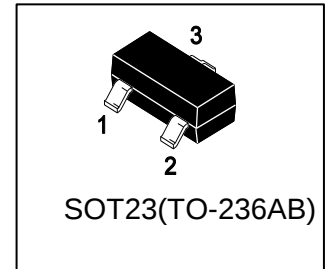


# LP2128LT1G

## 20V P-Channel Enhancement-Mode MOSFET

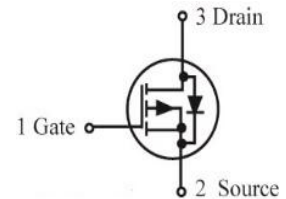
### 1. FEATURES

- $V_{DS} = -20V$
- Advanced trench process technology
- High Density Cell Design For Ultra Low On-Resistance
- Fully Characterized Avalanche Voltage and Current
- We declare that the material of product compliance with RoHS requirements and Halogen Free.



### 2. APPLICATIONS

- Simple Drive Requirement
- Small Package Outline
- Surface Mount Device



### 3. DEVICE MARKING AND ORDERING INFORMATION

| Device     | Marking | Shipping        |
|------------|---------|-----------------|
| LP2128LT1G | PA2     | 3000/Tape&Reel  |
| LP2128LT3G | PA2     | 10000/Tape&Reel |

### 4. MAXIMUM RATINGS( $T_a = 25^{\circ}C$ )

| Parameter                        | Symbol   | Limits   | Unit |
|----------------------------------|----------|----------|------|
| Drain-Source Voltage             | $V_{DS}$ | -20      | V    |
| Gate-to-Source Voltage           | $V_{GS}$ | $\pm 12$ | V    |
| Drain Current(Note 1)            |          |          | A    |
| – Continuous $T_a = 25^{\circ}C$ | $I_D$    | -6       |      |
| – Pulsed                         | $I_{DM}$ | -24      |      |
| Avalanche Current( $L=0.1mH$ )   | $I_{AS}$ | 12       | A    |
| Avalanche Energy( $L=0.1mH$ )    | $E_{AS}$ | 7.3      | mJ   |

### 5. THERMAL CHARACTERISTICS

| Parameter                            | Symbol          | Limits          | Unit          |
|--------------------------------------|-----------------|-----------------|---------------|
| Power Dissipation (Note 2)           | PD              | 1.1             | W             |
| Maximum Junction-to-Ambient (Note 2) | $R_{\theta JA}$ | 110             | $^{\circ}C/W$ |
| Junction and Storage temperature     | $T_J, T_{stg}$  | $-55 \sim +150$ | $^{\circ}C$   |

1.Repetitive Rating: Pulse width limited by the maximum junction temperature.

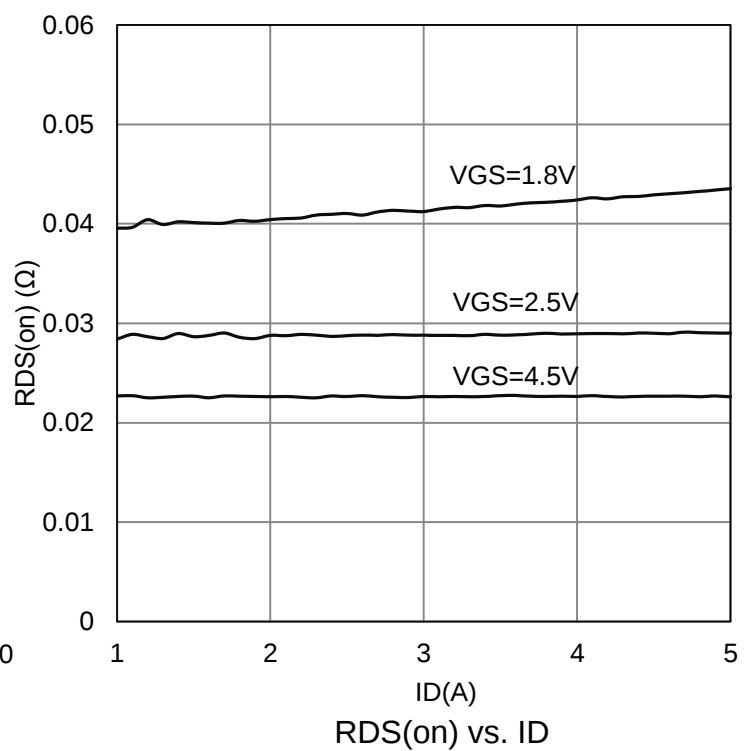
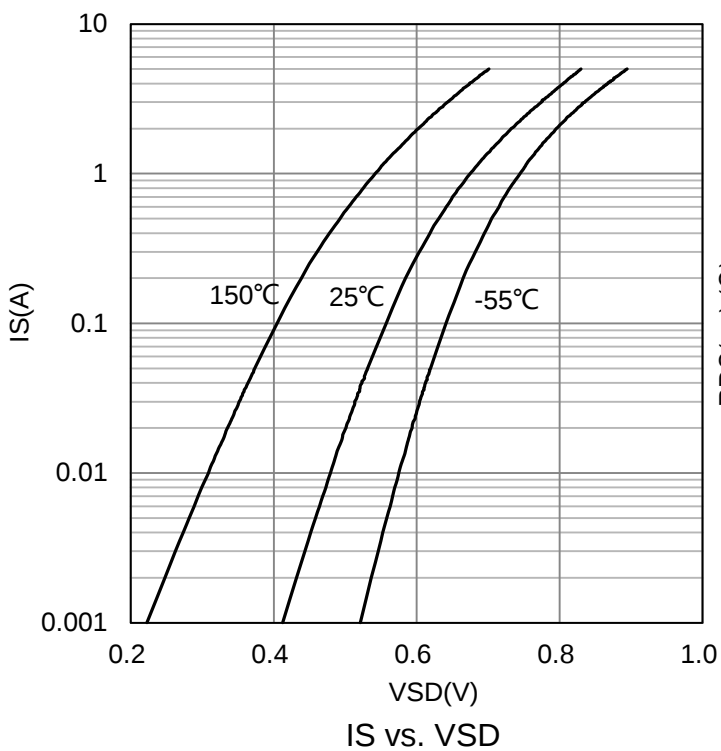
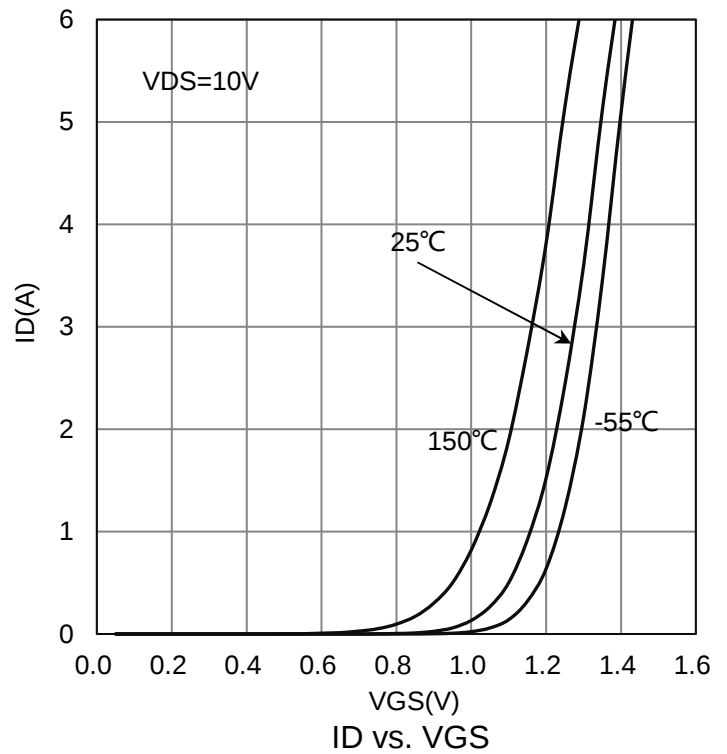
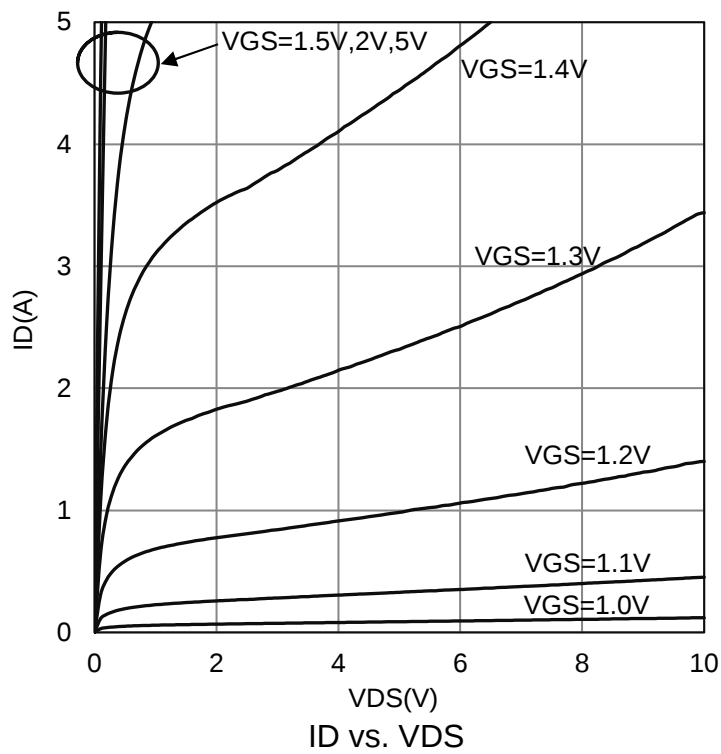
2.Surface mounted on "1.5 x 1.5" FR4 board using 1 sq in pad, 2 oz Cu.

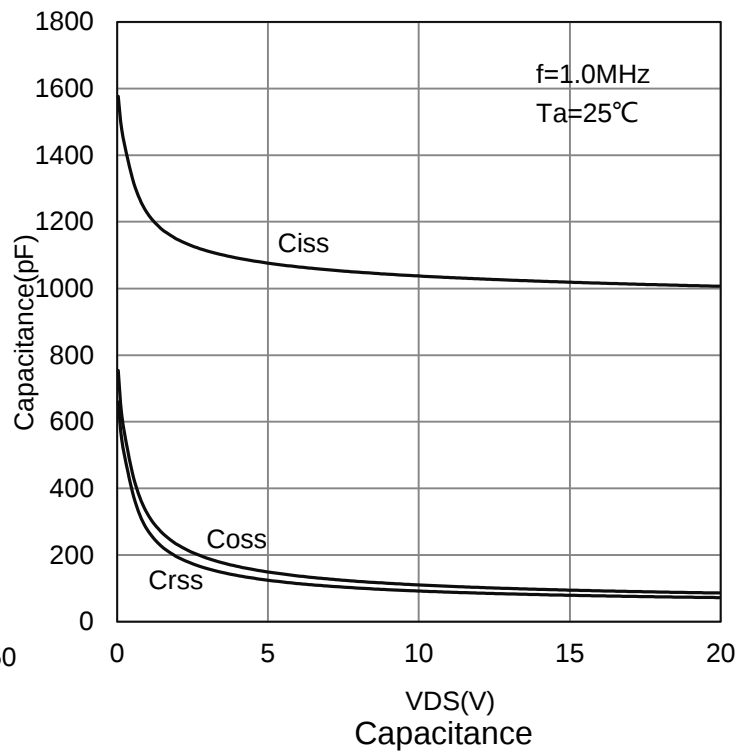
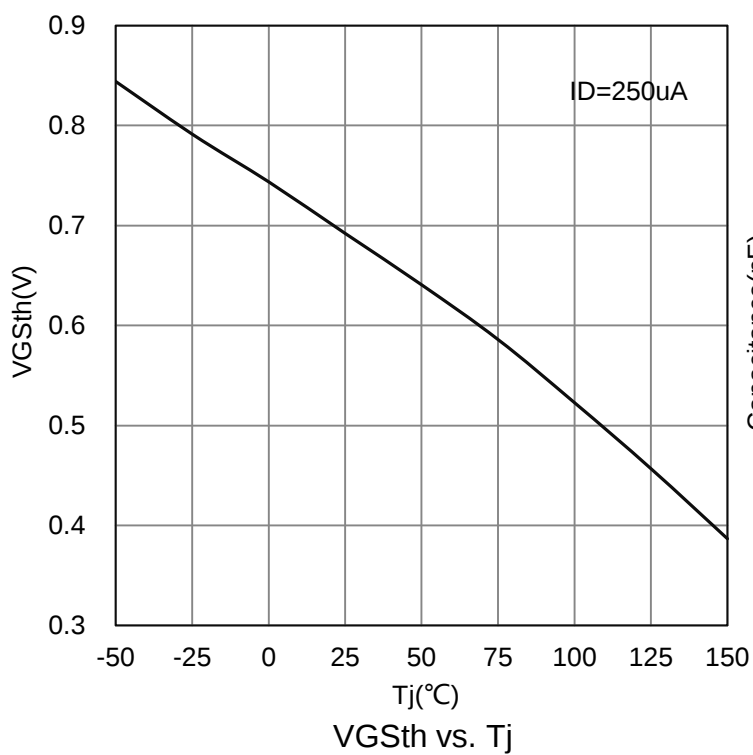
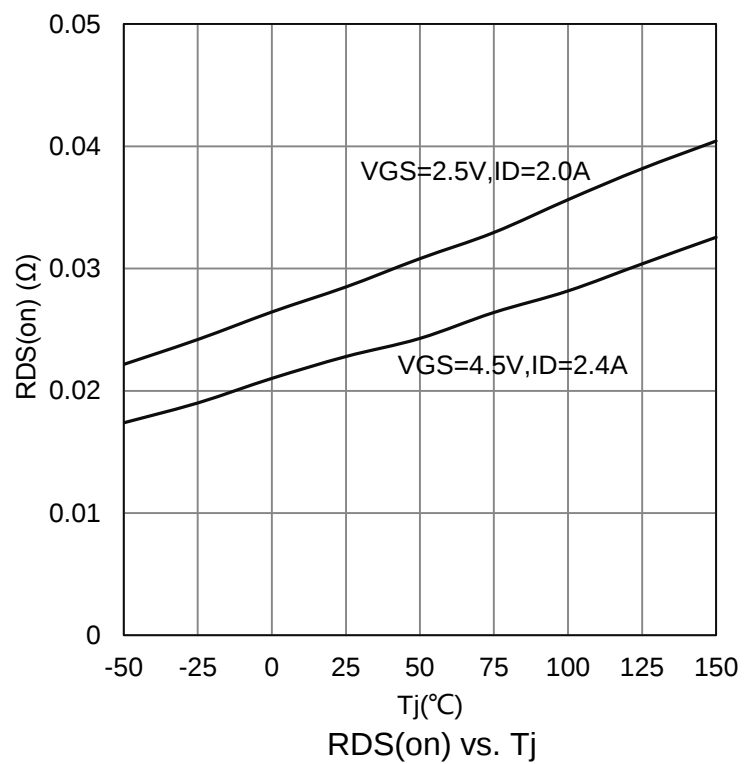
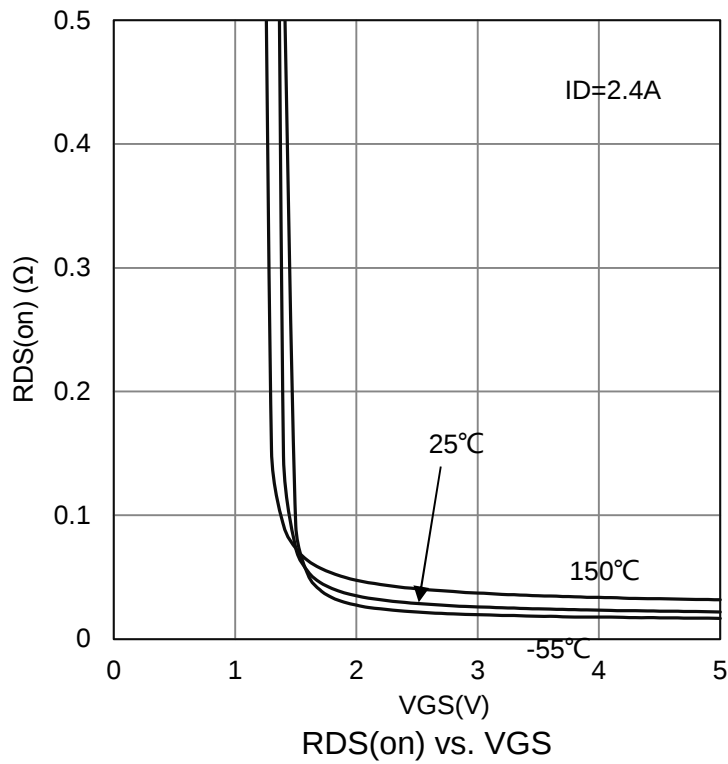
## 6. ELECTRICAL CHARACTERISTICS (Ta= 25°C)

| Characteristic                                                                                                                   | Symbol                                         | Min.        | Typ.           | Max.           | Unit |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------------|----------------|----------------|------|
| <b>Static</b>                                                                                                                    |                                                |             |                |                |      |
| Drain–Source Breakdown Voltage<br>(VGS = 0, ID = -250μA)                                                                         | VBRDSS                                         | -20         | -              | -              | V    |
| Zero Gate Voltage Drain Current<br>(VGS = 0, VDS = -20 V)                                                                        | IDSS                                           | -           | -              | -1             | μA   |
| Gate–Body Leakage Current<br>(VGS = ±12 V, VDS=0V)                                                                               | IGSS                                           | -           | -              | ±100           | nA   |
| Gate Threshold Voltage<br>(VDS = VGS, ID = -250μA)                                                                               | VGS(th)                                        | -0.45       | -              | -0.9           | V    |
| Static Drain–Source On–State Resistance<br>(VGS = -4.5 V, ID = -2.4 A)<br>(VGS = -2.5 V, ID = -2 A)<br>(VGS = -1.8 V, ID = -1 A) | RDS(on)                                        | -<br>-<br>- | 17<br>25<br>47 | 28<br>41<br>78 | mΩ   |
| <b>Dynamic(Note 3)</b>                                                                                                           |                                                |             |                |                |      |
| Input Capacitance<br>(VGS = 0 V, f = 1.0MHz, VDS= -4 V)                                                                          | Ciss                                           | -           | 1038           | -              | pF   |
| Output Capacitance<br>(VGS = 0 V, f = 1.0MHz, VDS= -4 V)                                                                         | Coss                                           | -           | 110            | -              | pF   |
| Reverse Transfer Capacitance<br>(VGS = 0 V, f = 1.0MHz, VDS= -4 V)                                                               | Crss                                           | -           | 92             | -              | pF   |
| Total Gate Charge                                                                                                                | (VDS=-10V, VGS=-4.5V, ID=-2.4A)                | Qg          | -              | 11             | nC   |
| Gate to Source Charg                                                                                                             |                                                | Qgs         | -              | 1.7            |      |
| Gate to Drain Charge                                                                                                             |                                                | Qgd         | -              | 2.5            |      |
| Turn-On Delay Time                                                                                                               | (VDD=-4V, RL=4Ω, RG=6.2 Ω, VGEN=-4.5V, ID=-1A) | td(on)      | -              | 6.2            | ns   |
| Rise Time                                                                                                                        |                                                | tr          | -              | 14.4           |      |
| Turn-Off Delay Time                                                                                                              |                                                | td(off)     | -              | 46             |      |
| Fall Time                                                                                                                        |                                                | tf          | -              | 24             |      |
| Diode Forward Voltage<br>(IS = -1.6A, VGS = 0V)                                                                                  | VSD                                            | -           | -              | -1.2           | V    |

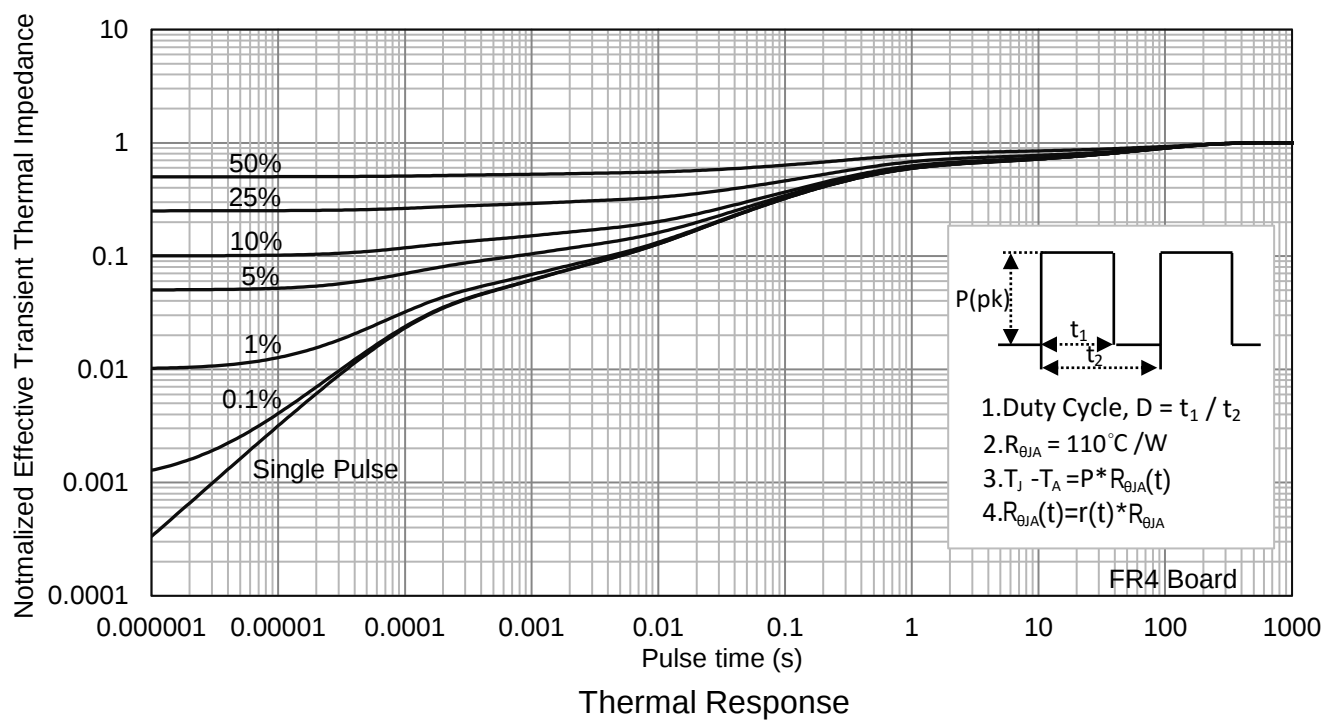
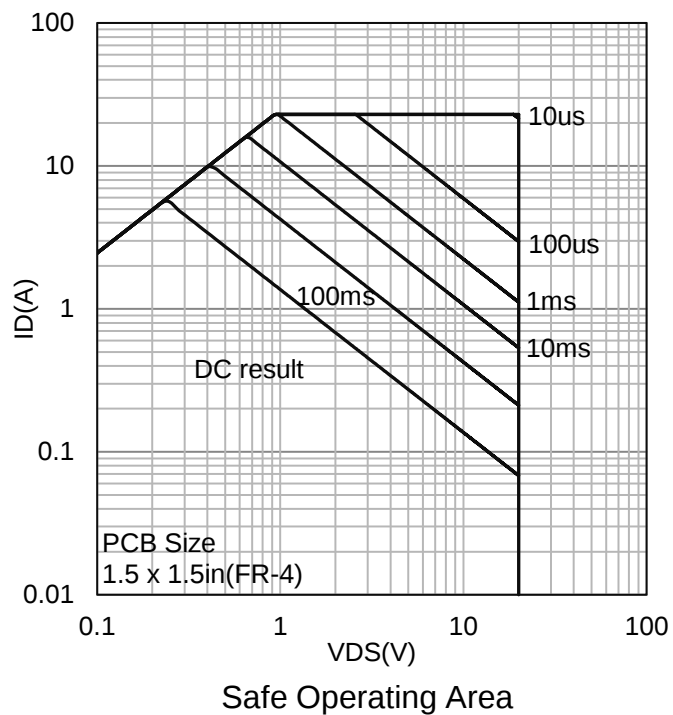
3.Pulse Test: Pulse Width ≤300 μs, Duty Cycle ≤2.0%.

## 7. ELECTRICAL CHARACTERISTICS CURVES

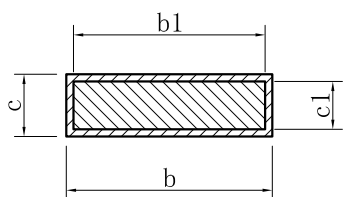
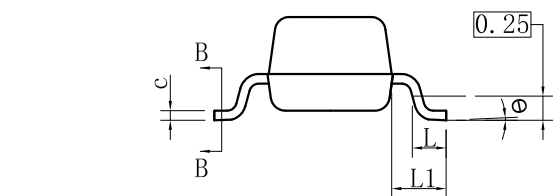


**7.ELECTRICAL CHARACTERISTICS CURVES(Con.)**


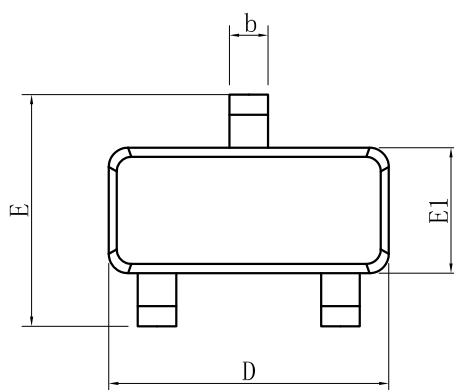
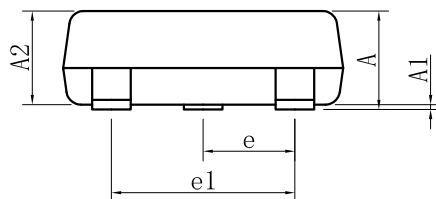
## 7.ELECTRICAL CHARACTERISTICS CURVES(Con.)



## 8.OUTLINE AND DIMENSIONS



SECTION B-B

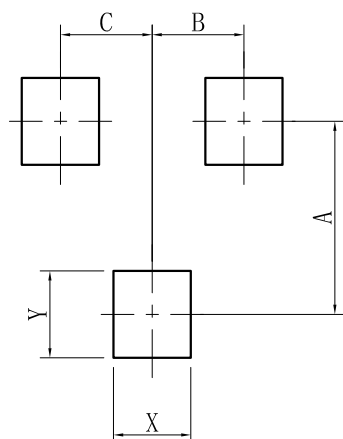


| SOT23                |         |      |      |
|----------------------|---------|------|------|
| DIM                  | MIN     | NOR  | MAX  |
| A                    | 0.89    | -    | 1.12 |
| A1                   | 0.01    | -    | 0.10 |
| A2                   | 0.88    | 0.95 | 1.02 |
| b                    | 0.30    | -    | 0.50 |
| b1                   | 0.30    | 0.40 | 0.45 |
| c                    | 0.08    | -    | 0.20 |
| c1                   | 0.08    | 0.10 | 0.16 |
| D                    | 2.80    | 2.90 | 3.04 |
| E                    | 2.10    | -    | 2.64 |
| E1                   | 1.20    | 1.30 | 1.40 |
| e                    | 0.95BSC |      |      |
| e1                   | 1.90BSC |      |      |
| L                    | 0.40    | 0.46 | 0.60 |
| L1                   | 0.54REF |      |      |
| θ                    | 0°      | -    | 8°   |
| All Dimensions in mm |         |      |      |

### GENERAL NOTES

- 1.Top package surface finish  $Ra0.4 \pm 0.2\mu m$
2. Bottom package surface finish  $Ra0.7 \pm 0.2\mu m$
- 3.Side package surface finish  $Ra0.4 \pm 0.2\mu m$

## 9.SOLDERING FOOTPRINT



| SOT23 |      |
|-------|------|
| DIM   | (mm) |
| X     | 0.80 |
| Y     | 0.90 |
| A     | 2.00 |
| B     | 0.95 |
| C     | 0.95 |

## **DISCLAIMER**

- Curve guarantee in the specification. The curve of test items with electric parameter is used as quality guarantee. The curve of test items without electric parameter is used as reference only.
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