TELUX™

Description

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

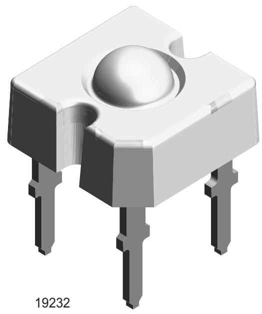
It is designed in an industry standard 7.62 mm square package utilizing highly developed (AS) AlInGaP technology.

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

All packing units are binned for luminous flux, forward voltage and color to achieve the most homogenous light appearance in application.

SAE and ECE color requirements for automobile application are available for color red.

ESD resistivity 2 kV (HBM) according to MIL STD 883D, method 3015.7.



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Features

- Utilizing one of the world's brightest (AS) AlInGaP technologies
- High luminous flux
- Supreme heat dissipation: R_{thJP} is 90 K/W
- High operating temperature: T_{amb} = - 40 to + 110 °C
- Meets SAE and ECE color requirements for the automobile industry for color red
- Packed in tubes for automatic insertion
- Luminous flux, forward voltage and color categorized for each tube
- Small mechanical tolerances allow precise usage of external reflectors or lightguides
- Lead-free device

Applications

Exterior lighting

Dashboard illumination

Tail-, Stop - and Turn Signals of motor vehicles

Replaces small incandescent lamps

Traffic signals and signs

Parts Table

Part	Color, Luminous Intensity	Angle of Half Intensity (±φ)	Technology
TLWR8900	Red, ϕ_V = 3000 mlm (typ.)	45 °	AlInGaP on GaAs
TLWY8900	Yellow, ϕ_V = 3000 mlm (typ.)	45 °	AlInGaP on GaAs
TLWTG8900	True green, ϕ_V = 3000 mlm (typ.)	45 °	InGaN on SiC
TLWBG8900	Blue green, ϕ_V = 1300 mlm (typ.)	45 °	InGaN on SiC
TLWB8900	Blue, ϕ_V = 650 mlm (typ.)	45 °	InGaN on SiC

Absolute Maximum Ratings

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

TLWR8900 , TLWY8900

Parameter	Test condition	Symbol	Value	Unit
Reverse voltage	I_R = 100 μA	V_R	10	V
DC Forward current	$T_{amb} \leq$ 85 °C	I_F	70	mA
Surge forward current	$t_p \leq$ 10 μs	I_{FSM}	1	A
Power dissipation	$T_{amb} \leq$ 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

TLWTG8900 , TLWBG8900 , TLWB8900

Parameter	Test condition	Symbol	Value	Unit
Reverse voltage	I_R = 10 μA	V_R	5	V
DC Forward current	$T_{amb} \leq$ 50 °C	I_F	50	mA
Surge forward current	$t_p \leq$ 10 μs	I_{FSM}	0.1	A
Power dissipation	$T_{amb} \leq$ 50 °C	P_V	230	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

TLWR8900

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Total flux	I_F = 70 mA, R_{thJA} = 200 °K/W	ϕ_V	2000	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	615	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	$\varphi_{0.9V}$		75		deg
Forward voltage	I_F = 70 mA, R_{thJA} = 200 °K/W	V_F	2.0	2.2	2.7	V
Reverse voltage	I_R = 10 μA	V_R	10	20		V
Junction capacitance	V_R = 0, f = 1 MHz	C_j		17		pF

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Yellow

TLWY8900

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Total flux	I_F = 70 mA, R_{thJA} = 200 °K/W	ϕ_V	2000	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	585	590	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	$\varphi_{0.9V}$		75		deg
Forward voltage	I_F = 70 mA, R_{thJA} = 200 °K/W	V_F	1.83	2.1	2.7	V
Reverse voltage	I_R = 10 µA	V_R	10	15		V
Junction capacitance	V_R = 0, f = 1 MHz	C_j		17		pF

True green

TLWTG8900

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Total flux	I_F = 50 mA, R_{thJA} = 200 °K/W	ϕ_V	1000	2000		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	535	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		4.4	5.0	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 green

TLWBG8900

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Total flux	I_F = 50 mA, R_{thJA} = 200 °K/W	ϕ_V	630	1300		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		4.4	5.0	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

TLWB8900

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Total flux	I_F = 50 mA, R_{thJA} = 200 °K/W	ϕ_V	320	650		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		4.4	5.0	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

Typical Characteristics (Tamb = 25 °C unless otherwise specified)

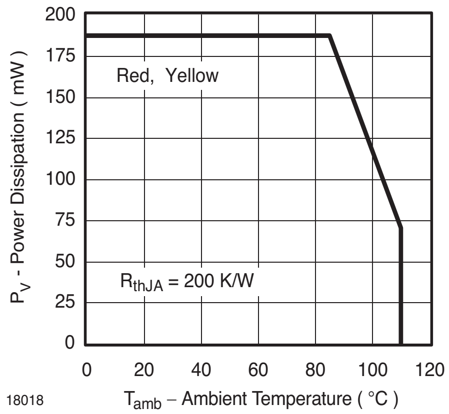


Figure 1. Power Dissipation vs. Ambient Temperature

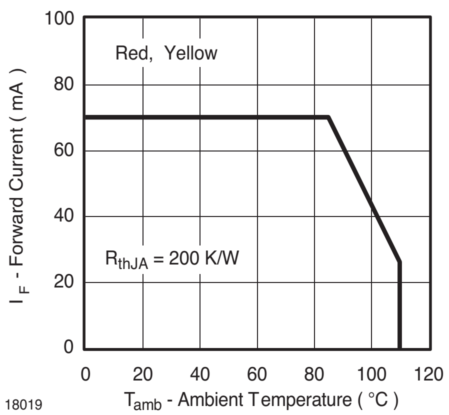


Figure 2. Forward Current vs. Ambient Temperature

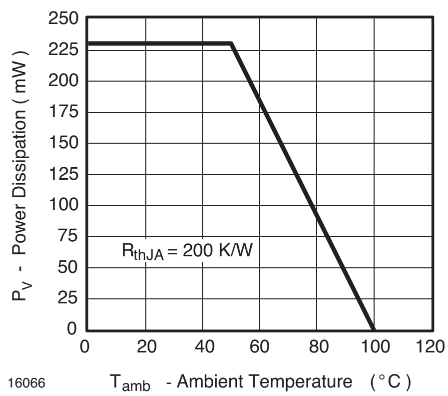


Figure 3. Power Dissipation vs. Ambient Temperature for InGaN

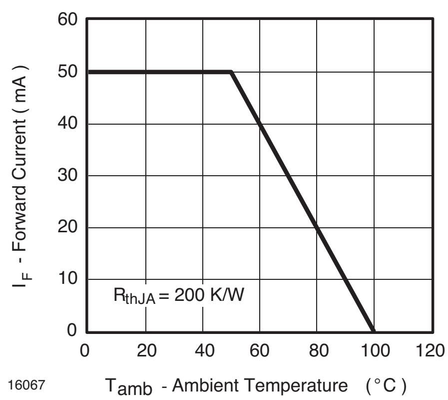


Figure 4. Forward Current vs. Ambient Temperature for InGaN

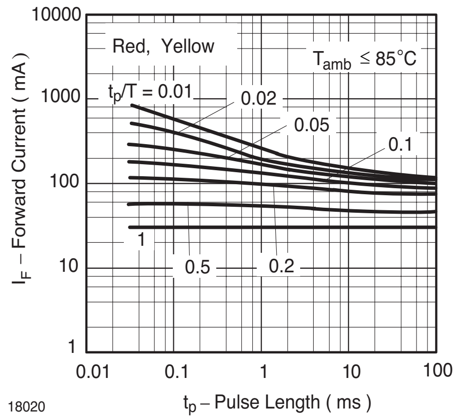


Figure 5. Forward Current vs. Pulse Length

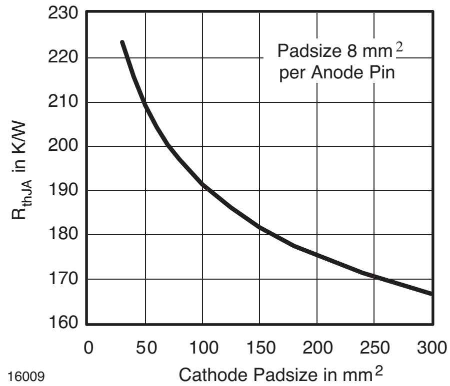


Figure 8. Thermal Resistance Junction Ambient vs. Cathode Padsize

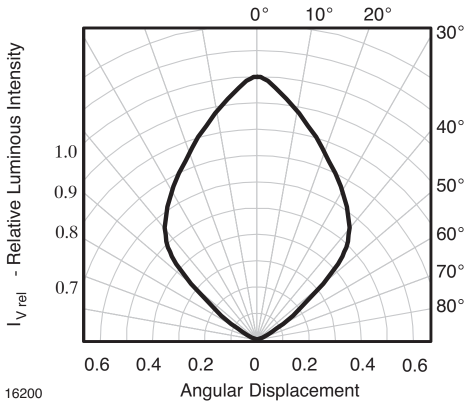


Figure 6. Rel. Luminous Intensity vs. Angular Displacement

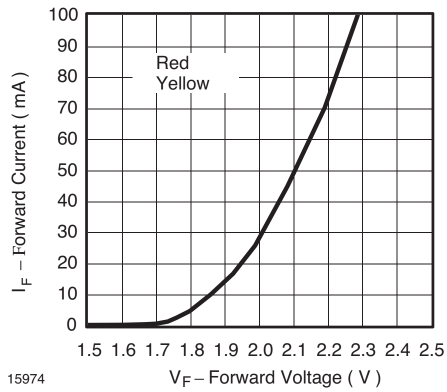


Figure 9. Forward Current vs. Forward Voltage

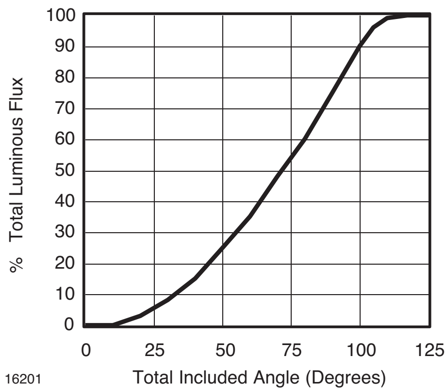


Figure 7. Percentage Total Luminous Flux vs. Total Included Angle for 90 ° emission angle

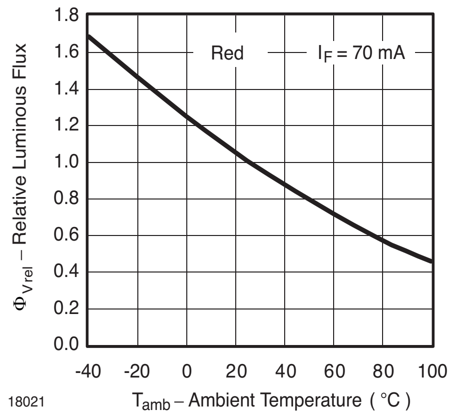


Figure 10. Rel. Luminous Flux vs. Ambient Temperature

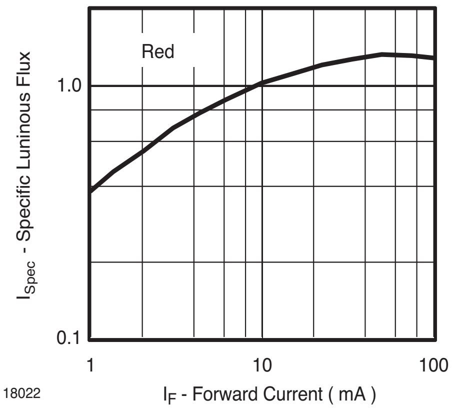


Figure 11. Specific Luminous Flux vs. Forward Current

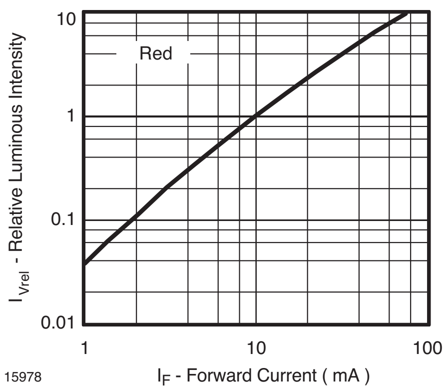


Figure 12. Relative Luminous Flux vs. Forward Current

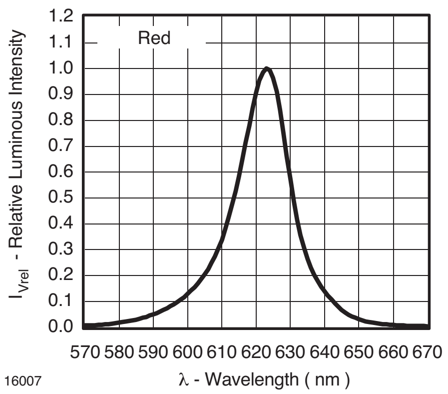


Figure 13. Relative Intensity vs. Wavelength

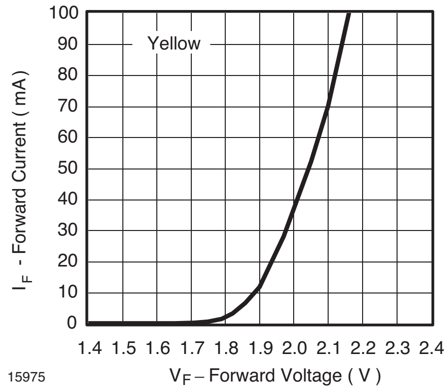


Figure 14. Forward Current vs. Forward Voltage

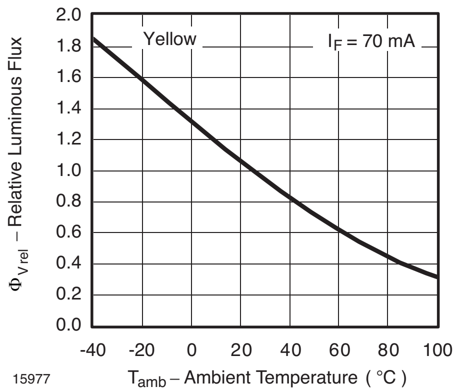


Figure 15. Rel. Luminous Flux vs. Ambient Temperature

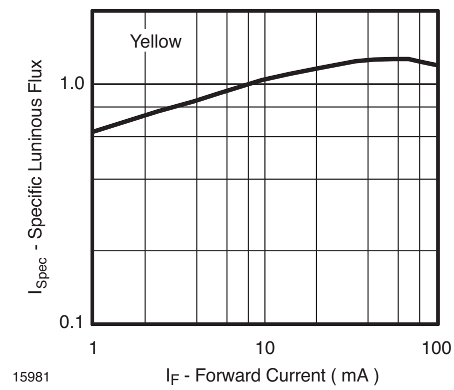


Figure 16. Specific Luminous Flux vs. Forward Current

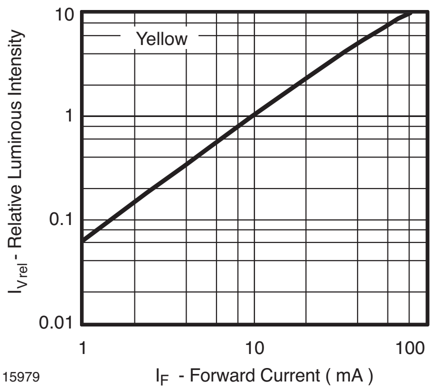


Figure 17. Relative Luminous Flux vs. Forward Current

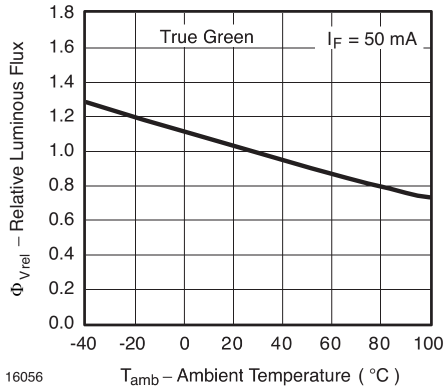


Figure 20. Rel. Luminous Flux vs. Ambient Temperature

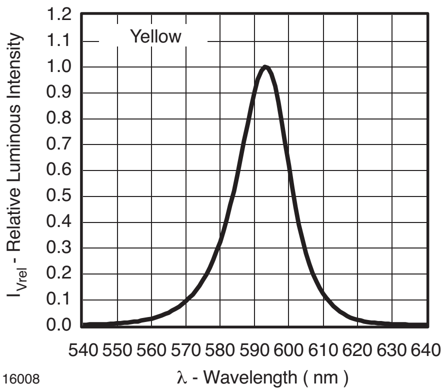


Figure 18. Relative Intensity vs. Wavelength

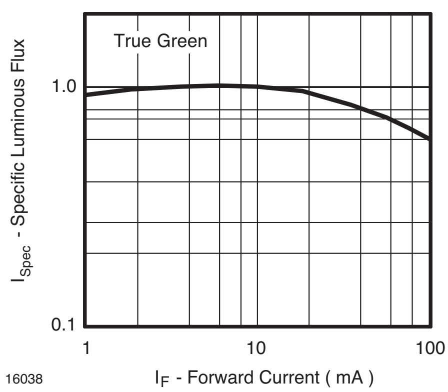


Figure 21. Specific Luminous Flux vs. Forward Current

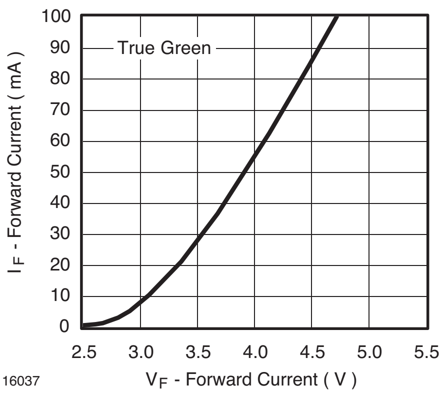


Figure 19. Forward Current vs. Forward Voltage

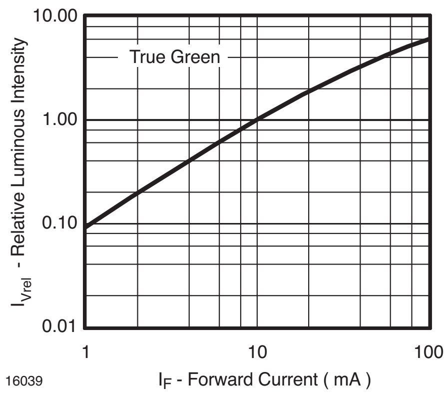


Figure 22. Relative Luminous Flux vs. Forward Current

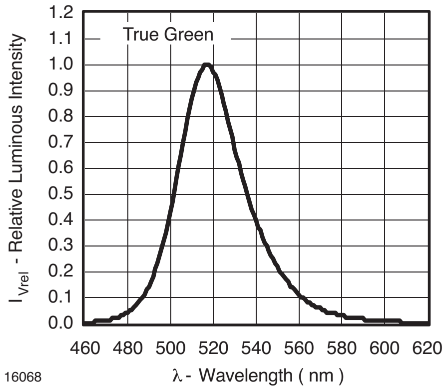


Figure 23. Relative Intensity vs. Wavelength

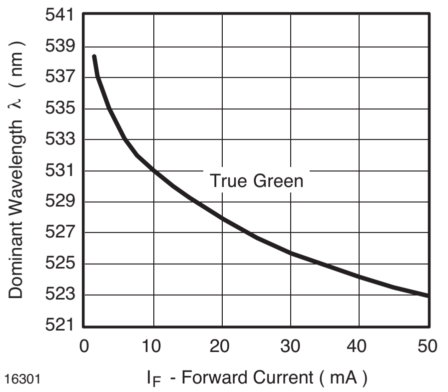


Figure 24. Dominant Wavelength vs. Forward Current

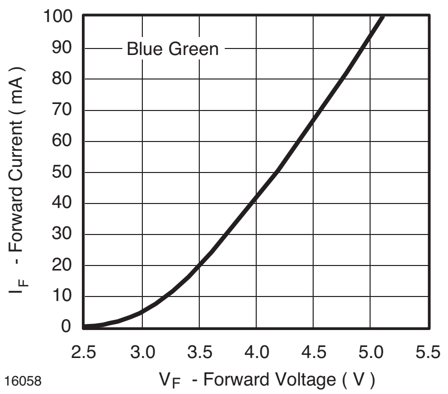


Figure 25. Forward Current vs. Forward Voltage

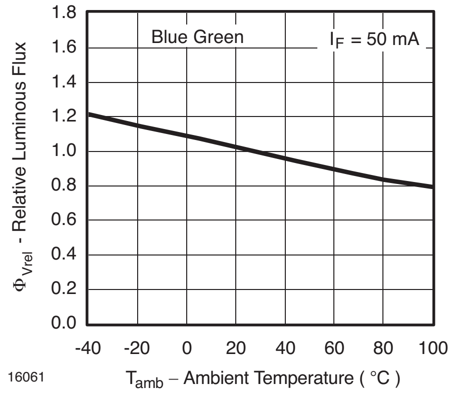


Figure 26. Rel. Luminous Flux vs. Ambient Temperature

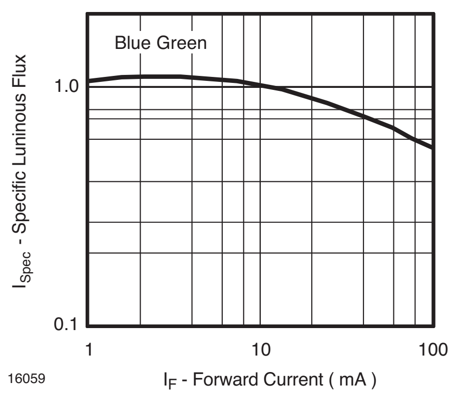


Figure 27. Specific Luminous Flux vs. Forward Current

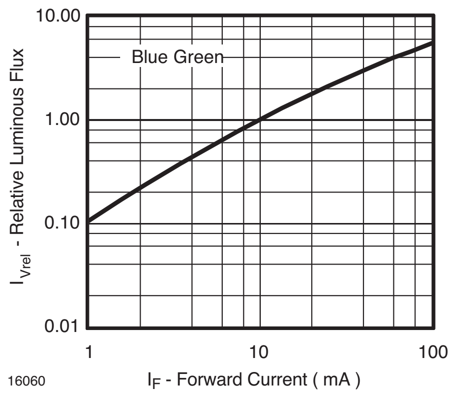


Figure 28. Relative Luminous Flux vs. Forward Current

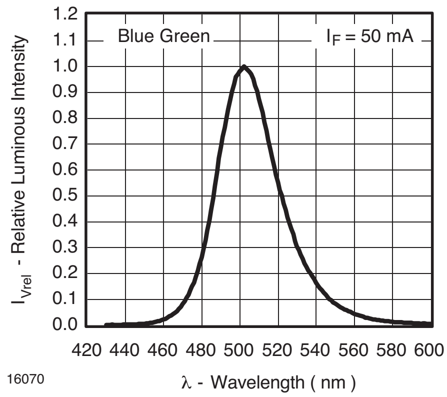


Figure 29. Relative Intensity vs. Wavelength

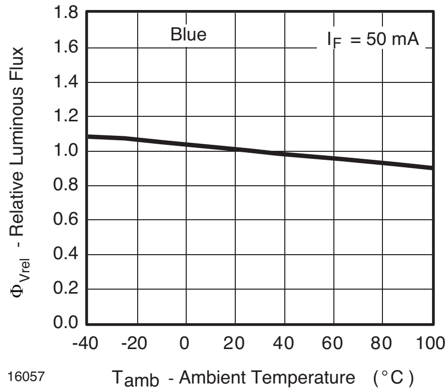


Figure 32. Rel. Luminous Flux vs. Ambient Temperature

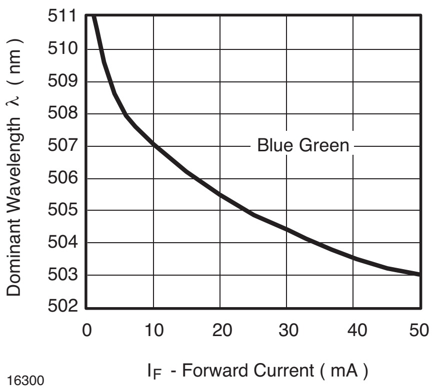


Figure 30. Dominant Wavelength vs. Forward Current

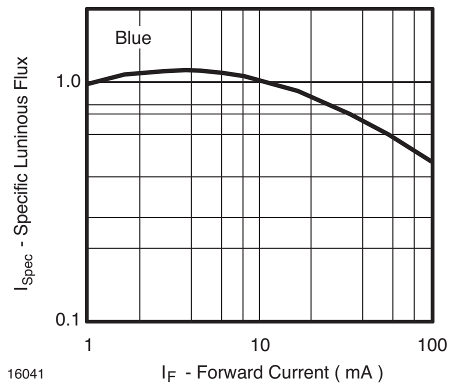


Figure 33. Specific Luminous Flux vs. Forward Current

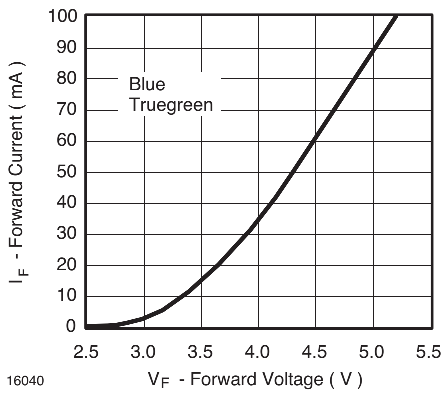


Figure 31. Forward Current vs. Forward Voltage

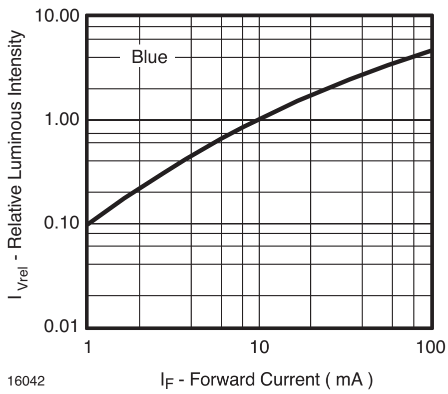


Figure 34. Relative Luminous Flux vs. Forward Current

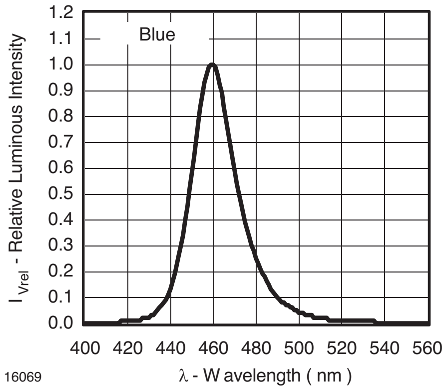


Figure 35. Relative Intensity vs. Wavelength

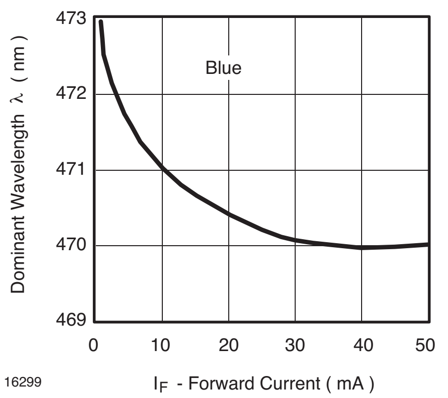
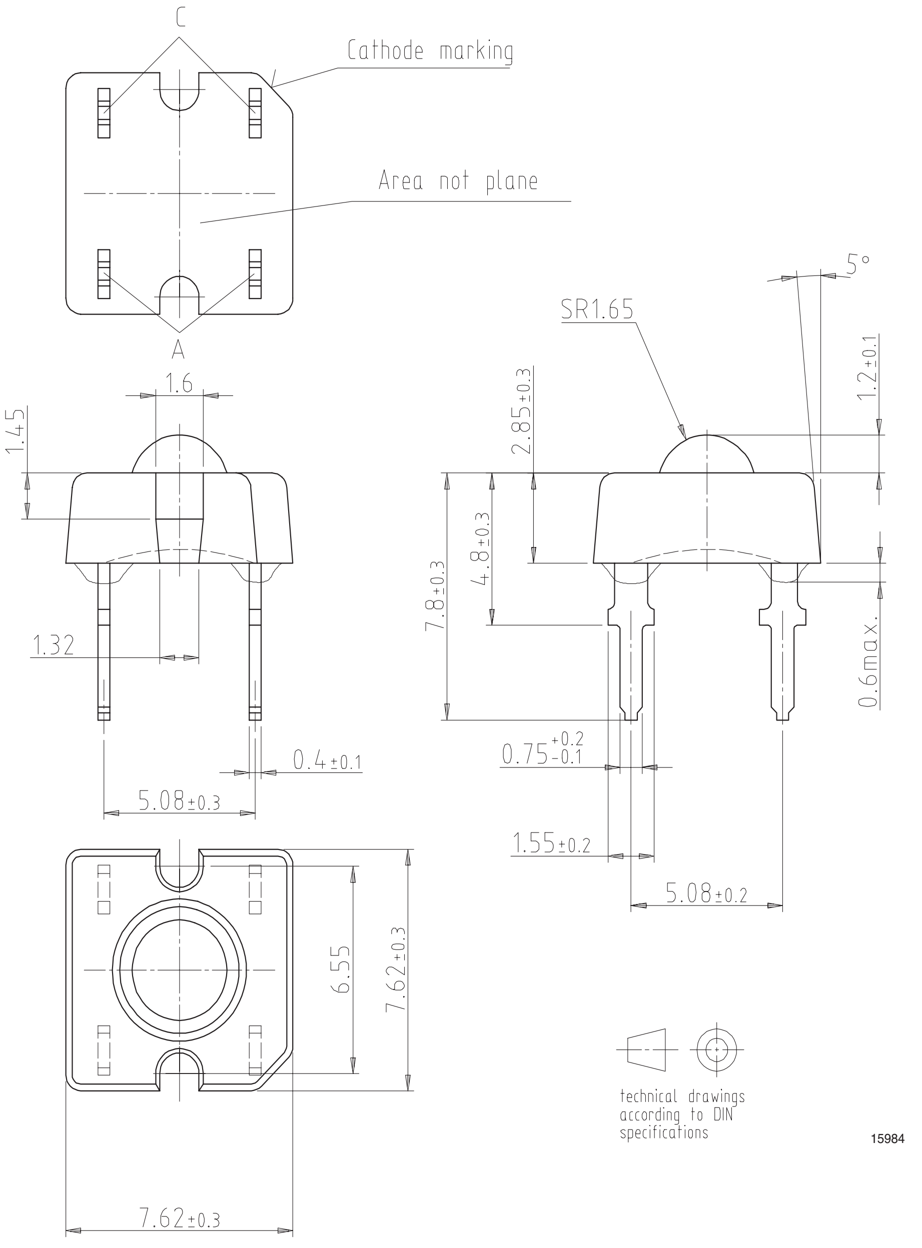


Figure 36. Dominant Wavelength vs. Forward Current

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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