

T-1^{3/4} (5 mm), T-1 (3 mm), Low Current LED Lamps

Technical Data

HLMP-4700, -4719, -4740
HLMP-1700, -1719, -1790

Features

- Low Power
- High Efficiency
- CMOS-MOS Compatible
- TTL Compatible
- Wide Viewing Angle
- Choice of Package Styles
- Choice of Colors

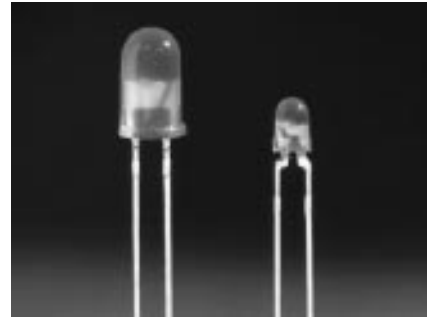
Applications

- Low Power DC Circuits
- Telecommunications Indicators

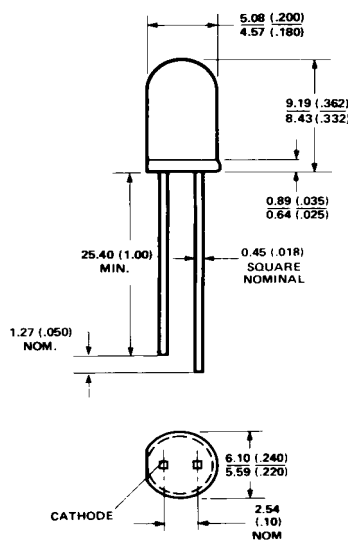
- Portable Equipment
- Keyboard Indicators

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.

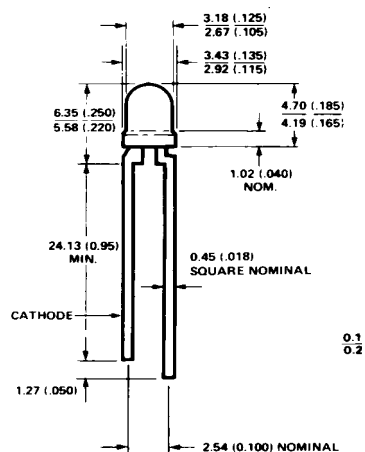


Package Dimensions



HLMP-4700, -4719, -4740

A



HLMP-1700, -1719, -1790

B

NOTES:
 1. ALL DIMENSIONS ARE IN MILLIMETRES (INCHES).
 2. AN EPOXY MINISCUS MAY EXTEND ABOUT 1 mm (0.040") DOWN THE LEADS.

Selection Guide

Package Description	Color	Device HLMP-	Luminous Intensity Iv (mcd) at 2 mA			$2\theta^{1/2}$	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-CD0xx	1.3	2.3	4.2		
	Yellow	4719	0.9	2.1	–		
		4719-A00xx	0.9	2.1	–		
		4719-BC0xx	1.4	2.5	4.4		
	Green	4719-BCBxx	1.4	2.5	4.4		
		4740	1.0	2.3	–		
		4740-A00xx	1.0	2.3	–		
T-1 Tinted Diffused	Red	4740-AB0xx	1.0	2.3	3.2	50	B
		1700	0.8	2.1	–		
		1700-B0000	0.8	2.1	–		
	Yellow	1700-CD000	1.3	2.3	4.2		
		1719	0.9	2.1	–		
		1719-A0000	0.9	2.1	–		
	Green	1719-AB000	0.9	2.1	2.8		
		1719-ABB00	0.9	2.1	2.8		
		1790	1.0	2.3	–		
		1790-A0000	1.0	2.3	–		
		1790-AB000	1.0	2.4	3.2		

Note:

1. $\theta^{1/2}$ 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

Mechanical Option

00: Bulk
 01: Tape & Reel, Crimped Leads
 02,BH: Tape & Reel, Straight Leads
 A1,B1: Right Angle Housing, Uneven Leads
 A2,B2: Right Angle Housing, Even Leads
 R1: Tape & Reel, Crimped Leads, Counter Clockwise

Color Bin Options

0: Full color bin distribution
 B: Color bin 2&3 only

Maximum Iv Bin Options

0: Open (No. max. limit)
 Others: Please refer to the Iv bin Table

Minimum Iv Bin Options

Please refer to the Iv bin Table

Color Option

00: GaP HER
 19: GaP Yellow
 40: GaP Green

Package Options

4: T-1^{3/4} (5 mm)
 1: T-1 (3 mm)

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 4719 4740	1700 1719 1790		1.8 1.9 1.8	2.0 2.5 2.2	V	2 mA
V_R	Reverse Breakdown Voltage	4700 4719 4740	1700 1719 1790	5.0 5.0 5.0			V	$I_R = 50 \mu\text{A}$
λ_d	Dominant Wavelength	4700 4719 4740	1700 1719 1790		626 585 569		nm	Note 1
$\Delta\lambda_{1/2}$	Spectral Line Halfwidth	4700 4719 4740	1700 1719 1790		40 36 28		nm	
τ_S	Speed of Response	4700 4719 4740	1700 1719 1790		90 90 500		ns	
C	Capacitance	4700 4719 4740	1700 1719 1790		11 15 18		pF	$V_F = 0$, $f = 1 \text{ MHz}$
$R\theta_{J-PIN}$	Thermal Resistance	4700 4719 4740	1700 1719 1790		260 ^[3] 290 ^[4]		$^\circ\text{C/W}$	Junction to Cathode Lead
λ_{PEAK}	Peak Wavelength	4700 4719 4740	1700 1719 1790		635 583 565		nm	Measurement at peak
η_V	Luminous Efficacy	4700 4719 4740	1700 1719 1790		145 500 595		<u>lumens</u> watt	Note 2

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 $I_e = I_v/\eta_V$, 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 Yellow Green	24 36 24	mW
DC and Peak Forward Current	7		mA
Transient Forward Current (10 μ s Pulse) ^[1]	500		mA
Reverse Voltage ($I_R = 50 \mu$ A)	5.0		V
Operating Temperature Range	Red/Yellow Green	-55°C to 100°C -20°C to 100°C	
Storage Temperature Range	-55°C to +100°C		
Lead Soldering Temperature [1.6 mm (0.063 in.) from body]	260°C for 5 seconds		

Note:

1. 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.

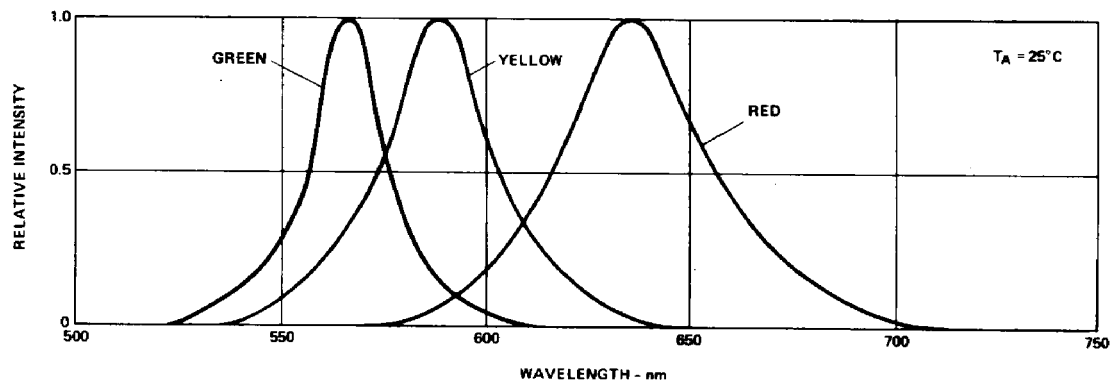


Figure 1. Relative Intensity vs. Wavelength.

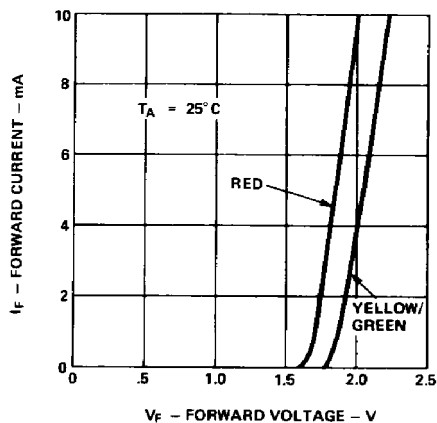


Figure 2. Forward Current vs. Forward Voltage.

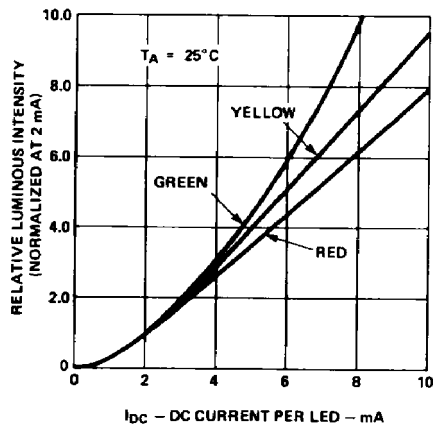


Figure 3. Relative Luminous Intensity vs. Forward Current.

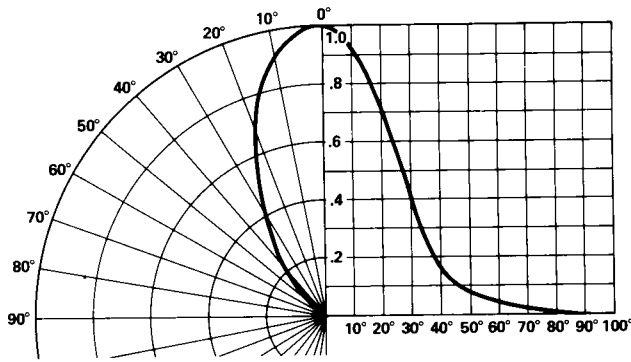


Figure 4. Relative Luminous Intensity vs. Angular Displacement for T-1^{3/4} Lamp.

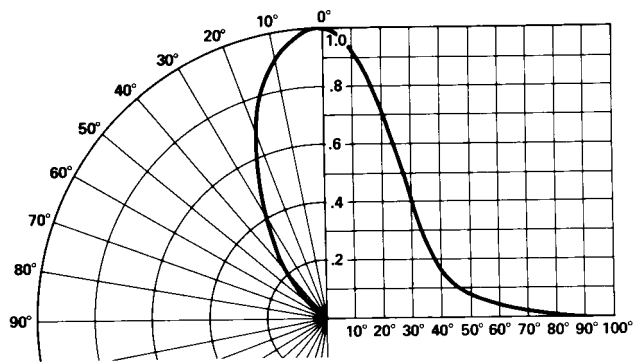


Figure 5. Relative Luminous Intensity vs. Angular Displacement for T-1 Lamp.

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, continued

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, continued

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
Yellow	1	582.0	584.5
	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 pcs/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	Right Angle Housing, uneven leads, minimum increment 500 pcs/bag
B2	Right Angle Housing, even leads, minimum increment 500 pcs/bag
BH	T-1, Tape & Reel, straight leads, minimum increment 2000 pcs/bag
R1	Tape & Reel, crimped leads, reeled counter clockwise, cathode lead leaving the reel first

Note:

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

Product Information and Literature

- [Events](#)
- [Guided Selection](#)
- [Library](#)
- [News Releases](#)
- [Order Information](#)
- [Global Account Sites](#)
- [Partner Portal](#)
- [Product Index](#)

Hot Links

- [Product Center](#)
- [Application Notes](#)
- [Datasheets](#)
- [FAQs](#)
- [Product Notifications](#)

HLMP-1719-A00FB

T-1 (3mm), Low Current LED Lamp**LIFE CYCLE STATUS**

AC - Active

This product is Market released and in full production

FEATURES

- Low Power
- High Efficiency
- CMOS-MOS Compatible
- TTL Compatible
- Wide Viewing Angle
- Yellow in Popular T-1 Package

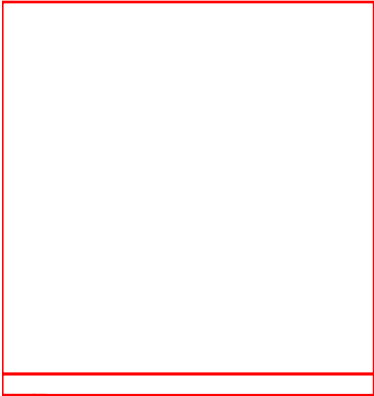
DESCRIPTION

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

Application Notes

Application Brief: AB I-002 - Thermal resistance values for LED lamps	35 KB pdf	Clid	Clid
Application Brief: AB A05 - LED thermal testing	60 KB pdf	Clid	Clid
Application Brief: AB A04: LED Lamp Thermal Properties	52 KB pdf	Clid	Clid
Application Brief: AB A03 - LED compatibility with automotive EMC transients	63 KB pdf	Clid	Clid
Application Brief: AB A02 - Benefits of LEDs for instrument cluster lighting	42 KB pdf	Clid	Clid
Application Brief: AB D-007 - Solutions for common LED design errors in segmented display and multi-indicator applications	39 KB pdf	Clid	Clid
Application Brief: AB I-012 - Temperature compensation circuit for constant LED intensity	35 KB pdf	Clid	Clid
Application Note: AN 1021 - Utilizing LED lamps packaged on tape and reel	229 KB pdf	Clid	Clid
Application Note: AN 1027: Soldering LED Components	470 KB pdf	Clid	Clid

<input type="checkbox"/>	Application Note: AN 1005 - Operational considerations for LED lamps and display devices	62 KB pdf	<input type="button" value="Click"/>	<input type="button" value="Click"/>
<input type="checkbox"/>	Application Note: AN 1100 - Selecting LED lamps for automotive interior applications	163 KB pdf	<input type="button" value="Click"/>	<input type="button" value="Click"/>
Data Sheets & Technical Specifications				
<input type="checkbox"/>	Datasheet: HLMP-47xx/17xx - T-1 3/4, T-1, Low Current LED Lamps	188 KB pdf	<input type="button" value="Click"/>	<input type="button" value="Click"/>
Product Notifications				
<input type="checkbox"/>	CCN: HP19990301-02: Qualification of new manufacturing facility	KB pdf	<input type="button" value="Click"/>	<input type="button" value="Click"/>



- Add to my links**
- Keep me updated**
- Help downloading files**

Product Information and Literature

HLMP-1790-AB0FH

T-1 (3mm), Low Current LED Lamp**LIFE CYCLE STATUS**

AC - Active

This product is Market released and in full production

FEATURES

- Low Power
- High Efficiency
- CMOS-MOS Compatible
- TTL Compatible
- Wide Viewing Angle
- High Performance Green in T-1 Package

DESCRIPTION

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

Application Notes

Application Brief: AB I-002 - Thermal resistance values for LED lamps	35 KB pdf	Clid	Clid
Application Brief: AB A05 - LED thermal testing	60 KB pdf	Clid	Clid
Application Brief: AB A04: LED Lamp Thermal Properties	52 KB pdf	Clid	Clid
Application Brief: AB A03 - LED compatibility with automotive EMC transients	63 KB pdf	Clid	Clid
Application Brief: AB A02 - Benefits of LEDs for instrument cluster lighting	42 KB pdf	Clid	Clid
Application Brief: AB D-007 - Solutions for common LED design errors in segmented display and multi-indicator applications	39 KB pdf	Clid	Clid
Application Brief: AB I-012 - Temperature compensation circuit for constant LED intensity	35 KB pdf	Clid	Clid
Application Note: AN 1021 - Utilizing LED lamps packaged on tape and reel	229 KB pdf	Clid	Clid
Application Note: AN 1027: Soldering LED Components	470 KB pdf	Clid	Clid

- [Events](#)
- [Guided Selection](#)
- [Library](#)
- [News Releases](#)
- [Order Information](#)
- [Global Account Sites](#)
- [Partner Portal](#)
- [Product Index](#)

Hot Links

- [Product Center](#)
- [Application Notes](#)
- [Datasheets](#)
- [FAQs](#)
- [Product Notifications](#)

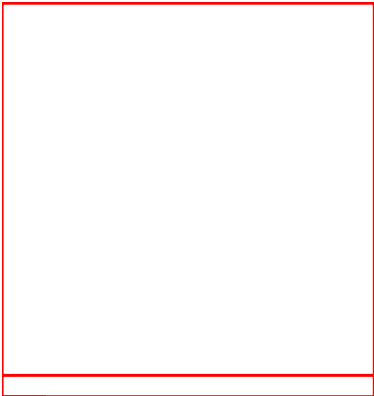
<input type="checkbox"/> Application Note: AN 1005 - Operational considerations for LED lamps and display devices	62 KB pdf	<input type="button" value="Click"/>	<input type="button" value="Click"/>
<input type="checkbox"/> Application Note: AN 1061 - Luminous intensity degradation data for emerald green LEDs (560 nm) vs. degradation data for standard green LEDs (569 nm)	26 KB pdf	<input type="button" value="Click"/>	<input type="button" value="Click"/>
<input type="checkbox"/> Application Note: AN 1100 - Selecting LED lamps for automotive interior applications	163 KB pdf	<input type="button" value="Click"/>	<input type="button" value="Click"/>
<input type="checkbox"/> Application Note: AN 1031- Achieving Uniform Front Panel Appearance using 2 Intensity Bin Select Option for LED Devices	100 KB pdf	<input type="button" value="Click"/>	<input type="button" value="Click"/>

Data Sheets & Technical Specifications

<input type="checkbox"/> Datasheet: HLMP-47xx/17xx - T-1 3/4, T-1, Low Current LED Lamps	188 KB pdf	<input type="button" value="Click"/>	<input type="button" value="Click"/>
---	---------------	--------------------------------------	--------------------------------------

Product Notifications

<input type="checkbox"/> CCN: HP19990301-02: Qualification of new manufacturing facility	KB pdf	<input type="button" value="Click"/>	<input type="button" value="Click"/>
---	-----------	--------------------------------------	--------------------------------------



- Add to my links**
- Keep me updated**
- Help downloading files**

Product Information and Literature

- [Events](#)
- [Guided Selection](#)
- [Library](#)
- [News Releases](#)
- [Order Information](#)
- [Global Account Sites](#)
- [Partner Portal](#)
- [Product Index](#)

Hot Links

- [Product Center](#)
- [Application Notes](#)
- [Datasheets](#)
- [FAQs](#)
- [Product Notifications](#)

HLMP-4700-CD0FH

T-13/4 (5mm), Low Current LED Lamp**LIFE CYCLE STATUS**

AC - Active

This product is Market released and in full production

FEATURES

- Low Power
- High Efficiency
- CMOS-MOS Compatible
- TTL Compatible
- Wide Viewing Angle
- High Efficiency Red in Popular T-13/4 Package

DESCRIPTION

This tinted diffused LED lamp is 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.

Application Notes

□ Application Brief: AB I-002 - Thermal resistance values for LED lamps	35 KB pdf	Click	Click
□ Application Brief: AB A05 - LED thermal testing	60 KB pdf	Click	Click
□ Application Brief: AB A04: LED Lamp Thermal Properties	52 KB pdf	Click	Click
□ Application Brief: AB A03 - LED compatibility with automotive EMC transients	63 KB pdf	Click	Click
□ Application Brief: AB A02 - Benefits of LEDs for instrument cluster lighting	42 KB pdf	Click	Click
□ Application Brief: AB D-007 - Solutions for common LED design errors in segmented display and multi-indicator applications	39 KB pdf	Click	Click
□ Application Brief: AB I-012 - Temperature compensation circuit for constant LED intensity	35 KB pdf	Click	Click
□ Application Note: AN 1021 - Utilizing LED lamps packaged on tape and reel	229 KB pdf	Click	Click

<input type="checkbox"/> Application Note: AN 1019 - Using the HLMP-4700/-1700/-7000 series low current lamps	60 KB pdf	<input type="button" value="Click"/>	<input type="button" value="Click"/>
<input type="checkbox"/> Application Note: AN 1027: Soldering LED Components	470 KB pdf	<input type="button" value="Click"/>	<input type="button" value="Click"/>
<input type="checkbox"/> Application Note: AN 1005 - Operational considerations for LED lamps and display devices	62 KB pdf	<input type="button" value="Click"/>	<input type="button" value="Click"/>
<input type="checkbox"/> Application Note: AN 1100 - Selecting LED lamps for automotive interior applications	163 KB pdf	<input type="button" value="Click"/>	<input type="button" value="Click"/>
<input type="checkbox"/> Application Note: AN 1031- Achieving Uniform Front Panel Appearance using 2 Intensity Bin Select Option for LED Devices	100 KB pdf	<input type="button" value="Click"/>	<input type="button" value="Click"/>

Data Sheets & Technical Specifications

<input type="checkbox"/> Datasheet: HLMP-47xx/17xx - T-1 3/4, T-1, Low Current LED Lamps	188 KB pdf	<input type="button" value="Click"/>	<input type="button" value="Click"/>
---	---------------	--------------------------------------	--------------------------------------

Product Notifications

<input type="checkbox"/> CCN: HP19990301-02: Qualification of new manufacturing facility	KB pdf	<input type="button" value="Click"/>	<input type="button" value="Click"/>
---	-----------	--------------------------------------	--------------------------------------



- Add to my links**
- Keep me updated**
- Help downloading files**

