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

| PRODUCT SUMMARY | | |
|---|---|---|
| $V_{DS}$ (V) | $r_{DS(on)}$ (Ω) | $I_D$ (A) |
| -30 | 0.150 @ $V_{GS}$ = -10 V | -2.2 |
| | 0.260 @ $V_{GS}$ = -4.5 V | -1.6 |

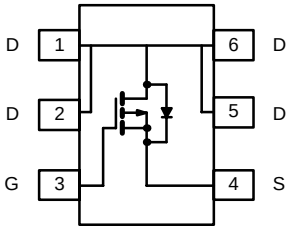
## FEATURES

- TrenchFET® Power MOSFETS: 1.8-V Rated
- Thermally Enhanced SC-70 Package

## APPLICATIONS

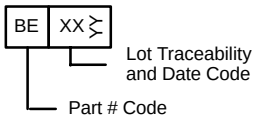
- Load Switches
  - Notebook PCs
  - Servers

**SOT-363**
**SC-70 (6-LEADS)**




Top View

Marking Code




Ordering Information: Si1433DH-T1

| ABSOLUTE MAXIMUM RATINGS ($T_A$ = 25°C UNLESS OTHERWISE NOTED) | | | | | |
|---|---|---|---|---|---|
| **Parameter** | | **Symbol** | **5 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 | $I_D$ | -2.2 | -1.9 | A |
| | $T_A$ = 85°C | | -1.7 | -1.4 | |
| Pulsed Drain Current | | $I_{DM}$ | -8 | | |
| Continuous Diode Current (Diode Conduction)[a] | | $I_S$ | -1.4 | -0.9 | |
| Maximum Power Dissipation[a] | $T_A$ = 25°C | $P_D$ | 1.45 | 0.95 | W |
| | $T_A$ = 85°C | | 0.75 | 0.5 | |
| 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 ≤ 5 sec | $R_{thJA}$ | 65 | 85 | °C/W |
| | Steady State | | 105 | 130 | |
| Maximum Junction-to-Foot (Drain) | Steady State | $R_{thJF}$ | 38 | 48 | |

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

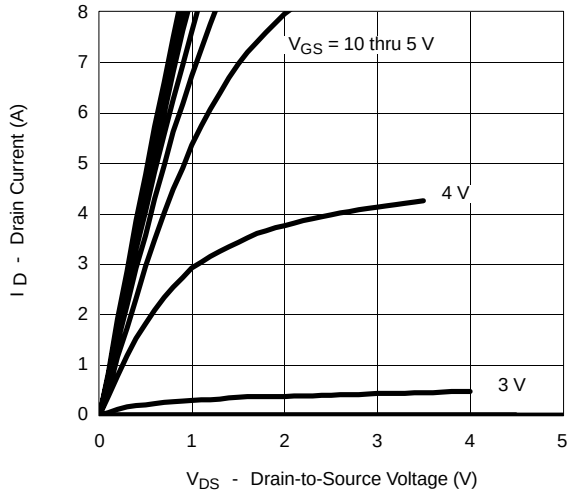
## SPECIFICATIONS ($T_J$ = 25°C UNLESS OTHERWISE NOTED)

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static** | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = -100 µA | -1 | | -3 | V |
| Gate-Body Leakage | $I_{GSS}$ | $V_{DS}$ = 0 V, $V_{GS}$ = ±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, $T_J$ = 85°C | | | -5 | |
| On-State Drain Current[a] | $I_{D(on)}$ | $V_{DS}$ = -5 V, $V_{GS}$ = -4.5 V | -4 | | | A |
| Drain-Source On-State Resistance[a] | $r_{DS(on)}$ | $V_{GS}$ = -10 V, $I_D$ = -2.2 A | | 0.120 | 0.150 | Ω |
| | | $V_{GS}$ = -4.5 V, $I_D$ = -1.6 A | | 0.210 | 0.260 | |
| Forward Transconductance[a] | $g_{fs}$ | $V_{DS}$ = -10 V, $I_D$ = -2.2 A | | 4 | | S |
| Diode Forward Voltage[a] | $V_{SD}$ | $I_S$ = -1.2 A, $V_{GS}$ = 0 V | | -0.85 | -1.2 | V |
| **Dynamic[b]** | | | | | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$ = -15 V, $V_{GS}$ = -4.5 V, $I_D$ = -2.2 A | | 3.1 | 5 | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 1.0 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 1.6 | | |
| 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 | | 11 | 17 | ns |
| Rise Time | $t_r$ | | | 17 | 26 | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 18 | 27 | |
| Fall Time | $t_f$ | | | 13 | 20 | |

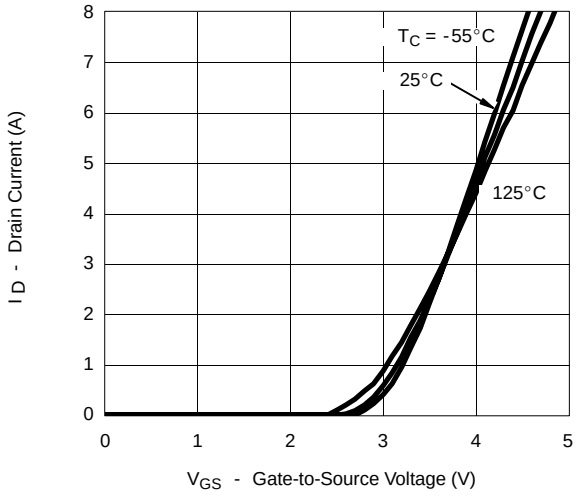
Notes
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

## TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

**Output Characteristics**

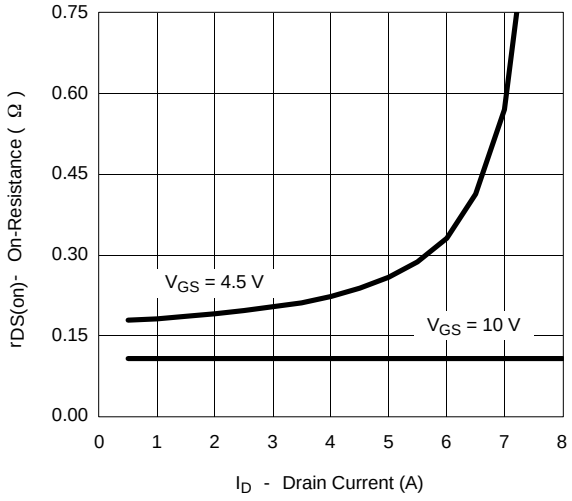



**Transfer Characteristics**

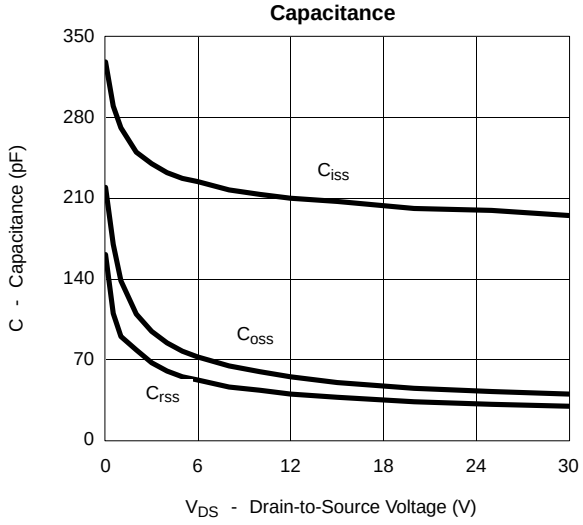


## TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

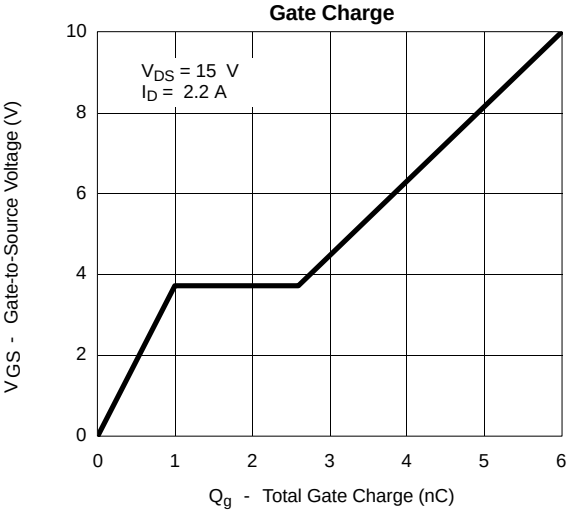
**On-Resistance vs. Drain Current**



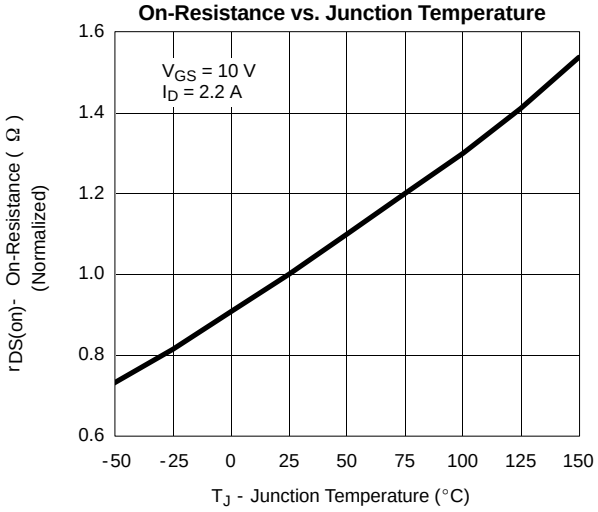

**Capacitance**



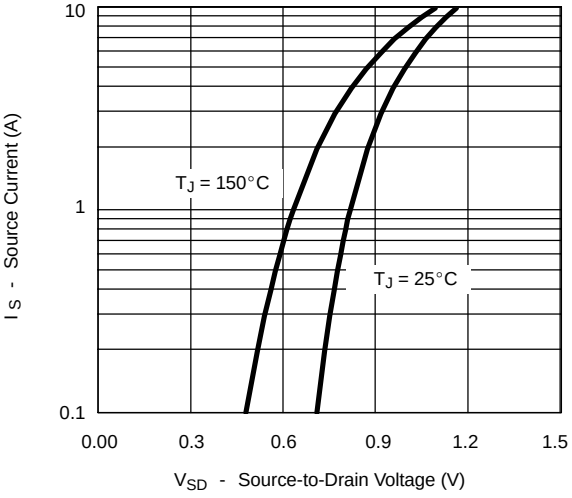

**Gate Charge**



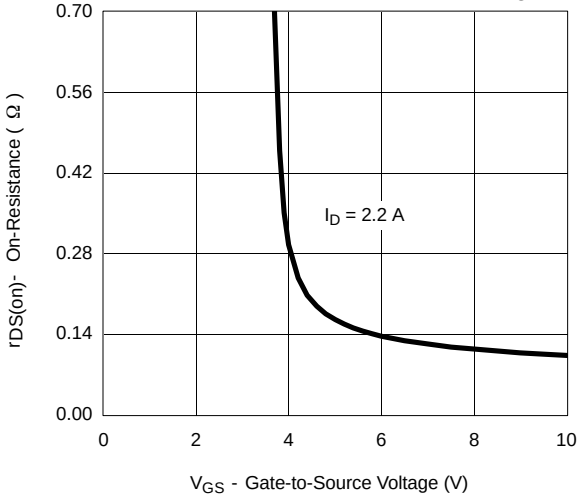

**On-Resistance vs. Junction Temperature**




**Source-Drain Diode Forward Voltage**

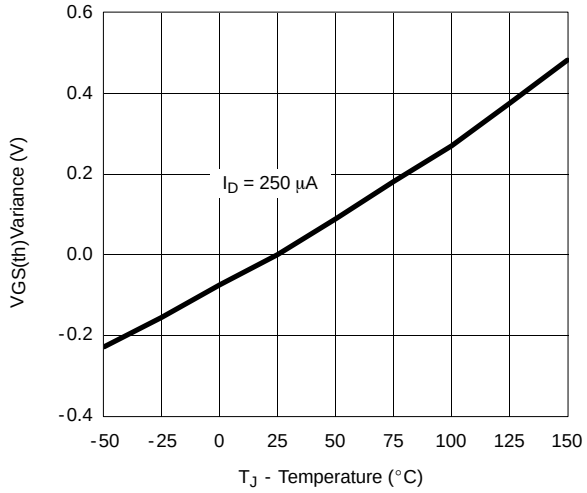



**On-Resistance vs. Gate-to-Source Voltage**

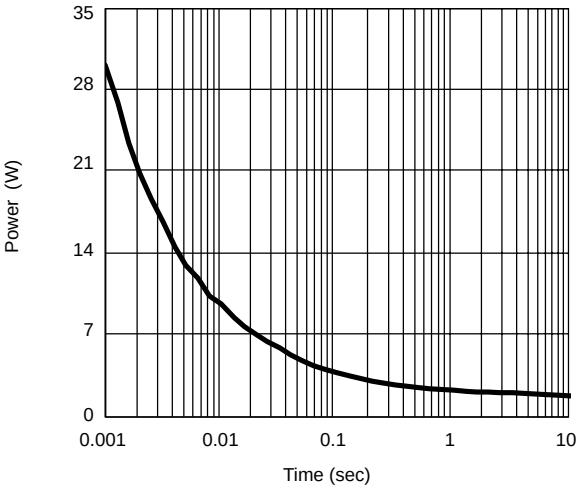


## TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

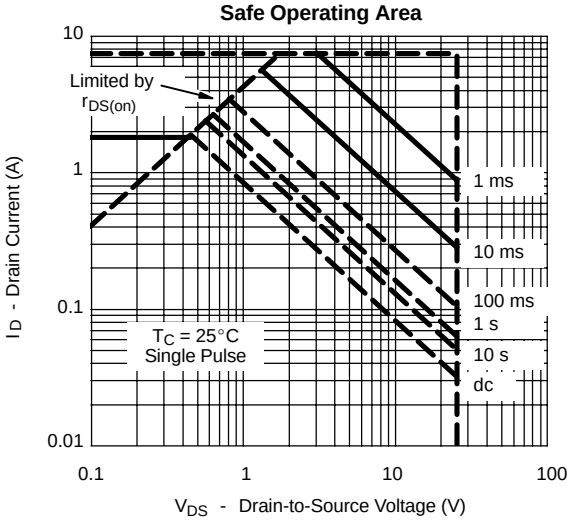
**Threshold Voltage**



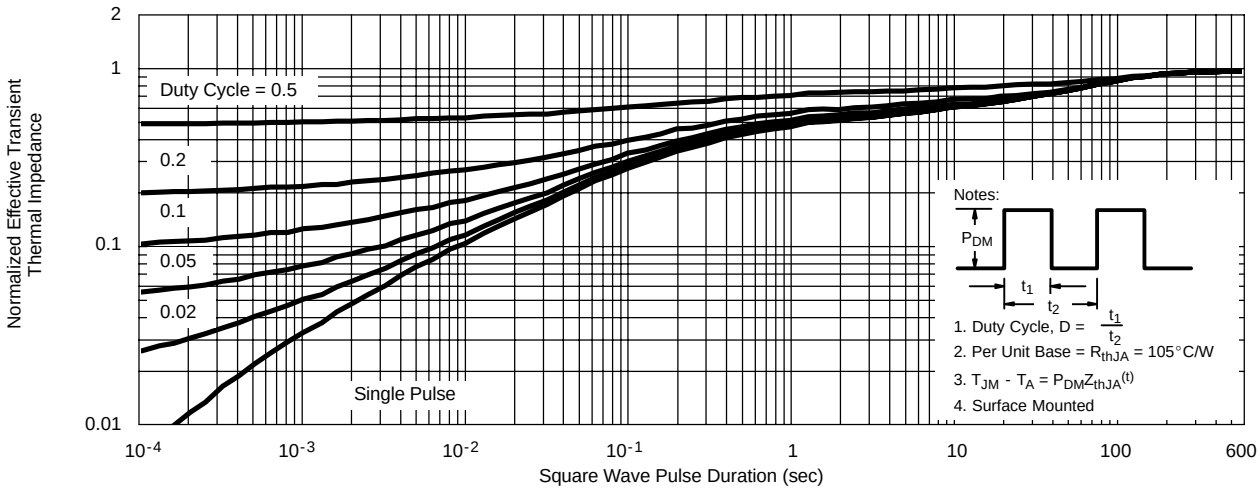

**Single Pulse Power, Junction-to-Ambient**




**Safe Operating Area**




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



## TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)