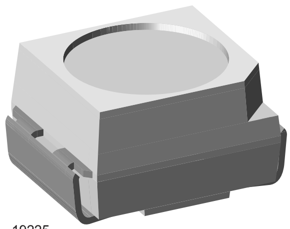
SMD LED in PLCC-2 Package

Description

These devices have been designed to meet the increasing demand for surface mounting technology.

The package of the TLM.310. is the PLCC-2 (equivalent to a size B tantalum capacitor).

It consists of a lead frame which is embedded in a white thermoplast. The reflector inside this package is filled up with clear epoxy.



e3 Pb-free

Features

- SMD LEDs with exceptional brightness
- Luminous intensity categorized
- Compatible with automatic placement equipment
- EIA and ICE standard package
- Compatible with infrared, vapor phase and wave solder processes according to CECC
- Available in 8 mm tape
- Low profile package
- Non-diffused lens: excellent for coupling to light pipes and backlighting
- Low power consumption
- Luminous intensity ratio in one packaging unit $I_{Vmax}/I_{Vmin} \leq 1.6$
- Lead-free device

Applications

Automotive: Backlighting in dashboards and switches

Telecommunication: Indicator and backlighting in telephone and fax

Indicator and backlight for audio and video equipment

Indicator and backlight in office equipment

Flat backlight for LCDs, switches and symbols

General use

Parts Table

Part	Color, Luminous Intensity	Angle of Half Intensity (±φ)	Technology
TLMH3100	Red, I_V > 2.5 mcd	60 °	GaAsP on GaP
TLMH3101	Red, I_V = (4 to 12.5) mcd	60 °	GaAsP on GaP
TLMH3102	Red, I_V = (6.3 to 20) mcd	60 °	GaAsP on GaP
TLMO3100	Soft orange, I_V > 2.5 mcd	60 °	GaAsP on GaP
TLMO3101	Soft orange, I_V = (4 to 12.5) mcd	60 °	GaAsP on GaP
TLMY3100	Yellow, I_V > 2.5 mcd	60 °	GaAsP on GaP
TLMY3102	Yellow, I_V = (6.3 to 20) mcd	60 °	GaAsP on GaP
TLMG3100	Green, I_V > 4 mcd	60 °	GaP on GaP
TLMG3102	Green, I_V = (10 to 20) mcd	60 °	GaP on GaP

Part	Color, Luminous Intensity	Angle of Half Intensity (±φ)	Technology
TLMG3105	Green, I_V = (6.3 to 20) mcd	60 °	GaP on GaP
TLMP3100	Pure green, I_V > 1 mcd	60 °	GaP on GaP
TLMP3101	Pure green, I_V = (1.6 to 5) mcd	60 °	GaP on GaP
TLMP3107	Pure green, I_V = (2.5 to 5) mcd	60 °	GaP on GaP
TLMP3102	Pure green, I_V = (2.5 to 8) mcd	60 °	GaP on GaP

Absolute Maximum Ratings

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

TLMG310. ,TLMH310. TLMO310. ,TLMP310. ,TLMY310.

Parameter	Test condition	Symbol	Value	Unit
Reverse voltage		V_R	6	V
DC forward current	$T_{amb} \leq 60$ °C	I_F	30	mA
Surge forward current	$t_p \leq 10$ µs	I_{FSM}	0.5	A
Power dissipation	$T_{amb} \leq 60$ °C	P_V	100	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	$t \leq 5$ s	T_{sd}	260	°C
Thermal resistance junction/ ambient	mounted on PC board (pad size > 16 mm^2)	R_{thJA}	400	K/W

Optical and Electrical Characteristics

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

Red

TLMH310.

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Luminous intensity 1)	I_F = 10 mA	TLMH3100	I_V	2.5	6		mcd
		TLMH3101	I_V	4		12.5	mcd
		TLMH3102	I_V	6.3		20	mcd
Dominant wavelength	I_F = 10 mA		λ_d	612		625	nm
Peak wavelength	I_F = 10 mA		λ_p		635		nm
Angle of half intensity	I_F = 10 mA		φ		± 60		deg
Forward voltage	I_F = 20 mA		V_F		2	2.8	V
Reverse voltage	I_R = 10 µA		V_R	6	15		V
Junction capacitance	V_R = 0, f = 1 MHz		C_j		15		pF

1) in one Packing Unit $I_{Vmax}/I_{Vmin} \leq 1.6$

Soft Orange

TLMO310.

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Luminous intensity [1]	I_F = 10 mA	TLMO3100	I_V	2.5	8		mcd
		TLMO3101	I_V	4		12.5	mcd
Dominant wavelength	I_F = 10 mA		λ_d	598		611	nm
Peak wavelength	I_F = 10 mA		λ_p		605		nm
Angle of half intensity	I_F = 10 mA		φ		± 60		deg
Forward voltage	I_F = 20 mA		V_F		2	2.8	V
Reverse voltage	I_R = 10 µA		V_R	6	15		V
Junction capacitance	V_R = 0, f = 1 MHz		C_j		15		pF

[1] in one Packing Unit $I_{Vmax}/I_{Vmin} \leq 1.6$

Yellow

TLMY310.

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Luminous intensity [1]	I_F = 10 mA	TLMY3100	I_V	2.5	6		mcd
		TLMY3102	I_V	6.3		20	mcd
Dominant wavelength	I_F = 10 mA		λ_d	581		594	nm
Peak wavelength	I_F = 10 mA		λ_p		585		nm
Angle of half intensity	I_F = 10 mA		φ		± 60		deg
Forward voltage	I_F = 20 mA		V_F		2.1	2.8	V
Reverse voltage	I_R = 10 µA		V_R	6	15		V
Junction capacitance	V_R = 0, f = 1 MHz		C_j		15		pF

[1] in one Packing Unit $I_{Vmax}/I_{Vmin} \leq 1.6$

Green

TLMG310.

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Luminous intensity [1]	I_F = 10 mA	TLMG3100	I_V	4	9		mcd
		TLMG3102	I_V	10		20	mcd
		TLMG3105	I_V	6.3		20	mcd
Dominant wavelength	I_F = 10 mA		λ_d	562		575	nm
Peak wavelength	I_F = 10 mA		λ_p		565		nm
Angle of half intensity	I_F = 10 mA		φ		± 60		deg
Forward voltage	I_F = 20 mA		V_F		2.2	2.8	V
Reverse voltage	I_R = 10 µA		V_R	6	15		V
Junction capacitance	V_R = 0, f = 1 MHz		C_j		15		pF

[1] in one Packing Unit $I_{Vmax}/I_{Vmin} \leq 1.6$

Pure green

TLMP310.

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Luminous intensity [1]	I_F = 10 mA	TLMP3100	I_V	1	4		mcd
		TLMP3101	I_V	1.6		5	mcd
		TLMP3102	I_V	2.5		8	mcd
		TLMP3107	I_V	2.5		5	mcd
Dominant wavelength	I_F = 10 mA		λ_d	555		565	nm
Peak wavelength	I_F = 10 mA		λ_p		555		nm
Angle of half intensity	I_F = 10 mA		φ		± 60		deg
Forward voltage	I_F = 20 mA		V_F		2.1	2.8	V
Reverse voltage	I_R = 10 μA		V_R	6	15		V
Junction capacitance	V_R = 0, f = 1 MHz		C_j		15		pF

[1] in one Packing Unit $I_{Vmax}/I_{Vmin} \leq 1.6$

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

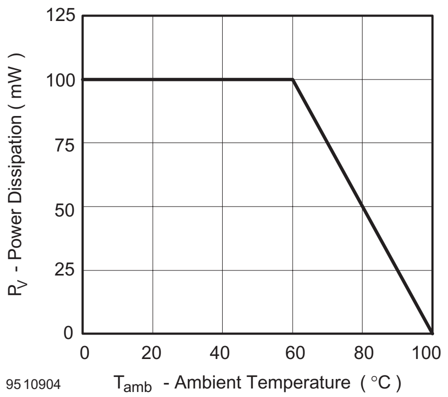


Figure 1. Power Dissipation vs. Ambient Temperature

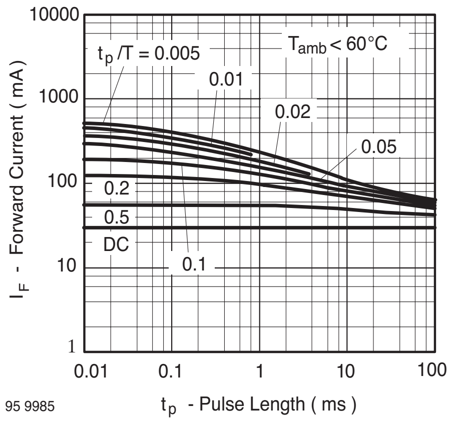


Figure 3. Pulse Forward Current vs. Pulse Duration

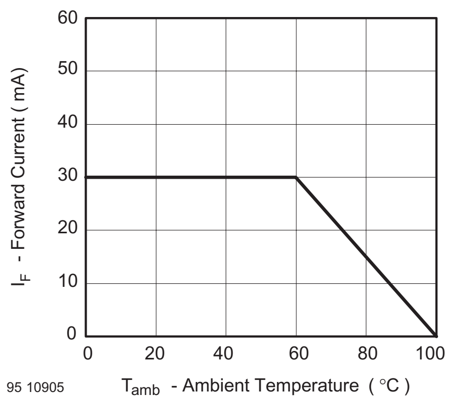


Figure 2. Forward Current vs. Ambient Temperature for InGaN

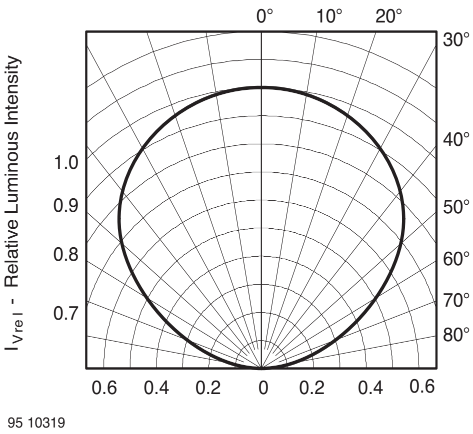


Figure 4. Rel. Luminous Intensity vs. Angular Displacement

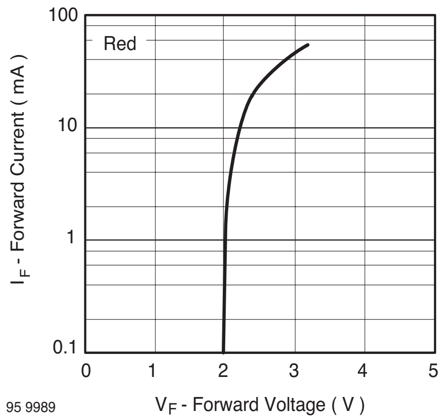


Figure 5. Forward Current vs. Forward Voltage

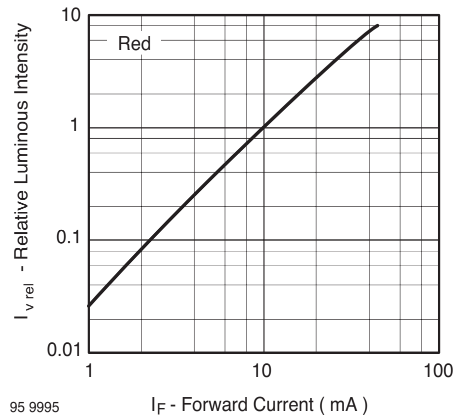


Figure 8. Relative Luminous Intensity vs. Forward Current

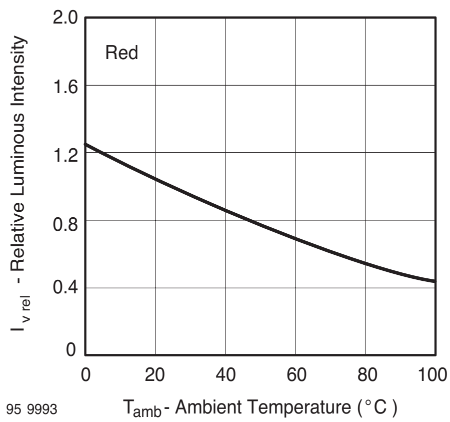


Figure 6. Rel. Luminous Intensity vs. Ambient Temperature

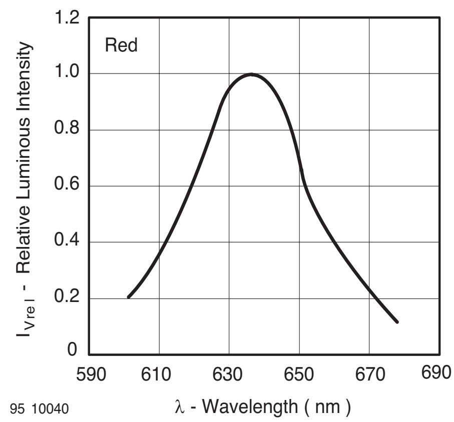


Figure 9. Relative Intensity vs. Wavelength

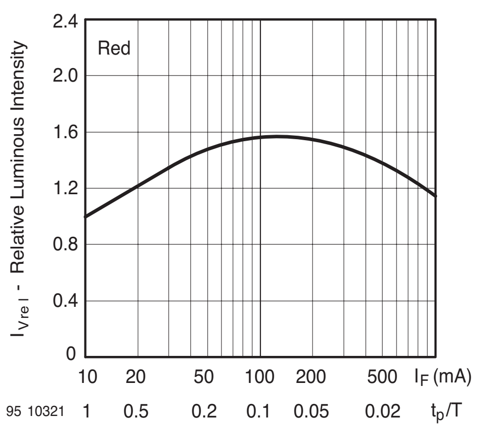


Figure 7. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

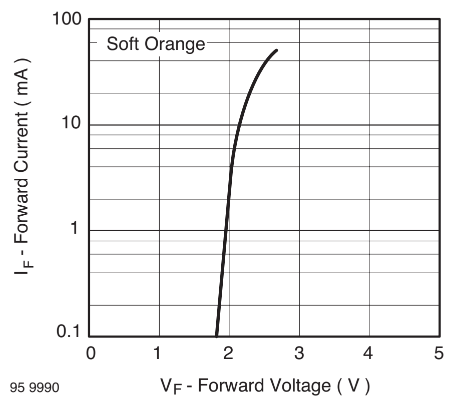


Figure 10. Forward Current vs. Forward Voltage

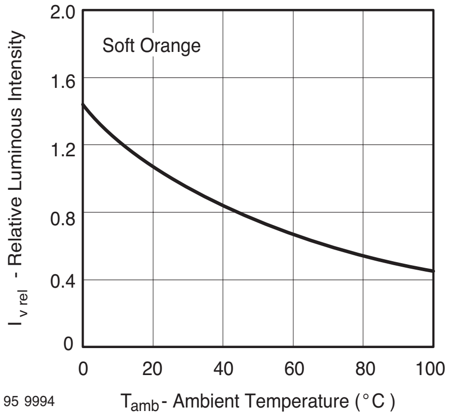


Figure 11. Rel. Luminous Intensity vs. Ambient Temperature

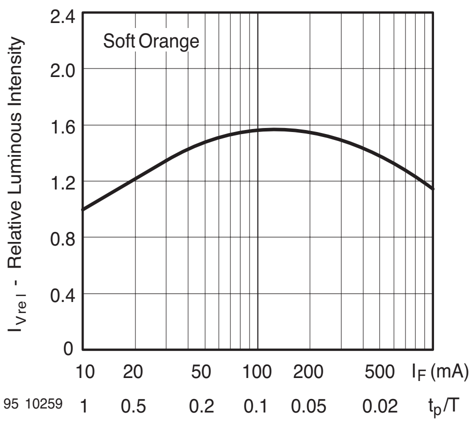


Figure 12. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

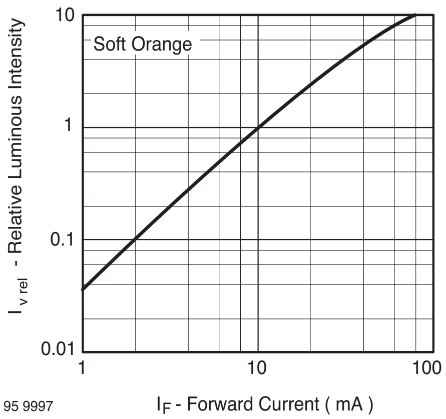


Figure 13. Relative Luminous Intensity vs. Forward Current

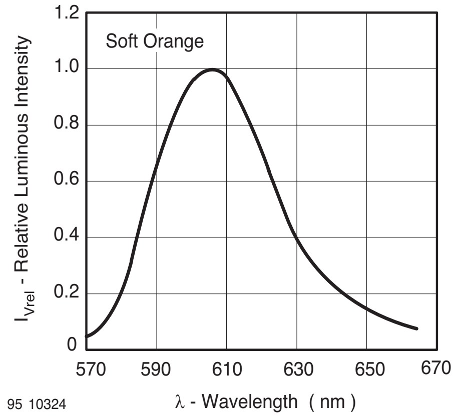


Figure 14. Relative Intensity vs. Wavelength

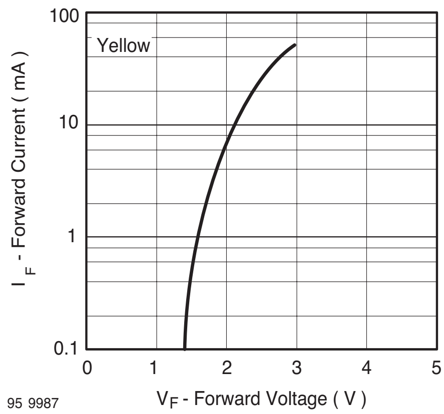


Figure 15. Forward Current vs. Forward Voltage

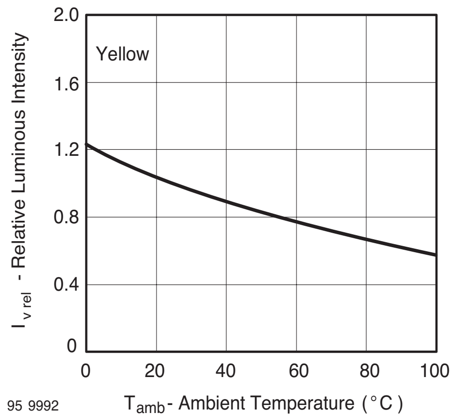


Figure 16. Rel. Luminous Intensity vs. Ambient Temperature

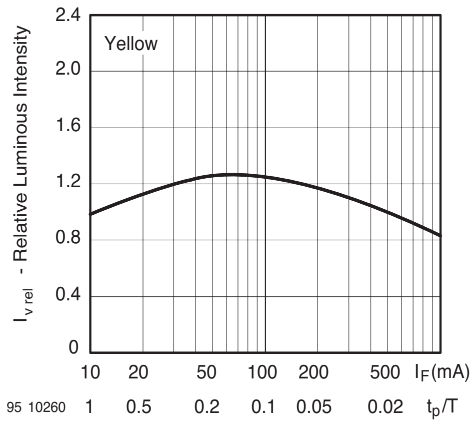


Figure 17. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

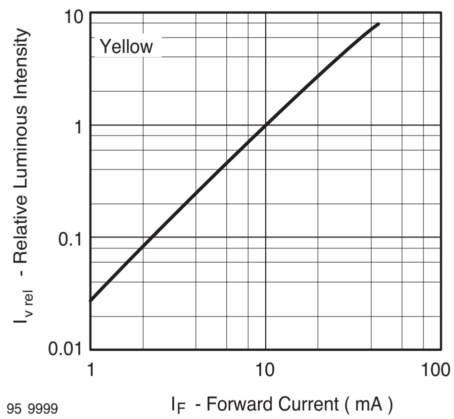


Figure 18. Relative Luminous Intensity vs. Forward Current

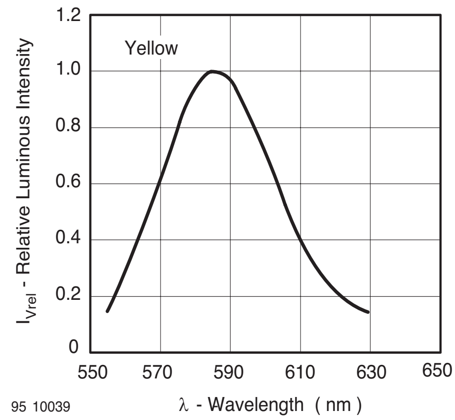


Figure 19. Relative Intensity vs. Wavelength

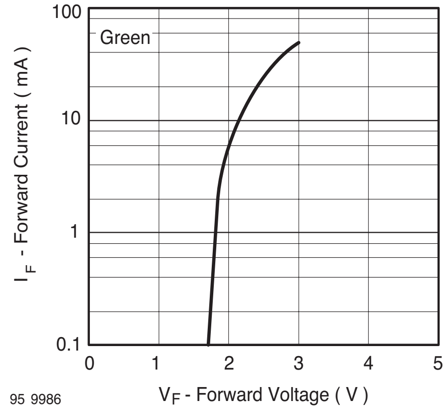


Figure 20. Forward Current vs. Forward Voltage

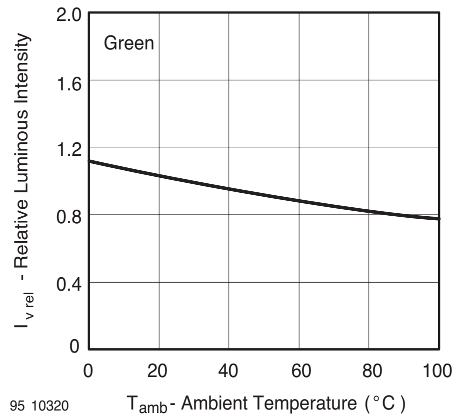


Figure 21. Rel. Luminous Intensity vs. Ambient Temperature

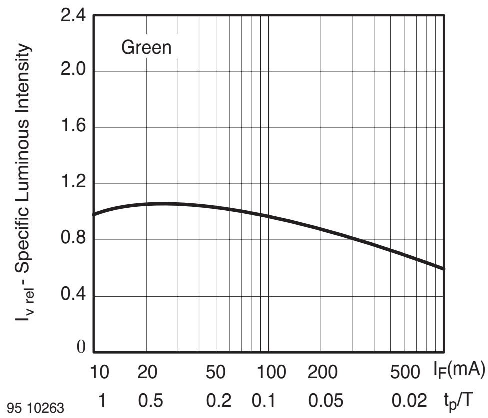


Figure 22. Specific Luminous Intensity vs. Forward Current

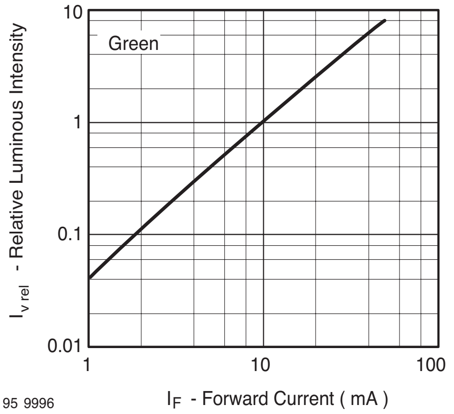


Figure 23. Relative Luminous Intensity vs. Forward Current

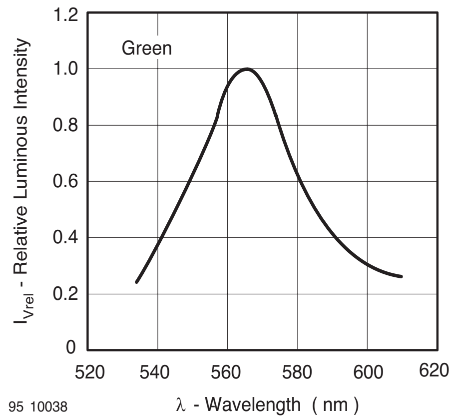


Figure 24. Relative Intensity vs. Wavelength

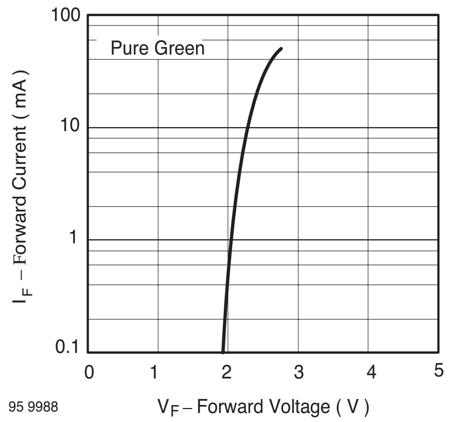


Figure 25. Forward Current vs. Forward Voltage

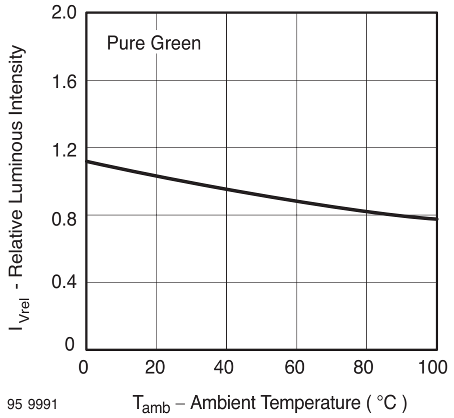


Figure 26. Rel. Luminous Intensity vs. Ambient Temperature

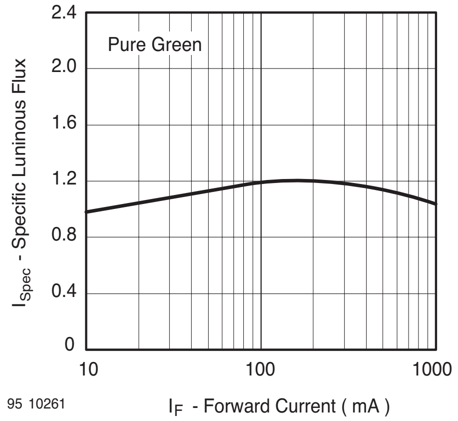


Figure 27. Specific Luminous Intensity vs. Forward Current

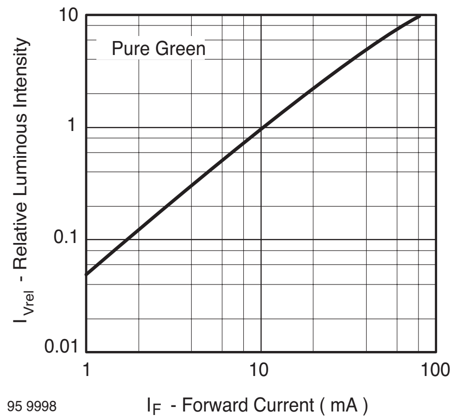


Figure 28. Relative Luminous Intensity vs. Forward Current

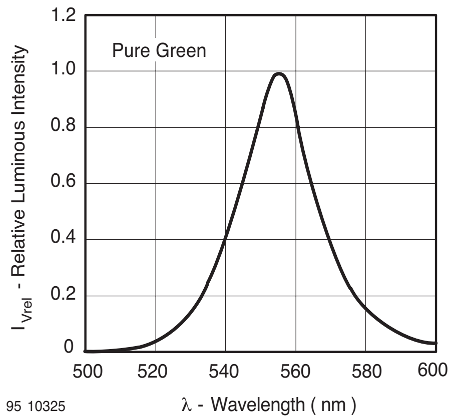
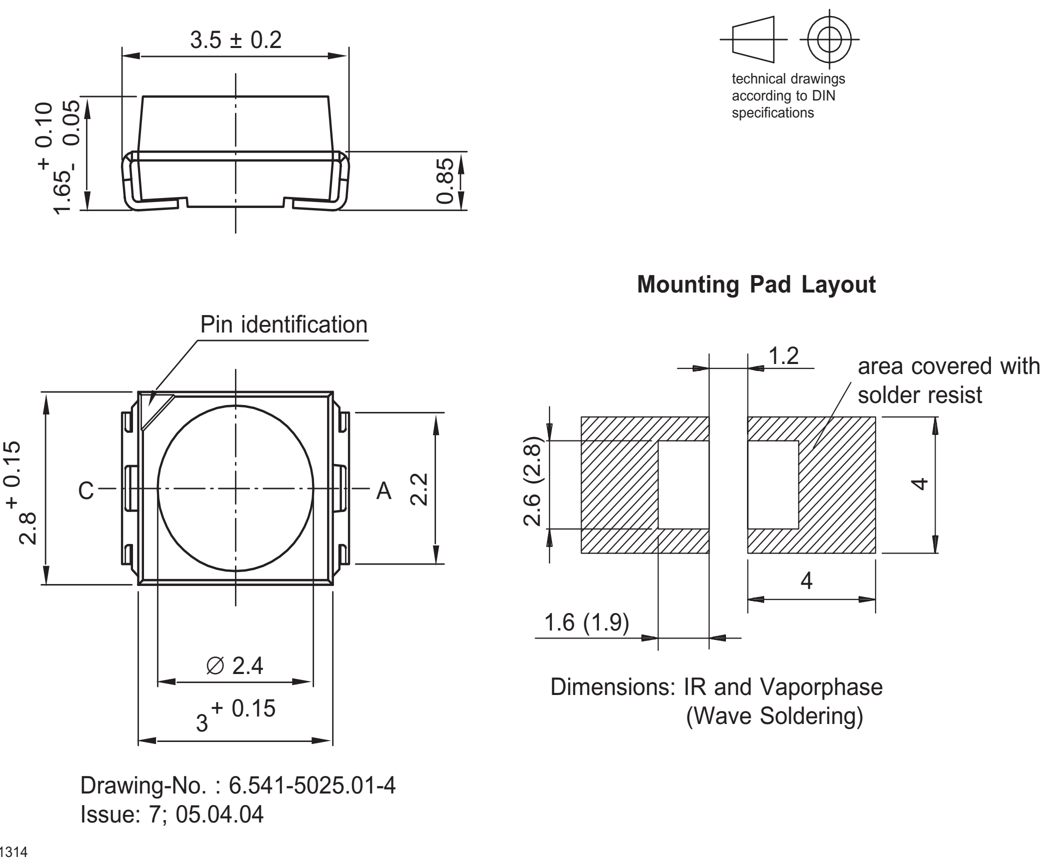


Figure 29. Relative Intensity vs. Wavelength

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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