

LITEON

High Density Mounting Type Photocoupler

LTV817/LTV827/LTV847

T-41-83

LITE-ON INC

3LE D ■ 5536367 0001738 2 ■ LTN

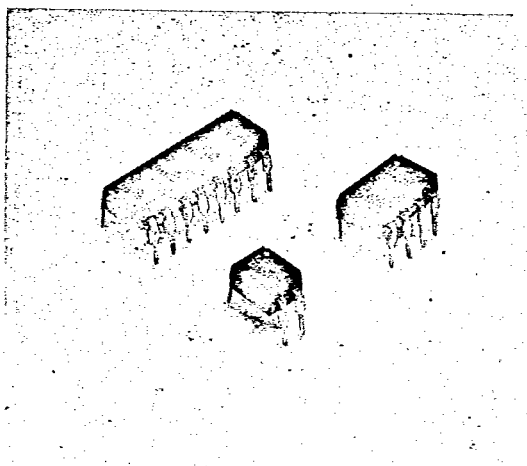


■ FEATURES

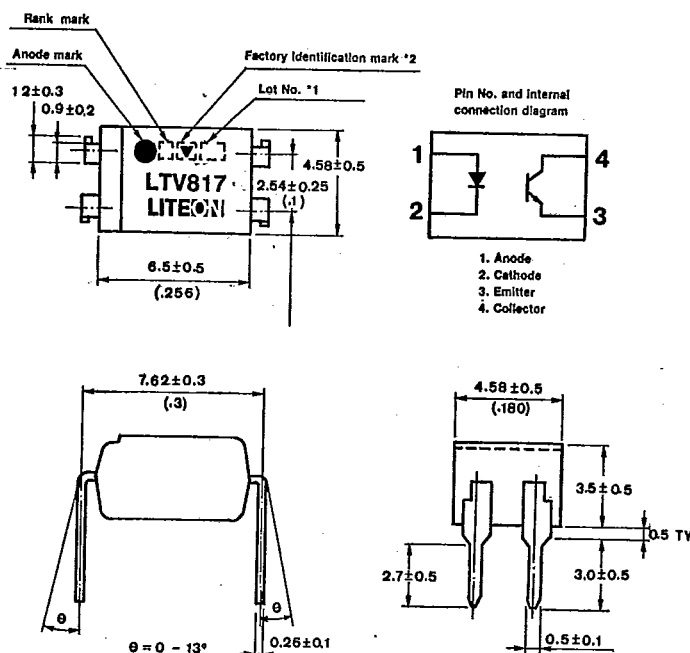
1. Current transfer ratio
CTR: MIN. 50% at $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$
2. High input-output isolation voltage
(V_{ISO} : 5,000 Vrms)
3. Compact dual-in-line package
LTV817: 1-channel type, LTV827: 2-channel type
LTV847: 4-channel type
4. UL approved (No. E113898(s))

■ APPLICATIONS

1. Computer terminals
2. System appliances, measuring instruments
3. Registers, copiers, automatic vending machines
4. Electric home appliances such as fan heaters, etc.
5. Medical instruments, physical and chemical equipments.
6. Signal transmission between circuits of different potentials and impedances



■ OUTLINE DIMENSIONS (UNIT: mm)



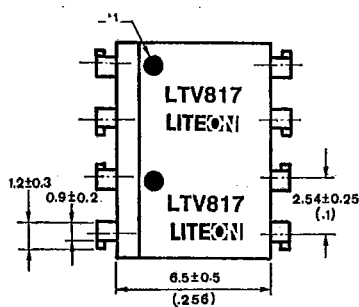
*1 2-digit number marked according to DIN standard

*2 Two versions available, one with factory identification mark and the other without

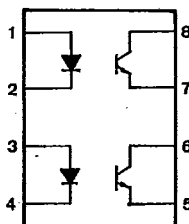
A-82

97

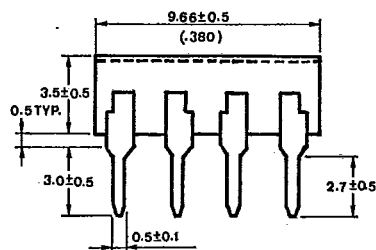
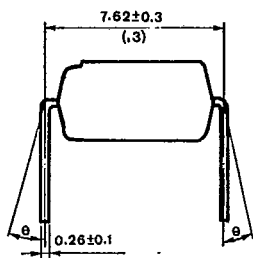
T-41-83



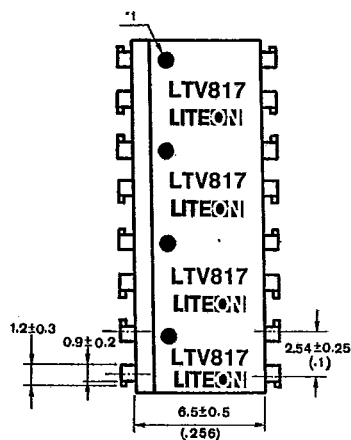
Pin No. and internal connection diagram



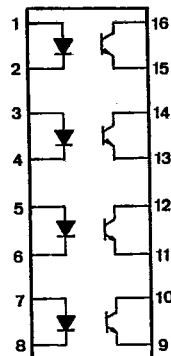
1, 3, Anode 5, 7, Emitter
2, 4, Cathode 6, 8, Collector



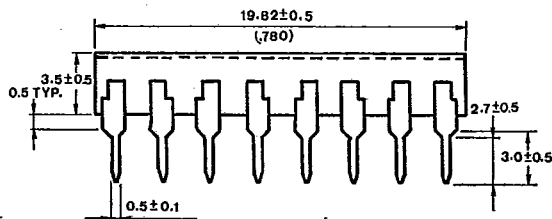
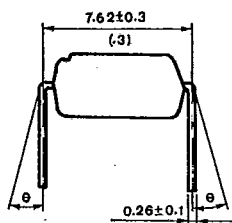
Note: *1 Anode mark



Pin No. and internal connection diagram



1 3 5 7 Anode
2 4 6 8 Cathode
9 11 13 15 Emitter
10 12 14 16 Collector



Note: *1 Anode mark

■ RATINGS AND CHARACTERISTICS

• Absolute maximum ratings

(Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	50	mA
	*1 Peak forward current	I_{FM}	1	A
	Reverse voltage	V_R	6	V
	Power dissipation	P	70	mW
Output	Collector-emitter voltage	V_{CEO}	35	V
	Emitter-collector voltage	V_{ECO}	6	V
	Collector current	I_C	50	mA
	Collector power dissipation	P_C	150	mW
Total power dissipation		P_{tot}	200	mW
Operating temperature		T_{opr}	-30 ~ +100	°C
Storage temperature		T_{stg}	-55 ~ +125	°C
*2 Isolation voltage		V_{iso}	5	kVrms
*3 Soldering temperature		T_{sol}	260	°C

*1 Pulse width $\leq 100\mu s$, Duty ratio: 0.001

*2 AC for 1 minute, 40~60% R.H.

*3 For 10 seconds

• Electro-optical characteristics

(Ta=25°C)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditions
Input	Forward voltage	V_F	—	1.2	1.4	V	$I_F = 20\text{mA}$
	Peak forward voltage	V_{FM}	—	—	3.0	V	$I_{FM} = 0.5\text{A}$
	Reverse current	I_R	—	—	10	μA	$V_R = 4\text{V}$
	Terminal capacitance	C_t	—	30	250	pF	$V = 0, f = 1\text{kHz}$
Output	Collector dark current	I_{CEO}	—	—	100	nA	$V_{CE} = 20\text{V}, I_F = 0, R_{BE} = \infty$
	Collector-emitter breakdown voltage	BV_{CEO}	35	—	—	V	$I_C = 0.1\text{mA}, I_F = 0$
	Emitter-collector breakdown voltage	BV_{ECO}	6	—	—	V	$I_E = 10\mu\text{A}, I_F = 0$
Transfer characteristics	* Collector current	I_C	2.5	—	30	mA	$I_F = 5\text{mA}, V_{CE} = 5\text{V}$
	Collector-emitter saturation voltage	$V_{CE}(\text{sat})$	—	0.1	0.2	V	$I_F = 20\text{mA}, I_C = 1\text{mA}$
	Isolation resistance	R_{ISO}	5×10^{10}	10^{11}	—	Ω	500V DC, 40~60% R.H.
	Floating capacitance	C_f	—	0.6	1.0	pF	$V = 0, f = 1\text{MHz}$
	Cut-off frequency	f_c	—	80	—	kHz	$V_{CE} = 5\text{V}, I_C = 2\text{mA}$ $R_L = 100\Omega, -3\text{dB}$
	Response time (Rise)	t_r	—	4	18	μs	$V_{CE} = 2\text{V}, I_C = 2\text{mA},$ $R_L = 100\Omega$
	Response time (Fall)	t_f	—	3	18	μs	

■ SUPPLEMENT

• Isolation voltage shall be measured in the following method.

- (1) Anode and cathode on input side, collector and emitter on output side shall be shortened individually.
 - (2) The isolation voltage tester with a zero-cross circuit shall be used.
 - (3) The waveform of applied voltage shall be a sine wave.
- (It is recommended that the isolation voltage shall be measured in insulation oil.)

• Rank table of collector current I_C (for LTV 817 only)

Model No.	Rank mark	I_C (mA)
LTV817A	A	4.0~8.0
LTV817B	B	6.5~13
LTV817C	C	10~20
LTV817D	D	15~30
LTV817	A, B, C, D or No mark	2.5~30

Conditions	$I_F = 5\text{mA}$ $V_{CE} = 5\text{V}$ $T_a = 25^\circ\text{C}$
------------	--

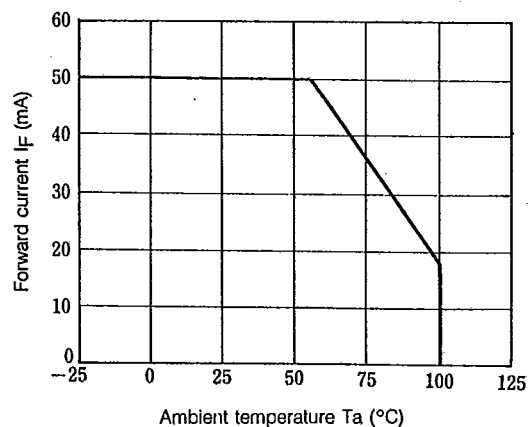
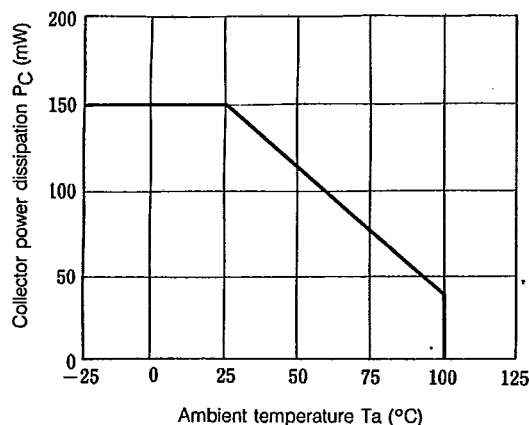
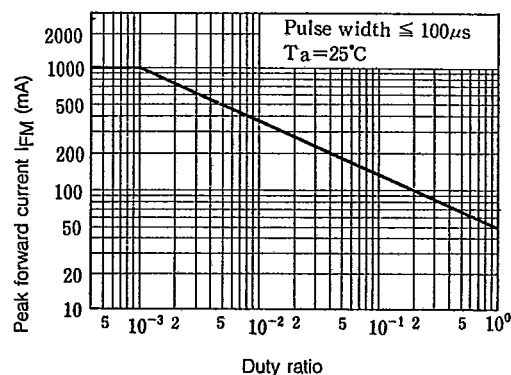
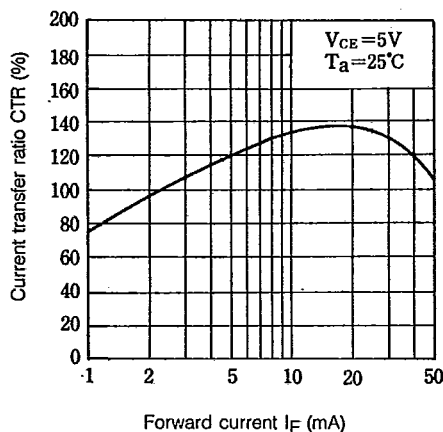
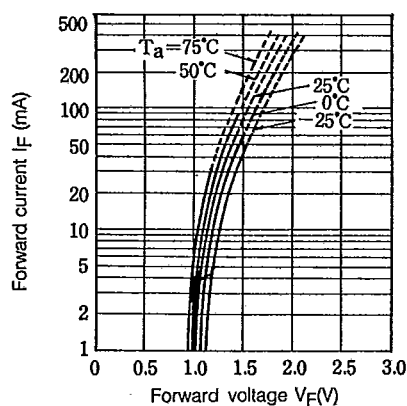
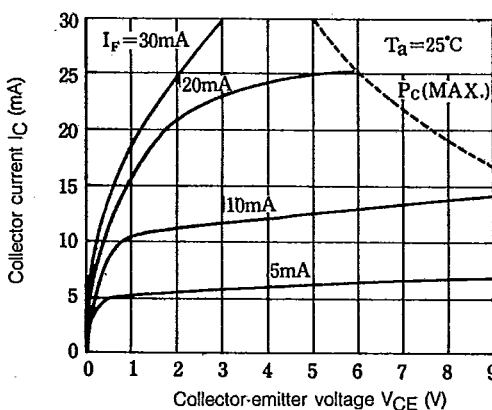
• Inspection standard

Outgoing inspection standard for LITON products are shown below.

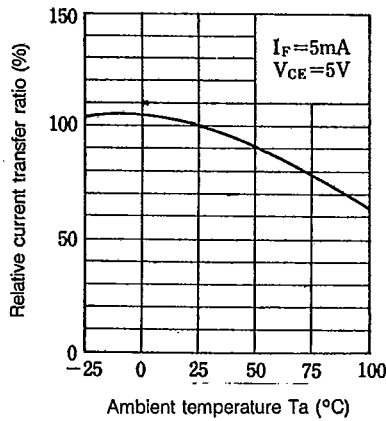
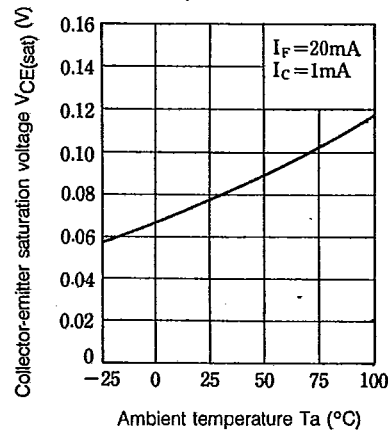
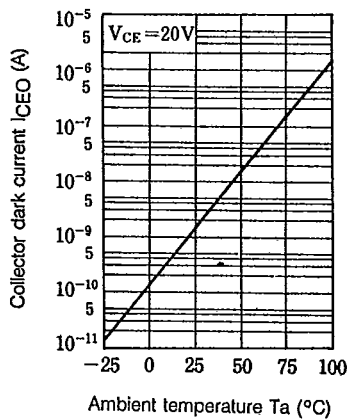
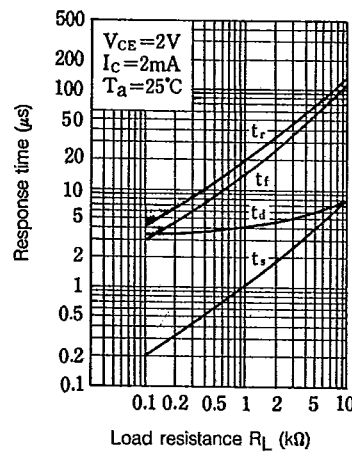
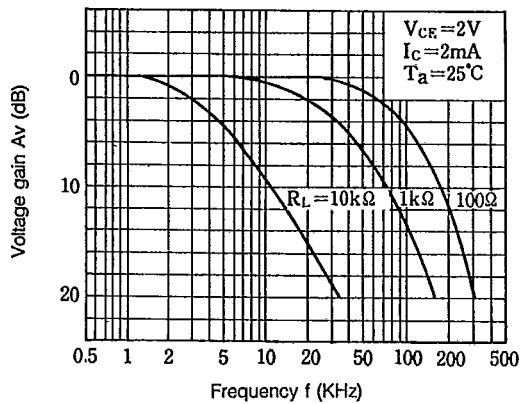
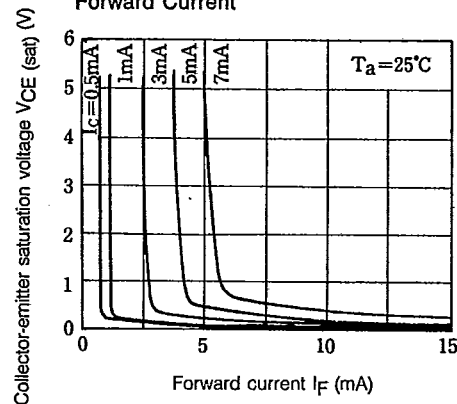
- (1) A single sampling plan, normal inspection level II based on MIL-STD-105D is applied. The AQL according to the inspection items are shown below.

Defect	Inspection item	AQL (%)	Judgement criterion
Major defect	• Electrical characteristics • Unreadable marking • Open, short	0.25	Depend on the specification
Minor defect	• Appearance • Dimension	0.4	

T-41-83

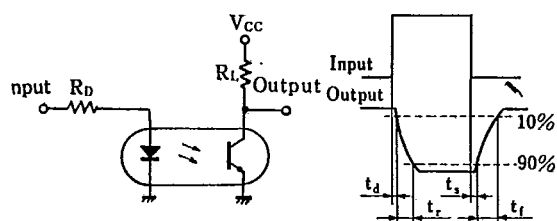
Fig. 1 Forward Current vs. Ambient Temperature**Fig. 2** Collector Power Dissipation vs. Ambient Temperature**Fig. 3** Peak Forward Current vs. Duty Ratio**Fig. 4** Current Transfer Ratio vs. Forward Current**Fig. 5** Forward Current vs. Forward Voltage**Fig. 6** Collector Current vs. Collector-emitter Voltage

T-41-83

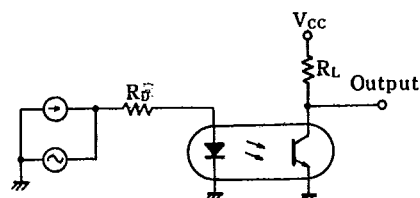
**Fig. 7** Relative Current Transfer Ratio vs. Ambient Temperature**Fig. 8** Collector-emitter Saturation Voltage vs. Ambient Temperature**Fig. 9** Collector Dark Current vs. Ambient Temperature**Fig. 10** Response Time vs. Load Resistance**Fig. 11** Frequency Response**Fig. 12** Collector-emitter Saturation Voltage vs. Forward Current

T-41-83

Test Circuit for Response Time



Test Circuit for Frequency Response



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

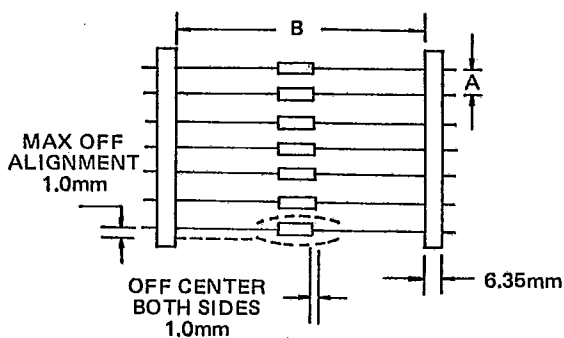


FIG. 2

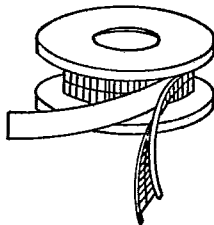
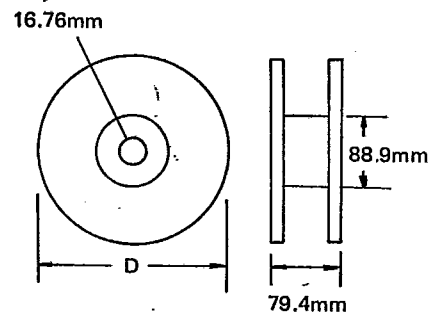


FIG. 3

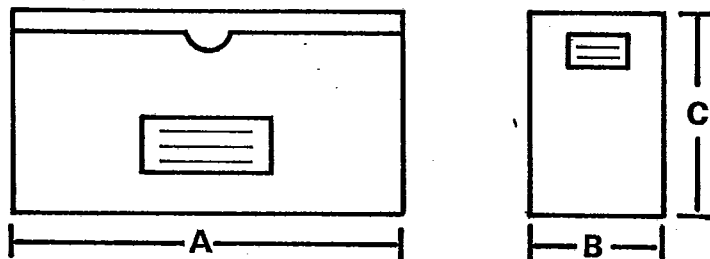


Bulk Packaging (Axial Lead Devices and Bridge Rectifiers)

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.

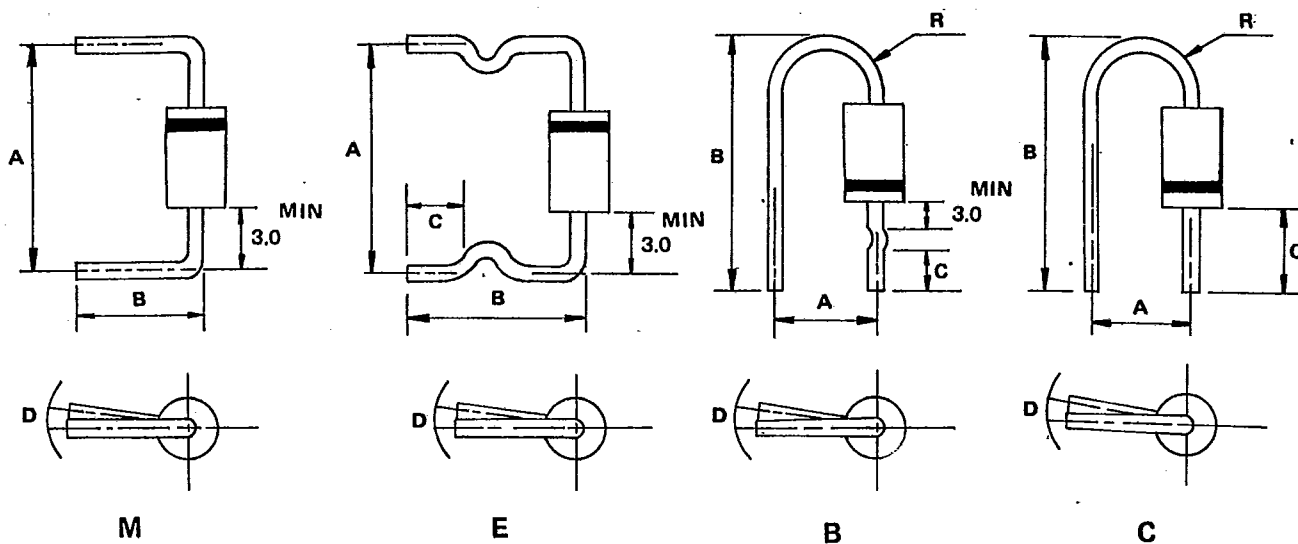
Packaging	Products Outline	Dimension *A*	Dimension *B*	Dimension *C*	Q'ty per BOX
26MM Horizontal Ammo Pack	DO-41 DO-41L(0.6mm Lead)	255	50	95	3K
					3K
52MM Horizontal Ammo Pack	DO-41and DO-41L DO 201AD	250	75	92	3K
					0.8K

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	—	—