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NPN SILICON PHOTOTRANSISTOR LED LAMPS



Lead-Free Parts

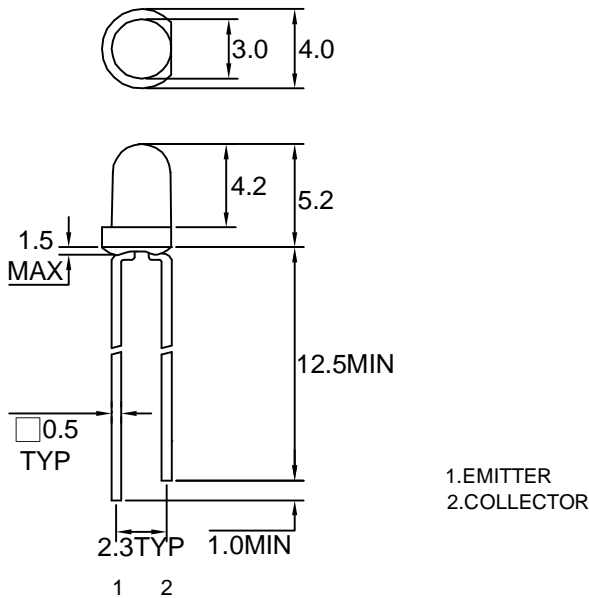
LPT2021-PF

# DATA SHEET

DOC. NO : QW0905-LPT2021-PF

REV. : A

DATE : 26 - Mar. - 2007

**Package Dimension**

**Features**

- High illumination sensitivity
- Stable characteristics
- Spectrally and mechanically matched with IR emitter

**Description**

The LPT2021-PF series are silicon nitride passivated NPN planar phototransistors with exceptionally stable characteristics and high illumination sensitivity the cases of LPT2021-PF are ncapsulated in dark blue transparent plastic T1 3/4 package individualt

Note:1.All dimension are in millimeter tolerance is  $\pm 0.25\text{mm}$  unless otherwise noted  
2.Specifications are subject to change without notice

**• MAXIMUM RATINGS( $T_a=25^\circ\text{C}$ )**

PARAMETER	MAXIMUM RATINGS	UNIT
Power Dissipation	100	mw
Collector-Emitter Voltage	30	V
Emitter-Collector Voltage	5	V
Operating Temperature	-50°C TO +100°C	
Storage Temperature	-50°C TO +100°C	
Lead Soldering Temperature(1.6mm From Body)	260°C for 3 seconds	

**• ELECTRICAL CHARACTERISTICS( $T_a=25^\circ\text{C}$ )**

PARAMETER	SYMBOL	Min.	Typ.	Max.	UNIT	TEST CONDITION
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	30			V	$I_c=1\text{mA}$ $E_e=0\text{mw}/\text{cm}^2$
Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	5			V	$I_E=100\ \mu\text{A}$ $E_e=0\text{mw}/\text{cm}^2$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			0.4	V	$I_c=0.5\text{mA}$ $E_e=20\text{mw}/\text{cm}^2$
Rise Time	$T_r$		5		$\mu\text{S}$	$V_{CE}=30\text{V}$ $I_C=800\ \mu\text{A}, R_L=1\text{K}\Omega$
Fall Time	$T_f$		5		$\mu\text{S}$	
Collector Dark Current	$I_{CEO}$			100	nA	$V_{CE}=10\text{V}$ $E_e=0\text{mw}/\text{cm}^2$
On State Collector Current	$I_p(on)$	1		2	mA	$V_{CE}=5\text{v}$ $E_e=1\text{mw}/\text{cm}^2$ $\lambda P=940\text{nm}$
		2		4	mA	
		4		8	mA	
		8			mA	



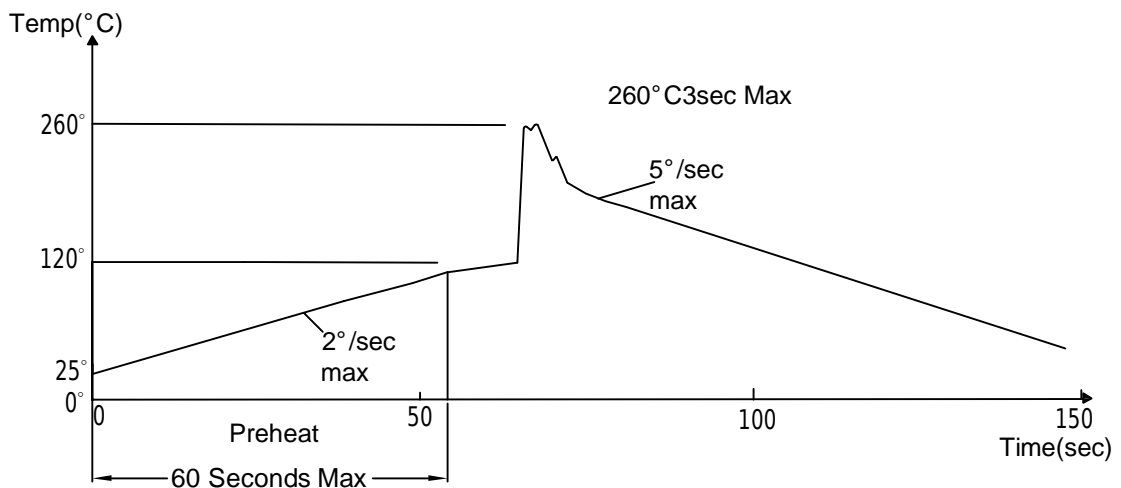
### Soldering Condition(Pb-Free)

#### 1.Iron:

- Soldering Iron:30W Max
- Temperature 350 ° C Max
- Soldering Time:3 Seconds Max(One time only)
- Distance:2mm Min(From solder joint to body)

#### 2.Wave Soldering Profile

- Dip Soldering
- Preheat: 120° C Max
- Preheat time: 60seconds Max
- Ramp-up
- 2° C/sec(max)
- Ramp-Down:-5° C/sec(max)
- Solder Bath:260° C Max
- Dipping Time:3 seconds Max
- Distance:2mm Min(From solder joint to body)



Note: 1.Wave solder should not be made more than one time.  
2.You can just only select one of the soldering conditions as above.



Reliability Test:

Test Item	Test Condition	Description	Reference Standard
Operating Life Test	1.Under Room Temperature 2.If=20mA 3.t=1000 hrs (-24hrs, +72hrs)	This test is conducted for the purpose of determining the resistance of a part in electrical and thermal stressed.	MIL-STD-750: 1026 MIL-STD-883: 1005 JIS C 7021: B-1
High Temperature Storage Test	1.Ta=85 °C±5°C 2.t=1000 hrs (-24hrs, +72hrs)	The purpose of this is the resistance of the device which is laid under condition of high temperature for hours.	MIL-STD-883:1008 JIS C 7021: B-10
Low Temperature Storage Test	1.Ta=-40 °C±5°C 2.t=1000 hrs (-24hrs, +72hrs)	The purpose of this is the resistance of the device which is laid under condition of low temperature for hours.	JIS C 7021: B-12
High Temperature High Humidity Test	1.Ta=65 °C±5°C 2.RH=90 %-95% 3.t=240hrs ±2hrs	The purpose of this test is the resistance of the device under tropical for hours.	MIL-STD-202:103B JIS C 7021: B-11
Thermal Shock Test	1.Ta=105 °C±5°C & -40°C±5°C (10min) (10min) 2.total 10 cycles	The purpose of this is the resistance of the device to sudden extreme changes in high and low temperature.	MIL-STD-202: 107D MIL-STD-750: 1051 MIL-STD-883: 1011
Solder Resistance Test	1.T.Sol=260 °C±5°C 2.Dwell time= 10 ±1sec.	This test intended to determine the thermal characteristic resistance of the device to sudden exposures at extreme changes in temperature when soldering the lead wire.	MIL-STD-202: 210A MIL-STD-750: 2031 JIS C 7021: A-1
Solderability Test	1.T.Sol=230 °C±5°C 2.Dwell time=5 ±1sec	This test intended to see soldering well performed or not.	MIL-STD-202: 208D MIL-STD-750: 2026 MIL-STD-883: 2003 JIS C 7021: A-2