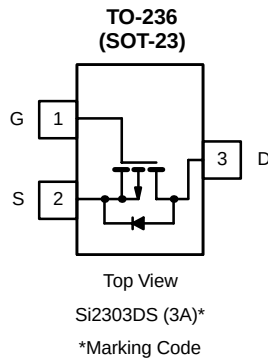




## P-Channel, 30-V (D-S) MOSFET

## PRODUCT SUMMARY

| $V_{DS}$ (V) | $r_{DS(on)}$ ( $\Omega$ ) | $I_D$ (A) <sup>b</sup> |
|--------------|---------------------------|------------------------|
| -30          | 0.240 @ $V_{GS} = -10$ V  | -1.4                   |
|              | 0.460 @ $V_{GS} = -4.5$ V | -1.0                   |

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$  UNLESS OTHERWISE NOTED)

| Parameter                                                      |                       | Symbol                            | 5 sec      | Steady State | Unit |
|----------------------------------------------------------------|-----------------------|-----------------------------------|------------|--------------|------|
| Drain-Source Voltage                                           |                       | V <sub>DS</sub>                   | −30        |              | V    |
| Gate-Source Voltage                                            |                       | V <sub>GS</sub>                   | ± 20       |              |      |
| Continuous Drain Current (T <sub>J</sub> = 150°C) <sup>b</sup> | T <sub>A</sub> = 25°C | I <sub>D</sub>                    | −1.4       | −1.3         | A    |
|                                                                | T <sub>A</sub> = 70°C |                                   | −1.1       | −1.0         |      |
| Pulsed Drain Current <sup>a</sup>                              |                       | I <sub>DM</sub>                   | −10        |              |      |
| Continuous Source Current (Diode Conduction) <sup>b</sup>      |                       | I <sub>S</sub>                    | −0.75      | −0.6         |      |
| Power Dissipation <sup>b</sup>                                 | T <sub>A</sub> = 25°C | P <sub>D</sub>                    | 0.9        | 0.7          | W    |
|                                                                | T <sub>A</sub> = 70°C |                                   | 0.57       | 0.45         |      |
| Operating Junction and Storage Temperature Range               |                       | T <sub>J</sub> , T <sub>stg</sub> | −55 to 150 |              | °C   |

## THERMAL RESISTANCE RATINGS

| Parameter                                | Symbol     | Typical | Maximum | Unit               |
|------------------------------------------|------------|---------|---------|--------------------|
| Maximum Junction-to-Ambient <sup>b</sup> | $R_{thJA}$ | 115     | 140     | $^\circ\text{C/W}$ |
| Maximum Junction-to-Ambient <sup>c</sup> |            | 140     | 175     |                    |

## Notes

- Pulse width limited by maximum junction temperature.
- Surface Mounted on FR4 Board,  $t \leq 5$  sec.
- Surface Mounted on FR4 Board.

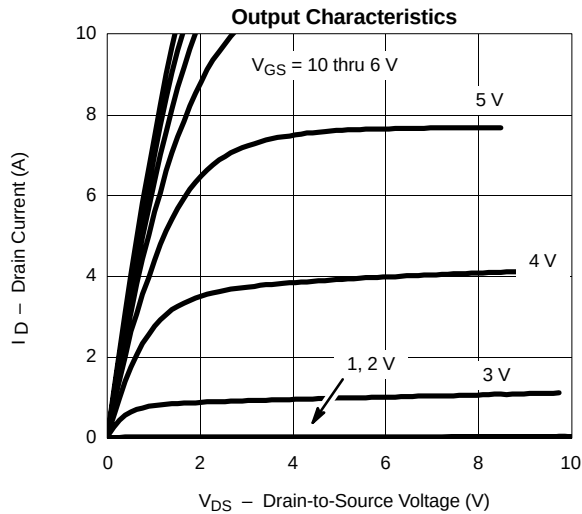
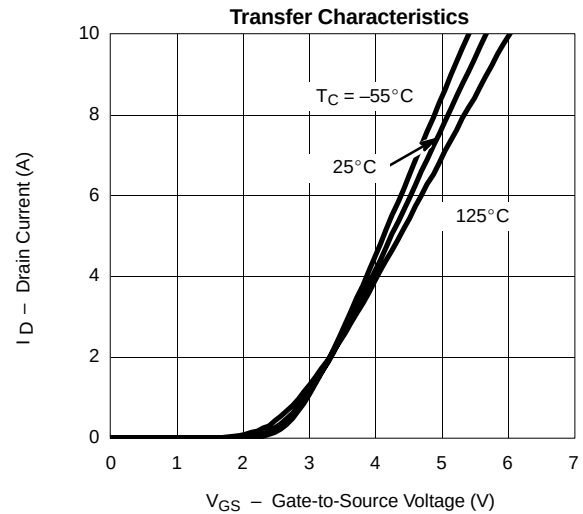
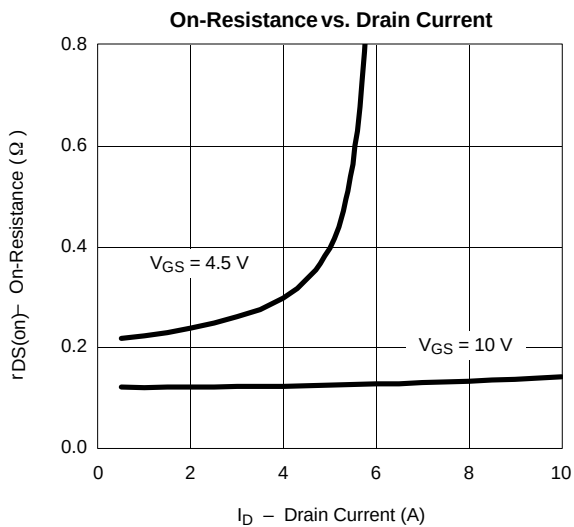
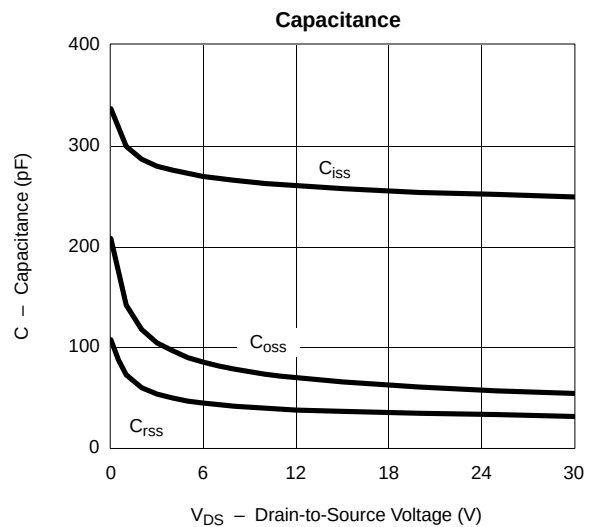
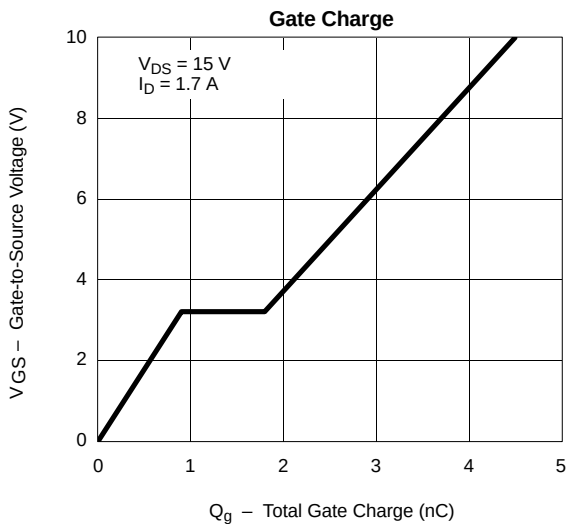
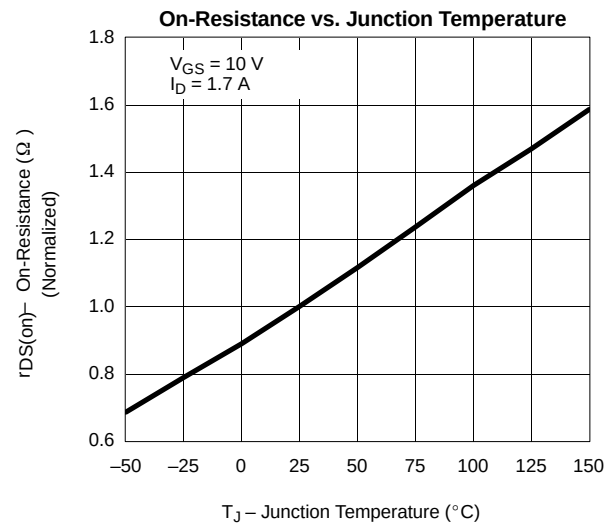
For SPICE model information via the Worldwide Web: <http://www.vishay.com/www/product/spice.htm>

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

| Parameter                               | Symbol        | Test Conditions                                                                                                                  | Limits |       |           | Unit          |
|-----------------------------------------|---------------|----------------------------------------------------------------------------------------------------------------------------------|--------|-------|-----------|---------------|
|                                         |               |                                                                                                                                  | Min    | Typ   | Max       |               |
| Static                                  |               |                                                                                                                                  |        |       |           |               |
| Drain-Source Breakdown Voltage          | $V_{(BR)DSS}$ | $V_{GS} = 0\text{ V}, I_D = -10\text{ }\mu\text{A}$                                                                              | -30    |       |           | V             |
| Gate-Threshold Voltage                  | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$                                                                                 | -1.0   |       | -3.0      |               |
| Gate-Body Leakage                       | $I_{GSS}$     | $V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$                                                                                  |        |       | $\pm 100$ | nA            |
| Zero Gate Voltage Drain Current         | $I_{DSS}$     | $V_{DS} = -30\text{ V}, V_{GS} = 0\text{ V}$                                                                                     |        |       | -1        | $\mu\text{A}$ |
|                                         |               | $V_{DS} = -30\text{ V}, V_{GS} = 0\text{ V}, T_J = 55^\circ\text{C}$                                                             |        |       | -10       |               |
| On-State Drain Current <sup>a</sup>     | $I_{D(on)}$   | $V_{DS} \leq -5\text{ V}, V_{GS} = -10\text{ V}$                                                                                 | -6     |       |           | A             |
| Drain-Source On-Resistance <sup>a</sup> | $r_{DS(on)}$  | $V_{GS} = -10\text{ V}, I_D = -1.7\text{ A}$                                                                                     |        | 0.120 | 0.240     | $\Omega$      |
|                                         |               | $V_{GS} = -4.5\text{ V}, I_D = -1.3\text{ A}$                                                                                    |        | 0.230 | 0.460     |               |
| Forward Transconductance <sup>a</sup>   | $g_{fs}$      | $V_{DS} = -5\text{ V}, I_D = -1.7\text{ A}$                                                                                      |        | 2.4   |           | S             |
| Diode Forward Voltage                   | $V_{SD}$      | $I_S = -0.75\text{ A}, V_{GS} = 0\text{ V}$                                                                                      |        | -0.80 | -1.2      | V             |
| Dynamic <sup>b</sup>                    |               |                                                                                                                                  |        |       |           |               |
| Total Gate Charge                       | $Q_g$         | $V_{DS} = -15\text{ V}, V_{GS} = -10\text{ V}$<br>$I_D \cong -1.7\text{ A}$                                                      |        | 4.5   | 10        | nC            |
| Gate-Source Charge                      | $Q_{gs}$      |                                                                                                                                  |        | 0.9   |           |               |
| Gate-Drain Charge                       | $Q_{gd}$      |                                                                                                                                  |        | 0.9   |           |               |
| Input Capacitance                       | $C_{iss}$     | $V_{DS} = -15\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$                                                                            |        | 260   |           | pF            |
| Output Capacitance                      | $C_{oss}$     |                                                                                                                                  |        | 65    |           |               |
| Reverse Transfer Capacitance            | $C_{rss}$     |                                                                                                                                  |        | 35    |           |               |
| Switching <sup>c</sup>                  |               |                                                                                                                                  |        |       |           |               |
| Turn-On Time                            | $t_{d(on)}$   | $V_{DD} = -15\text{ V}, R_L = 15\text{ }\Omega$<br>$I_D \cong -1.0\text{ A}, V_{GEN} = -4.5\text{ V}$<br>$R_G = 6\text{ }\Omega$ |        | 6     | 20        | ns            |
|                                         | $t_r$         |                                                                                                                                  |        | 10    | 20        |               |
| Turn-Off Time                           | $t_{d(off)}$  |                                                                                                                                  |        | 15    | 35        |               |
|                                         | $t_f$         |                                                                                                                                  |        | 7     | 20        |               |

## Notes

- a. Pulse test:  $PW \leq 300\text{ }\mu\text{s}$  duty cycle  $\leq 2\%$ .  
b. For DESIGN AID ONLY, not subject to production testing.  
c. Switching time is essentially independent of operating temperature. • FaxBack 408-970-5600

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

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