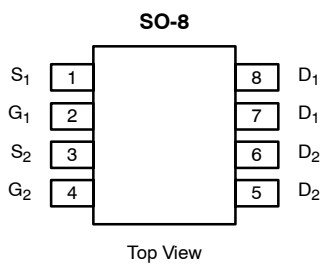


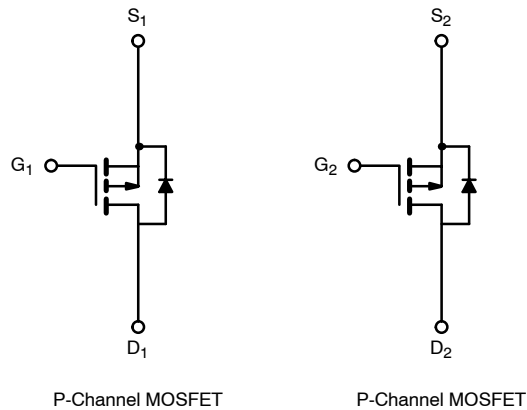


Dual P-Channel 2.5-V (G-S) MOSFET

| PRODUCT SUMMARY | | |
|-----------------|---------------------------|-----------|
| V_{DS} (V) | $r_{DS(on)}$ (Ω) | I_D (A) |
| -20 | 0.06 @ $V_{GS} = -4.5$ V | -4.7 |
| | 0.10 @ $V_{GS} = -2.5$ V | -3.7 |



Ordering Information: Si9933BDY—E3 (Lead Free)
Si9933BDY-T1—E3 (Lead Free with Tape and Reel)



| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) | | | | | |
|---|----------------|--------------------------|--------------|------------------|---|
| Parameter | Symbol | 10 secs | Steady State | Unit | |
| Drain-Source Voltage | V_{DS} | -20 | | V | |
| Gate-Source Voltage | V_{GS} | ± 12 | | | |
| Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a | I_D | $T_A = 25^\circ\text{C}$ | -4.7 | -3.6 | A |
| | | $T_A = 70^\circ\text{C}$ | -3.8 | -2.8 | |
| Pulsed Drain Current | I_{DM} | -20 | | | |
| continuous Source Current (Diode Conduction) ^a | I_S | -1.7 | -0.9 | | |
| Maximum Power Dissipation ^a | P_D | $T_A = 25^\circ\text{C}$ | 2.0 | 1.1 | W |
| | | $T_A = 70^\circ\text{C}$ | 1.3 | 0.7 | |
| 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 | R_{thJA} | $t \leq 10$ sec | 55 | 62.5 | $^\circ\text{C/W}$ |
| | | Steady State | 90 | 110 | |
| Maximum Junction-to-Foot (Drain) | R_{thJF} | 33 | 40 | | |

Notes

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

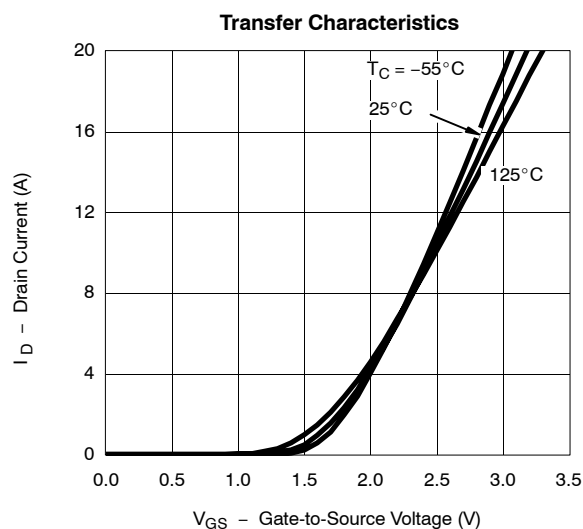
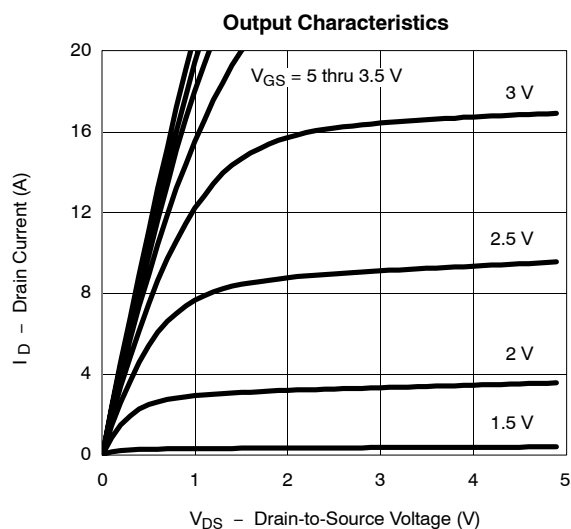
For SPICE model information via the Worldwide Web: <http://www.vishay.com/www/product/spice.htm>

SPECIFICATIONS (T_J = 25 °C UNLESS OTHERWISE NOTED)

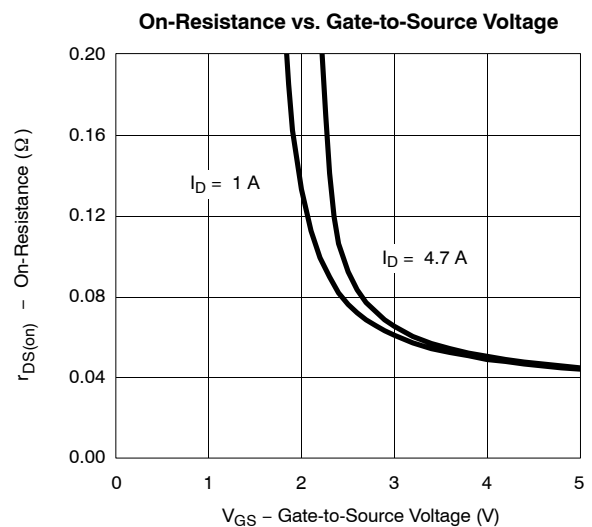
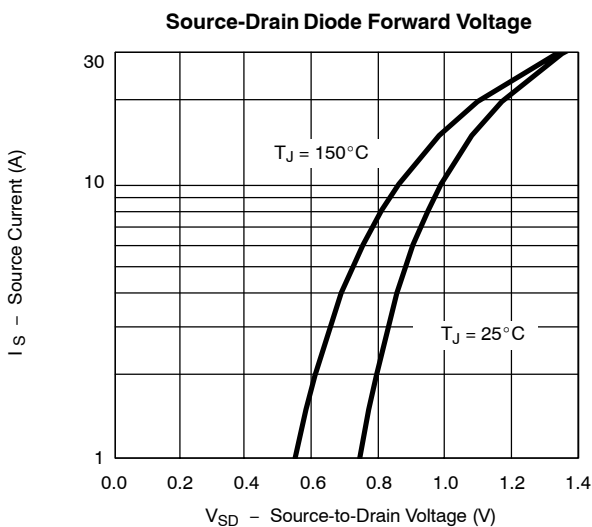
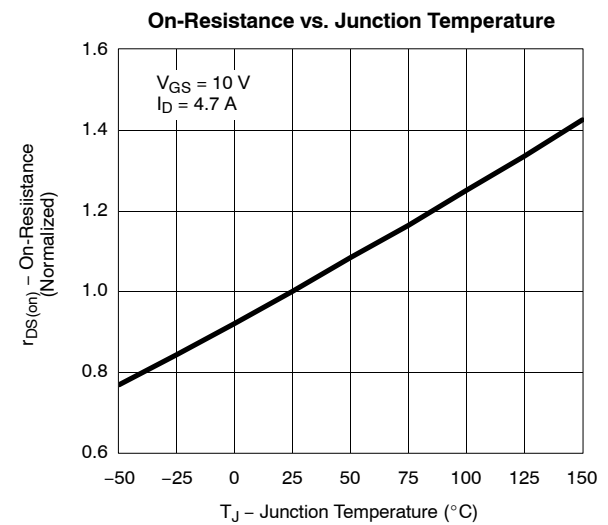
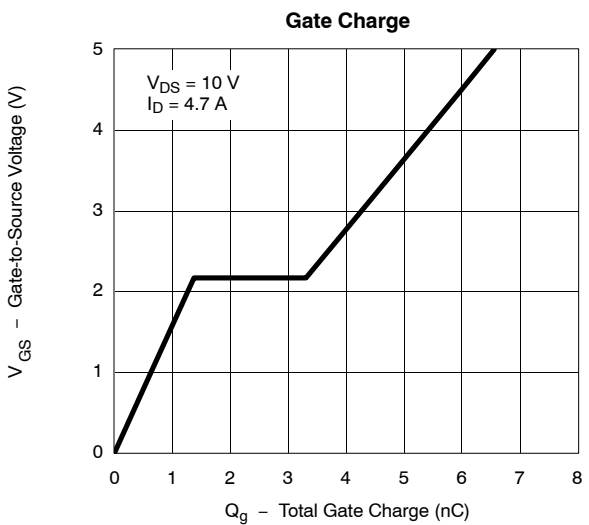
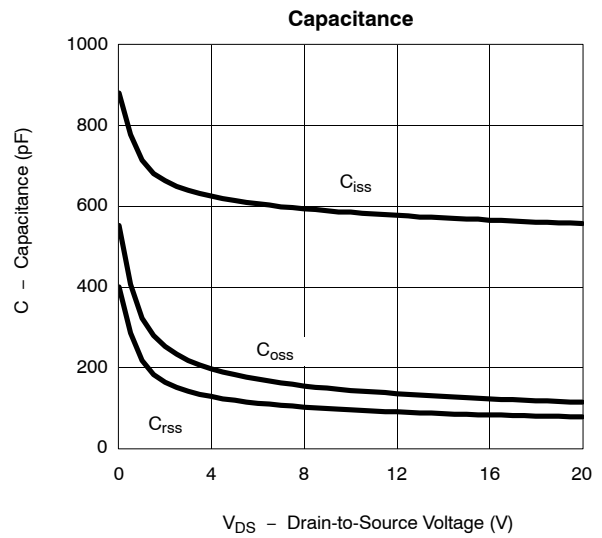
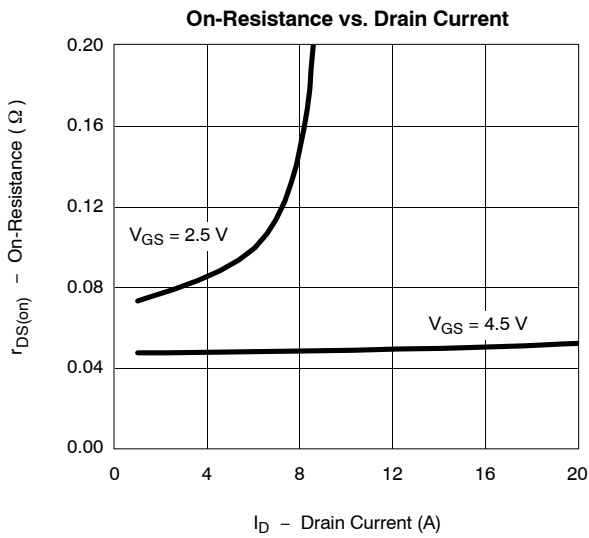
| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|---------------------|--|------|-------|------|------|
| Static | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = -250 μA | -0.6 | | -1.4 | V |
| Gate-Body Leakage | I _{GSS} | V _{DS} = 0 V, V _{GS} = ±12 V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} = -20 V, V _{GS} = 0 V | | | -1 | μA |
| | | V _{DS} = -20 V, V _{GS} = 0 V, T _J = 55 °C | | | -5 | |
| On-State Drain Current ^a | I _{D(on)} | V _{DS} ≤ -5 V, V _{GS} = -4.5 V | -20 | | | A |
| Drain-Source On-State Resistance ^a | r _{DS(on)} | V _{GS} = -4.5 V, I _D = -4.7 A | | 0.048 | 0.06 | Ω |
| | | V _{GS} = -2.5 V, I _D = -1 A | | 0.08 | 0.10 | |
| Forward Transconductance ^a | g _{fs} | V _{DS} = -10 V, I _D = -4.7 A | | 11 | | S |
| Diode Forward Voltage ^a | V _{SD} | I _S = -1.7 A, V _{GS} = 0 V | | -0.75 | -1.2 | V |
| Dynamic^b | | | | | | |
| Total Gate Charge | Q _g | V _{DS} = -10 V, V _{GS} = -4.5 V, I _D = -4.7 A | | 6 | 9 | nC |
| Gate-Source Charge | Q _{gs} | | | 1.4 | | |
| Gate-Drain Charge | Q _{gd} | | | 1.9 | | |
| Gate Resistance | R _g | f = 1 MHz | | 9.5 | | Ω |
| Turn-On Delay Time | t _{d(on)} | V _{DD} = -10 V, R _L = 10 Ω I _D ≅ -1 A, V _{GEN} = -4.5 V, R _g = 6 Ω | | 22 | 35 | ns |
| Rise Time | t _r | | | 35 | 55 | |
| Turn-Off Delay Time | t _{d(off)} | | | 45 | 70 | |
| Fall Time | t _f | | | 25 | 40 | |
| Source-Drain Reverse Recovery Time | t _{rr} | I _F = -1.7 A, di/dt = 100 A/μs | | 25 | 50 | |

Notes

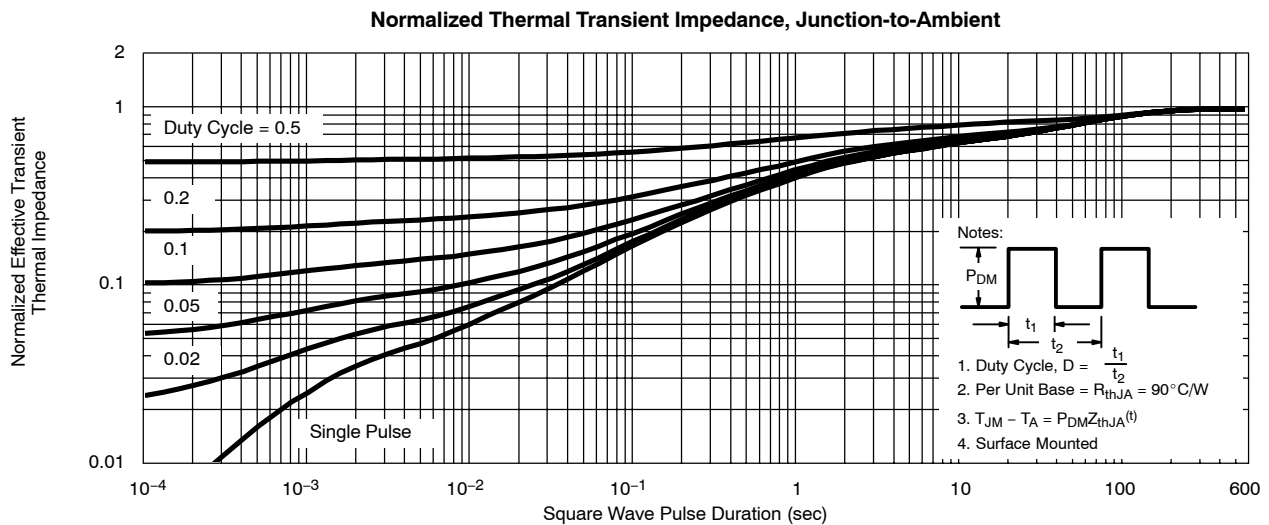
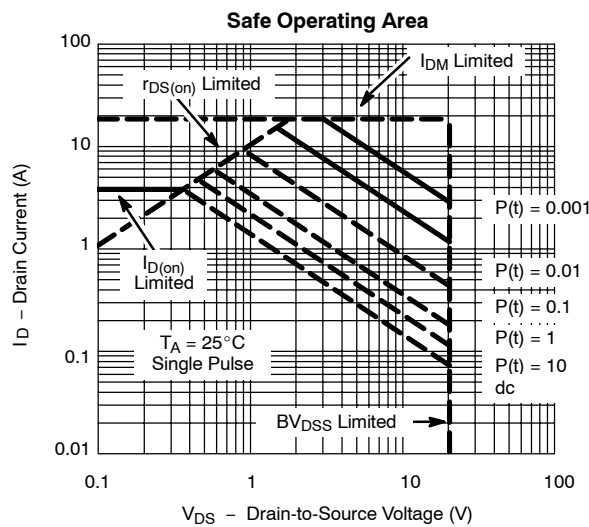
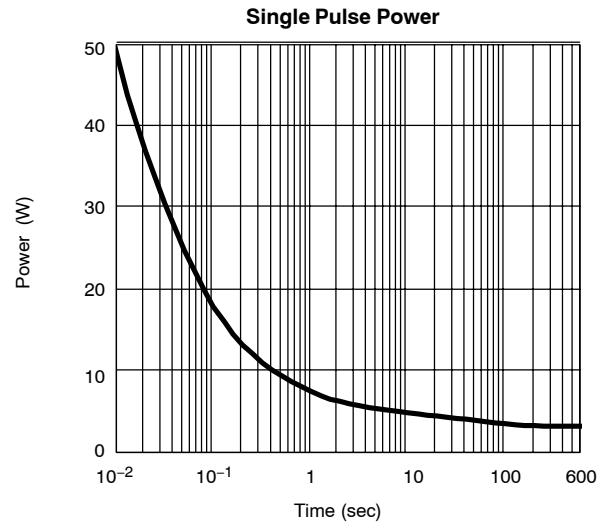
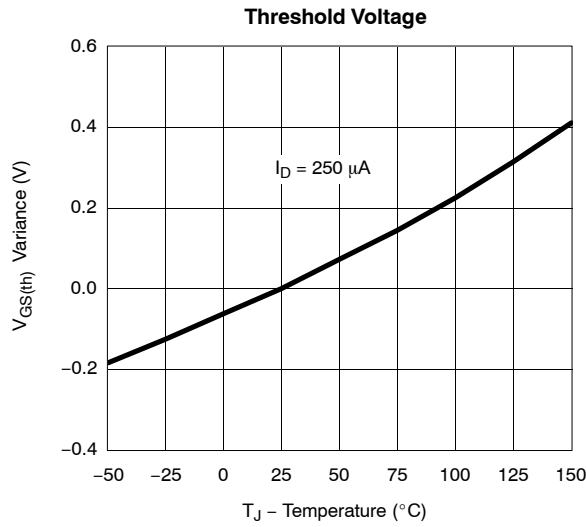
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

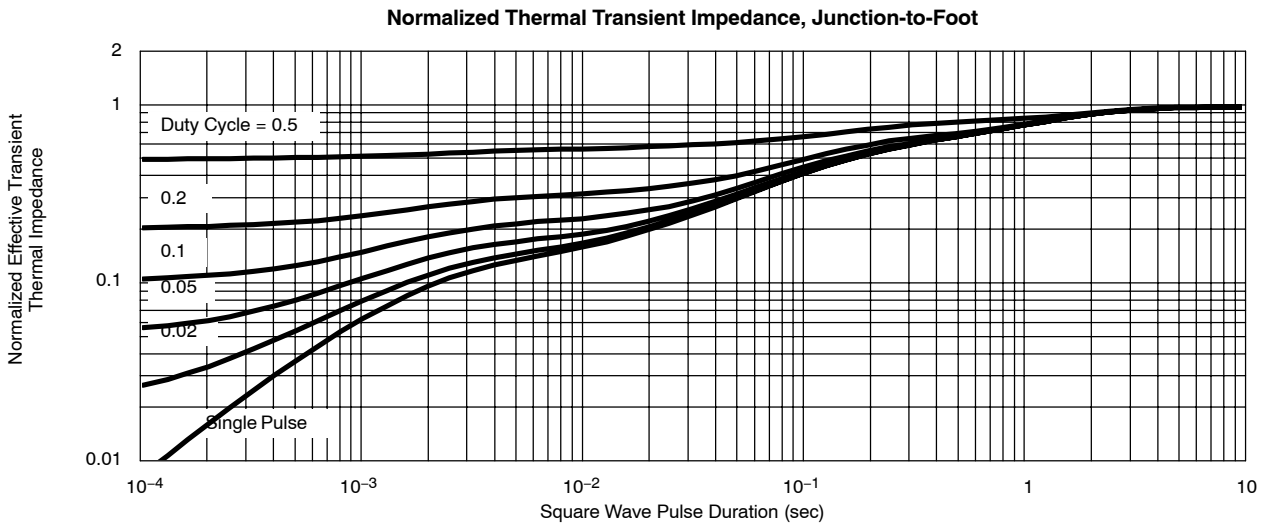


TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)





TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)





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