



LITE-ON INC 09E D 5536367 0001308 0

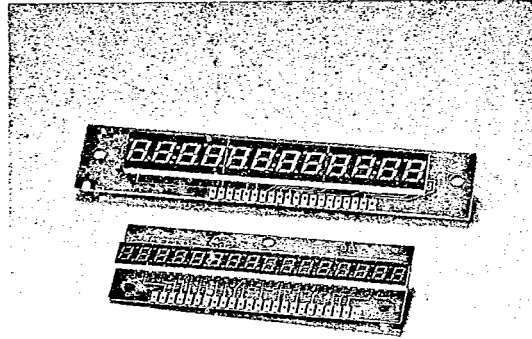
LTF 216141/804 SERIES

0.2" & 0.3" MULTI-DIGIT DISPLAYS

T-41-33

FEATURES

- 0.2 & 0.3 INCH (5.08mm/7.6mm) HEIGHT CHARACTER RED COLOR.
- COMMON CATHODE, MULTIPLEX PINOUT ARE AVAILABLE.
- CONTINUOUS UNIFORM SEGMENTS.
- WIDE ANGLE, LONG DISTANCE VIEWING.
- COLOR FILTER PROVIDES HIGH CONTRAST.
- LOW POWER REQUIREMENTS, HIGH RELIABILITY AND LONG LIFE.
- RED (GaAsP) 14 DIGIT LED CLOCK DISPLAY VERSION STANDARD BRIGHT RED (GaP) DISPLAY SUFFIX PARE AVAILABLE.



DESCRIPTION

The LTF-2000 Series devices are designed for viewing distance of up to two meters and for using in instrument, test equipment, communication equipment, business machines, computers, microprocessor . . . etc.

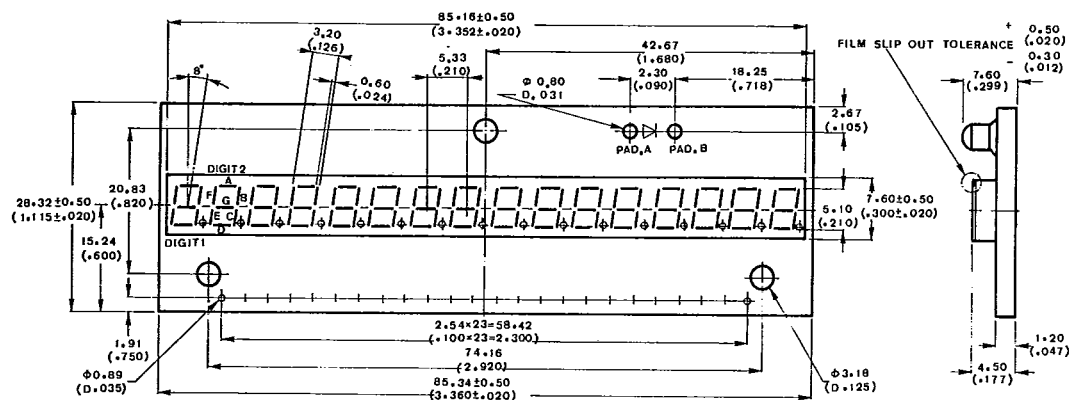
DEVICES

PART NO. LTF—	DESCRIPTION				D'SPLAY FONT	PACKAGE DEME- SION	PIN CONNEC- TION
	DRIVE		COLOR				
	FORM	CIRCUIT	BRIGHT RED	RED			
216141A1	C. C.	MPX		V	xBBBBBBBBBBBBBBx	A	A
216141A1P	C. C.	MPX	V		xBBBBBBBBBBBBBBx	A	A
804-12P	C. C.	MPX	V		BBBBBBBBBBBBBB.	B	B
804-12	C. C.	MPX		V	BBBBBBBBBBBBBB.	B	B
804-08P	C. C.	MPX	V		xxBBBBBBBBxx	B	B
804-08	C. C.	MPX		V	xxBBBBBBBBxx	B	B

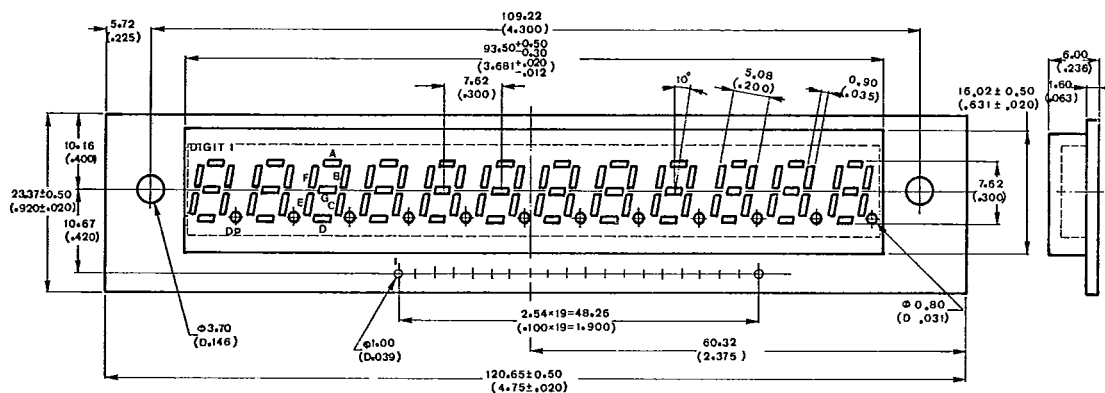
6-155 NOTES: 1. C.C.: common cathode 2. MPX: multiplex

PACKAGE DIMENSIONS

A. LTF-216141A1P



B. LTF-804



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



PIN CONNECTION

A. LTF-216141

PIN NO.	FUNCTION	PIN NO.	FUNCTION	PIN NO.	FUNCTION
1	Pad A Anode	9	Digit 7 Cathodes	17	Digit 11 Cathodes
2	Digit 2 Cathodes	10	Segment E Anode	18	Segment F Anode
3	Digit 3 Cathodes	11	Digit 8 Cathodes	19	Digit 12 Cathodes
4	Digit 4 Cathodes	12	Segment A Anode	20	Segment B Anode
5	Digit 5 Cathodes	13	Digit 9 Cathodes	21	Digit 13 Cathodes
6	Decimal Point Anode	14	Segment G Anode	22	Digit 14 Cathodes
7	Digit 6 Cathodes	15	Digit 10 Cathodes	23	Digit 15 Cathodes
8	Segment C Anode	16	Segment D Anode	24	Pad B Cathode

B. LTF-804-12

LTF-804-8

PIN	FUNCTION	PIN	FUNCTION	PIN	FUNCTION	PIN	FUNCTION
1	Digit 1 Cathodes	11	Digit 11 Cathodes	1	Nc	11	Nc
2	Digit 4 Cathodes	12	Segment A Anode	2	Digit 4 Cathodes	12	Segment A Anode
3	Digit 3 Cathodes	13	Segment B Anode	3	Digit 3 Cathodes	13	Segment B Anode
4	Digit 2 Cathodes	14	Segment C Anode	4	NC	14	Segment C Anode
5	Digit 5 Cathodes	15	Segment D Anode	5	Digit 5 Cathodes	15	Segment D Anode
6	Digit 6 Cathodes	16	Decimal Point Anodes	6	Digit 6 Cathodes	16	Decimal Point Anodes
7	Digit 7 Cathodes	17	Segment G Anode	7	Digit 7 Cathodes	17	Segment G Anode
8	Digit 8 Cathodes	18	Segment F Anode	8	Digit 8 Cathodes	18	Segment F Anode
9	Digit 9 Cathodes	19	Segment E Anode	9	Digit 9 Cathodes	19	Segment E Anode
10	Digit 10 Cathodes	20	Digit 12 Cathodes	10	Digit 10 Cathodes	20	Nc

ABSOLUTE MAXIMUM RATINGS AT $T_A = 25^\circ\text{C}$

PARAMETER	SYMBOL	RED	BRIGHT RED	GREEN	UNIT
Average Forward Current Per Segment/D.P. Direct Drive Current	I_{CF}	25	20	20	mA
Peak Forward Current Per Segment D.P. (Duty 1/10 1 KHz)	I_{PF}	200	150	150	mA
Continuous Forward Current Duplex Circuit (Duty 1/2)	I_F /pulse	30	30	30	mA
Reverse Voltage (Segment of Decimal Point)	V_R	5	5	5	V
Operating Temperature Range	T_{opr}	-25°C to 60°C			
Storage Temperature Range	T_{stg}	-25°C to 70°C			
Derating Linear From 25°C	P_D	2.0	2.4	2.4	mW
Derating Linear From 25°C		0.35	0.42	0.42	$\text{mA}/^\circ\text{C}$
Max Solder Temperature 260°C C From 3 Seconds at 2mm From the Case or Reflector Edge					

NOTE: Caution

Please be careful of the following.

- 1) Avoid washing the LED DISPLAY in water.
- 2) Except for the printed wiring board, Avoid heating the LED DISPLAY over MAXIMUM RATING.
- 3) Avoid using chemicals except for the following, when washing off flux and wiping off stain on surface of the LED DISPLAY

Freon TE or TF
Methyl or Ethyl Alcohol
Dai-Fron Solvent S3 or S3-E

ELECTRICAL/OPTICAL CHARACTERISTICS AT $T_A = 25^\circ\text{C}$

PARAMETER	SYMBOL	DEVICES	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Luminous Intensity	I_v	RED	35	70		μcd	$I_F = 10\text{ mA}$
		BRIGHT RED	40	80			
Peak Emission Wavelength	λ_P	RED	630	655	680	nm	$I_F = 20\text{ mA}$
		BRIGHT RED		697			
Spectral Line Half-Width	$\Delta\lambda$	RED		24		nm	$I_F = 20\text{ mA}$
		BRIGHT RED		90			
Forward Voltage	V_F	RED		1.7	2.2	V	$I_F = 20\text{ mA}$
		BRIGHT RED		2.1	2.8		
Reverse Current	I_R	RED			100	μA	$V_R = 5\text{V}$
		BRIGHT RED			100		
Luminous Intensity Matching Ratio	I_{vm}	All Model			2:1		$I_F = 10\text{ mA}$



TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES

(25°C Ambient Temperature Unless Otherwise Noted)

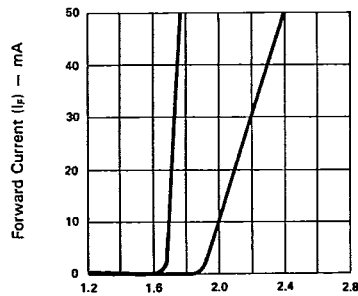


Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.

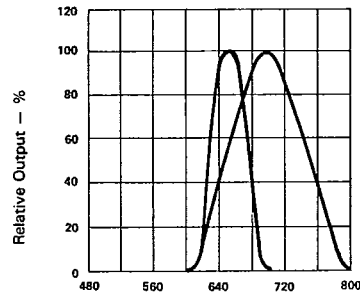


Fig. 2 SPECTRAL RESPONSE.

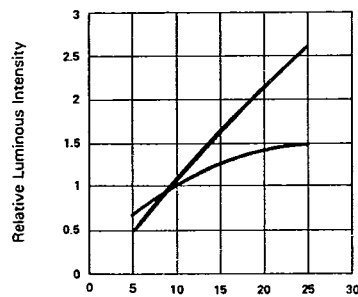


Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).

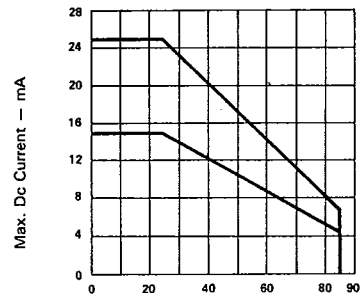
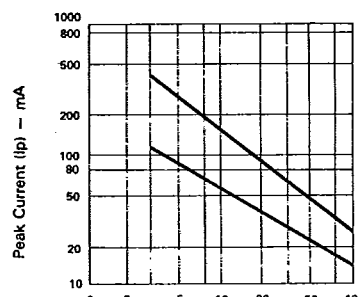
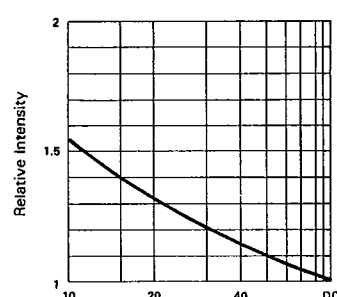


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.

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.)

- NOTES: 1. Clean only in water, isopropanol, ethanol, freon TF (or equivalent).
 2. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE (Commission Internationale De L'Eclairage) eye-response curve.
 3. The average luminous intensity is obtained by summing the luminous intensity of each segment and dividing by the total number of segments. The displays are categorized for luminous intensity with the intensity category designated by a letter located on the side of the package. The BIN brightness classification is as follows:

CATEGORY A:

BIN CODE	A	B	C	D	E	F	G	H	J	K	L
RANGE (μcd)	68~ 156	104~ 252	168~ 408	272~ 648	432~ 1044	696~ 1668	1112~ 2832	1888~ 4524	3016~ 7236	4820~ 11568	7712~ 16325

CATEGORY A-1:

BIN CODE	A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	F1	F2
RANGE (μcd)	60.8~ 114	76.8~ 144	96.8~ 186	124.8~ 240	168~ 324	216.8~ 408	272.8~ 516	344.8~ 648	432.8~ 816	544.8~ 1046.4	696.8~ 1320	880.8~ 1668

BIN CODE	G1	G2	H1	H2	J1	J2	K1	K2	L1
RANGE (μcd)	1112.8~ 2160	1440.8~ 2832	1888.8~ 3600	2400.8~ 4524	3016.8~ 5724	3816.8~ 7200	4800.8~ 9120	6080.8~ 11568	7712.8~ 14673.6

CATEGORY A-2:

BIN CODE	A1	A2	B1	B2	C1	C2	D1	D2	E1
RANGE (μcd)	60.8~ 114	76.8~ 144	96.8~ 186	124.8~ 204	168~ 324	216.8~ 408	272.8~ 516	344.8~ 648	432.8~ 816

BIN CODE	F1	F2	G1	G2	J1	J2	K1	K2	L1
RANGE (μcd)	544.8~ 1046.4	880.8~ 1800	1200.8~ 2760	1840.8~ 4524	3016.8~ 5724	3816.8~ 7200	4800.8~ 9120	6080.8~ 11568	7712~ 14673.6

CATEGORY B:

BIN CODE	B	C	D	E	F	G	H
RANGE (μcd)	40~ 94.8	64~ 150	100.8~ 240	160.8~ 384	256.8~ 600	400.8~ 960	640.8~ 1560

BIN CODE	J	K	L	M	N	P	Q
RANGE (μcd)	1040.8~ 2520	1680.8~ 4080	2720.8~ 6480	4320.8~ 10320	6880.8~ 16440	10960.8~ 26184	17456~ 41700

CATEGORY B-1:

BIN CODE	C1	C2	D1	D2	E1	E2	F1	F2	G1
RANGE (μcd)	64~ 120	80.8~ 150	100.8~ 192	128.8~ 240	160.8~ 300	200.8~ 384	256.8~ 480	320.8~ 600	400.8~ 756

BIN CODE	G2	H1	H2	J1	J2	K1	K2	L1
RANGE (μcd)	504.8~ 960	640.8~ 1224	816.8~ 1560	1040.8~ 1980	1320.8~ 2520	1680.8~ 3216	2144.8~ 4080	2720.8~ 5160

BIN CODE	L2	M1	M2	N1	N2	P1	P2	Q1
RANGE (μcd)	3440.8~ 6480	4320.8~ 8220	5480.8~ 10320	6880.8~ 13080	8720.8~ 16440	10960.8~ 20760	13840.8~ 26184	17456~ 33024



CATEGORY C:

BIN CODE	7	8	9	10	11	12	13	14
RANGE (μ cd)	384~ 756	504.8~ 984	656.8~ 1272	848.8~ 1644	1096.8~ 2136	1424.8~ 2796	1864.8~ 3648	2432.8~ 4800

BIN CODE	15	16	17	18	19	20	21
RANGE (μ cd)	3200.8~ 6240	4160.8~ 8160	5440.8~ 10668	7112.8~ 13860	9240.8~ 18000	12000.8~ 23400	15600~ 30420

CATEGORY G:

BIN CODE	E	F	G	H	J	K	L	M	L
RANGE (μ cd)	1.6~ 3.84	2.64~ 6	4.08~ 9.6	6.48~ 15.6	10.48~ 25.2	16.88~ 40.8	27.28~ 65.28	43.6~ 104.4	69.6~ 166.56