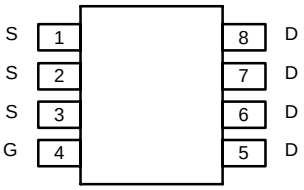
# N-Channel 30-V (D-S) MOSFET

| PRODUCT SUMMARY | | |
|---|---|---|
| $V_{DS}$ (V) | $r_{DS(on)}$ (Ω) | $I_D$ (A) |
| 30 | 0.0135 @ $V_{GS}$ = 10 V | 10 |
| | 0.020 @ $V_{GS}$ = 4.5 V | 8 |

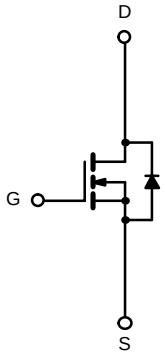
## FEATURES

- TrenchFET® Power MOSFET

**SO-8**




Top View




N-Channel MOSFET

Ordering Information: Si4410DY
Si4410DY-T1 (with Tape and Reel)

| ABSOLUTE MAXIMUM RATINGS ($T_A$ = 25°C UNLESS OTHERWISE NOTED) | | | | |
|---|---|---|---|---|
| Parameter | | Symbol | Limit | Unit |
| Drain-Source Voltage | | $V_{DS}$ | 30 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | |
| Continuous Drain Current ($T_J$ = 150°C)[a] | $T_A$ = 25°C | $I_D$ | 10 | A |
| | $T_A$ = 70°C | | 8 | |
| Pulsed Drain Current | | $I_{DM}$ | 50 | |
| Continuous Source Current (Diode Conduction)[a] | | $I_S$ | 2.3 | |
| 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 |
| Maximum Junction-to-Foot (Drain) | $R_{thJF}$ | 22 | |

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

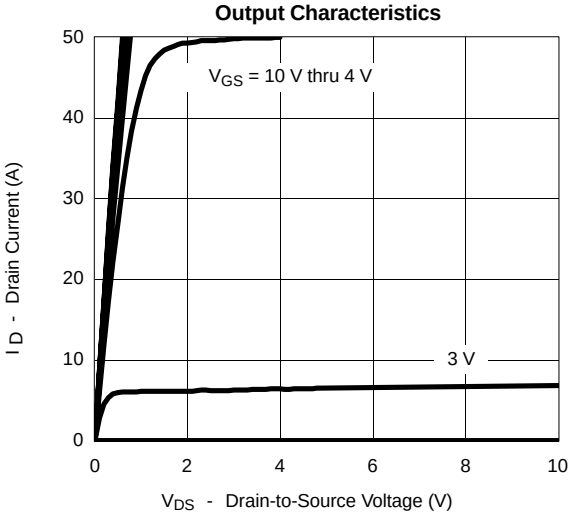
## SPECIFICATIONS ($T_J$ = 25°C UNLESS OTHERWISE NOTED)

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static** | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 250 μA | 1.0 | | | V |
| Gate-Body Leakage | $I_{GSS}$ | $V_{DS}$ = 0 V, $V_{GS}$ = ±20 V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 30 V, $V_{GS}$ = 0 V | | | 1 | μA |
| | | $V_{DS}$ = 30 V, $V_{GS}$ = 0 V, $T_J$ = 55°C | | | 25 | |
| On-State Drain Current[a] | $I_{D(on)}$ | $V_{DS}$ ≥ 5 V, $V_{GS}$ = 10 V | 20 | | | A |
| Drain-Source On-State Resistance[a] | $r_{DS(on)}$ | $V_{GS}$ = 10 V, $I_D$ =10 A | | 0.011 | 0.0135 | Ω |
| | | $V_{GS}$ = 4.5 V, $I_D$ = 5 A | | 0.015 | 0.020 | |
| Forward Transconductance[a] | $g_{fs}$ | $V_{DS}$ = 15 V, $I_D$ = 10 A | | 38 | | S |
| Diode Forward Voltage[a] | $V_{SD}$ | $I_S$ = 2.3 A, $V_{GS}$ = 0 V | | 0.7 | 1.1 | V |
| **Dynamic[b]** | | | | | | |
| Gate Charge | $Q_g$ | $V_{DS}$ = 15 V, $V_{GS}$ = 5 V, $I_D$ = 10 A | | 20 | 34 | nC |
| Total Gate Charge | $Q_{gt}$ | $V_{DS}$ = 15 V, $V_{GS}$ = 10 V, $I_D$ = 10 A | | 37 | 60 | |
| Gate-Source Charge | $Q_{gs}$ | | | 7 | | |
| Gate-Drain Charge | $Q_{gd}$ | $V_{DS}$ = 15 V, $V_{GS}$ = 10 V, $I_D$ = 10 A | | 7.0 | | |
| Gate Resistance | $R_g$ | | 0.5 | 1.5 | 2.6 | Ω |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}$ = 25 V, $R_L$ = 25 Ω<br>$I_D$ ≅ 1 A, $V_{GEN}$ = 10 V, $R_G$ = 6 Ω | | 19 | 30 | ns |
| Rise Time | $t_r$ | | | 9 | 20 | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 70 | 100 | |
| Fall Time | $t_f$ | | | 20 | 80 | |
| Source-Drain Reverse Recovery Time | $t_{rr}$ | $I_F$ = 2.3 A, di/dt = 100 A/μs | | 40 | 80 | |

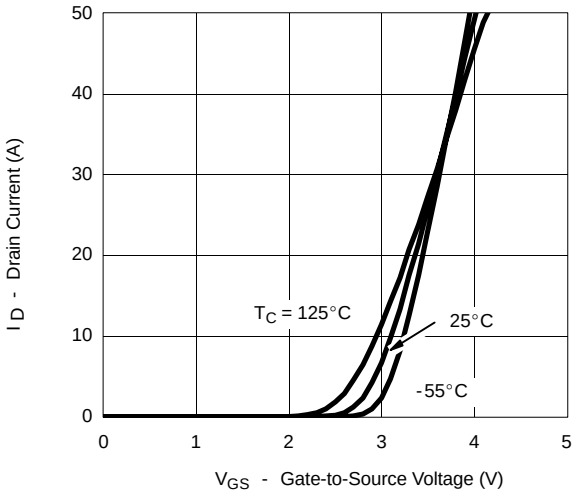
Notes
a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing. Values shown are for product revision A.

## TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

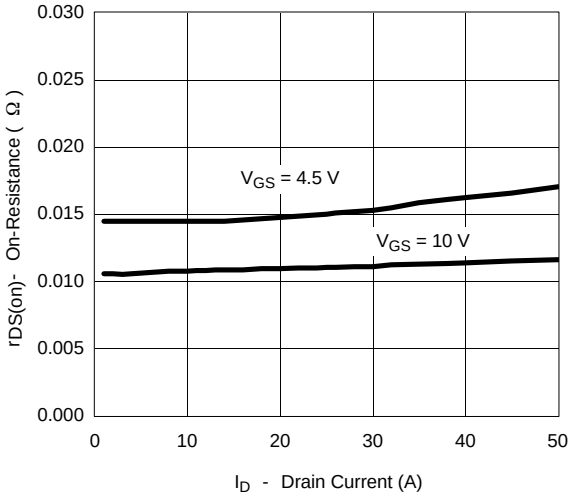
**Output Characteristics**



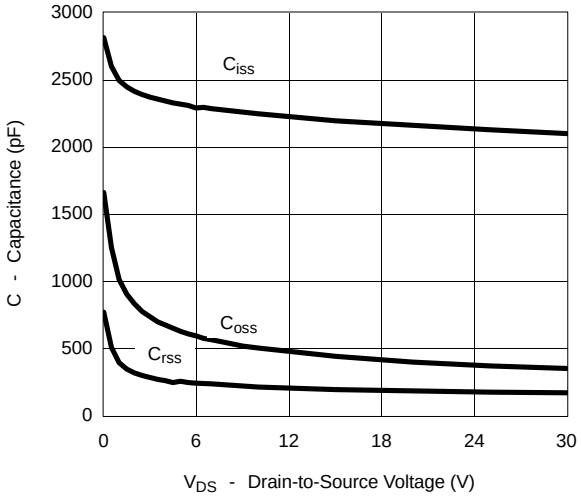

**Transfer Characteristics**



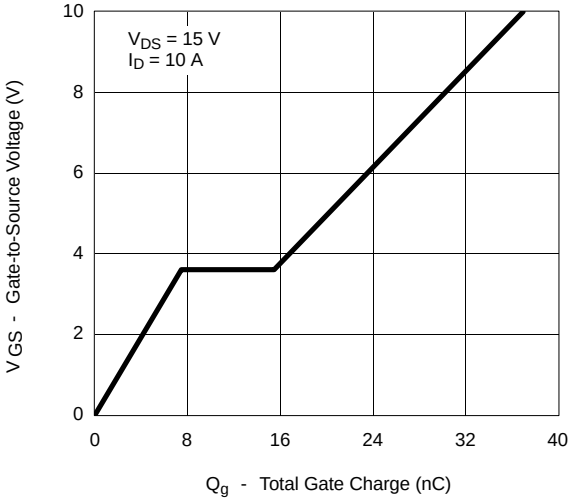

**On-Resistance vs. Drain Current**



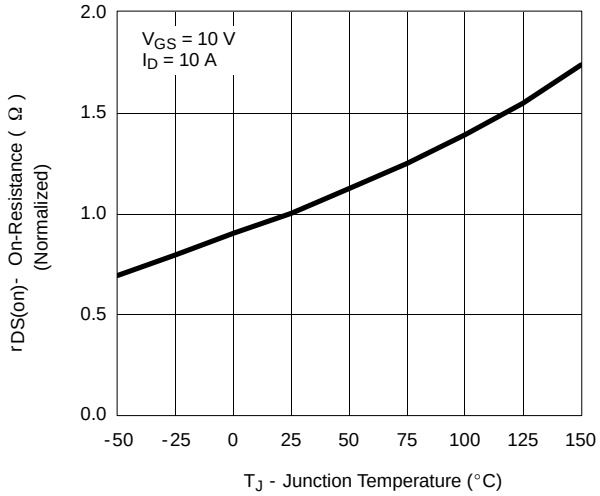

**Capacitance**




**Gate Charge**

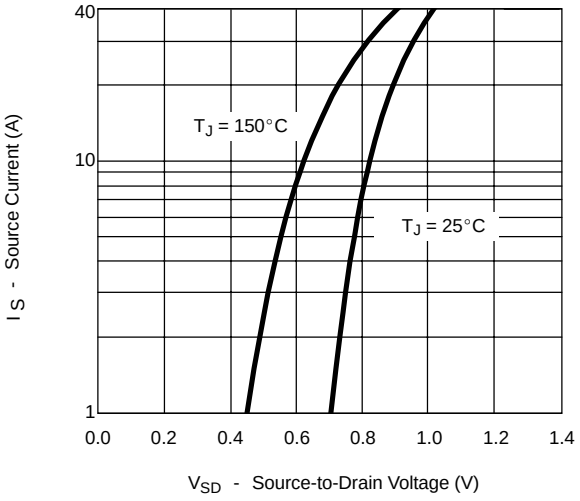



**On-Resistance vs. Junction Temperature**

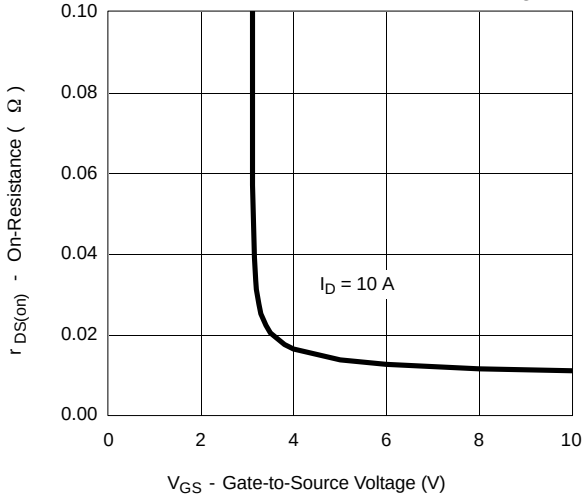


## TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

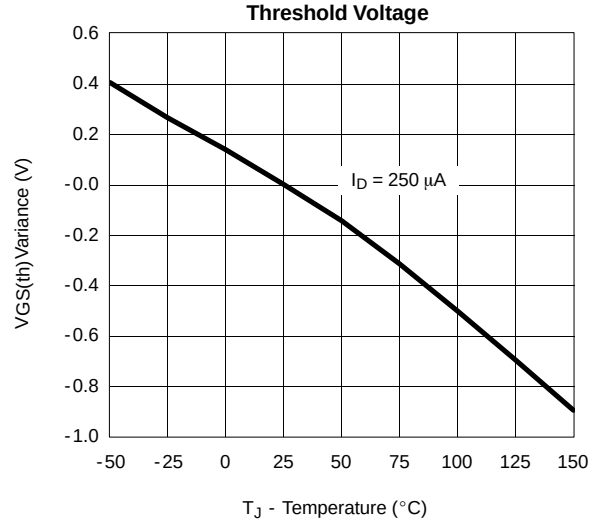
**Source-Drain Diode Forward Voltage**



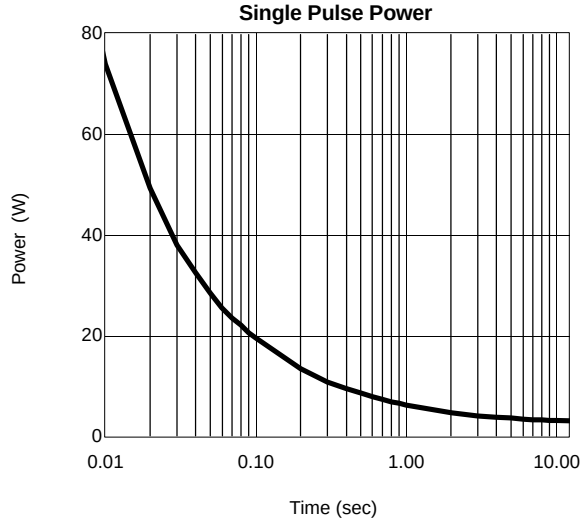

**On-Resistance vs. Gate-to-Source Voltage**



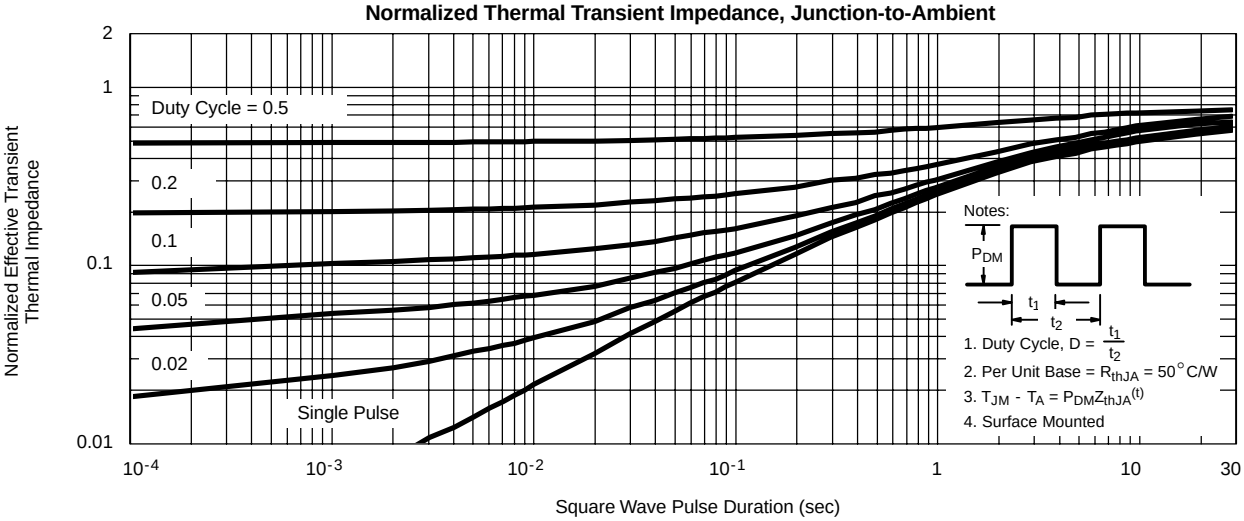

**Threshold Voltage**




**Single Pulse Power**




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



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