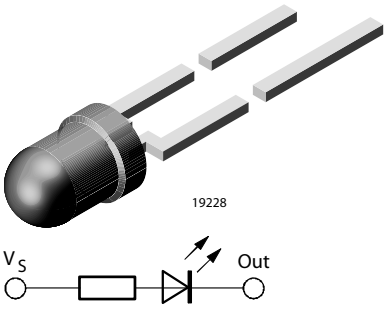
Resistor LED for 12 V Supply Voltage



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.

FEATURES

- With current limiting resistor for 12 V
- Cost effective: save space and resistor cost
- Standard ∅ 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
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb-free

e4

RoHS COMPLIANT

GREEN (5-2008)**

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
- Product series: resistor
- Angle of half intensity: ± 30°

PARTS TABLE

PART	COLOR, LUMINOUS INTENSITY	TECHNOLOGY
TLRP4400CU	Pure green, I_V > 0.63 mcd	GaP on GaP
TLRP4406CU	Pure green, I_V = (1.6 to 5) mcd	GaP on GaP
TLRH4400CU	Red, I_V > 1.6 mcd	GaAsP on GaP
TLRO4400CU	Soft orange, I_V > 4 mcd	GaAsP on GaP
TLRY4400CU	Yellow, I_V > 1.6 mcd	GaAsP on GaP
TLRG4400CU	Green, I_V > 1.6 mcd	GaP on GaP

** Please see document “Vishay Material Category Policy”: www.vishay.com/doc?99902

ABSOLUTE MAXIMUM RATINGS [1] TLRH4400CU, TLR04400CU, 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

Note:

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

OPTICAL AND ELECTRICAL CHARACTERISTICS [1] TLRH4400CU, RED						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous intensity [2]	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, f = 1 MHz	C_j		50		pF

Note:

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

[2] In one packing unit $I_{Vmin.}/I_{Vmax.} \leq 0.5$

OPTICAL AND ELECTRICAL CHARACTERISTICS [1] TLRO4400CU, SOFT ORANGE						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Luminous intensity [2]	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, f = 1 MHz	C_j		50		pF

Note:

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

[2] In one packing unit $I_{Vmin.}/I_{Vmax.} \leq 0.5$

OPTICAL AND ELECTRICAL CHARACTERISTICS [1], TLRY4400CU, YELLOW						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity [2]	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, f = 1 MHz	C_j		50		pF

Note:

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

[2] In one packing unit $I_{Vmin.}/I_{Vmax.} \leq 0.5$

OPTICAL AND ELECTRICAL CHARACTERISTICS [1], TLRG4400CU, GREEN						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity [2]	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, f = 1 MHz	C_j		50		pF

Note:

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

[2] In one packing unit $I_{Vmin.}/I_{Vmax.} \leq 0.5$

OPTICAL AND ELECTRICAL CHARACTERISTICS [1], TLRP440.CU, PURE GREEN							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity [2]	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, f = 1 MHz		C_j		50		pF

Note:

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

[2] In one packing unit $I_{Vmin.}/I_{Vmax.} \leq 0.5$

TYPICAL CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified

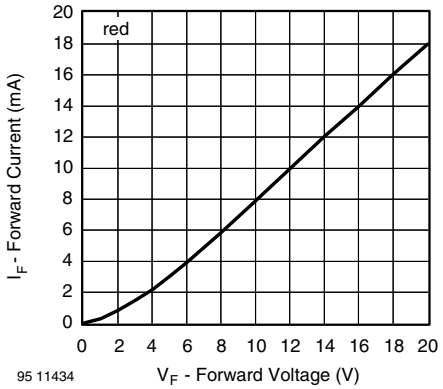


Figure 1. Forward Current vs. Forward Voltage

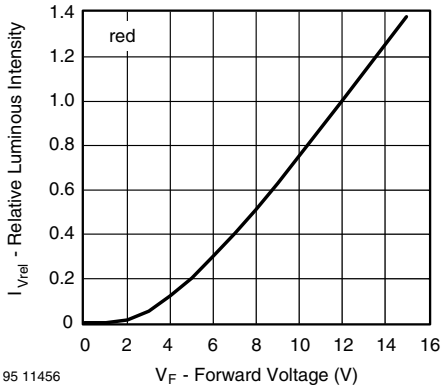


Figure 4. Relative Luminous Intensity vs. Forward Voltage

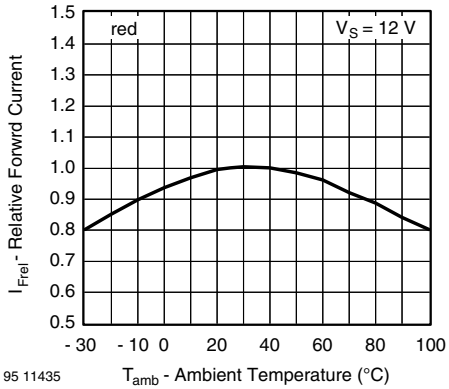


Figure 2. Relative Forward Current vs. Ambient Temperature

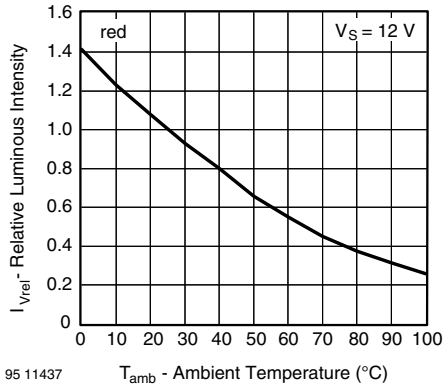


Figure 5. Rel. Luminous Intensity vs. Ambient Temperature

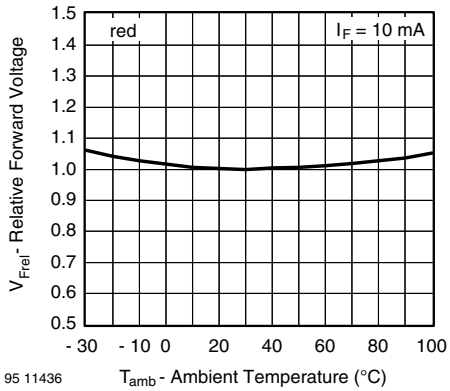


Figure 3. Relative Forward Voltage vs. Ambient Temperature

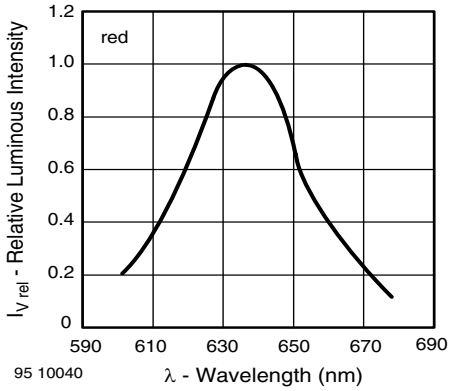


Figure 6. Relative Intensity vs. Wavelength

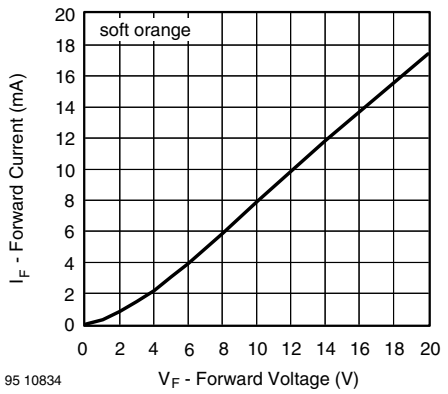


Figure 7. Forward Current vs. Forward Voltage

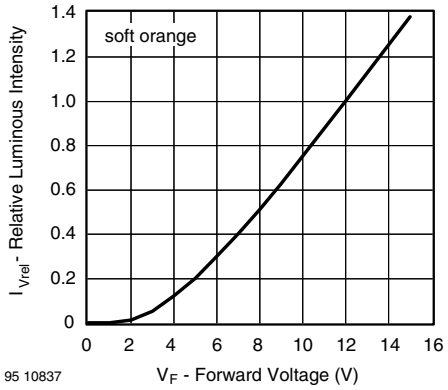


Figure 10. Relative Luminous Intensity vs. Forward Voltage

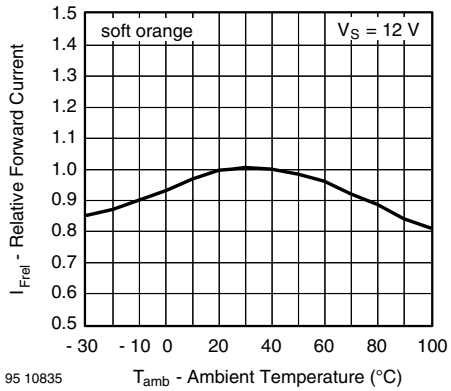


Figure 8. Relative Forward Current vs. Ambient Temperature

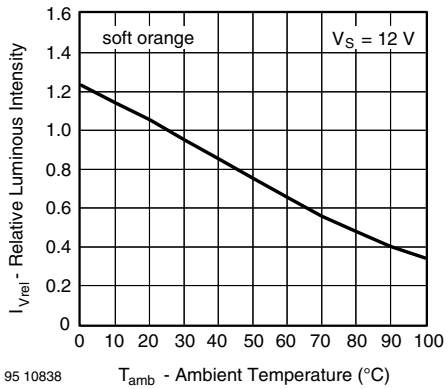


Figure 11. Rel. Luminous Intensity vs. Ambient Temperature

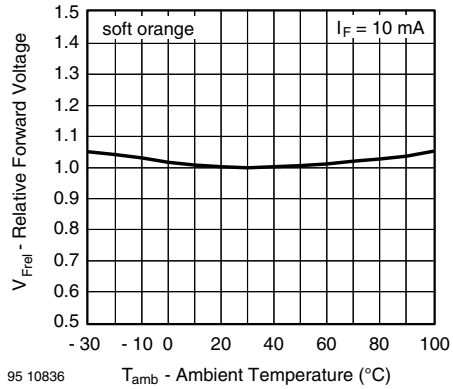


Figure 9. Relative Forward Voltage vs. Ambient Temperature

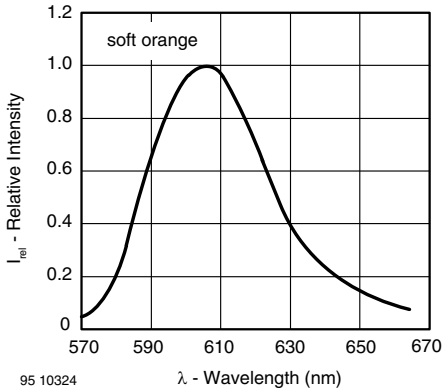


Figure 12. Relative Intensity vs. Wavelength

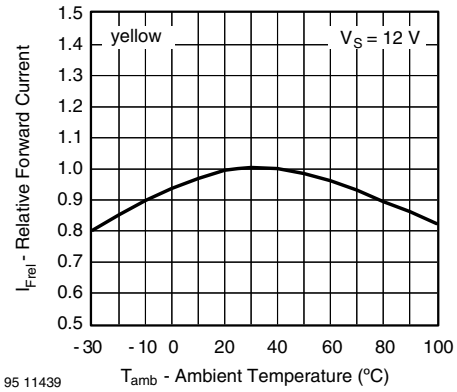


Figure 13. Relative Forward Current vs. Ambient Temperature

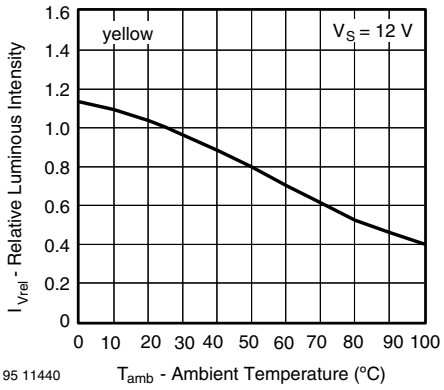


Figure 16. Rel. Luminous Intensity vs. Ambient Temperature

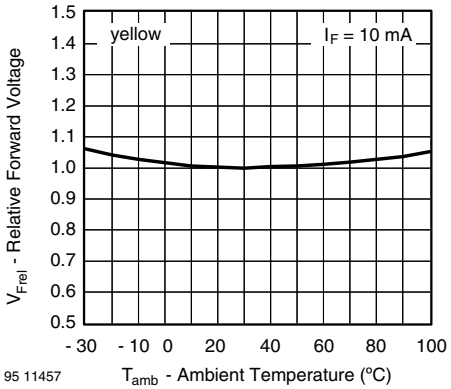


Figure 14. Relative Forward Voltage vs. Ambient Temperature

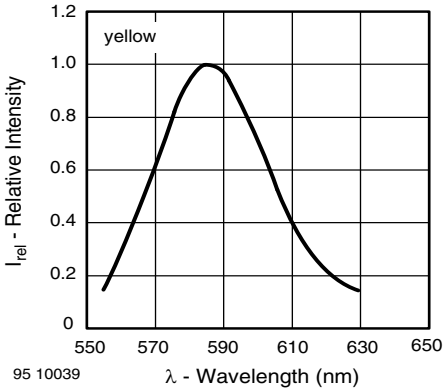


Figure 17. Relative Intensity vs. Wavelength

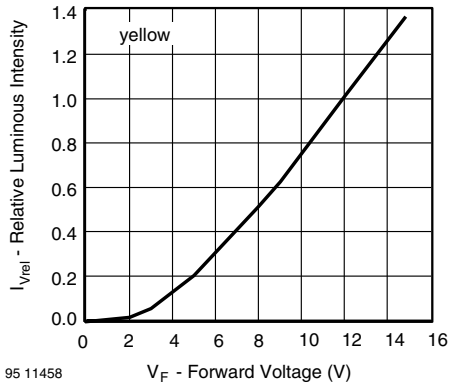


Figure 15. Relative Luminous Intensity vs. Forward Voltage

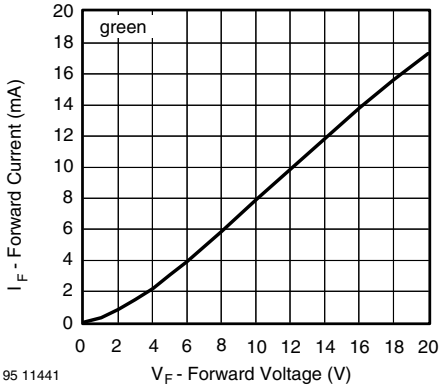


Figure 18. Forward Current vs. Forward Voltage

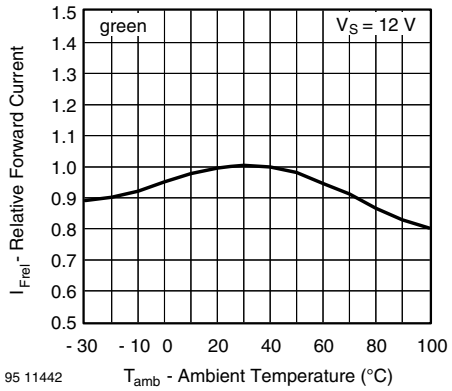


Figure 19. Relative Forward Current vs. Ambient Temperature

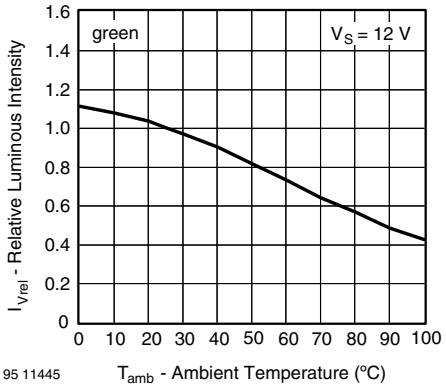


Figure 22. Rel. Luminous Intensity vs. Ambient Temperature

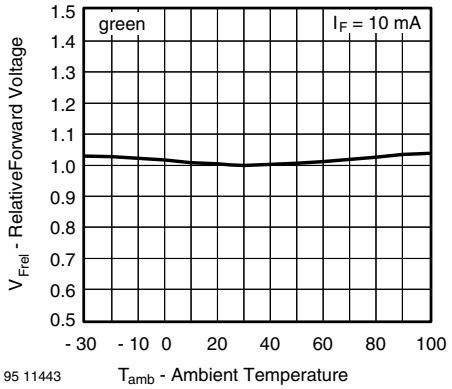


Figure 20. Relative Forward Voltage vs. Ambient Temperature

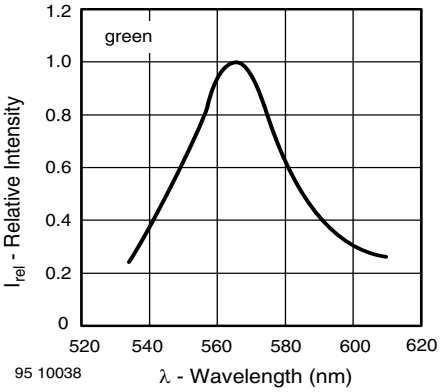


Figure 23. Relative Intensity vs. Wavelength

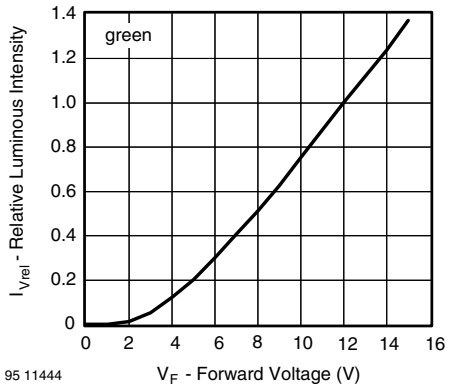


Figure 21. Relative Luminous Intensity vs. Forward Voltage

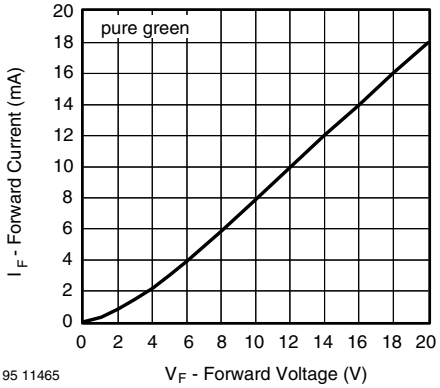


Figure 24. Forward Current vs. Forward Voltage

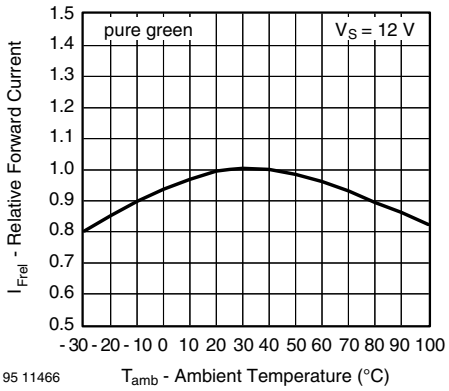


Figure 25. Relative Forward Current vs. Ambient Temperature

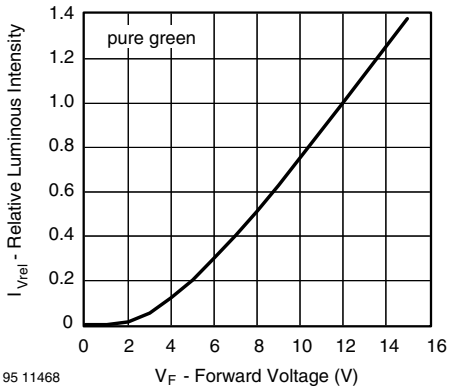


Figure 27. Relative Luminous Intensity vs. Forward Voltage

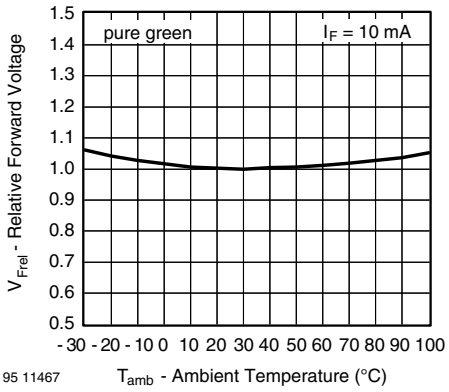


Figure 26. Relative Forward Voltage vs. Ambient Temperature

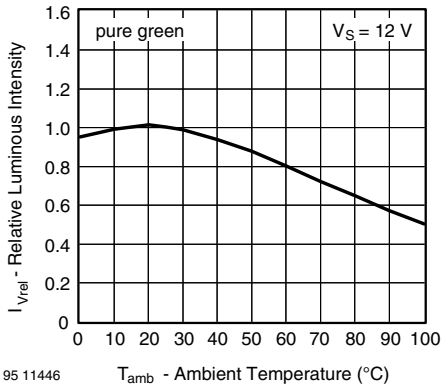
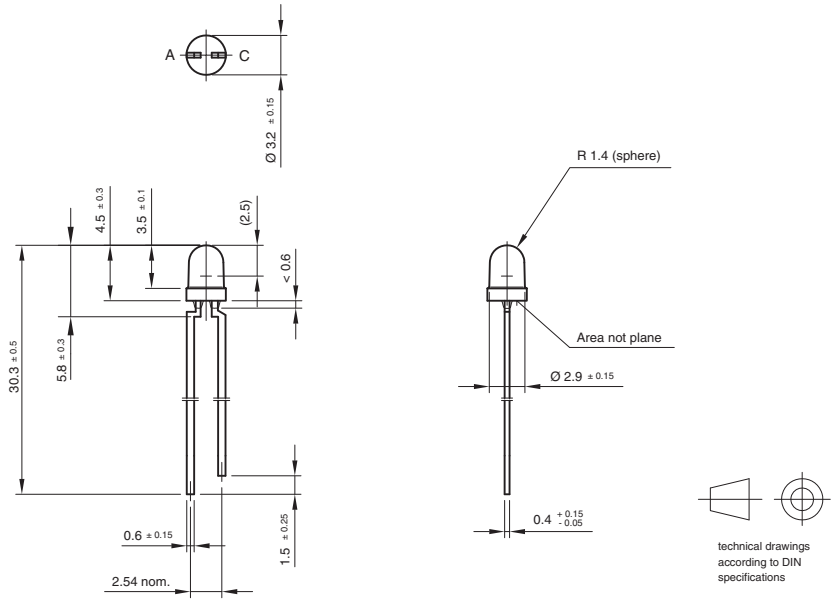


Figure 28. Rel. Luminous Intensity vs. Ambient Temperature

PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.544-5255.01-4
Issue: 7; 25.09.08
95 10913

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