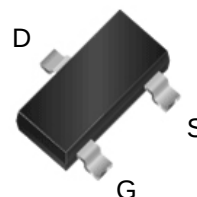
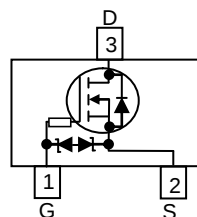


WNM7002
Single N-Channel, 60V, 0.3A, Power MOSFET
[Http://www.sh-willsemi.com](http://www.sh-willsemi.com)

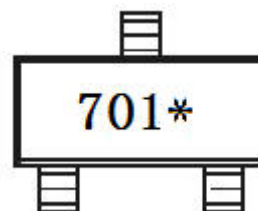
V_{DS} (V)	Typical $R_{DS(on)}$ (Ω)
60	3.7 @ $V_{GS}=10V$
	3.8 @ $V_{GS}=4.5V$
ESD protected	


SOT-23

Pin configuration (Top view)
Descriptions

The WNM7002 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 WNM7002 is Pb-free.

Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance
- Extremely Low Threshold Voltage
- Small package SOT-23



701 = Device Code

* = Month

Marking
Applications

- DC/DC converters
- Power supply converters circuit
- Load/Power Switching for portable device

Order information

Device	Package	Shipping
WNM7002-3/TR	SOT-23	3000/Tape&Reel

Absolute Maximum ratings

Parameter		Symbol	10 s	Steady State	Unit
Drain-Source Voltage		V _{DS}	60		V
Gate-Source Voltage		V _{GS}	±20		
Continuous Drain Current ^{a d}	T _A =25°C	I _D	0.30	0.28	A
	T _A =70°C		0.24	0.22	
Maximum Power Dissipation ^{a d}	T _A =25°C	P _D	0.96	0.83	W
	T _A =70°C		0.61	0.53	
Continuous Drain Current ^{b d}	T _A =25°C	I _D	0.26	0.25	A
	T _A =70°C		0.21	0.20	
Maximum Power Dissipation ^{b d}	T _A =25°C	P _D	0.78	0.66	W
	T _A =70°C		0.50	0.42	
Pulsed Drain Current ^c		I _{DM}	1.2		A
Operating Junction Temperature		T _J	-55 to 150		°C
Lead Temperature		T _L	260		°C
Storage Temperature Range		T _{stg}	-55 to 150		°C

Thermal resistance ratings

Single Operation					
Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance ^a	$t \leq 10\text{ s}$	$R_{\theta JA}$	105	130	$^{\circ}\text{C/W}$
	Steady State		130	150	
Junction-to-Ambient Thermal Resistance ^b	$t \leq 10\text{ s}$	$R_{\theta JA}$	130	160	
	Steady State		145	190	
Junction-to-Case Thermal Resistance		$R_{\theta JC}$	40	60	

a Surface mounted on FR4 Board using 1 square inch pad size, 1oz copper

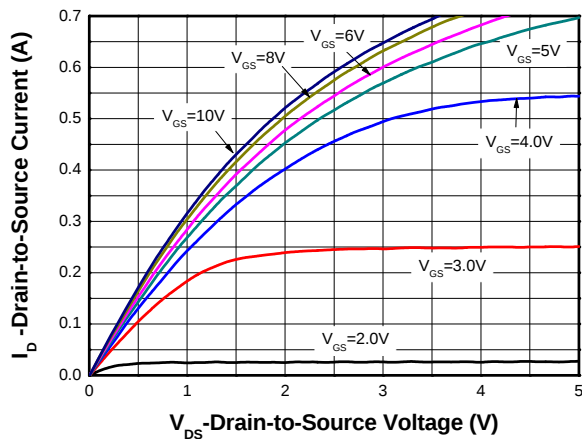
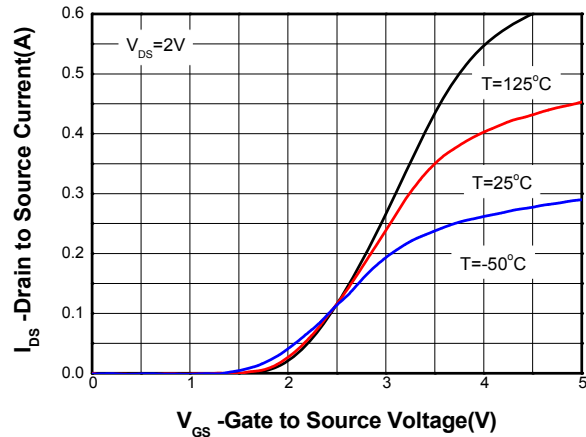
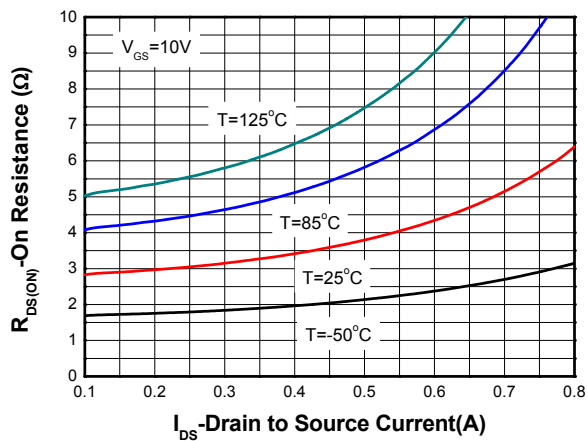
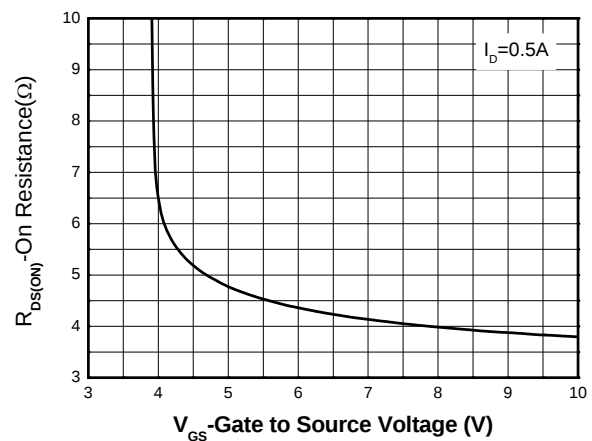
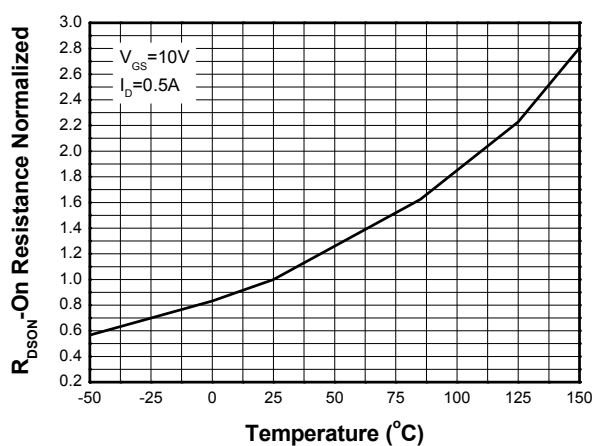
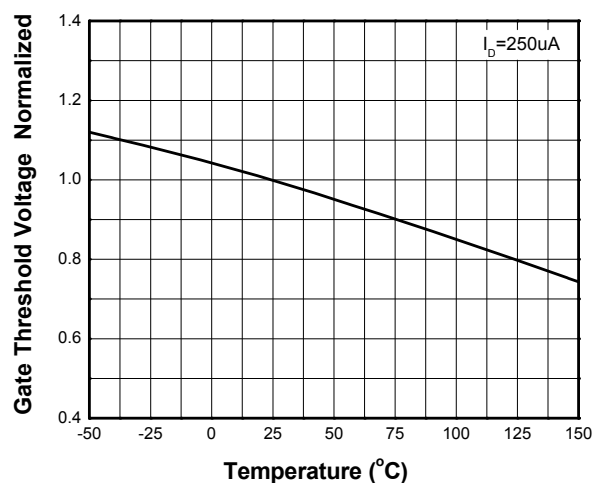
b Surface mounted on FR4 board using minimum pad size, 1oz copper

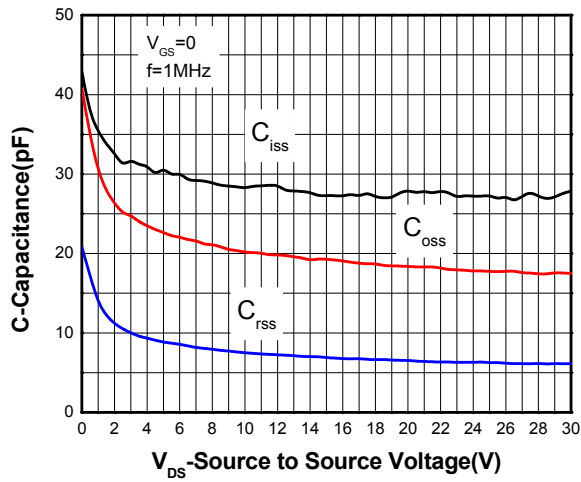
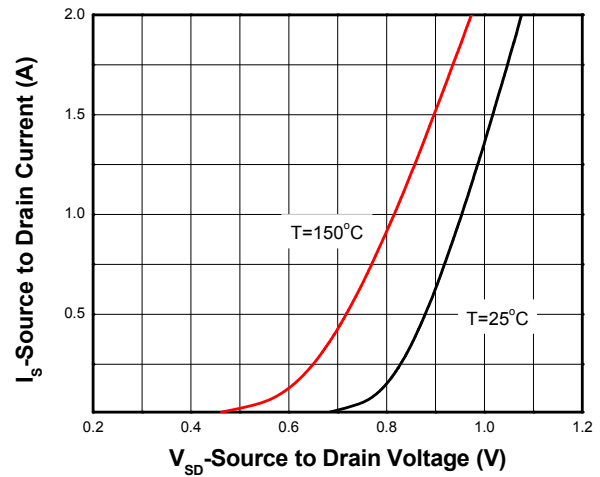
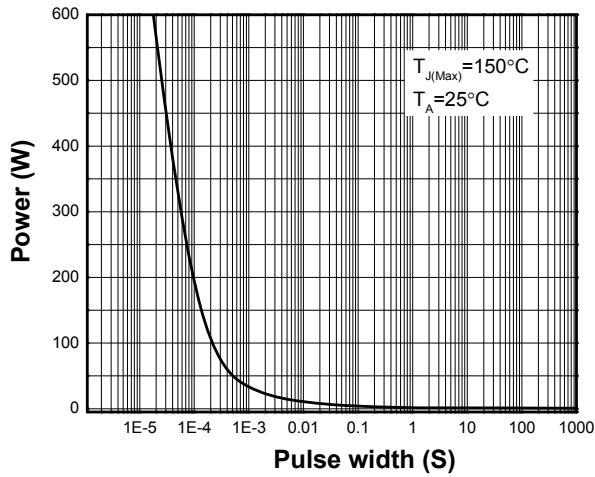
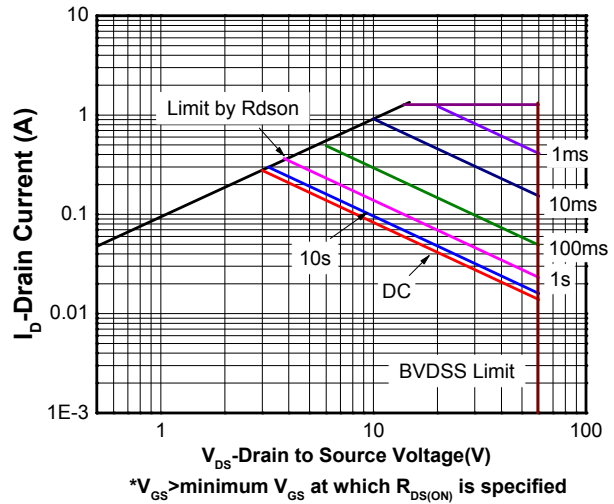
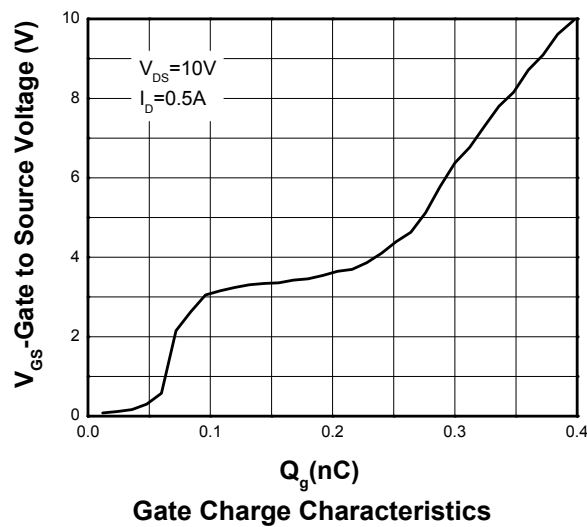
c Repetitive rating, pulse width limited by junction temperature, $t_p=10\mu\text{s}$, Duty Cycle=1%

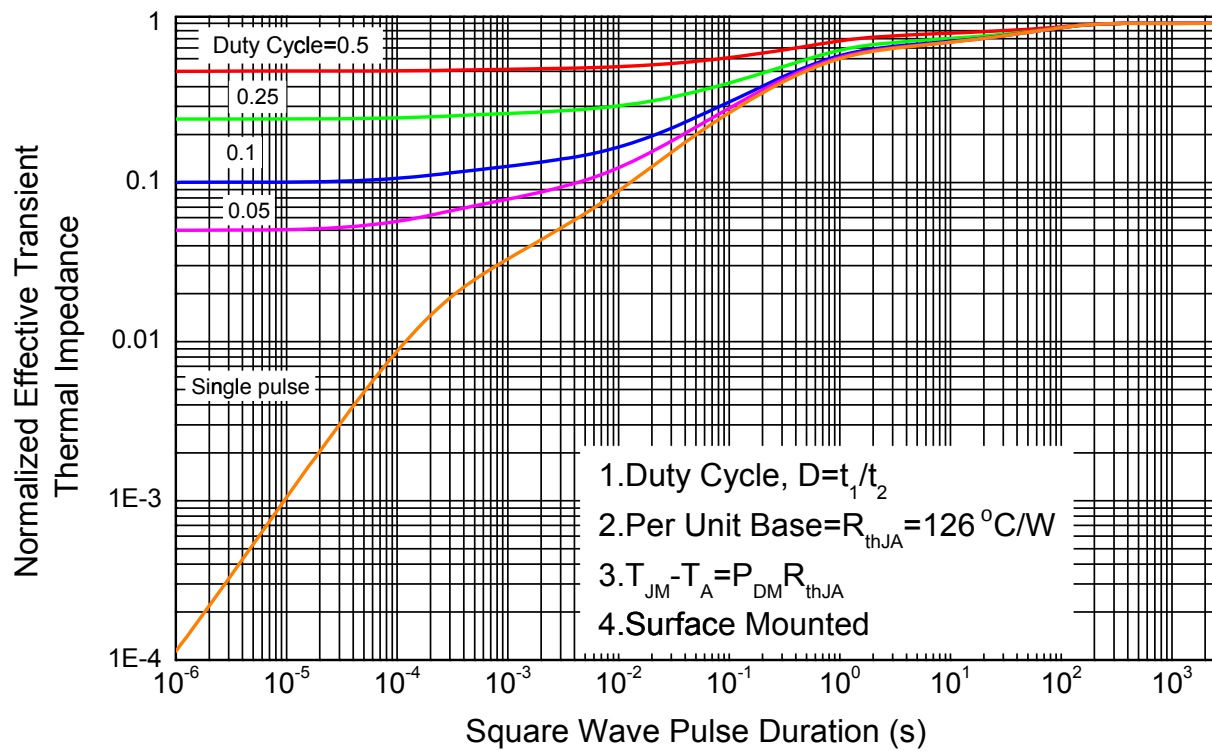
d Repetitive rating, pulse width limited by junction temperature $T_J=150^{\circ}\text{C}$.

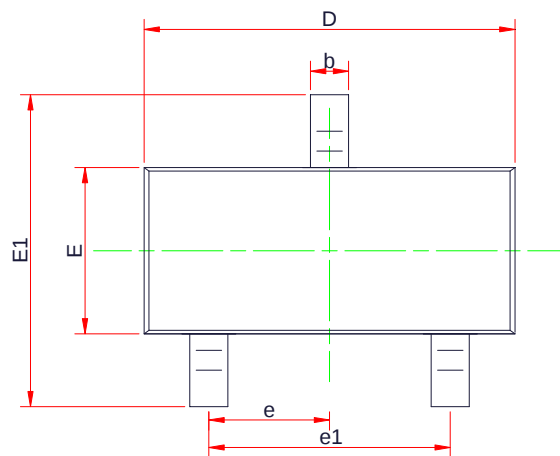
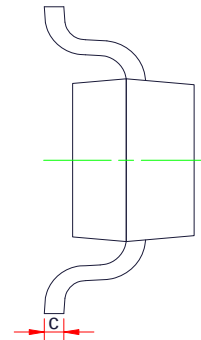
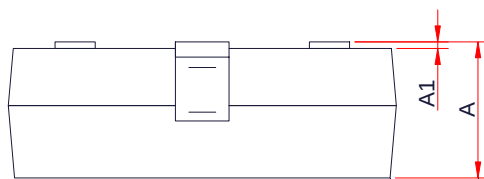
Electronics Characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0 V, I _D = 250uA	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =48V, V _{GS} = 0V			1	uA
Gate-to-source Leakage Current	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20V			±5	uA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = 250uA	1.0	1.4	2.0	V
Drain-to-source On-resistance	R _{DS(on)}	V _{GS} =10V, I _D =0.3A		3.7	4.7	Ω
		V _{GS} = 4.5V, I _D = 0.2A		3.8	5.6	
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C _{ISS}	V _{GS} = 0 V, f = 1.0MHz, V _{DS} = 25 V		14.4		pF
Output Capacitance	C _{OSS}			5.1		
Reverse Transfer Capacitance	C _{RSS}			0.27		
Total Gate Charge1	Q _{G(4.5V TOT)}	V _{GS} = 4.5&10 V, V _{DS} = 15 V, I _D =0.5 A		0.26		nC
Total Gate Charge2	Q _{G(10V TOT)}			0.41		
Threshold Gate Charge	Q _{G(TH)}			0.06		
Gate-to-Source Charge	Q _{GS}			0.1		
Gate-to-Drain Charge	Q _{GD}			0.14		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(ON)	V _{GS} = 10 V, V _{DS} = 30 V, R _L =60 Ω , R _G =25Ω		5.2		ns
Rise Time	tr			17.2		
Turn-Off Delay Time	td(OFF)			32.4		
Fall Time	tf			19.0		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V _{SD}	V _{GS} = 0 V, I _S = 200mA		0.8	1.2	V

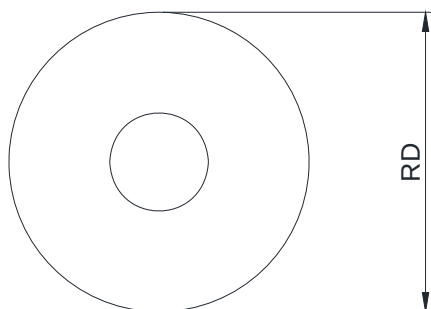
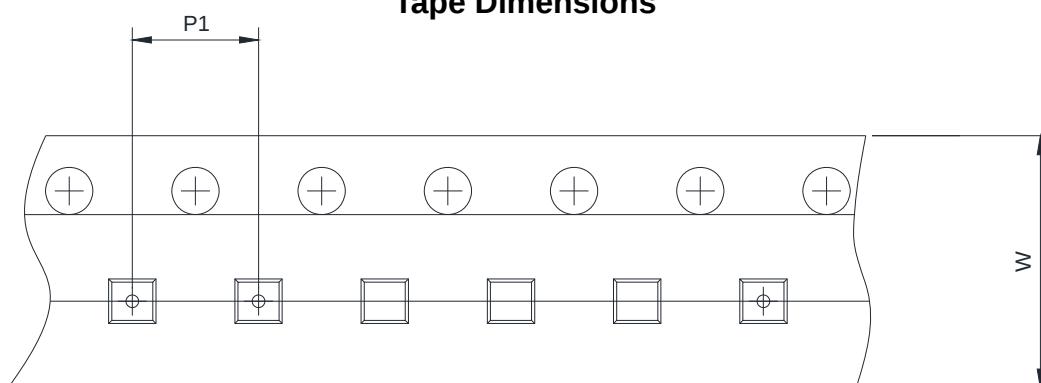
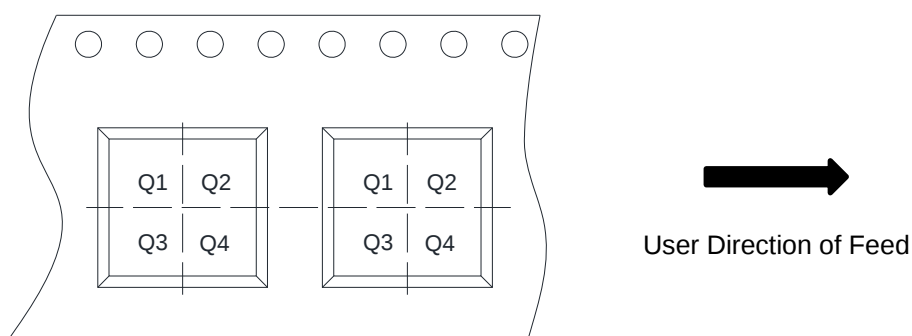
Typical Characteristics (Ta=25°C, unless otherwise noted)

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


Capacitance

Body diode forward voltage

Single pulse power

Safe operating power

Gate Charge Characteristics

Transient thermal response (Junction-to-Ambient)


Package outline dimensions
SOT-23

TOP VIEW

SIDE VIEW

SIDE VIEW

Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.89	1.10	1.30
A1	0.00	-	0.10
b	0.30	0.43	0.55
c	0.05	-	0.20
D	2.70	2.90	3.10
E	1.15	1.33	1.50
E1	2.10	2.40	2.70
e	0.95 Typ.		
e1	1.70	1.90	2.10

TAPE AND REEL INFORMATION
Reel Dimensions

Tape Dimensions

Quadrant Assignments For PIN1 Orientation In Tape


RD	Reel Dimension	☒ 7inch	☐ 13inch
W	Overall width of the carrier tape	☒ 8mm	☐ 12mm ☐ 16mm
P1	Pitch between successive cavity centers	☐ 2mm	☒ 4mm ☐ 8mm
Pin1	Pin1 Quadrant	☐ Q1	☐ Q2 ☒ Q3 ☐ Q4