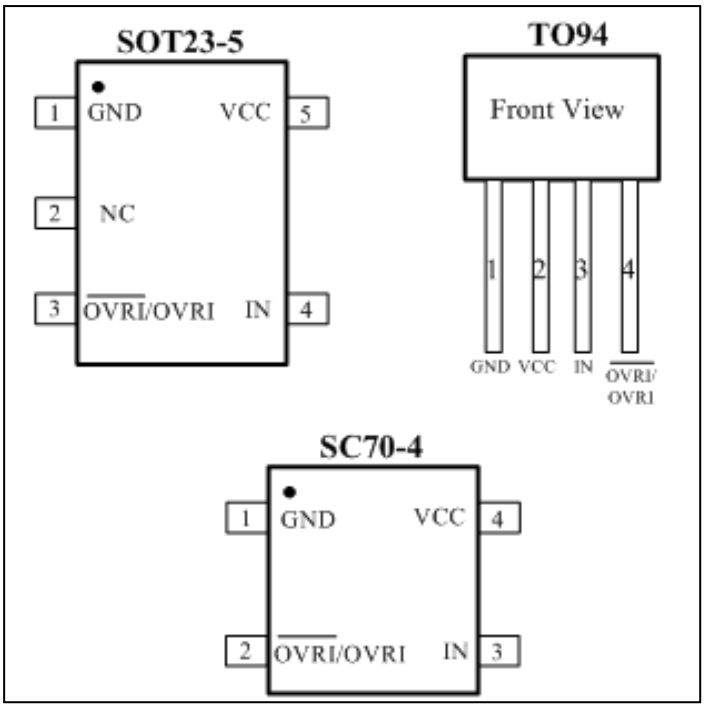
# Ultra Low Voltage Detectors

## Features

- Low/High Threshold voltage with 90mV/100mV for PT7M6101 and 190mV/200mV for PT7M6102 Internal Reference (10mV hysteresis)
- ±10mV Threshold Voltage Accuracy Over Temperature
- Low Power Consumption: 8μA (typical)
- Three Output Configurations
  Push-Pull Active Low-- $\overline{\text{OVRI}}$
  Push-Pull Active High--- OVRI
  Open-Drain Active Low--- $\overline{\text{OVRI}}$
- Guaranteed OVRI Valid to Vcc=1.0V
- Immune to Short Negative Vcc Transients
- SC70-4, SOT23-5 and TO94 Packages are available

## Pin Configuration




## Description

PT7M6101/6102 series are designed for over current detector. They provide excellent circuit reliability and low cost by eliminating external components. These devices assert an OVRI signal when the voltage at IN pin rises above the high threshold. After IN pin declines below the low threshold, OVRI signal is de-asserted.

PT7M6101CL/6102CL have a push-pull active-low output. PT7M6101CH/6102CH have a push-pull active-high output. PT7M6101NL/6102NL have an open-drain active-low output. The open-drain active-low output requires a pull-up resistor that can be connected to a voltage higher than $V_{DD}$.

Low supply current of 8μA makes PT7M6101//6102 series ideal for using in battery power supply. These devices are available in SC70-4, SOT23-5, TO94 lead free packages.

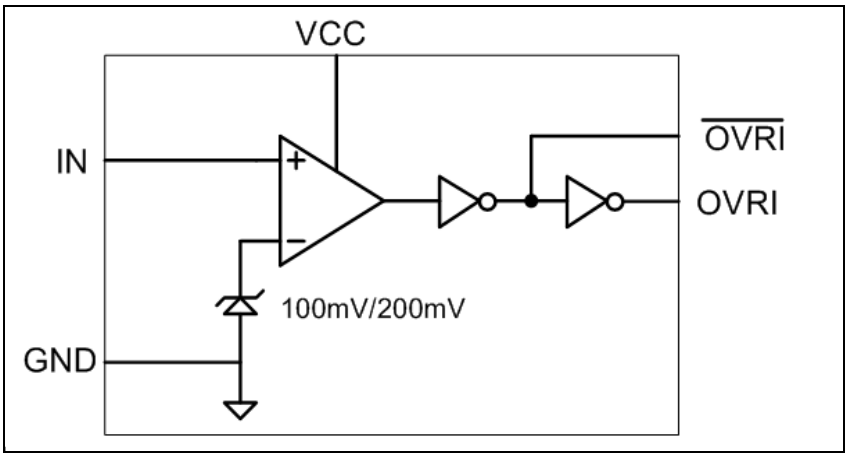
## Applications

- Over Current Protection in Battery Charger etc.
- Over Temperature Protection
- Power Supply
- Voltage Monitoring

## Pin Description

| Pin Name | I/O | Description |
|---|---|---|
| GND | GND | Ground |
| $\overline{\text{OVRI}}$ | O | Over-current Output, Push-Pull or Open-Drain, Active-Low. OVRI changes from HIGH to LOW when IN rises above the typical high detection threshold (100mV). OVRI remains HIGH after IN drops below the low detection threshold (90mV). |
| OVRI | O | Over-current Output, Push-Pull, Active-High. OVRI changes from LOW to HIGH when IN rises above the typical high detection threshold (100mV). OVRI remains LOW after IN drops below the low detection threshold (90mV). |
| IN | I | Detection Voltage Input. High-impedance input for comparator. Connect this pin to over-current sampling network. OVRI is asserted when IN is above the high threshold voltage. |
| VCC | Power | Supply Voltage |

## Block Diagram




## Maximum Ratings

Storage Temperature…… - 65°C to +150°C
Ambient Temperature with Power Applied.....-40°C to +85°C
Supply Voltage to Ground Potential ($V_{CC}$ to GND)…….. - 0.3 to $V_{CC}$ +6.0V
DC Input/Output Current ……20mA
Power Dissipation…….245mW

**Note:**
Stresses greater than those listed under MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

## AC Electrical Characteristics

($V_{CC}$ = +0.9V to +5.5V, unless otherwise noted. Typical values are at $T_A$ = +25 ℃)

| Description | Sym | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Vcc or RESET-IN to Reset Delay | | IN rising, step signal from 0V to 1V | - | 60 | - | µs |
| Propagation Delay(D0 only) | $t_P$ | IN falling, step signal from 1V to 0V | - | 40 | - | µs |

## DC Electrical Characteristics

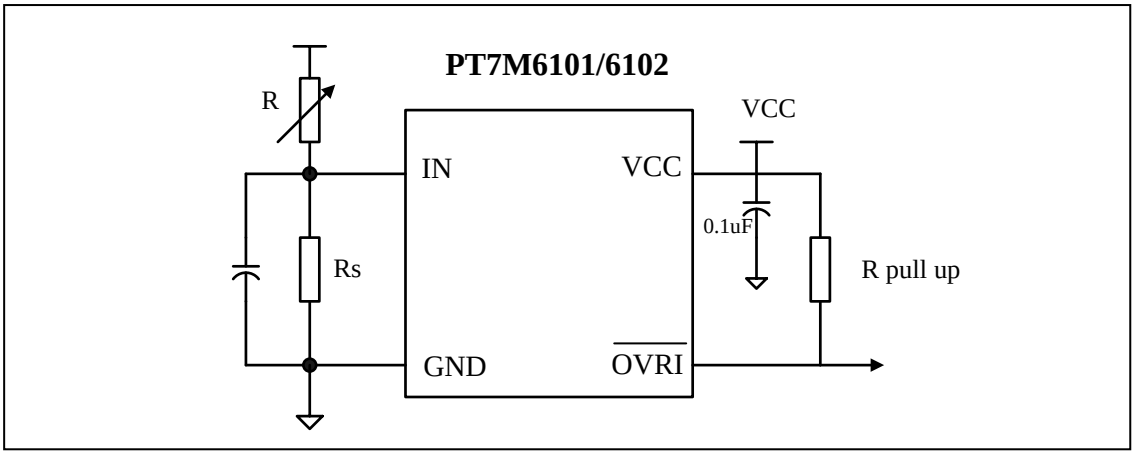
($V_{CC}$ = +0.9V to +5.5V, unless otherwise noted. Typical values are at $T_A$ = +25℃)

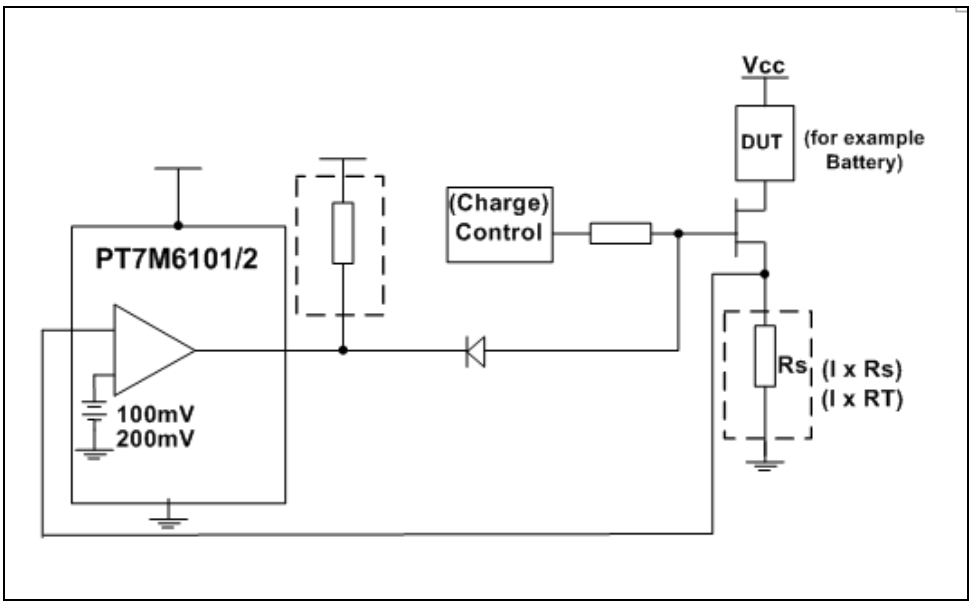
| Description | Sym | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Operating Voltage Range | $V_{CC}$ | $T_A$= -40℃ ~+85℃ | 0.9 | - | 5.5 | V |
| Supply Current | $I_{CC}$ | $V_{CC}$=1.2V, no load , reset not asserted | - | 7.5 | 13 | µA |
| | | $V_{CC}$=1.8V, no load , reset not asserted | - | 9 | 16 | |
| | | $V_{CC}$=3.6V, no load , reset not asserted | - | 16 | 25 | |
| IN Threshold | $V_{RSTIN}$ | 1.3V<=$V_{CC}$<=5.5V, -40℃ ~+85℃ (PT7M6101) | 90 | 100 | 110 | mV |
| | | 1.3V<=$V_{CC}$<=5.5V, -40℃ ~+85℃ (PT7M6102) | 190 | 200 | 210 | |
| Push-pull $\overline{OVRI}$ Output High Voltage | $V_{OH}$ | $V_{CC}$>=1.1V, $I_{source}$=50µA, reset not asserted | 0.8×Vcc | - | - | - |
| | | $V_{CC}$>=1.5V, $I_{source}$=150µA, reset not asserted | 0.8×Vcc | - | - | |
| | | $V_{CC}$ >=1.0V, $I_{source}$=50µA, reset asserted | 0.8×Vcc | - | - | |
| | | $V_{CC}$ >=1.5V, $I_{source}$=150µA, reset asserted | 0.8×Vcc | - | - | |
| Push-pull OVRI Output Low Voltage | $V_{OL}$ | $V_{CC}$ >=1.0V, $I_{sink}$=80µA, reset asserted | - | - | 0.2×Vcc | V |
| | | $V_{CC}$ >=1.5V, $I_{sink}$=200µA, reset asserted | - | - | 0.2×Vcc | |
| Push-pull $\overline{OVRI}$ Output Low Voltage | | $V_{CC}$ >=1.1V, $I_{sink}$=80µA, reset not asserted | - | - | 0.2×Vcc | |
| | | $V_{CC}$ >=1.5V, $I_{sink}$=200µA, reset not asserted | - | - | 0.2×Vcc | |
| Open-Drain $\overline{OVRI}$ Output Low Voltage | | $V_{CC}$ >=1.0V, $I_{sink}$=80µA, reset asserted | - | - | 0.15 | V |
| | | $V_{CC}$ >=1.5V, $I_{sink}$=200µA, reset asserted | - | - | 0.2 | |
| Open-Drain $\overline{OVRI}$ Output Leakage Current | $I_{LKG}$ | $V_{CC}$ > $V_{TH}$ , reset not asserted | - | - | 1.0 | µA |
| IN Leakage Current | $I_{RSTIN}$ | - | -25 | - | +25 | nA |
| Reset Threshold Hysteresis | $V_{HYS}$ | - | - | 10 | - | mV |

## Functional Description

PT7M6101/6102 series are designed for over current detector. They provide excellent circuit reliability and low cost by eliminating external components. These devices assert an OVRI signal when the voltage at IN pin rises above the high threshold. After IN pin declines below the low threshold, OVRI signal is de-asserted.

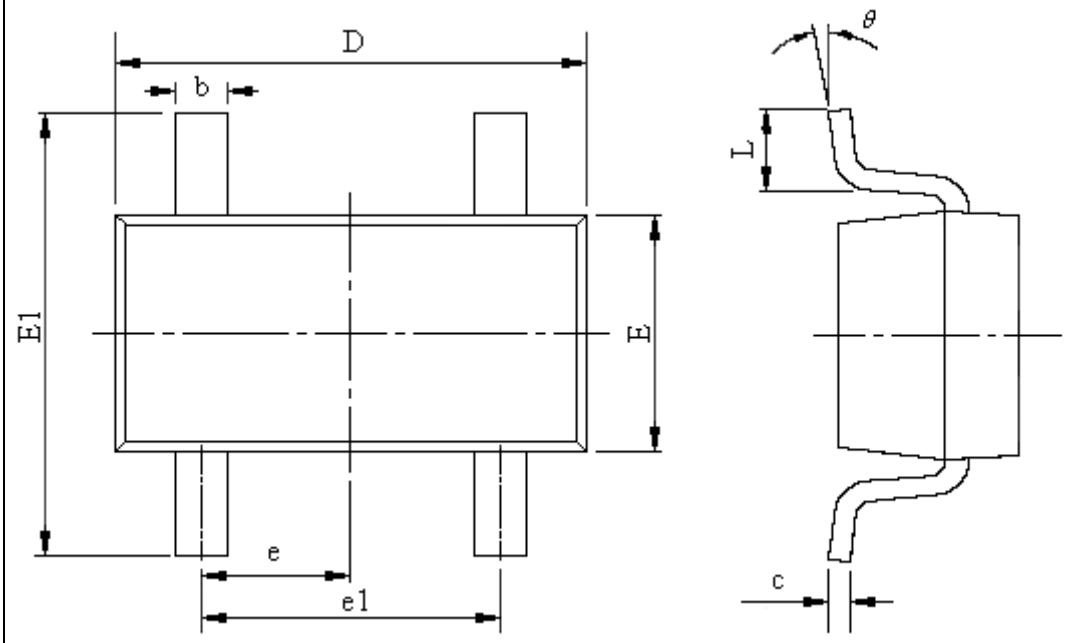
## Application Circuit

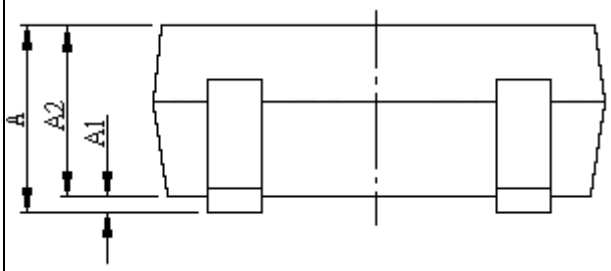


## Mechanical Information

**C (SC70-4)**

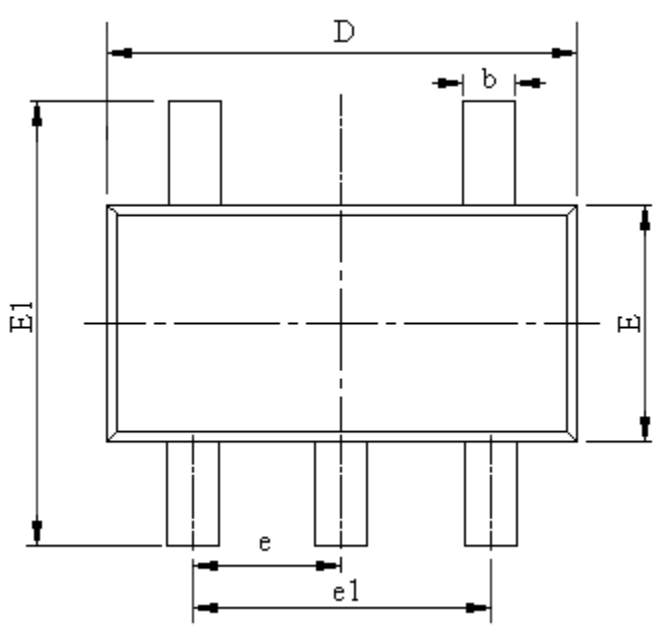


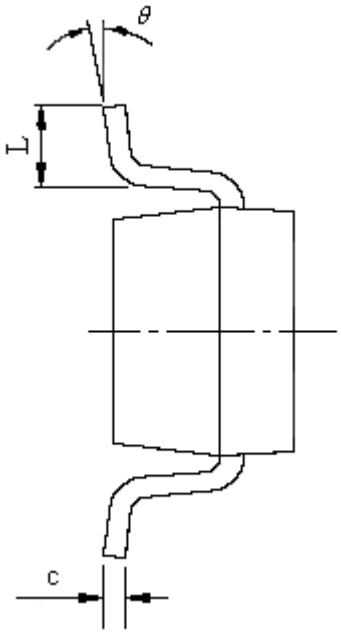



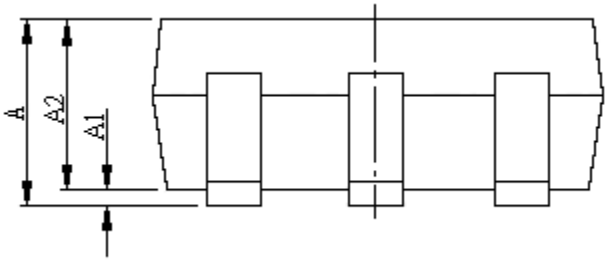

Note:
1) Controlling dimensions in millimeters.
2) Ref: JEDEC MO-203

| PKG. DIMENSIONS(MM) | | |
|---|---|---|
| SYMBOL | MIN | MAX |
| A | 0.9 | 1.1 |
| A1 | 0 | 0.1 |
| A2 | 0.9 | 1 |
| b | 0.15 | 0.35 |
| c | 0.08 | 0.15 |
| D | 2 | 2.2 |
| E | 1.15 | 1.35 |
| E1 | 2.15 | 2.45 |
| e | 0.65TYP | |
| e1 | 1.2 | 1.4 |
| L | 0.26 | 0.46 |
| θ | 0° | 8° |

**TA (SOT23-5)**



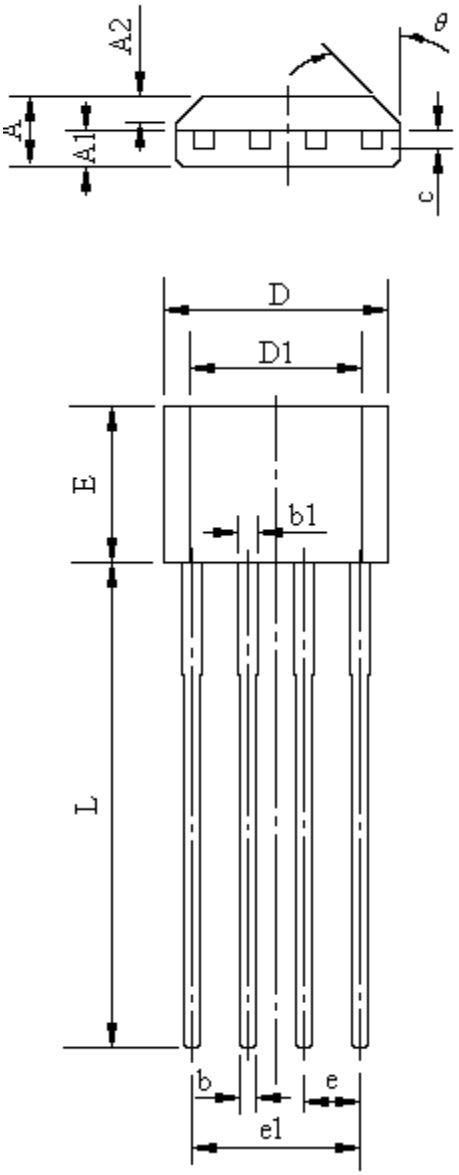




Note:
1) Controlling dimensions in millimeters.
2) Ref: JEDEC MO-178C/AA

| PKG. DIMENSIONS(MM) | | |
|---|---|---|
| SYMBOL | MIN | MAX |
| A | 1.05 | 1.25 |
| A1 | 0.00 | 0.10 |
| A2 | 1.05 | 1.15 |
| b | 0.30 | 0.50 |
| c | 0.10 | 0.20 |
| D | 2.82 | 3.02 |
| E | 1.50 | 1.70 |
| E1 | 2.65 | 2.95 |
| e | 0.95BSC | |
| e1 | 1.80 | 2.00 |
| L | 0.30 | 0.60 |
| θ | 0° | 8° |

**NE (TO94)**




| PKG. DIMENSIONS(MM) | | |
|---|---|---|
| SYMBOL | MIN | MAX |
| A | 1.40 | 1.80 |
| A1 | 0.70 | 0.90 |
| A2 | 0.50 | 0.70 |
| b | 0.36 | 0.50 |
| b1 | 0.38 | 0.55 |
| c | 0.36 | 0.51 |
| D | 4.98 | 5.28 |
| D1 | 3.78 | 4.08 |
| E | 3.45 | 3.75 |
| e | 1.27 BSC | |
| e1 | 3.71 | 3.91 |
| L | 14.90 | 15.30 |
| θ | 45 ºBSC | |

Note:
1) Controlling dimensions in millimeters.

## Ordering Information

| Part Number | Package Code | Package |
|---|---|---|
| PT7M610xCLC4E | C | Lead free and Green SC70-4 |
| PT7M610xCHC4E | C | Lead free and Green SC70-4 |
| PT7M610xNLC4E | C | Lead free and Green SC70-4 |
| PT7M610xCLTAE | TA | Lead free and Green SOT23-5 |
| PT7M610xCHTAE | TA | Leas free and Green SOT23-5 |
| PT7M610xNLTAE | TA | Lead free and Green SOT23-5 |
| PT7M610xCLNE | N | Lead free TO94 |
| PT7M610xCHNE | N | Lead free TO94 |
| PT7M610xNLNE | N | Lead free TO94 |

**Note:**

- Suffix "x" shows 1 or 2 with different function. See Table 1.
- E = Pb-free or Pb-free and Green
- Adding X Suffix= Tape/Reel
- Contact Pericom for availability.

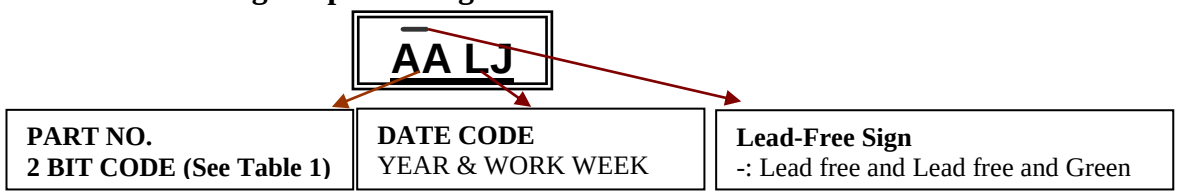
**Table 1 Part No code comparison table**

| No. | Part No. | Code |
|---|---|---|
| ***1*** | PT7M6101CL | jp |
| ***2*** | PT7M6101CH | jq |
| ***3*** | PT7M6101NL | jl |
| ***4*** | PT7M6102CL | rz |
| ***5*** | PT7M6102CH | sa |
| ***6*** | PT7M6102NL | sb |

**Function comparison of PT7M6101/6102**

| No | Part No. | Output Open-Drain | | Output Push-Pull | |
|---|---|---|---|---|---|
| | | Active high | Active low | Active high | Active low |
| 1 | PT7M6101CL/6102CL | - | - | - | √ |
| 2 | PT7M6101CH/6102CH | - | - | √ | - |
| 3 | PT7M6101NL/6102NL | - | √ | - | - |

## SOT23/SC70/SOT143 Package Top Marking Instruction




Example: **$\overline{\text{jp}}$ SN** PART NO.: PT7M6832WD0TA3E
DATE CODE: YEAR 2006 WW10
Lead free and Lead free and Green package


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