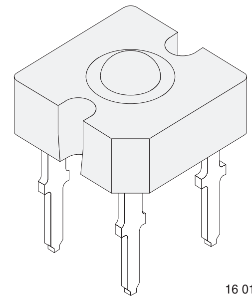
TELUX™ LED



Description

The TELUX™ series is a clear, non diffused LED for high end applications where supreme luminous flux is required.

It is designed in an industry standard 7.62 mm square package utilizing highly developed (AS) AlInGaP and InGaN technologies.

The supreme heat dissipation of TELUX™ allows applications at high ambient temperatures.

All packing units are binned for luminous flux and color to achieve best homogenous light appearance in application.

Features

- Utilizing (AS) AlInGaP and InGaN technologies
- High luminous flux
- Supreme heat dissipation: R_{thJP} is 90 K/W
- High operating temperature: T_j up to + 125 °C
- Type TLWR meets SAE and ECE color requirements
- Packed in tubes for automatic insertion
- Luminous flux and color categorized for each tube
- Small mechanical tolerances allow precise usage of external reflectors or lightguides
- TLWR and TLWY types additionally forward voltage categorized
- ESD-withstand voltage: > 2 kV acc. to MIL STD 883 D, Method 3015.7 for AlInGaP, > 1 kV for InGaN

Applications

- Exterior lighting
- Dashboard illumination
- Tail-, Stop - and Turn Signals of motor vehicles
- Replaces incandescent lamps
- Traffic signals and signs

Parts Table

Part	Color, Luminous Intensity	Angle of Half Intensity (±φ)	Technology
TLWR7900	Red, ϕ_V = (1500 to 3000) mlm	45 °	AlInGaP on GaAs
TLWO7900	Softorange, ϕ_V = (1500 to 3000) mlm	45 °	AlInGaP on GaAs
TLWY7900	Yellow, ϕ_V = (1000 to 2400) mlm	45 °	AlInGaP on GaAs
TLWTG7900	True green, ϕ_V = (630 to 1800) mlm	45 °	InGaN on SiC
TLWBG7900	Blue green, ϕ_V = (400 to 1250) mlm	45 °	InGaN on SiC
TLWB7900	Blue, ϕ_V = (200 to 6300) mlm	45 °	InGaN on SiC
TLWW7900	White, ϕ_V = (400 to 1250) mlm	45 °	InGaN / YAG on SiC

Absolute Maximum Ratings

T_{amb} = 25 °C, unless otherwise specified

TLWR7900 , TLWO7900 , TLWY7900

Parameter	Test condition	Symbol	Value	Unit
Reverse voltage	I_R = 10 μA	V_R	10	V
DC forward current	$T_{amb} \le 85$ °C	I_F	70	mA
Surge forward current	$t_p \le 10$ μs	I_{FSM}	1	A
Power dissipation	$T_{amb} \le 85$ °C	P_V	187	mW
Junction temperature		T_j	125	°C
Operating temperature range		T_{amb}	- 40 to + 110	°C
Storage temperature range		T_{stg}	- 55 to + 110	°C
Soldering temperature	t ≤ 5 s, 1.5 mm from body preheat temperature 100 °C/ 30 sec.	T_{sd}	260	°C
Thermal resistance junction/ ambient	with cathode heatsink of 70 mm^2	R_{thJA}	200	K/W
Thermal resistance junction/pin		R_{thJP}	90	K/W

TLWTG7900 , TLWBG7900 , TLWB7900 , TLWW7900

Parameter	Test condition	Symbol	Value	Unit
Reverse voltage	I_R = 10 μA	V_R	5	V
DC forward current	$T_{amb} \le 50$ °C	I_F	50	mA
Surge forward current	$t_p \le 10$ μs	I_{FSM}	0.1	A
Power dissipation	$T_{amb} \le 50$ °C	P_V	230	mW
	$T_{amb} \le 50$ °C	P_V	230	mW
	$T_{amb} \le 50$ °C	P_V	230	mW
	$T_{amb} \le 50$ °C	P_V	255	mW
Junction temperature		T_j	100	°C
Operating temperature range		T_{amb}	- 40 to + 100	°C
Storage temperature range		T_{stg}	- 55 to + 100	°C
Soldering temperature	t ≤ 5 s, 1.5 mm from body preheat temperature 100 °C/ 30 sec.	T_{sd}	260	°C
Thermal resistance junction/ ambient	with cathode heatsink of 70 mm^2	R_{thJA}	200	K/W
Thermal resistance junction/pin		R_{thJP}	90	K/W

Optical and Electrical Characteristics

T_{amb} = 25 °C, unless otherwise specified

Red

TLWR7900

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Total flux	I_F = 70 mA, R_{thJA} = 200 °K/W	ϕ_V	1500	2100	3000	mlm
Luminous intensity/Total flux	I_F = 70 mA, R_{thJA} = 200 °K/W	I_V/ϕ_V		0.7		mcd/mlm
Dominant wavelength	I_F = 70 mA, R_{thJA} = 200 °K/W	λ_d	611	618	634	nm
Peak wavelength	I_F = 70 mA, R_{thJA} = 200 °K/W	λ_p		624		nm
Angle of half intensity	I_F = 70 mA, R_{thJA} = 200 °K/W	φ		± 45		deg
Total included angle	90 % of Total Flux Captured	φ		100		deg
Forward voltage	I_F = 70 mA, R_{thJA} = 200 °K/W	V_F	1.83	2.2	2.67	V

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Reverse voltage	I_R = 10 μA	V_R	10	20		V
Junction capacitance	V_R = 0, f = 1 MHz	C_j		17		pF
Temperature coefficient of λ_{dom}	I_F = 50 mA	$TC_{\lambda dom}$		0.05		nm/K

Soft Orange

TLWO7900

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Total flux	I_F = 70 mA, R_{thJA} = 200 °K/W	ϕ_V	1500	2100	3000	mlm
Luminous intensity/Total flux	I_F = 70 mA, R_{thJA} = 200 °K/W	I_V/ϕ_V		0.7		mcd/mlm
Dominant wavelength	I_F = 70 mA, R_{thJA} = 200 °K/W	λ_d	598	605	611	nm
Peak wavelength	I_F = 70 mA, R_{thJA} = 200 °K/W	λ_p		610		nm
Angle of half intensity	I_F = 70 mA, R_{thJA} = 200 °K/W	φ		± 45		deg
Total included angle	90 % of Total Flux Captured	φ		100		deg
Forward voltage	I_F = 70 mA, R_{thJA} = 200 °K/W	V_F	1.83	2.2	2.67	V
Reverse voltage	I_R = 10 μA	V_R	10	20		V
Junction capacitance	V_R = 0, f = 1 MHz	C_j		17		pF
Temperature coefficient of λ_{dom}	I_F = 50 mA	$TC_{\lambda dom}$		0.06		nm/K

Yellow

TLWY7900

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Total flux	I_F = 70 mA, R_{thJA} = 200 °K/W	ϕ_V	1000	1400	2400	mlm
Luminous intensity/Total flux	I_F = 70 mA, R_{thJA} = 200 °K/W	I_V/ϕ_V		0.7		mcd/mlm
Dominant wavelength	I_F = 70 mA, R_{thJA} = 200 °K/W	λ_d	585	592	597	nm
Peak wavelength	I_F = 70 mA, R_{thJA} = 200 °K/W	λ_p		594		nm
Angle of half intensity	I_F = 70 mA, R_{thJA} = 200 °K/W	φ		± 45		deg
Total included angle	90 % of Total Flux Captured	φ		100		deg
Forward voltage	I_F = 70 mA, R_{thJA} = 200 °K/W	V_F	1.83	2.1	2.67	V
Reverse voltage	I_R = 10 μA	V_R	10	15		V
Junction capacitance	V_R = 0, f = 1 MHz	C_j		32		pF
Temperature coefficient of λ_{dom}	I_F = 50 mA	$TC_{\lambda dom}$		0.1		nm/K

True green

TLWTG7900

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Total flux	I_F = 50 mA, R_{thJA} = 200 °K/W	ϕ_V	630	900	1800	mlm
Luminous intensity/Total flux	I_F = 50 mA, R_{thJA} = 200 °K/W	I_V/ϕ_V		0.7		mcd/mlm
Dominant wavelength	I_F = 50 mA, R_{thJA} = 200 °K/W	λ_d	509	523	529	nm
Peak wavelength	I_F = 50 mA, R_{thJA} = 200 °K/W	λ_p		518		nm
Angle of half intensity	I_F = 50 mA, R_{thJA} = 200 °K/W	φ		± 45		deg
Total included angle	90 % of Total Flux Captured	φ		100		deg
Forward voltage	I_F = 50 mA, R_{thJA} = 200 °K/W	V_F		4.2	4.7	V
Reverse voltage	I_R = 10 μA	V_R	5	10		V
Junction capacitance	V_R = 0, f = 1 MHz	C_j		50		pF
Temperature coefficient of λ_{dom}	I_F = 30 mA	$TC_{\lambda dom}$		0.02		nm/K

Optical and Electrical Characteristics

T_{amb} = 25 °C, unless otherwise specified

Blue green

TLWBG7900

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Total flux	I_F = 50 mA, R_{thJA} = 200 °K/W	ϕ_V	400	700	1250	mlm
Luminous intensity/Total flux	I_F = 50 mA, R_{thJA} = 200 °K/W	I_V/ϕ_V		0.7		mcd/mlm
Dominant wavelength	I_F = 50 mA, R_{thJA} = 200 °K/W	λ_d	492	505	510	nm
Peak wavelength	I_F = 50 mA, R_{thJA} = 200 °K/W	λ_p		503		nm
Angle of half intensity	I_F = 50 mA, R_{thJA} = 200 °K/W	φ		± 45		deg
Total included angle	90 % of Total Flux Captured	φ		100		deg
Forward voltage	I_F = 50 mA, R_{thJA} = 200 °K/W	V_F		4.2	4.7	V
Reverse voltage	I_R = 10 µA	V_R	5	10		V
Junction capacitance	V_R = 0, f = 1 MHz	C_j		50		pF
Temperature coefficient of λ_{dom}	I_F = 30 mA	$TC_{\lambda dom}$		0.02		nm/K

Blue

TLWB7900

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Total flux	I_F = 50 mA, R_{thJA} = 200 °K/W	ϕ_V	200	330	630	mlm
Luminous intensity/Total flux	I_F = 50 mA, R_{thJA} = 200 °K/W	I_V/ϕ_V		0.7		mcd/mlm
Dominant wavelength	I_F = 50 mA, R_{thJA} = 200 °K/W	λ_d	462	470	476	nm
Peak wavelength	I_F = 50 mA, R_{thJA} = 200 °K/W	λ_p		460		nm
Angle of half intensity	I_F = 50 mA, R_{thJA} = 200 °K/W	φ		± 45		deg
Total included angle	90 % of Total Flux Captured	φ		100		deg
Forward voltage	I_F = 50 mA, R_{thJA} = 200 °K/W	V_F		4.3	4.7	V
Reverse voltage	I_R = 10 µA	V_R	5	10		V
Junction capacitance	V_R = 0, f = 1 MHz	C_j		50		pF
Temperature coefficient of λ_{dom}	I_F = 30 mA	$TC_{\lambda dom}$		0.03		nm/K

White

TLWW7900

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Total flux	I_F = 50 mA, R_{thJA} = 200 °K/W	ϕ_V	400	650	1250	mlm
Luminous intensity/Total flux	I_F = 50 mA, R_{thJA} = 200 °K/W	I_V/ϕ_V		0.7		mcd/mlm
Color temperature	I_F = 50 mA, R_{thJA} = 200 °K/W	T_K		5500		K
Angle of half intensity	I_F = 50 mA, R_{thJA} = 200 °K/W	φ		± 45		deg
Total included angle	90 % of Total Flux Captured	φ		100		deg
Forward voltage	I_F = 50 mA, R_{thJA} = 200 °K/W	V_F		4.3	5.1	V
Reverse voltage	I_R = 10 µA	V_R	5	10		V
Junction capacitance	V_R = 0, f = 1 MHz	C_j		50		pF

Typical Characteristics (T_{amb} = 25 °C unless otherwise specified)

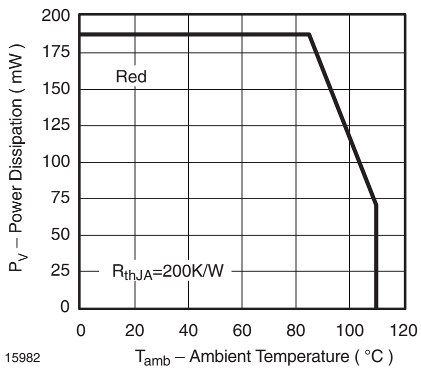


Figure 1. Power Dissipation vs. Ambient Temperature

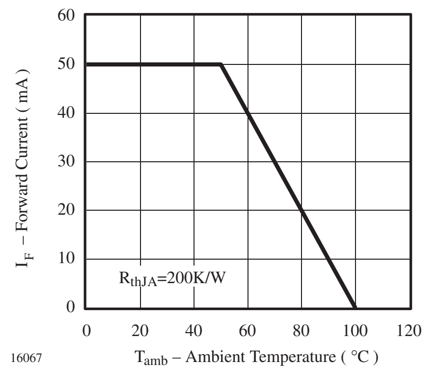


Figure 4. Forward Current vs. Ambient Temperature for InGaN

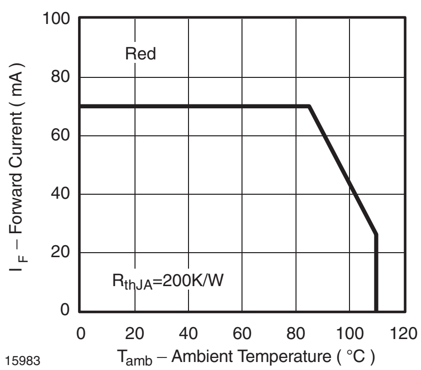


Figure 2. Forward Current vs. Ambient Temperature

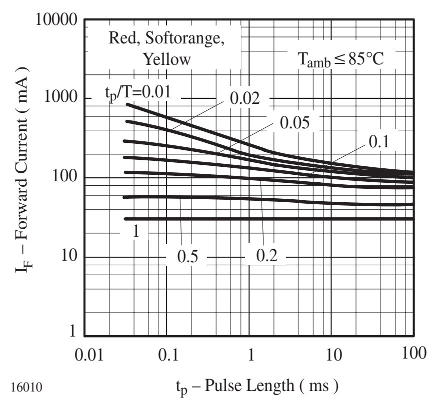


Figure 5. Forward Current vs. Pulse Length

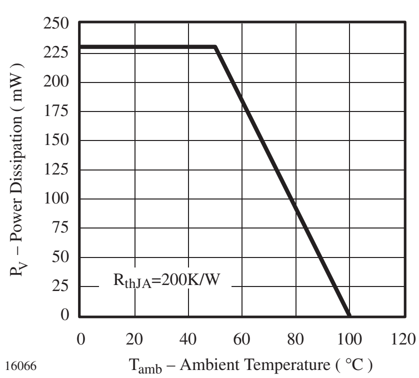


Figure 3. Power Dissipation vs. Ambient Temperature

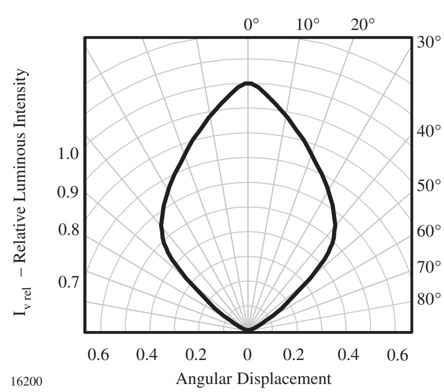


Figure 6. Rel. Luminous Intensity vs. Angular Displacement

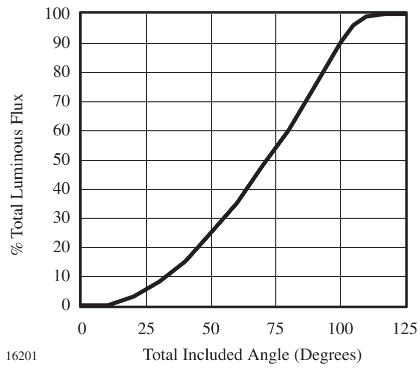


Figure 7. Percentage Total Luminous Flux vs. Total Included Angle for 90 ° emission angle

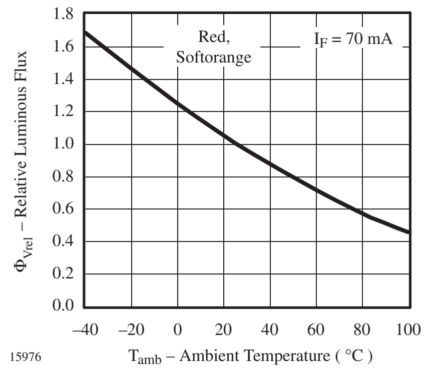


Figure 10. Rel. Luminous Flux vs. Ambient Temperature

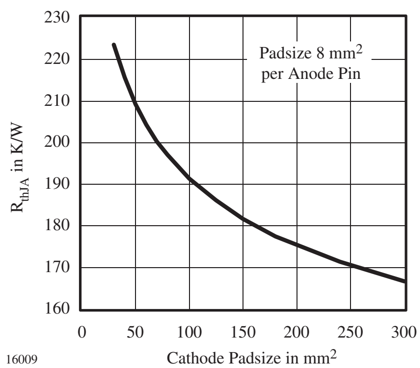


Figure 8. Thermal Resistance Junction Ambient vs. Cathode Padsize

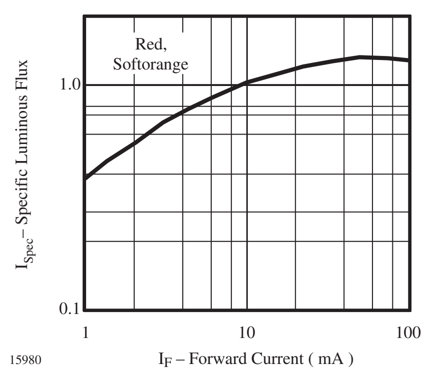


Figure 11. Specific Luminous Flux vs. Forward Current

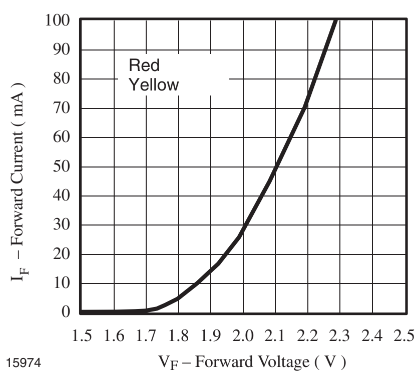


Figure 9. Forward Current vs. Forward Voltage

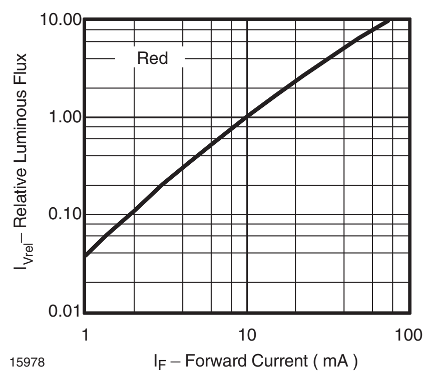


Figure 12. Relative Luminous Flux vs. Forward Current

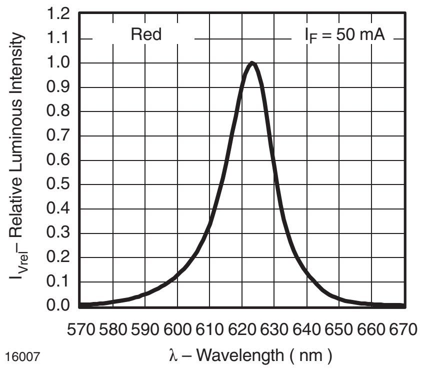


Figure 13. Relative Intensity vs. Wavelength

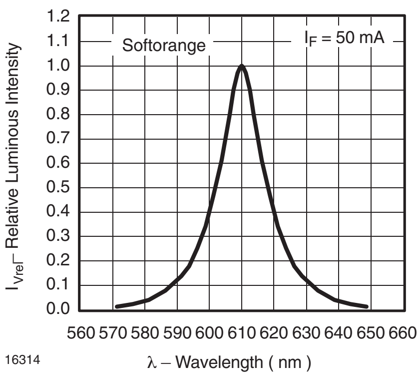


Figure 14. Relative Intensity vs. Wavelength

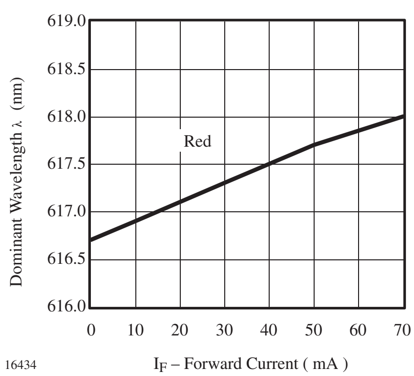


Figure 15. Dominant Wavelength vs. Forward Current

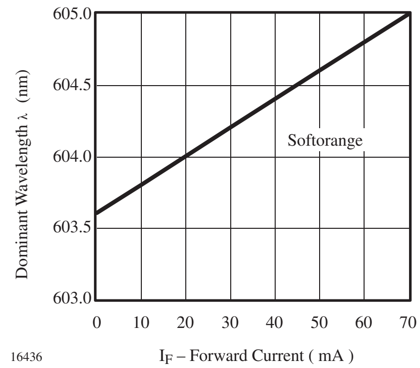


Figure 16. Dominant Wavelength vs. Forward Current

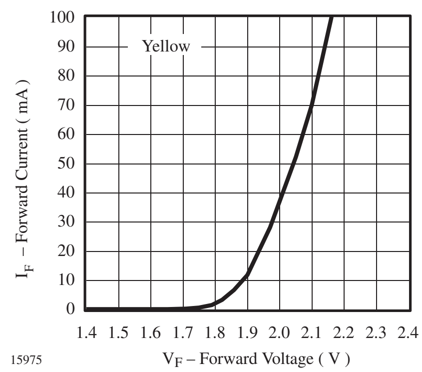


Figure 17. Forward Current vs. Forward Voltage

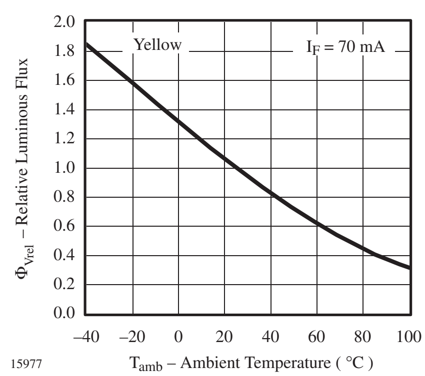


Figure 18. Rel. Luminous Flux vs. Ambient Temperature

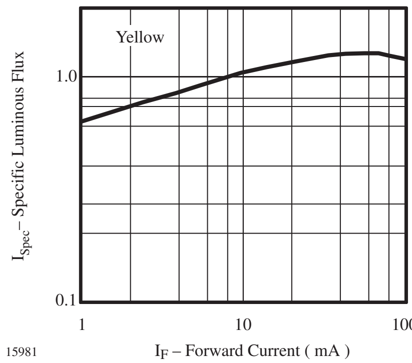


Figure 19. Specific Luminous Flux vs. Forward Current

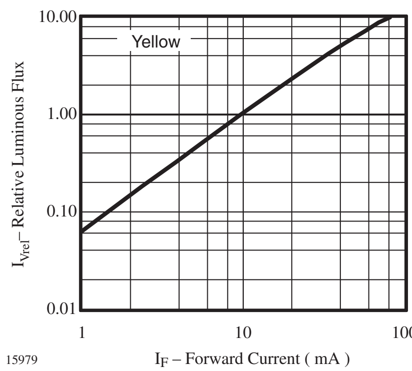


Figure 20. Relative Luminous Flux vs. Forward Current

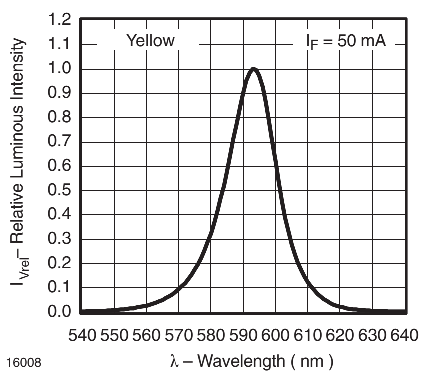


Figure 21. Relative Intensity vs. Wavelength

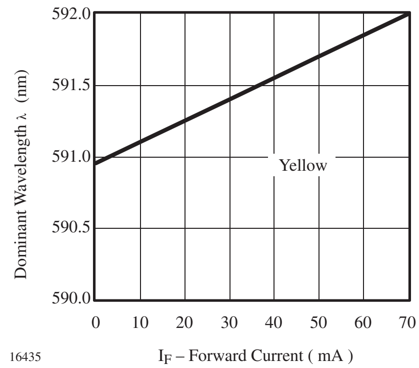


Figure 22. Dominant Wavelength vs. Forward Current

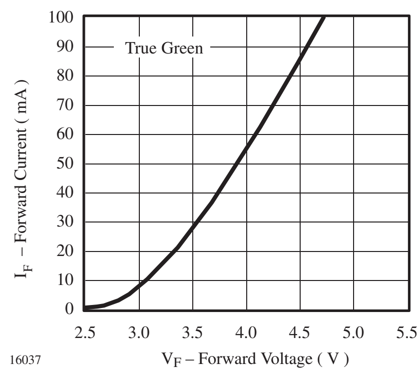


Figure 23. Forward Current vs. Forward Voltage

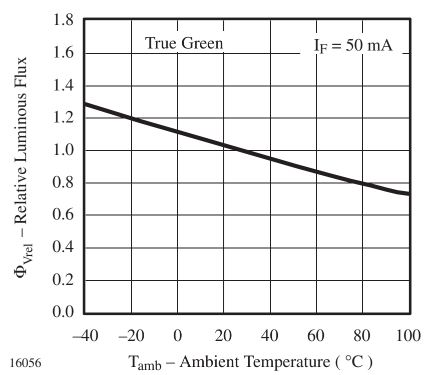


Figure 24. Rel. Luminous Flux vs. Ambient Temperature

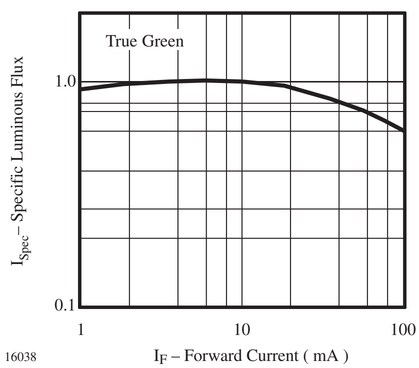


Figure 25. Specific Luminous Flux vs. Forward Current

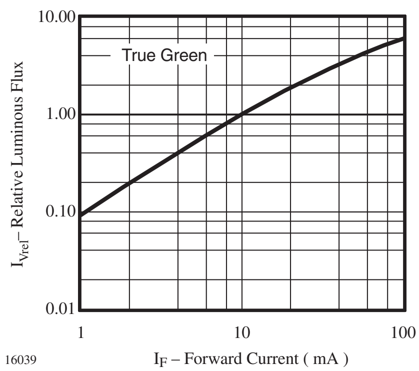


Figure 26. Relative Luminous Flux vs. Forward Current

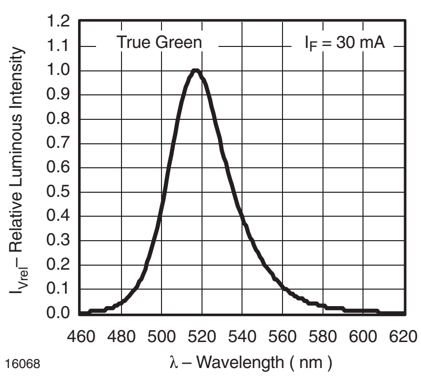


Figure 27. Relative Intensity vs. Wavelength

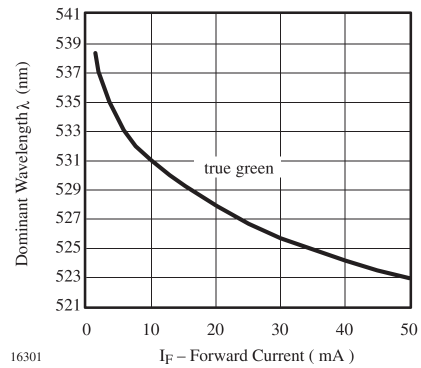


Figure 28. Dominant Wavelength vs. Forward Current

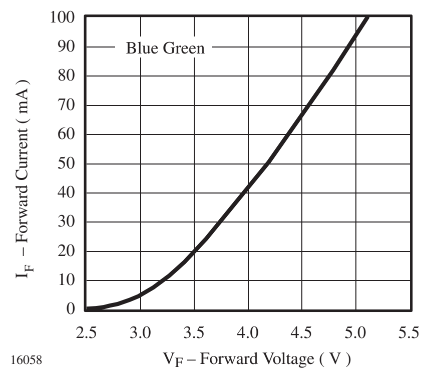


Figure 29. Forward Current vs. Forward Voltage

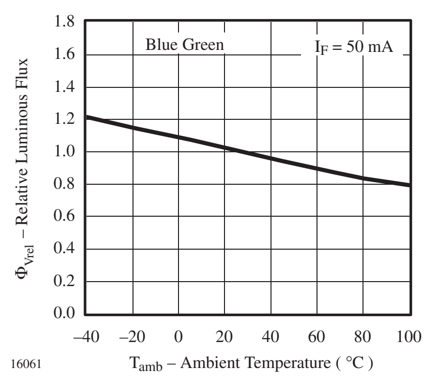


Figure 30. Rel. Luminous Flux vs. Ambient Temperature

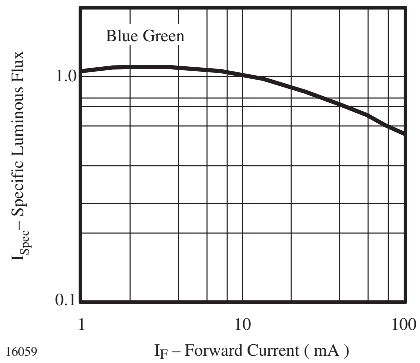


Figure 31. Specific Luminous Flux vs. Forward Current

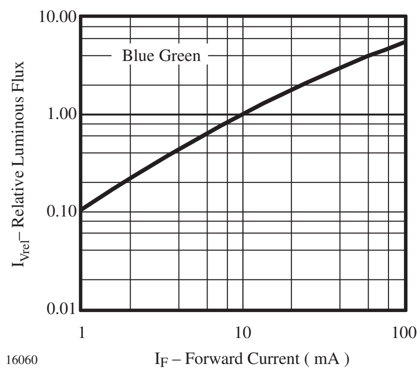


Figure 32. Relative Luminous Flux vs. Forward Current

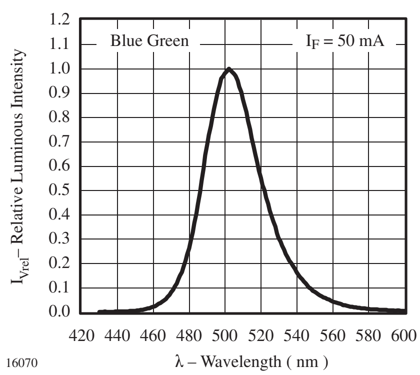


Figure 33. Relative Intensity vs. Wavelength

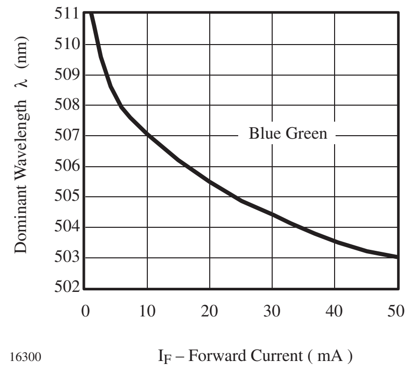


Figure 34. Dominant Wavelength vs. Forward Current

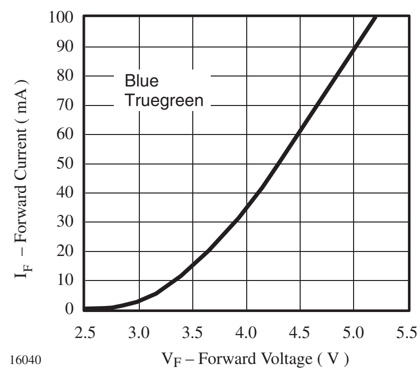


Figure 35. Forward Current vs. Forward Voltage

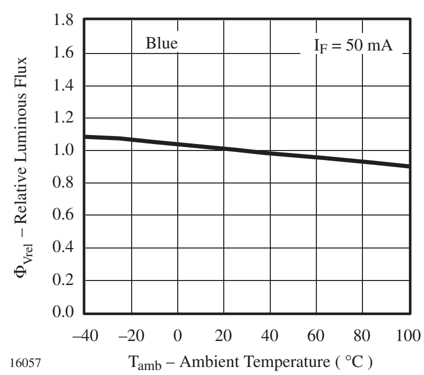


Figure 36. Rel. Luminous Flux vs. Ambient Temperature

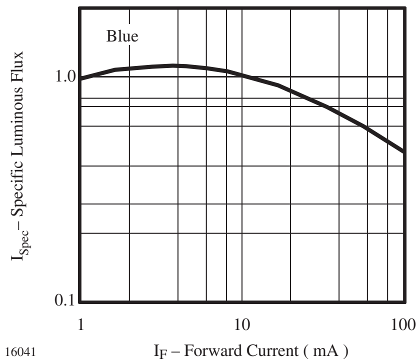


Figure 37. Specific Luminous Flux vs. Forward Current

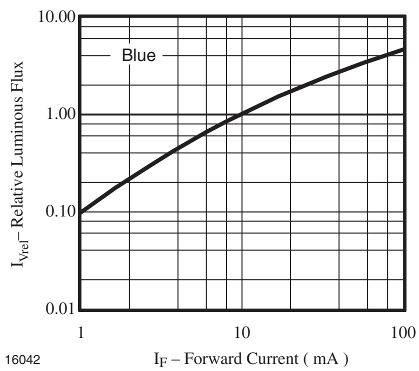


Figure 38. Relative Luminous Flux vs. Forward Current

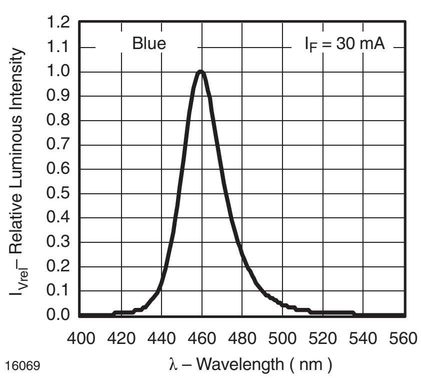


Figure 39. Relative Intensity vs. Wavelength

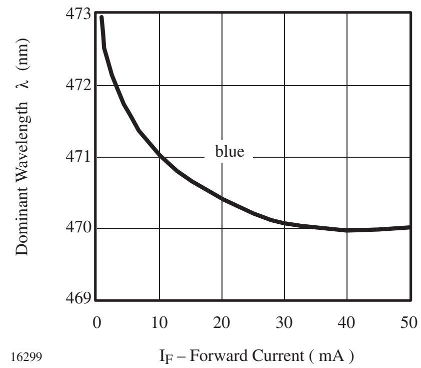


Figure 40. Dominant Wavelength vs. Forward Current

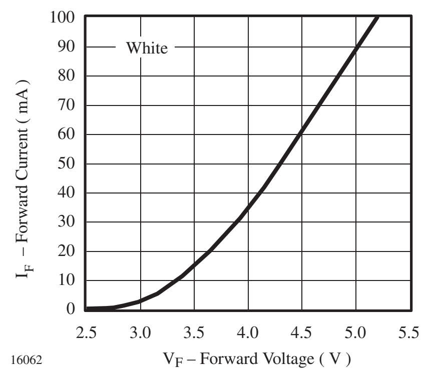


Figure 41. Forward Current vs. Forward Voltage

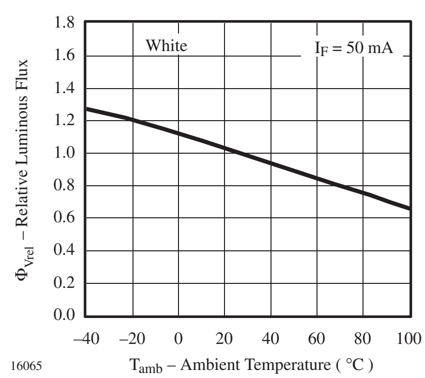


Figure 42. Rel. Luminous Flux vs. Ambient Temperature

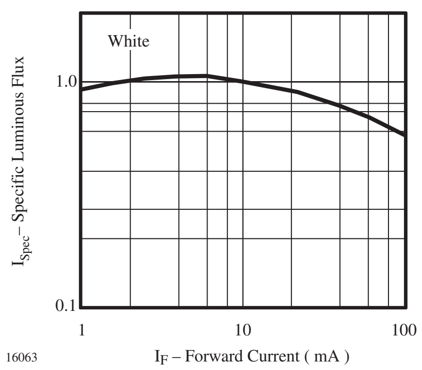


Figure 43. Specific Luminous Flux vs. Forward Current

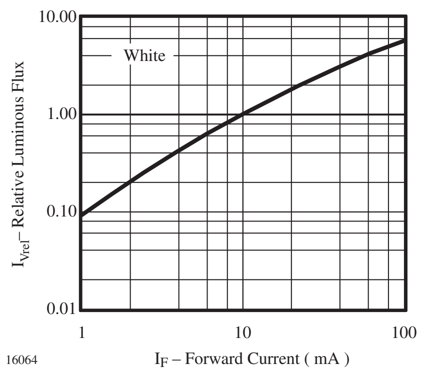


Figure 44. Relative Luminous Flux vs. Forward Current

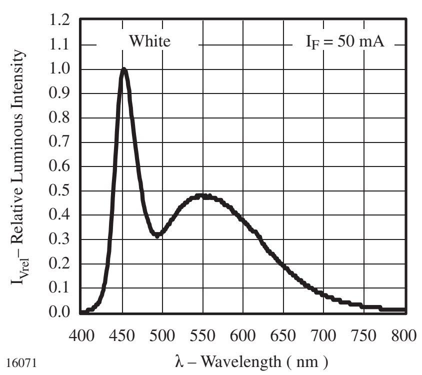


Figure 45. Relative Intensity vs. Wavelength

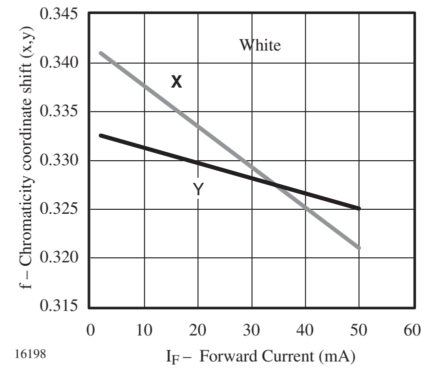
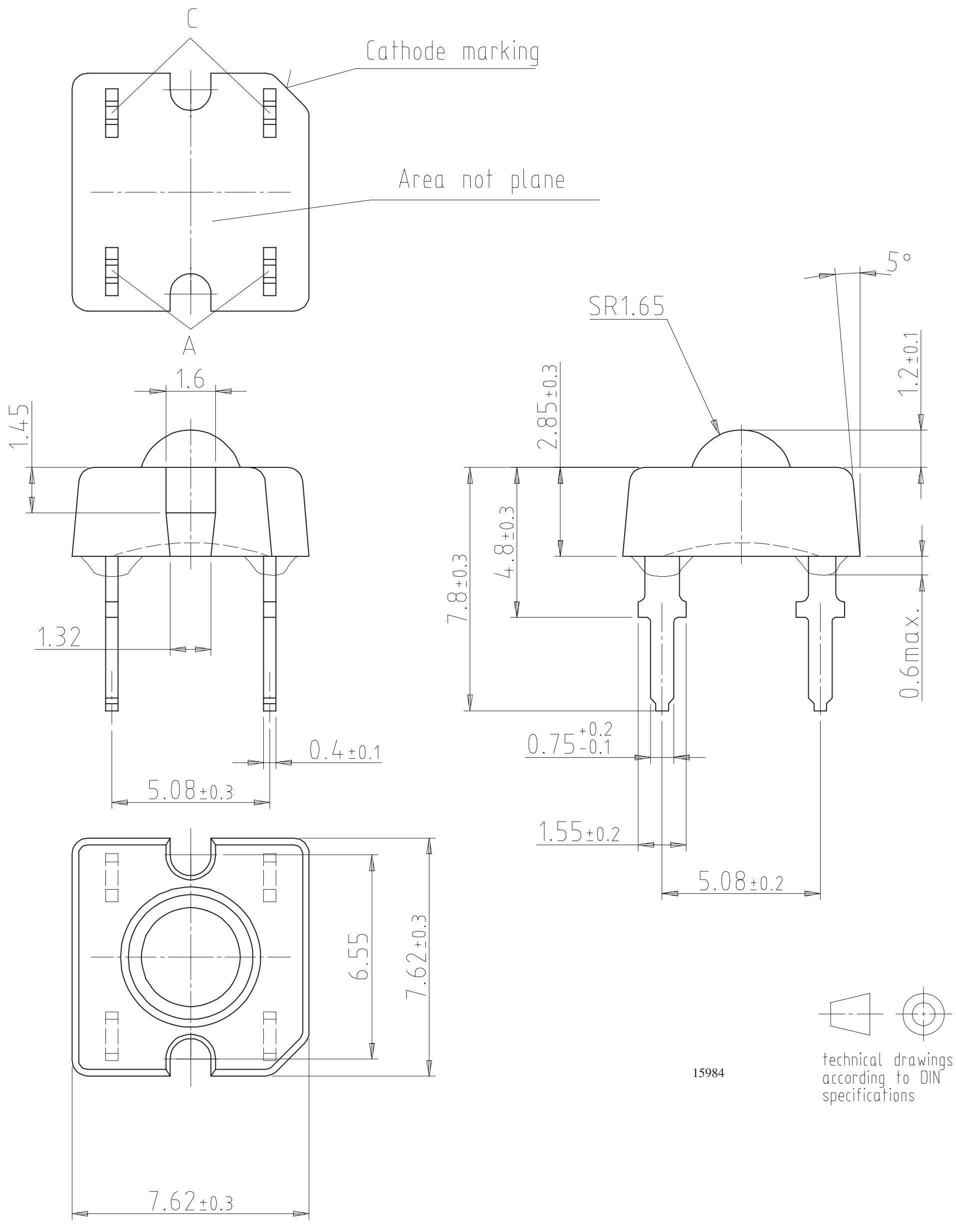


Figure 46. Chromaticity Coordinate Shift vs. Forward Current

Package Dimensions in mm



Ozone Depleting Substances Policy Statement

It is the policy of **Vishay Semiconductor GmbH** to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operatingsystems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

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