



# High Collector-emitter Voltage Type LTV702V

T41-83

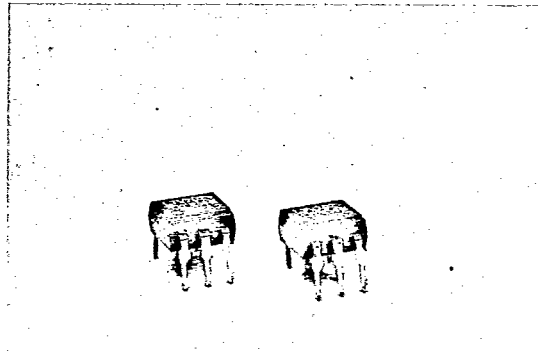


## ■ FEATURES

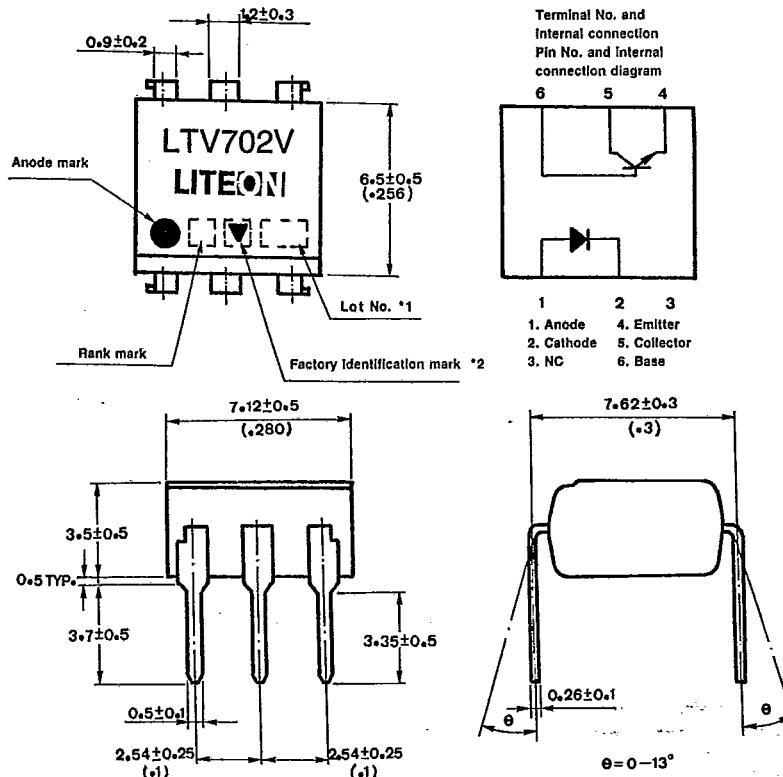
1. High collector-emitter voltage ( $V_{CEO}:70V$ )
2. High input-output isolation voltage ( $V_{ISO}:5,000V_{rms}$ )
3. Directly connectable to TTL
4. UL approved (No. E113898(S))

## ■ APPLICATIONS

1. Telephone sets, telephone exchangers
2. System appliances, measuring instruments
3. Signal transmission between circuits of different potentials and impedances



## ■ OUTLINE DIMENSIONS (UNIT: mm)



Note \*1 2-digit number shall be marked according to DIN standard.  
 \*2 Two version available, one with factory identification mark and the other without.

## ■ RATINGS AND CHARACTERISTICS

### • Absolute maximum ratings

(Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I <sub>F</sub>	60	mA
	*1 Peak forward current	I <sub>FM</sub>	1.5	A
	Reverse Voltage	V <sub>R</sub>	6	V
	Power dissipation	P	105	mW
Output	Collector-emitter voltage	V <sub>CEO</sub>	70	V
	Emitter-collector voltage	V <sub>ECO</sub>	6	V
	Collector current	I <sub>C</sub>	50	mA
	Collector power dissipation	P <sub>C</sub>	160	mW
	Collector-base voltage	V <sub>CBO</sub>	70	V
	Emitter-base voltage	V <sub>EBO</sub>	6	V
Total power dissipation		P <sub>tot</sub>	200	mW
Operating temperature		T <sub>opr</sub>	-55~+100	°C
Storage temperature		T <sub>stg</sub>	-55~+150	°C
*2 Isolation voltage		V <sub>iso</sub>	5	kVrms
*3 Soldering temperature		T <sub>sol</sub>	260	°C

\*1 Pulse width ≤ 10μs, Duty ratio: 0.0004

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

\*3 For 10 seconds.



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## • Electro-optical characteristics

(Ta=25°C)

	Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input	Forward voltage	$V_F$	—	1.4	1.7	V	$I_F=60\text{mA}$
	Reverse current	$I_R$	—	—	10	$\mu\text{A}$	$V_R=6\text{V}$
	Terminal capacitance	$C_t$	—	30	250	pF	$V=0, f=1\text{kHz}$
Output	Collector dark current	$I_{CEO}$	—	—	50	nA	$V_{CE}=10\text{V}, I_F=0$
	Collector-emitter breakdown voltage	$BV_{CEO}$	70	—	—	V	$I_C=0.1\text{mA}, I_F=0$
	Emitter collector breakdown voltage	$BV_{ECO}$	6	—	—	V	$I_E=10\mu\text{A}, I_F=0$
	Collector-base breakdown voltage	$BV_{CBO}$	70	—	—	V	$I_C=0.1\text{mA}, I_F=0$
Transfer characteristics	* Collector current	$I_C$	4	—	32	mA	$I_F=10\text{mA}, V_{CE}=5\text{V}$
	Collector-emitter saturation voltage	$V_{CE}(\text{sat})$	—	0.25	0.4	V	$I_F=10\text{mA}, I_C=2.5\text{mA}$
	Isolation resistance	$R_{ISO}$	$5 \times 10^{10}$	$1 \times 10^{11}$	—	$\Omega$	DC500V, 40 ~ 60% R.H
	Floating capacitance	$C_f$	—	0.6	1.0	pF	$V=0, f=1\text{MHz}$
	Cut-off frequency	$f_c$	—	150	—	KHz	$V_{CC}=5\text{V}, I_F=10\text{mA}$ $R_L=75\Omega, -3\text{dB}$
	Response time (Rise)	$t_r$	—	2	7	$\mu\text{s}$	$V_{CC}=5\text{V}, I_F=10\text{mA}$ $R_L=75\Omega$
	Response time (Fall)	$t_f$	—	2	8	$\mu\text{s}$	

$$*CTR = \frac{I_C}{I_F} \times 100\%$$

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## ■ 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) Isolation voltage tester with a zero-cross circuit shall be used.
- (3) Waveform of applied voltage shall be a sine wave.  
(It is recommended that the isolation voltage shall be measured in insulation oil.)

### • Collector current $I_C$ is classified as follows.

Model No.	Rank mark	$I_C$ (mA)
LTV 702V A	A	4.0~8.0
LTV 702V B	B	6.3~12.5
LTV 702V C	C	10~20
LTV 702V D	D	16~32
LTV 702V	A or B or C or D	4.0~32

Conditions	$I_F=10\text{mA}$ $V_{CE}=5\text{V}$ $T_a=25^\circ\text{C}$
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### • 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	<ul style="list-style-type: none"> <li>• Electrical characteristics</li> <li>• Unreadable marking</li> <li>• Open, short</li> </ul>	0.25	Depend on the specification
Minor defect	<ul style="list-style-type: none"> <li>• Appearance</li> <li>• Dimension</li> </ul>	0.4	

Fig. 1 Forward Current vs. Ambient Temperature

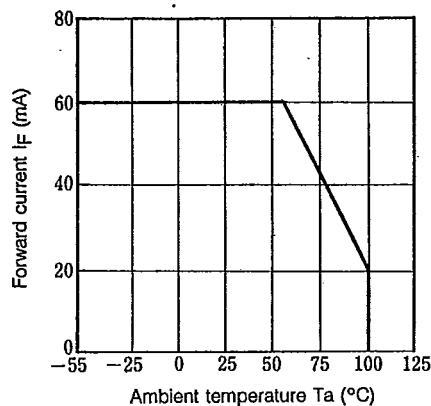
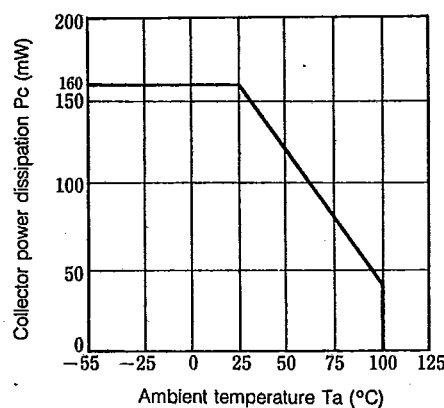
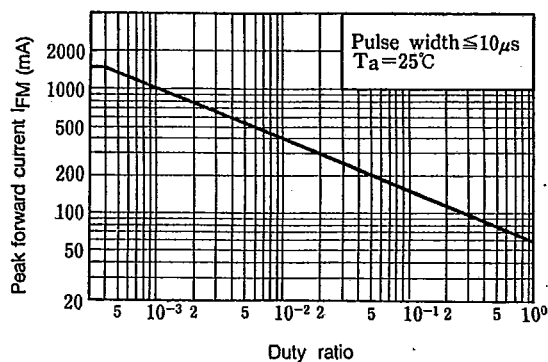


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

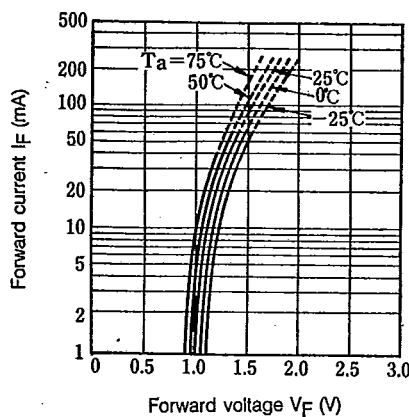




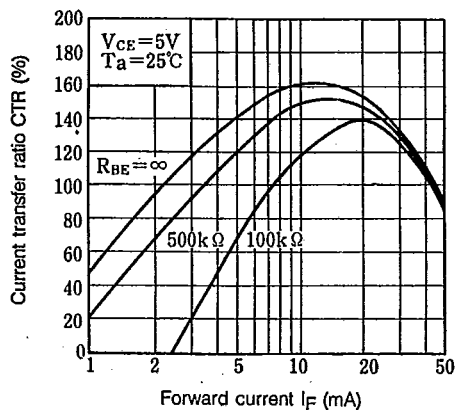
**Fig. 3** Peak Forward Current vs. Duty Ratio



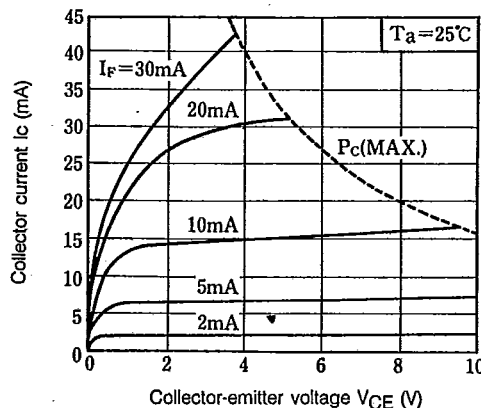
**Fig. 4** Forward Current vs. Forward Voltage



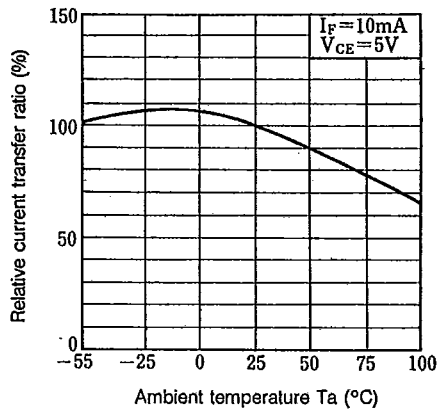
**Fig. 5** Current Transfer Ratio vs. Forward Current



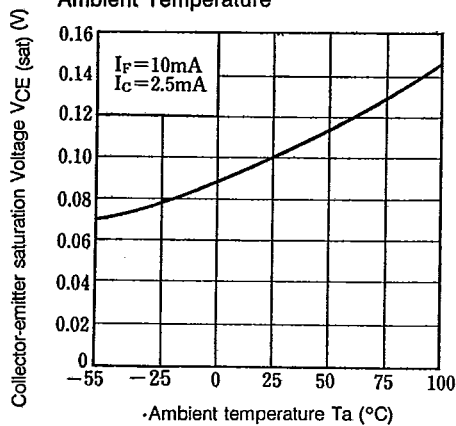
**Fig. 6** Collector Current vs. Collector-emitter Voltage



**Fig. 7** Relative Current Transfer Ratio vs. Ambient Temperature

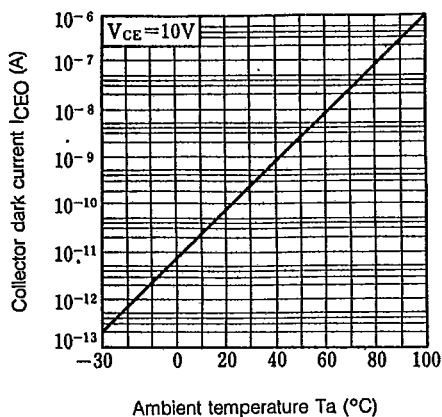


**Fig. 8** Collector-emitter Saturation Voltage vs. Ambient Temperature

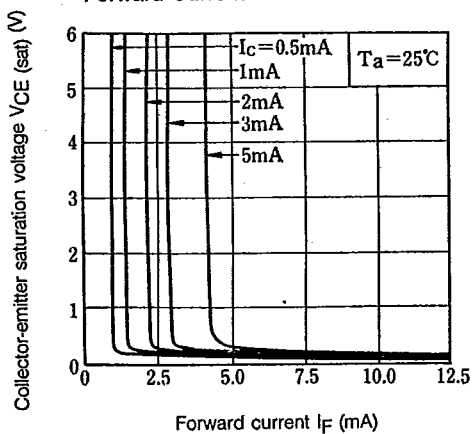


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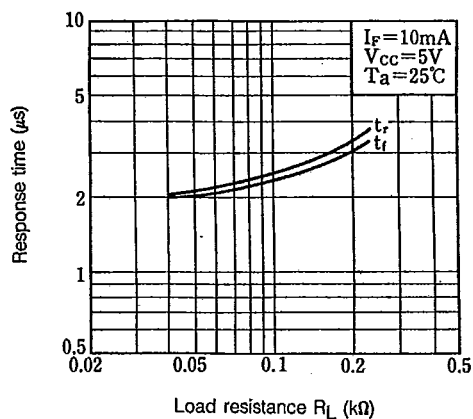
**Fig. 9** Collector Dark Current vs. Ambient Temperature



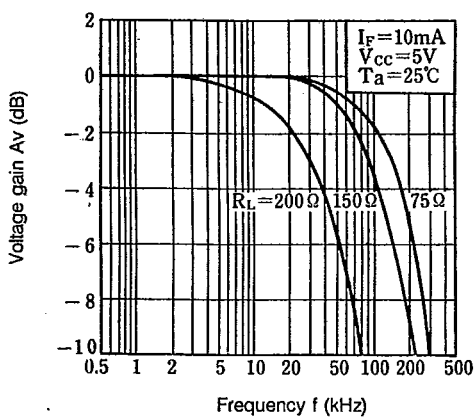
**Fig. 10** Collector-emitter Saturation Voltage vs. Forward Current



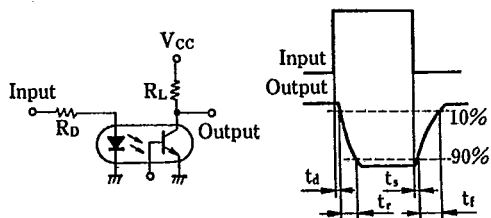
**Fig. 11** Response Time vs. Load Resistance



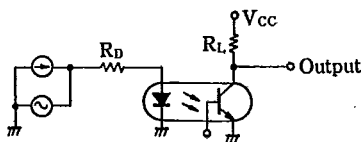
**Fig. 12.** Frequency Response



Test Circuit for Response Time



Test Circuit for Frequency Response



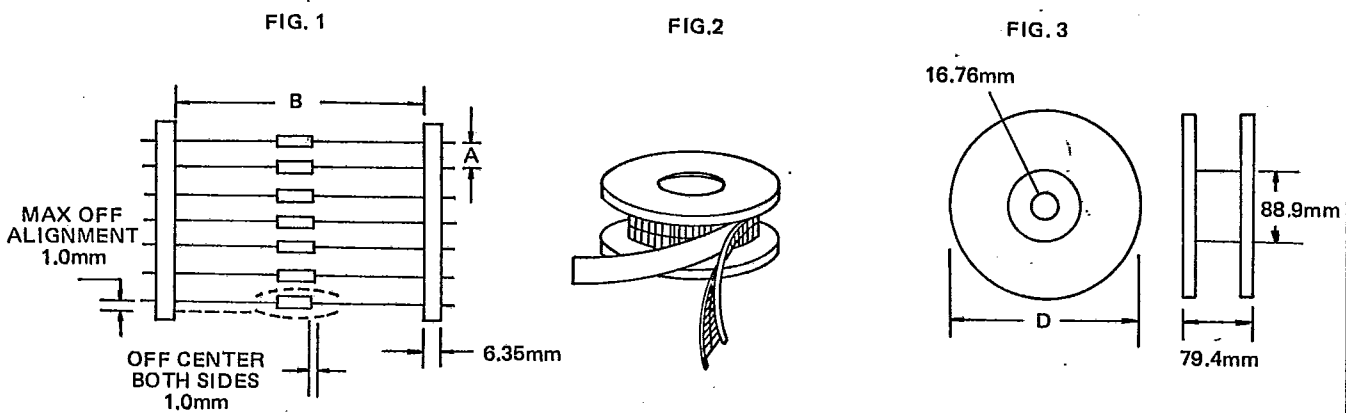
# PACKAGING

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## 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.

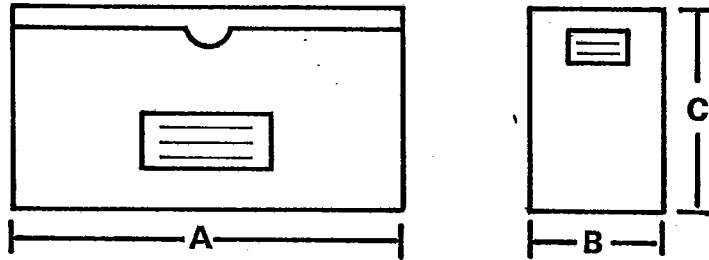


## Bulk Packaging (Axial Lead Devices and Bridge Rectifiers)

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

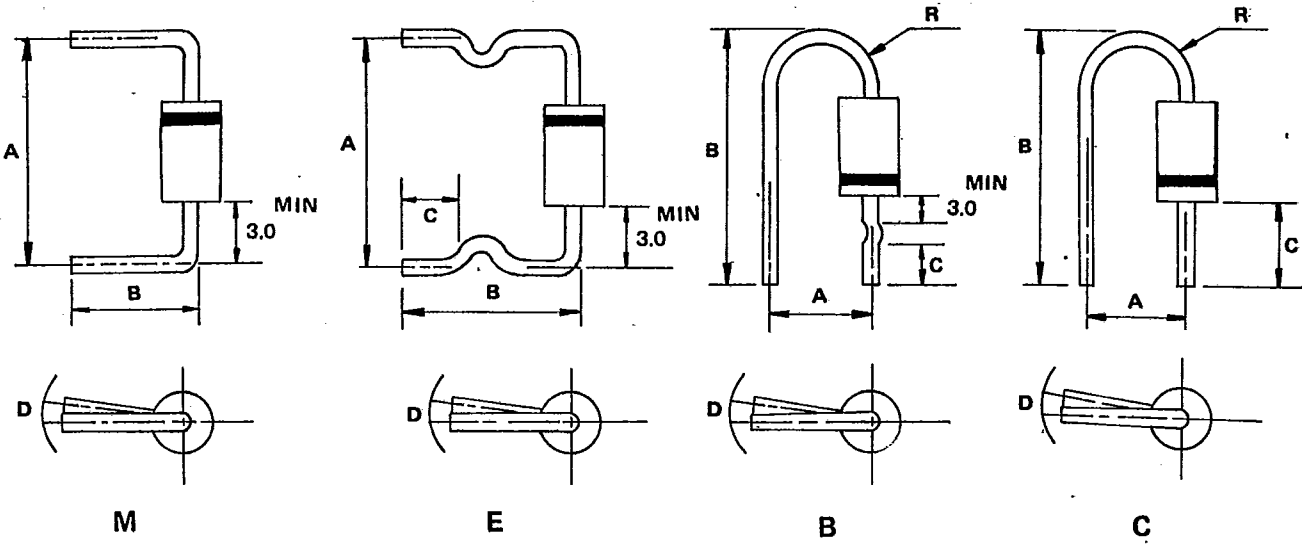
**CARTON SIZE**

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	-	-