



## N-Channel 2.5-V (G-S) MOSFET

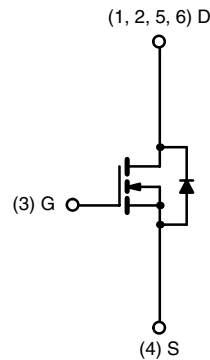
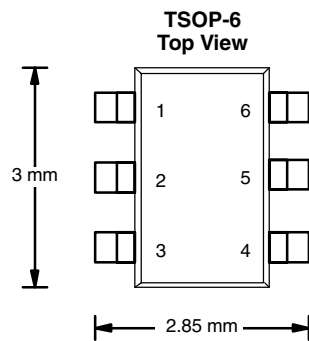
| PRODUCT SUMMARY |                           |           |
|-----------------|---------------------------|-----------|
| $V_{DS}$ (V)    | $r_{DS(on)}$ ( $\Omega$ ) | $I_D$ (A) |
| 20              | 0.045 @ $V_{GS} = 4.5$ V  | 5.3       |
|                 | 0.065 @ $V_{GS} = 2.5$ V  | 4.4       |

### FEATURES

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



**RoHS**  
COMPLIANT



Ordering Information: Si3446DV-T1  
Si3446DV-T1-E3 (Lead (Pb)-free)

N-Channel MOSFET

| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) |                          |                |            |                  |
|---|--------------------------|----------------|------------|------------------|
| Parameter   |                          | Symbol         | Limit      | Unit             |
| Drain-Source Voltage  |                          | $V_{DS}$       | 20         | V                |
| Gate-Source Voltage   |                          | $V_{GS}$       | $\pm 12$   |                  |
| Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>         | $T_A = 25^\circ\text{C}$ | $I_D$          | 5.3        | A                |
|   | $T_A = 70^\circ\text{C}$ |                | 4.2        |                  |
| Pulsed Drain Current  |                          | $I_{DM}$       | 20         |                  |
| Continuous Source Current (Diode Conduction) <sup>a</sup>                   |                          | $I_S$          | 1.7        |                  |
| Maximum Power Dissipation <sup>a</sup>                                      | $T_A = 25^\circ\text{C}$ | $P_D$          | 2.0        | W                |
|   | $T_A = 70^\circ\text{C}$ |                | 1.3        |                  |
| Operating Junction and Storage Temperature Range                            |                          | $T_J, T_{stg}$ | -55 to 150 | $^\circ\text{C}$ |

| THERMAL RESISTANCE RATINGS               |            |       |                    |
|--|------------|-------|--------------------|
| Parameter                                | Symbol     | Limit | Unit               |
| Maximum Junction-to-Ambient <sup>a</sup> | $R_{thJA}$ | 62.5  | $^\circ\text{C/W}$ |

**Notes**

a. Surface Mounted on FR4 Board,  $t \leq 5$  sec.

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

**SPECIFICATIONS (T<sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)**

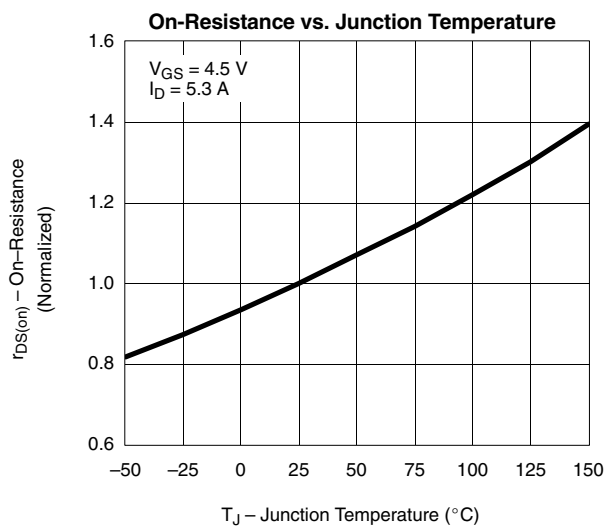
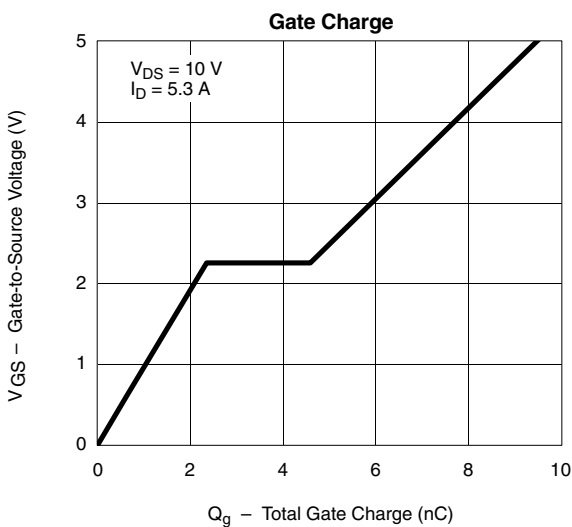
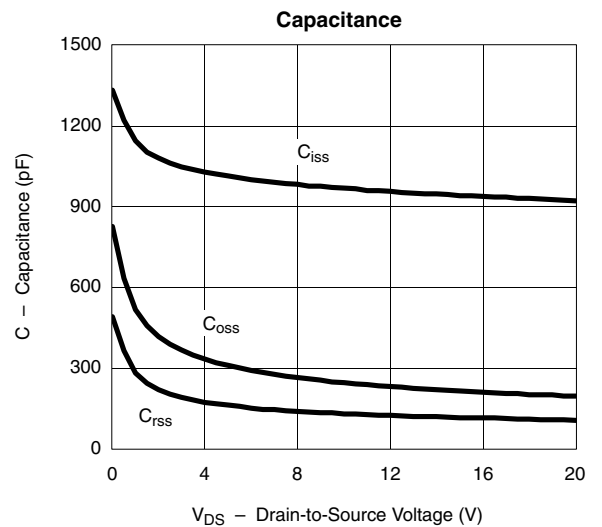
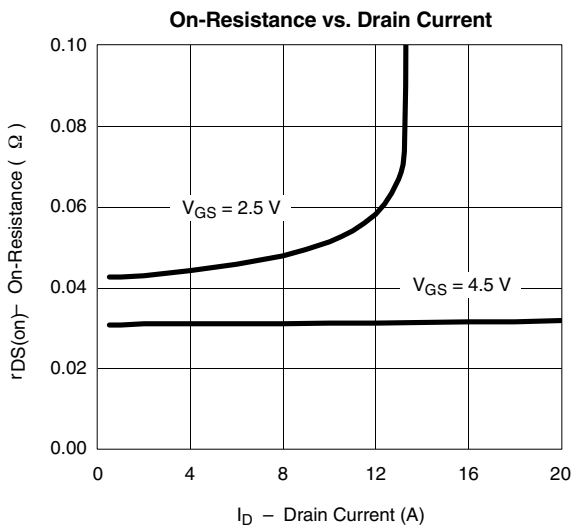
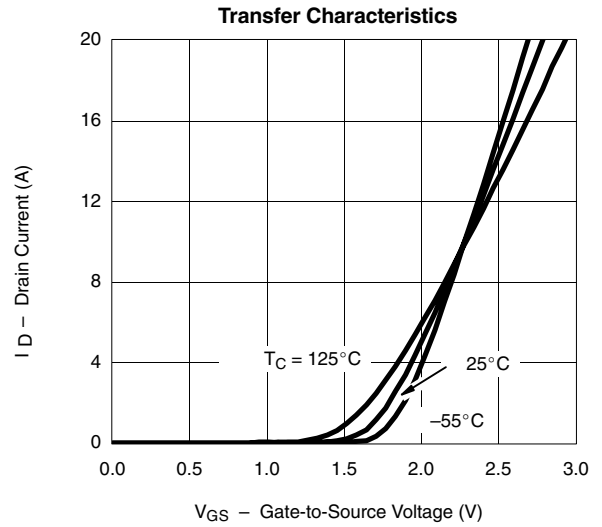
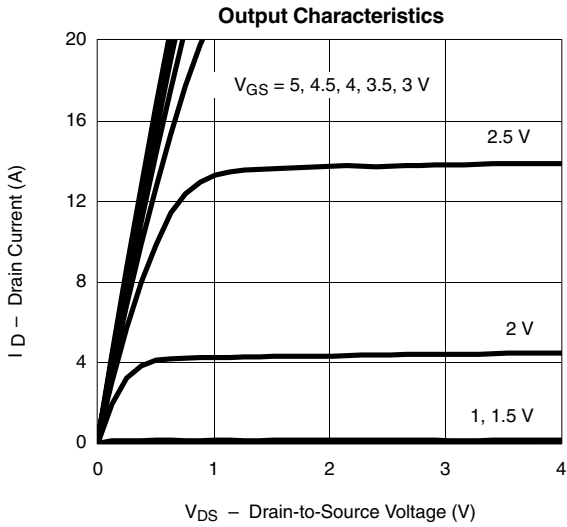
| Parameter                                     | Symbol              | Test Condition  | Min                                      | Typ   | Max   | Unit |
|---|---------------------|---|--|-------|-------|------|
| <b>Static</b>                                 |                     |   |  |       |       |      |
| Gate Threshold Voltage                        | V <sub>GS(th)</sub> | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA   | 0.6                                      |       | 1.6   | V    |
| Gate-Body Leakage                             | I <sub>GSS</sub>    | V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±12 V  |  |       | ±100  | nA   |
| Zero Gate Voltage Drain Current               | I <sub>DSS</sub>    | V <sub>DS</sub> = 20 V, V <sub>GS</sub> = 0 V   |  |       | 1     | μA   |
|   |                     | V <sub>DS</sub> = 20 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 70 °C   |  |       | 5     |      |
| On-State Drain Current <sup>a</sup>           | I <sub>D(on)</sub>  | V <sub>DS</sub> = 5 V, V <sub>GS</sub> = 4.5 V  | 10                                       |       |       | A    |
| Drain-Source On-State Resistance <sup>a</sup> | r <sub>DS(on)</sub> | V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 5.3 A   |  | 0.032 | 0.045 | Ω    |
|   |                     | V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 4.4 A   |  | 0.045 | 0.065 |      |
| Forward Transconductance <sup>a</sup>         | g <sub>fs</sub>     | V <sub>DS</sub> = 10 V, I <sub>D</sub> = 5.3 A  |  | 20    |       | S    |
| Diode Forward Voltage <sup>a</sup>            | V <sub>SD</sub>     | I <sub>S</sub> = 1.7 A, V <sub>GS</sub> = 0 V   |  |       | 1.2   | V    |
| <b>Dynamic<sup>b</sup></b>                    |                     |   |  |       |       |      |
| Total Gate Charge                             | Q <sub>g</sub>      | V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 5.3 A   |  | 10    | 20    | nC   |
| Gate-Source Charge                            | Q <sub>gs</sub>     |   |  | 2.5   |       |      |
| Gate-Drain Charge                             | Q <sub>gd</sub>     |   |  | 2.2   |       |      |
| Gate Resistance                               | R <sub>g</sub>      |   | 0.5                                      |       | 3.0   | Ω    |
| Turn-On Delay Time                            | t <sub>d(on)</sub>  | V <sub>DD</sub> = 10 V, R <sub>L</sub> = 10 Ω<br>I <sub>D</sub> ≅ 1 A, V <sub>GEN</sub> = 4.5 V, R <sub>G</sub> = 6 Ω |  | 30    | 50    | ns   |
| Rise Time                                     | t <sub>r</sub>      |   |  | 50    | 80    |      |
| Turn-Off Delay Time                           | t <sub>d(off)</sub> |   |  | 65    | 100   |      |
| Fall Time                                     | t <sub>f</sub>      |   |  | 35    | 60    |      |
| Source-Drain Reverse Recovery Time            | t <sub>rr</sub>     |   | I <sub>F</sub> = 1.7 A, di/dt = 100 A/μs |       | 60    |      |

## Notes

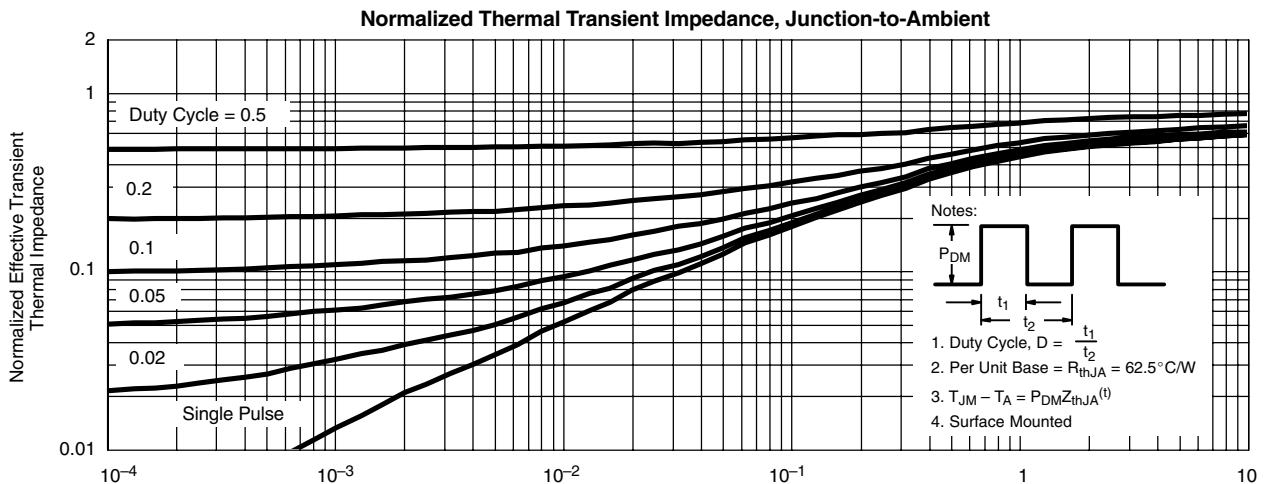
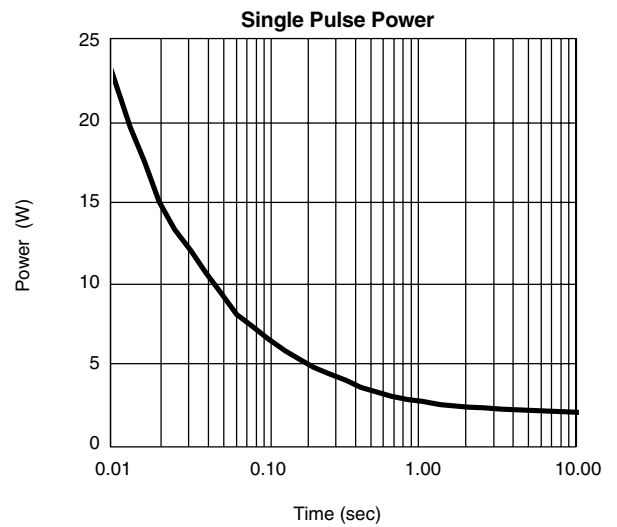
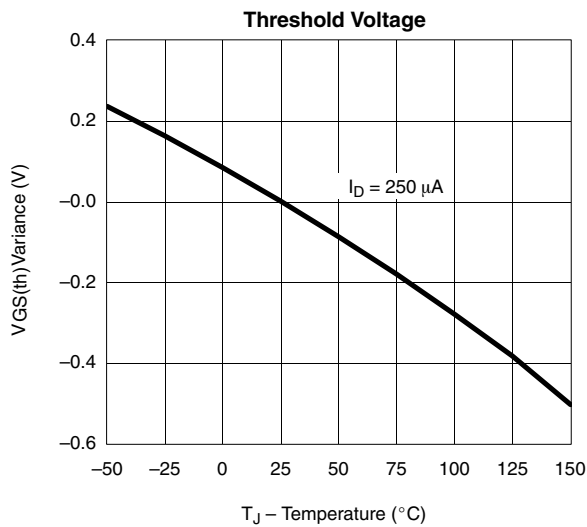
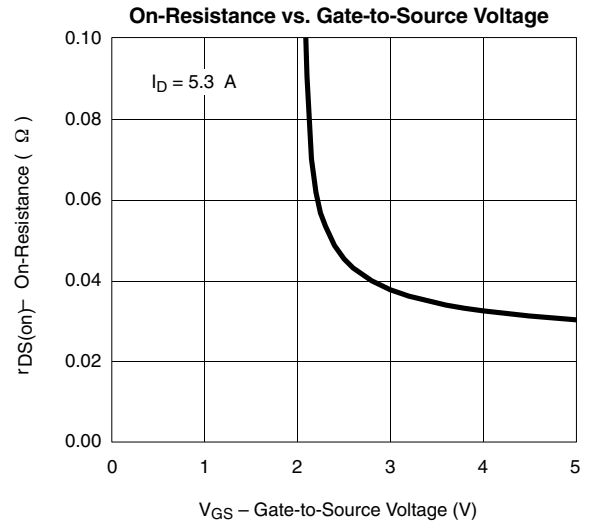
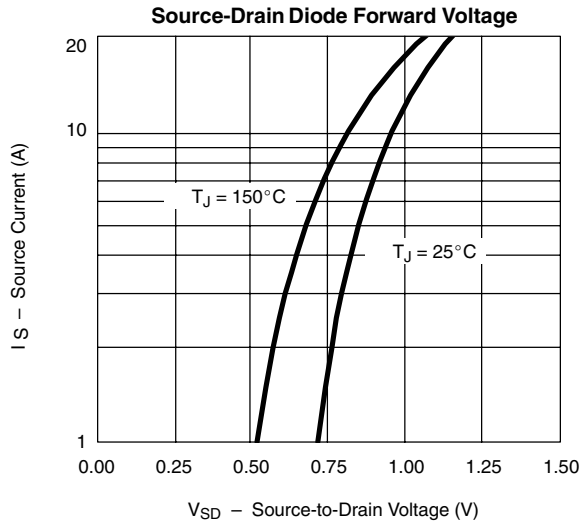
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.  
b. Guaranteed by design, not subject to production testing.



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



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