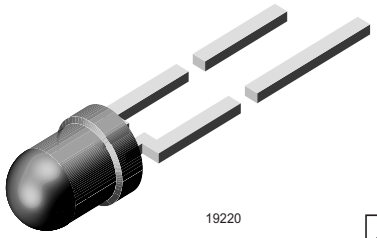
High Efficiency LED, ∅ 3 mm Tinted Total Diffused Package

Description

The TLH.46.. series was developed for applications which need a very wide radiation angle like backlighting, general indicating and lighting purposes.

It is housed in a 3 mm tinted total 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.



e3 Pb Pb-free

That allows users to assemble LEDs with uniform appearance.

Features

- Choice of three bright colors
- Standard T-1 package
- Small mechanical tolerances
- Suitable for DC and high peak current
- Very wide viewing angle
- Luminous intensity categorized
- Yellow and green color categorized
- Lead-free device

Applications

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

Parts Table

Part	Color, Luminous Intensity	Angle of Half Intensity (±φ)	Technology
TLHR4600	Red, I_V > 1 mcd	60 °	GaAsP on GaP
TLHR4601	Red, I_V > 1.6 mcd	60 °	GaAsP on GaP
TLHR4605	Red, I_V > 2.5 mcd	60 °	GaAsP on GaP
TLHY4600	Yellow, I_V > 0.63 mcd	60 °	GaAsP on GaP
TLHY4601	Yellow, I_V > 1 mcd	60 °	GaAsP on GaP
TLHY4605	Yellow, I_V > 2.5 mcd	60 °	GaAsP on GaP
TLHG4600	Green, I_V > 1 mcd	60 °	GaP on GaP
TLHG4601	Green, I_V > 1.6 mcd	60 °	GaP on GaP
TLHG4605	Green, I_V > 4 mcd	60 °	GaP on GaP

Absolute Maximum Ratings

T_{amb} = 25 °C, unless otherwise specified
TLHR46.. , TLHY46.. , TLHG46.. ,

Parameter	Test condition	Symbol	Value	Unit
Reverse voltage		V_R	6	V
DC Forward current	$T_{amb} \leq 60$ °C	I_F	30	mA
Surge forward current	$t_p \leq 10$ µs	I_{FSM}	1	A
Power dissipation	$T_{amb} \leq 60$ °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

Red

TLHR46..

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Luminous intensity [1]	I_F = 10 mA	TLHR4600	I_V	1	2		mcd
		TLHR4601	I_V	1.6	3.5		mcd
		TLHR4605	I_V	2.5	6		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		± 60		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

[1] in one Packing Unit $I_{Vmin}/I_{Vmax} \leq 0.5$

Yellow

TLHY46..

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Luminous intensity [1]	I_F = 10 mA	TLHY4600	I_V	0.63	2		mcd
		TLHY4601	I_V	1	3.5		mcd
		TLHY4605	I_V	2.5	5		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		± 60		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

[1] in one Packing Unit $I_{Vmin}/I_{Vmax} \leq 0.5$

Green

TLHG46..

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Luminous intensity [1]	I_F = 10 mA	TLHG4600	I_V	1	2		mcd
		TLHG4601	I_V	1.6	3.5		mcd
		TLHG4605	I_V	4	6		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		± 60		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

[1] in one Packing Unit $I_{Vmin}/I_{Vmax} \leq 0.5$

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

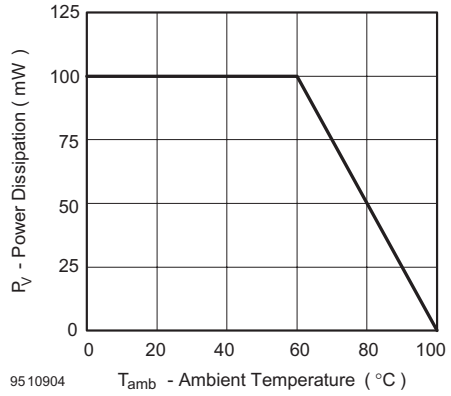


Figure 1. Power Dissipation vs. Ambient Temperature

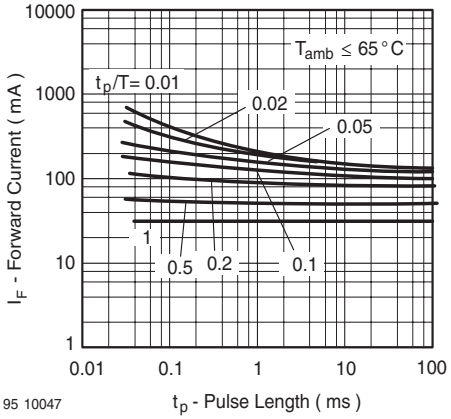


Figure 3. Forward Current vs. Pulse Length

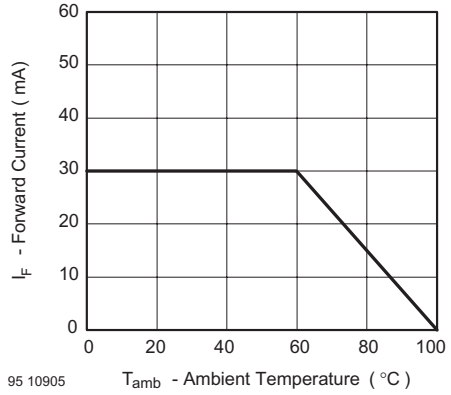


Figure 2. Forward Current vs. Ambient Temperature for InGaN

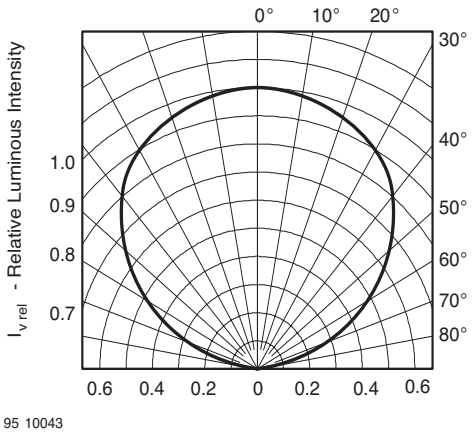


Figure 4. Rel. Luminous Intensity vs. Angular Displacement

Package Dimensions in mm