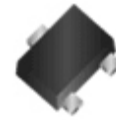
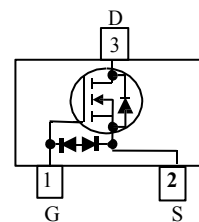


WNM2077
Single N-Channel, 20V, 0.54A, Power MOSFET
[Http://www.willsemi.com](http://www.willsemi.com)

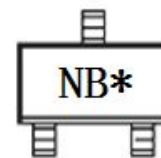
| V _{DS} (V) | R _{ds(on)} (Ω) |
|---------------------|------------------------------|
| 20 | 0.420@ V _{GS} =4.5V |
| | 0.580@ V _{GS} =2.5V |
| | 0.840@ V _{GS} =1.8V |
| ESD Protected | |


SOT-723
Descriptions

The WNM2077 is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent R_{DS(ON)} with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product WNM2077 is Pb-free.


Pin configuration (Top view)
Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance for higher DC current
- Extremely Low Threshold Voltage
- Small package SOT-723



NB = Device Code
* = Month (A~Z)

Marking
Applications

- Driver for Relay, Solenoid, Motor, LED etc.
- DC-DC converter circuit
- Power Switch
- Load Switch
- Charging

Order information

| Device | Package | Shipping |
|--------------|---------|----------------|
| WNM2077-3/TR | SOT-723 | 8000/Reel&Tape |

Absolute Maximum ratings

| Parameter | | Symbol | 10 S | Steady State | Unit |
|---|------------------------|-----------|------------|--------------|------------------|
| Drain-Source Voltage | | V_{DS} | 20 | | V |
| Gate-Source Voltage | | V_{GS} | ± 10 | | |
| Continuous Drain Current ^{ad} | $T_A=25^\circ\text{C}$ | I_D | 0.54 | 0.51 | A |
| | $T_A=70^\circ\text{C}$ | | 0.43 | 0.41 | |
| Maximum Power Dissipation ^{ad} | $T_A=25^\circ\text{C}$ | P_D | 0.36 | 0.31 | W |
| | $T_A=70^\circ\text{C}$ | | 0.23 | 0.20 | |
| Continuous Drain Current ^{bd} | $T_A=25^\circ\text{C}$ | I_D | 0.49 | 0.44 | A |
| | $T_A=70^\circ\text{C}$ | | 0.39 | 0.35 | |
| Maximum Power Dissipation ^{bd} | $T_A=25^\circ\text{C}$ | P_D | 0.29 | 0.23 | W |
| | $T_A=70^\circ\text{C}$ | | 0.18 | 0.14 | |
| Pulsed Drain Current ^c | | I_{DM} | 0.9 | | A |
| Operating Junction Temperature | | T_J | 150 | | $^\circ\text{C}$ |
| Lead Temperature | | T_L | 260 | | $^\circ\text{C}$ |
| Storage Temperature Range | | T_{stg} | -55 to 150 | | $^\circ\text{C}$ |

Thermal resistance ratings

| Parameter | | Symbol | Typical | Maximum | Unit |
|---|-----------------------|-----------------|---------|---------|--------------------|
| Junction-to-Ambient Thermal Resistance ^a | $t \leq 10 \text{ s}$ | $R_{\theta JA}$ | 255 | 345 | $^\circ\text{C/W}$ |
| | Steady State | | 325 | 395 | |
| Junction-to-Ambient Thermal Resistance ^b | $t \leq 10 \text{ s}$ | $R_{\theta JA}$ | 375 | 430 | |
| | Steady State | | 445 | 535 | |
| Junction-to-Case Thermal Resistance | | $R_{\theta JC}$ | 220 | 300 | |

a Surface mounted on FR-4 Board using 1 square inch pad size, 1oz copper

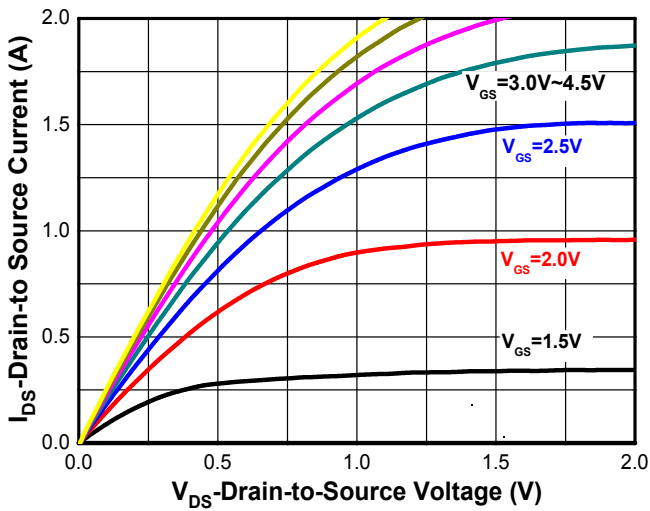
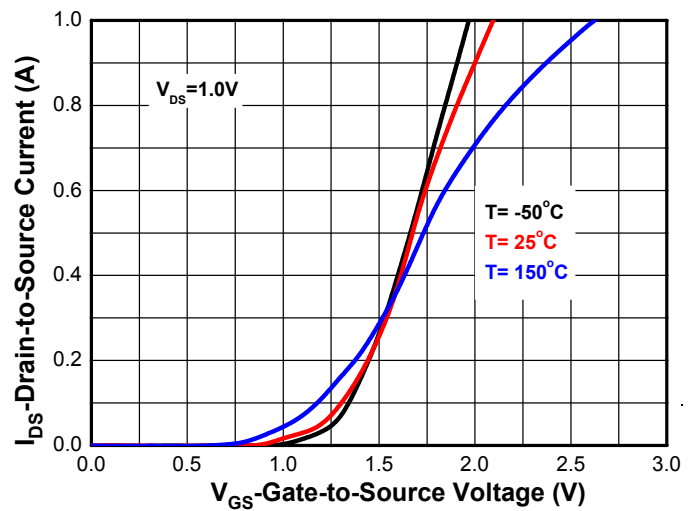
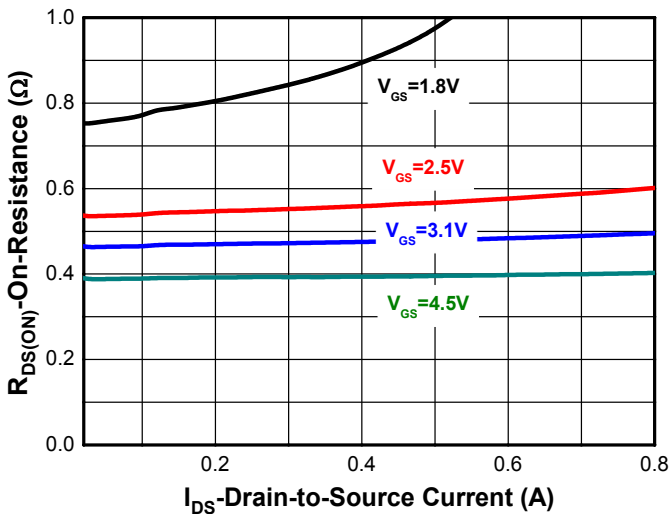
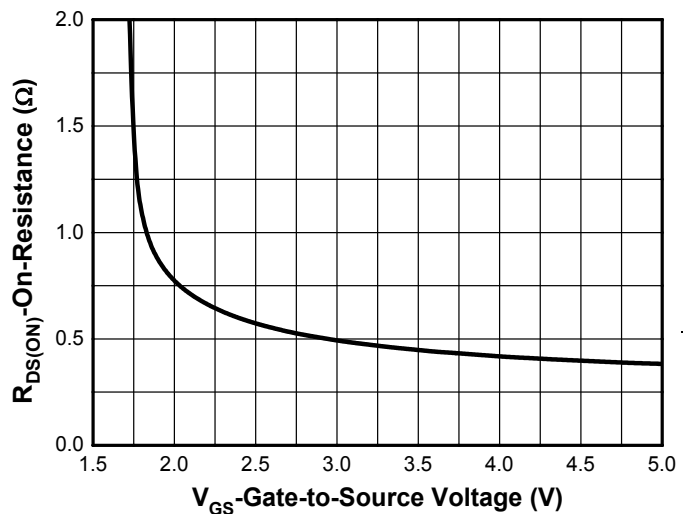
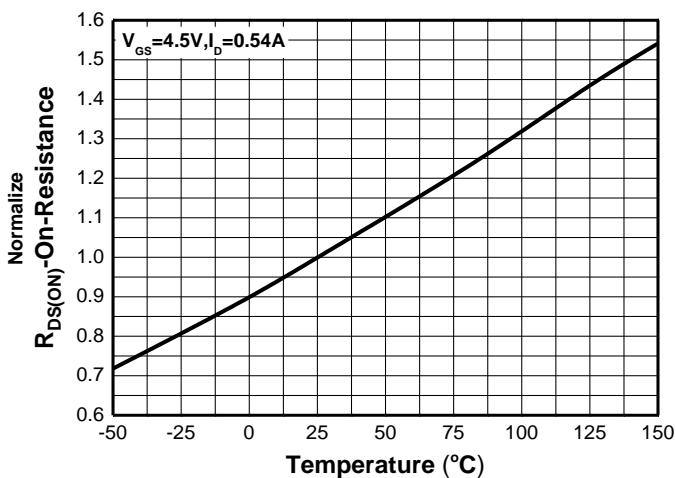
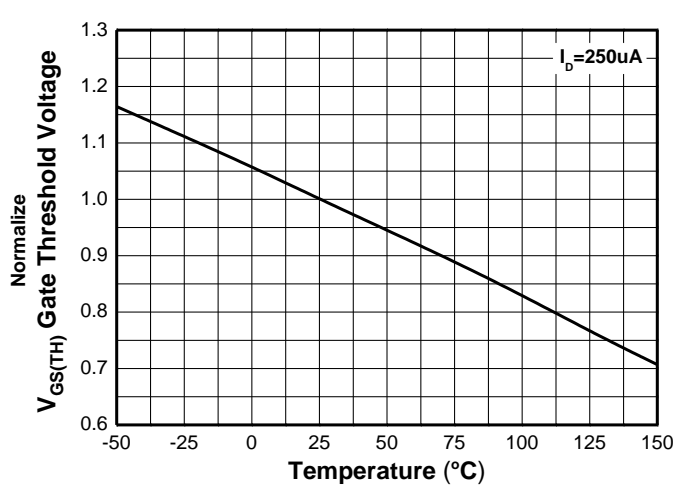
b Surface mounted on FR-4 board using minimum pad size, 1oz copper

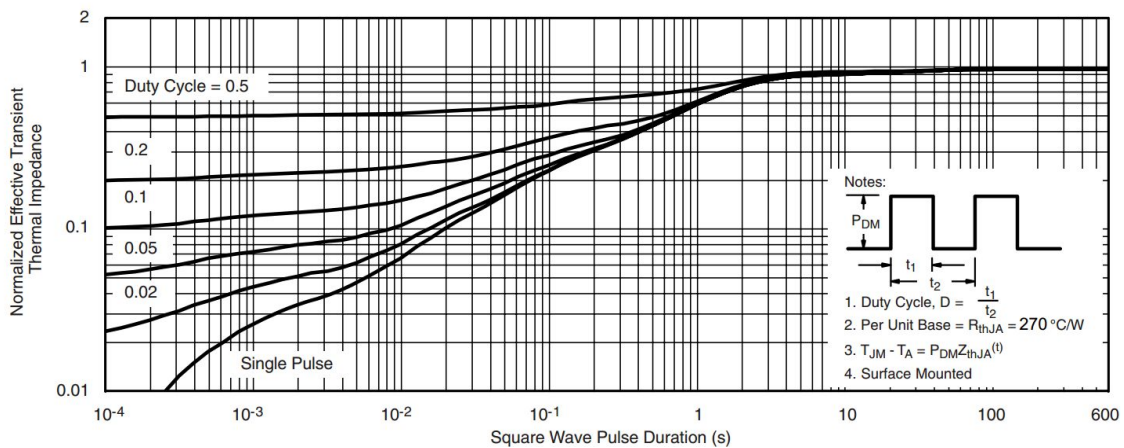
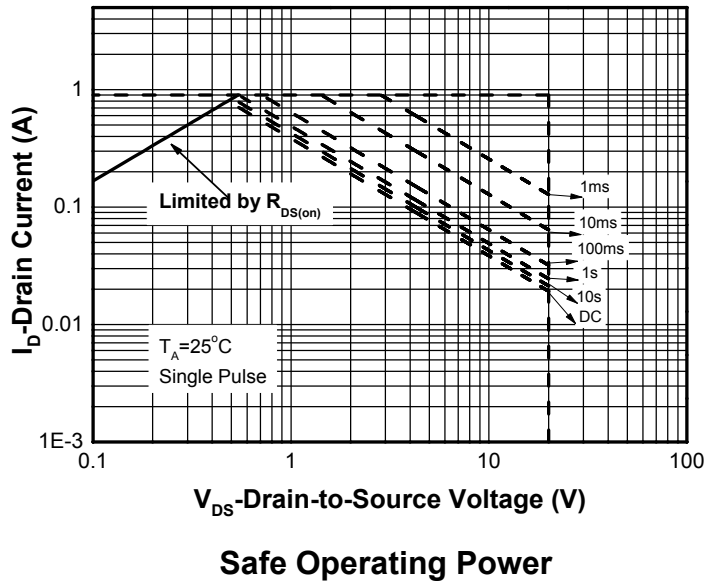
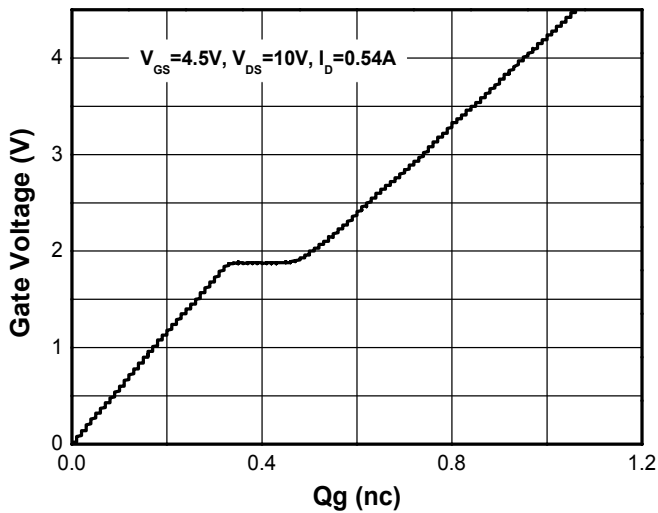
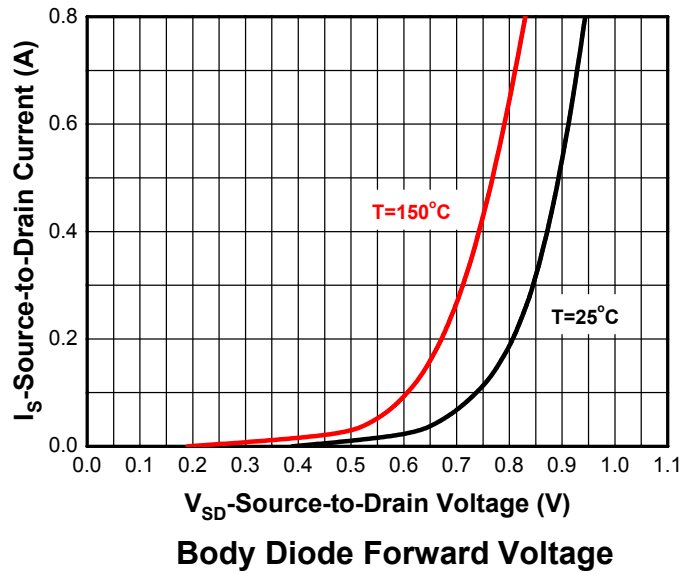
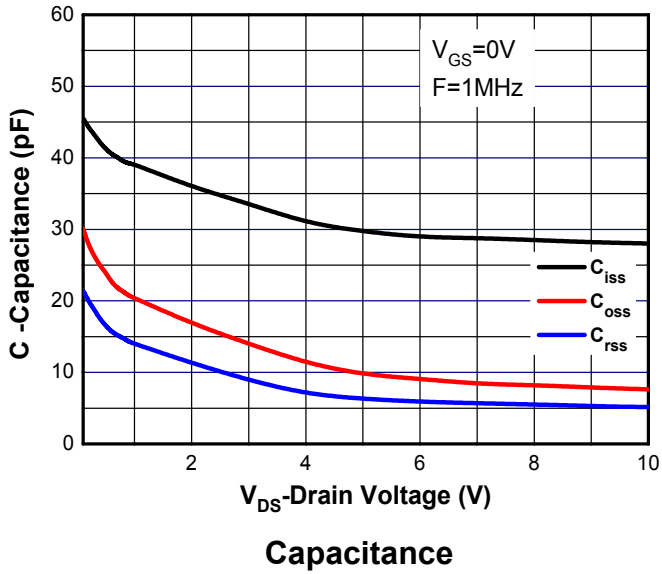
c Pulse width < 380 μs , Duty Cycle < 2%

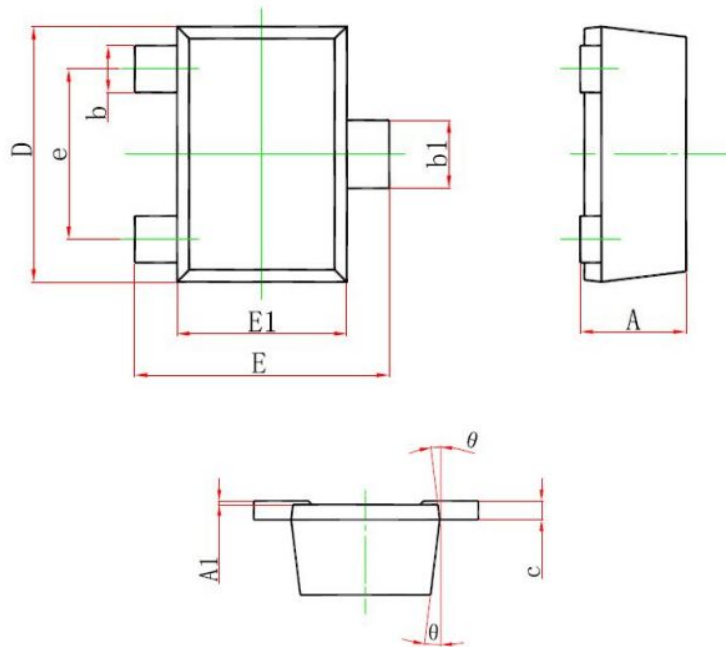
d Maximum junction temperature $T_J=150^\circ\text{C}$.

Electronics Characteristics (Ta=25°C, unless otherwise noted)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|--------------|--|------|------|---------|---------------|
| OFF CHARACTERISTICS | | | | | | |
| Drain-to-Source Breakdown Voltage | BV_{DSS} | $V_{GS} = 0\text{ V}, I_D = 250\mu\text{A}$ | 20 | | | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 16\text{V}, V_{GS} = 0\text{V}$ | | | 1 | μA |
| Gate-to-source Leakage Current | I_{GSS} | $V_{DS} = 0\text{ V}, V_{GS} = \pm 10\text{V}$ | | | ± 5 | μA |
| ON CHARACTERISTICS | | | | | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{GS} = V_{DS}, I_D = 250\mu\text{A}$ | 0.45 | 0.70 | 1.0 | V |
| Forward Transconductance | g_{FS} | $V_{DS} = 10\text{V}, I_D = 0.35\text{A}$ | | 0.85 | | S |
| Drain-to-source On-resistance ^{b, c} | $R_{DS(on)}$ | $V_{GS} = 4.5\text{V}, I_D = 0.35\text{A}$ | | 420 | 600 | m Ω |
| | | $V_{GS} = 3.1\text{V}, I_D = 0.20\text{A}$ | | 500 | 700 | |
| | | $V_{GS} = 2.5\text{V}, I_D = 0.20\text{A}$ | | 580 | 800 | |
| | | $V_{GS} = 1.8\text{V}, I_D = 0.20\text{A}$ | | 840 | 1300 | |
| | | $V_{GS} = 1.5\text{V}, I_D = 0.04\text{A}$ | | 1100 | 1600 | |
| CAPACITANCES, CHARGES | | | | | | |
| Input Capacitance | C_{ISS} | $V_{GS} = 0\text{ V},$ $f = 1\text{MHz},$ $V_{DS} = 10\text{ V}$ | | 30 | | pF |
| Output Capacitance | C_{OSS} | | | 7 | | |
| Reverse Transfer Capacitance | C_{RSS} | | | 5 | | |
| Total Gate Charge | $Q_{G(TOT)}$ | $V_{GS} = 4.5\text{ V},$ $V_{DS} = 10\text{ V},$ $I_D = 0.54\text{A}$ | | 1.07 | | nC |
| Threshold Gate Charge | $Q_{G(TH)}$ | | | 0.12 | | |
| Gate-to-Source Charge | Q_{GS} | | | 0.32 | | |
| Gate-to-Drain Charge | Q_{GD} | | | 0.14 | | |
| SWITCHING CHARACTERISTICS | | | | | | |
| Turn-On Delay Time | $t_d(ON)$ | $V_{GS} = 4.5\text{ V},$ $V_{DD} = 10\text{ V},$ $I_D = 0.54\text{ A},$ $R_G = 6\ \Omega$ | | 7.2 | | ns |
| Rise Time | t_r | | | 9.5 | | |
| Turn-Off Delay Time | $t_d(OFF)$ | | | 19.6 | | |
| Fall Time | t_f | | | 4.6 | | |
| BODY DIODE CHARACTERISTICS | | | | | | |
| Forward Voltage | V_{SD} | $V_{GS} = 0\text{ V}, I_S = 0.3\text{A}$ | | 0.85 | 1.5 | V |

Typical Characteristics (Ta=25°C, unless otherwise noted)

Output Characteristics

Transfer Characteristics

On Resistance vs. Drain Current

On Resistance vs. Gate-to-Source Voltage

On Resistance vs. Junction Temperature

Threshold Voltage vs. Temperature



Package outline dimensions
SOT-723


| Symbol | Dimension in Millimeters | |
|--------|--------------------------|-------|
| | Min. | Max. |
| A | | 0.500 |
| A1 | 0.000 | 0.050 |
| b | 0.170 | 0.270 |
| b1 | 0.270 | 0.370 |
| c | | 0.150 |
| D | 1.150 | 1.250 |
| E | 1.150 | 1.250 |
| E1 | 0.750 | 0.850 |
| e | 0.800 TYP | |
| θ | 7° REF. | |