# N-Channel Enhancement Mode Field Effect Transistor

## Product Summary

| | |
|---|---|
| $V_{DS}$ | 60V |
| $I_D$ | 300mA |
| $R_{DS(ON)}$( at $V_{GS}$=10V) | 2.5ohm |
| $R_{DS(ON)}$( at $V_{GS}$=4.5V) | 3.0ohm |

Gate-Source ESD Rating Up to 2KV (HBM)

## General Description

Trench Power MV MOSFET technology
Voltage controlled small signal switch
Low input Capacitance
Fast Switching Speed
Low Input / Output Leakage
Moisture Sensitivity Level 1
Epoxy Meets UL 94 V-0 Flammability Rating
Halogen Free

## Applications

Battery operated systems
Solid-state relays
Direct logic-level interface TTL/CMOS

**Absolute Maximum Ratings** ($T_A$=25 unless otherwise noted)

| Parameter | | Symbol | Limit | Unit |
|---|---|---|---|---|
| Drain-source Voltage | | $V_{DS}$ | 60 | V |
| Gate-source Voltage | | $V_{GS}$ | 20 | V |
| Drain Current | $T_A$=25 @ Steady State | $I_D$ | 300 | mA |
| | $T_A$=70 @ Steady State | | 240 | |
| Pulsed Drain Current [A] | | $I_{DM}$ | 1.5 | A |
| Total Power Dissipation @ $T_A$=25 | | $P_D$ | 300 | mW |

Thermal Resistance Junction-to-Ambient @ Steady State

**Electrical Characteristics** ($T_J$=25 unless otherwise noted)

| Parameter | Symbol | Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **Static Parameter** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$= 0V, $I_D$=250 | 60 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=60V,$V_{GS}$=0V | | | 1 | |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{GS}$= 20V, $V_{DS}$=0V | | | 10 | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$= $V_{GS}$, $I_D$=250 | 1 | 1.5 | 2.5 | V |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}$= 10V, $I_D$=300mA | | 1.9 | 2.5 | |
| | | $V_{GS}$= 4.5V, $I_D$=200mA | | 2.0 | 3.0 | |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=300mA,$V_{GS}$=0V | | | 1.2 | V |
| Maximum Body-Diode Continuous Current | $I_S$ | | | | 300 | mA |
| **Dynamic Parameters** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=30V,$V_{GS}$=0V,f=1MHZ | | 27 | | pF |
| Output Capacitance | $C_{oss}$ | | | 3 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 2 | | |
| **Switching Parameters** | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{GS}$=10V,$V_{DS}$=30V,$I_D$=0.3A | | 1.65 | 2.4 | nC |
| Turn-on Delay Time | $t_{D(on)}$ | $V_{GS}$=10V,$V_{DD}$=30V, $I_D$=300mA, $R_{GEN}$=6 | | 6.5 | | ns |

## Typical Performance Characteristics

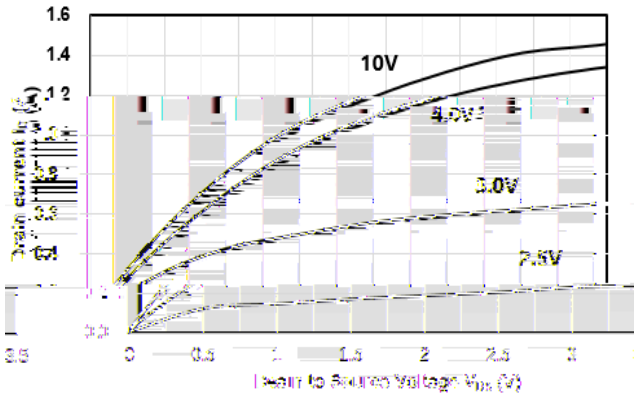



Figure1. Output Characteristics

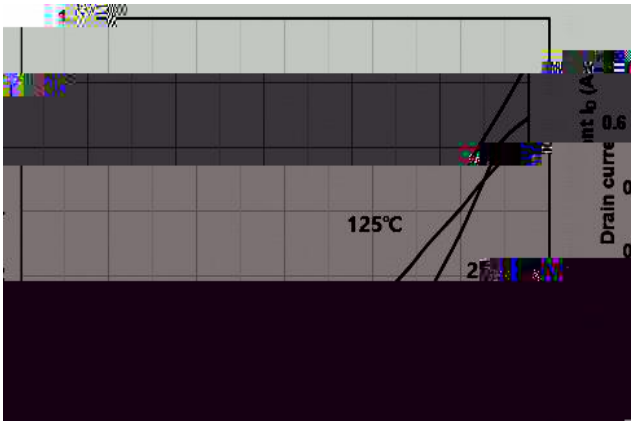



Figure2. Transfer Characteristics

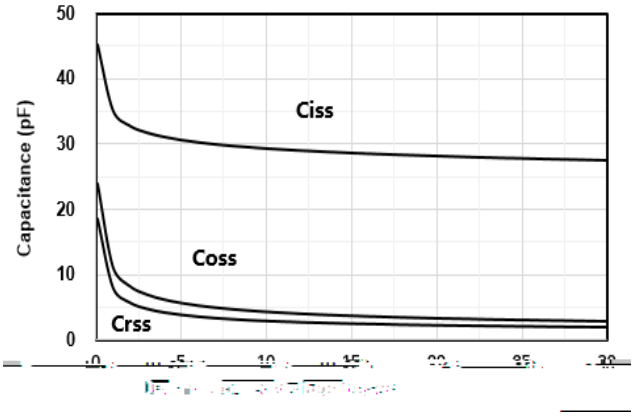



Figure3. Capacitance Characteristics

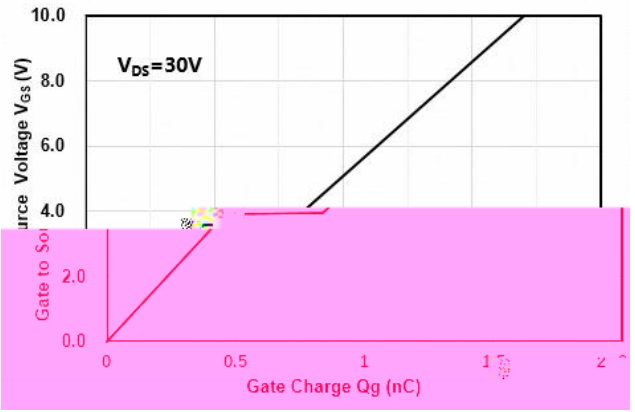



Figure4. Gate Charge

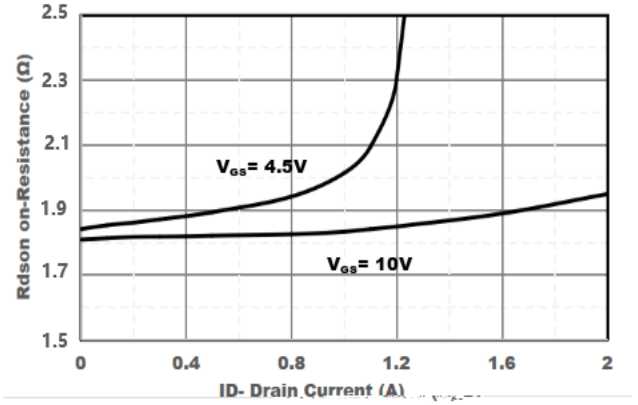



Figure5. Drain-Source on Resistance

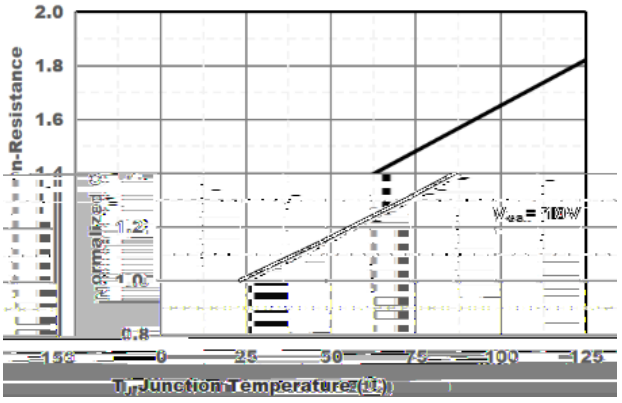



Figure6. Drain-Source on Resistance

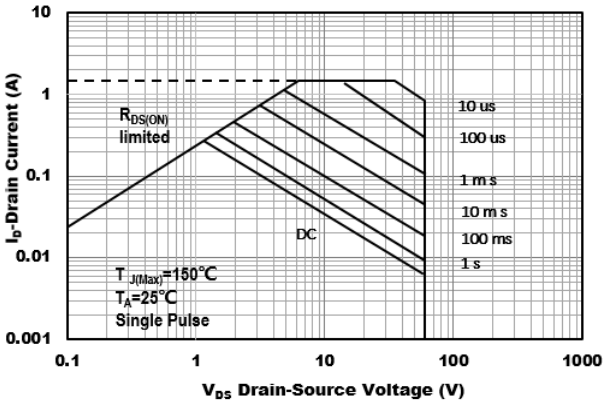



Figure7. Safe Operation Area

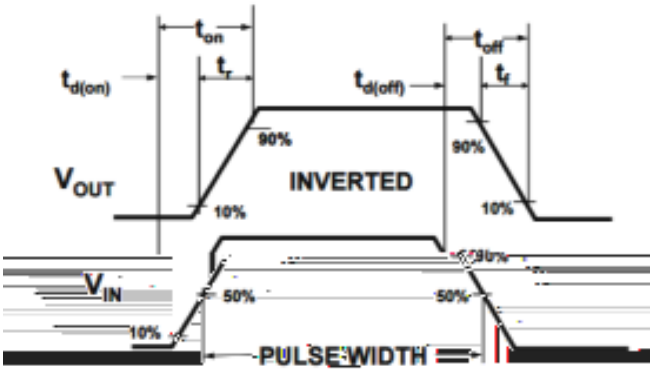
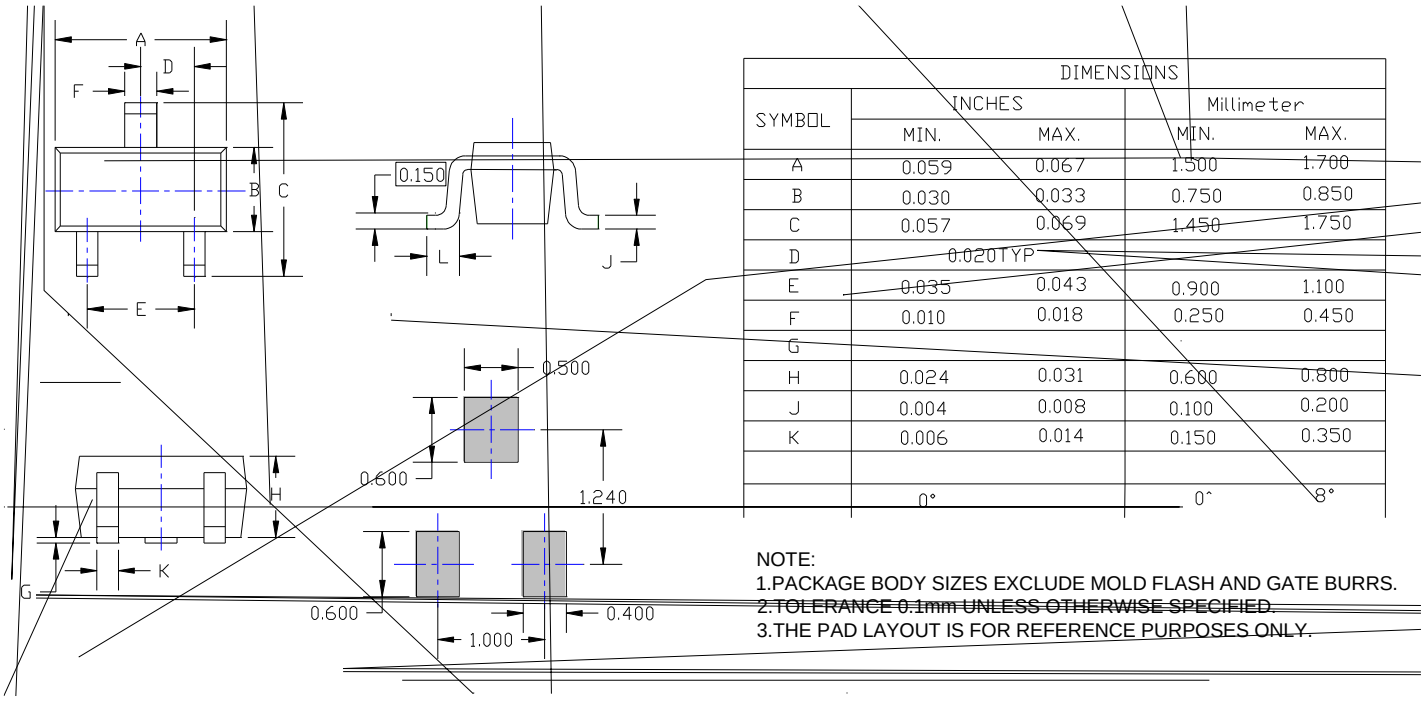



Figure8. Switching wave

## SOT-523 Package Information




| DIMENSIONS | | | | |
|---|---|---|---|---|
| SYMBOL | INCHES | | Millimeter | |
| | MIN. | MAX. | MIN. | MAX. |
| A | 0.059 | 0.067 | 1.500 | 1.700 |
| B | 0.030 | 0.033 | 0.750 | 0.850 |
| C | 0.057 | 0.069 | 1.450 | 1.750 |
| D | 0.020TYP | | | |
| E | 0.035 | 0.043 | 0.900 | 1.100 |
| F | 0.010 | 0.018 | 0.250 | 0.450 |
| G | | | | |
| H | 0.024 | 0.031 | 0.600 | 0.800 |
| J | 0.004 | 0.008 | 0.100 | 0.200 |
| K | 0.006 | 0.014 | 0.150 | 0.350 |
| | | | | |
| | 0° | | 0° | 8° |

NOTE:
1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.

## Disclaimer

The information presented in this document is for reference only. Yangzhou Yangjie Electronic Technology Co., Ltd. reserves the right to make changes without notice for the specification of the products displayed herein to improve reliability, function or design or otherwise.

The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of with would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), Yangjie or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale.

This publication supersedes & replaces all information previously supplied. For additional information, please visit our website http:// www.21yangjie.com