0.36" Single Digit Numeric LED Displays

LTS-360 Series

Features

- 0.36 inch (9.14mm) digit height
- Continuous uniform segments.
- Choices of six bright colors-AlGaAs red/bright red/green/yellow/red orange/high efficiency red.
- Low power requirement.
- Excellent characters appearance.
- High brightness.
- Wide viewing angle.
- Solid state reliability.
- Categorized for luminous intensity.
- I.C. compatiable.
- Easy mounting on P.C. board.

Descriptions

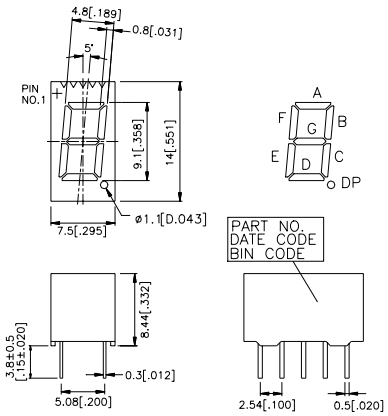
The LTS-360 series are 0.36 inch (9.14mm) height single digit displays. AlGaAs red desplays has gray face and white segments. Bright red and hight efficieny red displays have red face and red segments. Green, yellow AlGaAs red and red orange displays have gray face and white segments.

The AlGaAs red seven segment displys 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.

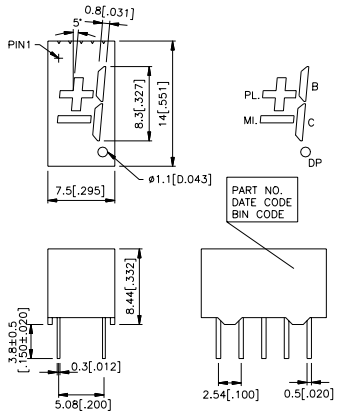
The AlGaAs red series devices utilize LED chips which are made from AlGaAs on a non-transparent GaAs substrate. The bright red and green series devices utilize LED chips which are made from GaP on a transparent GaPsubstrate. The yellow and red orange series devices utilize LED chips which are made from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

Package Dimensions

A.LTS-360/367



B.LTS-368



Notes:All dimensions are in millimeters (inches). Tolerance:± 0.25mm (0.01") unless otherwise noted.

Devices

Part No. LTS-						Description	Package Dimension	Internal Circuit Diagram
AlGaAs Red	Bright Red	Green	Yellow	Red Orange	Hi.-EFF. Red			
360WC	360P	360G	360Y	360E	360HR	Common Anode, Rt. Hand Decimal	A	A
367WC	367P	367G	367Y	367E	367HR	Common Cathode, Rt. Hand Decimal	A	B
368WC	368P	368G	368Y	368E	368HR	Common Cathode, ± 1 Overflow	B	C

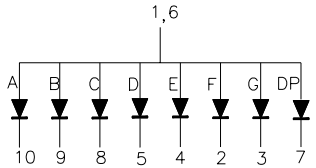
Pin Connection

Pin No.	Connection		
	A.LTS-360	B.LTS-367	C.LTS-368
1.	Common Anode *1	Common Cathode *1	Cathode Pl. & Mi. *2
2.	Cathode F	Anode F	Anode Plus Sign
3.	Cathode G	Anode G	Anode Minus Sign
4.	Cathode E	Anode E	Cathode Pl. & Mi. *2
5.	Cathode D	Anode D	No Pin
6.	Common Anode *1	Common Cathode *1	Cathode B, C & D.P. *3
7.	Cathode D.P.	Anode D.P.	Anode D.P.
8.	Cathode C	Anode C	Anode C
9.	Cathode B	Anode B	Anode B
10.	Cathode A	Anode A	Cathode B, C & D.P. *3

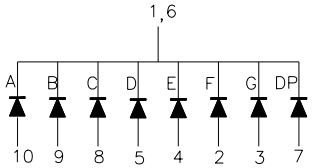
Note:1.Pin 1 & 6 are internally connected. 2.Pin 1 & 4 are internally connected. 3.Pin 6 & 10 are internally connected.

Internal Circuit Diagrams

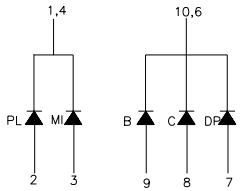
A.LTS-360



B.LTS-367



C.LTS-368



Absolute Maximum Rating at Ta=25℃

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℃ Per Segment	0.4	0.2	0.33	0.27	0.33	0.33	mA/℃
Reverse Voltage Per Segment	5	5	5	5	5	5	V
Operating Temperature Range	-35℃ to +85℃						
Stroage Temperature Range	-35℃ to +85℃						
Solder Temperature 1/16 Inch Below Seating Plane for 3 Seconds at 260℃							

Electrical/Optical Characteristics at Ta=25℃

LTS-360WC/367WC/368WC

Parameter	Symbol	Min.	Typ.	Max.	Unit	Tset Condition
Average Luminous Intensity	Iv	200	650		μcd	IF=1mA
			3400			IF=5mA
Peak Emission Wavelength	λP		660		nm	IF=20mA
Spectral Line Half-Width	Δλ		35		nm	IF=20mA
Dominant Wavelength	λd		638		nm	IF=20mA
Forward Voltage, Per Segment	VF		1.6	2.4	V	IF=1mA
			1.7			IF=5mA
			1.8			IF=20mA
Reverse Current, Per Segment	IR			100	μA	VR=5V
Luminous Intensity Matching Ratio	Iv-m			2:1		IF=1mA

LTS-360P

Parameter	Symbol	Min.	Typ.	Max.	Unit	Tset Condition
Average Luminous Intensity	Iv	320	750		μcd	IF=10mA
Peak Emission Wavelength	λP		697		nm	IF=20mA
Spectral Line Half-Width	Δλ		90		nm	IF=20mA
Dominant Wavelength	λd		657		nm	IF=20mA
Forward Voltage, Per Segment or D.P.	VF		2.1	2.6	V	IF=20mA
Reverse Current, Per Segment or D.P.	IR			100	μA	VR=5V
Luminous Intensity Matching Ratio	Iv-m			2:1		IF=10mA

LTS-360G

Parameter	Symbol	Min.	Typ.	Max.	Unit	Tset Condition
Average Luminous Intensity	Iv	800	2000		μcd	IF=10mA
Peak Emission Wavelength	λP		565		nm	IF=20mA
Spectral Line Half-Width	Δλ		30		nm	IF=20mA
Dominant Wavelength	λd		569		nm	IF=20mA
Forward Voltage, Per Segment or D.P.	VF		2.1	2.6	V	IF=20mA
Reverse Current, Per Segment or D.P.	IR			100	μA	VR=5V
Luminous Intensity Matching Ratio	Iv-m			2:1		IF=10mA

LTS-360Y

Parameter	Symbol	Min.	Typ.	Max.	Unit	Tset Condition
Average Luminous Intensity	Iv	800	2000		μcd	IF=10mA
Peak Emission Wavelength	λP		585		nm	IF=20mA
Spectral Line Half-Width	Δλ		35		nm	IF=20mA
Dominant Wavelength	λd		588		nm	IF=20mA
Forward Voltage, Per Segment or D.P.	VF		2.1	2.6	V	IF=20mA
Reverse Current, Per Segment or D.P.	IR			100	μA	VR=5V
Luminous Intensity Matching Ratio	Iv-m			2:1		IF=10mA

LTS-360E

Parameter	Symbol	Min.	Typ.	Max.	Unit	Tset Condition
Average Luminous Intensity	Iv	800	2000		μcd	IF=10mA
Peak Emission Wavelength	λP		630		nm	IF=20mA
Spectral Line Half-Width	Δλ		40		nm	IF=20mA
Dominant Wavelength	λd		621		nm	IF=20mA
Forward Voltage, Per Segment or D.P.	VF		2.0	2.6	V	IF=20mA
Reverse Current, Per Segment or D.P.	IR			100	μA	VR=5V
Luminous Intensity Matching Ratio	Iv-m			2:1		IF=10mA

LTS-360HR

Parameter	Symbol	Min.	Typ.	Max.	Unit	Tset Condition
Average Luminous Intensity	Iv	800	2000		μcd	IF=10mA
Peak Emission Wavelength	λP		635		nm	IF=20mA
Spectral Line Half-Width	Δλ		40		nm	IF=20mA
Dominant Wavelength	λd		623		nm	IF=20mA
Forward Voltage, Per Segment or D.P.	VF		2.1	2.6	V	IF=20mA
Reverse Current, Per Segment or D.P.	IR			100	μA	VR=5V
Luminous Intensity Matching Ratio	Iv-m			2:1		IF=10mA

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

DISPLAYS

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

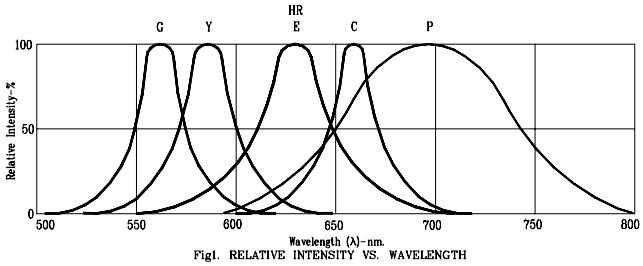


Fig1. RELATIVE INTENSITY VS. WAVELENGTH

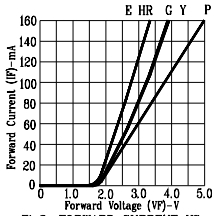


Fig2. FORWARD CURRENT VS. FORWARD VOLTAGE

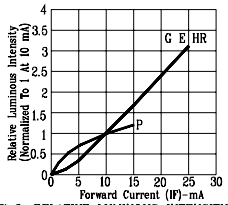


Fig3. RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

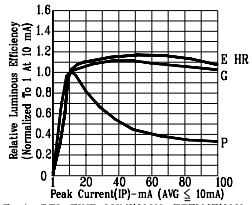


Fig4. RELATIVE LUMINOUS EFFICIENCY (LUMINOUS INTENSITY PER UNIT CURRENT) VS. PEAK CURRENT

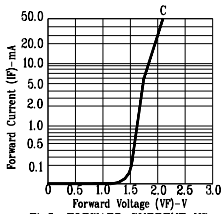


Fig5. FORWARD CURRENT VS. FORWARD VOLTAGE

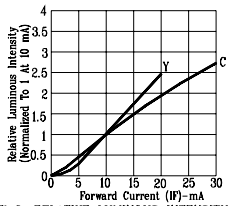


Fig6. RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

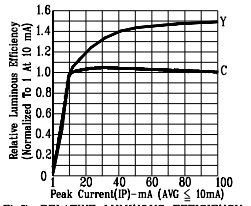


Fig7. RELATIVE LUMINOUS EFFICIENCY (LUMINOUS INTENSITY PER UNIT CURRENT) VS. PEAK CURRENT

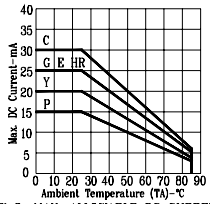


Fig8. MAX. ALLOWABLE DC CURRENT. VS. AMBIENT TEMPERATURE.

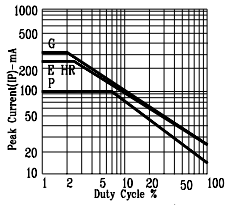


Fig9. MAX. PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE 1KHz)

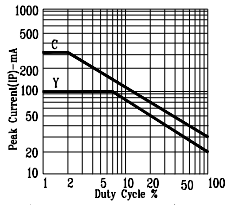


Fig10. MAX. PEAK CURRENT VS. DUTY CYCLE % (REFRESH RATE 1KHz)

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