

LITEON

0.4" Single Digit Numeric LED Displays LTS-4000A Series

Features

- 0.4 inch (10.16mm) digit height.
- Choices of six bright colors-AlGaAs red/bright red/ green/yellow/red orange/high efficiency red.
- Low power requirement.
- Excellent characters appearance.
- Categorized for luminous intensity.
- I.C. compatible.
- Easy mounting on P.C. board or socket.

Descriptions

The LTS-4000A series are 0.4 inch (10.16mm) height single digit displays. AlGaAs red displays has gray face and white segments. Bright red displays has black face and red segments. Green and yellow displays have gray face and white segments. Red orange displays has orange face and orange segments. The high efficiency red displays have red face and red segments.

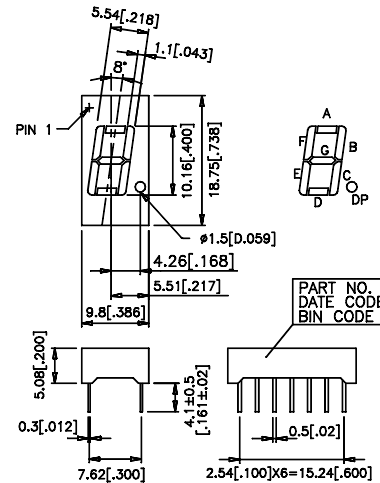
The AlGaAs red seven segment displays are designed for applications requiring low power consumption. They are tested and selected for their excellent low current characteristics to ensure that the segments are matched at low current. Drive current as low as 1 mA per segment is available.

The AlGaAs red series devices 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. All devices have gray face and white segments.

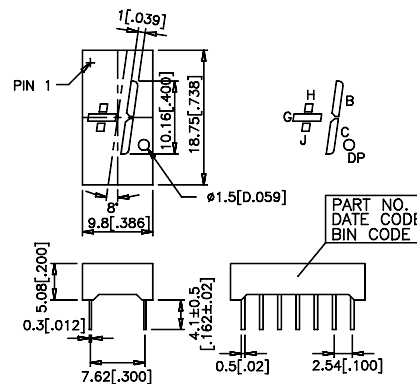
Notes: All dimensions are in millimeters (inches). Tolerance: $\pm 0.25\text{mm}$ (0.01") unless otherwise noted.

Package Dimensions

A. LTS-4x10A/4x40A/4x80A

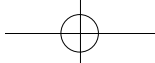


B. LTS-4x05A/4x30A



Devices

Part No.						Description	Package Dimension	Internal Circuit Diagram
AlGaAs Red	Bright Red	Green	Yellow	Red Orange	Hi.-Eff Red			
4705AWC	4705AP	4505AG	4805AY	4605AE	4905AHR	Universal, ± 1 Overflow	B	A
4710AWC	4710AP	4510AG	4810AY	4610AE	4910AHR	Common Anode, Rt. Hand Decimal	A	B
4730AWC	4730AP	4530AG	4830AY	4630AE	4930AHR	Common Anode, ± 1 Overflow	B	C
4740AWC	4740AP	4540AG	4840AY	4640AE	4940AHR	Common Cathode, Rt. Hand Decimal	A	D
4780AWC	4780AP	4580AG	4880AY	4680AE	4980AHR	Common Cathode, Rt. Hand Decimal	A	E



Pin Connection

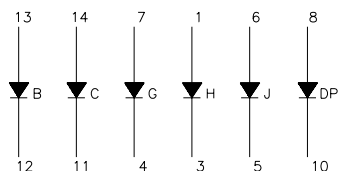
Pin No.	Connection				
	A.LTS-4x05A	B.LTS-4x10A	C.LTS-4x30A	D.LTS-4x40A	E.LTS-4X80A
1.	Anode H	Cathode A	Anode G, H & J *2	Anode F	Common Cathode *4
2.	No Pin	Cathode F	No Pin	Anode G	Anode F
3.	Cathode H	Common Anode *1	Anode G, H & J *2	No Pin	Anode G
4.	Cathode G	No Pin	No Pin	Common Cathode *3	Anode E
5.	Cathode J	No Pin	No Pin	No Pin	Anode D
6.	Anode J	No Pin	No Connection	Anode E	Common Cathode *4
7.	Anode G	Cathode E	Cathode H & J	Anode D	Anode D.P.
8.	Anode D.P.	Cathode D	Cathode G	Anode C	Anode C
9.	No Pin	Cathode D.P.	Cathode D.P.	Anode D.P.	Anode B
10.	Cathode D.P.	Cathode C	Cathode C	No Pin	Anode A
11.	Cathode C	Cathode G	Cathode B	No Pin	-
12.	Cathode B	No Pin	No Pin	Common Cathode *3	-
13.	Anode B	Cathode B	No Pin	Anode B	-
14.	Anode C	Common Anode *1	Anode B, C & D.P.	Anode A	-

Notes: 1.Pin 3 & 14 are internally connected. 3.Pin 4 & 12 are internally connected.
2.Pin 1 & 3 are internally connected. 4.Pin 1 & 6 are internally connected.

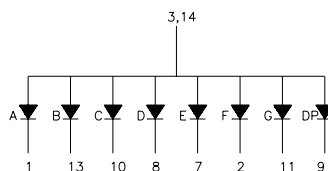
DISPLAYS

Internal Circuit Diagrams

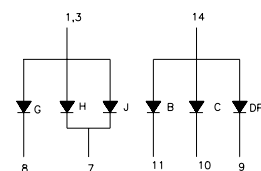
A.LTS-4X05A



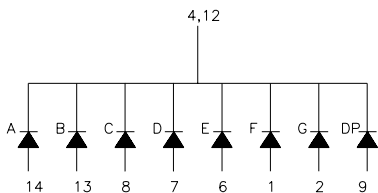
B.LTS-4X10A



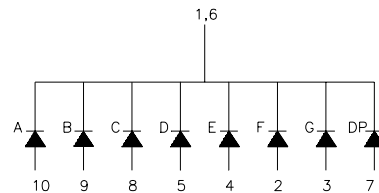
C.LTS-4X30A



D.LTS-4X40A

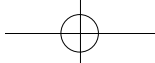


E.LTS-4X80A



Absolute Maximum Rating at Ta=25°C

Parameter	AlGaAs Red	Bright Red	Green	Yellow	Red Orange	Hi. -Eff. Red	Unit
Power Dissipation Per Segment	75	40	75	60	75	75	mW
Peak Forward Current Per Segment (1/10 Duty Cycle, 0.1ms Pulse Width)	125	60	100	80	100	100	mA
Continuous Forward Current Per Segment	30	15	25	20	25	25	mA
Derating Linear from 25°C Per Segment	0.4	0.2	0.33	0.27	0.33	0.33	mA/°C
Reverse Voltage Per Segment	5	5	5	5	5	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-4705/4710/4730/4740/4780AWC

Parameter	Symbol	Min.	Typ.	Max.	Unit	Tset Condition
Average Luminous Intensity	I _v	200	650		μ cd	I _F =1mA
			3100			I _F =5mA
Peak Emission Wavelength	λ P		660		nm	I _F =20mA
Spectral Line Half-Width	Δ λ		35		nm	I _F =20mA
Dominant Wavelength	λ d		638		nm	I _F =20mA
Forward Voltage, Per Segment or D.P.	V _F		1.6	2.4	V	I _F =1mA
			1.7			I _F =5mA
			1.8			I _F =20mA
Reverse Current, Per Segment or D.P.	I _R			100	μ A	V _R =5V
Luminous Intensity Matching Ratio	I _v -m			2.1		I _F =1mA

LTS-4705/4710/4730/4740/4780AP

Parameter	Symbol	Min.	Typ.	Max.	Unit	Tset Condition
Average Luminous Intensity	I _v	340	800		μ cd	I _F =10mA
Peak Emission Wavelength	λ P		697		nm	I _F =20mA
Spectral Line Half-Width	Δ λ		90		nm	I _F =20mA
Dominant Wavelength	λ d		657		nm	I _F =20mA
Forward Voltage, Per Segment or D.P.	V _F		2.1	2.6	V	I _F =20mA
Reverse Current, Per Segment or D.P.	I _R			100	μ A	V _R =5V
Luminous Intensity Matching Ratio	I _v -m			2:1		I _F =10mA

LTS-4505/4510/4530/4540/4580AG

Parameter	Symbol	Min.	Typ.	Max.	Unit	Tset Condition
Average Luminous Intensity	I _v	870	2200		μ cd	I _F =10mA
Peak Emission Wavelength	λ P		565		nm	I _F =20mA
Spectral Line Half-Width	Δ λ		30		nm	I _F =20mA
Dominant Wavelength	λ d		569		nm	I _F =20mA
Forward Voltage, Per Segment or D.P.	V _F		2.1	2.6	V	I _F =20mA
Reverse Current, Per Segment or D.P.	I _R			100	μ A	V _R =5V
Luminous Intensity Matching Ratio	I _v -m			2:1		I _F =10mA

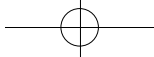
LTS-4805/4810/4830/4840/4880AY

Parameter	Symbol	Min.	Typ.	Max.	Unit	Tset Condition
Average Luminous Intensity	I _v	870	2200		μ cd	I _F =10mA
Peak Emission Wavelength	λ P		585		nm	I _F =20mA
Spectral Line Half-Width	Δ λ		35		nm	I _F =20mA
Dominant Wavelength	λ d		588		nm	I _F =20mA
Forward Voltage, Per Segment or D.P.	V _F		2.1	2.6	V	I _F =20mA
Reverse Current, Per Segment or D.P.	I _R			100	μ A	V _R =5V
Luminous Intensity Matching Ratio	I _v -m			2:1		I _F =10mA

LTS-4605/4610/4630/4640/4680AE

Parameter	Symbol	Min.	Typ.	Max.	Unit	Tset Condition
Average Luminous Intensity	I _v	870	2200		μ cd	I _F =10mA
Peak Emission Wavelength	λ P		630		nm	I _F =20mA
Spectral Line Half-Width	Δ λ		40		nm	I _F =20mA
Dominant Wavelength	λ d		621		nm	I _F =20mA
Forward Voltage, Per Segment or D.P.	V _F		2.0	2.6	V	I _F =20mA
Reverse Current, Per Segment or D.P.	I _R			100	μ A	V _R =5V
Luminous Intensity Matching Ratio	I _v -m			2:1		I _F =10mA

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LTS-4905/4910/4930/4940/4980AHR

Parameter	Symbol	Min.	Typ.	Max.	Unit	Tset Condition
Average Luminous Intensity	I _v	870	2200		μ cd	I _F =10mA
Peak Emission Wavelength	λ _P		635		nm	I _F =20mA
Spectral Line Half-Width	Δλ		40		nm	I _F =20mA
Dominant Wavelength	λ _d		623		nm	I _F =20mA
Forward Voltage, Per Segment	V _F		2.0	2.6	V	I _F =20mA
Reverse Current, Per Segment	I _R			100	μ A	V _R =5V
Luminous Intensity Matching Ratio	I _v -m			2:1		I _F =10mA

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

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

DISPLAYS

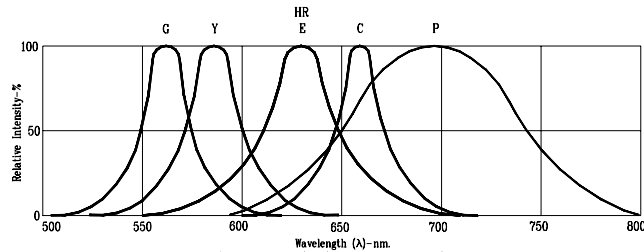


Fig1. RELATIVE INTENSITY VS. WAVELENGTH

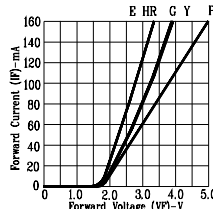


Fig2. FORWARD CURRENT VS. FORWARD VOLTAGE

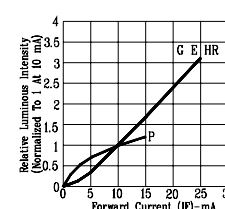


Fig3. RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

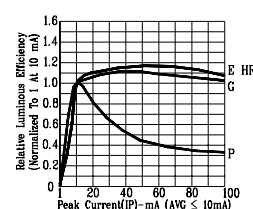


Fig4. RELATIVE LUMINOUS EFFICIENCY (LUMINOUS INTENSITY PER UNIT CURRENT) VS. PEAK CURRENT

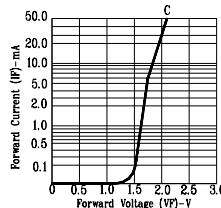


Fig5. FORWARD CURRENT VS. FORWARD VOLTAGE

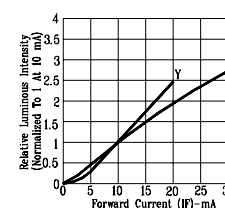


Fig6. RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

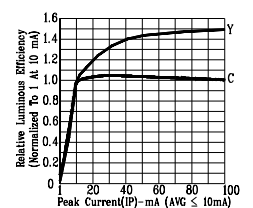


Fig7. RELATIVE LUMINOUS EFFICIENCY (LUMINOUS INTENSITY PER UNIT CURRENT) VS. PEAK CURRENT

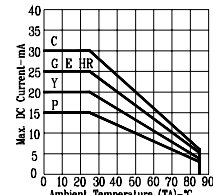


Fig8. MAX. ALLOWABLE DC CURRENT VS. AMBIENT TEMPERATURE

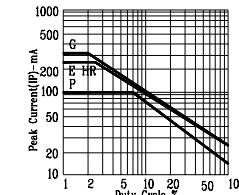


Fig9. MAX. PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE 1KHz)

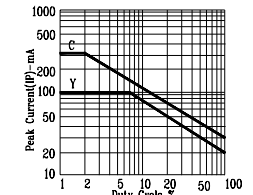


Fig10. MAX. PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE 1KHz)

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