

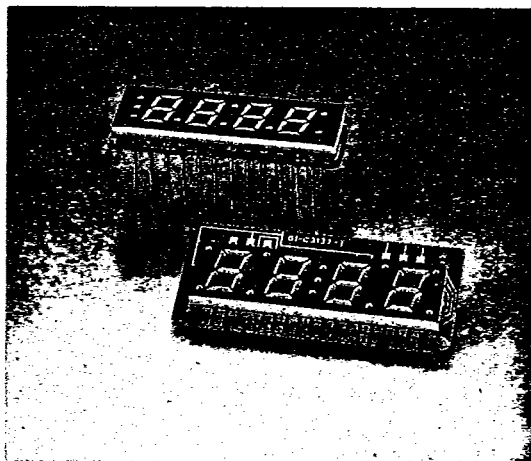


## LTC-3000 SERIES

### 0.3" FOUR DIGIT LED CLOCK FREQUENCY DISPLAYS

#### FEATURES

- 0.3 INCH (7.62 mm) HEIGHT CHARACTER RED OR GREEN COLOR.
- COMMON CATHODE, COMMON ANODE; DIRECT, DUPLEX AND MULTIPLEX PIN OUT ARE AVAILABLE.
- FLEXIBLE TO SELECT BOTH 12/24 HOURS AND FULL FEATURE.
- CONTINUOUS UNIFORM SEGMENTS.
- WIDE ANGLE, LONG DISTANCE VIEWING.
- COLOR FILTER PROVIDES HIGH CONTRAST.
- LOW POWER REQUIREMENTS, HIGH RELIABILITY AND LONG LIFE.
- PRACTICAL BRIGHTNESS ARE OBTAINED AT ABOUT 8MA/SEGMENT DIRECT DRIVE; 20MA (WITH 1/2 DUTY RATIO) FOR DUPLEX DRIVE; 50MA (WITH 1/2 DUTY RATIO) FOR MULTIPLEX DRIVE.
- RED (GaASP) 4 DIGIT LED COLOCK DISPLAY VERSION STANDARD [GREEN (GaP) DISPLAY SUFFIX G, BRIGHT RED (GaP) DISPLAY-SUFFIX P ARE AVAILABLE].



#### DESCRIPTION

The LTC-3000 Series devices are designed for viewing distance of up to two meters and for using in instrument, test equipment, communication equipment, business machines, computers, micro processor . . . etc.

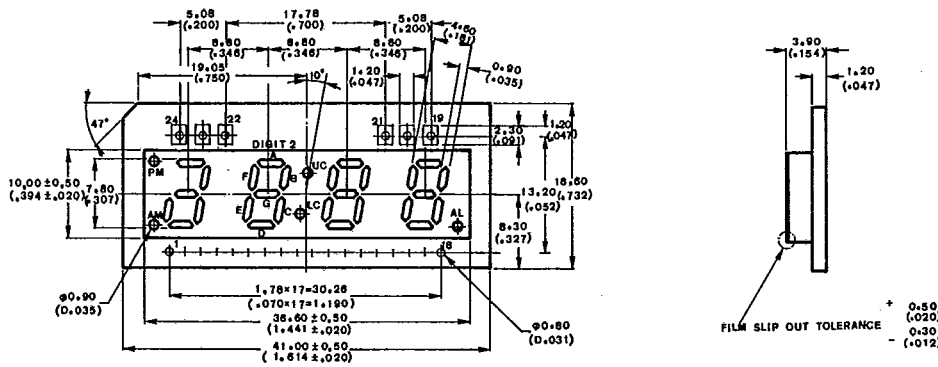
PART NO. LTC-	DESCRIPTION				PIN OUT				INTERNAL CIRCUIT DIAGRAM	PACKAGE DIMENSION
	DRIVE		COLOR		SEG A.G.D. E.F. OF 1ST DIGIT	ALARM		AM / PM		
	FORM	CIRCUIT	BRIGHT RED	GREEN		UP	LOW			
3137A1P-12	C.C.	DPX	V		NO		V	V/V	A	A
3137A1G-12	C.C.	DPX		V	NO		V	V/V	A	A
3137A1P-24	C.C.	DPX	V		A.G.D.E.		V		A	A
3137A1G-24	C.C.	DPX		V	A.G.D.E.		V		A	A
3702SP	C.C.	MPX	V		A.G.D.E.F.	V	V	V/V	B	B
3702SG	C.C.	MPX		V	A.G.D.E.F.	V	V	V/V	B	B
3708SP	C.C.	MPX	V		A.G.D.E.F.	V		V/V	C	C
3708SG	C.C.	MPX		V	A.G.D.E.F.	V		V/V	C	C
3808SP	C.A.	D.D.		V	NO	V	V	V/V	D	D
3808SG	C.A.	D.D.		V	NO	V	V	V/V	D	D

PART NO. LTC-	DESCRIPTION				PIN OUT			INTERNAL CIRCUIT DIAGRAM	PACKAGE DIMENSION	
	DRIVE		COLOR		SEG A.G.D. E.F. OF 1ST DIGIT	ALARM				AM / PM
	FORM	CIRCUIT	BRIGHT RED	GREEN		UP	LOW			
3868A1P-12	C.C.	D.D.	V		NO		V	V/V	E	E
3868A1G-12	C.C.	D.D.		V	NO		V	V/V	E	E
3881P	C.C.	MPX	V		YES			/	F	F
3881G	C.C.	MPX		V	YES			/	F	F
3882G	C.A.	MPX		V	YES			/	G	G
3882P	C.A.	MPX	V		YES			/	G	G

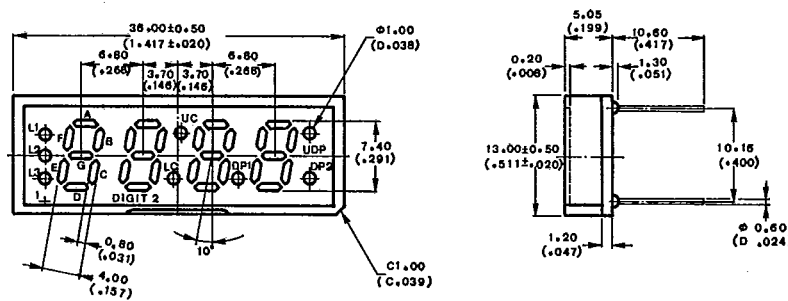
NOTES: 1. C.A.: common anode C.C.: common cathode 2. MPX: multiplex DPX.: duplex D.D.: direct drive

PACKAGE DIMENSIONS

A. LTC-3137A1 x Series



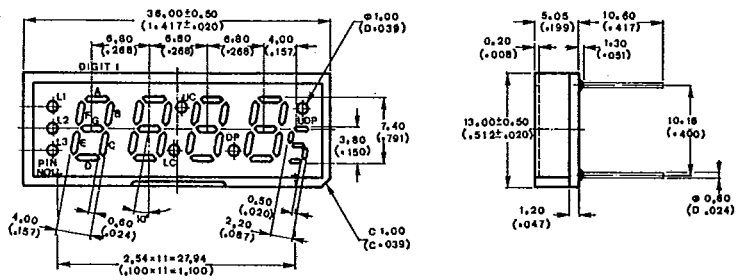
B. LTC-3702S x Series



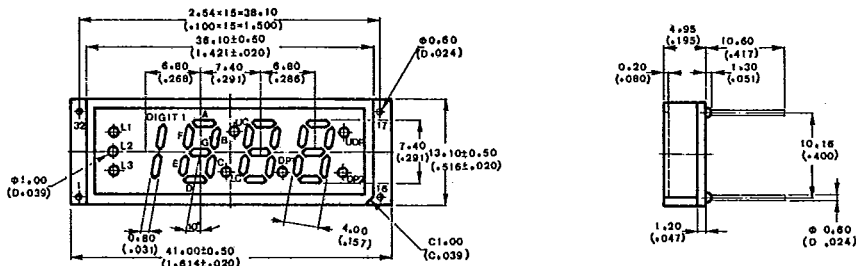
LED CLOCK & FREQUENCY DISPLAYS

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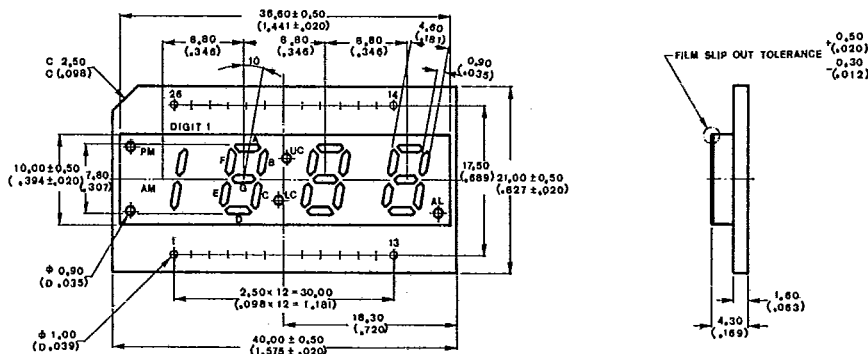
C. LTC-3708S x Series



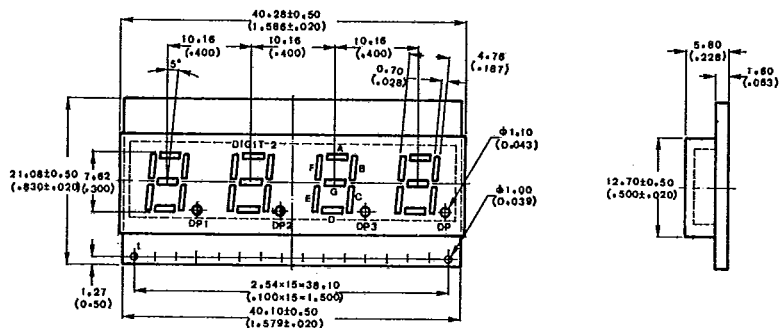
D. LTC-3808S x Series



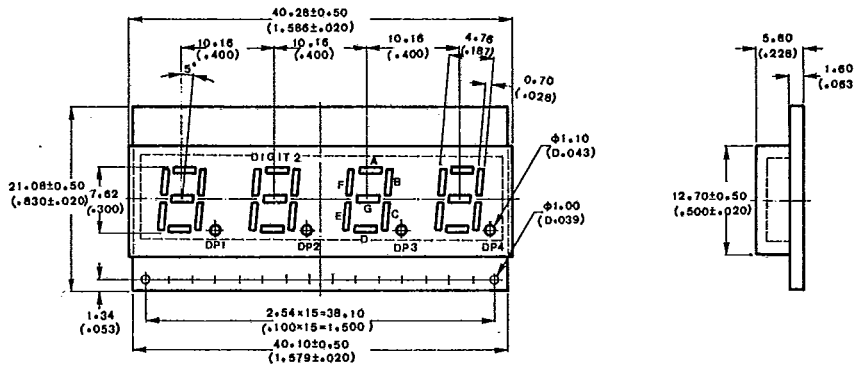
E. LTC-3868A1 x Series



F. LTC-3881 x Series



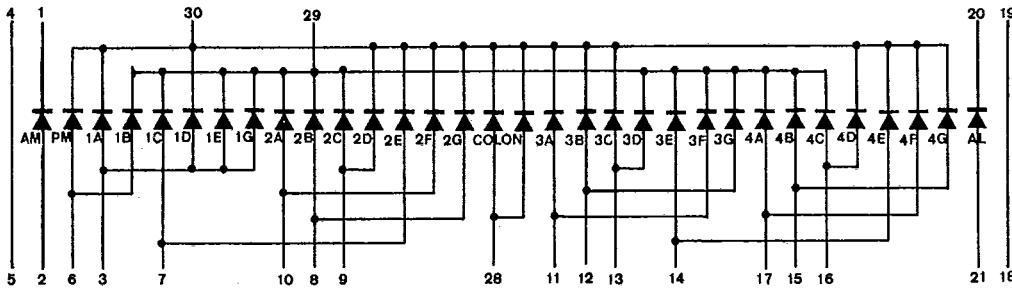
G. LTC-3882 x Series



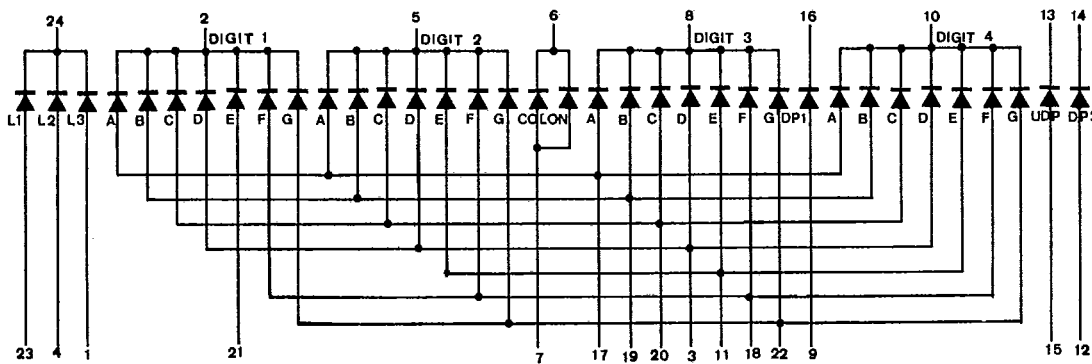
NOTE: All dimensions are in  $\frac{\text{millimeters}}{\text{(inches)}}$  tolerance is  $\frac{0.25\text{mm}}{(0.010'')}$  unless otherwise noted.

INTERNAL CIRCUIT DIAGRAM

A. LTC-3137

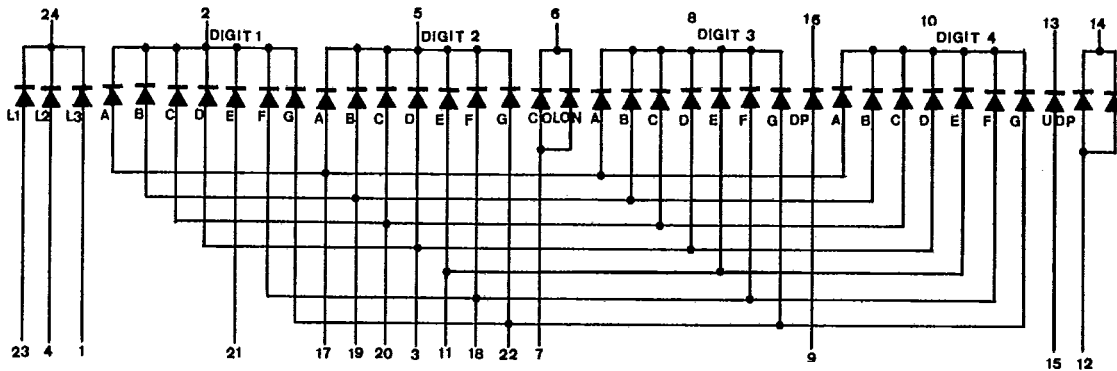


B. LTC-3702

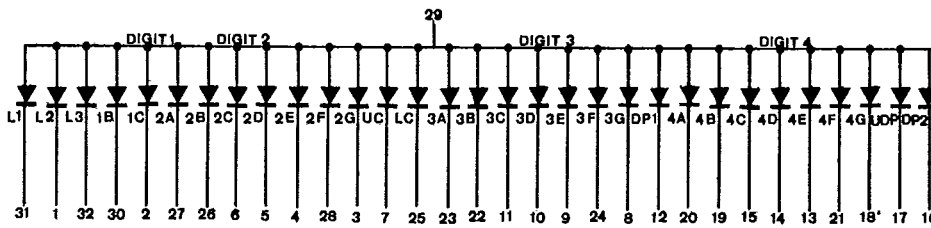


LED CLOCK &  
FREQUENCY DISPLAYS

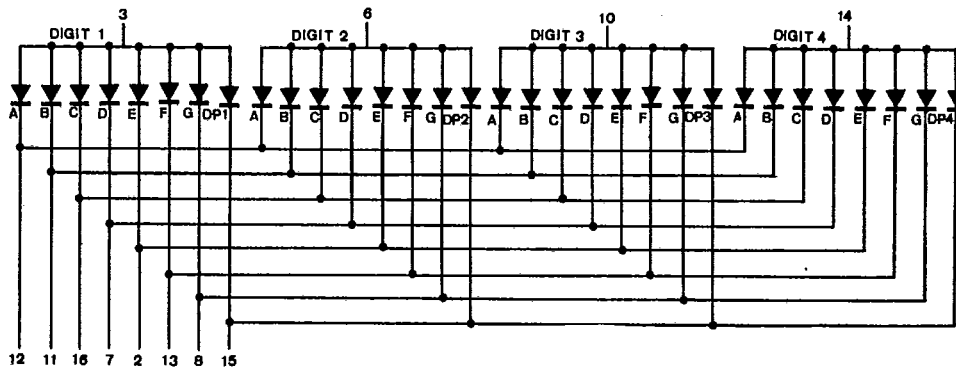
C. LTC-3708



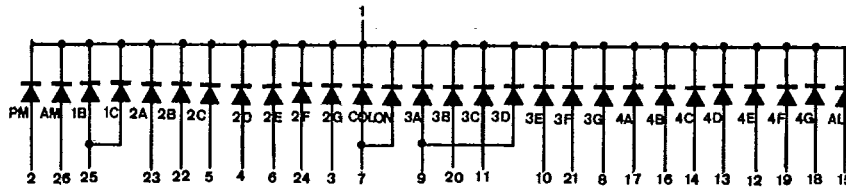
D. LTC-3808S x Series



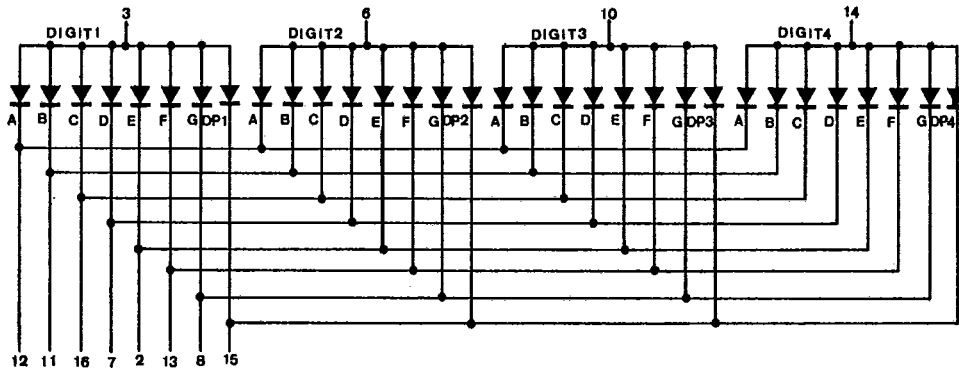
F. LTC-3881



E. LTC-3768  
3868



G. LTC-3882



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LED CLOCK &  
FREQUENCY DISPLAYS

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 or 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	$P_D$	2.4	2.4	2.4	mW
Derating Linear From 25°C		0.35	0.42	0.42	mA/°C
Max. Solder Temperature 260°C For 3 Seconds at 2 mm 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-From 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	80		$\mu\text{cd}$	$I_F = 10\text{ mA}$
		BRIGHT RED	65	155			
		GREEN	90	220			
Peak Emission Wavelength	$\lambda_p$	RED	630	655	680	nm	$I_F = 20\text{ mA}$
		BRIGHT RED		697			
		GREEN		565			
Spectral Line Half-Width	$\Delta\lambda$	RED		24		nm	$I_F = 20\text{ mA}$
		BRIGHT RED		90			
		GREEN		30			
Forward Voltage	$V_F$	RED		1.7	2.2	V	$I_F = 20\text{ mA}$
		BRIGHT RED		2.1	2.8		
		GREEN		2.1	2.8		
Reverse Current	$I_R$	RED			100	$\mu\text{A}$	$V_R = 5\text{ V}$
		BRIGHT RED			100		
		GREEN			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)

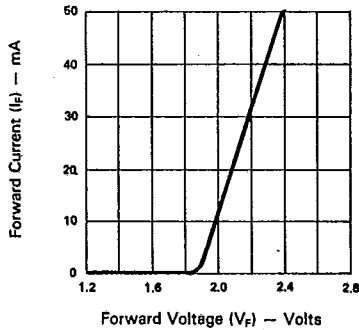


Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.

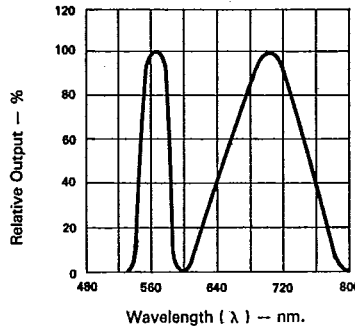


Fig. 2 SPECTRAL RESPONSE.

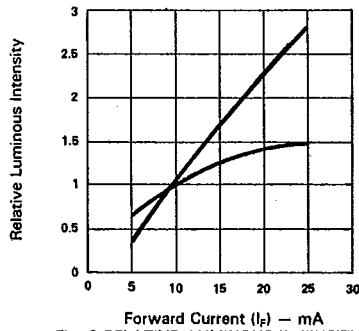


Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).

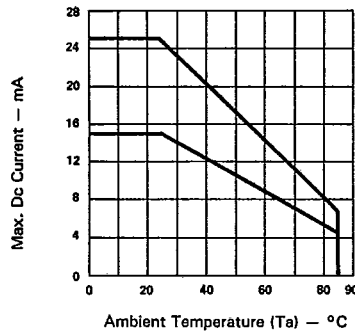


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.

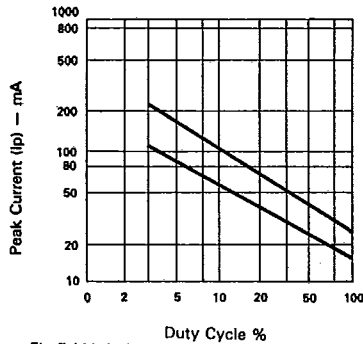


Fig. 5 MAX. PEAK CURRENT Vs. DUTY CYCLE.%. (REFRESH RATE - F = 1 KHz)

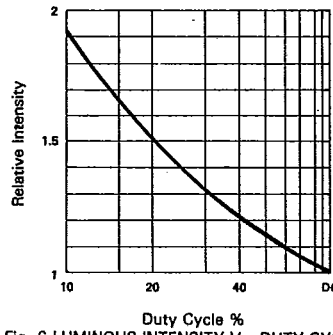


Fig. 6 LUMINOUS INTENSITY Vs. DUTY CYCLE.%. (AVERAGE I\_f = 10mA PER SEG.)

LED CLOCK & FREQUENCY DISPLAYS