



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

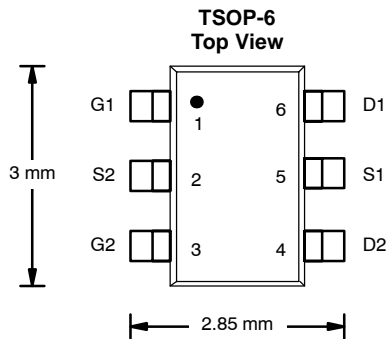
| PRODUCT SUMMARY | | |
|-----------------|---------------------------|-----------|
| V_{DS} (V) | $r_{DS(on)}$ (Ω) | I_D (A) |
| -30 | 0.133 @ $V_{GS} = -10$ V | -2.2 |
| | 0.245 @ $V_{GS} = -4.5$ V | -1.6 |

FEATURES

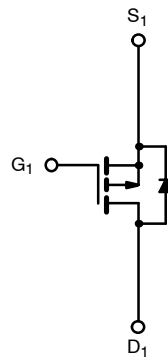
- TrenchFET® Power MOSFET
- Symmetrical Dual P-Channel

APPLICATIONS

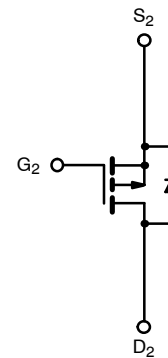
- Battery Switch for Portable Devices
- Computers
 - Bus Switch
 - Load Switch



Ordering Information: Si3993DV-T1
Si3993DV-T1—E3 (Lead Free)
Marking Code: MFxxx



P-Channel MOSFET



P-Channel MOSFET

| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ 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 ($T_J = 150^\circ\text{C}$) ^a | I_D | $T_A = 25^\circ\text{C}$ | -2.2 | -1.8 | A |
| | | $T_A = 70^\circ\text{C}$ | -1.7 | -1.4 | |
| Pulsed Drain Current | I_{DM} | -8 | | | |
| Continuous Diode Current (Diode Conduction) ^a | I_S | -1.05 | -0.75 | | |
| Maximum Power Dissipation ^a | P_D | $T_A = 25^\circ\text{C}$ | 1.15 | 0.83 | W |
| | | $T_A = 70^\circ\text{C}$ | 0.73 | 0.53 | |
| Operating Junction and Storage Temperature Range | T_J, T_{stg} | -55 to 150 | | $^\circ\text{C}$ | |

| THERMAL RESISTANCE RATINGS | | | | | |
|--|----------------|------------|---------|---------|--------------------|
| Parameter | | Symbol | Typical | Maximum | Unit |
| Maximum Junction-to-Ambient ^a | $t \leq 5$ sec | R_{thJA} | 93 | 110 | $^\circ\text{C/W}$ |
| | Steady State | | 130 | 150 | |
| Maximum Junction-to-Foot (Drain) | Steady State | R_{thJF} | 75 | 90 | |

Notes

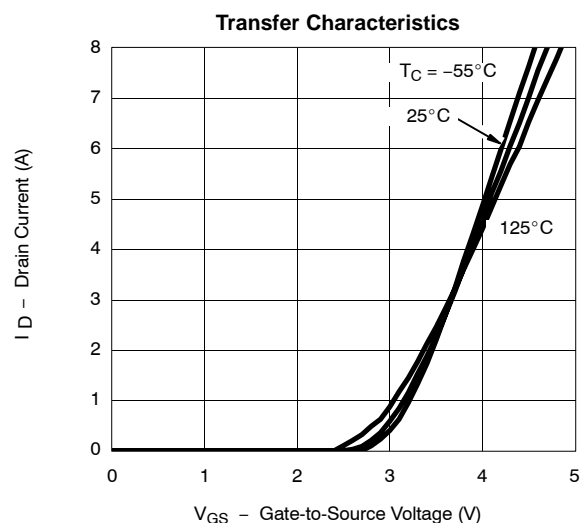
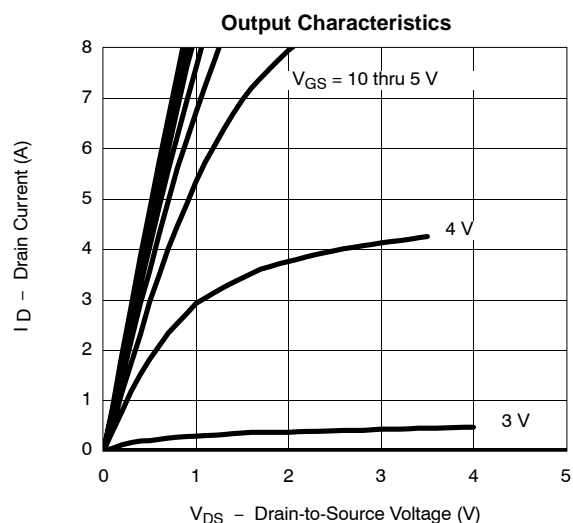
a. Surface Mounted on 1" x 1" FR4 Board.

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 | | -3 | 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 | -5 | | | A |
| Drain-Source On-State Resistance ^a | r _{DS(on)} | V _{GS} = -10 V, I _D = -2.2 A | | 0.107 | 0.133 | Ω |
| | | V _{GS} = -4.5 V, I _D = -1.6 A | | 0.194 | 0.245 | |
| Forward Transconductance ^a | g _{fs} | V _{DS} = -5 V, I _D = -2.2 A | | 4 | | S |
| Diode Forward Voltage ^a | V _{SD} | I _S = -1.05 A, V _{GS} = 0 V | | -0.82 | -1.10 | 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 I _D ≅ -1 A, V _{GEN} = -10 V, R _g = 6 Ω | | 10 | 15 | ns |
| Rise Time | t _r | | | 16 | 25 | |
| Turn-Off Delay Time | t _{d(off)} | | | 17 | 25 | |
| Fall Time | t _f | | | 12 | 20 | |
| Source-Drain Reverse Recovery Time | t _{rr} | | I _F = -1.05 A, di/dt = 100 A/μs | | 18 | |

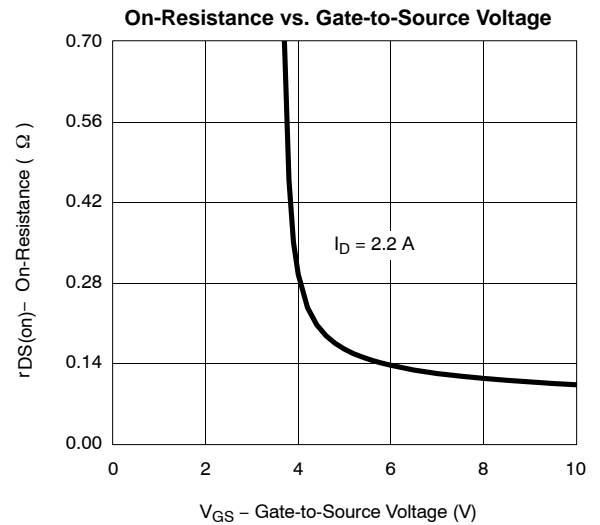
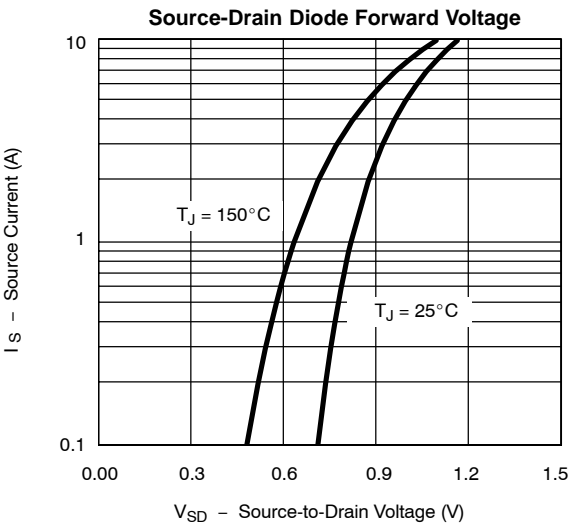
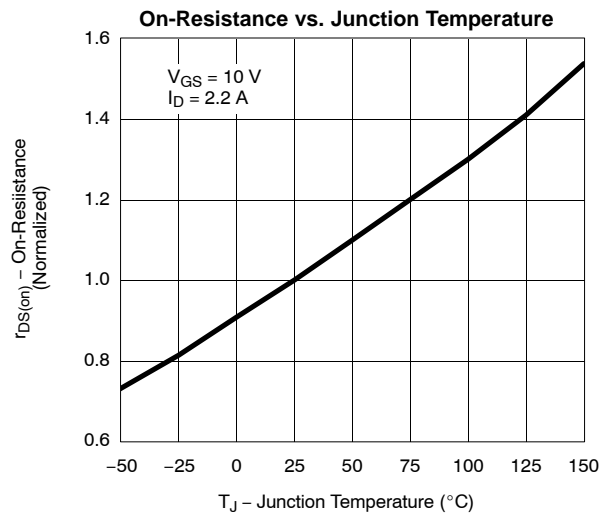
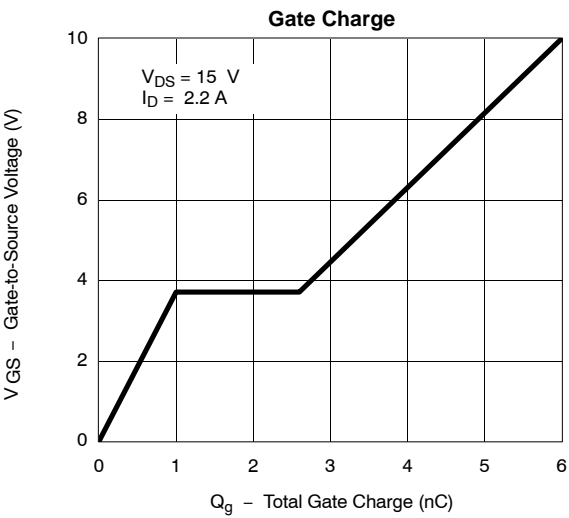
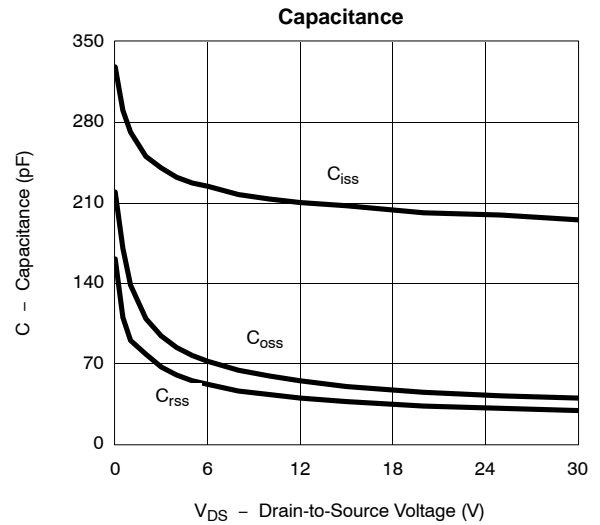
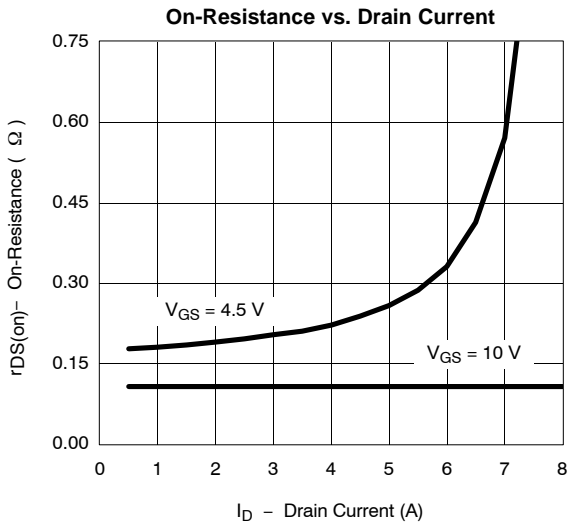
Notes

- 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)

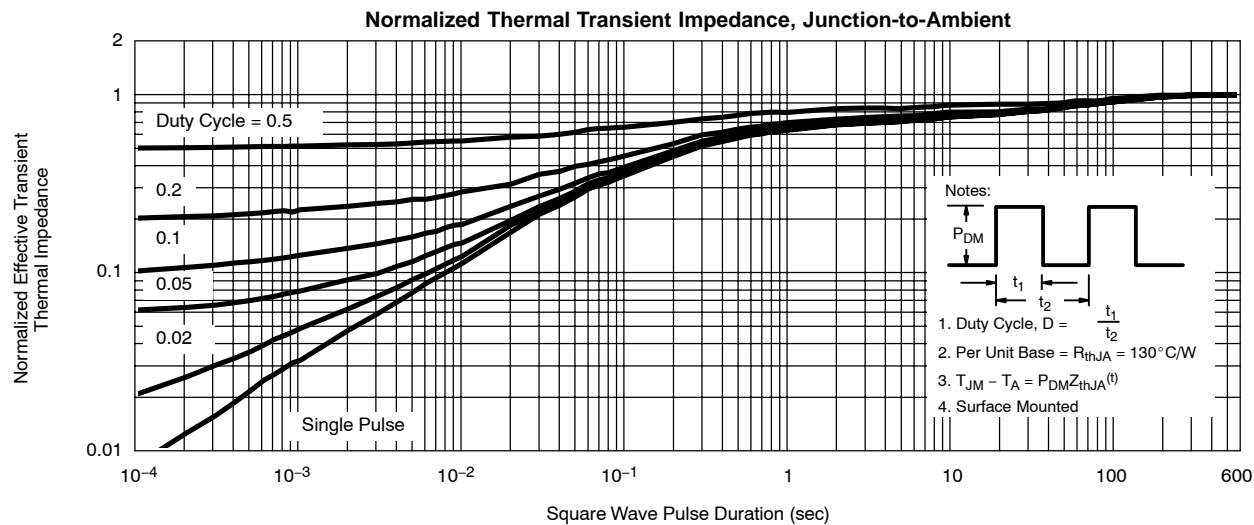
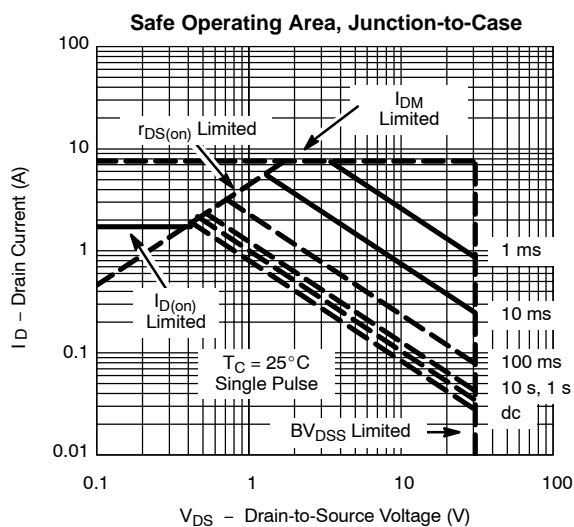
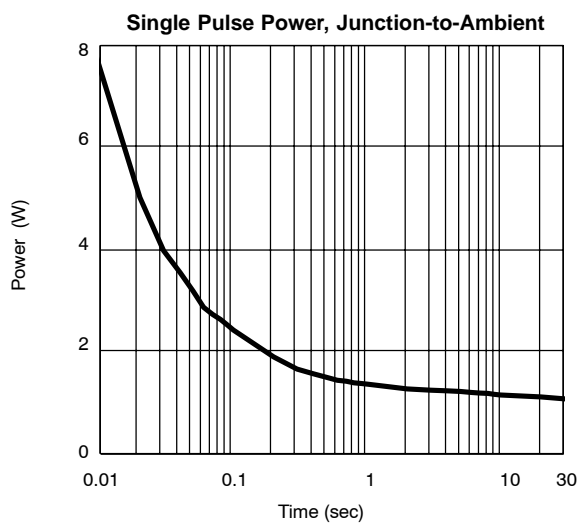
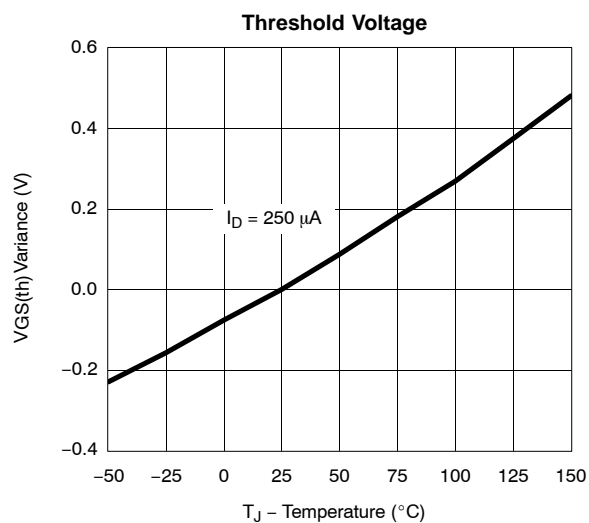


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



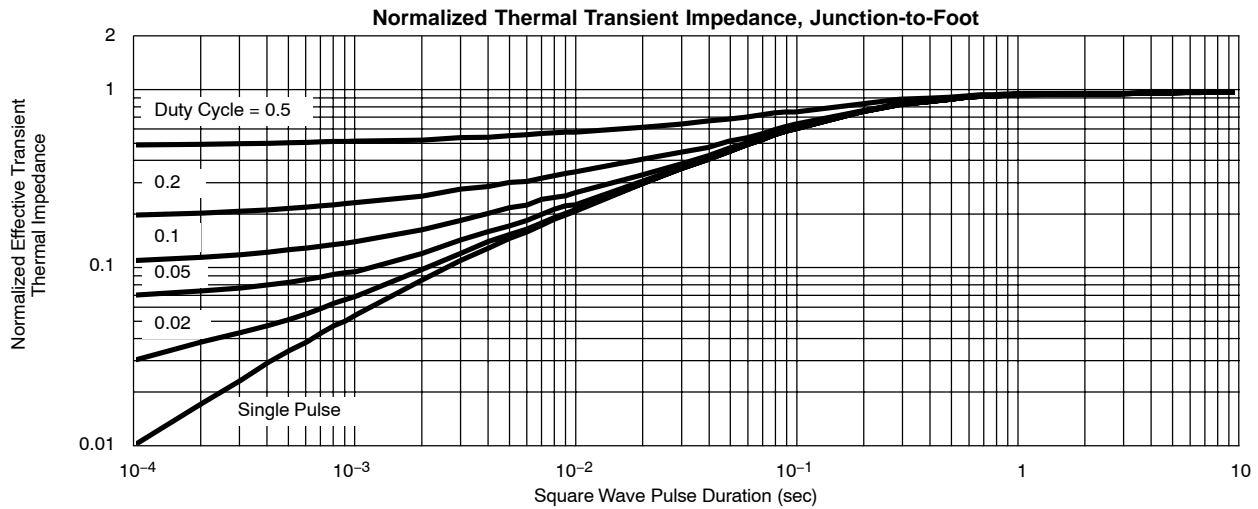


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TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)





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