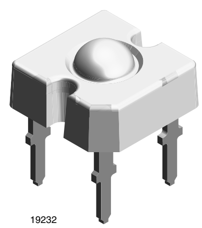
TELUX™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FEATURES

- Utilizing one of the world's brightest (AS) AllnGaP 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 (Pb)-free device
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC
- Compatible with wave solder processes acc. to CECC 00802 and J-STD-020C
- ESD-withstand voltage: up to 2 kV according to JESD22-A114-B

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) AllnGaP 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.

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
TLWR7900	Red, ϕ_V = 2100 mlm (typ.)	45 °	AllnGaP on GaAs
TLWO7900	Soft Orange, ϕ_V = 2100 mlm (typ.)	45 °	AllnGaP on GaAs
TLWY7900	Yellow, ϕ_V = 1400 mlm (typ.)	45 °	AllnGaP on GaAs

ABSOLUTE MAXIMUM RATINGS[1)], TLWR7900, TLWO7900, TLWY7900				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
Reverse voltage[2)]	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		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

Note:
1) T_{amb} = 25 °C unless otherwise specified
2) Driving the LED in reverse direction is suitable for a short term application

OPTICAL AND ELECTRICAL CHARACTERISTICS[1)], TLWR7900, RED						
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	$\varphi_{0.9V}$		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	$TC\lambda_{dom}$		0.05		nm/K

Note:
1) T_{amb} = 25 °C unless otherwise specified

OPTICAL AND ELECTRICAL CHARACTERISTICS[1)], TLWO7900, SOFT ORANGE						
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

Note:
1) T_{amb} = 25 °C unless otherwise specified

OPTICAL AND ELECTRICAL CHARACTERISTICS[1], TLWY7900, YELLOW

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	$\varphi_{0.9V}$		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	$TC\lambda_{dom}$		0.01		nm/K

Note:
[1] T_{amb} = 25 °C unless otherwise specified

LUMINOUS FLUX CLASSIFICATION

GROUP	LIGHT INTENSITY [MLM]	
STANDARD	MIN	MAX
B	1000	1800
C	1500	2400
D	2000	3000

Note:
Luminous intensity is tested at a current pulse duration of 25 ms and an accuracy of ± 11 %.

The above type numbers represent the order groups which include only a few brightness groups. Only one group will be shipped on each tube (there will be no mixing of two groups on each tube).

In order to ensure availability, single brightness groups will be not orderable.

In a similar manner for colors where wavelength groups are measured and binned, single wavelength groups will be shipped in any one tube.
In order to ensure availability, single wavelength groups will not be orderable.

COLOR CLASSIFICATION

GROUP	DOM. WAVELENGTH (NM)					
	YELLOW		RED		SOFT ORANGE	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
0	585	588				
1	587	591	611	618	598	601
2	589	594	614	622	600	603
3	592	597	616	634	602	605
4					604	607
5					606	609
6					608	611

Note:
Wavelengths are tested at a current pulse duration of 25 ms and an accuracy of ± 1 nm.

TYPICAL CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified

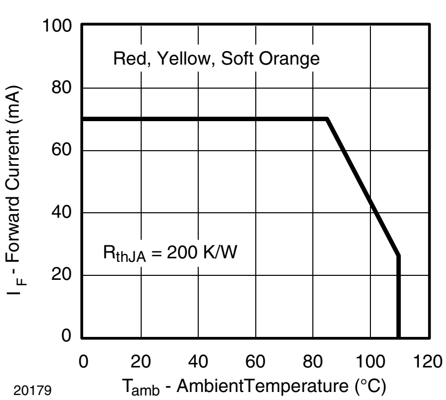


Figure 1. Forward Current vs. Ambient Temperature

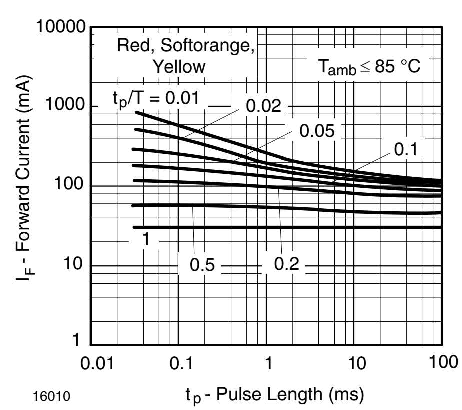


Figure 2. Forward Current vs. Pulse Length

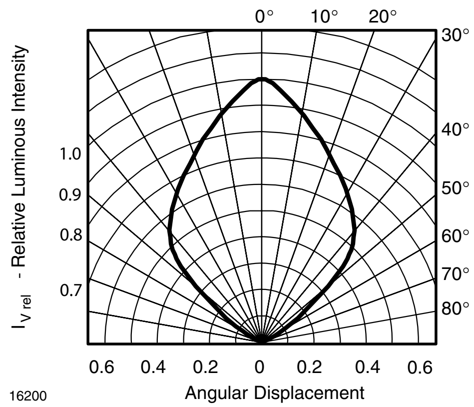


Figure 3. Rel. Luminous Intensity vs. Angular Displacement

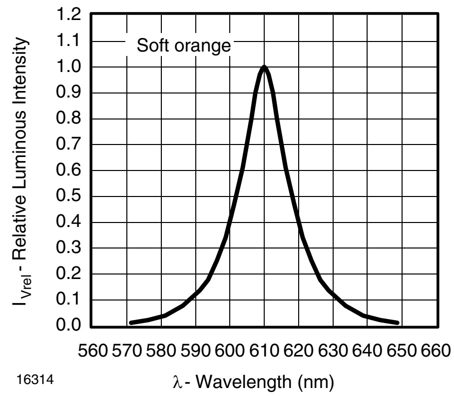


Figure 6. Relative Intensity vs. Wavelength

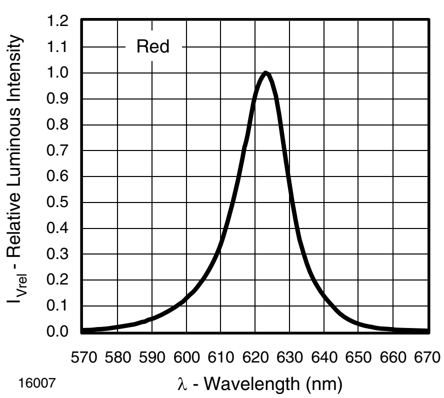


Figure 4. Relative Intensity vs. Wavelength

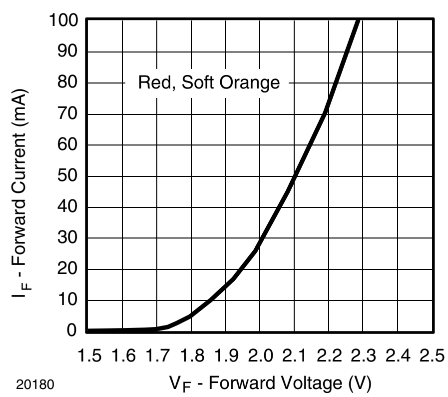


Figure 7. Forward Current vs. Forward Voltage

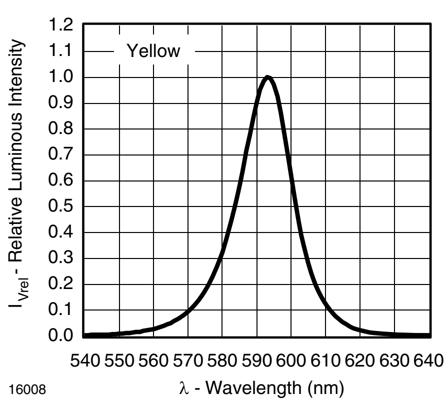


Figure 5. Relative Intensity vs. Wavelength

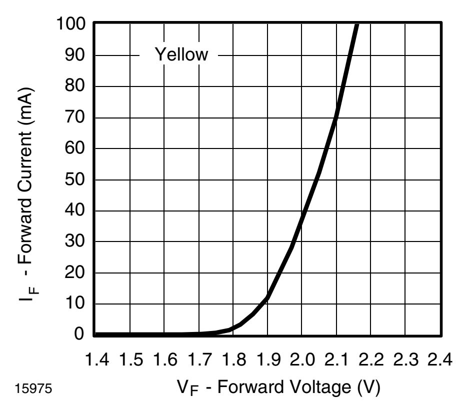


Figure 8. Forward Current vs. Forward Voltage

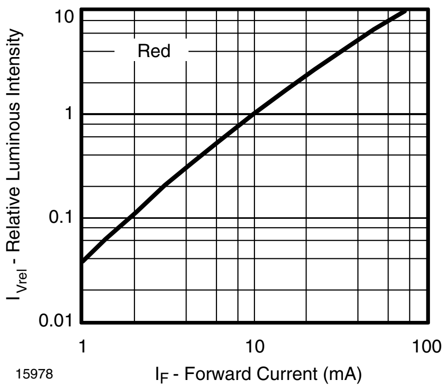


Figure 9. Relative Luminous Flux vs. Forward Current

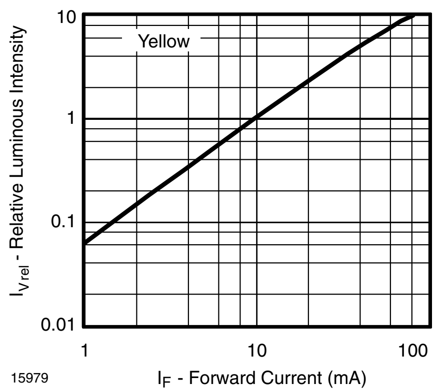


Figure 10. Relative Luminous Flux vs. Forward Current

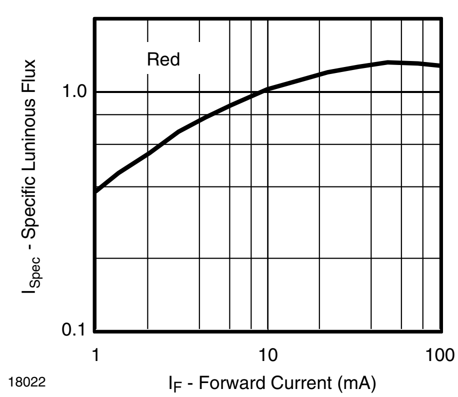


Figure 11. Specific Luminous Flux vs. Forward Current

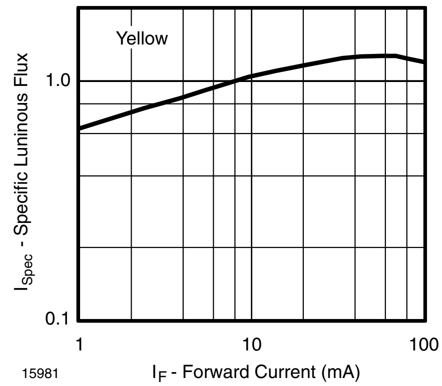


Figure 12. Specific Luminous Flux vs. Forward Current

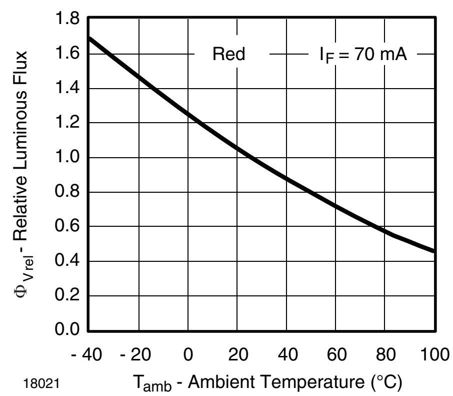


Figure 13. Rel. Luminous Flux vs. Ambient Temperature

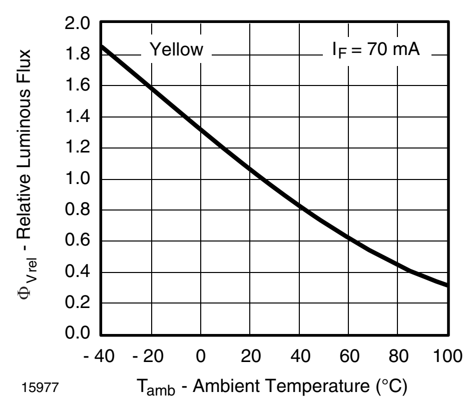


Figure 14. Rel. Luminous Flux vs. Ambient Temperature

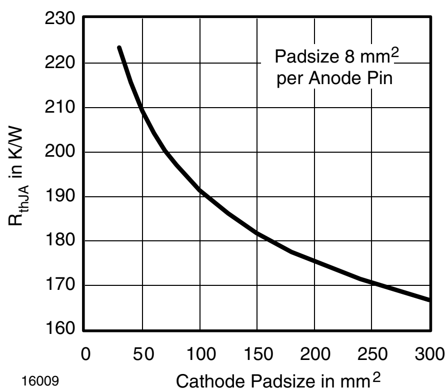


Figure 15. Thermal Resistance Junction Ambient vs. Cathode Padsize

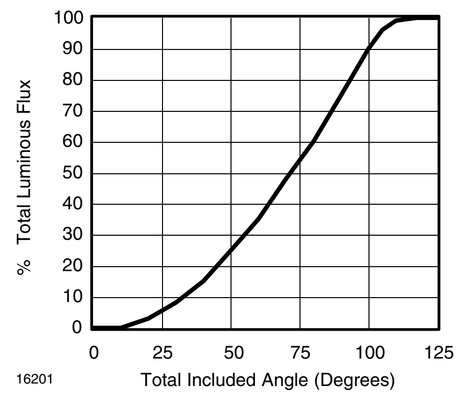
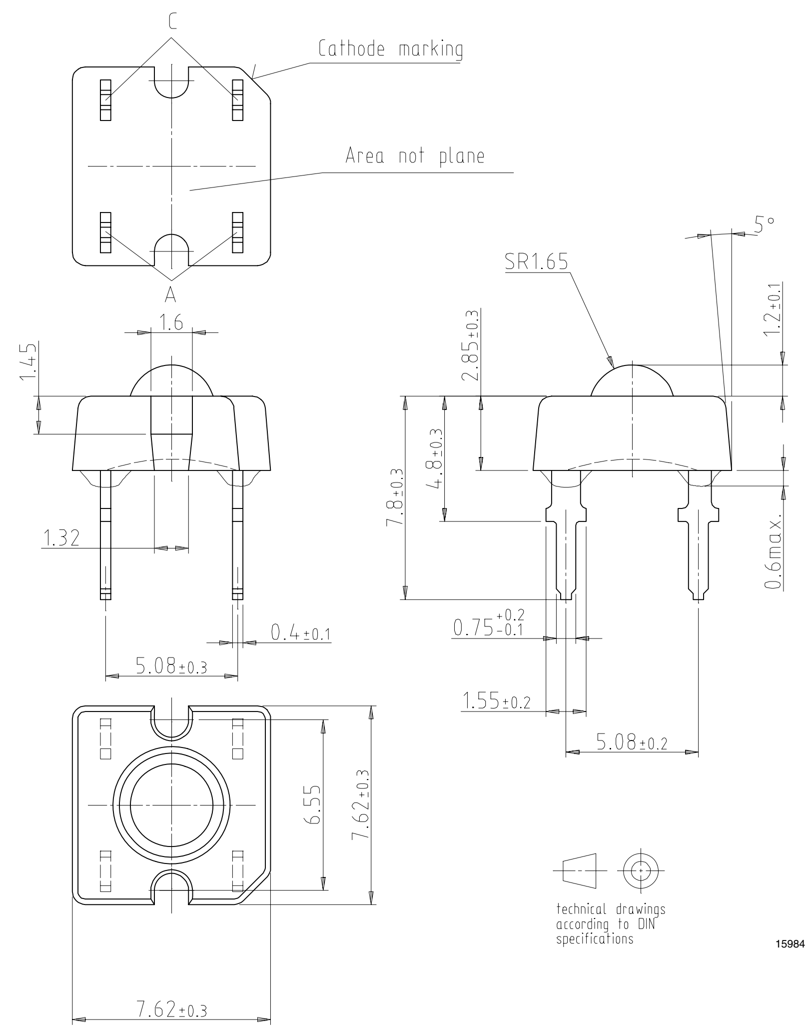


Figure 16. Percentage Total Luminous Flux vs. Total Included Angle for 90° emission angle

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 operating systems 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.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany

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