

## P-Channel 60-V(D-S) MOSFET

|                 |                   |           |
|-----------------|-------------------|-----------|
| <b>V(BR)DSS</b> | <b>RDS(on)MAX</b> | <b>ID</b> |
| -60V            | 165mΩ@ 10V        | -2.0A     |

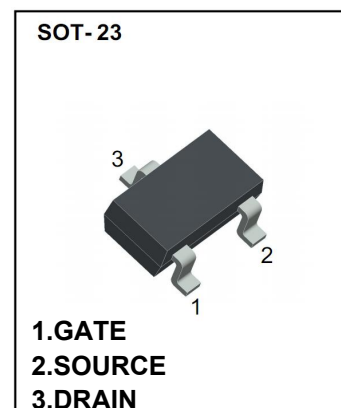
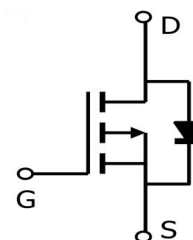
### FEATURE

- ※ TrenchFET Power MOSFET

### APPLICATION

- ※ Load Switch for Portable Devices
- ※ DC/DC Converter

### Equivalent Circuit



### Absolute Maximum Ratings ( Ta=25°C unless otherwise noted)

| Parameter  | Symbol  | Value    | Unit |
|--|---------|----------|------|
| Drain-Source Voltage                             | VDS     | -60      | V    |
| Gate-Source Voltage                              | VGS     | ±20      | V    |
| Continuous Drain Current                         | ID      | -2.0     | A    |
| Drain Current-Pulsed (note 1)                    | IDM     | -10      | A    |
| Pulsed Drain Current                             | IDM     | -8       | A    |
| Avalanche Current                                | IAS     | -5       | A    |
| Power Dissipation                                | PD      | 1.25     | W    |
| Thermal Resistance from Junction to Ambient      | RθJA    | 120      | °C/W |
| Operating Junction and Storage Temperature Range | TJ,TSTG | -55~+150 | °C   |

### Note :

- ※Surface Mounted on FR4 Board, t < 5 sec.

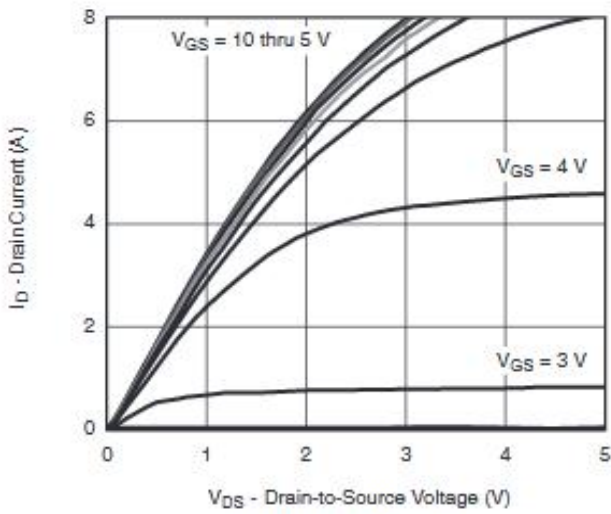
**MOSFET ELECTRICAL CHARACTERISTICS**
**Static Electrical Characteristics (Ta = 25 °C Unless Otherwise Noted)**

| Parameter                          | Symbol   | Test Condition  | Min | Typ   | Max   | Unit |
|------------------------------------|----------|---|-----|-------|-------|------|
| Drain-source breakdown voltage     | V(BR)DSS | VGS = 0V, ID = -250μA                                     | -60 |       |       | V    |
| Gate threshold voltage             | VGS(th)  | VDS = VGS, ID = -250μA                                    | -1  | -1.9  | -3    | V    |
| Gate-source leakage current        | IGSS     | VDS = 0V, VGS = ±20 V                                     |     |       | ±100  | nA   |
| Zero gate voltage drain current    | IDSS     | VDS = -60V, VGS = 0V                                      |     |       | -1    | μA   |
|                                    | IDSS     | VDS = -48V, VGS = 0V,<br>TJ=125°C                         |     |       | -50   | μA   |
| On-state Drain Current             | ID(ON)   | VGS = -10V, VDS ≥ -4.5V                                   | -6  |       |       | A    |
| Drain-source on-resistance         | RDS(on)  | VGS = -10V, ID = -2A                                      |     | 158   | 165   | mΩ   |
| Forward tranconductance            | gFS      | VDS = -4.5V, ID = -1A                                     |     | 1.9   |       | S    |
| Input capacitance                  | Ciss     | VDS = -30V, VGS = 0V,<br>f=1MHz                           |     | 210   |       | pF   |
| Output capacitance                 | Coss     |   |     | 28    |       | pF   |
| Reverse transfer capacitance       | Crss     |   |     | 20    |       | pF   |
| Total Gate Charge                  | Qg       | VDS = -30V, VGS = -10V,<br>ID = -1.25 A                   |     | 5.4   | 12    | nC   |
| Gate-Source Charge                 | Qgs      |   |     | 1.15  |       | nC   |
| Gate-Drain Charge                  | Qgd      |   |     | 0.92  |       | nC   |
| Turn-on Delay time                 | td(on)   | VDD = -30V, RL = 6Ω,<br>ID = -1A<br>VGEN = -4.5V, RG = 6Ω |     | 10.5  | 20    | nS   |
| Rise time                          | tr       |   |     | 11.5  | 20    | nS   |
| Turn-on Delay time                 | td(off)  |   |     | 15.5  | 30    | nS   |
| Fall time                          | tr       |   |     | 7.5   | 15    | nS   |
| Continuous Current                 | IS       |   |     |       | -1.25 | A    |
| Pulsed Current                     | ISM      |   |     |       | -8    | A    |
| Diode forward voltage              | VSD      | IS = -1.25A, VGS = 0V                                     |     | -0.82 | -1.25 | V    |
| Source-Drain Reverse Recovery Time | trr      | IF = -1.25A Di/Dt = 100A/μs                               |     | 30    | 55    | ns   |

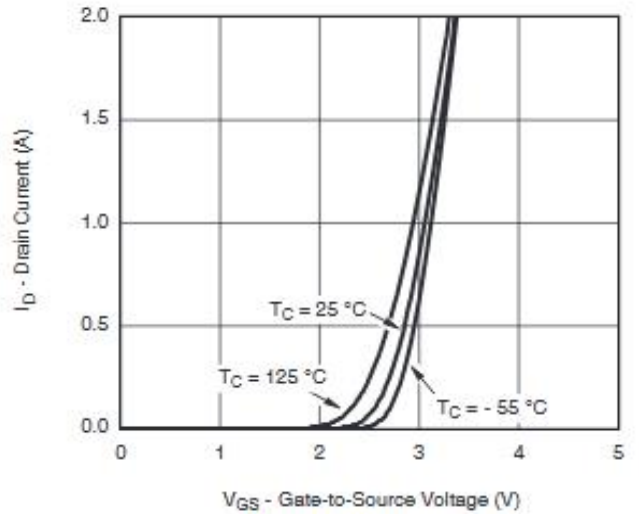
**Note :**

1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t < 5 sec.
3. Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.

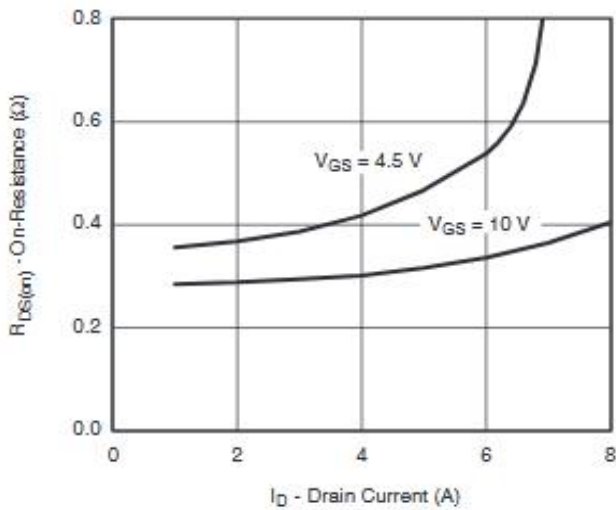
## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



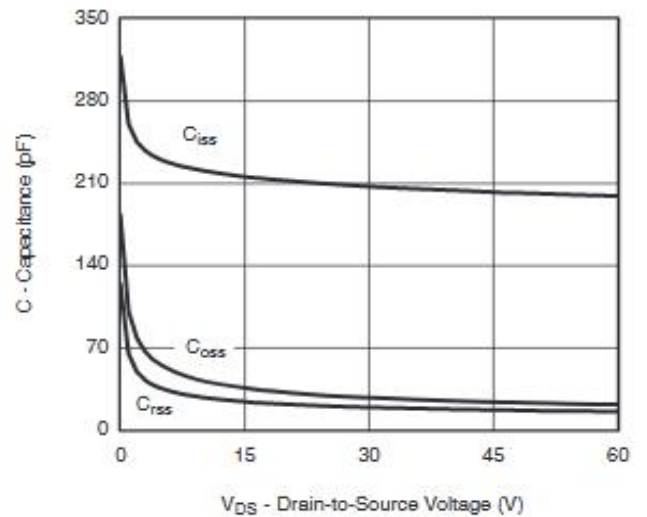
**Output Characteristics**



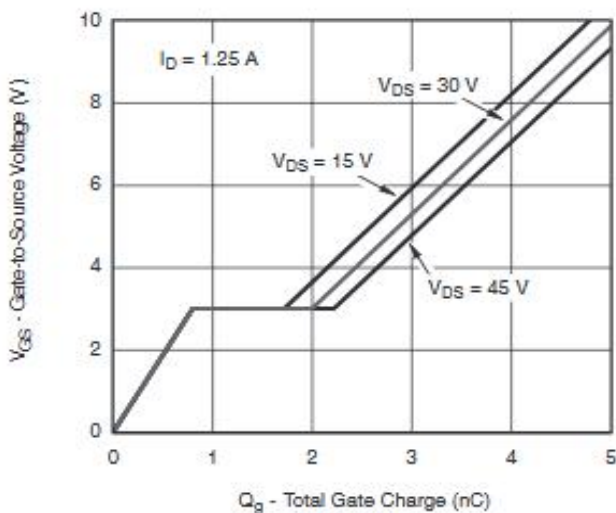
**Transfer Characteristics**



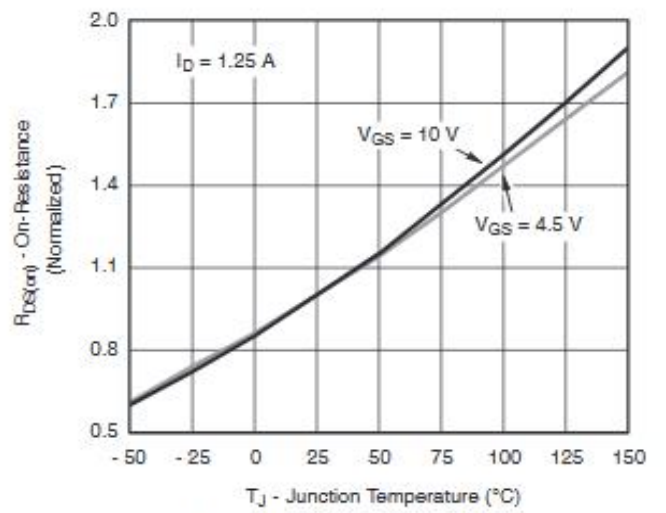
**On-Resistance vs. Drain Current and Gate Voltage**



**Capacitance**

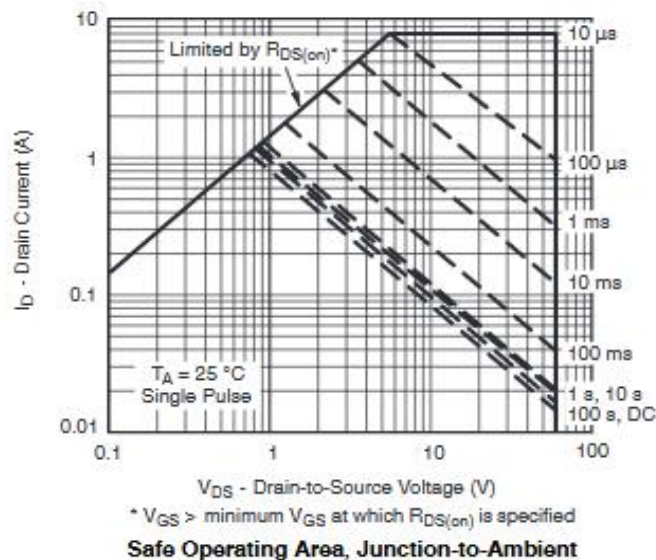
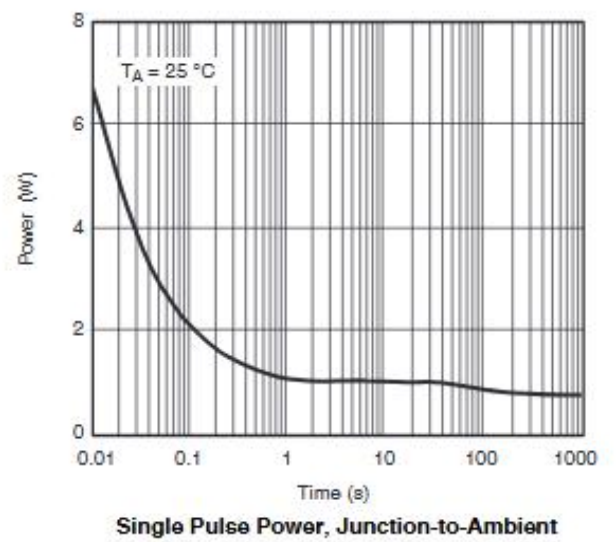
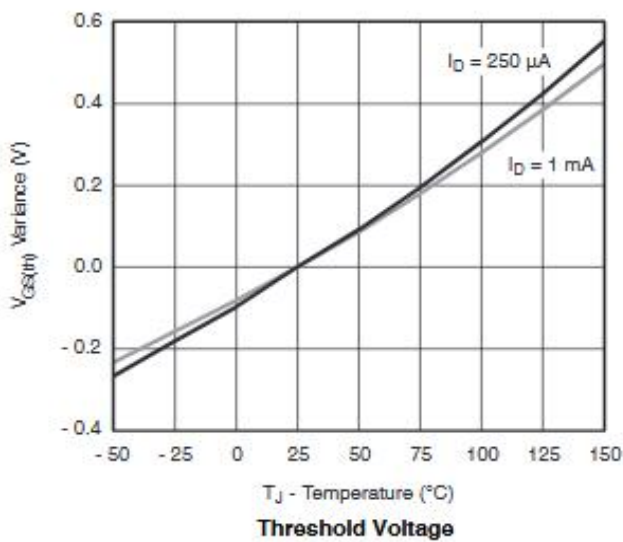
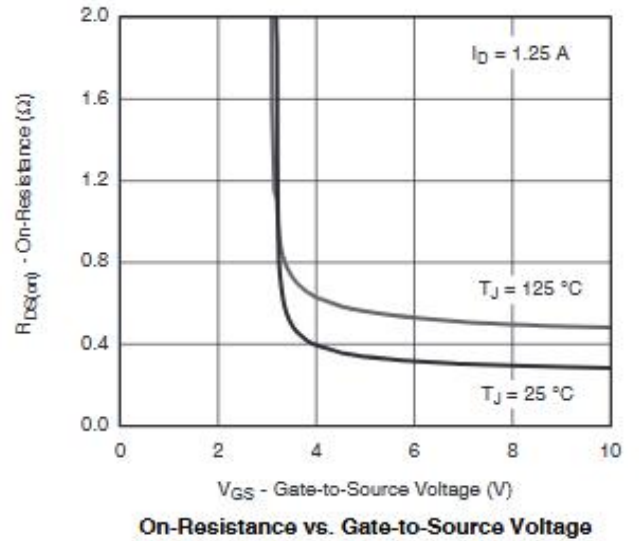
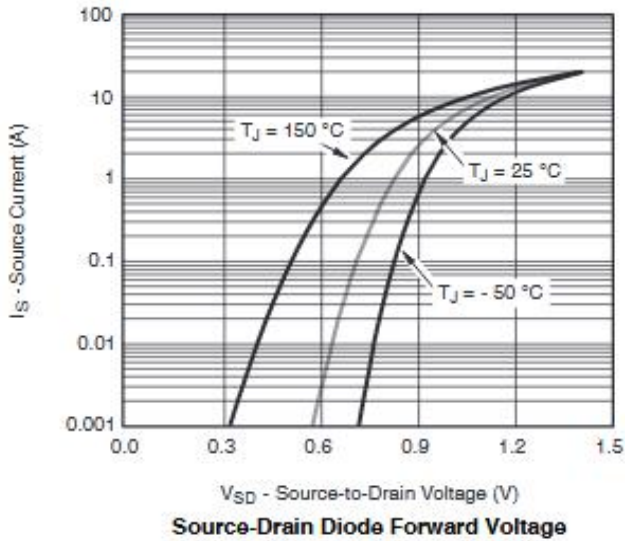


**Gate Charge**

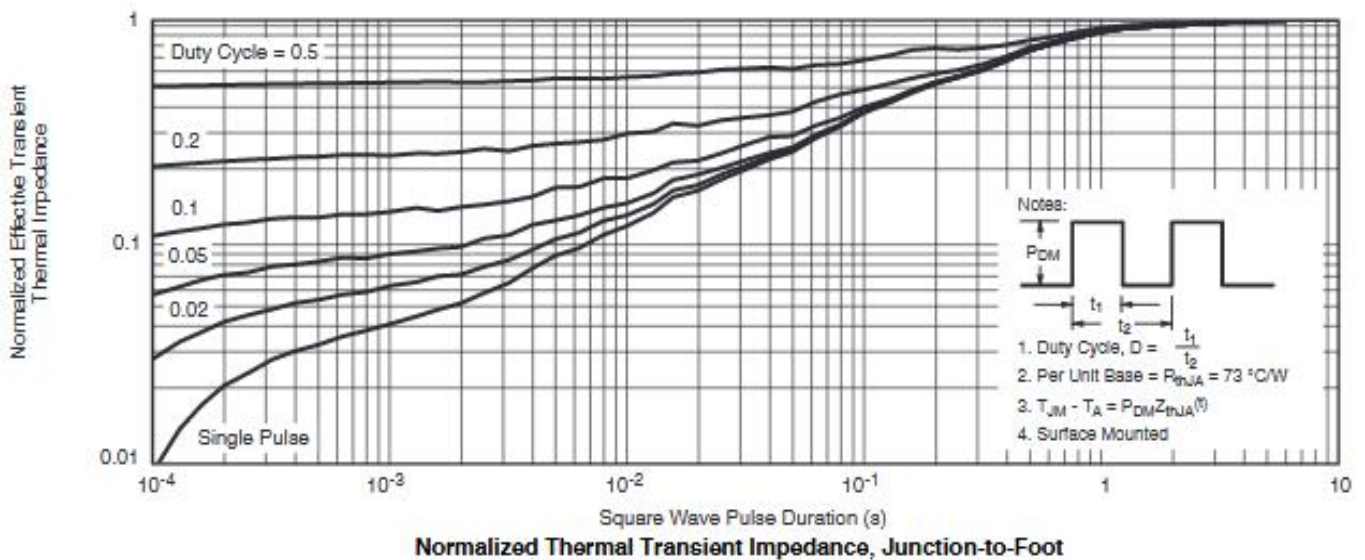
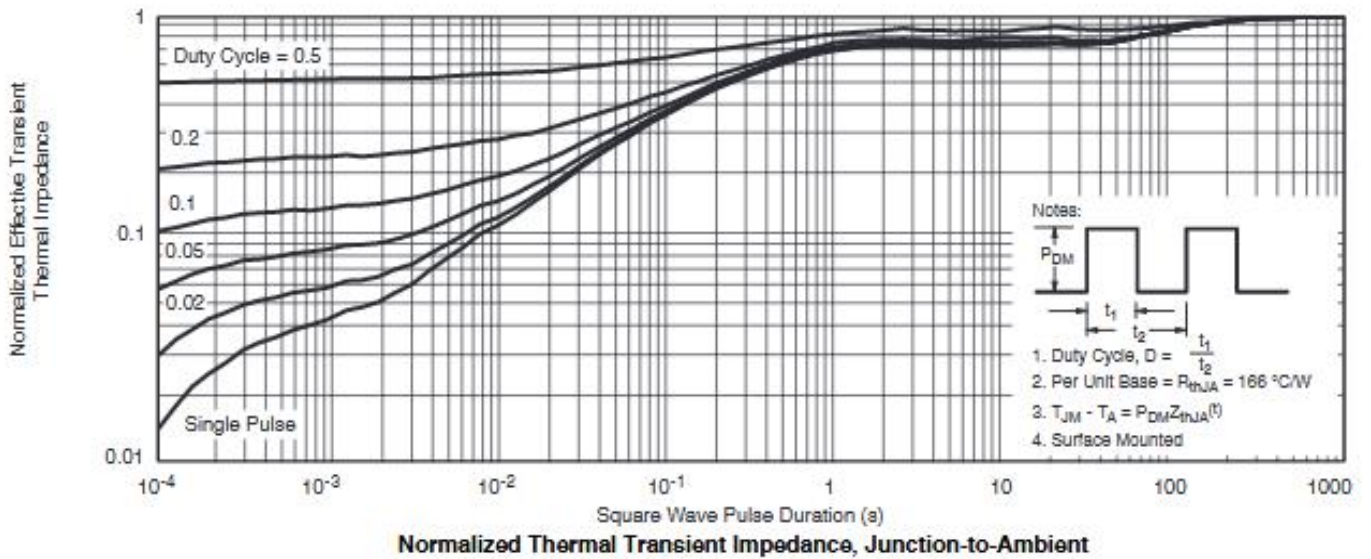


**On-Resistance vs. Junction Temperature**

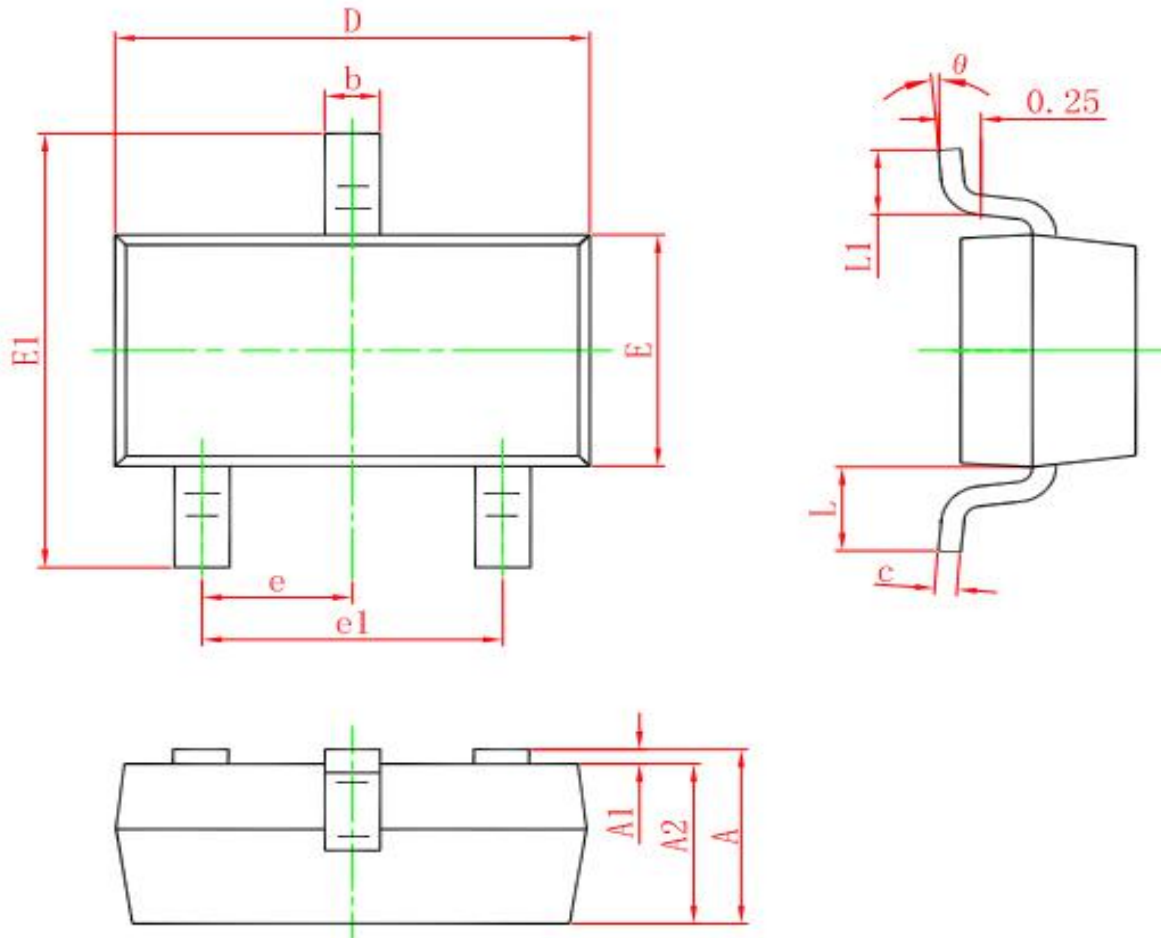
## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



**SOT-23 PACKAGE OUTLINE DIMENSIONS**



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min.                      | Max.  | Min.                 | Max.  |
| A      | 0.900                     | 1.150 | 0.035                | 0.045 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 0.900                     | 1.050 | 0.035                | 0.041 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.080                     | 0.150 | 0.003                | 0.006 |
| D      | 2.800                     | 3.000 | 0.110                | 0.118 |
| E      | 1.200                     | 1.400 | 0.047                | 0.055 |
| E1     | 2.250                     | 2.550 | 0.089                | 0.100 |
| e      | 0.950 TYP.                |       | 0.037 TYP.           |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.550 REF.                |       | 0.022 REF.           |       |
| L1     | 0.300                     | 0.500 | 0.012                | 0.020 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |

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