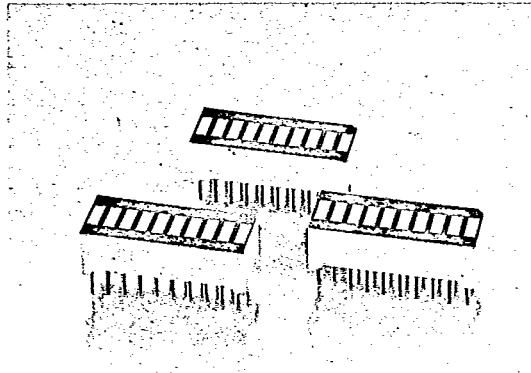


**LITEON****LTA-1000 SERIES**  
BAR GRAPH ARRAY

T41-31

**FEATURES**

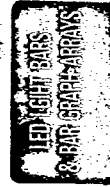
- LARGE SEGMENTS, CLOSELY SPACED.
- CHOICE OF SIX BRIGHT COLORS-RED/BRIGHT RED / GREEN / YELLOW / ORANGE / HIGH EFFICIENCY RED.
- END STACKABLE.
- FAST SWITCHING, EXCELLENT FOR MULTIPLEXING.
- LOW POWER REQUIREMENT.
- IC COMPATIBLE.
- WIDE VIEWING ANGLE.
- CATEGORIZED FOR LUMINOUS INTENSITY.
- EASY MOUNTING ON P.C. BOARD OR SOCKETS.

**DESCRIPTION**

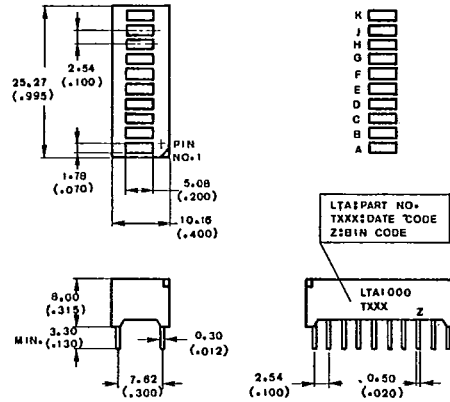
The LTA-1000 series are ten rectangular light sources array displays designed for a variety of applications where a continuously large, bright source of light is required. The red series devices utilize LED chips which are made from GaAsP on a GaAs substrate. The bright red and green series devices utilize 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. The red, bright red, green, yellow, and orange devices have gray face and white segment color. The high efficiency red devices have red face and red segment color.

**DEVICES**

PART NO. LTA--						DESCRIPTION
RED	BRIGHT RED	GREEN	YELLOW	ORANGE	HI.-EFF. RED	
1000R	1000P	1000G	1000Y	1000E	1000HR	Universal, Ten Rectangular Bar



PACKAGE DIMENSIONS



NOTE: All dimensions are in millimeters tolerance are: (inches)

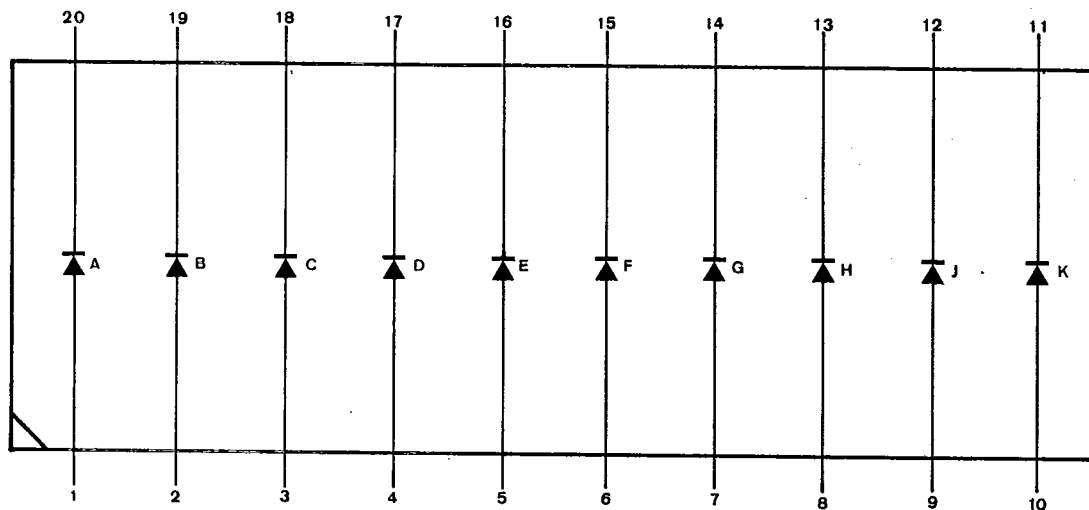
- Lead length (from seating plane): minimum value  $\frac{+1.00}{-0.000}$  mm  $\left( \frac{+0.040''}{-0.000''} \right)$
- $\frac{\pm 0.25\text{mm}}{(0.010'')}$  unless otherwise noted.

PIN CONNECTION

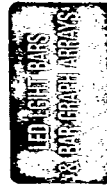
PIN NO.	CONNECTION	PIN NO.	CONNECTION
1	Anode A	11	Cathode K
2	Anode B	12	Cathode J
3	Anode C	13	Cathode H
4	Anode D	14	Cathode G
5	Anode E	15	Cathode F
6	Anode F	16	Cathode E
7	Anode G	17	Cathode D
8	Anode H	18	Cathode C
9	Anode J	19	Cathode B
10	Anode K	20	Cathode A

T-41-31

## INTERNAL CIRCUIT DIAGRAM

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

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



**ELECTRICAL/OPTICAL CHARACTERISTICS AT  $T_a = 25^\circ\text{C}$**   
**LTA-1000R**

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous intensity	$I_v$	200	500		$\mu\text{cd}$	$I_f = 10 \text{ mA}$
Peak Emission Wavelength	$\lambda_p$		655		nm	$I_f = 20 \text{ mA}$
Spectral Line Half-Width	$\Delta\lambda$		24		nm	$I_f = 20 \text{ mA}$
Forward Voltage any Bar	$V_f$		1.7	2.0	V	$I_f = 20 \text{ mA}$
Reverse Current, any Bar	$I_R$			100	$\mu\text{A}$	$V_R = 5\text{V}$
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)

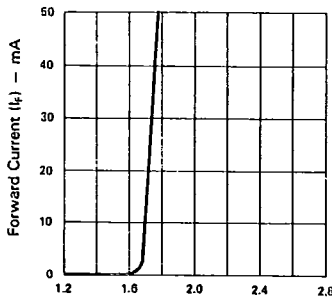


Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.

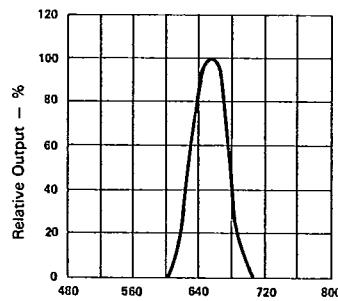


Fig. 2 SPECTRAL RESPONSE.

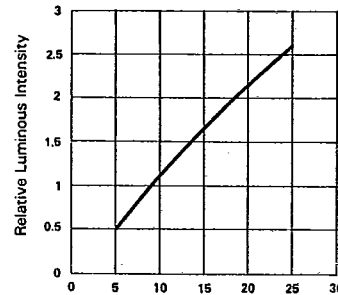


Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).

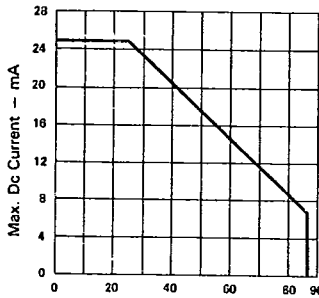


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.

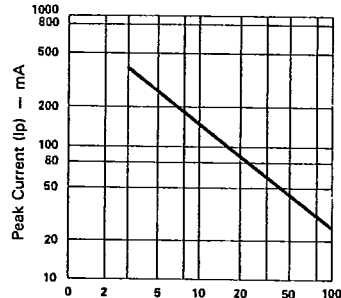


Fig. 5 MAX. PEAK CURRENT Vs. DUTY CYCLE% (REFRESH RATE - F = 1 KHz)

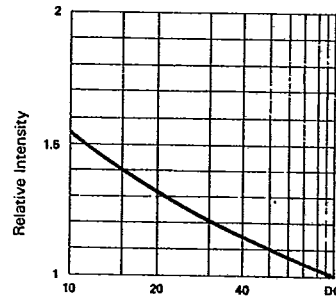


Fig. 6 LUMINOUS INTENSITY Vs. DUTY CYCLE% (AVERAGE  $I_f = 10\text{mA}$  PER SEG.)

**ELECTRICAL/OPTICAL CHARACTERISTICS AT  $T_A = 25^\circ\text{C}$   
LTA-1000P**

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous intensity	$I_v$	300	700		$\mu\text{cd}$	$I_F = 10 \text{ mA}$
Peak Emission Wavelength	$\lambda_p$		697		nm	$I_F = 20 \text{ mA}$
Spectral Line Half-Width	$\Delta\lambda$		90		nm	$I_F = 20 \text{ mA}$
Forward Voltage any Bar	$V_F$		2.1	2.8	V	$I_F = 20 \text{ mA}$
Reverse Current, any Bar	$I_R$			100	$\mu\text{A}$	$V_R = 5\text{V}$
Luminous Intensity Matching Ratio	$I_v\text{-m}$			2:1		$I_F = 20 \text{ mA}$

**TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES**

( $25^\circ\text{C}$  Ambient Temperature Unless Otherwise Noted)

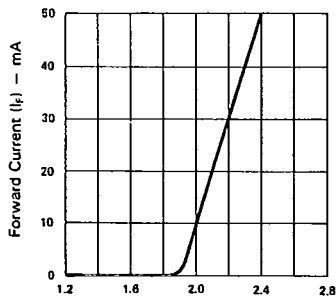


Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.

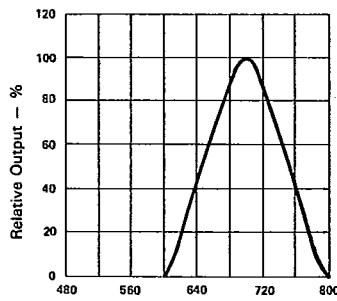


Fig. 2 SPECTRAL RESPONSE.

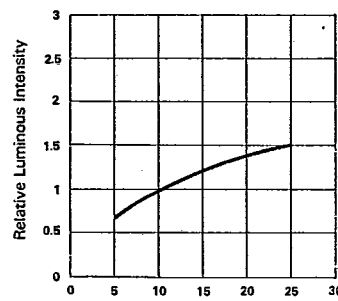


Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).

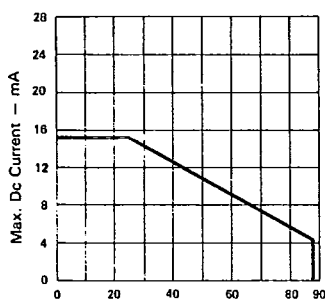


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.

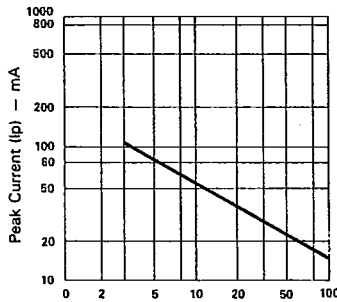
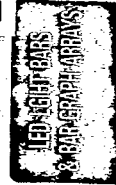


Fig. 5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE - F = 1 KHz)



**ELECTRICAL/OPTICAL CHARACTERISTICS AT  $T_A = 25^\circ\text{C}$**   
**LTA-1000G**

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous intensity	$I_v$	800	2000		$\mu\text{cd}$	$I_F = 10\text{ mA}$
Peak Emission Wavelength	$\lambda_p$		565		nm	$I_F = 20\text{ mA}$
Spectral Line Half-Width	$\Delta\lambda$		30		nm	$I_F = 20\text{ mA}$
Forward Voltage any Bar	$V_F$		2.1	2.8	V	$I_F = 20\text{ mA}$
Reverse Current, any Bar	$I_R$			100	$\mu\text{A}$	$V_R = 5\text{ V}$
Luminous Intensity Matching Ratio	$I_v\text{-m}$			2:1		$I_F = 20\text{ mA}$

**TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES**

( $25^\circ\text{C}$  Ambient Temperature Unless Otherwise Noted)

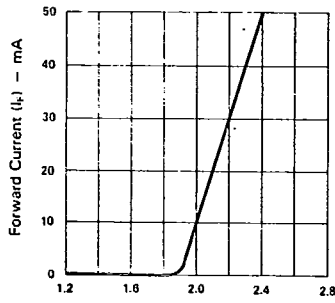


Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.

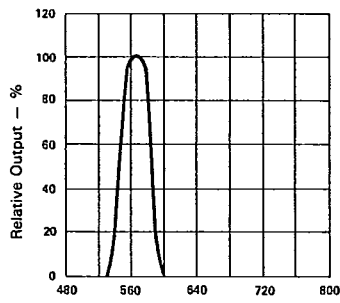


Fig. 2 SPECTRAL RESPONSE.

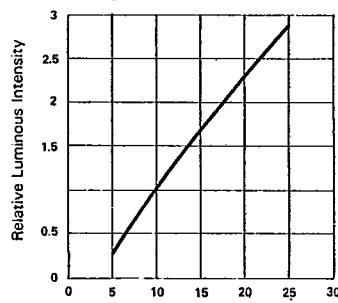


Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT)

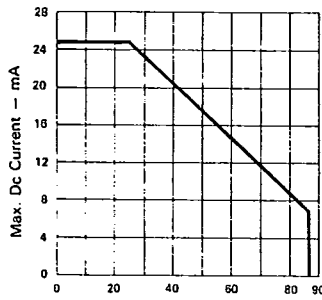


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.

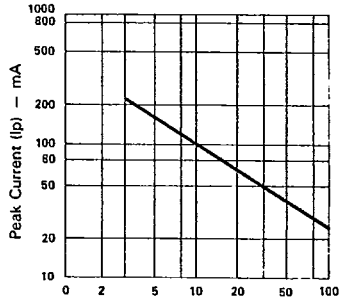


Fig. 5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE -  $F = 1\text{ KHz}$ )

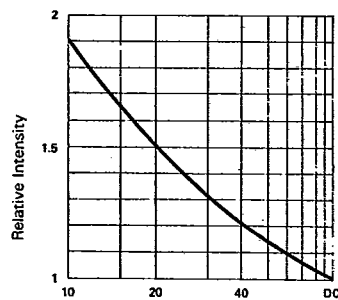


Fig. 6 LUMINOUS INTENSITY Vs. DUTY CYCLE.% (AVERAGE  $I_f = 10\text{mA}$  PER SEG.)

**ELECTRICAL/OPTICAL CHARACTERISTICS AT  $T_A = 25^\circ\text{C}$**   
**LTA-1000Y**

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous Intensity	$I_v$	800	2000		$\mu\text{cd}$	$I_F = 10\text{ mA}$
Peak Emission Wavelength	$\lambda_p$		585		nm	$I_F = 20\text{ mA}$
Spectral Line Half-Width	$\Delta\lambda$		35		nm	$I_F = 20\text{ mA}$
Forward Voltage any Bar	$V_F$		2.1	2.8	V	$I_F = 20\text{ mA}$
Reverse Current, any Bar	$I_R$			100	$\mu\text{A}$	$V_R = 5\text{V}$
Luminous Intensity Matching Ratio	$I_v\text{-m}$			2:1		$I_F = 20\text{ mA}$

**TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES**

( $25^\circ\text{C}$  Ambient Temperature Unless Otherwise Noted)

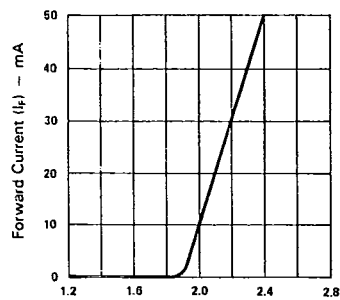


Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.

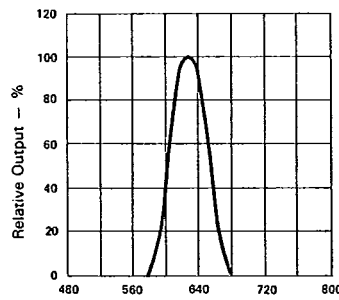


Fig. 2 SPECTRAL RESPONSE.

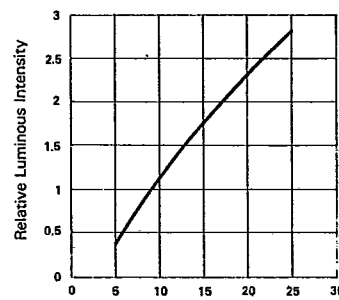


Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).

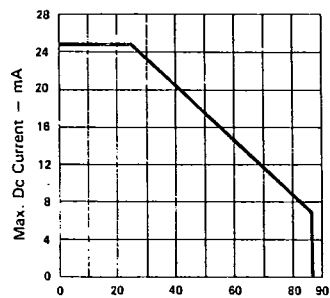


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.

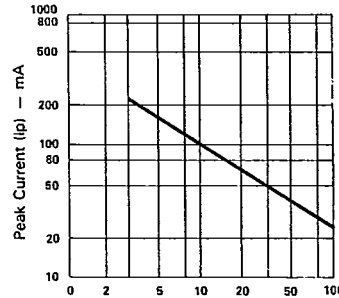


Fig. 5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE - F = 1 KHz)

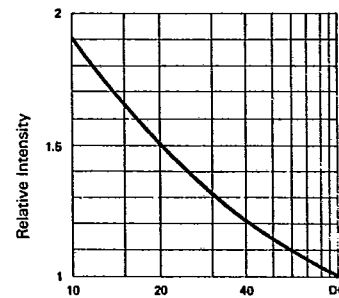


Fig. 6 LUMINOUS INTENSITY Vs. DUTY CYCLE% (AVERAGE  $I_F = 10\text{mA}$  PER SEG.)

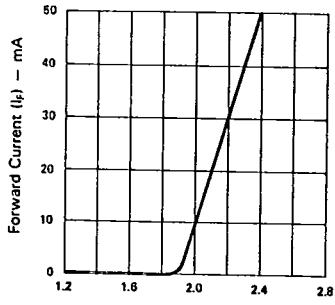


**ELECTRICAL/OPTICAL CHARACTERISTICS AT  $T_A = 25^\circ\text{C}$**   
LTA-1000E

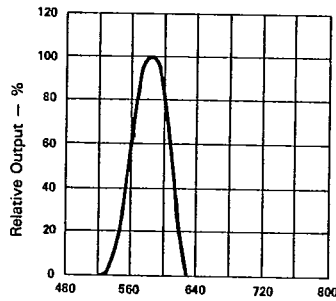
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous intensity	$I_v$	800	2000		$\mu\text{cd}$	$I_F = 10\text{ mA}$
Peak Emission Wavelength	$\lambda_p$		630		nm	$I_F = 20\text{ mA}$
Spectral Line Half-Width	$\Delta\lambda$		40		nm	$I_F = 20\text{ mA}$
Forward Voltage any Bar	$V_F$		2.1	2.8	V	$I_F = 20\text{ mA}$
Reverse Current, any Bar	$I_R$			100	$\mu\text{A}$	$V_R = 5\text{V}$
Luminous Intensity Matching Ratio	$I_v\text{-m}$			2:1		$I_F = 20\text{ mA}$

**TYPICAL ELECTRICAL/OPTICAL CHARACTERISTIC CURVES**

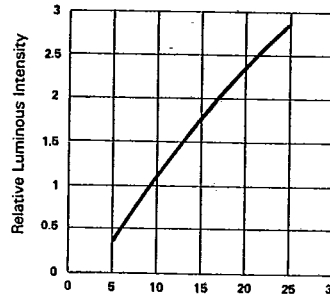
( $25^\circ\text{C}$  Ambient Temperature Unless Otherwise Noted)



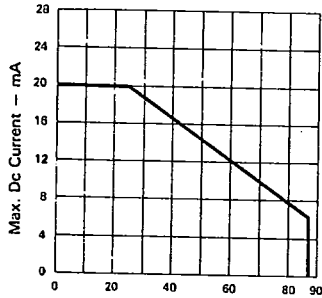
Forward Voltage ( $V_f$ ) - Volts  
Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.



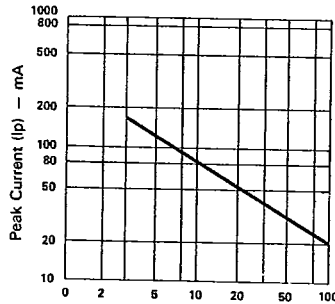
Wavelength ( $\lambda$ ) - nm.  
Fig. 2 SPECTRAL RESPONSE.



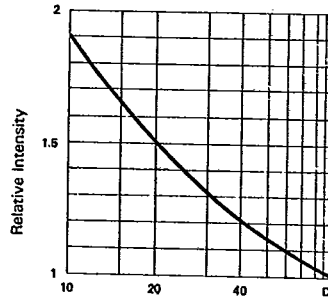
Forward Current ( $I_f$ ) - mA  
Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).



Ambient Temperature ( $T_a$ ) -  $^\circ\text{C}$   
Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.



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



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



**ELECTRICAL/OPTICAL CHARACTERISTICS AT TA = 25°C**  
**LTA-1000HR**

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
Average Luminous intensity	$I_v$	800	2000		$\mu\text{cd}$	$I_F = 10 \text{ mA}$
Peak Emission Wavelength	$\lambda_p$		635		nm	$I_F = 20 \text{ mA}$
Spectral Line Half-Width	$\Delta\lambda$		40		nm	$I_F = 20 \text{ mA}$
Forward Voltage any Bar	$V_F$		2.1	2.8	V	$I_F = 20 \text{ mA}$
Reverse Current, any Bar	$I_R$			100	$\mu\text{A}$	$V_R = 5\text{V}$
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)

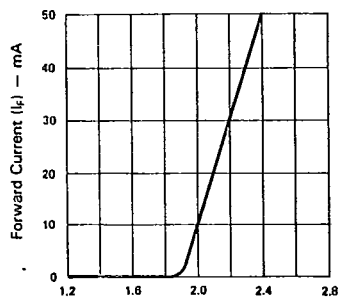


Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.

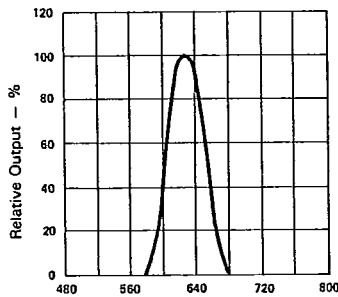


Fig. 2 SPECTRAL RESPONSE.

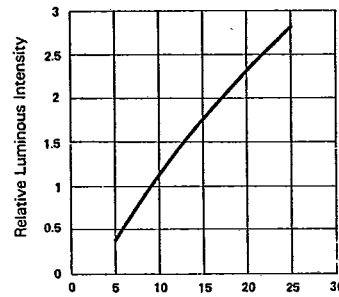


Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).

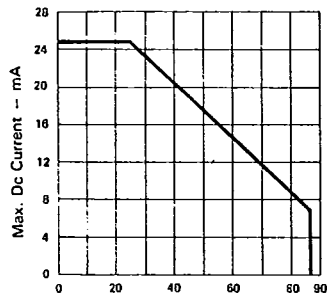


Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.

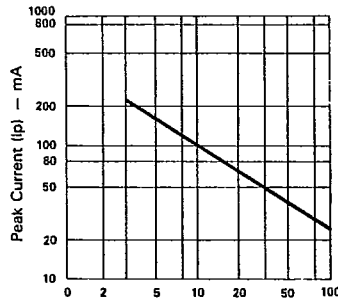


Fig. 5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE - F = 1 KHz)

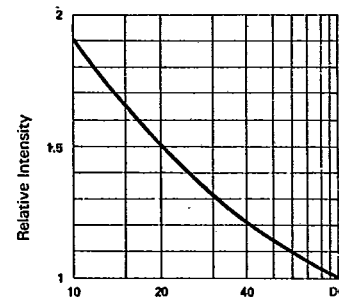


Fig. 6 LUMINOUS INTENSITY Vs. DUTY CYCLE.% (AVERAGE  $I_F = 10\text{mA}$  PER SEG.)



- 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 International De L'Eclairage) eye-response curve.

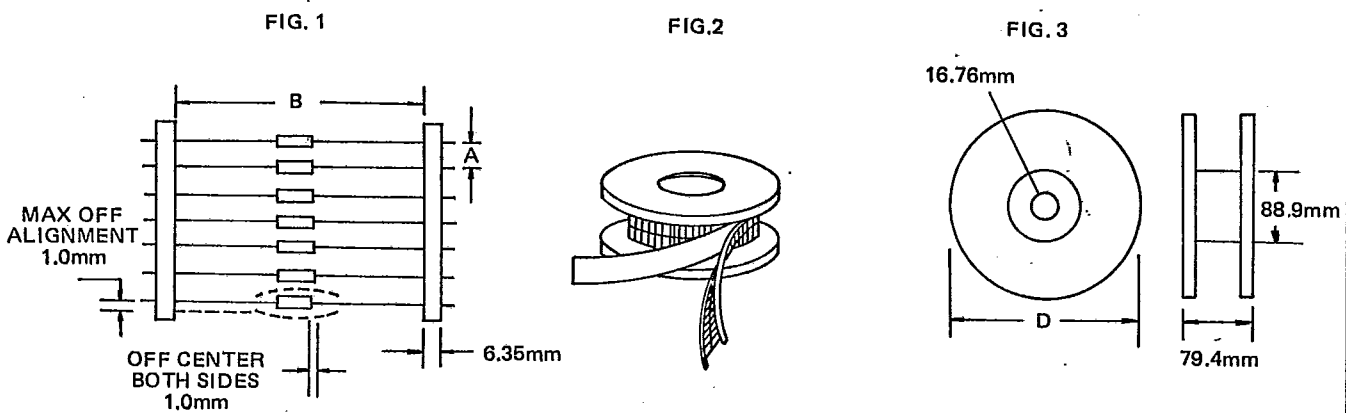
# PACKAGING

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 3.17m.m. and 635mm greater than the length of the component involved.

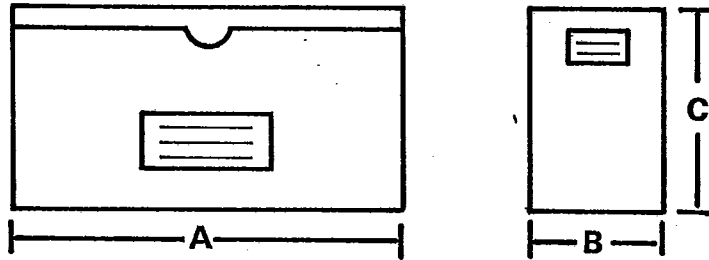


## Bulk Packaging (Axial Lead Devices and Bridge Rectifiers)

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.

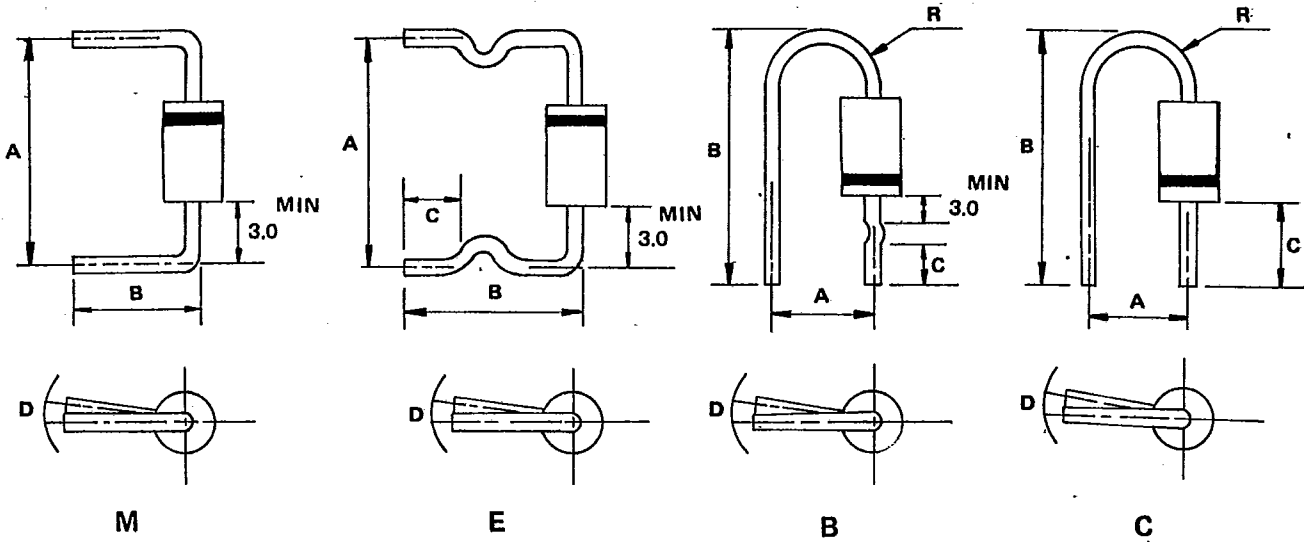
Packaging	Products Outline	Dimension *A*	Dimension *B*	Dimension *C*	Q'ty per BOX
26MM Horizontal Ammo Pack	DO-41 DO-41L(0.6mm Lead)	255	50	95	3K
					3K
52MM Horizontal Ammo Pack	DO-41and DO-41L DO 201AD	250	75	92	3K
					0.8K

**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

# 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	-	-