

HLMP-4700, HLMP-4719, HLMP-4740
HLMP-1700, HLMP-1719, HLMP-1790
 T-1^{3/4} (5 mm), T-1 (3 mm), Low Current
 LED Lamps



Data Sheet



Description

These tinted diffused LED lamps are designed and optimized specifically for low DC current operation. Luminous intensity and forward voltage are tested at 2 mA to assure consistent brightness at TTL output current levels.

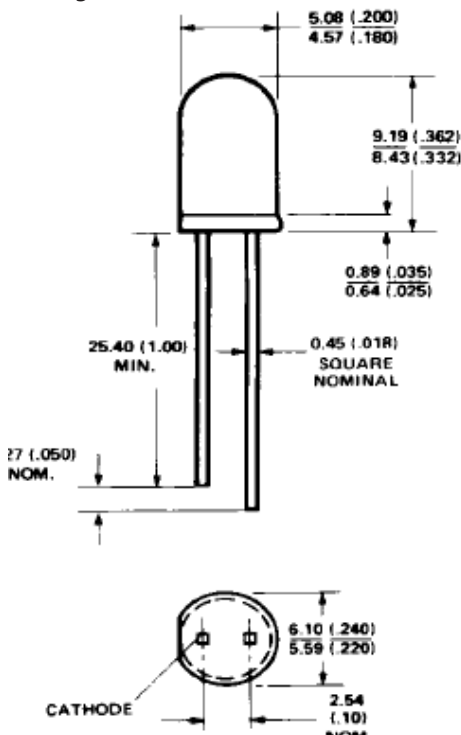
Applications

- Low power DC circuits
- Telecommunications indicators
- Portable equipment
- Keyboard indicators

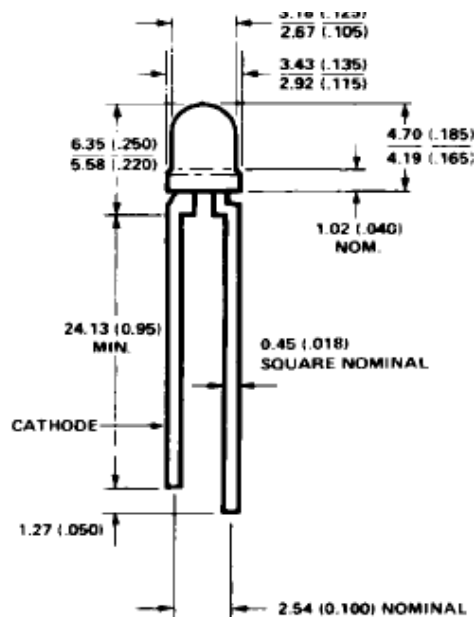
Features

- Low power
- High efficiency
- CMOS-MOS compatible
- TTL compatible
- Wide viewing angle
- Choice of package styles
- Choice of colors

Package Dimensions



HLMP-4700, -4719, -4740
A



HLMP-1700, -1719, -1790
A

Notes:

1. All dimensions are in millimetres (inches).
2. An Epoxy Minicup may extend about 1mm (0.040") down the leads

Selection Guide

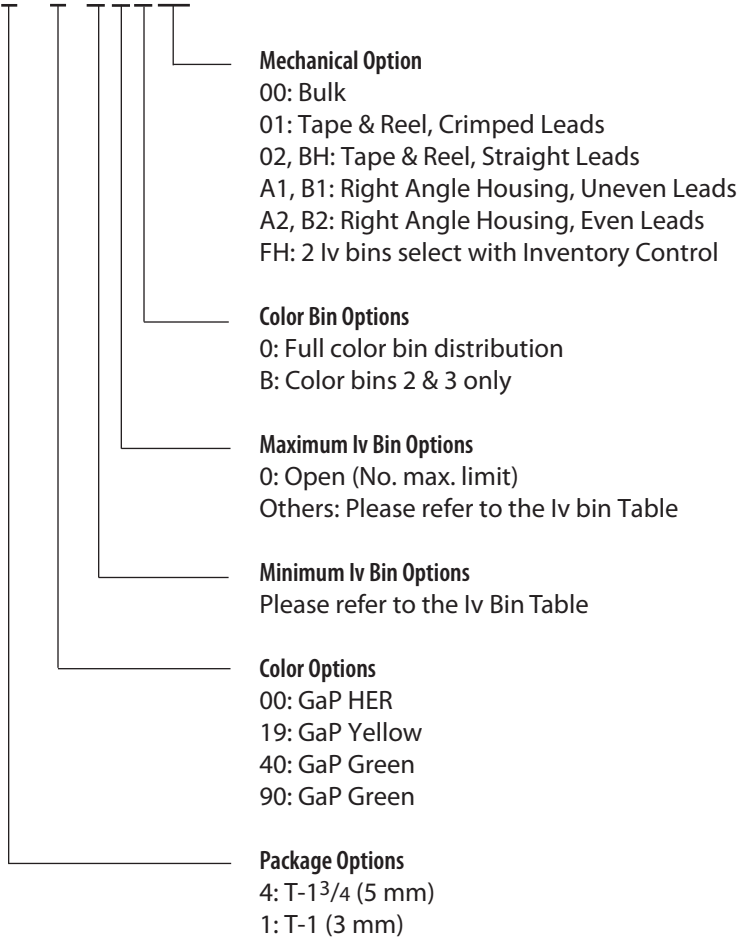
Package Description	Color	Device HLMP-	Luminous Intensity I _v (mcd) at 2 mA			2θ ^{1/2}	Package Outline
			Min.	Typ.	Max.		
T-1 3/4 Tinted Diffused	Red	4700	1.5	2.3	–	50	A
		4700-C00xx	1.5	2.3	–		
		4700-CD0FH	1.5	2.3	4.2		
	Yellow	4719	0.9	2.1	–		
		4719-A00xx	0.9	2.1	–		
	Green	4740	1.0	2.3	–		
		4740-A00xx	1.0	2.3	–		
		4740-AB000	1.0	2.3	3.2		
	T-1 Tinted Diffused	Red	1700	0.8	2.1		
1700-B00xx			0.8	2.1	–		
Yellow		1719	0.9	2.1	–		
		1719-A00xx	0.9	2.1	–		
		1719-ABB00	0.9	2.1	2.8		
Green		1790	1.0	2.3	–		
		1790-A00xx	1.0	2.3	–		
		1790-AB0FH	1.0	2.4	3.2		

Note:

1. θ^{1/2} is the typical off-axis angle at which the luminous intensity is half the axial luminous intensity.

Part Numbering System

HLMP - X 7 XX - X X X XX



Electrical/Optical Characteristics at $T_A = 25^\circ\text{C}$

Symbol	Description	T-1 ^{3/4}	T-1	Min.	Typ.	Max.	Units	Test Conditions
V _F	Forward Voltage	4700	1700		1.7	2.0	V	2 mA
		4719	1719		1.8	2.5		
		4740	1790		1.9	2.2		
V _R	Reverse Breakdown Voltage	4700	1700	5.0			V	I _R = 50 μA
		4719	1719	5.0				
		4740	1790	5.0				
λ _d	Dominant Wavelength	4700	1700		626		nm	Note 1
		4719	1719		585			
		4740	1790		569			
Δλ _{1/2}	Spectral Line Halfwidth	4700	1700		40		nm	
		4719	1719		36			
		4740	1790		28			
τ _S	Speed of Response	4700	1700		90		ns	
		4719	1719		90			
		4740	1790		500			
C	Capacitance	4700	1700		11		pF	V _F = 0, f = 1 MHz
		4719	1719		15			
		4740	1790		18			
Rθ _{J-PIN}	Thermal Resistance	4700	1700		260 ^[3]		°C/W	Junction to Cathode Lead
		4719	1719		290 ^[4]			
		4740	1790					
λ _{PEAK}	Peak Wavelength	4700	1700		635		nm	Measurement at Peak
		4740	1790		565			
λ _V	Luminous Efficacy	4700	1700		145		lumens <u>watt</u>	Note 2
		4719	1719		500			
		4740	1790		595			

Notes:

1. The dominant wavelength, λ_d, is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.
2. The radiant intensity, I_e, in watts per steradian, may be found from the equation I_e = I_v/η_v, where I_v is the luminous intensity in candelas and η_v is luminous efficacy in lumens/watt.
3. T-1^{3/4}.
4. T-1.

Absolute Maximum Ratings

Parameter		Maximum Rating	Units
Power Dissipation (Derate linearly from 92°C at 1.0 mA/°C)	Red	14	mW
	Yellow	17.5	
	Green	15.4	
DC and Peak Forward Current		7	mA
Transient Forward Current (10 μs Pulse) ^[1]		500	mA
Reverse Voltage (I _R = 50 μA)		5.0	V
Operating Temperature Range	Red/Yellow	-40 to 100	°C
	Green	-20 to 100	°C
Storage Temperature Range		-40 to +100	°C

Notes:

- The transient peak current is the maximum non-recurring peak current the devices can withstand without damaging the LED die and wire bonds. It is not recommended that the device be operated at peak currents beyond the Absolute Maximum Peak Forward Current.

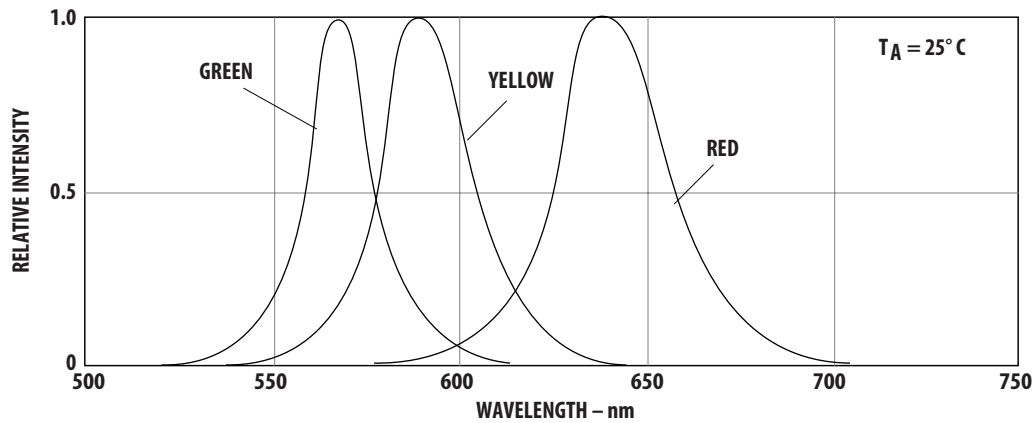


Figure 1. Relative intensity vs. wavelength.

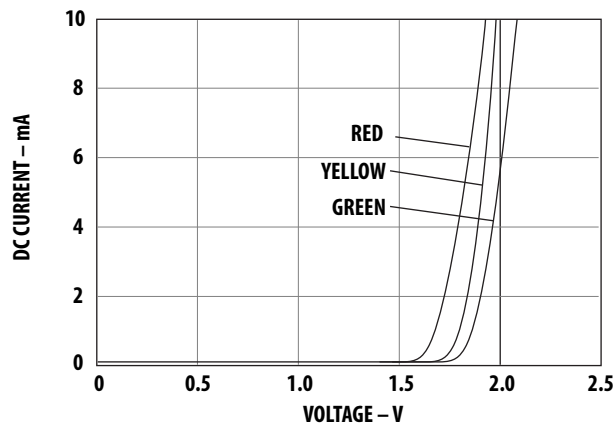


Figure 2. Forward current vs. forward voltage.

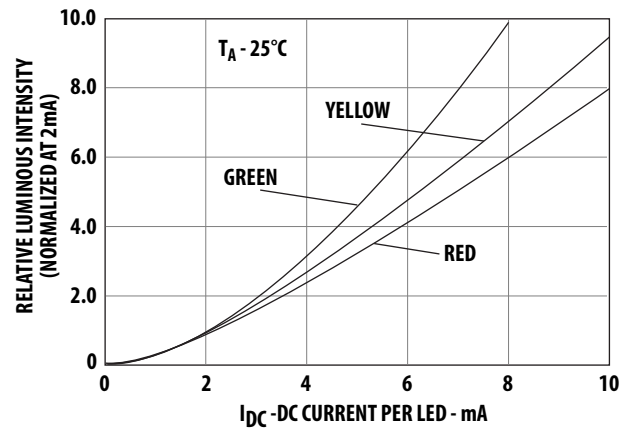


Figure 3. Relative luminous intensity vs. forward current.

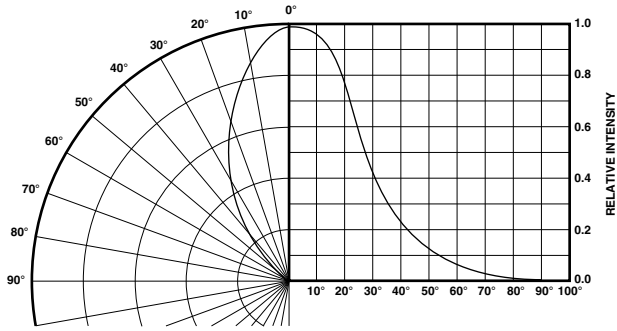


Figure 4. Relative luminous intensity vs. angular displacement for T-1^{3/4} lamp.

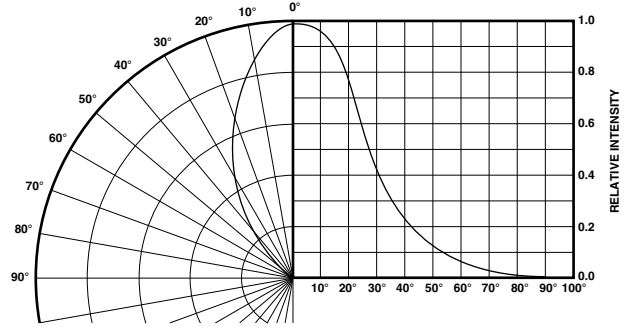


Figure 5. Relative illuminous intensity vs. angular displacement for T-1 lamp.

Intensity Bin Limits

Color	Bin	Intensity Range (mcd)	
		Min.	Max.
Red	B	0.9	1.5
	C	1.5	2.4
	D	2.4	3.8
	E	3.8	6.1
	F	6.1	9.7
	G	9.7	15.5
	H	15.5	24.8
	I	24.8	39.6
	J	39.6	63.4
	K	63.4	101.5
	L	101.5	162.4
	M	162.4	234.6
	N	234.6	340.0
	O	340.0	540.0
	P	540.0	850.0
	Q	850.0	1200.0
	R	1200.0	1700.0
	S	1700.0	2400.0
	T	2400.0	3400.0
	U	3400.0	4900.0
V	4900.0	7100.0	
W	7100.0	10200.0	
X	10200.0	14800.0	
Y	14800.0	21400.0	
Z	21400.0	30900.0	

Maximum tolerance for each bin limit is $\pm 18\%$.

Intensity Bin Limits

Color	Bin	Intensity Range (mcd)	
		Min.	Max.
Yellow	A	1.0	1.6
	B	1.6	2.5
	C	2.5	4.0
	D	4.0	6.5
	E	6.5	10.3
	F	10.3	16.6
	G	16.6	26.5
	H	26.5	42.3
	I	42.3	67.7
	J	67.7	108.2
	K	108.2	173.2
	L	173.2	250.0
	M	250.0	360.0
	N	360.0	510.0
	O	510.0	800.0
	P	800.0	1250.0
	Q	1250.0	1800.0
	R	1800.0	2900.0
	S	2900.0	4700.0
	T	4700.0	7200.0
U	7200.0	11700.0	
V	11700.0	18000.0	
W	18000.0	27000.0	

Maximum tolerance for each bin limit is $\pm 18\%$.

Intensity Bin Limits

Color	Bin	Intensity Range (mcd)	
		Min.	Max.
Green	A	1.1	1.8
	B	1.8	2.9
	C	2.9	4.7
	D	4.7	7.6
	E	7.6	12.0
	F	12.0	19.1
	G	19.1	30.7
	H	30.7	49.1
	I	49.1	78.5
	J	78.5	125.7
	K	125.7	201.1
	L	201.1	289.0
	M	289.0	417.0
	N	417.0	680.0
	O	680.0	1100.0
	P	1100.0	1800.0
	Q	1800.0	2700.0
R	2700.0	4300.0	
S	4300.0	6800.0	
T	6800.0	10800.0	
U	10800.0	16000.0	
V	16000.0	25000.0	
W	25000.0	40000.0	

Maximum tolerance for each bin limit is $\pm 18\%$.

Color Categories

Color	Category #	Lambda (nm)	
		Min.	Max.
Green	6	561.5	564.5
	5	564.5	567.5
	4	567.5	570.5
	3	570.5	573.5
	2	573.5	576.5
	1	582.0	584.5
Yellow	3	584.5	587.0
	2	587.0	589.5
	4	589.5	592.0
	5	592.0	593.0

Tolerance for each bin limit is ± 0.5 nm.

Mechanical Option Matrix

Mechanical Option Code	Definition
00	Bulk Packaging, minimum increment 500 pc/bag
01	Tape & Reel, crimped leads, min. increment 1300 pcs/bag for T-1 3/4, 1800 pcs/bag for T-1
02	Tape & Reel, straight leads, min. increment 1300 pcs/bag for T-1 3/4, 1800 pcs/bag for T-1
A1	T-1, Right Angle Housing, uneven leads, minimum increment 500 pcs/bag
A2	T-1, Right Angle Housing, even leads, minimum increment 500 pcs/bag
B1	T-1 3/4, Right Angle Housing, uneven leads, minimum increment 500 pcs/bag
B2	T-1 3/4, Right Angle Housing, even leads, minimum increment 500 pcs/bag
BH	T-1, Tape & Reel, straight leads, minimum increment 2000 pcs/bag
FH	Devices that require inventory control and 2 lv bin select
R1	Tape & Reel, crimped leads, reeled counter clockwise, cathode lead leaving the reel first

Notes: All categories are established for classification of products. Products may not be available in all categories. Please contact your local Avago representative for further clarification/information.