



# General Purpose Type Photocoupler

## LTV4N35/LTV4N37

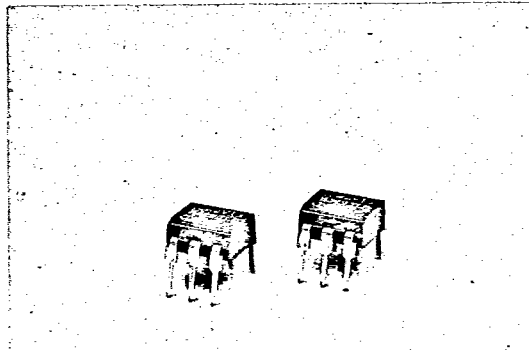
T-41-83

### ■ FEATURES

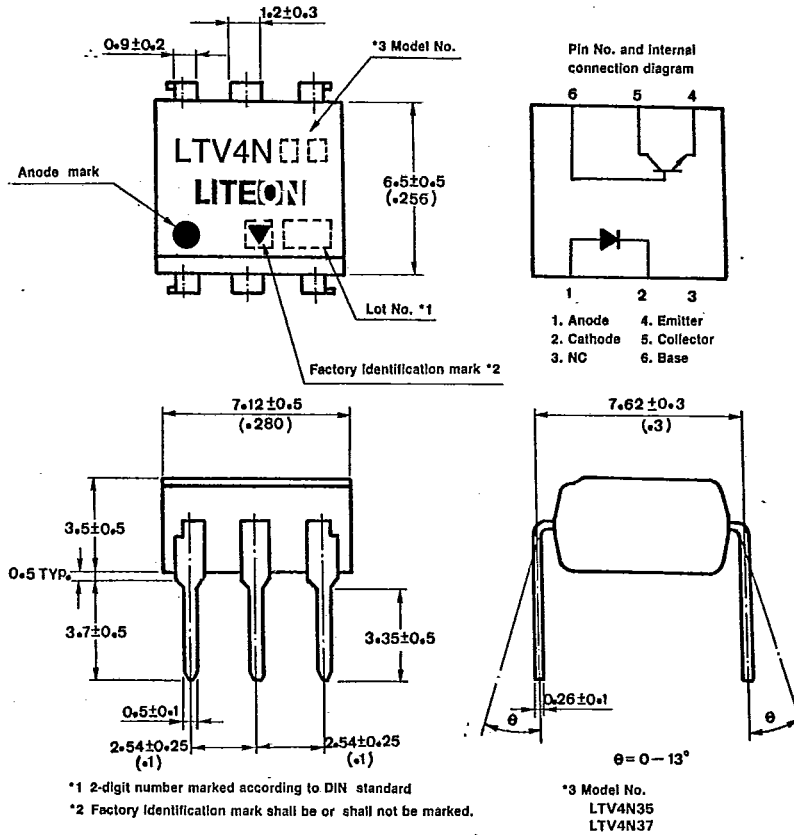
1. High current transfer ratio  
(CTR; MIN. 100% at  $I_F = 10\text{mA}$ ,  $V_{CE} = 10\text{V}$ )
2. Response time  
 $t_{on}$ ; TYP.  $3\mu\text{s}$  at  $V_{CC} = 10\text{V}$ ,  $I_C = 2\text{mA}$ ,  $R_L = 100\Omega$
3. Input-output isolation voltage: LTV4N35 ( $V_{iso}$ : 3,550Vrms)  
LTV4N37 ( $V_{iso}$ : 1,500Vrms)
4. UL approved (No. E113898 (S))

### ■ APPLICATIONS

1. I/O interfaces for computers
2. System appliances, measuring instruments
3. Signal transmission between circuits of different potentials and impedances



### ■ OUTLINE DIMENSIONS (UNIT: mm)





## ■ 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>	3	A
	Reverse voltage	V <sub>R</sub>	6	V
	Power dissipation	P	100	mW
Output	Collector-emitter voltage	V <sub>CEO</sub>	30	V
	Collector-base voltage	V <sub>CBO</sub>	70	V
	Emitter-collector voltage	V <sub>ECO</sub>	7	V
	Collector current	I <sub>C</sub>	100	mA
	Collector power dissipation	P <sub>C</sub>	300	mW
Total power dissipation		P <sub>tot</sub>	350	mW
* 2 Isolation voltage	LTV4N35	V <sub>iso</sub>	3,550	V <sub>rms</sub>
	LTV4N37		1,500	
Operating temperature		T <sub>opr</sub>	-55 ~ +100	°C
Storage temperature		T <sub>stg</sub>	-55 ~ +150	°C
* 3 Soldering temperature		T <sub>sol</sub>	260	°C

\*1 Pulse width ≤ 1 μs, Duty ratio: 0.001

\*2 AC for 1 minute 40~60% R.L.

\*3 For 10 seconds

## • Electro-optical characteristics

(Ta=25°C)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditions	
Input	Forward voltage	V <sub>F</sub>	—	1.2	1.5	V	I <sub>F</sub> = 10mA	
	Reverse current	I <sub>R</sub>	—	—	10	μA	V <sub>R</sub> = 4V	
	Terminal capacitance	C <sub>t</sub>	—	50	—	pF	V = 0, f = 1 MHz	
Output	Collector dark current	I <sub>CEO</sub>	Ta = 25°C	—	—	50	nA	V <sub>CE</sub> = 10V,
			Ta = 100°C	—	—	500	μA	V <sub>CE</sub> = 30V
	Collector-emitter breakdown voltage	BV <sub>CEO</sub>	30	—	—	V	I <sub>C</sub> = 0.1mA I <sub>F</sub> = 0	
	Emitter-collector breakdown voltage	BV <sub>ECO</sub>	7	—	—	V	I <sub>E</sub> = 10μA I <sub>F</sub> = 0	
Collector-base breakdown voltage	BV <sub>CBO</sub>	70	—	—	V	I <sub>C</sub> = 0.1mA I <sub>F</sub> = 0		
Transfer characteristics	*1 Collector Current	I <sub>C</sub>	Ta = 25°C	10	—	—	mA	I <sub>F</sub> = 10mA V <sub>CE</sub> = 10V
			Ta = -55°C	4	—	—		
			Ta = 100°C	4	—	—		
	Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	—	—	0.3	V	I <sub>F</sub> = 50mA I <sub>C</sub> = 2mA	
	Isolation resistance	R <sub>iso</sub>	5 × 10 <sup>10</sup>	1 × 10 <sup>11</sup>	—	Ω	DC500V, 40 ~ 60% R.H.	
	Floating capacitance	C <sub>f</sub>	—	1.0	2.5	pF	V = 0, f = 1MHz	
	Response time (Turn-on time)	t <sub>on</sub>	—	3	10	μs	V <sub>CC</sub> = 10V R <sub>BE</sub> = ∞ R <sub>L</sub> = 100Ω I <sub>C</sub> = 2mA	
	Response time (Turn-off time)	t <sub>off</sub>	—	3	10	μs		

\*1 Pulse test: Input pulse width = 300μs Duty ratio ≤ 0.02, CTR =  $\frac{I_C}{I_F} \times 100\%$



## ■ SUPPLEMENT

### • Isolation voltage shall be measured in the following method.

- (1) Short between anode and cathode on the primary side and between collector, emitter and base on the secondary side.
- (2) The isolation voltage tester with zero-cross circuit shall be used.
- (3) The waveform of applied voltage shall be a sine wave.

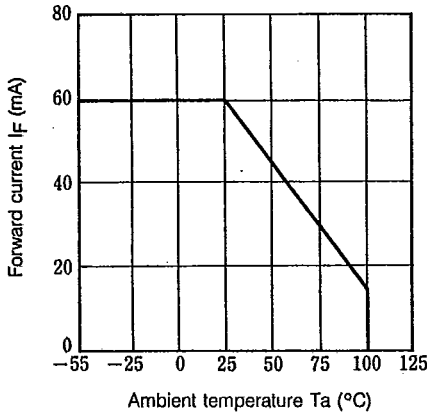
### • Inspection standard

Incoming inspection standard for LITON products are shown below.

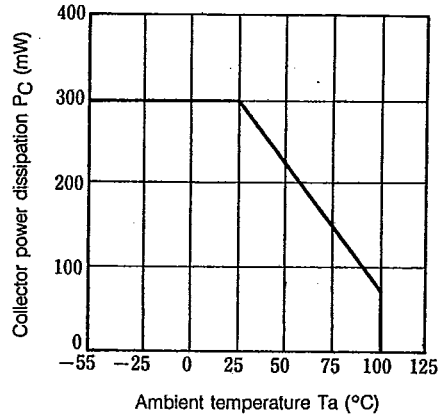
- (1) A single sampling plan, normal inspection level II based on MIL-STD-105D is applied. The AQL according to the inspection items are shown below.

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	

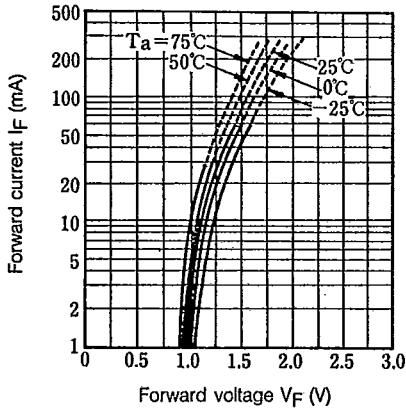
**Fig. 1** Forward Current vs. Ambient Temperature



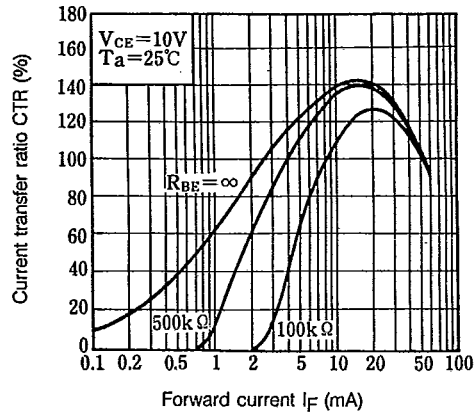
**Fig. 2** Collector Power Dissipation vs. Ambient Temperature



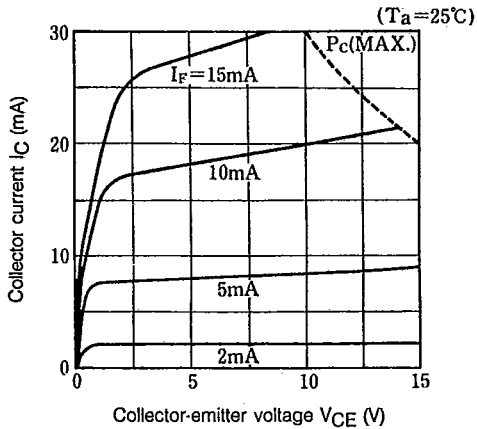
**Fig. 3** Forward Current vs. Forward Voltage



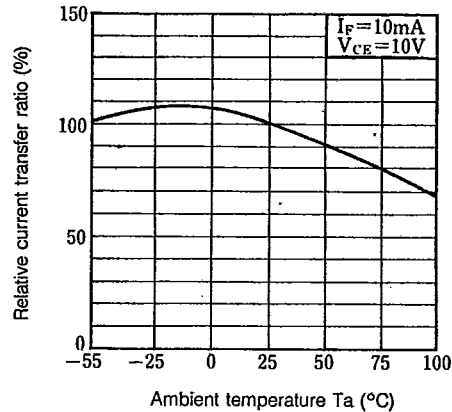
**Fig. 4** Current Transfer Ratio vs. Forward Current



**Fig. 5** Collector Current vs. Collector-emitter Voltage

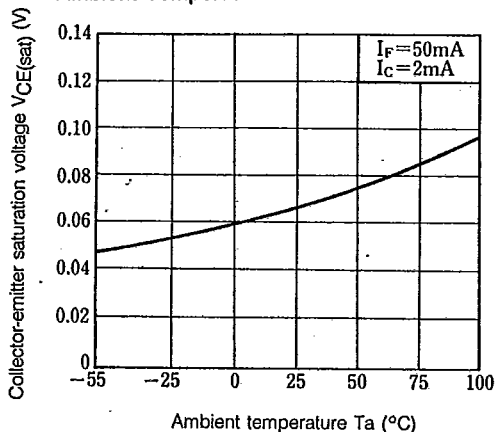


**Fig. 6** Relative Current Transfer Ratio vs. Ambient Temperature

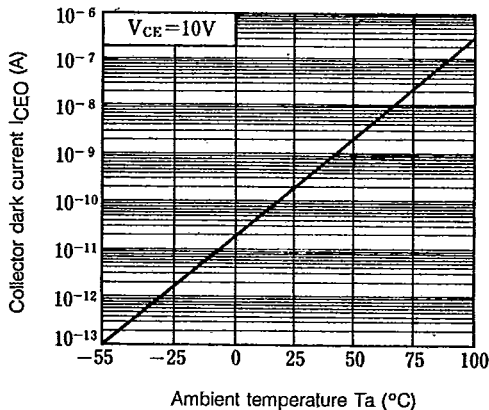




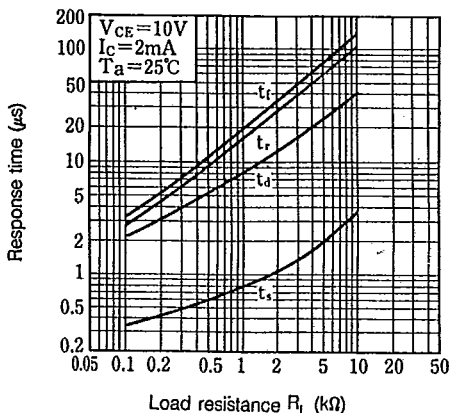
**Fig. 7** Collector-emitter Saturation Voltage vs. Ambient Temperature



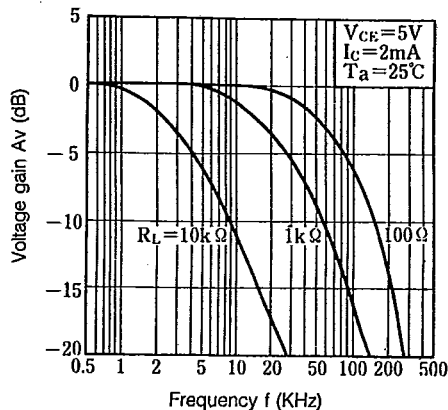
**Fig. 8** Collector Dark Current vs. Ambient Temperature



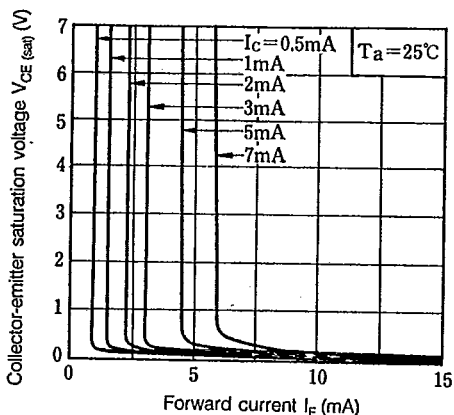
**Fig. 9** Response Time vs. Load Resistance



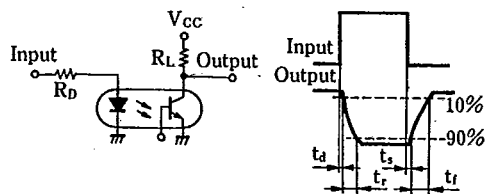
**Fig. 10** Frequency Response



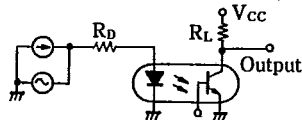
**Fig. 11** Collector-emitter Saturation Voltage vs. Forward current



Test Circuit for Response Time



Test Circuit for Frequency Response



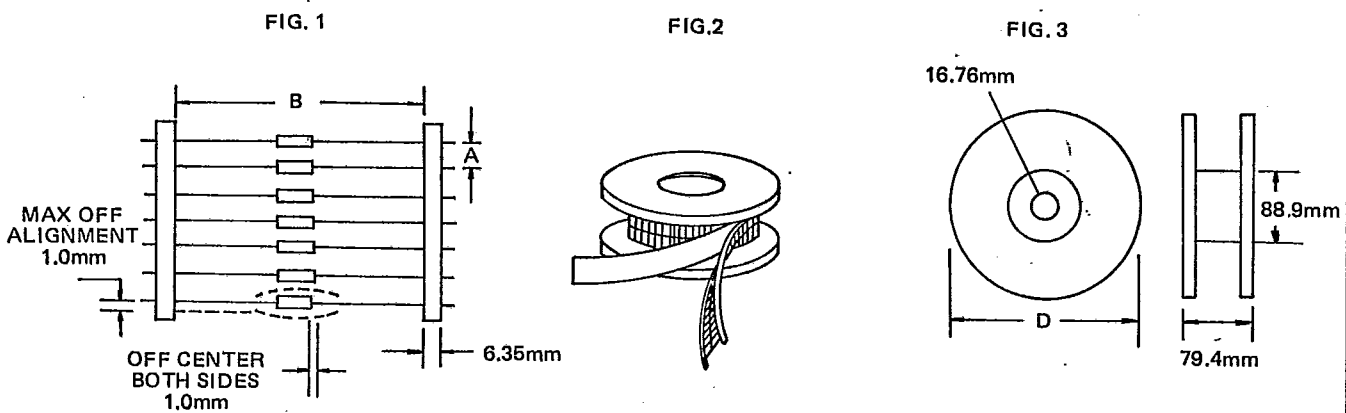
# PACKAGING

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

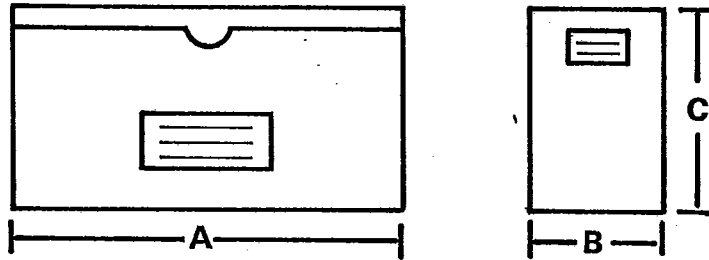


## Bulk Packaging (Axial Lead Devices and Bridge Rectifiers)

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	255	50	95	3K
	DO-41L(0.6mm Lead)				3K
52MM Horizontal Ammo Pack	DO-41and DO-41L	250	75	92	3K
	DO 201AD				0.8K

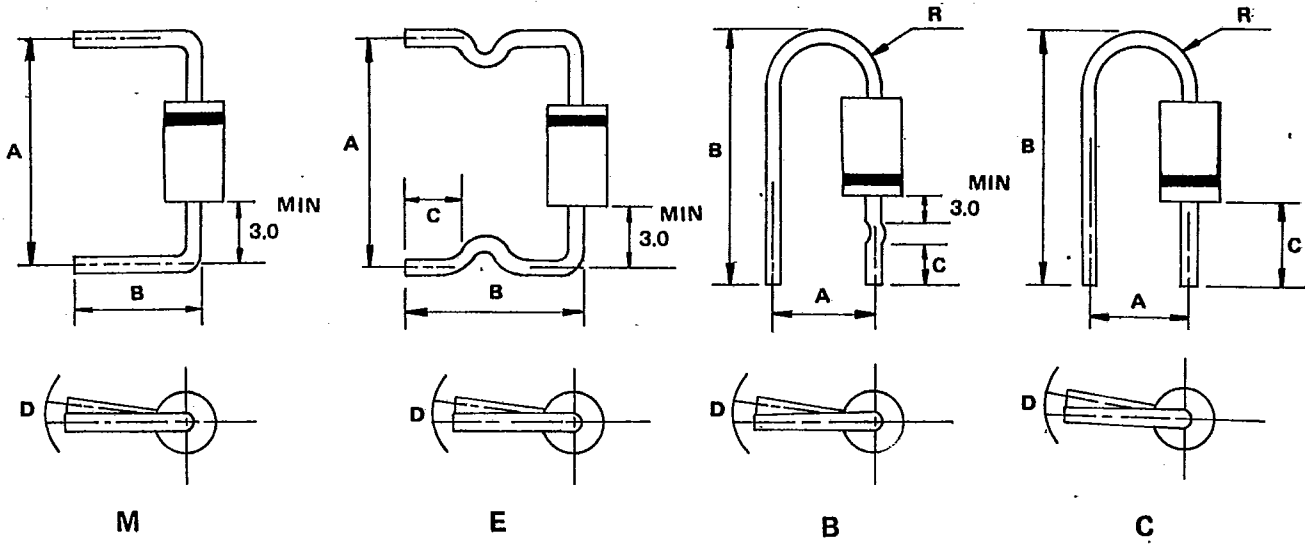
**CARTON SIZE**

Unit:m. m.

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