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TRIPLE DIGIT LED DISPLAY (0.56 Inch)



Lead-Free Parts

LTD521/2SBKS-XX-PF

DATA SHEET

DOC. NO : QW0905-LTD521/2SBKS-XX-PF

REV. : A

DATE : 20 - Oct. - 2006



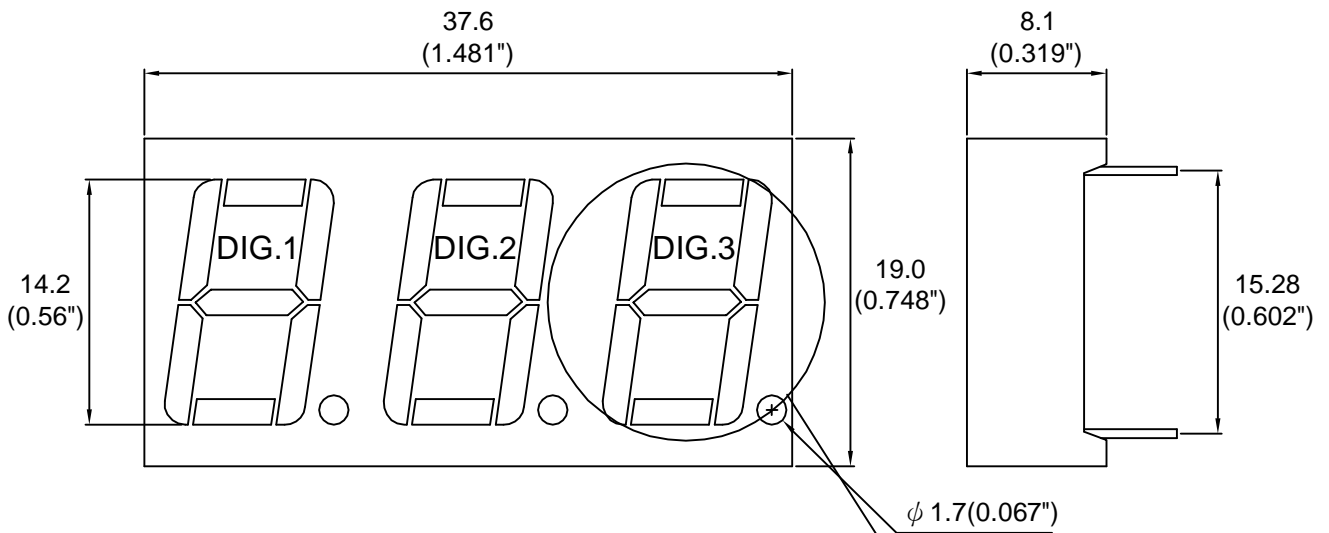
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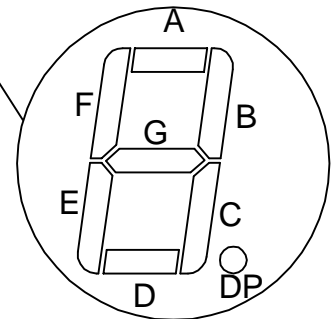
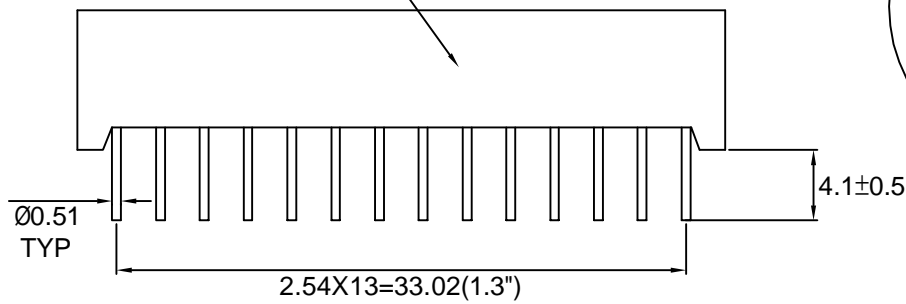
PART NO. LTD521/2SBKS-XX-PF

Page 1/9

Package Dimensions



LTD521/2SBKS-XX-PF
LIGITEK



PIN NO.1 →

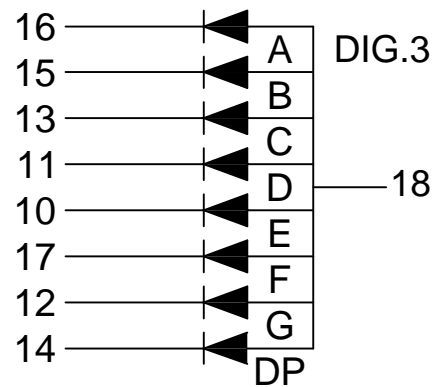
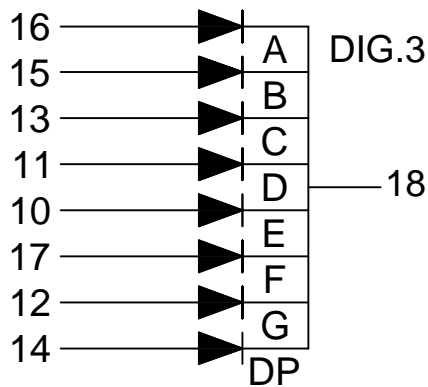
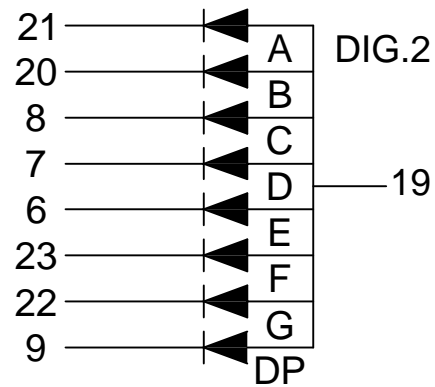
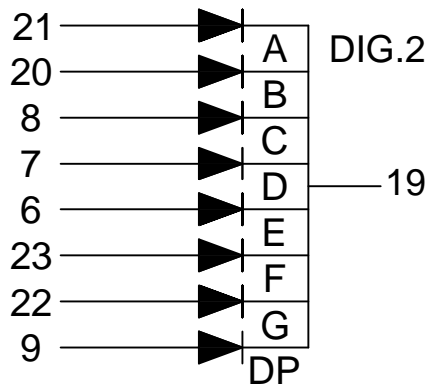
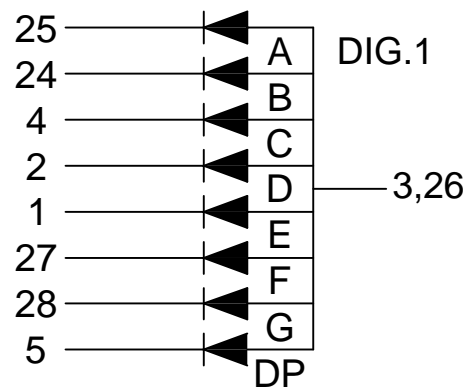
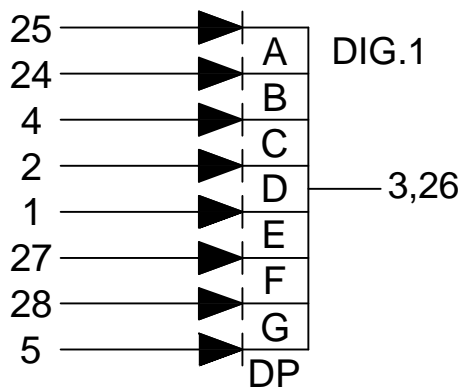
Note : 1.All dimension are in millimeters and (Inch) tolerance is $\pm 0.25(0.01)$ unless otherwise noted.
2.Specifications are subject to change without notice.



Internal Circuit Diagram

LTD521SBKS-XX-PF

LTD522SBKS-XX-PF





Electrical Connection

PIN NO.	LTD521SBKS-XX-PF	PIN NO.	LTD521SBKS-XX-PF
1	Anode Dig.1 E	15	Anode Dig.3 B
2	Anode Dig.1 D	16	Anode Dig.3 A
3	Common Cathode Dig.1	17	Anode Dig.3 F
4	Anode Dig.1 C	18	Common Cathode Dig.3
5	Anode Dig.1 DP	19	Common Cathode Dig.2
6	Anode Dig.2 E	20	Anode Dig.2 B
7	Anode Dig.2 D	21	Anode Dig.2 A
8	Anode Dig.2 C	22	Anode Dig.2 G
9	Anode Dig.2 DP	23	Anode Dig.2 F
10	Anode Dig.3 E	24	Anode Dig.1 B
11	Anode Dig.3 D	25	Anode Dig.1 A
12	Anode Dig.3 G	26	Common Cathode Dig.1
13	Anode Dig.3 C	27	Anode Dig.1 F
14	Anode Dig.3 DP	28	Anode Dig.1 G

**Electrical Connection**

PIN NO.	LTD522SBKS-XX-PF	PIN NO.	LTD522SBKS-XX-PF
1	Cathode Dig.1 E	15	Cathode Dig.3 B
2	Cathode Dig.1 D	16	Cathode Dig.3 A
3	Common Anode Dig.1	17	Cathode Dig.3 F
4	Cathode Dig.1 C	18	Common Anode Dig.3
5	Cathode Dig.1 DP	19	Common Anode Dig.2
6	Cathode Dig.2 E	20	Cathode Dig.2 B
7	Cathode Dig.2 D	21	Cathode Dig.2 A
8	Cathode Dig.2 C	22	Cathode Dig.2 G
9	Cathode Dig.2 DP	23	Cathode Dig.2 F
10	Cathode Dig.3 E	24	Cathode Dig.1 B
11	Cathode Dig.3 D	25	Cathode Dig.1 A
12	Cathode Dig.3 G	26	Common Anode Dig.1
13	Cathode Dig.3 C	27	Cathode Dig.1 F
14	Cathode Dig.3 DP	28	Cathode Dig.1 G



Absolute Maximum Ratings at Ta=25 °C

Parameter	Symbol	Ratings	UNIT
		SBKS	
Forward Current Per Chip	IF	30	mA
Peak Forward Current Per Chip (Duty 1/10,0.1ms Pulse Width)	IFP	100	mA
Power Dissipation Per Chip	PD	120	mW
Reverse Current Per Any Chip	Ir	50	μA
Electrostatic Discharge(*)	ESD	500	V
Operating Temperature	Topr	-25 ~ +85	°C
Storage Temperature	Tstg	-25 ~ +85	°C
Solder Temperature 1/16 Inch Below Seating Plane For 3 Seconds At 260 °C			

* Static Electricity or power surge will damage the LED. Use of a conductive wrist band or anti-electrostatic glove is recommended when handling these LED. All devices, equipment and machinery must be properly grounded.

Part Selection And Application Information(Ratings at 25°C)

PART NO	CHIP		common cathode or anode	λ D (nm)	Δ λ (nm)	Electrical				IV-M
	Material	Emitted				Vf(v)		Iv(mcd)		
						Typ.	Max.	Min.	Typ.	
LTD521SBKS-XX-PF	InGaN/SiC	Blue	Common Cathode	475	26	3.5	4.2	6.1	10.5	2:1
LTD522SBKS-XX-PF			Common Anode							

Note : 1.The forward voltage data did not including ±0.1V testing tolerance.
2. The luminous intensity data did not including ±15% testing tolerance.



Test Condition For Each Parameter

Parameter	Symbol	Unit	Test Condition
Forward Voltage Per Chip	V _f	volt	I _f =20mA
Luminous Intensity Per Chip	I _v	mcd	I _f =10mA
Dominant Wavelength	λ D	nm	I _f =20mA
Spectral Line Half-Width	$\Delta \lambda$	nm	I _f =20mA
Reverse Current Any Chip	I _r	μ A	V _r =5V
Luminous Intensity Matching Ratio	IV-M		



Typical Electro-Optical Characteristics Curve

SBK-S CHIP

Fig.1 Forward current vs. Forward Voltage

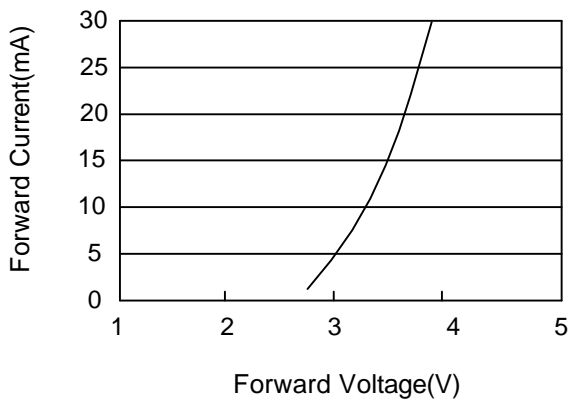


Fig.2 Relative Intensity vs. Forward Current

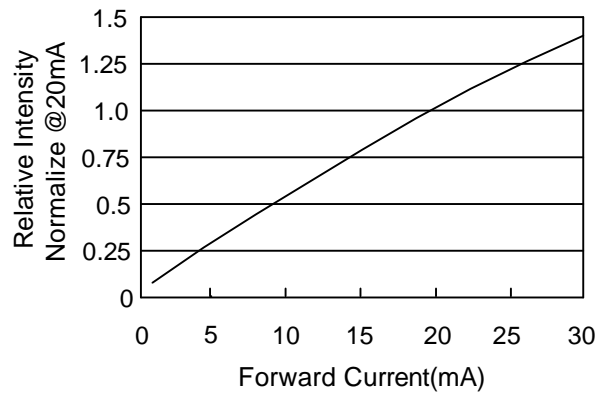


Fig.3 Forward Current vs. Temperature

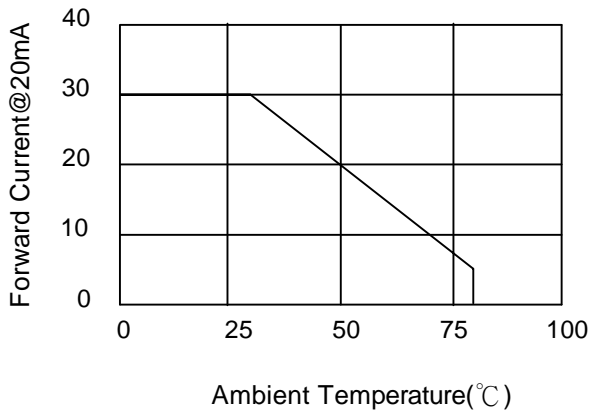
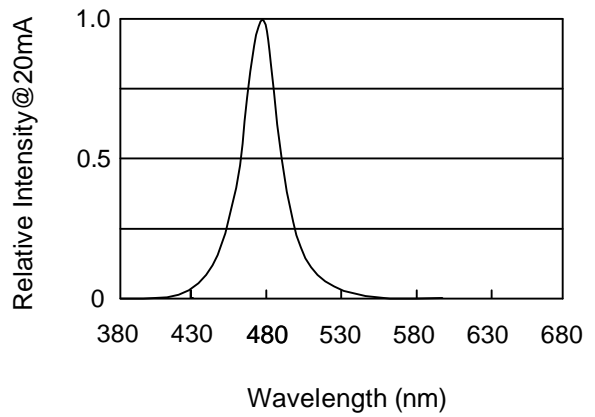


Fig.4 Relative Intensity vs. Wavelength





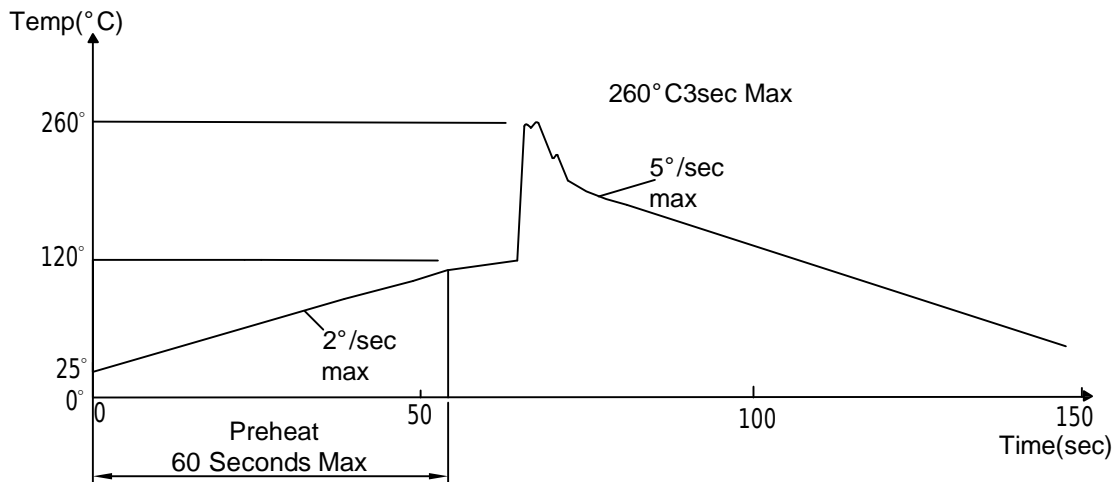
Soldering Condition(Pb-Free)

1.Iron:

Soldering Iron:30W Max
Temperature 350° C Max
Soldering Time:3 Seconds Max(One time only)
Distance:Solder Temperature 1/16 Inch Below Seating
Plane For 3 Seconds At 260° C

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:Solder Temperature 1/16 Inch Below Seating
Plane For 3 Seconds At 260° C



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=10mA 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=105 °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