



LTS- 30301/30801 30302A/30802A SERIES

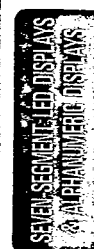
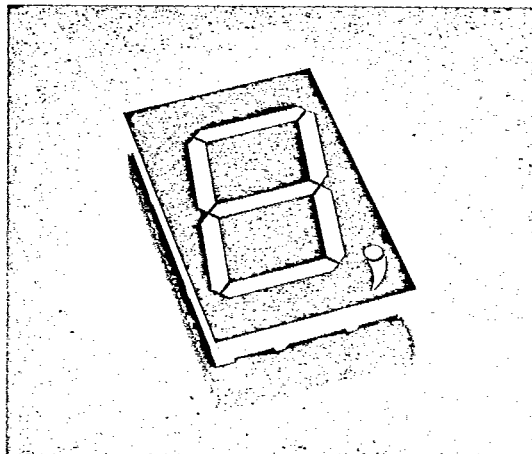
3 INCH SINGLE COLOR & MULTICOLOR ULTRA LARGE SINGLE DIGIT LED NUMERICAL DISPLAY

LITE-ON INC

31E D 5536367 0002322 9 LTN

FEATURES

- 3 INCH (76.2mm) ULTRA LARGE DIGIT.
- CONTINUOUS UNIFORM SEGMENTS.
- LOW POWER REQUIREMENT.
- EXCELLENT CHARACTERS APPEARANCE HIGH CONTRAST.
- HIGH BRIGHTNESS.
- WIDE VIEWING ANGLE.
- SOLID STATE RELIABILITY.
- CATEGORIZED FOR LUMINOUS INTENSITY.
- I.C. COMPATIBLE.
- EASY MOUNTING ON P.C. BOARD.
- SINGLE COLOR DISPLAYS HAVE THE CHOICE OF TWO BRIGHT COLORS - GREEN/HIGH EFFICIENCY RED.
- MULTICOLOR DISPLAYS ARE APPLICABLE TO THREE BRIGHT COLORS - GREEN, ORANGE AND YELLOW (GREEN AND ORANGE MIXED).



DESCRIPTION

The LTS-30000 series are 3 inch (76.2mm) height ultra large single digit displays.

The LTS-30301/30801 series are single color displays. The green displays have black face and green segment color, the high efficiency red displays have black face and red segment color.

The LTS-30302A/30802A are multicolor displays. The multicolor displays have black face and white segment color.

The green series utilize LED chips which are made from GaP on a transparent GaP substrate. The high efficiency red series devices utilize LED chips which are made from GaAsP on a transparent GaP substrate.

DEVICES

PART NO. LTS--			DESCRIPTION	PACKAGE DIMENSION	INTERNAL CIRCUIT DIAGRAM
GREEN	HI-EFF. RED	MULTI-COLOR			
30301G	30301HRB	—	Common Cathode	A	A
30801G	30801HRB	—	Common Anode	A	B
—	—	30302A	Common Cathode	B	C
—	—	30802A	Common Anode	B	D

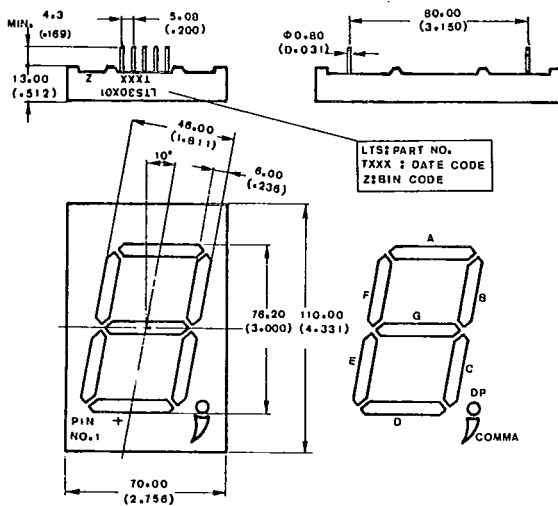
5-20

683

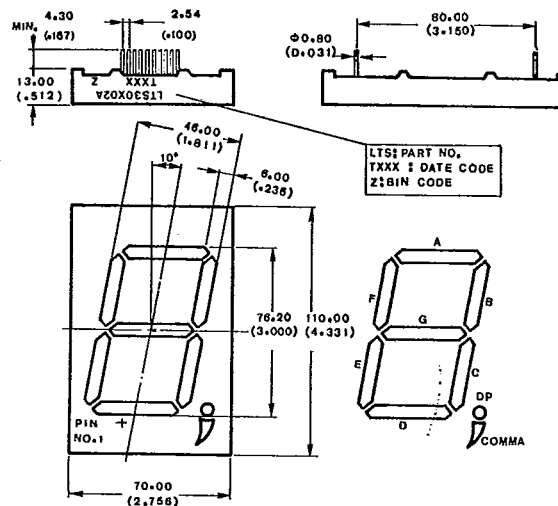
T-41-33

PACKAGE DIMENSIONS

A. LTS-30301/30801



B. LTS-30302A/30802A



NOTE: All dimensions are in $\frac{\text{millimeters}}{\text{(inches)}}$ tolerance are:

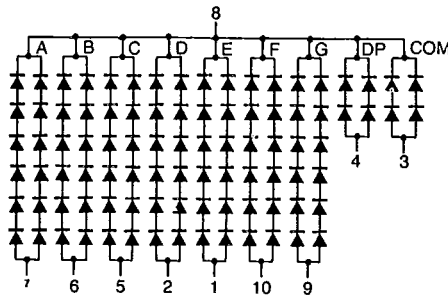
1. Lead length (from seating plane): minimum value $\frac{+1.00}{-0.00}$ mm $\frac{+0.040''}{-0.000''}$ 2. ± 0.25 mm $\frac{0.010''}{(0.010'')}$ unless otherwise noted.

PIN CONNECTION

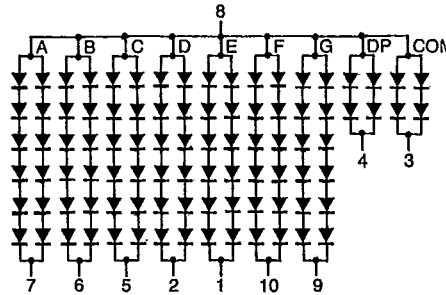
PIN NO.	CONNECTION			
	LTS-30301	LTS-30801	LTS-30302A	LTS-30802A
1	Segment E Anode	Segment E Cathode	Anode E, Green	Cathode E, Green
2	Segment D Anode	Segment D Cathode	Anode E, Orange	Cathode E, Orange
3	Comma Anode	Comma Cathode	Anode D, Green	Cathode D, Green
4	D. P. Anode	D. P. Cathode	Anode D, Orange	Cathode D, Orange
5	Segment C Anode	Segment C Cathode	Anode Comma, Green	Cathode Comma, Green
6	Segment B Anode	Segment B Cathode	Anode Comma, Orange	Cathode Comma, Orange
7	Segment A Anode	Segment A Cathode	Anode DP, Green	Cathode DP, Green
8	Common Cathode	Common Anode	Anode DP, Orange	Cathode DP, Orange
9	Segment G Anode	Segment G Cathode	Anode C, Green	Cathode C, Green
10	Segment F Anode	Segment F Cathode	Anode C, Orange	Cathode C, Orange
11			Anode B, Green	Cathode B, Green
12			Anode B, Orange	Cathode B, Orange
13			Anode A, Green	Cathode A, Green
14			Anode A, Orange	Cathode A, Orange
15			Cathode Common, Green	Anode Common, Green
16			Cathode Common, Orange	Anode Common, Orange
17			Anode F, Green	Cathode F, Green
18			Anode F, Orange	Cathode F, Orange
19			Anode G, Green	Cathode G, Green
20			Anode G, Orange	Cathode G, Orange

INTERNAL CIRCUIT DIAGRAM

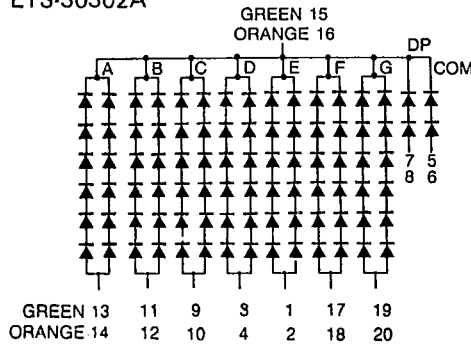
A. LTS-30301



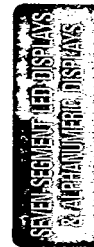
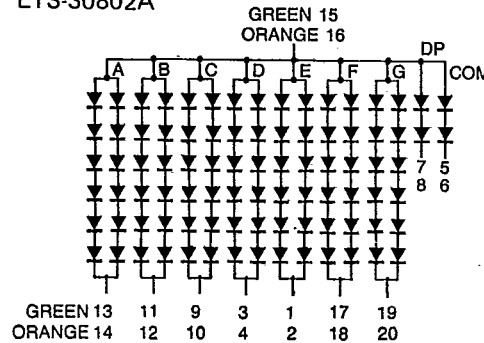
B. LTS-30801



C. LTS-30302A



D. LTS-30802A

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

PARAMETER	30x01		30x02A		UNIT
	GREEN	HI.-EFF. RED	GREEN	ORANGE	
Power Dissipation Per Segment	650	650	330	330	mW
Peak Forward Current Per Segment (1/10 Duty Cycle, 0.1ms Pulse Width)	160	160	80	80	mA
Continuous Forward Current Per Segment	40	40	20	20	mA
Derating Linear From 25°C Per Segment	0.48	0.48	0.24	0.24	mA/°C
Reverse Voltage Per Segment	30	30	30	30	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					

T-41-33

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

LTS-30301G/30801G

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	I_v	12	30		mcd	$I_F = 20\text{ mA}$
Peak Emission Wavelength	λ_p		565		nm	$I_F = 40\text{ mA}$
Spectral Line Half-Width	$\Delta\lambda$		30		nm	$I_F = 40\text{ mA}$
Forward Voltage, any Segment (D.P.)	V_F		12.6 (4.2)	16.8 (5.6)	V	$I_F = 40\text{ mA}$
Reverse Current, any Segment	I_R			200	μA	$V_R = 30\text{V}$
Luminous Intensity Matching Ratio	$I_v\text{-m}$			2:1		$I_F = 40\text{ mA}$

TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES

(25°C Ambient Temperature Unless Otherwise Noted)

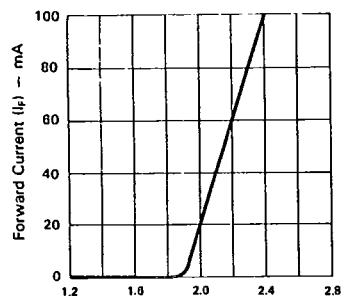


Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.

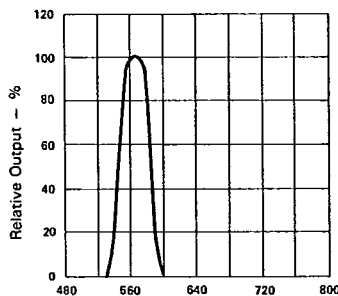


Fig. 2 SPECTRAL RESPONSE.

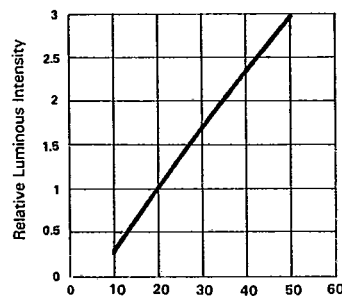


Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).

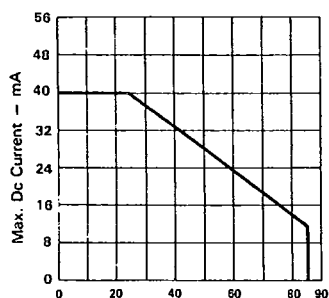


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.

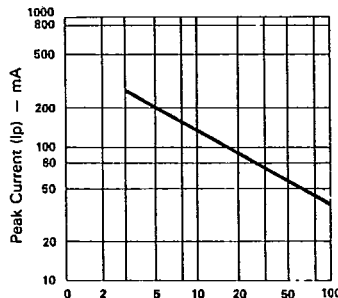
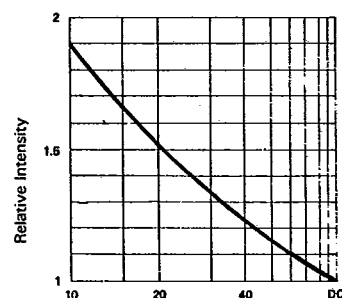


Fig. 5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE - F = 1 KHz)

Fig. 6 LUMINOUS INTENSITY Vs. DUTY CYCLE.% (AVERAGE $I_F = 10\text{mA}$ PER SEG.)

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

LTS-30301 HRB/30801 HRB

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	I_v	12	30		mcd	$I_F = 20\text{ mA}$
Peak Emission Wavelength	λ_P		635		nm	$I_F = 40\text{ mA}$
Spectral Line Half-Width	$\Delta\lambda$		40		nm	$I_F = 40\text{ mA}$
Forward Voltage, any Segment (D.P.)	V_F		12.6 (4.2)	16.8 (5.6)	V	$I_F = 40\text{ mA}$
Reverse Current, any Segment	I_R			200	μA	$V_R = 30\text{V}$
Luminous Intensity Matching Ratio	$I_v\text{-m}$			2:1		$I_F = 40\text{ mA}$

TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES

(25°C Ambient Temperature Unless Otherwise Noted)

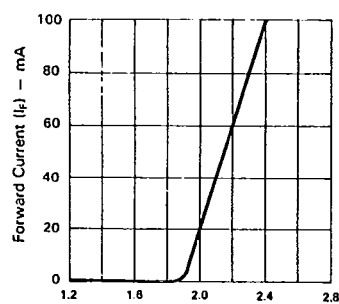


Fig. 1 FORWARD CURRENT VS. FORWARD VOLTAGE.

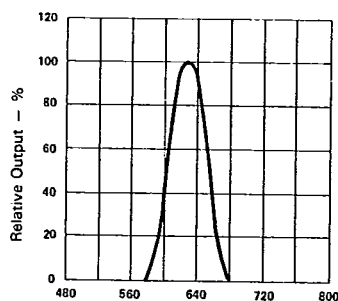


Fig. 2 SPECTRAL RESPONSE.

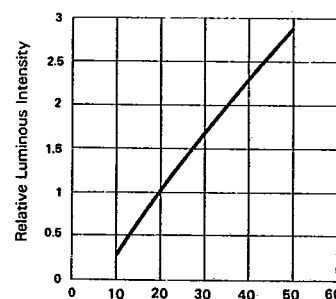


Fig. 3 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT (PER SEGMENT).

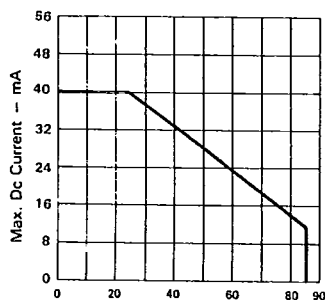
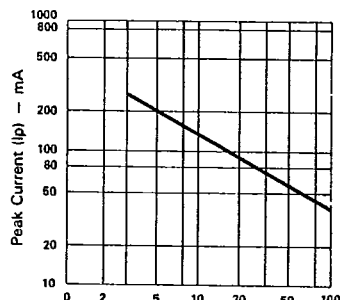
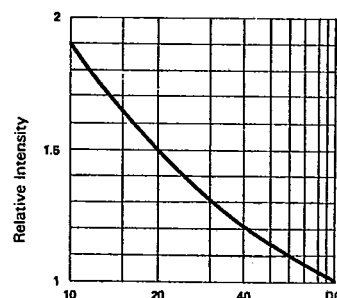


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. VS AMBIENT TEMPERATURE.

Fig. 5 MAX. PEAK CURRENT VS. DUTY CYCLE. % (REFRESH RATE - $F = 1\text{ KHz}$)Fig. 6 LUMINOUS INTENSITY VS. DUTY CYCLE. % (AVERAGE $I_F = 10\text{ mA PER SEG.}$)SEVEN SEGMENT LED DISPLAYS
& ALPHANUMERIC DISPLAYS

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

LTS-30302A/30802A (GREEN)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	I_v	6	15		mcd	$I_F = 10\text{ mA}$
Peak Emission Wavelength	λ_p		565		nm	$I_F = 20\text{ mA}$
Spectral Line Half-Width	$\Delta\lambda$		30		nm	$I_F = 20\text{ mA}$
Forward Voltage, any Segment (D.P.)	V_F		12.6 (4.2)	16.8 (5.6)	V	$I_F = 20\text{ mA}$
Reverse Current, any Segment	I_R			100	μA	$V_R = 30\text{V}$
Luminous Intensity Matching Ratio	$I_v\text{-m}$			2:1		$I_F = 20\text{ mA}$

TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES

(25°C Ambient Temperature Unless Otherwise Noted)

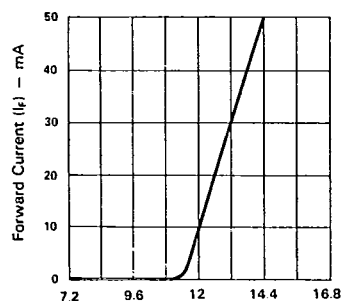


Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.

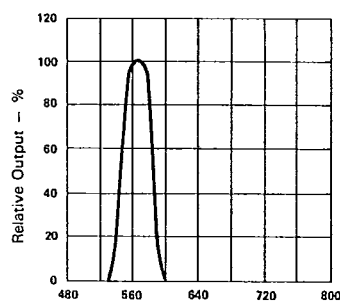


Fig. 2 SPECTRAL RESPONSE.

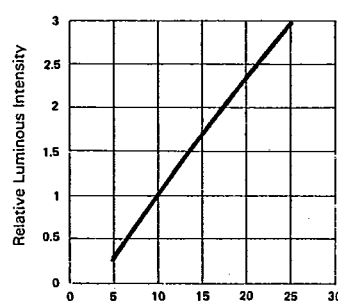


Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).

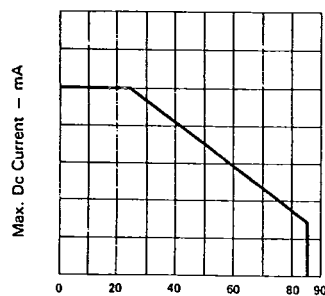


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.

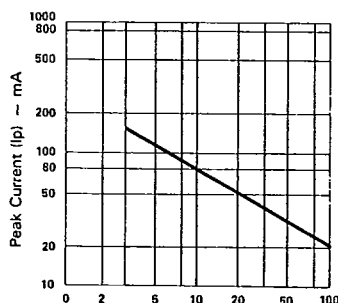
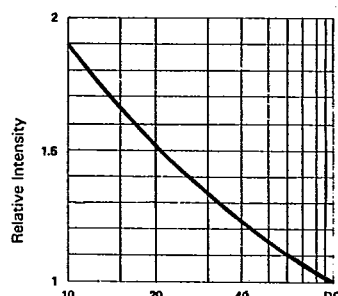


Fig. 5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE - F = 1 KHz)

Fig. 6 LUMINOUS INTENSITY Vs. DUTY CYCLE.% (AVERAGE $I_F = 10\text{mA}$ PER SEG.)

T-41-33

ELECTRICAL/OPTICAL CHARACTERISTICS AT $T_A = 25^\circ\text{C}$ LTS-30302A/30802A (ORANGE)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	I_v	6	15		mcd	$I_F = 10\text{ mA}$
Peak Emission Wavelength	λ_p		630		nm	$I_F = 20\text{ mA}$
Spectral Line Half-Width	$\Delta\lambda$		40		nm	$I_F = 20\text{ mA}$
Forward Voltage, any Segment (D.P.)	V_F		12.6 (4.2)	16.8 (5.6)	V	$I_F = 20\text{ mA}$
Reverse Current, any Segment	I_R			100	μA	$V_R = 30\text{V}$
Luminous Intensity Matching Ratio	$I_v\text{-m}$			2:1		$I_F = 20\text{ mA}$

TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES

(25°C Ambient Temperature Unless Otherwise Noted)

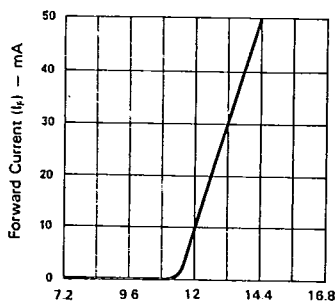


Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.

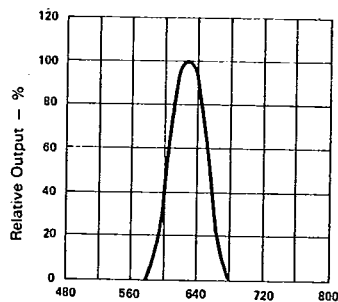


Fig. 2 SPECTRAL RESPONSE.

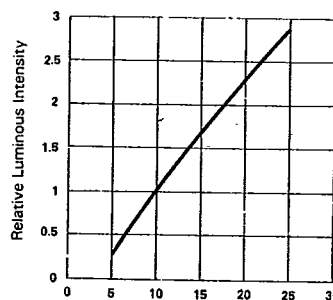


Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).

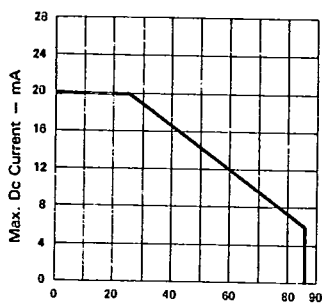


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.

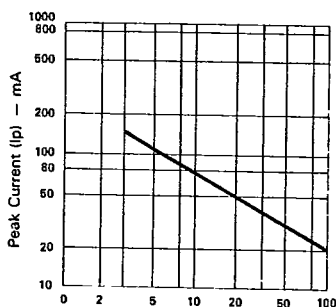


Fig. 5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE - $F = 1\text{ KHz}$)

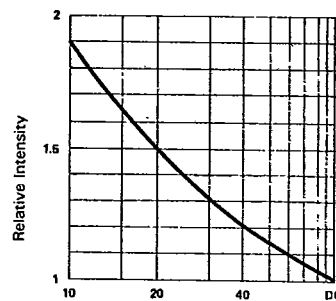


Fig. 6 LUMINOUS INTENSITY Vs. DUTY CYCLE% (AVERAGE $I_F = 10\text{mA}$ PER SEG.)

SEVEN-SEGMENTED DISPLAYS
ALPHANUMERIC DISPLAYS

5-26

689

PACKAGING

T-90-20

Reel Packaging (Axial Lead Units)

DEVICE TYPE	COMPONENT SPACE (MM) "A"	TAPE SPACE (MM) "B"	REEL DIA (MM) "D"	QUANTITY (EA)		CARTON	
				REEL	CARTON	SIZE (MM)	WEIGHT (KG)
DO-41 DO-41L	5±0.5	52.4±1.5	326~336	5000	20K	355 x 355 x 355	10.5
DO-201AD	10±0.5	52.4±1.5	326~336	1200	4.8K	355 x 355 x 355	9.0
P6(Aleg)	10±0.5	52.4±1.5	326~336	700	2.8K	355 x 355 x 355	8.8

The C dimension of Fig. 3 is between 3.17mm and 635mm greater than the length of the component involved.

FIG. 1

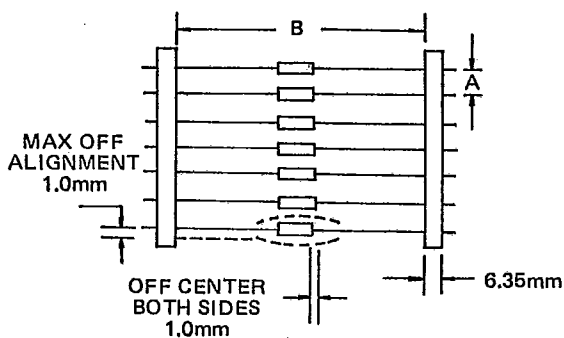


FIG. 2

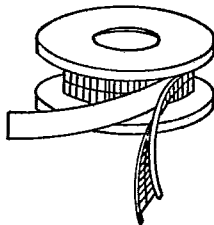
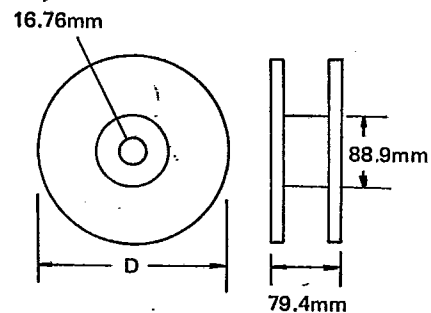


FIG. 3

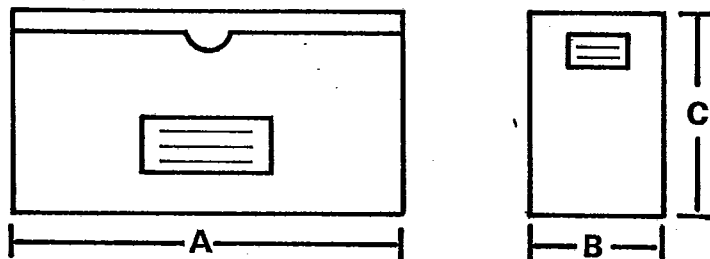


Bulk Packaging (Axial Lead Devices and Bridge Rectifiers)

DEVICE TYPE	PACKAGING SIZE (MM)		QUANTITY (EA)		APPROX GROSS WEIGHT (KG)	
	BOX	CARTON	BOX	CARTON	BOX	CARTON
DO-41 DO-41L	196 x 84 x 20	450 x 210 x 250	1000	50K	0.38	20
DO-201AD	305 x 93 x 59	355 x 355 x 355	1000	20K	1.35	28
P6(Aleg)	305 x 93 x 59	355 x 355 x 355	500	10K	1.2	24.5
PBM	357 x 125 x 60	530 x 360 x 340	1000	20K	1.5	32.3
PBDF	495 x 155 x 145	500 x 325 x 305	5000	20K	5.1	21.5
PBP	357 x 125 x 60	530 x 360 x 340	500	10K	1.5	31.5
PBL	375 x 220 x 155	470 x 385 x 455	1000	5K	5.7	30.5
PBPC-6	357 x 125 x 60	560 x 360 x 340	250	5K	1.1	22
PBPC-8	357 x 125 x 60	560 x 360 x 340	250	5K	1.7	35
KBPC	375 x 220 x 365	470 x 390 x 385	500	1K	15.1	31.5
KBPC-W	375 x 220 x 365	470 x 390 x 385	500	1K	14.5	30.0

AMMO BOX PACKAGING

BOX SIZE



Unit:m. m.

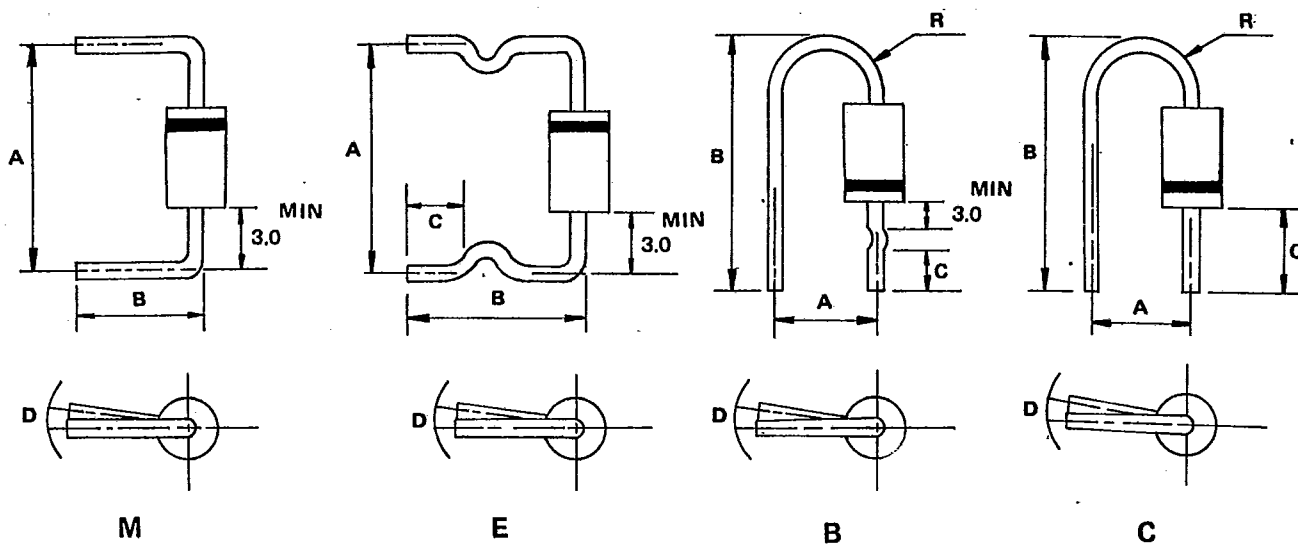
Packaging	Products Outline	Dimension *A*	Dimension *B*	Dimension *C*	Q'ty per BOX
26MM Horizontal Ammo Pack	DO-41 DO-41L(0.6mm Lead)	255	50	95	3K
					3K
52MM Horizontal Ammo Pack	DO-41and DO-41L DO 201AD	250	75	92	3K
					0.8K

CARTON SIZE

Unit:m. m.

Packaging	Products Outline	length	Width	High	Q'ty Per Carton
26MM Horizontal Ammo Pack	DO-41 DO-41L(0.6mm Lead)	330	310	268	42K
					48K
52MM Horizontal Ammo Pack	DO-41and DO-41L DO 201AD	355	355	340	12K
					12K

PREFORMED LEAD DRAWING



Case type	Preformed type	A (mm)		B (mm)		C (mm)		D (mm)		R (mm)	
		range	tolerance	range	tolerance	range	tolerance	range	tolerance	range	tolerance
D041	M	9.0-20.0	1.0	8.0-22.0	±0.5	—	—	1.5	max	—	—
	E	11.0-20.0	±1.0	11.0-16.0	±1.0	4.0-5.0	±0.5	1.5	max	—	—
	B	7.5	±0.5	19.0-22.0	±0.5	7.5	±0.5	1.5	max	2.5-4.0	Typ
	C	4.5	±0.8	18.0-19.0	±0.5	9.0	±0.5	1.5	max	2.5-4.0	Typ
D0201AD	M	15.0-20.0	±1.0	8.0-22.0	±1.0	—	—	2.0	max	—	—
	E	15.0-20.0	±1.0	10.0-22.0	±1.0	3.0-15.0	±0.5	2.0	max	—	—
P6(Aleg)	M	15.0-20.0	±1.0	8.0-22.0	±1.0	—	—	2.0	max	—	—