

MSKSEMI

SEMICONDUCTOR



ESD



TVS



TSS



MOV



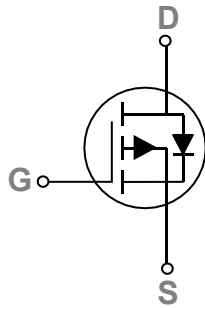
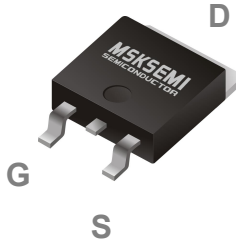
GDT



PLED

Product data sheet

TO252 Pin Configuration



Features

- -60V,-25A, $R_{DS(ON)}$ 38m Ω @VGS = -10V
- Improved dv/dt capability
- Fast switching
- Green Device Available

Applications

- Networking
- Load Switch
- LED applications

| | | |
|-------|--------------|------|
| BVDSS | RDSON | ID |
| -60V | 38m Ω | -25A |

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

| Symbol | Parameter | Rating | Units |
|------------------|--|------------|-------|
| V _{DS} | Drain-Source Voltage | -60 | V |
| V _{GS} | Gate-Source Voltage | ±20 | V |
| I _D | Drain Current – Continuous (T _C =25°C) | -25 | A |
| | Drain Current – Continuous (T _C =100°C) | -16 | A |
| I _{DM} | Drain Current – Pulsed ¹ | -100 | A |
| P _D | Power Dissipation (T _C =25°C) | 72 | W |
| | Power Dissipation – Derate above 25°C | 0.578 | W/°C |
| T _{STG} | Storage Temperature Range | -55 to 150 | °C |
| T _J | Operating Junction Temperature Range | -55 to 150 | °C |

Thermal Characteristics

| Symbol | Parameter | Typ. | Max. | Unit |
|------------------|--|------|------|------|
| R _{θJA} | Thermal Resistance Junction to ambient | --- | 62 | °C/W |
| R _{θJC} | Thermal Resistance Junction to Case | --- | 1.73 | °C/W |

Electrical Characteristics (T_J=25 °C, unless otherwise noted)
Off Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-------------------|--------------------------------|---|------|------|------|------|
| BV _{DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V, I _D =-250uA | -60 | --- | --- | V |
| I _{DSS} | Drain-Source Leakage Current | V _{DS} =-60V, V _{GS} =0V, T _J =25°C | --- | --- | -1 | uA |
| | | V _{DS} =-48V, V _{GS} =0V, T _J =125°C | --- | --- | -10 | uA |
| I _{GSS} | Gate-Source Leakage Current | V _{GS} =±20V, V _{DS} =0V | --- | --- | ±100 | nA |

On Characteristics

| | | | | | | |
|---------------------|-----------------------------------|---|------|------|------|----|
| R _{DS(ON)} | Static Drain-Source On-Resistance | V _{GS} =-10V, I _D =-8A | --- | 38 | 48 | mΩ |
| | | V _{GS} =-4.5V, I _D =-6A | --- | 46 | 60 | mΩ |
| V _{GS(th)} | Gate Threshold Voltage | V _{GS} =V _{DS} , I _D =-250uA | -1.0 | -1.6 | -2.5 | V |
| g _{fs} | Forward Transconductance | V _{DS} =-10V, I _S =-3A | --- | 11 | --- | S |

Dynamic and switching Characteristics

| | | | | | | |
|---------------------|-------------------------------------|---|-----|------|------|----|
| Q _g | Total Gate Charge ^{2, 3} | V _{DS} =-30V, V _{GS} =-10V, I _D =-10A | --- | 19 | 30 | nC |
| Q _{gs} | Gate-Source Charge ^{2, 3} | | --- | 2.5 | 3.8 | |
| Q _{gd} | Gate-Drain Charge ^{2, 3} | | --- | 4.3 | 6.5 | |
| T _{d(on)} | Turn-On Delay Time ^{2, 3} | V _{DD} =-30V, V _{GS} =-10V, R _G =25Ω I _D =-10A | --- | 25 | 40 | ns |
| T _r | Rise Time ^{2, 3} | | --- | 58 | 95 | |
| T _{d(off)} | Turn-Off Delay Time ^{2, 3} | | --- | 65 | 110 | |
| T _f | Fall Time ^{2, 3} | | --- | 35 | 55 | |
| C _{iss} | Input Capacitance | V _{DS} =-30V, V _{GS} =0V, F=1MHz | --- | 1200 | 1800 | pF |
| C _{oss} | Output Capacitance | | --- | 85 | 130 | |
| C _{rss} | Reverse Transfer Capacitance | | --- | 60 | 90 | |
| R _g | Gate resistance | V _{GS} =0V, V _{DS} =0V, F=1MHz | --- | 14 | --- | Ω |

Drain-Source Diode Characteristics and Maximum Ratings

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-----------------|---------------------------|--|------|------|------|------|
| I _S | Continuous Source Current | V _G =V _D =0V, Force Current | --- | --- | -25 | A |
| I _{SM} | Pulsed Source Current | | --- | --- | -50 | A |
| V _{SD} | Diode Forward Voltage | V _{GS} =0V, I _S =-1A, T _J =25°C | --- | --- | -1 | V |
| t _{rr} | Reverse Recovery Time | V _R =-50V, I _S =-10A | --- | 30 | --- | ns |
| Q _{rr} | Reverse Recovery Charge | di/dt=100A/μs, T _J =25°C | --- | 20 | --- | nC |

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=-25V, V_{GS}=-10V, L=0.1mH, I_{AS}=-34A., Starting T_J=25°C
3. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

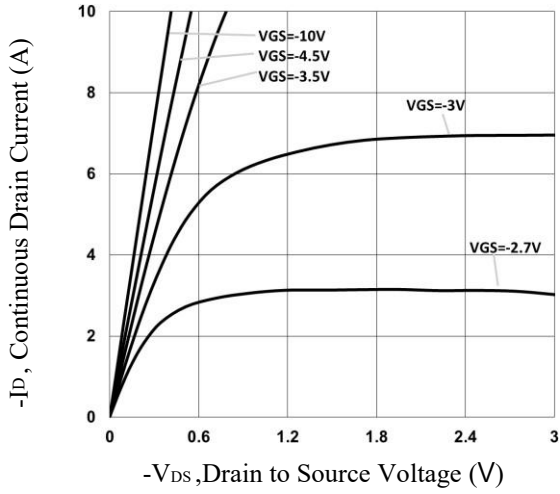


Fig.1 Typical Output Characteristics

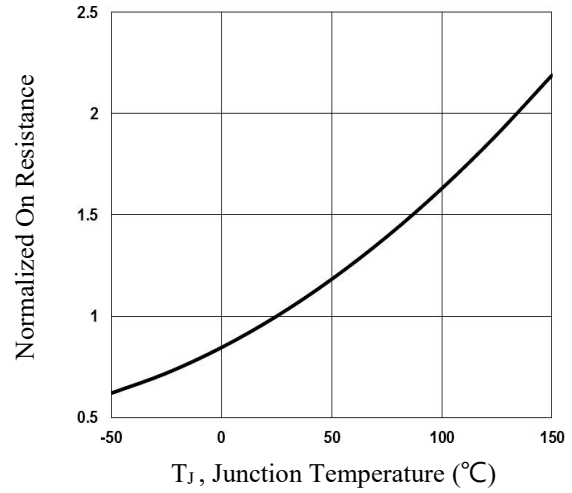


Fig.2 Normalized RDS(on) vs. TJ

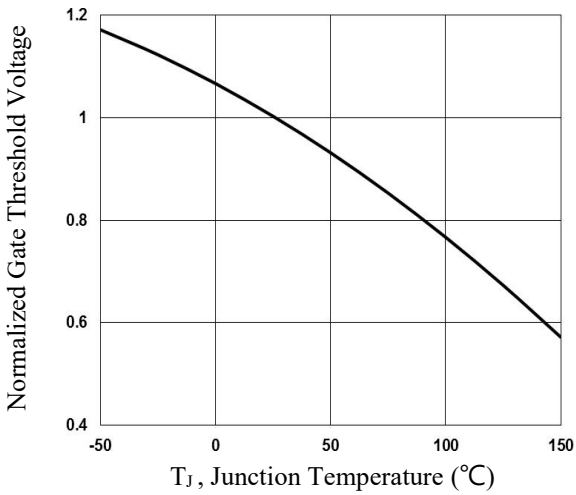


Fig.3 Normalized V_{th} vs. TJ

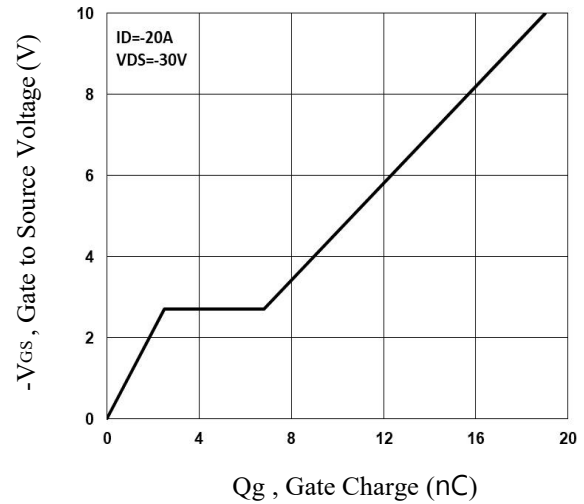


Fig.4 Gate Charge Waveform

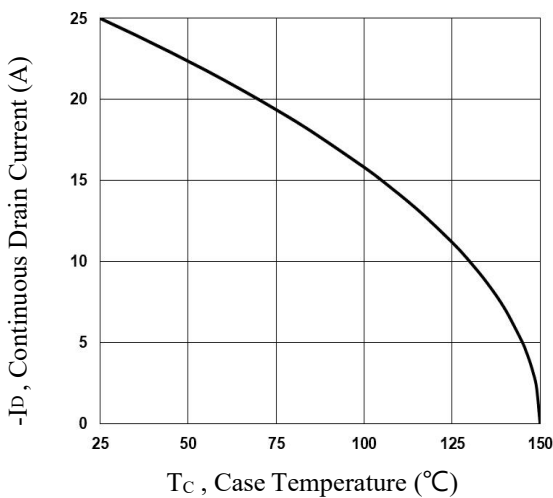


Fig.5 Continuous Drain Current vs. TC

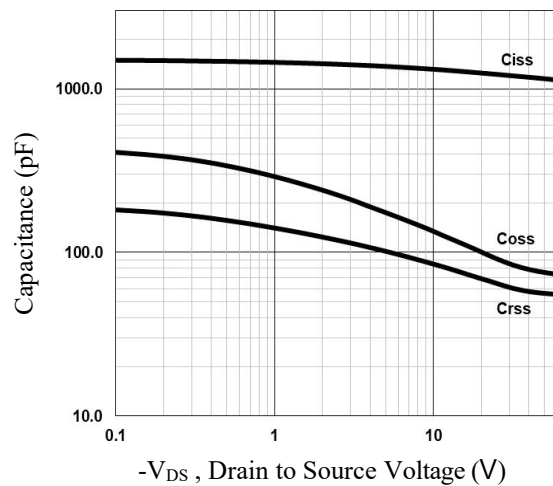


Fig.6 Capacitance Characteristics

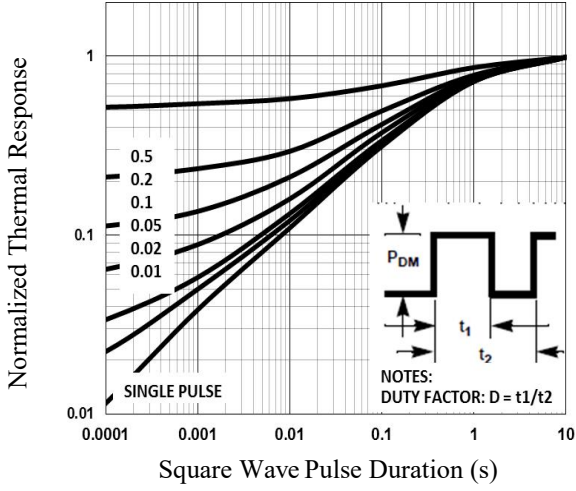


Fig.7 Normalized Transient Impedance

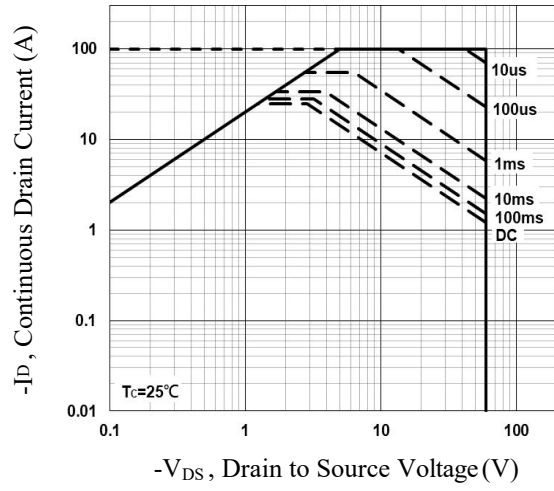
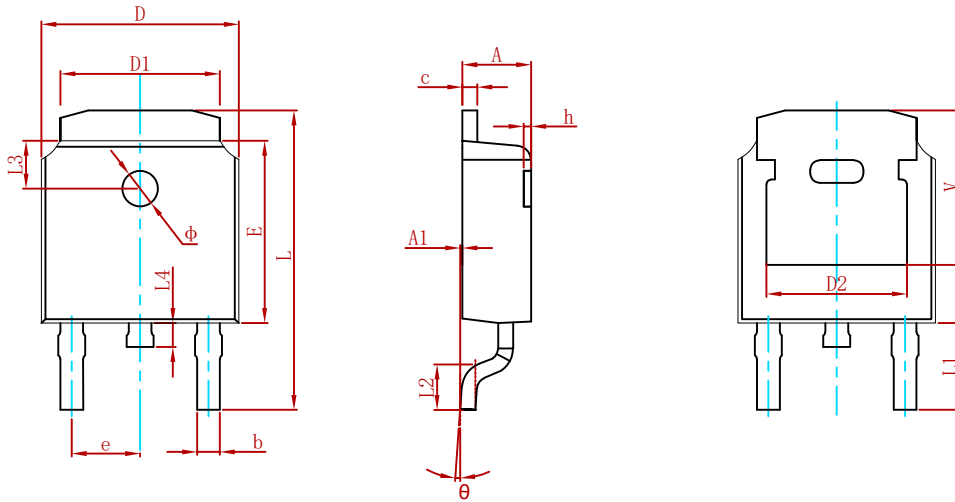


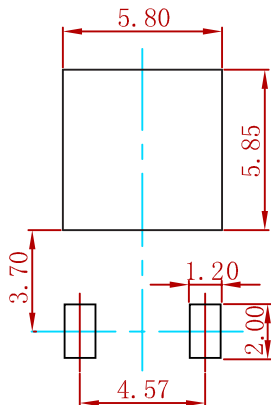
Fig.8 Maximum Safe Operation Area

PACKAGE MECHANICAL DATA



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|--------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 2.200 | 2.400 | 0.087 | 0.094 |
| A1 | 0.000 | 0.127 | 0.000 | 0.005 |
| b | 0.635 | 0.770 | 0.025 | 0.030 |
| c | 0.460 | 0.580 | 0.018 | 0.023 |
| D | 6.500 | 6.700 | 0.256 | 0.264 |
| D1 | 5.100 | 5.460 | 0.201 | 0.215 |
| D2 | 4.830 REF. | | 0.190 REF. | |
| E | 6.000 | 6.200 | 0.236 | 0.244 |
| e | 2.186 | 2.386 | 0.086 | 0.094 |
| L | 9.712 | 10.312 | 0.382 | 0.406 |
| L1 | 2.900 REF. | | 0.114 REF. | |
| L2 | 1.400 | 1.700 | 0.055 | 0.067 |
| L3 | 1.600 REF. | | 0.063 REF. | |
| L4 | 0.600 | 1.000 | 0.024 | 0.039 |
| φ | 1.100 | 1.300 | 0.043 | 0.051 |
| θ | 0° | 8° | 0° | 8° |
| h | 0.000 | 0.300 | 0.000 | 0.012 |
| V | 5.250 REF. | | 0.207 REF. | |

Suggested Pad Layout



Note:
 1. Controlling dimension: in millimeters.
 2. General tolerance: ± 0.05mm.
 3. The pad layout is for reference purposes only.

REEL SPECIFICATION

| P/N | PKG | QTY |
|-----------|--------|------|
| AOD409-MS | TO-252 | 2500 |

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