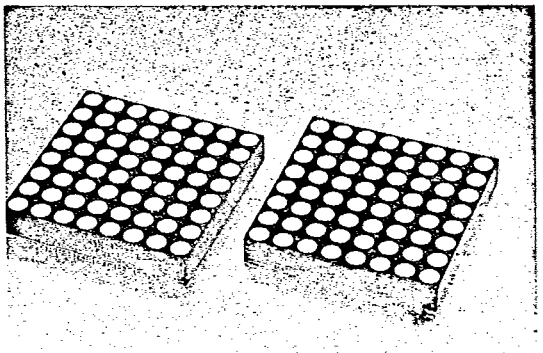
LITEON

# LTP-18088X 18188A SERIES

## 1.85" 8 x 8 SINGLE COLOR & MULTICOLOR DOT MATRIX DISPLAYS

T-41-35

## FEATURES



- 1.85INCH (47.0 mm) MATRIX HEIGHT.
- LOW POWER REQUIREMENT.
- HIGH CONTRAST.
- HIGH BRIGHTNESS.
- SINGLE PLANE, WIDE VIEWING ANGLE.
- 8 x 8 ARRAY WITH X-Y SELECT.
- COMPATIBLE WITH USASCII AND EBCDIC CODES.
- STACKABLE VERTICALLY AND HORIZONTALLY.
- CHOICE OF TWO MATRIX ORIENTATION CATHODE ROW OR CATHODE COLUMN.
- EASY MOUNTING ON P.C. BOARD.
- CATEGORIZED FOR LUMINOUS INTENSITY.
- SINGLE COLOR DISPLAYS HAVE THE CHOICE OF BRIGHT COLORS-GREEN/ORANGE/.
- MULTICOLOR DISPLAYS ARE APPLICABLE TO THREE BRIGHT COLORS: GREEN, ORANGE AND YELLOW (GREEN AND ORANGE MIXED)

## DESCRIPTION

The LTP-18x88 series are 1.85 inch (47.0 mm) matrix-height 8x8 dot matrix displays.
The LTP-18188A are multicolor applicable displays. The multicolor displays have black face and white dot color.
The LTP-18088 series are single color displays. The green, and orange displays have black face and white dot color.
The green series devices utilize LED chips which are made from GaP on a transparent GaP substrate.
The orange series devices utilize LED chips which are made from GaAsP on a transparent GaP substrate.

## DEVICES

| PART NO. LTP— | | | DESCRIPTION | PACKAGE DIMENSION | INTERNAL CIRCUIT DIAGRAM |
|---|---|---|---|---|---|
| GREEN | ORANGE | MULTI-COLOR | | | |
| LTP-18088G | 18088E | — | Anode Column, Cathode Row | A | A |
| — | — | 18188A | Anode Column, Cathode Row | B | B |

## PIN CONNECTION

| PIN NO. | CONNECTION | |
|---|---|---|
| | A: LTP-18088 | B: LTP-18188A |
| 1 | Cathode Row 2 | Cathode Row 2 |
| 2 | Anode Column 2 | Anode Column 2 Green |
| 3 | No Pin | Anode Column 2 Orange |
| 4 | Cathode Row 4 | Cathode Row 4 |
| 5 | Anode Column 4 | Anode Column 4 Green |
| 6 | No Pin | Anode Column 4 Orange |
| 7 | Cathode Row 6 | Cathode Row 6 |
| 8 | Anode Column 6 | Anode Column 6 Green |
| 9 | No Pin | Anode Column 6 Orange |
| 10 | Cathode Row 8 | Cathode Row 8 |
| 11 | Anode Column 8 | Anode Column 8 Green |
| 12 | No Pin | Anode Column 8 Orange |
| 13 | Cathode Row 7 | Cathode Row 7 |
| 14 | Anode Column 7 | Anode Column 7 Green |
| 15 | No Pin | Anode Column 7 Orange |
| 16 | Cathode Row 5 | Cathode Row 5 |
| 17 | Anode Column 5 | Anode Column 5 Green |
| 18 | No Pin | Anode Column 5 Orange |
| 19 | Cathode Row 3 | Cathode Row 3 |
| 20 | Anode Column 3 | Anode Column 3 Green |
| 21 | No Pin | Anode Column 3 Orange |
| 22 | Cathode Row 1 | Cathode Row 1 |
| 23 | Anode Column 1 | Anode Column 1 Green |
| 24 | No Pin | Anode Column 1 Orange |

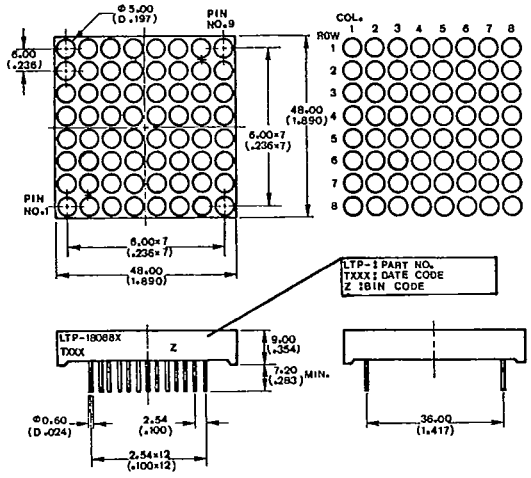
DOT MATRIX DISPLAYS

## ABSOLUTE MAXIMUM RATINGS AT $T_A = 25°C$

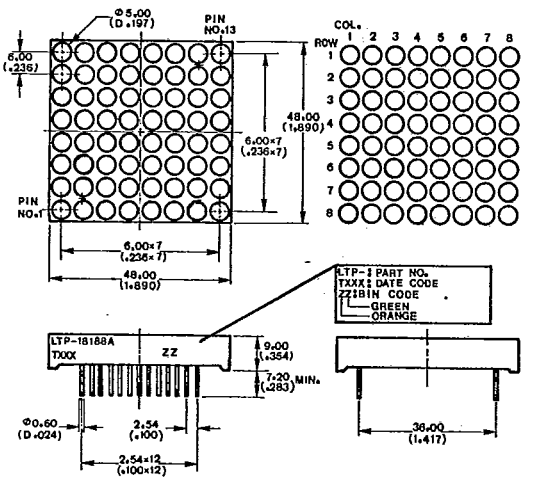
| PARAMETER | GREEN | ORANGE | UNIT |
|---|---|---|---|
| Power Dissipation Per Dot | 75 | 75 | mW |
| Peak Forward Current Per Dot (1/16 Duty Cycle, 0.1ms Pulse Width) | 100 | 100 | mA |
| Continuous Forward Current Per Dot | 25 | 25 | mA |
| Derating Linear From 25°C Per Dot | 0.3 | 0.3 | mA/°C |
| Reverse Voltage Per Dot | 5 | 5 | 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 | | | |

## PACKAGE DIMECTIONS

A. LTP-18088




B. LTP-18188A

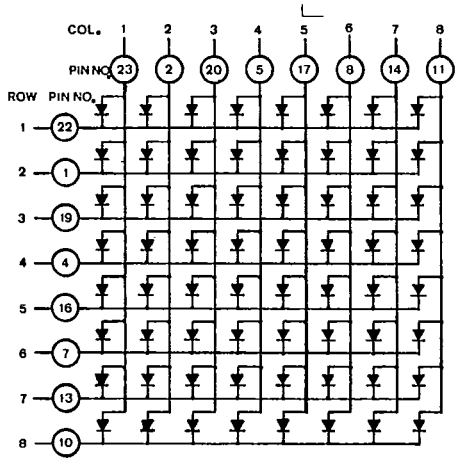



NOTE: All dimensions are in $\frac{\text{millimeters}}{(\text{inches})}$ tolerance are:

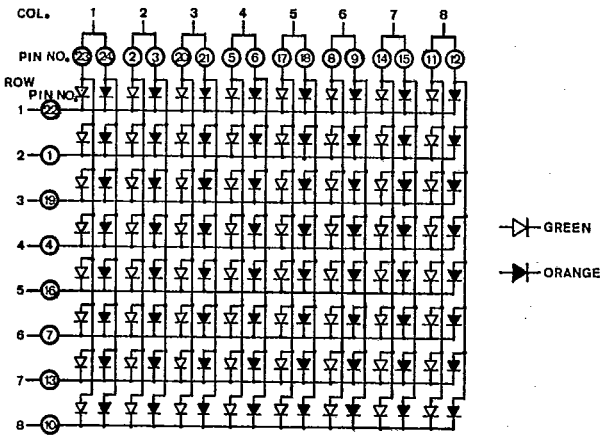
1. Lead length (from seating plane): minimum value $\frac{+1.00}{-0.000}$ mm $\left(\frac{+0.040''}{-0.000''}\right)$
2. $\frac{\pm 0.25\text{mm}}{(0.010'')}$ unless otherwise otherwise noted.

## INTERNAL CIRCUIT DIAGRAM

A. LTP-18088

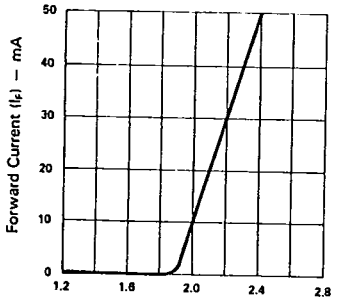



B. LTP-18188A

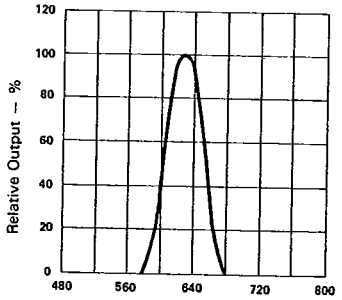


## ELECTRICAL/OPTICAL CHARACTERISTICS AT $T_A$ = 25°C
## LTP-18088E/18188A (DRANGE)

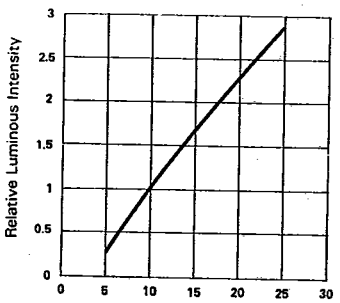
| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST CONDITION |
|---|---|---|---|---|---|---|
| Average Luminous Intensity | Iv | 1000 | 3500 | | µcd | Ip = 48 mA 1/8 DUTY |
| Peak Emission Wavelength | λp | | 630 | | nm | I = 20 mA |
| Spectral Line Half-Width | Δλ | | 40 | | nm | I = 20 mA |
| Forward Voltage any Dot | V | | 2.1 | 2.8 | V | I = 20 mA |
| Reverse Current any Dot | I | | | 100 | µA | V = 5V |
| Luminous Intensity Matching Ratio | Iv-m | | | 2:1 | | I = 20 mA |



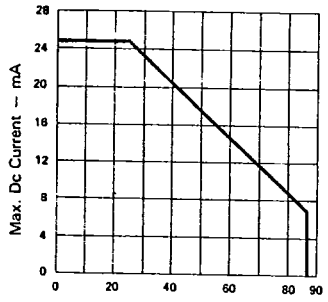

Forward Voltage ($V_F$) – Volts
Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.



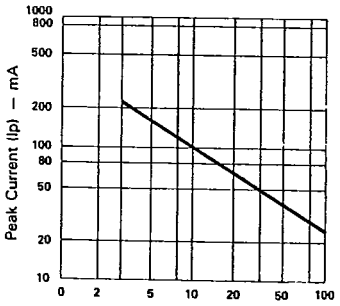

Wavelength ( λ ) – nm.
Fig. 2 SPECTRAL RESPONSE.



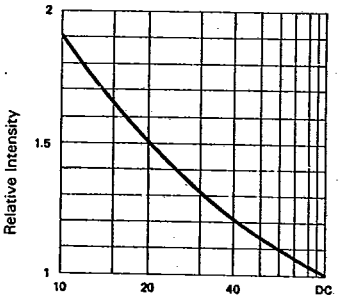

Forward Current ($I_F$) – mA
Fig. 3 RELATIVE LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).




Ambient Temperature (Ta) – °C
Fig. 4 MAX. ALLOWABLE DC CURRENT PER SEG. Vs AMBIENT TEMPERATURE.



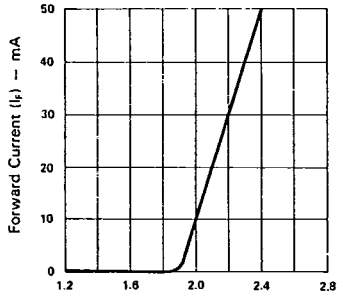

Duty Cycle %
Fig.5 MAX. PEAK CURRENT Vs. DUTY CYCLE.% (REFRESH RATE – F = 1 KHz)



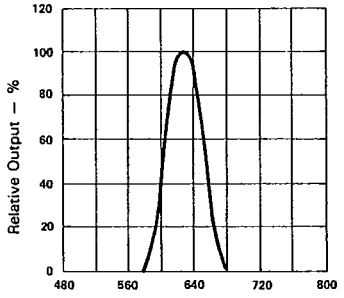

Duty Cycle %
Fig 6 LUMINOUS INTENSITY Vs. DUTY CYCLE% (AVERAGE $I_F$ = 10mA PER SEG.)

## ELECTRICAL/OPTICAL CHARACTERISTICS AT $T_A$ = 25°C
## LTP-18088G/18188A (GREEN)

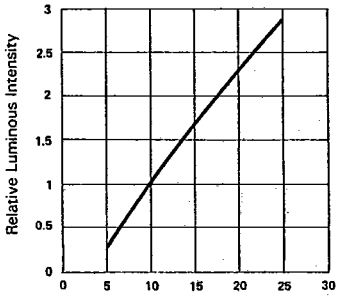
| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST CONDITION |
|---|---|---|---|---|---|---|
| Average Luminous Intensity | Iv | 1000 | 3500 | | µcd | Ip = 48 mA 1/8 DUTY |
| Peak Emission Wavelength | λp | | 565 | | nm | I = 20 mA |
| Spectral Line Half-Width | Δλ | | 30 | | nm | I = 20 mA |
| Forward Voltage any Dot | V | | 2.1 | 2.8 | V | I = 20 mA |
| Reverse Current any Dot | I | | | 100 | µA | V = 5V |
| Luminous Intensity Matching Ratio | Iv-m | | | 2:1 | | I = 20 mA |



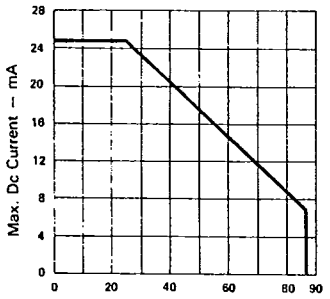

Forward Voltage ($V_F$) – Volts
Fig. 1 FORWARD CURRENT Vs. FORWARD VOLTAGE.



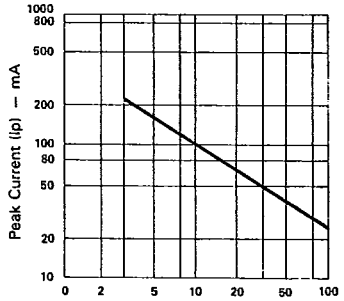

Wavelength ( λ ) – nm.
Fig. 2 SPECTRAL RESPONSE.



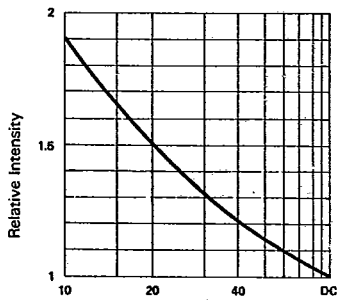

Forward Current ($I_F$) – mA
Fig. 3 RELATIVE, LUMINOUS INTENSITY Vs. FORWARD CURRENT (PER SEGMENT).




Ambient Temperature (Ta) – °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 KHz)




Duty Cycle %
Fig. 6 LUMINOUS INTENSITY Vs. DUTY CYCLE% (AVERAGE $I_F$ = 10mA PER SEG.)

# 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.

FIG. 1

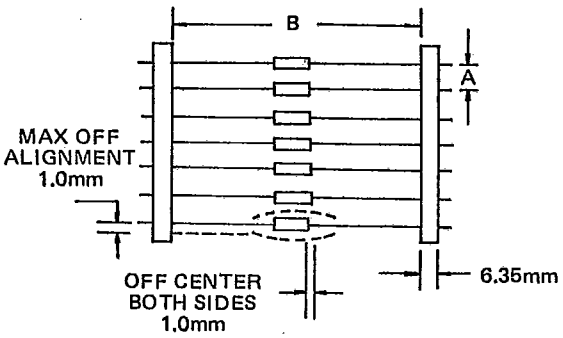



FIG.2

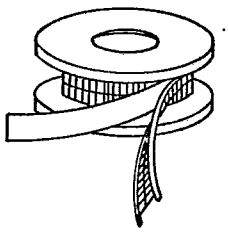
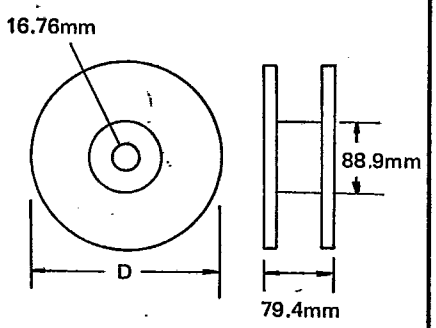


FIG. 3

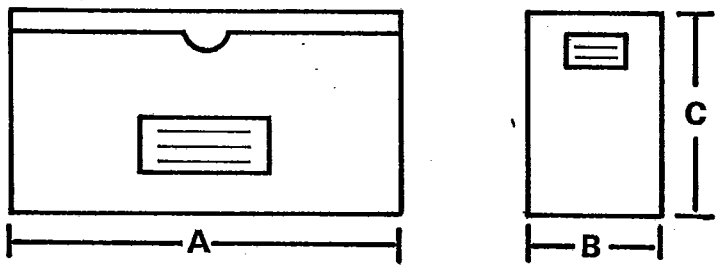



## Bulk Packaging (Axial Lead Devices and Bridge Rectifiers)

| 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.

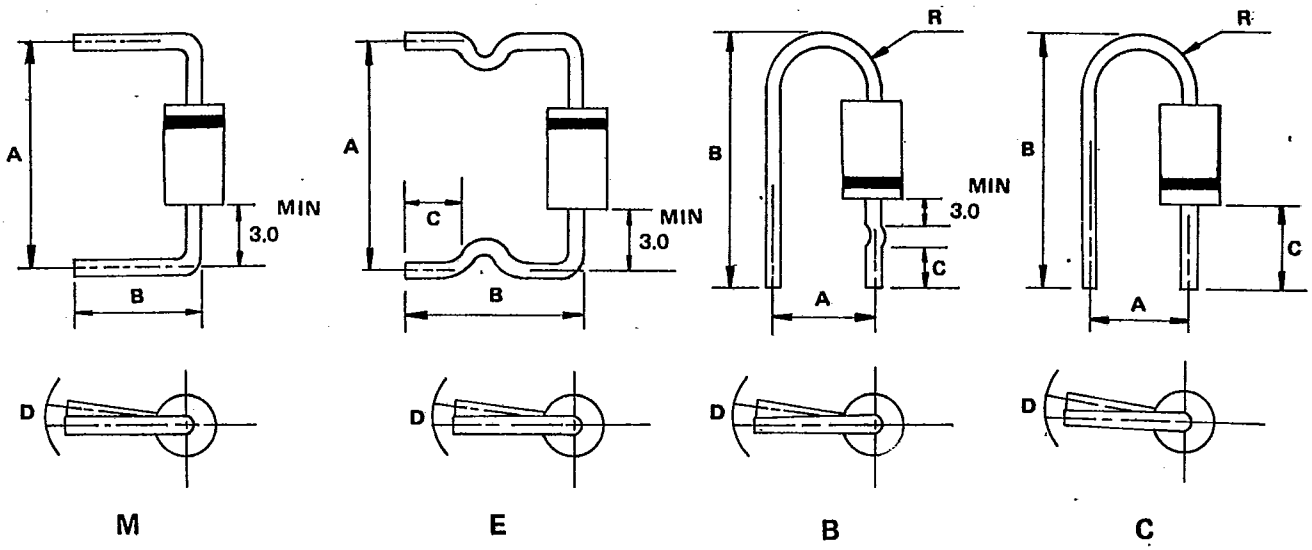
| Packaging | Products Outline | Dimension "A" | Dimension "B" | Dimension "C" | Q'ty per BOX |
|---|---|---|---|---|---|
| 26MM Horizontal Ammo Pack | DO-41 | 255 | 50 | 95 | 3K |
| | DO-41L(0.6mm Lead) | | | | 3K |
| 52MM Horizontal Ammo Pack | DO-41and DO-41L | 250 | 75 | 92 | 3K |
| | DO 201AD | | | | 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 |
| DO201AD | 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 | — | — |