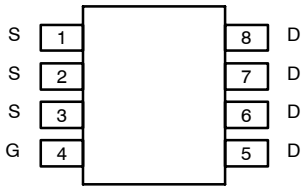
# N-Channel 30-V (D-S) MOSFET

| PRODUCT SUMMARY | | |
|---|---|---|
| $V_{DS}$ (V) | $r_{DS(on)}$ (Ω) | $I_D$ (A) |
| 30 | 0.0065 @ $V_{GS}$ = 10 V | 23 |
| | 0.008 @ $V_{GS}$ = 4.5 V | 17 |

## FEATURES

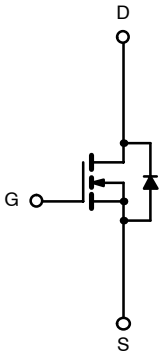
- TrenchFET® Power MOSFET
- 100% $R_g$ Tested

SO-8




Top View

Ordering Information: Si4404DY
Si4404DY-T1 (with Tape and Reel)




N-Channel MOSFET

| ABSOLUTE MAXIMUM RATINGS ($T_A$ = 25°C UNLESS OTHERWISE NOTED) | | | | | |
|---|---|---|---|---|---|
| Parameter | | Symbol | 10 secs | Steady State | 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 | $I_D$ | 23 | 15 | A |
| | $T_A$ = 70°C | | 19 | 12 | |
| Pulsed Drain Current (10 μs Pulse Width) | | $I_{DM}$ | 60 | | |
| Continuous Source Current (Diode Conduction)[a] | | $I_S$ | 2.9 | 1.3 | |
| Maximum Power Dissipation[a] | $T_A$ = 25°C | $P_D$ | 3.5 | 1.6 | W |
| | $T_A$ = 70°C | | 2.2 | 1 | |
| 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] | t ≤ 10 sec | $R_{thJA}$ | 29 | 35 | °C/W |
| | Steady State | | 67 | 80 | |
| Maximum Junction-to-Foot (Drain) | Steady State | $R_{thJF}$ | 13 | 16 | |

Notes
a. Surface Mounted on 1" x 1" FR4 Board.

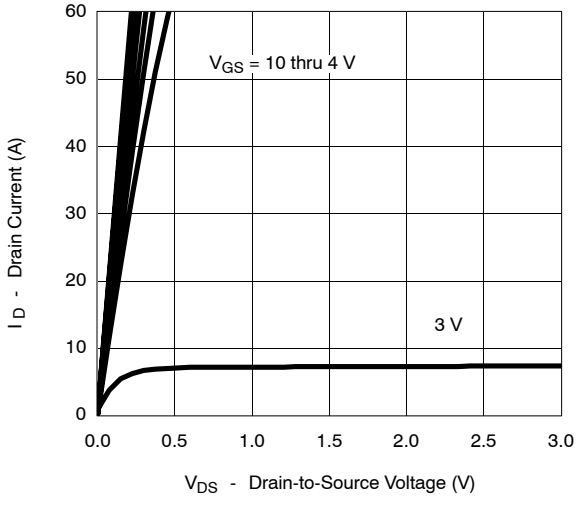
## SPECIFICATIONS ($T_J$ = 25°C UNLESS OTHERWISE NOTED)

| 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 | | | 5 | |
| On-State Drain Current[a] | $I_{D(on)}$ | $V_{DS}$ ≥ 5 V, $V_{GS}$ = 10 V | 30 | | | A |
| Drain-Source On-State Resistance[a] | $r_{DS(on)}$ | $V_{GS}$ = 10 V, $I_D$ = 23 A | | 0.0045 | 0.0065 | Ω |
| | | $V_{GS}$ = 4.5 V, $I_D$ = 17 A | | 0.0068 | 0.008 | |
| Forward Transconductance[a] | $g_{fs}$ | $V_{DS}$ = 15 V, $I_D$ = 23 A | | 80 | | S |
| Diode Forward Voltage[a] | $V_{SD}$ | $I_S$ = 2.9 A, $V_{GS}$ = 0 V | | 0.8 | 1.2 | V |
| **Dynamic[b]** | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$ = 15 V, $V_{GS}$ = 4.5 V, $I_D$ = 23 A | | 36 | 55 | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 15 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 12 | | |
| Gate Resistance | $R_g$ | | 1.5 | 2.2 | 3.7 | Ω |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}$ = 15 V, $R_L$ = 15 Ω<br>$I_D$ ≅ 1 A, $V_{GEN}$ = 10 V, $R_G$ = 6 Ω | | 20 | 30 | ns |
| Rise Time | $t_r$ | | | 15 | 23 | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 105 | 160 | |
| Fall Time | $t_f$ | | | 40 | 60 | |
| Source-Drain Reverse Recovery Time | $t_{rr}$ | $I_F$ = 2.9 A, di/dt = 100 A/μs | | 50 | 80 | |

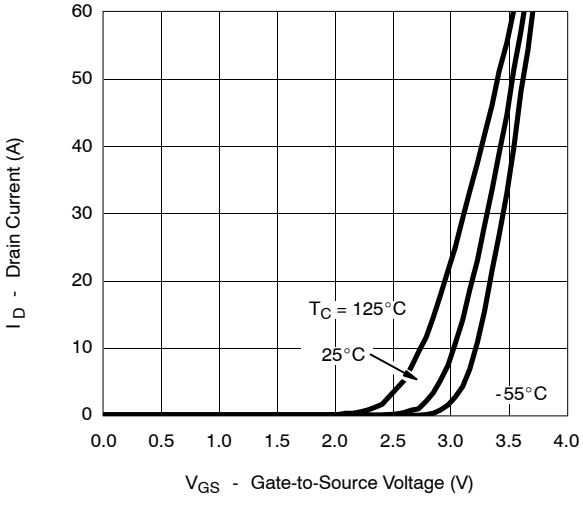
Notes
a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

## TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

**Output Characteristics**

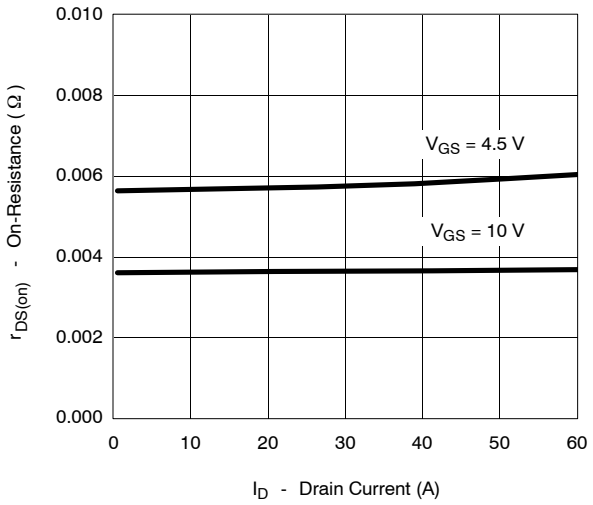



**Transfer Characteristics**

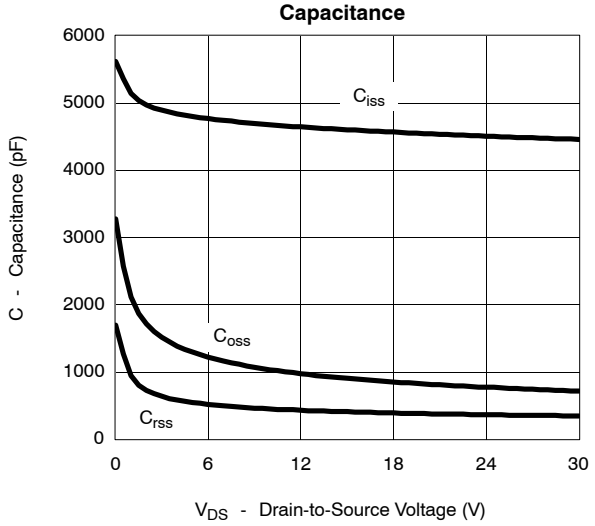


## TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

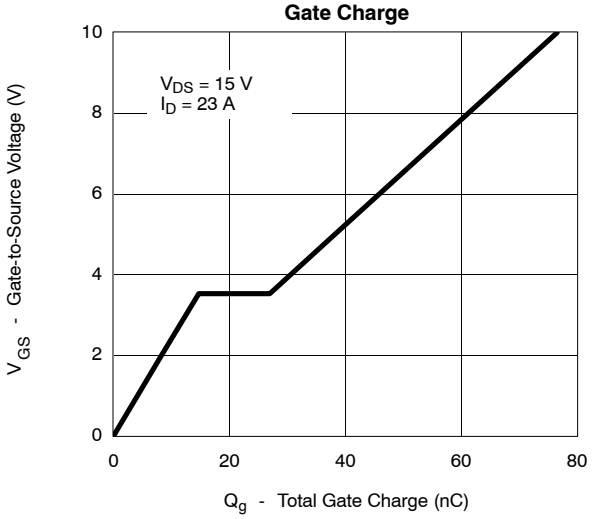
**On-Resistance vs. Drain Current**



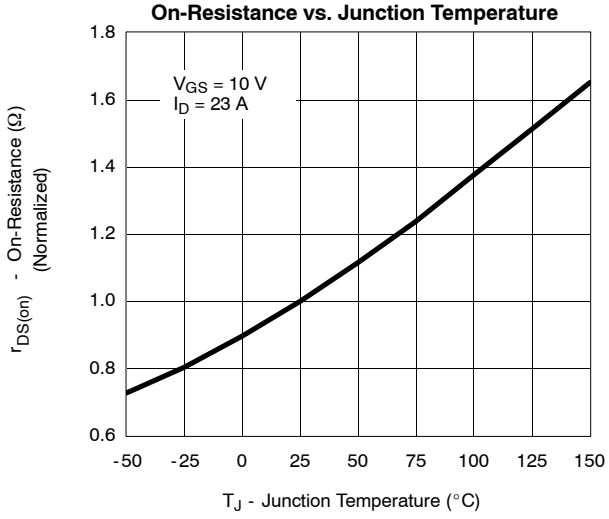

**Capacitance**



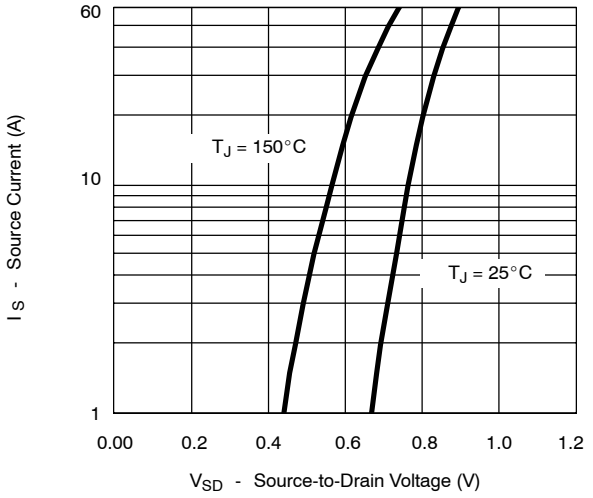

**Gate Charge**



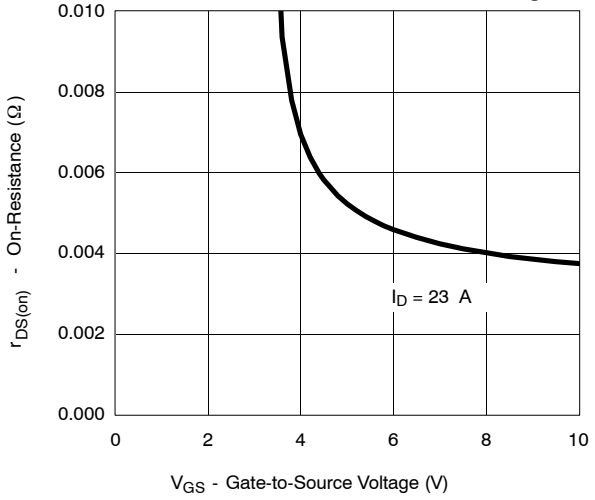

**On-Resistance vs. Junction Temperature**




**Source-Drain Diode Forward Voltage**

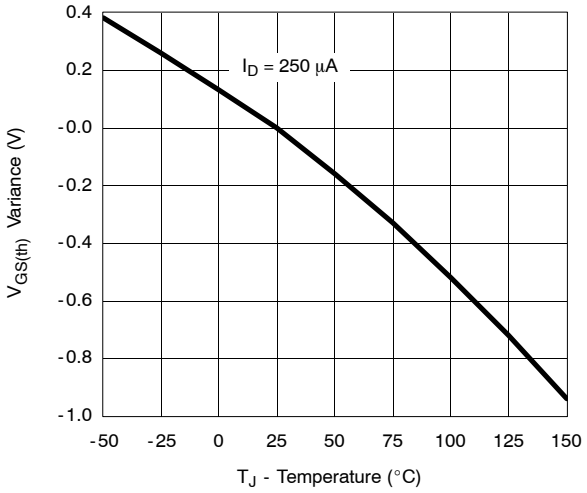



**On-Resistance vs. Gate-to-Source Voltage**

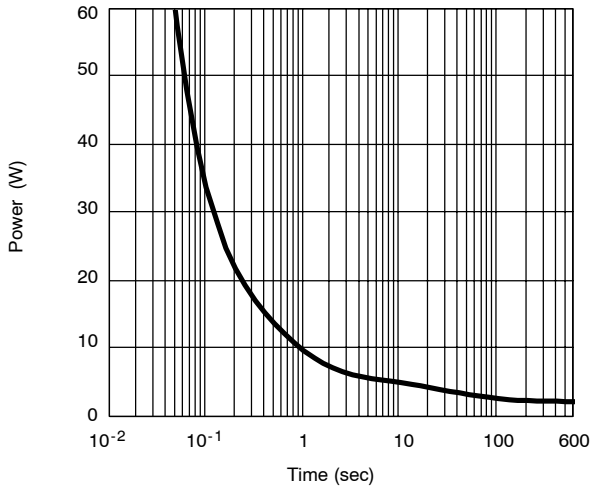


## TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

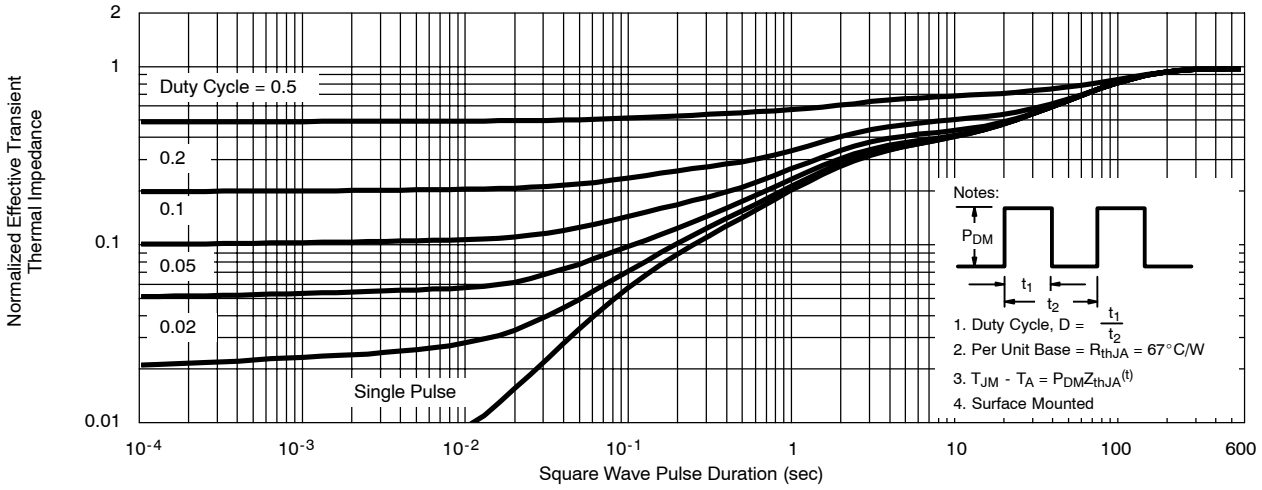
**Threshold Voltage**




**Single Pulse Power**




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




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

