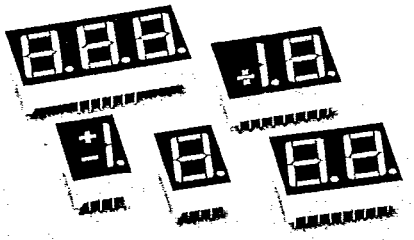
LITE-ON LED SPECIALIST

LTS-6000 LTD-6000 SERIES LTC-561/571

0.56" SEVEN-SEGMENT NUMERIC DISPLAYS

FEATURES

- 0.56 INCH (14.2mm) DIGIT HEIGHT.
- CHOICE OF SIX BRIGHT COLORS-RED/BRIGHT RED / GREEN / YELLOW/ORANGE/HIGH EFFICIENCY RED.
- LOW POWER REQUIREMENT.
- EXCELLENT CHARACTERS APPEARANCE.
- CATEGORIZED FOR LUMINOUS INTENSITY.
- I.C. COMPATIBLE.
- EASY MOUNTING ON P.C. BOARD OR SOCKETS.



DESCRIPTION

The LTS-6000, LTD-6000, LTC-561/571 series are 0.56 inch (14.2mm) height single, dual and triple digit displays.

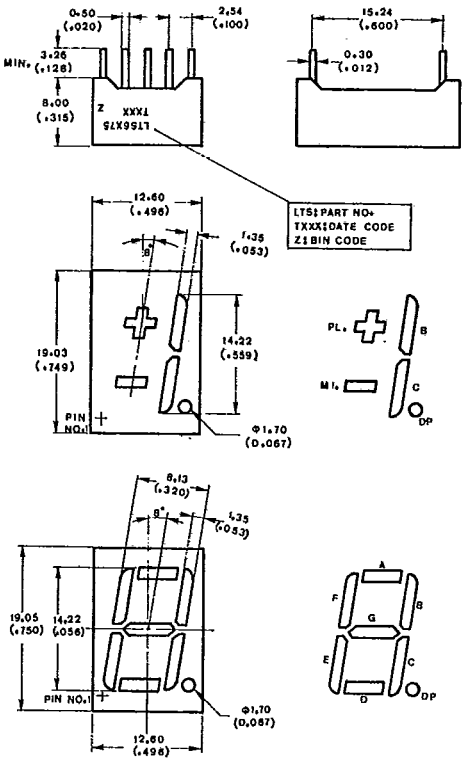
The red series devices utilize LED chips which are made from GaAsP on a GaAs substrate. The bright red and green series devices utilize LED chips which are made from GaP on a transparent GaP substrate. The yellow, orange and high efficiency red series devices utilize LED chips which are made from GaAsP on a transparent GaP substrate. Red and bright red displays have black face and red segment color. Green and yellow displays have gray face and white segment color. Orange displays have orange face and orange segment color. High efficiency red displays have red face and red segment color.

DEVICES

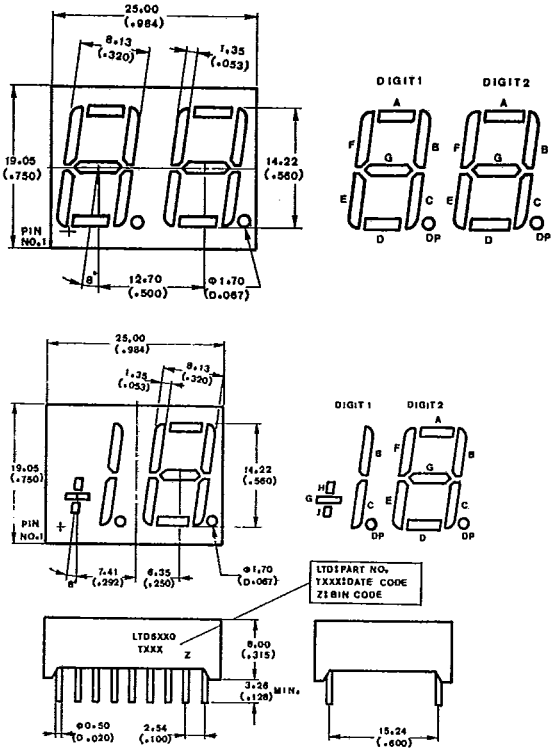
PART NO.						DESCRIPTION	PACKAGE DIMENSION	INTERNAL CIRCUIT DIAGRAM
RED	BRIGHT RED	GREEN	YELLOW	ORANGE	HI.-EFF. RED			
LTS-6760R	6760P	6460G	6860Y	6660E	6960HR	Common Anode, Rt. Hand Decimal	A	A
LTS-6780R	6780P	6480G	6880Y	6680E	6980HR	Common Cathode, Rt. Hand Decimal	A	B
LTS-6775R	6775P	6475G	6875Y	6675E	6975HR	Common Anode, ±1 Overflow	A	C
LTS-6795R	6795P	6495G	6895Y	6695E	6995HR	Common Cathode, ±1 Overflow	A	D
LTD-6710R	6710P	6410G	6810Y	6610E	6910HR	Common Anode, Rt. Hand Decimal	B	E
LTD-6730R	6730P	6430G	6830Y	6630E	6930HR	Common Anode, ±1.8 Overflow	B	F
LTD-6740R	6740P	6440G	6840Y	6640E	6940HR	Common Cathode, Rt. Hand Decimal	B	G
LTD-6750R	6750P	6450G	6850Y	6650E	6950HR	Common Cathode, ±1.8 Overflow	B	H
LTC-561R	561P	561G	561Y	561E	561HR	Multiplex Common Anode, Rt. Hand Decimal	C	I
LTC-571R	511P	571G	571Y	571E	571HR	Multiplex Common Cathode, Rt. Hand Decimal	C	J

PACKAGE DIMENSION

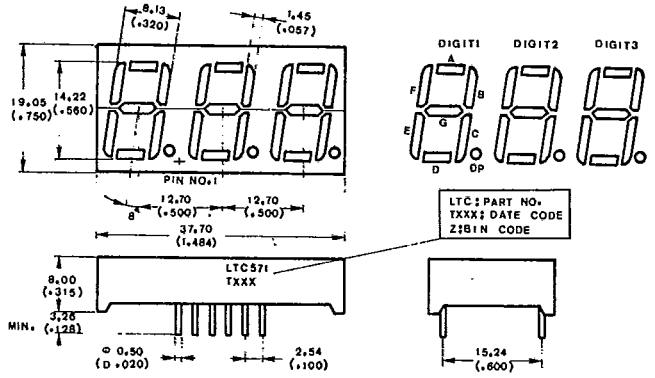
A. LTS-6x60/6x80/6x75/6x95



B. LTD-6x10/6x30/6x40/6x50



C. LTC-561/571



SEVEN-SEGMENT LED DISPLAYS

NOTE: All dimensions are in millimeters (inches), tolerance is 0.25mm (0.010") unless otherwise noted.

PIN CONNECTION

PIN NO.	CONNECTION			
	A. LTS-6x60	B. LTS-6x80	C. LTS-6x75	D. LTS-6x95
1	Cathode E	Anode E	Cathode Minus Sign	Anode Minus Sign
2	Cathode D	Anode D	Anode Pl., Mi *2	Cathode Pl., Mi. *2
3	Common Anode *1	Common Cathode *1	Cathode C	Anode C
4	Cathode C	Anode C	Anode B,C,Dp *3	Cathode B, C, Dp *3
5	Cathode D.P.	Anode D.P.	Cathode Cp	Anode Dp
6	Cathode B	Anode B	Cathode B	Anode B
7	Cathode A	Anode A	Anode B, C, Dp *3	Cathode B, C, Dp *3
8	Common Anode *1	Common Cathode *1	Anode Pl., Mi. *2	Cathode Pl., Mi. *2
9	Cathode F	Anode F	Cathode Plus Sign	Anode Plus Sign
10	Cathode G	Anode G	No Connection	No Connection

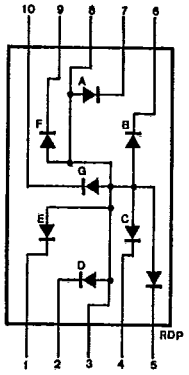
NOTES: 1. Pin 3 & 8 are internally connected.
2. Pin 2 & 8 are internally connected.
3. Pin 4 7 are internally connected.

PIN NO.	CONNECTION			
	A. LTD-6x10	B. LTD-6x30	C. LTD-6x40	D. LTD-6x50
1	Cathode E (Digit 1)	Cathode G (Digit 1)	Anode E (Digit 1)	Anode G (Digit 1)
2	Cathode D (Digit 1)	Cathode J. H (Digit 1)	Anode D (Digit 1)	Anode J. H (Digit 1)
3	Cathode C (Digit 1)	Cathode C (Digit 1)	Anode C (Digit 1)	Anode C (Digit 1)
4	Cathode D.P. (Digit 1)	Cathode D.P. (Digit 1)	Anode D.P. (Digit 1)	Anode D.P. (Digit 1)
5	Cathode E (Digit 2)	Cathode E (Digit 2)	Anode E (Digit 2)	Anode E (Digit 2)
6	Cathode D (Digit 2)	Cathode D (Digit 2)	Anode D (Digit 2)	Anode D (Digit 2)
7	Cathode G (Digit 2)	Cathode G (Digit 2)	Anode G (Digit 2)	Anode G (Digit 2)
8	Cathode C (Digit 2)	Cathode C (Digit 2)	Anode C (Digit 2)	Anode C (Digit 2)
9	Cathode D.P. (Digit 2)	Cathode D.P. (Digit 2)	Anode D.P. (Digit 2)	Anode D.P. (Digit 2)
10	Cathode B (Digit 2)	Cathode B (Digit 2)	Anode B (Digit 2)	Anode B (Digit 2)
11	Cathode A (Digit 2)	Cathode A (Digit 2)	Anode A (Digit 2)	Anode A (Digit 2)
12	Cathode F (Digit 2)	Cathode F (Digit 2)	Anode F (Digit 2)	Anode F (Digit 2)
13	Common Anode (Digit 2)	Common Anode (Digit 2)	Common Cathode (Digit 2)	Common Cathode (Digit 2)
14	Common Anode (Digit 1)	Common Anode (Digit 1)	Common Cathode (Digit 1)	Common Cathode (Digit 1)
15	Cathode B (Digit 1)	Cathode B (Digit 1)	Anode B (Digit 1)	Anode B (Digit 1)
16	Cathode A (Digit 1)	No Connection	Anode A (Digit 1)	No Connection
17	Cathode G (Digit 1)	No Connection	Anode G (Digit 1)	No Connection
18	Cathode F (Digit 1)	No Connection	Anode F (Digit 1)	No Connection

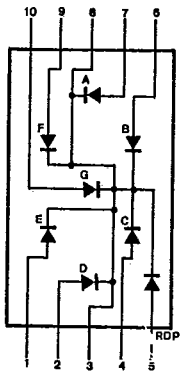
PIN NO.	CONNECTION	
	A. LTC-561	B. LTC-571
1	Cathode E	Anode E
2	Cathode D	Anode D
3	Cathode D.P.	Anode D.P.
4	Cathode C	Anode C
5	Cathode G	Anode G
6	No Connection	No Connection
7	Cathode B	Anode B
8	Common Anode, Digit 3	Common Cathode, Digit 3
9	Common Anode, Digit 2	Common Cathode, Digit 2
10	Cathode F	Anode F
11	Cathode A	Anode A
12	Common Anode, Digit 1	Common Cathode, Digit 1

INTERNAL CIRCUIT DIAGRAM

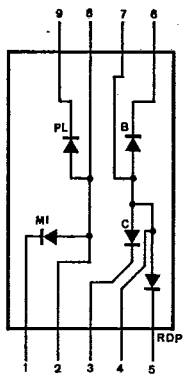
A. LTS-6x60



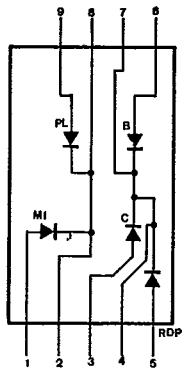
B. LTS-6x80



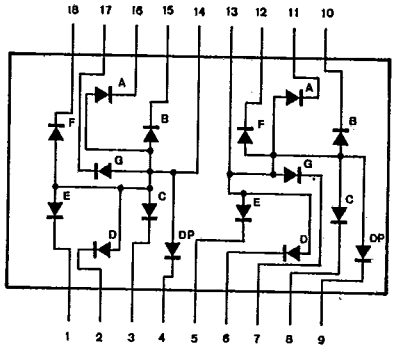
C. LTS-6x75



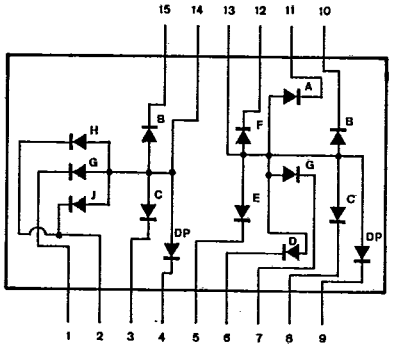
D. LTS-6x95



E. LTD-6x10

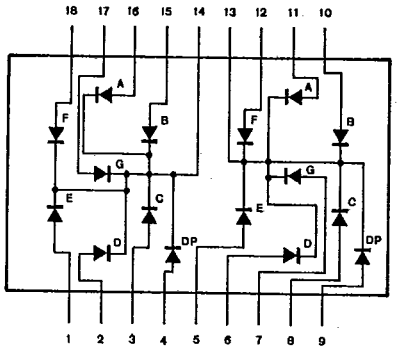


F. LTD-6x30

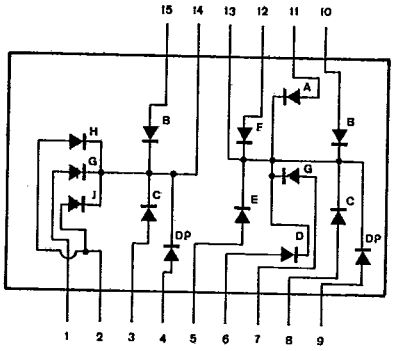


SEVEN-SEGMENT LED DISPLAYS

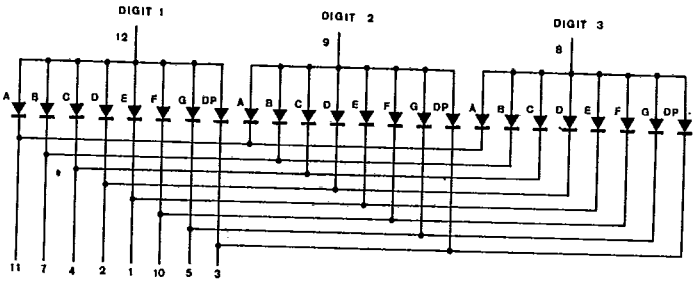
G. LTD-6x40



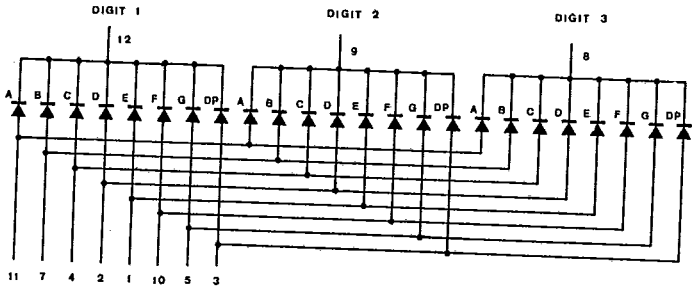
H. LTD-6x50



I. LTC-561



J. LTC-571



ABSOLUTE MAXIMUM RATINGS AT $T_A = 25°C$

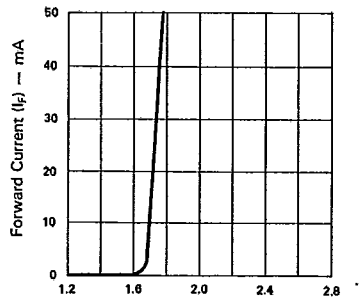
PARAMETER	RED	BRIGHT RED	GREEN	YELLOW	ORANGE	HI.-EFF. RED	UNIT
Power Dissipation Per Segment	55	40	75	60	75	75	mW
Peak Forward Current Per Segment (1/10 Duty Cycle, 0.1ms Pulse Width)	160	60	100	80	100	100	mA
Continuous Forward Current Per Segment	25	15	25	20	25	25	mA
Derating Linear From 25°C Per Segment	0.3	0.18	0.3	0.24	0.3	0.3	mA/°C
Reverse Voltage Per Segment	5	5	5	5	5	5	V
Operating Temperature Range	−25°C to +85°C						
Storage Temperature Range	−25°C to +85°C						
Solder Temperature 1/16 inch Below Seating Plane for 3 Seconds at 260°C							

ELECTRICAL/OPTICAL CHARACTERISTICS AT T_A = 25°C
LTS-6700R/LTD-6700R/LTC-561R/571R SERIES

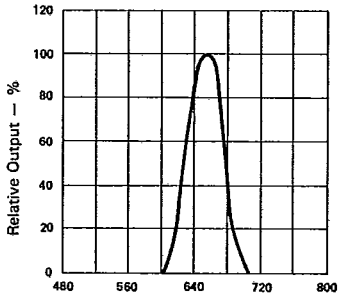
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	Iv	200	600		μcd	I_F = 10 mA
Peak Emission Wavelength	λP		655		nm	I_F = 20 mA
Spectral Line Half-Width	Δλ		24		nm	I_F = 20 mA
Forward Voltage, any Segment or D.P.	V_F		1.7	2.0	V	I_F = 20 mA
Reverse Current, any Segment or D.P.	I_R			100	μA	V_R = 5 V
Luminous Intensity Matching Ratio	Iv-m			2:1		I_F = 20 mA

Note: The BIN brightness classification see page 6-160, category A

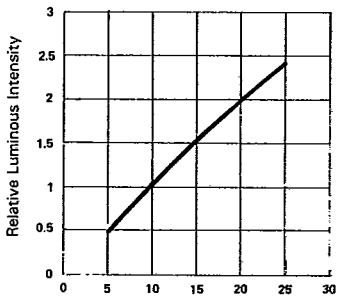
TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES
(25° C Ambient Temperature Unless Otherwise Noted)



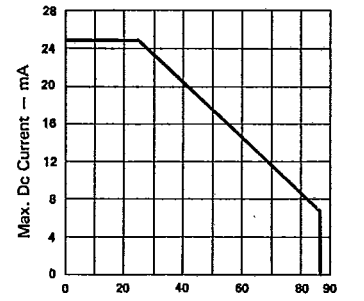
Forward Voltage (V_F) — Volts
Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.



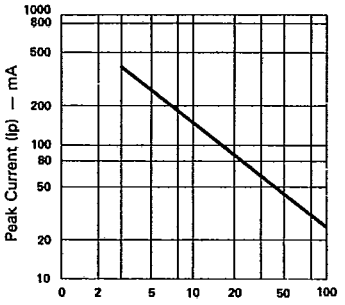
Wavelength (λ) — nm.
Fig. 2 SPECTRAL RESPONSE.



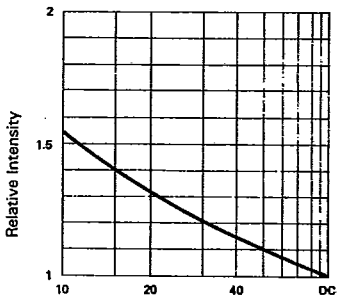
Forward Current (I_F) — mA
Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).



Ambient Temperature (Ta) — °C
Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.



Duty Cycle %
Fig. 5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE — F = 1 KHz)



Duty Cycle %
Fig. 6 LUMINOUS INTENSITY Vs. DUTY CYCLE% (AVERAGE I_F = 10mA PER SEG.)

SEVEN-SEGMENT LED DISPLAYS

ELECTRICAL/OPTICAL CHARACTERISTICS AT T_A = 25°C
LTS-6700P/LTD-6700P/LTC-561P/LTC-571P SERIES

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	Iv	300	950		μcd	IF = 10 mA
Peak Emission Wavelength	λP		697		nm	IF = 20 mA
Spectral Line Half-Width	Δλ		90		nm	IF = 20 mA
Forward Voltage, any Segment or D.P.	VF		2.1	2.8	V	IF = 20 mA
Reverse Current, any Segment or D.P.	IR			100	μA	VR = 5 V
Luminous Intensity Matching Ratio	Iv-m			2:1		IF = 20 mA

Note: The BIN brightness classification see page 6-160, category A except LTD-6700P categorize A-2

TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES

(25°C Ambient Temperature Unless Otherwise Noted)

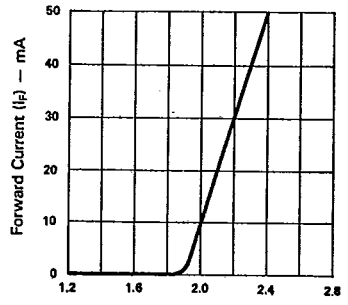


Fig.1 FORWARD CURRENT Vs. FORWARD VOLTAGE.

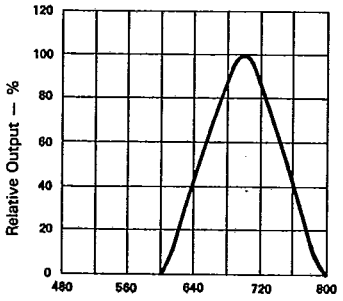


Fig. 2 SPECTRAL RESPONSE.

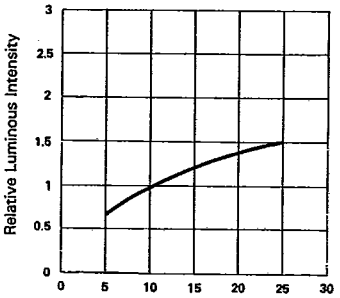


Fig. 3 RELATIVE, LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).

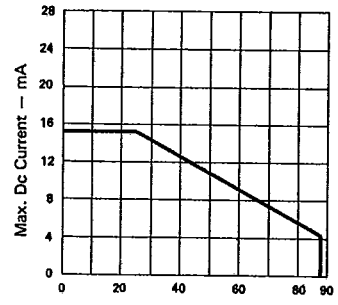


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.

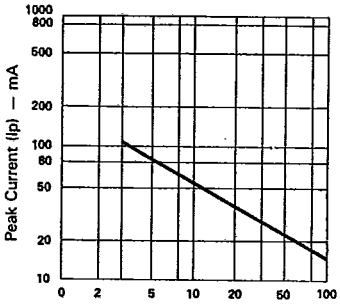


Fig.5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE – F = 1 KHz)

ELECTRICAL/OPTICAL CHARACTERISTICS AT T_A = 25°C
LTS-6400G/LTD-6400G/LTC-561G/LTC-571G SERIES

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	Iv	800	2400		μcd	IF = 10 mA
Peak Emission Wavelength	λP		565		nm	IF = 20 mA
Spectral Line Half-Width	Δλ		30		nm	IF = 20 mA
Forward Voltage, any Segment or D.P.	VF		2.1	2.8	V	IF = 20 mA
Reverse Current, any Segment or D.P.	IR			100	μA	VR = 5 V
Luminous Intensity Matching Ratio	Iv-m			2:1		IF = 20 mA

Note: The BIN brightness classification see page 6-160, category A

TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES

(25°C Ambient Temperature Unless Otherwise Noted)

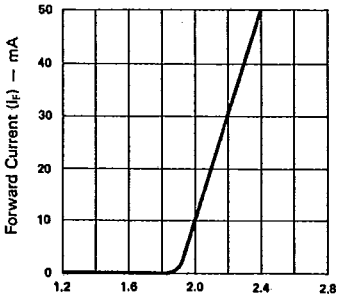


Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.

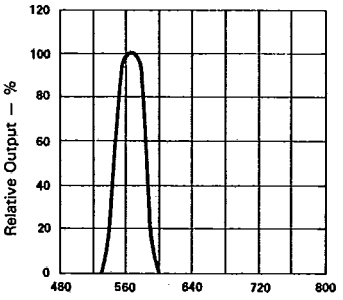


Fig. 2 SPECTRAL RESPONSE.

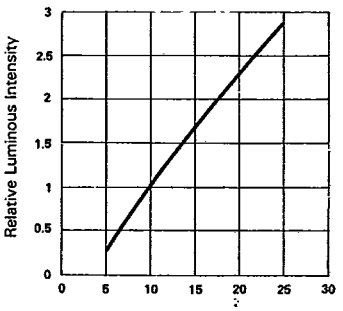


Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).

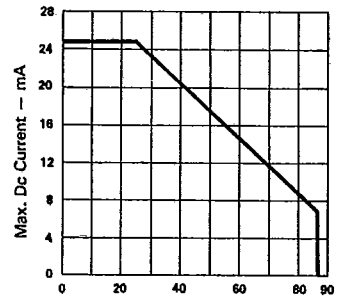


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.

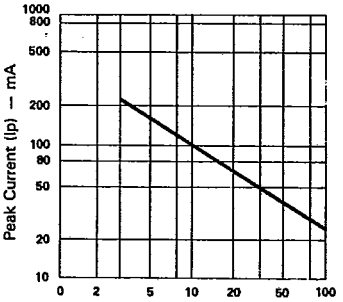


Fig. 5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE – F = 1 KHz)

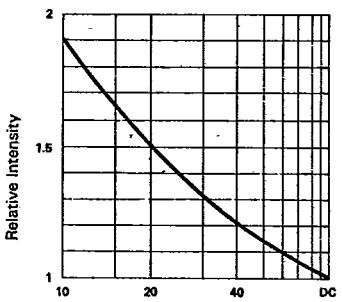


Fig.6 LUMINOUS INTENSITY Vs. DUTY CYCLE% (AVERAGE I_F = 10mA PER SEG.)

SEVEN-SEGMENT LED DISPLAYS

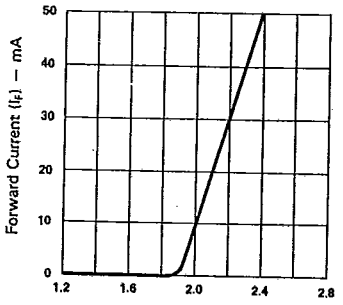
ELECTRICAL/OPTICAL CHARACTERISTICS AT T_A = 25°C
LTS-6800Y/LTD-6800Y/LTC-561Y/LTC-571Y

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	Iv	800	2400		μcd	IF = 10 mA
Peak Emission Wavelength	λP		585		nm	IF = 20 mA
Spectral Line Half-Width	Δλ		35		nm	IF = 20 mA
Forward Voltage, any Segment or D.P.	VF		2.1	2.8	V	IF = 20 mA
Reverse Current, any Segment or D.P.	IR			100	μA	VR = 5 V
Luminous Intensity Matching Ratio	Iv-m			2:1		IF = 20 mA

Note: The BIN brightness classification see page 6-160, category A

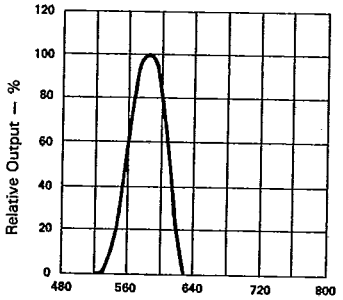
TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES

(25°C Ambient Temperature Unless Otherwise Noted)



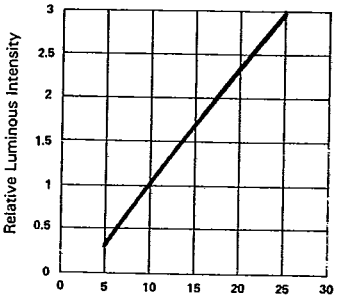
Forward Voltage (V_F) — Volts

Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.



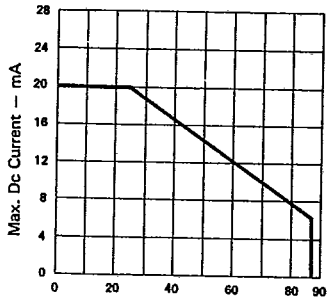
Wavelength (λ) — nm.

Fig. 2 SPECTRAL RESPONSE.



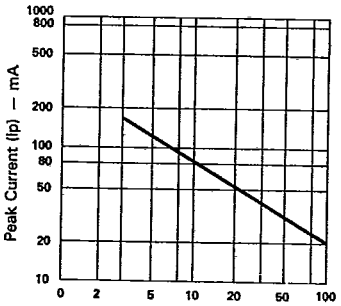
Forward Current (I_F) — mA

Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).



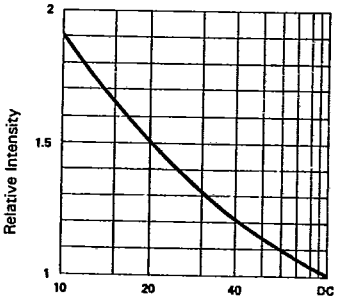
Ambient Temperature (Ta) — °C

Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.



Duty Cycle %

Fig. 5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE — F = 1 KHz)



Duty Cycle %

Fig. 6 LUMINOUS INTENSITY Vs. DUTY CYCLE% (AVERAGE I_F = 10mA PER SEG.)

ELECTRICAL/OPTICAL CHARACTERISTICS AT T_A = 25°C
LTS-6600E/LTD-6600E/LTC-561E/LTC-571E SERIES

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	Iv	800	2400		μcd	I_F = 10 mA
Peak Emission Wavelength	λP		630		nm	I_F = 20 mA
Spectral Line Half-Width	Δλ		45		nm	I_F = 20 mA
Forward Voltage, any Segment or D.P.	V_F		2.1	2.8	V	I_F = 20 mA
Reverse Current, any Segment or D.P.	I_R			100	μA	V_R = 5 V
Luminous Intensity Matching Ratio	Iv-m			2:1		I_F = 20 mA

Note: The BIN brightness classification see page 6-160, category A

TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES
(25°C Ambient Temperature Unless Otherwise Noted)

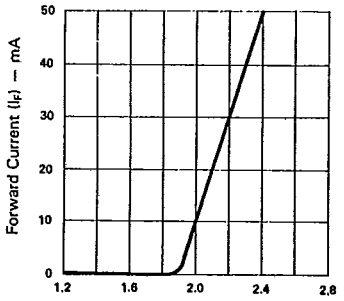


Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.

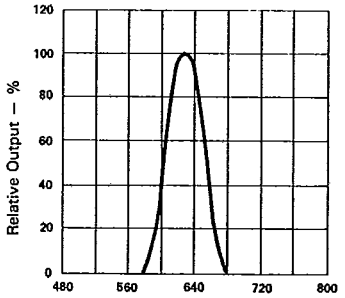


Fig. 2 SPECTRAL RESPONSE.

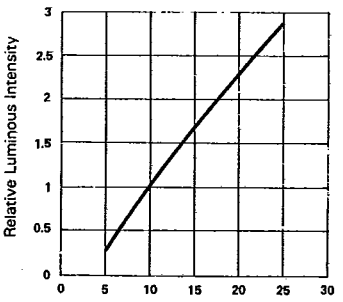


Fig. 3 RELATIVE, LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).

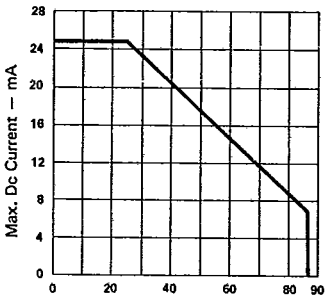


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.

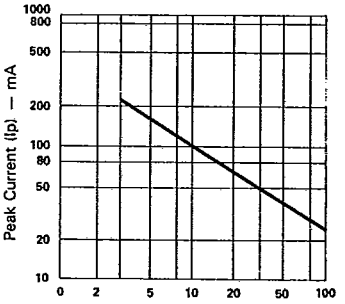


Fig. 5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE – F = 1 KHz)

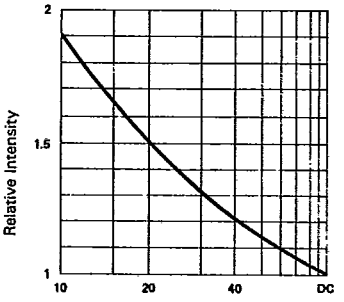


Fig. 6 LUMINOUS INTENSITY Vs. DUTY CYCLE% (AVERAGE I_F = 10mA PER SEG.)

SEVEN SEGMENT LED DISPLAYS

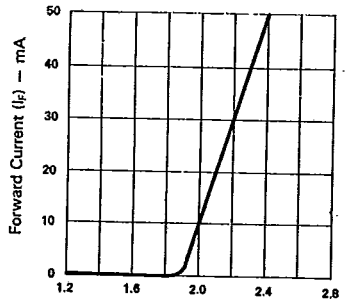
ELECTRICAL/OPTICAL CHARACTERISTICS AT $T_A = 25°C$
LTS-6900HR/LTD-6900HR/LTC-561HR/LTC-571HR SERIES

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	Iv	800	2400		µcd	IF = 10 mA
Peak Emission Wavelength	λP		635		nm	IF = 20 mA
Spectral Line Half-Width	Δλ		45		nm	IF = 20 mA
Forward Voltage, any Segment or D.P.	VF		2.1	2.8	V	IF = 20 mA
Reverse Current, any Segment or D.P.	IR			100	µA	VR = 5 V
Luminous Intensity Matching Ratio	Iv-m			2:1		IF = 20 mA

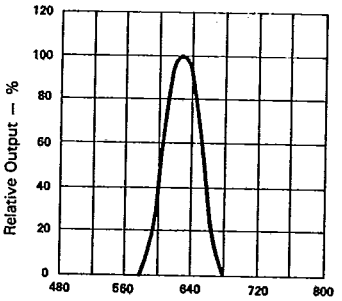
Note: The BIN brightness classification see page 6-160, category A except LTD-6910HR categorize A-1 and LTD-6950H/LTD-6940HR categorize A-2

TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES

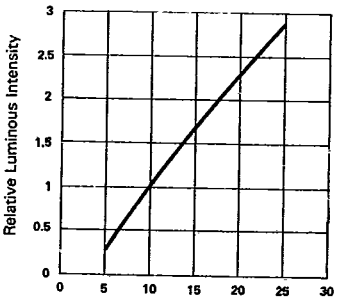
(25°C Ambient Temperature Unless Otherwise Noted)



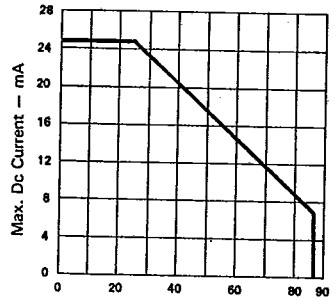
Forward Voltage (V_F) — Volts
Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.



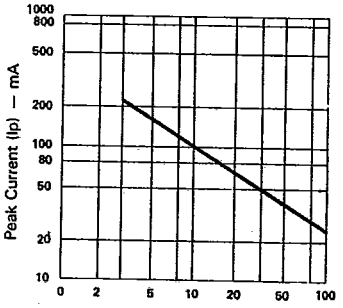
Wavelength (λ) — nm.
Fig. 2 SPECTRAL RESPONSE.



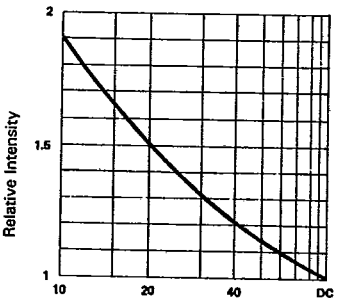
Forward Current (I_F) — mA
Fig. 3 RELATIVE, LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).



Ambient Temperature (Ta) — °C
Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.



Duty Cycle %
Fig. 5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE – F = 1 KHz)



Duty Cycle %
Fig. 6 LUMINOUS INTENSITY Vs. DUTY CYCLE% (AVERAGE I_F = 10mA PER SEG.)