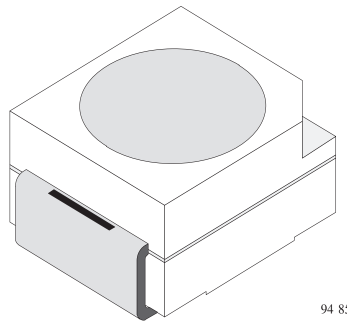
Power SMD LED in P-LCC-2 Package

Description

The TLM.33.. series is an advanced modification of the Vishay TLM.31.. series. It is designed to incorporate larger chips, therefore, capable of withstanding a 50 mA drive current.

The package of the TLM.33.. is the P-LCC-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.



Features

- Utilizing (AS) AlInGaP technology
- Available in 8 mm tape
- Luninous intensity, color and forward voltage categorized per packing unit
- Luminous intensity ratio per packing unit $I_{Vmax}/I_{Vmin} \leq 1.6$
- Thermal resistance R = 400 K/W
- ESD class 2
- Suitable for all soldering methods according to CECC

Applications

- Traffic Signals and Signs
- Interior and exterior lighting
- Dashboard illumination
- Indicator and backlighting purposes for audio, video, LCD's switches, symbols, illuminated advertising etc.

Parts Table

Part	Color, Luminous Intensity	Angle of Half Intensity (±φ)	Technology
TLMK3300	Red, I_V > 200 mcd	60 °	AlInGaP on GaAs
TLMK3301	Red, I_V = (250 to 800) mcd	60 °	AlInGaP on GaAs
TLMK3302	Red, I_V = (400 to 800) mcd	60 °	AlInGaP on GaAs
TLMK3303	Red, I_V = (400 to 1250) mcd	60 °	AlInGaP on GaAs
TLMS3300	Super red, I_V > 160 mcd	60 °	AlInGaP on GaAs
TLMS3301	Super red, I_V = (160 to 400) mcd	60 °	AlInGaP on GaAs
TLMS3302	Super red, I_V = (250 to 800) mcd	60 °	AlInGaP on GaAs
TLMO3300	Soft orange, I_V > 200 mcd	60 °	AlInGaP on GaAs
TLMO3301	Soft orange, I_V = (250 to 640) mcd	60 °	AlInGaP on GaAs
TLMO3302	Soft orange, I_V = (320 to 800) mcd	60 °	AlInGaP on GaAs
TLMO3303	Soft orange, I_V = (400 to 1250) mcd	60 °	AlInGaP on GaAs
TLMY3300	Yellow, I_V > 200 mcd	60 °	AlInGaP on GaAs
TLMY3301	Yellow, I_V = (250 to 640) mcd	60 °	AlInGaP on GaAs
TLMY3302	Yellow, I_V = (320 to 800) mcd	60 °	AlInGaP on GaAs
TLMY3303	Yellow, I_V = (400 to 1250) mcd	60 °	AlInGaP on GaAs

Absolute Maximum Ratings

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

TLMY33.., TLMO33.., TLMK33.., TLMS33..

Parameter	Test condition		Symbol	Value	Unit
Reverse voltage			V_R	5	V
DC forward current	T_{amb} ≤ 73 °C (400 K/W)		I_F	50	mA
Power dissipation	T_{amb} ≤ 73 °C (400 K/W)		P_V	130	mW
Junction temperature			T_j	125	°C
Operating temperature range			T_{amb}	- 40 to + 100	°C
Storage temperature range			T_{stg}	- 40 to + 100	°C
Soldering temperature	t ≤ 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

TLMK33..

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Luminous intensity	I_F = 50 mA	TLMK3300	I_V	200	500		mcd
	I_F = 50 mA	TLMK3301	I_V	250		800	mcd
	I_F = 50 mA	TLMK3302	I_V	400		800	mcd
	I_F = 50 mA	TLMK3303	I_V	400		1250	mcd
Luminous flux/Luminous intensity			ϕ_V/I_V		3		mlm/ mcd
Dominant wavelength	I_F = 50 mA		λ_d	611	617	622	nm
Peak wavelength	I_F = 50 mA		λ_p		624		nm
Spectral bandwidth at 50 % $I_{rel\ max}$	I_F = 50 mA		$\lambda\Delta$		18		nm
Angle of half intensity	I_F = 50 mA		φ		± 60		deg
Forward voltage	I_F = 50 mA		V_F	1.85	2.1	2.55	V
Reverse current	V_R = 5 V		V_R		0.01	10	μA

Super red

TLMS33..

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Luminous intensity	I_F = 50 mA	TLMS3300	I_V	160	300		mcd
	I_F = 50 mA	TLMS3301	I_V	160		400	mcd
	I_F = 50 mA	TLMS3302	I_V	250		800	mcd
Luminous flux/Luminous intensity			ϕ_V/I_V		3		mlm/ mcd
Dominant wavelength	I_F = 50 mA		λ_d	626	630	638	nm
Peak wavelength	I_F = 50 mA		λ_p		641		nm
Spectral bandwidth at 50 % $I_{rel\ max}$	I_F = 50 mA		$\lambda\Delta$		17		nm
Angle of half intensity	I_F = 50 mA		φ		± 60		deg
Forward voltage	I_F = 50 mA		V_F	1.85	2.1	2.55	V
Reverse current	V_R = 5 V		V_R		0.01	10	μA

Soft Orange

TLMO33..

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Luminous intensity	I_F = 50 mA	TLMO3300	I_V	200	500		mcd
	I_F = 50 mA	TLMO3301	I_V	250		640	mcd
	I_F = 50 mA	TLMO3302	I_V	320		800	mcd
	I_F = 50 mA	TLMO3303	I_V	400		1250	mcd
Luminous flux/Luminous intensity			ϕ_V/I_V		3		mlm/ mcd
Dominant wavelength	I_F = 50 mA		λ_d	600	605	611	nm
Peak wavelength	I_F = 50 mA		λ_p		611		nm
Spectral bandwidth at 50 % $I_{rel\ max}$	I_F = 50 mA		$\lambda\Delta$		17		nm
Angle of half intensity	I_F = 50 mA		φ		± 60		deg
Forward voltage	I_F = 50 mA		V_F	1.85	2.1	2.55	V
Reverse current	V_R = 5 V		V_R		0.01	10	μA

Yellow

TLMY33..

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Luminous intensity	I_F = 50 mA	TLMY3300	I_V	200	450		mcd
	I_F = 50 mA	TLMY3301	I_V	250		640	mcd
	I_F = 50 mA	TLMY3302	I_V	320		800	mcd
	I_F = 50 mA	TLMY3303	I_V	400		1250	mcd
Luminous flux/Luminous intensity			ϕ_V/I_V		3		mlm/ mcd
Dominant wavelength	I_F = 50 mA		λ_d	583	588	594	nm
Peak wavelength	I_F = 50 mA		λ_p		590		nm
Spectral bandwidth at 50 % $I_{rel\ max}$	I_F = 50 mA		$\lambda\Delta$		18		nm
Angle of half intensity	I_F = 50 mA		φ		± 60		deg
Forward voltage	I_F = 50 mA		V_F	1.85	2.1	2.55	V
Reverse current	V_R = 5 V		V_R		0.01	10	μA

Forward Voltage Classification

Group	Forward Voltage (V)	
	min	max
1	1.85	2.25
2	2.15	2.55

Color Classification

Group	Dominant Wavelength (nm)					
	Red		Soft Orange		Yellow	
	min	max	min	max	min	max
1	611	618	598	601	581	584
2	614	622	600	603	583	586
3			602	605	585	588

Group	Dominant Wavelength (nm)					
	Red		Soft Orange		Yellow	
	min	max	min	max	min	max
4			604	607	587	590
5			606	609	589	592
6			608	611	591	594

Luminous Intensity Classification

Group	Luminous Intensity (mcd)	
	min	max
Xa	160	250
Xb	200	320
Ya	250	400
Yb	320	500
Za	400	630
Zb	500	800
0a	630	1000
0b	800	1250

Group Name on Label

Luminous Intensity Group	Halfgroup	Wavelength	Forward Voltage
Z	b	2	1

One packing unit/tape contains only one classification group of luminous intensity, color and forward voltage

Only one single classification groups is not available

The given groups are not order codes, customer specific group combinations require marketing agreement

No color subgrouping for Super Red

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

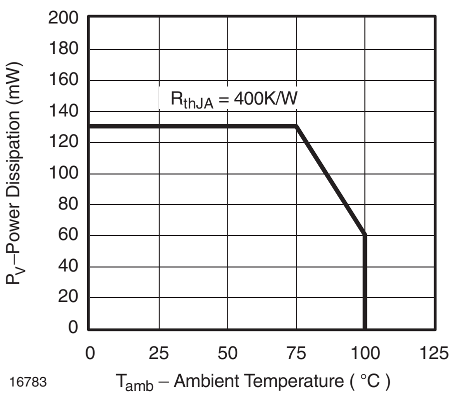


Figure 1. Power Dissipation vs. Ambient Temperature

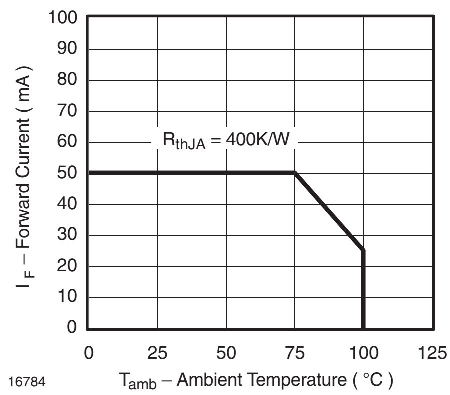


Figure 2. Forward Current vs. Ambient Temperature

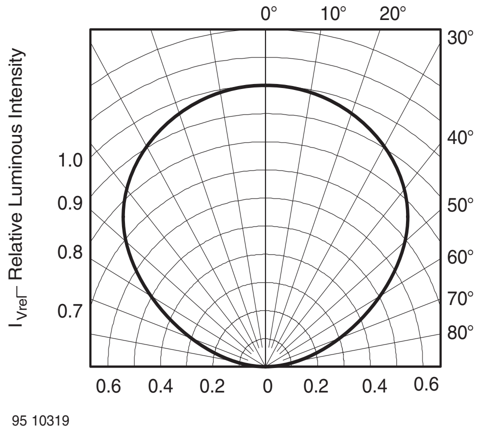


Figure 3. Rel. Luminous Intensity vs. Angular Displacement

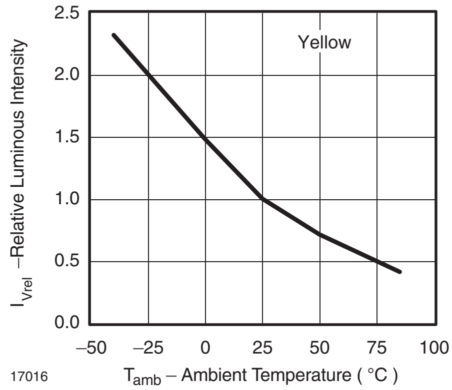


Figure 6. Relative Luminous Intensity vs. Amb. Temperature

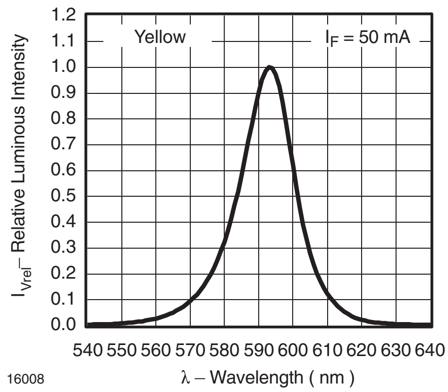


Figure 4. Relative Luminous Intensity vs. Wavelength

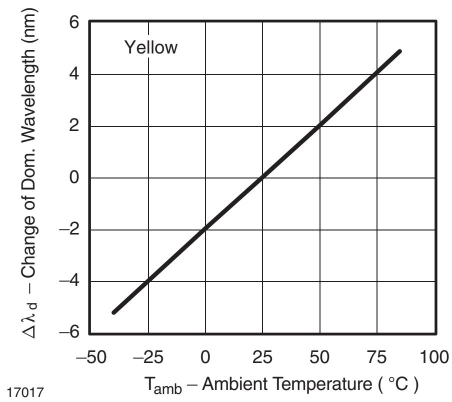


Figure 7. Change of Dominant Wavelength vs. Ambient Temperature

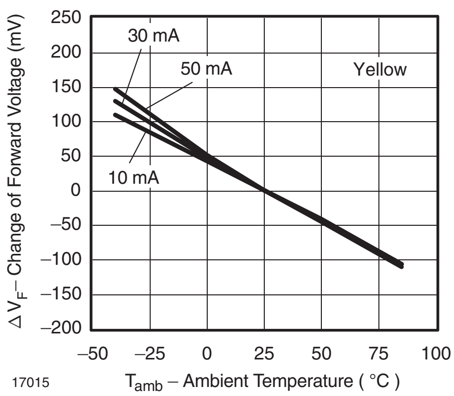


Figure 5. Change of Forward Voltage vs. Ambient Temperature

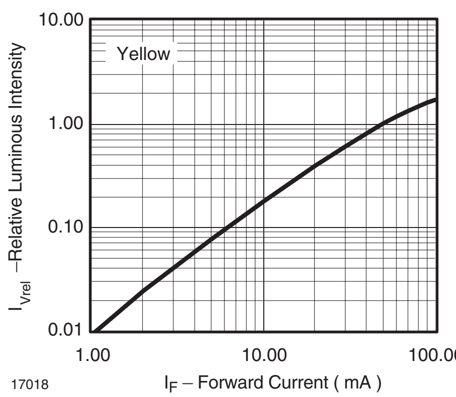


Figure 8. Relative Luminous Intensity vs. Forward Current

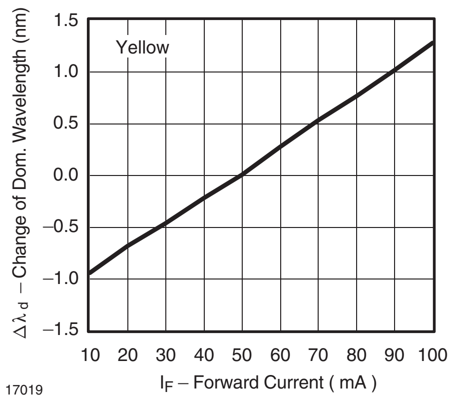


Figure 9. Change of Dominant Wavelength vs. Forward Current

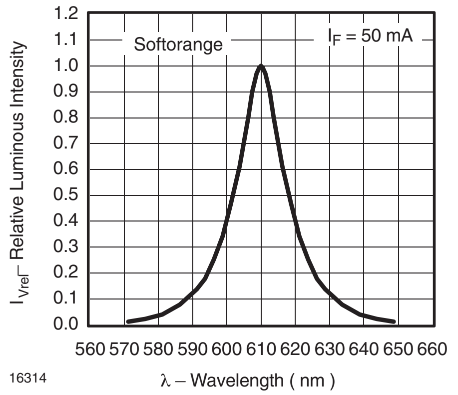


Figure 10. Relative Luminous Intensity vs. Wavelength

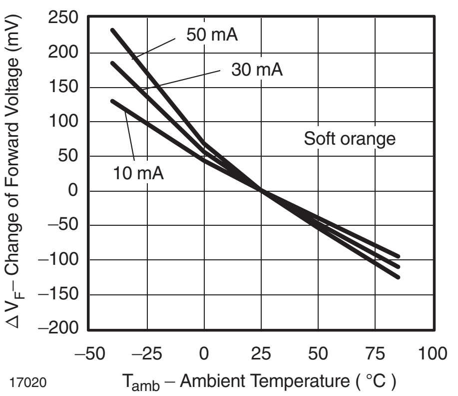


Figure 11. Change of Forward Voltage vs. Ambient Temperature

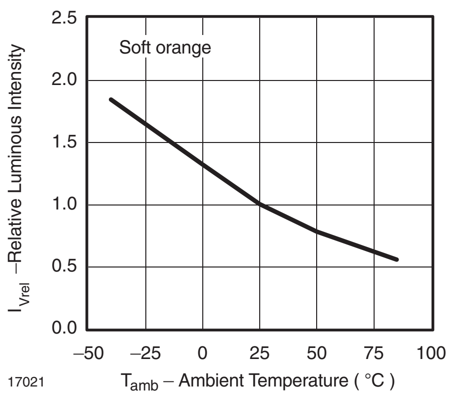


Figure 12. Relative Luminous Intensity vs. Amb. Temperature

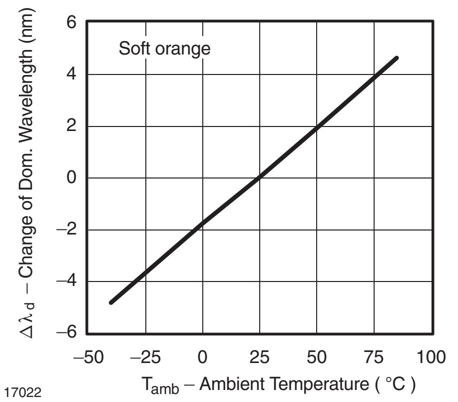


Figure 13. Change of Dominant Wavelength vs. Ambient Temperature

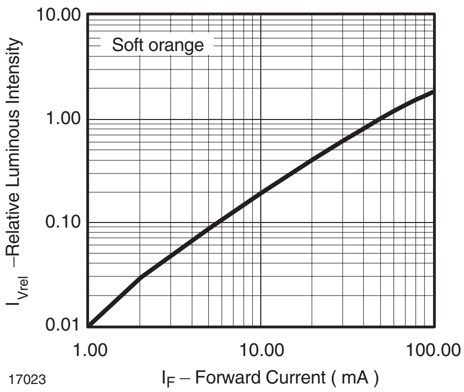


Figure 14. Relative Luminous Intensity vs. Forward Current

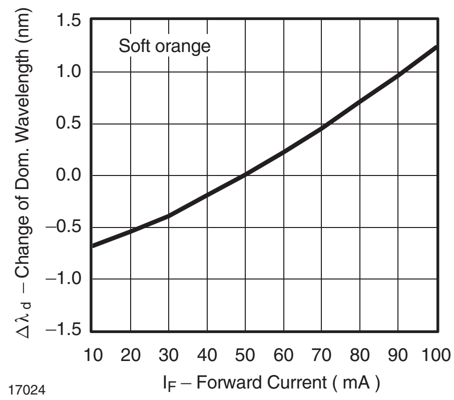


Figure 15. Change of Dominant Wavelength vs. Forward Current

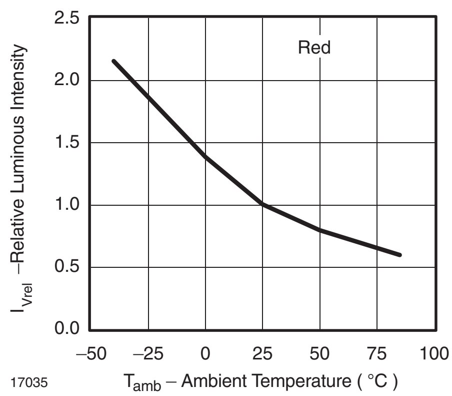


Figure 18. Relative Luminous Intensity vs. Amb. Temperature

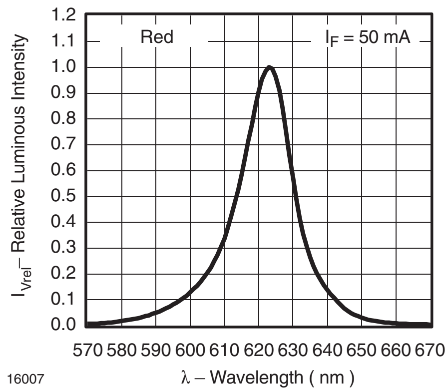


Figure 16. Relative Luminous Intensity vs. Wavelength

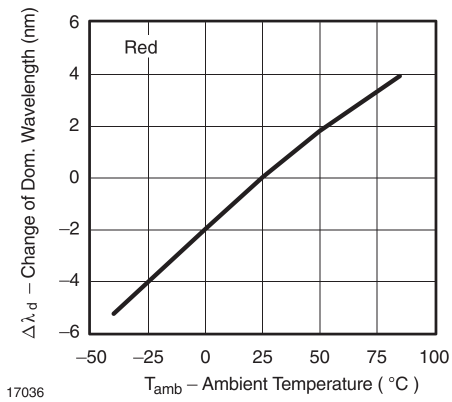


Figure 19. Change of Dominant Wavelength vs. Ambient Temperature

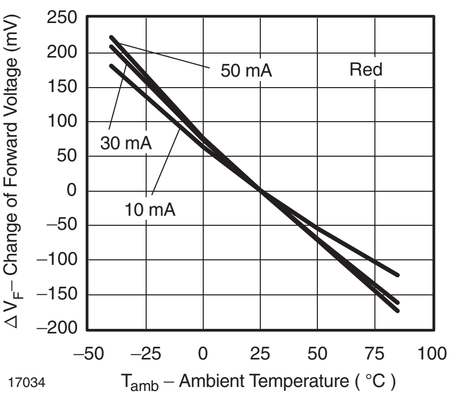


Figure 17. Change of Forward Voltage vs. Ambient Temperature

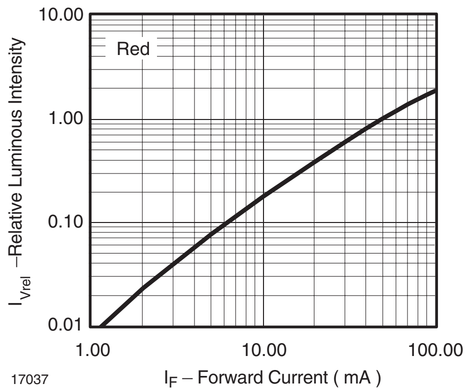


Figure 20. Relative Luminous Intensity vs. Forward Current

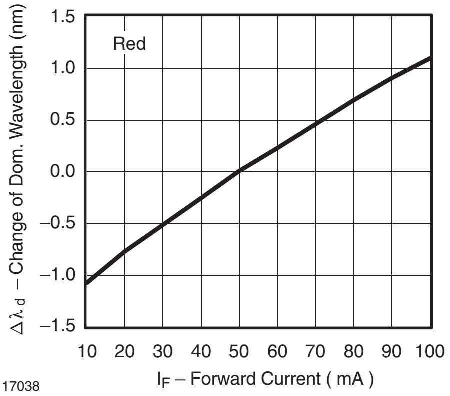


Figure 21. Change of Dominant Wavelength vs. Forward Current

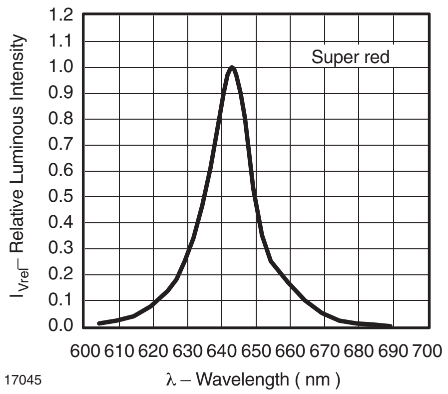


Figure 22. Relative Luminous Intensity vs. Wavelength

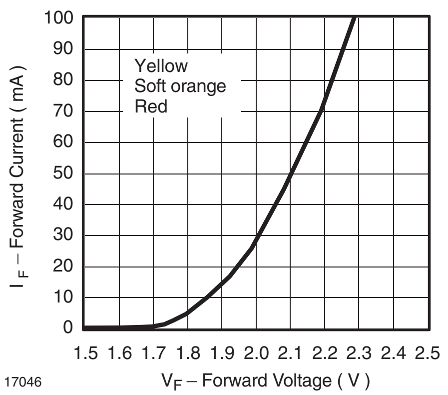


Figure 23. Forward Current vs. Forward Voltage

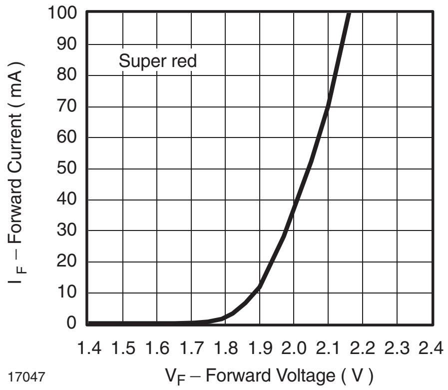


Figure 24. Forward Current vs. Forward Voltage

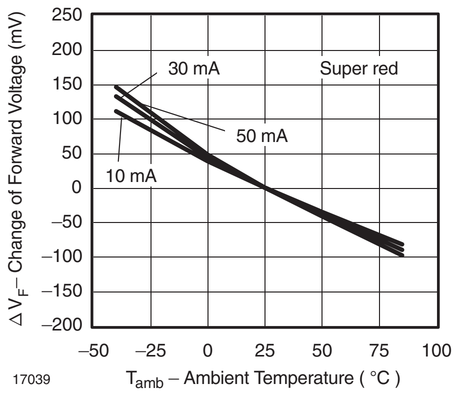


Figure 25. Change of Forward Voltage vs. Ambient Temperature

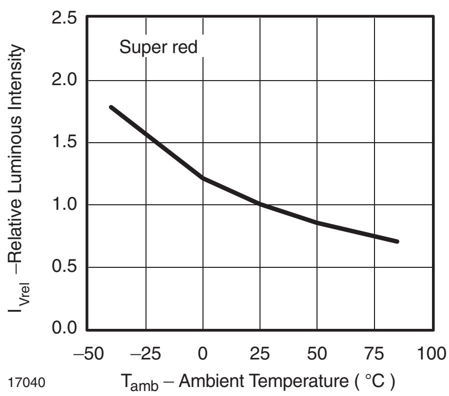


Figure 26. Relative Luminous Intensity vs. Amb. Temperature

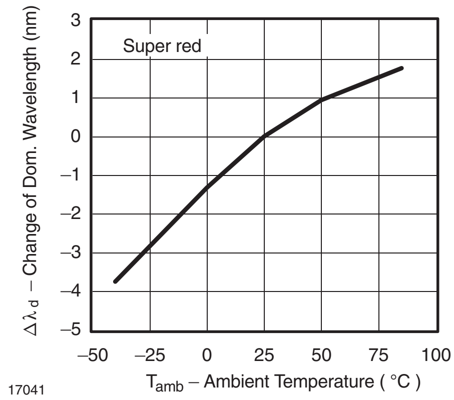


Figure 27. Change of Dominant Wavelength vs. Ambient Temperature

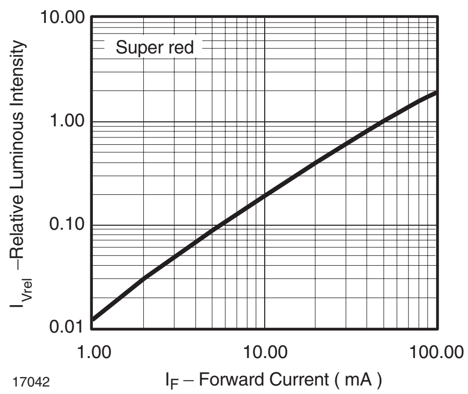


Figure 28. Relative Luminous Intensity vs. Forward Current

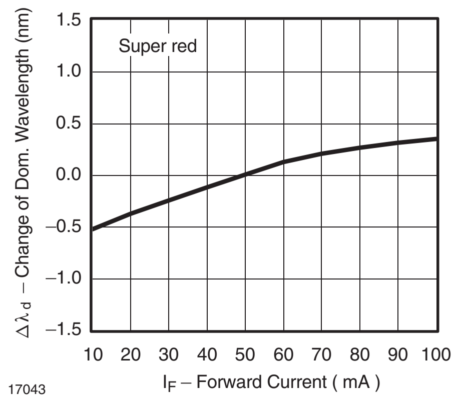


Figure 29. Change of Dominant Wavelength vs. Forward Current

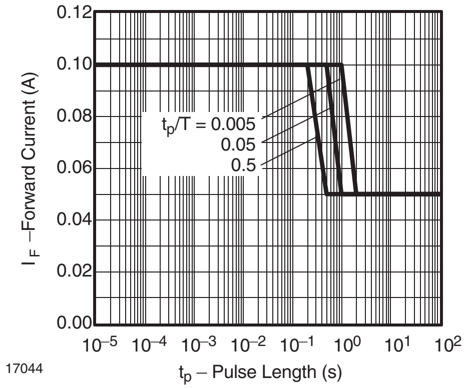
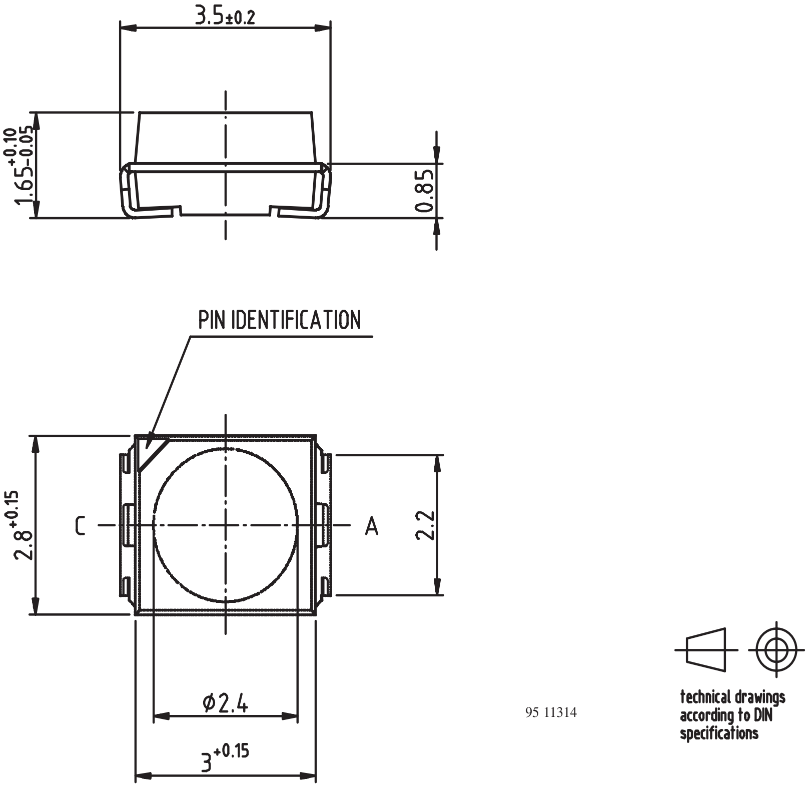
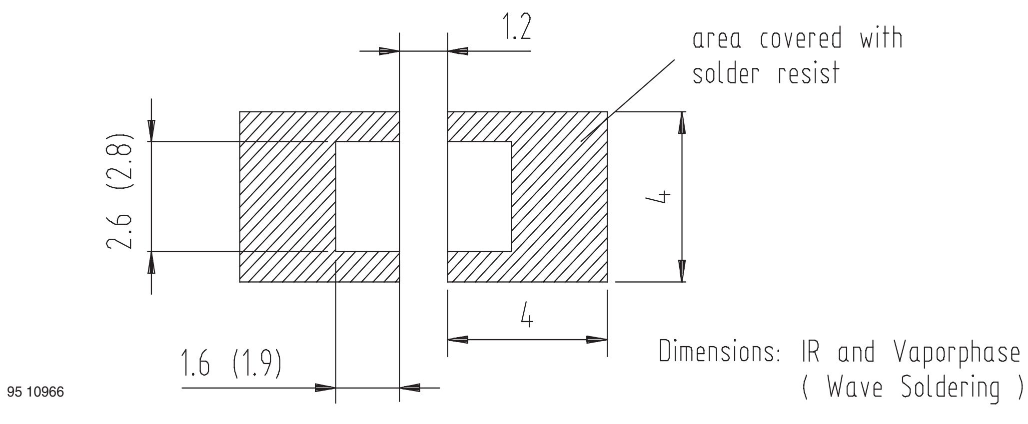


Figure 30. Forward Current vs. Pulse Length

Package Dimensions in mm



PCB Pad Layout 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.

We reserve the right to make changes to improve technical design and may do so without further notice.

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use Vishay Semiconductors products for any unintended or unauthorized application, the buyer shall indemnify Vishay Semiconductors against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

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