



Description

The DMN2050L-7 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

$V_{DS} = 20V$ $I_D = 6.0A$

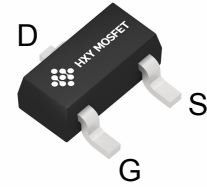
$R_{DS(ON)} < 27m\Omega @ V_{GS}=4.5V$

Application

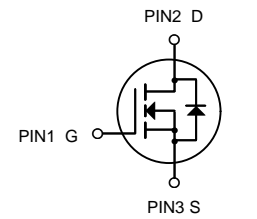
Battery protection

Load switch

Uninterruptible power supply



SOT-23



N-Channel MOSFET

Ordering Information

| Product ID | Pack | Brand | Qty(PCS) |
|------------|--------|------------|----------|
| DMN2050L-7 | SOT-23 | HXY MOSFET | 3000 |

Absolute Maximum Ratings ($T_A=25^\circ C$ unless otherwise noted)

| Symbol | Parameter | Limit | Unit |
|-----------------|--|------------|--------------|
| V_{DS} | Drain-Source Voltage | 20 | V |
| V_{GS} | Gate-Source Voltage | ± 12 | V |
| I_D | Drain Current-Continuous | 6 | A |
| I_{DM} | Drain Current-Pulsed (Note 1) | 25 | A |
| P_D | Maximum Power Dissipation | 0.35 | W |
| T_J, T_{STG} | Operating Junction and Storage Temperature Range | -55 To 150 | $^\circ C$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient (Note 2) | 100 | $^\circ C/W$ |



$T_a=25\text{ }^\circ\text{C}$ unless otherwise specified

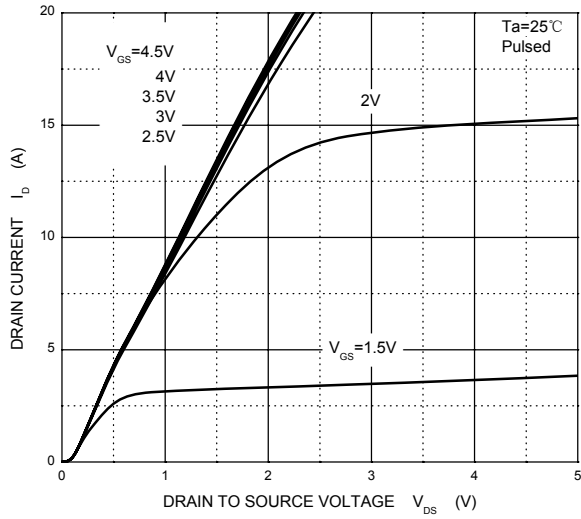
| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|----------------------------------|---------------|--|-----|------|-----------|------------|
| Static Parameters | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$ | 20 | | | V |
| Gate-source leakage current | I_{GSS} | $V_{DS} = 0V, V_{GS} = \pm 12V$ | | | ± 100 | nA |
| Zero gate voltage drain current | I_{DSS} | $V_{DS} = 16V, V_{GS} = 0V$ | | | 1.0 | μA |
| Gate threshold voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\mu A$ | 0.5 | 0.7 | 1.0 | V |
| Drain-source on-state resistance | $R_{DS(on)}$ | $V_{GS} = 4.5V, I_D = 5.0A$ | | 22 | 27 | m Ω |
| | | $V_{GS} = 2.5V, I_D = 4.0A$ | | 35 | 42 | |
| | | $V_{GS} = 1.8V, I_D = 2.0A$ | | | 73 | |
| Diode forward voltage | V_{SD} | $V_{GS} = 0V, I_S = 1A$ | | 0.75 | 1 | V |
| Forward transconductance | g_{fs} | $V_{DS} = 5V, I_D = 3.8A$ | 4 | | | S |
| Dynamic Parameters* | | | | | | |
| Input capacitance | C_{iss} | $V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$ | | 630 | | pF |
| Output capacitance | C_{oss} | | | 164 | | |
| Reverse transfer capacitance | C_{rss} | | | 137 | | |
| Gate resistance | R_g | $V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$ | | 1.5 | | Ω |
| Switching Parameters* | | | | | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{GS} = 5V, V_{DS} = 10V,$ $R_L = 1.7\Omega, R_{GEN} = 6\Omega$ | | 5.5 | | ns |
| Rise time | t_r | | | 14 | | |
| Turn-off delay time | $t_{d(off)}$ | | | 29 | | |
| Fall time | t_f | | | 10.2 | | |

*These parameters have no way to verify.

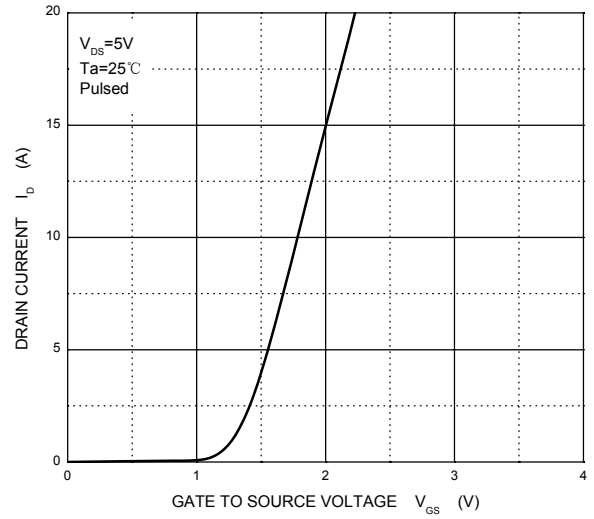


Typical Characteristics

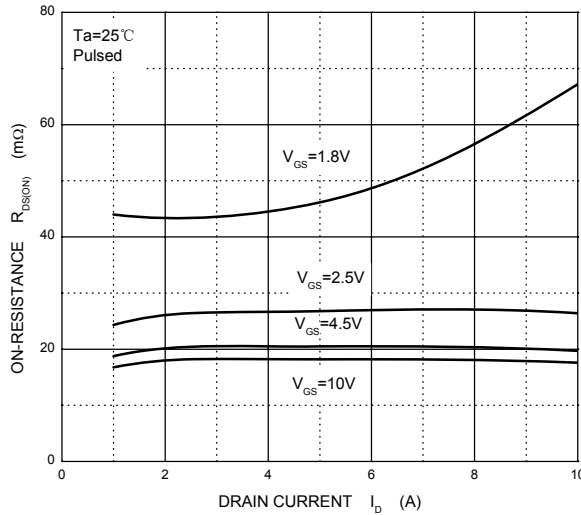
Output Characteristics



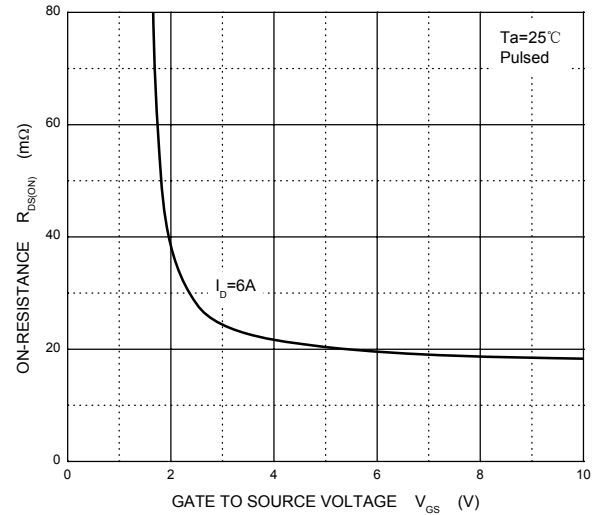
Transfer Characteristics



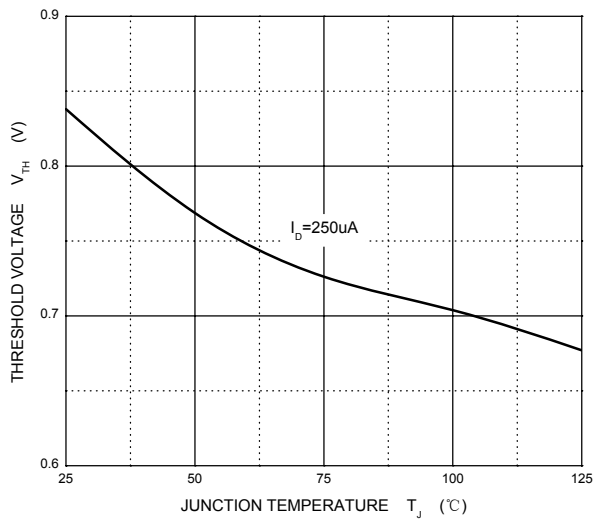
$R_{DS(ON)}$ — I_D



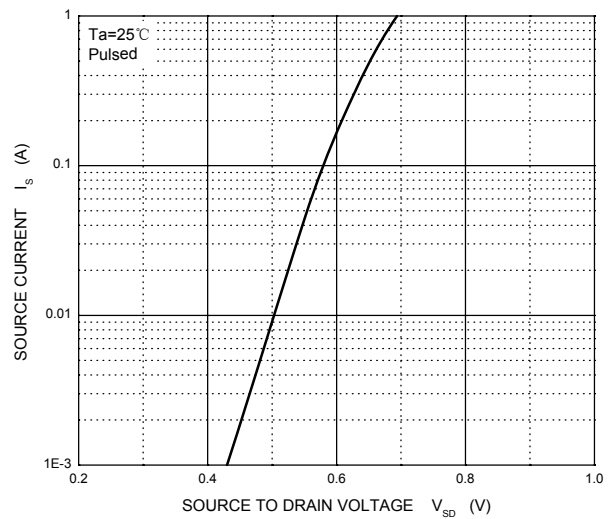
$R_{DS(ON)}$ — V_{GS}



Threshold Voltage

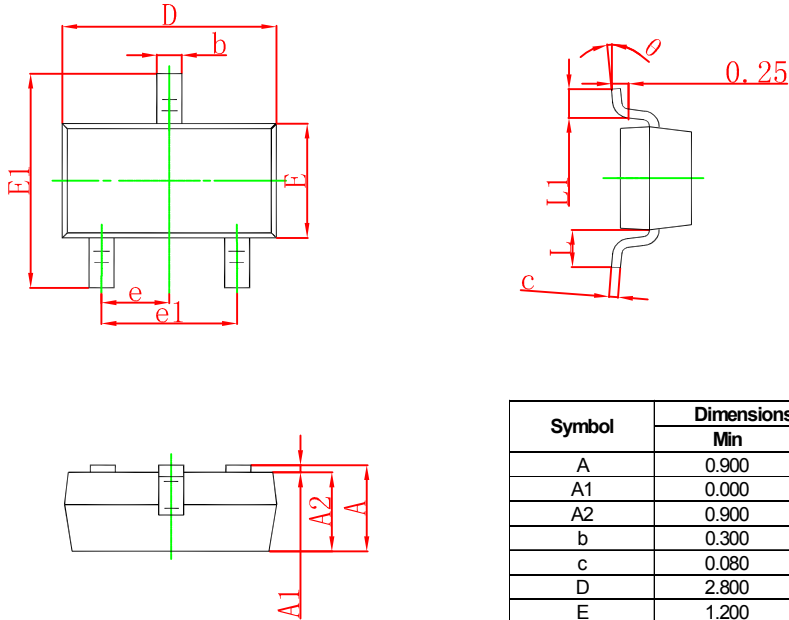


I_S — V_{SD}



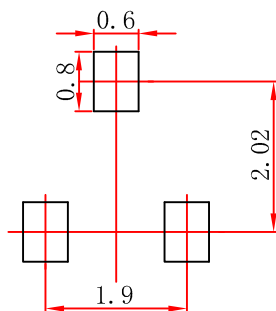


SOT-23 Package Outline Dimensions



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 0.900 | 1.150 | 0.035 | 0.045 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.050 | 0.035 | 0.041 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E | 1.200 | 1.400 | 0.047 | 0.055 |
| E1 | 2.250 | 2.550 | 0.089 | 0.100 |
| e | 0.950 TYP | | 0.037 TYP | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.550 REF | | 0.022 REF | |
| L1 | 0.300 | 0.500 | 0.012 | 0.020 |
| θ | 0° | 8° | 0° | 8° |

SOT-23 Suggested Pad Layout



- Note:
1. Controlling dimension: in millimeters.
 2. General tolerance: $\pm 0.05\text{mm}$.
 3. The pad layout is for reference purposes only.



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