WNMD2179

Dual N-Channel, 20V, 6.3A, Power MOSFET

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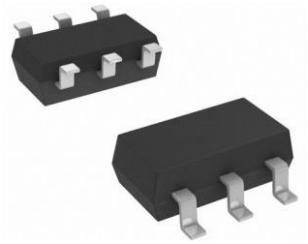
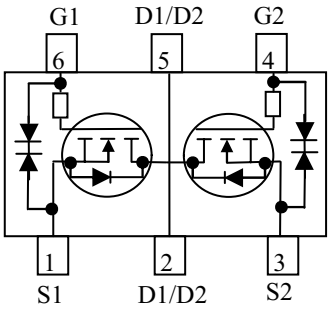
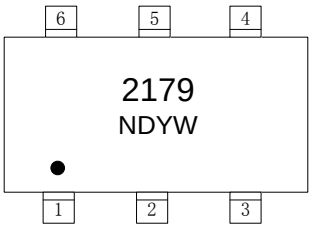
V_{DS} (V)	Rds(on) (Ω)
20	0.0175@ V_{GS}=4.5V
	0.0195@ V_{GS}=3.1V
	0.0215@ V_{GS}=2.5V
ESD Rating: 2000V HBM	



TSOT-23-6L



Pin configuration (Top view)



2179 = Device Code
ND = Special Code
Y = Year
W =Week(A~z)

Marking

Descriptions

The WNMD2179 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 WNMD2179 is Pb-free.

Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance for higher DC current
- Extremely Low Threshold Voltage
- Small package TSOT-23-6L

Applications

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

Order information

Device	Package	Shipping
WNMD2179-6/TR	TSOT-23-6L	3000/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 [a]	T_A=25°C	I_D	6.3	5.7	A
	T_A=70°C		5.0	4.6	
Maximum Power Dissipation [a]	T_A=25°C	P_D	1.1	0.9	W
	T_A=70°C		0.7	0.6	
Continuous Drain Current [b]	T_A=25°C	I_D	5.8	5.2	A
	T_A=70°C		4.6	4.1	
Maximum Power Dissipation [b]	T_A=25°C	P_D	0.9	0.7	W
	T_A=70°C		0.6	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	$R_{\theta JA}$	90	108	°C/W
	Steady State		110	130	
Junction-to-Ambient Thermal Resistance [b]	t ≤ 10 s	$R_{\theta JA}$	105	128	
	Steady State		133	158	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	60	75	
Dual Operation					
Junction-to-Ambient Thermal Resistance [a]	t ≤ 10 s	$R_{\theta JA}$	94	112	°C/W
	Steady State		115	132	
Junction-to-Ambient Thermal Resistance [b]	t ≤ 10 s	$R_{\theta JA}$	110	132	
	Steady State		138	162	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	63	78	

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

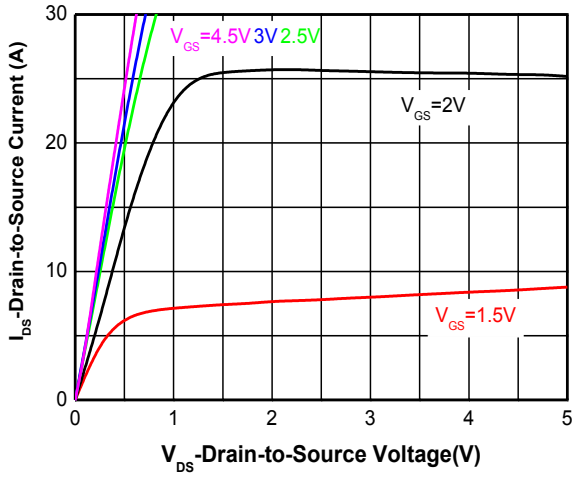
c Repetitive rating, pulse width limited by junction temperature, t_p=10μs, Duty Cycle=1%

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

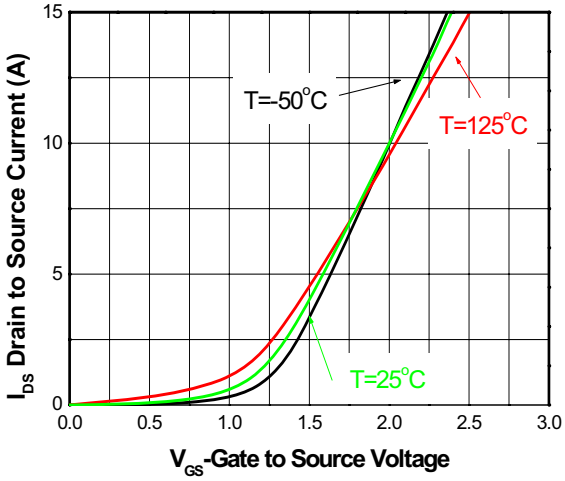
Electronics Characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0 V, I_D = 250uA	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =16 V, V_{GS} = 0V			1	uA
Gate-to-source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±10V			±5	uA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = 250uA	0.5	0.7	1.0	V
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS} = 4.5V, I_D = 6.3A	11	17.5	21	mΩ
		V_{GS} = 3.1V, I_D = 6.0A	13	19.5	23	
		V_{GS} = 2.5V, I_D = 5.5A	15	21.5	26	
Forward Transconductance	g_{FS}	V_{DS} = 5.0 V, I_D = 6.3A		16		S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 100kHz, V_{DS} = 10 V		800		pF
Output Capacitance	C_{OSS}			108		
Reverse Transfer Capacitance	C_{RSS}			93		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = 4.5 V, V_{DS} = 10 V, I_D = 6.3 A		11.8		nC
Threshold Gate Charge	$Q_{G(TH)}$			0.74		
Gate-to-Source Charge	Q_{GS}			1.55		
Gate-to-Drain Charge	Q_{GD}			3.2		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(ON)	V_{GS} = 4.5 V, V_{DS} =10 V, R_L=2.0 Ω, R_G=6 Ω		410		ns
Rise Time	tr			1200		
Turn-Off Delay Time	td(OFF)			6100		
Fall Time	tf			3500		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = 1.0A		0.75	1.5	V

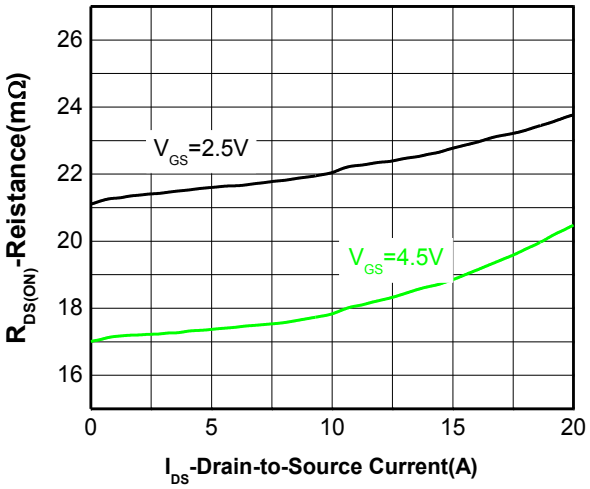
Typical Characteristics (Ta=25°C, unless otherwise noted)



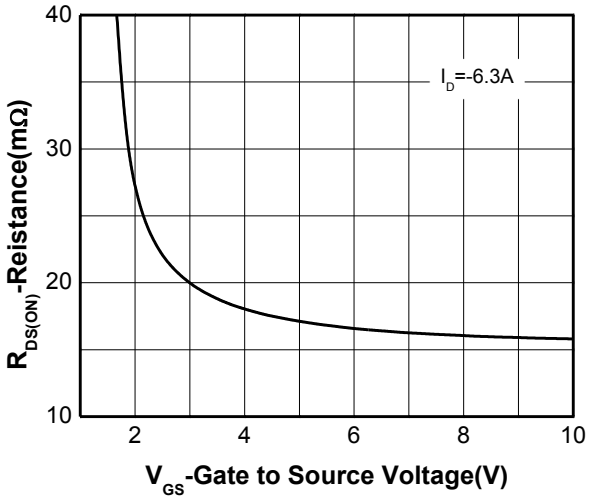
Output characteristics



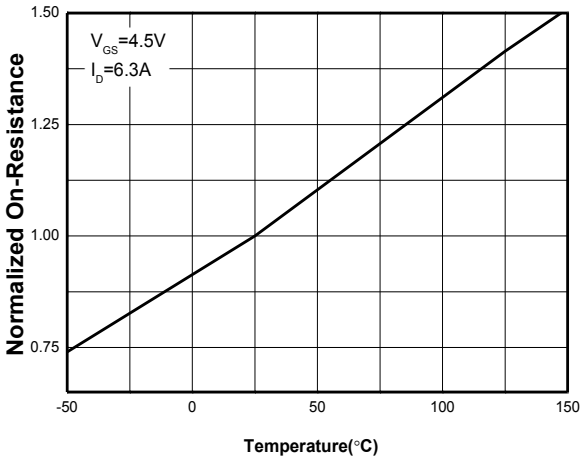
Transfer characteristics



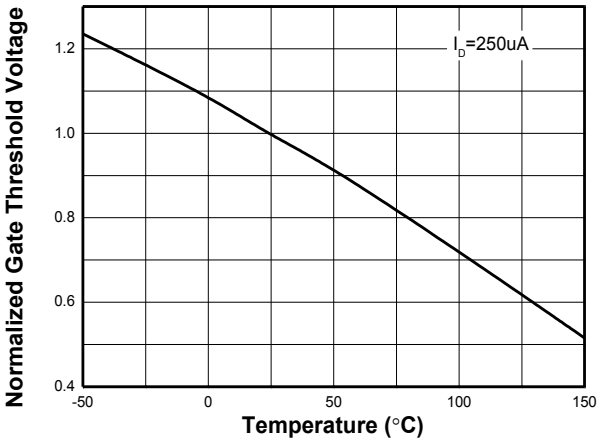
On-Resistance vs. Drain current



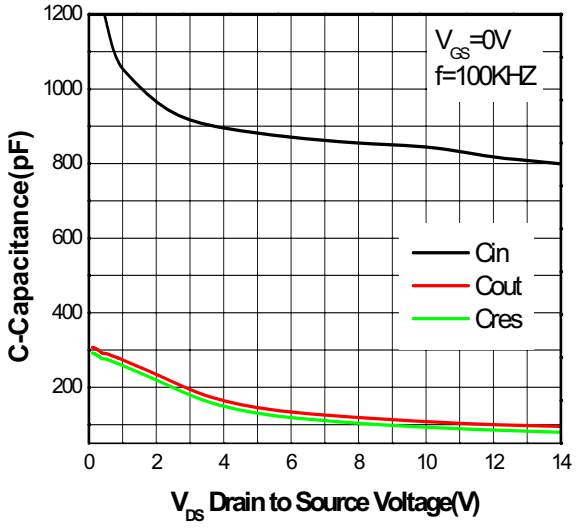
On-Resistance vs. Gate-to-Source voltage



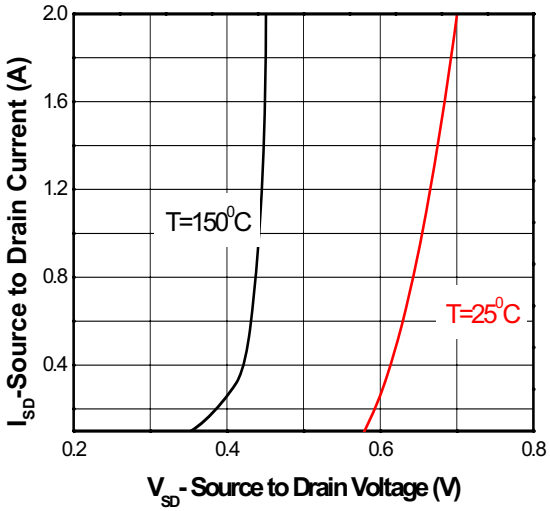
On-Resistance vs. Junction temperature



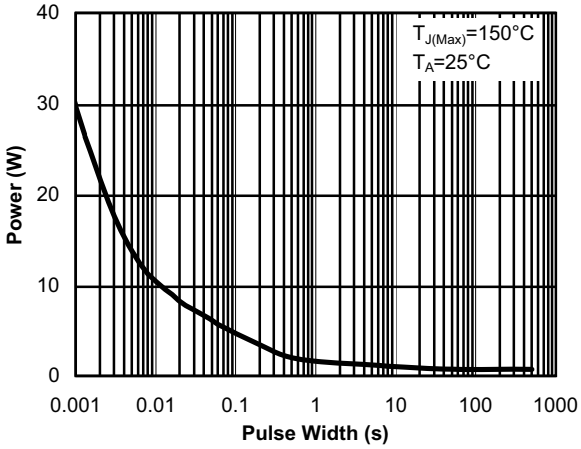
Threshold voltage vs. Temperature



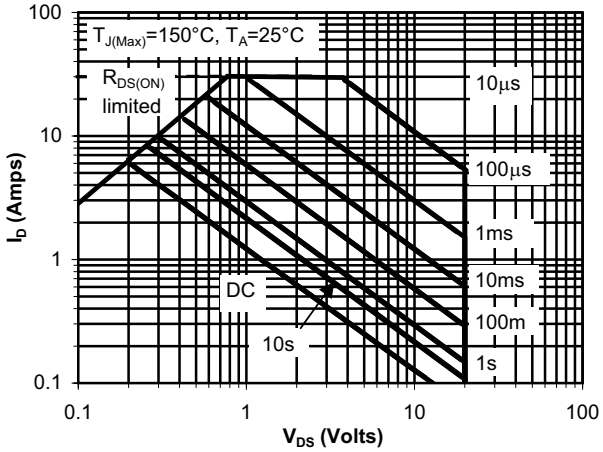
Capacitance



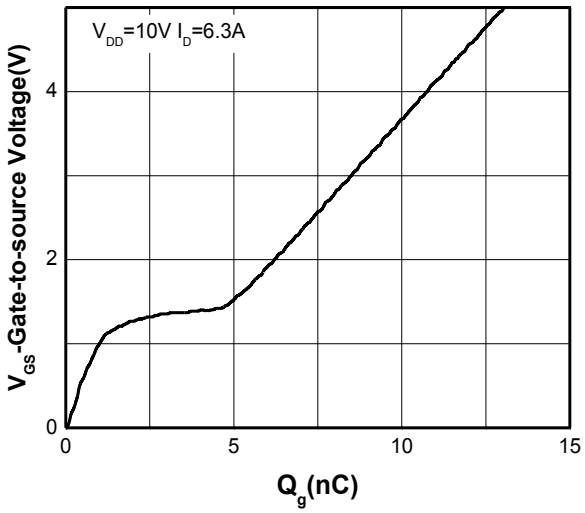
Body diode forward voltage



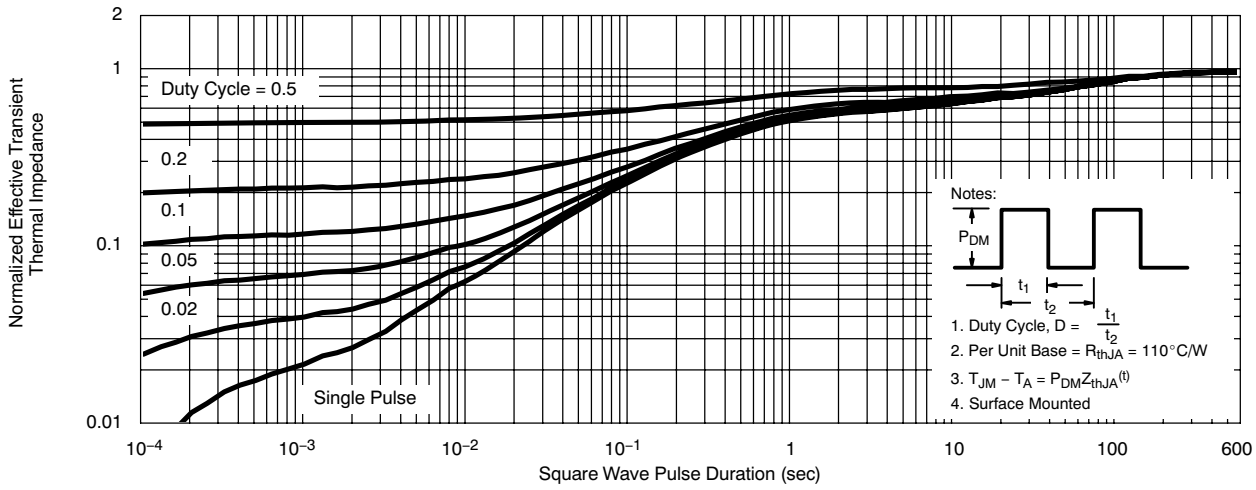
Single pulse power



Safe operating power



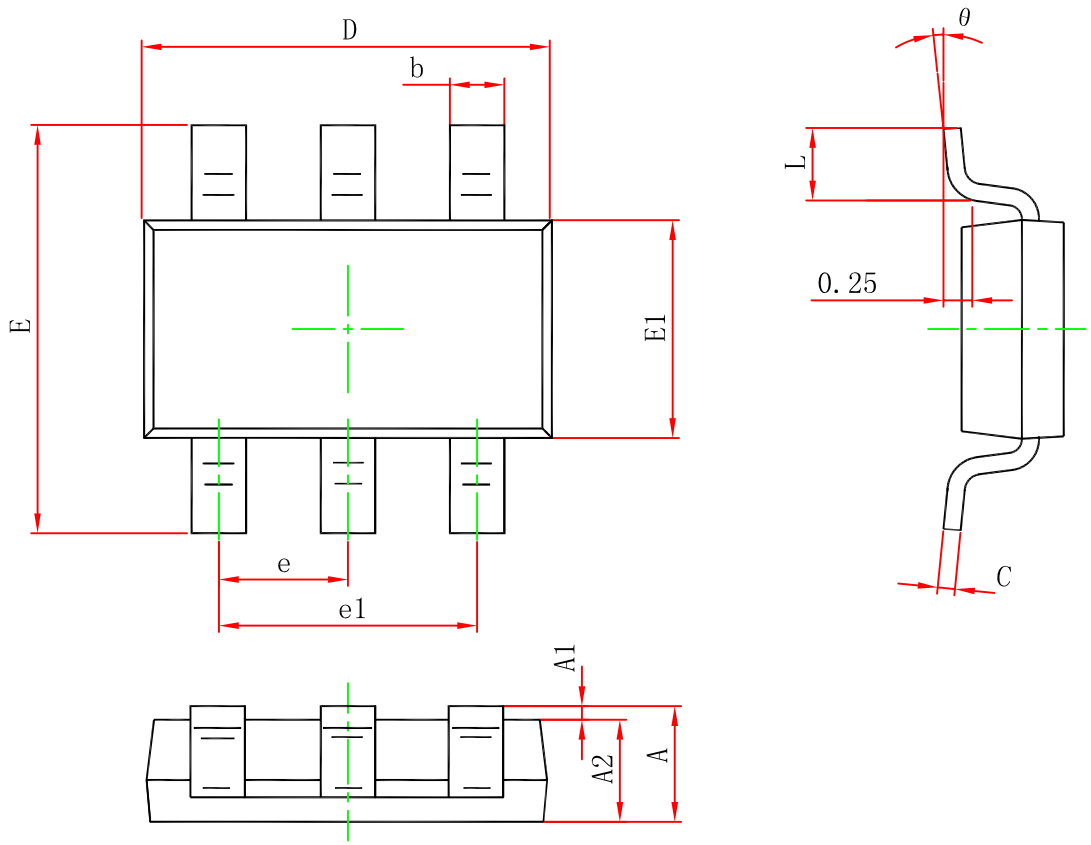
Gate Charge Characteristics



Transient thermal response (Junction-to-Ambient)

Package outline dimensions

TSOT-23-6L



NOTES:
ALL DIMENSIONS MEET JEDEC STANDARD MO-193 AA
DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS.

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	**Max**	**Min**	**Max**
A	---	0.900	---	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b	0.350	0.500	0.014	0.020
c	0.080	0.200	0.003	0.008
D	2.820	3.020	0.111	0.119
E1	1.600	1.700	0.063	0.067
E	2.650	2.950	0.104	0.116
e	0.95（BSC）		0.037(BSC)	
e1	1.90（BSC）		0.075(BSC)	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°