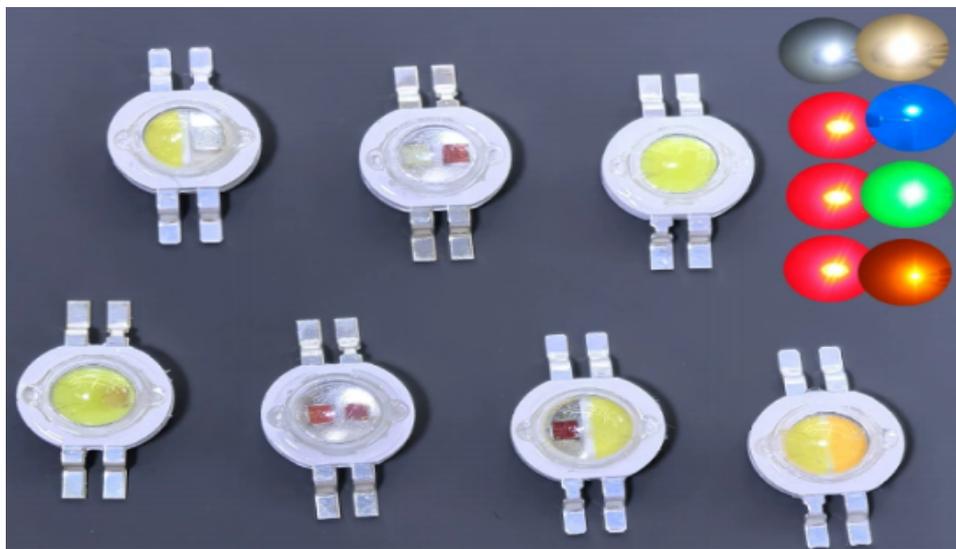




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DUAL Color Series Datasheet



Features :

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



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Absolute Maximum Ratings

Parameter	Symbol	Value	Units
DC Forward Current	(2W) (6W) I_F	350 700	mA
Peak Pulsed Current; (tp≤100μs, Duty cycle=0.25)	(2W) (6W) 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	λ_d	R: 620-630 A: 605-610 G: 520-525 B: 450-455 Y: 585-595	nm
CCT	1800K 2000-3000K 3000-3500K 5000-6500K 4000-4500K 7000-8000K 9000-10000K		
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	-

REMARK

The above colors can be freely combined into 2W 6W two-color. Some colors need to be customized.
Please consult the salesperson for the MOQ of customize the dual color LED

Notes:

1. Wavelengths are stated as peak wavelength.
2. TDS maintains a tolerance of ±5nm for peak wavelength.



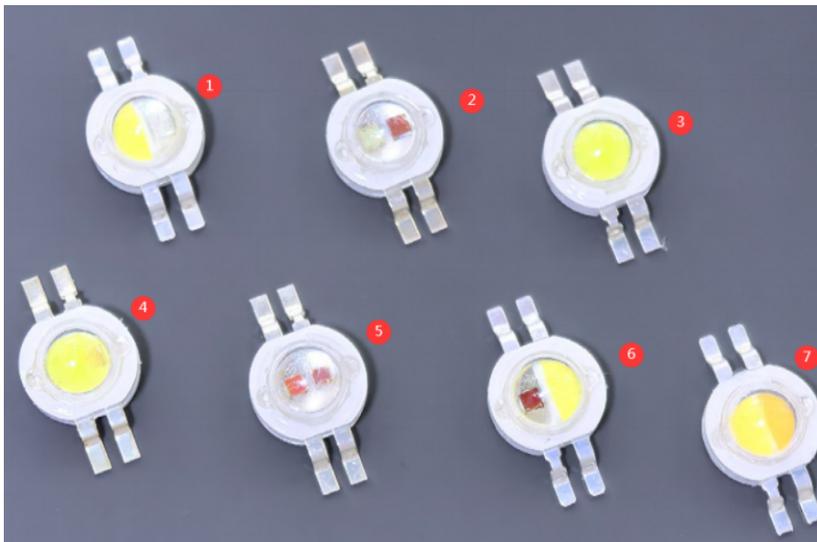
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Luminous Flux Characteristic (T_j=25°C)

Color	Wattage (W)	WLD/CCT (NM/K)	Luminous Flux(lm)	Voltage V	Forward Current (mA)	TDS MODEL ID
Yellow	2W	585-590	Y25-35/W100-120	1.9-2.4	350	TDS-P002L4YW
White	6W	6000-6500	Y40-50/W200-220	3-3.4	700	TDS-P006L4YW
Red	2W	620-630	Y25-35/W100-120	1.9-2.2	350	TDS-P002L4RW
White	6W	6000-6500	Y40-50/W200-220	3-3.4	700	TDS-P006L4RW
Blue	2W	460-465	B15-20/W100-120	1.9-2.2	350	TDS-P002L4RW
White	6W	6000-6500	B30-40/W200-220	3-3.4	700	TDS-P006L4RW
Warm white	2W	3000-3500	100-120	3-3.4	350	TDS-P002L4RW
White	6W	6000-6500	200-220	3-3.4	700	TDS-P006L4RW
Red	2W	620-630	Y25-35/R25-35	1.9-2.4	350	TDS-P002L4RW
Yellow	6W	585-590	Y40-50/R40-50	1.9-2.4	700	TDS-P006L4RW
RED	2W	620-630	R25-35/B15-25	1.9-2.4	350	TDS-P002L4RB
BLUE	6W	460-465	R40-50/B25-35	3-3.4	700	TDS-P006L4RB
RED	2W	620-630	R25-35/G60-70	1.9-2.4	350	TDS-P002L4RG
GREEN	6W	520-530	R40-50/G180-200	3-3.4	700	TDS-P006L4RG

Other color can also be customized according to your requirement.



1.White/Blue (White green) 2.Green/Red(Green yellow) 3.White/White 4.White yellow
5.Yellow Red 6.White yellow (White red) 7.White/warm white

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

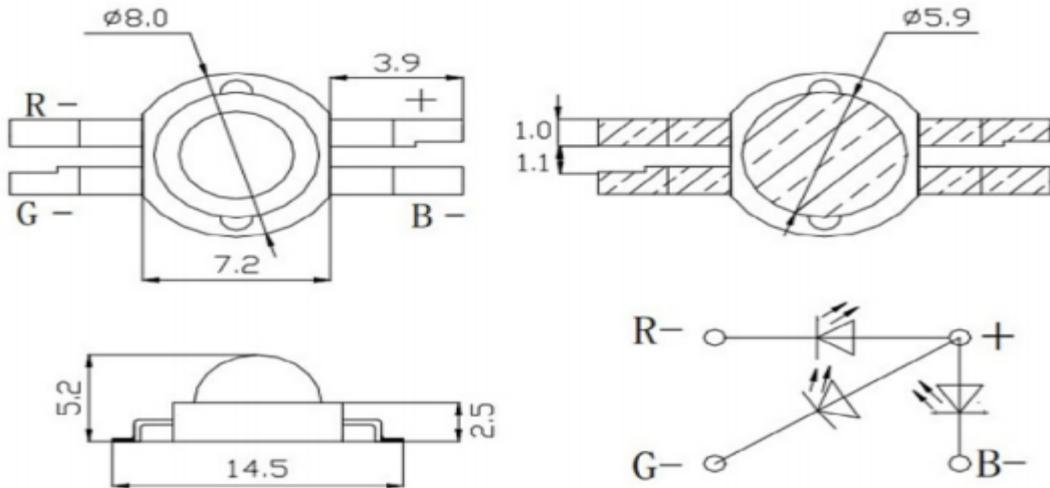


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Mechanical Dimensions

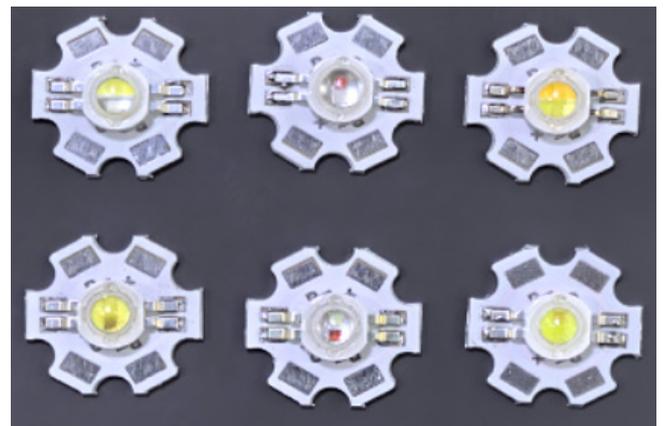
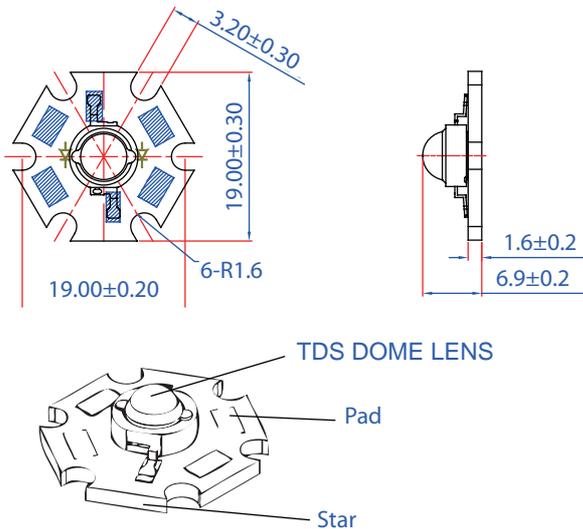
Emitter Type Dimension



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.

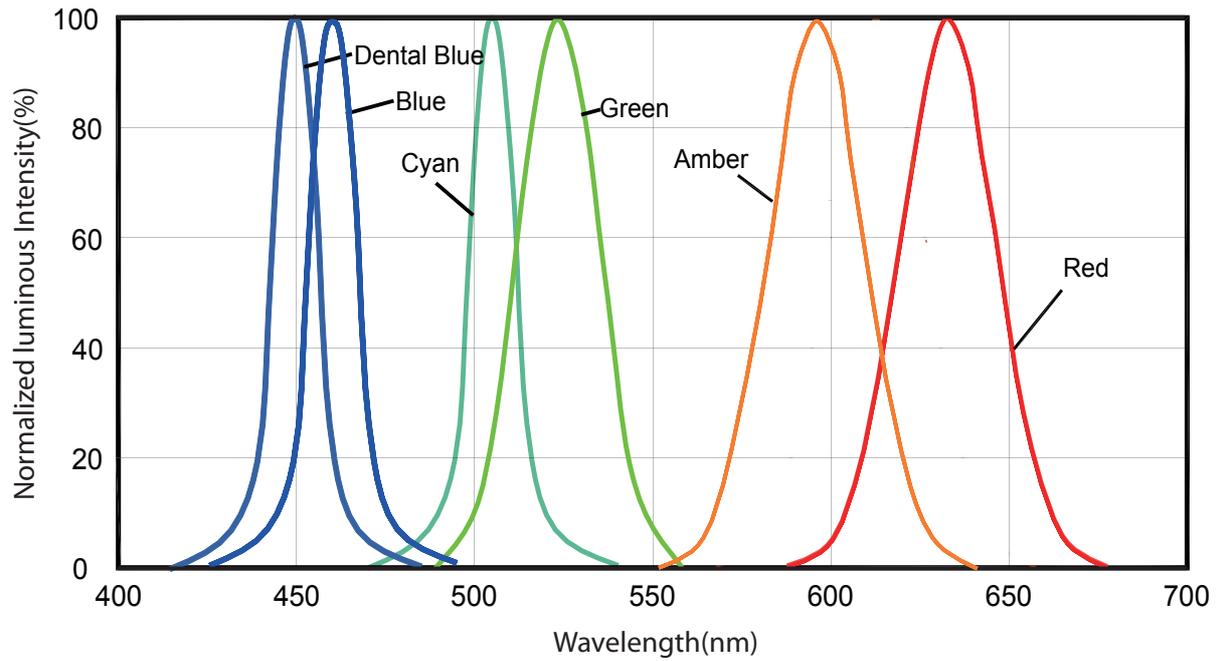


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Characteristic curve

Color Spectrum



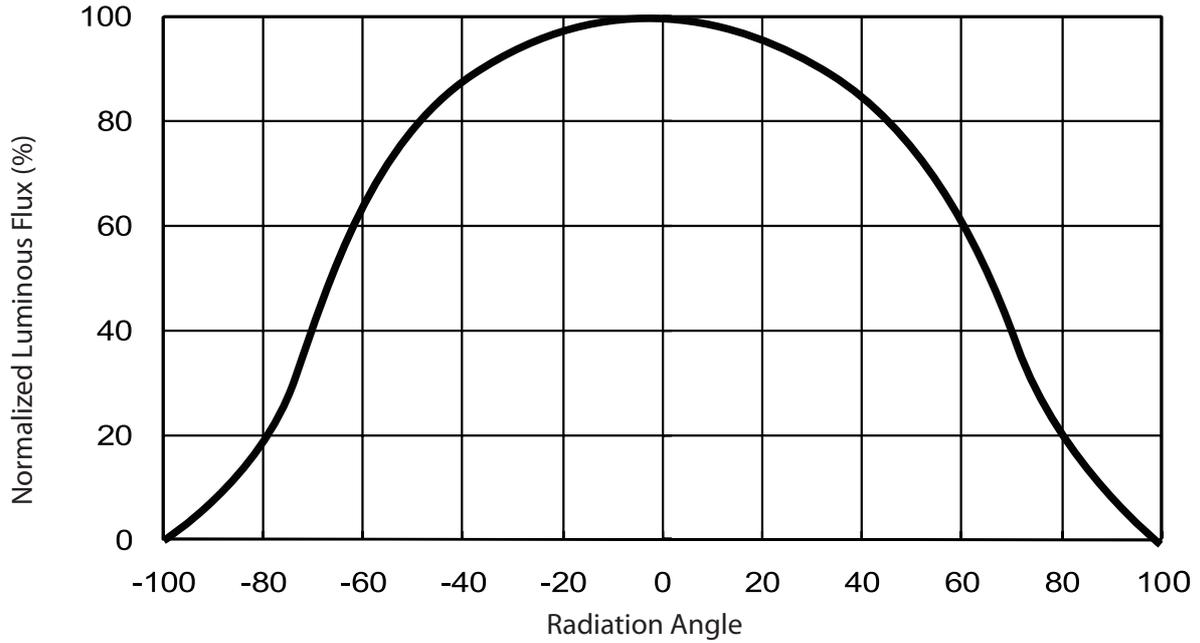
Color Spectrum at a typical CCT for TDS-P001/3L4 Single color



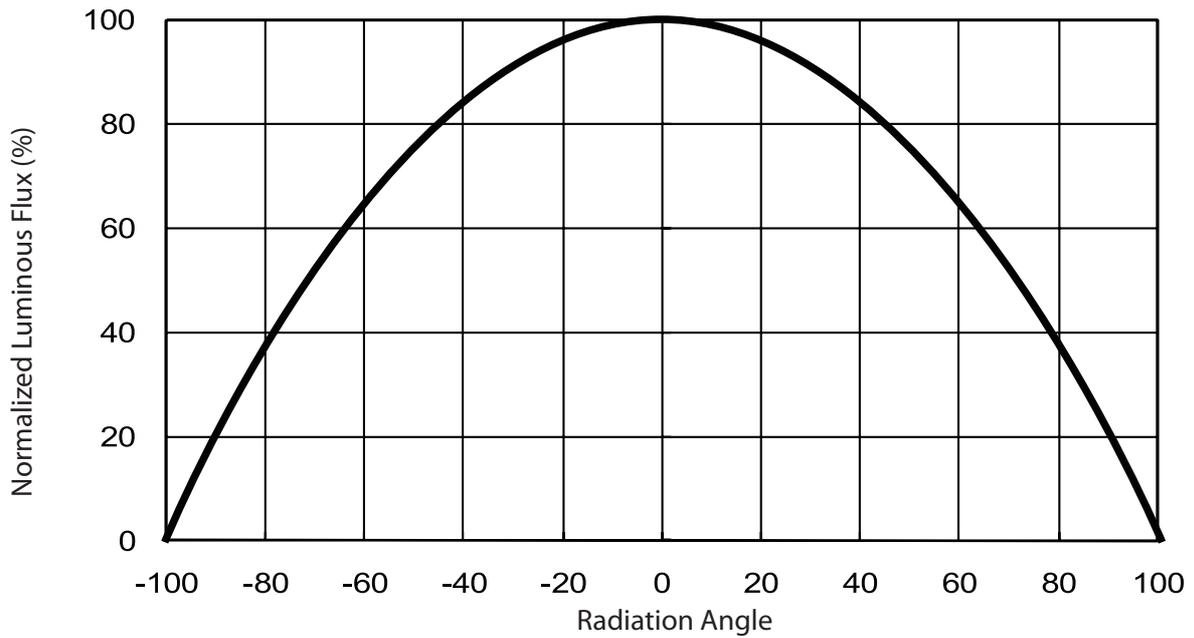
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Beam Pattern



Typical Spatial distribution for Red ,Amber



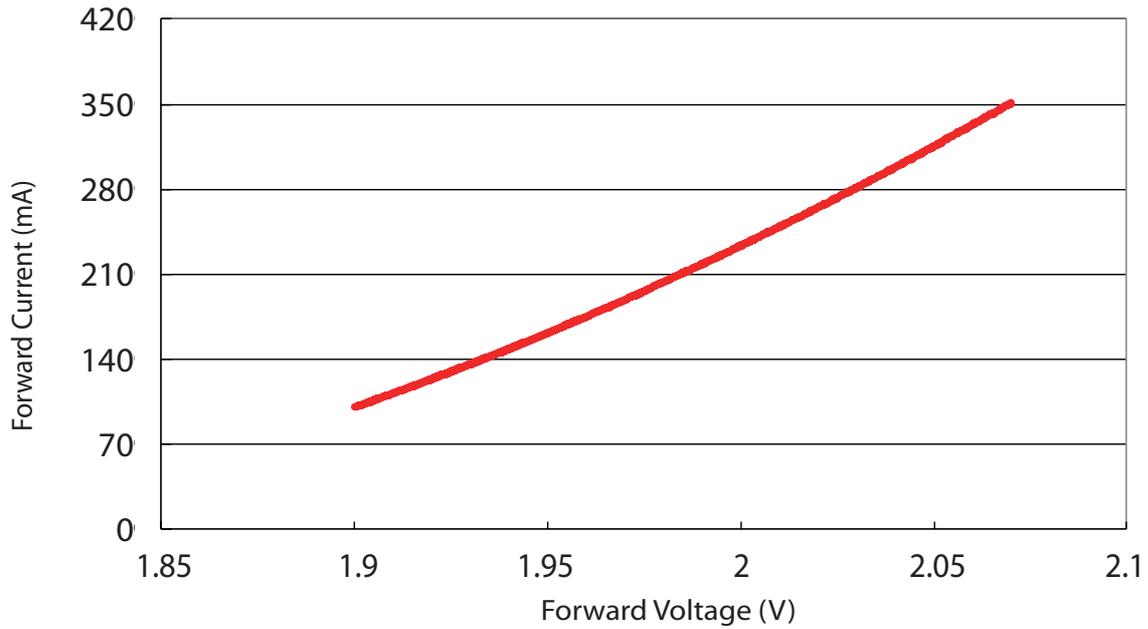
Typical Spatial distribution for Blue and True Green, Cyan, Dental Blue



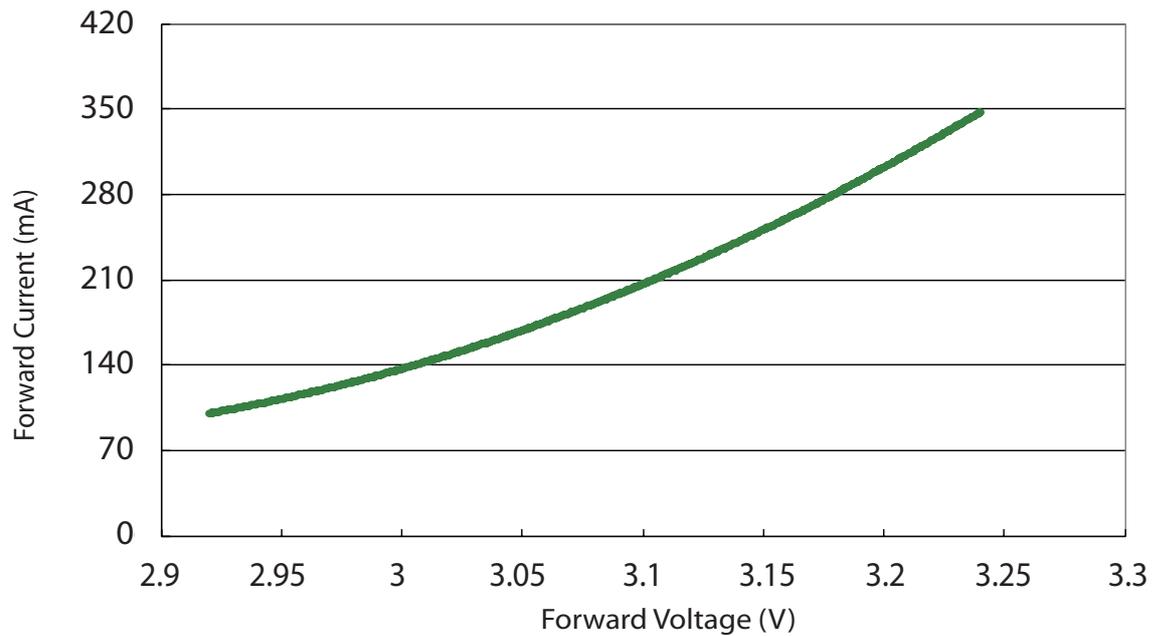
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Forward Current vs. Forward Voltage (1W)



Forward Current vs. Forward Voltage for 1W Red

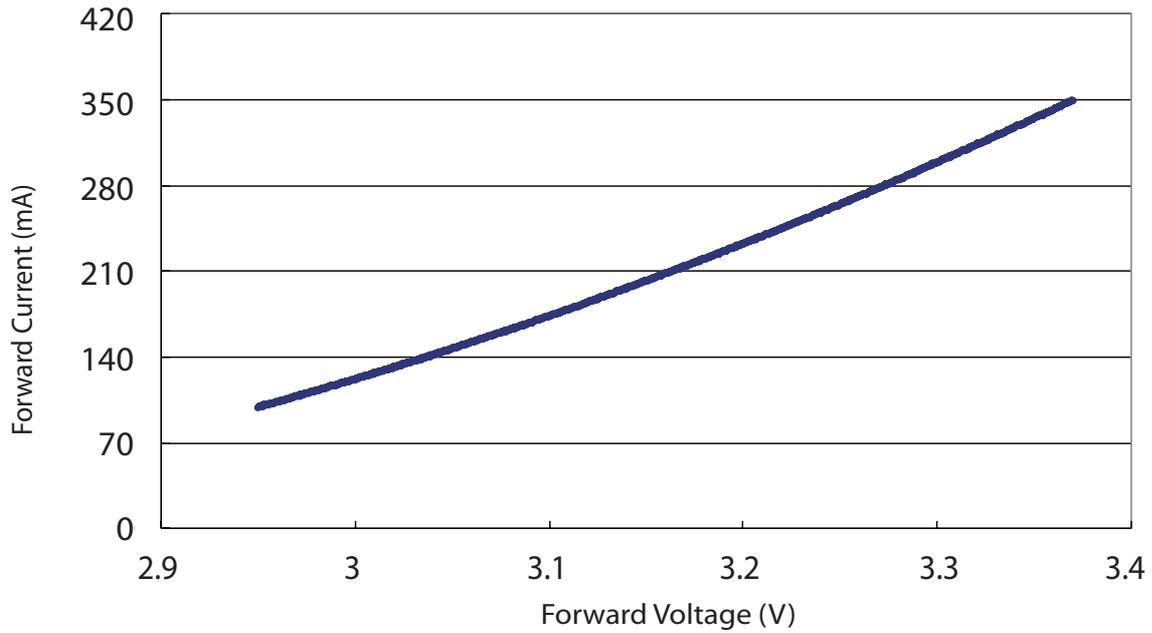


Forward Current vs. Forward Voltage for 1W True Green

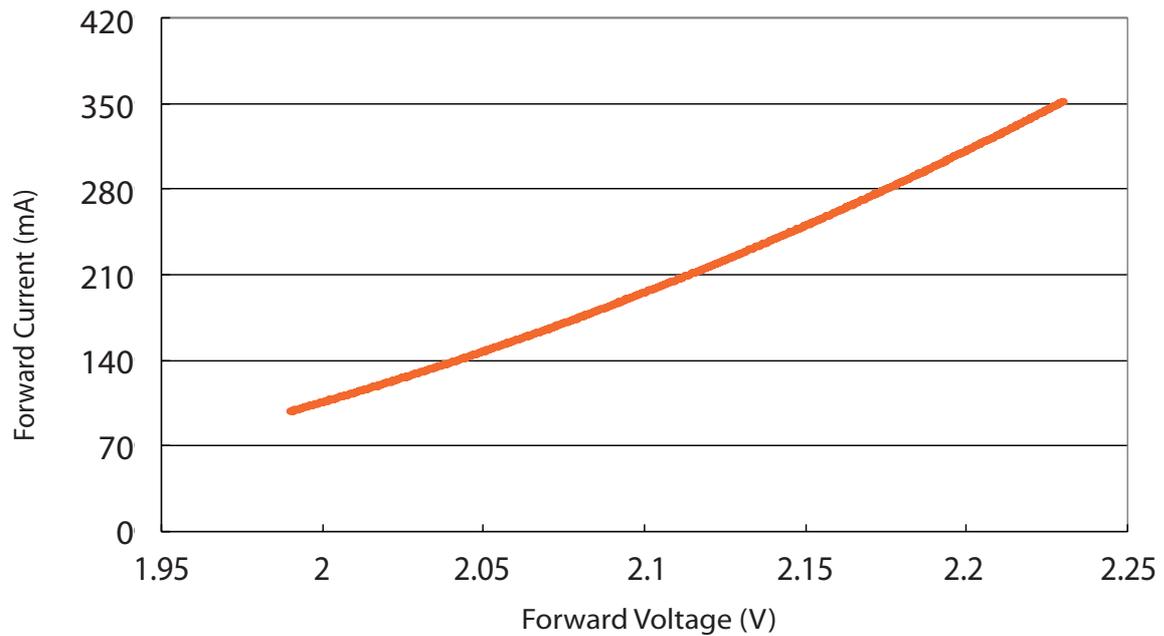


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Forward Current vs. Forward Voltage for 1W Blue

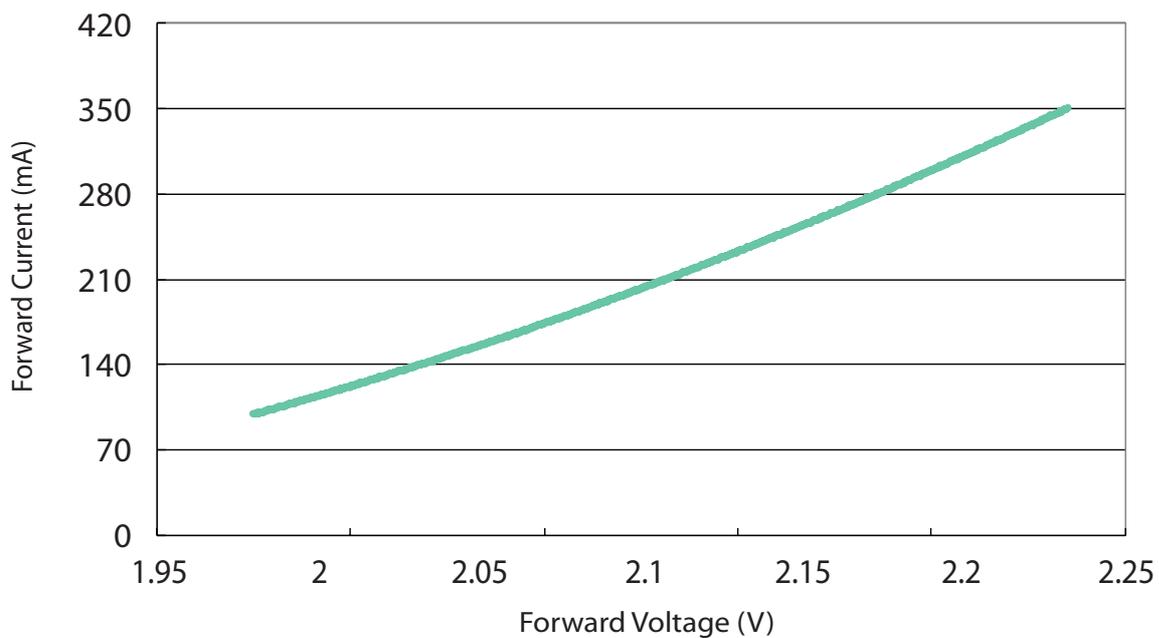


Forward Current vs. Forward Voltage for 1W Amber



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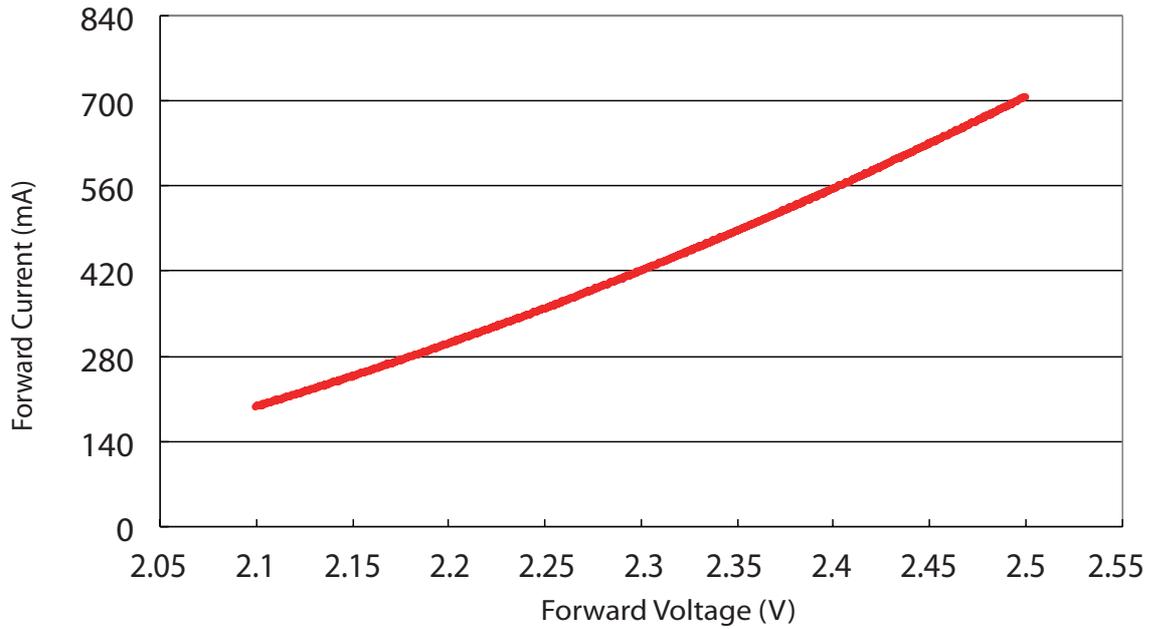
Forward Current vs. Forward Voltage for 1W Cyan



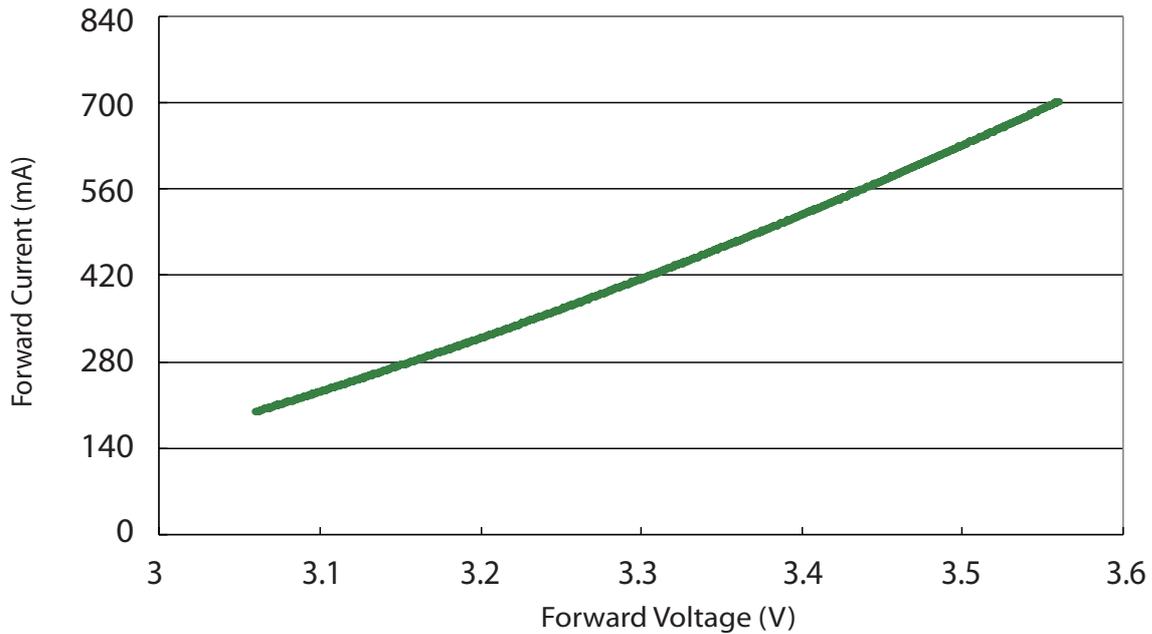
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Forward Current vs. Forward Voltage (3W)



Forward Current vs. Forward Voltage for 3W Red

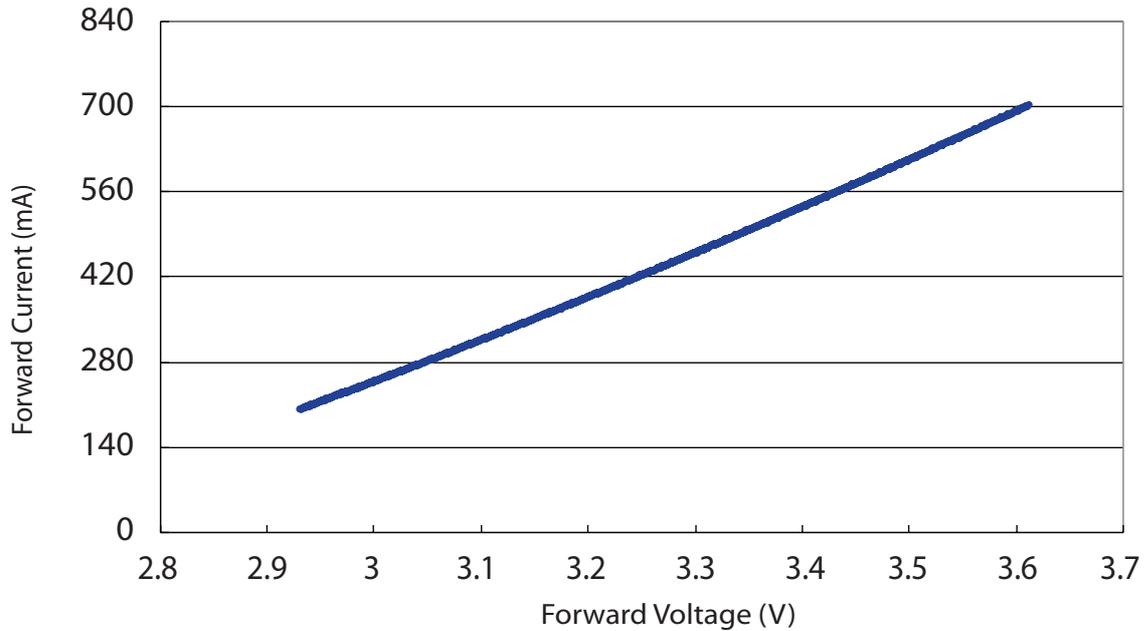


Forward Current vs. Forward Voltage for 3W True Green

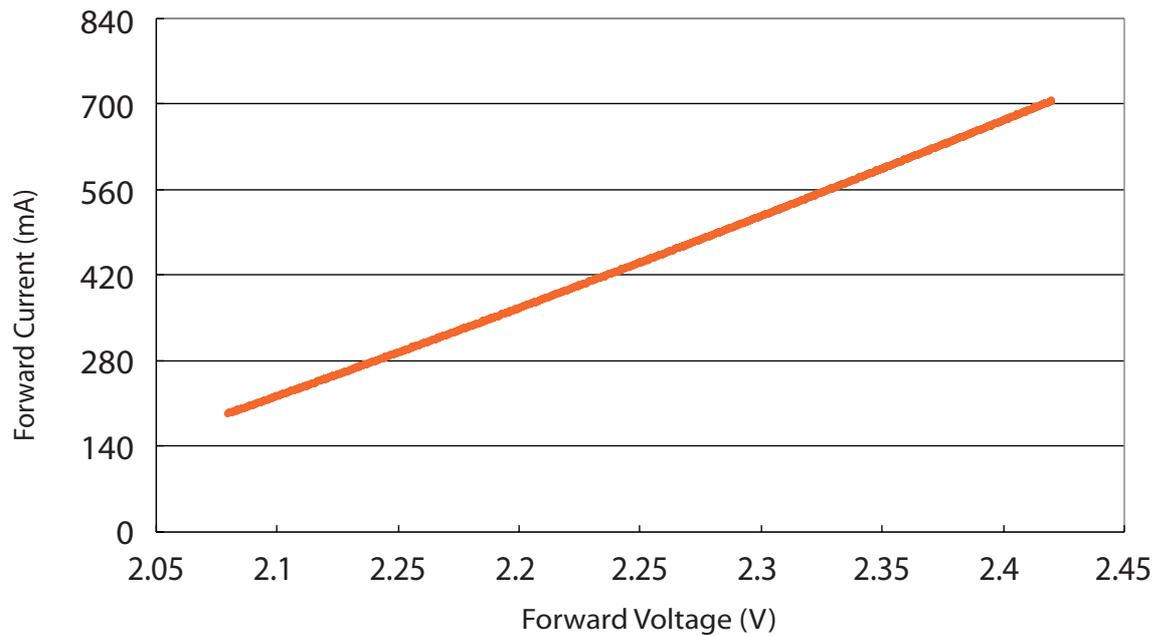


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Forward Current vs. Forward Voltage for 3W Blue

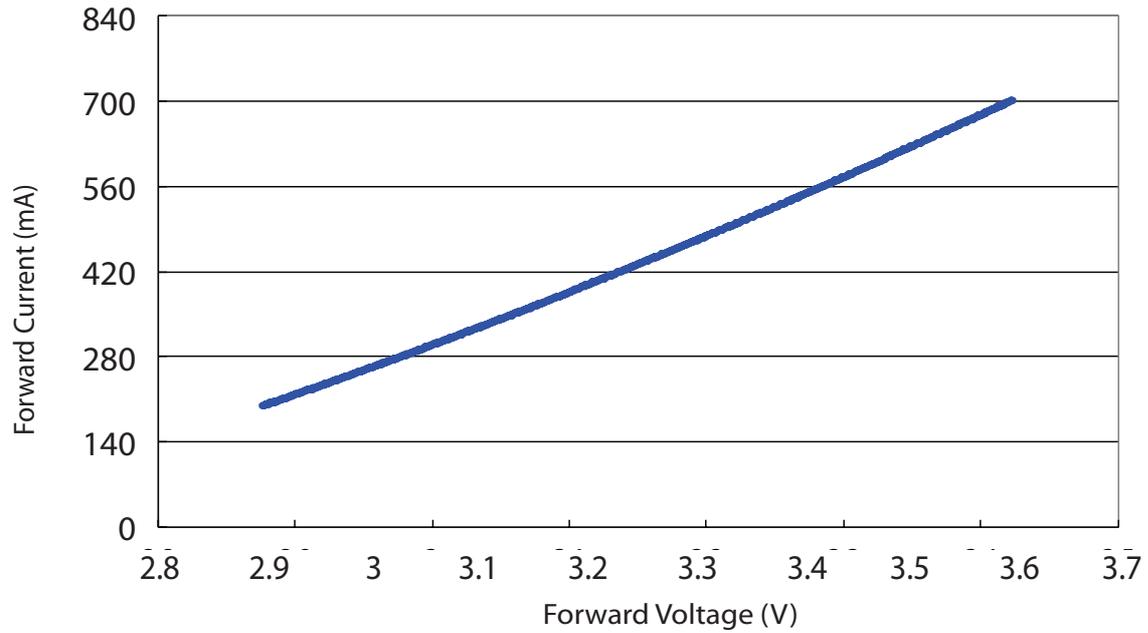


Forward Current vs. Forward Voltage for 3W Amber



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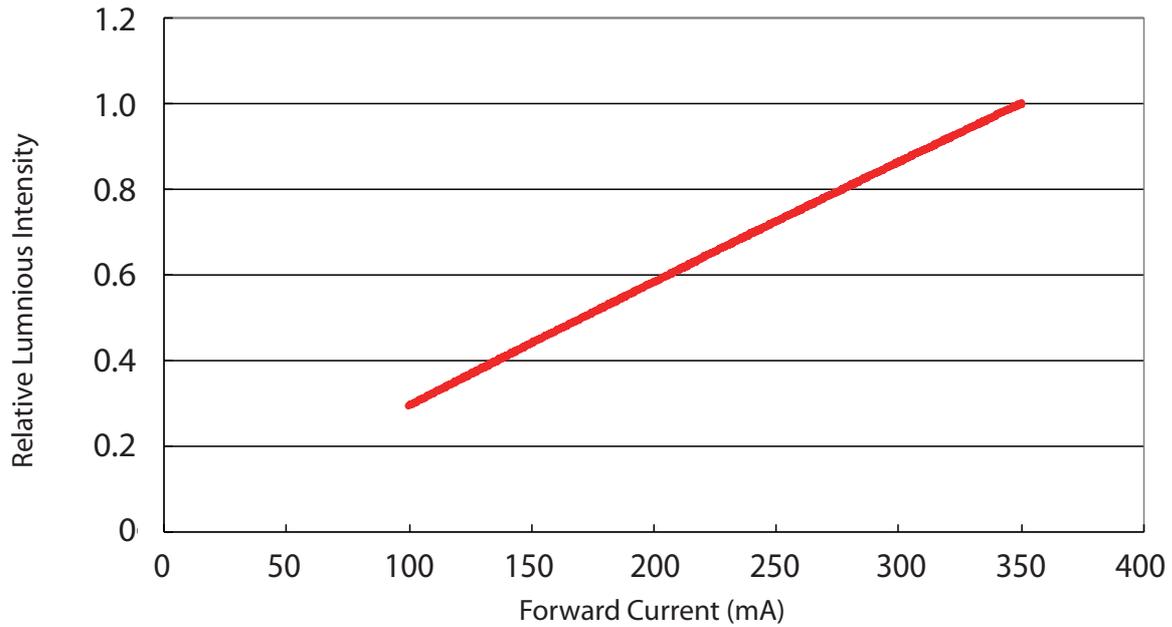
Forward Current vs. Forward Voltage for 3W Dental Blue



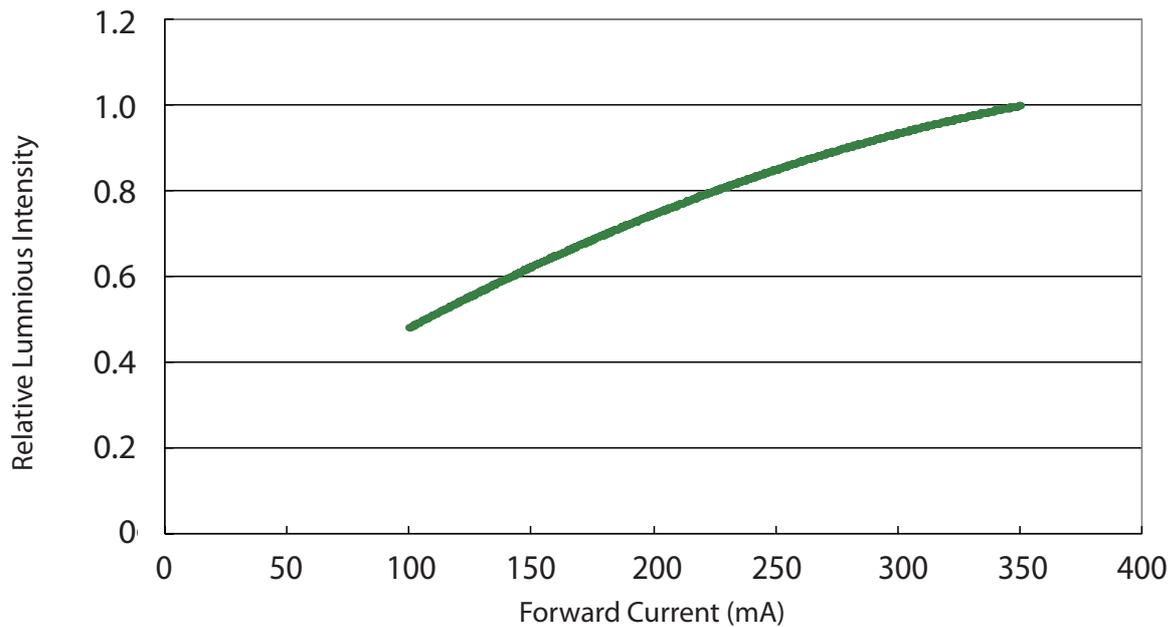
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Relative Luminous Intensity vs. Forward Current (1W)



Relative Luminous Intensity vs. Forward Current for 1W Red

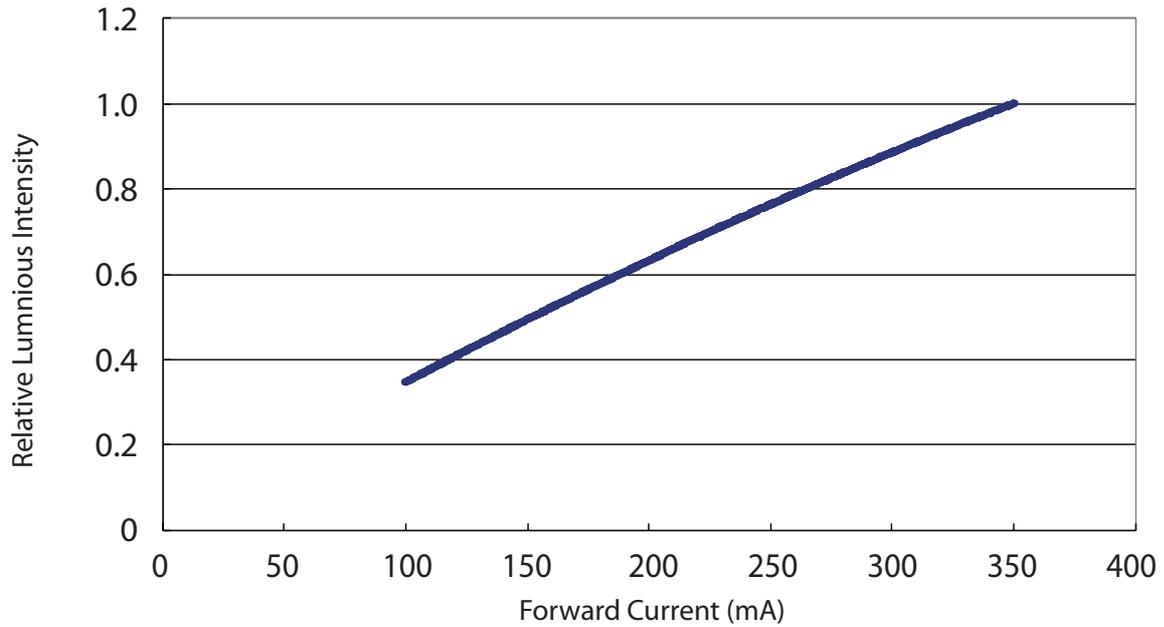


Relative Luminous Intensity vs. Forward Current for 1W True Green

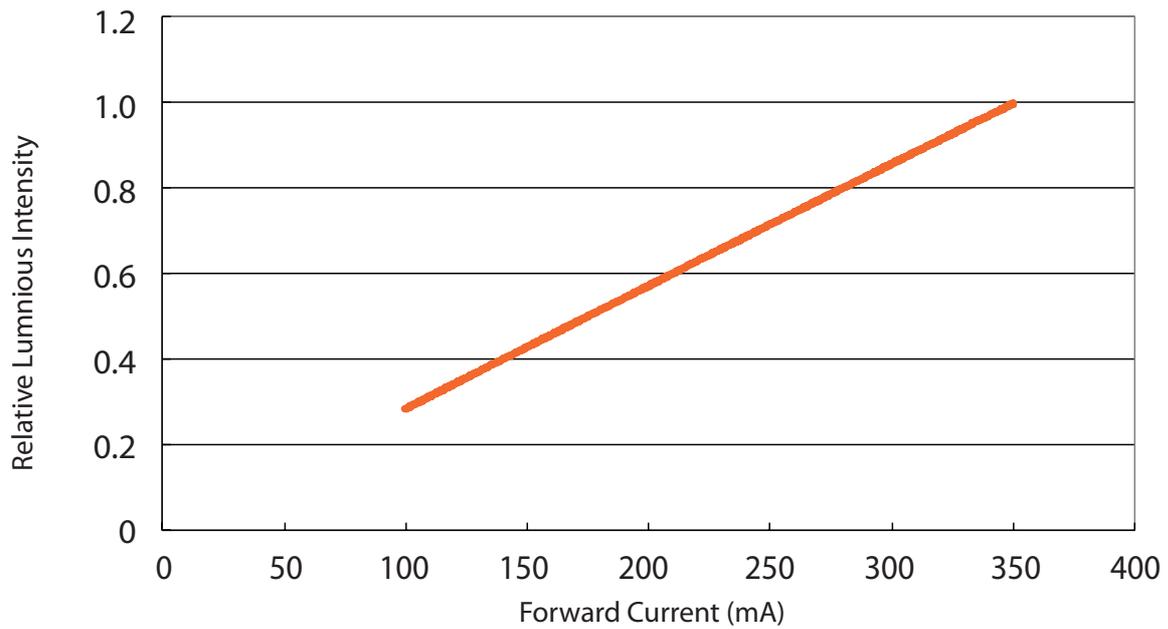


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Relative Luminous Intensity vs. Forward Current for 1W Blue

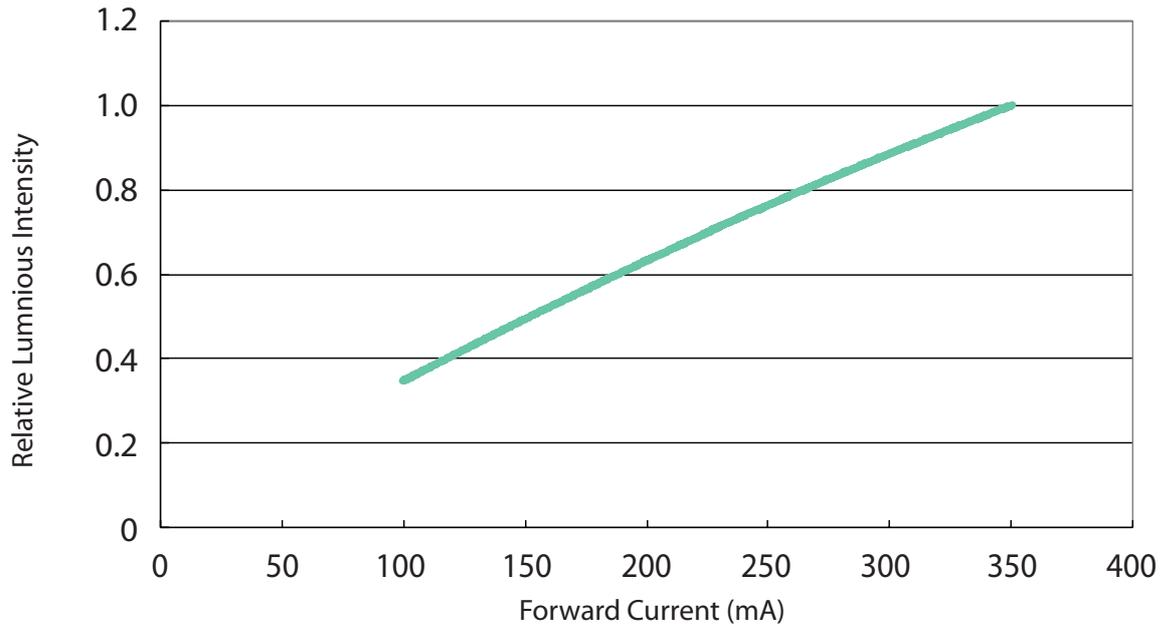


Relative Luminous Intensity vs. Forward Current for 1W Amber



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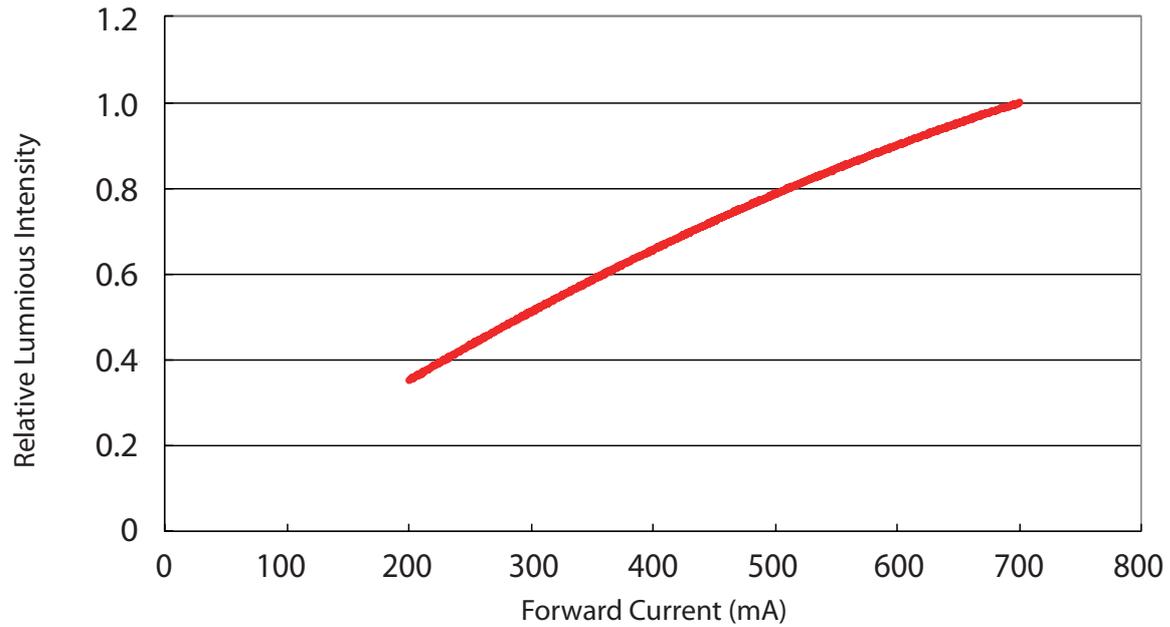
Relative Luminous Intensity vs. Forward Current for 1W Cyan



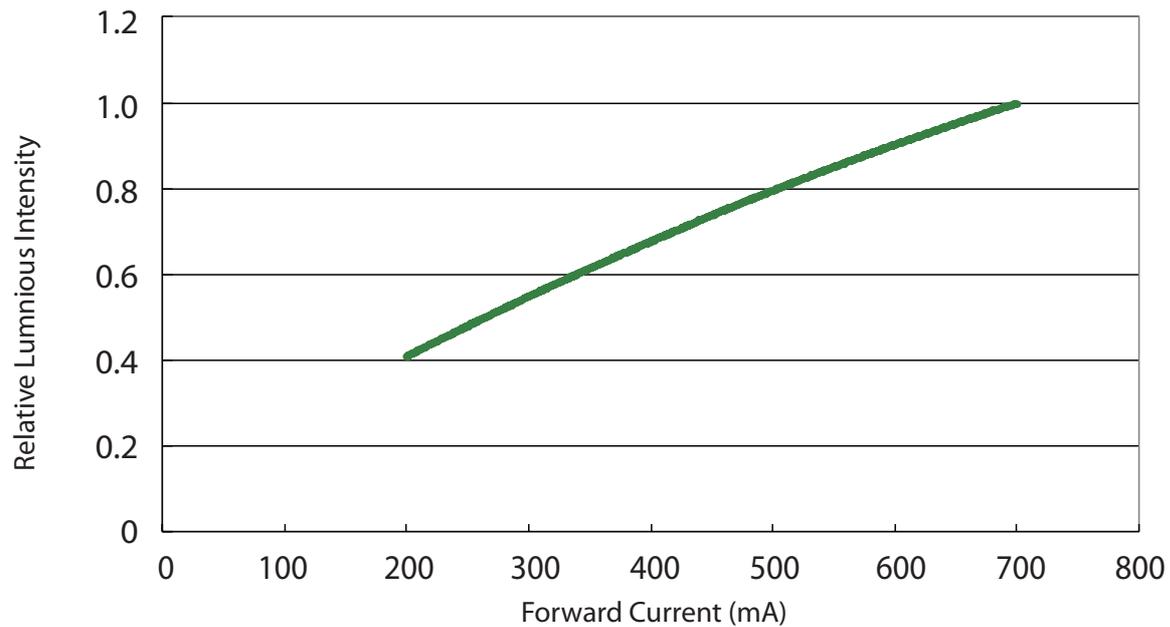
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Relative Intensity vs. Forward Current (3W)



Relative Luminous Intensity vs. Forward Current for 3W Red

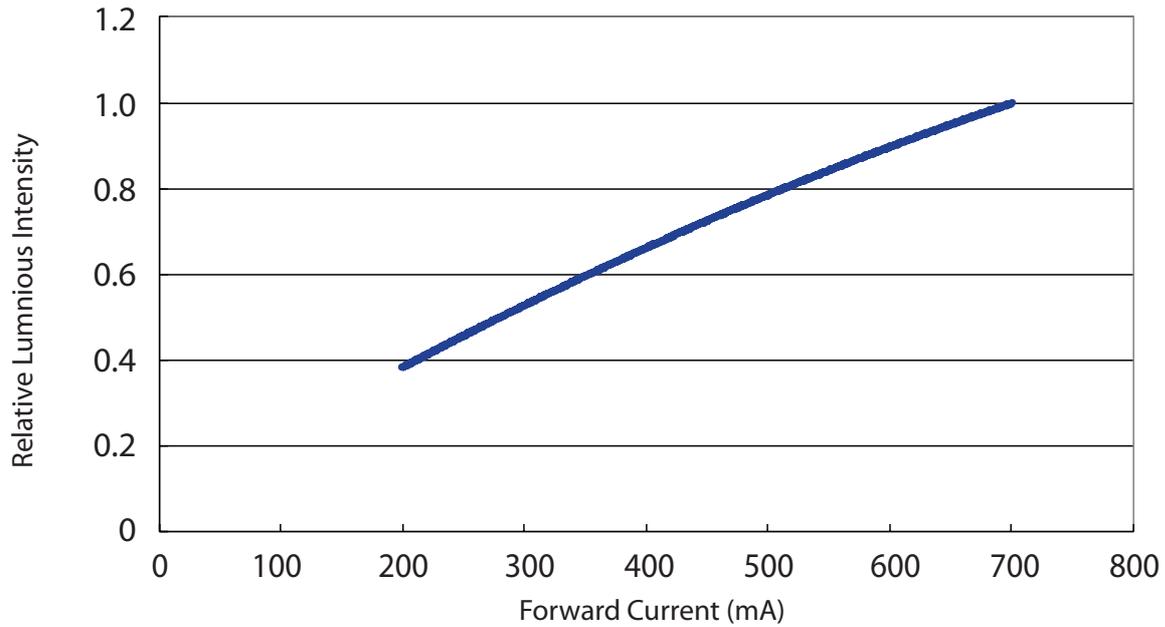


Relative Luminous Intensity vs. Forward Current for 3W True Green

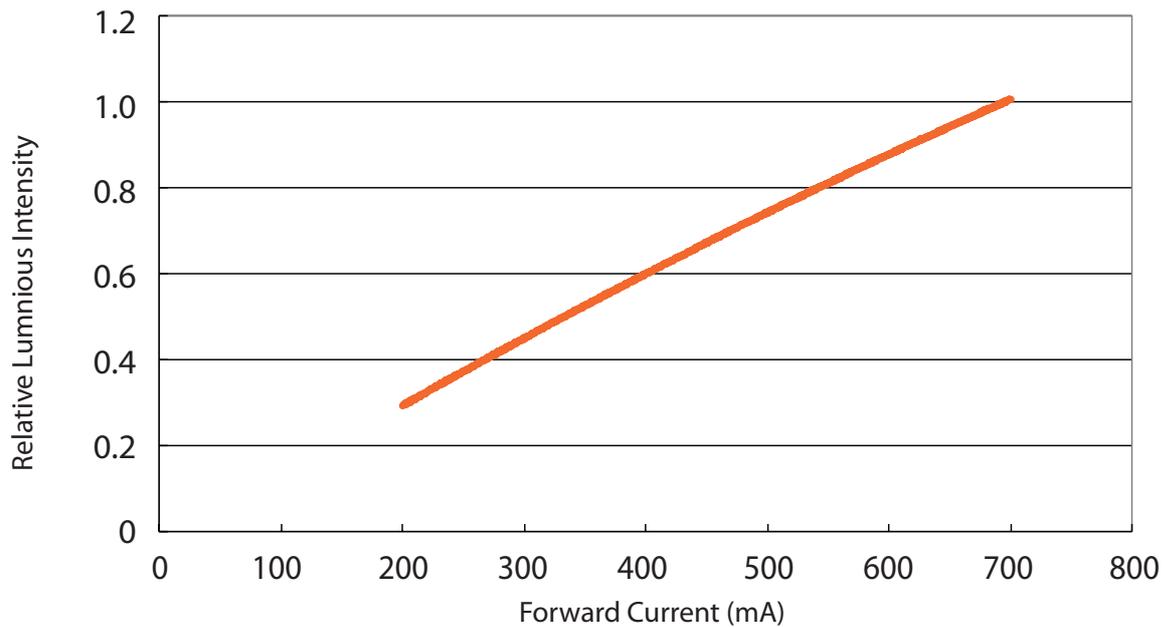


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Relative Luminous Intensity vs. Forward Current for 3W Blue

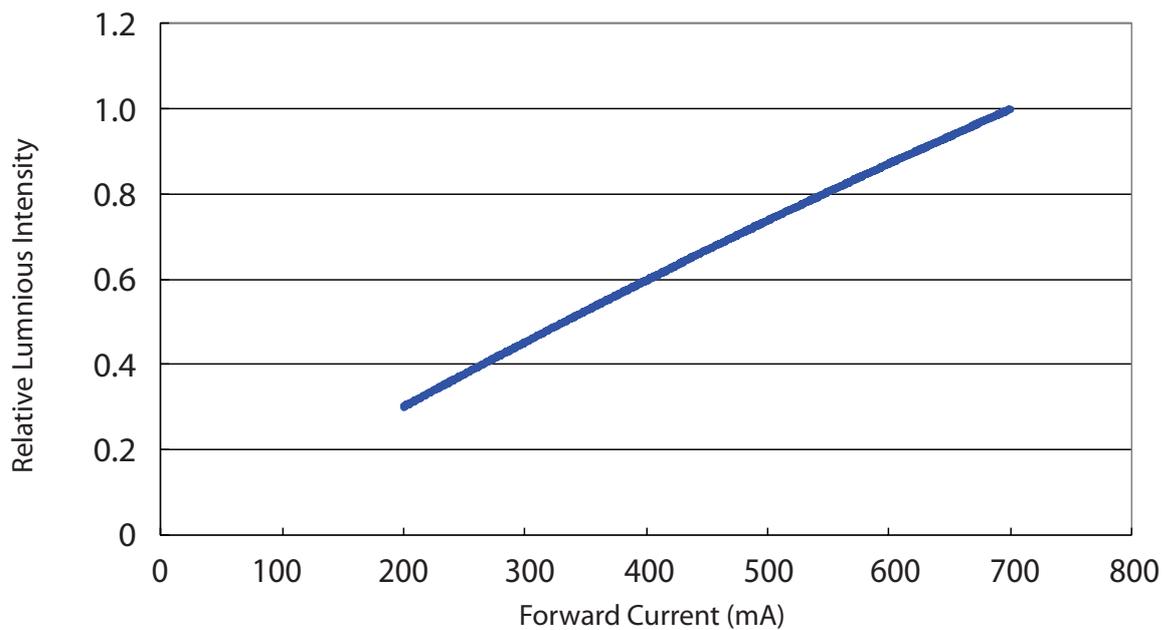


Relative Luminous Intensity vs. Forward Current for 3W Amber



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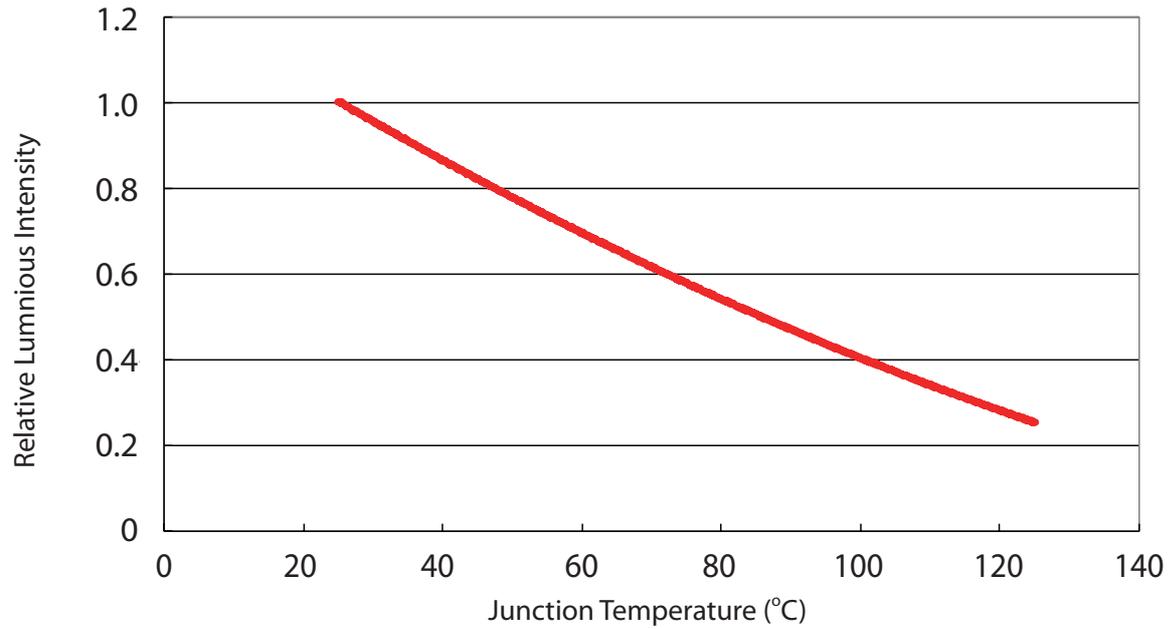
Relative Luminous Intensity vs. Forward Current for 3W Dental Blue



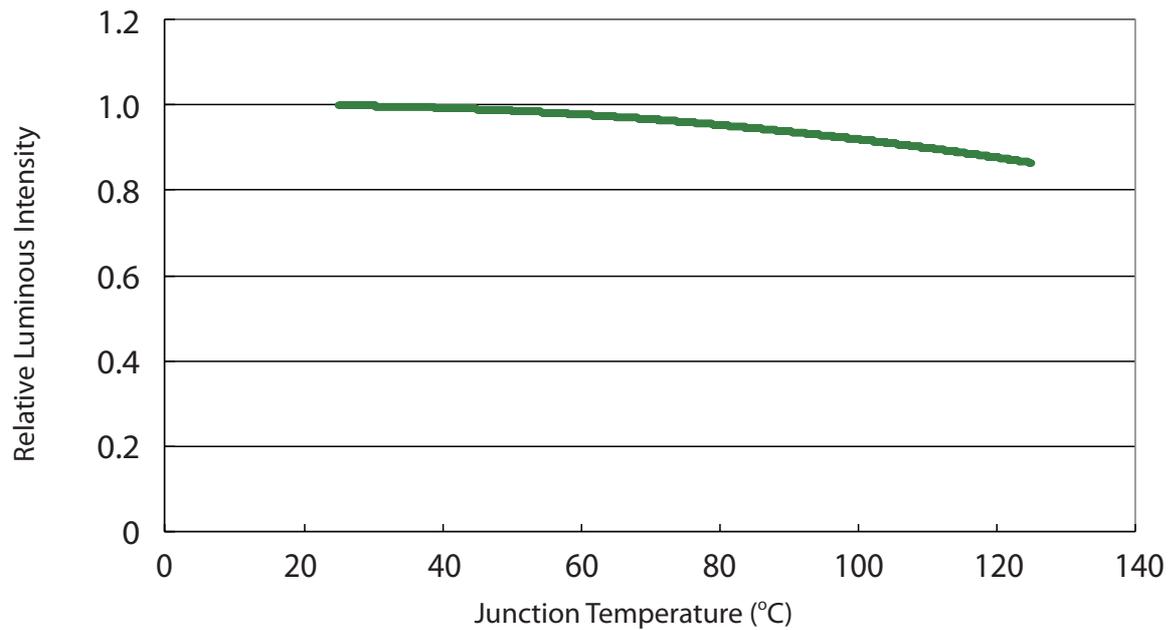
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Relative Luminous intensity vs. Junction Temperature (1W)



Relative Luminous Intensity vs. junction temperature for 1W Red

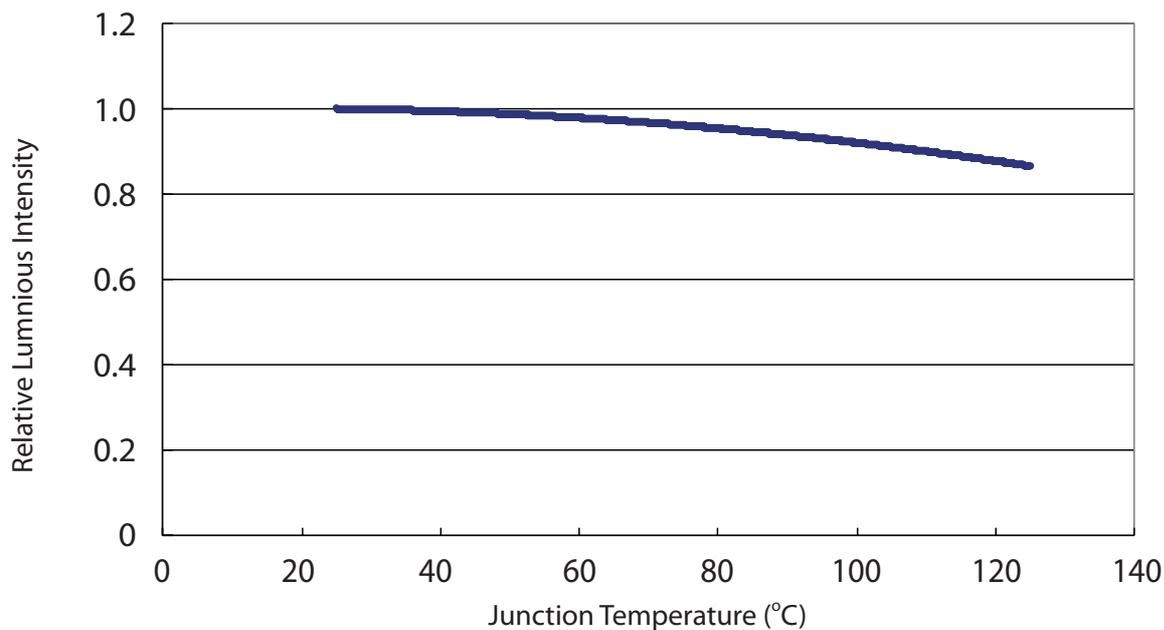


Relative Luminous Intensity vs. junction temperature for 1W True Green

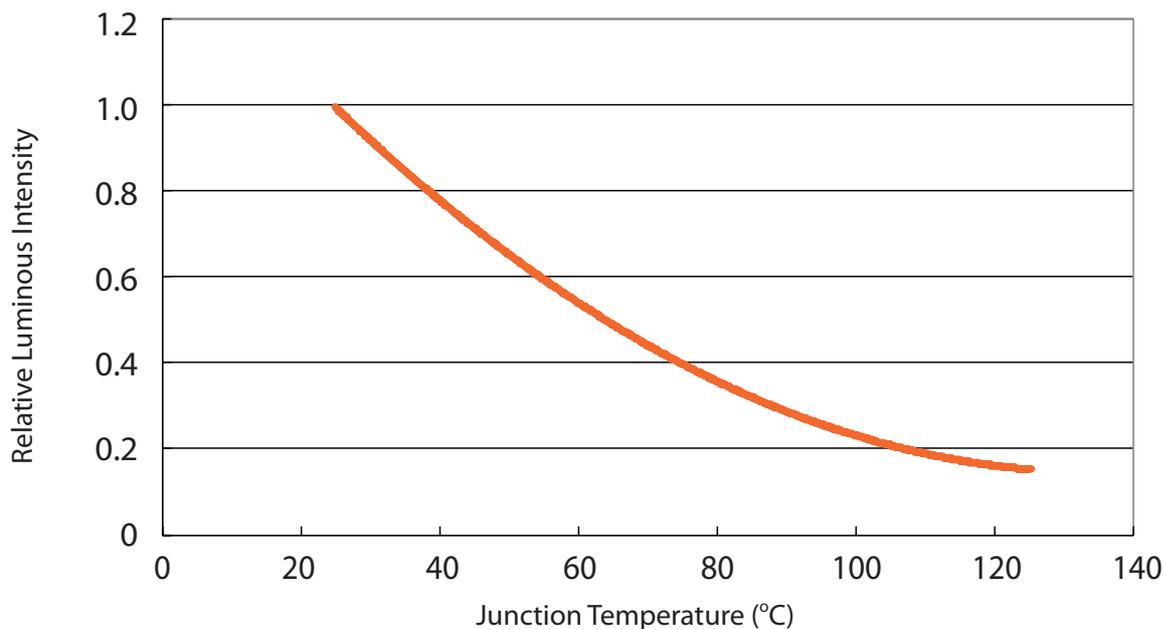


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Relative Luminous Intensity vs. junction temperature for 1W Blue

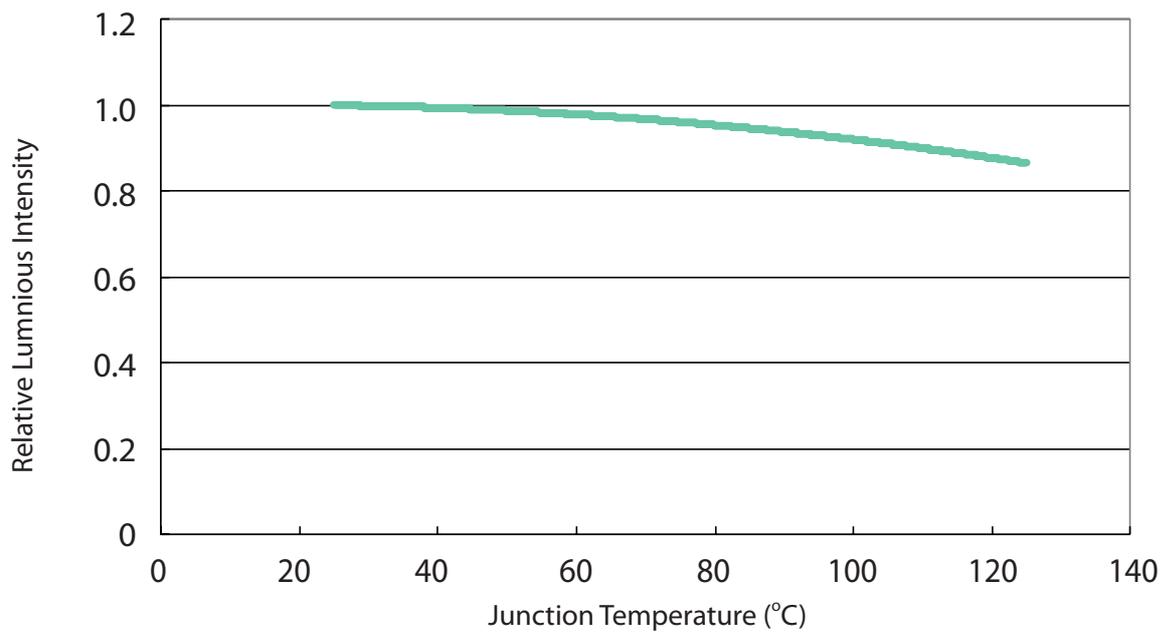


Relative Luminous Intensity vs. junction temperature for 1W Amber



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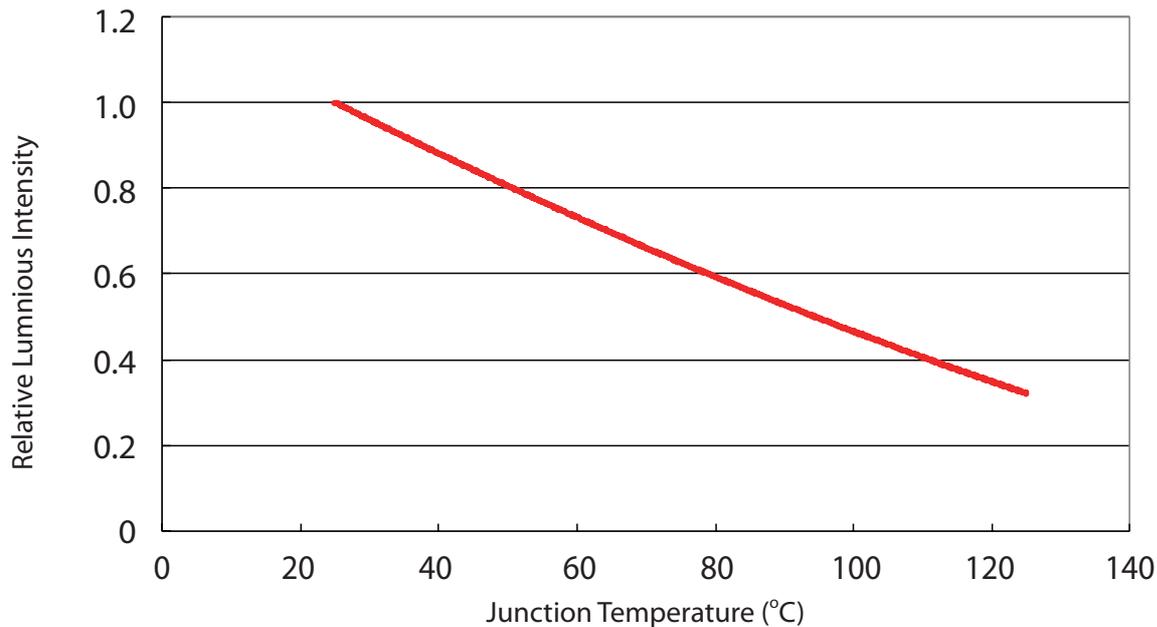
Relative Luminous Intensity vs. junction temperature for 1W Cyan



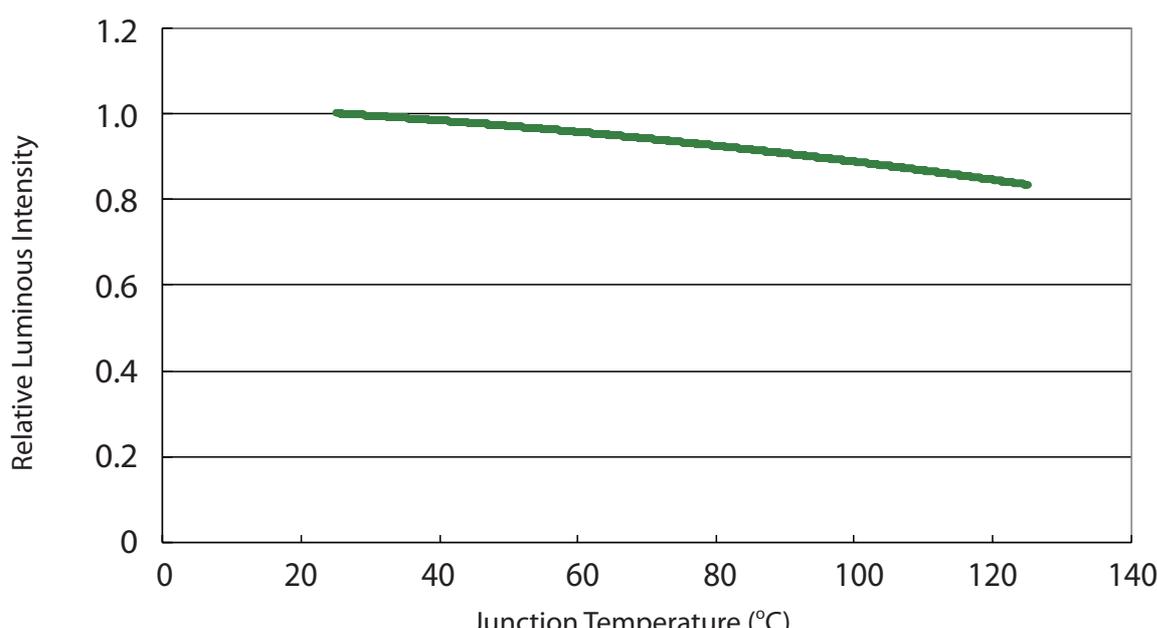
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Relative Luminous Flux vs. Junction Temperature (3W)



Relative Luminous Intensity vs. junction temperature for 3W Red

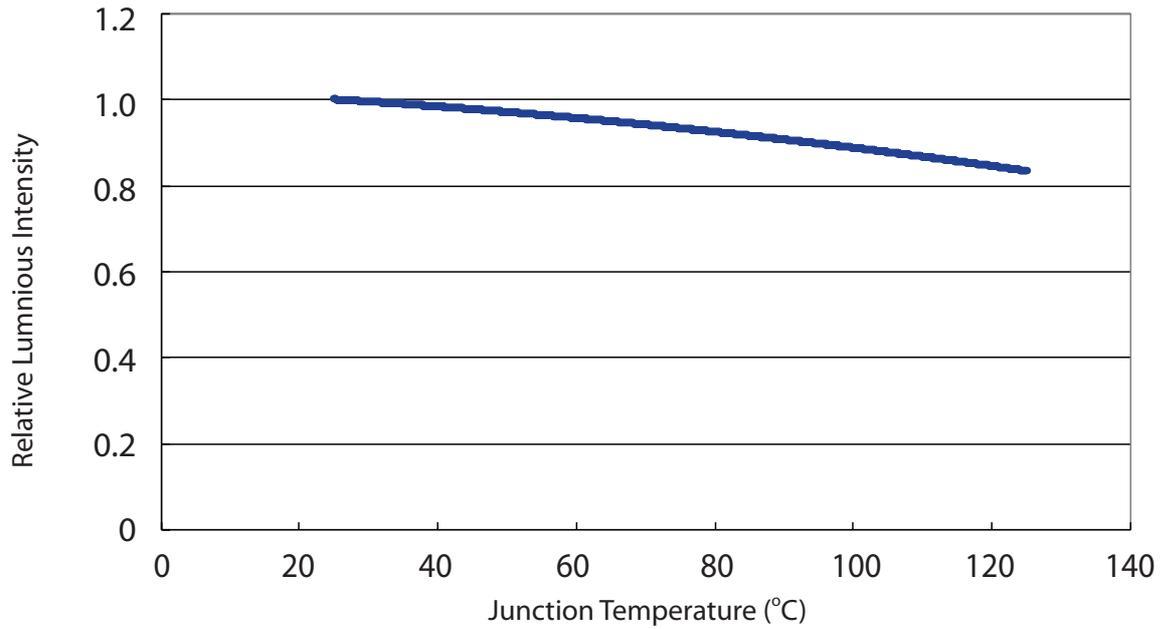


Relative Luminous Intensity vs. junction temperature for 3W True Green

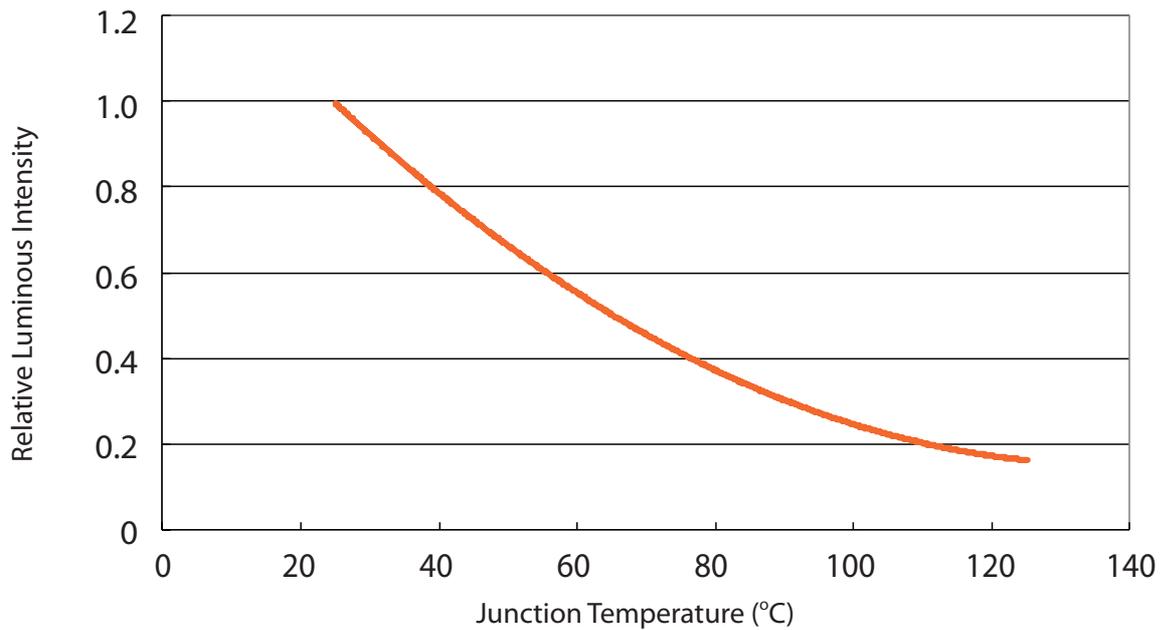


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Relative Luminous Intensity vs. junction temperature for 3W Blue

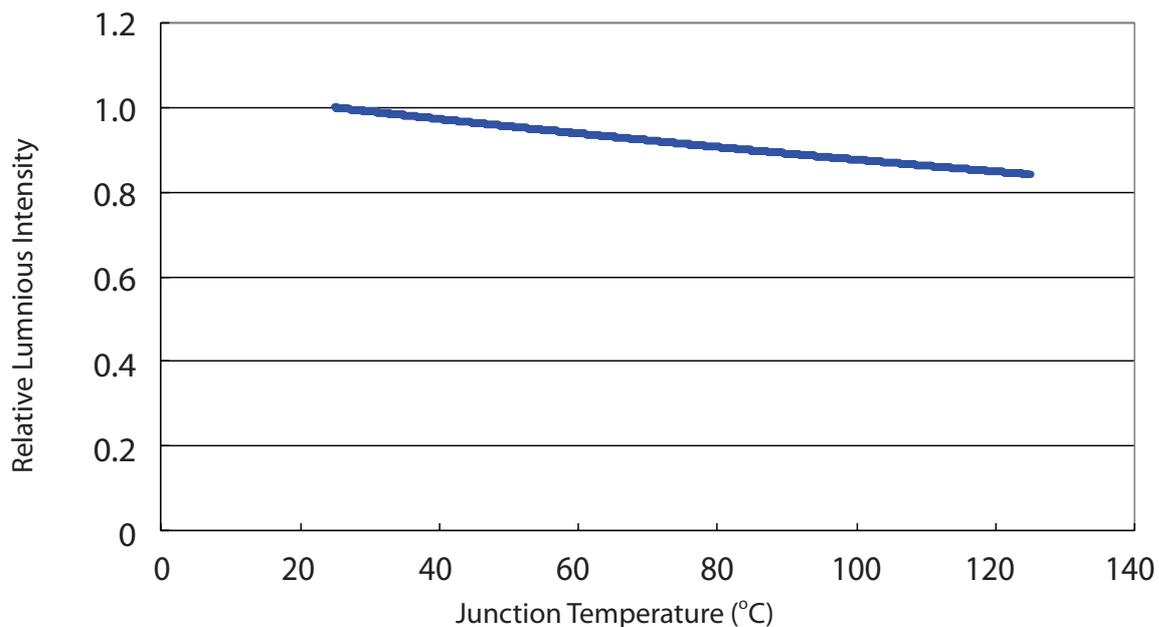


Relative Luminous Intensity vs. junction temperature for 3W Amber



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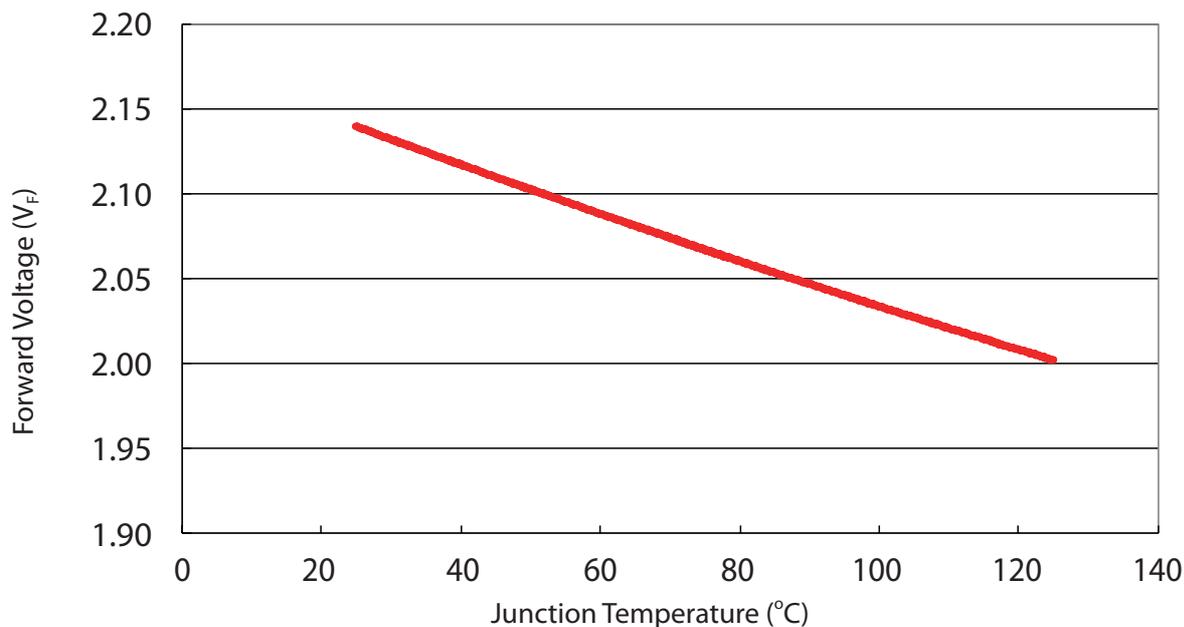
Relative Luminous Intensity vs. junction temperature for 3W Dental Blue



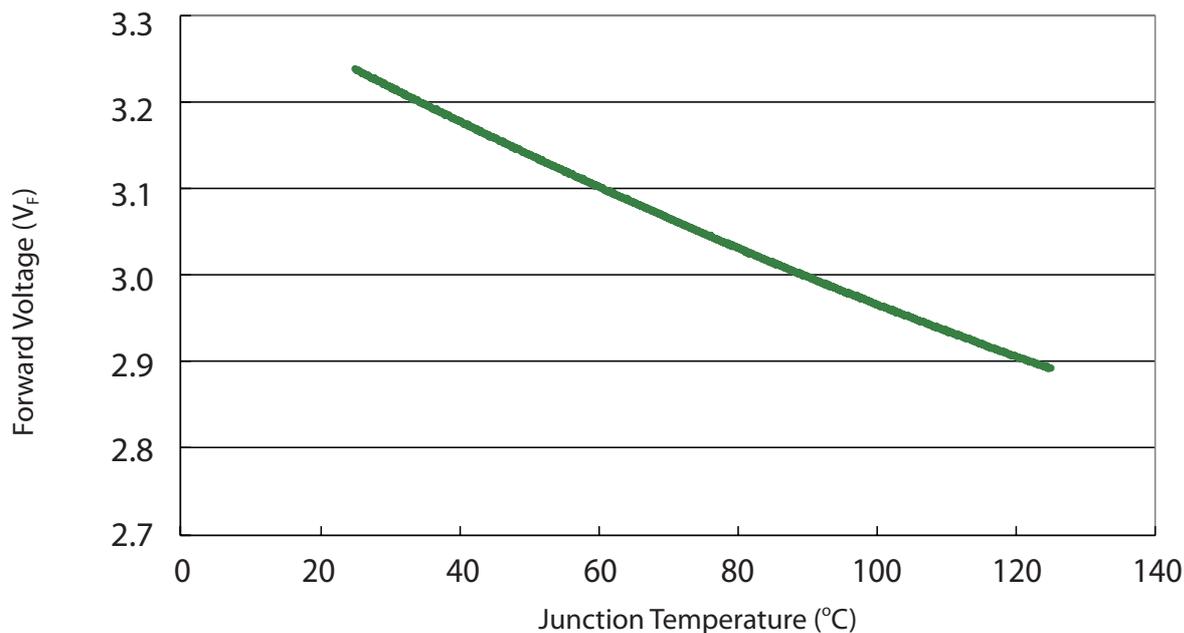
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Forward Voltage vs. Junction Temperature (1W)



Forward voltage vs. junction temperature for 1W Red

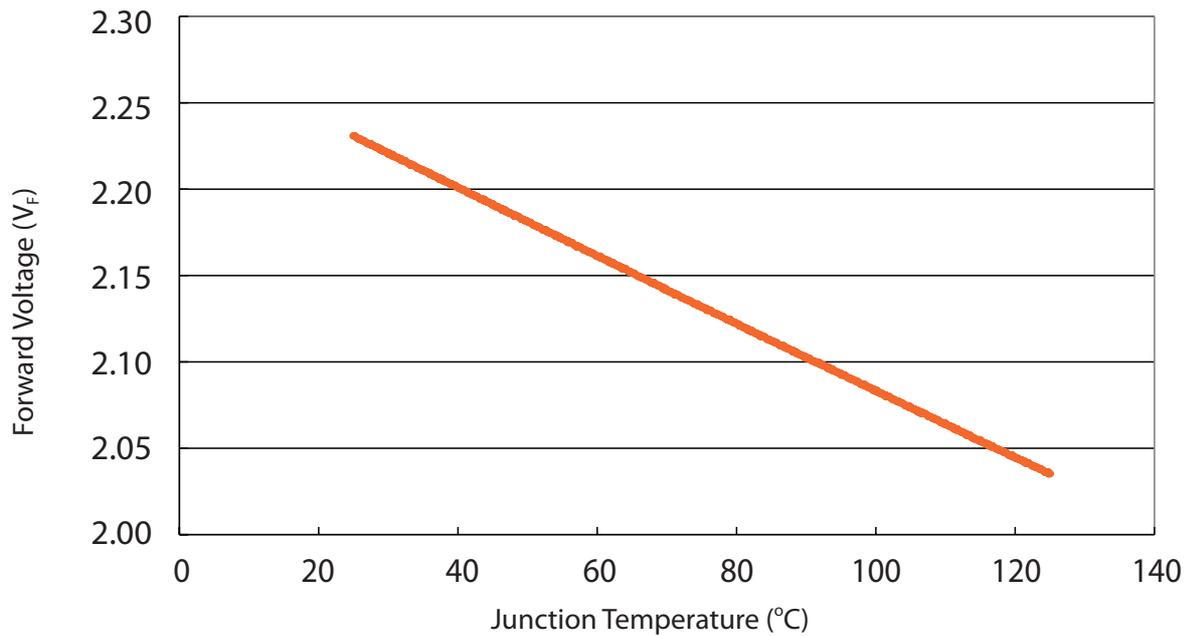
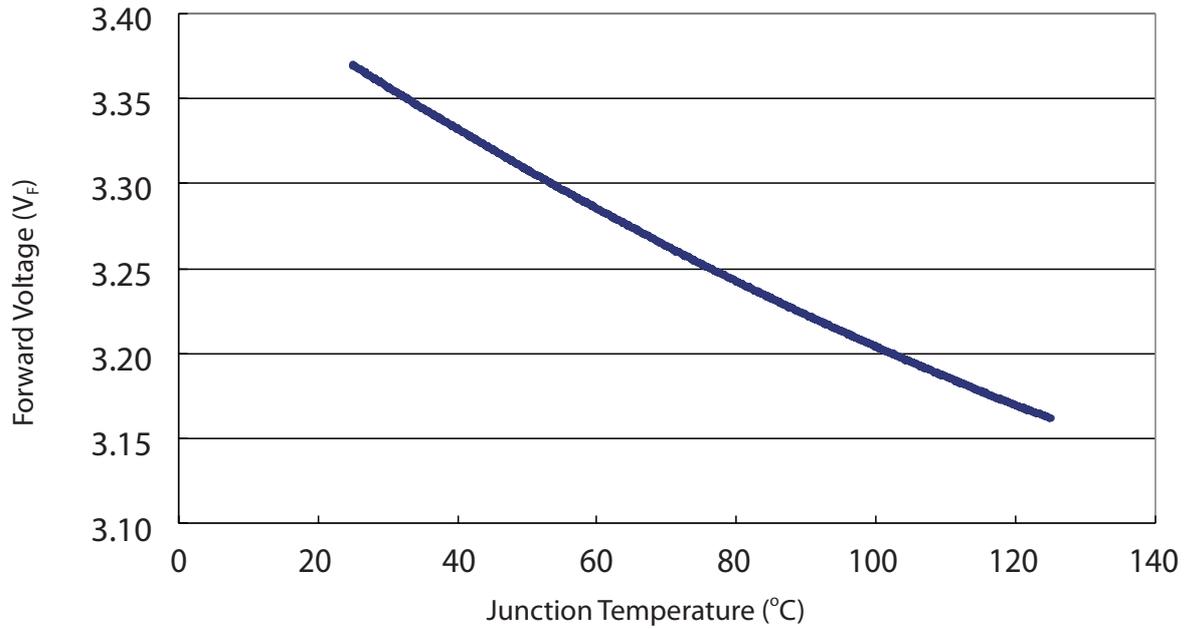


Forward voltage vs. junction temperature for 1W True Green



TDS LIGHTING CO.,LTD

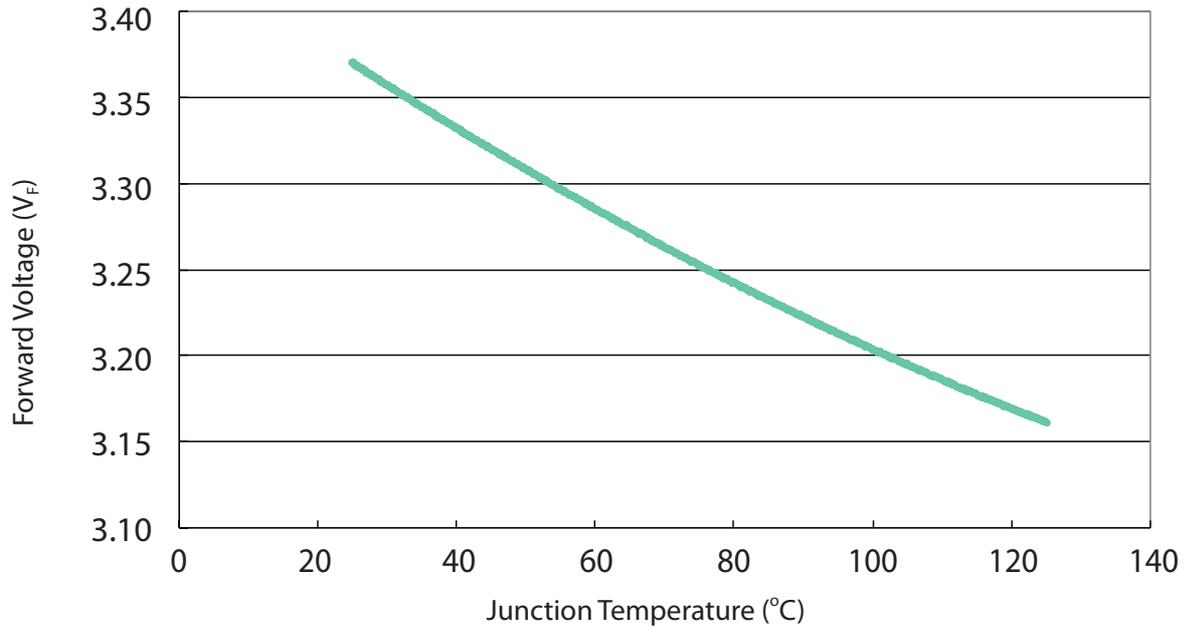
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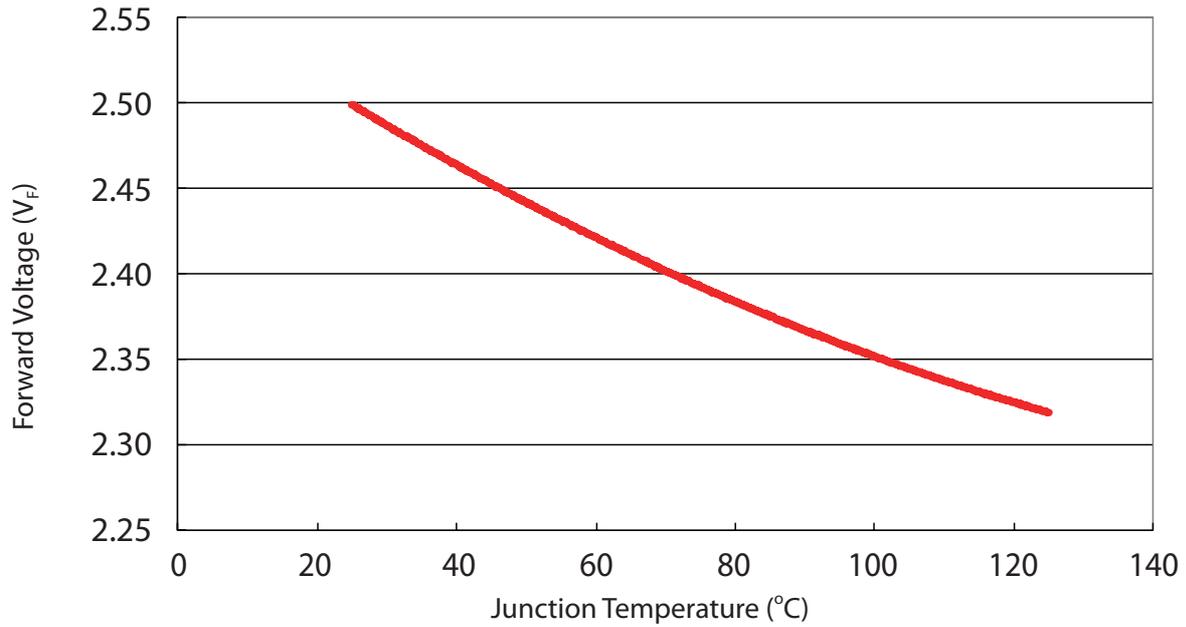
Forward voltage vs. junction temperature for 1W Cyan



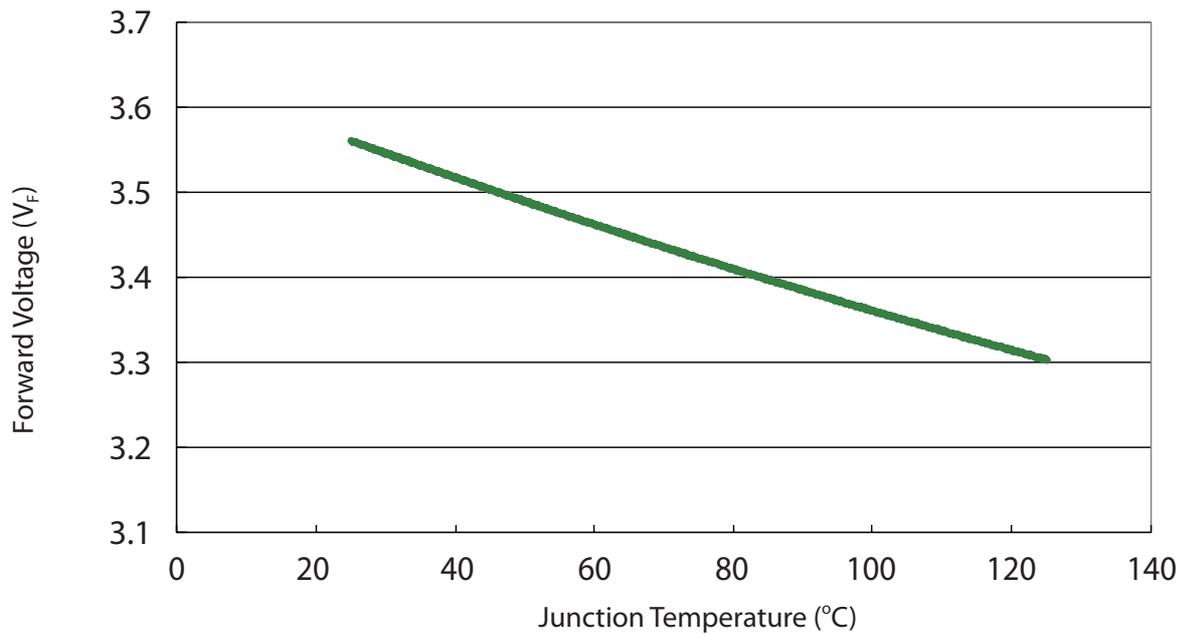
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Forward Voltage vs. Junction Temperature (3W)



Forward voltage vs. junction temperature for 3W Red

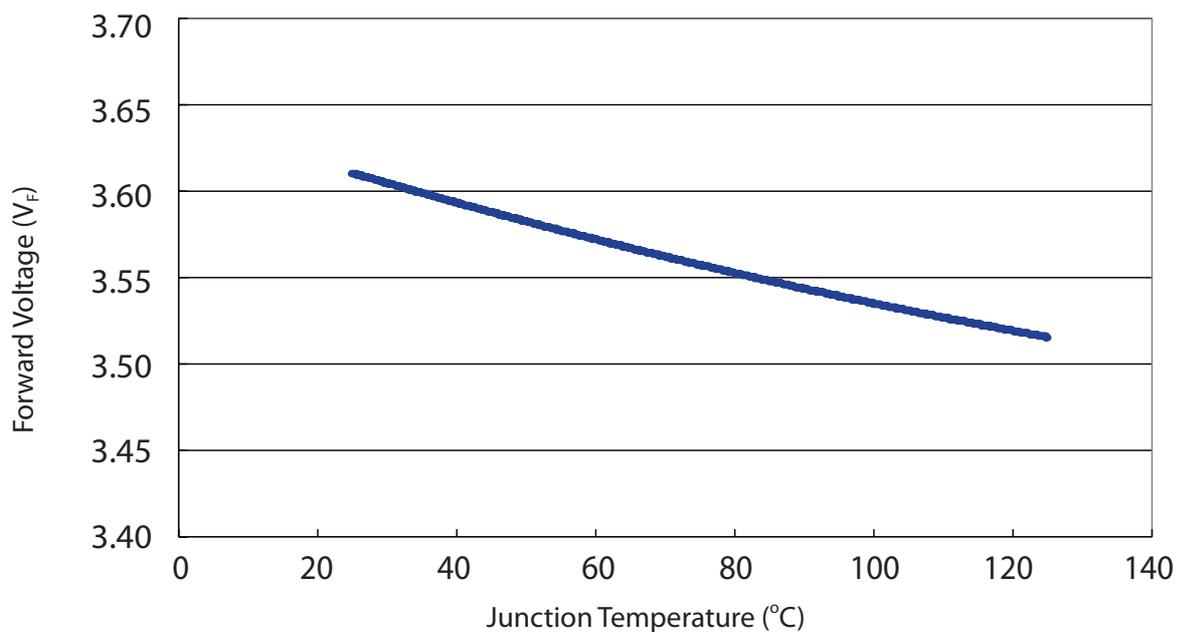


Forward voltage vs. junction temperature for 3W True Green

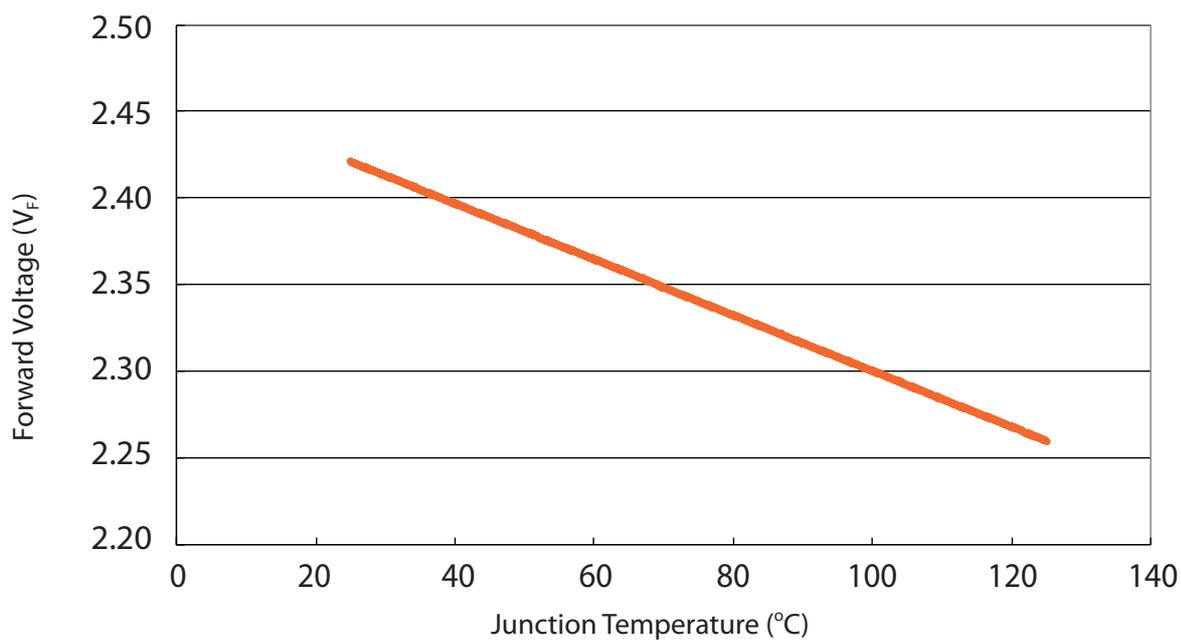


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Forward voltage vs. junction temperature for 3W Blue

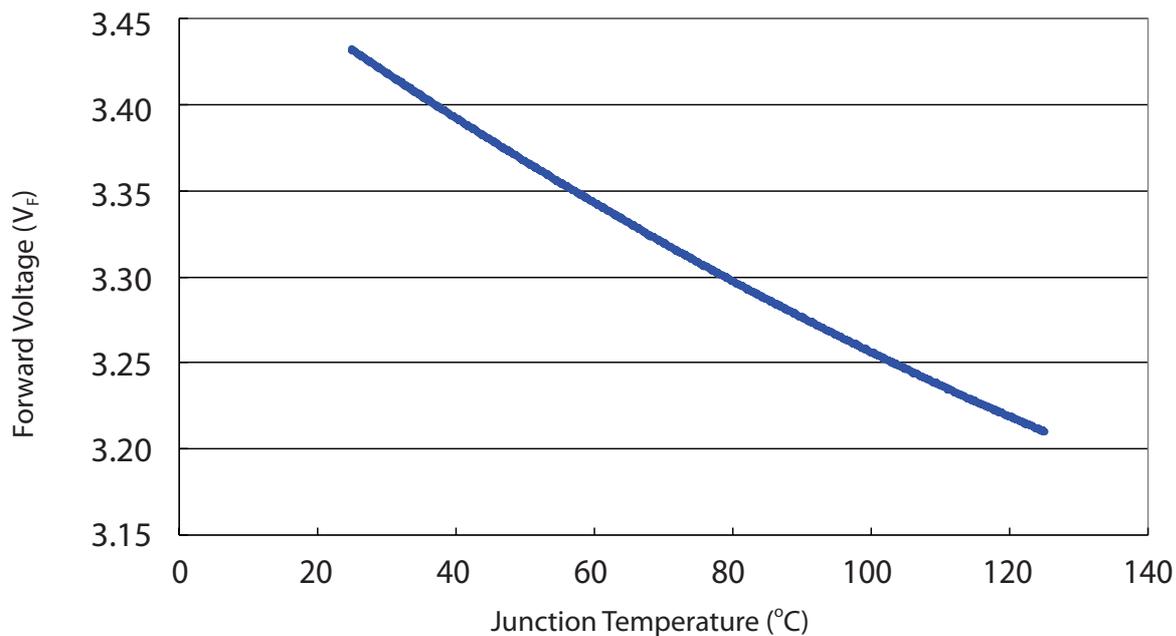


Forward voltage vs. junction temperature for 3W Amber



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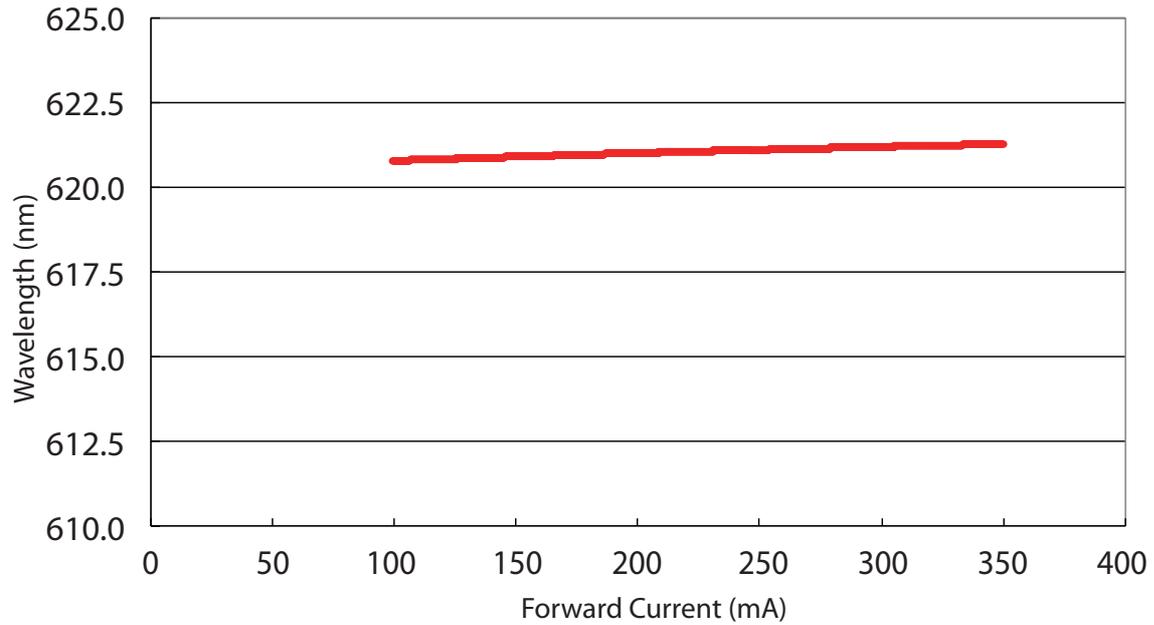
Forward voltage vs. junction temperature for 3W Dental Blue



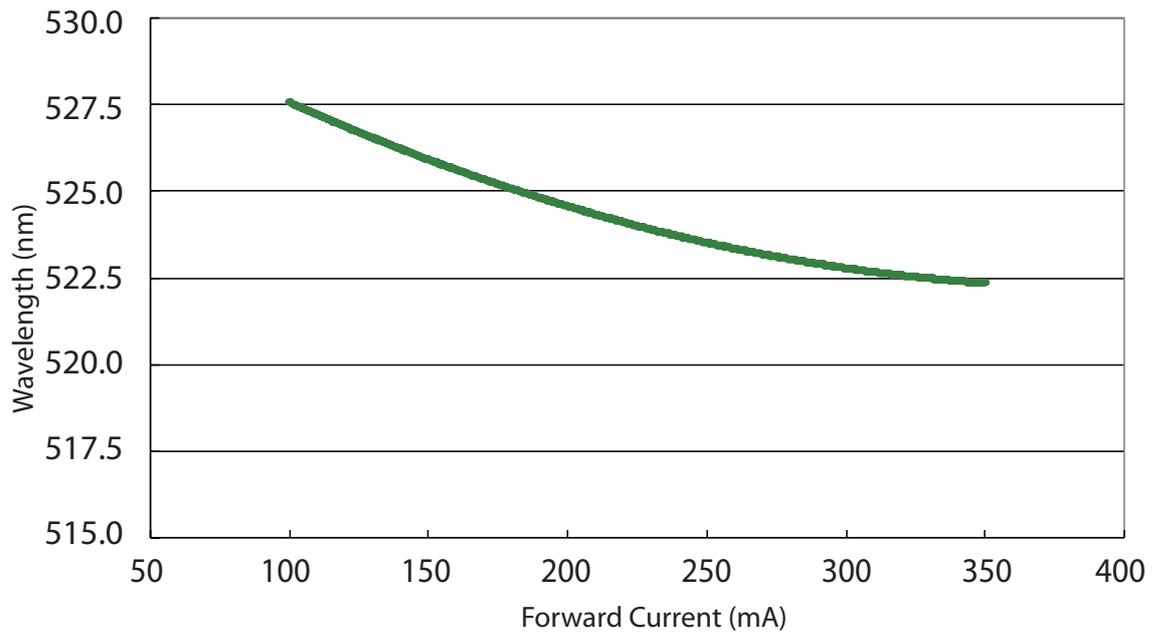
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Wavelength vs. Forward Current (1W)



Wavelength vs. Forward Current for 1W Red

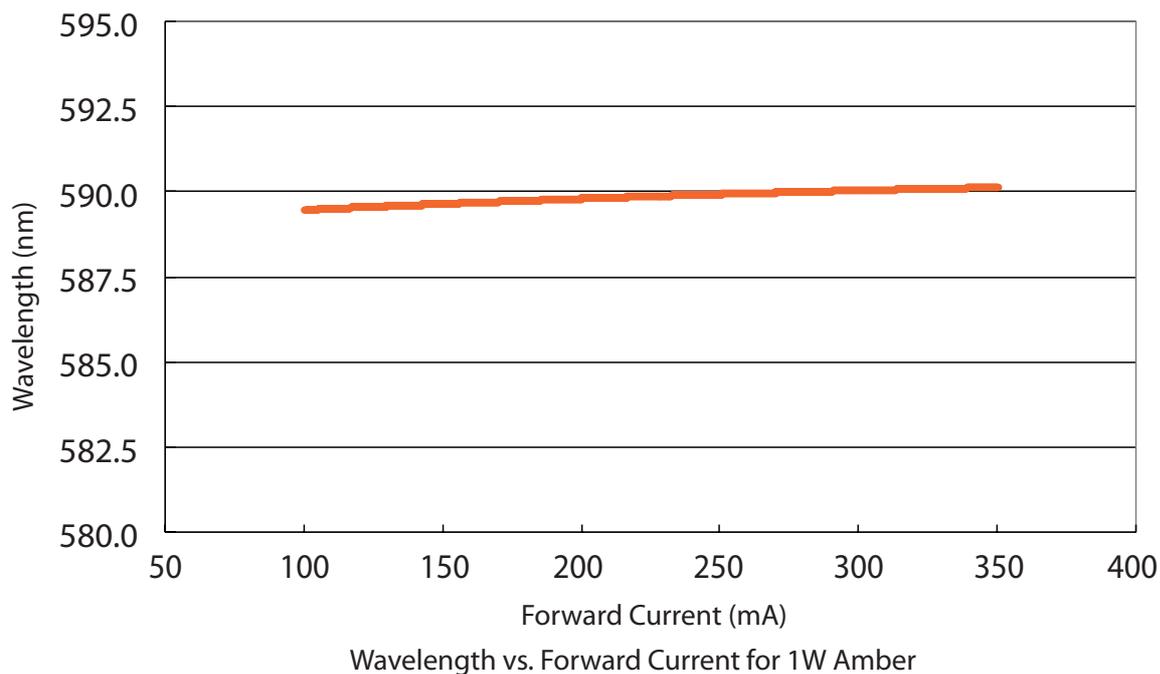
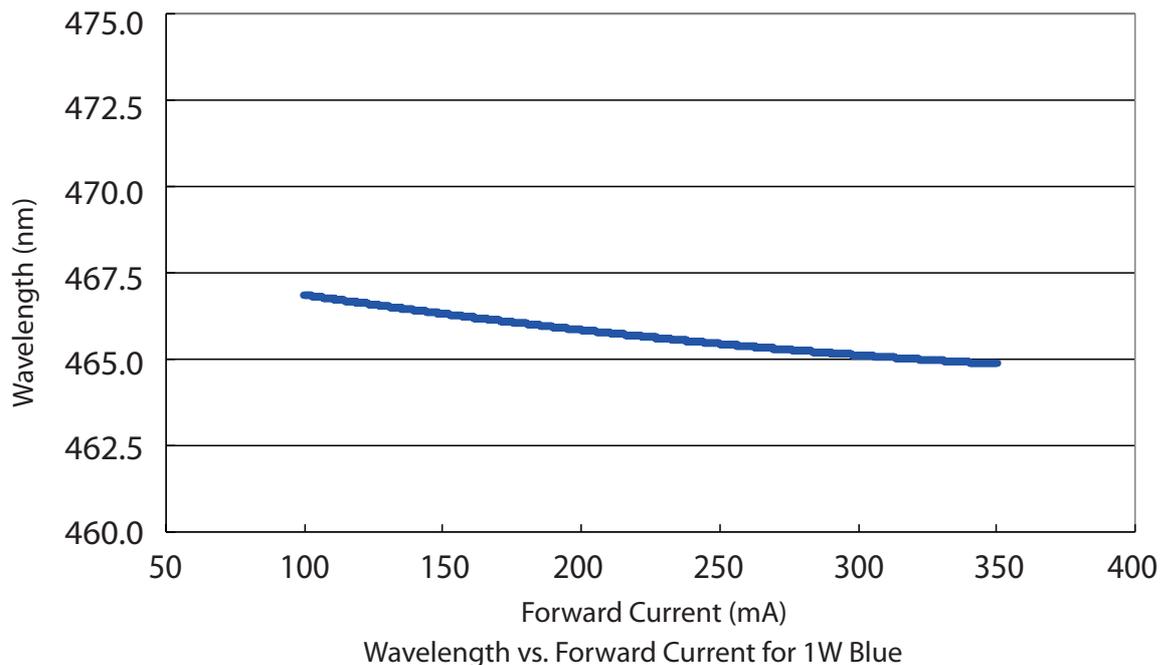


Wavelength vs. Forward Current for 1W True Green



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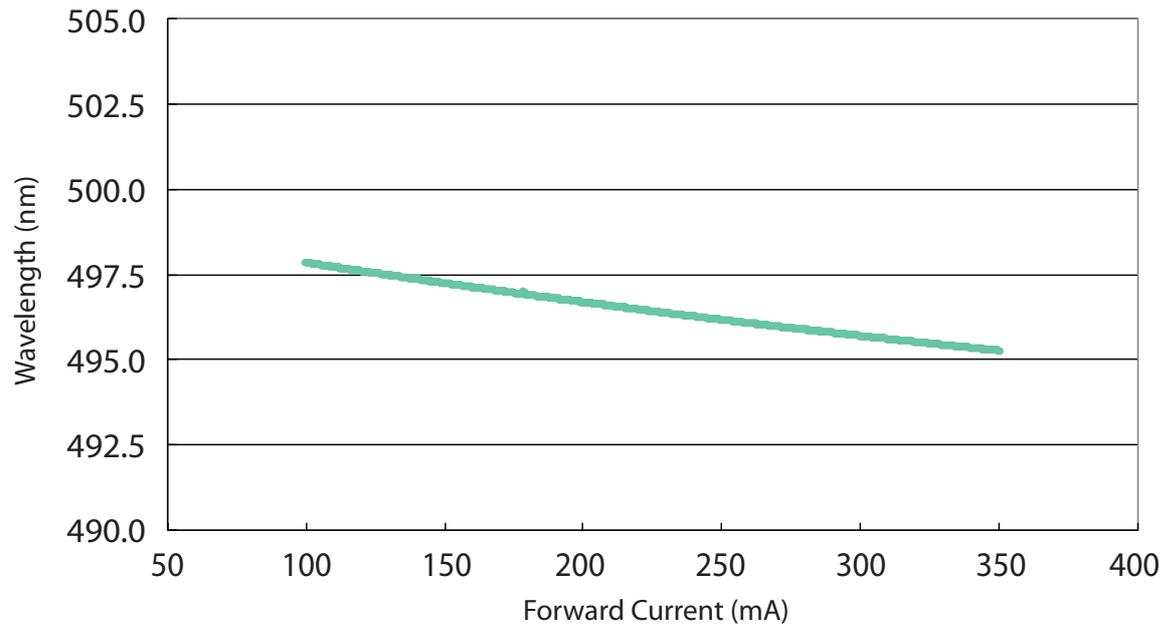
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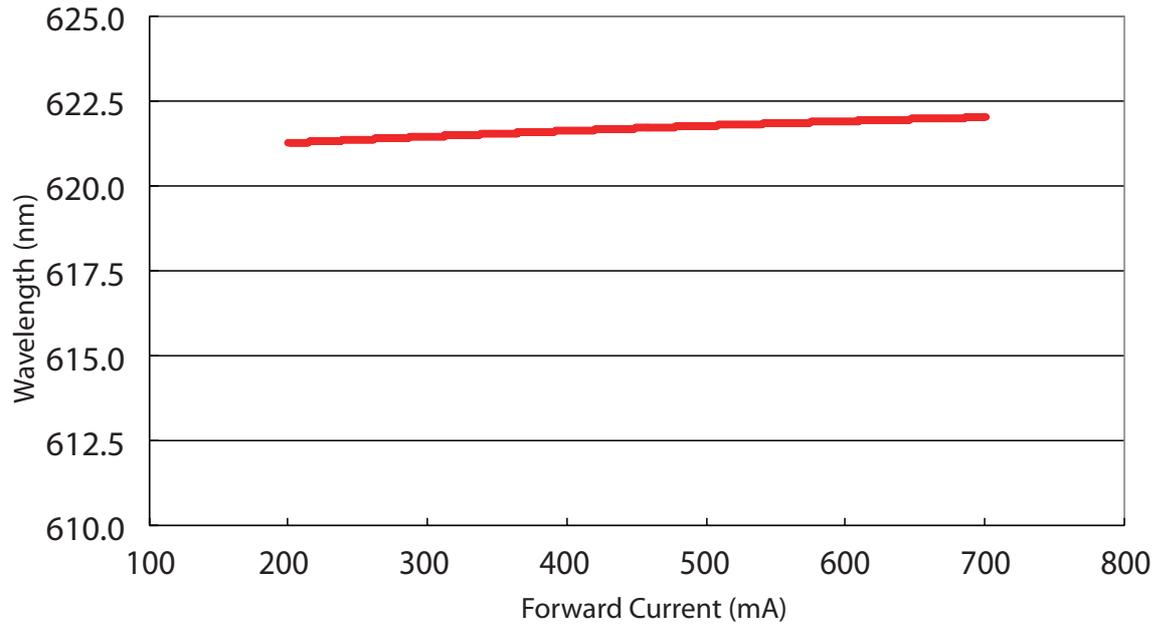
Wavelength vs. Forward Current for 1W Cyan



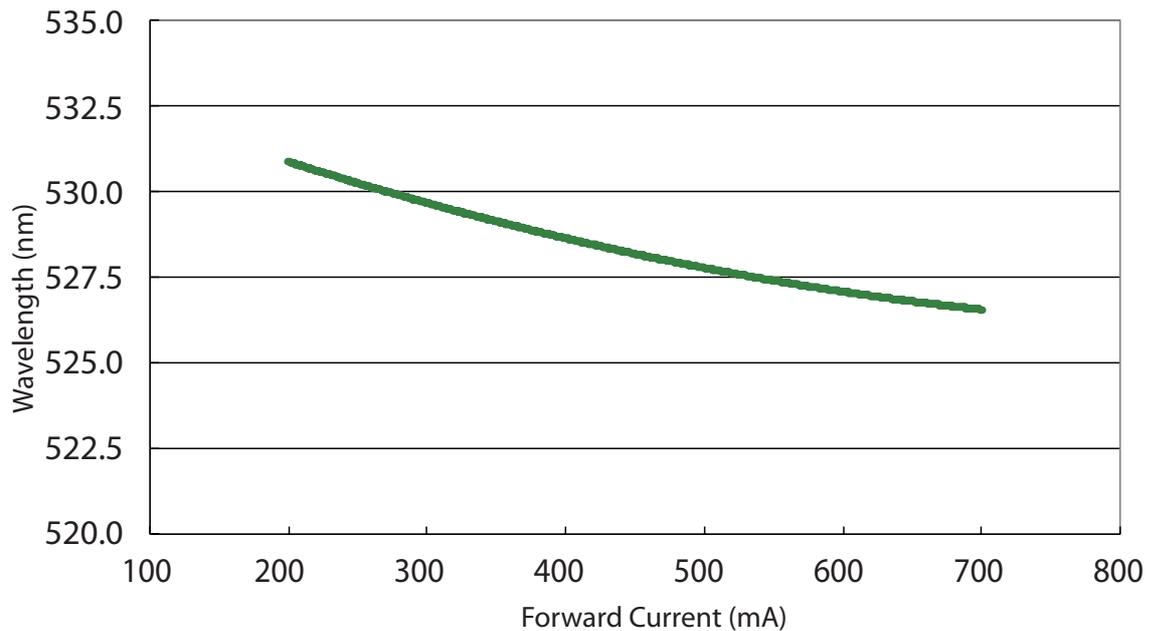
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Wavelength vs. Forward Current (3W)



Wavelength vs. Forward Current for 3W Red

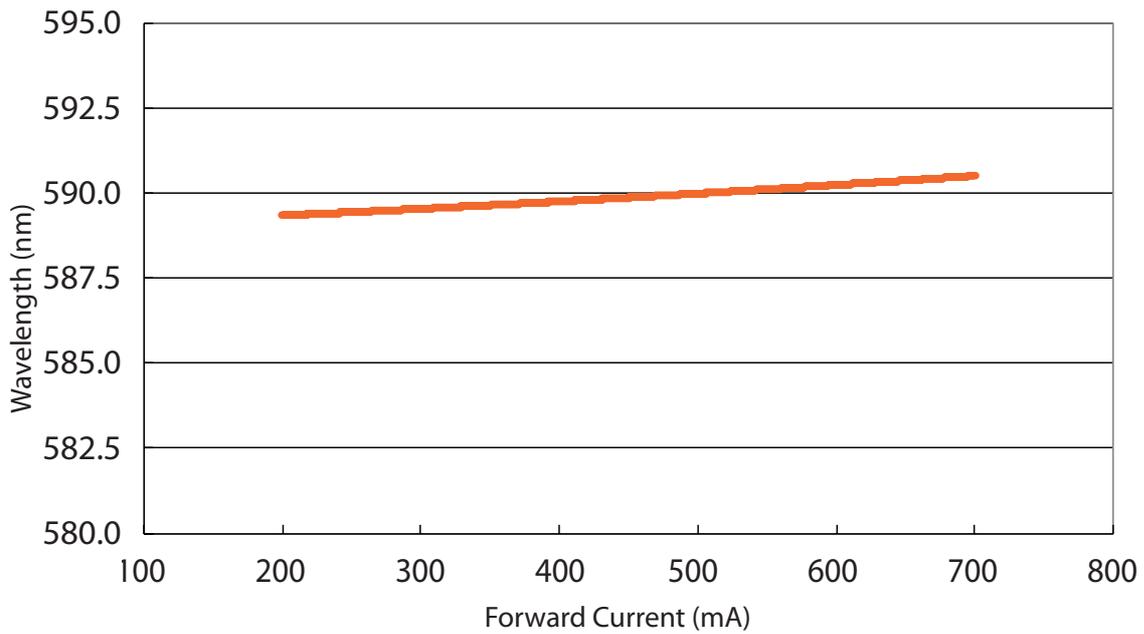
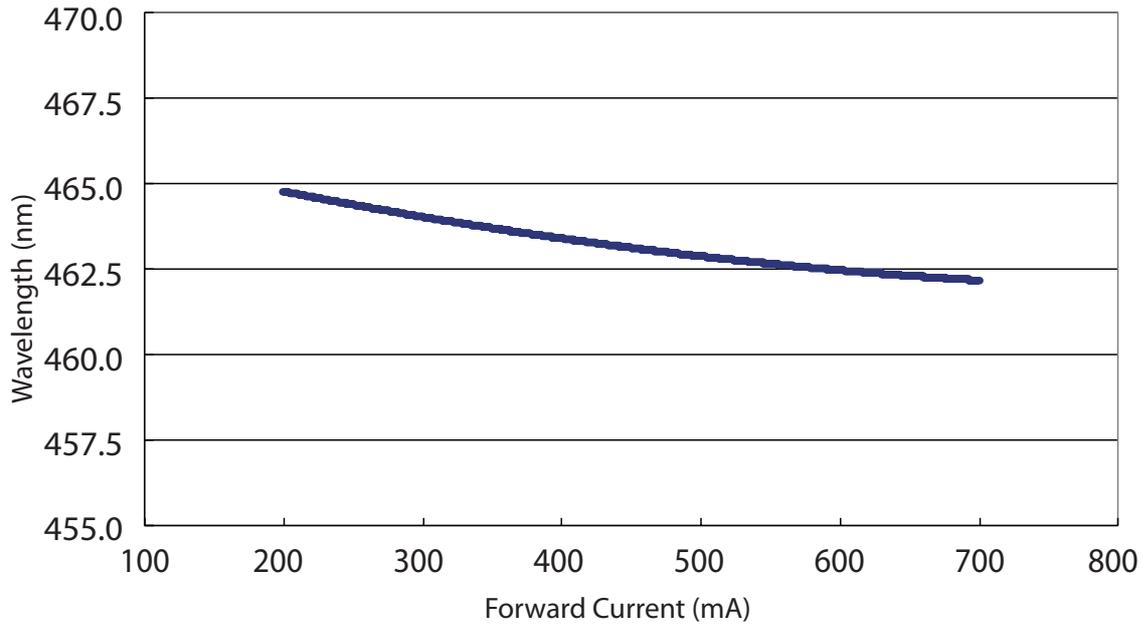


Wavelength vs. Forward Current for 3W True Green



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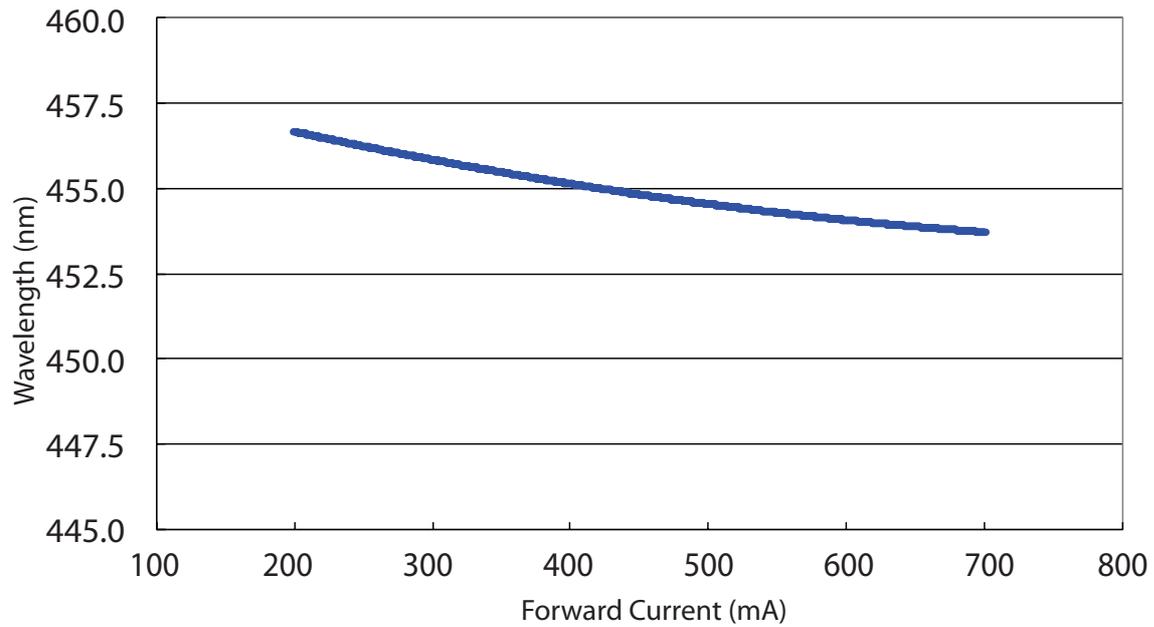
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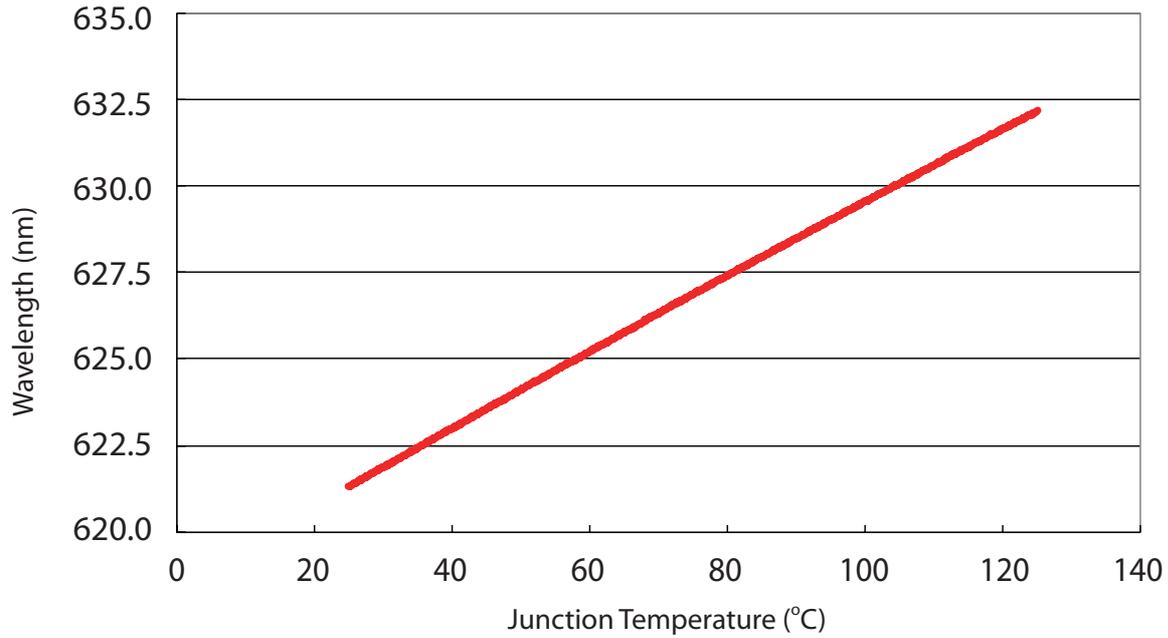
Wavelength vs. Forward Current for 3W Dental Blue



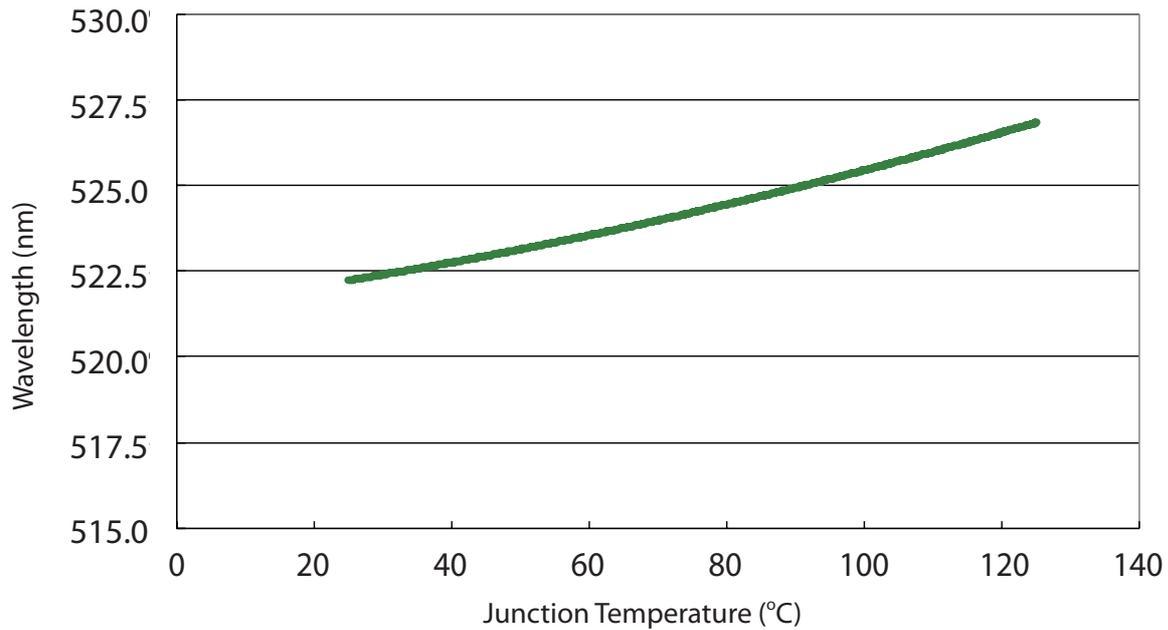
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Wavelength vs. Junction Temperature (1W)



Wavelength vs. junction temperature for 1W Red

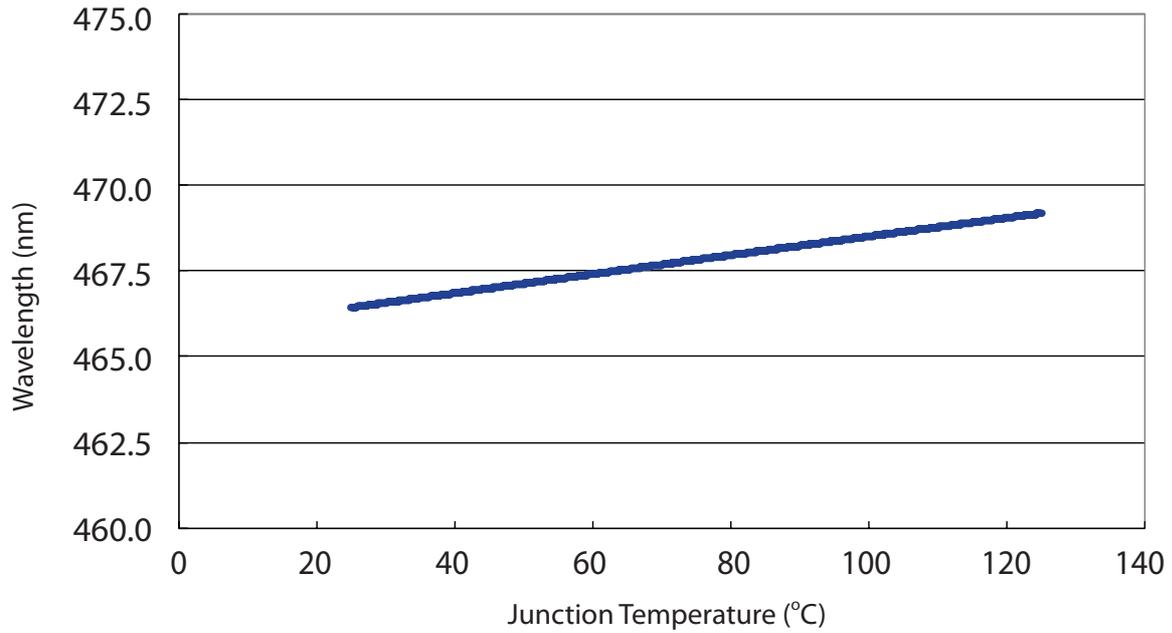


Wavelength vs. junction temperature for 1W True Green

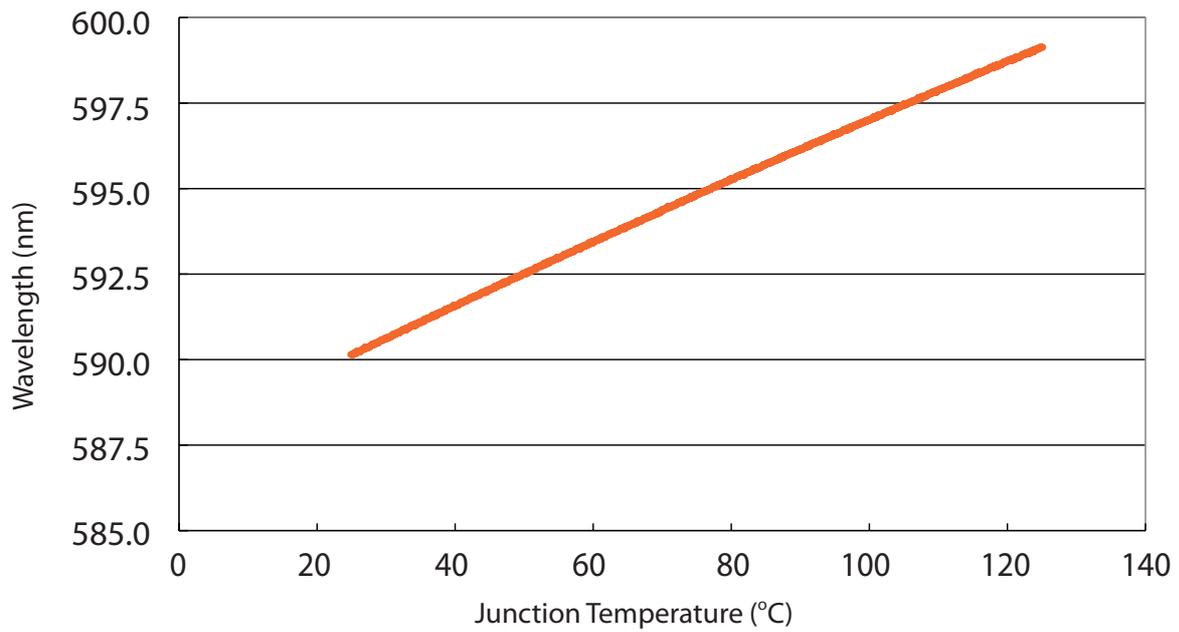


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Wavelength vs. junction temperature for 1W Blue

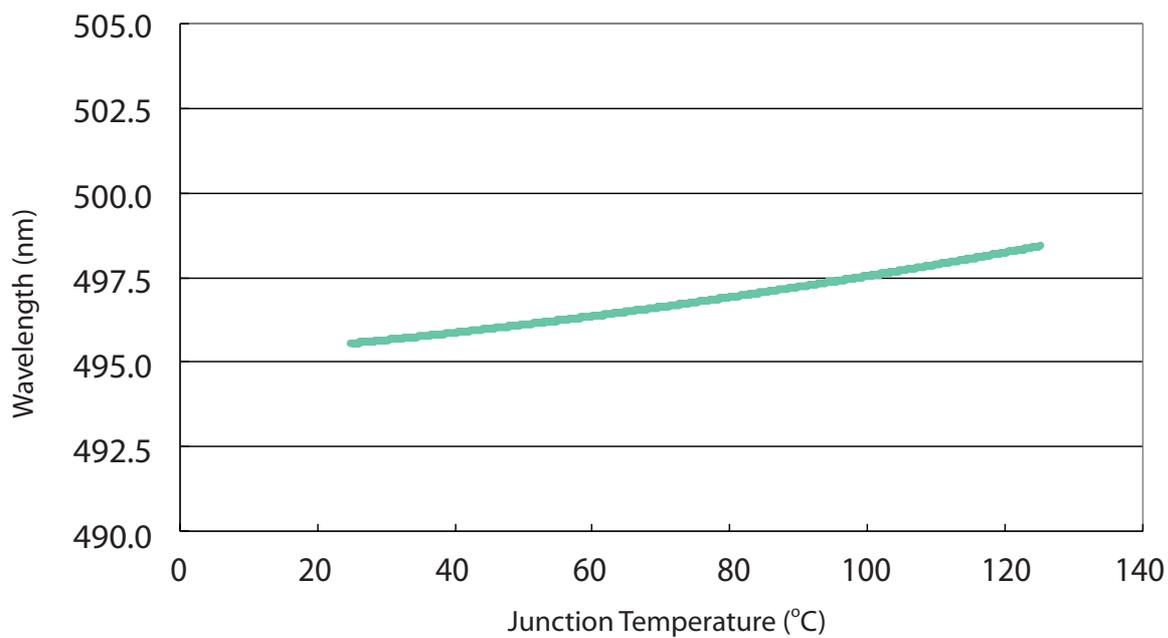


Wavelength vs. junction temperature for 1W Amber



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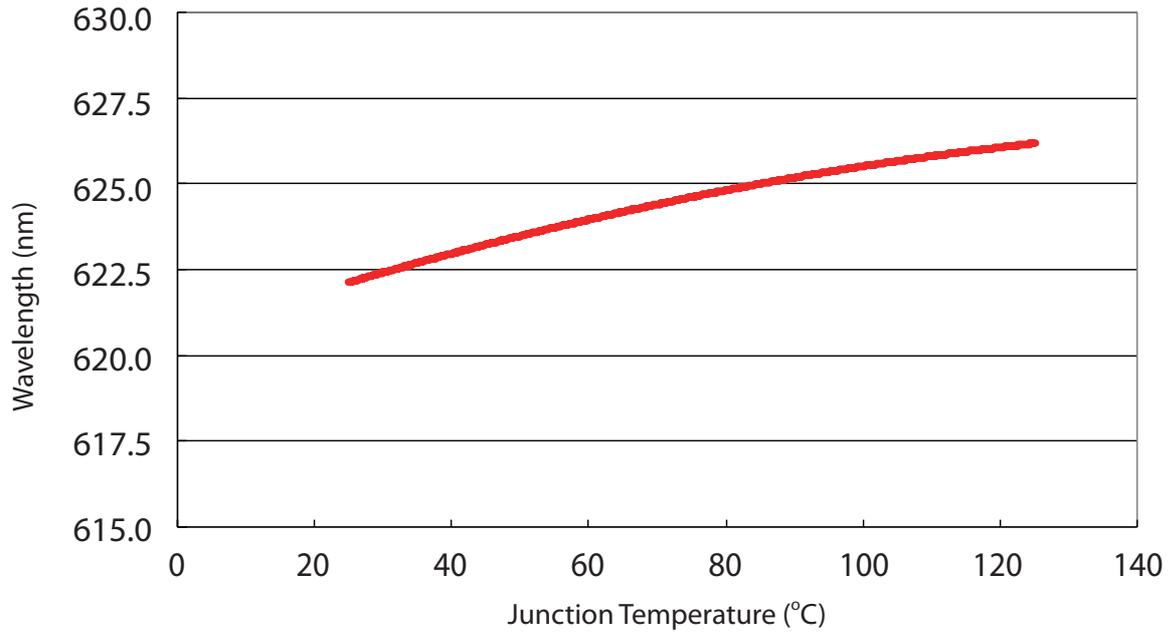
Wavelength vs. junction temperature for 1W Cyan



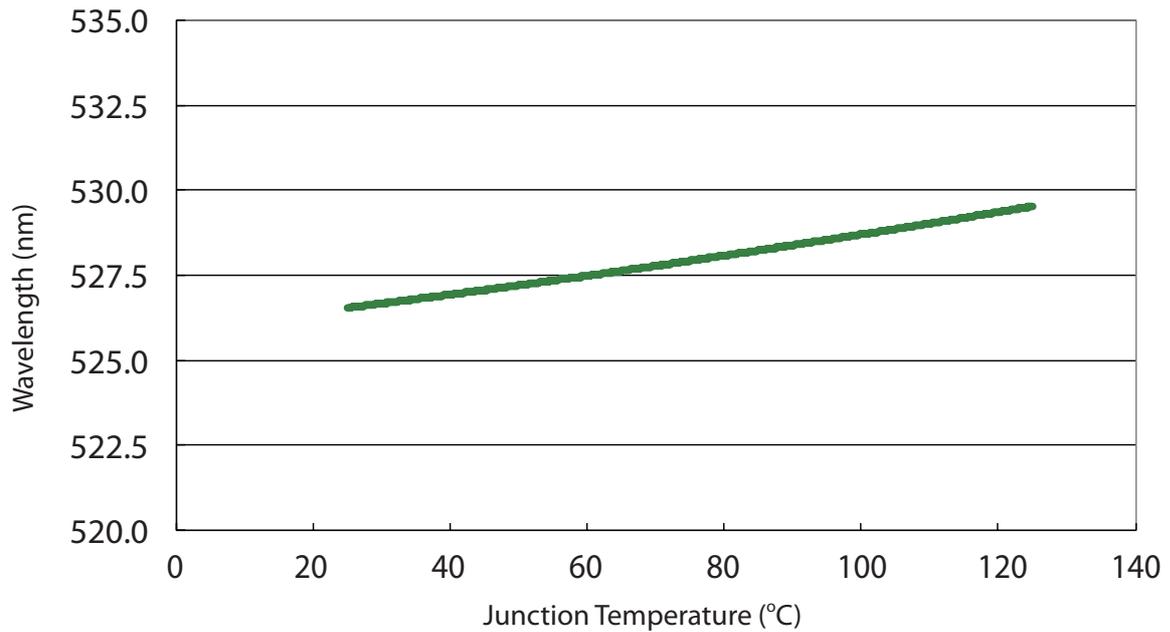
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Wavelength vs. Junction Temperature (3W)



Wavelength vs. junction temperature for 3W Red

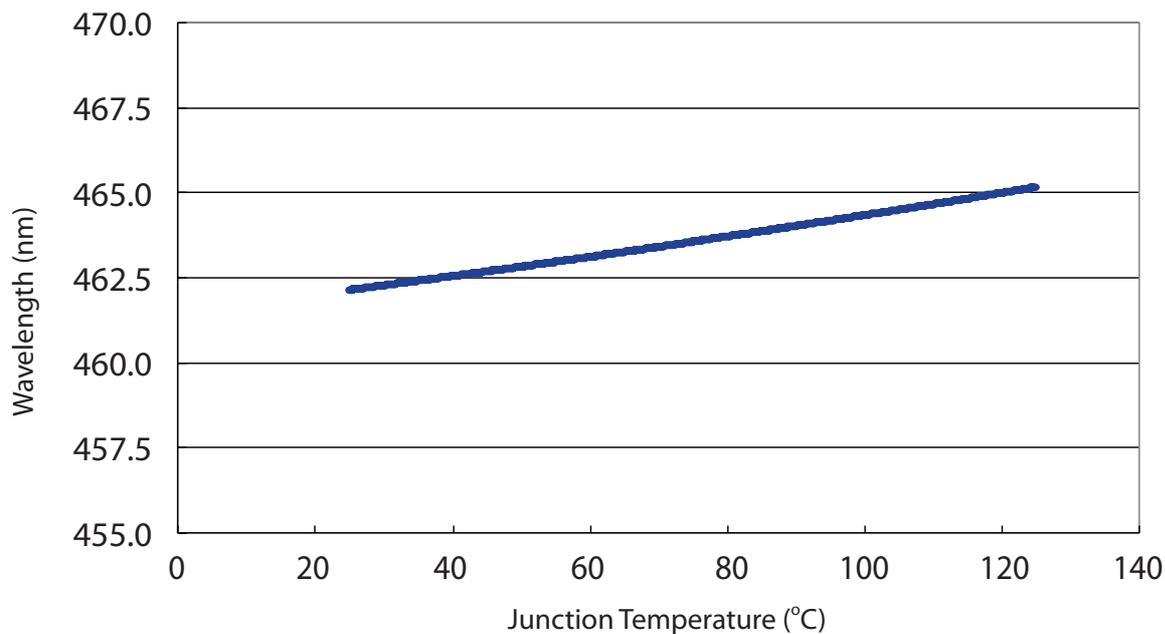


Wavelength vs. junction temperature for 3W True Green

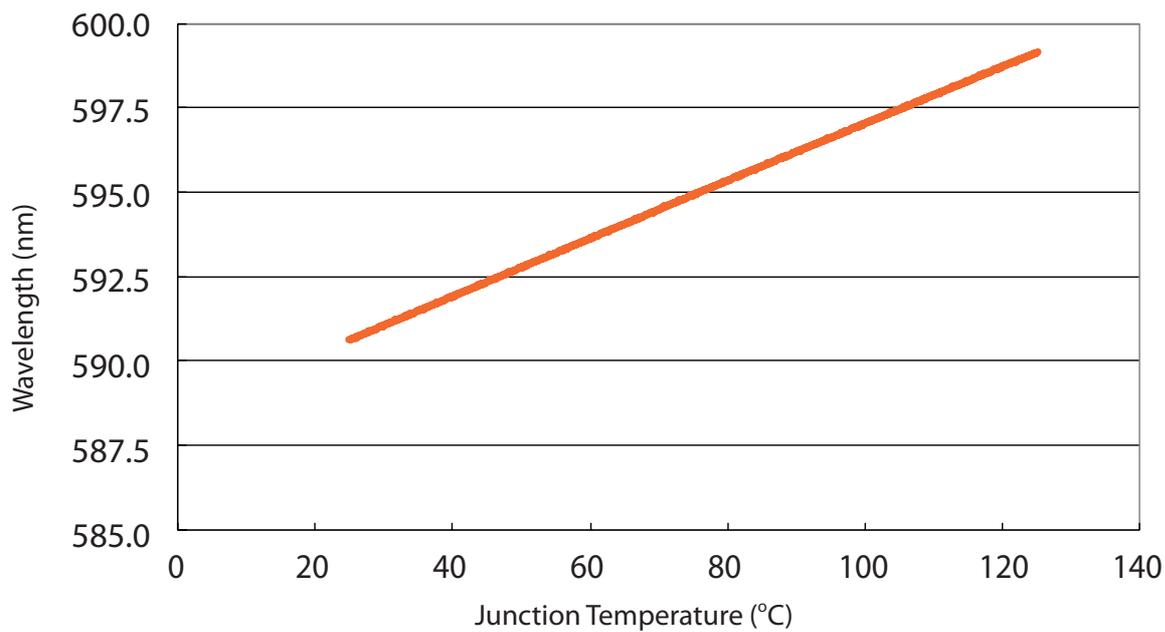


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Wavelength vs. junction temperature for 3W Blue

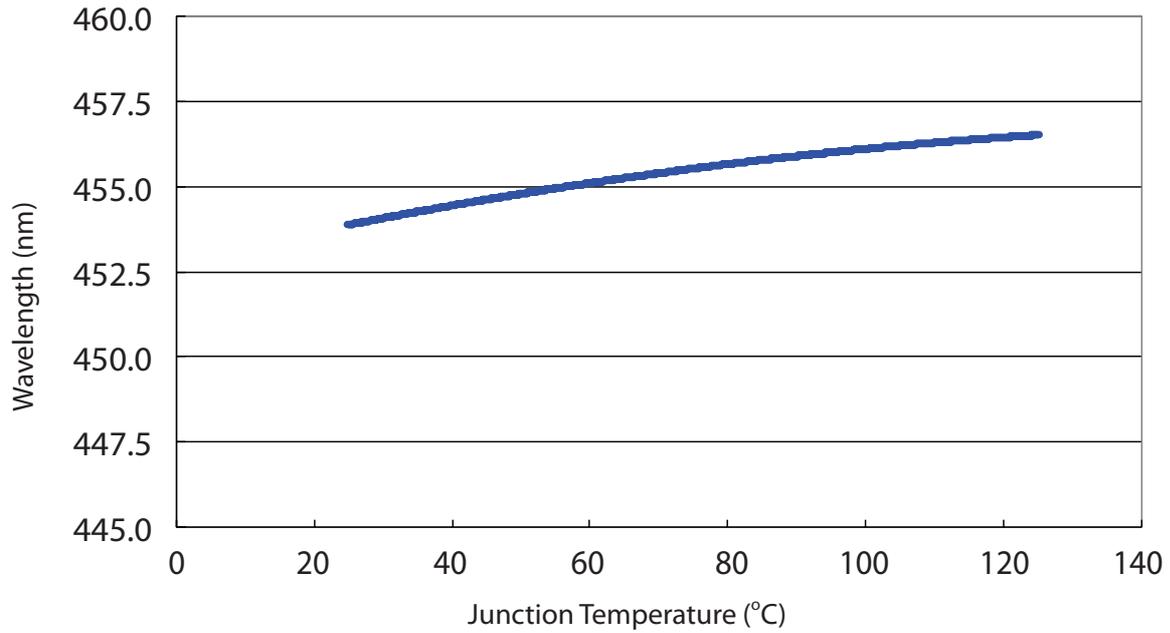


Wavelength vs. junction temperature for 3W Amber



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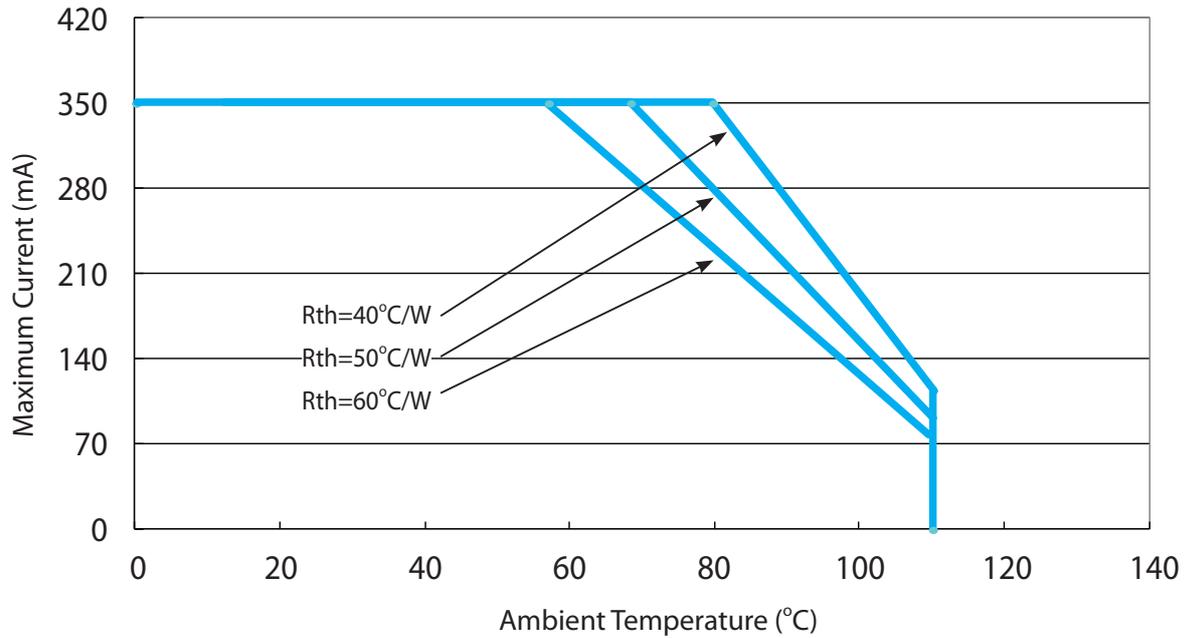
Wavelength vs. junction temperature for 3W Dental Blue



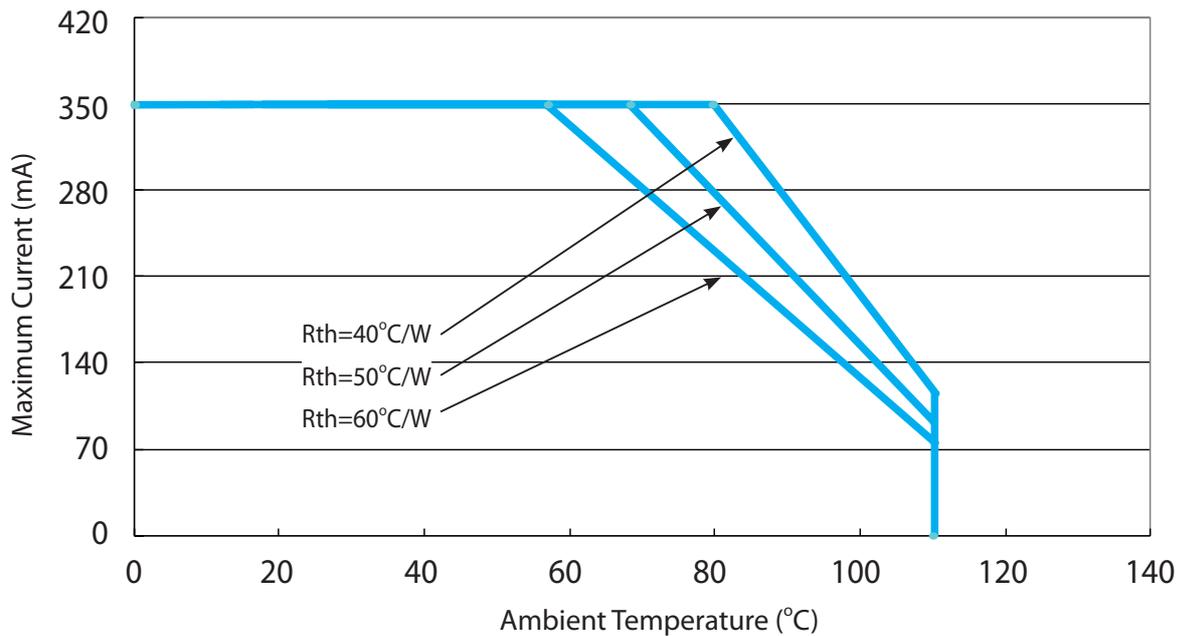
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Maximum Current vs. Ambient Temperature (1W)



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



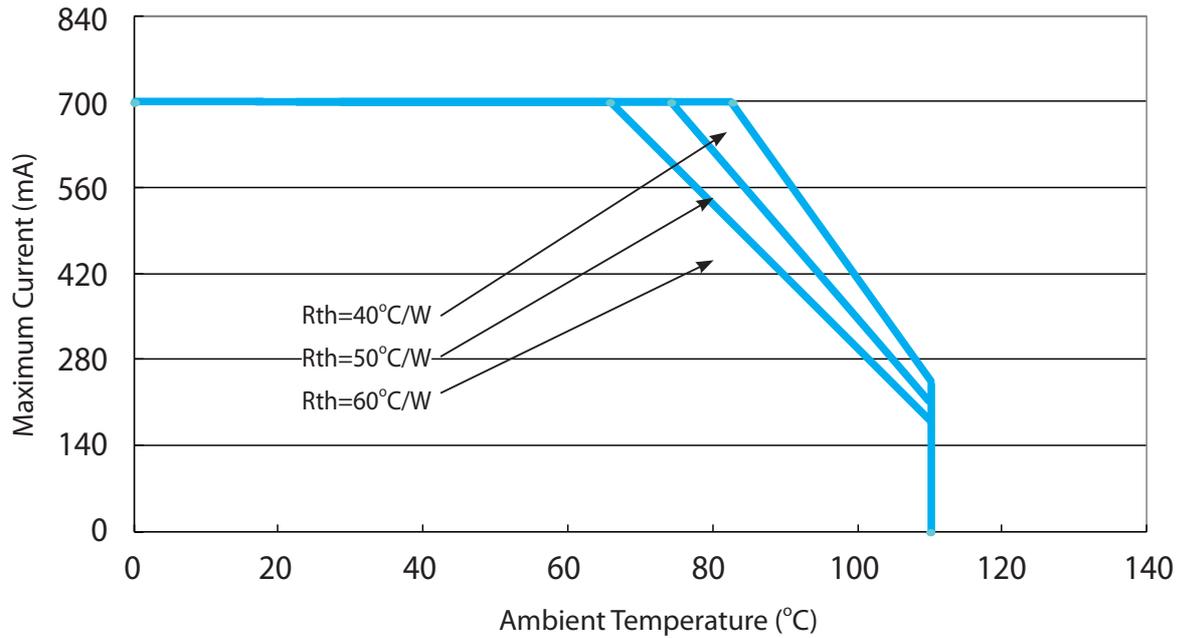
Maximum Current vs. Ambient Temperature for 1W Blue, True Green, and Cyan Blue



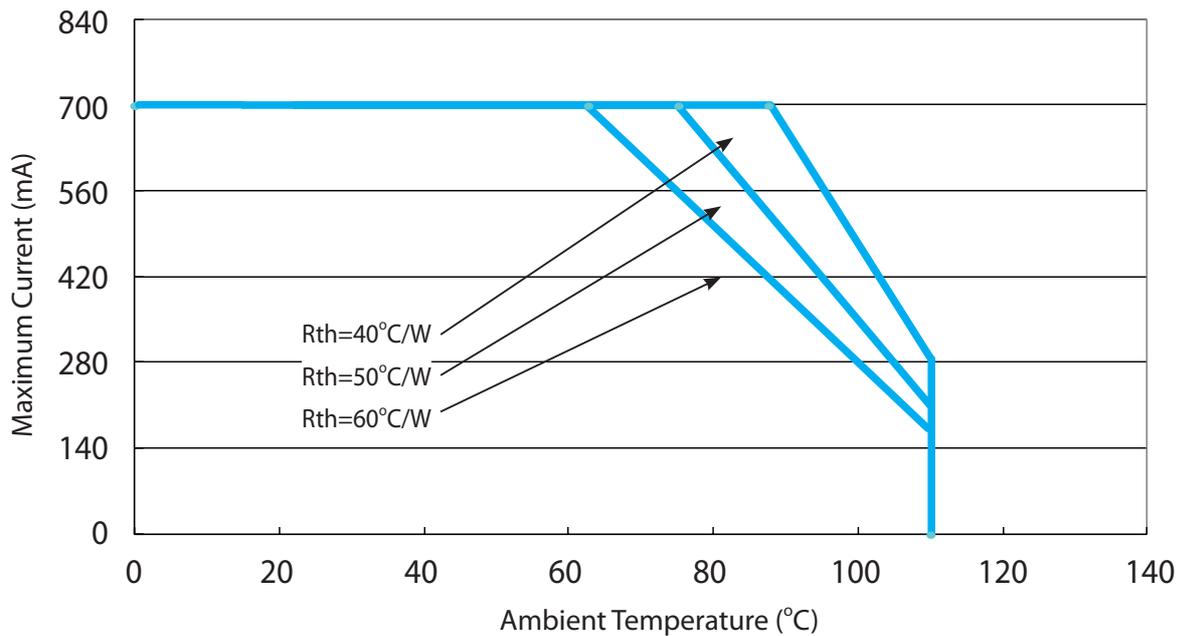
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Maximum Current vs. Ambient Temperature (3W)



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



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

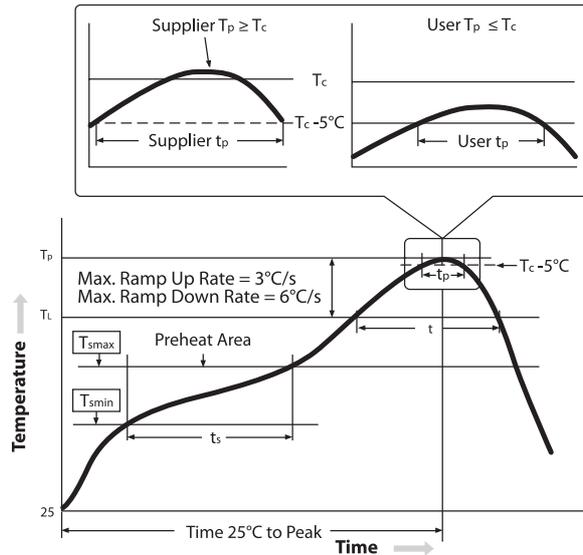


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Reflow Profile

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})	150°C
Temperature Max (T_{smax})	200°C
Time (t_s) from (T_{smin} to T_{smax})	60-120 seconds
Ramp-up rate (TL to T_p)	3°C/ seconds max.
Liquidous temperature (TL)	217°C
Time (t_l) maintained above TL	60-150 seconds
Peak package body temperature (T_p) ⁽¹⁾	255°C~260°C
Classification temperature (T_c)	260°C
Time (t_p) within 5°C of the specified classification temperature (T_c) ⁽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 (T_p) is defined as a supplier minimum and a user maximum.
2. Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.



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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%	-
$\Delta u'v'$	-	0.006
Forward Voltage	-	Initial Data x 1.1
Reverse Current	-	10 μ A
Resistance to Soldering Heat	No dead lamps or visual damage	



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Application Information

