

P-Channel 1.8-V (G-S) MOSFET

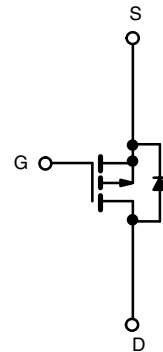
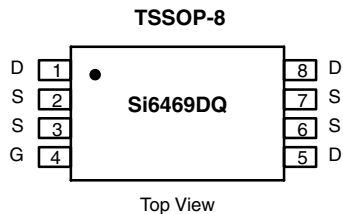
| PRODUCT SUMMARY | | |
|-----------------|-----------------------------|-----------|
| V_{DS} (V) | $R_{DS(on)}$ (Ω) | I_D (A) |
| - 8 | 0.028 at $V_{GS} = - 4.5$ V | ± 6.0 |
| | 0.031 at $V_{GS} = - 3.3$ V | ± 5.8 |
| | 0.040 at $V_{GS} = - 2.5$ V | ± 5.0 |
| | 0.065 at $V_{GS} = - 1.8$ V | ± 3.6 |

FEATURES

- Halogen-free
- TrenchFET[®] Power MOSFETs: 1.8 V Rated



RoHS
COMPLIANT



Ordering Information: Si6469DQ-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} | - 8 | V | | |
| Gate-Source Voltage | V_{GS} | ± 8 | | | |
| Continuous Drain Current ($T_J = 150$ °C) ^{a, b} | I_D | $T_A = 25$ °C | ± 6.0 | A | |
| | | $T_A = 70$ °C | ± 5.0 | | |
| Pulsed Drain Current | I_{DM} | ± 30 | | | |
| Continuous Source Current (Diode Conduction) ^{a, b} | I_S | - 1.25 | | | |
| Maximum Power Dissipation ^{a, b} | P_D | $T_A = 25$ °C | 1.5 | W | |
| | | $T_A = 70$ °C | 1.0 | | |
| Operating Junction and Storage Temperature Range | T_J, T_{stg} | - 55 to 150 | °C | | |

| THERMAL RESISTANCE RATINGS | | | | | |
|--|------------|---------------|---------|------|--|
| Parameter | Symbol | Typical | Maximum | Unit | |
| Maximum Junction-to-Ambient ^a | R_{thJA} | $t \leq 10$ s | 83 | °C/W | |
| | | Steady State | 95 | | |

Notes:

a. Surface Mounted on FR4 board.

b. $t \leq 10$ s.

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

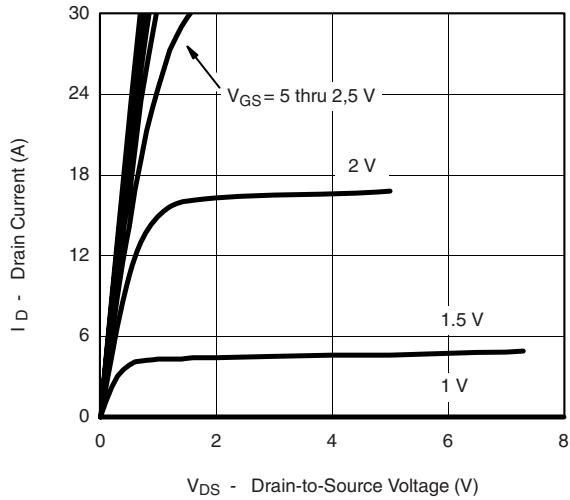
| SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted | | | | | | |
|---|--------------|--|--------|-------------------|-----------|---------------|
| Parameter | Symbol | Test Conditions | Min. | Typ. ^b | Max. | Unit |
| Static | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$ | - 0.45 | | | V |
| Gate-Body Leakage | I_{GSS} | $V_{DS} = 0\text{ V}, V_{GS} = \pm 8\text{ V}$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = -6.4\text{ V}, V_{GS} = 0\text{ V}$ | | | - 1 | μA |
| | | $V_{DS} = -6.4\text{ V}, V_{GS} = 0\text{ V}, T_J = 70\text{ }^\circ\text{C}$ | | | - 25 | |
| On-State Drain Current ^a | $I_{D(on)}$ | $V_{DS} \geq -8\text{ V}, V_{GS} = -4.5\text{ V}$ | - 30 | | | A |
| Drain-Source On-State Resistance ^a | $R_{DS(on)}$ | $V_{GS} = -4.5\text{ V}, I_D = -6.0\text{ A}$ | | 0.021 | 0.028 | Ω |
| | | $V_{GS} = -3.3\text{ V}, I_D = -5.8\text{ A}$ | | 0.024 | 0.031 | |
| | | $V_{GS} = -2.5\text{ V}, I_D = -5.0\text{ A}$ | | 0.030 | 0.040 | |
| | | $V_{GS} = -1.8\text{ V}, I_D = -3.6\text{ A}$ | | 0.048 | 0.065 | |
| Forward Transconductance ^a | g_{fs} | $V_{DS} = -8\text{ V}, I_D = -6.0\text{ A}$ | | 18 | | S |
| Diode Forward Voltage ^a | V_{SD} | $I_S = -1.25\text{ A}, V_{GS} = 0\text{ V}$ | | - 0.68 | - 1.1 | V |
| Dynamic^b | | | | | | |
| Total Gate Charge | Q_g | $V_{DS} = -6\text{ V}, V_{GS} = -4.5\text{ V}, I_D = -6.0\text{ A}$ | | 20 | 40 | nC |
| Gate-Source Charge | Q_{gs} | | 4.5 | | | |
| Gate-Drain Charge | Q_{gd} | | 3.6 | | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD} = -6\text{ V}, R_L = 6\text{ }\Omega$ $I_D \cong -1\text{ A}, V_{GEN} = -4.5\text{ V}, R_G = 6\text{ }\Omega$ | | 20 | 50 | ns |
| Rise Time | t_r | | 30 | 60 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | 85 | 150 | | |
| Fall Time | t_f | | 50 | 90 | | |
| Source-Drain Reverse Recovery Time | t_{rr} | $I_F = -1.25\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$ | | 50 | 100 | |

Notes:

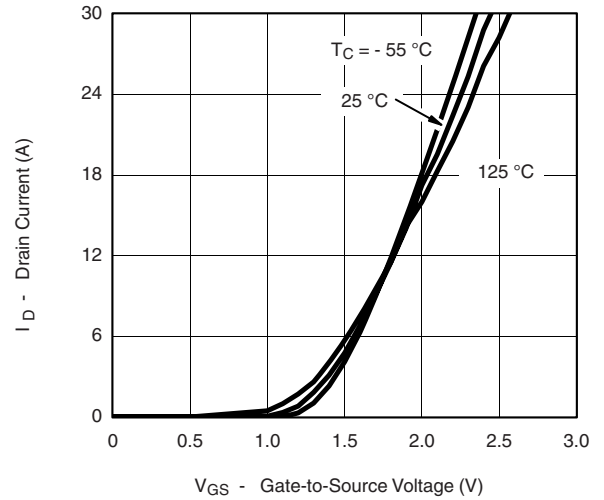
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
 b. Guaranteed by design, not subject to production testing.

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.

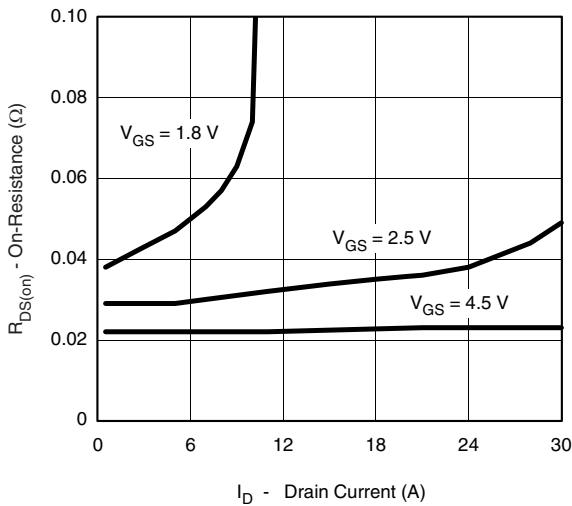
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



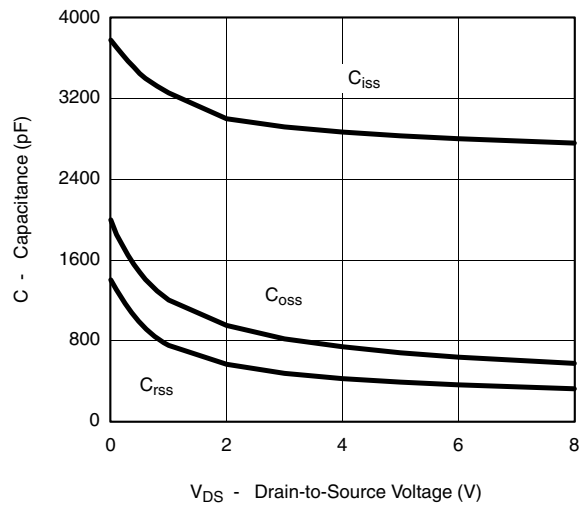
Output Characteristics



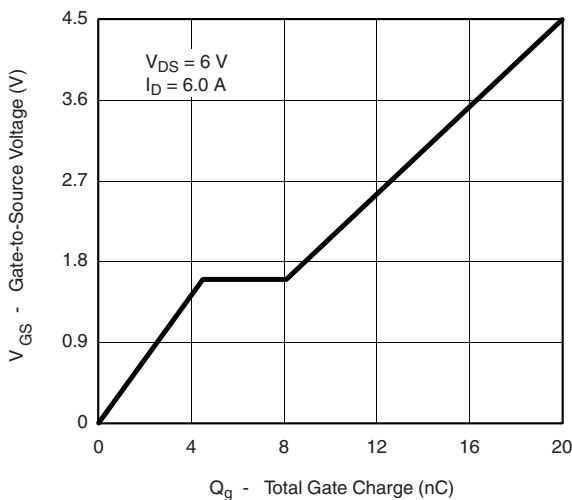
Transfer Characteristics



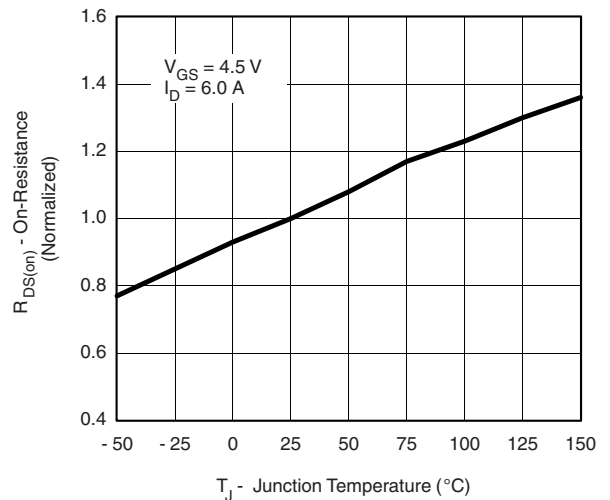
On-Resistance vs. Drain Current



Capacitance

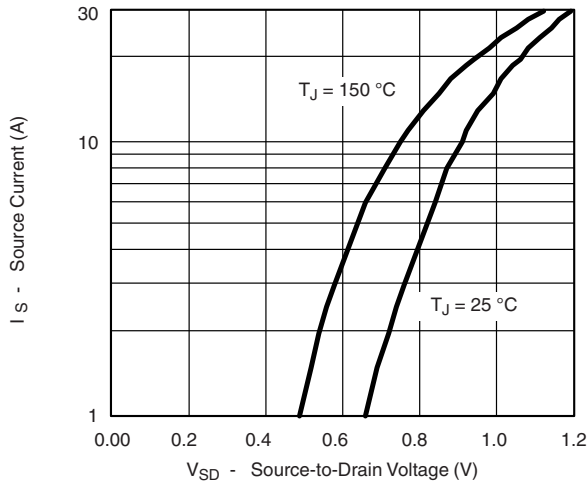


Gate Charge

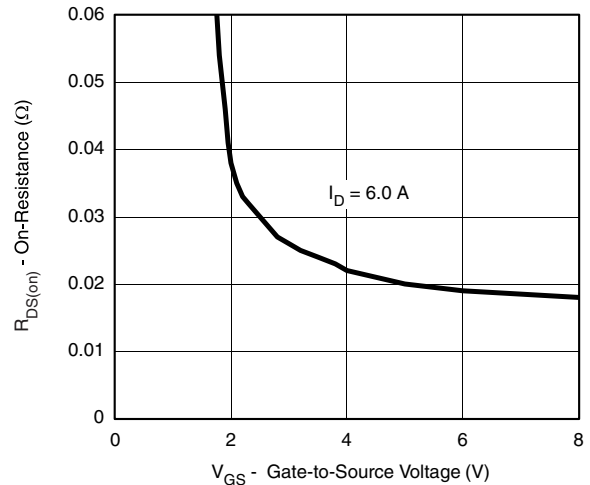


On-Resistance vs. Junction Temperature

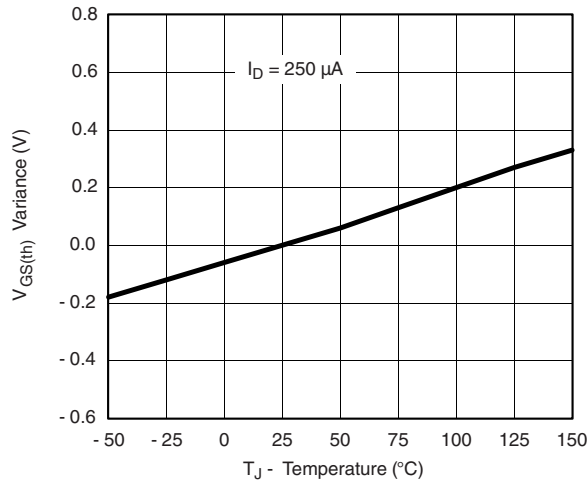
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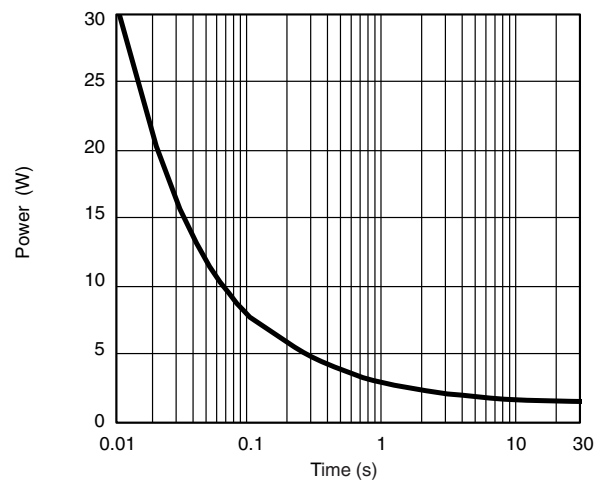
Source-Drain Diode Forward Voltage



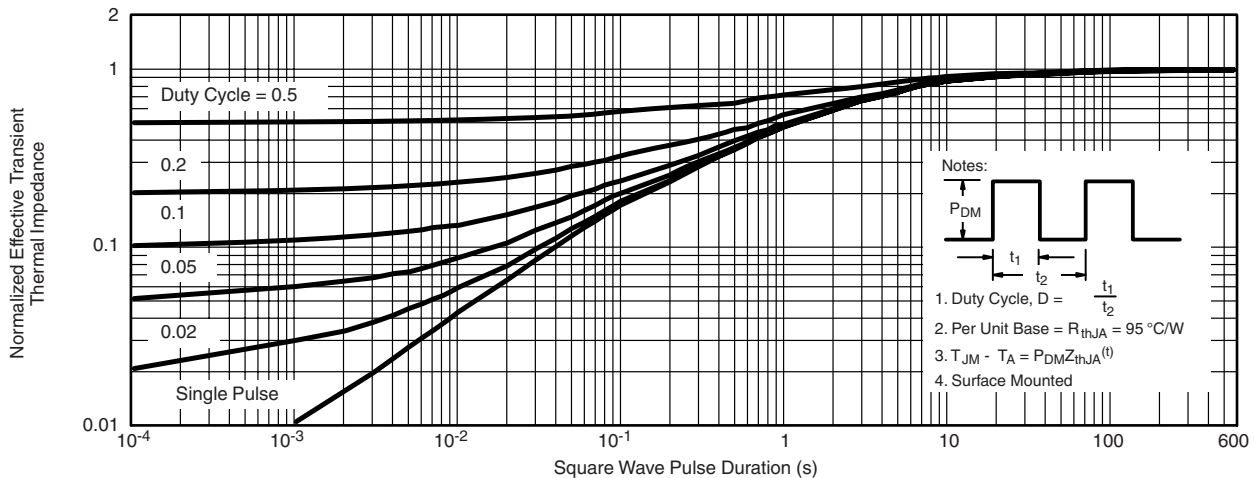
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient

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