

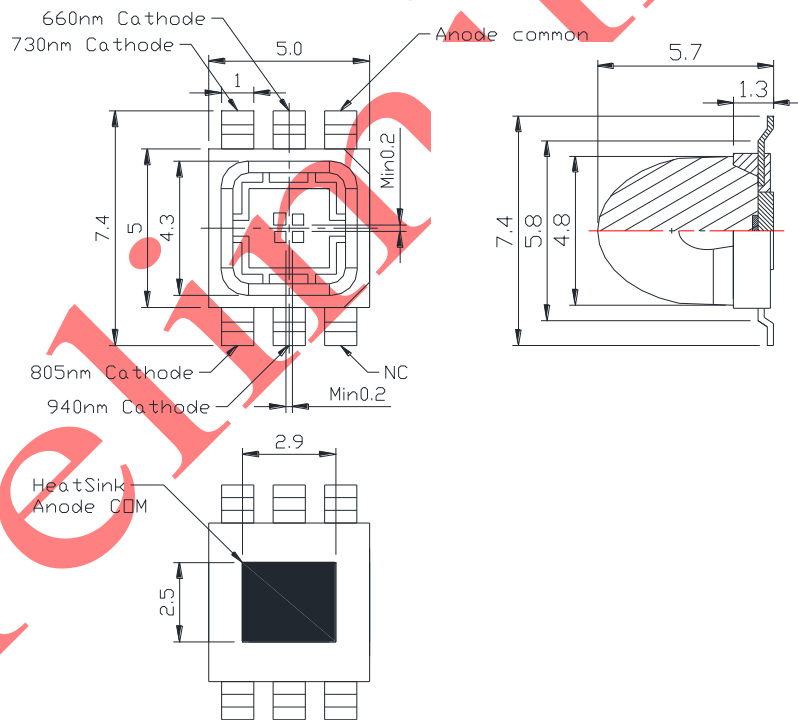
Data Sheet

SMB660D/730/805D/940-4040-02

Multi wavelength LED

USHIO

Outline and Internal Circuit



(Unit : mm)

Features

- Chip Material : AlGaInP(660nm) , AlGaAs(730nm,805nm,940nm)
- Chip Dimension : 400um * 400um
- Number of Chips : 4pcs
- Peak Wavelength : 660/730/805/940nm typ.
- Lead Frame Die : Silver Plated on Copper
- Package Resin : PA9T Resin
- Lens : Epoxy Resin

Application

660nm

Absolute Maximum Ratings (Tc=25°C)

Item	Symbol	Ratings	Unit
Power Dissipation	PD	120	mW
Forward Current	IF	50	mA
Pulse Forward Current	IFP	200	mA
Reverse Voltage	VR	5	V
Thermal Resistance	Rthja	10	K/W
Junction Temperature	Tj	120	°C
Operating Temperature	Topr	-40 ~ +100	°C
Storage Temperature	Tstg	-40 ~ +100	°C
Soldering Temperature	TSOL	250	°C

‡Pulse Forward Current condition: Duty 1% and Pulse Width=10us.

‡Soldering condition: Soldering condition must be completed with 5 seconds at 250°C.

Optical and Electrical Characteristics (Tc=25°C)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Forward Voltage	VF		2.0	2.3	V	IF=20mA
	VFP		3.2			IFP=200mA
Total Radiated Power	PO		12		mW	IF=20mA
			110			IFP=200mA
Peak Wavelength	λ_p	650		670	nm	IF=20mA
Half Width	$\Delta\lambda$		16		nm	IF=20mA
Rise Time	tr		35		ns	IF=20mA
Fall Time	tf		30		ns	IF=20mA

‡ Radiated Power is measured by S3584-08.

730nm

Absolute Maximum Ratings (Tc=25°C)

Item	Symbol	Ratings	Unit
Power Dissipation	PD	150	mW
Forward Current	IF	75	mA
Pulse Forward Current	IFP	500	mA
Reverse Voltage	VR	5	V
Thermal Resistance	Rthja	10	K/W
Junction Temperature	Tj	120	°C
Operating Temperature	Topr	-40 ~ +100	°C
Storage Temperature	Tstg	-40 ~ +100	°C
Soldering Temperature	TSOL	250	°C

‡Pulse Forward Current condition: Duty 1% and Pulse Width=10us.

‡Soldering condition: Soldering condition must be completed with 5 seconds at 250°C.

Optical and Electrical Characteristics (Tc=25°C)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Forward Voltage	VF		1.7	2.0	V	IF=20mA
	VFP		4.0			IFP=500mA
Total Radiated Power	PO		8.7		mW	IF=20mA
			190			IFP=500mA
Peak Wavelength	λ_p	720		740	nm	IF=20mA
Half Width	$\Delta\lambda$		24		nm	IF=20mA
Rise Time	tr		35		ns	IF=20mA
Fall Time	tf		60		ns	IF=20mA

‡ Radiated Power is measured by S3584-08.

805nm

Absolute Maximum Ratings (Tc=25°C)

Item	Symbol	Ratings	Unit
Power Dissipation	PD	200	mW
Forward Current	IF	100	mA
Pulse Forward Current	IFP	500	mA
Reverse Voltage	VR	5	V
Thermal Resistance	Rthja	10	K/W
Junction Temperature	Tj	120	°C
Operating Temperature	Topr	-40 ~ +100	°C
Storage Temperature	Tstg	-40 ~ +100	°C
Soldering Temperature	TSOL	250	°C

‡Pulse Forward Current condition: Duty 1% and Pulse Width=10us.

‡Soldering condition: Soldering condition must be completed with 5 seconds at 250°C.

Optical and Electrical Characteristics (Tc=25°C)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Forward Voltage	VF		1.7	1.9	V	IF=20mA
	VFP		3.5			IFP=500mA
Total Radiated Power	PO		11		mW	IF=20mA
			180			IFP=500mA
Peak Wavelength	λ_p	795		815	nm	IF=20mA
Half Width	$\Delta\lambda$		22		nm	IF=20mA
Rise Time	tr		35		ns	IF=20mA
Fall Time	tf		30		ns	IF=20mA

‡ Radiated Power is measured by S3584-08.

940nm

Absolute Maximum Ratings (Tc=25°C)

Item	Symbol	Ratings	Unit
Power Dissipation	PD	140	mW
Forward Current	IF	100	mA
Pulse Forward Current	IFP	1000	mA
Reverse Voltage	VR	5	V
Thermal Resistance	Rthja	10	K/W
Junction Temperature	Tj	120	°C
Operating Temperature	Topr	-40 ~ +100	°C
Storage Temperature	Tstg	-40 ~ +100	°C
Soldering Temperature	TSOL	250	°C

‡Pulse Forward Current condition: Duty 1% and Pulse Width=10us.

‡Soldering condition: Soldering condition must be completed with 5 seconds at 250°C.

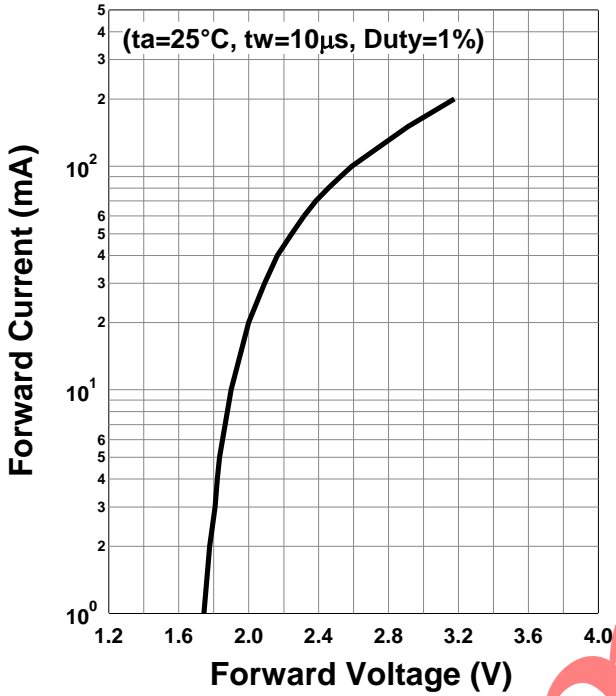
Optical and Electrical Characteristics (Tc=25°C)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Forward Voltage	VF		1.2	1.4	V	IF=20mA
	VFP		2.2			IFP=1A
Total Radiated Power	PO		4.8		mW	IF=20mA
			210			IFP=1A
Peak Wavelength	λ_p	930		950	nm	IF=20mA
Half Width	$\Delta\lambda$		50		nm	IF=20mA
Rise Time	tr		200		ns	IF=20mA
Fall Time	tf		800		ns	IF=20mA

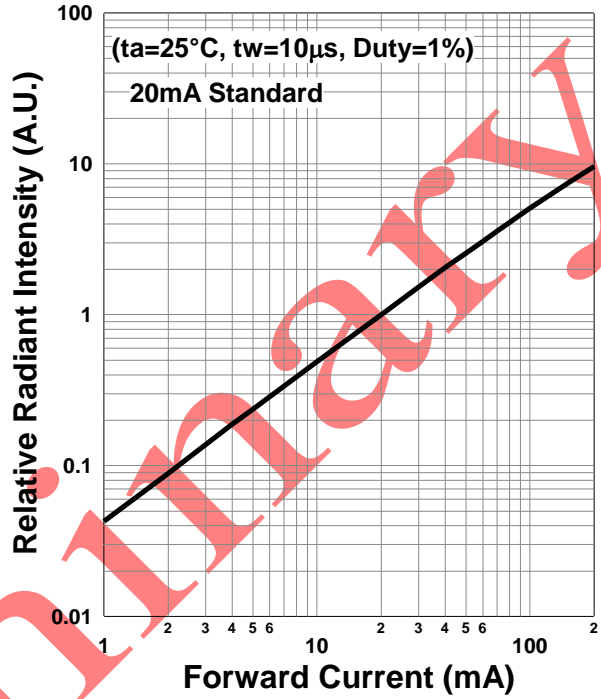
‡ Radiated Power is measured by S3584-08.

Typical Characteristic Curves 660nm

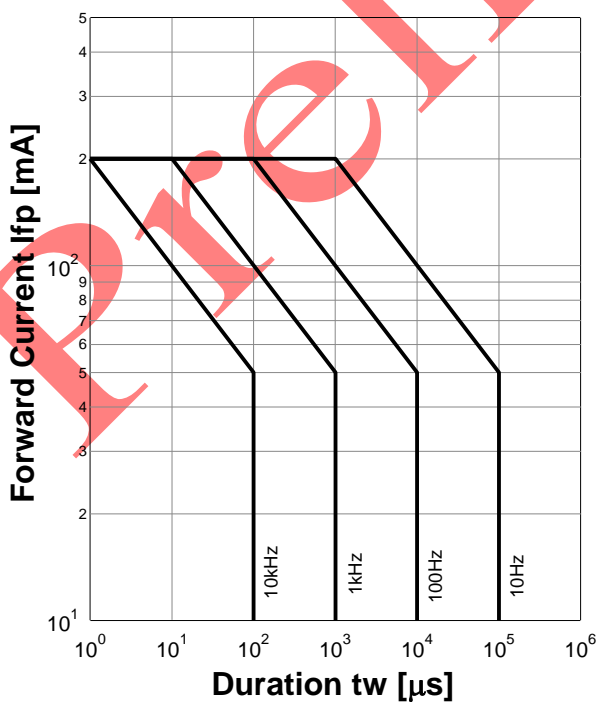
Forward Current - Forward Voltage



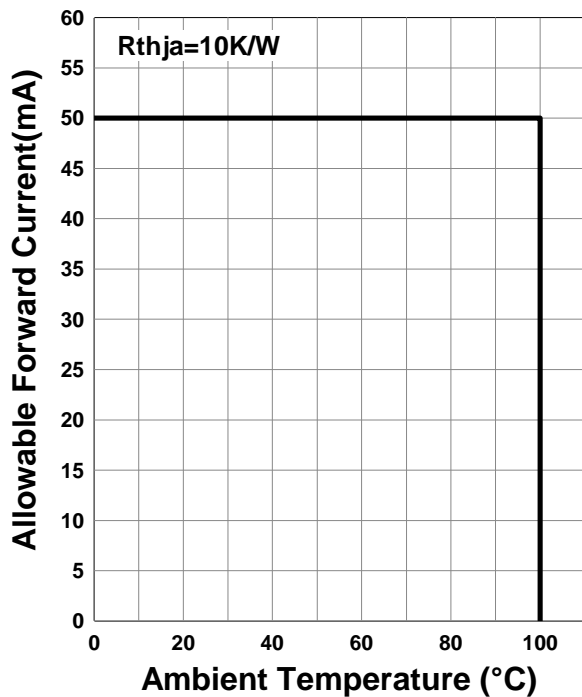
Relative Radiant Intensity - Forward Current



Forward Current - Pulse Duration

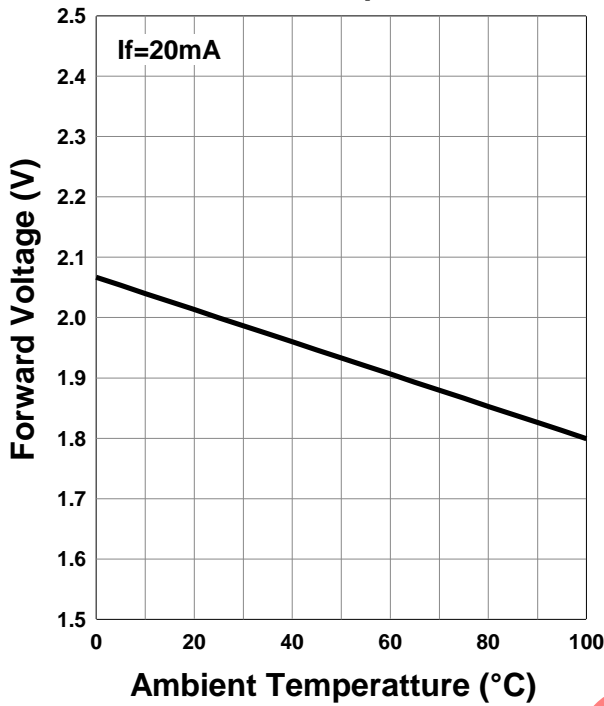


Allowable Forward Current - Ambient Temperature

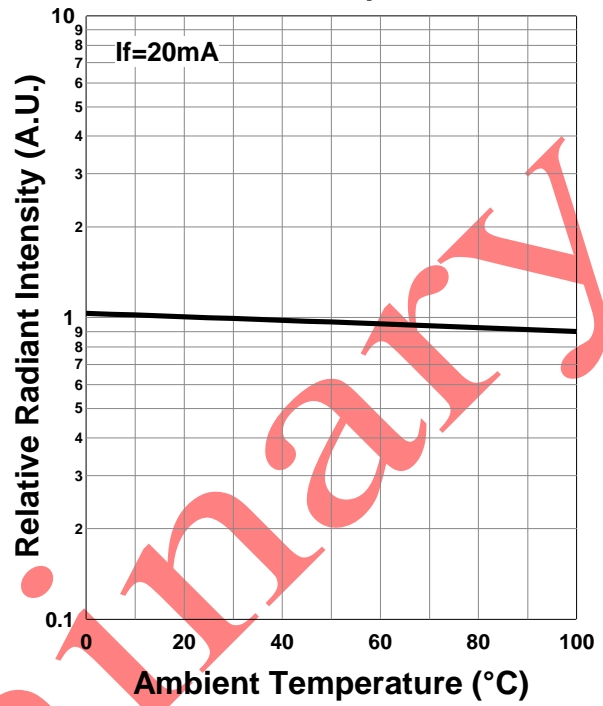


660nm

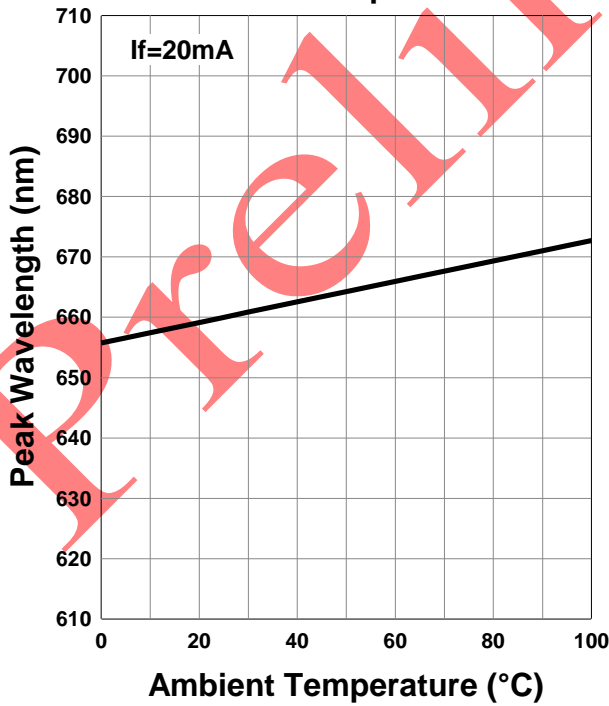
Forward Voltage - Ambient Temperature



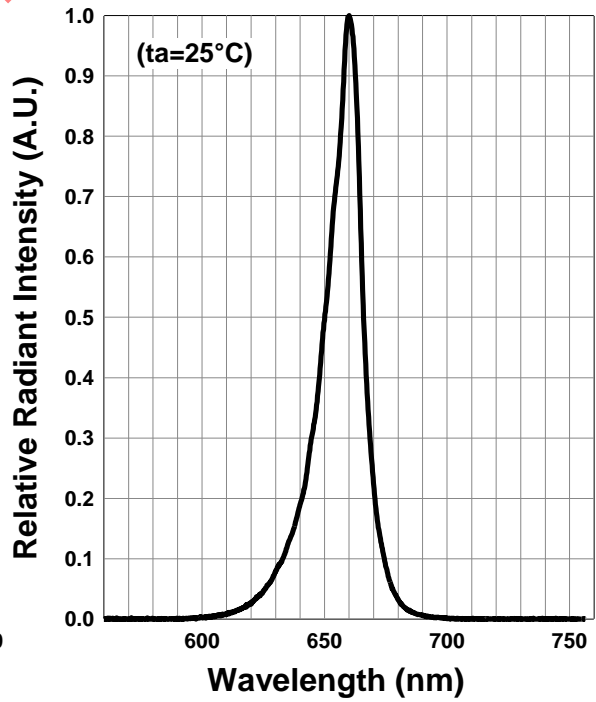
Relative Radiant Intensity - Ambient Temperature



Peak Wavelength - Ambient Temperature

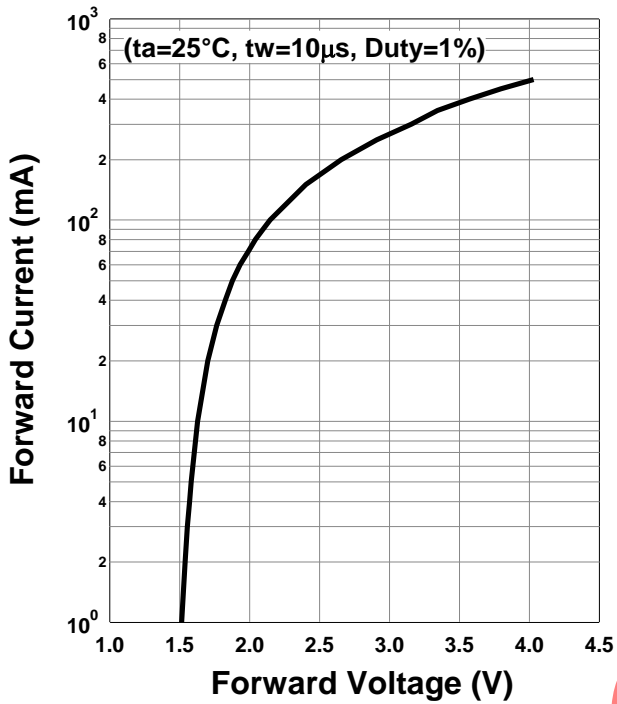


Relative Spectral Emission

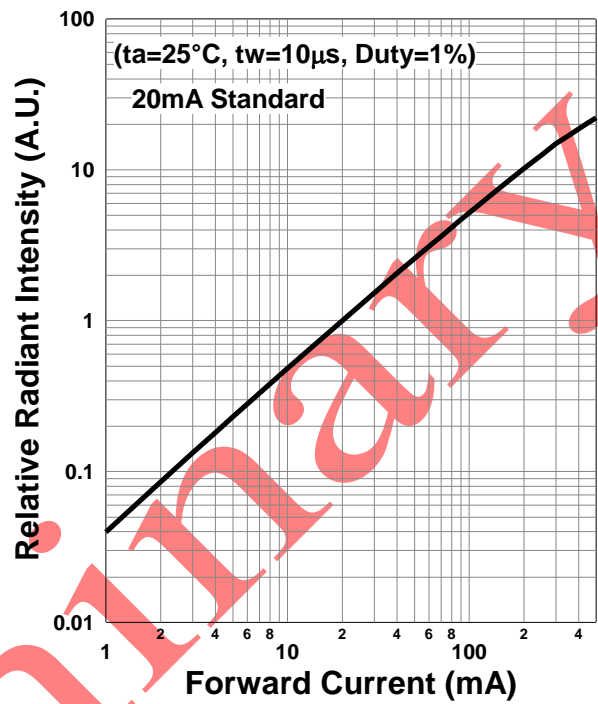


Typical Characteristic Curves 730nm

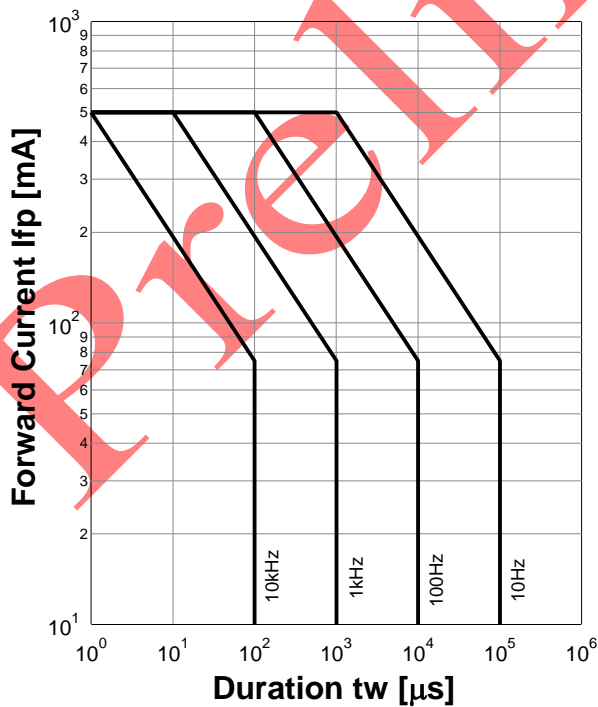
Forward Current - Forward Voltage



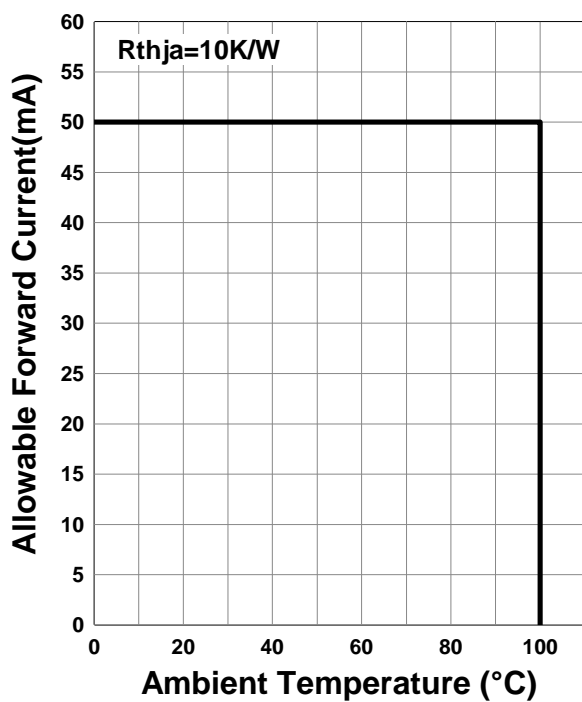
Relative Radiant Intensity - Forward Current



Forward Current - Pulse Duration

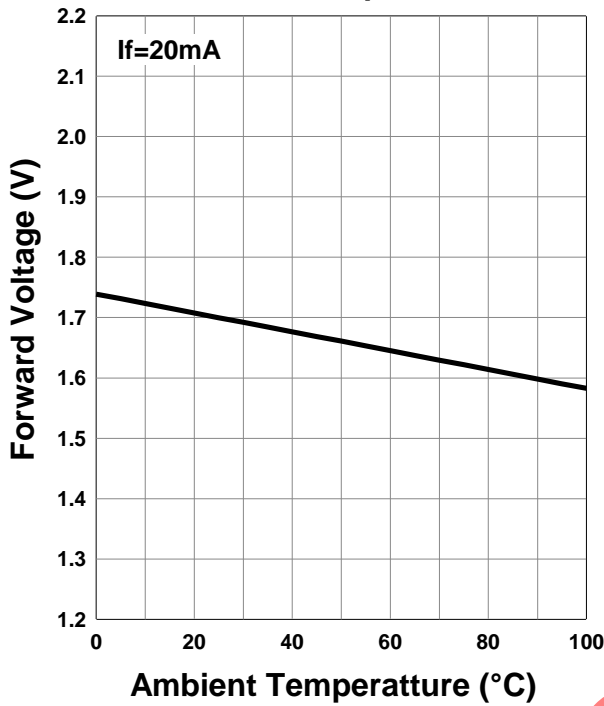


Allowable Forward Current - Ambient Temperature

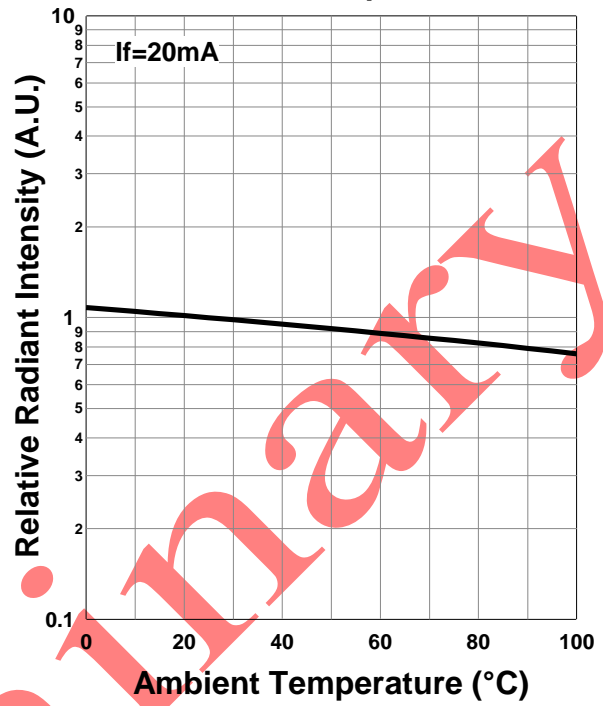


730nm

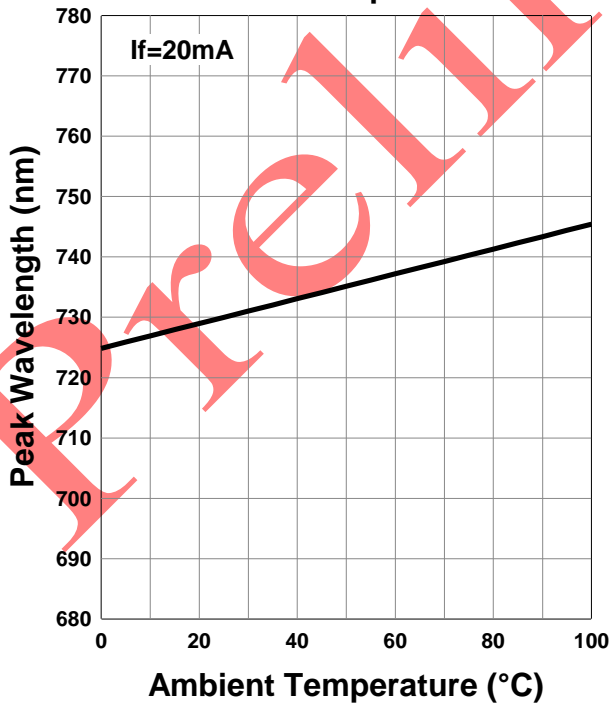
Forward Voltage - Ambient Temperature



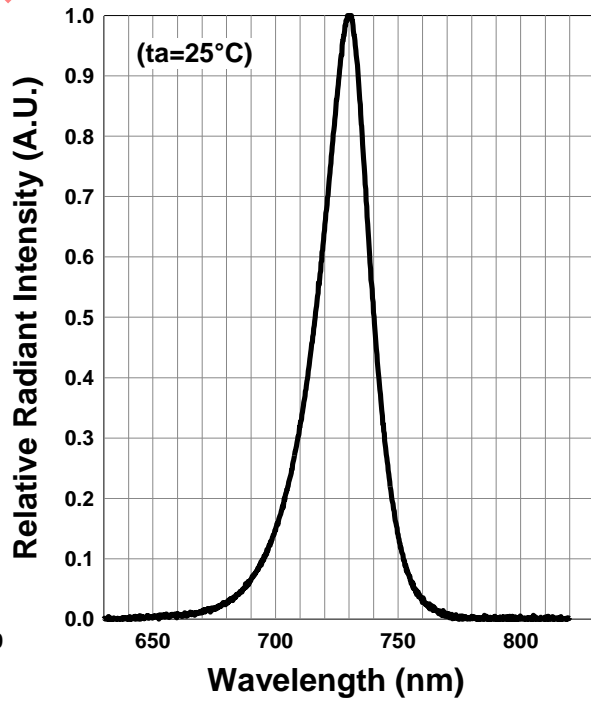
Relative Radiant Intensity - Ambient Temperature



Peak Wavelength - Ambient Temperature

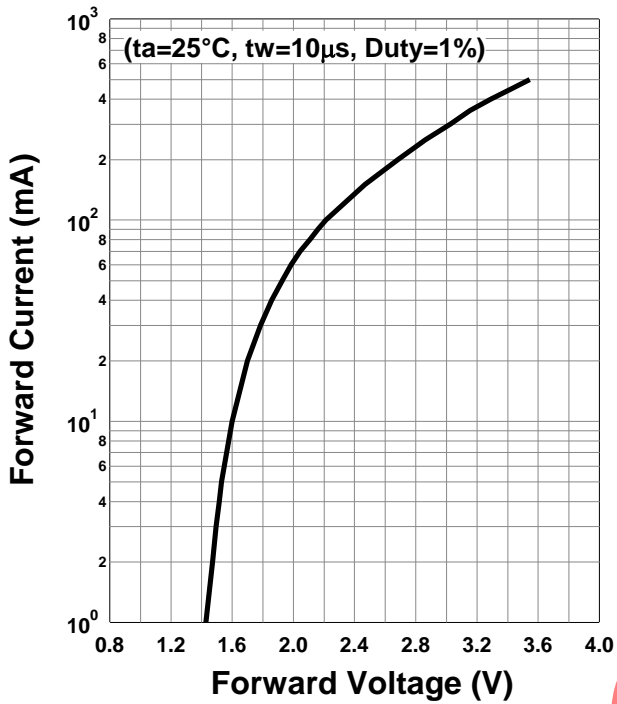


Relative Spectral Emission

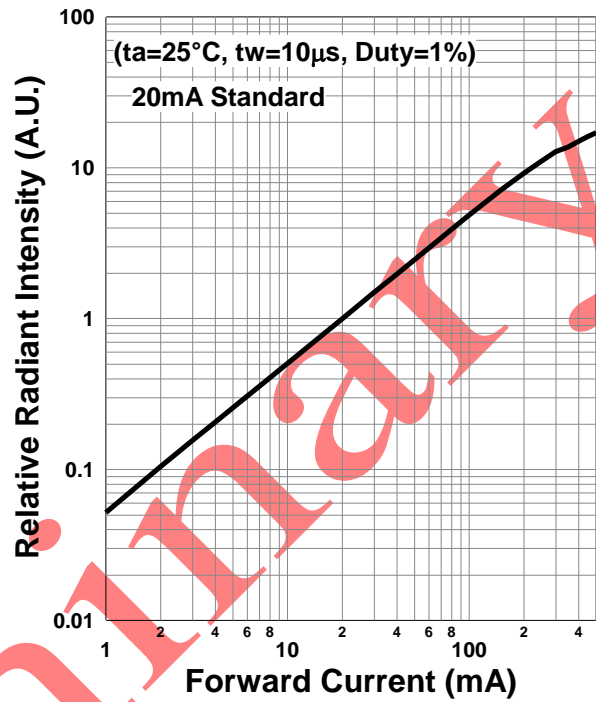


Typical Characteristic Curves 805nm

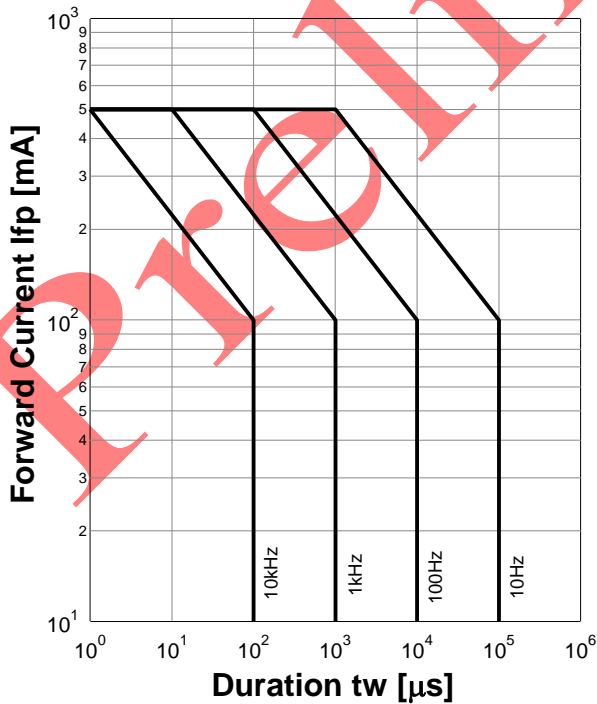
Forward Current - Forward Voltage



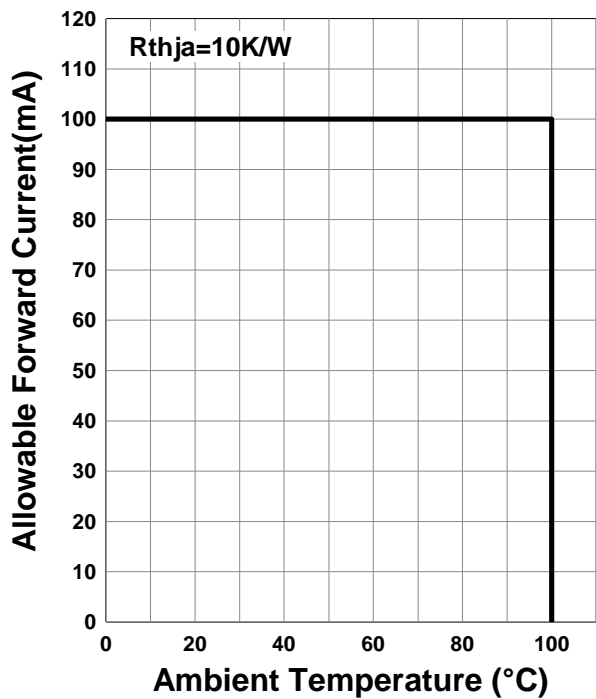
Relative Radiant Intensity - Forward Current



Forward Current - Pulse Duration

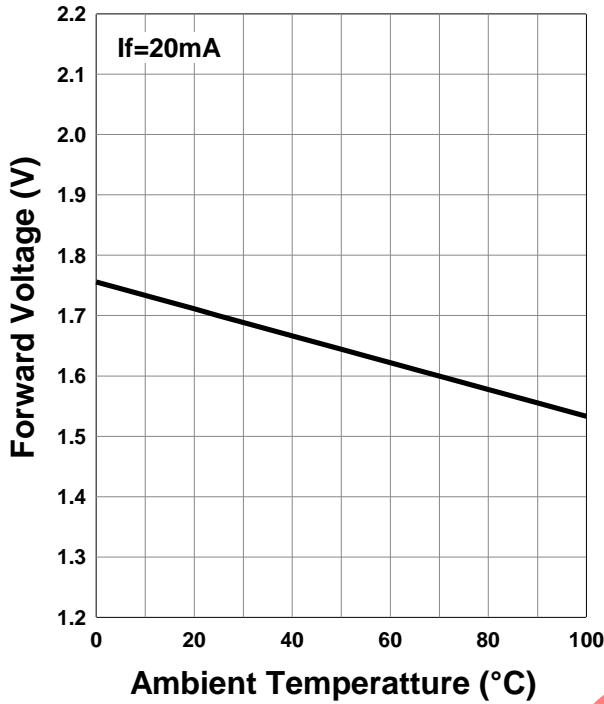


Allowable Forward Current - Ambient Temperature

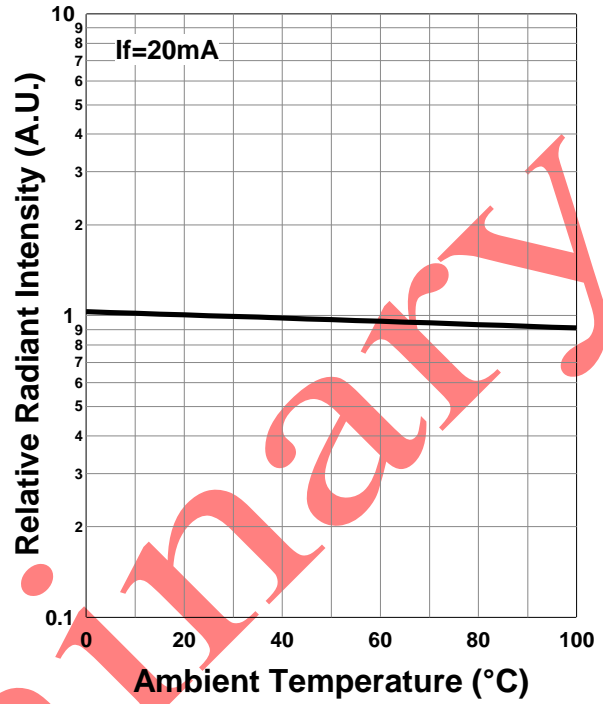


805nm

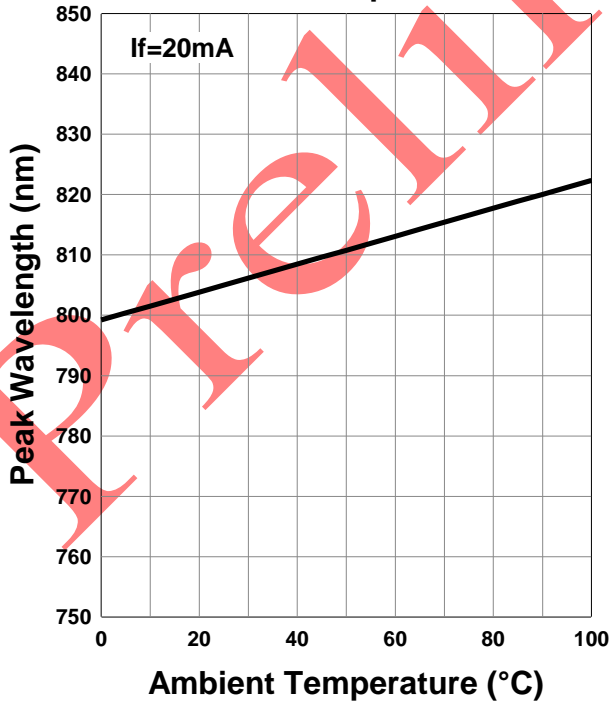
Forward Voltage - Ambient Temperature



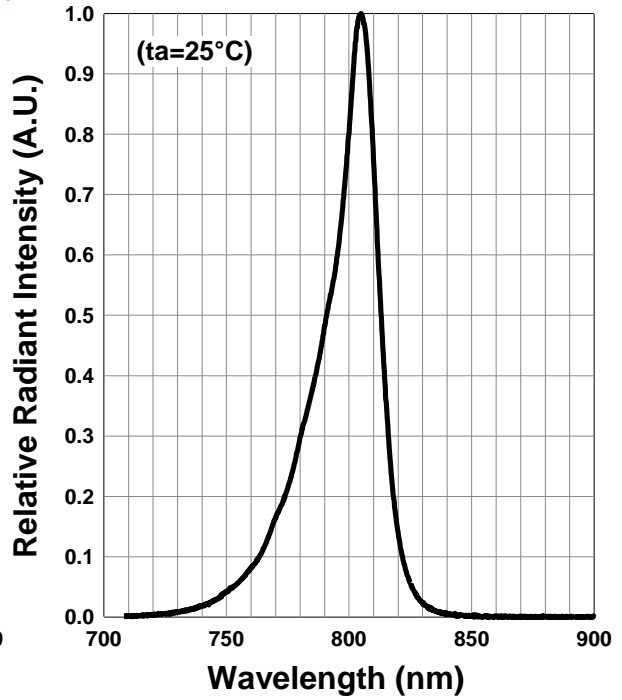
Relative Radiant Intensity - Ambient Temperature



Peak Wavelength - Ambient Temperature

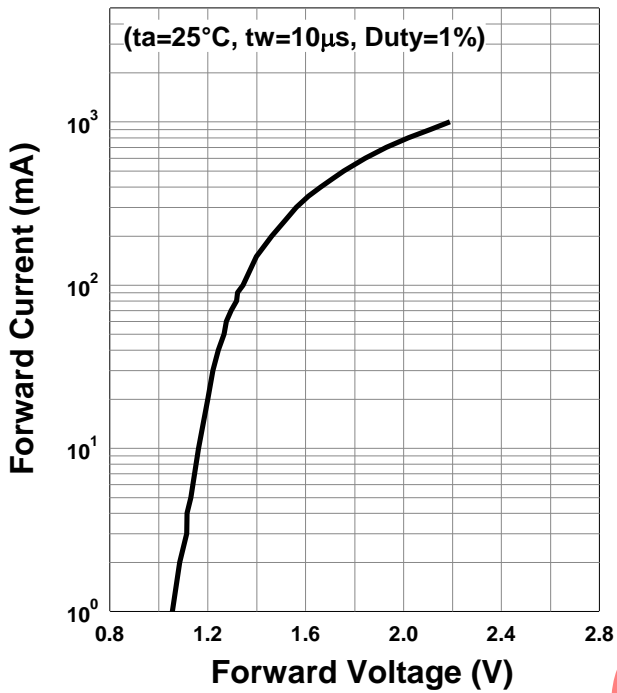


Relative Spectral Emission

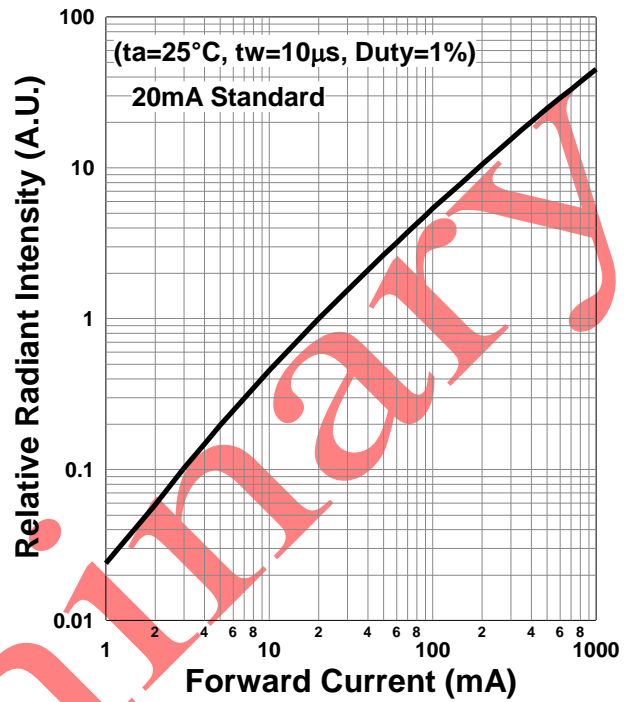


Typical Characteristic Curves 940nm

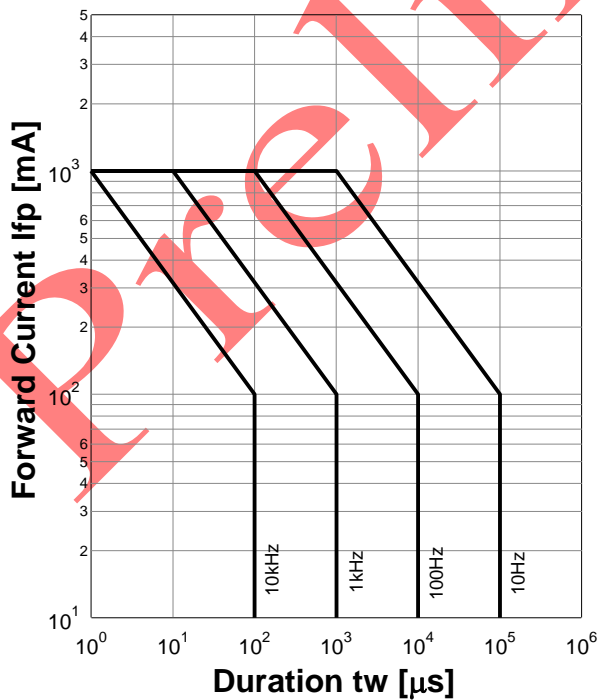
Forward Current - Forward Voltage



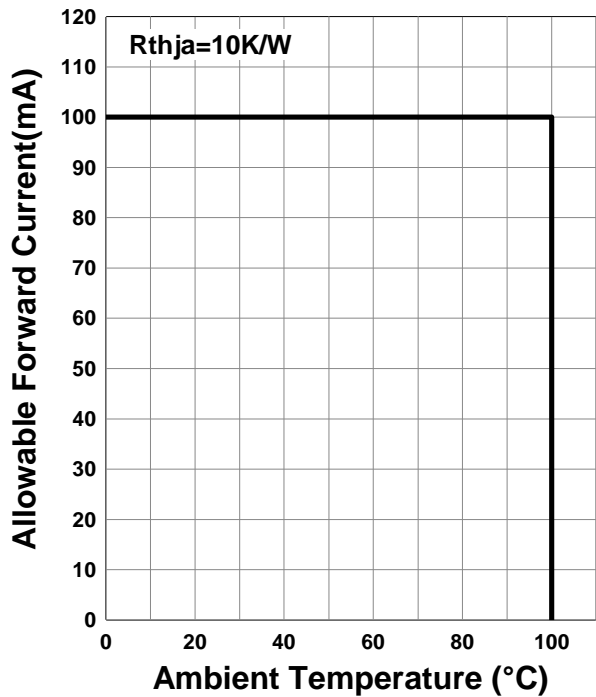
Relative Radiant Intensity - Forward Current



Forward Current - Pulse Duration

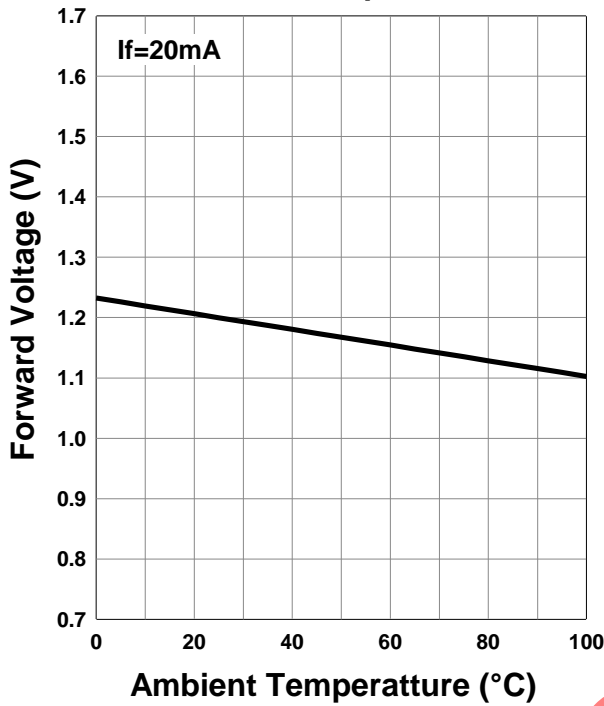


Allowable Forward Current - Ambient Temperature

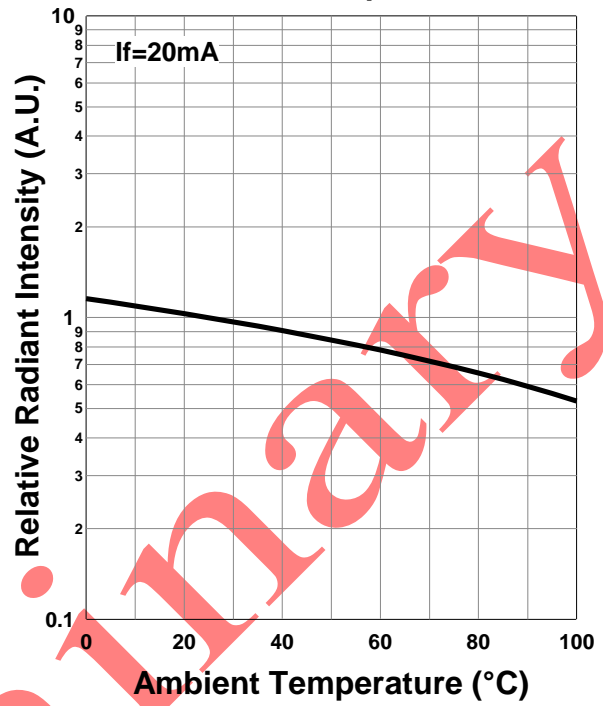


940nm

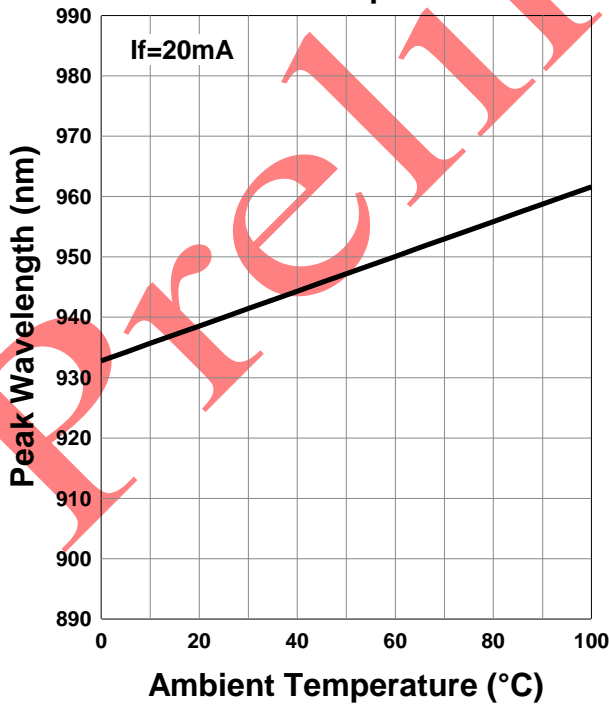
Forward Voltage - Ambient Temperature



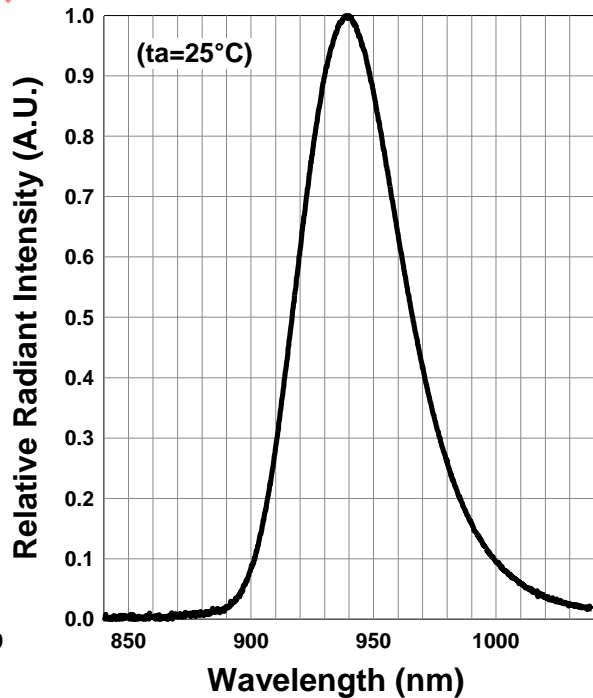
Relative Radiant Intensity - Ambient Temperature

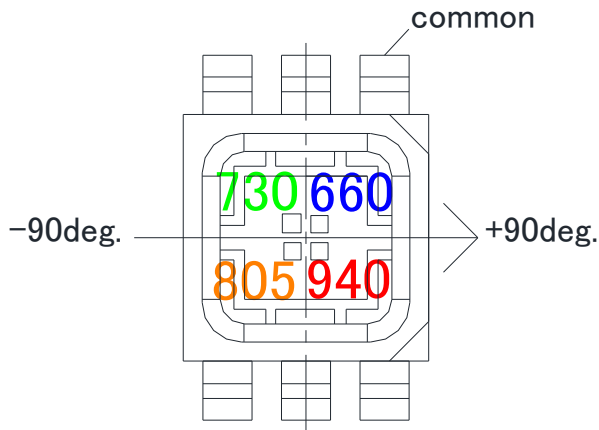


Peak Wavelength - Ambient Temperature

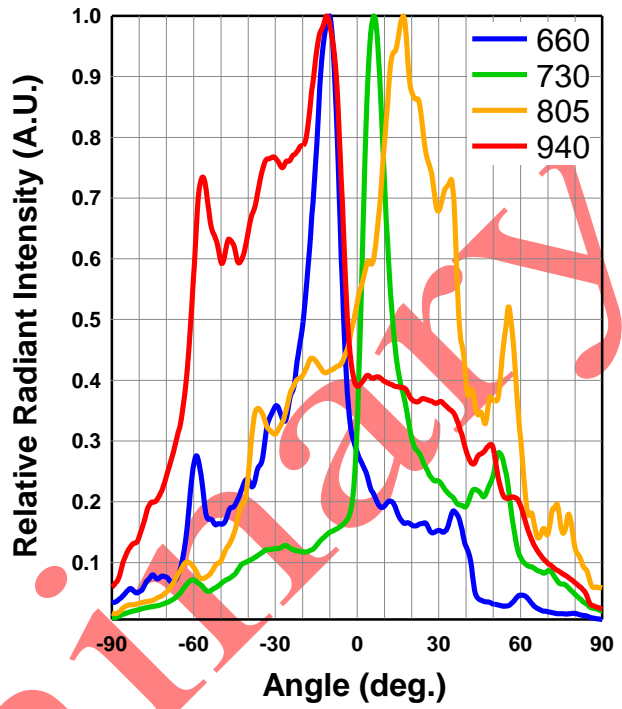


Relative Spectral Emission

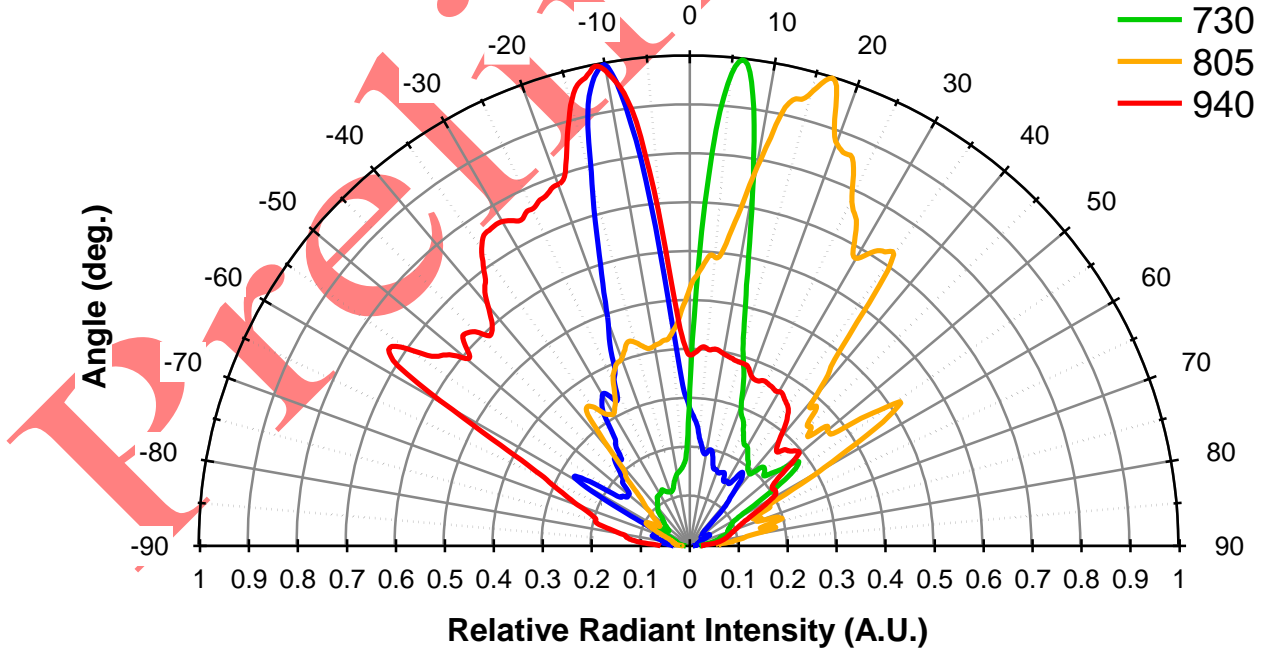




Radiation Characteristics



Radiation Characteristics



Sampling Test (PRELIMINARY)

- Sampling Test Item
 - ◆ Forward Voltage (Vf) @If=20mA
 - ◆ Peak Wavelength (WLP) @If=20mA
 - ◆ Spectral Band Width (FWHM) @If=20mA
 - ◆ Total Radiated Power (Po) @If=20mA
 - ◆ Radiation Characteristics @If=20mA

- Sampling Size Determination

Sampling size is determined as below.

Lot-size	Sampling Size		
	Vf, WLP, FWHM, Po	Vf, WLP, FWHM, Po and Radiation Characteristics*	Total
1pcs ~ 3,000pcs	2pcs	1pcs	3pcs
3,001pcs ~ 4,000pcs	3pcs	1pcs	4pcs
4,001pcs ~ 5,000pcs	3pcs	2pcs	5pcs
5,001pcs ~ 6,000pcs	4pcs	2pcs	6pcs
6,001pcs ~ 7,000pcs	5pcs	2pcs	7pcs
7,001pcs ~ 8,000pcs	6pcs	2pcs	8pcs
8,001pcs ~ 9,000pcs	6pcs	3pcs	9pcs
9,001pcs ~ 10,000pcs	7pcs	3pcs	10pcs

*Radiation Characteristics are measured with a PCB board.

Wrapping

Moisture barrier bag aluminum laminated film with a desiccant to keep out the moisture absorption during the transportation and storage.

SMD LED storage and handling precautions

Storage Conditions before Opening a Moisture-Barrier Aluminum Bag

- Before opening a moisture-barrier aluminum bag, please store it at <30°C, <60%RH.
- Please note that the maximum shelf life is 12 months under these conditions.

Storage Conditions after Opening a Moisture-Barrier Aluminum Bag

- After opening a moisture-barrier aluminum bag, store the aluminum bag and silica gel in a desiccator.
- After opening the bag, please solder the LEDs within 72 hours in a room with 5 - 30°C, <50%RH.
- Please put any unused, remaining LEDs and silica gel back in the same aluminum bag and then vacuum-seal the bag.
- It is recommended to keep the re-sealed bag in a desiccator at <30%RH.
- The 72-hour- long floor life does not include the time while LEDs are stored in the moisture-barrier aluminum bag. However, we strongly recommend to solder the LEDs as soon as possible after opening the aluminum bag

Notes about Re-sealing a Moisture-Barrier Aluminum Bag

- When vacuum-sealing an opened aluminum bag, if you find the moisture-indicator of the silica gel has changed to pink from blue (indicating a relative humidity of 30 % or more), please do not use the unused LEDs, the aluminum bag, or the silica gel.

Notes about Opening a Re-sealed Moisture-Barrier Aluminum Bag

- When opening a vacuumed and re-sealed aluminum bag in order to use the remaining LEDs stored in the bag, if you find that the moisture-indicator of the silica has changed to pink, please do not use the LEDs.

Disclaimer

Product specifications and data shown in this product catalog are subject to change without notice for the purposes of improving product performance, reliability, design, or otherwise.

Product data and parameters in this catalog are typical values based on reasonably up-to-date measurements.

Product data and parameters may vary by user application and over time.

Products shown in this catalog are intended to be used for general electronic equipment. Products are not guaranteed for applications where product malfunction or failure may cause personal injury or death, including but not limited to life-supporting / saving devices, medical devices, safety devices, airplanes, aerospace equipment, automobiles, traffic control systems, and nuclear reactor control systems.

*Effective July 2016, Ushio Epitex Inc. is now Ushio Opto Semiconductors, Inc.