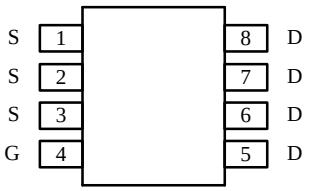
# P-Channel Enhancement-Mode MOSFET

## Product Summary

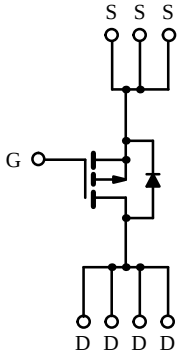
| $V_{DS}$ (V) | $r_{DS(on)}$ (Ω) | $I_D$ (A) |
|---|---|---|
| –20 | 0.050 @ $V_{GS}$ = –10 V | ± 5.8 |
| | 0.065 @ $V_{GS}$ = –6 V | ± 4.9 |
| | 0.090 @ $V_{GS}$ = –4.5 V | ± 4.0 |

*Recommended upgrade: Si4435DY or Si4953DY*
*Lower profile/smaller size see Si6435DQ*

**SO-8**




Top View




P-Channel MOSFET

## Absolute Maximum Ratings ($T_A$ = 25°C Unless Otherwise Noted)

| Parameter | | Symbol | Limit | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | –20 | V |
| Gate-Source Voltage | | $V_{GS}$ | ± 20 | |
| Continuous Drain Current ($T_J$ = 150°C)[a] | $T_A$ = 25°C | $I_D$ | ± 5.8 | A |
| | $T_A$ = 70°C | | ± 4.6 | |
| Pulsed Drain Current | | $I_{DM}$ | ± 20 | |
| Continuous Source Current (Diode Conduction)[a] | | $I_S$ | –2.4 | |
| Maximum Power Dissipation[a] | $T_A$ = 25°C | $P_D$ | 2.5 | W |
| | $T_A$ = 70°C | | 1.6 | |
| Operating Junction and Storage Temperature Range | | $T_J$, $T_{stg}$ | –55 to 150 | °C |

## Thermal Resistance Ratings

| Parameter | Symbol | Limit | Unit |
|---|---|---|---|
| Maximum Junction-to-Ambient[a] | $R_{thJA}$ | 50 | °C/W |

Notes
a. Surface Mounted on FR4 Board, t ≤ 10 sec.

Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70124.
A SPICE Model data sheet is available for this product (FaxBack document #70512).

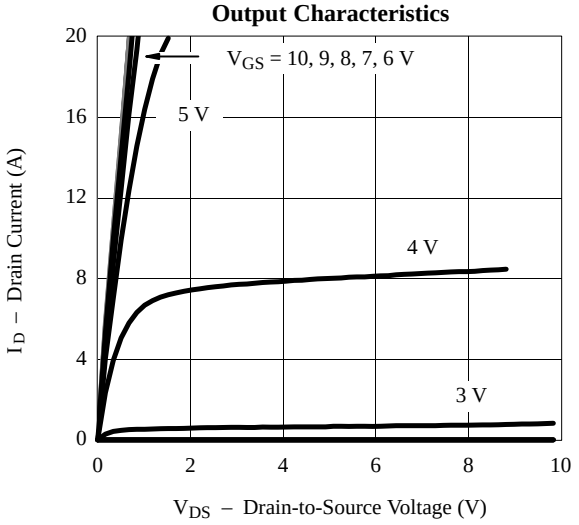
## Specifications ($T_J$ = 25°C Unless Otherwise Noted)

| Parameter | Symbol | Test Condition | Min | Typ[a] | Max | Unit |
|---|---|---|---|---|---|---|
| **Static** | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = –250 µA | –1.0 | | | V |
| Gate-Body Leakage | $I_{GSS}$ | $V_{DS}$ = 0 V, $V_{GS}$ = ± 20 V | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = –16 V, $V_{GS}$ = 0 V | | | –1 | µA |
| | | $V_{DS}$ = –10 V, $V_{GS}$ = 0 V, $T_J$ = 70°C | | | –5 | |
| On-State Drain Current[b] | $I_{D(on)}$ | $V_{DS}$ ≤ –5 V, $V_{GS}$ = –10 V | –20 | | | A |
| | | $V_{DS}$ ≤ –5 V, $V_{GS}$ = –4.5 V | –5 | | | |
| Drain-Source On-State Resistance[b] | $r_{DS(on)}$ | $V_{GS}$ = –10 V, $I_D$ = –5.3 A | | 0.033 | 0.050 | Ω |
| | | $V_{GS}$ = –6 V, $I_D$ = –3.6 A | | 0.042 | 0.065 | |
| | | $V_{GS}$ = –4.5 V, $I_D$ = –2.0 A | | 0.056 | 0.090 | |
| Forward Transconductance[b] | $g_{fs}$ | $V_{DS}$ = –15 V, $I_D$ = –5.3 A | | 9.5 | | S |
| Diode Forward Voltage[b] | $V_{SD}$ | $I_S$ = –2.4 A, $V_{GS}$ = 0 V | | –0.76 | –1.2 | V |
| **Dynamic[a]** | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$ = –10 V, $V_{GS}$ = –10 V, $I_D$ = –5.3 A | | 27 | 50 | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 4.5 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 5.6 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}$ = –10 V, $R_L$ = 10 Ω<br>$I_D$ ≅ –1 A, $V_{GEN}$ = –10 V, $R_G$ = 6 Ω | | 15 | 30 | ns |
| Rise Time | $t_r$ | | | 25 | 60 | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 56 | 120 | |
| Fall Time | $t_f$ | | | 23 | 100 | |
| Source-Drain Reverse Recovery Time | $t_{rr}$ | $I_F$ = –2.4 A, di/dt = 100 A/µs | | 65 | 100 | |

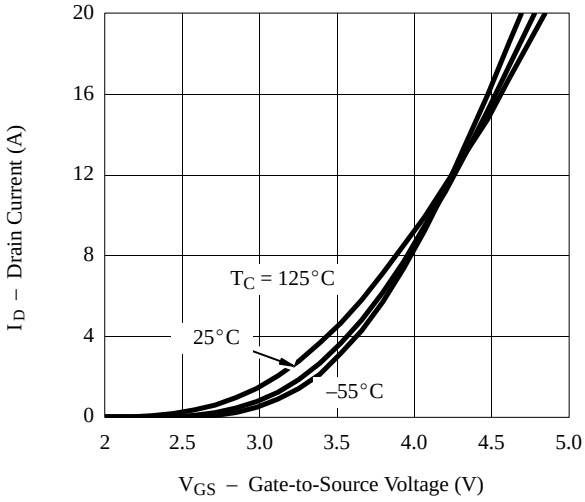
Notes
a. Guaranteed by design, not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.

## Typical Characteristics (25°C Unless Otherwise Noted)

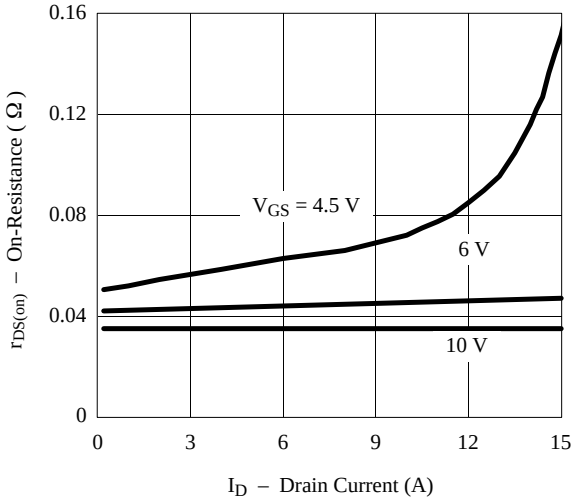
**Output Characteristics**



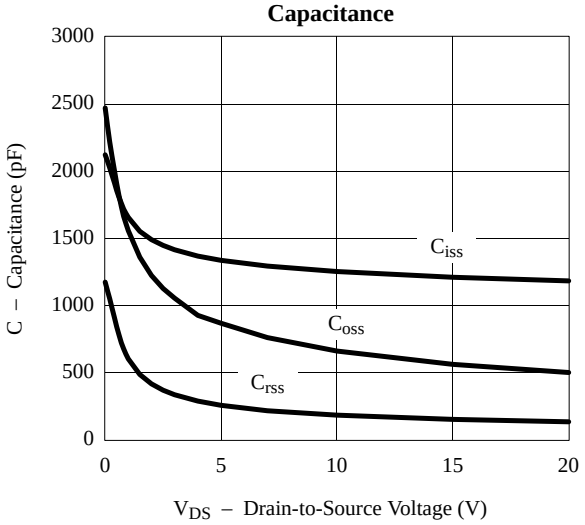

**Transfer Characteristics**



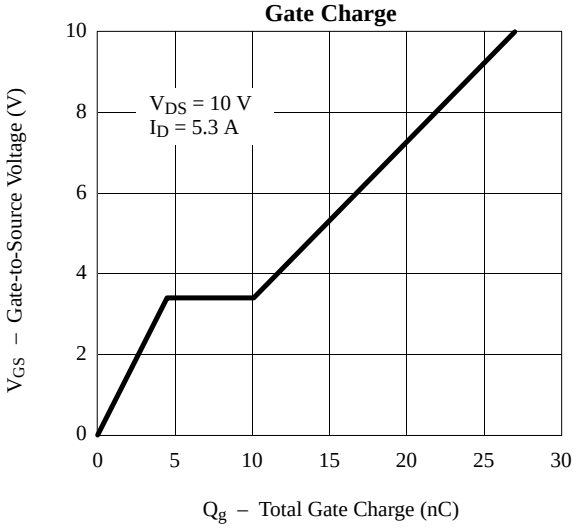

**On-Resistance vs. Drain Current**



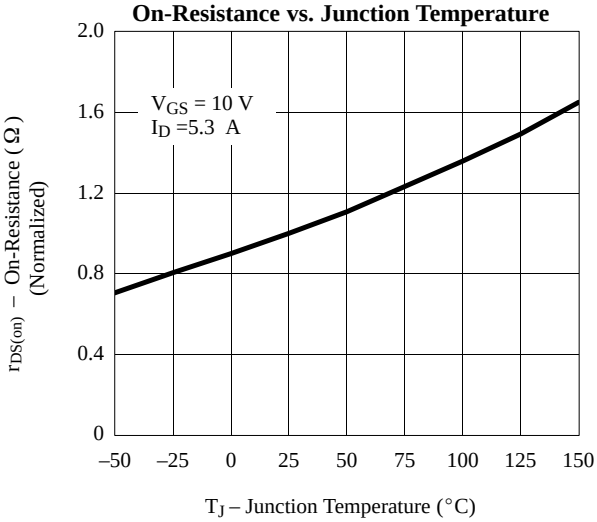

**Capacitance**




**Gate Charge**

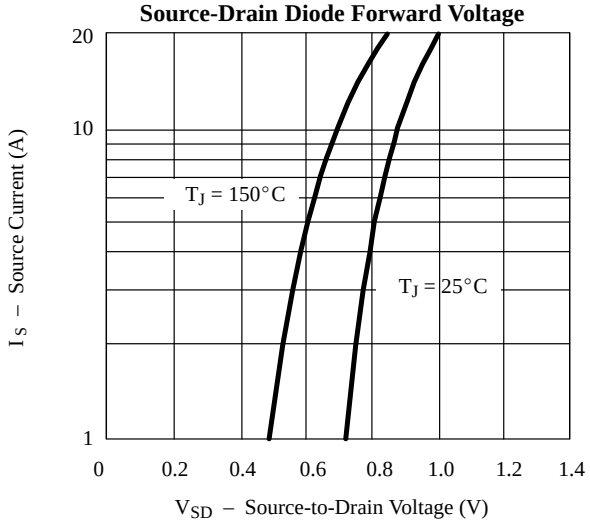



**On-Resistance vs. Junction Temperature**

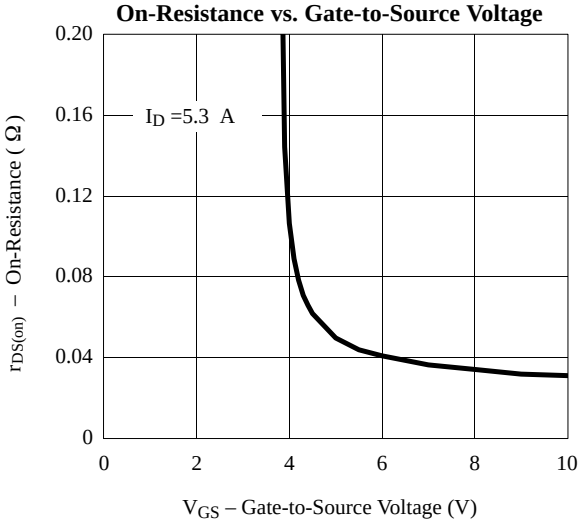


# Typical Characteristics (25°C Unless Otherwise Noted)

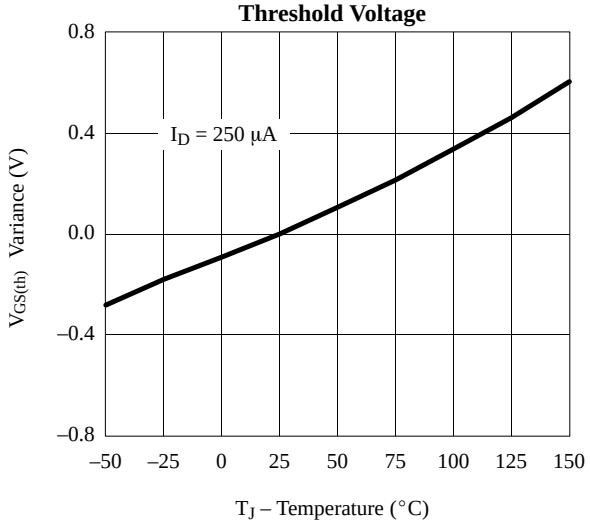
**Source-Drain Diode Forward Voltage**



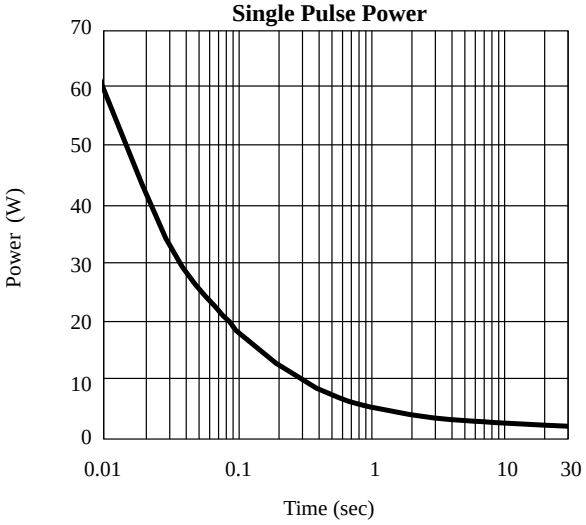

**On-Resistance vs. Gate-to-Source Voltage**




**Threshold Voltage**




**Single Pulse Power**




**Normalized Thermal Transient Impedance, Junction-to-Ambient**

