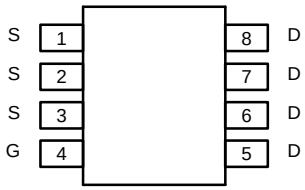
# P-Channel Enhancement-Mode MOSFET

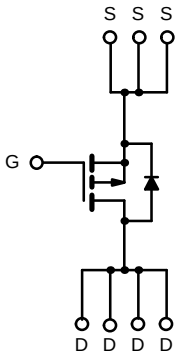
| PRODUCT SUMMARY | | |
|---|---|---|
| $V_{DS}$ (V) | $R_{DS(ON)}$ (Ω) | $I_D$ (A) |
| –20 | 0.040 @ $V_{GS}$ = –4.5 V | ± 6.4 |
| | 0.060 @ $V_{GS}$ = –2.5 V | ± 5.1 |

*Recommended upgrade: Si9424DY*

**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 | | $V_{GS}$ | ± 8 | |
| Continuous Drain Current ($T_J$ = 150°C)[A] | $T_A$ = 25°C | $I_D$ | ± 6.4 | A |
| | $T_A$ = 70°C | | ± 5.1 | |
| Pulsed Drain Current | | $I_{DM}$ | ± 10 | |
| Continuous Source Current (Diode Conduction)[A] | | $I_S$ | –2.5 | |
| 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 #70147.
A SPICE Model data sheet is available for this product (FaxBack document #70528).

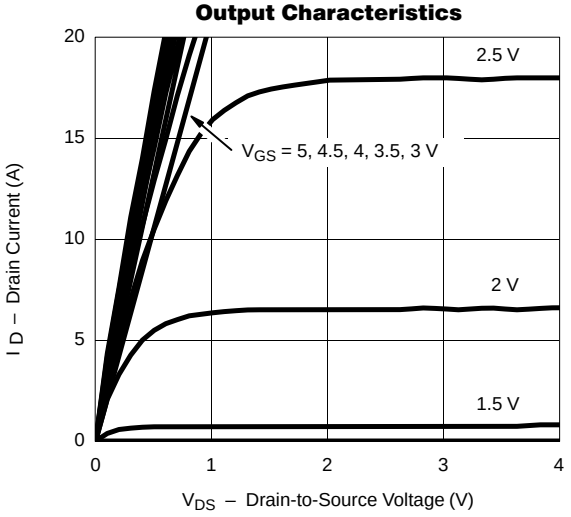
| SPECIFICATIONS ($T_J$ =25°C UNLESS OTHERWISE NOTED) | | | | | | |
|---|---|---|---|---|---|---|
| **PARAMETER** | **SYMBOL** | **TEST CONDITION** | **MIN** | **TYP** | **MAX** | **UNIT** |
| **STATIC** | | | | | | |
| | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = -250$ µA | –0.6 | | | V |
| Gate-Body Leakage | $I_{GSS}$ | $V_{DS} = 0$ V, $V_{GS} = \pm 8$ V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS} = -16$ V, $V_{GS} = 0$ V | | | –1 | µA |
| | | $V_{DS} = -16$ V, $V_{GS} = 0$ V, $T_J = 70°C$ | | | –5 | |
| On-State Drain Current[A] | $I_{D(on)}$ | $V_{DS} \le -5$ V, $V_{GS} = -4.5$ V | –10 | | | A |
| | | $V_{DS} \le -5$ V, $V_{GS} = -2.5$ V | –5 | | | |
| Drain-Source On-State Resistance[A] | $r_{DS(on)}$ | $V_{GS} = -4.5$ V, $I_D = -6.4$ A | | 0.031 | 0.040 | Ω |
| | | $V_{GS} = -2.5$ V, $I_D = -5.1$ A | | 0.045 | 0.060 | |
| Forward Transconductance[A] | $g_{fs}$ | $V_{DS} = -9$ V, $I_D = -6.4$ A | | 14 | | S |
| Diode Forward Voltage[A] | $V_{SD}$ | $I_S = -2.5$ A, $V_{GS} = 0$ V | | –0.9 | –1.2 | V |
| **Dynamic[B]** | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{DS} = -10$ V, $V_{GS} = -4.5$ V, $I_D = -6.4$ A | | 30 | 50 | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 5 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 9 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD} = -10$ V, $R_L = 6\ \Omega$<br>$I_D \cong -1$ A, $V_{GEN} = -4.5$ V, $R_G = 6\ \Omega$ | | 25 | 50 | ns |
| Rise Time | $t_r$ | | | 42 | 80 | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 160 | 200 | |
| Fall Time | $t_f$ | | | 75 | 120 | |
| Source-Drain Reverse Recovery Time | $t_{rr}$ | $I_F = -2.5$ A, di/dt = 100 A/µs | | 50 | 100 | |

Notes

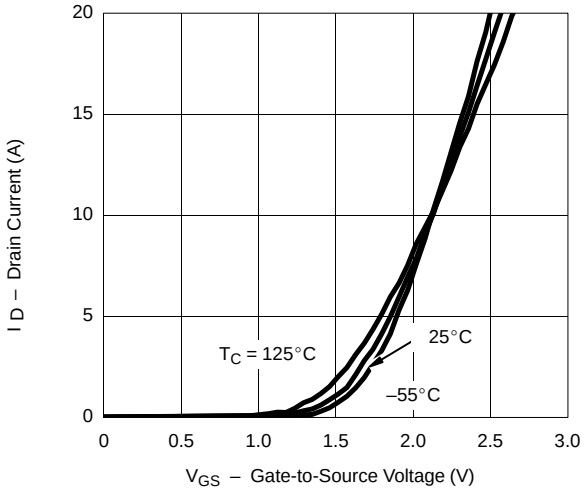
A. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.
B. Guaranteed by design, not subject to production testing.

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

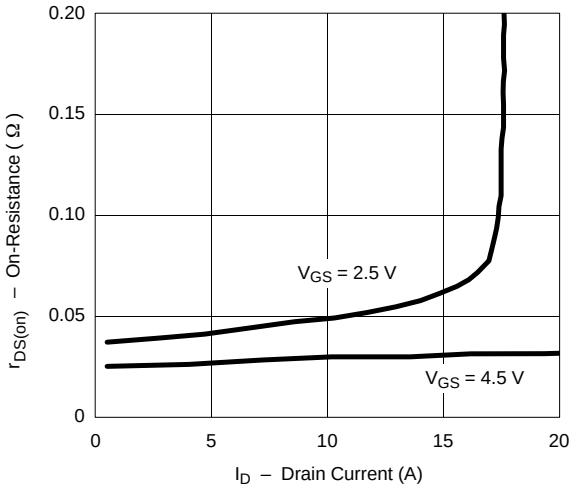
### Output Characteristics



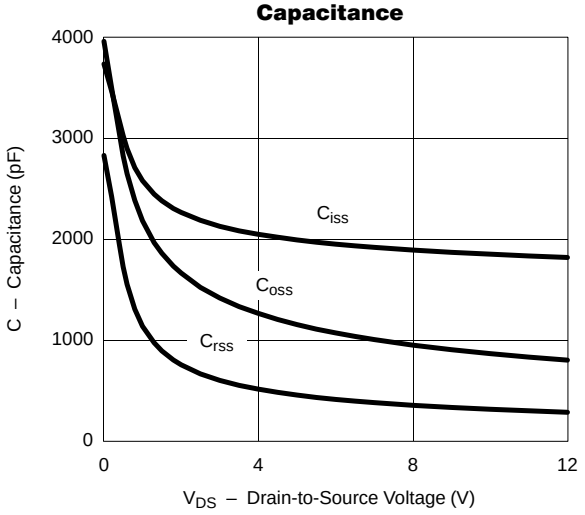

### Transfer Characteristics



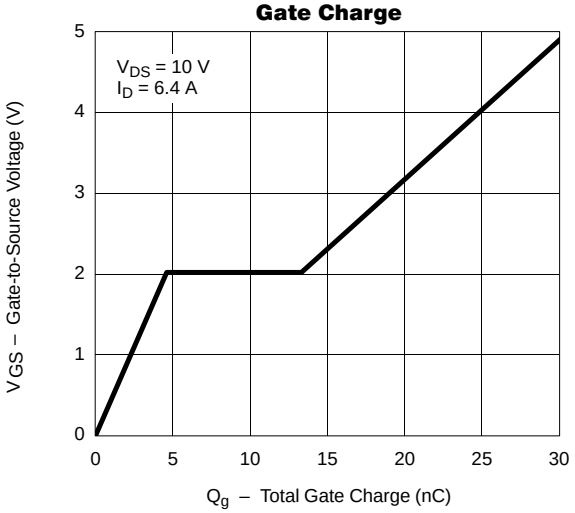

### On-Resistance vs. Drain Current



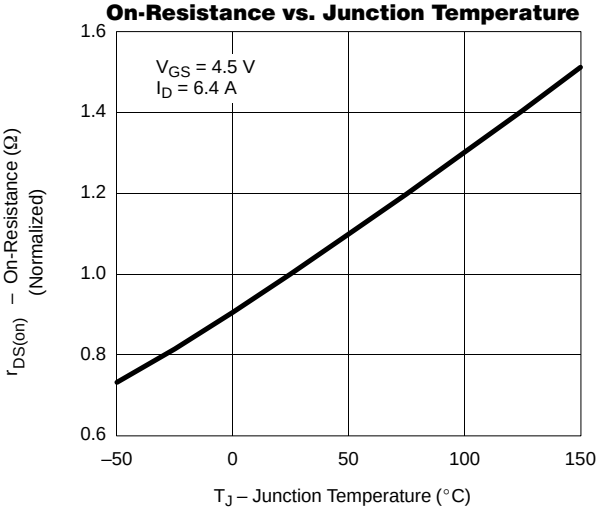

### Capacitance




### Gate Charge

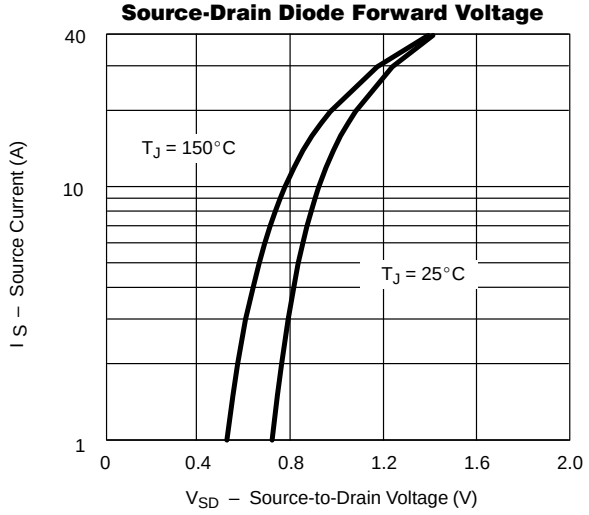



### On-Resistance vs. Junction Temperature

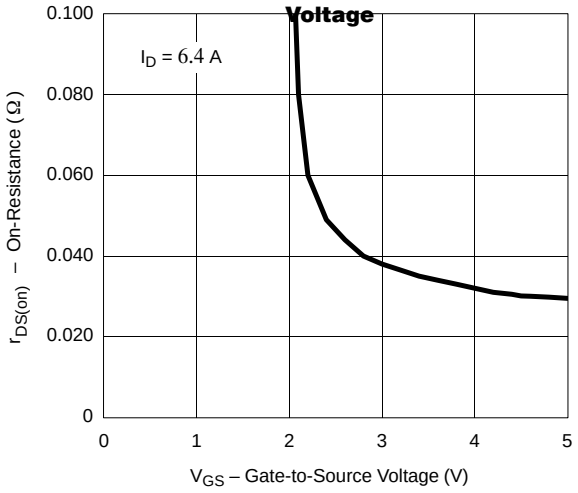


## Typical Characteristics (25°C Unless Otherwise Noted)

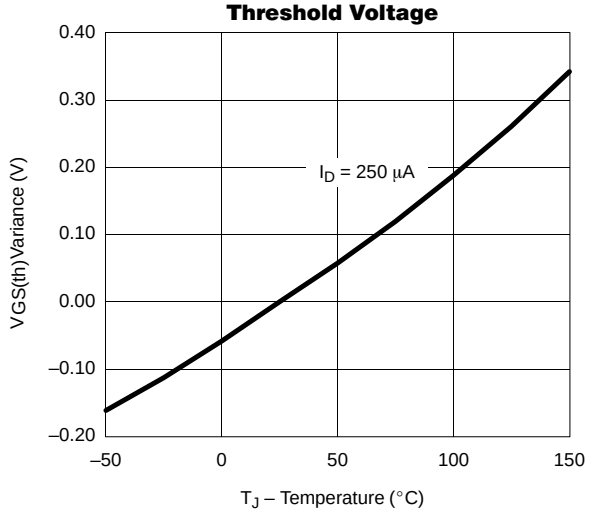
### Source-Drain Diode Forward Voltage



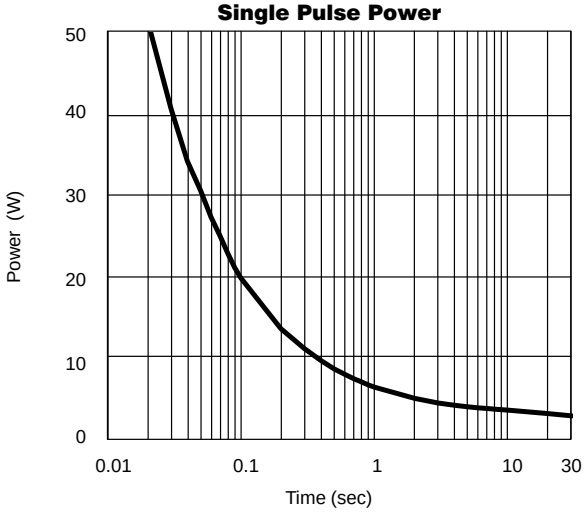

### On-Resistance vs. Gate-to-Source Voltage




### Threshold Voltage




### Single Pulse Power




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