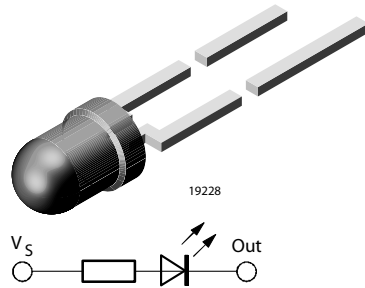




Resistor LED for 12 V Supply Voltage



FEATURES

- With current limiting resistor for 12 V
- EMC specified (DIN 40 839)
- Resistant against transient high voltage spikes
- Cost effective: save space and resistor cost
- Standard Ø 3 mm (T-1) package
- Wide viewing angle
- Choice of four bright colors
- Luminous intensity categorized
- Yellow and green color categorized
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC



RoHS
COMPLIANT

DESCRIPTION

These devices are developed for the automotive industry with special requirements as for EMC (electro magnetic compatibility) in motor vehicles with 12 V supply voltage.

They are resistant against transient conduction (high voltage spikes) and interferences by conduction and coupling.

The TLR.4420CU 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 and green. 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
- Off/on indicator in cars
- 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: $\pm 30^\circ$

PARTS TABLE

PART	COLOR, LUMINOUS INTENSITY	TECHNOLOGY
TLRH4420CU	Red, $I_V > 1.6$ mcd	GaAsP on GaP
TLRO4420CU	Soft orange, $I_V > 4$ mcd	GaAsP on GaP
TLRY4420CU	Yellow, $I_V > 1.6$ mcd	GaAsP on GaP
TLRG4420CU	Green, $I_V > 1.6$ mcd	GaP on GaP

ABSOLUTE MAXIMUM RATINGS ¹⁾, TLRH4420CU, TLRO4420CU, TLR4420CU, TLRG4420CU

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	6	V
Forward voltage	$T_{amb} \leq 65^\circ\text{C}$	V_F	16	V
Power dissipation	$T_{amb} \leq 65^\circ\text{C}$	P_V	240	mW
Junction temperature		T_j	100	$^\circ\text{C}$
Operating temperature range		T_{amb}	- 40 to + 100	$^\circ\text{C}$
Storage temperature range		T_{stg}	- 55 to + 100	$^\circ\text{C}$
Soldering temperature	$t \leq 5 \text{ s}$, 2 mm from body	T_{sd}	260	$^\circ\text{C}$
Thermal resistance junction/ambient		R_{thJA}	150	K/W

Note:

¹⁾ $T_{amb} = 25^\circ\text{C}$ unless otherwise specified**OPTICAL AND ELECTRICAL CHARACTERISTICS ¹⁾, TLRH4420CU, RED**

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity ²⁾	$V_S = 12 \text{ V}$	I_V	1.6	10		mcd
Dominant wavelength	$V_S = 12 \text{ V}$	λ_d	612		625	nm
Peak wavelength	$V_S = 12 \text{ V}$	λ_p		635		nm
Angle of half intensity	$V_S = 12 \text{ V}$	φ		± 30		deg
Forward current	$V_S = 12 \text{ V}$	I_F		10	12	mA
Breakdown voltage	$I_R = 10 \mu\text{A}$	V_{BR}	6	70		V
Junction capacitance	$V_R = 0$, $f = 1 \text{ MHz}$	C_j		50		pF

Note:

¹⁾ $T_{amb} = 25^\circ\text{C}$ unless otherwise specified²⁾ In one packing unit $I_{Vmin}/I_{Vmax} \leq 0.5$ **OPTICAL AND ELECTRICAL CHARACTERISTICS ¹⁾, TLRO4420CU, SOFT ORANGE**

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity ²⁾	$V_S = 12 \text{ V}$	I_V	4	10		mcd
Dominant wavelength	$V_S = 12 \text{ V}$	λ_d	598		611	nm
Peak wavelength	$V_S = 12 \text{ V}$	λ_p		605		nm
Angle of half intensity	$V_S = 12 \text{ V}$	φ		± 30		deg
Forward current	$V_S = 12 \text{ V}$	I_F		10	12	mA
Breakdown voltage	$I_R = 10 \mu\text{A}$	V_{BR}	6	70		V
Junction capacitance	$V_R = 0$, $f = 1 \text{ MHz}$	C_j		50		pF

Note:

¹⁾ $T_{amb} = 25^\circ\text{C}$ unless otherwise specified²⁾ In one packing unit $I_{Vmin}/I_{Vmax} \leq 0.5$



OPTICAL AND ELECTRICAL CHARACTERISTICS ¹⁾, TLR4420CU, YELLOW

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity ²⁾	$V_S = 12\text{ V}$	I_V	1.6	10		mcd
Dominant wavelength	$V_S = 12\text{ V}$	λ_d	581		594	nm
Peak wavelength	$V_S = 12\text{ V}$	λ_p		585		nm
Angle of half intensity	$V_S = 12\text{ V}$	ϕ		± 30		deg
Forward current	$V_S = 12\text{ V}$	I_F		10	12	mA
Breakdown voltage	$I_R = 10\text{ }\mu\text{A}$	V_{BR}	6	70		V
Junction capacitance	$V_R = 0, f = 1\text{ MHz}$	C_j		50		pF

Note:

¹⁾ $T_{amb} = 25\text{ }^\circ\text{C}$ unless otherwise specified

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

OPTICAL AND ELECTRICAL CHARACTERISTICS ¹⁾, TLRG4420CU, GREEN

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity ²⁾	$V_S = 12\text{ V}$	I_V	1.6	10		mcd
Dominant wavelength	$V_S = 12\text{ V}$	λ_d	562		575	nm
Peak wavelength	$V_S = 12\text{ V}$	λ_p		565		nm
Angle of half intensity	$V_S = 12\text{ V}$	ϕ		± 30		deg
Forward current	$V_S = 12\text{ V}$	I_F		10	12	mA
Breakdown voltage	$I_R = 10\text{ }\mu\text{A}$	V_{BR}	6	70		V
Junction capacitance	$V_R = 0, f = 1\text{ MHz}$	C_j		50		pF

Note:

¹⁾ $T_{amb} = 25\text{ }^\circ\text{C}$ unless otherwise specified

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

TYPICAL CHARACTERISTICS

$T_{amb} = 25\text{ }^\circ\text{C}$ unless otherwise specified

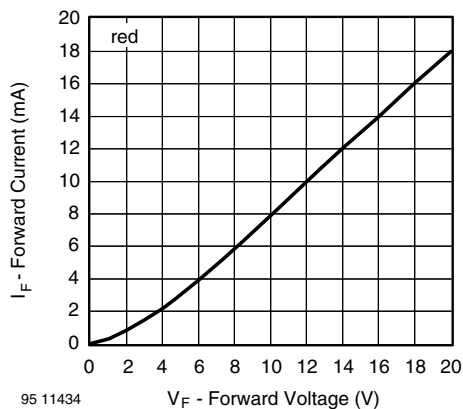


Figure 1. Forward Current vs. Forward Voltage

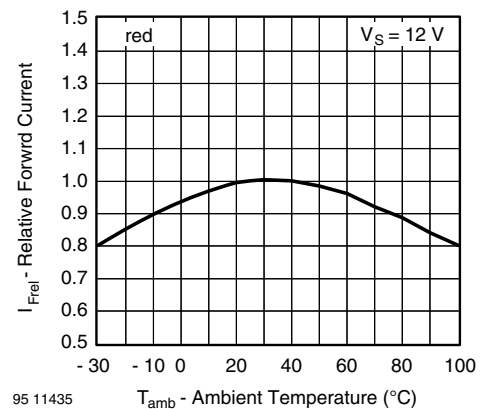


Figure 2. Relative Forward Current vs. Ambient Temperature

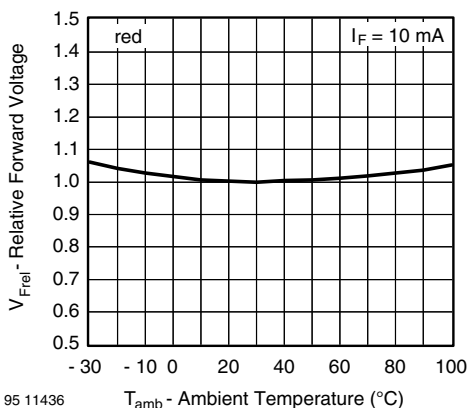


Figure 3. Relative Forward Voltage vs. Ambient Temperature

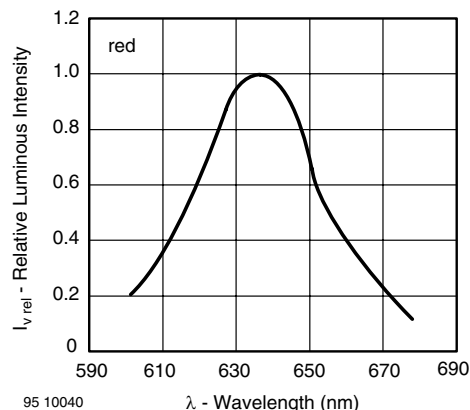


Figure 6. Relative Intensity vs. Wavelength

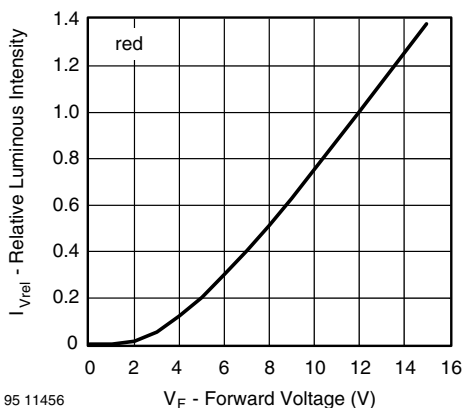


Figure 4. Relative Luminous Intensity vs. Forward Voltage

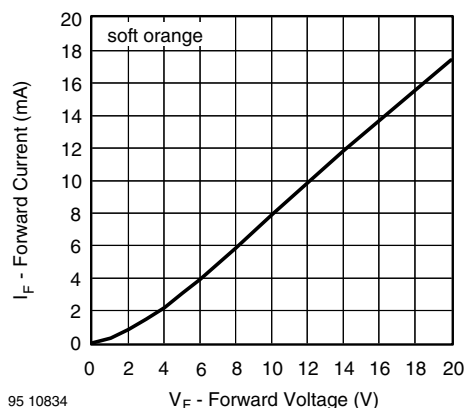


Figure 7. Forward Current vs. Forward Voltage

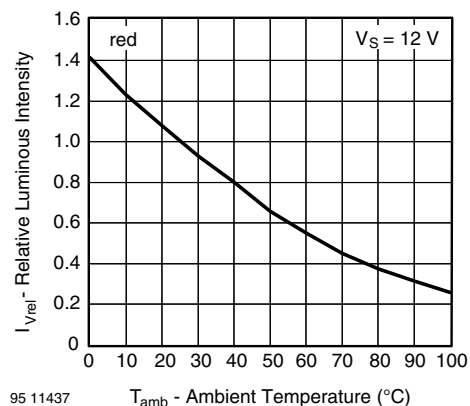


Figure 5. Rel. Luminous Intensity vs. Ambient Temperature

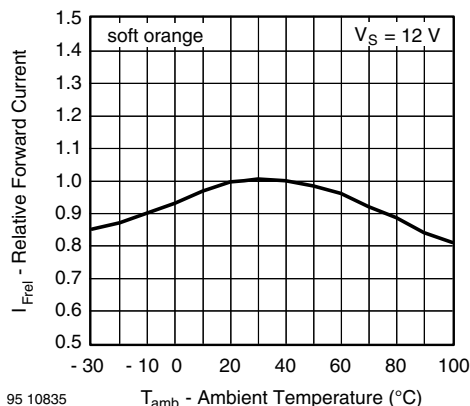


Figure 8. Relative Forward Current vs. Ambient Temperature

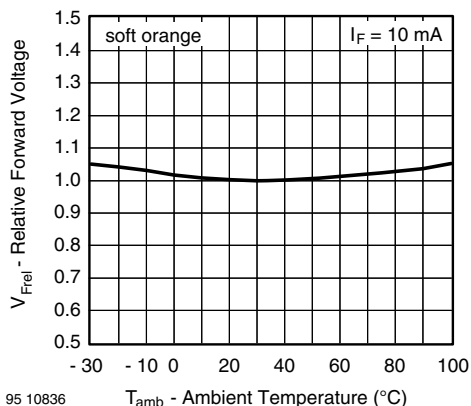


Figure 9. Relative Forward Voltage vs. Ambient Temperature

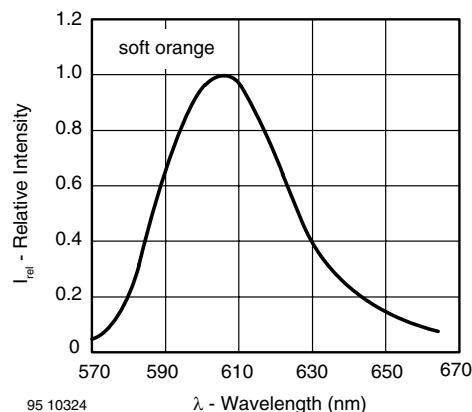


Figure 12. Relative Intensity vs. Wavelength

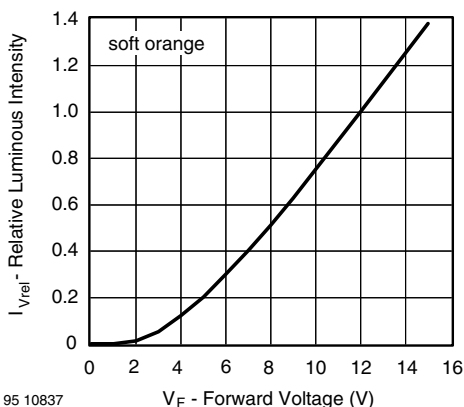


Figure 10. Relative Luminous Intensity vs. Forward Voltage

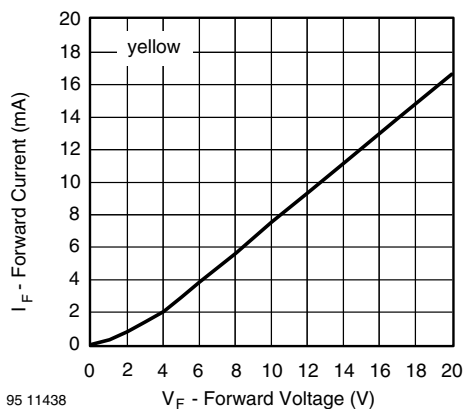


Figure 13. Forward Current vs. Forward Voltage

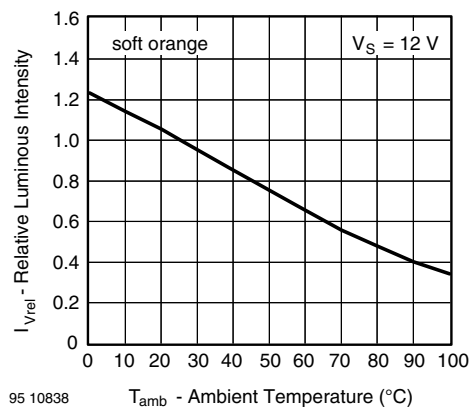


Figure 11. Rel. Luminous Intensity vs. Ambient Temperature

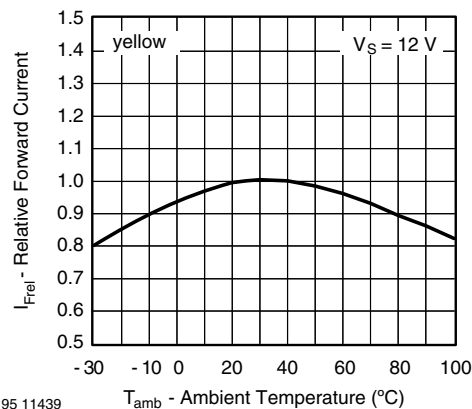


Figure 14. Relative Forward Current vs. Ambient Temperature

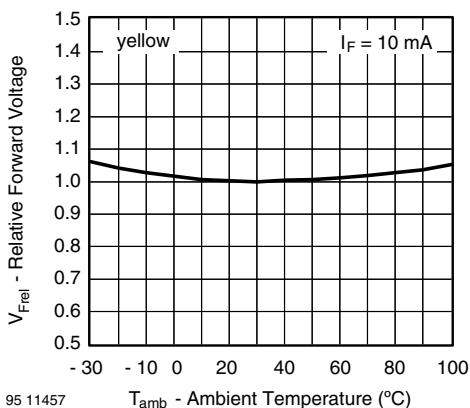


Figure 15. Relative Forward Voltage vs. Ambient Temperature

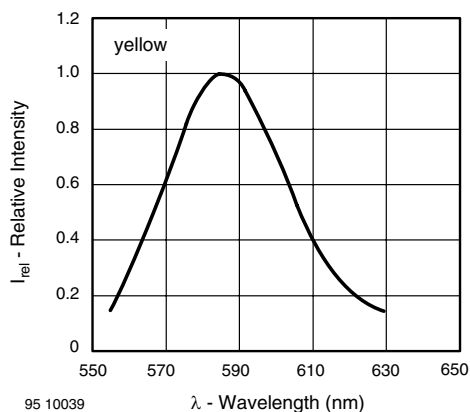


Figure 18. Relative Intensity vs. Wavelength

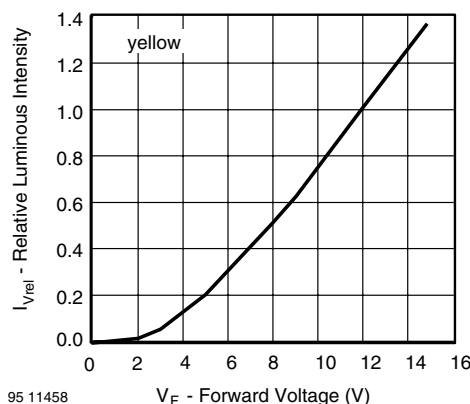


Figure 16. Relative Luminous Intensity vs. Forward Voltage

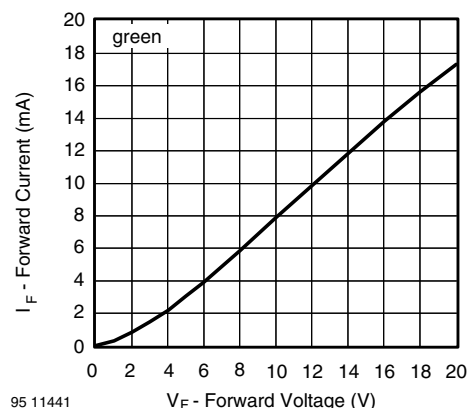


Figure 19. Forward Current vs. Forward Voltage

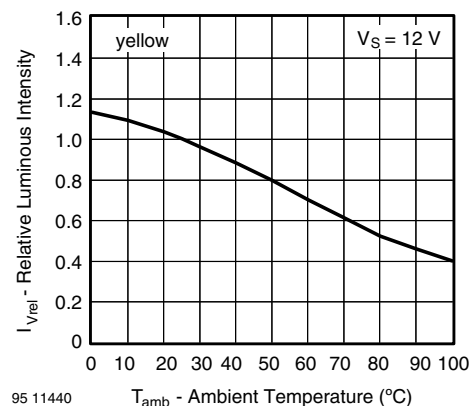


Figure 17. Rel. Luminous Intensity vs. Ambient Temperature

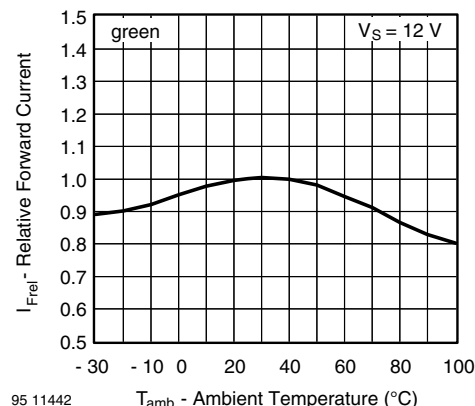


Figure 20. Relative Forward Current vs. Ambient Temperature

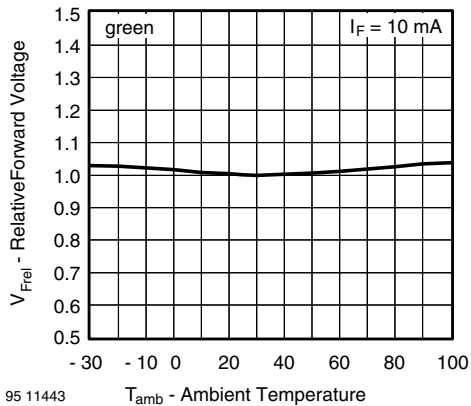


Figure 21. Relative Forward Voltage vs. Ambient Temperature

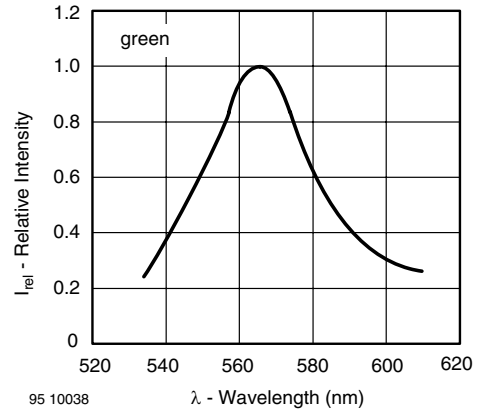


Figure 24. Relative Intensity vs. Wavelength

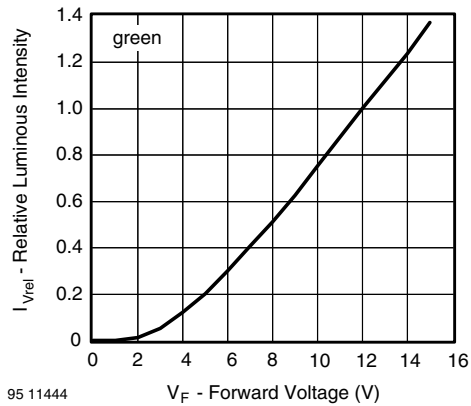


Figure 22. Relative Luminous Intensity vs. Forward Voltage

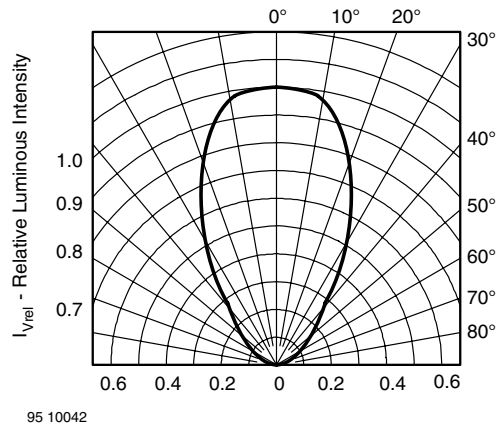


Figure 25. Rel. Luminous Intensity vs. Angular Displacement

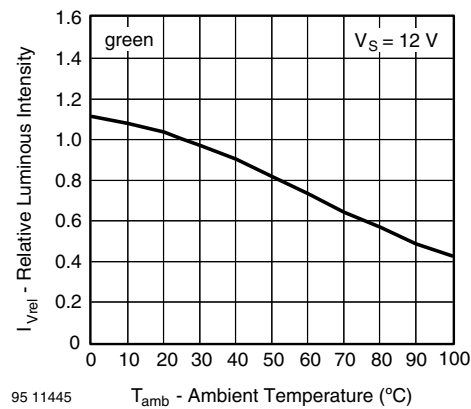
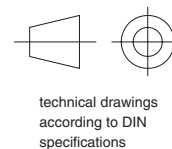
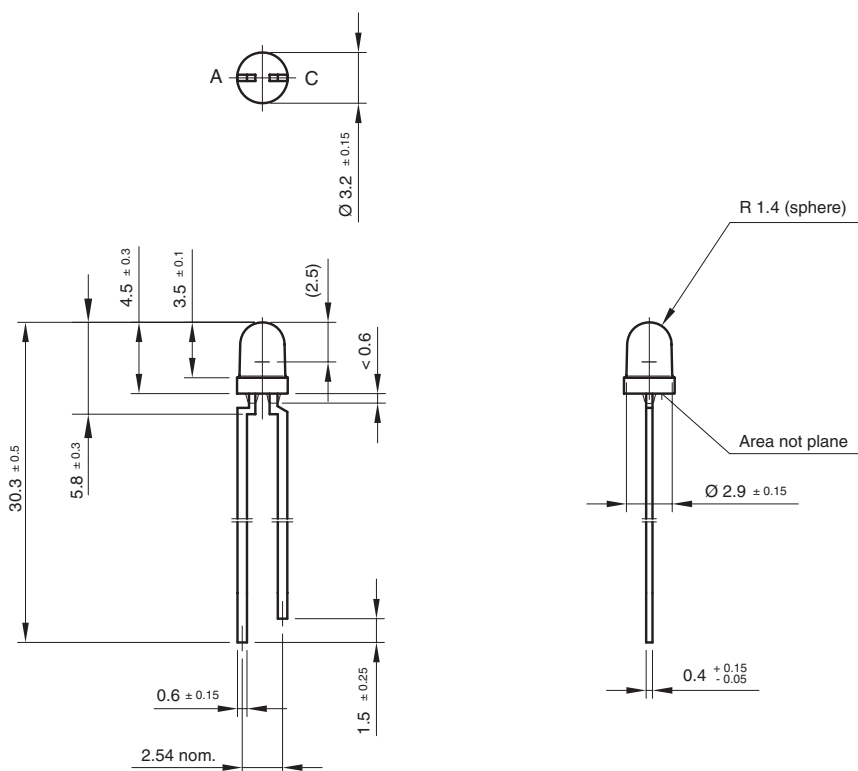


Figure 23. Rel. Luminous Intensity vs. Ambient Temperature

PACKAGE DIMENSIONS in millimeters



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95 10913



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