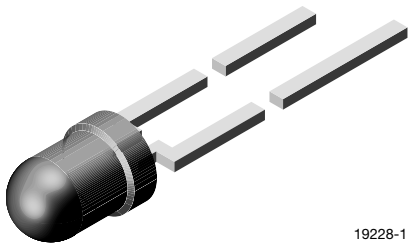
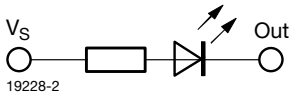
TLRH440.CU, TLRO440.CU, TLRY440.CU, TLRG440.CU, TLRP440.CU

Resistor LED for 12 V Supply Voltage





FEATURES

- With current limiting resistor for 12 V
- Cost effective: save space and resistor cost
- Standard Ø 3 mm (T-1) package
- Wide viewing angle
- Choice of five bright colors
- Luminous intensity categorized
- Yellow and green color categorized
- Luminous intensity and color are measured at 12 V
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

Pb-free
e4
RoHS COMPLIANT
HALOGEN FREE GREEN (5-2008)

DESCRIPTION

These devices are developed for the automotive industry and other industries which use 12 V sources.

The TLR.440.CU series contains an integrated resistor for current limiting in series with the LED chip. This allows the lamp to be driven from a 12 V source without an external current limiter.

Available colors are red, soft orange, yellow, green and pure green. The luminous intensity of such an LED is measured at constant voltage of 12 V.

These tinted diffused lamps provide a wide off-axis viewing angle.

These LEDs are intended for space critical applications such as automobile instrument panels, switches and others which are driven from a 12 V source.

APPLICATIONS

- Status light in cars and other applications with a 12 V source
- Off/on indicator in cars and other applications with a 12 V source
- Background illumination for switches
- Off/on indicator in switches

PRODUCT GROUP AND PACKAGE DATA

- Product group: LED
- Package: 3 mm resistor
- Product series: standard
- Angle of half intensity: ± 30°

PARTS TABLE

PART	COLOR	LUMINOUS INTENSITY (mcd)			at V_S (V)	WAVELENGTH (nm)			at V_S (V)	FORWARD VOLTAGE (V)			at V_S (V)	TECHNOLOGY
		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		
TLRH4400CU	Red	1.6	10	-	12	612	-	625	12	-	10	12	12	GaAsP on GaP
TLRO4400CU	Soft orange	4	10	-	12	598	-	611	12	-	10	12	12	GaAsP on GaP
TLRY4400CU	Yellow	1.6	10	-	12	581	-	594	12	-	10	12	12	GaAsP on GaP
TLRG4400CU	Green	1.6	10	-	12	562	-	575	12	-	10	12	12	GaP on GaP
TLRP4400CU	Pure green	0.63	3	-	12	555	-	565	12	-	10	12	12	GaP on GaP
TLRP4406CU	Pure green	1.6	-	5	12	555	-	565	12	-	10	12	12	GaP on GaP

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)
TLRH4400CU, TLRO4400CU, TLRY4400CU, TLRG4400CU, TLRP4400CU

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	6	V
Forward voltage	$T_{amb} \leq 65$ °C	V_F	16	V
Power dissipation		P_V	240	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, 2 mm from body	T_{sd}	260	°C
Thermal resistance junction/ambient		R_{thJA}	150	K/W

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
TLRH4400CU, RED

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity (1)	V_S = 12 V	I_V	1.6	10	-	mcd
Dominant wavelength	V_S = 12 V	λ_d	612	-	625	nm
Peak wavelength	V_S = 12 V	λ_p	-	635	-	nm
Angle of half intensity	V_S = 12 V	φ	-	± 30	-	deg
Forward current	V_S = 12 V	I_F	-	10	12	mA
Breakdown voltage	I_R = 10 µA	V_{BR}	6	20	-	V
Junction capacitance	V_R = 0 V, f = 1 MHz	C_j	-	50	-	pF

Note
(1) In one packing unit $I_{Vmin.}/I_{Vmax.} \leq 0.5$.

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
TLRO4400CU, SOFT ORANGE

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity (1)	V_S = 12 V	I_V	4	10	-	mcd
Dominant wavelength	V_S = 12 V	λ_d	598	-	611	nm
Peak wavelength	V_S = 12 V	λ_p	-	605	-	nm
Angle of half intensity	V_S = 12 V	φ	-	± 30	-	deg
Forward current	V_S = 12 V	I_F	-	10	12	mA
Breakdown voltage	I_R = 10 µA	V_{BR}	6	20	-	V
Junction capacitance	V_R = 0 V, f = 1 MHz	C_j	-	50	-	pF

Note
(1) In one packing unit $I_{Vmin.}/I_{Vmax.} \leq 0.5$.

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
TLRY4400CU, YELLOW

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity (1)	V_S = 12 V	I_V	1.6	10	-	mcd
Dominant wavelength	V_S = 12 V	λ_d	581	-	594	nm
Peak wavelength	V_S = 12 V	λ_p	-	585	-	nm
Angle of half intensity	V_S = 12 V	φ	-	± 30	--	deg
Forward current	V_S = 12 V	I_F	-	10	12	mA
Breakdown voltage	I_R = 10 µA	V_{BR}	6	20	-	V
Junction capacitance	V_R = 0 V, f = 1 MHz	C_j	-	50	-	pF

Note
(1) In one packing unit $I_{Vmin.}/I_{Vmax.} \leq 0.5$.

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
TLRG4400CU, GREEN

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity (1)	V_S = 12 V	I_V	1.6	10	-	mcd
Dominant wavelength	V_S = 12 V	λ_d	562	-	575	nm
Peak wavelength	V_S = 12 V	λ_p	-	565	-	nm
Angle of half intensity	V_S = 12 V	φ	-	± 30	-	deg
Forward current	V_S = 12 V	I_F	-	10	12	mA
Breakdown voltage	I_R = 10 µA	V_{BR}	6	20	-	V
Junction capacitance	V_R = 0 V, f = 1 MHz	C_j	-	50	-	pF

Note
(1) In one packing unit $I_{Vmin.}/I_{Vmax.} \leq 0.5$.

OPTICAL AND ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)
TLRP4400CU, TLRP4406CU, PURE GREEN

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity (1)	V_S = 12 V	TLRP4400CU	I_V	0.63	3	-	mcd
		TLRP4406CU	I_V	1.6	-	5	mcd
Dominant wavelength	V_S = 12 V		λ_d	555	-	565	nm
Peak wavelength	V_S = 12 V		λ_p	-	555	-	nm
Angle of half intensity	V_S = 12 V		φ	-	± 30	-	deg
Forward current	V_S = 12 V		I_F	-	10	12	mA
Breakdown voltage	I_R = 10 µA		V_{BR}	6	20	-	V
Junction capacitance	V_R = 0 V, f = 1 MHz		C_j	-	50	-	pF

Note
(1) In one packing unit $I_{Vmin.}/I_{Vmax.} \leq 0.5$.

TYPICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

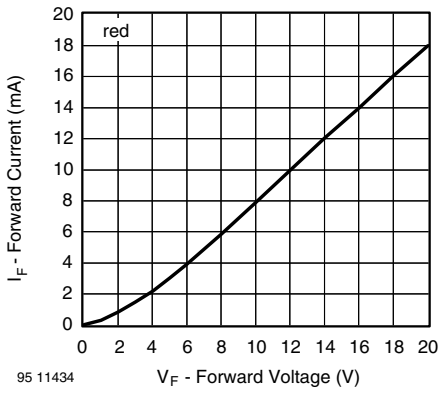


Fig. 1 - Forward Current vs. Forward Voltage

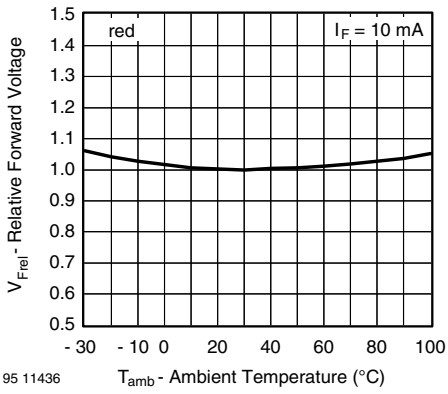


Fig. 3 - Relative Forward Voltage vs. Ambient Temperature

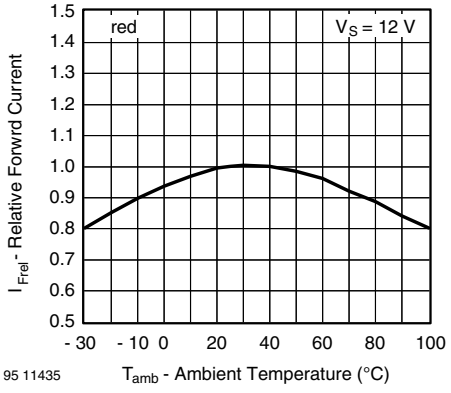


Fig. 2 - Relative Forward Current vs. Ambient Temperature

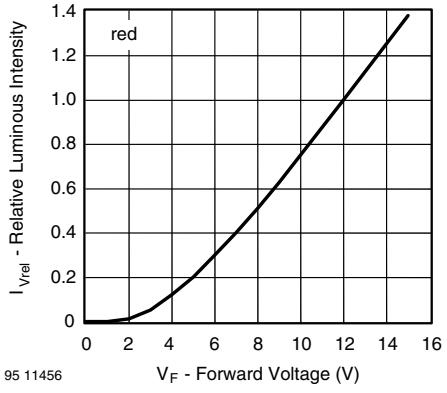


Fig. 4 - Relative Luminous Intensity vs. Forward Voltage

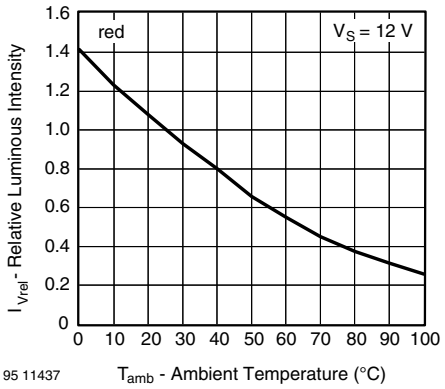


Fig. 5 - Relative Luminous Intensity vs. Ambient Temperature

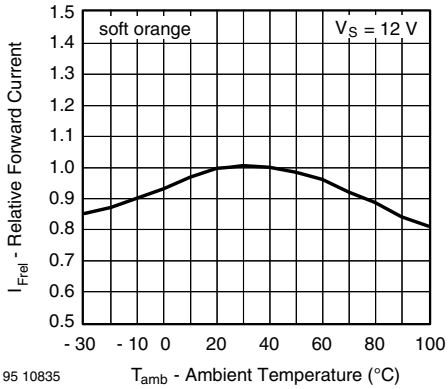


Fig. 8 - Relative Forward Current vs. Ambient Temperature

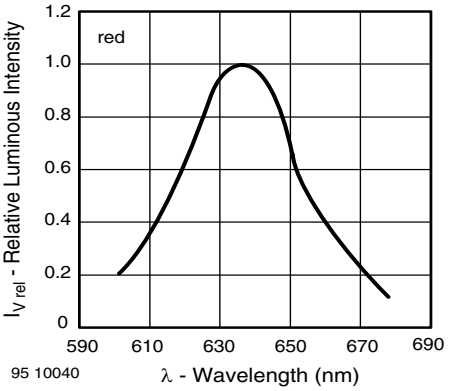


Fig. 6 - Relative Intensity vs. Wavelength

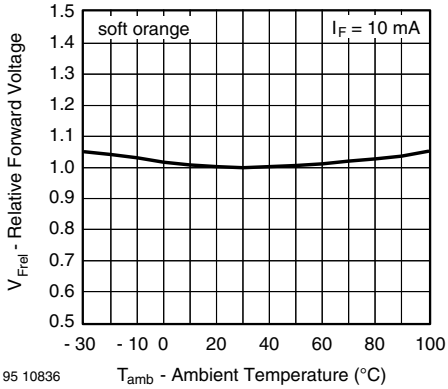


Fig. 9 - Relative Forward Voltage vs. Ambient Temperature

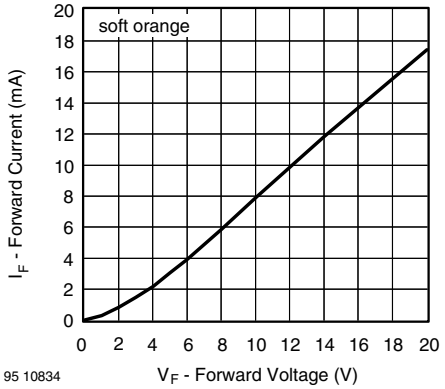


Fig. 7 - Forward Current vs. Forward Voltage

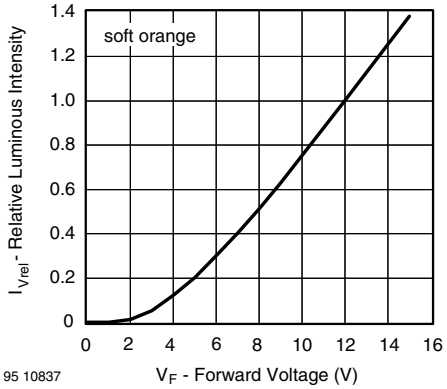


Fig. 10 - Relative Luminous Intensity vs. Forward Voltage

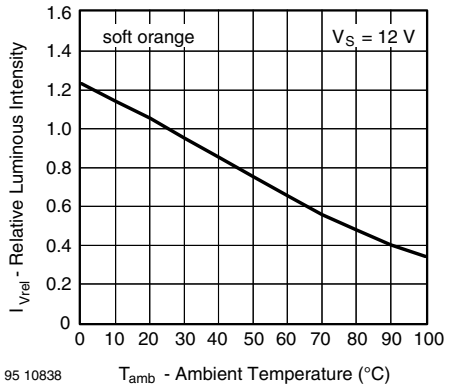


Fig. 11 - Relative Luminous Intensity vs. Ambient Temperature

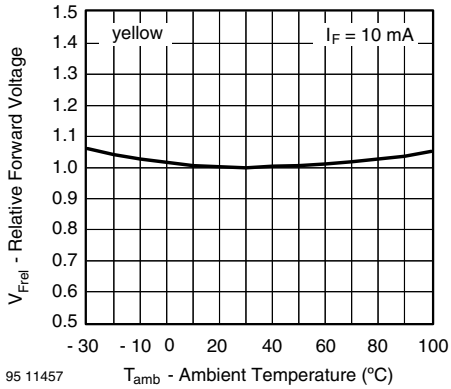


Fig. 14 - Relative Forward Voltage vs. Ambient Temperature

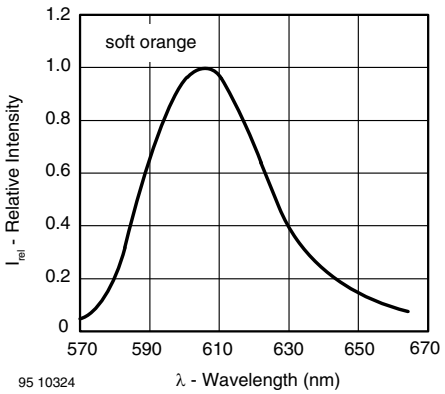


Fig. 12 - Relative Intensity vs. Wavelength

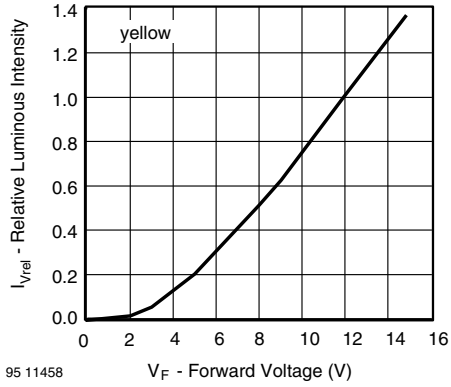


Fig. 15 - Relative Luminous Intensity vs. Forward Voltage

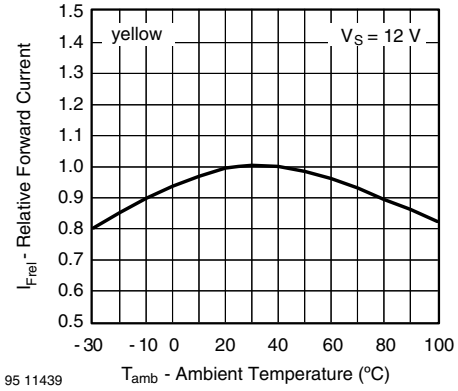


Fig. 13 - Relative Forward Current vs. Ambient Temperature

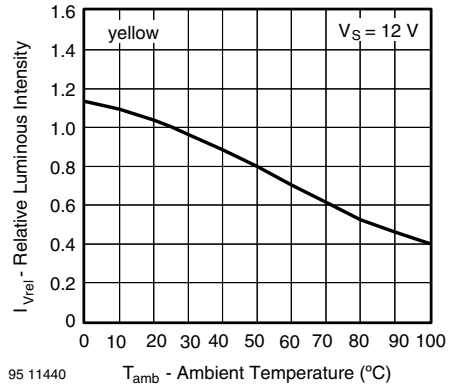


Fig. 16 - Relative Luminous Intensity vs. Ambient Temperature

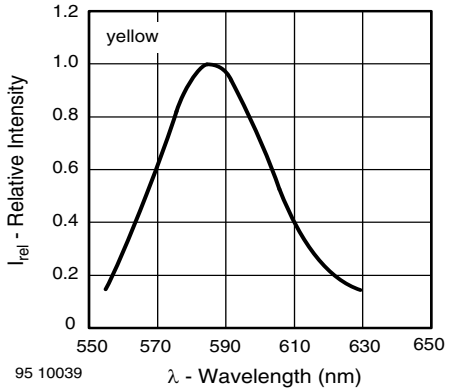


Fig. 17 - Relative Intensity vs. Wavelength

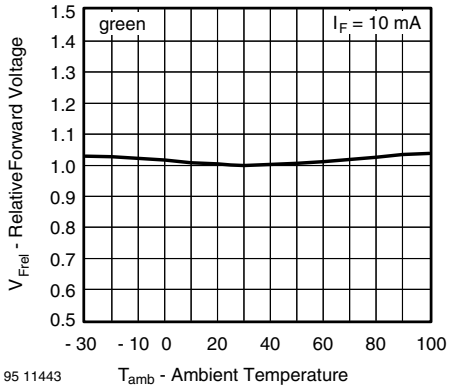


Fig. 20 - Relative Forward Voltage vs. Ambient Temperature

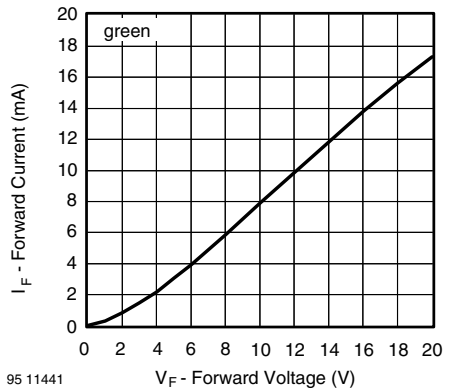


Fig. 18 - Forward Current vs. Forward Voltage

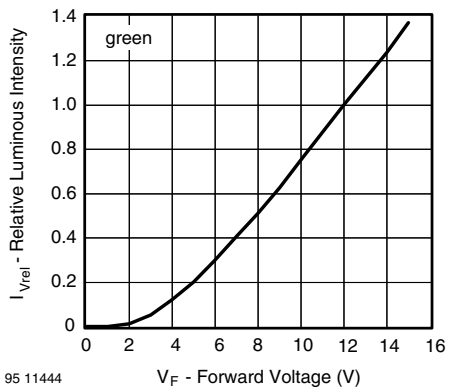


Fig. 21 - Relative Luminous Intensity vs. Forward Voltage

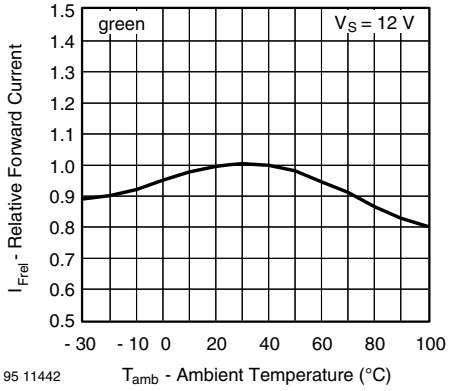


Fig. 19 - Relative Forward Current vs. Ambient Temperature

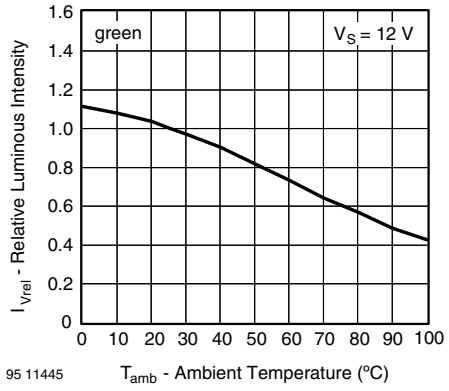


Fig. 22 - Relative Luminous Intensity vs. Ambient Temperature

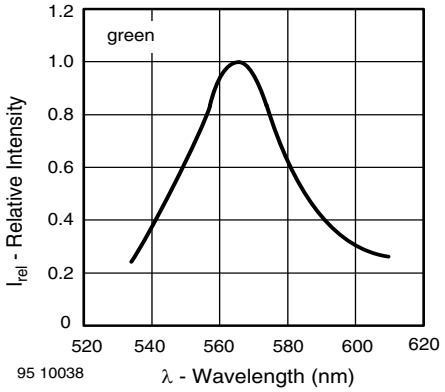


Fig. 23 - Relative Intensity vs. Wavelength

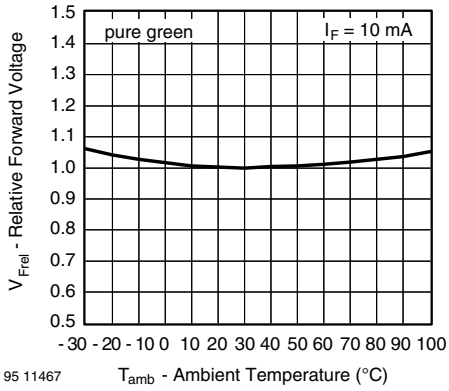


Fig. 26 - Relative Forward Voltage vs. Ambient Temperature

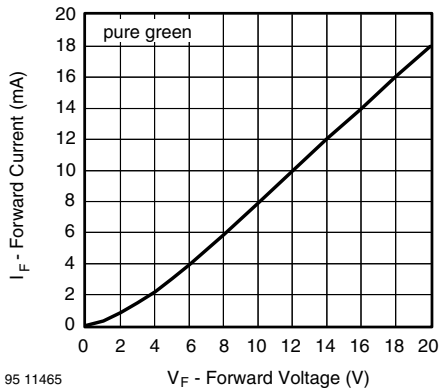


Fig. 24 - Forward Current vs. Forward Voltage

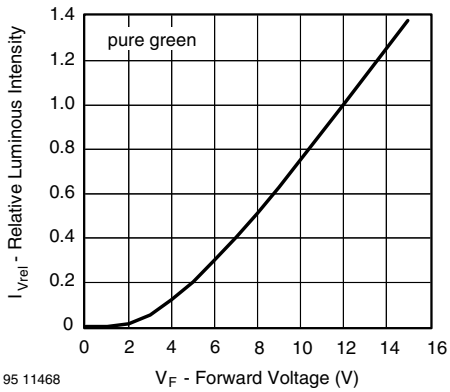


Fig. 27 - Relative Luminous Intensity vs. Forward Voltage

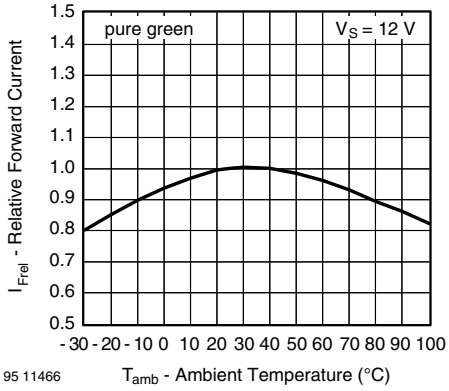


Fig. 25 - Relative Forward Current vs. Ambient Temperature

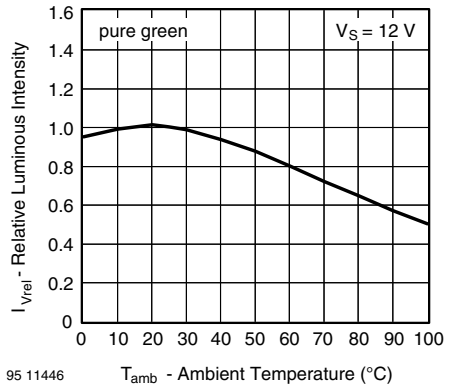
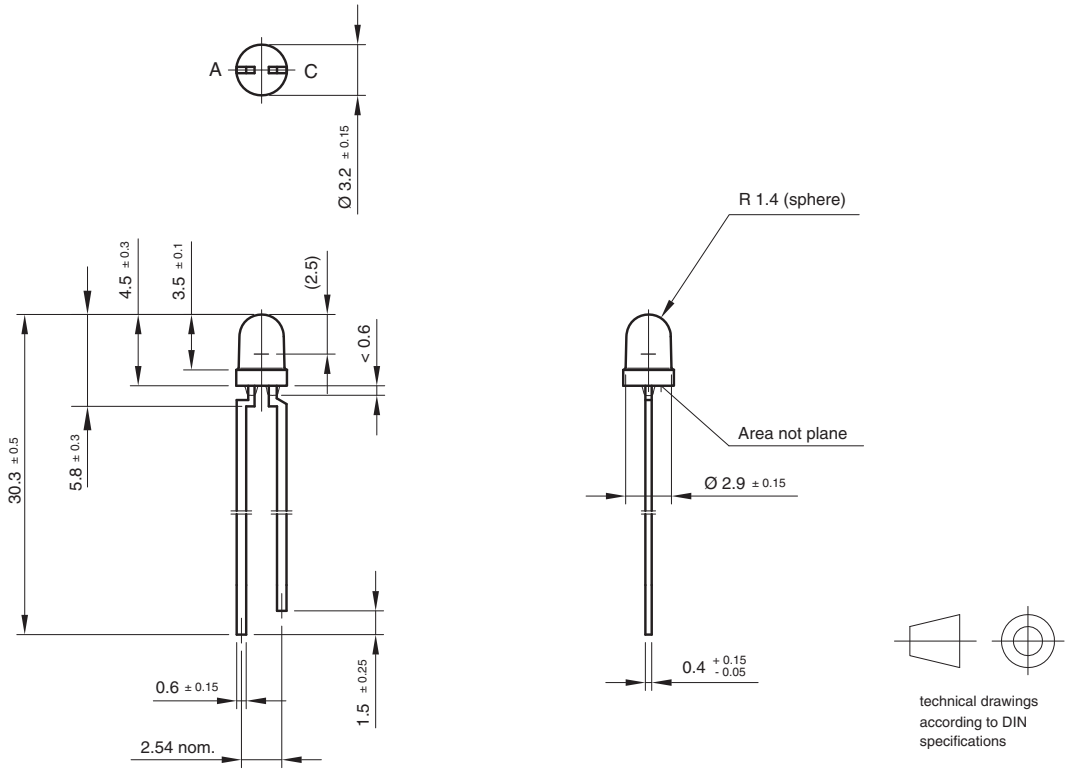


Fig. 28 - Relative Luminous Intensity vs. Ambient Temperature

PACKAGE DIMENSIONS in millimeters



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Issue: 7; 25.09.08
95 10913

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Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.