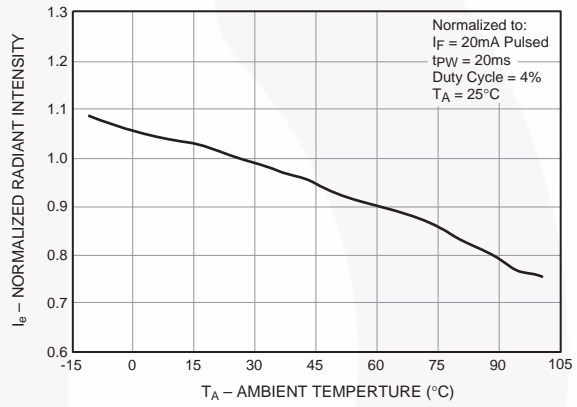


Figure 5. Forward Voltage vs. Forward Current

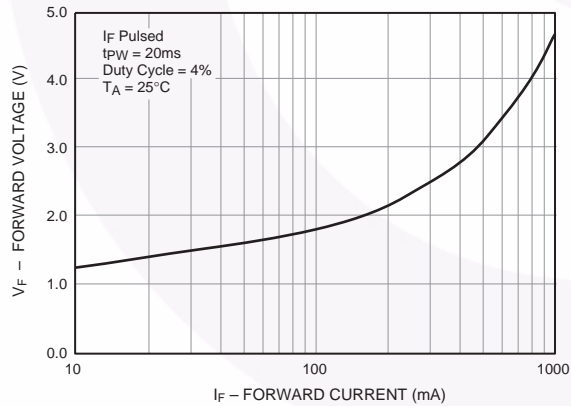
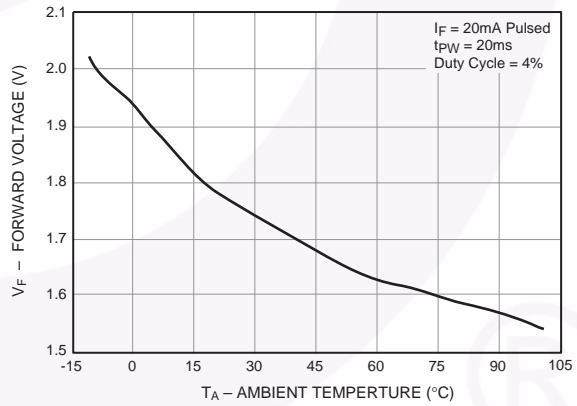


Figure 6. Forward Voltage vs. Ambient Temperature



Typical Performance Curves (Continued)

Figure 7. Radiation Diagram

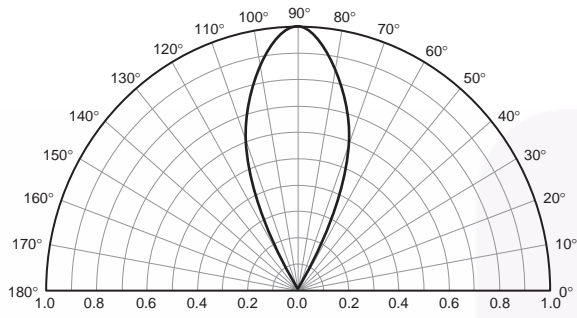
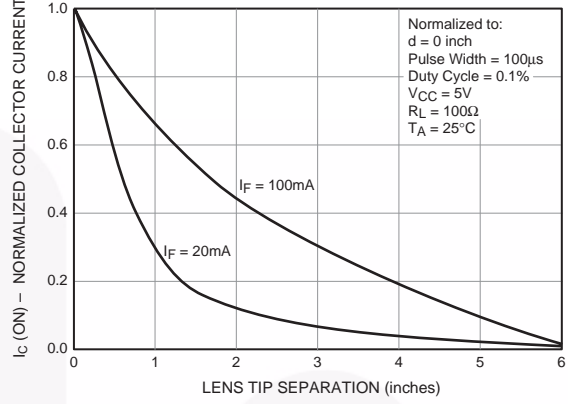








Figure 8. Coupling Characteristics of QED22X and QSD22X





TRADEMARKS

The following includes registered and unregistered trademarks and service marks, owned by Fairchild Semiconductor and/or its global subsidiaries, and is not intended to be an exhaustive list of all such trademarks.

- | | | | |
|---|---|---|---|
| Build it Now™ | F-PFS™ | PowerTrench® | The Power Franchise® |
| CorePLUS™ | FRFET® | Programmable Active Droop™ | the power franchise |
| CorePOWER™ | Global Power Resource SM | QFET® | TinyBoost™ |
| CROSSVOLT™ | Green FPS™ | QS™ | TinyBuck™ |
| CTL™ | Green FPS™ e-Series™ | Quiet Series™ | TinyLogic® |
| Current Transfer Logic™ | GTO™ | RapidConfigure™ | TINYOPTO™ |
| EcoSPARK® | IntelliMAX™ |  ™ | TinyPower™ |
| EfficientMax™ | ISOPLANAR™ | Saving our world, 1mW/W/kW at a time™ | TinyPWM™ |
| EZSWITCH™ * | MegaBuck™ | SmartMax™ | TinyWire™ |
|  ™ | MICROCOUPLER™ | SMART START™ | µSerDes™ |
|  ™ | MicroFET™ | SPM® |  ™ |
| Fairchild® | MicroPak™ | STEALTH™ | UHC® |
| Fairchild Semiconductor® | MillerDrive™ | SuperFET™ | Ultra FRFET™ |
| FACT Quiet Series™ | MotionMax™ | SuperSOT™-3 | UniFET™ |
| FACT® | Motion-SPM™ | SuperSOT™-6 | VCX™ |
| FAST® | OPTOLOGIC® | SuperSOT™-8 | VisualMax™ |
| FastvCore™ | OPTOPLANAR® | SupreMOS™ | |
| FlashWriter® * |  ™ | SyncFET™ | |
| FPS™ | PDP 3-PM™ |  ™ | |
| | Power-SPM™ | | |

* EZSWITCH™ and FlashWriter® are trademarks of System General Corporation, used under license by Fairchild Semiconductor.

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION, OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS. THESE SPECIFICATIONS DO NOT EXPAND THE TERMS OF FAIRCHILD'S WORLDWIDE TERMS AND CONDITIONS, SPECIFICALLY THE WARRANTY THEREIN, WHICH COVERS THESE PRODUCTS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF FAIRCHILD SEMICONDUCTOR CORPORATION.

As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support, device, or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

ANTI-COUNTERFEITING POLICY

Fairchild Semiconductor Corporation's Anti-Counterfeiting Policy. Fairchild's Anti-Counterfeiting Policy is also stated on our external website, www.fairchildsemi.com, under Sales Support.

Counterfeiting of semiconductor parts is a growing problem in the industry. All manufacturers of semiconductor products are experiencing counterfeiting of their parts. Customers who inadvertently purchase counterfeit parts experience many problems such as loss of brand reputation, substandard performance, failed applications, and increased cost of production and manufacturing delays. Fairchild is taking strong measures to protect ourselves and our customers from the proliferation of counterfeit parts. Fairchild strongly encourages customers to purchase Fairchild parts either directly from Fairchild or from Authorized Fairchild Distributors who are listed by country on our web page cited above. Products customers buy either from Fairchild directly or from Authorized Fairchild Distributors are genuine parts, have full traceability, meet Fairchild's quality standards for handling and storage and provide access to Fairchild's full range of up-to-date technical and product information. Fairchild and our Authorized Distributors will stand behind all warranties and will appropriately address any warranty issues that may arise. Fairchild will not provide any warranty coverage or other assistance for parts bought from Unauthorized Sources. Fairchild is committed to combat this global problem and encourage our customers to do their part in stopping this practice by buying direct or from authorized distributors.

PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative / In Design	Datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
No Identification Needed	Full Production	Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.
Obsolete	Not In Production	Datasheet contains specifications on a product that is discontinued by Fairchild Semiconductor. The datasheet is for reference information only.

Rev. I36