

# MSKSEMI

SEMICONDUCTOR



ESD



TVS



TSS



MOV

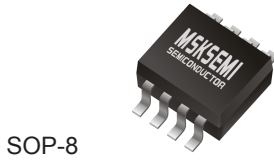


GDT

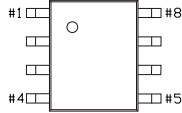


PLED

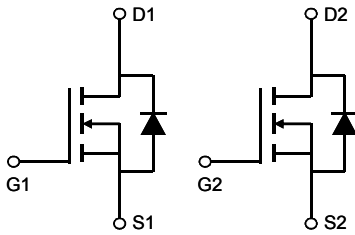
Product data sheet



SOP-8



1 S2 5 D1  
2 G2 6 D1  
3 S1 7 D2  
4 G1 8 D2



**Features**

- $V_{DS} (V) = 30V$
- $I_D = 10A (V_{GS} = 10V)$
- $R_{DS(ON)} < 12m\Omega (V_{GS} = 10V)$
- $R_{DS(ON)} < 16.5m\Omega (V_{GS} = 4.5V)$

**Absolute Maximum Ratings  $T_a = 25^\circ C$**

| Parameter                               | Symbol           | Rating           | Unit       |              |
|---|------------------|------------------|------------|--------------|
| Drain-Source Voltage                    | $V_{DS}$         | 30               | V          |              |
| Gate-Source Voltage                     | $V_{GS}$         | $\pm 20$         |            |              |
| Continuous Drain Current                | $I_D$            | $T_A=25^\circ C$ | 10         | A            |
|   |                  | $T_A=70^\circ C$ | 8          |              |
| Pulsed Drain Current                    | $I_{DM}$         | 55               |            |              |
| Avalanche Current                       | $I_{AS}, I_{AR}$ | 22               |            |              |
| Repetitive Avalanche Energy             | $L=0.1mH$        | $E_{AS}, E_{AR}$ | 24         | mJ           |
| Power Dissipation                       | $P_D$            | $T_A=25^\circ C$ | 2          | W            |
|   |                  | $T_A=70^\circ C$ | 1.3        |              |
| Thermal Resistance.Junction- to-Ambient | $R_{thJA}$       | $t \leq 10s$     | 62.5       | $^\circ C/W$ |
|   |                  | Steady-State     | 90         |              |
| Thermal Resistance.Junction- to-Lead    | $R_{thJL}$       | 40               |            |              |
| Junction Temperature                    | $T_J$            | 150              | $^\circ C$ |              |
| Storage Temperature Range               | $T_{stg}$        | -55 to 150       |            |              |

## Electrical Characteristics Ta = 25°C

| Parameter                             | Symbol              | Test Conditions   | Min | Typ | Max  | Unit |
|---------------------------------------|---------------------|---|-----|-----|------|------|
| Drain-Source Breakdown Voltage        | V <sub>DSS</sub>    | I <sub>D</sub> =250 μA, V <sub>GS</sub> =0V   | 30  |     |      | V    |
| Zero Gate Voltage Drain Current       | I <sub>DSS</sub>    | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V   |     |     | 1    | μA   |
|                                       |                     | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C                           |     |     | 5    |      |
| Gate-Body Leakage Current             | I <sub>GSS</sub>    | V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V  |     |     | ±100 | nA   |
| Gate Threshold Voltage                | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                                  | 1.5 |     | 2.5  | V    |
| Static Drain-Source On-Resistance     | R <sub>DS(on)</sub> | V <sub>GS</sub> =10V, I <sub>D</sub> =10A   |     |     | 12   | mΩ   |
|                                       |                     | V <sub>GS</sub> =10V, I <sub>D</sub> =10A T <sub>J</sub> =125°C                           |     |     | 18   |      |
|                                       |                     | V <sub>GS</sub> =4.5V, I <sub>D</sub> =8A   |     |     | 16.5 |      |
| On State Drain Current                | I <sub>D(ON)</sub>  | V <sub>GS</sub> =10V, V <sub>DS</sub> =5V   | 55  |     |      | A    |
| Forward Transconductance              | g <sub>FS</sub>     | V <sub>DS</sub> =5V, I <sub>D</sub> =10A  |     | 43  |      | S    |
| Input Capacitance                     | C <sub>iss</sub>    | V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, f=1MHz   | 610 |     | 910  | pF   |
| Output Capacitance                    | C <sub>oss</sub>    |   | 88  |     | 160  |      |
| Reverse Transfer Capacitance          | C <sub>rss</sub>    |   | 40  |     | 100  |      |
| Gate Resistance                       | R <sub>g</sub>      | V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1MHz  | 0.8 |     | 2.4  | Ω    |
| Total Gate Charge (10V)               | Q <sub>g</sub>      | V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, I <sub>D</sub> =10A                           | 11  |     | 17   | nC   |
| Total Gate Charge (4.5V)              |                     |   | 5   |     | 8    |      |
| Gate Source Charge                    | Q <sub>gs</sub>     |   | 2.4 |     |      |      |
| Gate Drain Charge                     | Q <sub>gd</sub>     |   | 3   |     |      |      |
| Turn-On DelayTime                     | t <sub>d(on)</sub>  | V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, R <sub>L</sub> =1.5Ω,<br>R <sub>GEN</sub> =3Ω |     | 4.4 |      | ns   |
| Turn-On Rise Time                     | t <sub>r</sub>      |   |     | 9   |      |      |
| Turn-Off DelayTime                    | t <sub>d(off)</sub> |   |     | 17  |      |      |
| Turn-Off Fall Time                    | t <sub>f</sub>      |   |     | 6   |      |      |
| Body Diode Reverse Recovery Time      | t <sub>rr</sub>     | I <sub>F</sub> = 10A, di/dt= 500A/us  | 5.6 |     | 8    | nC   |
| Body Diode Reverse Recovery Charge    | Q <sub>rr</sub>     |   | 6.4 |     | 9.6  |      |
| Maximum Body-Diode Continuous Current | I <sub>S</sub>      |   |     |     | 2.5  | A    |
| Diode Forward Voltage                 | V <sub>SD</sub>     | I <sub>S</sub> =1A, V <sub>GS</sub> =0V   |     |     | 1    | V    |

Note. The static characteristics in Figures 1 to 6 are obtained using <300us pulses, duty cycle 0.5% max.

Typical Characteristics

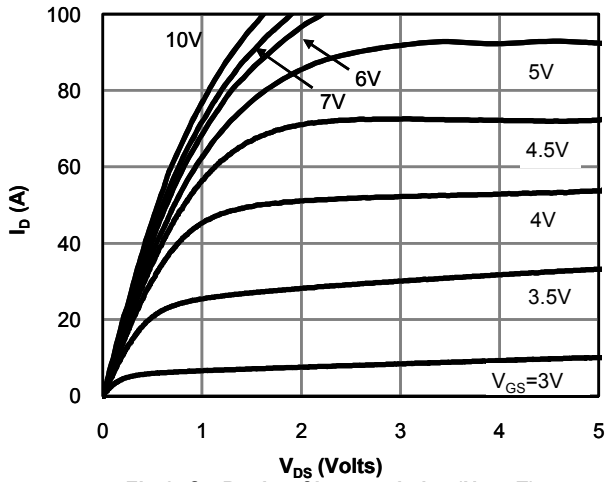


Fig 1: On-Region Characteristics (Note E)

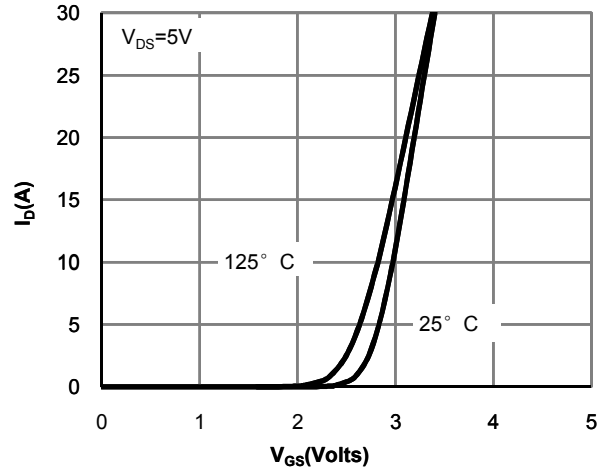


Figure 2: Transfer Characteristics (Note E)

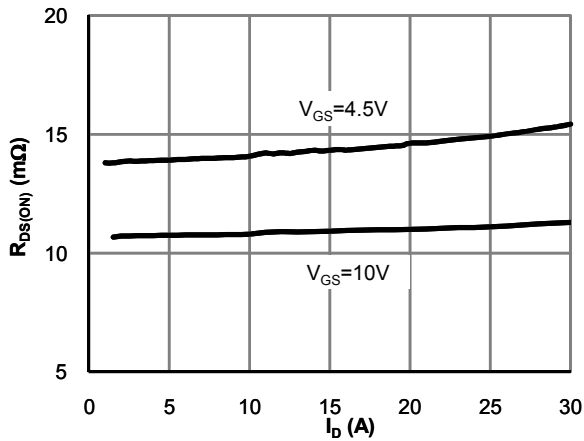


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

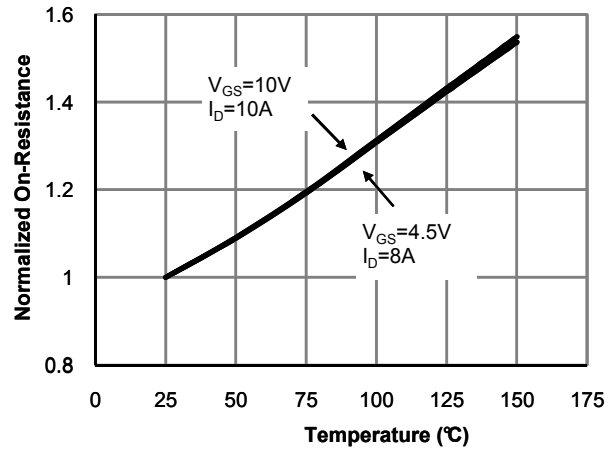


Figure 4: On-Resistance vs. Junction Temperature (Note E)

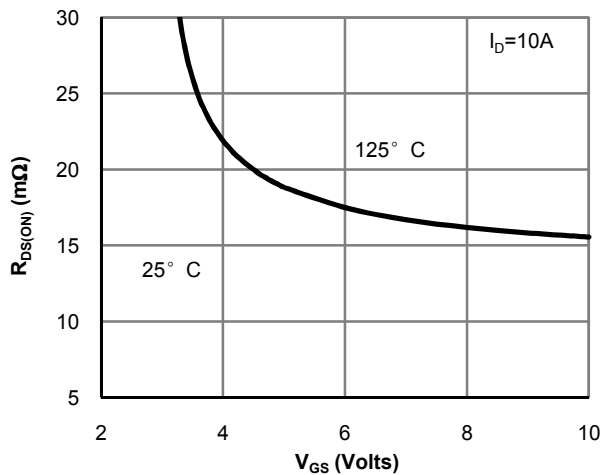


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

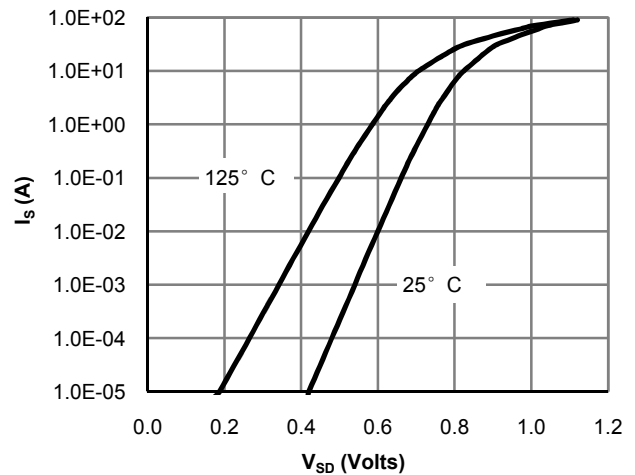


Figure 6: Body-Diode Characteristics (Note E)

Typical Characteristics

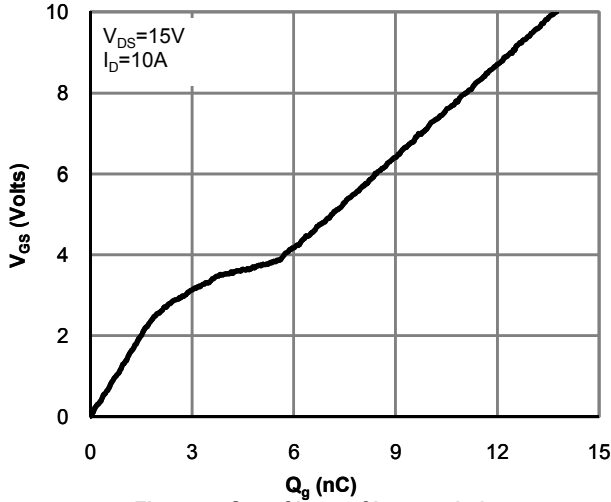


Figure 7: Gate-Charge Characteristics

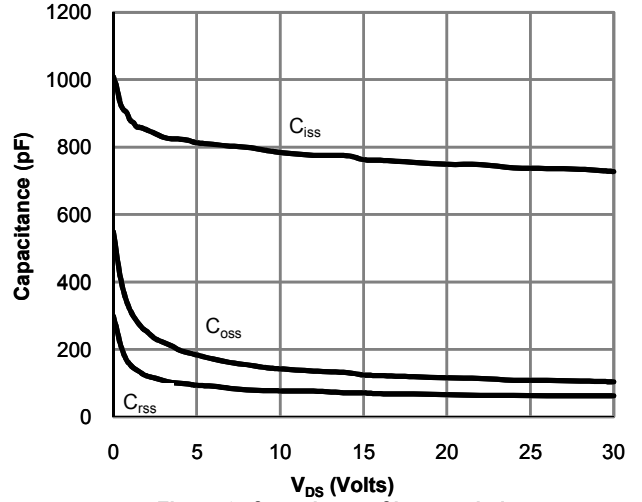


Figure 8: Capacitance Characteristics

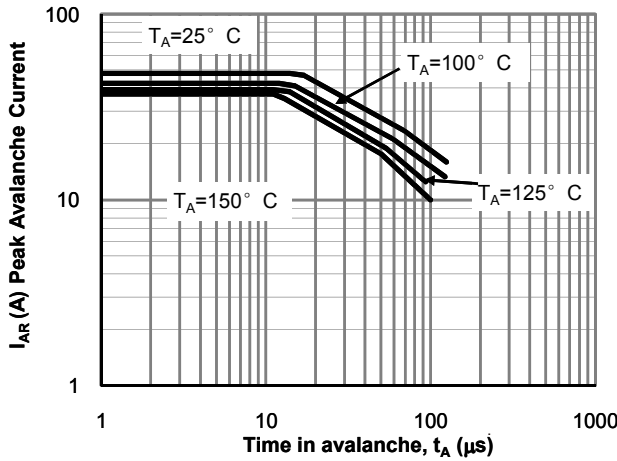


Figure 9: Single Pulse Avalanche capability (Note C)

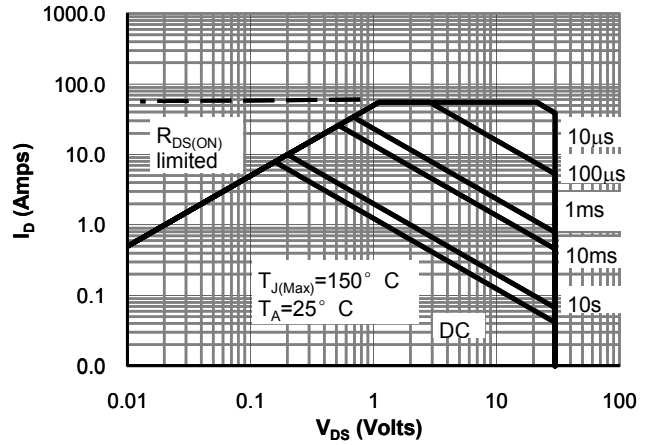


Figure 10: Maximum Forward Biased Safe Operating Area (Note F)

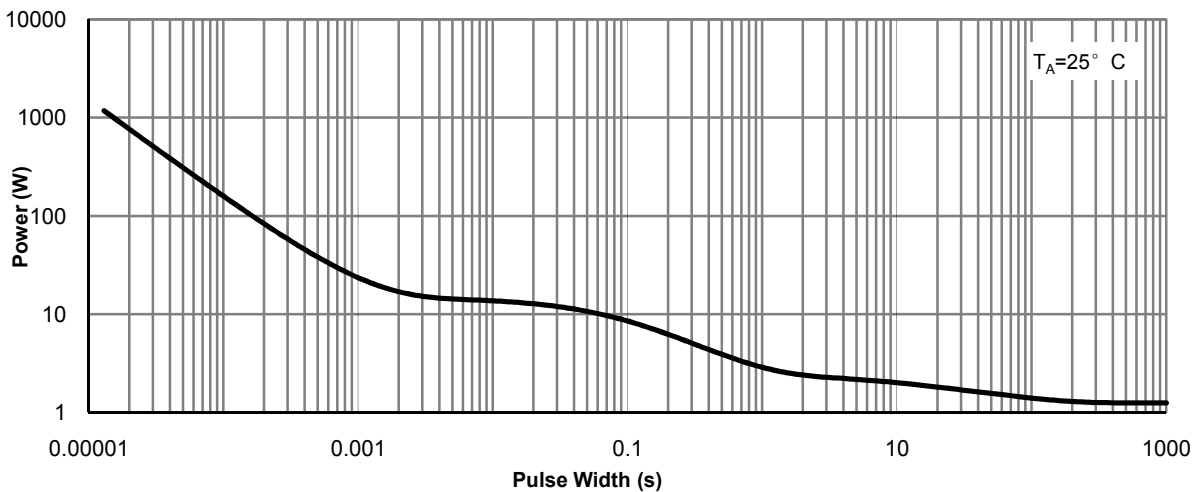


Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note F)

Typical Characteristics

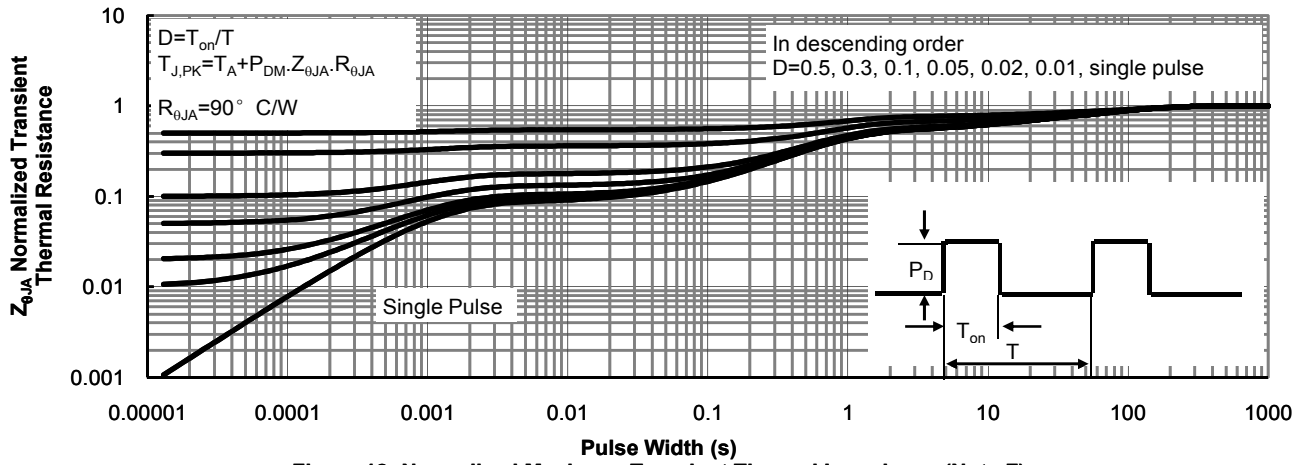
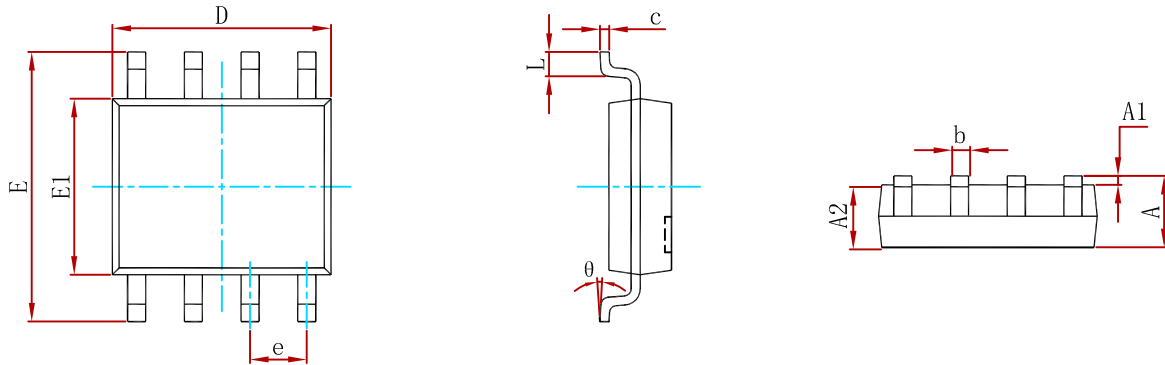


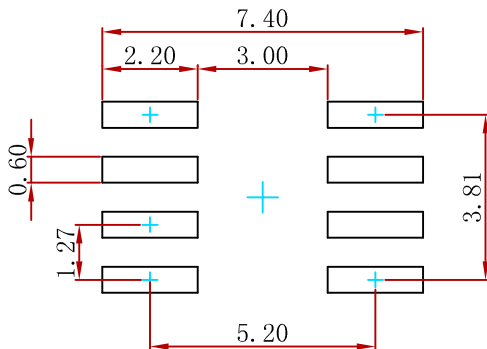
Figure 12: Normalized Maximum Transient Thermal Impedance (Note F)

**PACKAGE MECHANICAL DATA**



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 1.350                     | 1.750 | 0.053                | 0.069 |
| A1     | 0.100                     | 0.250 | 0.004                | 0.010 |
| A2     | 1.350                     | 1.550 | 0.053                | 0.061 |
| b      | 0.330                     | 0.510 | 0.013                | 0.020 |
| c      | 0.170                     | 0.250 | 0.007                | 0.010 |
| D      | 4.800                     | 5.000 | 0.189                | 0.197 |
| e      | 1.270 (BSC)               |       | 0.050 (BSC)          |       |
| E      | 5.800                     | 6.200 | 0.228                | 0.244 |
| E1     | 3.800                     | 4.000 | 0.150                | 0.157 |
| L      | 0.400                     | 1.270 | 0.016                | 0.050 |
| 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  |
|-----------|-------|------|
| AO4832-MS | SOP-8 | 3000 |

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