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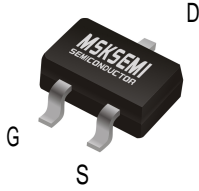
Product data sheet

Features

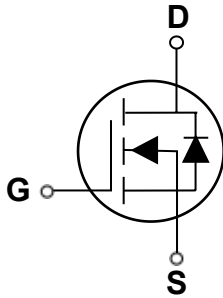
- 30V, 5.8A, $R_{DS(ON)} = 20m\Omega @ V_{GS} = 1.0V$
- Improved dv/dt capability
- Fast switching
- Green Device Available

Applications

- MB / VGA / Vcore
- Load Switch
- Hand-Held Instrument



SOT-23-3L



| | | |
|-------|-------|------|
| BVDSS | RDSON | ID |
| 30V | 20mΩ | 5.8A |

Absolute Maximum Ratings $T_c=25^\circ C$ unless otherwise noted

| Symbol | Parameter | Rating | Units |
|-----------|--------------------------------------------------|------------|---------------|
| V_{DS} | Drain-Source Voltage | 30 | V |
| V_{GS} | Gate-Source Voltage | ± 12 | V |
| I_D | Drain Current – Continuous ($T_c=25^\circ C$) | 5.8 | A |
| | Drain Current – Continuous ($T_c=100^\circ C$) | 4.1 | A |
| I_{DM} | Drain Current – Pulsed ¹ | 26 | A |
| P_D | Power Dissipation ($T_c=25^\circ C$) | 1.4 | W |
| | Power Dissipation – Derate above $25^\circ C$ | 0.012 | W/ $^\circ C$ |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ C$ |
| T_J | Operating Junction Temperature Range | -55 to 150 | $^\circ C$ |

Thermal Characteristics

| Symbol | Parameter | Typ. | Max. | Unit |
|-----------------|----------------------------------------|------|------|--------------|
| $R_{\theta JA}$ | Thermal Resistance Junction to ambient | --- | 80 | $^\circ C/W$ |

Off Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|------------------------------|------------------------------------|------------------------------------------|------|------|-----------|---------|
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=250\mu A$ | 30 | --- | --- | V |
| $\Delta BV_{DSS}/\Delta T_J$ | BV_{DSS} Temperature Coefficient | Reference to 25°C, $I_D=1mA$ | --- | 0.04 | --- | V/°C |
| I_{DSS} | Drain-Source Leakage Current | $V_{DS}=30V, V_{GS}=0V, T_J=25^\circ C$ | --- | --- | 1 | μA |
| | | $V_{DS}=24V, V_{GS}=0V, T_J=125^\circ C$ | --- | --- | 10 | μA |
| I_{GSS} | Gate-Source Leakage Current | $V_{GS}=\pm 12V, V_{DS}=0V$ | --- | --- | ± 100 | nA |

On Characteristics

| | | | | | | |
|---------------------|------------------------------------------------|-------------------------------|-----|-----|-----|------------|
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance ³ | $V_{GS}=10V, I_D=5A$ | --- | 20 | 30 | m Ω |
| | | $V_{GS}=4.5V, I_D=4A$ | --- | 24 | 36 | m Ω |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}=V_{DS}, I_D=250\mu A$ | 0.5 | 0.9 | 1.2 | V |
| $\Delta V_{GS(th)}$ | $V_{GS(th)}$ Temperature Coefficient | | --- | -4 | --- | mV/°C |
| g_{fs} | Forward Transconductance | $V_{DS}=10V, I_D=4A$ | --- | 6.5 | --- | S |

Dynamic and switching Characteristics

| | | | | | | |
|--------------|-------------------------------------|---------------------------------------------------|-----|------|-----|----------|
| Q_g | Total Gate Charge ^{3, 4} | $V_{DS}=15V, V_{GS}=4.5V, I_D=6A$ | --- | 4.1 | --- | nC |
| Q_{gs} | Gate-Source Charge ^{3, 4} | | --- | 1 | --- | |
| Q_{gd} | Gate-Drain Charge ^{3, 4} | | --- | 2.1 | --- | |
| $T_{d(on)}$ | Turn-On Delay Time ^{3, 4} | $V_{DD}=15V, V_{GS}=10V, R_G=6\Omega$ $I_D=1A$ | --- | 2.8 | --- | ns |
| T_r | Rise Time ^{3, 4} | | --- | 7.2 | --- | |
| $T_{d(off)}$ | Turn-Off Delay Time ^{3, 4} | | --- | 15.8 | --- | |
| T_f | Fall Time ^{3, 4} | | --- | 4.6 | --- | |
| C_{iss} | Input Capacitance | $V_{DS}=25V, V_{GS}=0V, F=1MHz$ | --- | 345 | --- | pF |
| C_{oss} | Output Capacitance | | --- | 55 | --- | |
| C_{rss} | Reverse Transfer Capacitance | | --- | 32 | --- | |
| R_g | Gate resistance | $V_{GS}=0V, V_{DS}=0V, F=1MHz$ | --- | 3.2 | --- | Ω |

Drain-Source Diode Characteristics and Maximum Ratings

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|----------|------------------------------------|---------------------------------------|------|------|------|------|
| I_S | Continuous Source Current | $V_G=V_D=0V, \text{Force Current}$ | --- | --- | 5.8 | A |
| I_{SM} | Pulsed Source Current ³ | | --- | --- | 26 | A |
| V_{SD} | Diode Forward Voltage ³ | $V_{GS}=0V, I_S=1A, T_J=25^\circ C$ | --- | --- | 1.3 | V |
| t_{rr} | Reverse Recovery Time | $V_{GS}=0V, I_S=1A, di/dt=100A/\mu s$ | --- | --- | --- | ns |
| Q_{rr} | Reverse Recovery Charge | $T_J=25^\circ C$ | --- | --- | --- | nC |

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=25V, V_{GS}=10V, L=1mH, I_{AS}=8A, R_G=25\Omega, \text{Starting } T_J=25^\circ C$.
3. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

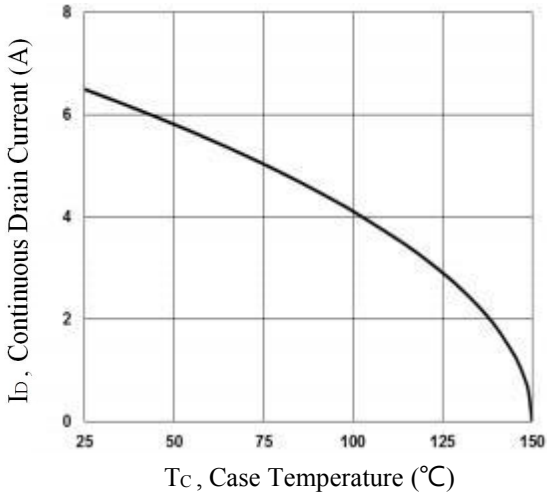


Fig.1 Continuous Drain Current vs. T_C

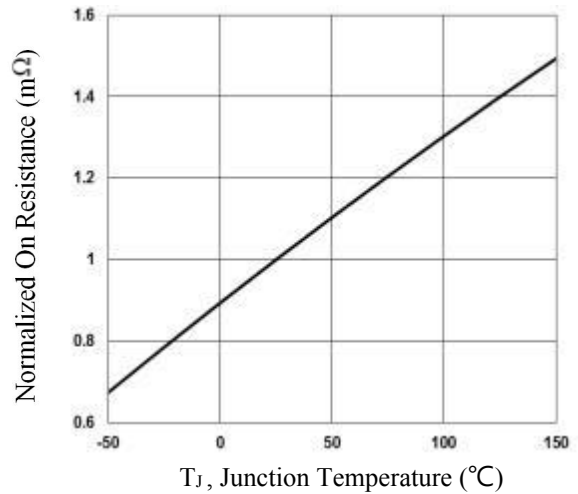


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

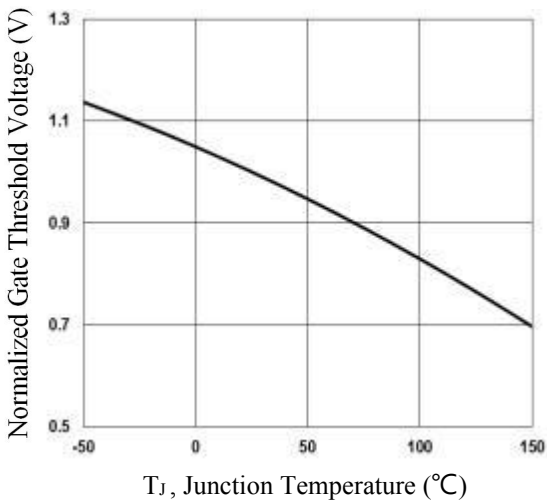


Fig.3 Normalized V_{th} vs. T_J

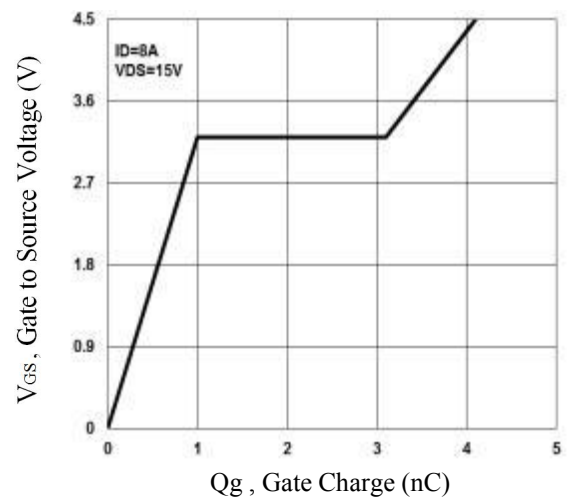


Fig.4 Gate Charge Waveform

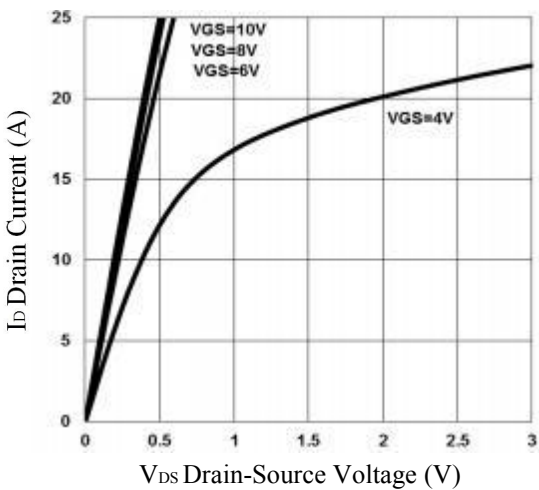


Fig.5 On Region Characteristics

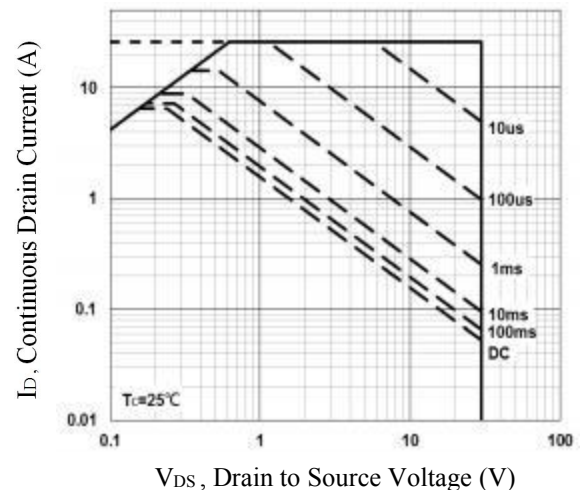


Fig.6 Maximum Safe Operation Area

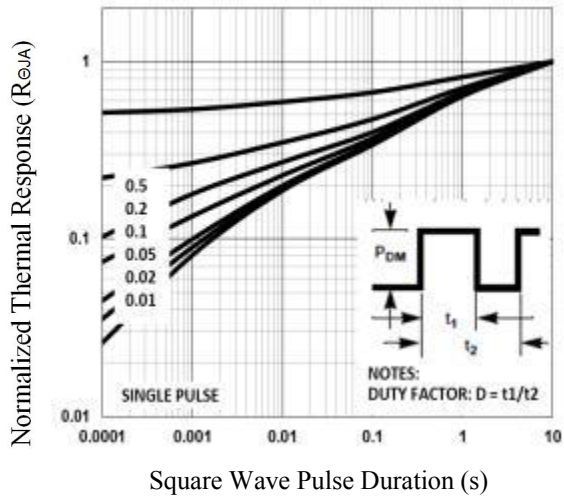


Fig. 7 Normalized Transient Response

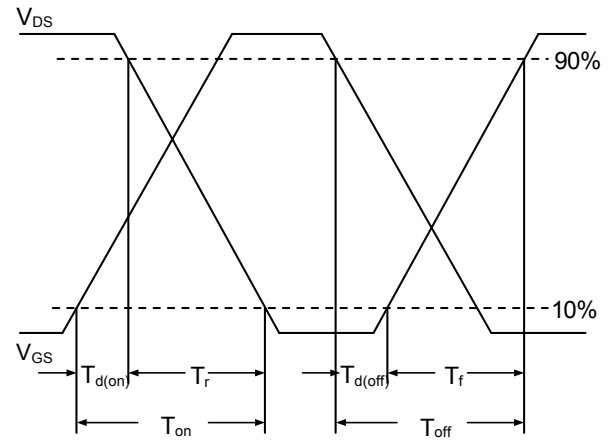
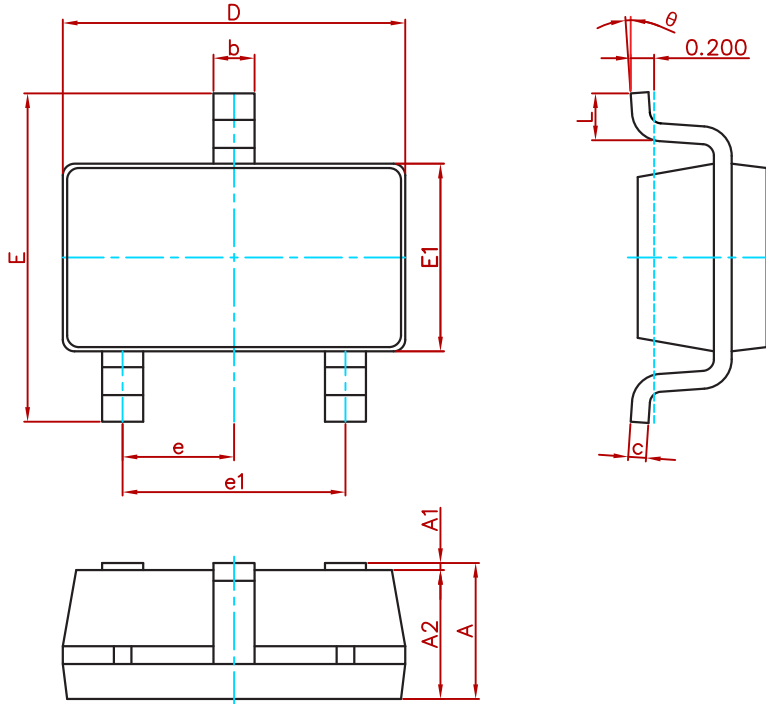


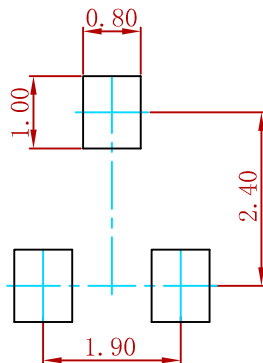
Fig. 8 Switching Time Waveform

PACKAGE MECHANICAL DATA



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 2.820 | 3.020 | 0.111 | 0.119 |
| E1 | 1.500 | 1.700 | 0.059 | 0.067 |
| E | 2.650 | 2.950 | 0.104 | 0.116 |
| e | 0.950(BSC) | | 0.037(BSC) | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.300 | 0.600 | 0.012 | 0.024 |
| θ | 0° | 8° | 0° | 8° |

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 |
|---------|-----------|------|
| AO3400A | SOT-23-3L | 3000 |

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