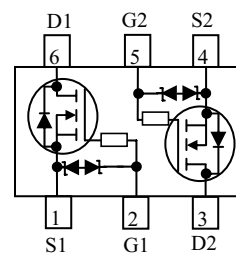


WNMD6003
Dual N-Channel, 60V, 0.30A, Power MOSFET
[Http://www.sh-willsemi.com](http://www.sh-willsemi.com)

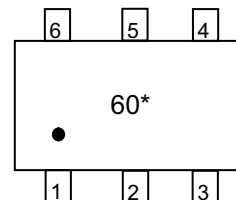
V_{DS} (V)	$R_{ds(on)}$ (Ω)
60	1.4@ $V_{GS}=10V$
	1.7@ $V_{GS}=4.5V$
ESD Rating:2000V HBM	


SOT-563
Descriptions

The WNMD6003 is Dual 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 WNMD6003 is Pb-free and Halogen-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-563



60 = 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
WNMD6003-6/TR	SOT-563	3000/Reel&Tape

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 ^{ad}	T _A =25°C	I _D	0.30	0.27	A
	T _A =70°C		0.24	0.21	
Maximum Power Dissipation ^{ad}	T _A =25°C	P _D	0.37	0.29	W
	T _A =70°C		0.23	0.18	
Continuous Drain Current ^{bd}	T _A =25°C	I _D	0.26	0.23	A
	T _A =70°C		0.20	0.19	
Maximum Power Dissipation ^{bd}	T _A =25°C	P _D	0.27	0.22	W
	T _A =70°C		0.17	0.14	
Pulsed Drain Current ^c		I _{DM}	1.0		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

Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance ^a	$t \leq 10 \text{ s}$	$R_{\theta JA}$	285	335	$^{\circ}\text{C/W}$
	Steady State		340	430	
Junction-to-Ambient Thermal Resistance ^b	$t \leq 10 \text{ s}$	$R_{\theta JA}$	380	460	
	Steady State		465	555	
Junction-to-Case Thermal Resistance		$R_{\theta JC}$	280	320	

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

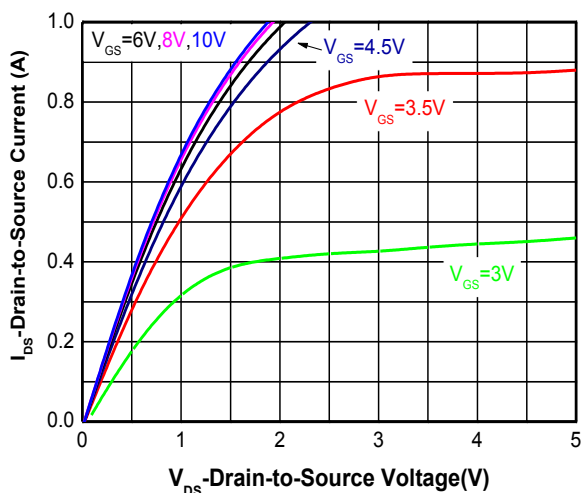
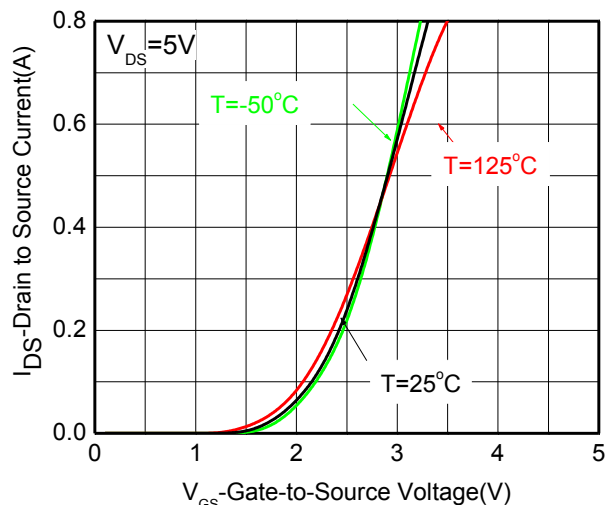
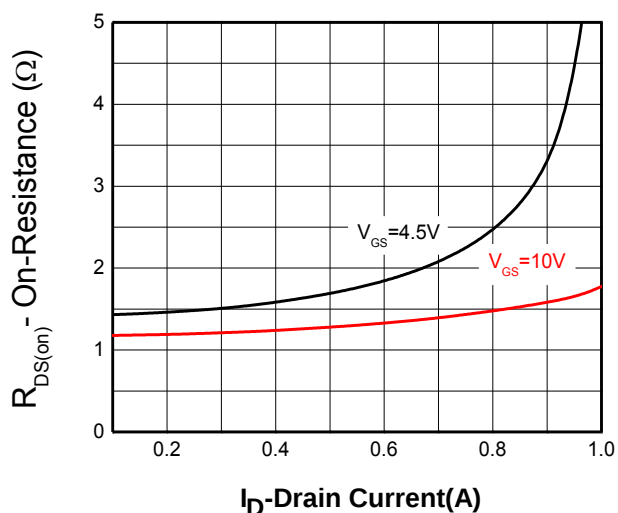
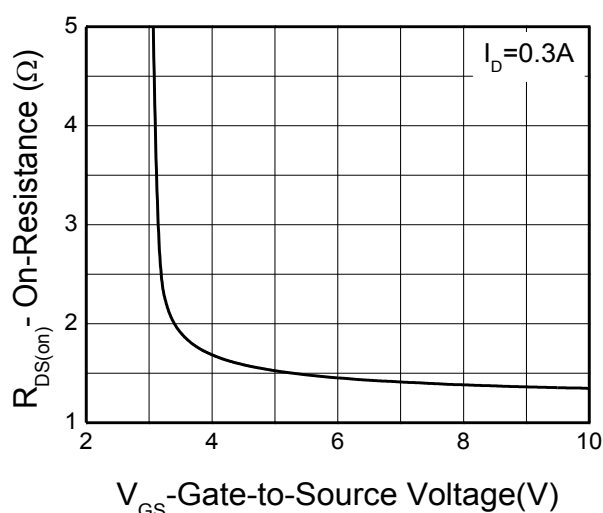
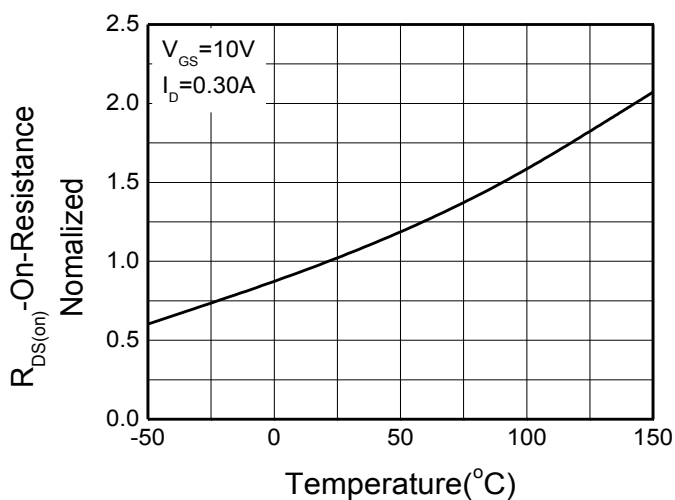
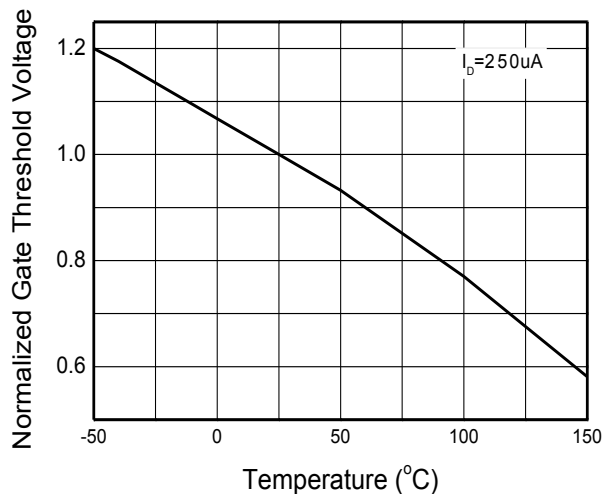
b Surface mounted on FR-4 board using minimum pad size, 1oz copper.

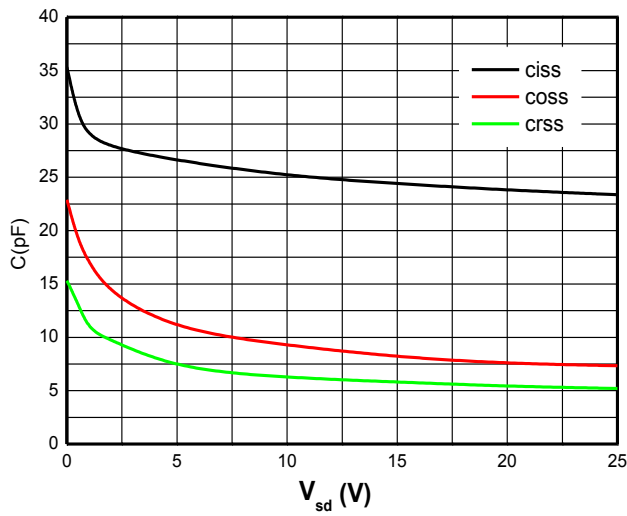
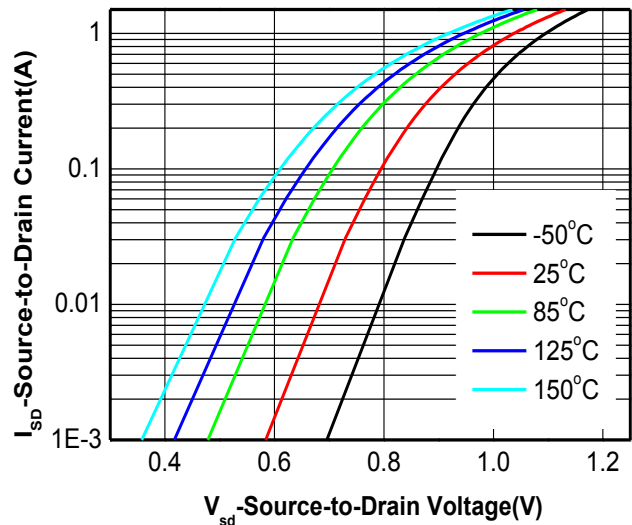
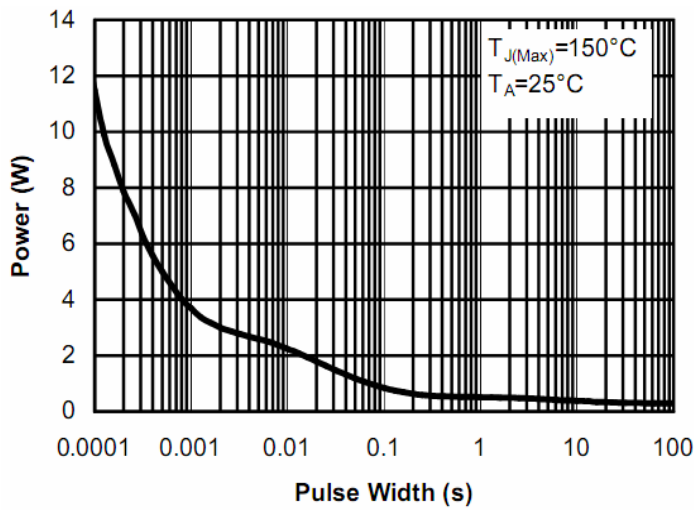
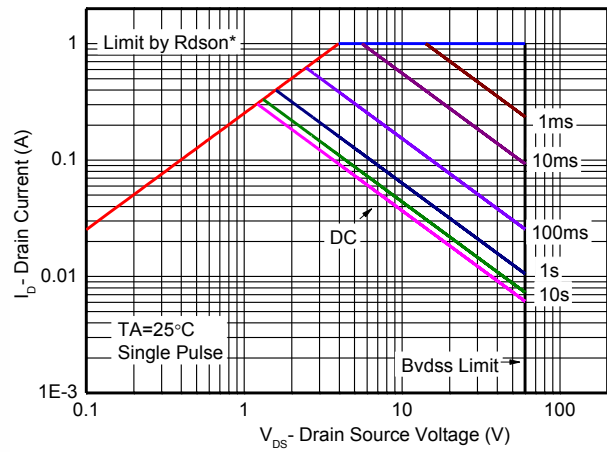
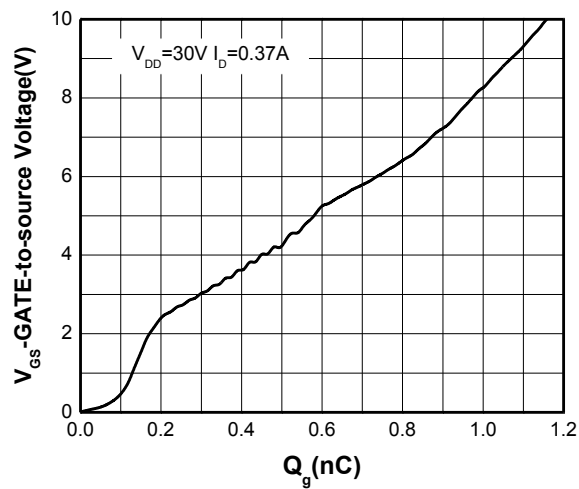
c Pulse width < 380 μs .

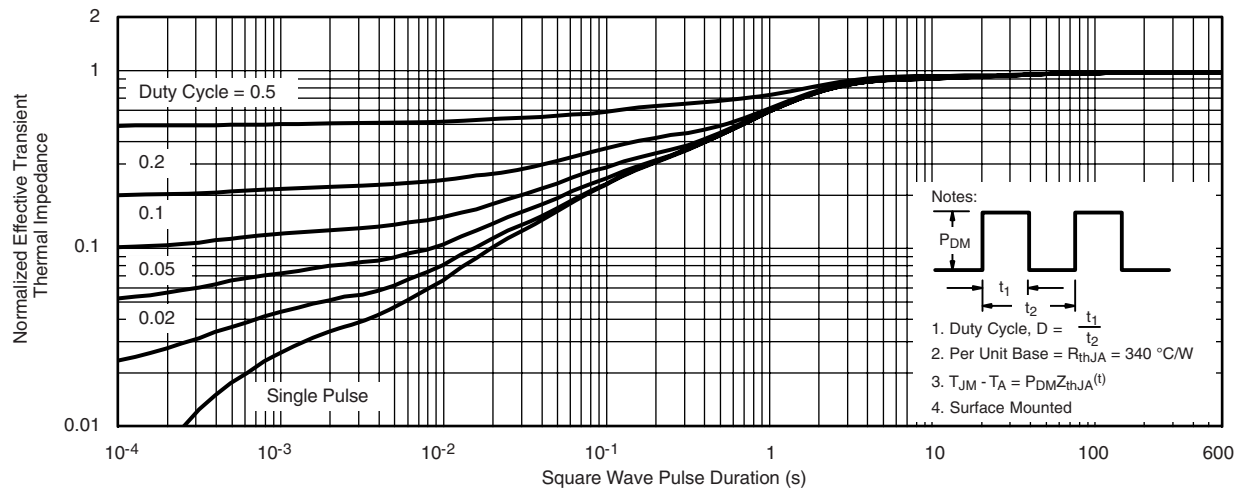
d Maximum junction temperature $T_J=150^{\circ}\text{C}$.

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

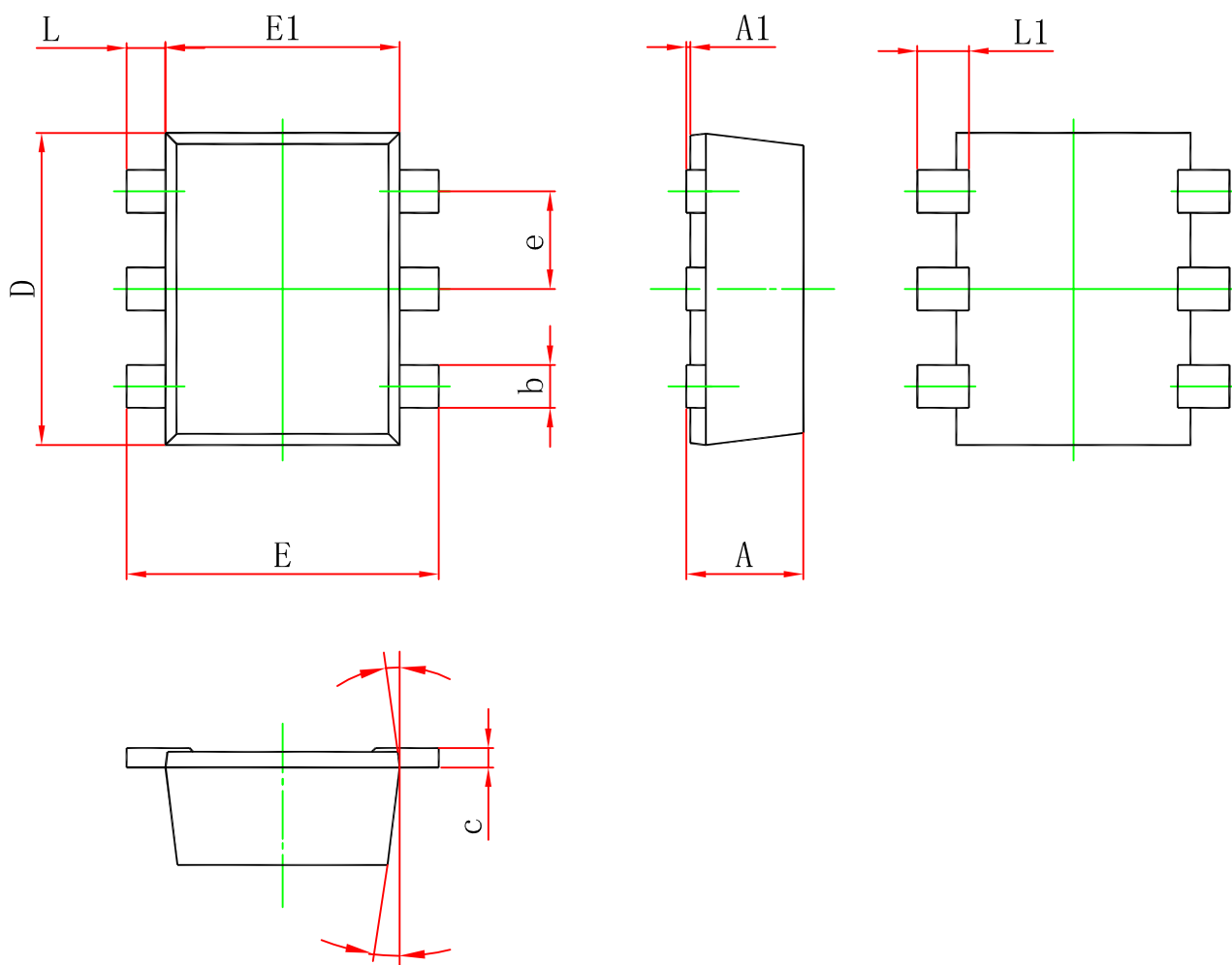
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0 V, I _D = 250uA	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} = 0V			1	uA
Gate-to-source Leakage Current	I _{GSS}	V _{DS} = 0 V, V _{GS} =±20V			±5	uA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = 250uA	0.8	1.3	2	V
Drain-to-source On-resistance ^{b, c}	R _{DS(on)}	V _{GS} = 10V, I _D = 0.3A		1.4	2.0	Ω
		V _{GS} = 4.5V, I _D = 0.2A		1.7	2.6	
Forward Transconductance	g _{FS}	V _{DS} =15V, I _D =0.25A		0.42		S
CAPACITANCES, CHARGES						
Input Capacitance	C _{ISS}	V _{GS} = 0 V, f = 1.0 MHz, V _{DS} = 25V		23.37		pF
Output Capacitance	C _{OSS}			7.33		
Reverse Transfer Capacitance	C _{RSS}			5.2		
Total Gate Charge	Q _{G(TOT)}	V _{GS} = 10 V, V _{DD} = 30 V, I _D =0.37A		1.2		nC
Threshold Gate Charge	Q _{G(TH)}			0.15		
Gate-to-Source Charge	Q _{GS}			0.21		
Gate-to-Drain Charge	Q _{GD}			0.12		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(ON)	V _{DD} =30V,R _L =150Ω I _D =0.2A,V _{GEN} =10V, R _G =10 Ω		7.6		ns
Rise Time	tr			5.1		
Turn-Off Delay Time	td(OFF)			24.6		
Fall Time	tf			10		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V _{SD}	V _{GS} = 0 V, I _S =0.3A		0.9	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


Capacitance

Body diode forward voltage

Single pulse power

Safe operating power

Gate Charge Characteristics



Transient thermal response (Junction-to-Ambient)

Package outline dimensions
SOT-563


Symbol	Dimensions In Millimeters		Dimensions in inches	
	Min.	Max.	Min.	Max.
A	0.525	0.600	0.021	0.024
A1	0.000	0.050	0.000	0.002
e	0.450	0.550	0.018	0.022
c	0.090	0.160	0.004	0.006
D	1.500	1.700	0.059	0.067
b	0.170	0.270	0.007	0.011
E1	1.100	1.300	0.043	0.051
E	1.500	1.700	0.059	0.067
L	0.100	0.300	0.004	0.012
L1	0.200	0.400	0.008	0.016
θ	7 °REF.		7 °REF.	