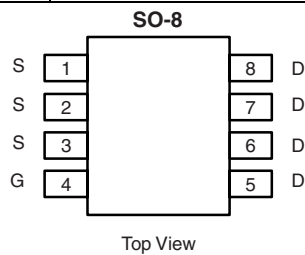


N-Channel 30-V (D-S) MOSFET with Schottky Diode

| MOSFET PRODUCT SUMMARY | | |
|------------------------|----------------------------------|--------------------|
| V _{DS} (V) | R _{DS(on)} (Ω) | I _D (A) |
| 30 | 0.016 at V _{GS} = 10 V | 9.5 |
| | 0.021 at V _{GS} = 4.5 V | 7.7 |

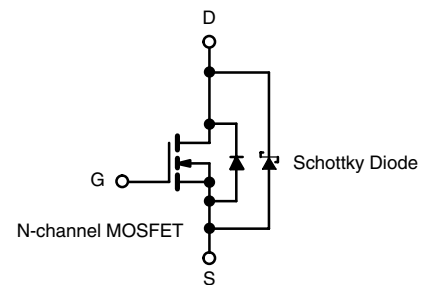
| SCHOTTKY PRODUCT SUMMARY | | |
|--------------------------|--|--------------------|
| V _{DS} (V) | V _{SD} (V) Diode Forward Voltage | I _F (A) |
| 30 | 0.50 V at 1.0 A | 1.4 |



Ordering Information: Si4812BDY-T1-E3 (Lead (Pb)-free)
Si4812BDY-T1-GE3 (Lead (Pb)-free and Halogen-free)

FEATURES

- Halogen-free According to IEC 61249-2-21 Available
- LITTLE FOOT® Plus Power MOSFET
- 100 % R_g Tested



| ABSOLUTE MAXIMUM RATINGS T _A = 25 °C, unless otherwise noted | | | | | |
|---|-----------------------------------|------------------------|--------------|------|---|
| Parameter | Symbol | Limit | | Unit | |
| | | 10 s | Steady State | | |
| Drain-Source Voltage (MOSFET) | V _{DS} | 30 | | V | |
| Reverse Voltage (Schottky) | | 30 | | | |
| Gate-Source Voltage (MOSFET) | V _{GS} | ± 20 | | | |
| Continuous Drain Current (T _J = 150 °C) (MOSFET) ^{a, b} | I _D | T _A = 25 °C | 9.5 | 7.3 | A |
| | | T _A = 70 °C | 7.7 | 5.9 | |
| Pulsed Drain Current (MOSFET) | I _{DM} | 50 | | | |
| Continuous Source Current (MOSFET Diode Conduction) ^{a, b} | I _S | 2.1 | 1.2 | A | |
| Average Forward Current (Schottky) | I _F | 1.4 | 0.8 | | |
| Pulsed Forward Current (Schottky) | I _{FM} | 30 | | | |
| Single Pulse Avalanche Current | I _{AS} | 5 | | mJ | |
| Avalanche Energy | | E _{AS} | 1.25 | | |
| Maximum Power Dissipation (MOSFET) ^{a, b} | P _D | T _A = 25 °C | 2.5 | 1.4 | W |
| | | T _A = 70 °C | 1.6 | 0.9 | |
| Maximum Power Dissipation (Schottky) ^{a, b} | P _D | T _A = 25 °C | 2.0 | 1.2 | |
| | | T _A = 70 °C | 1.3 | 0.8 | |
| Operating Junction and Storage Temperature Range | T _J , T _{stg} | - 55 to 150 | | °C | |

| THERMAL RESISTANCE RATINGS | | | | | |
|---|----------|-------------------|---------|---------|------|
| Parameter | Device | Symbol | Typical | Maximum | Unit |
| Maximum Junction-to-Ambient (t ≤ 10 s) ^a | MOSFET | R _{thJA} | 40 | 50 | °C/W |
| | Schottky | | 50 | 60 | |
| Maximum Junction-to-Ambient (t = Steady State) ^a | MOSFET | | 72 | 90 | |
| | Schottky | | 85 | 100 | |
| Maximum Junction-to-Foot (t = Steady State) ^a | MOSFET | R _{thJF} | 18 | 23 | |
| | Schottky | R _{thJF} | 24 | 30 | |

Notes:

a. Surface Mounted on FR4 board.

b. t ≤ 10 s.

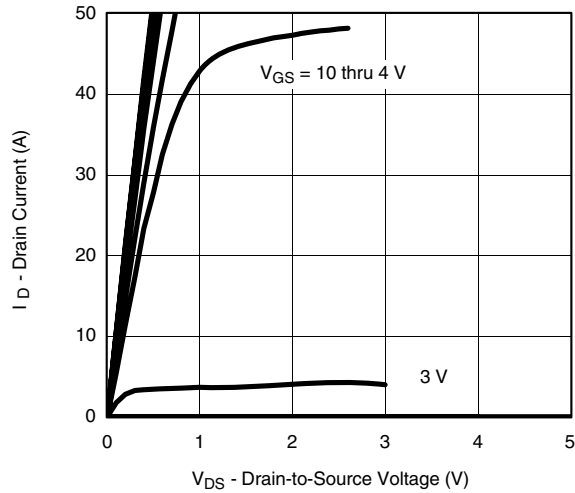
| MOSFET AND SCHOTTKY SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted | | | | | | |
|---|--------------|--|------|--------|-----------|----------|
| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
| Static | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$ | 1 | | 3 | V |
| Gate-Body Leakage | I_{GSS} | $V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current (MOSFET and Schottky) | I_{DSS} | $V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$ | | 0.004 | 0.100 | mA |
| | | $V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}, T_J = 100\text{ }^\circ\text{C}$ | | 0.7 | 10 | |
| | | $V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$ | | 3.0 | 20 | |
| On-State Drain Current ^a | $I_{D(on)}$ | $V_{DS} \geq 5\text{ V}, V_{GS} = 10\text{ V}$ | 20 | | | A |
| Drain-Source On-State Resistance ^a | $R_{DS(on)}$ | $V_{GS} = 10\text{ V}, I_D = 9.5\text{ A}$ | | 0.013 | 0.016 | Ω |
| | | $V_{GS} = 4.5\text{ V}, I_D = 7.7\text{ A}$ | | 0.0165 | 0.021 | |
| Forward Transconductance ^a | g_{fs} | $V_{DS} = 15\text{ V}, I_D = 9.5\text{ A}$ | | 45 | | S |
| Schottky Diode Forward Voltage ^a | V_{SD} | $I_S = 1.0\text{ A}, V_{GS} = 0\text{ V}$ | | 0.45 | 0.50 | V |
| | | $I_S = 1.0\text{ A}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$ | | 0.33 | 0.42 | |
| Dynamic^b | | | | | | |
| Total Gate Charge | Q_g | $V_{DS} = 15\text{ V}, V_{GS} = 5\text{ V}, I_D = 9.5\text{ A}$ | | 8.5 | 13 | nC |
| Gate-Source Charge | Q_{gs} | | | 3 | | |
| Gate-Drain Charge | Q_{gd} | | | 2.6 | | |
| Gate Resistance | R_g | | 0.3 | 0.7 | 1.1 | Ω |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD} = 15\text{ V}, R_L = 15\text{ }\Omega$ $I_D \cong 1\text{ A}, V_{GEN} = 10\text{ V}, R_g = 6\text{ }\Omega$ | | 15 | 25 | ns |
| Rise Time | t_r | | | 13 | 20 | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 20 | 30 | |
| Fall Time | t_f | | | 8 | 15 | |
| Source-Drain Reverse Recovery Time | t_{rr} | $I_F = 1.0\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$ | | 22 | 35 | |

Notes:

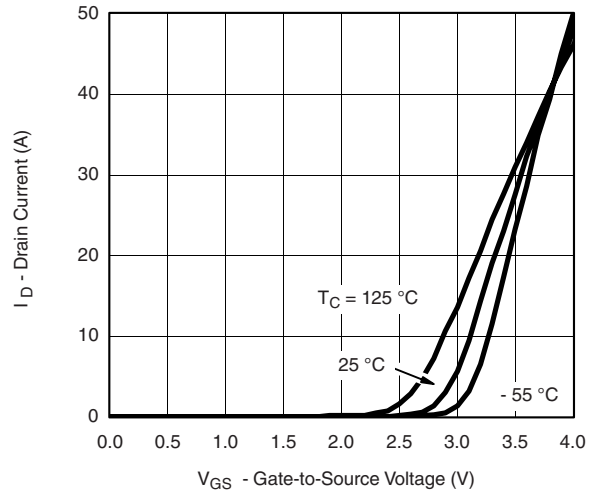
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

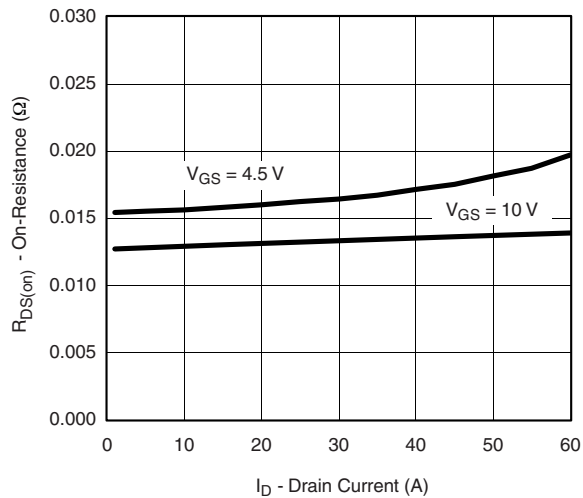
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



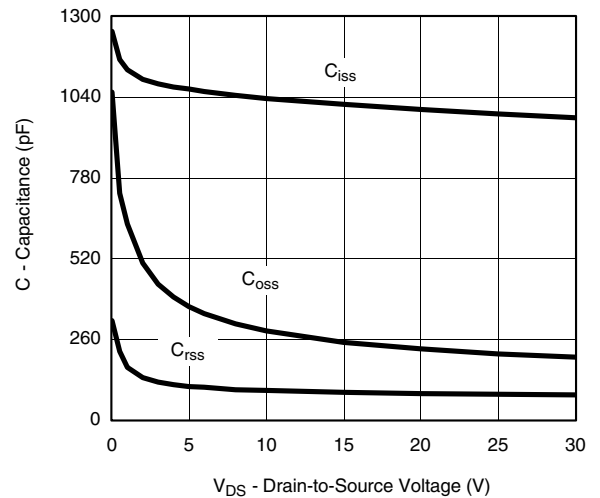
Output Characteristics



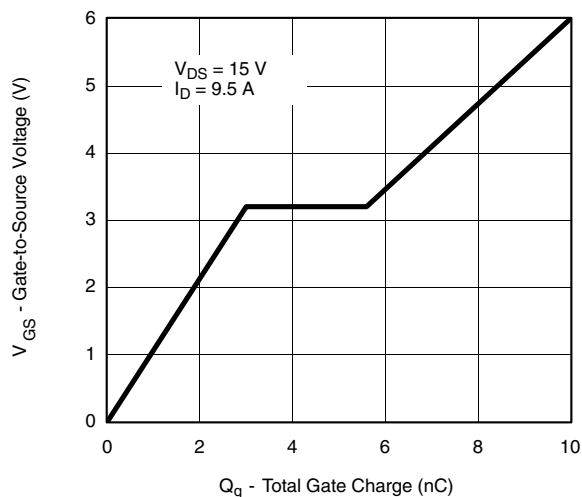
Transfer Characteristics



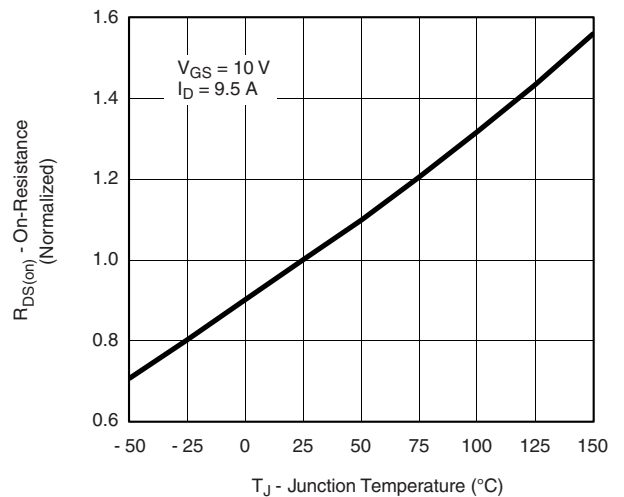
On-Resistance vs. Drain Current



Capacitance

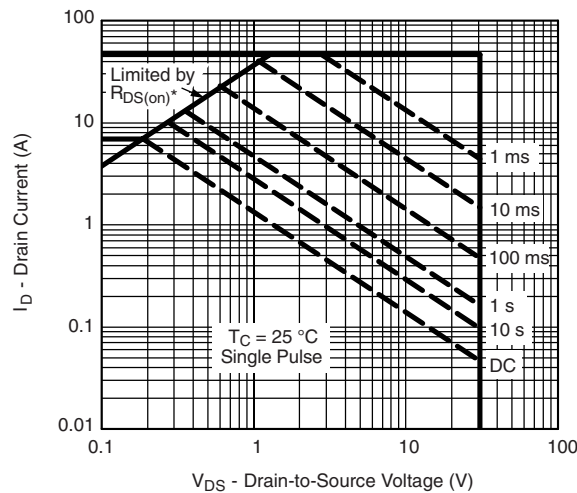
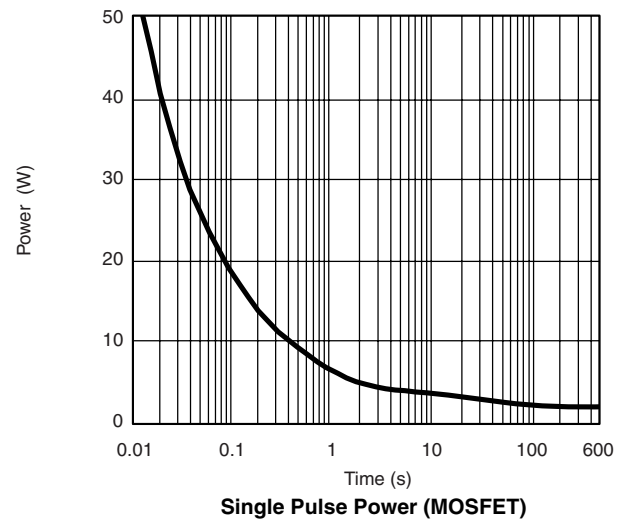
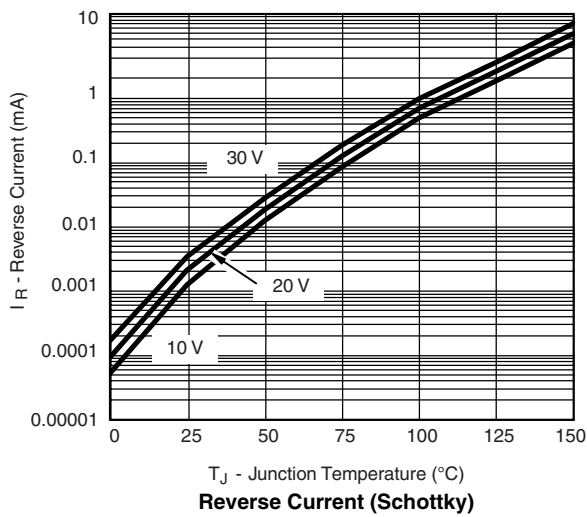
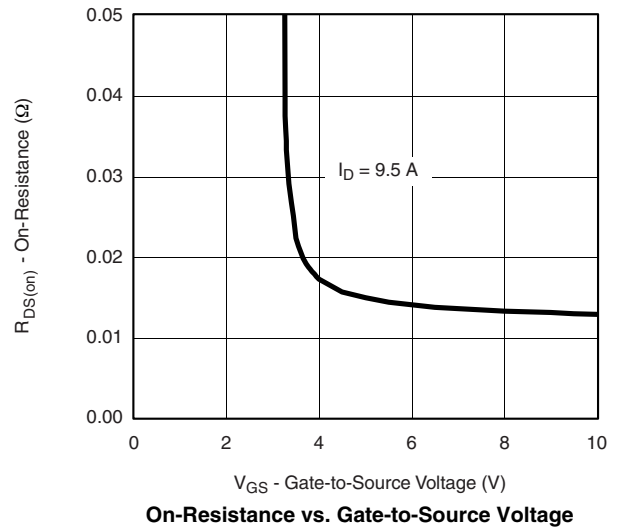
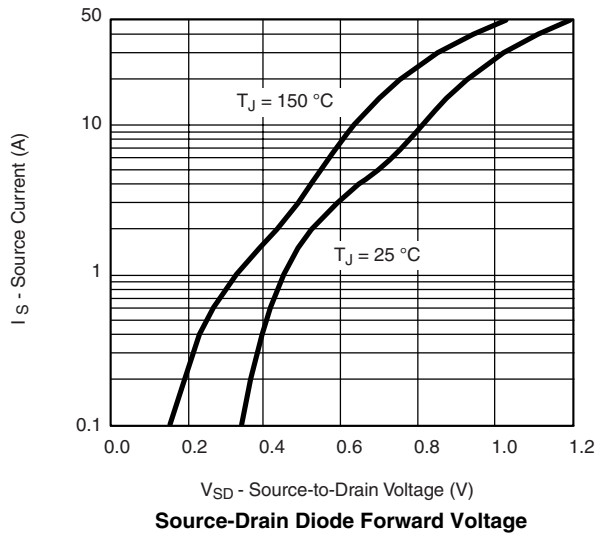


Gate Charge



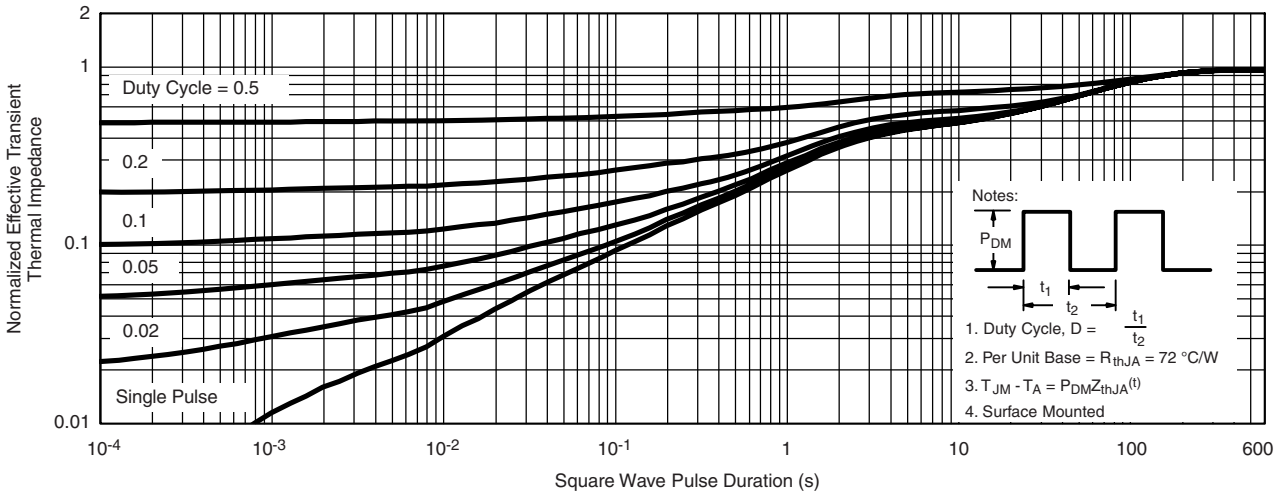
On-Resistance vs. Junction Temperature

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

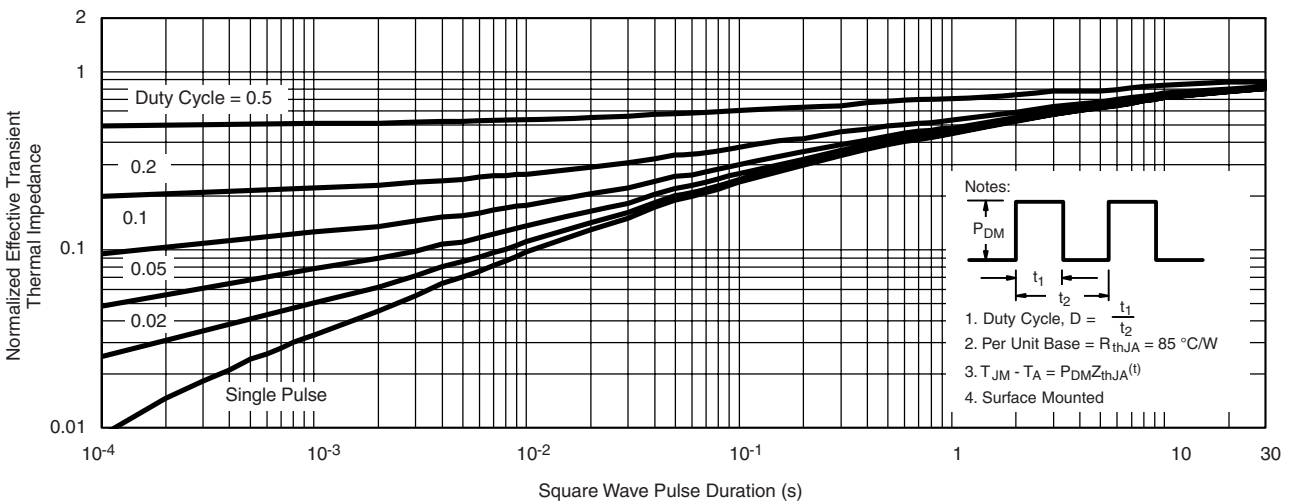


* $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Normalized Thermal Transient Impedance, Junction-to-Ambient (MOSFET)

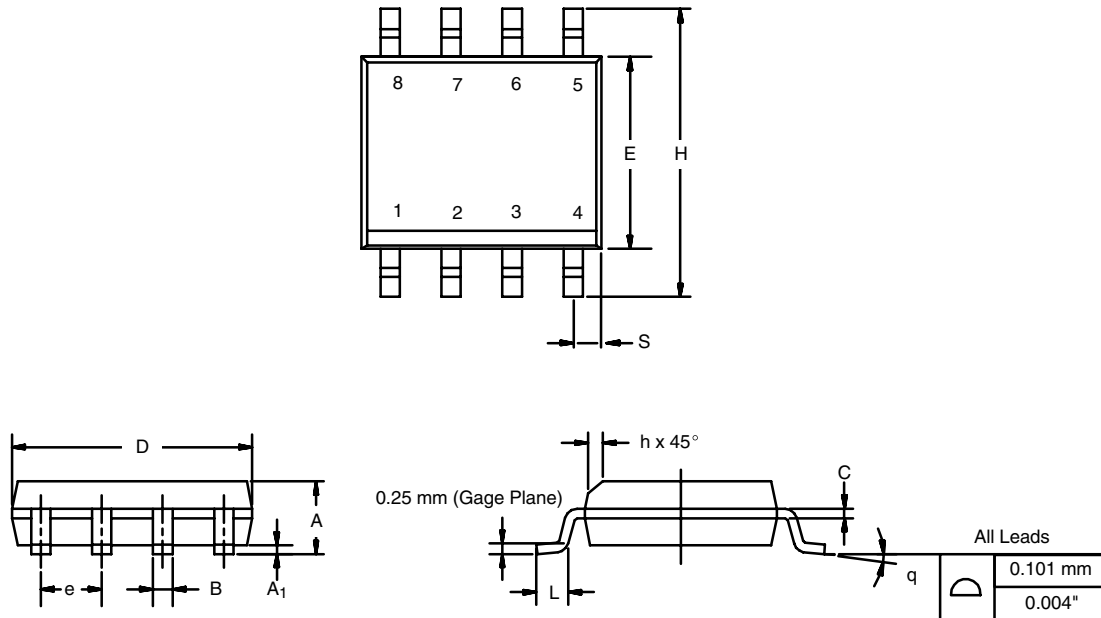


Normalized Thermal Transient Impedance, Junction-to-Ambient (Schottky)

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SOIC (NARROW): 8-LEAD

JEDEC Part Number: MS-012



| DIM | MILLIMETERS | | INCHES | |
|--------------------------------|-------------|------|-----------|-------|
| | Min | Max | Min | Max |
| A | 1.35 | 1.75 | 0.053 | 0.069 |
| A ₁ | 0.10 | 0.20 | 0.004 | 0.008 |
| B | 0.35 | 0.51 | 0.014 | 0.020 |
| C | 0.19 | 0.25 | 0.0075 | 0.010 |
| D | 4.80 | 5.00 | 0.189 | 0.196 |
| E | 3.80 | 4.00 | 0.150 | 0.157 |
| e | 1.27 BSC | | 0.050 BSC | |
| H | 5.80 | 6.20 | 0.228 | 0.244 |
| h | 0.25 | 0.50 | 0.010 | 0.020 |
| L | 0.50 | 0.93 | 0.020 | 0.037 |
| q | 0° | 8° | 0° | 8° |
| S | 0.44 | 0.64 | 0.018 | 0.026 |
| ECN: C-06527-Rev. I, 11-Sep-06 | | | | |
| DWG: 5498 | | | | |

RECOMMENDED MINIMUM PADS FOR SO-8



Recommended Minimum Pads
Dimensions in Inches/(mm)

[Return to Index](#)



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