

SOT-23 Plastic-Encapsulate MOSFET 20V N-Channel MOSFET

**HALOGEN
FREE**

Product Summary

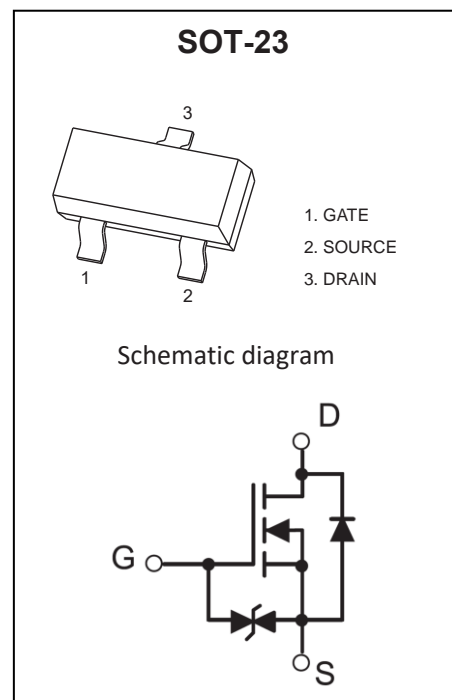
| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | I_D |
|---------------|-----------------|-------|
| 20V | 14mΩ@10V | 7A |
| | 16mΩ@4.5V | |
| | 17mΩ@3.8V | |
| | 20mΩ@2.5V | |
| | 48mΩ@1.8V | |

Feature

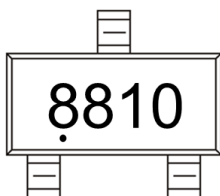
- Surface Mount Package
- Low $R_{DS(ON)}$
- ESD Protect

Application

- Load/Power Switching
- Small Portable Electronics



MARKING:



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|--|-----------------|---------------------------|--------------------|
| Drain-Source Voltage | V_{DS} | 20 | V |
| Gate-Source Voltage | V_{GS} | ±12 | V |
| Continuous Drain Current ^{1,5} | I_D | $T_A = 25^\circ\text{C}$ | 7 |
| | | $T_A = 100^\circ\text{C}$ | 4.4 |
| Pulsed Drain Current ² | I_{DM} | 30 | A |
| Power Dissipation ^{4,5} | P_D | 0.3 | W |
| Thermal Resistance from Junction to Ambient ⁵ | $R_{\theta JA}$ | 417 | $^\circ\text{C/W}$ |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -55~ +150 | $^\circ\text{C}$ |

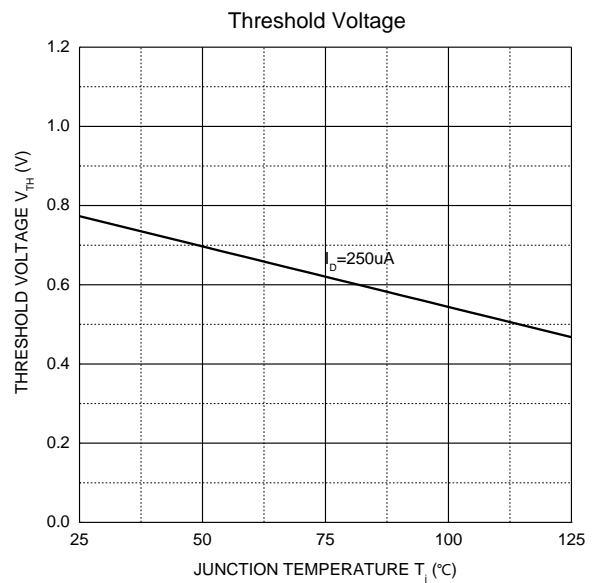
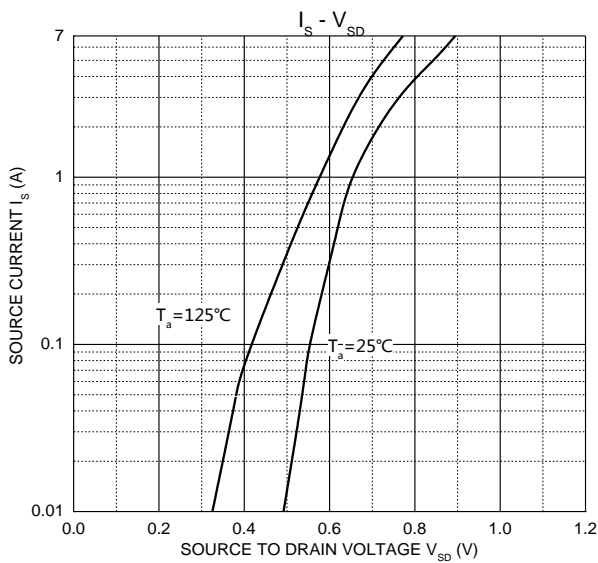
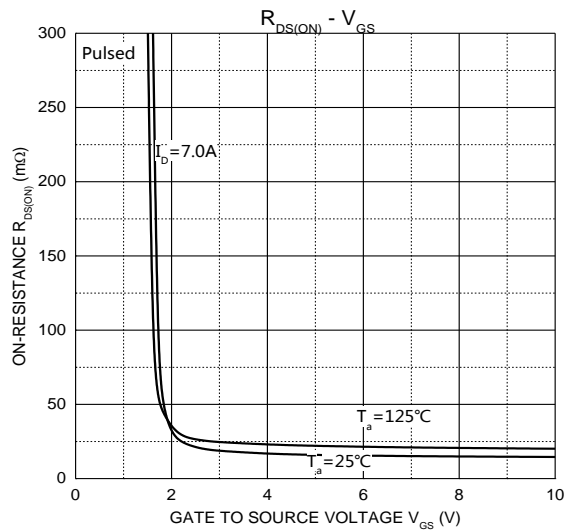
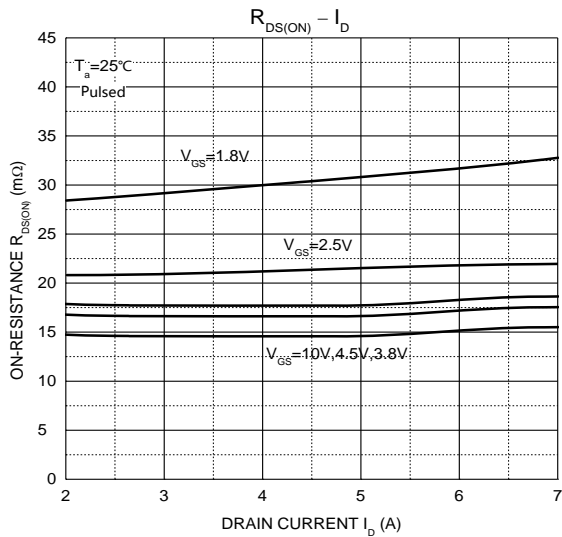
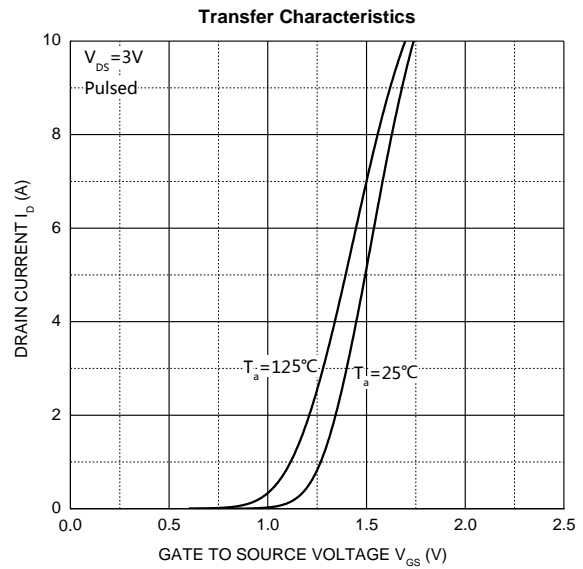
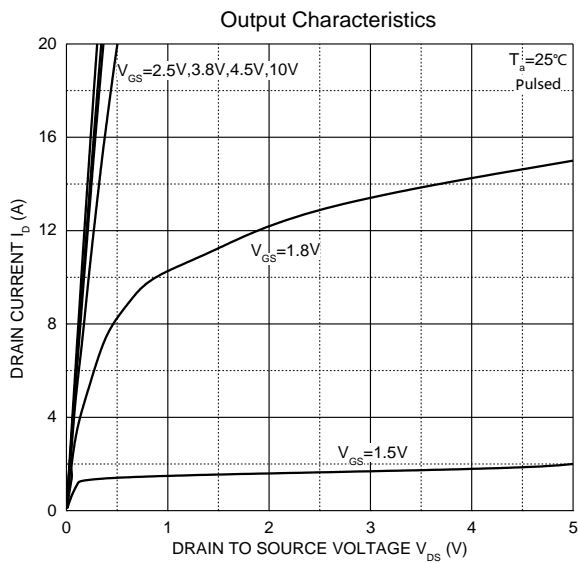
Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

| Parameter | Symbol | Test Condition | Min | Type | Max | Unit |
|--|---------------|---|-----|------|----------|------------|
| Off Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$ | 20 | | | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 16V, V_{GS} = 0V$ | | | 1 | μA |
| Gate-Body Leakage Current | I_{GSS} | $V_{GS} = \pm 4.5V, V_{DS} = 0V$ | | | ± 1 | μA |
| | | $V_{GS} = \pm 8.0V, V_{DS} = 0V$ | | | ± 10 | μA |
| On Characteristics³ | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\mu A$ | 0.4 | 0.7 | 1.0 | V |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS} = 10V, I_D = 7.0A$ | | 14 | 20 | m Ω |
| | | $V_{GS} = 4.5V, I_D = 6.6A$ | | 16 | 22 | |
| | | $V_{GS} = 3.8V, I_D = 6.0A$ | | 17 | 26 | |
| | | $V_{GS} = 2.5V, I_D = 5.5A$ | | 20 | 33 | |
| | | $V_{GS} = 1.8V, I_D = 3.0A$ | | 48 | 70 | |
| Dynamic Characteristics⁴ | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$ | | 740 | | pF |
| Output Capacitance | C_{oss} | | | 141 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 136 | | |
| Switching Characteristics⁴ | | | | | | |
| Total Gate Charge | Q_g | $V_{DS} = 10V, V_{GS} = 4.5V, I_D = 7.0A$ | | 15 | | nC |
| Gate-Source Charge | Q_{gs} | | | 0.8 | | |
| Gate-Drain Charge | Q_{gd} | | | 3.2 | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD} = 10V, V_{GS} = 5V, R_L = 1.35\Omega,$ $R_G = 3\Omega$ | | 6 | | ns |
| Turn-On Rise Time | t_r | | | 13 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | | 52 | | |
| Turn-Off Fall Time | t_f | | | 16 | | |
| Source-Drain Diode Characteristics | | | | | | |
| Diode Forward Voltage ³ | V_{SD} | $V_{GS} = 0V, I_S = 1A$ | | | 1.2 | V |

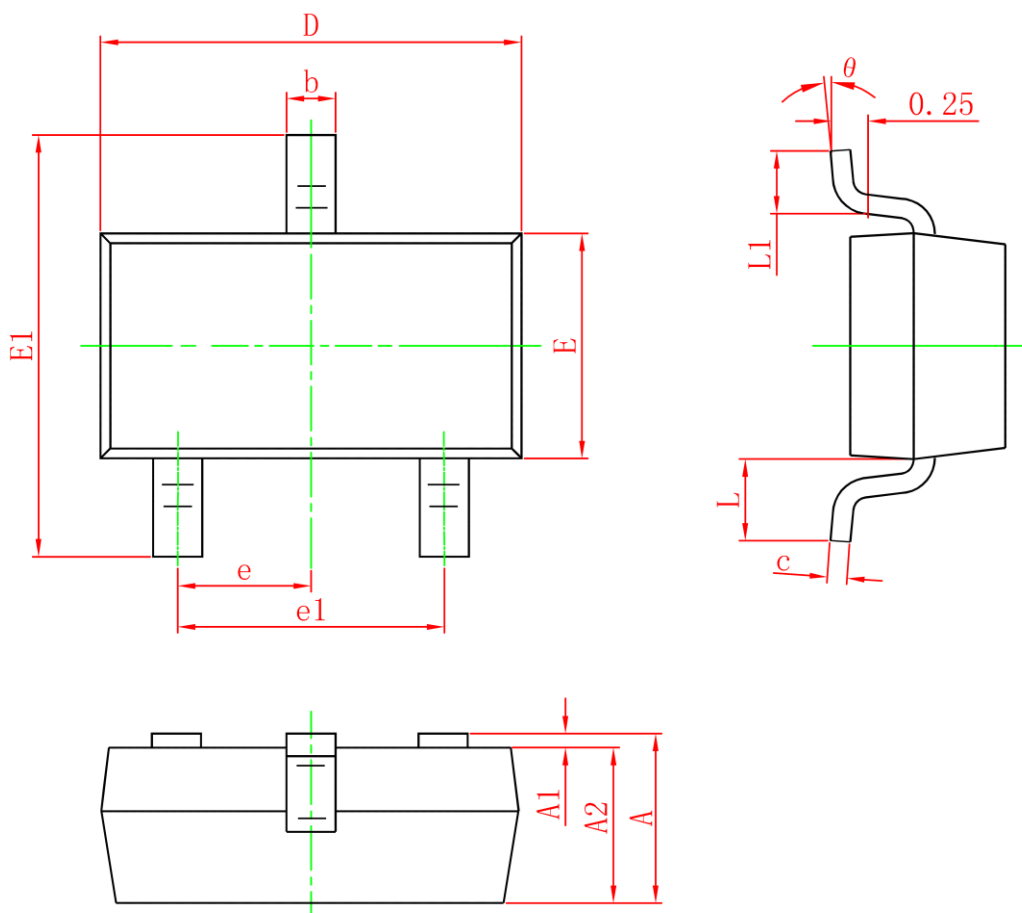
Notes :

- 1.The maximum current rating is limited by package.
- 2.Pulse Test : Pulse Width $\leq 10\mu s$, duty cycle $\leq 1\%$.
- 3.Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 4.The power dissipation P_D is limited by $T_{J(MAX)} = 150^\circ\text{C}$.
- 5.Device mounted on $1in^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$.

Typical Characteristics



SOT-23 Package Information



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|----------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 0.900 | 1.300 | 0.035 | 0.051 |
| A1 | 0 | 0.100 | 0 | 0.004 |
| A2 | 0.900 | 1.200 | 0.035 | 0.047 |
| b | 0.300 | 0.550 | 0.012 | 0.022 |
| c | 0.080 | 0.158 | 0.003 | 0.006 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E | 1.150 | 1.500 | 0.045 | 0.059 |
| E1 | 2.200 | 2.700 | 0.087 | 0.106 |
| e | 0.950TYP | | 0.037TYP | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.550REF | | 0.022REF | |
| L1 | 0.300 | 0.500 | 0.012 | 0.020 |
| θ | 0° | 8° | 0° | 8° |