Single Color Series Datasheet

Features :

- Various colors for choice
- Low voltage operation
- Instant light
- Long operating life
- Reflow process compatible

Absolute Maximum Ratings

Parameter		Symbol	Value	Units
DC Forward Current	(1W) (3W)	I_F	350 700	mA
Peak Pulsed Current; (tp≤100μs, Duty cycle=0.25)	(1W) (3W)	I_{pulse}	500 1000	mA
Reverse Voltage		V_R	5	V
Drive Voltage		V_D	5	V
LED Junction Temperature		T_J	125	°C
Operating Temperature		-	-30 ~ +110	°C
Storage Temperature		-	-40 ~ +120	°C
ESD Sensitivity (HBM)		-	2,000	V
Soldering Temperature		-	260	°C
Manual Soldering Time at 260˚C(Max.)		-	5	Sec.

Notes:
1. Proper current derating must be observed to maintain junction temperature below the maximum at all time.
2. LEDs are not designed to be driven in reverse bias.
3. Allowable reflow cycles are 3 times for each LED.
4. T_p: Pulse width time

Characteristics

Parameter		Symbol	Value	Units
Viewing Angle	(R/A) (T/J/B/C/D)	$2\Theta^{1/2}$	135 150	Degree
Thermal resistance		-	10	°C/W
$\Delta V_F/\Delta T$		$\Delta V_F/\Delta T$	-2	mV/˚C
Wavelength		λd	R: 620-630 A: 585-595 T: 515-535 J: 490-510 B: 455-475	nm
Wavelength		λp	D: 450-470	nm
JEDEC Moisture Sensitivity		-	Level 2a **Floor Life** Conditions: ≤30˚C / 60% RH **Soak Requirements(Standard)** Time (hours): 120+1/-0 Conditions: 60˚C / 60% RH	-

Notes:
1. Wavelengths are stated as peak wavelength.
2. TDS maintains a tolerance of ±1nm for peak wavelength.

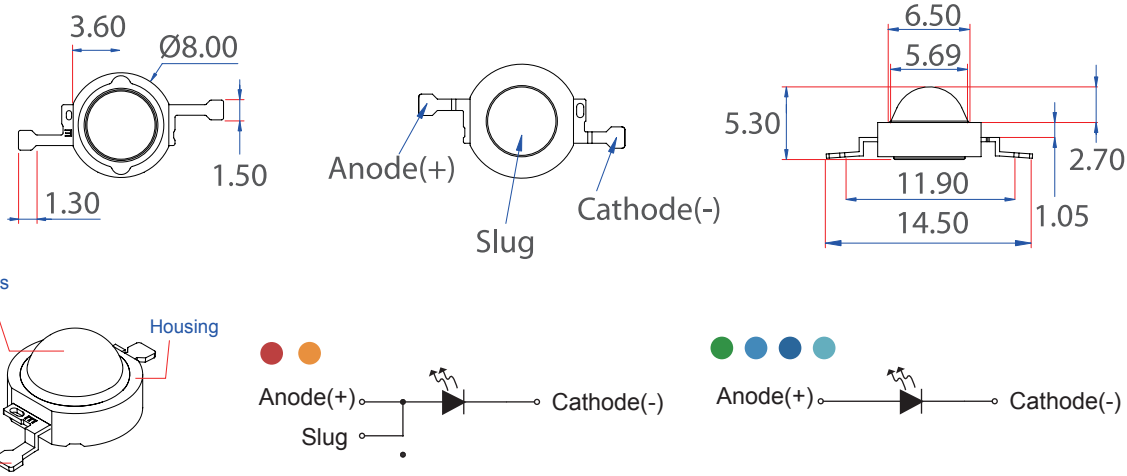
Luminous Flux Characteristic (T_j=25˚C)

Color	Wattage (W)		Min. Luminous Flux(lm)	Max. Luminous Flux(lm)	Forward Current (mA)	
Red	1		39.4	51.2	350	
			51.2	66.5		
	3		86.5	110	700	
			110	160		
True Green	1		66.5	86.5	350	
			86.5	110		
	3		110	160	700	
			160	180		
			180	200		
Blue	1		17.9	23.3	350	
			23.3	30.3		
			30.3	39.4		
	3		39.4	51.2	700	
			51.2	66.5		
Amber	1		39.4	51.2	350	
			51.2	66.5		
			66.5	86.5		
	3		110	160	700	
Cyan	1		51.2	66.5	350	
			66.5	86.5		
Dental Blue	3		600	700	700	
			700	800		
			800	900		

Note:
Flux is measured with an accuracy of ± 10%.

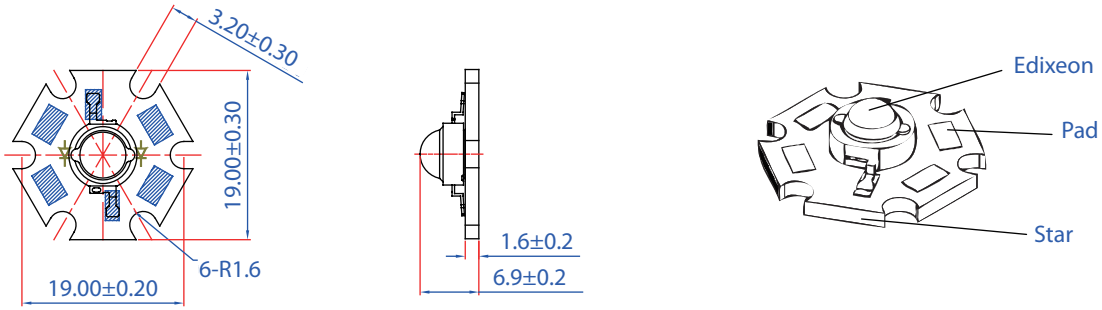
Mechanical Dimensions

Emitter Type Dimension



Notes:
1. All dimensions are in mm.
2. Lambertian and side emitting series slug has polarity as anode.
3. It is important that the slug can't contact aluminum surface. It is strongly recommended that there should coat a uniform electrically isolated heat dissipation film on the aluminum surface.

Star Dimensions

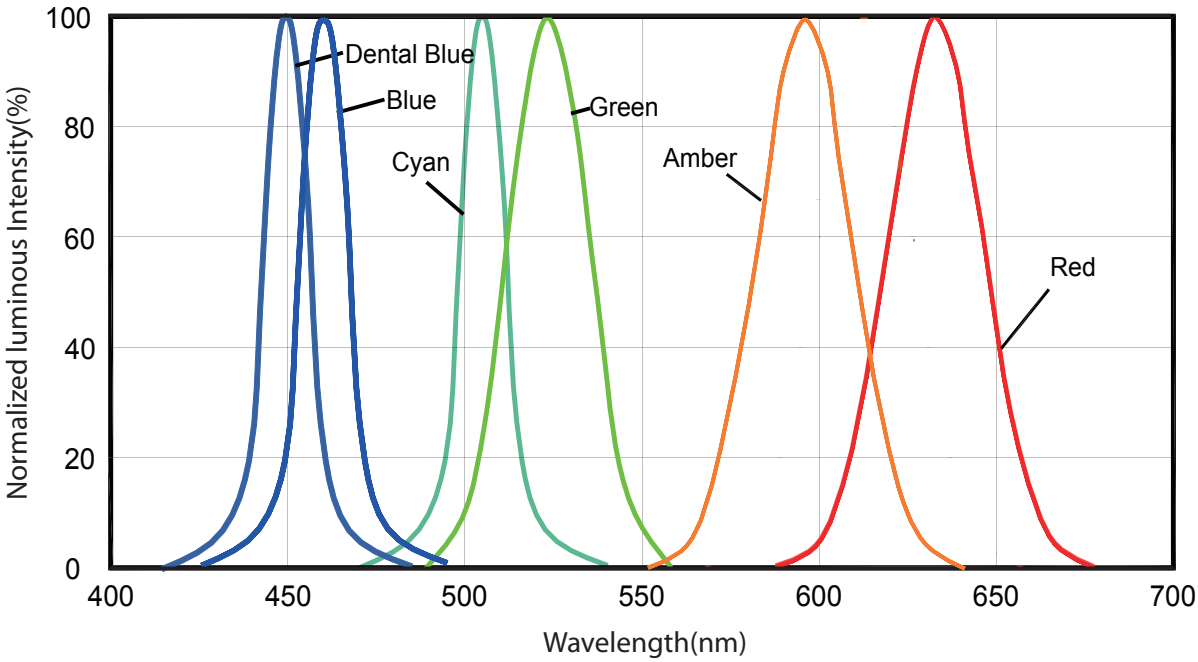


Emitter color	Slug at the bottom of the electrode	Circuit
R/A	Anode	
T/B	No electrode	

Notes:
1. All dimensions are in mm.
2. Lambertian and side emitting series slug has polarity as anode.
3. It is important that the slug can't contact aluminum surface, It is strongly recommended that there should coat a uniform electrically isolated heat dissipation film on the aluminum surface.

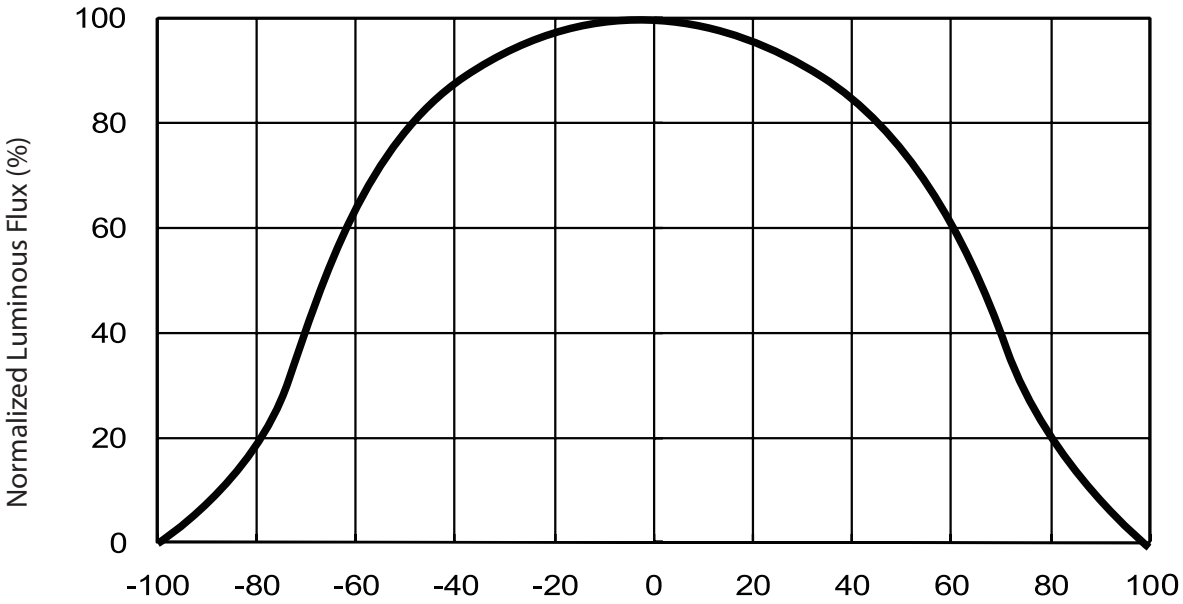
Characteristic curve

Color Spectrum

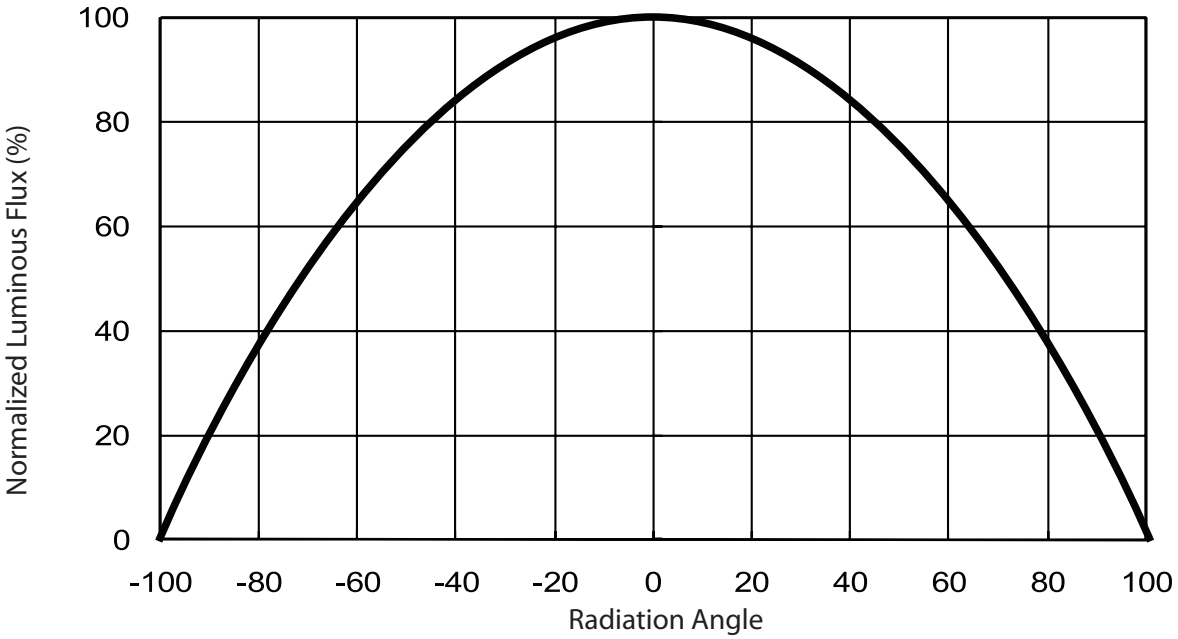


Color Spectrum at a typical CCT forTDS-P001/3L4 Single color

Beam Pattern

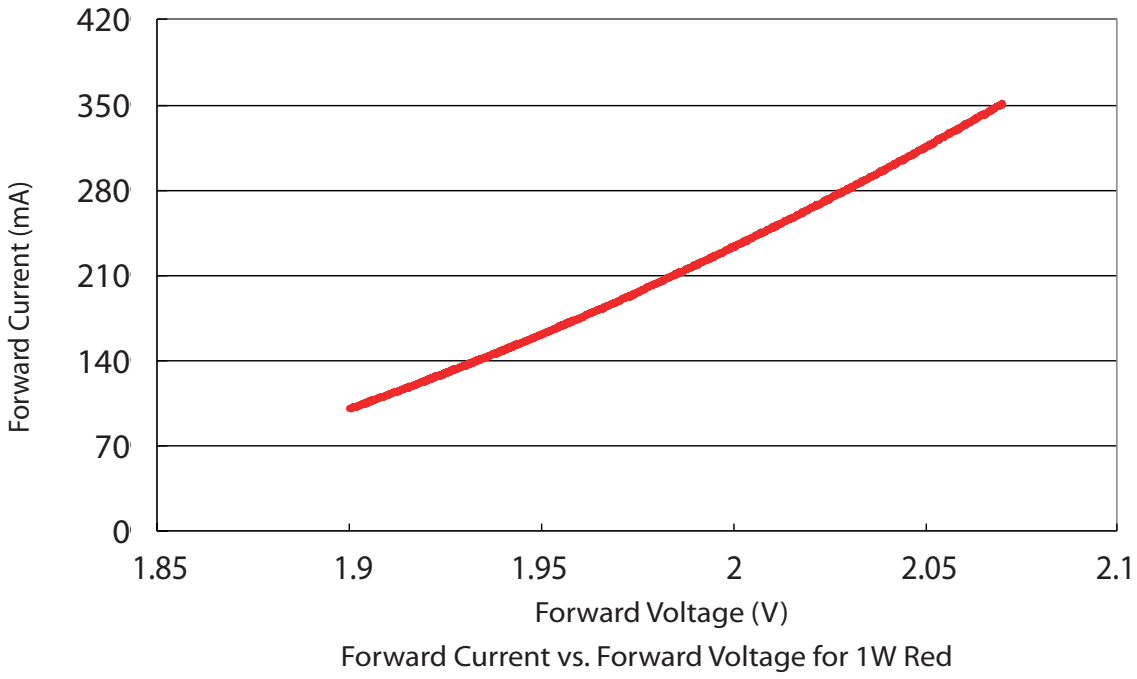


Typical Spatial distribution for Red ,Amber

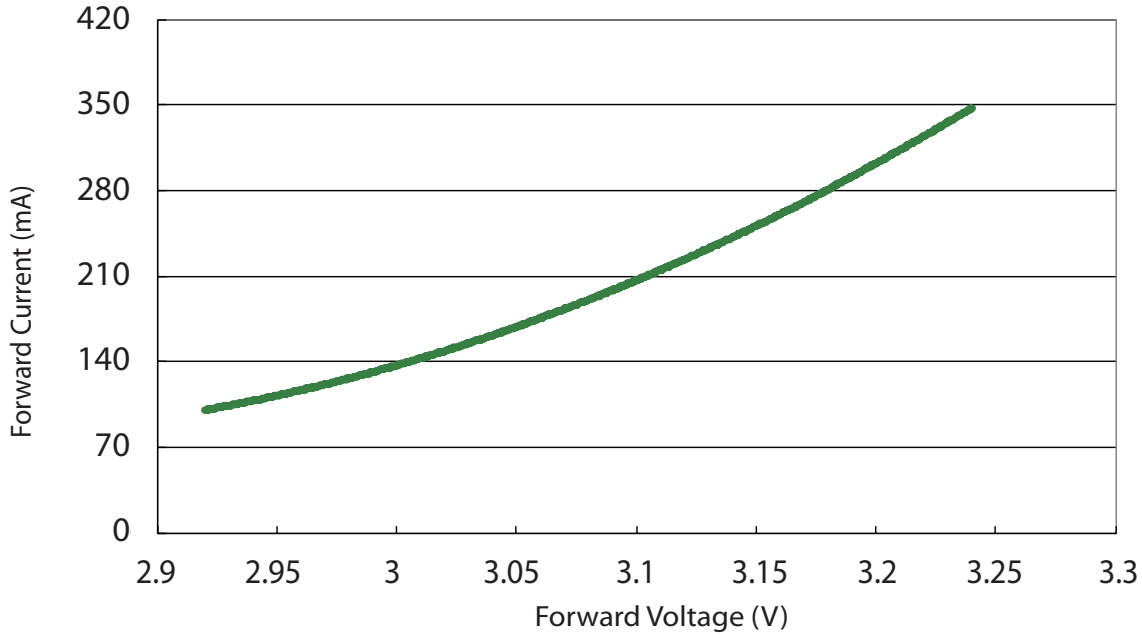


Typical Spatial distribution for Blue and True Green, Cyan, Dental Blue

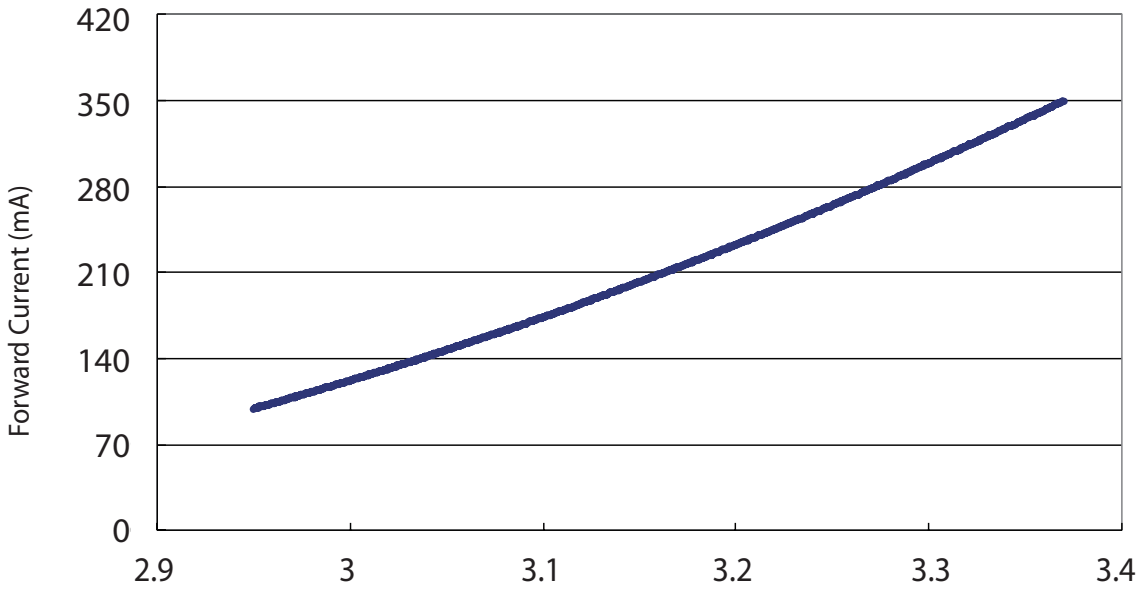
Forward Current vs. Forward Voltage (1W)



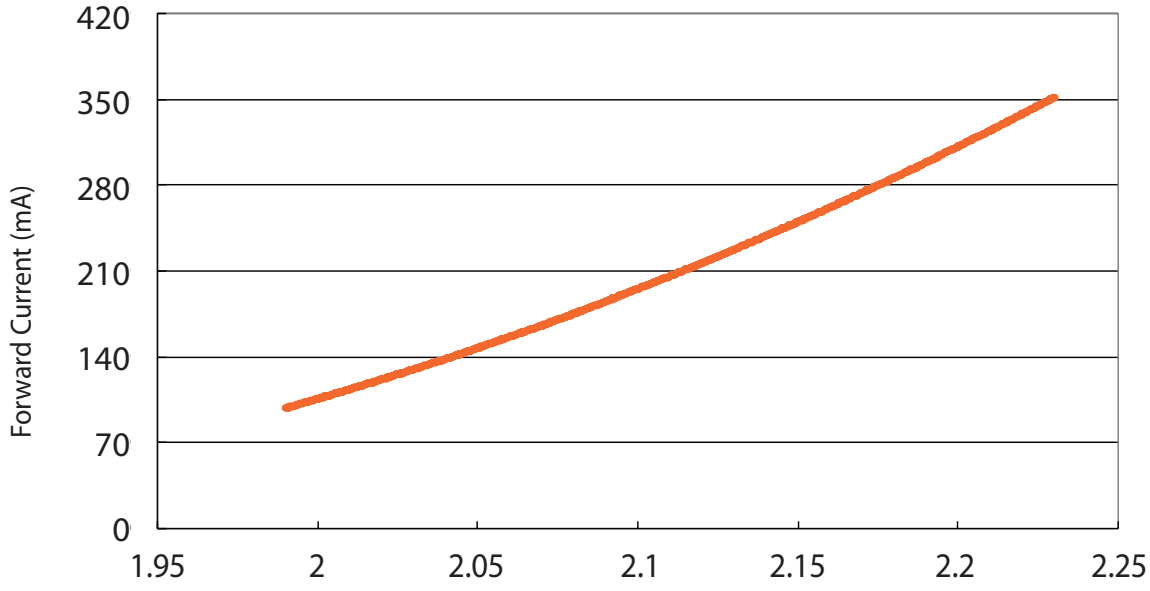
Forward Current vs. Forward Voltage for 1W Red



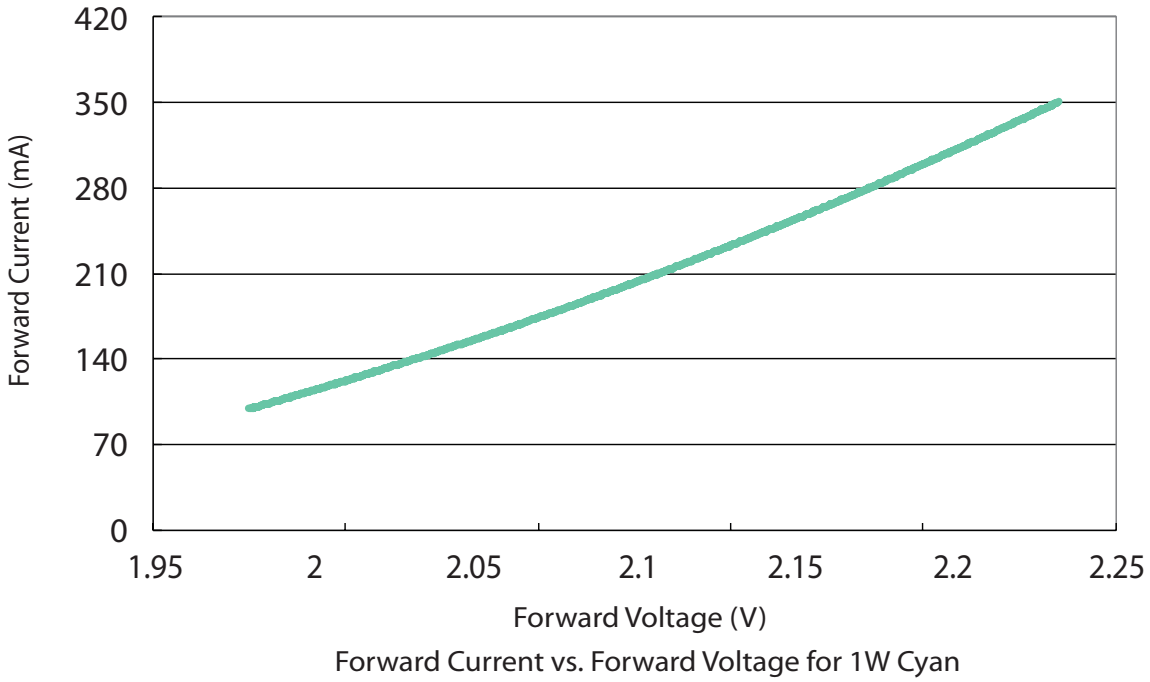
Forward Current vs. Forward Voltage for 1W True Green



Forward Current vs. Forward Voltage for 1W Blue

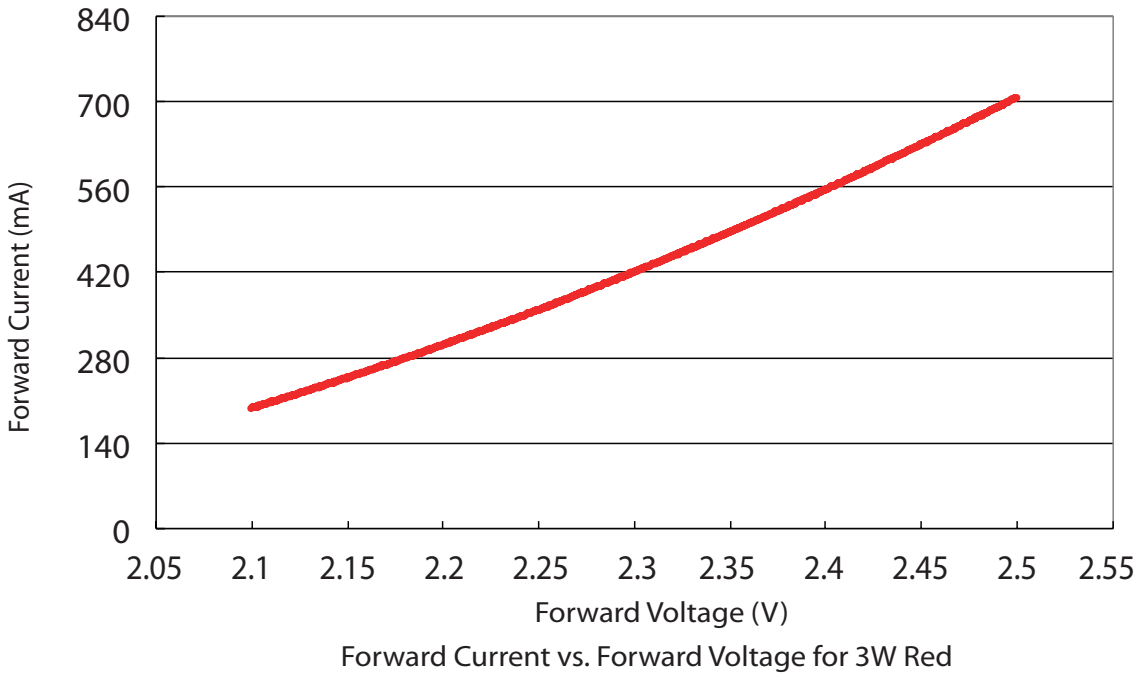


Forward Current vs. Forward Voltage for 1W Amber

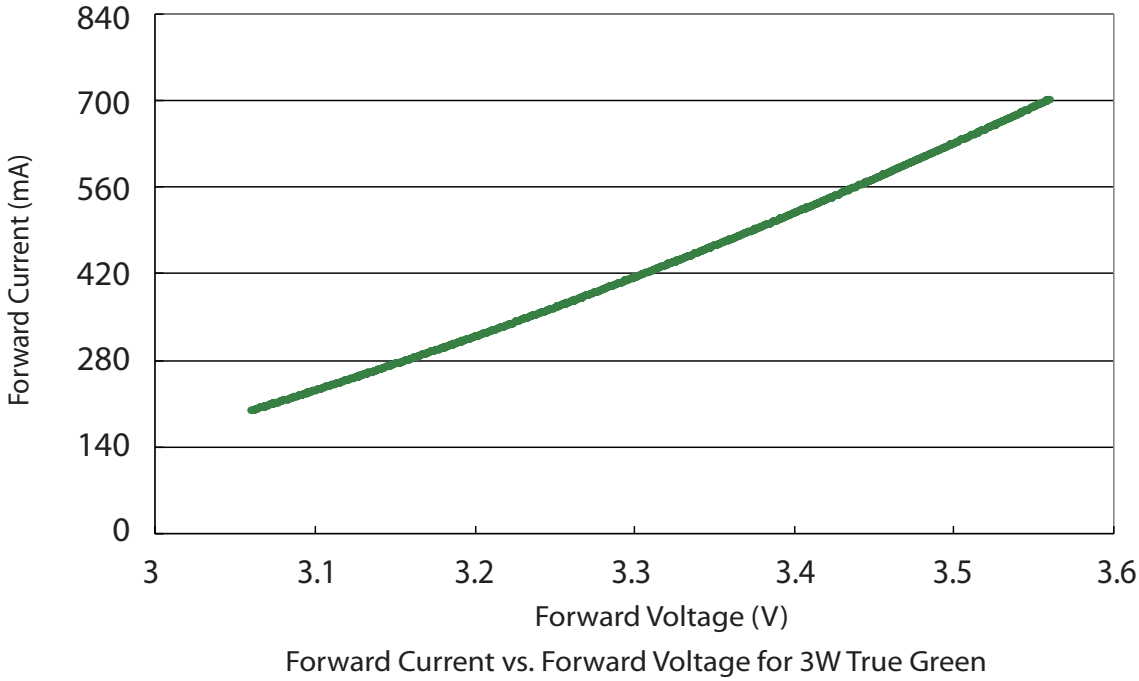


Forward Current vs. Forward Voltage for 1W Cyan

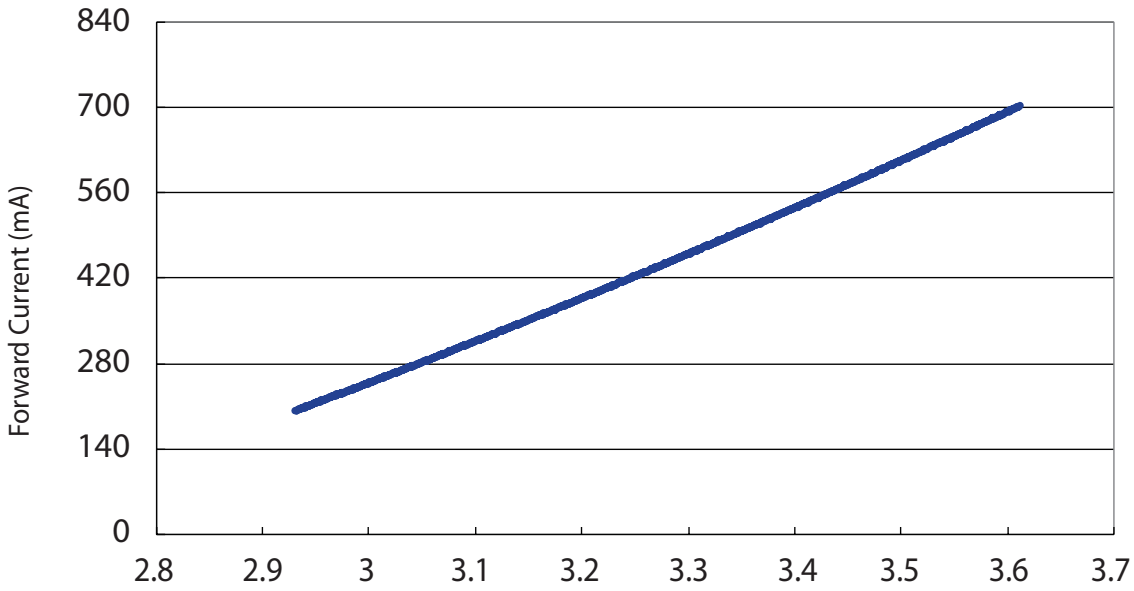
Forward Current vs. Forward Voltage (3W)



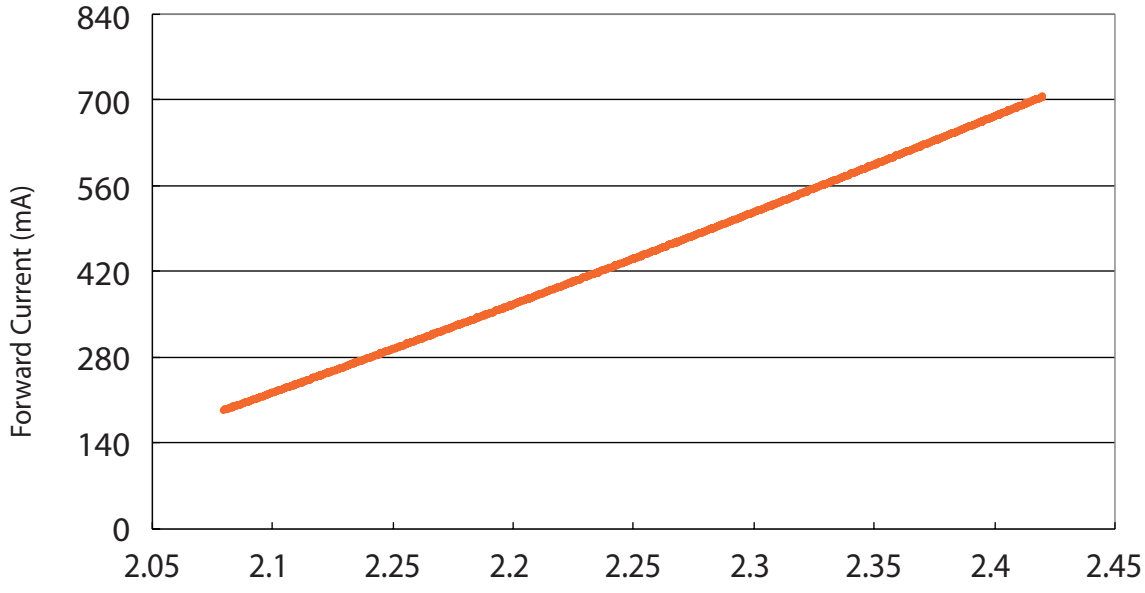
Forward Current vs. Forward Voltage for 3W Red



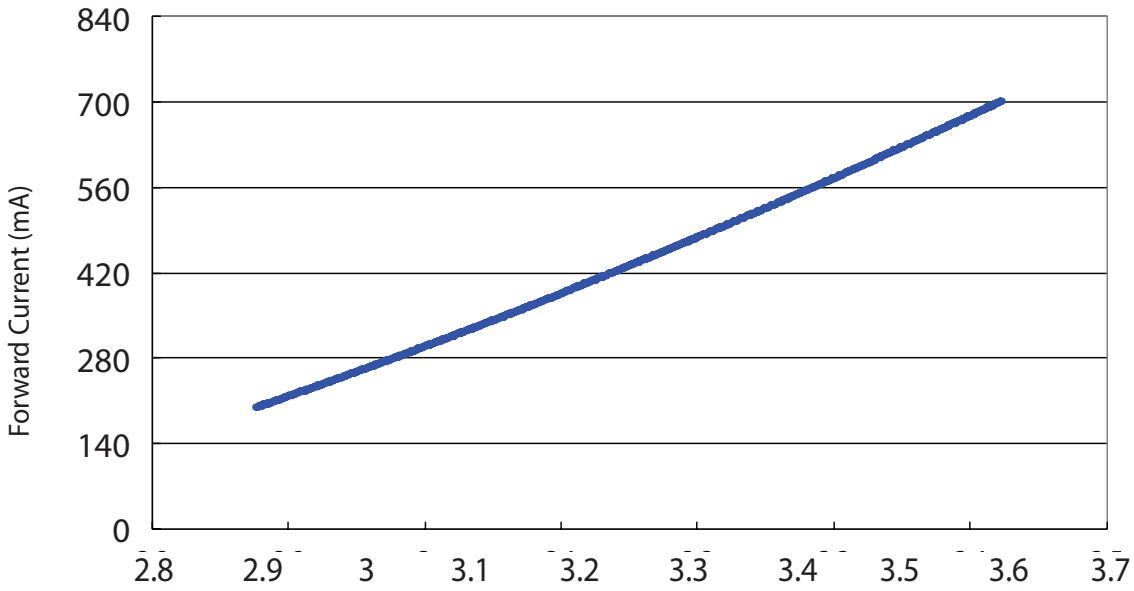
Forward Current vs. Forward Voltage for 3W True Green



Forward Current vs. Forward Voltage for 3W Blue

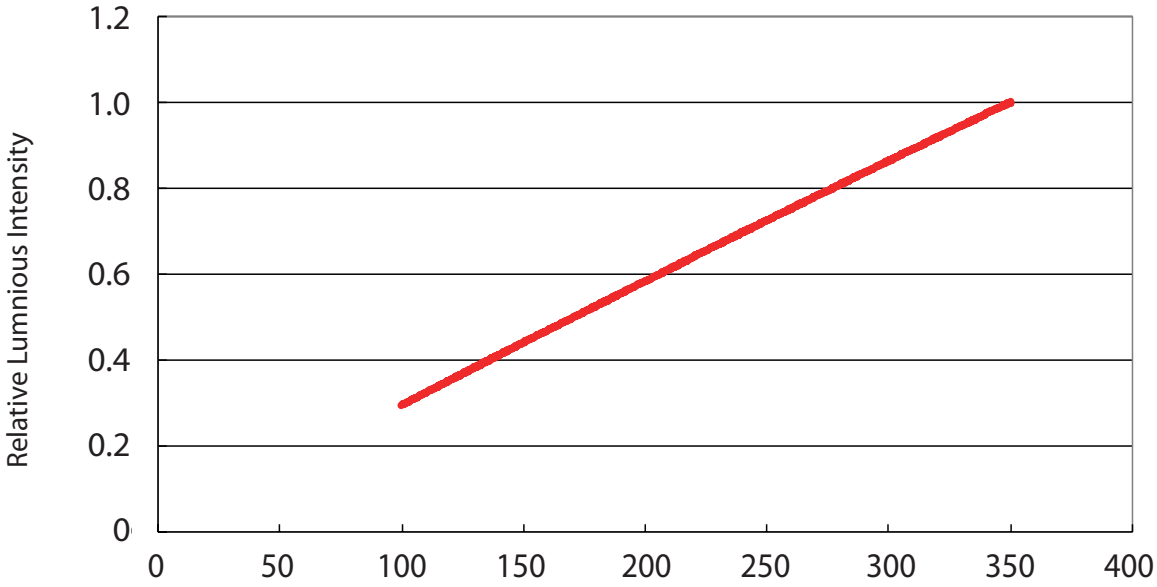


Forward Current vs. Forward Voltage for 3W Amber

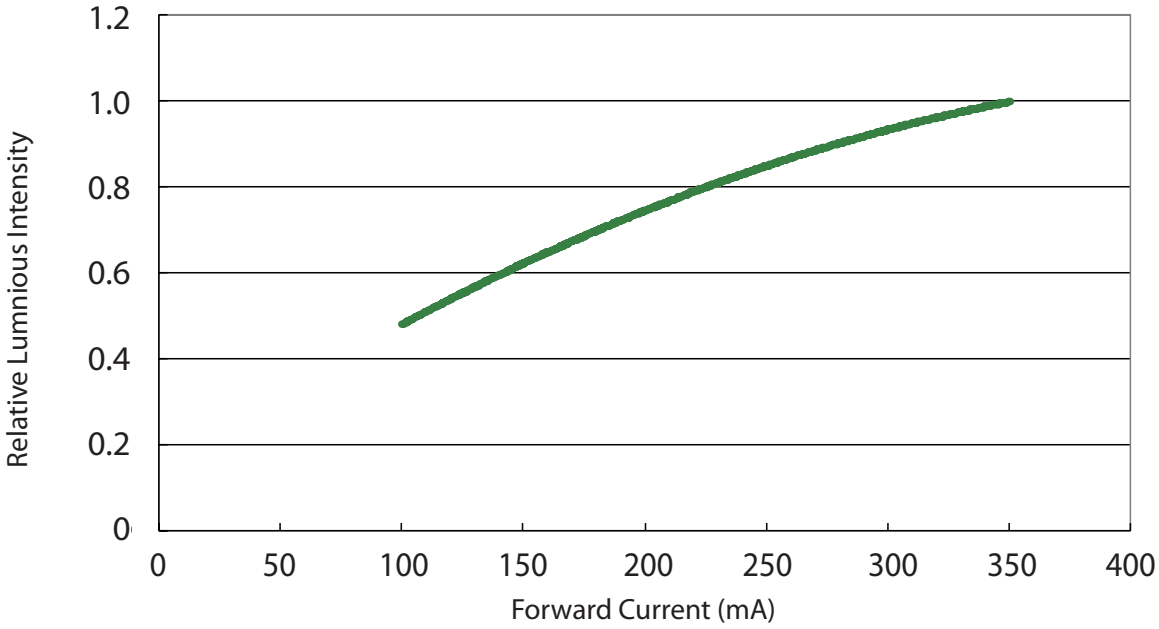


Forward Current vs. Forward Voltage for 3W Dental Blue

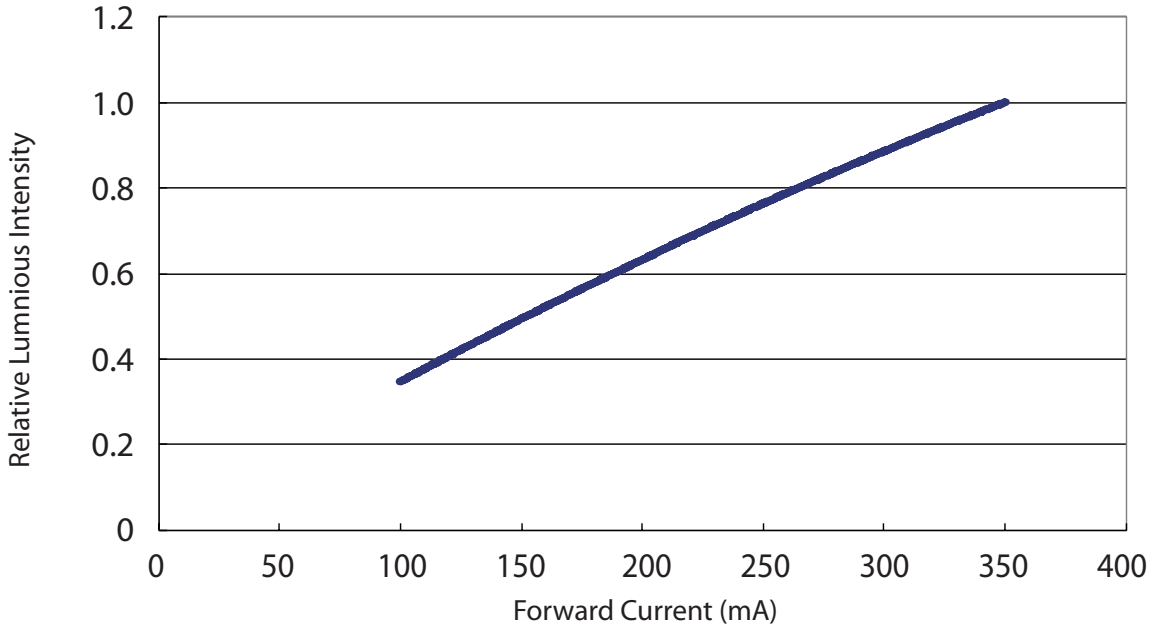
Relative Luminous Intensity vs. Forward Current (1W)



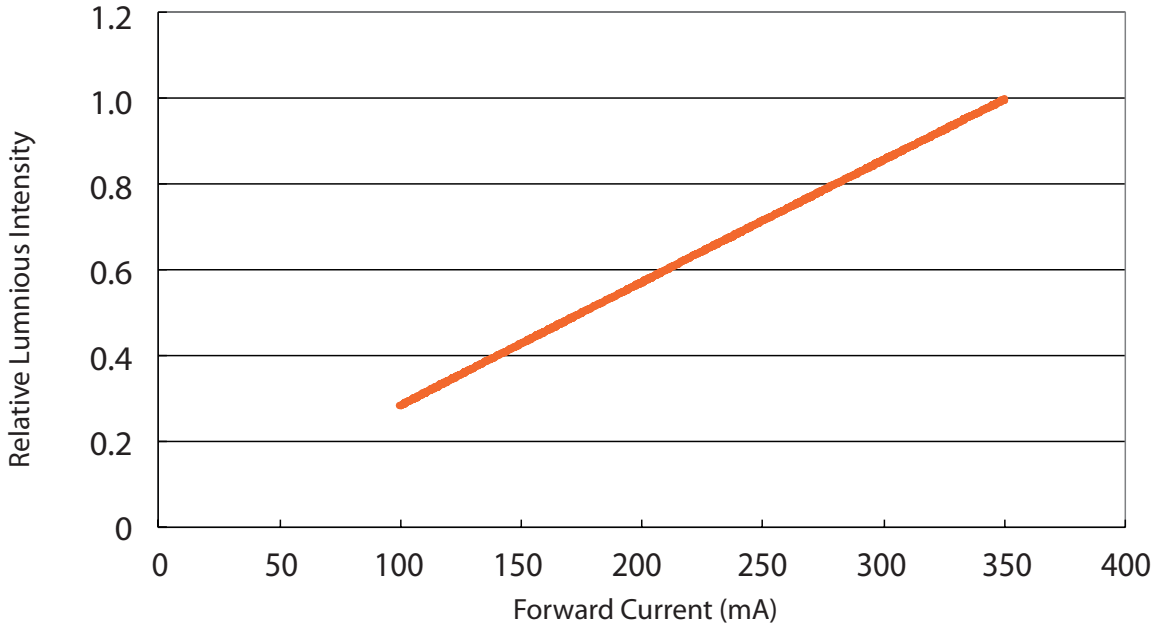
Relative Luminous Intensity vs. Forward Current for 1W Red



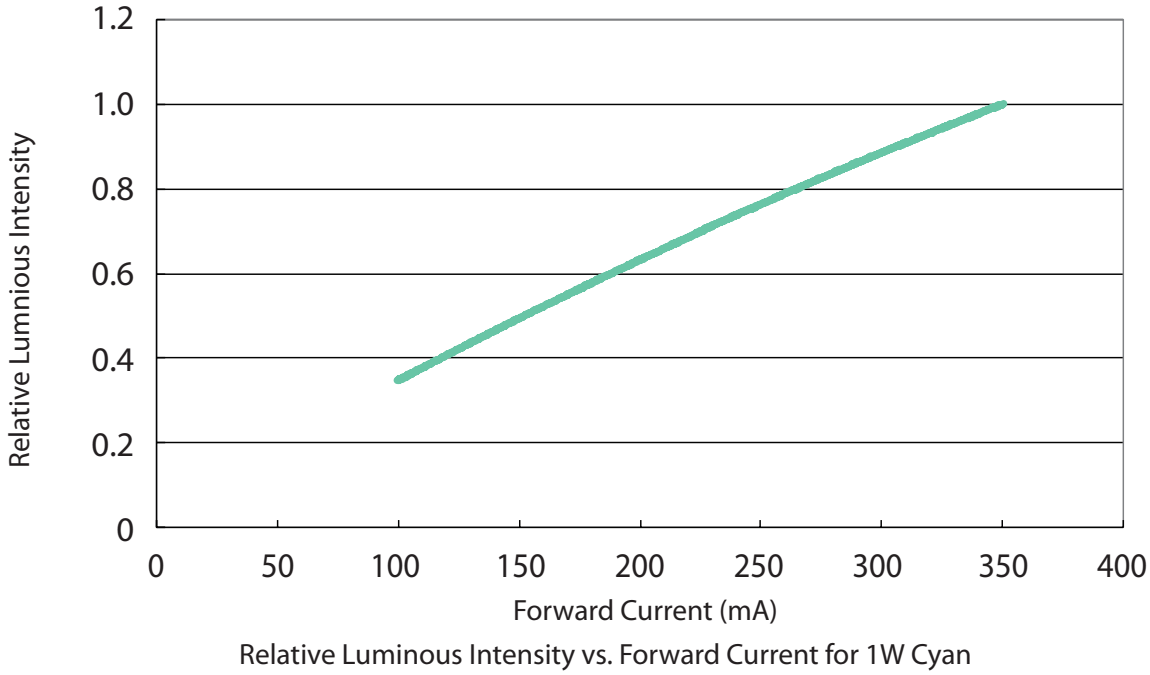
Relative Luminous Intensity vs. Forward Current for 1W True Green



Relative Luminous Intensity vs. Forward Current for 1W Blue

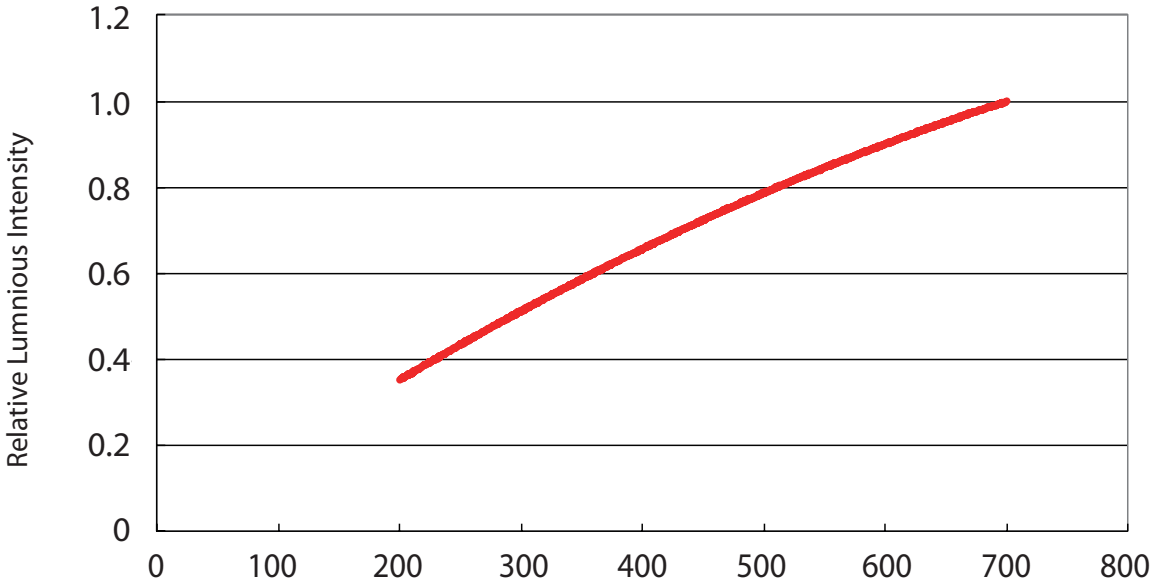


Relative Luminous Intensity vs. Forward Current for 1W Amber

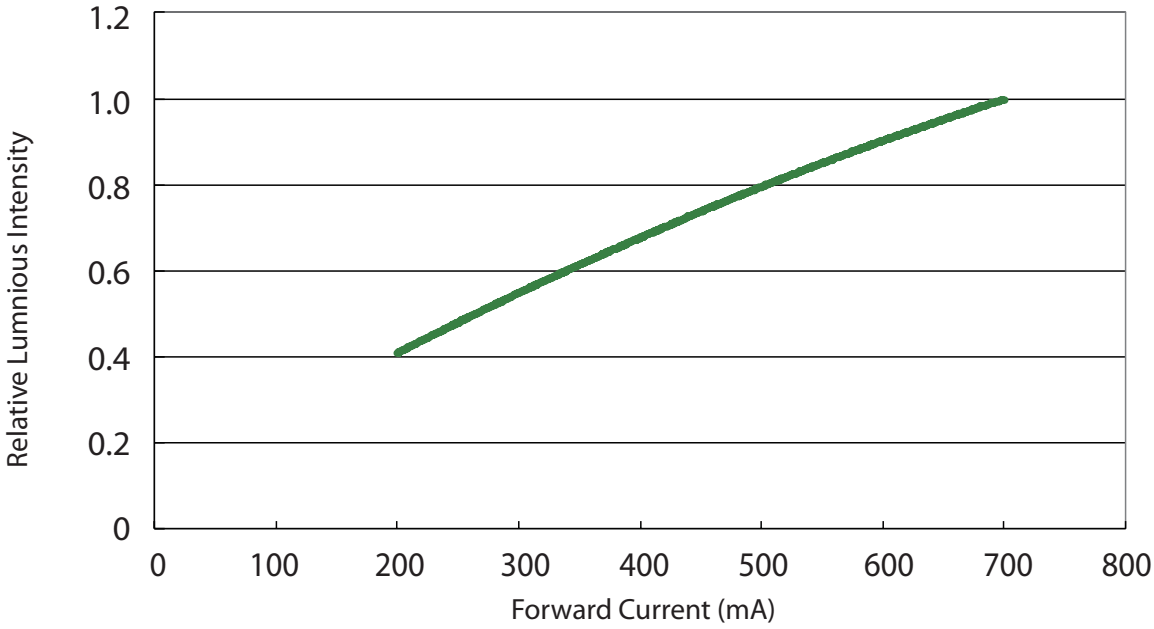


Relative Luminous Intensity vs. Forward Current for 1W Cyan

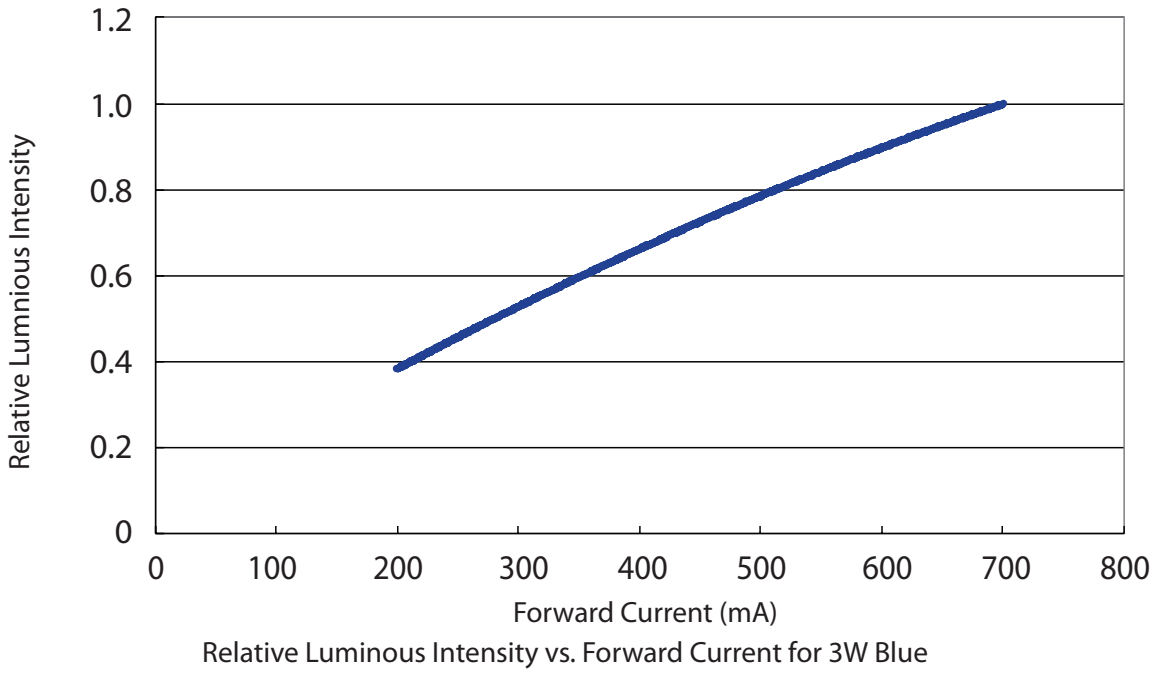
Relative Intensity vs. Forward Current (3W)



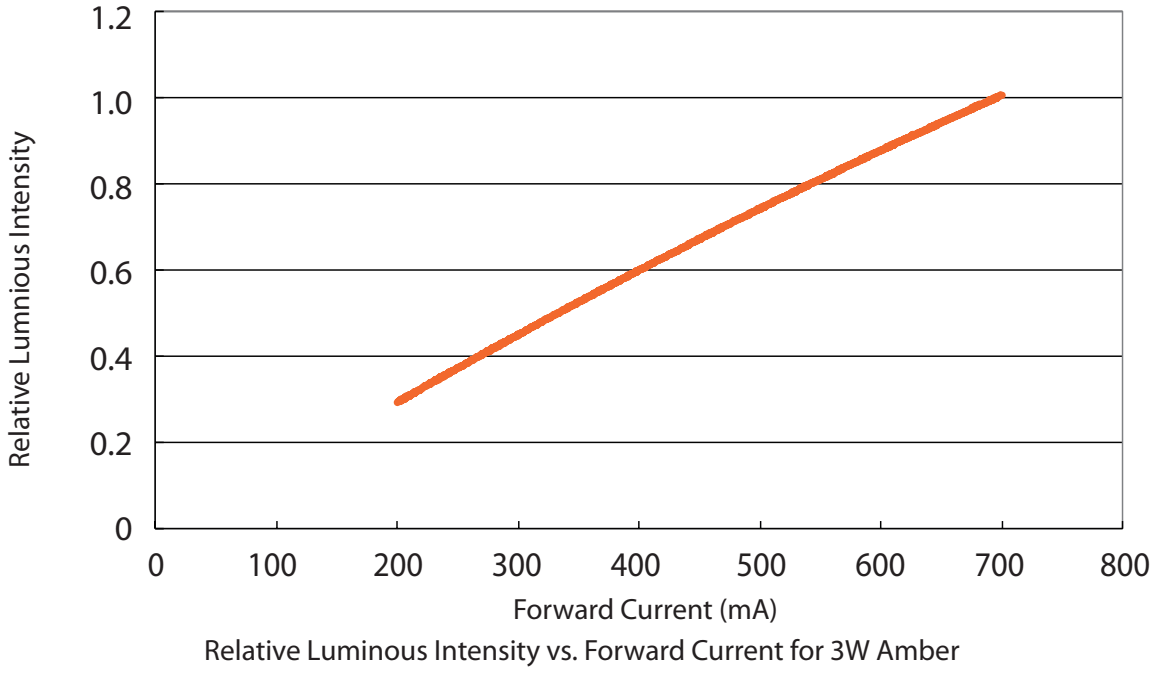
Relative Luminous Intensity vs. Forward Current for 3W Red



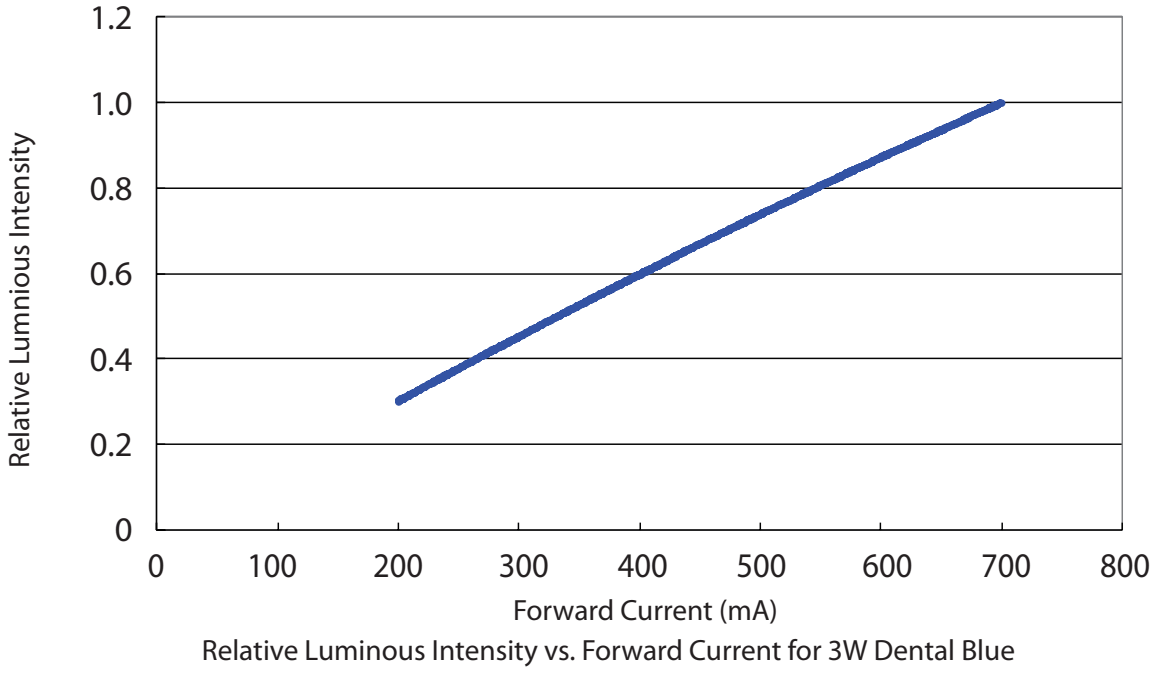
Relative Luminous Intensity vs. Forward Current for 3W True Green



Relative Luminous Intensity vs. Forward Current for 3W Blue

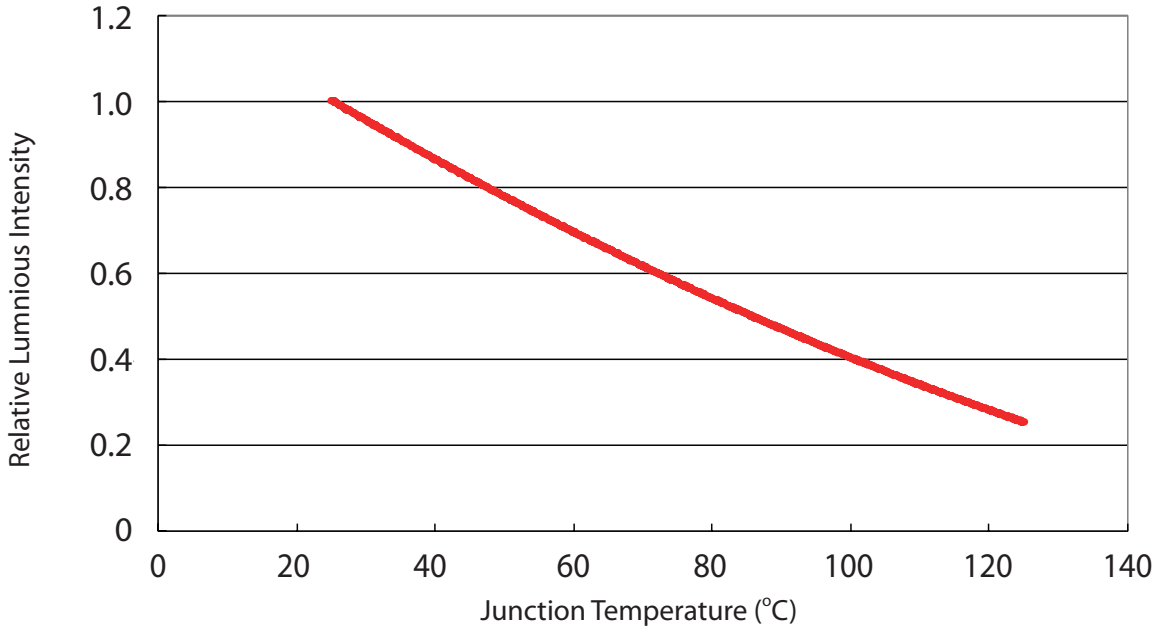


Relative Luminous Intensity vs. Forward Current for 3W Amber

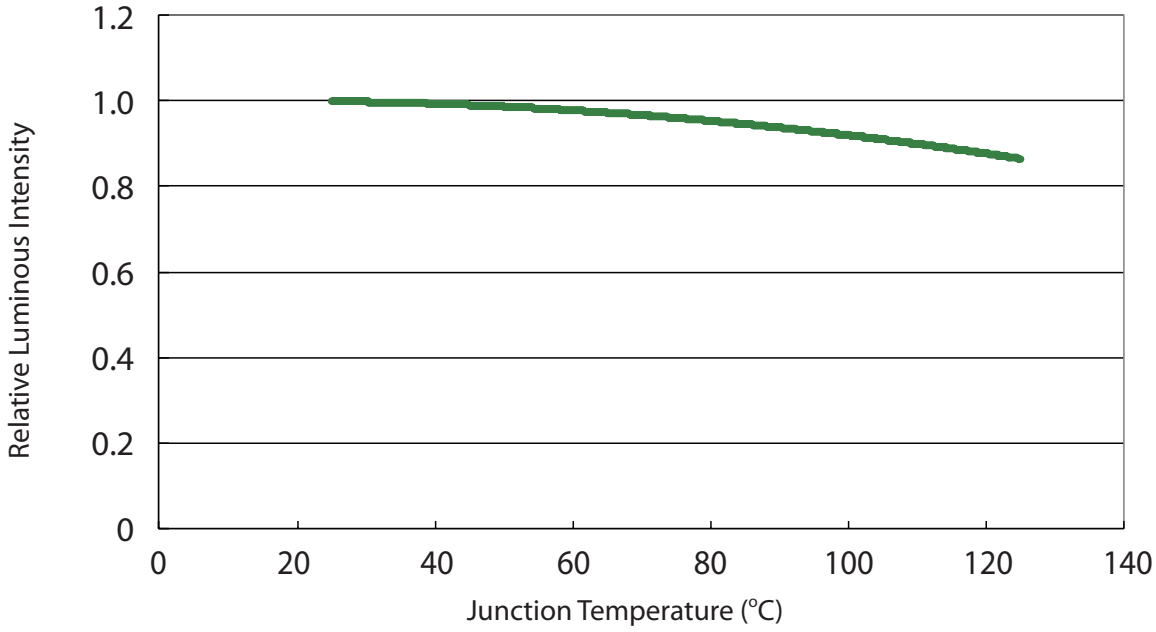


Relative Luminous Intensity vs. Forward Current for 3W Dental Blue

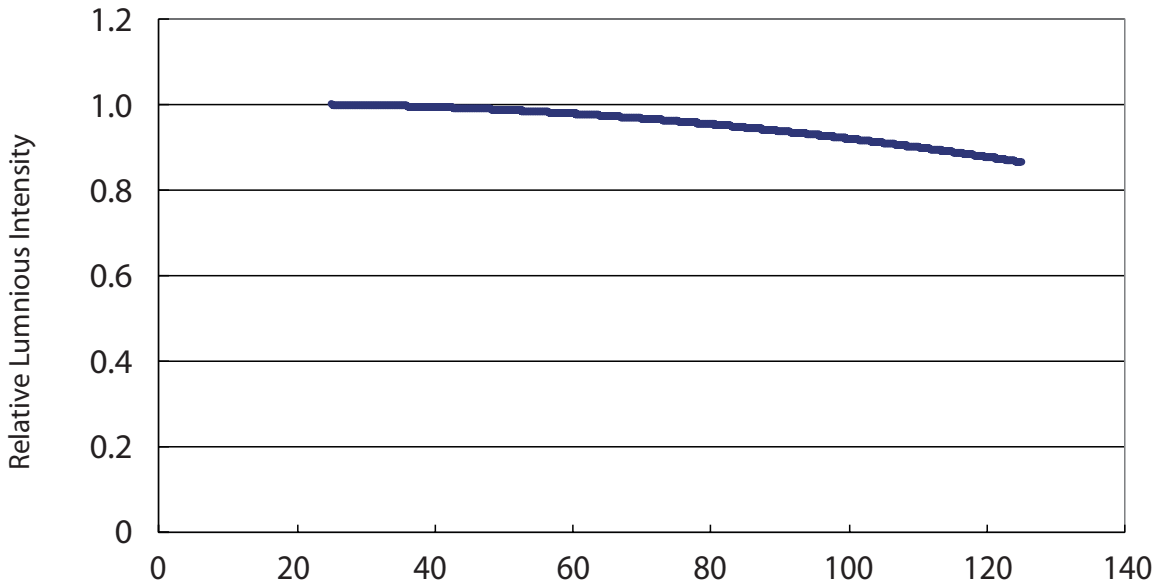
Relative Luminous intensity vs. Junction Temperature (1W)



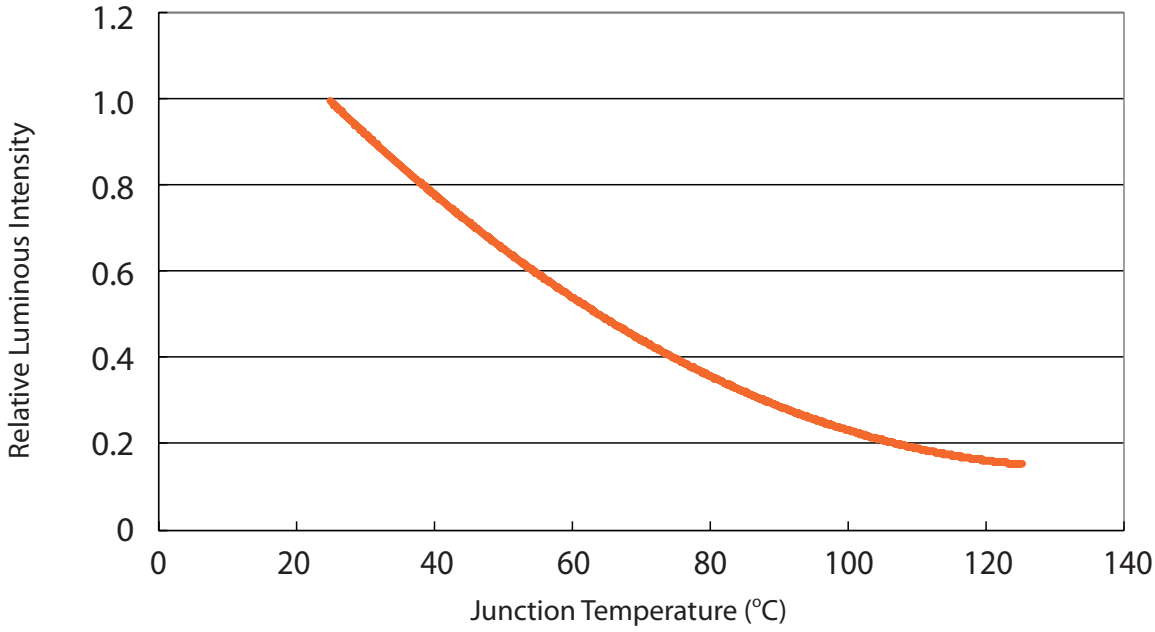
Relative Luminous Intensity vs. junction temperature for 1W Red



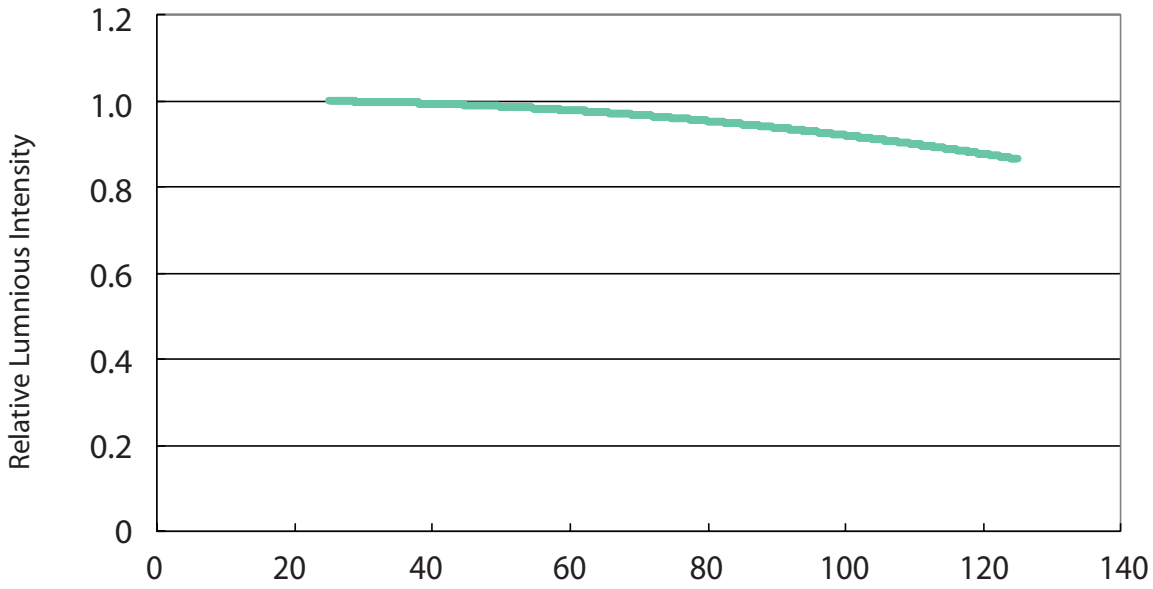
Relative Luminous Intensity vs. junction temperature for 1W True Green



Relative Luminous Intensity vs. junction temperature for 1W Blue

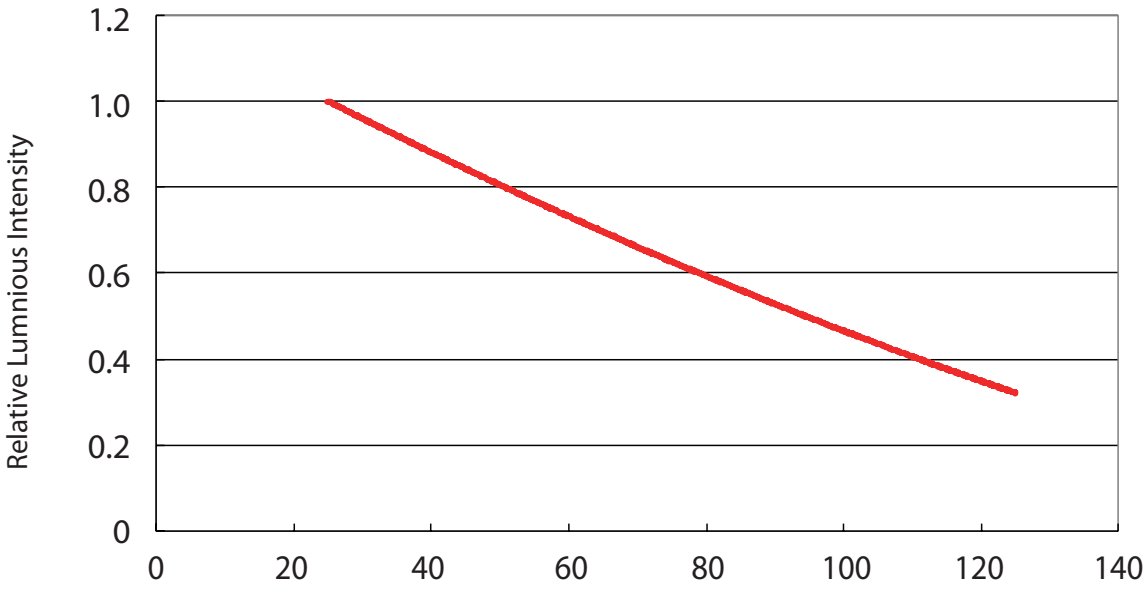


Relative Luminous Intensity vs. junction temperature for 1W Amber

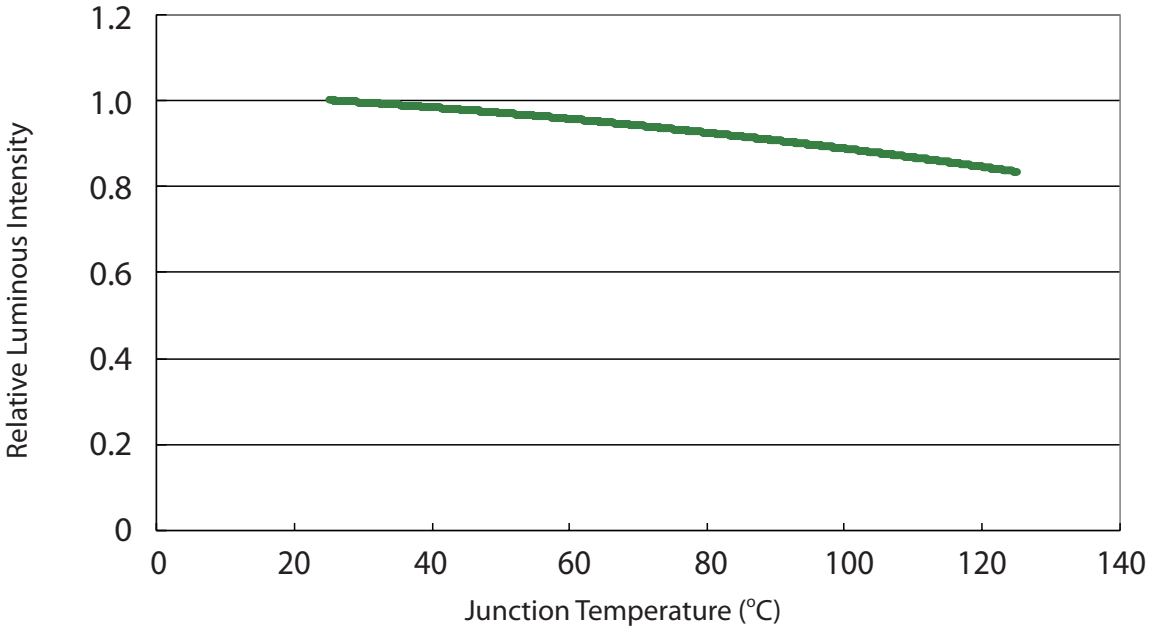


Relative Luminous Intensity vs. junction temperature for 1W Cyan

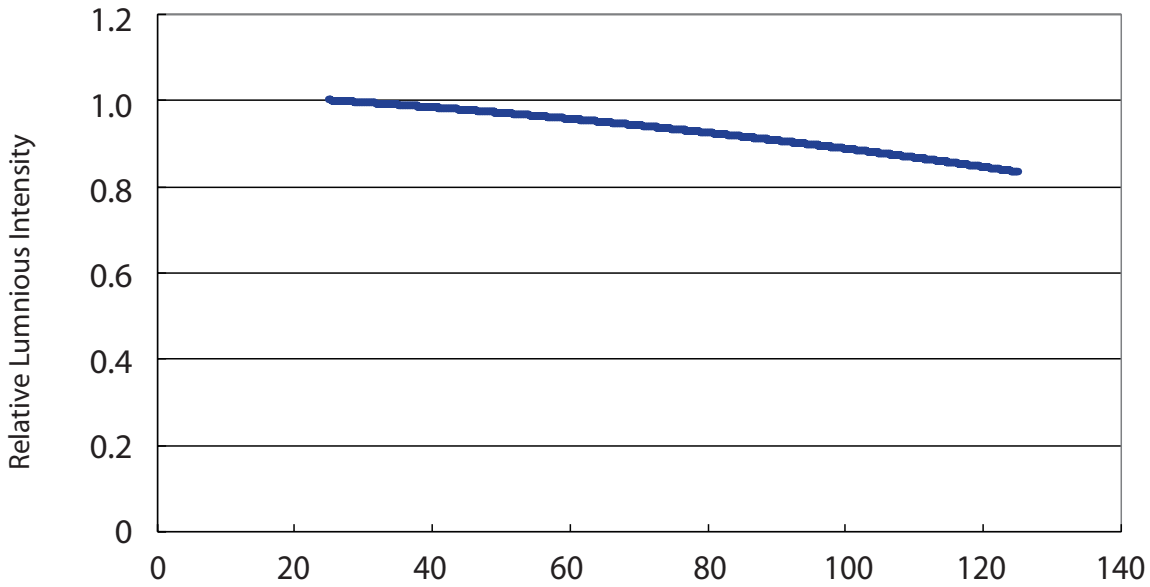
Relative Luminous Flux vs. Junction Temperature (3W)



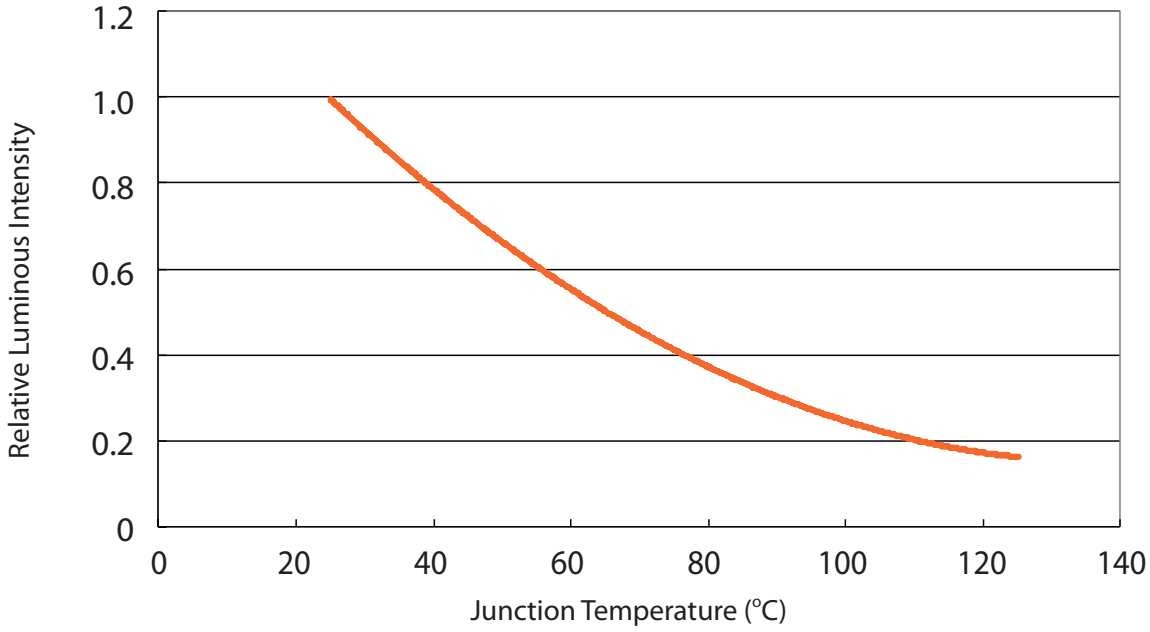
Relative Luminous Intensity vs. junction temperature for 3W Red



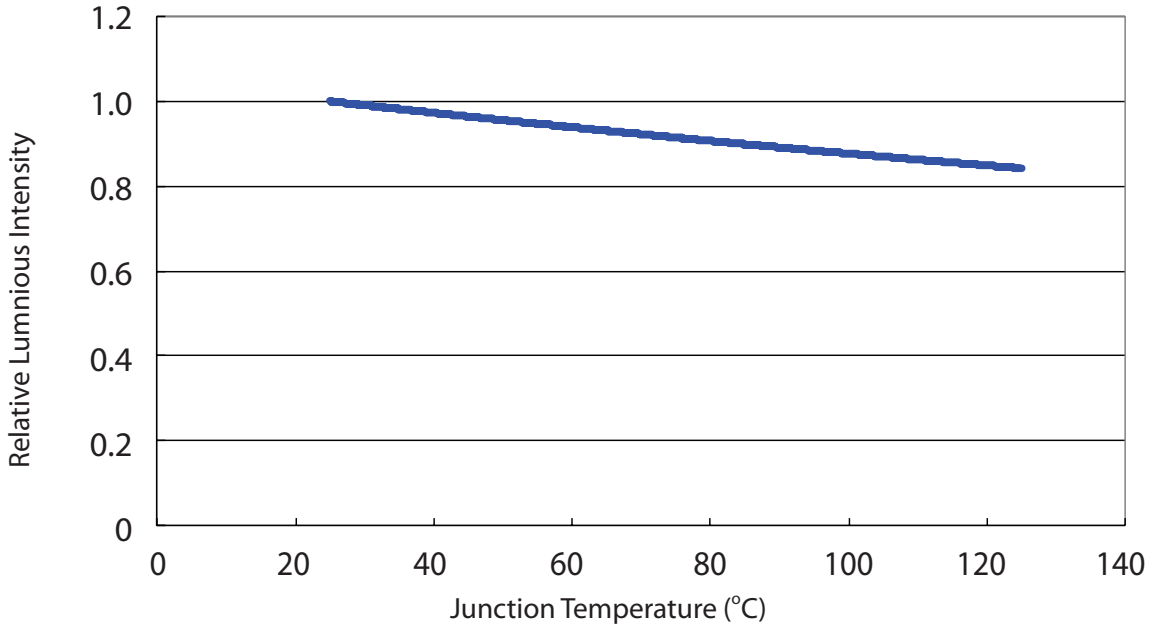
Relative Luminous Intensity vs. junction temperature for 3W True Green



Relative Luminous Intensity vs. junction temperature for 3W Blue

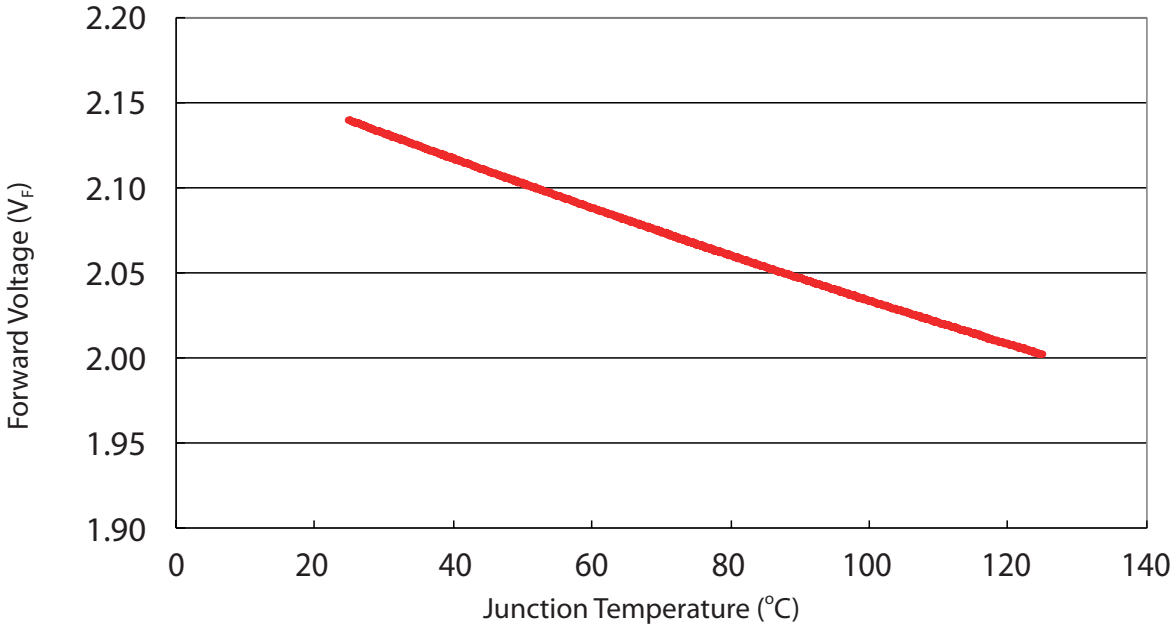


Relative Luminous Intensity vs. junction temperature for 3W Amber

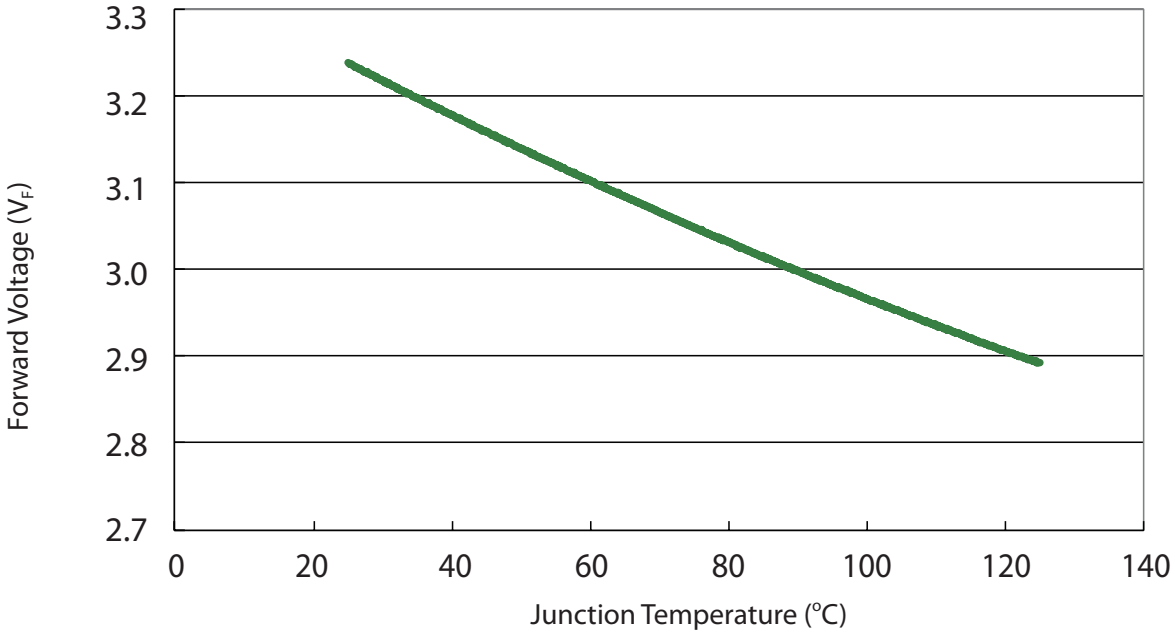


Relative Luminous Intensity vs. junction temperature for 3W Dental Blue

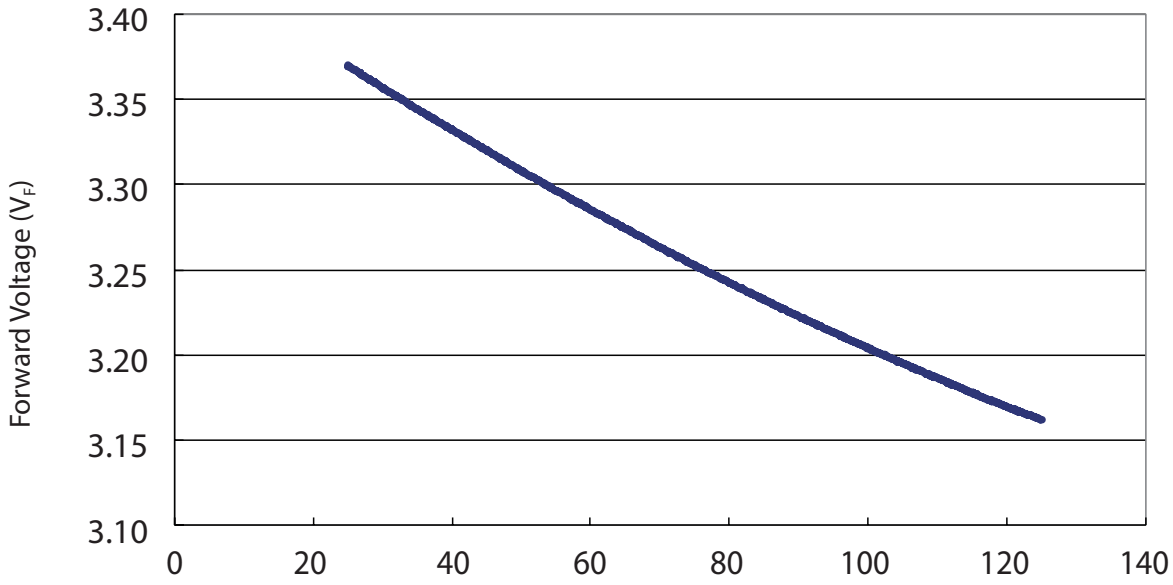
Forward Voltage vs. Junction Temperature (1W)



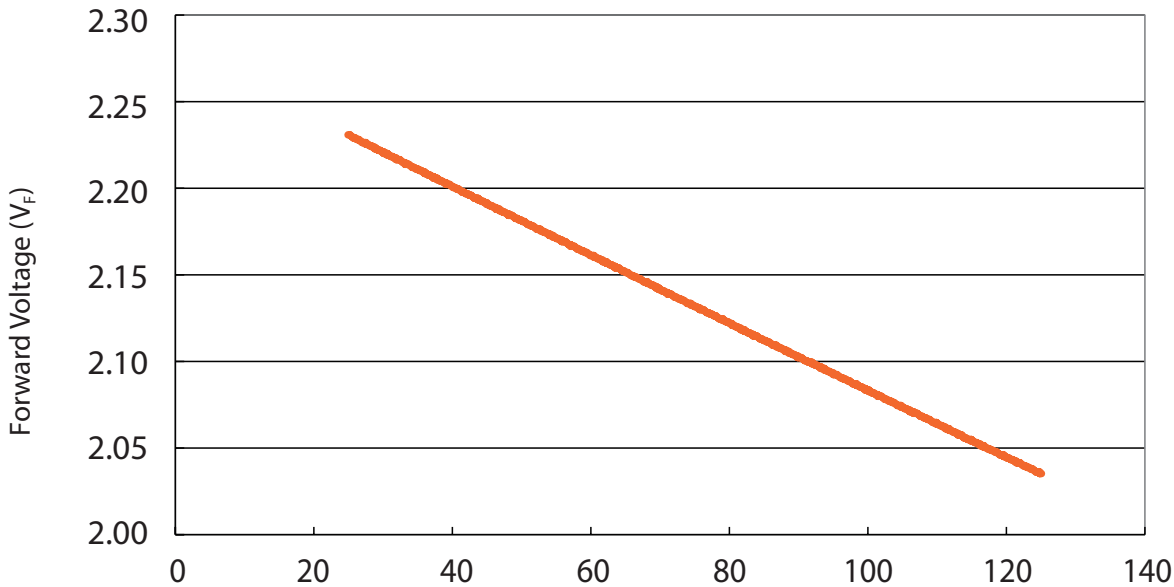
Forward voltage vs. junction temperature for 1W Red



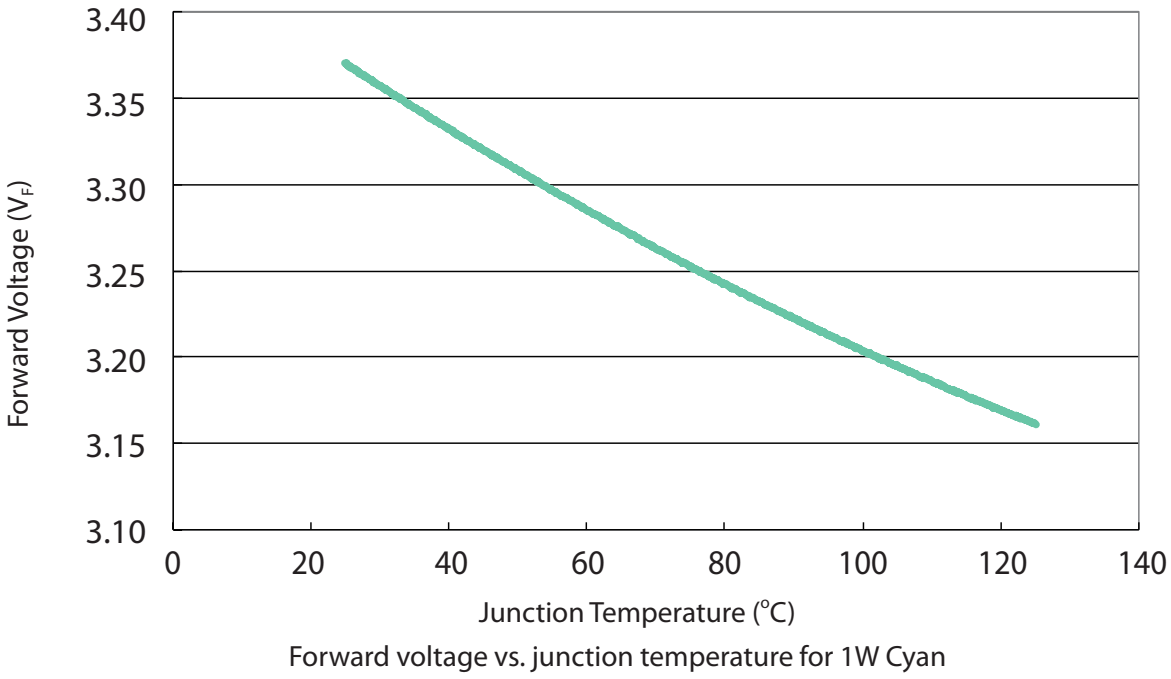
Forward voltage vs. junction temperature for 1W True Green



Forward voltage vs. junction temperature for 1W Blue

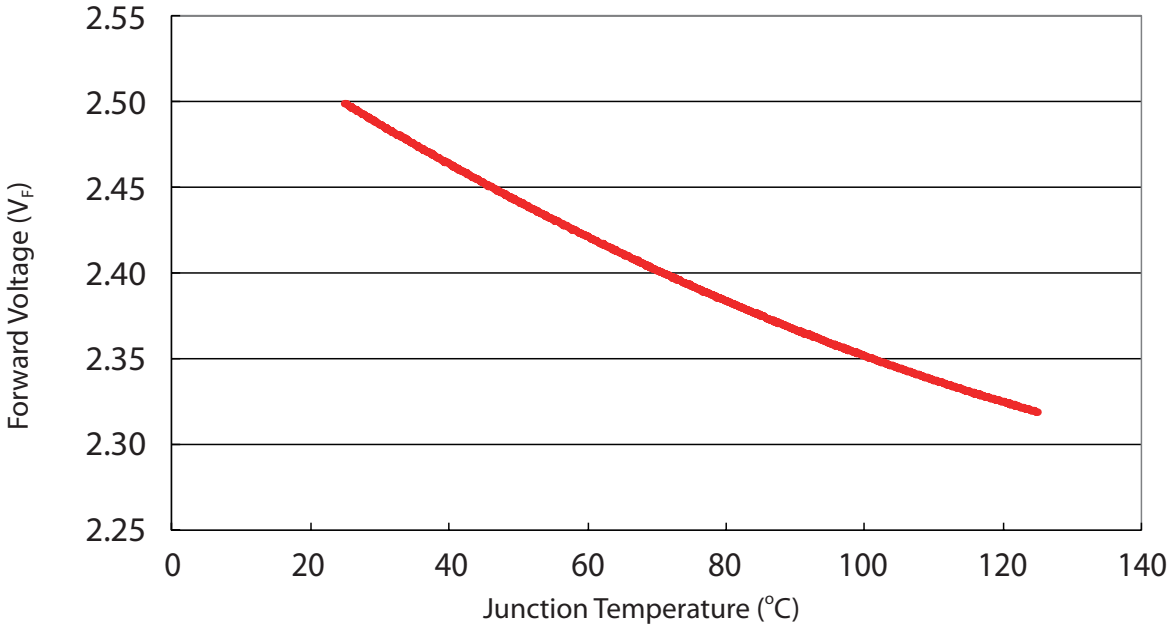


Forward voltage vs. junction temperature for 1W Amber

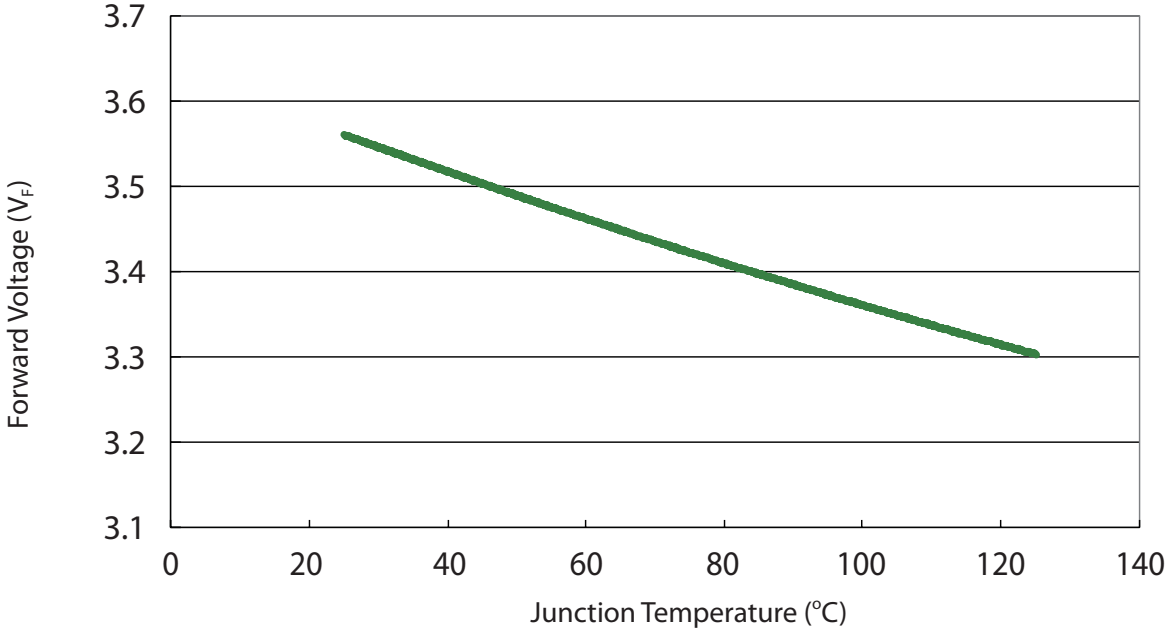


Forward voltage vs. junction temperature for 1W Cyan

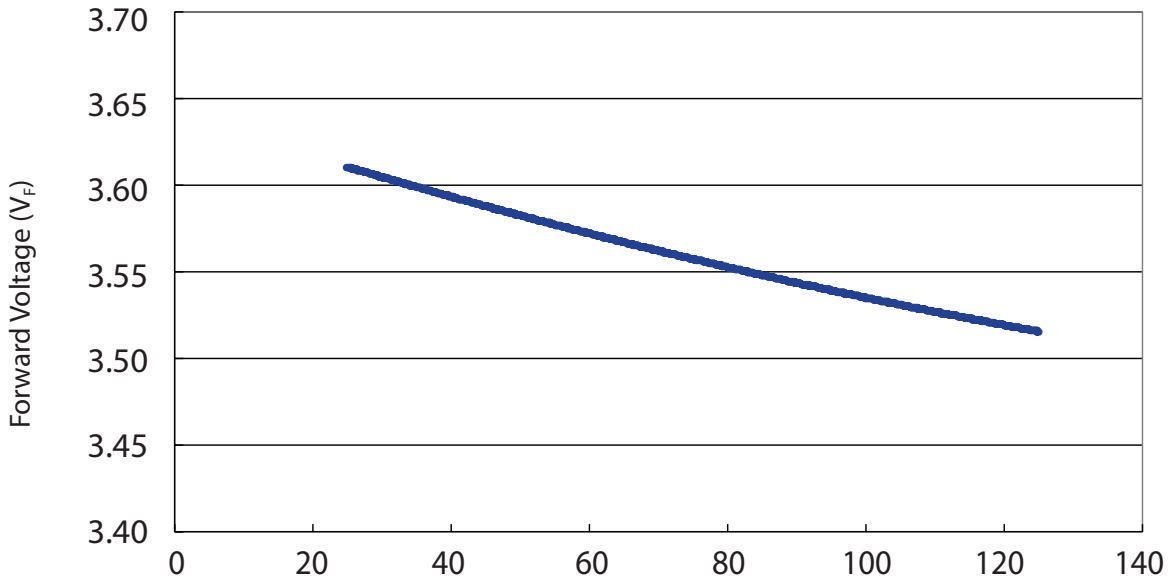
Forward Voltage vs. Junction Temperature (3W)



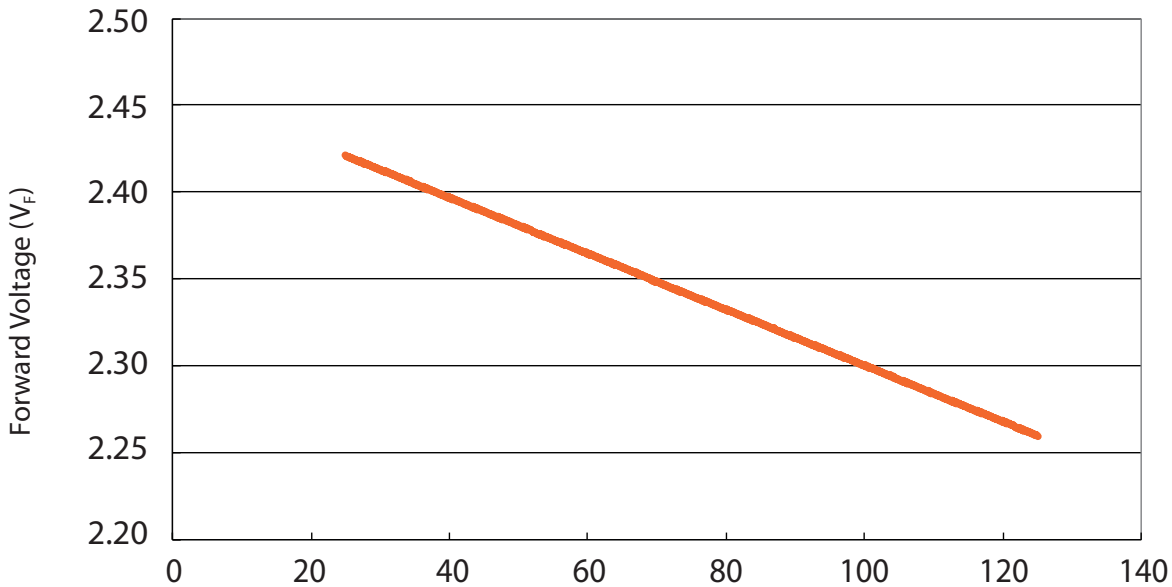
Forward voltage vs. junction temperature for 3W Red



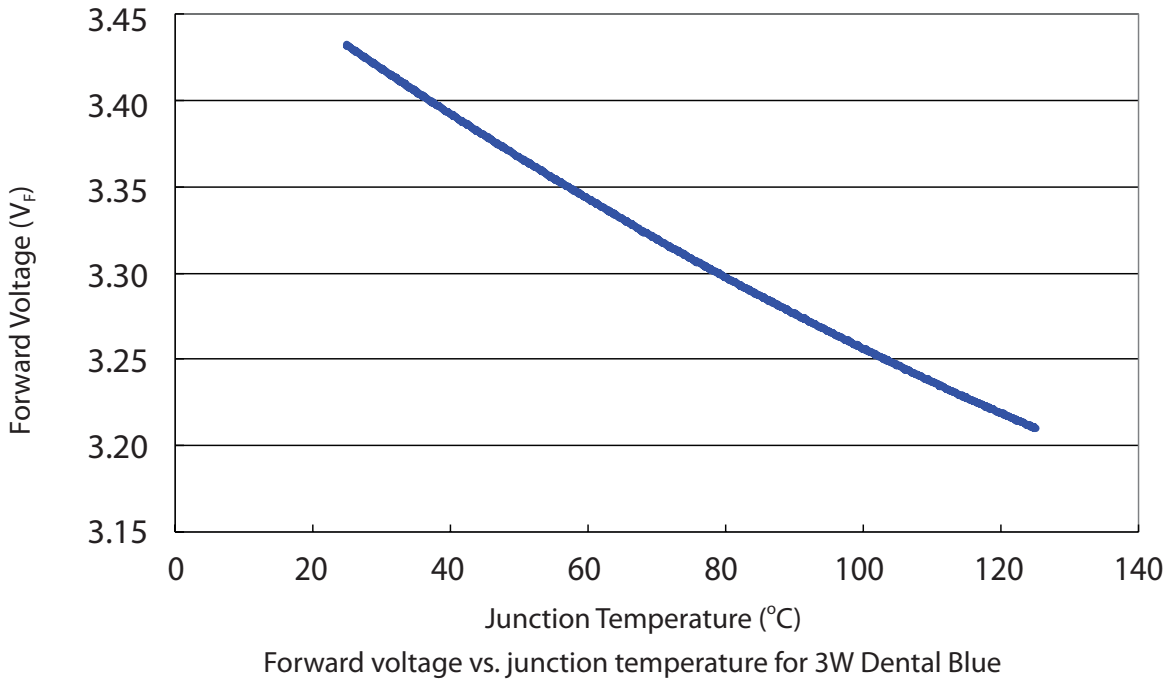
Forward voltage vs. junction temperature for 3W True Green



Forward voltage vs. junction temperature for 3W Blue

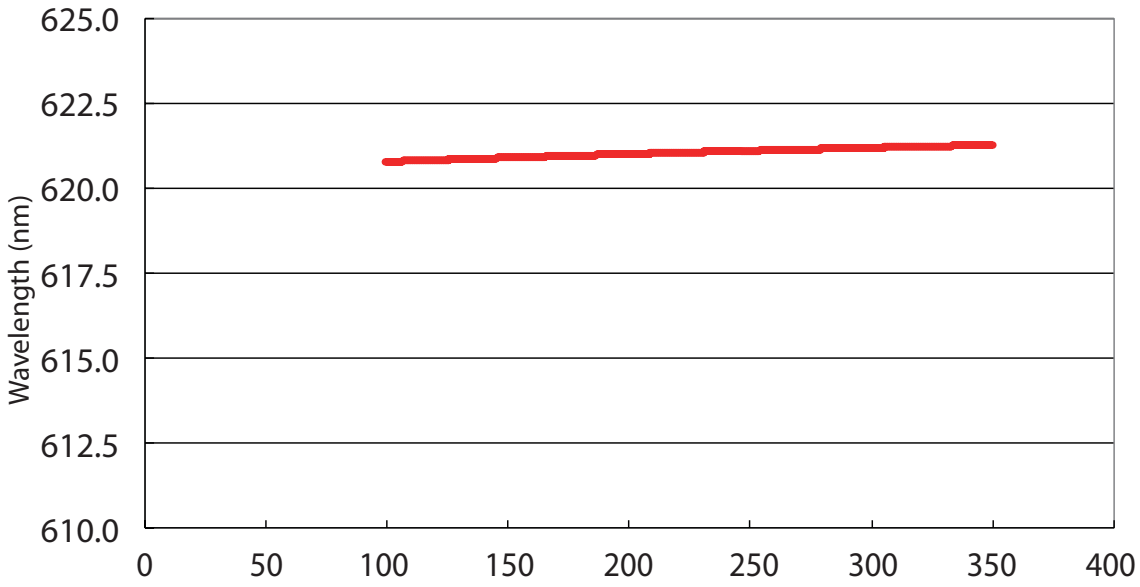


Forward voltage vs. junction temperature for 3W Amber

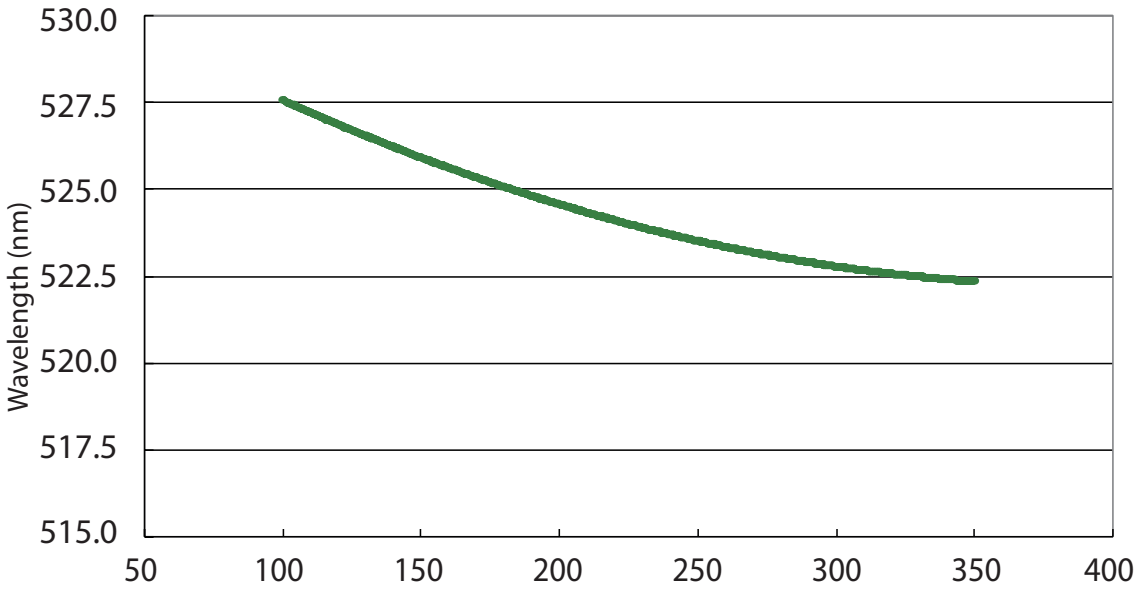


Forward voltage vs. junction temperature for 3W Dental Blue

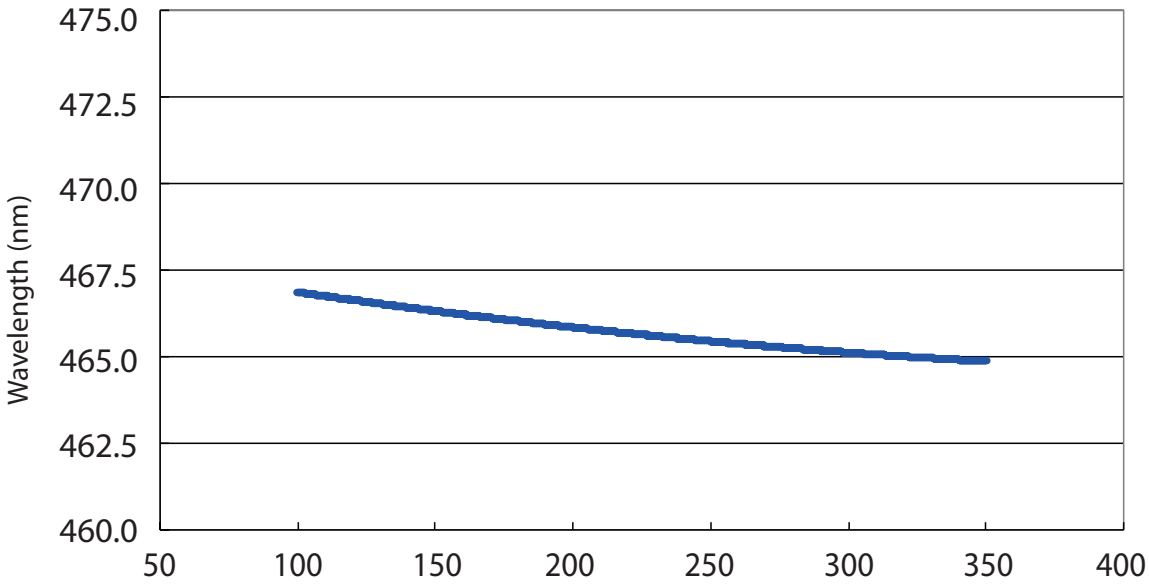
Wavelength vs. Forward Current (1W)



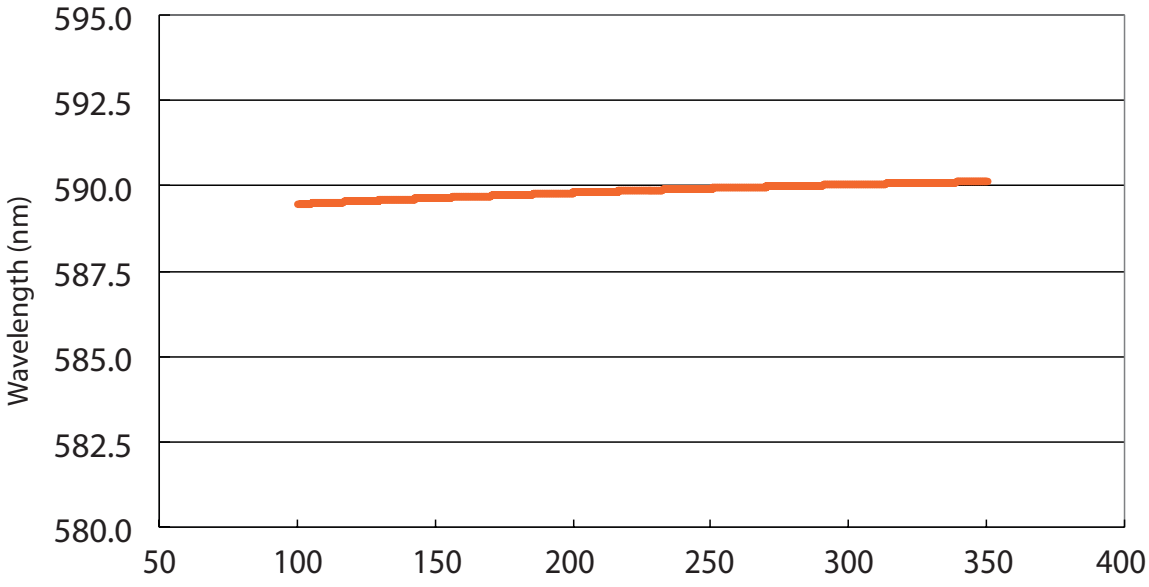
Wavelength vs. Forward Current for 1W Red



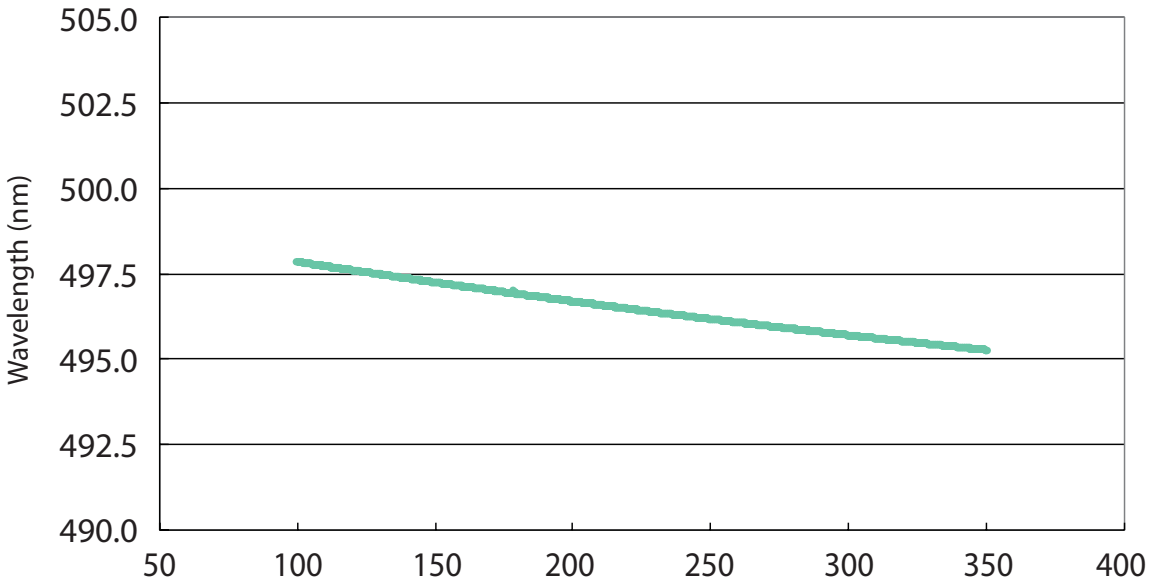
Wavelength vs. Forward Current for 1W True Green



Wavelength vs. Forward Current for 1W Blue

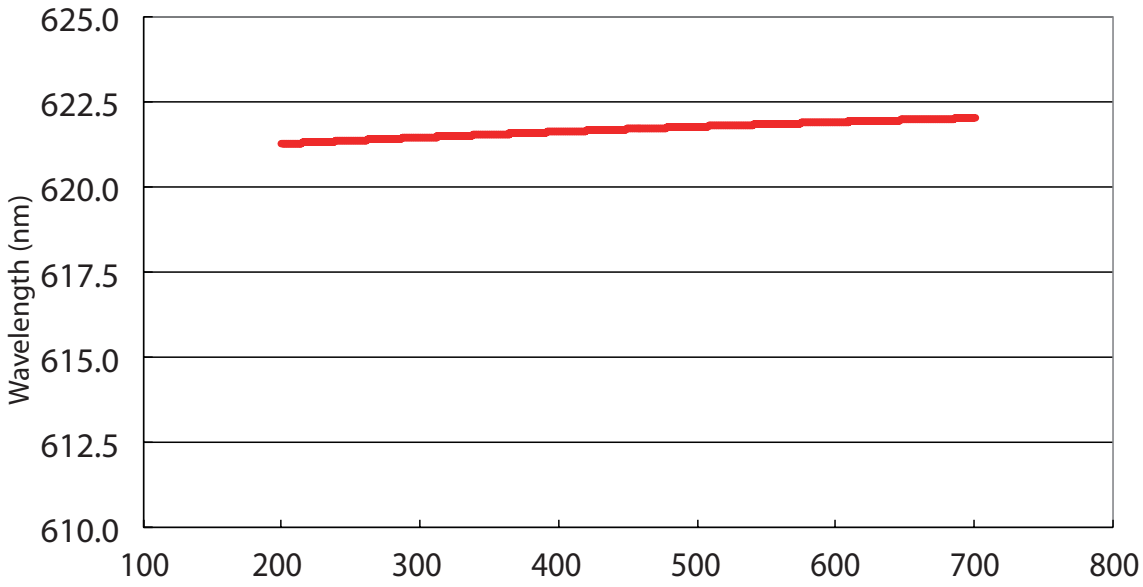


Wavelength vs. Forward Current for 1W Amber

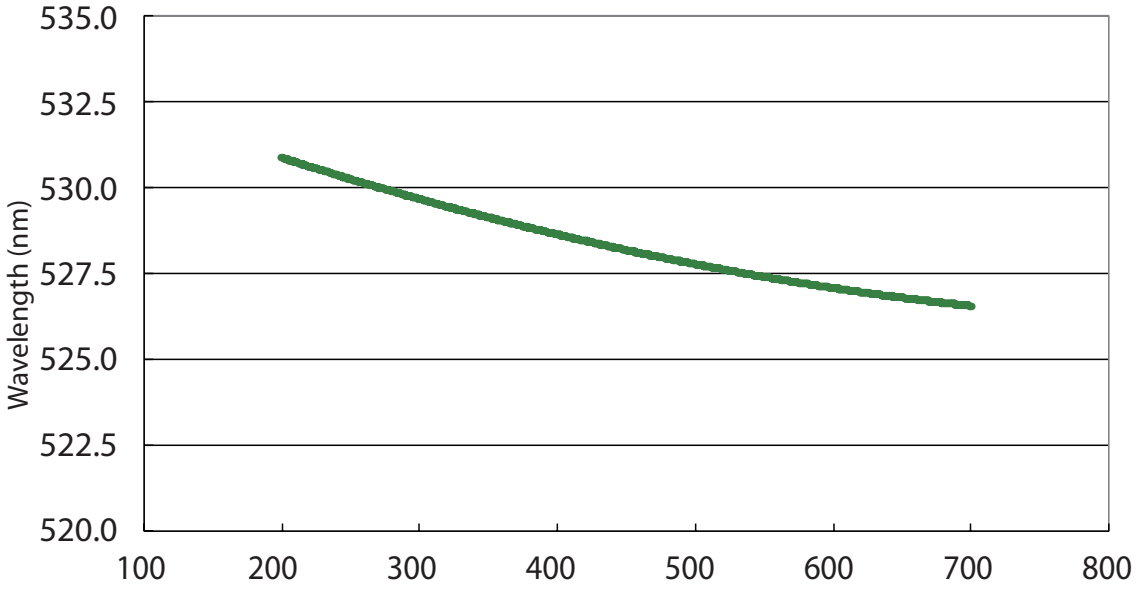


Wavelength vs. Forward Current for 1W Cyan

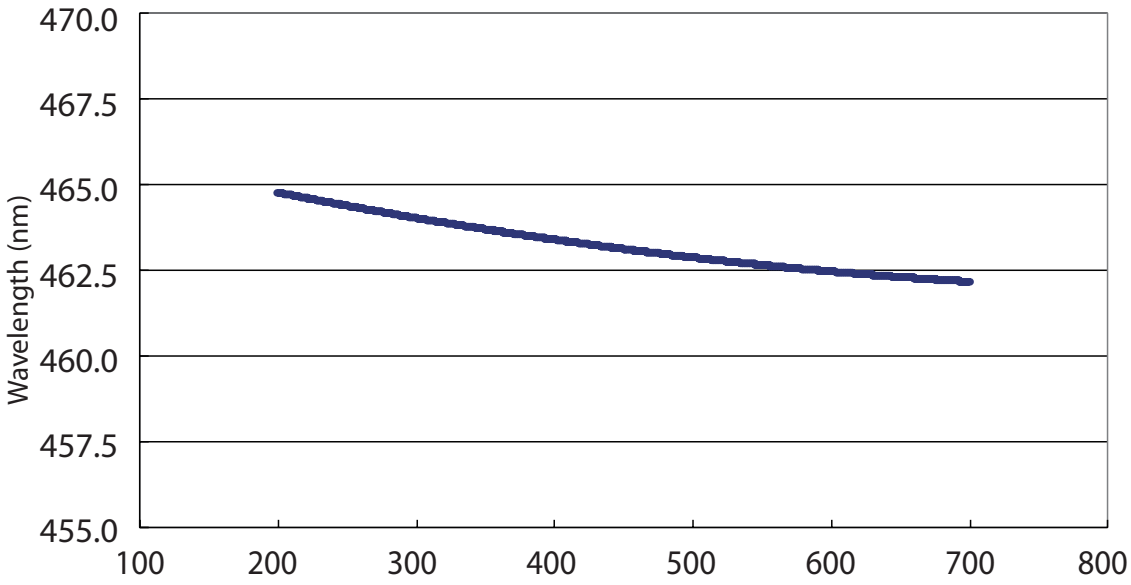
Wavelength vs. Forward Current (3W)



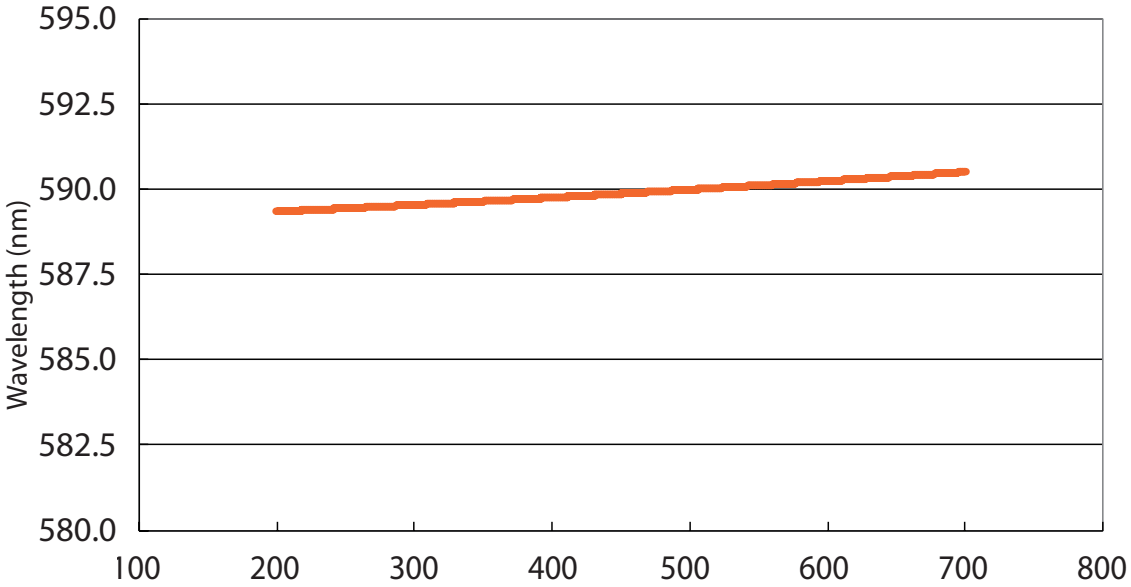
Wavelength vs. Forward Current for 3W Red



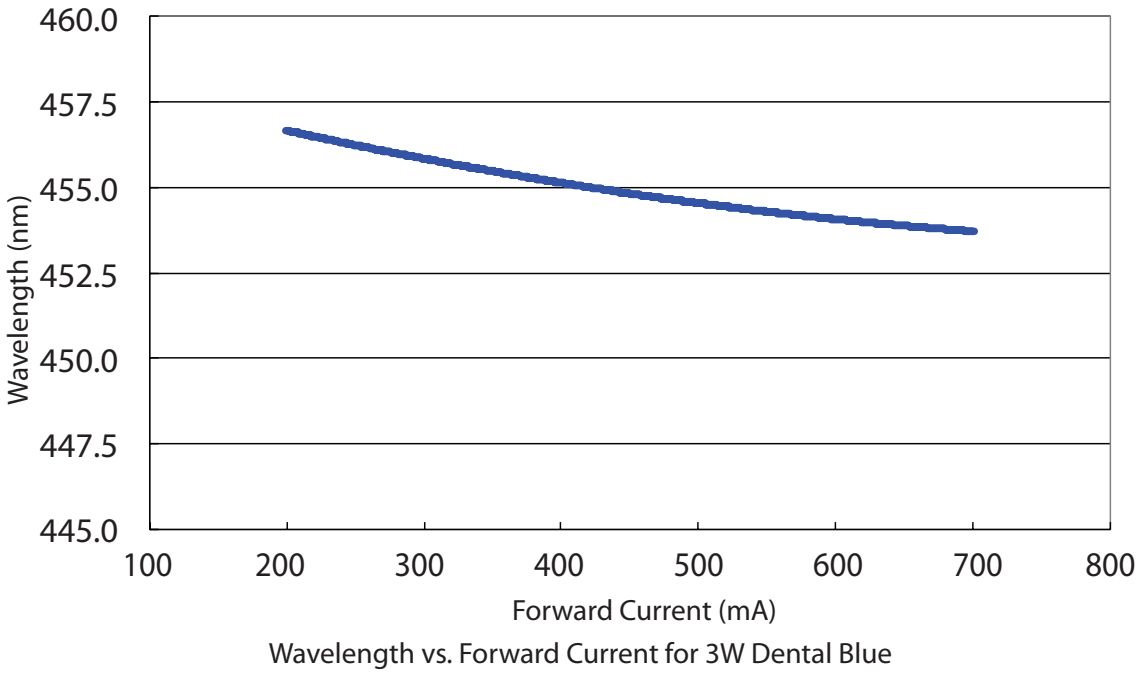
Wavelength vs. Forward Current for 3W True Green



Wavelength vs. Forward Current for 3W Blue

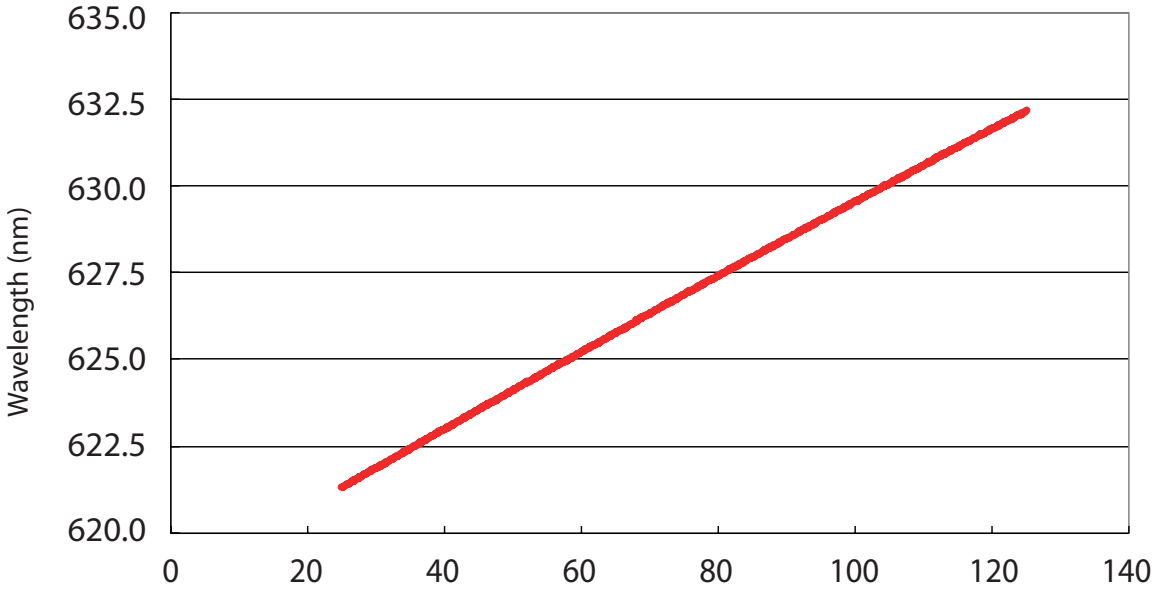


Wavelength vs. Forward Current for 3W Amber

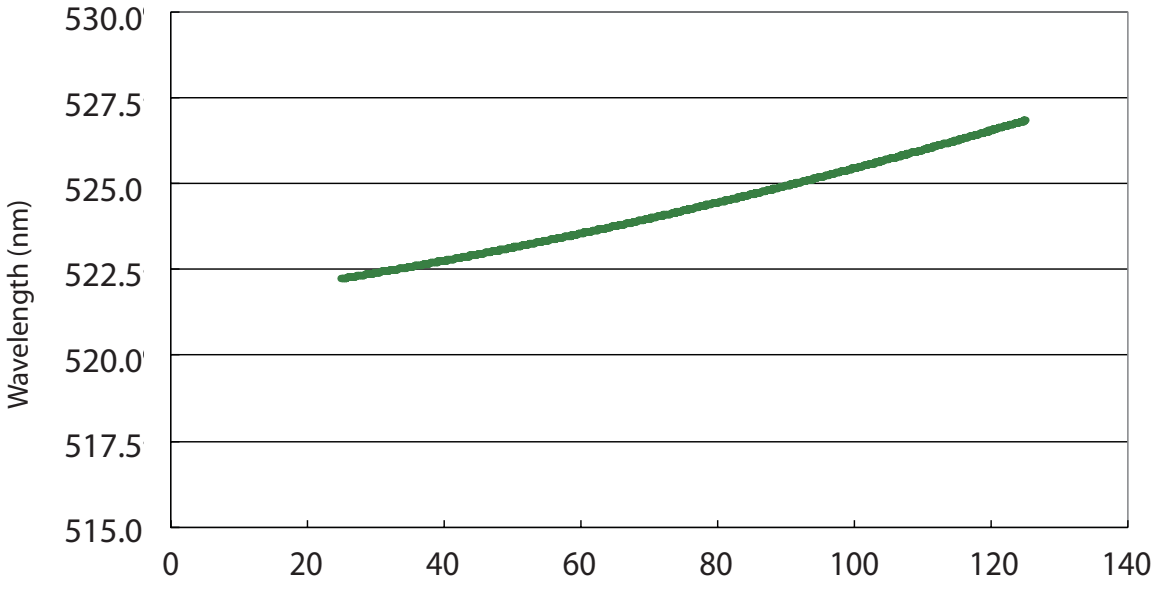


Wavelength vs. Forward Current for 3W Dental Blue

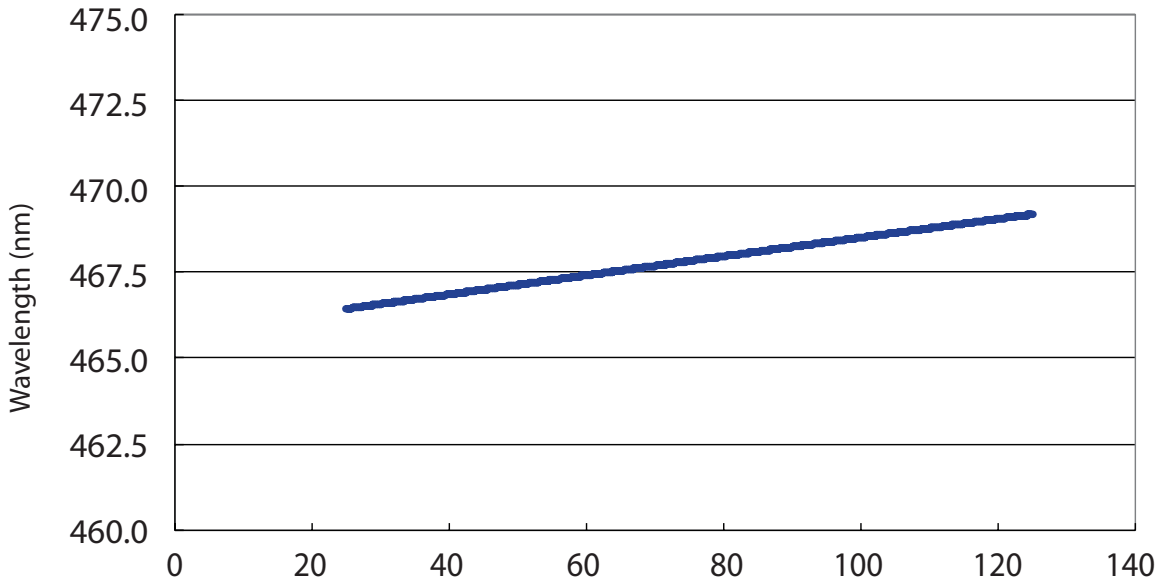
Wavelength vs. Junction Temperature (1W)



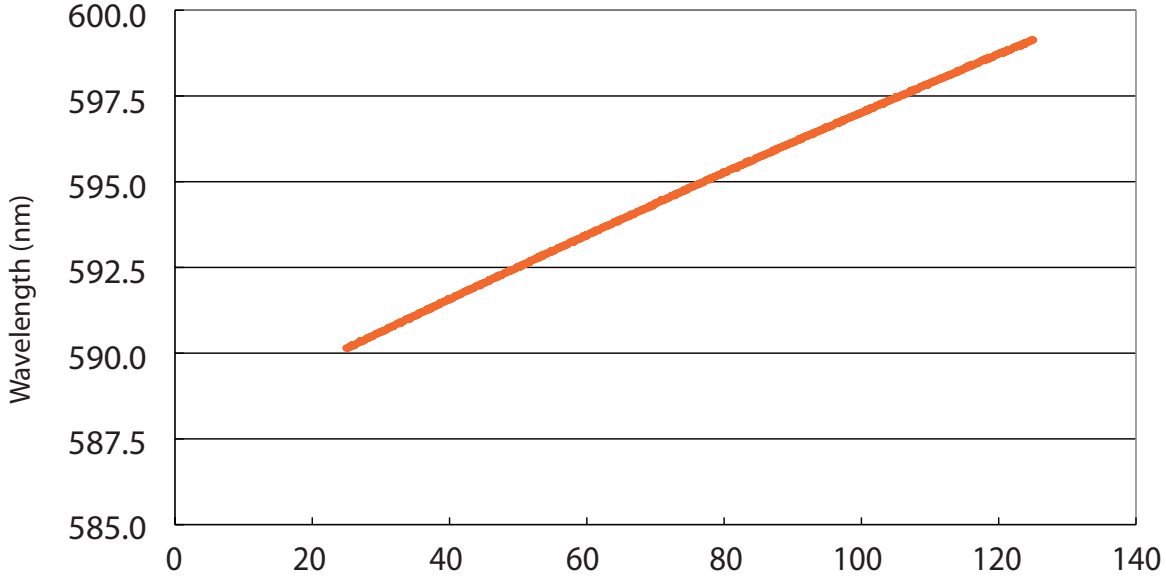
Wavelength vs. junction temperature for 1W Red



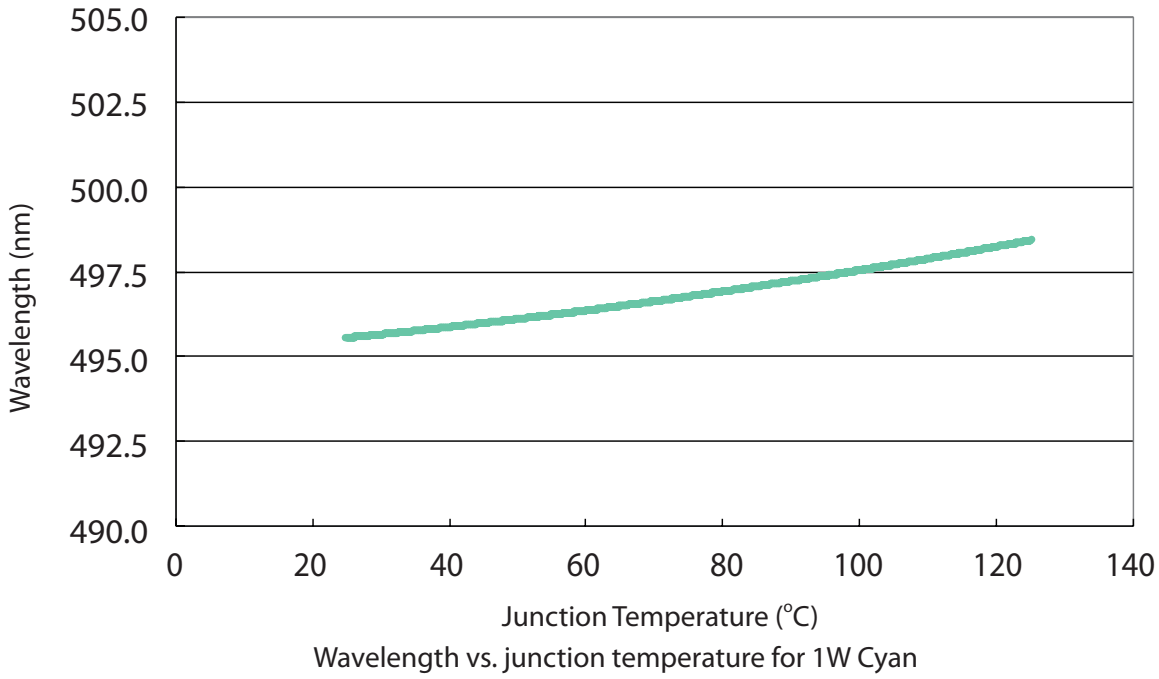
Wavelength vs. junction temperature for 1W True Green



Wavelength vs. junction temperature for 1W Blue

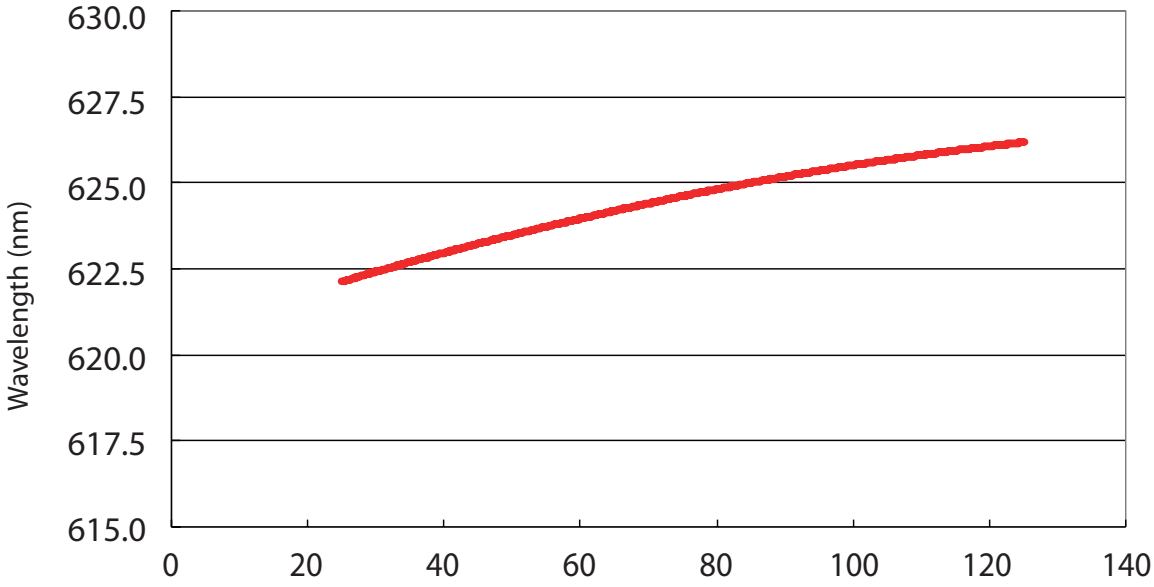


Wavelength vs. junction temperature for 1W Amber

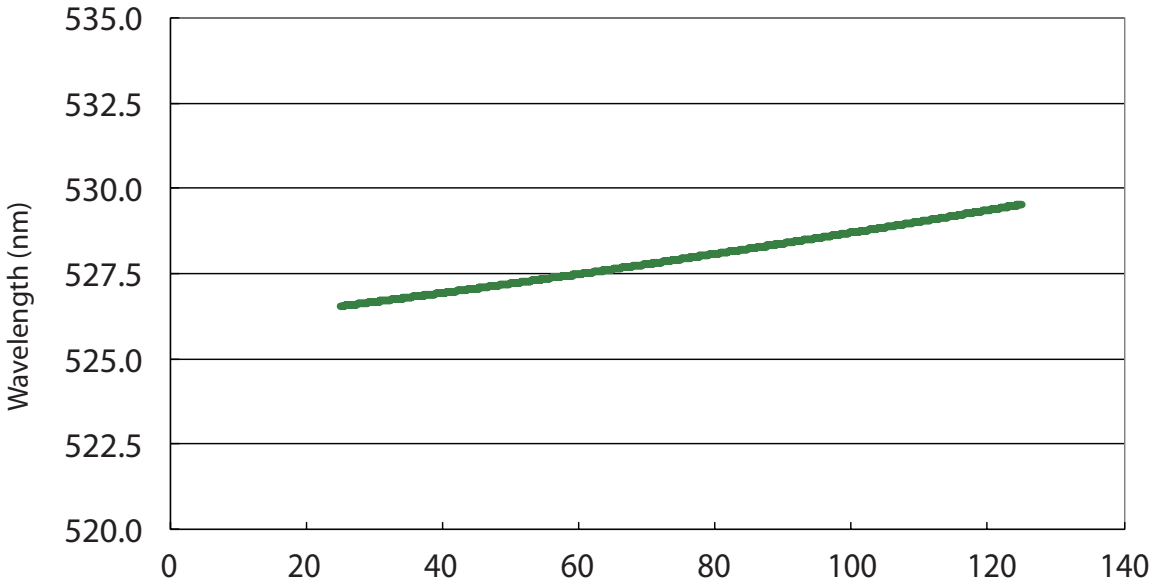


Wavelength vs. junction temperature for 1W Cyan

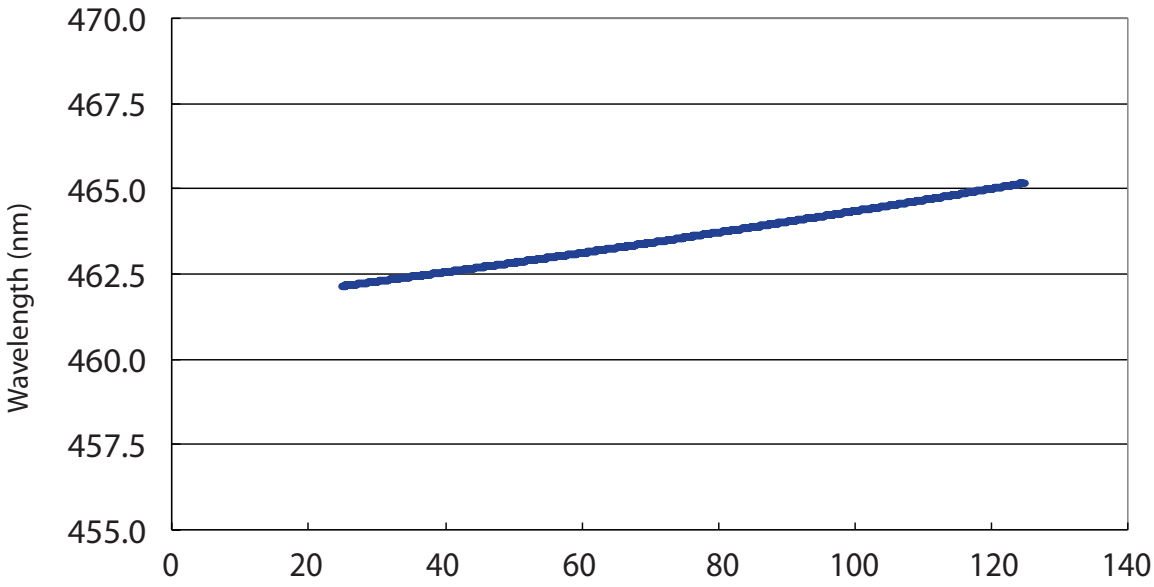
Wavelength vs. Junction Temperature (3W)



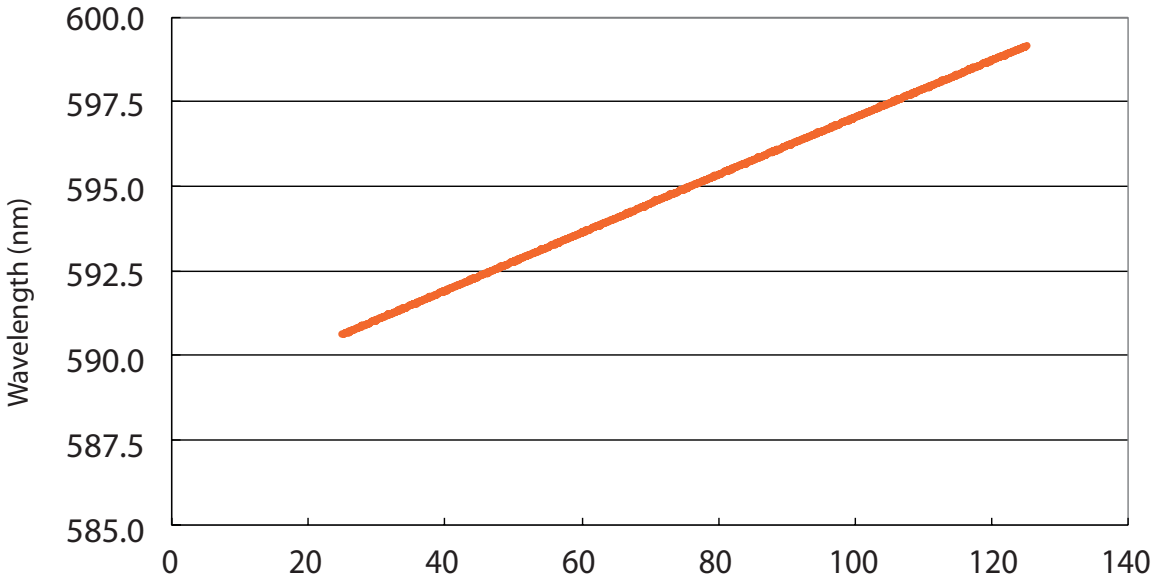
Wavelength vs. junction temperature for 3W Red



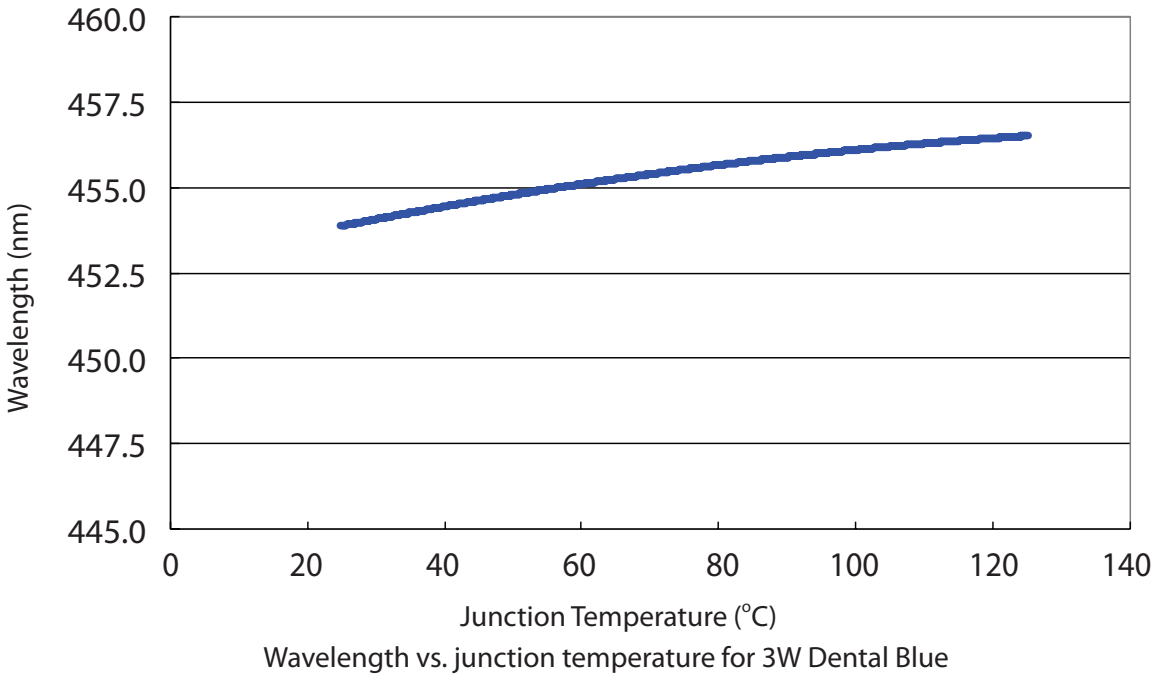
Wavelength vs. junction temperature for 3W True Green



Wavelength vs. junction temperature for 3W Blue

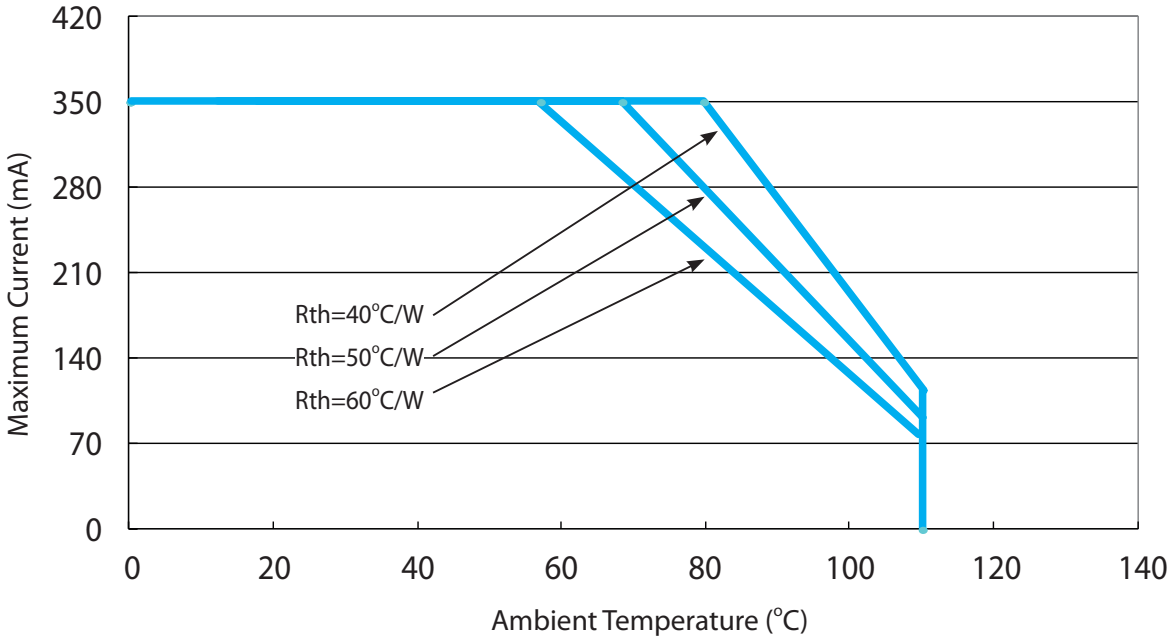


Wavelength vs. junction temperature for 3W Amber

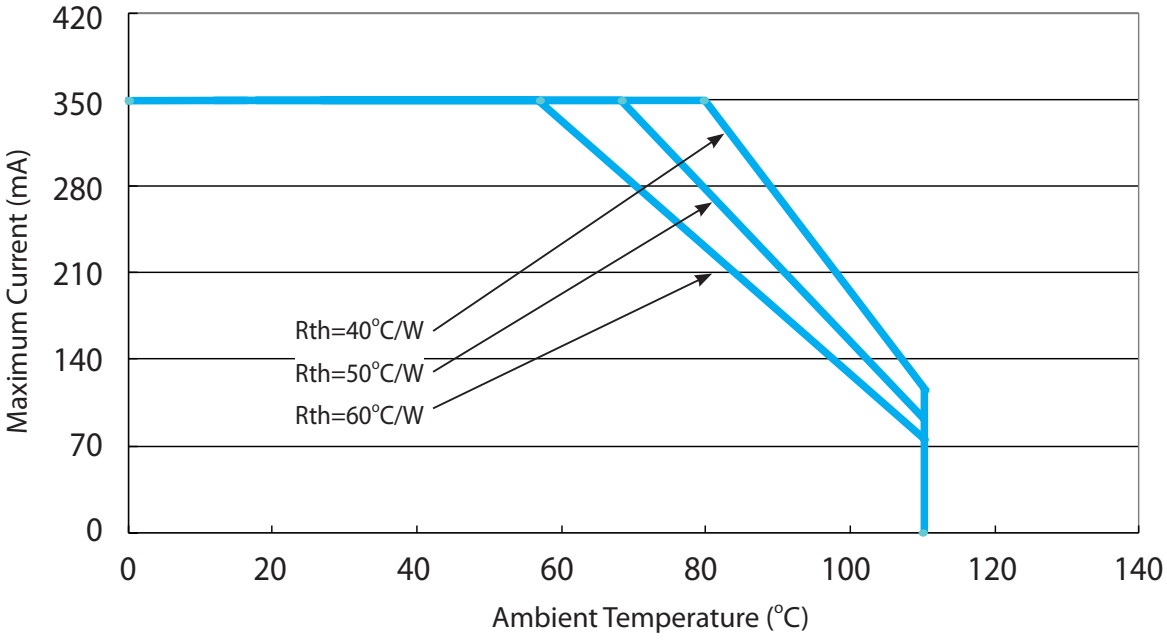


Wavelength vs. junction temperature for 3W Dental Blue

Maximum Current vs. Ambient Temperature (1W)

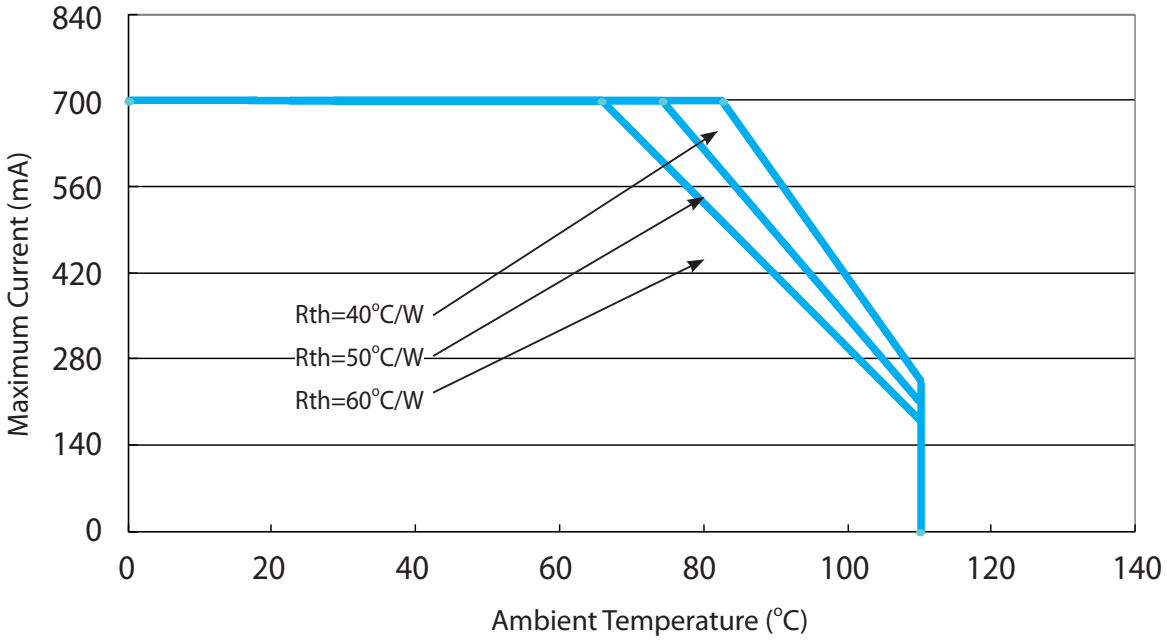


Maximum Current vs. Ambient Temperature for 1W Red and Amber

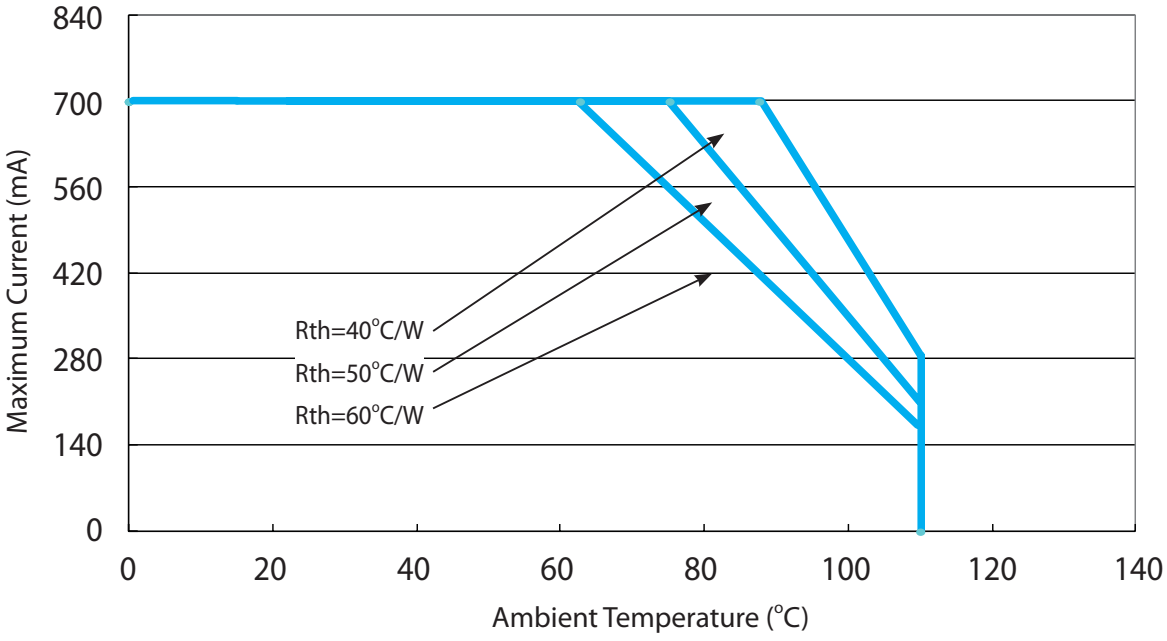


Maximum Current vs. Ambient Temperature for 1W Blue, True Green, and Cyan Blue

Maximum Current vs. Ambient Temperature (3W)



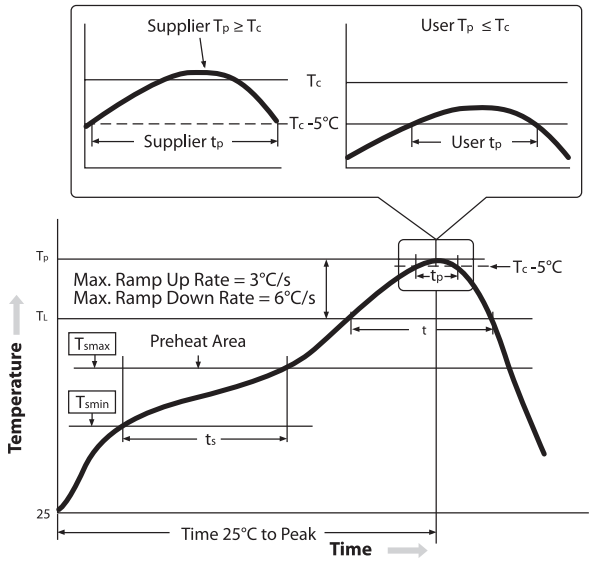
Maximum Current vs. Ambient Temperature for 3W Red and Amber



Maximum Current vs. Ambient Temperature for 3W Blue, True Green, and Dental Blue

Reflow Profile

The following reflow profile is from IPC/JEDEC J-STD-020D which provided here for reference.



Classification Reflow Profiles

Profile Feature	Low-Temp,Pb-Free Assembl
Preheat/Soak Temperature Min (T_{smin}) Temperature Max (T_{smax}) Time (ts) from (T_{smin} to T_{smax})	 150°C 200°C 60-120 seconds
Ramp-up rate (TL to T_P)	3°C/ seconds max.
Liquidous temperature (TL) Time (tL) maintained above TL	217°C 60-150 seconds
Peak package body temperature (T_P) [1]	255°C~260°C
Classification temperature (T_C)	260°C
Time (tp) within 5°C of the specified classification temperature (Tc) [2]	30 seconds
Average ramp-down rate (T_p to T_{smax})	6°C/second max.
Time 25°C to peak temperature	6minutes max

Notes:
1. Tolerance for peak profile temperature (Tp) is defined as a supplier minimum and a user maximum.
2. Tolerance for time at peak profile temperature (tp) is defined as a supplier minimum and a user maximum.

Reliability

NO .	Test Item	Test Condition	Remark
1	Temperature Cycle	-40°C~100°C 30, 30, mins	100 Cycle
2	Thermal Shock	-40°C~100°C 15, 15 mins ≦10 sec	100 Cycle
3	Resistance to Soldering Heat	T_{SOL}=260°C, 30 sec	3 times
4	Moisture Resistance	25°C~65°C 90% RH 24 hrs / 1 cycle	10 Cycle
5	High-Temperature Storage	T_A=100°C	1,000 hrs
6	Humidity Heat Storage	T_A=85°C RH=85%	1,000 hrs
7	Low-Temperature Storage	T_A=-40°C	1,000 hrs
8	Operation Life test	25°C	1,000 hrs
9	High Temperature Operation Life test	85°C	1,000 hrs
10	High Humidity Heat Life Test	85°C, 85%RH	1,000 hrs
11	ON/OFF Test	30 sec ON, 30 sec OFF	10W times

Failure Criteria

Item	Criteria for Judgment	
	Min.	Max.
Lumen Maintenance	85%	-
Δu'v'	-	0.006
Forward Voltage	-	Initial Data x 1.1
Reverse Current	-	10 μA
Resistance to Soldering Heat	No dead lamps or visual damage	

Application Information