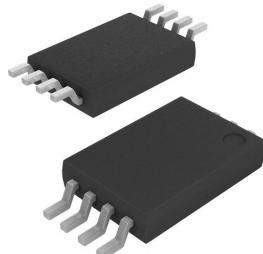


WNMD2158

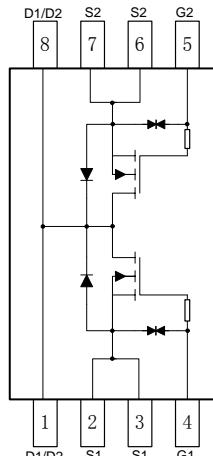
Dual N-Channel, 20V, 7.0A, Power MOSFET

www.sh-willsemi.com

V_{DS} (V)	R_{DS(on)} (Ω)
20	0.0148@ V _{GS} =4.5V
	0.017@ V _{GS} =3.1V
	0.019@ V _{GS} =2.5V
ESD Rating: 2000V HBM	



TSSOP-8L



Pin configuration (Top view)



Descriptions

The WNMD2158 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 WNMD2158 is Pb-free.

Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance for higher DC current
- Extremely Low Threshold Voltage
- Small package TSSOP-8L

Applications

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

2158 = Device Code

YY =Year

WW =Week

Marking

Order information

Device	Package	Shipping
WNMD2158-8/TR	TSSOP-8L	3000/Reel&Tape

Absolute Maximum ratings

Parameter	Symbol	10 S	Steady State	Unit
Drain-Source Voltage	V _{DS}	20	±10	V
Gate-Source Voltage	V _{GS}	±10		
Continuous Drain Current ^a	T _A =25°C	I _D	7.0	5.9
	T _A =70°C		5.6	4.7
Maximum Power Dissipation ^a	T _A =25°C	P _D	1.4	1.0
	T _A =70°C		0.9	0.6
Continuous Drain Current ^b	T _A =25°C	I _D	6.3	5.6
	T _A =70°C		5.0	4.5
Maximum Power Dissipation ^b	T _A =25°C	P _D	1.1	0.9
	T _A =70°C		0.7	0.5
Pulsed Drain Current ^c	I _{DM}		30	A
Operating Junction Temperature	T _J		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 ≤ 10 s	R _{θJA}	66	87	°C/W
	Steady State		90	120	
Junction-to-Ambient Thermal Resistance ^b	t ≤ 10 s	R _{θJA}	84	108	°C/W
	Steady State		110	135	
Junction-to-Case Thermal Resistance	Steady State	R _{θJC}	54	71	
Dual Operation					
Junction-to-Ambient Thermal Resistance ^a	t ≤ 10 s	R _{θJA}	70	92	°C/W
	Steady State		95	125	
Junction-to-Ambient Thermal Resistance ^b	t ≤ 10 s	R _{θJA}	90	115	°C/W
	Steady State		115	135	
Junction-to-Case Thermal Resistance	Steady State	R _{θJC}	56	72	

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

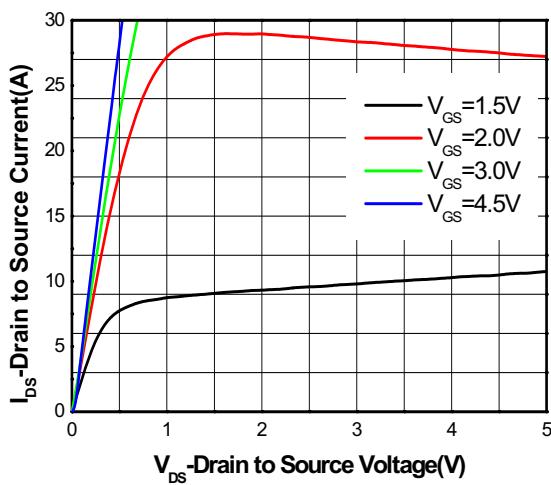
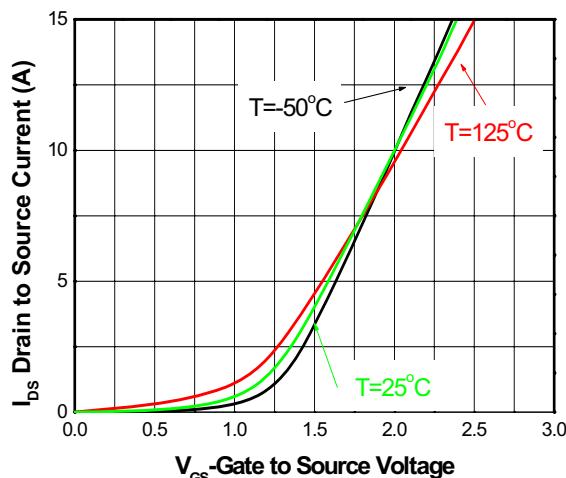
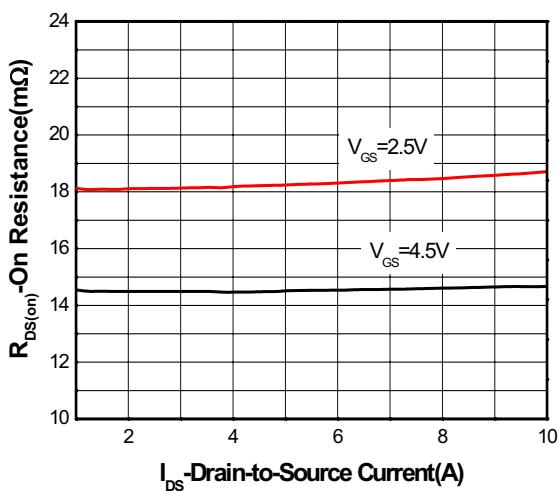
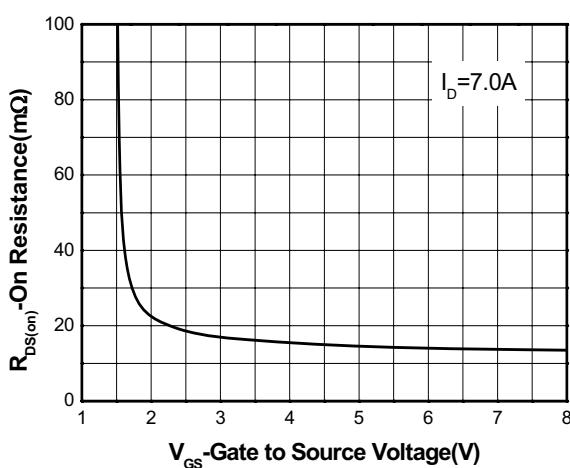
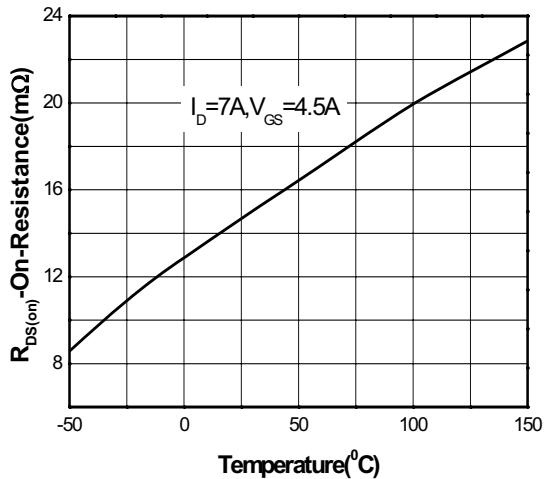
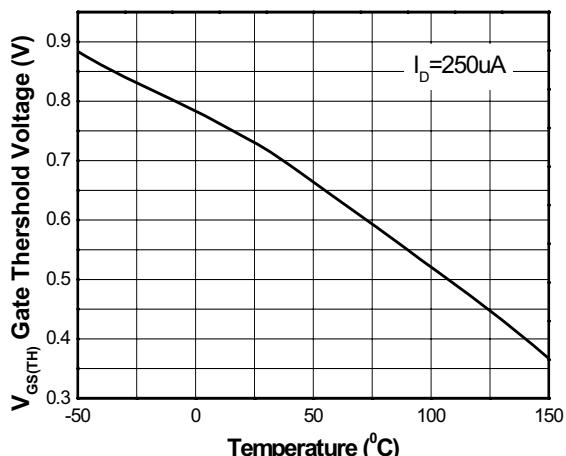
b Surface mounted on FR4 board using minimum pad size, 1oz copper

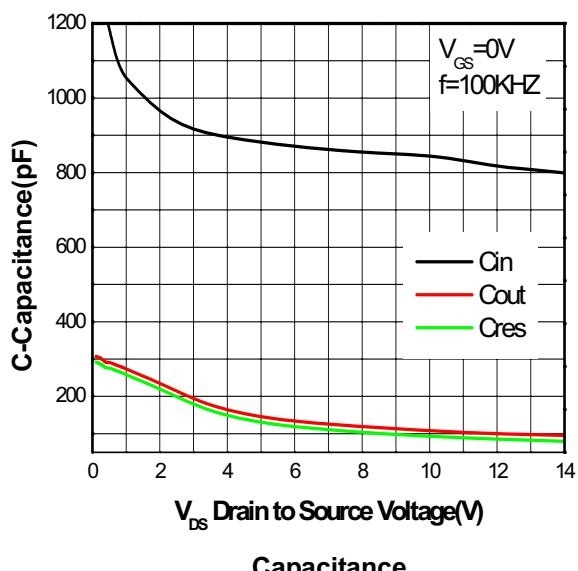
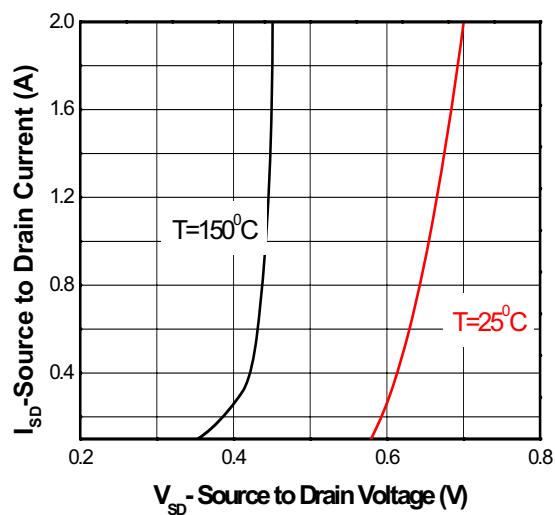
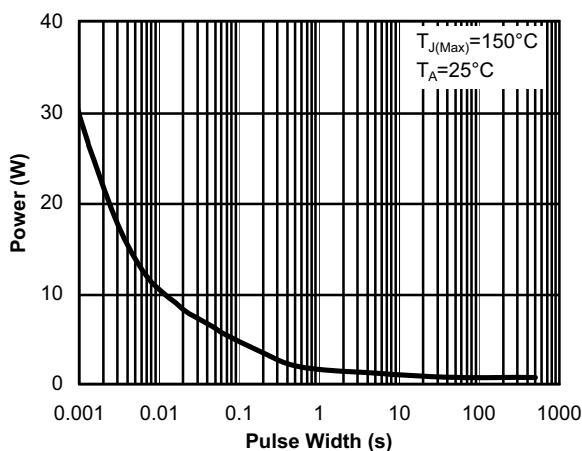
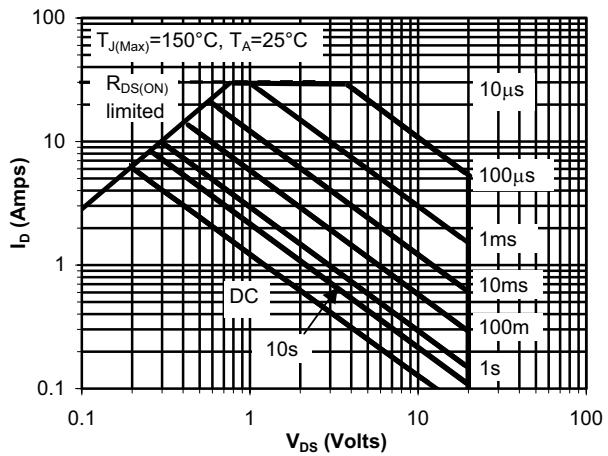
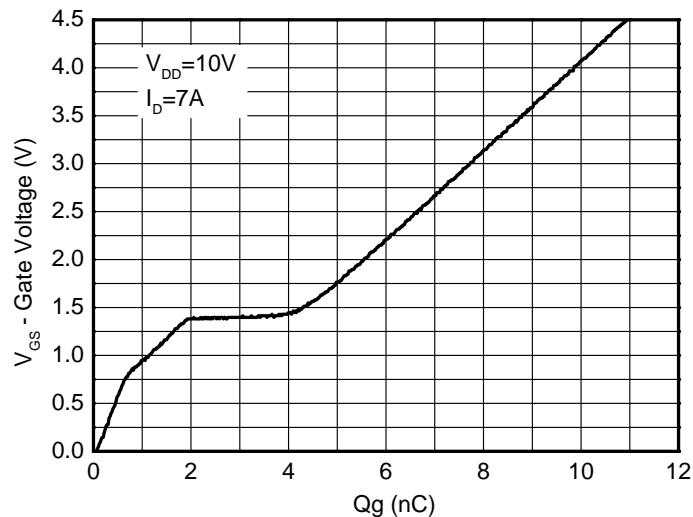
c Repetitive rating, pulse width limited by junction temperature, t_p=10μs, Duty Cycle=1%

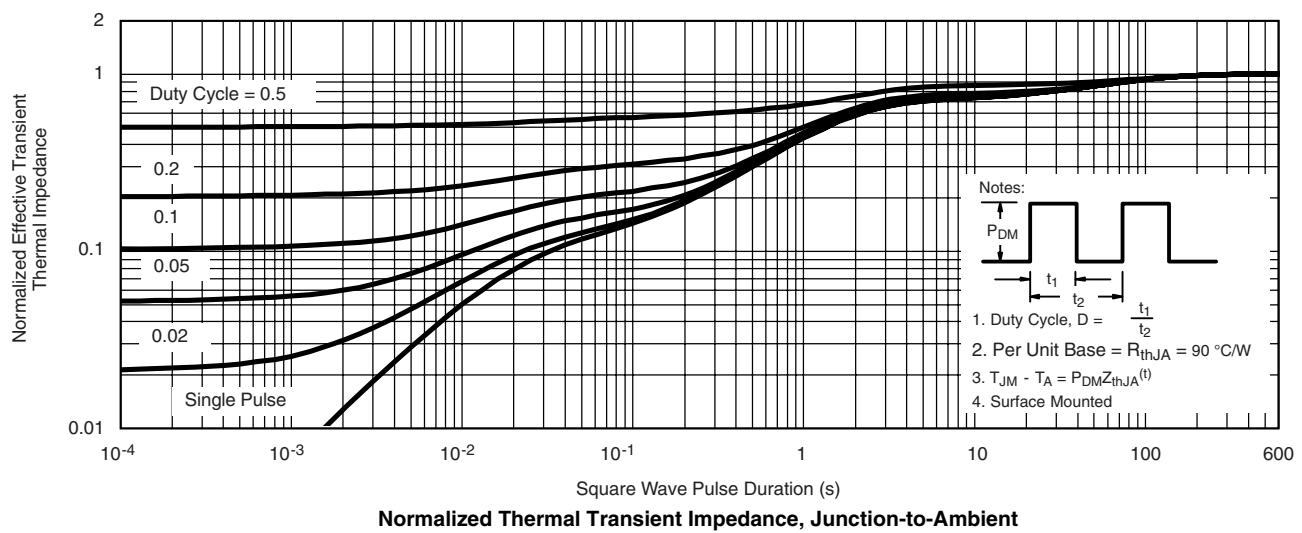
d Repetitive rating, pulse width limited by junction temperature T_J=150°C.

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
Drain-to-source On-resistance	$R_{DS(on)}$	$V_{GS} = 4.5\text{V}, I_D = 7.0\text{A}$	11	14.8	19	$\text{m}\Omega$
		$V_{GS} = 3.1\text{V}, I_D = 6.5\text{A}$	12	17	21	
		$V_{GS} = 2.5\text{V}, I_D = 5.5 \text{ A}$	14	19	24	
Forward Transconductance	g_{FS}	$V_{DS} = 5 \text{ V}, I_D = 7.0\text{A}$		16.6		S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	$V_{GS} = 0 \text{ V}, f = 100\text{KHz}, V_{DS} = 10 \text{ V}$		800		pF
Output Capacitance	C_{OSS}			108		
Reverse Transfer Capacitance	C_{RSS}			93		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = 4.5 \text{ V}, V_{DS} = 10 \text{ V}, I_D = 7.0\text{A}$		10.9		nC
Threshold Gate Charge	$Q_{G(TH)}$			0.62		
Gate-to-Source Charge	Q_{GS}			1.92		
Gate-to-Drain Charge	Q_{GD}			2.0		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$td(\text{ON})$	$V_{GS} = 4.5 \text{ V}, V_{DS} = 10\text{V}, R_L=2.0 \Omega, R_G=6 \Omega$		410		ns
Rise Time	Tr			1200		
Turn-Off Delay Time	$td(\text{OFF})$			6100		
Fall Time	Tf			3500		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	$V_{GS} = 0 \text{ V}, I_S = 1.0\text{A}$		0.65	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



Package outline dimensions
TSSOP-8L
