

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

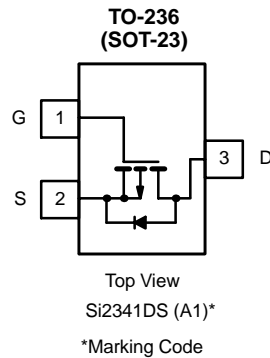
| <b>PRODUCT SUMMARY</b> |                           |                        |
|------------------------|---------------------------|------------------------|
| $V_{DS}$ (V)           | $r_{DS(on)}$ ( $\Omega$ ) | $I_D$ (A) <sup>b</sup> |
| -30                    | 0.072 @ $V_{GS} = -10$ V  | -2.8                   |
|                        | 0.120 @ $V_{GS} = -4.5$ V | -2.0                   |

**FEATURES**

- TrenchFET<sup>®</sup> Power MOSFETS

**APPLICATIONS**

- Load Switch
- PA Switch



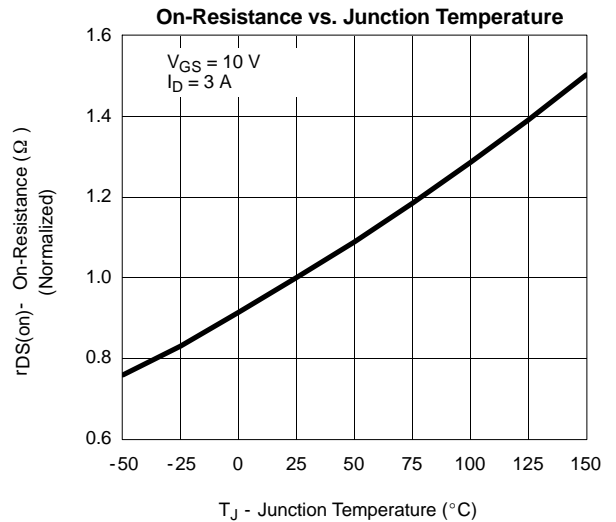
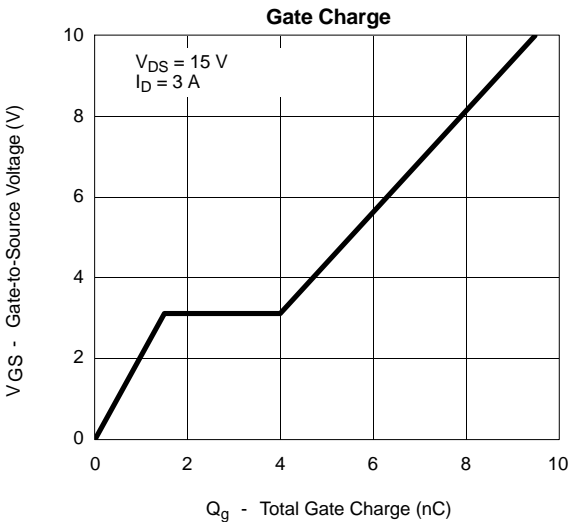
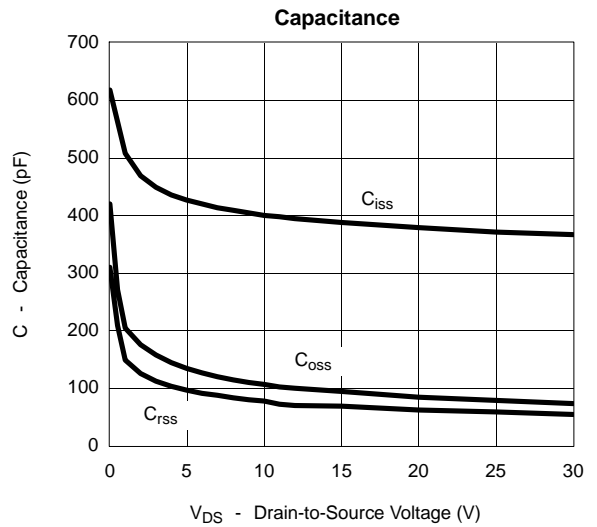
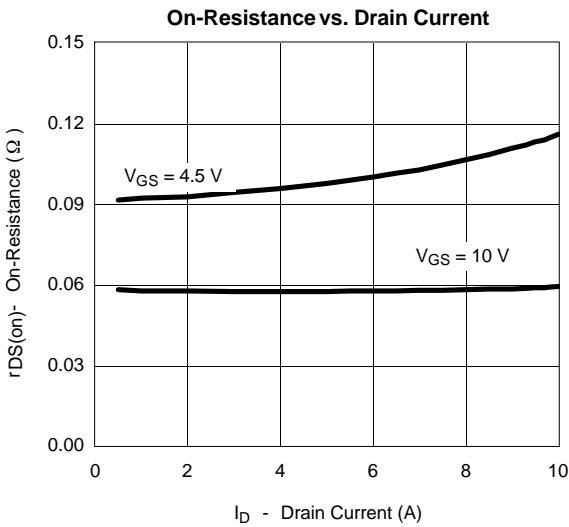
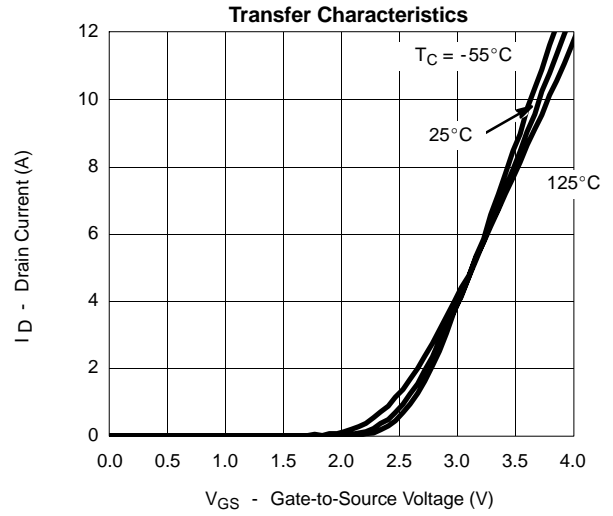
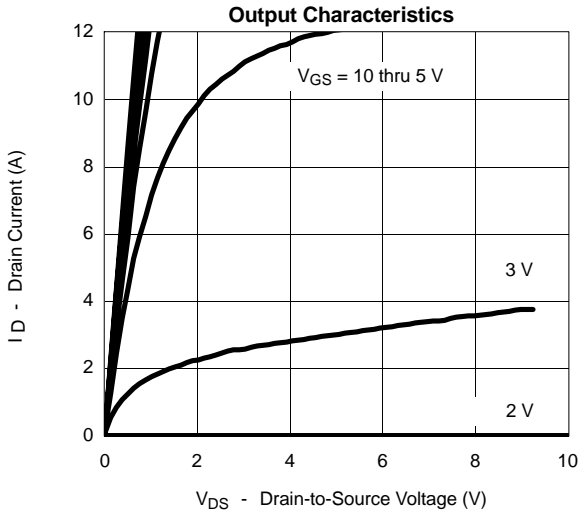
Ordering Information: Si2341DS

| <b>ABSOLUTE MAXIMUM RATINGS (<math>T_A = 25^\circ\text{C}</math> UNLESS OTHERWISE NOTED)</b> |                          |                |            |              |                  |
|--|--------------------------|----------------|------------|--------------|------------------|
| Parameter  |                          | Symbol         | 5 sec      | Steady State | Unit             |
| Drain-Source Voltage   |                          | $V_{DS}$       | -30        |              | V                |
| Gate-Source Voltage  |                          | $V_{GS}$       | $\pm 20$   |              |                  |
| Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>b</sup>                          | $T_A = 25^\circ\text{C}$ | $I_D$          | -2.8       | -2.5         | A                |
|  | $T_A = 70^\circ\text{C}$ |                | -2.2       | -2.0         |                  |
| Pulsed Drain Current <sup>a</sup>  |                          | $I_{DM}$       | -12        |              |                  |
| Continuous Source Current (Diode Conduction) <sup>b</sup>                                    |                          | $I_S$          | -0.75      | -0.6         |                  |
| Power Dissipation <sup>b</sup>   | $T_A = 25^\circ\text{C}$ | $P_D$          | 0.9        | 0.71         | W                |
|  | $T_A = 70^\circ\text{C}$ |                | 0.57       | 0.45         |                  |
| Operating Junction and Storage Temperature Range   |                          | $T_J, T_{stg}$ | -55 to 150 |              | $^\circ\text{C}$ |

| <b>THERMAL RESISTANCE RATINGS</b>        |            |         |         |                    |
|--|------------|---------|---------|--------------------|
| 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     |                    |
| Maximum Junction-to-Foot (Drain)         | $R_{thJF}$ | 60      | 75      |                    |

| <b>SPECIFICATIONS (T<sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)</b> |                      |  |        |       |       |      |
|--|----------------------|--|--------|-------|-------|------|
| Parameter  | Symbol               | Test Conditions  | Limits |       |       | Unit |
|  |                      |  | Min    | Typ   | Max   |      |
| <b>Static</b>  |                      |  |        |       |       |      |
| Drain-Source Breakdown Voltage                                       | V <sub>(BR)DSS</sub> | V <sub>GS</sub> = 0 V, I <sub>D</sub> = -10 μA   | -30    |       |       | V    |
| Gate-Threshold Voltage   | V <sub>GS(th)</sub>  | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 μA   | -1.0   |       | -3.0  |      |
| Gate-Body Leakage  | I <sub>GSS</sub>     | V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V   |        |       | ±100  | nA   |
| Zero Gate Voltage Drain Current                                      | I <sub>DSS</sub>     | V <sub>DS</sub> = -24 V, V <sub>GS</sub> = 0 V   |        |       | -1    | μA   |
|  |                      | V <sub>DS</sub> = -24 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55 °C   |        |       | -10   |      |
| On-State Drain Current <sup>a</sup>                                  | I <sub>D(on)</sub>   | V <sub>DS</sub> ≤ -5 V, V <sub>GS</sub> = -10 V  | -6     |       |       | A    |
| Drain-Source On-Resistance <sup>a</sup>                              | r <sub>DS(on)</sub>  | V <sub>GS</sub> = -10 V, I <sub>D</sub> = -2.8 A   |        | 0.057 | 0.072 | Ω    |
|  |                      | V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -2.0 A  |        | 0.090 | 0.120 |      |
| Forward Transconductance <sup>a</sup>                                | g <sub>fs</sub>      | V <sub>DS</sub> = -5 V, I <sub>D</sub> = -2.8 A  |        | 8.0   |       | S    |
| Diode Forward Voltage  | V <sub>SD</sub>      | I <sub>S</sub> = -0.75 A, V <sub>GS</sub> = 0 V  |        | -0.8  | -1.2  | V    |
| <b>Dynamic<sup>b</sup></b>   |                      |  |        |       |       |      |
| Total Gate Charge  | Q <sub>g</sub>       | V <sub>DS</sub> = -15 V, V <sub>GS</sub> = -10 V<br>I <sub>D</sub> ≅ -2.8 A  |        | 9.5   | 15    | nC   |
| Gate-Source Charge   | Q <sub>gs</sub>      |  |        | 1.5   |       |      |
| Gate-Drain Charge  | Q <sub>gd</sub>      |  |        | 2.5   |       |      |
| Input Capacitance  | C <sub>iss</sub>     | V <sub>DS</sub> = -15 V, V <sub>GS</sub> = 0, f = 1 MHz  |        | 400   |       | pF   |
| Output Capacitance   | C <sub>oss</sub>     |  |        | 95    |       |      |
| Reverse Transfer Capacitance   | C <sub>rss</sub>     |  |        | 70    |       |      |
| <b>Switching<sup>c</sup></b>   |                      |  |        |       |       |      |
| Turn-On Time   | t <sub>d(on)</sub>   | V <sub>DD</sub> = -15 V, R <sub>L</sub> = 15 Ω<br>I <sub>D</sub> ≅ -1.0 A, V <sub>GEN</sub> = -4.5 V<br>R <sub>G</sub> = 6 Ω |        | 7     | 15    | ns   |
|  | t <sub>r</sub>       |  |        | 15    | 25    |      |
| Turn-Off Time  | t <sub>d(off)</sub>  |  |        | 20    | 30    |      |
|  | t <sub>f</sub>       |  |        | 20    | 30    |      |

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



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

