

N-Channel 60-V (D-S) MOSFET

| PRODUCT SUMMARY | | |
|-----------------|---------------------------|-----------|
| V_{DS} (V) | $R_{DS(on)}$ (Ω) | I_D (A) |
| 60 | 0.16 at $V_{GS} = 10$ V | 2.0 |
| | 0.22 at $V_{GS} = 4.5$ V | 1.7 |

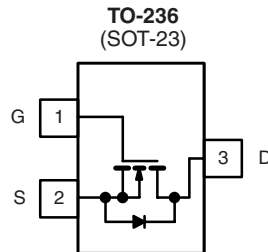
FEATURES

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



Available
RoHS*
COMPLIANT

HALOGEN
FREE
Available



Top View
Si2308DS (A8)*
* Marking Code

Ordering Information: Si2308DS-T1
Si2308DS-T1-E3 (Lead (Pb)-free)
Si2308DS-T1-GE3 (Lead (Pb)-free and Halogen-free)

| ABSOLUTE MAXIMUM RATINGS $T_A = 25$ °C, unless otherwise noted | | | |
|--|----------------|---------------|------|
| Parameter | Symbol | Limit | Unit |
| Drain-Source Voltage | V_{DS} | 60 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | |
| Continuous Drain Current ($T_J = 150$ °C) ^a | I_D | $T_A = 25$ °C | 2.0 |
| | | $T_A = 70$ °C | 1.6 |
| Pulsed Drain Current ^b | I_{DM} | 10 | A |
| Continuous Source Current (Diode Conduction) ^a | I_S | 1.0 | |
| Maximum Power Dissipation ^a | P_D | $T_A = 25$ °C | 1.25 |
| | | $T_A = 70$ °C | 0.80 |
| Operating Junction and Storage Temperature Range | T_J, T_{stg} | - 55 to 150 | °C |

| THERMAL RESISTANCE RATINGS | | | |
|--|------------|---------|------|
| Parameter | Symbol | Maximum | Unit |
| Maximum Junction-to-Ambient ^a | R_{thJA} | 100 | °C/W |
| Maximum Junction-to-Ambient ^c | | 166 | |

Notes:

- Surface Mounted on FR4 board, $t \leq 5$ s.
- Pulse width limited by maximum junction temperature.
- Surface Mounted on FR4 board.

For SPICE model information via the Worldwide Web: www.vishay.com/www/product/spice.htm

* Pb containing terminations are not RoHS compliant, exemptions may apply.

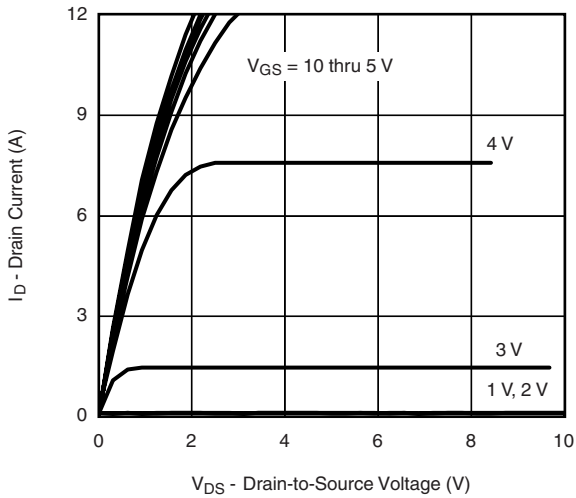
| MOSFET SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted | | | | | | |
|---|---------------|---|------|-------|-----------|---------------|
| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
| Static | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{DS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$ | 60 | | | V |
| Gate-Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$ | 1.5 | | 3.0 | |
| Gate-Body Leakage | I_{GSS} | $V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 60\text{ V}, V_{GS} = 0\text{ V}$ | | | 0.5 | μA |
| | | $V_{DS} = 60\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$ | | | 10 | |
| On-State Drain Current ^a | $I_{D(on)}$ | $V_{DS} \geq 4.5\text{ V}, V_{GS} = 10\text{ V}$ | 6 | | | A |
| | | $V_{DS} \geq 4.5\text{ V}, V_{GS} = 4.5\text{ V}$ | 4 | | | |
| Drain-Source On-State Resistance ^a | $R_{DS(on)}$ | $V_{GS} = 10\text{ V}, I_D = 2.0\text{ A}$ | | 0.125 | 0.16 | Ω |
| | | $V_{GS} = 4.5\text{ V}, I_D = 1.7\text{ A}$ | | 0.155 | 0.22 | |
| Forward Transconductance ^a | g_{fs} | $V_{DS} = 4.5\text{ V}, I_D = 2.0\text{ A}$ | | 4.6 | | S |
| Diode Forward Voltage ^a | V_{SD} | $I_S = 1\text{ A}, V_{GS} = 0\text{ V}$ | | 0.77 | 1.2 | V |
| Dynamic | | | | | | |
| Total Gate Charge | Q_g | $V_{DS} = 30\text{ V}, V_{GS} = 10\text{ V}, I_D = 2.0\text{ A}$ | | 4.8 | 10 | nC |
| Gate-Source Charge | Q_{gs} | | | 0.8 | | |
| Gate-Drain Charge | Q_{gd} | | | 1.0 | | |
| Gate Resistance | R_g | | 0.5 | | 3.3 | Ω |
| Input Capacitance | C_{iss} | $V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$ | | 240 | | μF |
| Output Capacitance | C_{oss} | | | 50 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 15 | | |
| Switching | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD} = 30\text{ V}, R_L = 30\text{ }\Omega$ $I_D \cong 1\text{ A}, V_{GEN} = 4.5\text{ V}, R_g = 6\text{ }\Omega$ | | 7 | 15 | ns |
| Rise Time | t_r | | | 10 | 20 | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 17 | 35 | |
| Fall Time | t_f | | | 6 | 15 | |

Notes:

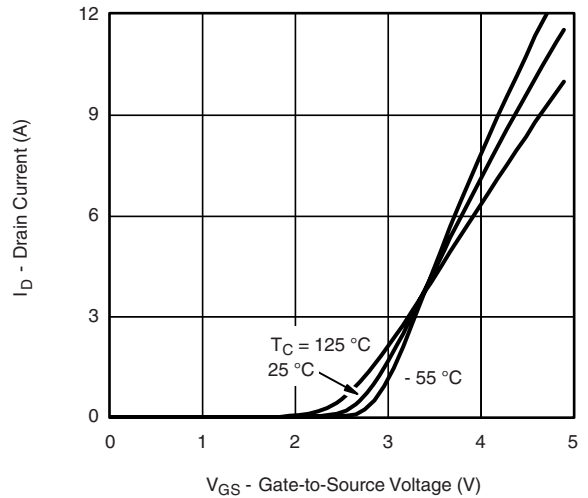
a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

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.

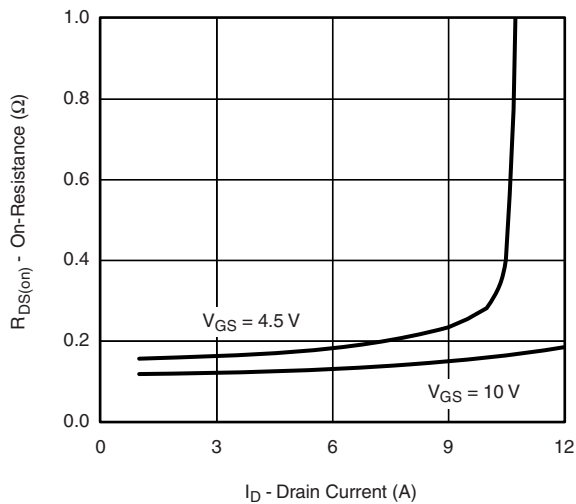
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



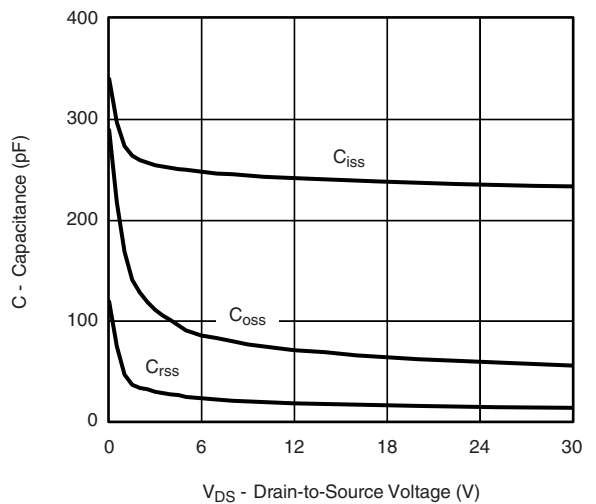
Output Characteristics



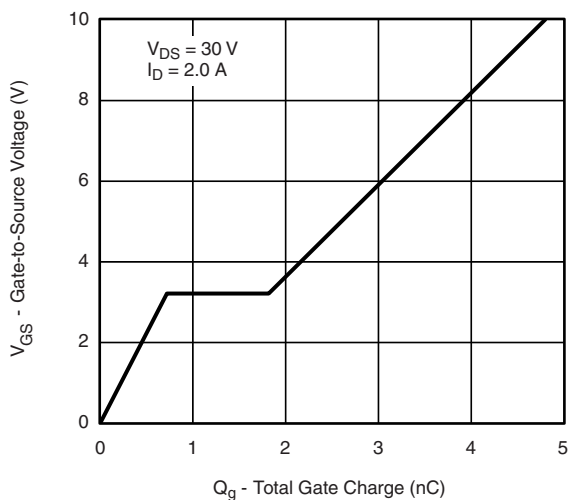
Transfer Characteristics



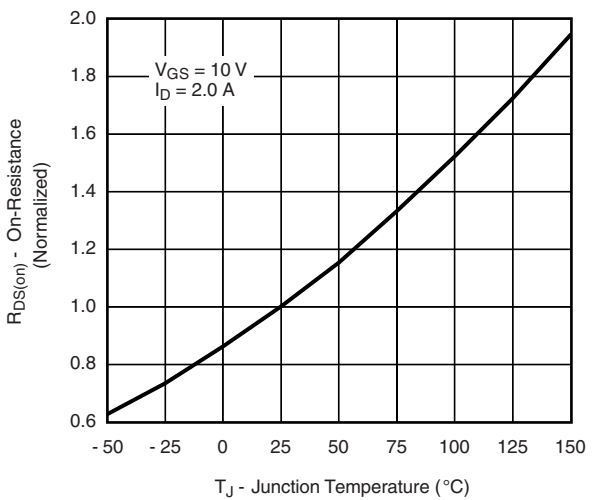
On-Resistance vs. Drain Current



Capacitance

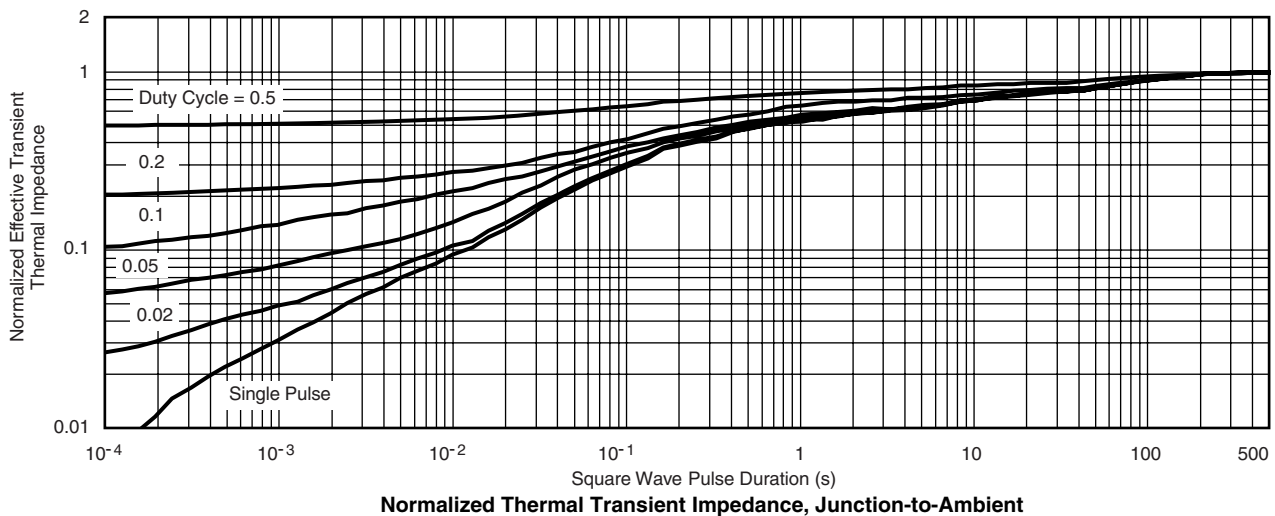
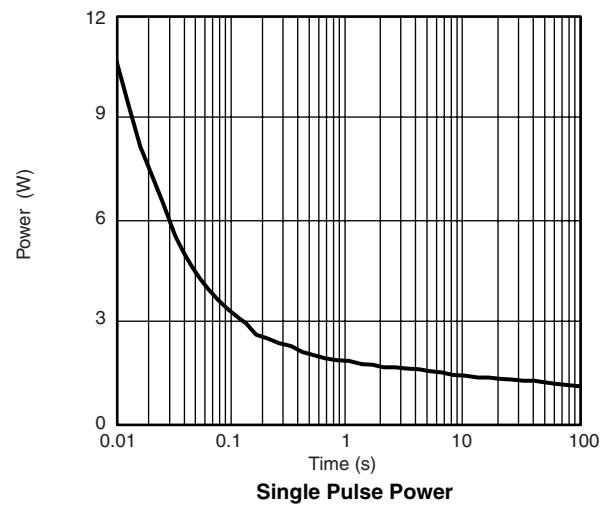
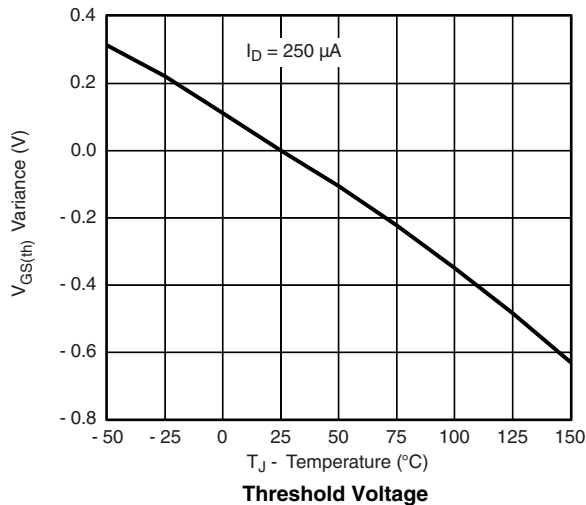
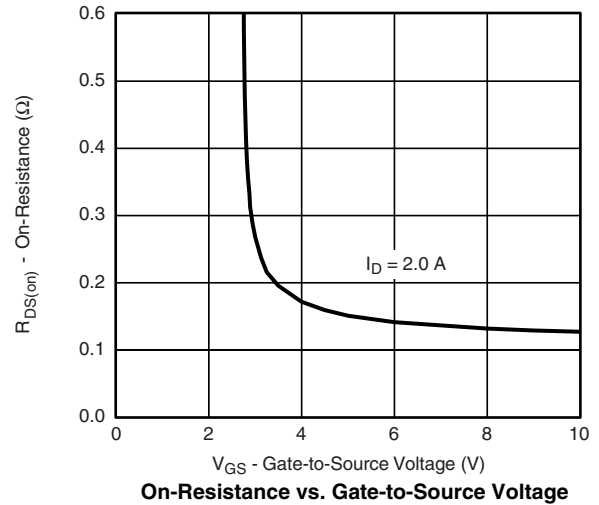
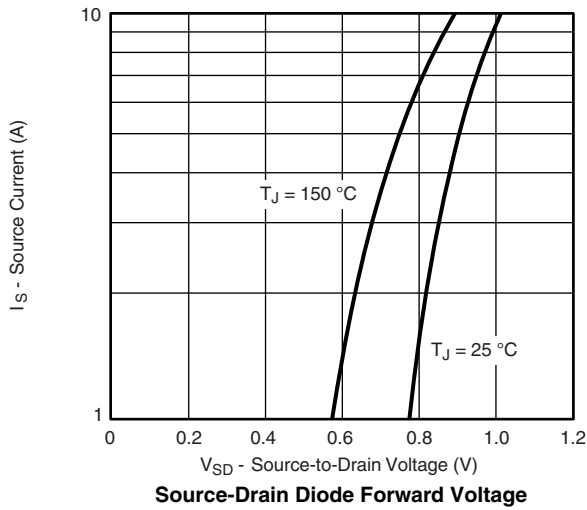


Gate Charge



On-Resistance vs. Junction Temperature

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



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