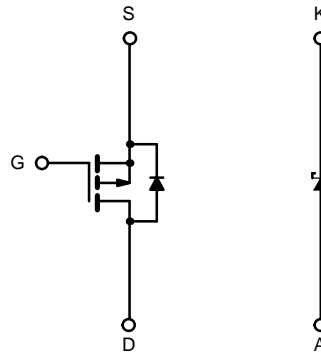
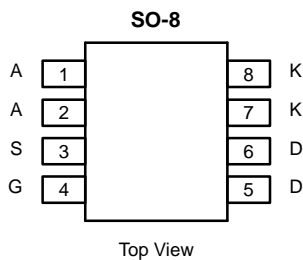


## P-Channel 30-V (D-S) MOSFET with Schottky Diode

| MOSFET PRODUCT SUMMARY |                           |           |
|------------------------|---------------------------|-----------|
| $V_{DS}$ (V)           | $r_{DS(on)}$ ( $\Omega$ ) | $I_D$ (A) |
| -30                    | 0.045 @ $V_{GS} = -10$ V  | $\pm 5$   |
|                        | 0.090 @ $V_{GS} = -4.5$ V | $\pm 3.5$ |

| SCHOTTKY PRODUCT SUMMARY |                                    |           |
|--------------------------|------------------------------------|-----------|
| $V_{KA}$ (V)             | $V_f$ (V)<br>Diode Forward Voltage | $I_F$ (A) |
| 30                       | 0.53 V @ 3 A                       | 3         |

LITTLE FOOT Plus™



P-Channel MOSFET

| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)     |                          |                |            |                  |
|---|--------------------------|----------------|------------|------------------|
| Parameter   |                          | Symbol         | Limit      | Unit             |
| Drain-Source Voltage (MOSFET)   |                          | $V_{DS}$       | -30        | V                |
| Reverse Voltage (Schottky)  |                          | $V_{KA}$       | 30         |                  |
| Gate-Source Voltage (MOSFET)  |                          | $V_{GS}$       | $\pm 20$   |                  |
| Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) (MOSFET) <sup>a, b</sup> | $T_A = 25^\circ\text{C}$ | $I_D$          | $\pm 5$    | A                |
|   | $T_A = 70^\circ\text{C}$ |                | $\pm 3.9$  |                  |
| Pulsed Drain Current (MOSFET)   |                          | $I_{DM}$       | $\pm 20$   |                  |
| Continuous Source Current (MOSFET Diode Conduction) <sup>a, b</sup>             |                          | $I_S$          | -1.7       |                  |
| Average Forward Current (Schottky)  |                          | $I_F$          | 3          |                  |
| Pulsed Forward Current (Schottky)   |                          | $I_{FM}$       | 20         |                  |
| Maximum Power Dissipation (MOSFET) <sup>a, b</sup>                              | $T_A = 25^\circ\text{C}$ | $P_D$          | 2          | W                |
|   | $T_A = 70^\circ\text{C}$ |                | 1.28       |                  |
| Maximum Power Dissipation (Schottky) <sup>a, b</sup>                            | $T_A = 25^\circ\text{C}$ |                | 1.83       |                  |
|   | $T_A = 70^\circ\text{C}$ |                | 1.17       |                  |
| Operating Junction and Storage Temperature Range                                |                          | $T_J, T_{stg}$ | -55 to 150 | $^\circ\text{C}$ |

Notes

- a. Surface Mounted on FR4 Board.
- b.  $t \leq 10$  sec.



| THERMAL RESISTANCE RATINGS                                     |          |            |         |         |      |
|--|----------|------------|---------|---------|------|
| Parameter  | Device   | Symbol     | Typical | Maximum | Unit |
| Maximum Junction-to-Ambient ( $t \leq 10$ sec) <sup>a</sup>    | MOSFET   | $R_{thJA}$ | 52      | 62.5    | °C/W |
|  | Schottky |            | 56      | 68      |      |
| Maximum Junction-to-Ambient ( $t =$ steady state) <sup>a</sup> | MOSFET   |            | 82      | 100     |      |
|  | Schottky |            | 91      | 110     |      |
| Maximum Junction-to-Foot                                       | MOSFET   | $R_{thJF}$ | 27      | 33      |      |
|  | Schottky |            | 32      | 40      |      |

## Notes

- a. Surface Mounted on FR4 Board.  
b.  $t \leq 10$  sec.

| MOSFET SPECIFICATIONS ( $T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) |              |  |      |       |           |               |
|--|--------------|--|------|-------|-----------|---------------|
| Parameter  | Symbol       | Test Condition   | Min  | Typ   | Max       | Unit          |
| <b>Static</b>  |              |  |      |       |           |               |
| Gate Threshold Voltage   | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = -250 \mu\text{A}$  | -1.0 |       |           | V             |
| Gate-Body Leakage  | $I_{GSS}$    | $V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$  |      |       | $\pm 100$ | nA            |
| Zero Gate Voltage Drain Current  | $I_{DSS}$    | $V_{DS} = -24 \text{ V}, V_{GS} = 0 \text{ V}$   |      |       | -1        | $\mu\text{A}$ |
|  |              | $V_{DS} = -24 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 75^\circ\text{C}$   |      |       | -10       |               |
| On-State Drain Current <sup>a</sup>                                      | $I_{D(on)}$  | $V_{DS} \geq -5 \text{ V}, V_{GS} = -10 \text{ V}$   | -20  |       |           | A             |
| Drain-Source On-State Resistance <sup>a</sup>                            | $r_{DS(on)}$ | $V_{GS} = -10 \text{ V}, I_D = -5 \text{ A}$   |      | 0.036 | 0.045     | $\Omega$      |
|  |              | $V_{GS} = -4.5 \text{ V}, I_D = -3.5 \text{ A}$  |      | 0.060 | 0.090     |               |
| Forward Transconductance <sup>a</sup>                                    | $g_{fs}$     | $V_{DS} = -15 \text{ V}, I_D = -5 \text{ A}$   |      | 9     |           | S             |
| Diode Forward Voltage <sup>a</sup>                                       | $V_{SD}$     | $I_S = -1.7 \text{ A}, V_{GS} = 0 \text{ V}$   |      | -0.75 | -1.2      | V             |
| <b>Dynamic<sup>b</sup></b>   |              |  |      |       |           |               |
| Total Gate Charge  | $Q_g$        | $V_{DS} = -15 \text{ V}, V_{GS} = -5 \text{ V}, I_D = -5 \text{ A}$  |      | 10    | 20        | nC            |
| Gate-Source Charge   | $Q_{gs}$     |  | 4.5  |       |           |               |
| Gate-Drain Charge  | $Q_{gd}$     |  | 3.6  |       |           |               |
| Turn-On Delay Time   | $t_{d(on)}$  | $V_{DD} = -15 \text{ V}, R_L = 15 \Omega$<br>$I_D \cong -1 \text{ A}, V_{GEN} = -10 \text{ V}, R_G = 6 \Omega$ |      | 13    | 25        | ns            |
| Rise Time  | $t_r$        |  | 15   | 30    |           |               |
| Turn-Off Delay Time  | $t_{d(off)}$ |  | 37   | 70    |           |               |
| Fall Time  | $t_f$        |  | 14   | 30    |           |               |
| Source-Drain Reverse Recovery Time                                       | $t_{rr}$     | $I_F = -1.7 \text{ A}, di/dt = 100 \text{ A}/\mu\text{s}$  |      | 35    | 70        |               |

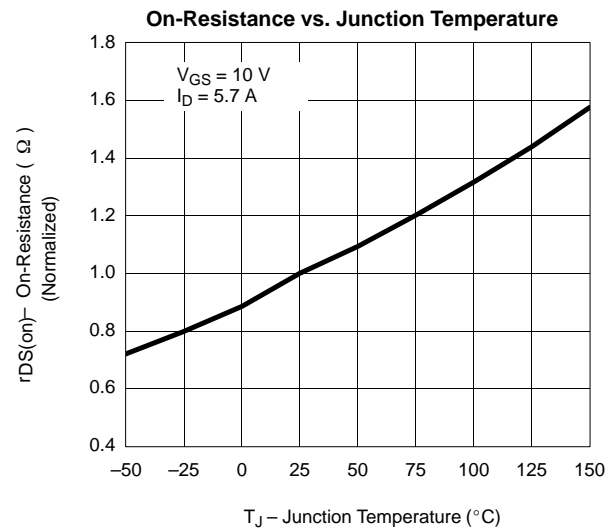
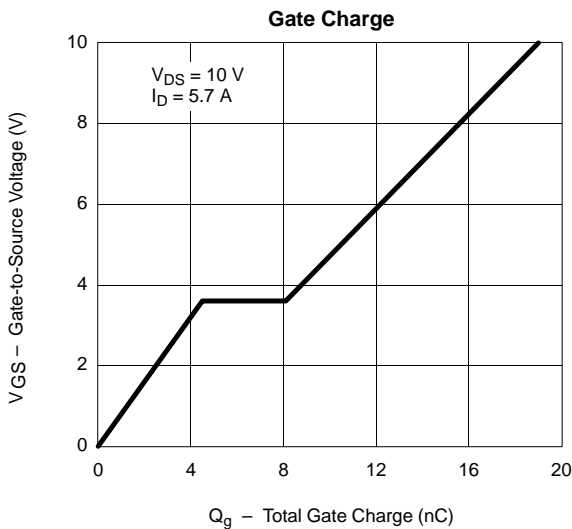
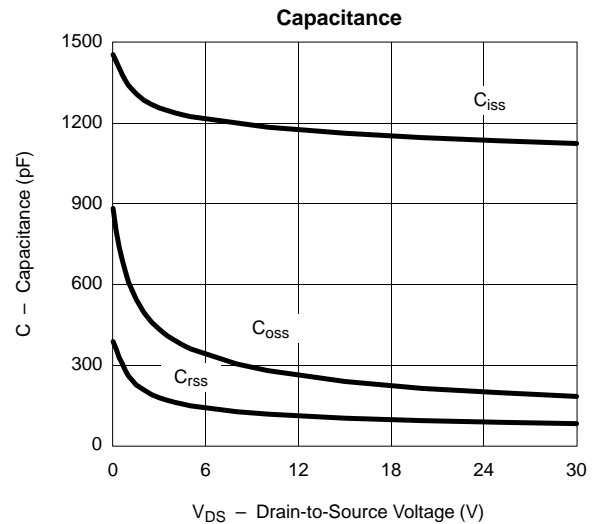
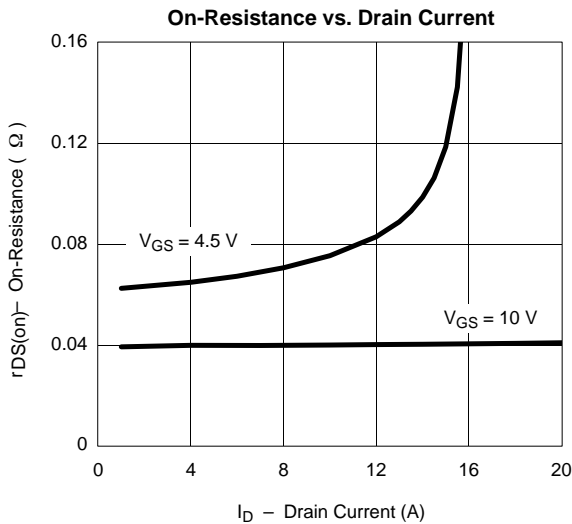
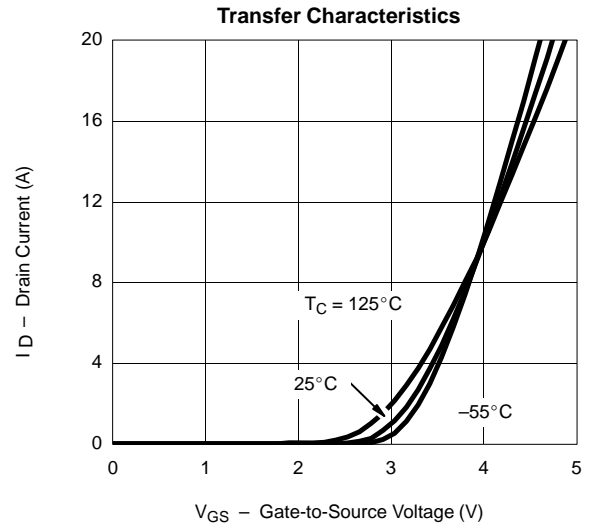
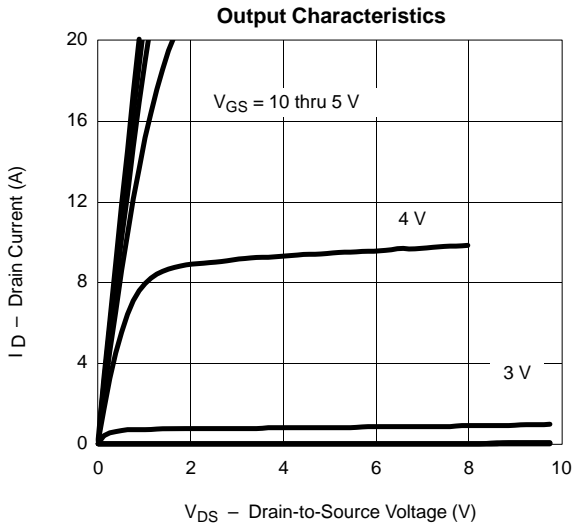
## Notes

- a. Pulse test; pulse width  $\leq 300 \mu\text{s}$ , duty cycle  $\leq 2\%$ .  
b. Guaranteed by design, not subject to production testing.

| SCHOTTKY SPECIFICATIONS ( $T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) |          |   |     |       |      |      |
|--|----------|---|-----|-------|------|------|
| Parameter  | Symbol   | Test Condition                                | Min | Typ   | Max  | Unit |
| Forward Voltage Drop   | $V_F$    | $I_F = 3 \text{ A}$                           |     | 0.485 | 0.53 | V    |
|  |          | $I_F = 3 \text{ A}, T_J = 125^\circ\text{C}$  |     | 0.42  | 0.47 |      |
| Maximum Reverse Leakage Current  | $I_{rm}$ | $V_r = 30 \text{ V}$                          |     | 0.008 | 0.1  | mA   |
|  |          | $V_r = 30 \text{ V}, T_J = 75^\circ\text{C}$  |     | 0.4   | 5    |      |
| Junction Capacitance   | $C_T$    | $V_r = 30 \text{ V}, T_J = 125^\circ\text{C}$ |     | 6.5   | 20   | pF   |
|  |          | $V_r = 15 \text{ V}$                          |     | 102   |      |      |



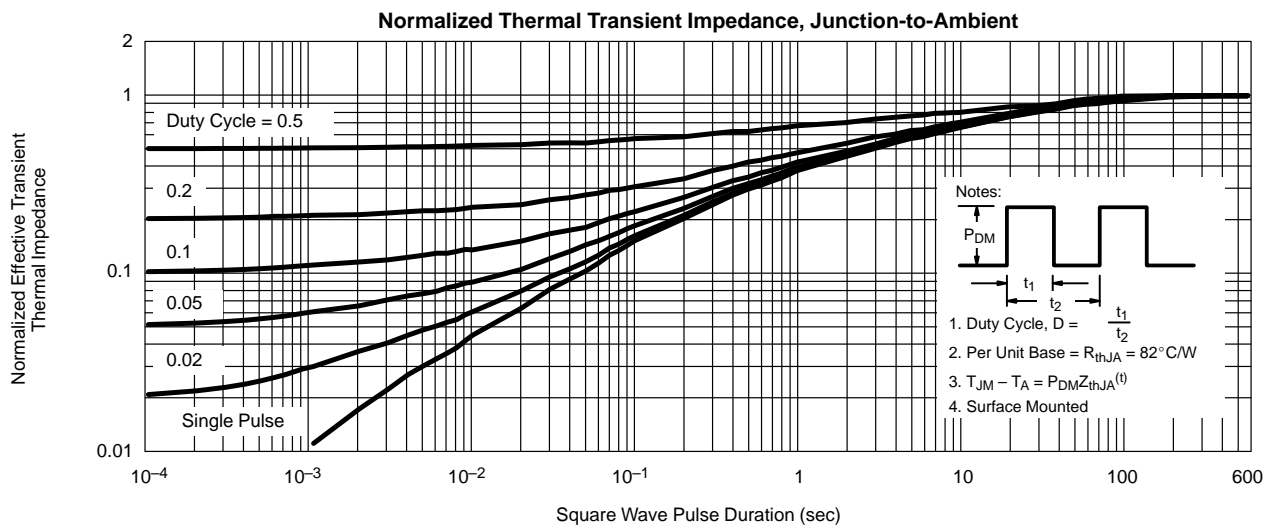
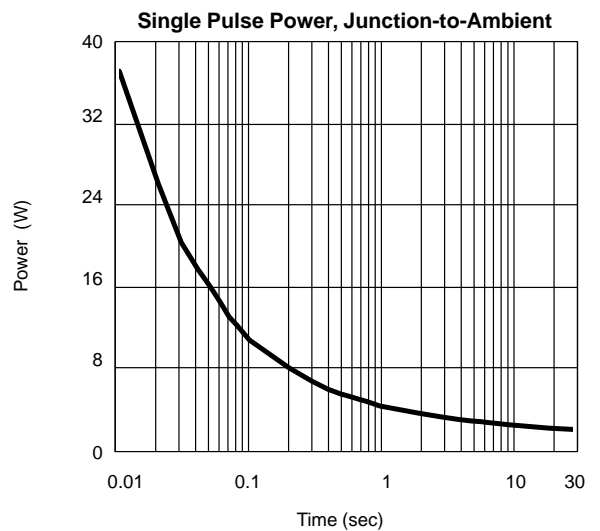
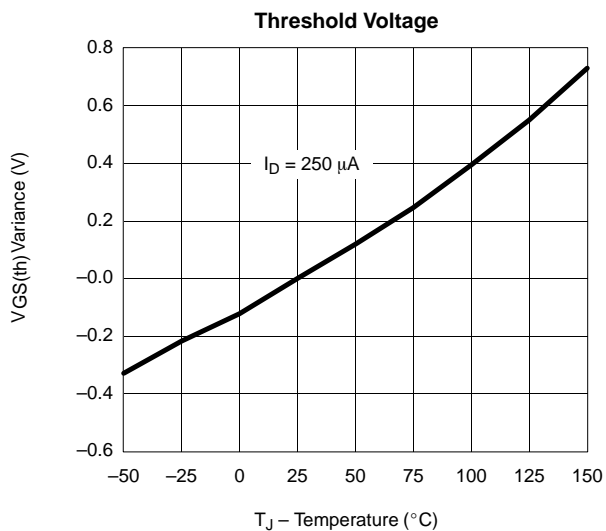
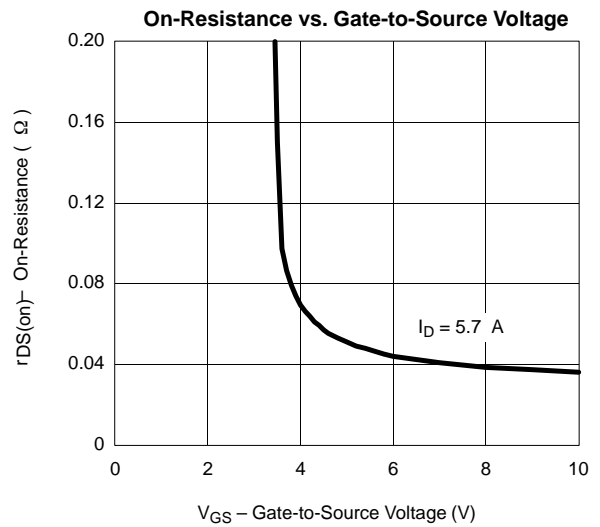
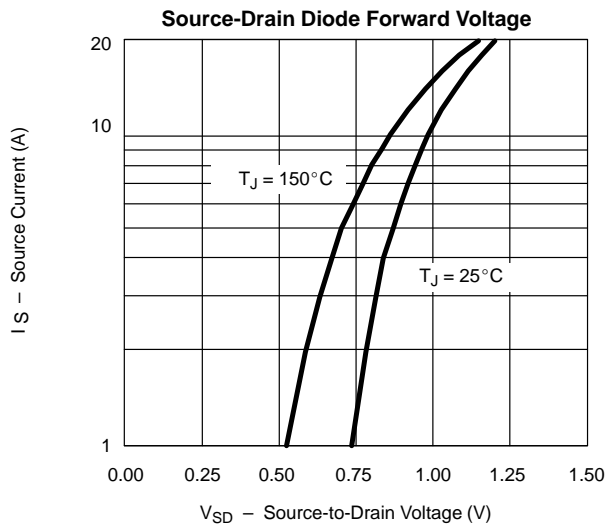
**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)** **MOSFET**





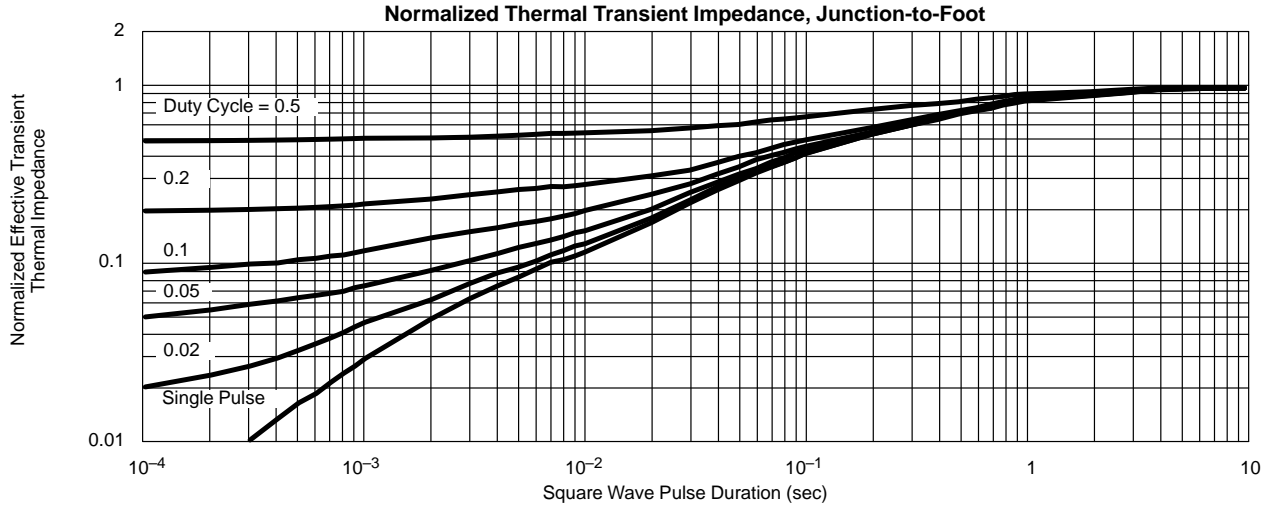
### TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

### MOSFET

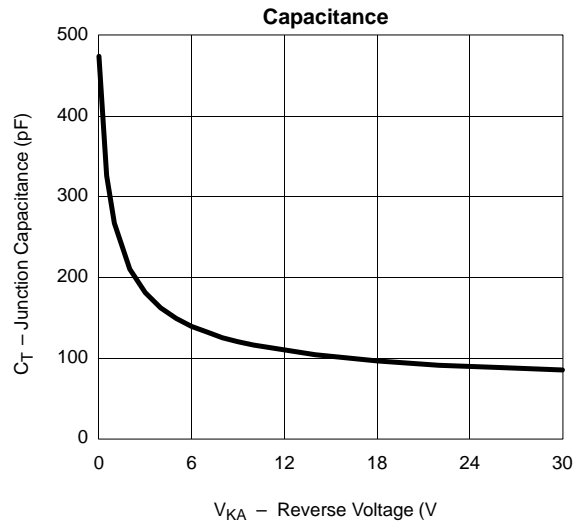
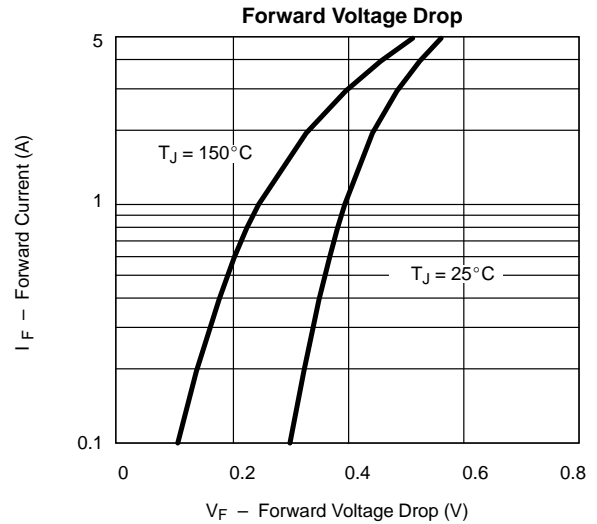
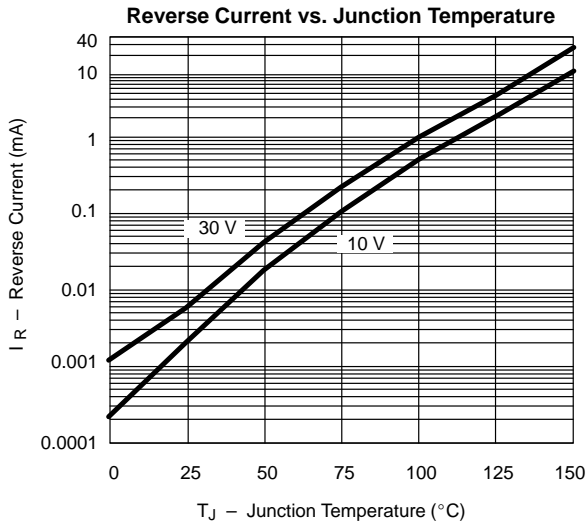




**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) MOSFET**



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





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

**SCHOTTKY**

