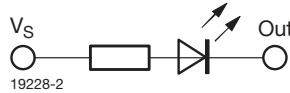
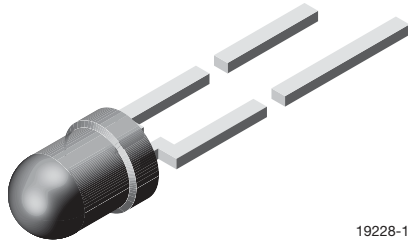




## Resistor LED for 12 V Supply Voltage



### 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
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



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

PARTS TABLE														
PART	COLOR	LUMINOUS INTENSITY (mcd)			at V <sub>s</sub> (V)	WAVELENGTH (nm)			at V <sub>s</sub> (V)	FORWARD VOLTAGE (V)			at V <sub>s</sub> (V)	TECHNOLOGY
		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.		
TLRH4420CU	Red	1.6	10	-	12	612	-	625	12	-	10	12	12	GaAsP on GaP
TLRO4420CU	Soft orange	4	10	-	12	598	-	611	12	-	10	12	12	GaAsP on GaP
TLRY4420CU	Yellow	1.6	10	-	12	581	-	594	12	-	10	12	12	GaAsP on GaP
TLRG4420CU	Green	1.6	10	-	12	562	-	575	12	-	10	12	12	GaP on GaP

ABSOLUTE MAXIMUM RATINGS (T <sub>amb</sub> = 25 °C, unless otherwise specified)				
TLRH4420CU , TLRO4420CU , TLR4420CU , TLRG4420CU				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V <sub>R</sub>	6	V
Forward voltage	T <sub>amb</sub> ≤ 65 °C	V <sub>F</sub>	16	V
Power dissipation	T <sub>amb</sub> ≤ 65 °C	P <sub>V</sub>	240	mW
Junction temperature		T <sub>j</sub>	100	°C
Operating temperature range		T <sub>amb</sub>	- 40 to + 100	°C
Storage temperature range		T <sub>stg</sub>	- 55 to + 100	°C
Soldering temperature	t ≤ 5 s, 2 mm from body	T <sub>sd</sub>	260	°C
Thermal resistance junction/ambient		R <sub>thJA</sub>	150	K/W

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

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity <sup>(1)</sup>	$V_S = 12\text{ V}$	$I_V$	1.6	10	-	mcd
Dominant wavelength	$V_S = 12\text{ V}$	$\lambda_d$	612	-	625	nm
Peak wavelength	$V_S = 12\text{ V}$	$\lambda_p$	-	635	-	nm
Angle of half intensity	$V_S = 12\text{ V}$	$\varphi$	-	$\pm 30$	-	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	$V_R = 0\text{ V}, f = 1\text{ MHz}$	$C_j$	-	50	-	pF

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

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity <sup>(1)</sup>	$V_S = 12\text{ V}$	$I_V$	4	10	-	mcd
Dominant wavelength	$V_S = 12\text{ V}$	$\lambda_d$	598	-	611	nm
Peak wavelength	$V_S = 12\text{ V}$	$\lambda_p$	-	605	-	nm
Angle of half intensity	$V_S = 12\text{ V}$	$\varphi$	-	$\pm 30$	-	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**<sup>(1)</sup> In one packing unit  $I_{Vmin}/I_{Vmax} \leq 0.5$ .**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**TLR4420CU, YELLOW**

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity <sup>(1)</sup>	$V_S = 12\text{ V}$	$I_V$	1.6	10	-	mcd
Dominant wavelength	$V_S = 12\text{ V}$	$\lambda_d$	581	-	594	nm
Peak wavelength	$V_S = 12\text{ V}$	$\lambda_p$	-	585	-	nm
Angle of half intensity	$V_S = 12\text{ V}$	$\varphi$	-	$\pm 30$	-	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**<sup>(1)</sup> In one packing unit  $I_{Vmin}/I_{Vmax} \leq 0.5$ .**OPTICAL AND ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)  
**TLRG4420CU, GREEN**

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Luminous intensity <sup>(1)</sup>	$V_S = 12\text{ V}$	$I_V$	1.6	10	-	mcd
Dominant wavelength	$V_S = 12\text{ V}$	$\lambda_d$	562	-	575	nm
Peak wavelength	$V_S = 12\text{ V}$	$\lambda_p$	-	565	-	nm
Angle of half intensity	$V_S = 12\text{ V}$	$\varphi$	-	$\pm 30$	-	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**<sup>(1)</sup> In one packing unit  $I_{Vmin}/I_{Vmax} \leq 0.5$ .



TYPICAL CHARACTERISTICS (T<sub>amb</sub> = 25 °C, unless otherwise specified)

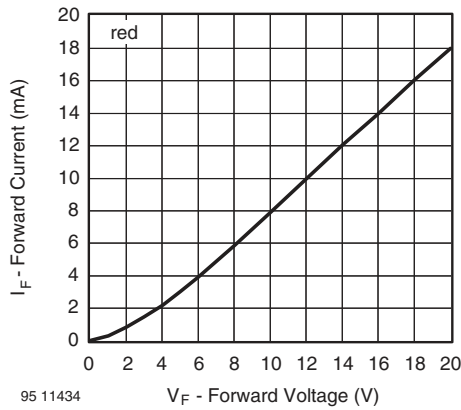


Fig. 1 - Forward Current vs. Forward Voltage

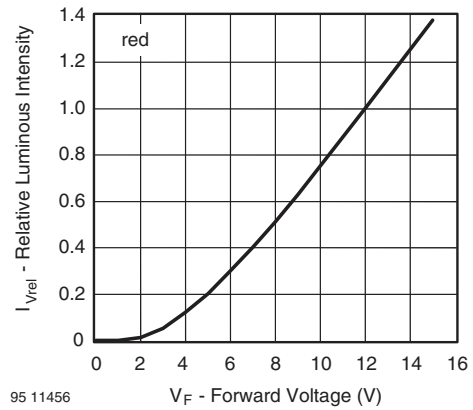


Fig. 4 - Relative Luminous Intensity vs. Forward Voltage

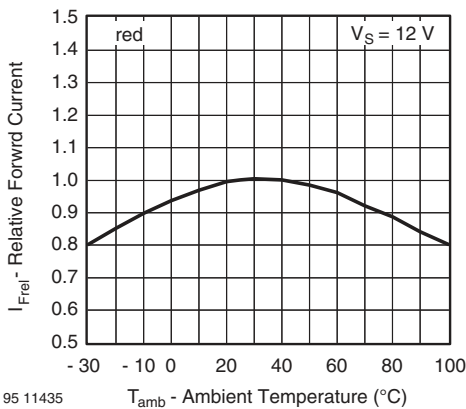


Fig. 2 - Relative Forward Current vs. Ambient Temperature

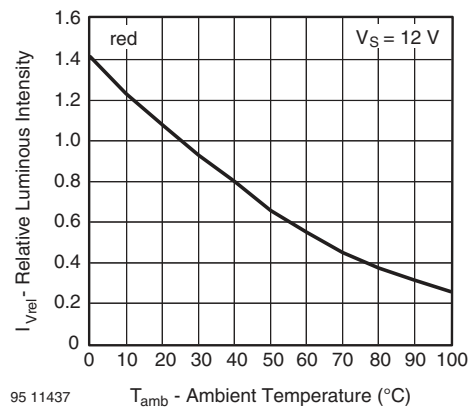


Fig. 5 - Relative Luminous Intensity vs. Ambient Temperature

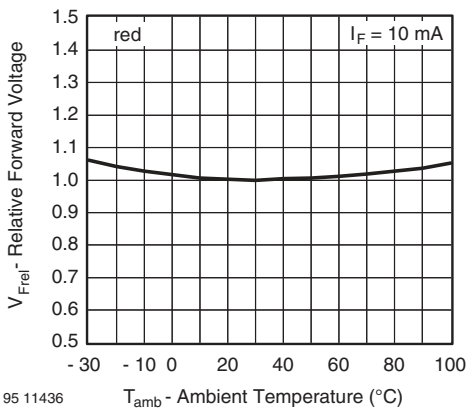


Fig. 3 - Relative Forward Voltage vs. Ambient Temperature

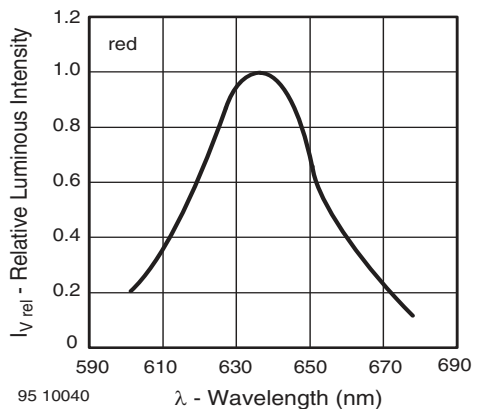
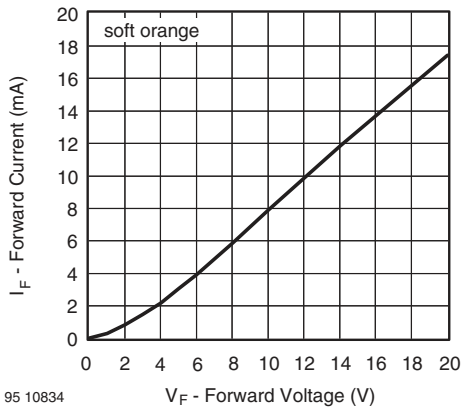
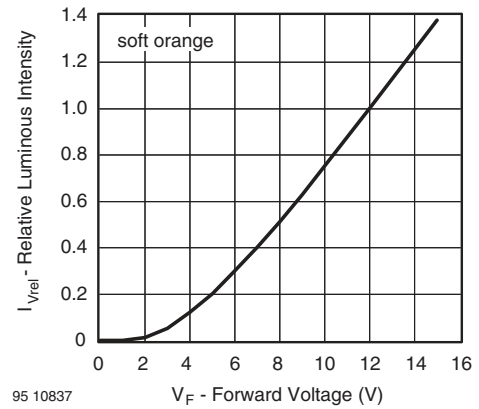


Fig. 6 - Relative Intensity vs. Wavelength



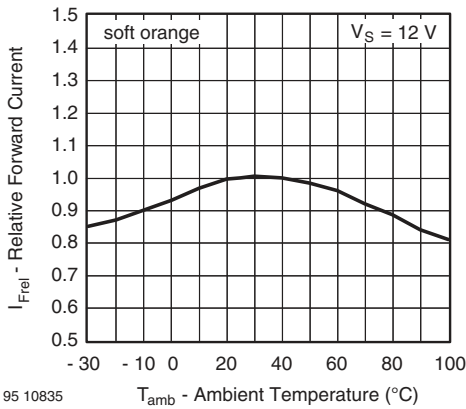
95 10834

Fig. 7 - Forward Current vs. Forward Voltage



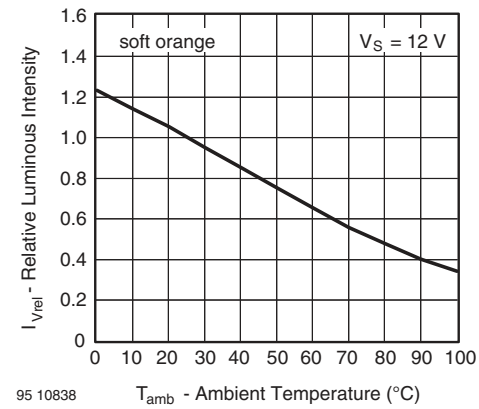
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Fig. 10 - Relative Luminous Intensity vs. Forward Voltage



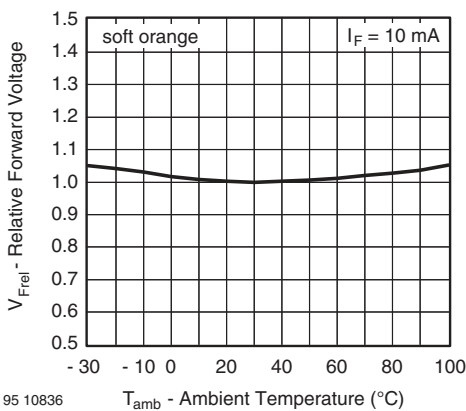
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Fig. 8 - Relative Forward Current vs. Ambient Temperature



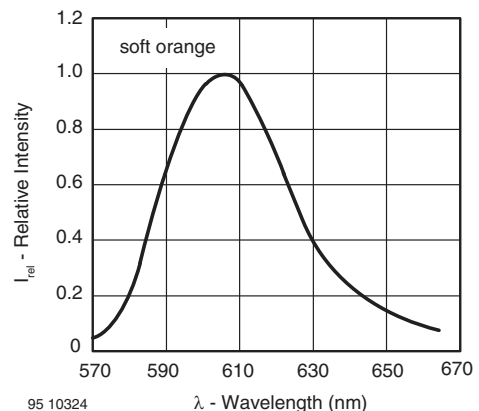
95 10838

Fig. 11 - Relative Luminous Intensity vs. Ambient Temperature



95 10836

Fig. 9 - Relative Forward Voltage vs. Ambient Temperature



95 10324

Fig. 12 - Relative Intensity vs. Wavelength

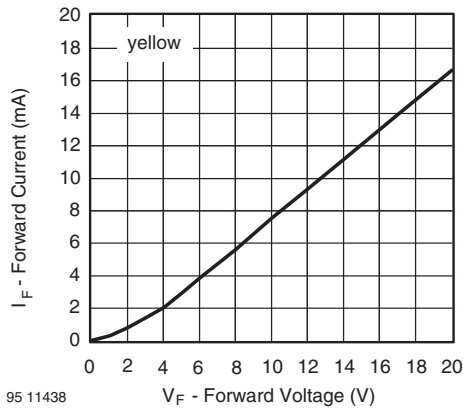


Fig. 13 - Forward Current vs. Forward Voltage

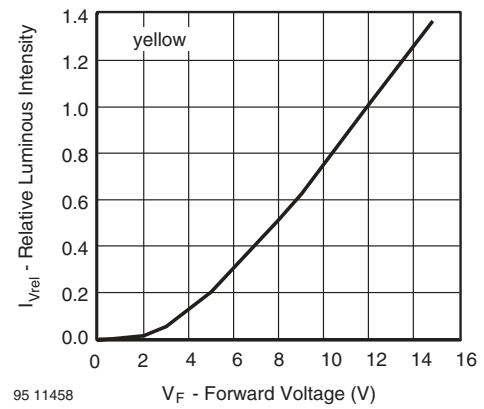


Fig. 16 - Relative Luminous Intensity vs. Forward Voltage

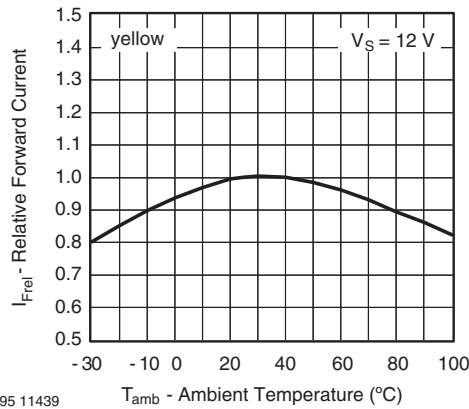


Fig. 14 - Relative Forward Current vs. Ambient Temperature

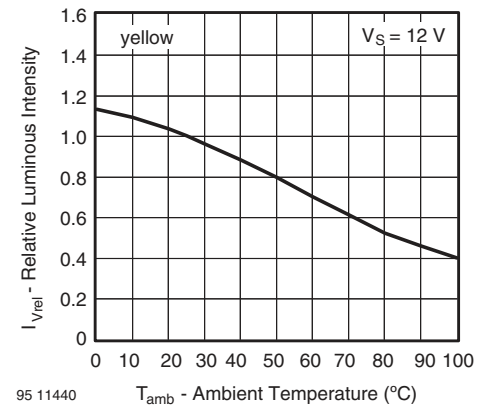


Fig. 17 - Relative Luminous Intensity vs. Ambient Temperature

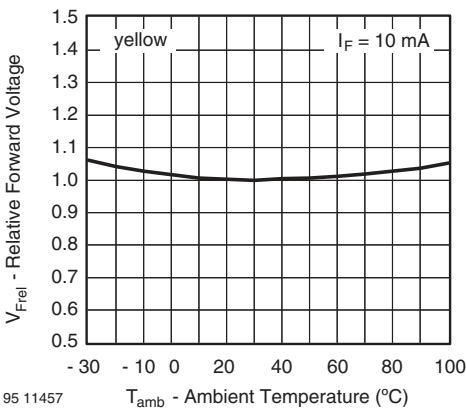


Fig. 15 - Relative Forward Voltage vs. Ambient Temperature

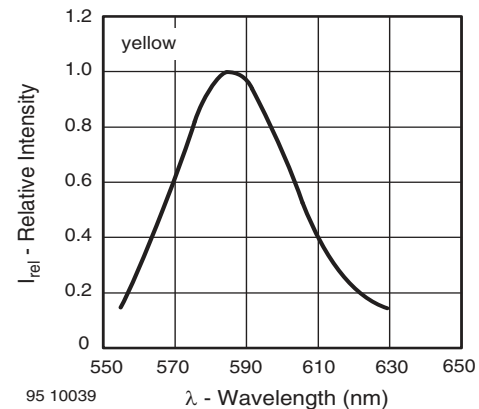


Fig. 18 - Relative Intensity vs. Wavelength

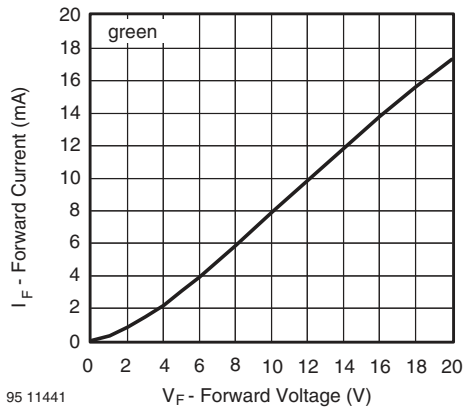


Fig. 19 - Forward Current vs. Forward Voltage

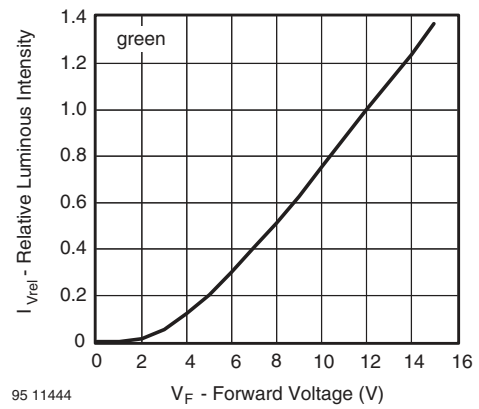


Fig. 22 - Relative Luminous Intensity vs. Forward Voltage

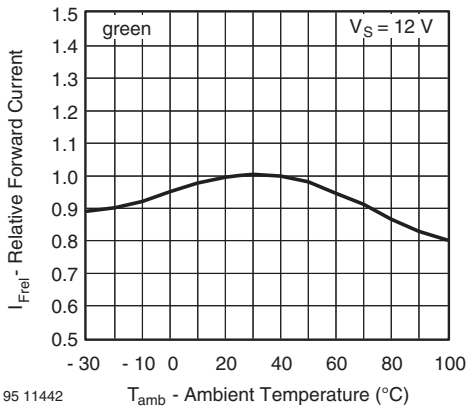


Fig. 20 - Relative Forward Current vs. Ambient Temperature

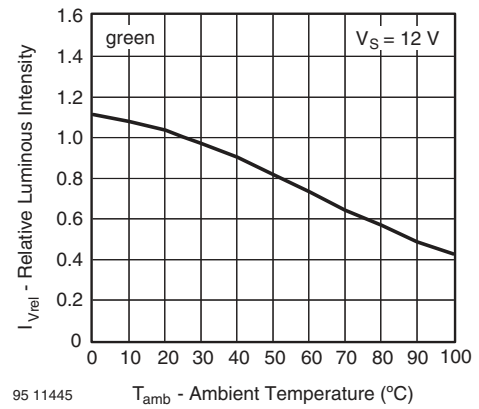


Fig. 23 - Relative Luminous Intensity vs. Ambient Temperature

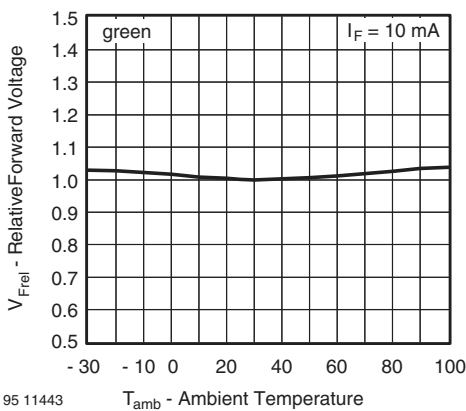


Fig. 21 - Relative Forward Voltage vs. Ambient Temperature

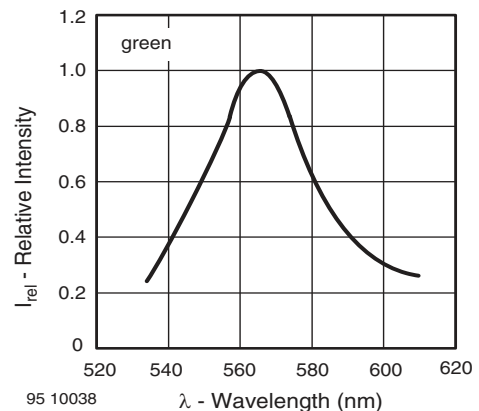


Fig. 24 - Relative Intensity vs. Wavelength

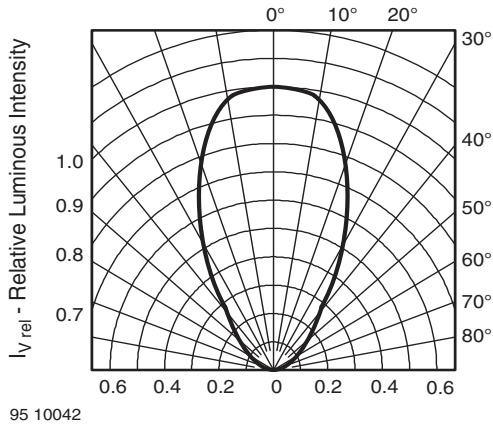
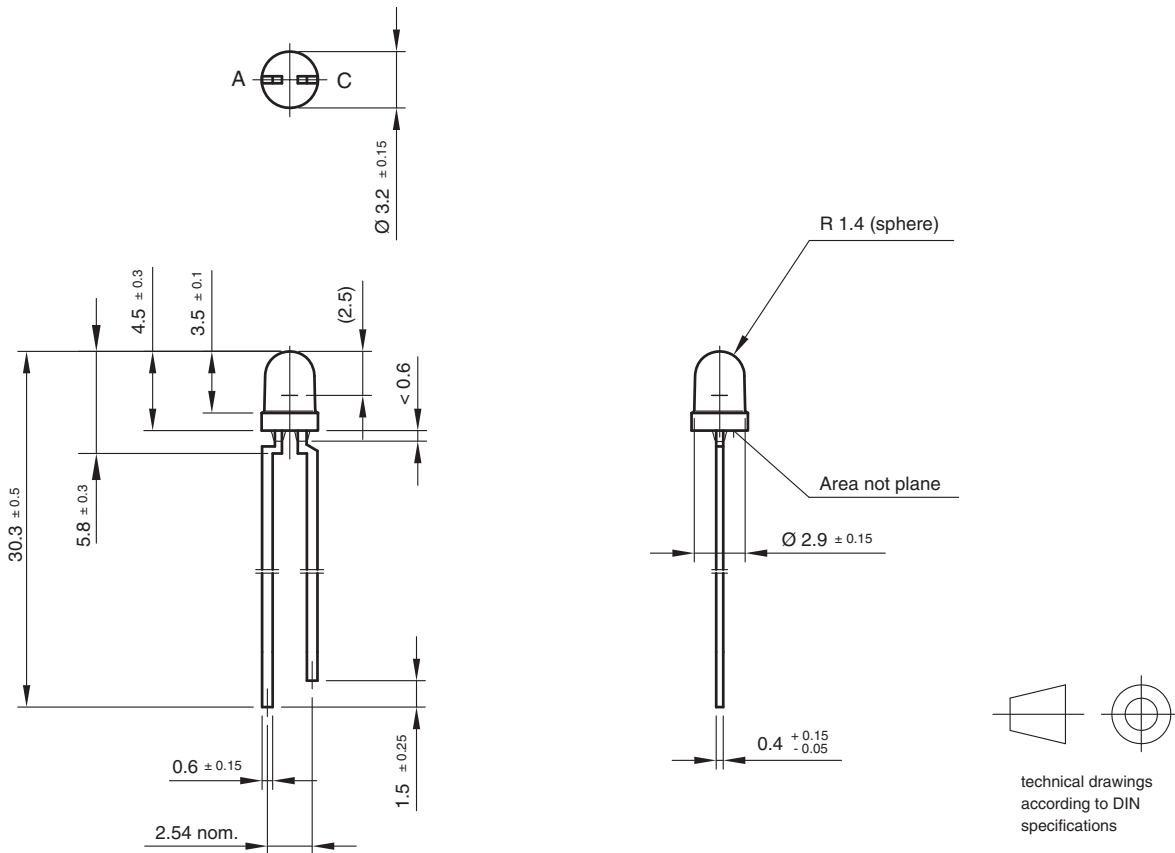


Fig. 25 - Relative Luminous Intensity vs. Angular Displacement

**PACKAGE DIMENSIONS** in millimeters



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



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