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# 5" Single Color & Multicolor Ultra Large Single Digit LED Numeric LED Displays

LTS-50000 Series

## Features

- 5 inch (127.0mm) ultra large digit height.
- Continuous uniform segments.
- Low power requirement.
- Excellent characters appearance.
- High contrast.
- High brightness.
- Wide viewing angle.
- Solid state reliability.
- Categorized for luminous intensity.
- I.C. compatible.
- Easy mounting on P.C. board.
- Single color displays have the choice of two bright color - green/high efficiency red.
- Multicolor displays are applicable to three bright colors - green, orange and yellow (green and orange mixed).

## Description

The LTS-50000 series are 5 inch (127.0mm) height ultra large single digit displays.

The LTS-50301/50801 series are singles displays.

The green displays have black face and green segments, the high efficiency red displays have black face and red segments.

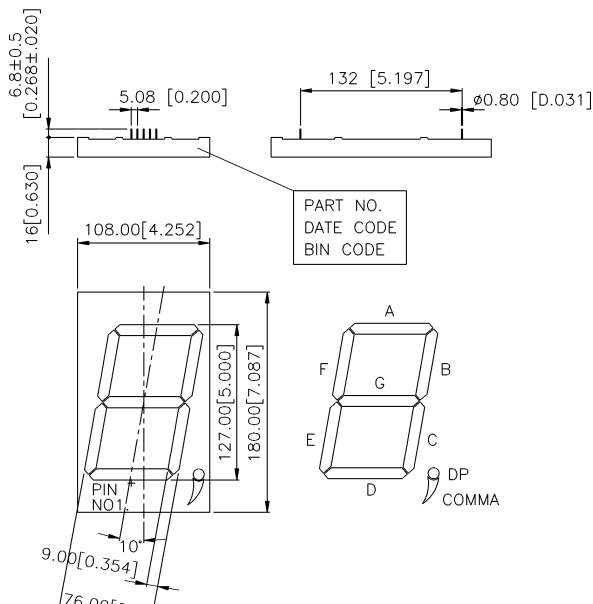
The LTS-50302A/50802A are multicolor displays.

The multicolor displays have black face and white segments.

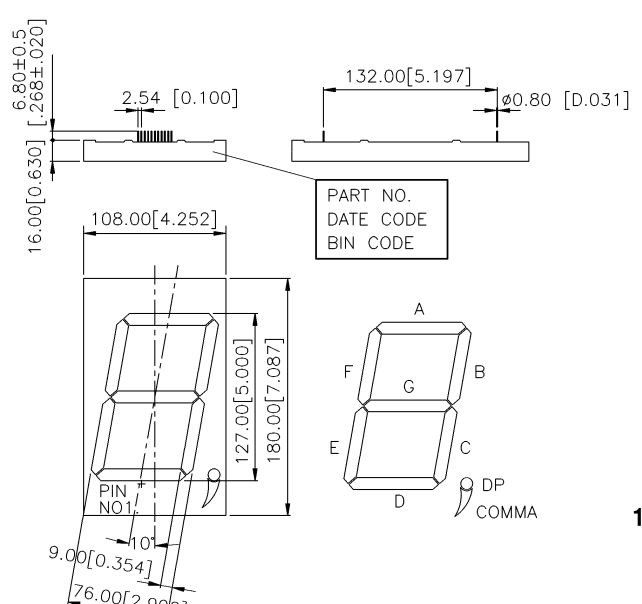
The green series utilize LED chips which are made from GaP on a transparent GaP substrate. The orange series devices utilize LED chips which are made from GaAsP on a transparent GaP substrate.

## Package Dimensions

A.LTS-50301/50801



B.LTS-50302A/50802A



SEVEN-SEGMENT LED DISPLAYS

## Devices

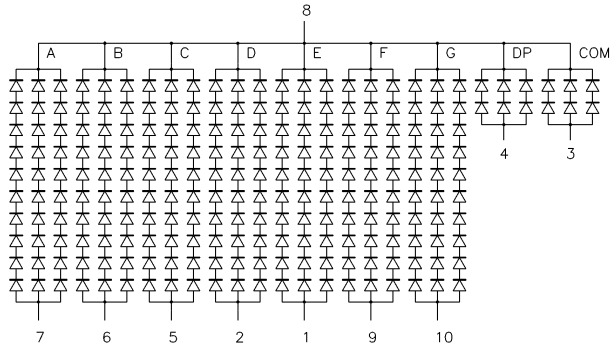
Part No. LTS-			Description	Package Dimension	Internal Circuit Diagram
GREEN	Hi.-Eff. Red	Multi- Color			
50301G	50301HRB	-	Common Cathode	A	A
50801G	50801HRB	-	Common Anode	A	B
-	-	50302A	Common Cathode	B	C
-	-	50802A	Common Anode	B	D

## Pin Connection

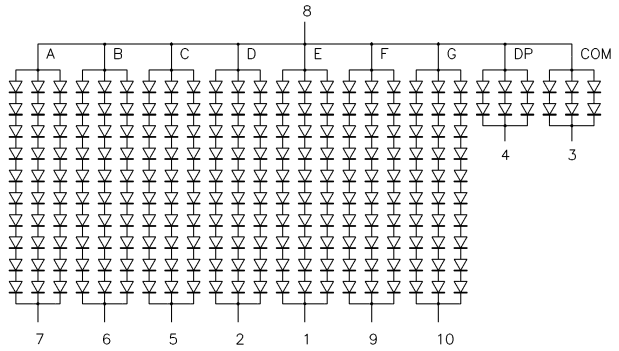
Pin No.	Connection			
	LTS-50301	LTS-50801	LTS-50302A	LTS-50802A
1.	Segment E Anode	Segment E Cathode	Anode E, Green	Cathode E, Green
2.	Segment D Anode	Segment D Cathode	Anode E, Orange	Cathode E, Orange
3.	Comma Anode	Comma Cathode	Anode D, Green	Cathode D, Green
4.	D.P. Anode	D.P. Cathode	Anode D, Orange	Cathode D, Orange
5.	Segment C Anode	Segment C Cathode	Anode Comma, Green	Cathode Comma, Green
6.	Segment B Anode	Segment B Cathode	Anode Comma, Orange	Cathode Comma, Orange
7.	Segment A Anode	Segment A Cathode	Anode DP. Green	Cathode DP. Green
8.	Common Cathode	Common Anode	Anode DP. Orange	Cathode DP. Orange
9.	Segment F Anode	Segment F Cathode	Anode C, Green	Cathode C, Green
10.	Segment G Anode	Segment G Cathode	Anode C, Orange	Cathode C, Orange
11.			Anode B, Green	Cathode B, Green
12.			Anode B, Orange	Cathode B, Orange
13.			Anode A, Green	Cathode A, Green
14.			Anode A, Orange	Cathode A, Orange
15.			Cathode Common, Green	Anode Common, Green
16.			Cathode Common, Orange	Anode Common, Orange
17.			Anode G, Green	Cathode G, Green
18.			Anode G, Orange	Cathode G, Orange
19.			Anode F, Green	Cathode F, Green
20.			Anode F, Orange	Cathode F, Orange

# Internal Circuit Diagrams

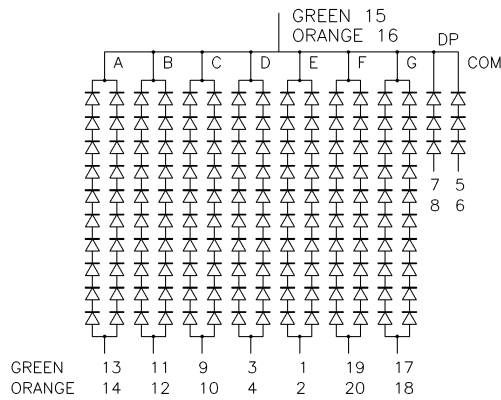
A.LTS-50301



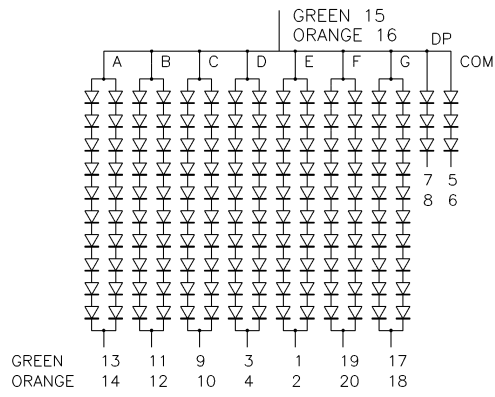
B.LTS-50801



C.LTS-50302A



D.LTS-50802A



Notes: 20 chips green & 20 chips orange in one segment.

## Absolute Maximum Rating at Ta=25 °C

Parameter	50x01		50x02A		Unit
	Green	Hi.-Eff.Red	Green	Orange	
Power Dissipation Per Segment	1200	1200	900	900	mW
Peak Forward Current Per Segment (1/10 Duty Cycle, 0.1ms Pulse Width)	180	180	160	160	mA
Continuous Forward Current Per Segment Derating Linear from 25 °C Per Segment	60 0.72	60 0.72	40 0.48	40 0.48	mA mA/ °C
Reverse Voltage Per Segment	50	50	50	50	V
Operating Temperature Range	-35 °C to +85 °C				
Storage Temperature Range	-35 °C to +85 °C				
Solder Temperature 1/16 Inch Below Seating Plane for 3 Seconds at 260 °C					

SEVEN-SEGMENT LED DISPLAYS

## Electrical/Optical Characteristics at Ta=25 °C

LTS-50301G/50801G

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Average Luminous Intensity	Iv	21	60		μ cd	If=30mA
Peak Emission Wavelength	λ P		565		nm	If=20mA
Spectral Line Half-Width	Δ λ		30		nm	If=20mA
Dominant Wavelength	λ d		569		nm	If=20mA
Forward Voltage, per Segment or D.P.	V <sub>F</sub>		21 (4.2)	28 (5.6)	V	If=60mA
Reverse Current, per Segment or D.P.	I <sub>R</sub>			300	μ A	V <sub>R</sub> =50V
Luminous Intensity Matching Ratio	Iv-m			2:1		If=10mA

LTS-50301HRB/50801HRB

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Average Luminous Intensity	Iv	21	60		μ cd	If=30mA
Peak Emission Wavelength	λ P		635		nm	If=20mA
Spectral Line Half-Width	Δ λ		40		nm	If=20mA
Dominant Wavelength	λ d		621		nm	If=20mA
Forward Voltage, any Segment or D.P.	V <sub>F</sub>		20 (4.0)	28 (5.6)	V	If=60mA
Reverse Current, any Segment or D.P.	I <sub>R</sub>			300	μ A	V <sub>R</sub> =50V
Luminous Intensity Matching Ratio	Iv-m			2:1		If=10mA

LTS-50302A/50802A(ORANGE)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Average Luminous Intensity	Iv	13	40		μ cd	If=20mA
Peak Emission Wavelength	λ P		630		nm	If=20mA
Spectral Line Half-Width	Δ λ		40		nm	If=20mA
Dominant Wavelength	λ d		621		nm	If=20mA
Forward Voltage, per Segment or D.P.	V <sub>F</sub>		20 (4.0)	28 (5.6)	V	If=40mA
Reverse Current, per Segment or D.P.	I <sub>R</sub>			200	μ A	V <sub>R</sub> =50V
Luminous Intensity Matching Ratio	Iv-m			2:1		If=10mA

LTS-50302A/50802A(GREEN)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Average Luminous Intensity	$I_v$	13	40		$\mu$ cd	$I_F=20mA$
Peak Emission Wavelength	$\lambda_P$		565		nm	$I_F=20mA$
Spectral Line Half-Width	$\Delta \lambda$		30		nm	$I_F=20mA$
Dominant Wavelength	$\lambda_d$		569		nm	$I_F=20mA$
Forward Voltage, any Segment or D.P.	$V_F$		21 (6.3)	28 (8.4)	V	$I_F=40mA$
Reverse Current, any Segment or D.P.	$I_R$			200	$\mu$ A	$V_R=50V$
Luminous Intensity Matching Ratio	$I_v-m$			2:1		$I_F=10mA$

# Typical Electrical/Optical Characteristic Curves (25 °C Ambient Temperature Unless Otherwise Noted)

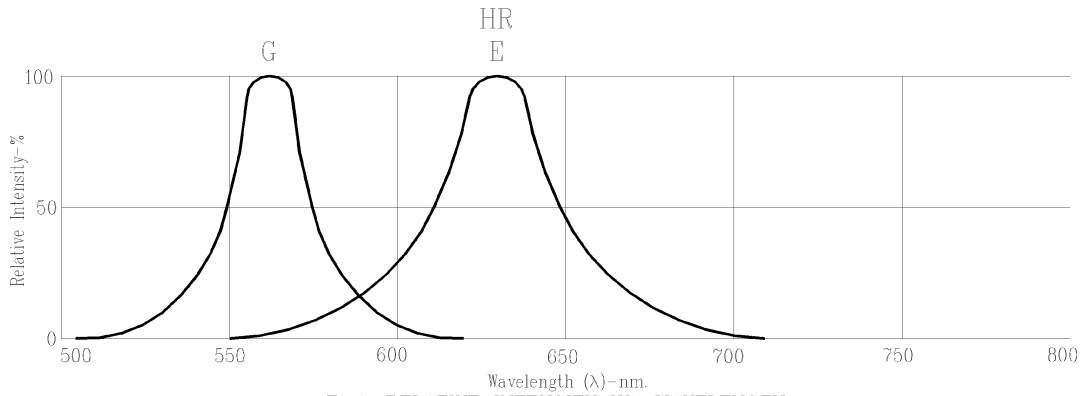


Fig1. RELATIVE INTENSITY VS. WAVELENGTH

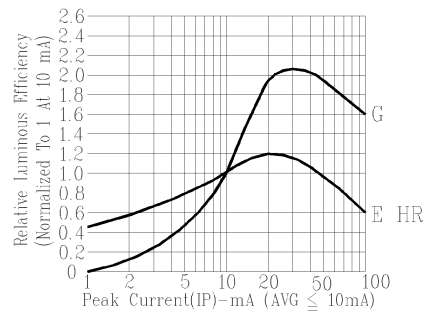


Fig2. RELATIVE LUMINOUS EFFICIENCY (LUMINOUS INTENSITY PER UNIT CURRENT) VS. PEAK CURRENT

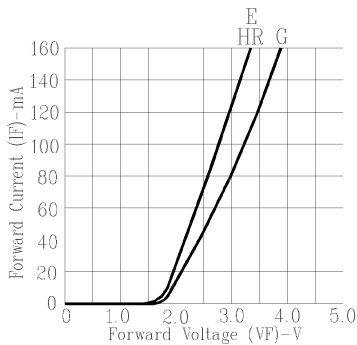


Fig3. FORWARD CURRENT VS. FORWARD VOLTAGE

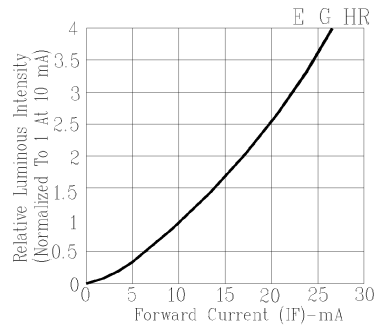


Fig4. RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

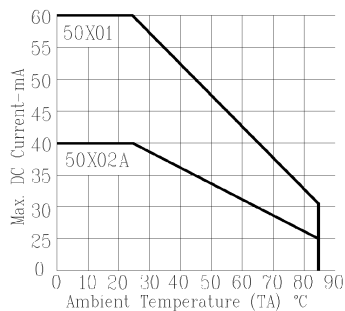


Fig5. MAX. ALLOWABLE DC CURRENT VS. AMBIENT TEMPERATURE.

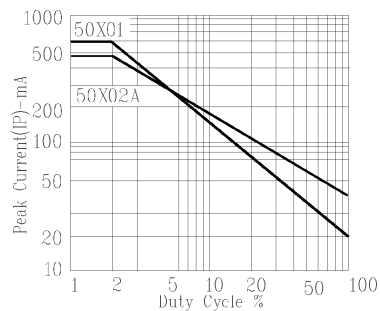


Fig6. MAX. PEAK CURRENT VS. DUTY CYCLE (REFRESH RATE 1KHz)

NOTE: G=GREEN E=ORANGE HR=HI.EFF.RED (REFRESH RATE 1KHz)