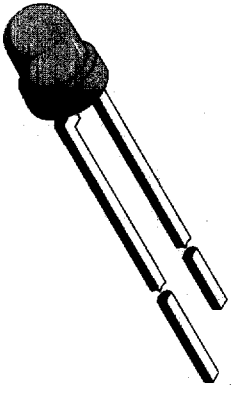
High Efficiency LED in ø 3 mm Tinted Diffused Package

Color	Type	Technology	Angle of Half Intensity ±φ
High efficiency red	TLHR44..	GaAsP on GaP	30°
Soft orange	TLHO44..	GaAsP on GaP	
Yellow	TLHY44..	GaAsP on GaP	
Green	TLHG44..	GaP on GaP	
Pure green	TLHP44..	GaP on GaP	

Description

The TLH.44.. series was developed for standard applications like general indicating and lighting purposes.
It is housed in a 3 mm tinted diffused plastic package. The wide viewing angle of these devices provides a high on-off contrast.
Several selection types with different luminous intensities are offered. All LEDs are categorized in luminous intensity groups. The green and yellow LEDs are categorized additionally in wavelength groups.
That allows users to assemble LEDs with uniform appearance.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Features

- Standard T-1 package
- Small mechanical tolerances
- Suitable for DC and high peak current
- Wide viewing angle
- Luminous intensity categorized
- Yellow and green color categorized

Applications

Status lights
OFF / ON indicator
Background illumination
Readout lights
Maintenance lights
Legend light

TLH.44..

Absolute Maximum Ratings

T_{amb} = 25°C, unless otherwise specified

TLHR44.. ,TLHO44.. ,TLHY44.. ,TLHG44.. ,TLHP44..

Parameter	Test Conditions	Type	Symbol	Value	Unit
Reverse voltage			V_R	6	V
DC forward current			I_F	30	mA
Surge forward current	$t_p \le 10$ µs		I_{FSM}	1	A
Power dissipation	$T_{amb} \le 60$°C		P_V	100	mW
Junction temperature			T_j	100	°C
Operating temperature range			T_{amb}	–20 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}	400	K/W

Optical and Electrical Characteristics

T_{amb} = 25°C, unless otherwise specified

High efficiency red (TLHR44..)

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Luminous intensity	I_F = 10 mA, $I_{Vmin}/I_{Vmax} \ge 0.5$	TLHR4400	I_V	1.6	3		mcd
		TLHR4401	I_V	2.5	5		mcd
		TLHR4405	I_V	6.3	10		mcd
Dominant wavelength	I_F = 10 mA		λ_d	612		625	nm
Peak wavelength	I_F = 10 mA		λ_p		635		nm
Angle of half intensity	I_F = 10 mA		φ		±30		deg
Forward voltage	I_F = 20 mA		V_F		2	3	V
Reverse voltage	I_R = 10 µA		V_R	6	15		V
Junction capacitance	V_R = 0, f = 1 MHz		C_j		50		pF

Soft orange (TLHO44..)

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Luminous intensity	I_F = 10 mA, $I_{Vmin}/I_{Vmax} \ge 0.5$	TLHO4400	I_V	1.6	4		mcd
Dominant wavelength	I_F = 10 mA		λ_d	598		611	nm
Peak wavelength	I_F = 10 mA		λ_p		605		nm
Angle of half intensity	I_F = 10 mA		φ		±30		deg
Forward voltage	I_F = 20 mA		V_F		2.4	3	V
Reverse voltage	I_R = 10 µA		V_R	6	15		V
Junction capacitance	V_R = 0, f = 1 MHz		C_j		15		pF

Yellow (TLHY44..)

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Luminous intensity	I_F = 10 mA, $I_{Vmin}/I_{Vmax} \geq 0.5$	TLHY4400	I_V	1.6	3		mcd
		TLHY4401	I_V	2.5	5		mcd
		TLHY4405	I_V	6.3	10		mcd
Dominant wavelength	I_F = 10 mA		λ_d	581		594	nm
Peak wavelength	I_F = 10 mA		λ_p		585		nm
Angle of half intensity	I_F = 10 mA		φ		±30		deg
Forward voltage	I_F = 20 mA		V_F		2.4	3	V
Reverse voltage	I_R = 10 µA		V_R	6	15		V
Junction capacitance	V_R = 0, f = 1 MHz		C_j		50		pF

Green (TLHG44..)

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Luminous intensity	I_F = 10 mA, $I_{Vmin}/I_{Vmax} \geq 0.5$	TLHG4400	I_V	2.5	4		mcd
		TLHG4401	I_V	4	6		mcd
		TLHG4405	I_V	6.3	12		mcd
Dominant wavelength	I_F = 10 mA		λ_d	562		575	nm
Peak wavelength	I_F = 10 mA		λ_p		565		nm
Angle of half intensity	I_F = 10 mA		φ		±30		deg
Forward voltage	I_F = 20 mA		V_F		2.4	3	V
Reverse voltage	I_R = 10 µA		V_R	6	15		V
Junction capacitance	V_R = 0, f = 1 MHz		C_j		50		pF

Pure green (TLHP44..)

Parameter	Test Conditions	Type	Symbol	Min	Typ	Max	Unit
Luminous intensity	I_F = 10 mA, $I_{Vmin}/I_{Vmax} \geq 0.5$	TLHP4400	I_V	0.63	2		mcd
		TLHP4401	I_V	1	3		mcd
		TLHP4405	I_V	1.6	3.5		mcd
Dominant wavelength	I_F = 10 mA		λ_d	555		565	nm
Peak wavelength	I_F = 10 mA		λ_p		555		nm
Angle of half intensity	I_F = 10 mA		φ		±30		deg
Forward voltage	I_F = 20 mA		V_F		2.4	3	V
Reverse voltage	I_R = 10 µA		V_R	6	15		V
Junction capacitance	V_R = 0, f = 1 MHz		C_j		50		pF

Typical Characteristics (T_{amb} = 25°C, unless otherwise specified)

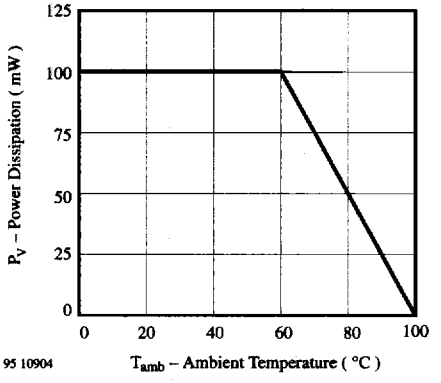

Figure 1. Power Dissipation vs. Ambient Temperature

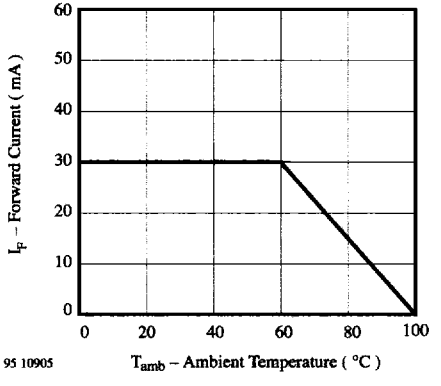

Figure 2. Forward Current vs. Ambient Temperature

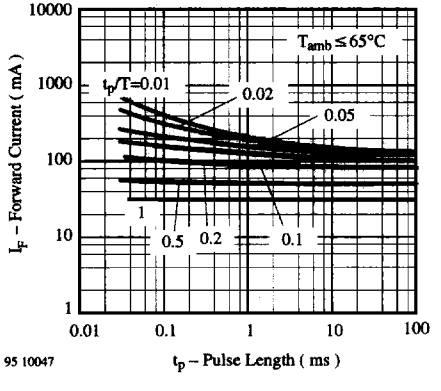

Figure 3. Forward Current vs. Pulse Length

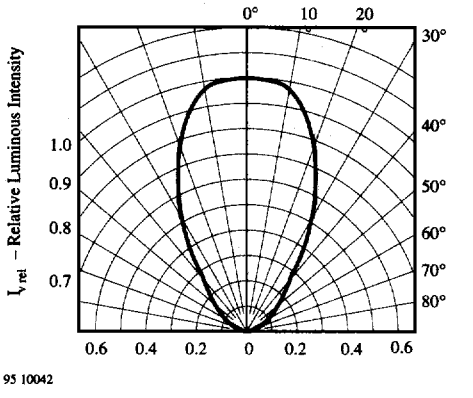

Figure 4. Rel. Luminous Intensity vs. Angular Displacement

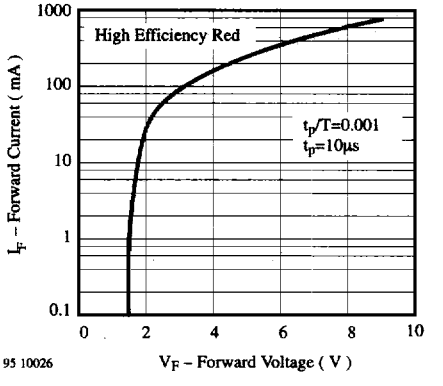

Figure 5. Forward Current vs. Forward Voltage

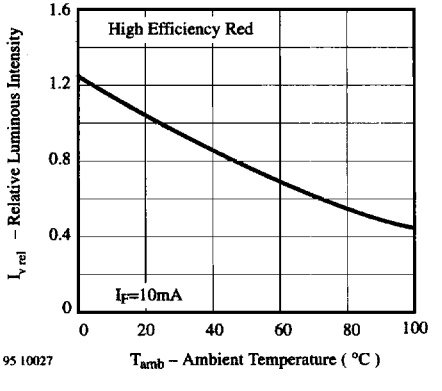

Figure 6. Rel. Luminous Intensity vs. Ambient Temperature

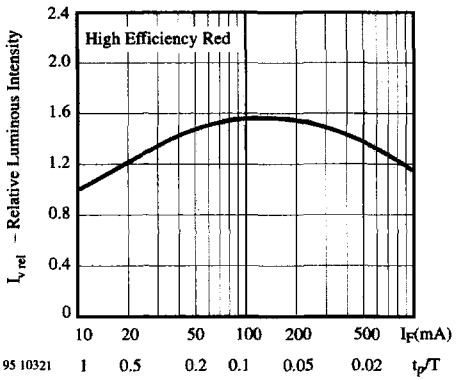

Figure 7. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

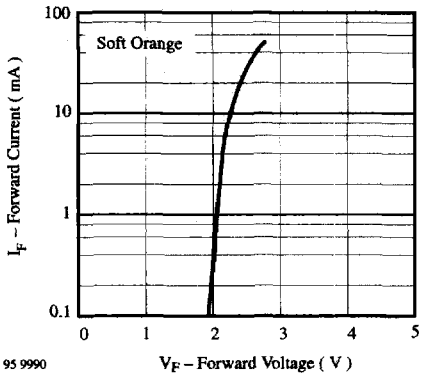

Figure 10. Forward Current vs. Forward Voltage

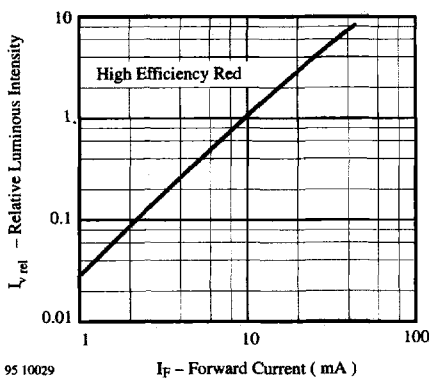

Figure 8. Relative Luminous Intensity vs. Forward Current

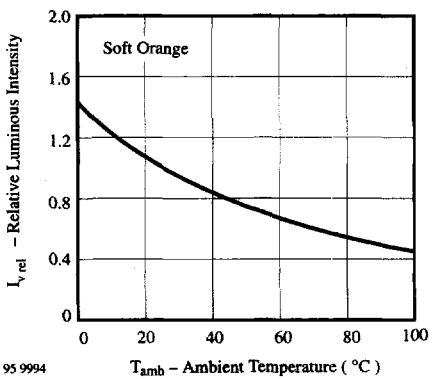

Figure 11. Rel. Luminous Intensity vs. Ambient Temperature

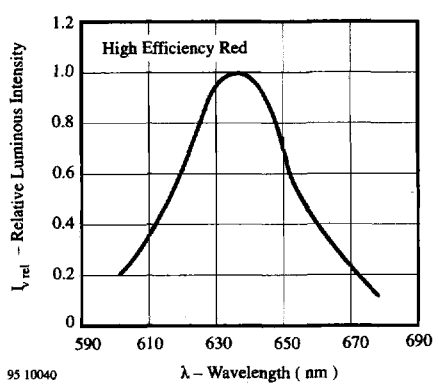

Figure 9. Relative Luminous Intensity vs. Wavelength

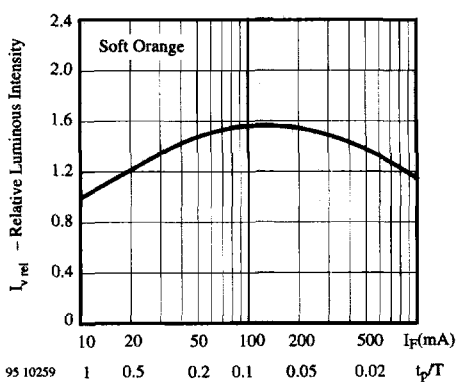

Figure 12. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

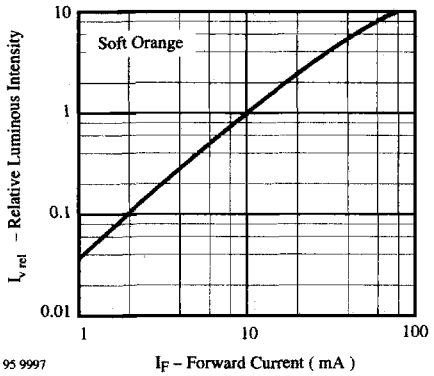

Figure 13. Relative Luminous Intensity vs. Forward Current

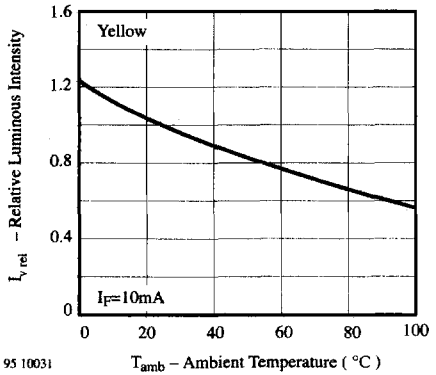

Figure 16. Rel. Luminous Intensity vs. Ambient Temperature

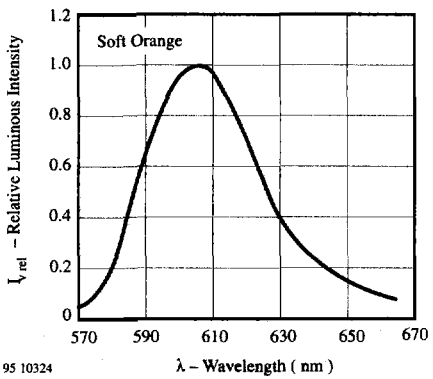

Figure 14. Relative Luminous Intensity vs. Wavelength

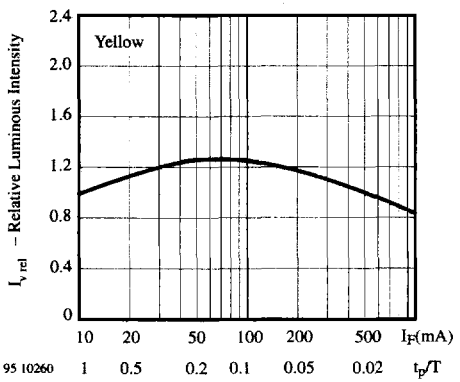

Figure 17. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

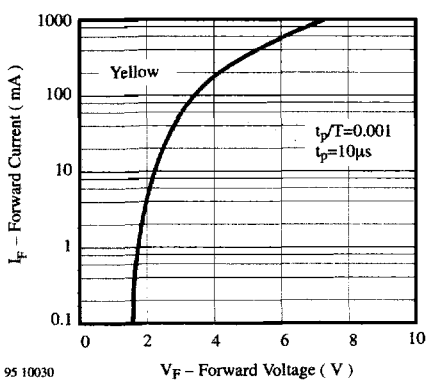

Figure 15. Forward Current vs. Forward Voltage

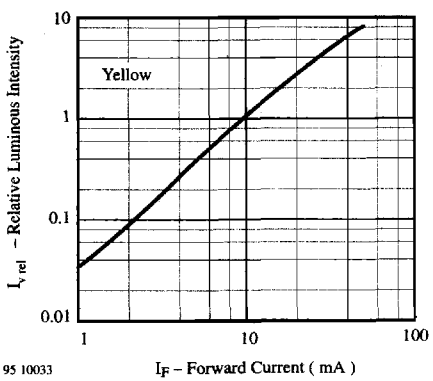

Figure 18. Relative Luminous Intensity vs. Forward Current

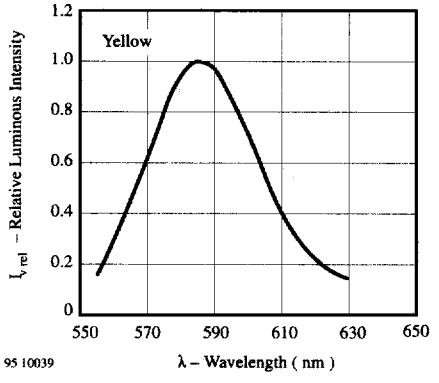

Figure 19. Relative Luminous Intensity vs. Wavelength

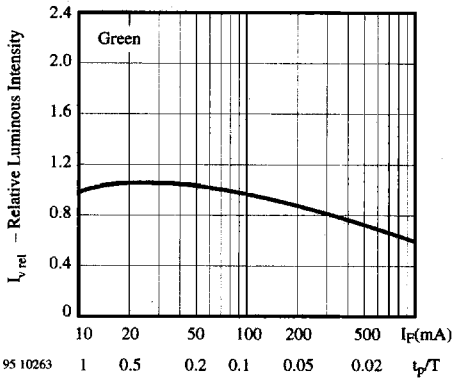

Figure 22. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

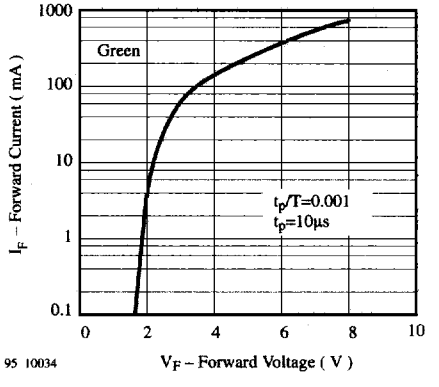

Figure 20. Forward Current vs. Forward Voltage

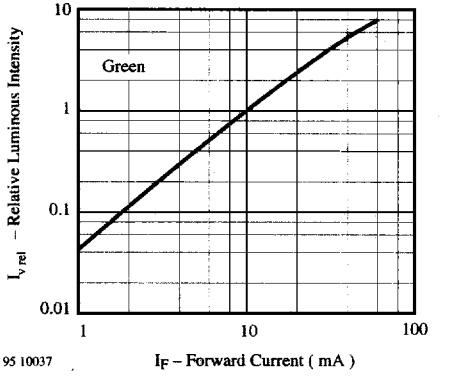

Figure 23. Relative Luminous Intensity vs. Forward Current

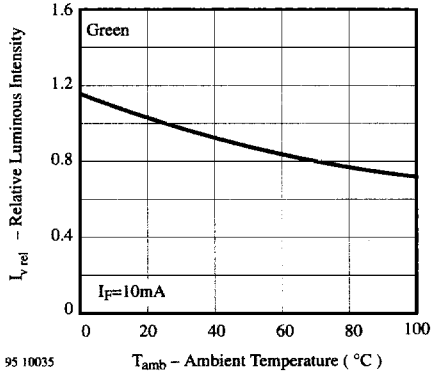

Figure 21. Rel. Luminous Intensity vs. Ambient Temperature

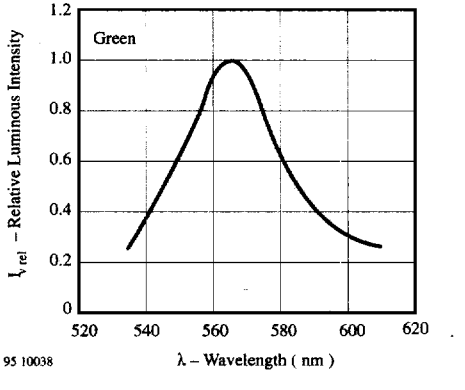

Figure 24. Relative Luminous Intensity vs. Wavelength

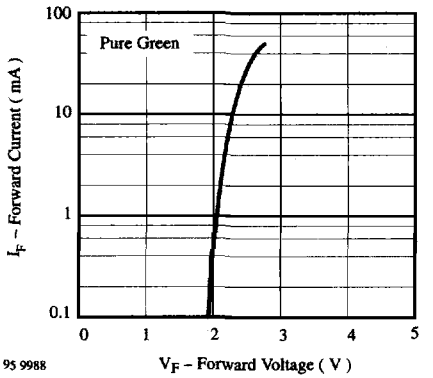

Figure 25. Forward Current vs. Forward Voltage

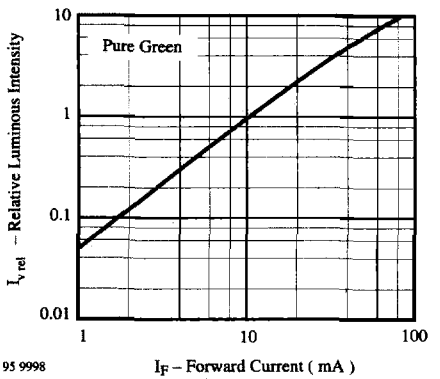

Figure 28. Relative Luminous Intensity vs. Forward Current

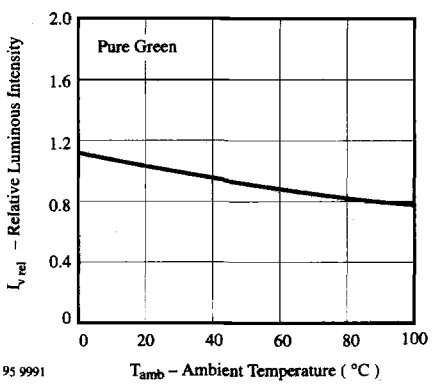

Figure 26. Rel. Luminous Intensity vs. Ambient Temperature

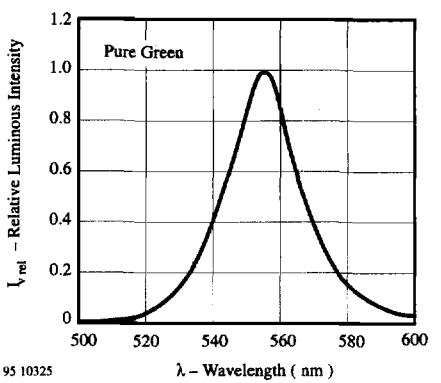

Figure 29. Relative Luminous Intensity vs. Wavelength

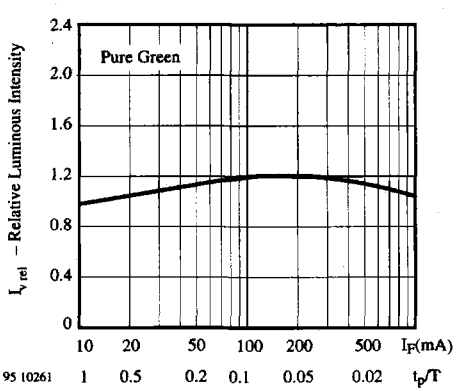

Figure 27. Rel. Lumin. Intensity vs. Forw. Current/Duty Cycle

Dimensions in mm