

## P-Channel 12-V (D-S) MOSFET

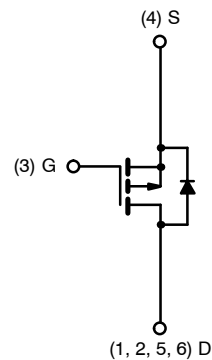
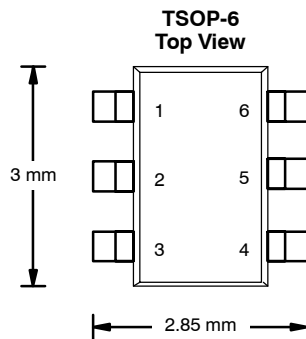
| PRODUCT SUMMARY |                           |           |
|-----------------|---------------------------|-----------|
| $V_{DS}$ (V)    | $r_{DS(on)}$ ( $\Omega$ ) | $I_D$ (A) |
| -12             | 0.040 @ $V_{GS} = -4.5$ V | -6.0      |
|                 | 0.053 @ $V_{GS} = -2.5$ V | -5.2      |
|                 | 0.072 @ $V_{GS} = -1.8$ V | -4.5      |

### FEATURES

- TrenchFET® Power MOSFET: 1.8-V Rated
- Ultra Low On-Resistance

### APPLICATIONS

- Load Switch
- PA Switch



P-Channel MOSFET

Ordering Information: Si3447BDV-T1  
Si3447BDV-T1—E3 (Lead Free)

Marking Code: B7xxx

| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) |                          |                |            |              |
|-----------------------------------------------------------------------------|--------------------------|----------------|------------|--------------|
| Parameter                                                                   |                          | Symbol         | 5 secs     | Steady State |
| Drain-Source Voltage                                                        |                          | $V_{DS}$       | -12        |              |
| Gate-Source Voltage                                                         |                          | $V_{GS}$       | $\pm 8$    |              |
| Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>         | $T_A = 25^\circ\text{C}$ | $I_D$          | -6.0       | -4.5         |
|                                                                             | $T_A = 85^\circ\text{C}$ |                | -4.3       | -3.3         |
| Pulsed Drain Current                                                        |                          | $I_{DM}$       | -20        |              |
| Continuous Diode Current (Diode Conduction) <sup>a</sup>                    |                          | $I_S$          | -1.7       | -0.9         |
| Maximum Power Dissipation <sup>a</sup>                                      | $T_A = 25^\circ\text{C}$ | $P_D$          | 2.0        | 1.1          |
|                                                                             | $T_A = 85^\circ\text{C}$ |                | 1.0        | 0.6          |
| Operating Junction and Storage Temperature Range                            |                          | $T_J, T_{stg}$ | -55 to 150 |              |

| THERMAL RESISTANCE RATINGS               |                |            |         |         |                    |
|------------------------------------------|----------------|------------|---------|---------|--------------------|
| Parameter                                |                | Symbol     | Typical | Maximum | Unit               |
| Maximum Junction-to-Ambient <sup>a</sup> | $t \leq 5$ sec | $R_{thJA}$ | 50      | 62.5    | $^\circ\text{C/W}$ |
|                                          | Steady State   |            | 90      | 110     |                    |
| Maximum Junction-to-Foot (Drain)         | Steady State   | $R_{thJF}$ | 30      | 36      |                    |

#### Notes

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

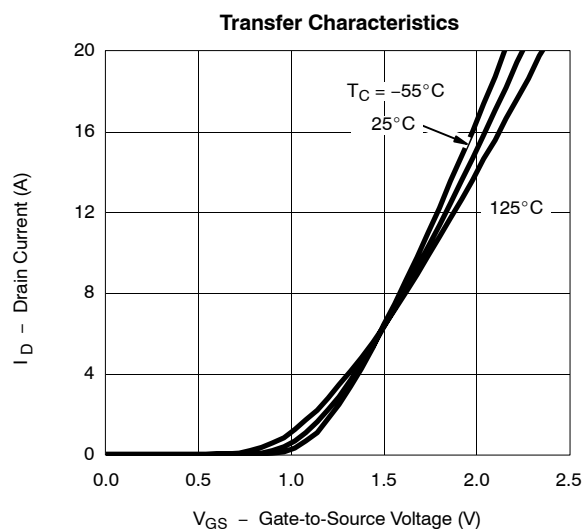
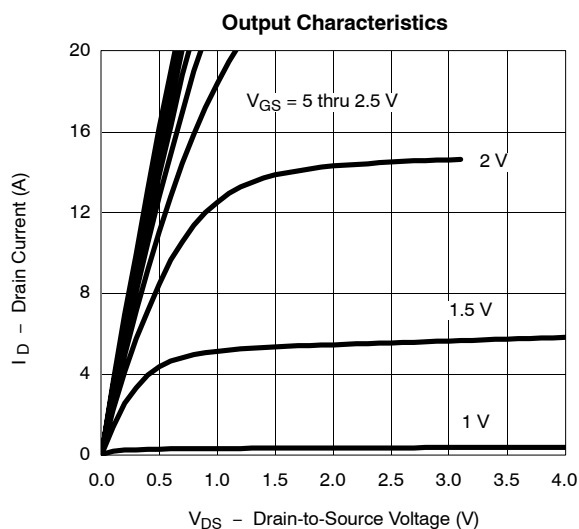
**SPECIFICATIONS ( $T_J = 25^\circ\text{C}$  UNLESS OTHERWISE NOTED)**

| Parameter                                     | Symbol       | Test Condition                                                                                                  | Min   | Typ   | Max       | Unit          |
|-----------------------------------------------|--------------|-----------------------------------------------------------------------------------------------------------------|-------|-------|-----------|---------------|
| <b>Static</b>                                 |              |                                                                                                                 |       |       |           |               |
| Gate Threshold Voltage                        | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = -250\ \mu\text{A}$                                                                      | -0.45 |       | 1         | V             |
| Gate-Body Leakage                             | $I_{GSS}$    | $V_{DS} = 0\ \text{V}, V_{GS} = \pm 8\ \text{V}$                                                                |       |       | $\pm 100$ | nA            |
| Zero Gate Voltage Drain Current               | $I_{DSS}$    | $V_{DS} = -12\ \text{V}, V_{GS} = 0\ \text{V}$                                                                  |       |       | -1        | $\mu\text{A}$ |
|                                               |              | $V_{DS} = -12\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 85^\circ\text{C}$                                          |       |       | -5        |               |
| On-State Drain Current <sup>a</sup>           | $I_{D(on)}$  | $V_{DS} = -5\ \text{V}, V_{GS} = -4.5\ \text{V}$                                                                | -20   |       |           | A             |
| Drain-Source On-State Resistance <sup>a</sup> | $r_{DS(on)}$ | $V_{GS} = -4.5\ \text{V}, I_D = -6.0\ \text{A}$                                                                 |       | 0.033 | 0.040     | $\Omega$      |
|                                               |              | $V_{GS} = -2.5\ \text{V}, I_D = -5.2\ \text{A}$                                                                 |       | 0.044 | 0.053     |               |
|                                               |              | $V_{GS} = -1.8\ \text{V}, I_D = -2.0\ \text{A}$                                                                 |       | 0.060 | 0.072     |               |
| Forward Transconductance <sup>a</sup>         | $g_{fs}$     | $V_{DS} = -5\ \text{V}, I_D = -6.0\ \text{A}$                                                                   |       | 15    |           | S             |
| Diode Forward Voltage <sup>a</sup>            | $V_{SD}$     | $I_S = -1.7\ \text{A}, V_{GS} = 0\ \text{V}$                                                                    |       | -0.7  | -1.2      | V             |
| <b>Dynamic<sup>b</sup></b>                    |              |                                                                                                                 |       |       |           |               |
| Total Gate Charge                             | $Q_g$        | $V_{DS} = -6\ \text{V}, V_{GS} = -4.5\ \text{V}, I_D = -6.0\ \text{A}$                                          |       | 9.3   | 14        | nC            |
| Gate-Source Charge                            | $Q_{gs}$     |                                                                                                                 |       | 1.5   |           |               |
| Gate-Drain Charge                             | $Q_{gd}$     |                                                                                                                 |       | 2.6   |           |               |
| Turn-On Delay Time                            | $t_{d(on)}$  | $V_{DD} = -6\ \text{V}, R_L = 6\ \Omega$<br>$I_D \cong -1\ \text{A}, V_{GEN} = -4.5\ \text{V}, R_g = 6\ \Omega$ |       | 20    | 30        | ns            |
| Rise Time                                     | $t_r$        |                                                                                                                 |       | 46    | 70        |               |
| Turn-Off Delay Time                           | $t_{d(off)}$ |                                                                                                                 |       | 62    | 95        |               |
| Fall Time                                     | $t_f$        |                                                                                                                 |       | 62    | 95        |               |
| Source-Drain Reverse Recovery Time            | $t_{rr}$     | $I_F = -1.7\ \text{A}, di/dt = 100\ \text{A}/\mu\text{s}$                                                       |       | 40    | 80        |               |

## Notes

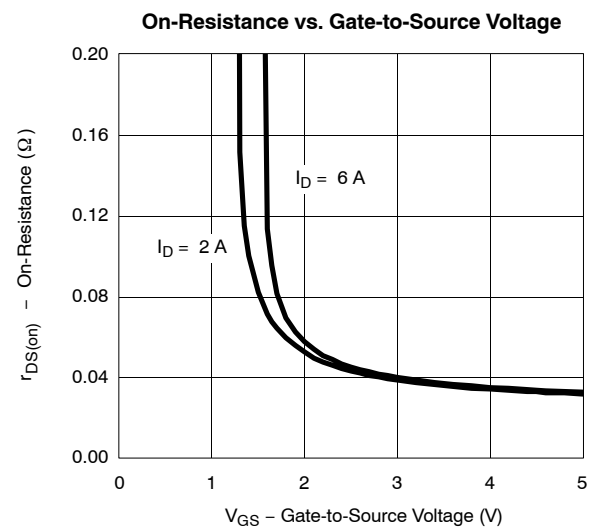
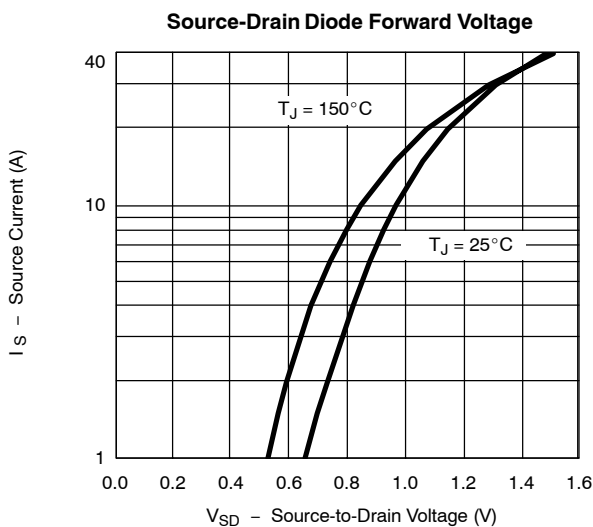
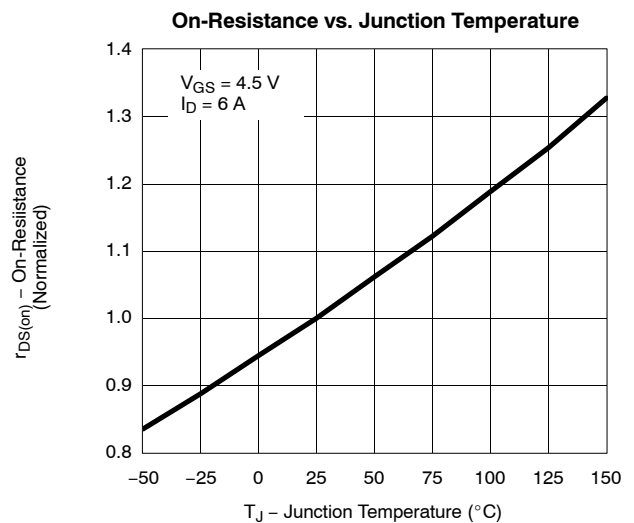
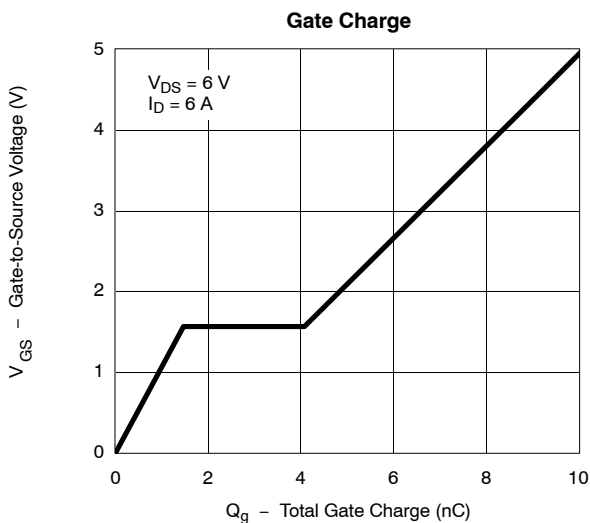
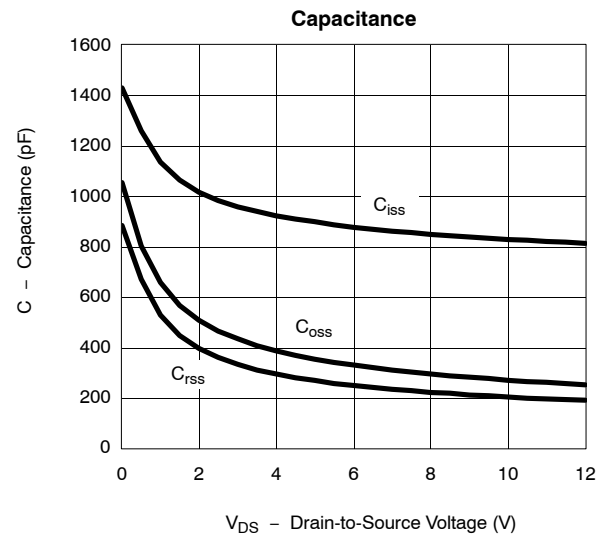
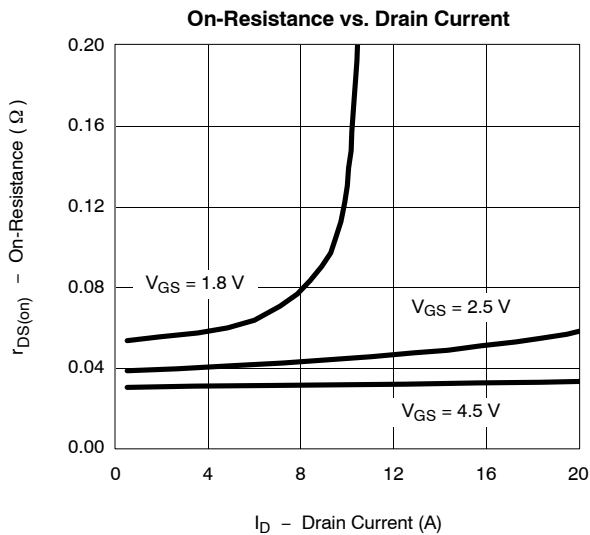
a. Pulse test; pulse width  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ .

b. Guaranteed by design, not subject to production testing.

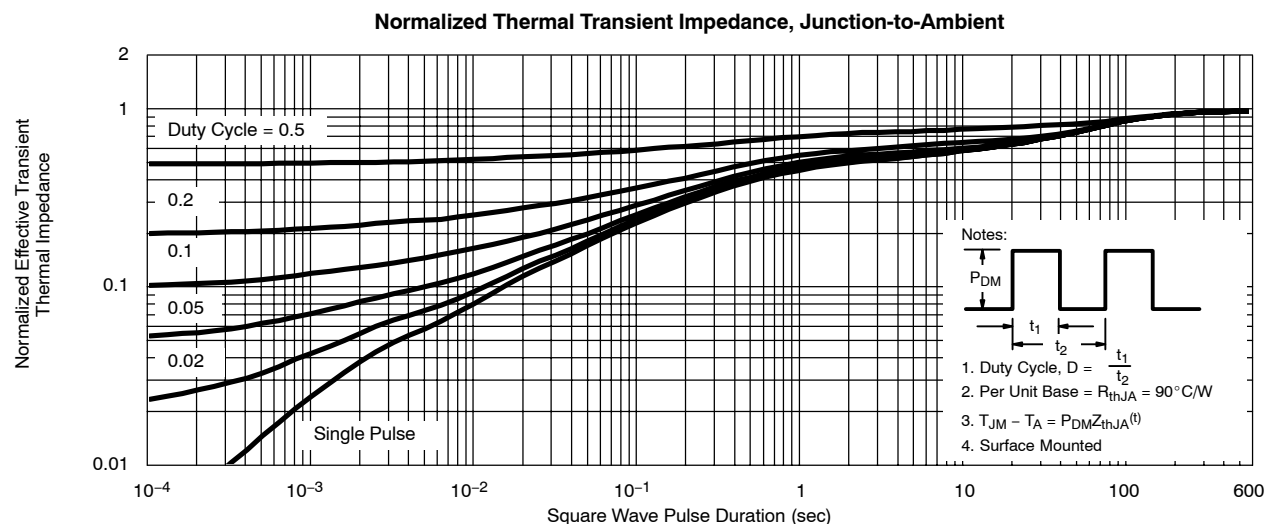
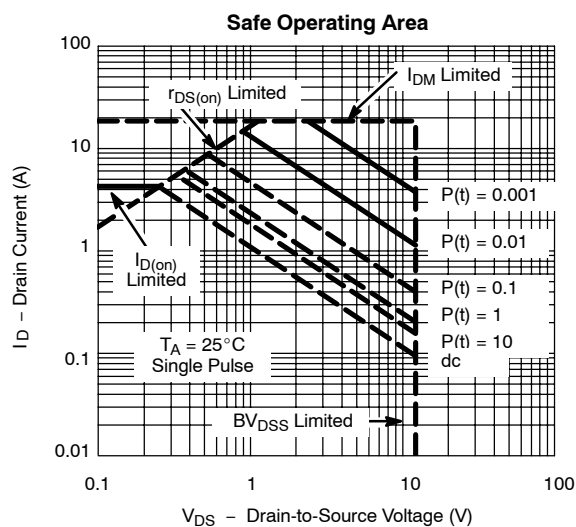
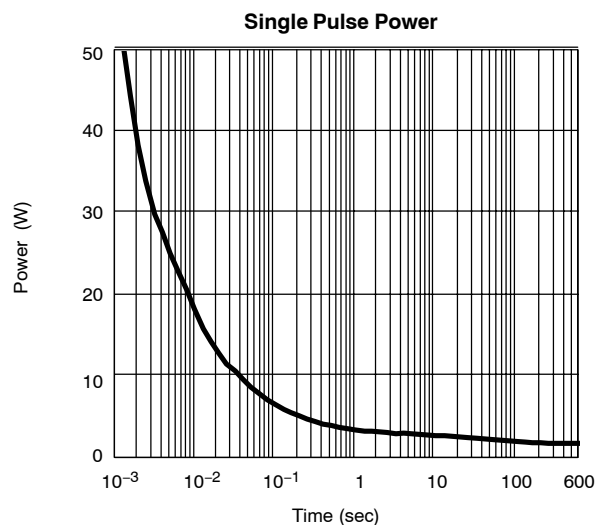
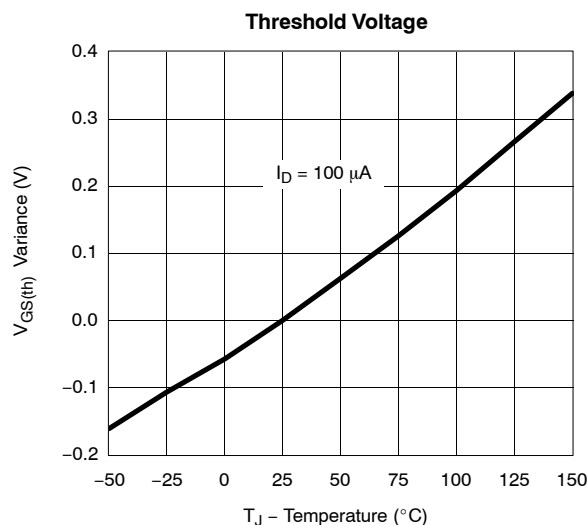
**TYPICAL CHARACTERISTICS ( $25^\circ\text{C}$  UNLESS NOTED)**



**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

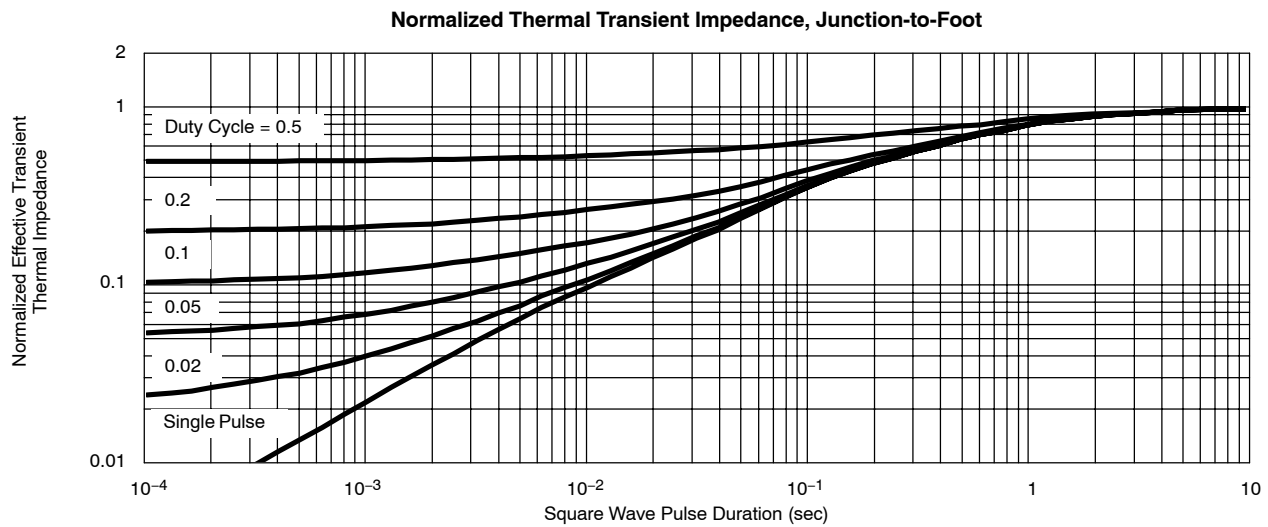


**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**





**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**





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