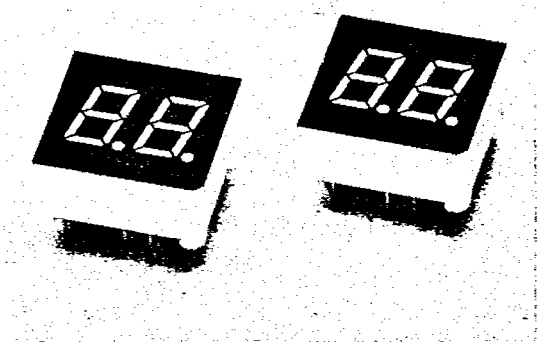
LITE-ON LED SPECIALIST

LTD-322/323 SERIES

0.3" DUAL DIGIT NUMERIC DISPLAYS

FEATURES

- 0.3 INCH (7.62mm) DIGIT HEIGHT.
- CONTINUOUS UNIFORM SEGMENTS.
- CHOICE OF THREE BRIGHT COLORS-RED/ BRIGHT RED/GREEN.
- LOW POWER REQUIREMENT.
- EXCELLENT CHARACTERS APPEARANCE.
- HIGH CONTRAST.
- HIGH BRIGHTNESS.
- WIDE VIEWING ANGLE.
- SOLID STATE RELIABILITY.
- COMMON ANODE OR COMMON CATHODE MODELS.
- TWO DIGIT PACKAGE SIMPLIFIES ALIGNMENTS & ASSEMBLY.
- LEADS ON .100" (2.54mm) CENTERS.
- CATEGORIZED FOR LUMINOUS INTENSITY.
- I.C. COMPATIBLE.
- EASY MOUNTING ON P.C. BOARD.



DESCRIPTION

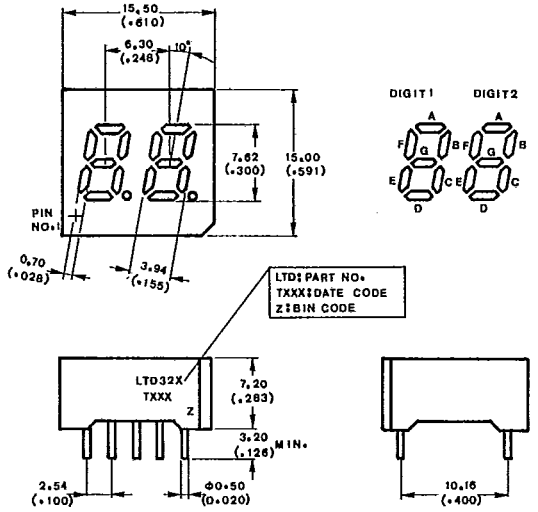
The LTD-322/323 series are 0.3 inch (7.62 mm) height dual digit displays.
The red series devices utilize LED chips which are made from GaAsP on a GaAs substrate. The bright red and green series devices utilize LED chips which are made from GaP on a transparent GaP substrate. Red, bright red and green displays have black face and white segment color.

SEVEN-SEGMENT LED DISPLAYS

DEVICES

PART NO. LTD–			DESCRIPTION	INTERNAL CIRCUIT DIAGRAM
RED	BRIGHT RED	GREEN		
322R	322P	322G	Common Cathode	A
323R	323P	323G	Common Anode	B

PACKAGE DIMENSIONS



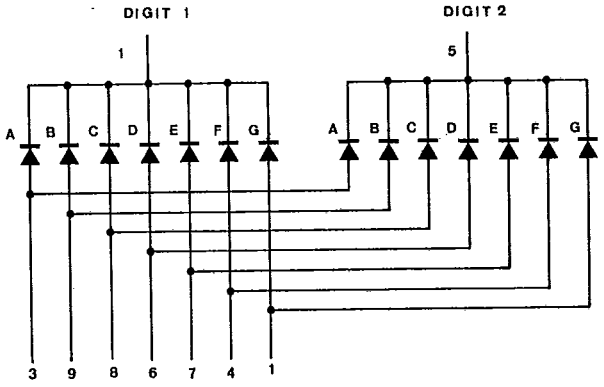
NOTE: All dimensions are in $\frac{\text{millimeters}}{\text{(inches)}}$, tolerance is $\frac{\text{0.25mm}}{\text{(0.010")}}$ unless otherwise noted.

PIN CONNECTION

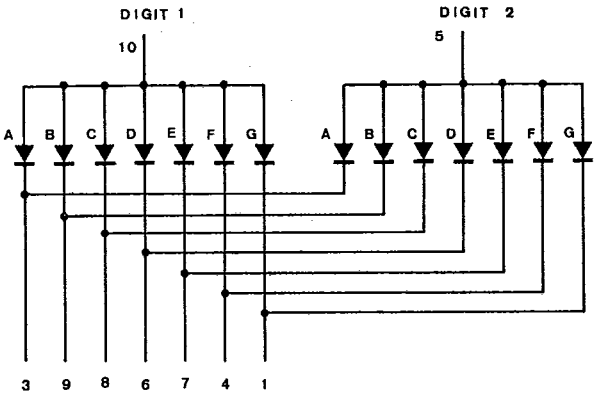
PIN NO.	CONNECTION	
	A. LTD-322	B. LTD-323
1	Anode G	Cathode G
2	No Pin	No Pin
3	Anode A	Cathode A
4	Anode F	Cathode F
5	Common Cathode (Digit 2)	Common Anode (Digit 2)
6	Anode D	Cathode D
7	Anode E	Cathode E
8	Anode C	Cathode C
9	Anode B	Cathode B
10	Common Cathode (Digit 1)	Common Anode (Digit 1)

INTERNAL CIRCUIT DIAGRAM

A. LTD-322



B. LTP-323



ABSOLUTE MAXIMUM RATINGS AT T_A = 25°C

PARAMETER	RED	BRIGHT RED	GREEN	UNIT
Power Dissipation Per Segment	55	40	75	mW
Peak Forward Current Per Segment (1/10 Duty Cycle, 0.1ms Pulse Width)	160	60	100	mA
Continuous Forward Current Per Segment	25	15	25	mA
Derating Linear From 25°C Per Segment	0.3	0.18	0.3	mA/°C
Reverse Voltage Per Segment	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
LTD-322R/323R

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	Iv	200	400		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
Reverse Current, 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 = 5V
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)

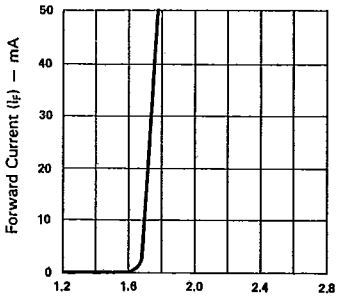


Fig.1 FORWARD CURRENT Vs. FORWARD VOLTAGE.

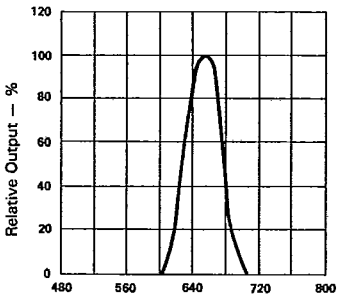


Fig. 2 SPECTRAL RESPONSE.

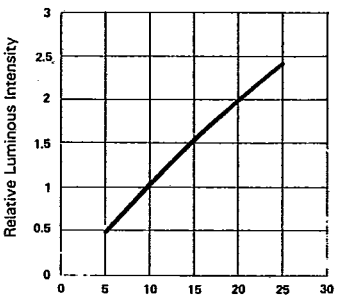


Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).

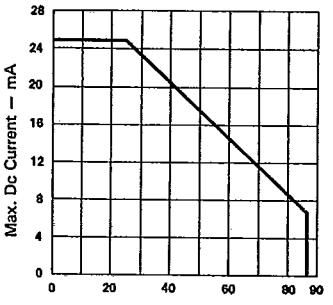


Fig.4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.

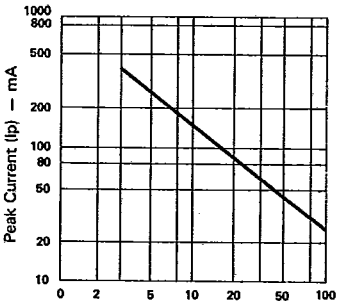


Fig.5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE — F = 1 KHz)

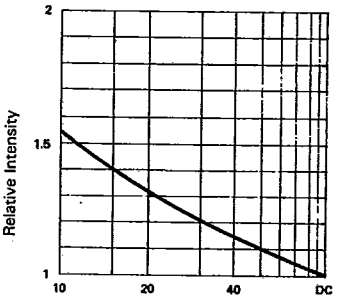


Fig.6 LUMINOUS INTENSITY Vs. DUTY CYCLE% (AVERAGE I_F = 10mA PER SEG.)

ELECTRICAL/OPTICAL CHARACTERISTICS AT T_A = 25°C
LTD – 322P/323P

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	Iv	250	650		μcd	I_F = 10 mA
Peak Emission Wavelength	λp		697		nm	I_F = 20 mA
Spectral Line Half-Width	Δλ		90		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 = 5V
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)

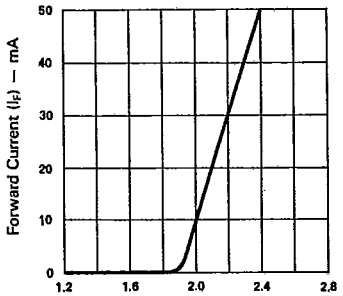


Fig.1 FORWARD CURRENT Vs. FORWARD VOLTAGE.

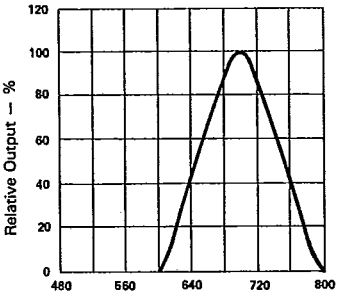


Fig. 2 SPECTRAL RESPONSE.

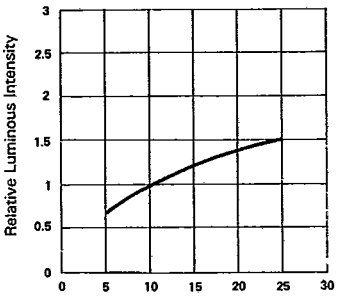


Fig. 3 RELATIVE, LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).

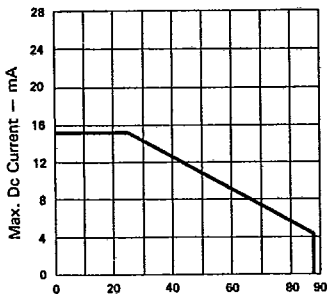


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.

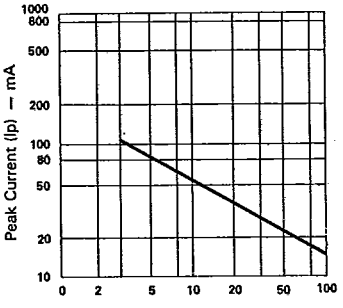


Fig.5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE – F = 1 KHz)

SEVEN-SEGMENT LED DISPLAYS

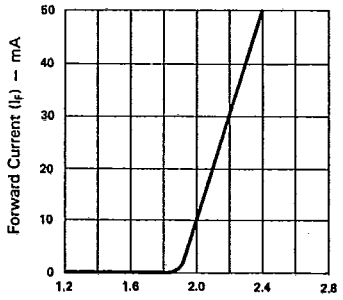
ELECTRICAL/OPTICAL CHARACTERISTICS AT T_A = 25°C
LTD-322G/323G

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	Iv	600	1600		μcd	I_F = 10 mA
Peak Emission Wavelength	λp		565		nm	I_F = 20 mA
Spectral Line Half-Width	Δλ		30		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 = 5V
Luminous Intensity Matching Ratio	Iv-m			2:1		I_F = 20 mA

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

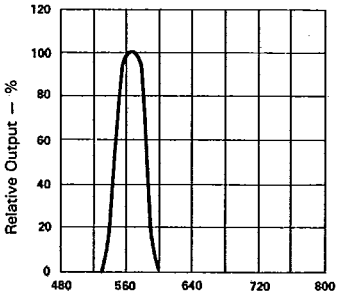
TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES

(25°C Ambient Temperature Unless Otherwise Noted)



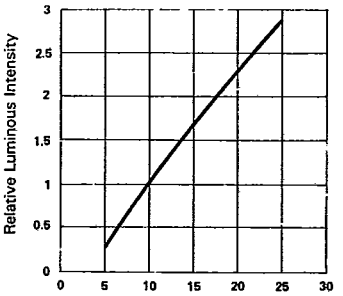
Forward Voltage (V_F) – Volts

Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.



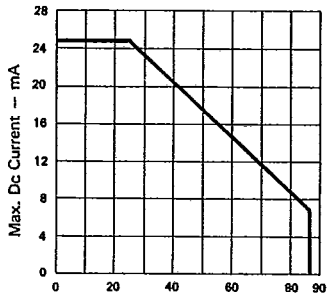
Wavelength (λ) – nm.

Fig. 2 SPECTRAL RESPONSE.



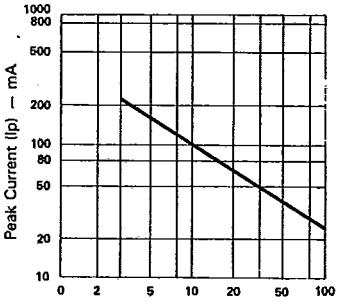
Forward Current (I_F) – mA

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



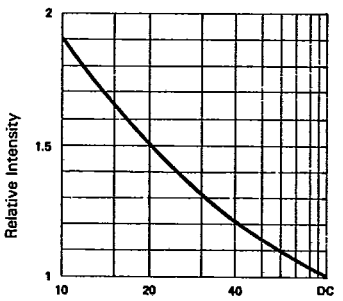
Ambient Temperature (Ta) – °C

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.)