

# S-LP12N10D2

## 100V P-Channel Power MOSFET

### 1. FEATURES

- Low thermal impedance.
- Fast switching speed.
- We declare that the material of product compliance with RoHS requirements and Halogen Free.
- S-prefix for automotive and other applications requiring unique site and control change requirements; AEC-Q101 qualified and PPAP capable.

### 2. APPLICATIONS

- Power Tools
- DC-DC conversion
- Motor Control

### 3. DEVICE MARKING AND RESISTOR VALUES

| Device      | Marking | Shipping          |
|-------------|---------|-------------------|
| S-LP12N10D2 | 12N10   | 2500pcs/Tape&Reel |

### 4. MAXIMUM RATINGS

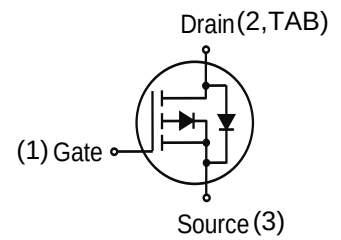
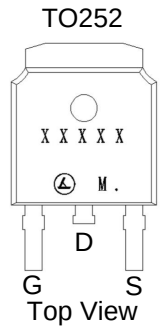
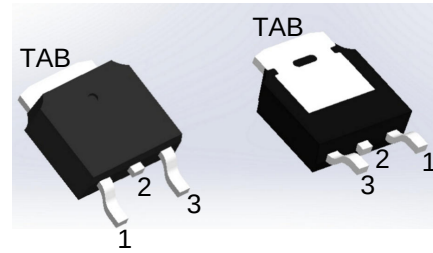
| Parameter                                        |          | Symbol  | Limits   | Unit |
|--------------------------------------------------|----------|---------|----------|------|
| Drain-to-Source Voltage                          |          | VDS     | -100     | V    |
| Gate-to-Source Voltage                           |          | VGS     | ± 20     | V    |
| Continuous Drain Current(Note 1)                 | TC=25°C  | ID      | -12      | A    |
|                                                  | TC=100°C |         | -8       |      |
| Pulsed Drain Current (Note 2)                    |          | IDM     | -48      | A    |
| Avalanche Current                                |          | IAS     | 4.9      | A    |
| Avalanche Energy(L=0.1mH)                        |          | EAS     | 1.2      | mJ   |
| Power Dissipation(Note 1)                        | TC=25°C  | PD      | 62.5     | W    |
|                                                  | TC=100°C |         | 25       |      |
| Operating Junction and Storage Temperature Range |          | Tj/Tstg | -55~+150 | °C   |

### 5. THERMAL CHARACTERISTICS

| Parameter                   | Symbol | Max | Unit |
|-----------------------------|--------|-----|------|
| Junction-to-Ambient(Note 1) | RθJA   | 60  | °C/W |
| Junction-to-Case            | RθJC   | 2   |      |

Note:1.Surface mounted on "1.5in x 1.5in" FR4 board using 1\*1 in pad, 2 oz Cu.

2.Pulse width limited by maximum junction temperature.

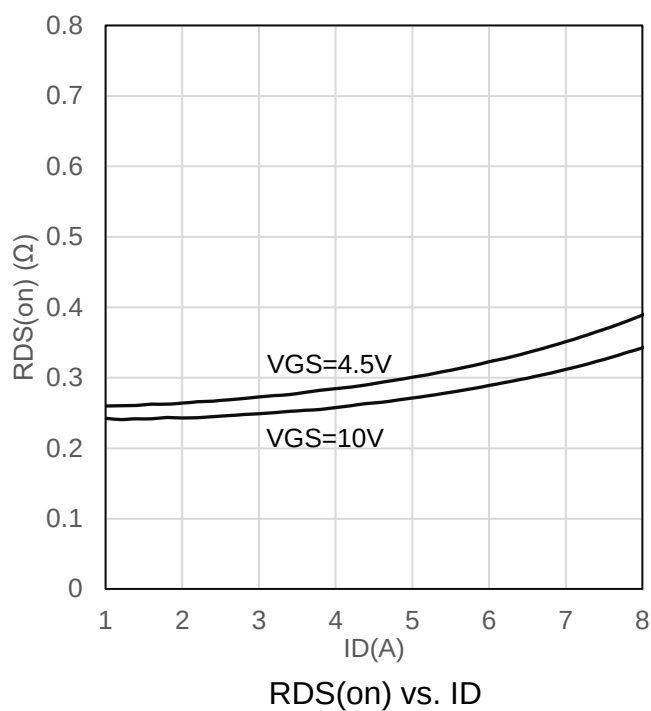
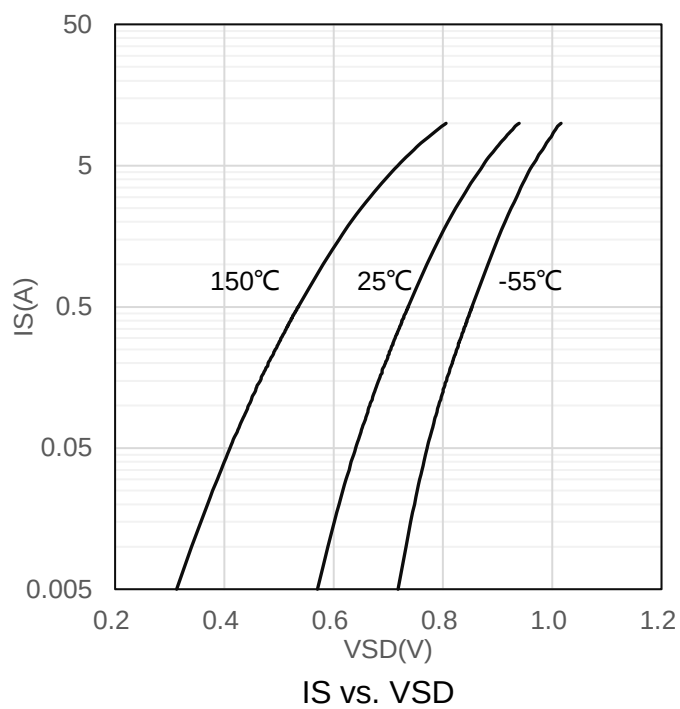
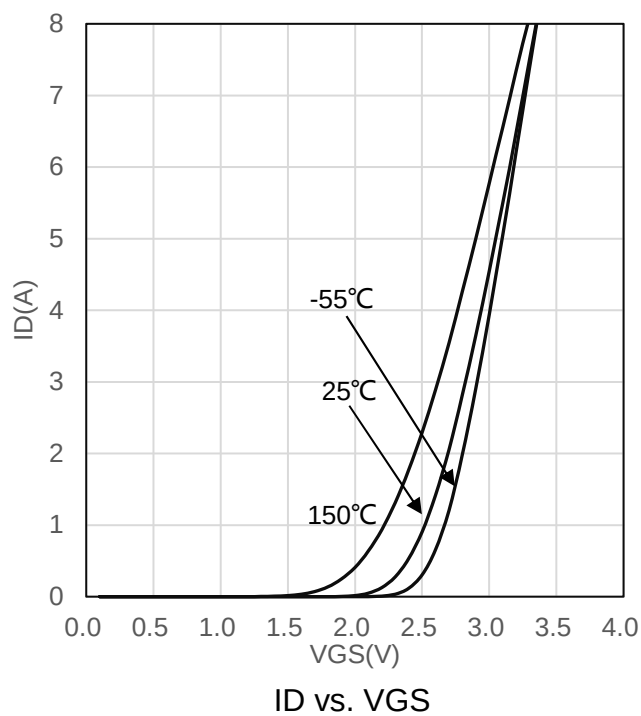
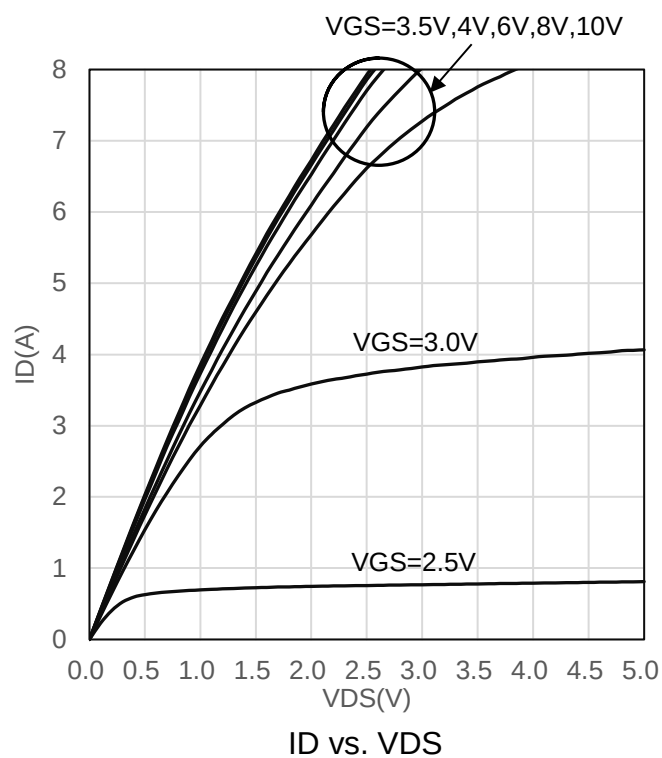


## 6. ELECTRICAL CHARACTERISTICS

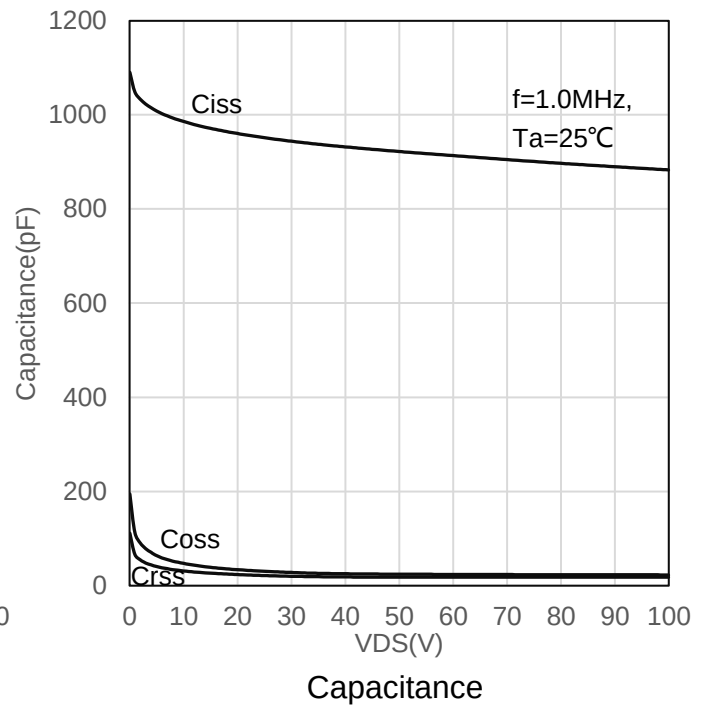
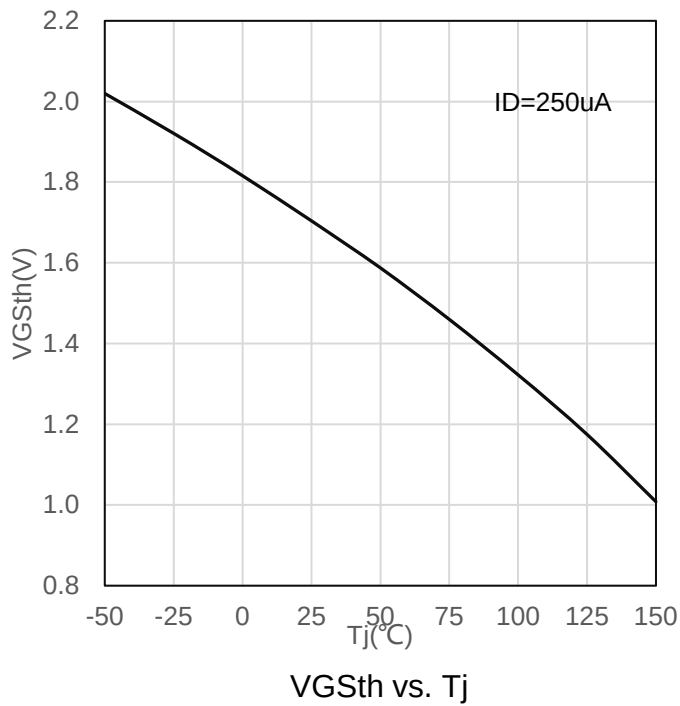
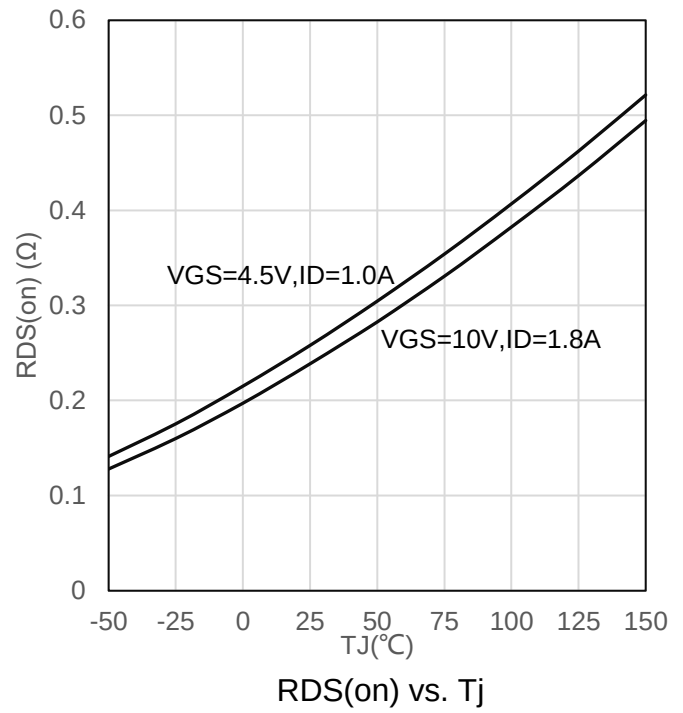
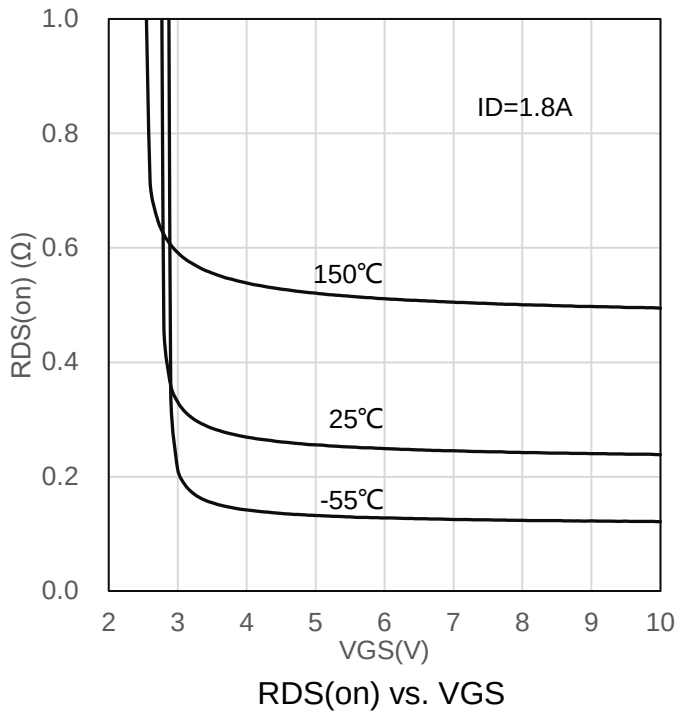
| Characteristic                                                                                    | Symbol                                                                        | Min.    | Typ.   | Max.       | Unit       |
|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|---------|--------|------------|------------|
| STATIC                                                                                            |                                                                               |         |        |            |            |
| Drain-Source Breakdown Voltage<br>(VGS = 0 V, ID = -250 $\mu$ A)                                  | VBRDSS                                                                        | -100    | -      | -          | V          |
| Gate Threshold Voltage<br>(VDS = VGS, ID = -250 $\mu$ A)                                          | VGS(th)                                                                       | -1.1    | -      | -3         | V          |
| Gate-Body leakage current<br>(VDS = 0 V, VGS = $\pm$ 20 V)                                        | IGSS                                                                          | -       | -      | $\pm$ 100  | nA         |
| Zero Gate Voltage Drain Current<br>(VDS = -80 V, VGS = 0 V)                                       | IDSS                                                                          | -       | -      | -1         | $\mu$ A    |
| Drain-to-Source On-Resistance (Note 3)<br>(VGS = -10 V, ID = -1.8 A)<br>(VGS = -4.5 V, ID = -1 A) | RDS(on)                                                                       | -<br>-  | -<br>- | 270<br>340 | m $\Omega$ |
| Diode Forward Voltage<br>(IS = -1 A, VGS = 0 V)                                                   | VSD                                                                           | -       | -      | -1.2       | V          |
| DYNAMIC                                                                                           |                                                                               |         |        |            |            |
| Input Capacitance                                                                                 | (VGS = 0 V, VDS = -50 V, f = 1MHz)                                            | Ciss    | -      | 861        | pF         |
| Output Capacitance                                                                                |                                                                               | Coss    | -      | 25.8       |            |
| Reverse Transfer Capacitance                                                                      |                                                                               | Crss    | -      | 17         |            |
| Total Gate Charge                                                                                 | (VDS = -50 V, VGS = -10 V, ID = -1 A)                                         | Qg      | -      | 14.8       | nC         |
| Gate Source Charge                                                                                |                                                                               | Qgs     | -      | 2.4        |            |
| Gate Drain Charge                                                                                 |                                                                               | Qgd     | -      | 4          |            |
| Turn-On DelayTime                                                                                 | (VDS = -50 V, RL = 5 $\Omega$ , ID = -10 A, VGEN = -10 V, RGEN = 6 $\Omega$ ) | td(on)  | -      | 6.3        | ns         |
| Turn-On Rise Time                                                                                 |                                                                               | tr      | -      | 9.5        |            |
| Turn-Off DelayTime                                                                                |                                                                               | td(off) | -      | 43         |            |
| Turn-Off Fall Time                                                                                |                                                                               | tf      | -      | 16         |            |
| Gate Resistance<br>(VDS = 0 V, VGS = 0 V, f = 1.0MHz)                                             | Rg                                                                            | -       | 22     | -          | $\Omega$   |

3. Pulse test: PW  $\leq$  300 $\mu$ s duty cycle  $\leq$  2%.

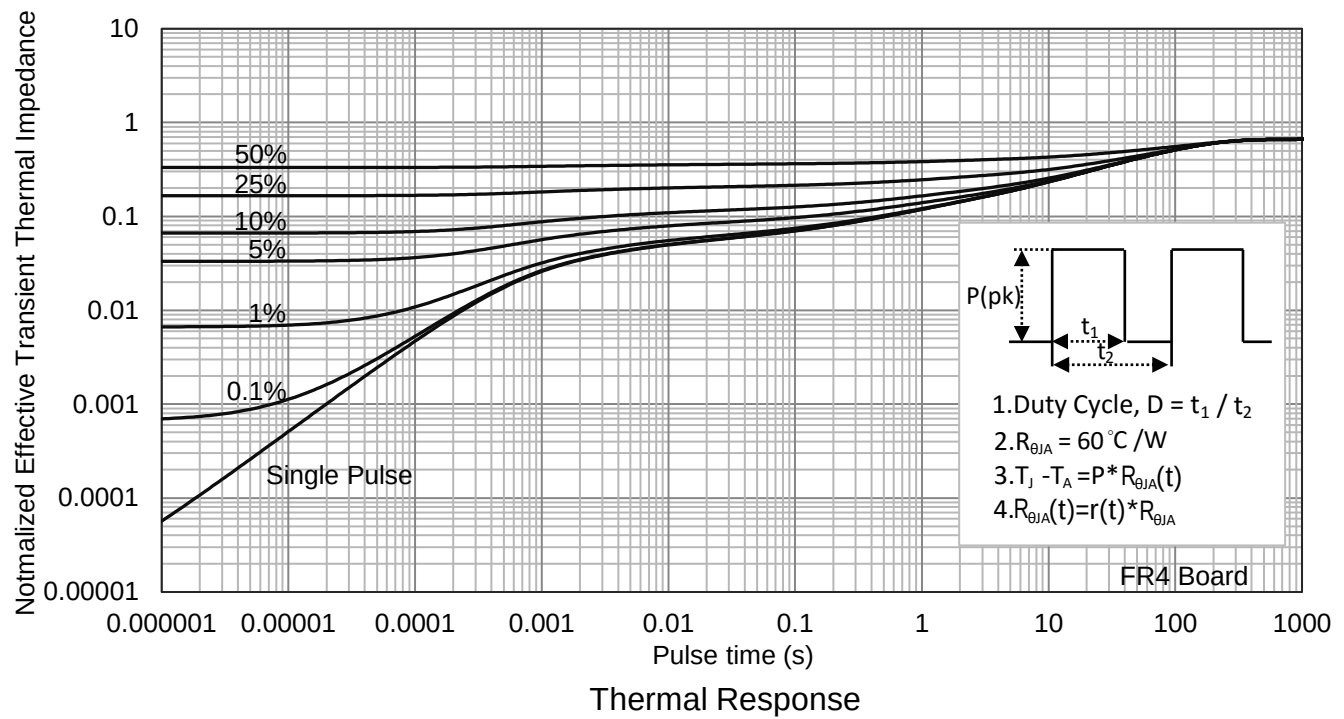
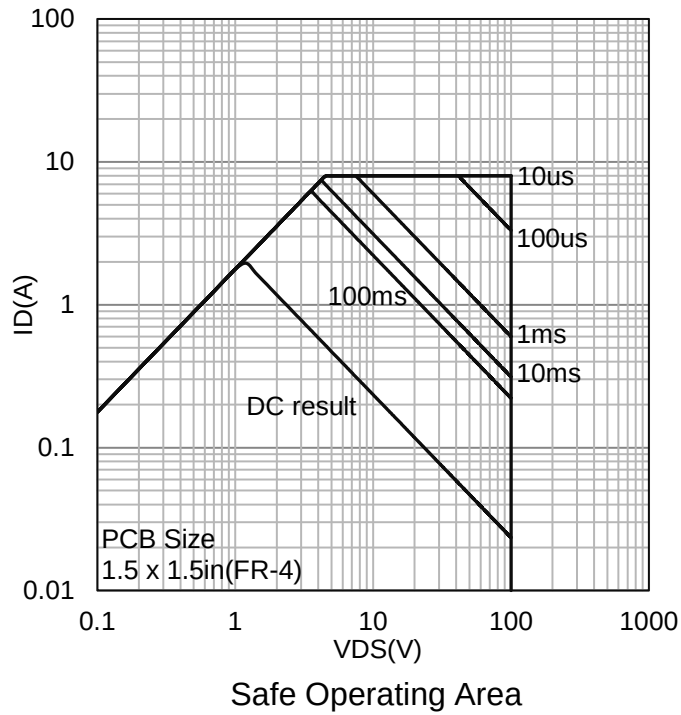
## 7. ELECTRICAL CHARACTERISTICS CURVES



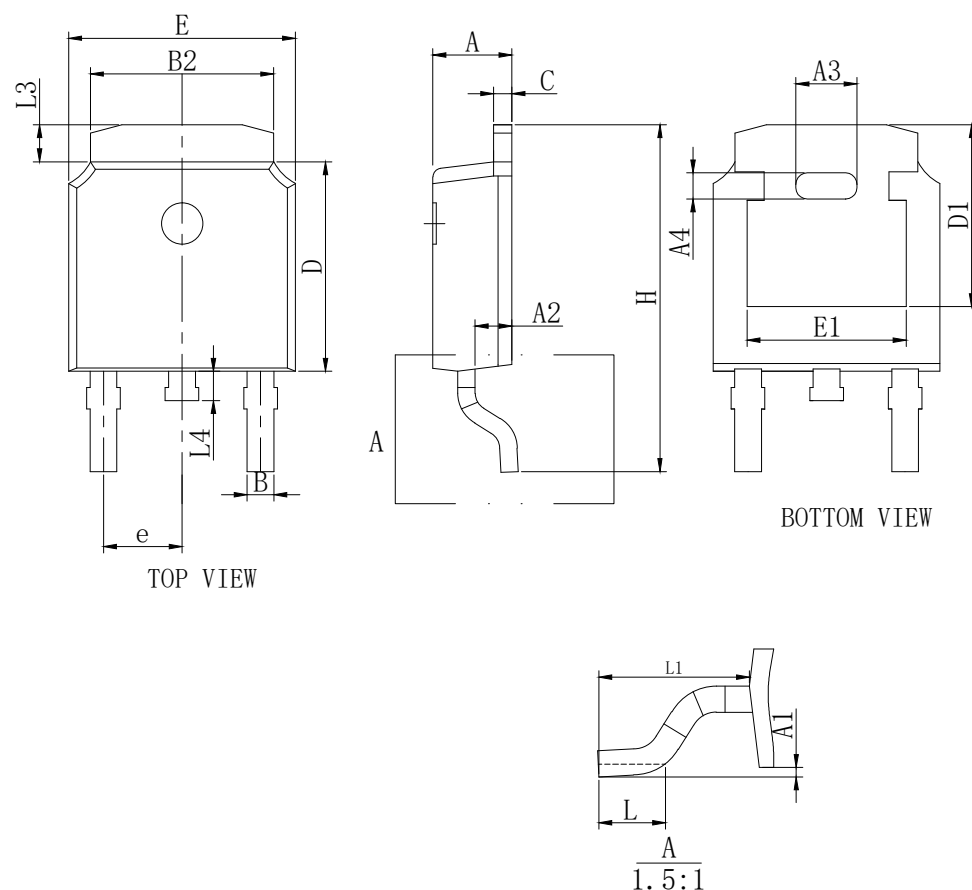
## 7. ELECTRICAL CHARACTERISTICS CURVES(Con.)



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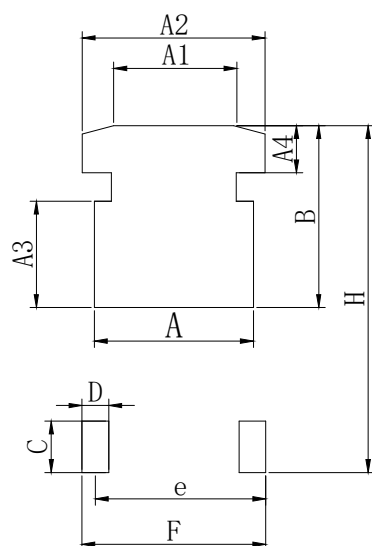


## 8.OUTLINE AND DIMENSIONS



| DIM | MILLIMETERS |       |      |
|-----|-------------|-------|------|
|     | MIN         | NOM   | MAX  |
| A   | 2.15        | 2.30  | 2.45 |
| A1  | 0           | -     | 0.20 |
| A2  | 0.90        | 1.07  | 1.17 |
| A3  | 1.58        | 1.78  | 1.98 |
| A4  | 0.56        | 0.76  | 0.96 |
| B   | 0.68        | 0.78  | 0.88 |
| B2  | 5.20        | 5.33  | 5.46 |
| C   | 0.49        | -     | 0.58 |
| D   | 5.90        | 6.10  | 6.30 |
| D1  | 5.30REF     |       |      |
| E   | 6.40        | 6.60  | 6.80 |
| E1  | 4.63        | 4.83  | 5.03 |
| e   | 2.286BSC    |       |      |
| H   | 9.8         | 10.10 | 10.4 |
| L   | 1.09        | 1.29  | 1.49 |
| L1  | 2.90REF     |       |      |
| L3  | 0.88        | 1.08  | 1.28 |
| L4  | 0.55        | 0.80  | 1.05 |

## 9.SOLDERING FOOTPRINT



| DIM | MIN(mm) |
|-----|---------|
| A   | 6.03    |
| A1  | 4.50    |
| A2  | 6.46    |
| A3  | 4.10    |
| A4  | 2.37    |
| B   | 6.50    |
| C   | 2.50    |
| D   | 1.68    |
| e   | 4.80    |
| H   | 12.35   |
| F   | 5.95    |

## **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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