

Small Signal N-Channel, 20V, 0.3A, MOSFET

$V_{(BR)DSS}$	$R_{DS(on)}$ Typ.
20 V	1.4Ω @ 4.5V
	2.2Ω @ 2.5V
	3.8Ω @ 1.8V

Descriptions

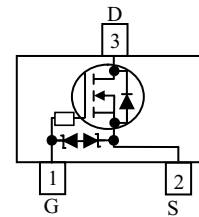
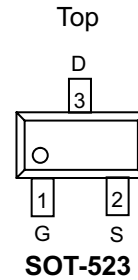
The WNM4002 is the N-Channel enhancement MOS Field Effect Transistor, uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in small signal switch. Standard product WNM4002 is Pb-free.

Features

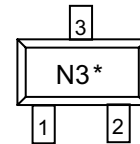
- Trench N-Channel
- Supper high density cell design for extremely low $R_{ds(on)}$
- Exceptional ON resistance and maximum DC current capability
- Small package design with SOT-523

Applications

- Driver: Relays, Solenoids, Lamps, Hammers
- Power supply converters circuit
- Load/Power Switching for potable device



Pin Configuration



N3 = Device Code

* = Month

Marking

Order Information

Device	Package	Shipping
WNM4002-3/TR	SOT-523	3000/Tape&Reel

Absolute Maximum Ratings

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

Symbol	Parameter	Ratings	Unit
V_{DSS}	Drain-to-Source Voltage	20	V
V_{GSS}	Gate-to-Source Voltage	± 6.0	V
I_D	Drain Current – Continue Note1	0.3	A
	Drain Current – Pulsed ($t<300\mu\text{s}$, Duty $<2\%$) Note1	0.6	A
P_D	Power Dissipation – Note1	0.25	W
T_J	Operation junction temperature range	150	$^{\circ}\text{C}$
T_{SG}	Storage temperature range	-55~150	$^{\circ}\text{C}$

Thermal Resistance Ratings

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

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient – Note1	500	620	$^{\circ}\text{C}/\text{W}$

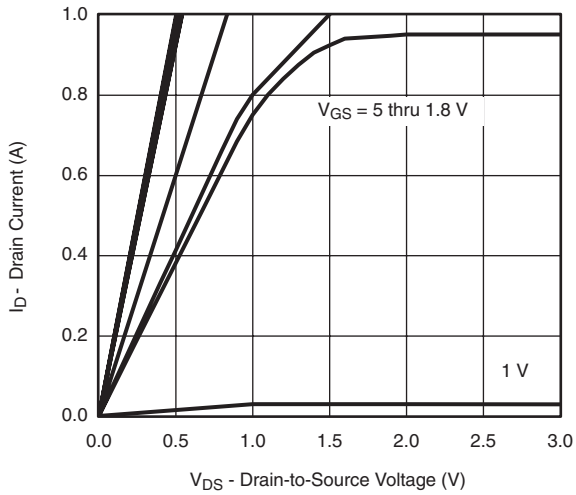
Note1: Surface mounted on a 2 oz copper, 1 in² pad, FR-4 board.

Electronics Characteristics

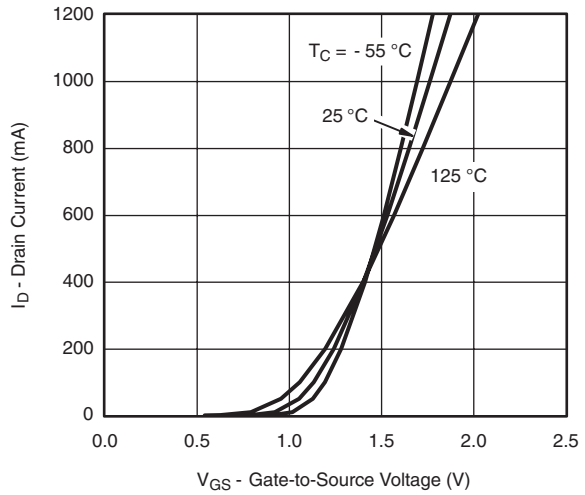
(T_A=25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min	Typ.	Max	Unit
Off Characteristics						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	20			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =20V, V _{GS} =0V			1	uA
I _{GSS}	Gate –Source leakage current	V _{DS} =0V, V _{GS} =±5V			5	uA
ON Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D =250uA	0.35		1.0	V
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =4.5V, I _D =0.3A			2.0	Ω
		V _{GS} =2.5V, I _D =0.1A			3.5	Ω
		V _{GS} =1.8V, I _D =0.01A			5.0	Ω
g _{FS}	Forward Transconductance	V _{DS} =6V, I _D =0.1A		1.0		S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =6V, V _{GS} =0V, F=100kHz		72		pF
C _{oss}	Output Capacitance			12		pF
C _{rss}	Reverse Transfer Capacitance			10		pF
Q _{G(TOT)}	Total Gate Charge	V _{DS} =6V, V _{GS} =4.5V, I _D =0.01A		1.1		nC
Q _{GS}	Gate-Source Charge			0.11		nC
Q _{GD}	Gate-Drain Charge			0.45		nC
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =10V, V _{GS} =4.5V, I _D =0.1A, R _G =6Ω		22		ns
t _r	Turn-On Rise Time			80		ns
t _{d(off)}	Turn-Off Delay Time			700		ns
t _f	Turn-Off Fall Time			380		ns
Drain-to-Source Diode Characteristics						
V _{SD}	Forward Diode Voltage	V _{GS} =0V, I _S =0.15A		-0.7		V

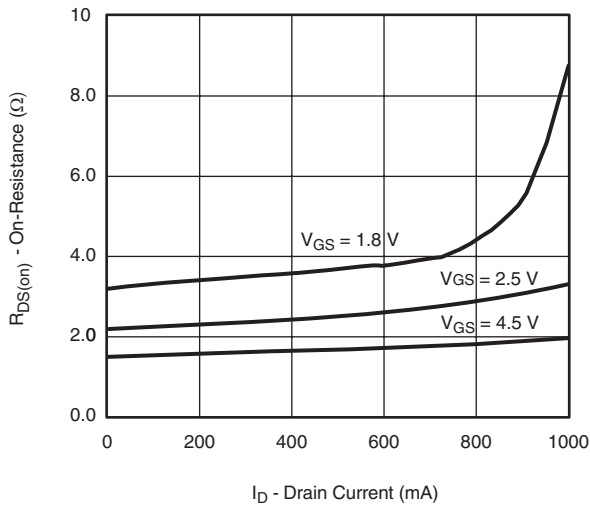
Typical Performance Graph



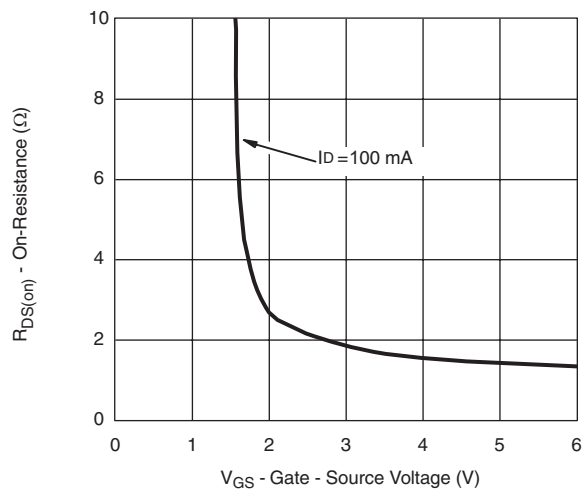
Output Characteristics



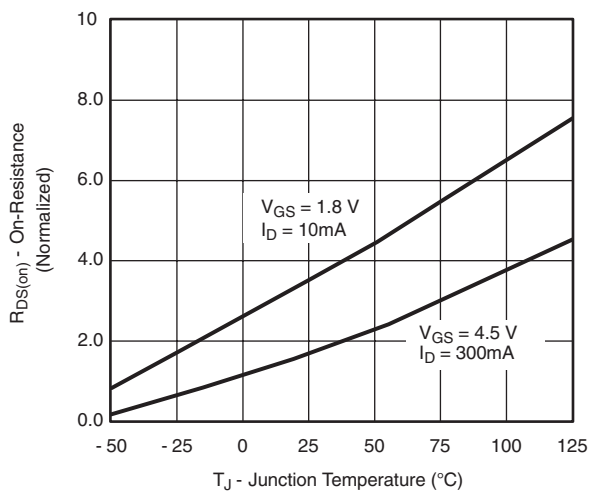
Transfer Characteristics



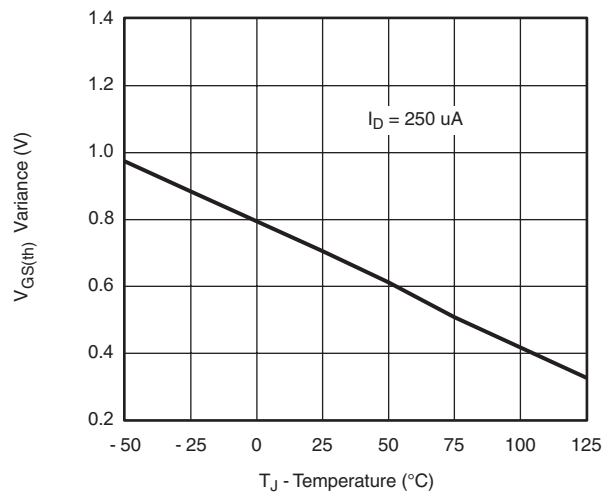
On Resistance vs. Drain Current



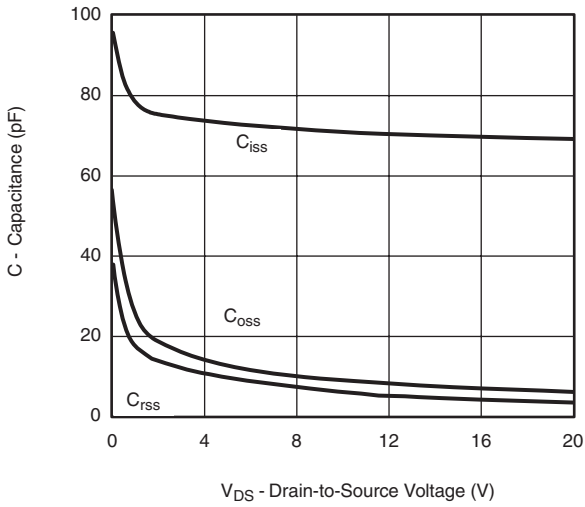
On Resistance vs. Gate - Source Voltage



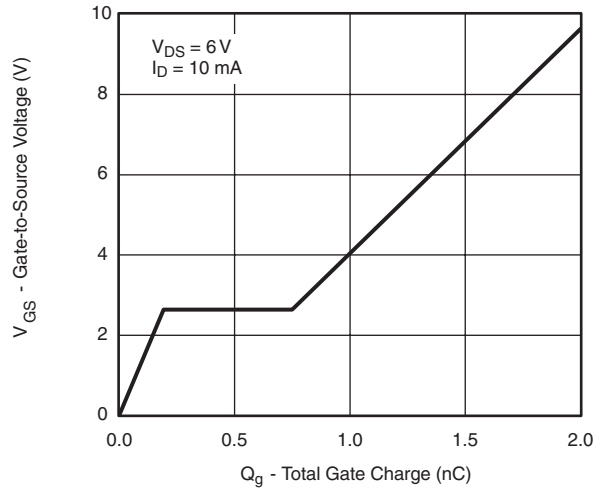
On Resistance vs. Junction Temperature



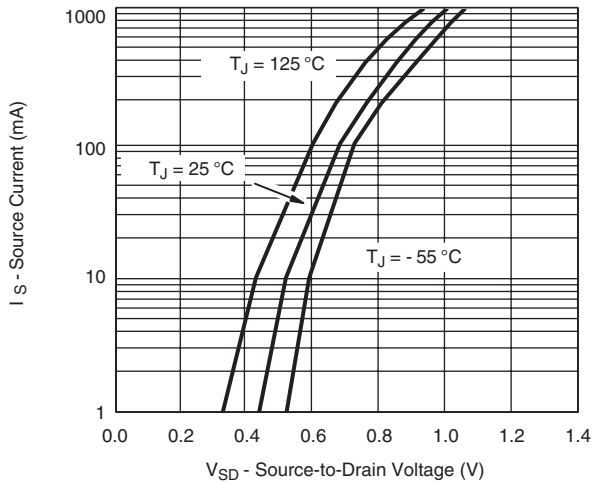
Threshold Voltage



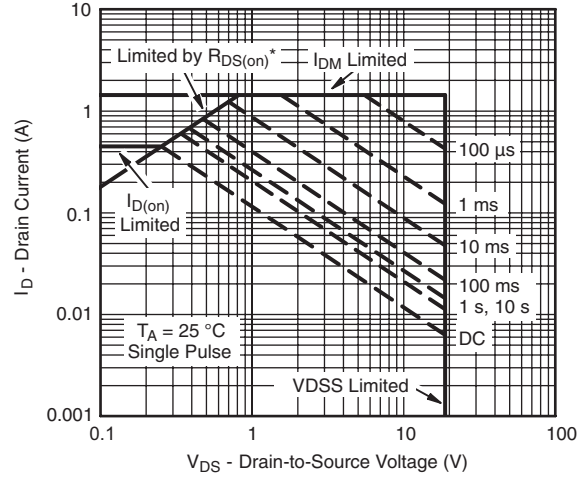
Capacitance



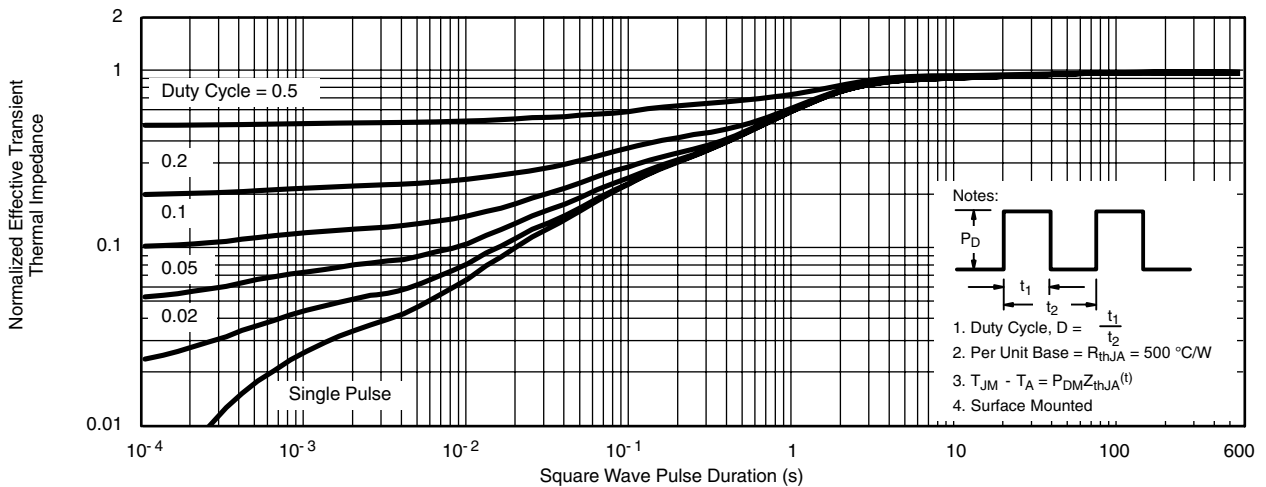
Gate Charge



Source-Drain Diode Forward Voltage



Safe Operation Area, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient