

LITEON

1.0" Single Digit Numeric LED Displays

LTS-10000 Series

Features

- 1.0 inch (25.4mm) digit height.
- Continuous uniform segments.
- Low power consumption.
- Low power requirement.
- Excellent characters appearance.
- Solid state reliability.
- Wide viewing angle.
- Categorized for luminous intensity.
- I.C. compatible.
- Easy mounting on P.C. board or socket.

Description

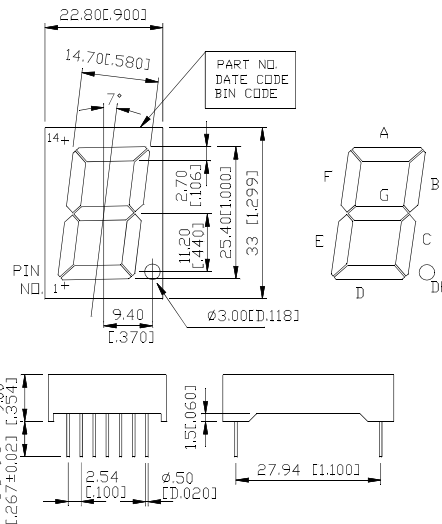
The LTS-10000 series are 1.0 inch (25.4mm) height seven segment single digit displays. The Displays have black face and white segment.

The AlGaAs red seven segment displays are designed for applications requiring low power consumption. They are tested and selected for their excellent low current characteristics to ensure that the segments are matched at low current. Drive current as low as 1mA per segment is available.

The AlGaAs red series device utilize LED chips which are made from AlGaAs on a non-transparent GaAs substrate. The bright red and green series devices utilize LED chips which are made from GaP on a transparent GaP substrate. The yellow and red orange series devices utilize LED chips which are made from GaAsP on a transparent GaP substrate.

Package Dimensions

LTS-10304/10804



Notes: All dimensions are in millimeters (inches).

Tolerance: $\pm 0.25\text{mm}$ (0.01") unless otherwise noted.

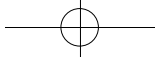
Devices

Part No. LTS-					Description	Internal Circuit Diagram
AlGaAs Red	Bright Red	Green	Yellow	Red Orange		
10804WC	10804P	10804G	10804Y	10804E	Common Anode, Rt. Hand Decimal	A
10304WC	10304P	10304G	10304Y	10304E	Common Cathode, Rt. Hand Decimal	B

Pin Connection

Pin No.	Connection	
	A.LTS-10804	B.LTS-10304
1.	Cathode E	Anode E
2.	Cathode D	Anode D
3.	No Pin	No Pin
4.	Common Anode	Common Cathode
5.	Cathode C	Anode C
6.	Cathode D.P.	Anode D.P.
7.	No Pin	No Pin
8.	Cathode B	Anode B
9.	Cathode A	Anode A
10.	No Pin	No Pin
11.	Common Anode	Common Cathode
12.	Cathode F	Anode F
13.	No Pin	No Pin
14.	Cathode G	Anode G

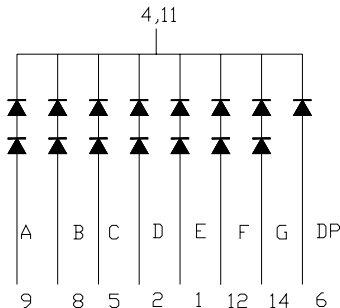
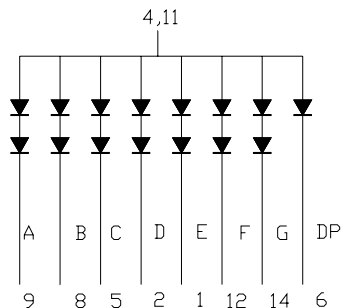
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Internal Circuit Diagrams

A.LTS-10804

B.LTS-10304



Absolute Maximum Rating at Ta=25°C

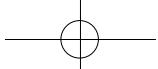
Parameter	AlGaAs Red	Bright Red	Green	Yellow	Red Orange	Unit
Power Dissipation Per Segment	120	70	120	100	120	mW
Peak Forward Current Per Segment (1/10 Duty Cycle, 0.1ms Pulse Width)	125	60	100	80	100	mA
Continuous Forward Current Per Segment Derating Linear from 25°C Per Segment	30 0.4	15 0.2	25 0.33	20 0.27	25 0.33	mA mA/°C
Reverse Voltage Per Segment	(10)5	(10)5	(10)5	(10)5	(10)5	V
Operating Temperature Range	-35°C to +85°C					
Stroage Temperature Range	-35°C to +85°C					
Solder Temperature 1/16 Inch Below Seating Plane for 3 Seconds at 260°C						

Electrical/Optical Characteristics at Ta=25°C

LTS-10304WC/10804WC

Parameter	Symbol	Min.	Typ.	Max.	Unit	Tset Condition
Average Luminous Intensity	I _v	500	1200		μ cd	I _F =1mA
			7500			I _F =5mA
Peak Emission Wavelength	λ _P		660		nm	I _F =20mA
Spectral Line Half-Width	Δλ		35		nm	I _F =20mA
Dominant Wavelength	λ _d		638		nm	I _F =20mA
Forward Voltage, Per Segment	V _F		3.2(1.6)	4.8(2.4)	V	I _F =1mA
			3.4(1.7)			I _F =5mA
			3.6(1.8)			I _F =20mA
Reverse Current, Per Segment	I _R			100	μ A	V _R =10V(5V)
Luminous Intensity Matching Ratio	I _v -m			2:1		I _F =1mA

DISPLAYS



LTS-10304P/10804P

Parameter	Symbol	Min.	Typ.	Max.	Unit	Tset Condition
Average Luminous Intensity	I_v	1060	2500		μ cd	$I_F=10\text{mA}$
Peak Emission Wavelength	λ_P		697		nm	$I_F=20\text{mA}$
Spectral Line Half-Width	$\Delta\lambda$		90		nm	$I_F=20\text{mA}$
Dominant Wavelength	λ_d		657		nm	$I_F=20\text{mA}$
Forward Voltage, Per Segment	V_F		4.2(2.1)	5.2(2.6)	V	$I_F=20\text{mA}$
Reverse Current, Per Segment	I_R			100	μ A	$V_R=10\text{V}(5\text{V})$
Luminous Intensity Matching Ratio	$I_v\text{-m}$			2:1		$I_F=10\text{mA}$

LTS-10304G/10804G

Parameter	Symbol	Min.	Typ.	Max.	Unit	Tset Condition
Average Luminous Intensity	I_v	1780	6000		μ cd	$I_F=10\text{mA}$
Peak Emission Wavelength	λ_P		565		nm	$I_F=20\text{mA}$
Spectral Line Half-Width	$\Delta\lambda$		30		nm	$I_F=20\text{mA}$
Dominant Wavelength	λ_d		569		nm	$I_F=20\text{mA}$
Forward Voltage, Per Segment	V_F		4.2(2.1)	5.2(2.6)	V	$I_F=20\text{mA}$
Reverse Current, Per Segment	I_R			100	μ A	$V_R=10\text{V}(5\text{V})$
Luminous Intensity Matching Ratio	$I_v\text{-m}$			2:1		$I_F=10\text{mA}$

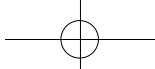
LTS-10304Y/10804Y

Parameter	Symbol	Min.	Typ.	Max.	Unit	Tset Condition
Average Luminous Intensity	I_v	1780	6000		μ cd	$I_F=10\text{mA}$
Peak Emission Wavelength	λ_P		585		nm	$I_F=20\text{mA}$
Spectral Line Half-Width	$\Delta\lambda$		35		nm	$I_F=20\text{mA}$
Dominant Wavelength	λ_d		588		nm	$I_F=20\text{mA}$
Forward Voltage, Per Segment	V_F		4.2(2.1)	5.2(2.6)	V	$I_F=20\text{mA}$
Reverse Current, Per Segment	I_R			100	μ A	$V_R=10\text{V}(5\text{V})$
Luminous Intensity Matching Ratio	$I_v\text{-m}$			2:1		$I_F=10\text{mA}$

LTS-10304E/10804E

Parameter	Symbol	Min.	Typ.	Max.	Unit	Tset Condition
Average Luminous Intensity	I_v	1780	6000		μ cd	$I_F=10\text{mA}$
Peak Emission Wavelength	λ_P		630		nm	$I_F=20\text{mA}$
Spectral Line Half-Width	$\Delta\lambda$		40		nm	$I_F=20\text{mA}$
Dominant Wavelength	λ_d		621		nm	$I_F=20\text{mA}$
Forward Voltage, Per Segment	V_F		4.0(2.0)	5.2(2.6)	V	$I_F=20\text{mA}$
Reverse Current, Per Segment	I_R			100	μ A	$V_R=10\text{V}(5\text{V})$
Luminous Intensity Matching Ratio	$I_v\text{-m}$			2:1		$I_F=10\text{mA}$

Note: Luminous intensity is measured with a light sensor and filter combination that approximates the CIE (Commission Internationale De L'Eclairage) eye-response curve.



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

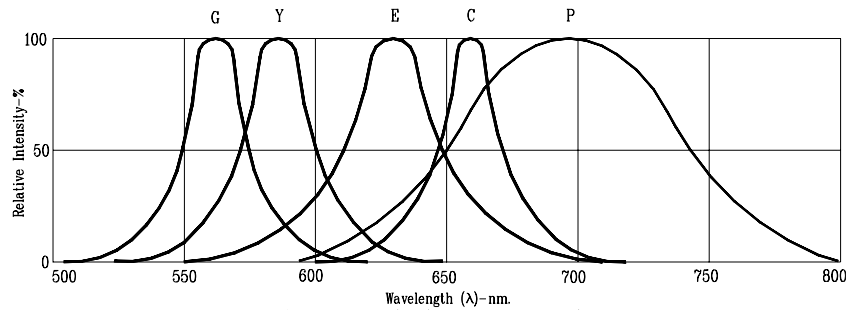


Fig1. RELATIVE INTENSITY VS. WAVELENGTH

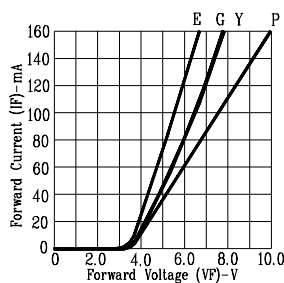


Fig2. FORWARD CURRENT VS. FORWARD VOLTAGE

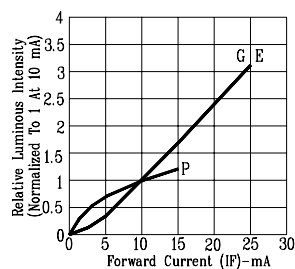


Fig3. RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

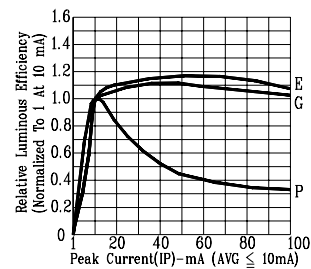


Fig4. RELATIVE LUMINOUS EFFICIENCY (LUMINOUS INTENSITY PER UNIT CURRENT) VS. PEAK CURRENT

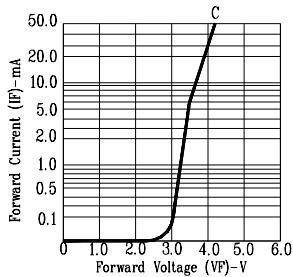


Fig5. FORWARD CURRENT VS. FORWARD VOLTAGE

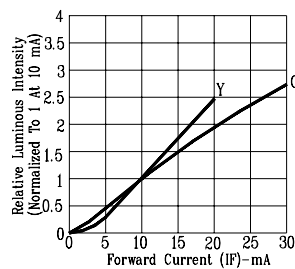


Fig6. RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

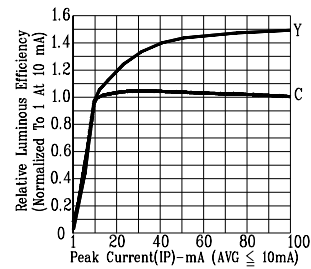


Fig7. RELATIVE LUMINOUS EFFICIENCY (LUMINOUS INTENSITY PER UNIT CURRENT) VS. PEAK CURRENT

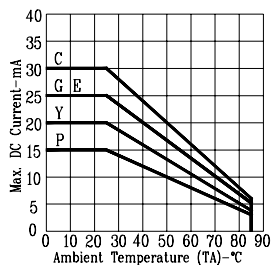


Fig8. MAX. ALLOWABLE DC CURRENT VS. AMBIENT TEMPERATURE.

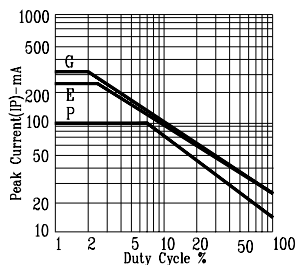


Fig9. MAX. PEAK CURRENT VS. DUTY CYCLE %
(REFRESH RATE 1KHz)

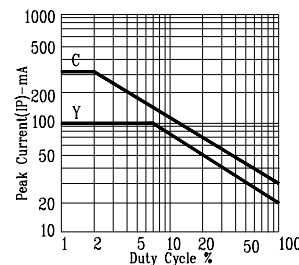


Fig10. MAX. PEAK CURRENT VS. DUTY CYCLE %
(REFRESH RATE 1KHz)

NOTE: G=GREEN E=RED ORANGE C=AlGaAs RED Y=YELLOW P=BRIGHT RED (REFRESH RATE 1KHz)

DISPLAYS