# ML62 Series Positive Voltage Regulator

## ❖ *Application*

◆ *Battery Powered Equipment*
◆ *Palmtops*
◆ *Portable Cameras and Video Recorders*
◆ *Reference Voltage Sources*

## ❖ *Features*

● CMOS Low Power Consumption :
  Typical 3.3uA at Vout=5.0V
● Output Voltage Range : 1.1V to 6.0V in 0.1V increments
● Highly Accurate:
  Output Voltage $\pm$ 3% for 1.1V to 1.9V
  Output Voltage $\pm$ 2% for 2.0V to 6.0V
● Maximum Output Current: 250mA
  (within the maximum power dissipation, Vout=5.0V)
● Small Input-Output Voltage Differential:
  0.12V at 100mA and 0.38V at 200mA
● Input stability: Typ. 0.2%/V
● Package Available:
  SOT-23 (150mW), SOT-89 (500mW) &
  TO-92 (300mW)

## ❖ *General Description*

The ML62 is a group of positive voltage output, three-pin regulator which provides high output current even when the input/output voltage differential is small.

The ML62 consists of a high-precision voltage reference, an error correction circuit, and a current limited output driver.

## ❖ *Block Diagram*
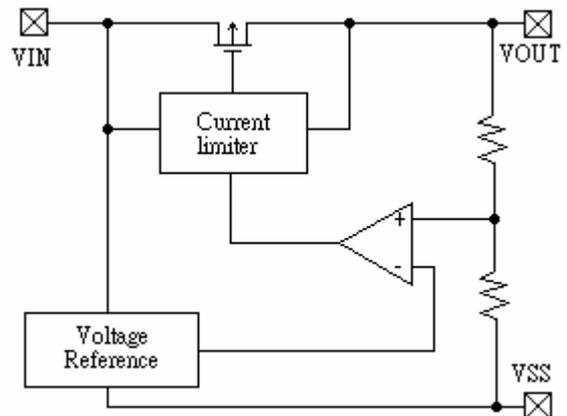


## ❖ *Absolute Maximum Ratings*

| Parameter | | Symbol | Ratings | Units |
|---|---|---|---|---|
| Input Voltage | | $V_{IN}$ | 10 | V |
| Output Current | | $I_{OUT}$ | 500 | mA |
| Output Voltage | | $V_{OUT}$ | $V_{SS}-0.3 \sim V_{IN}+0.3$ | V |
| Continuous Total Power Dissipation | SOT-23 | $P_d$ | 150 | mW |
| | SOT-89 | | 500 | |
| | TO-92 | | 300 | |
| Operating Ambient Temperature | | $T_{opr}$ | $-40 \sim +70$ | $^{o}C$ |
| Storage Temperature | | $T_{stg}$ | $-40 \sim +70$ | $^{o}C$ |

Mdc Minilogic Device Corporation

## ❖ *Pin Configuration*

**SOT-23**
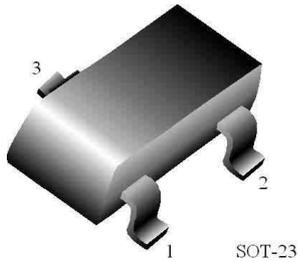


| Pin Number | Pin Name | Description |
|:---:|:---:|:---:|
| 1 | VSS | Ground |
| 2 | VOUT | Supply Voltage Output |
| 3 | VIN | Supply Voltage Input |

**SOT-89**
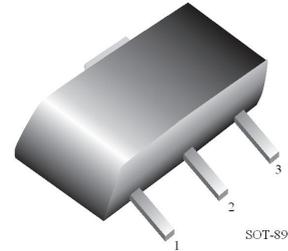


| Pin Number | Pin Name | Description |
|:---:|:---:|:---:|
| 1 | VSS | Ground |
| 2 | VIN | Supply Voltage Input |
| 3 | VOUT | Supply Voltage Output |

**TO-92**
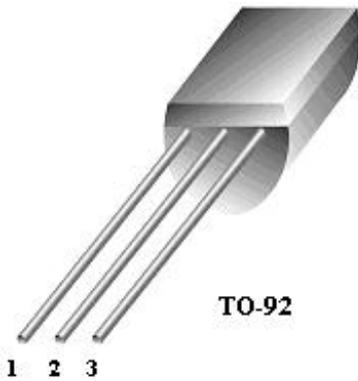


| Pin Number | Pin Name | Description |
|:---:|:---:|:---:|
| 1 | VSS | Ground |
| 2 | VIN | Supply Voltage Input |
| 3 | VOUT | Supply Voltage Output |

Λ dc Minilogic Device Corporation

## ❖ *Standard Circuit*

## Note on Use

1. Oscillation may occur as a result of the impedance present between the power supply and the IC's input. Please use a capacitor (CIN) of at least 1uF, when the impedance is 10 ohm or more.
   With a large output current, Voltage output can be stabilised by increasing capacitor (CIN) size. If CIN is small and capacitor (CL) size is increased, oscillation may occur. In such cases, Voltage output can be stabilised by either increasing the size of CIN or decreasing the size of CL.

2. Please ensure that output current (IOUT) is less than Pd / (VIN-VOUT) and does not exceed the stipulated Continuous Total Power Dissipation value (Pd).

## ❖ *Test Circuit*

Test Circuit 1                                              Test Circuit 2

**Mdc Minilogic Device Corporation**
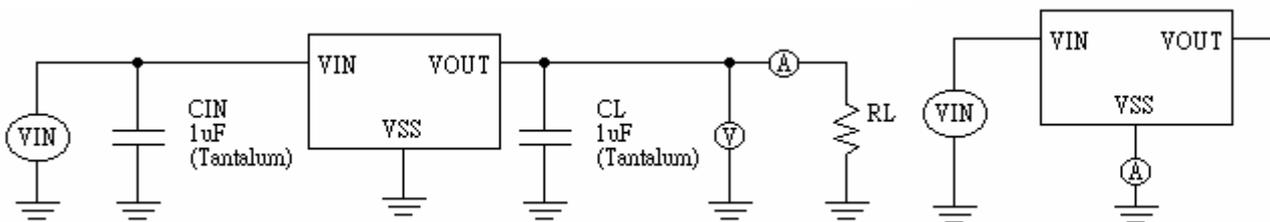
## ❖ *Electrical Characteristic*

### ML62502 $V_{OUT}(T)$=5.0V(Note 1)

| Parameter | Symbol | Conditions | Min | Typ | Max | Units | Circuit |
|---|---|---|---|---|---|---|---|
| Output Voltage | VOUT(E) (Note 2) | IOUT=40mA VIN=6.0V | 4.900 | 5.000 | 5.100 | V | 1 |
| Maximum Output Current | IOUT max | VIN=6.0V, VOUT(E) ≥ 4.5V | 250 | | | mA | 1 |
| Load Stability | ΔVOUT | VIN=6.0V, 1mA≤IOUT≤100mA | | 40 | 80 | mV | 1 |
| Input –Output Voltage Differential (Note 3) | Vdif1 | IOUT=100mA | | 120 | 400 | mV | 1 |
| | Vdif2 | IOUT=200mA | | 380 | 750 | mV | 1 |
| Supply Current | ISS | VIN=6.0V | | 3.3 | 4.5 | uA | 2 |
| Input Stability | $\frac{\Delta VOUT}{\Delta VIN * VOUT}$ | IOUT=40mA 6.0V≤VIN≤10.0V | | 0.2 | 0.3 | %V | 1 |
| Input Voltage | VIN | | | | 10 | V | - |

### ML62402 $V_{OUT}(T)$=4.0V(Note 1)

| Parameter | Symbol | Conditions | Min | Typ | Max | Units | Circuit |
|---|---|---|---|---|---|---|---|
| Output Voltage | VOUT(E) (Note 2) | IOUT=40mA VIN=5.0V | 3.920 | 4.000 | 4.080 | V | 1 |
| Maximum Output Current | IOUT max | VIN=5.0V, VOUT(E) ≥3.6V | 200 | | | mA | 1 |
| Load Stability | ΔVOUT | VIN=5.0V, 1mA≤IOUT≤100mA | | 45 | 90 | mV | 1 |
| Input –Output Voltage Differential (Note 3) | Vdif1 | IOUT=90mA | | 170 | 400 | mV | 1 |
| | Vdif2 | IOUT=180mA | | 400 | 750 | mV | 1 |
| Supply Current | ISS | VIN=5.0V | | 3.0 | 4.5 | uA | 2 |
| Input Stability | $\frac{\Delta VOUT}{\Delta VIN * VOUT}$ | IOUT=40mA 5.0V≤VIN≤10.0V | | 0.2 | 0.3 | %V | 1 |
| Input Voltage | VIN | | | | 10 | V | - |

### ML62302 $V_{OUT}(T)$=3.0V(Note 1)

| Parameter | Symbol | Conditions | Min | Typ | Max | Units | Circuit |
|---|---|---|---|---|---|---|---|
| Output Voltage | VOUT(E) (Note 2) | IOUT=40mA VIN=4.0V | 2.940 | 3.000 | 3.060 | V | 1 |
| Maximum Output Current | IOUT max | VIN=4.0V, VOUT(E) ≥2.7V | 150 | | | mA | 1 |
| Load Stability | ΔVOUT | VIN=4.0V, 1mA≤IOUT≤80mA | | 45 | 90 | mV | 1 |
| Input –Output Voltage Differential (Note 3) | Vdif1 | IOUT=80mA | | 180 | 450 | mV | 1 |
| | Vdif2 | IOUT=150mA | | 400 | 850 | mV | 1 |
| Supply Current | ISS | VIN=4.0V | | 2.8 | 4.5 | uA | 2 |
| Input Stability | $\frac{\Delta VOUT}{\Delta VIN * VOUT}$ | IOUT=40mA 4.0V≤VIN≤10.0V | | 0.2 | 0.3 | %V | 1 |
| Input Voltage | VIN | | | | 10 | V | - |

### ML62202 $V_{OUT}(T)$=2.0V(Note 1)

| Parameter | Symbol | Conditions | Min | Typ | Max | Units | Circuit |
|---|---|---|---|---|---|---|---|
| Output Voltage | VOUT(E) (Note 2) | IOUT=40mA VIN=3.0V | 1.960 | 2.000 | 2.040 | V | 1 |
| Maximum Output Current | IOUT max | VIN=3.0V, VOUT(E) ≥1.8V | 100 | | | mA | 1 |
| Load Stability | ΔVOUT | VIN=3.0V, 1mA≤IOUT≤60mA | | 45 | 90 | mV | 1 |
| Input –Output Voltage Differential (Note 3) | Vdif1 | IOUT=60mA | | 180 | 450 | mV | 1 |
| | Vdif2 | IOUT=100mA | | 400 | 850 | mV | 1 |
| Supply Current | ISS | VIN=3.0V | | 2.5 | 4.5 | uA | 2 |
| Input Stability | $\frac{\Delta VOUT}{\Delta VIN * VOUT}$ | IOUT=40mA 3.0V≤VIN≤10.0V | | 0.2 | 0.3 | %V | 1 |
| Input Voltage | VIN | | | | 10 | V | - |

Note : 1. VOUT(T) = Specified Output Voltage.

2. VOUT(E) = Effective Output Voltage (i.e. the output voltage when (VOUT(T)+1.0V) is provided at the VIN pin while maintaining a certain IOUT value).

3. Vdif = VIN1(Note 4) – VOUT(E)

4. VIN1 = The input voltage at the time 98% of VOUT (E) is output (input voltage has been gradually reduced).

Mdc Minilogic Device Corporation

## ❖ *Electrical Characteristics by Output Voltage*

| Part Number | Output voltage $V_{OUT}(V)$ | | | | Max Output Current $I_{OUT\ max}(mA)$ | | Load Stability $\Delta V_{OUT}(mV)$ | | | I-O Voltage Differential $V_{difl}(mV)$ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Conditions | MIN. | TYP. | MAX. | Conditions | MIN. | Conditions | TYP. | MAX. | Conditions | TYP. | MAX. |
| ML62113 | | 1.067 | 1.100 | 1.133 | | | | | | IOUT=20mA | 250 | 450 |
| ML62123 | | 1.164 | 1.200 | 1.236 | | | | | | | | |
| ML62133 | | 1.261 | 1.300 | 1.339 | | | | | | | | |
| ML62143 | | 1.358 | 1.400 | 1.442 | | | VIN=VOUT(T)+1V | | | IOUT=30mA | 250 | 450 |
| ML62153 | | 1.455 | 1.500 | 1.545 | | 80 | 1mA<IOUT<40mA | 45 | 90 | | | |
| ML62163 | | 1.552 | 1.600 | 1.648 | | | | | | | | |
| ML62173 | | 1.649 | 1.700 | 1.751 | | | | | | | | |
| ML62183 | | 1.746 | 1.800 | 1.854 | | | | | | IOUT=40mA | 250 | 450 |
| ML62193 | | 1.843 | 1.900 | 1.957 | | | | | | | | |
| ML62202 | | 1.960 | 2.000 | 2.040 | | | | | | | | |
| ML62212 | | 2.058 | 2.100 | 2.142 | | | | | | | | |
| ML62222 | | 2.156 | 2.200 | 2.244 | | | | | | | | |
| ML62232 | | 2.254 | 2.300 | 2.346 | | | | | | | | |
| ML62242 | | 2.352 | 2.400 | 2.448 | | 100 | $V_{IN}=V_{OUT}(T)+1V$ $1mA \leq I_{OUT} \leq 60mA$ | 45 | 90 | $I_{OUT}$=60mA | 180 | 450 |
| ML62252 | | 2.450 | 2.500 | 2.550 | | | | | | | | |
| ML62262 | | 2.548 | 2.600 | 2.652 | | | | | | | | |
| ML62272 | | 2.646 | 2.700 | 2.754 | | | | | | | | |
| ML62282 | | 2.744 | 2.800 | 2.856 | | | | | | | | |
| ML62292 | | 2.842 | 2.900 | 2.958 | | | | | | | | |
| ML62302 | | 2.940 | 3.000 | 3.060 | | | | | | | | |
| ML62312 | | 3.038 | 3.100 | 3.162 | | | | | | | | |
| ML62322 | | 3.136 | 3.200 | 3.264 | | | | | | | | |
| ML62332 | | 3.234 | 3.300 | 3.366 | | | | | | | | |
| ML62342 | | 3.332 | 3.400 | 3.468 | $V_{IN}=V_{OUT}(T)+1V$ $V_{OUT}(E) \geq$ $V_{OUT}(T)*0.9$ | 150 | $V_{IN}=V_{OUT}(T)+1V$ $1mA \leq I_{OUT} \leq 80mA$ | 45 | 90 | $I_{OUT}$=80mA | 180 | 450 |
| ML62352 | $I_{OUT}$=40mA $V_{IN}=V_{OUT}(T)+1V$ | 3.430 | 3.500 | 3.570 | | | | | | | | |
| ML62362 | | 3.528 | 3.600 | 3.672 | | | | | | | | |
| ML62372 | | 3.626 | 3.700 | 3.774 | | | | | | | | |
| ML62382 | | 3.724 | 3.800 | 3.876 | | | | | | | | |
| ML62392 | | 3.822 | 3.900 | 3.978 | | | | | | | | |
| ML62402 | | 3.920 | 4.000 | 4.080 | | | | | | | | |
| ML62412 | | 4.018 | 4.100 | 4.182 | | | | | | | | |
| ML62422 | | 4.116 | 4.200 | 4.284 | | | | | | | | |
| ML62432 | | 4.214 | 4.300 | 4.386 | | | | | | | | |
| ML62442 | | 4.312 | 4.400 | 4.488 | | 200 | $V_{IN}=V_{OUT}(T)+1V$ $1mA \leq I_{OUT} \leq 100mA$ | 45 | 90 | $I_{OUT}$=90mA | 170 | 400 |
| ML62452 | | 4.410 | 4.500 | 4.590 | | | | | | | | |
| ML62462 | | 4.508 | 4.600 | 4.692 | | | | | | | | |
| ML62472 | | 4.606 | 4.700 | 4.794 | | | | | | | | |
| ML62482 | | 4.704 | 4.800 | 4.896 | | | | | | | | |
| ML62492 | | 4.802 | 4.900 | 4.998 | | | | | | | | |
| ML62502 | | 4.900 | 5.000 | 5.100 | | | | | | | | |
| ML62512 | | 4.998 | 5.100 | 5.202 | | | | | | | | |
| ML62522 | | 5.096 | 5.200 | 5.304 | | | | | | | | |
| ML62532 | | 5.194 | 5.300 | 5.406 | | | | | | | | |
| ML62542 | | 5.292 | 5.400 | 5.508 | | | | | | | | |
| ML62552 | | 5.390 | 5.500 | 5.610 | | 250 | $V_{IN}=V_{OUT}+1V$ $1mA \leq I_{OUT} \leq 100mA$ | 40 | 80 | $I_{OUT}$=100mA | 120 | 400 |
| ML62562 | | 5.488 | 5.600 | 5.712 | | | | | | | | |
| ML62572 | | 5.586 | 5.700 | 5.814 | | | | | | | | |
| ML62582 | | 5.684 | 5.800 | 5.916 | | | | | | | | |
| ML62592 | | 5.782 | 5.900 | 6.018 | | | | | | | | |
| ML62602 | | 5.880 | 6.000 | 6.120 | | | | | | | | |

Minilogic Device Corporation

| Part Number | I-O Voltage Differential V$_{dif2}$(mV) | | | Supply Current I$_{SS}$(uA) | | | Input Stability $\Delta V_{OUT}/(\Delta V_{IN}*V_{OUT})$ (%V) | | | Input Voltage V$_{IN}$(V) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Conditions | TYP. | MAX. | Conditions | TYP. | MAX. | Conditions | TYP. | MAX. | MAX. |
| ML62113 | IOUT=40mA | 450 | 850 | | | | | | | |
| ML62123 | | | | | | | | | | |
| ML62133 | IOUT=60mA | 450 | 850 | | 2.0 | 4.5 | | 0.2 | 0.4 | |
| ML62143 | | | | | | | | | | |
| ML62153 | | | | | | | | | | |
| ML62163 | | | | | | | | | | |
| ML62173 | IOUT=80mA | 450 | 850 | | | | | | | |
| ML62183 | | | | | | | | | | |
| ML62193 | | | | | | | | | | |
| ML62202 | I$_{OUT}$=100mA | 400 | 850 | | 2.5 | 4.5 | | | | |
| ML62212 | | | | | | | | | | |
| ML62222 | | | | | | | | | | |
| ML62232 | | | | | | | | | | |
| ML62242 | | | | | | | | | | |
| ML62252 | | | | | | | | | | |
| ML62262 | | | | | | | | | | |
| ML62272 | | | | | | | | | | |
| ML62282 | | | | | | | | | | |
| ML62292 | | | | | | | | | | |
| ML62302 | I$_{OUT}$=150mA | 400 | 850 | V$_{IN}$=V$_{OUT}$(T)+1V | 2.8 | 4.5 | I$_{OUT}$=40mA V$_{OUT}$(T)+1V≤V$_{IN}$≤10V | | | 10 |
| ML62312 | | | | | | | | | | |
| ML62322 | | | | | | | | | | |
| ML62332 | | | | | | | | | | |
| ML62342 | | | | | | | | | | |
| ML62352 | | | | | | | | | | |
| ML62362 | | | | | | | | | | |
| ML62372 | | | | | | | | | | |
| ML62382 | | | | | | | | | | |
| ML62392 | | | | | | | | | | |
| ML62402 | I$_{OUT}$=180mA | 400 | 750 | | 3.0 | 4.5 | | 0.2 | 0.3 | |
| ML62412 | | | | | | | | | | |
| ML62422 | | | | | | | | | | |
| ML62432 | | | | | | | | | | |
| ML62442 | | | | | | | | | | |
| ML62452 | | | | | | | | | | |
| ML62462 | | | | | | | | | | |
| ML62472 | | | | | | | | | | |
| ML62482 | | | | | | | | | | |
| ML62492 | | | | | | | | | | |
| ML62502 | I$_{OUT}$=200mA | 380 | 750 | | 3.3 | 4.5 | | | | |
| ML62512 | | | | | | | | | | |
| ML62522 | | | | | | | | | | |
| ML62532 | | | | | | | | | | |
| ML62542 | | | | | | | | | | |
| ML62552 | | | | | | | | | | |
| ML62562 | | | | | | | | | | |
| ML62572 | | | | | | | | | | |
| ML62582 | | | | | | | | | | |
| ML62592 | | | | | | | | | | |
| ML62602 | | | | | | | | | | |

Mdc Minilogic Device Corporation

## ❖ *Typical Performance Characteristics*

### 1) Output Voltage vs. Output Current



ML62502
VIN = 6.0V
Topr =80°C
Topr =25°C
Topr =-40°C
Output Voltage VOUT(V)
Output Current IOUT(mA)



ML62302
VIN = 4.0V
Topr =80°C
Topr =25°C
Topr =-40°C
Output Voltage VOUT(V)
Output Current IOUT(mA)
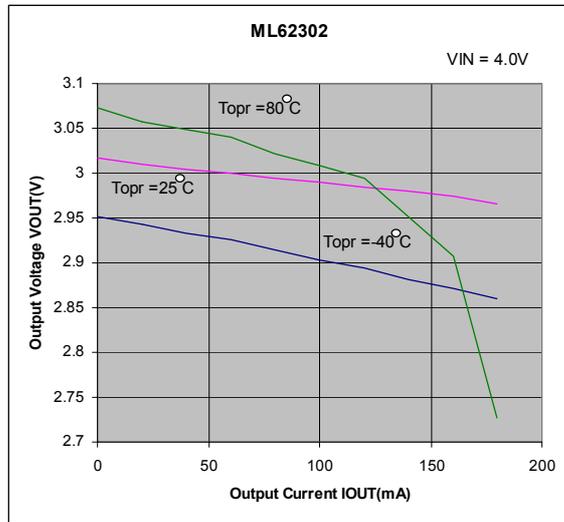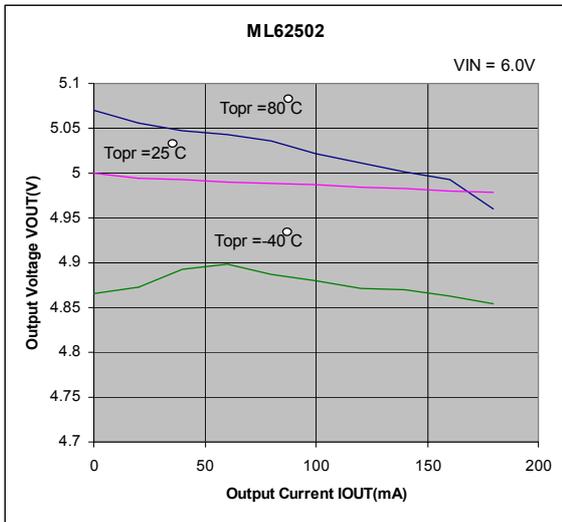
### 2) Output Voltage vs. Input Voltage



ML62502
Topt = 25℃
CL = 0.1uF(Tantalum)
Iout = 1mA
Iout = 40mA
Iout = 10mA
Output Voltage VOUT(V)
Input Voltage VIN(V)



ML62302
Topt = 25℃
CL = 0.1uF(Tantalum)
Iout = 1mA
Iout = 40mA
Iout = 10mA
Output Voltage VOUT(V)
Input Voltage VIN(V)
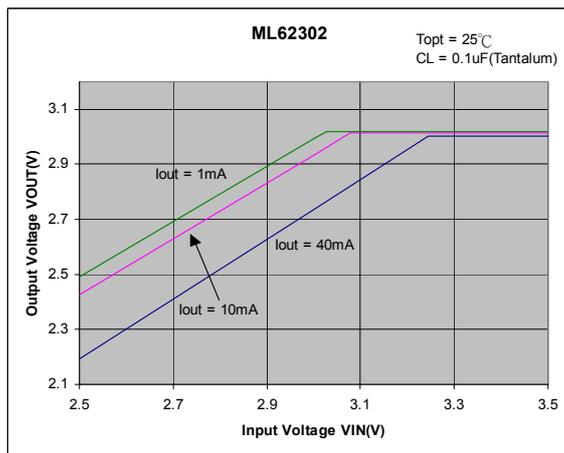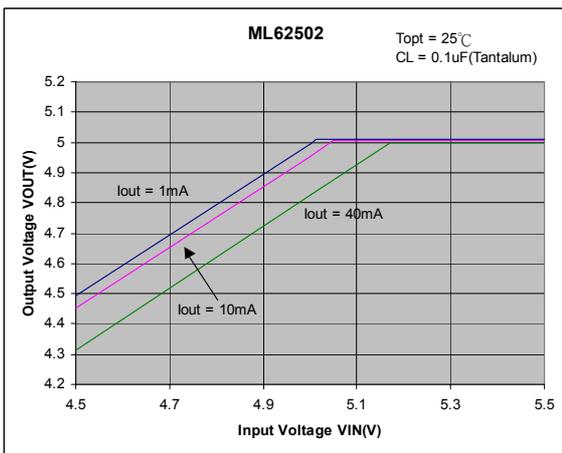
### 3) Input/Output Voltage Differential vs. Output Current



ML62502
CL = 0.1uF(Tantalum)
Topr =80°C
Topr =25°C
Topr =-40°C
Input/Output Voltage Diff Vdif(V)
Output Current IOUT(mA)



ML62302
CL = 0.1uF(Tantalum)
Topr =80°C
Topr =25°C
Topr =-40°C
Input/Output Voltage Diff Vdif(V)
Output Current IOUT(mA)

P7/14

Minilogic Device Corporation
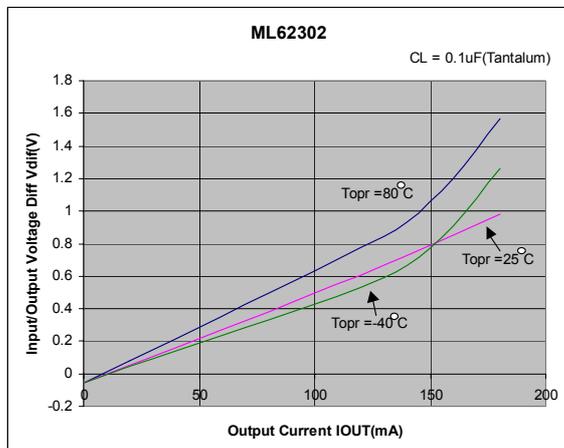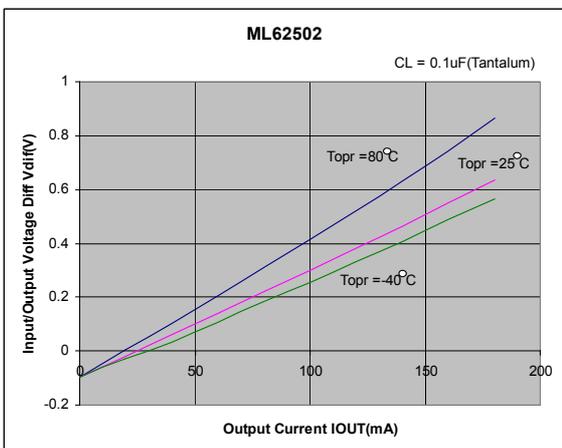
## 4) Supply Current vs. Input Voltage
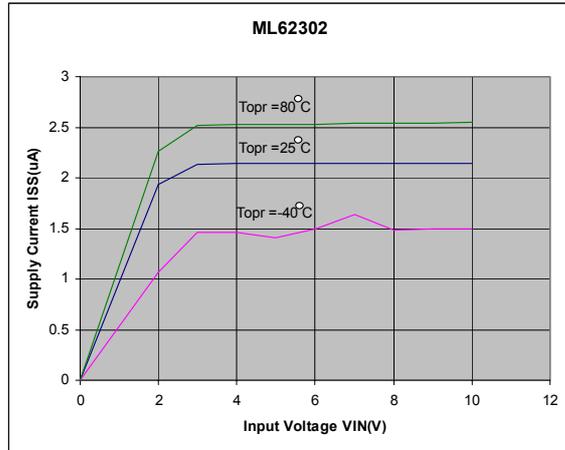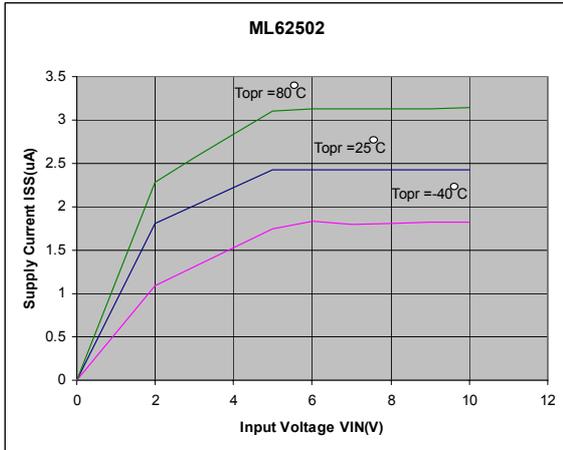


## 5) Output Voltage vs. Ambient Temperature
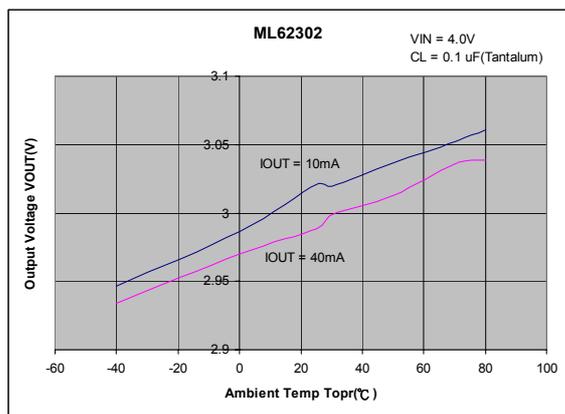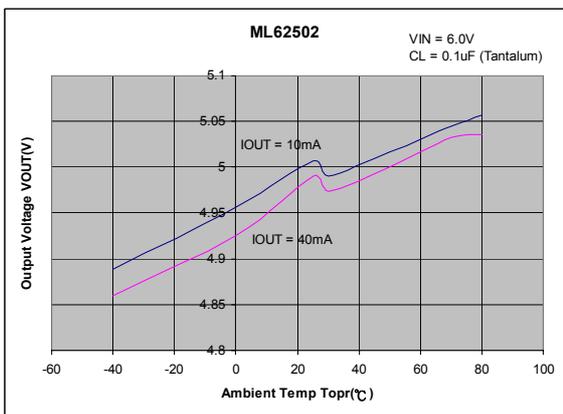


## 6) Supply Current vs. Ambient Temperature

### Minilogic Device Corporation
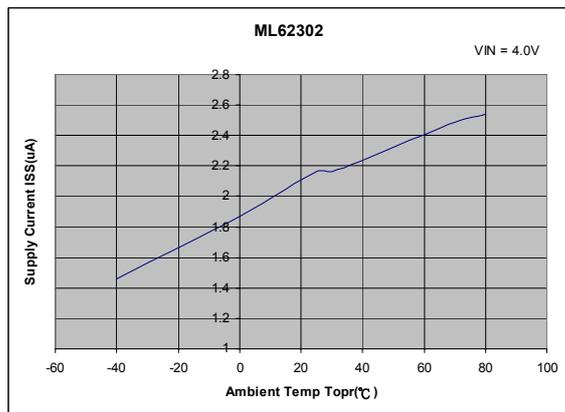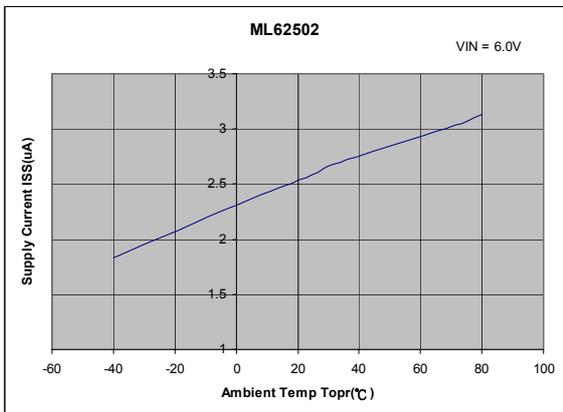
## ❖ *Ordering Information*

| Designator | Description |
|---|---|
| a | **Output Voltage**<br>eg. 30=3.0V<br>50=5.0V |
| b | **Output Voltage Accuracy**<br>2 = ± 2.0%<br>3 = ± 3.0% |
| c | **Package Type**<br>M = SOT-23<br>P = SOT-89<br>T = TO-92 |
| d | **Device Orientation**<br>R = Embossed Tape<br>    (Orientation of Device : Right)<br>L = Embossed Tape<br>    (Orientation of Device : Left)<br>B = Bag (TO-92)<br>H = Paper Tape (TO-92) |

```
ML62xxxxx
    ↻↑↑↑
    a bcd
```

## ❖ *Marking*

**SOT-23 :**

| Designator | Description |
|---|---|
| 1 | **Type**<br>R = Positive Voltage Regulator |
| 2,3 | **Output Voltage**<br>eg. 30 = 3.0V |
| 4 | **Internal Code** |

eg.

```
  ┌─3─┐        ┌─3─┐
  │1234│       │R30A│
  └1──2┘       └1──2┘
SOT-23 (Top View)  SOT-23 (Top View)
```

**SOT-89 :**

| Designator | Description |
|---|---|
| 1 | **Type**<br>R = Positive Voltage Regulator |
| 2,3 | **Output Voltage**<br>eg. 30 = 3.0V |
| 4 | **Output Voltage Accuracy**<br>2 = ± 2.0%<br>3 = ± 3.0% |
| 5 | **Internal Code** |

eg.

```
 ┌──────┐      ┌──────┐
 │12345 │      │R302A │
 └1  2  3┘     └1  2  3┘
SOT-89 (Top View)  SOT-89 (Top View)
```
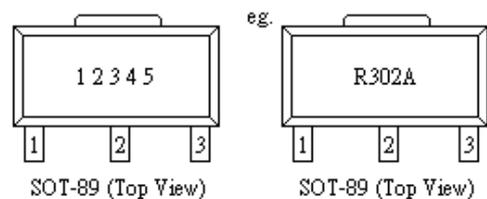
**TO-92 :**

| Designator | Description |
|---|---|
| 1 | **Type**<br>R = Positive Voltage Regulator |
| 2,3 | **Output Voltage**<br>eg. 30 = 3.0V |
| 4 | **Output Voltage Accuracy**<br>2 = ± 2.0%<br>3 = ± 3.0% |
| 5 | **Internal code** |
| 6, 7 | **Year Code**<br>    eg. 00 = Year 2000 |
| 8, 9 | **Week Code**<br>    eg. 10 = Week 10 |

eg.

```
 ┌──────┐      ┌──────┐
 │12345 │      │R302A │
 │6789  │      │0010  │
 └1  2  3┘     └1  2  3┘
TO92 (Front View)  TO92 (Front View)
```

M dc Minilogic Device Corporation
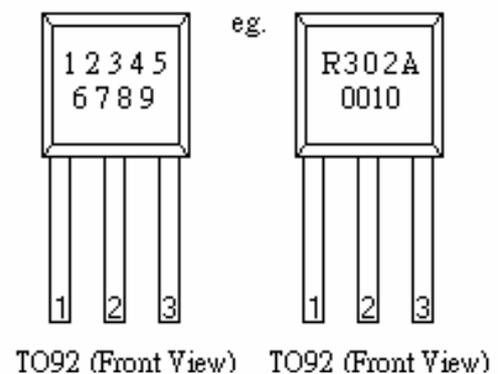
# ❖ *Packaging Information*

**SOT-23 :**

(0.8)

0.4 $^{-0.1}_{-0.05}$

0.15 $^{-0.1}_{-0.05}$

0 ~ 0.1

2.8 ± 0.2

1.6 $^{+1.2}_{-0.1}$

min. 0.2

(0.95)

1.9 ± 0.2

2.9 ± 0.2

1.1 ± 0.1

**SOT-89 :**

4.5 ± 0.1

1.72 ± 0.1

1.5 ± 0.1

2.45 ± 0.15

4.25 max

1.1 mm

0.42 ± 0.06

0.49 ± 0.06

0.42 ± 0.06

0.4 ± 0.04

1.5 ± 0.1

1.5 ± 0.1

**TO-92 :**

1.27  1.27

4.2 max

∅5.2 max

5.3 max

12.7 min
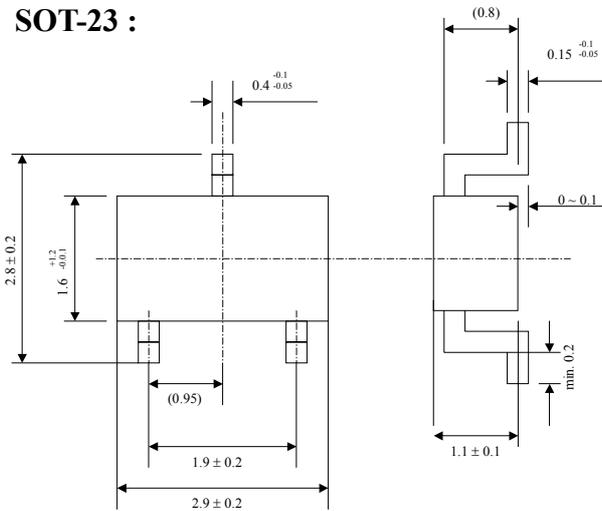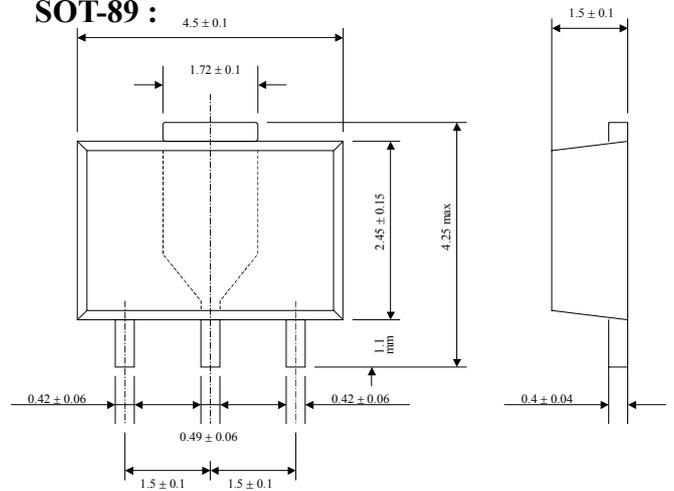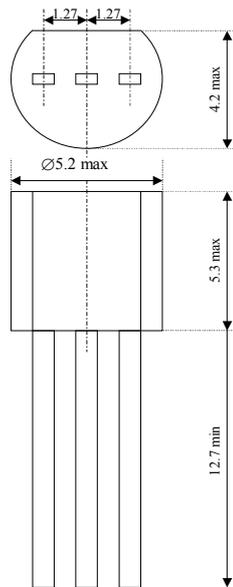
Units : mm

# ❖ *Recommended Pattern Layout*

**SOT-23 :**

2.4

1.9

0.8

1.0

**SOT-89**

2.2

0.9

45°

45°

3.7

1.5

1.0

1.0

1.6

Mdc Minilogic Device Corporation
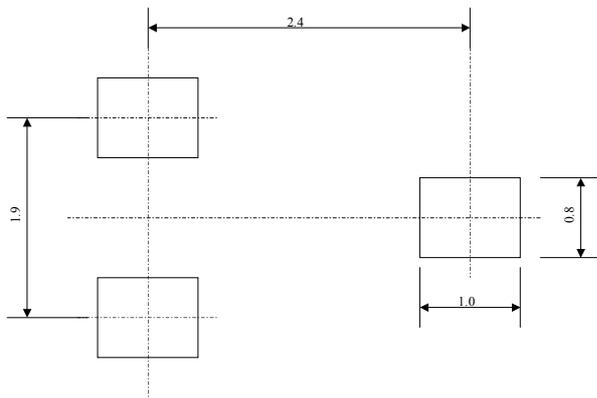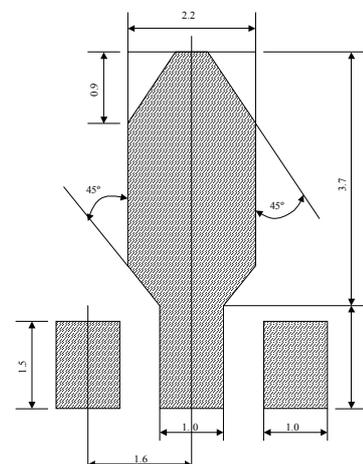
## ❖ *Tape and Reel Information*

**SOT-23 :**



BACK VIEW
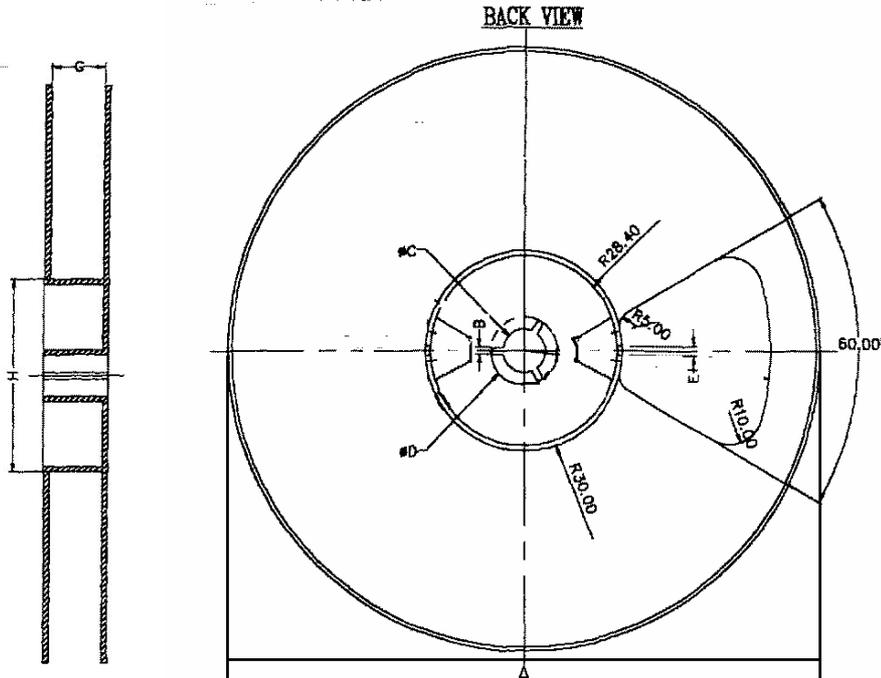
| | SIZE (mm) |
|---|---|
| A | $\varnothing\ 178 \pm 0.8$ |
| B | $2 \pm 0.2$ |
| C | $\varnothing\ 13 \pm 0.2$ |
| D | $\varnothing\ 21 \pm 0.8$ |
| G | $8 \pm 0.5$ |
| H | $\varnothing\ 60$ |

3,000 pcs / reel

**SOT-23 Taping Specifications :**
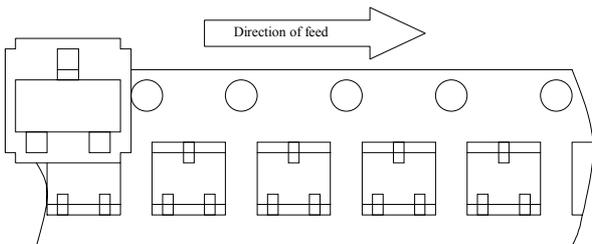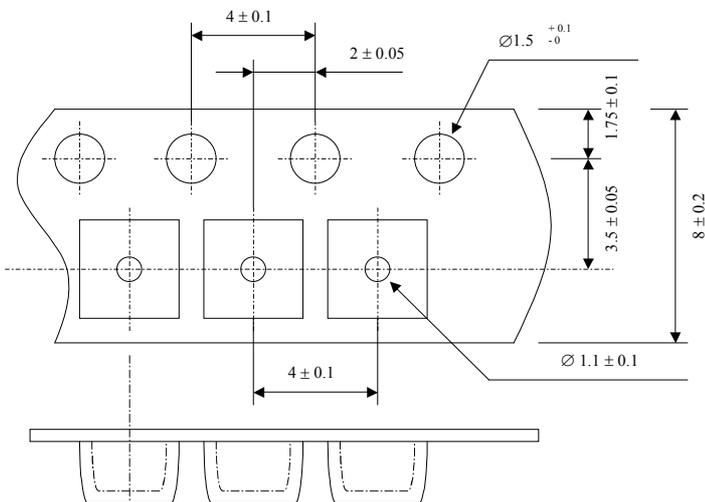


"R" type [Orientation of Device: Right]
Standard Type

"L" type [Orientation of Device: Left]
Reverse Type

Mdc Minilogic Device Corporation

## SOT-89 :

BACK VIEW
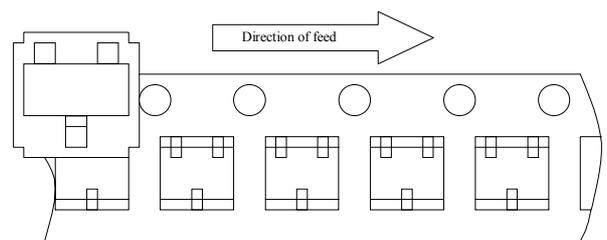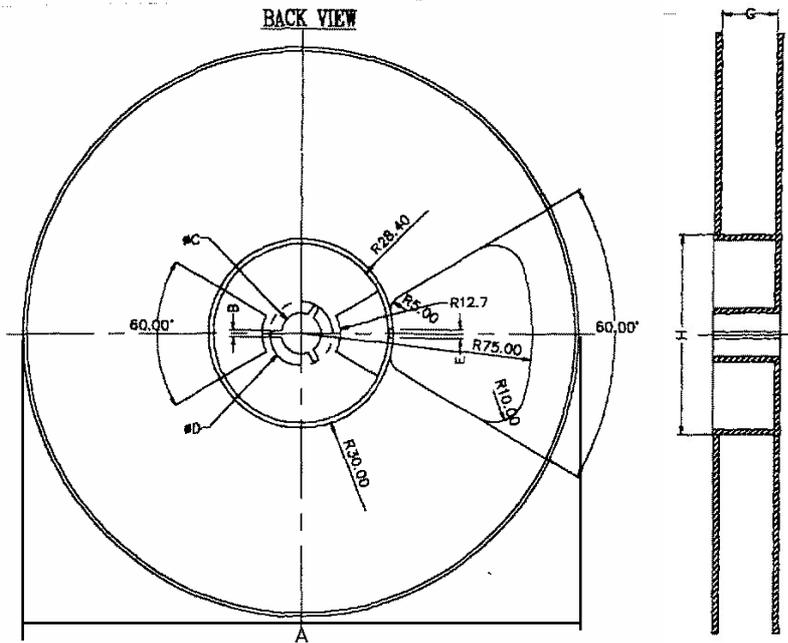
| | SIZE (mm) |
|---|---|
| A | $\varnothing\,178 \pm 0.8$ |
| B | $2 \pm 0.2$ |
| C | $\varnothing\,13 \pm 0.2$ |
| D | $\varnothing\,21 \pm 0.8$ |
| G | $12 \pm 0.5$ |
| H | $\varnothing\,60$ |

1,000 pcs / reel

## SOT-89 Taping Specifications :
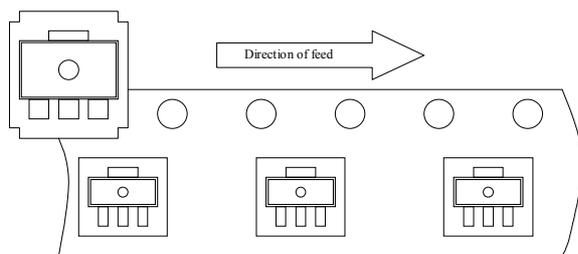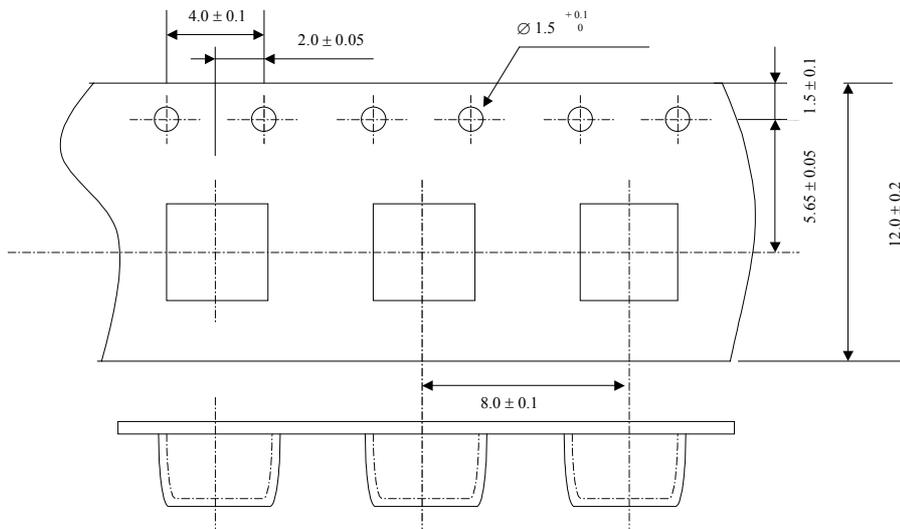
$4.0 \pm 0.1$

$2.0 \pm 0.05$

$\varnothing\,1.5 \ ^{+0.1}_{0}$

$1.5 \pm 0.1$

$5.65 \pm 0.05$

$12.0 \pm 0.2$

$8.0 \pm 0.1$

Direction of feed

Direction of feed

"R" type [Orientation of Device: Right]
Standard Type

"L" type [Orientation of Device: Left]
Reverse Type

$\wedge\underline{dc}$ Minilogic Device Corporation
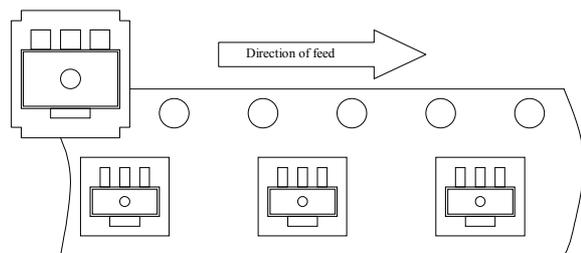
**TO-92 Taping Specifications :**
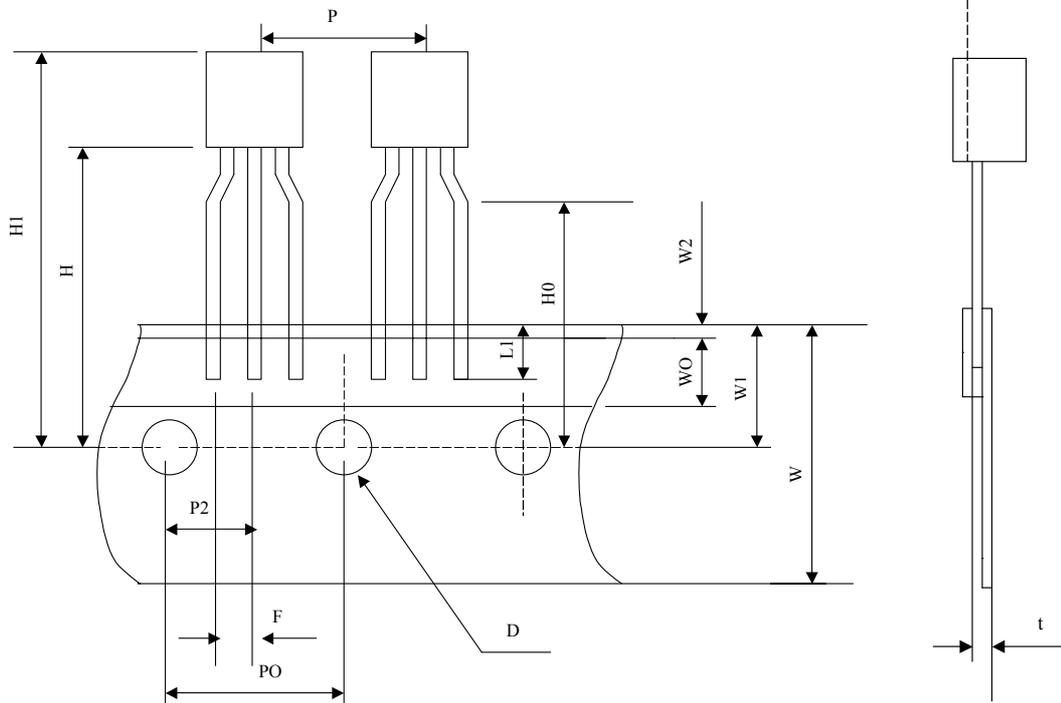


|  | SIZE (mm) |
|---|---|
| *P* | $12.7 \pm 1.0$ |
| PO | $12.7 \pm 0.3$ |
| P2 | $6.35 \pm 0.4$ |
| F | $2.5 \,^{+0.45}_{-0.15}$ |
| W | $18.0 \pm 1.0$ |
| WO | $6.0 \pm 0.3$ |
| W1 | $9.0 \pm 0.5$ |
| W2 | 0.5 MAX |
| H | $19.0 \pm 0.5$ |
| H0 | $16.0 \pm 0.5$ |
| H1 | 32.25 MAX |
| D | $\varnothing \, 4.0 \pm 0.2$ |
| t | $0.6 \pm 0.2$ |
| L1 | 3.5 MIN |

2,000 pcs / box

Mdc Minilogic Device Corporation

## ❖ *History of Revision*

| REV | DESCRIPTION | DATE |
|---|---|---|
|  | First Official Specification | 04/04/01 |
| A | SOT-23, SOT-89 & TO-92 Package and packing description added. Operating and Storage Temperature modified. | 23/10/01 |
| B | Absolute Maximum Input Rating of Input Voltage increased from 10V to 12V. | 02/08/02 |
| C | 1.1V to 1.9V Voltage Regulator Added. Typical Performance Characteristics added. | 24/10/02 |
| D | Modify 1.1V to 1.9V Voltage Regulator Electrical Characteristics. | 08/11/02 |
| E | Modify 1.1V & 1.2V Voltage Regulator I-O Voltage Differential Characteristics. | 23/12/02 |
| F | Modify 1.3V to 1.6V Voltage Regulator I-O Voltage Differential Characteristics. | 24/1/03 |
| G | Modify Operating and Storage Temperature Range, and the outlook of packages. | 4/10/03 |
| H | Absolute Maximum Input Rating of Input Voltage reduced from 12V to 10V. | 3/9/04 |