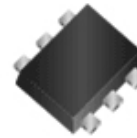


WNMD2154A

Dual N-Channel, 20V, 820mA, Power MOSFET

[Http://www.sh-willsemi.com](http://www.sh-willsemi.com)

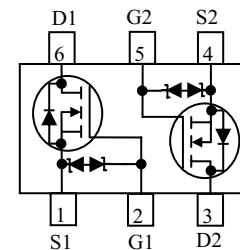
V_{DS} (V)	Max $R_{DS(on)}$ (m Ω)
20	550 @ $V_{GS}=4.5V$
	710 @ $V_{GS}=3.1V$
	900 @ $V_{GS}=2.5V$
	1400 @ $V_{GS}=1.8V$
ESD Rating: 2000V HBM	



SOT-563

Description

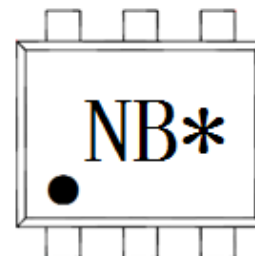
The WNMD2154A is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product WNMD2154A is Pb-free.



Pin configuration (Top view)

Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance
- Extremely Low Threshold Voltage
- Small package SOT-563



NB = Device Code
* = Month

Marking

Applications

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

Order information

Device	Package	Shipping
WNMD2154A-6/TR	SOT-563	3000/Tape&Reel

Absolute Maximum ratings

Parameter	Symbol	Maximum	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 10	
Continuous Drain Current	I_D	$T_A=25^{\circ}\text{C}$	mA
		$T_A=70^{\circ}\text{C}$	
Pulsed Drain Current ^c	I_{DM}	3000	mA
Power Dissipation ^a	P_D	$T_A=25^{\circ}\text{C}$	mW
		$T_A=70^{\circ}\text{C}$	
Operating Junction Temperature	T_J	-55 to 150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 to 150	$^{\circ}\text{C}$

Thermal resistance ratings

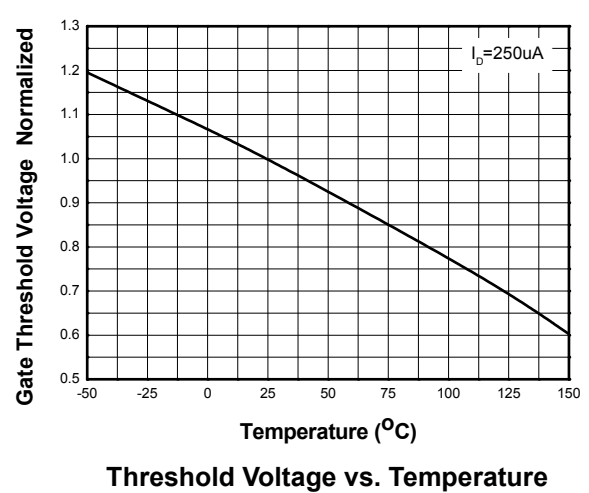
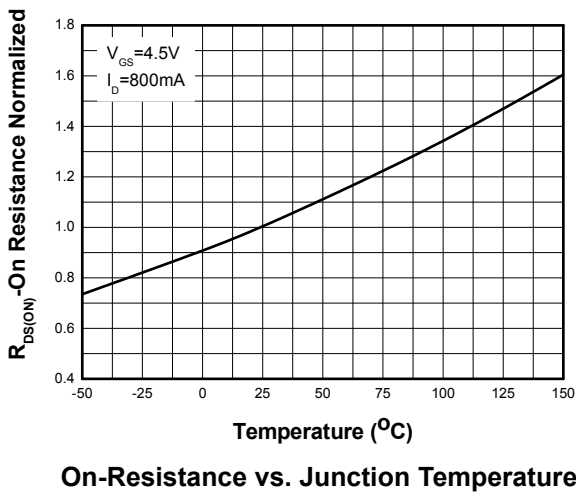
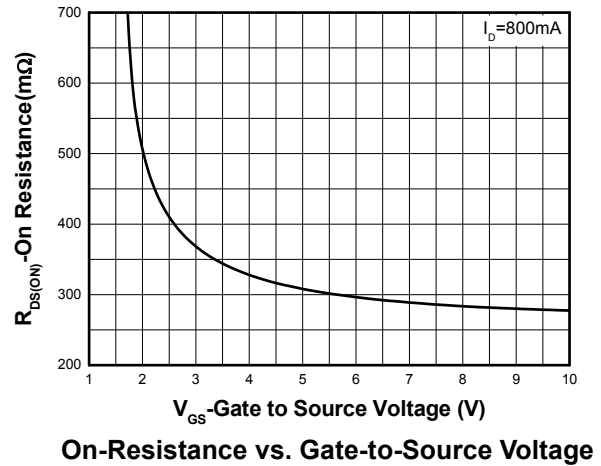
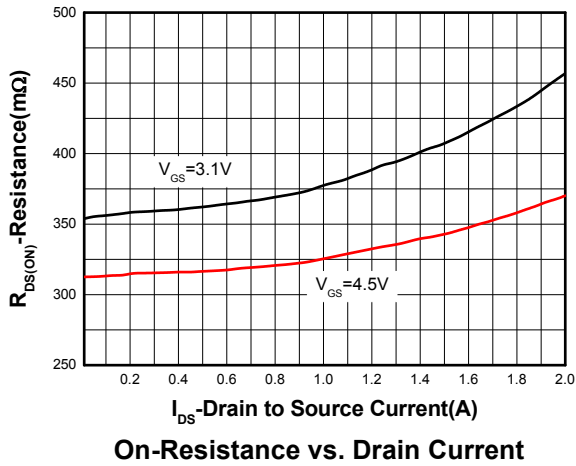
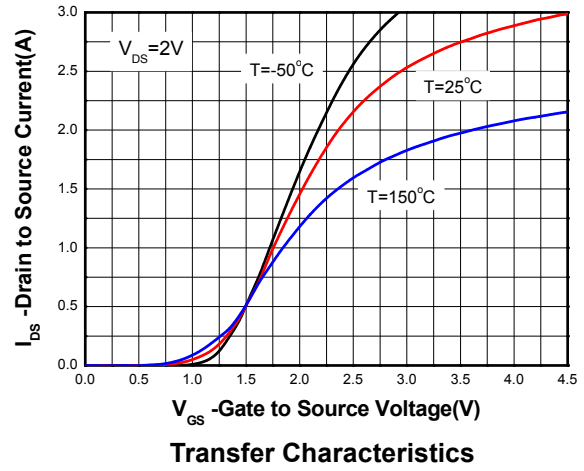
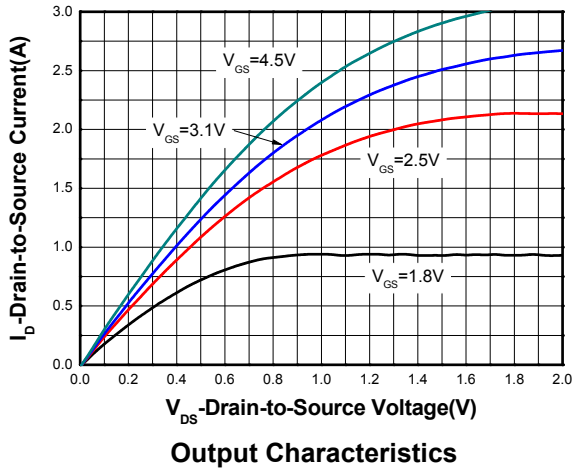
Single Operation				
Parameter		Symbol	Maximum	Unit
Junction-to-Ambient Thermal Resistance ^a	$t \leq 10 \text{ s}$	$R_{\theta JA}$	209	$^{\circ}\text{C/W}$
	Steady State		243	
Junction-to-Ambient Thermal Resistance ^b	$t \leq 10 \text{ s}$	$R_{\theta JA}$	385	
	Steady State		475	

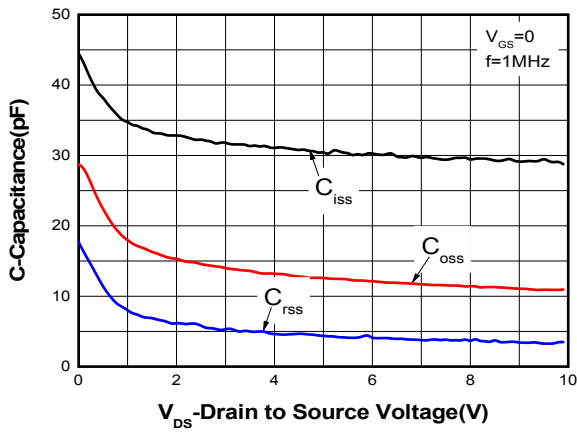
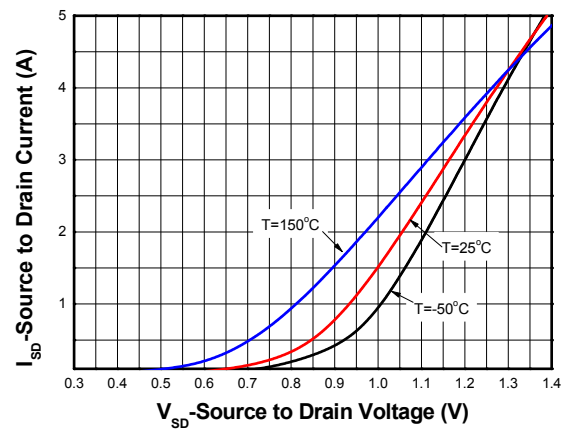
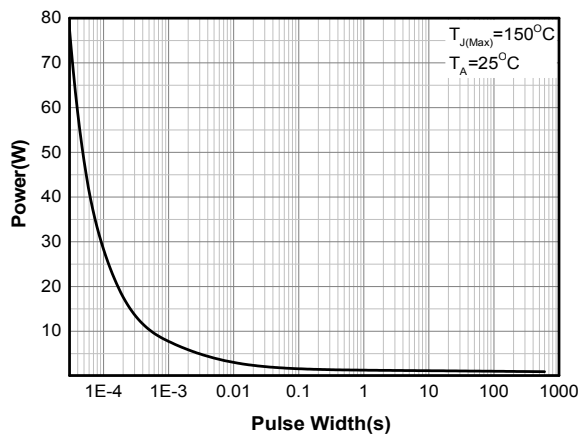
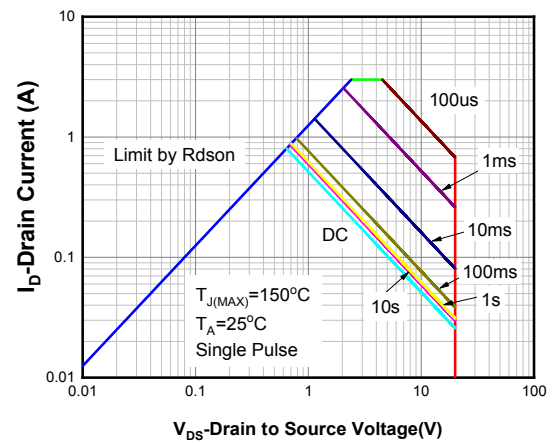
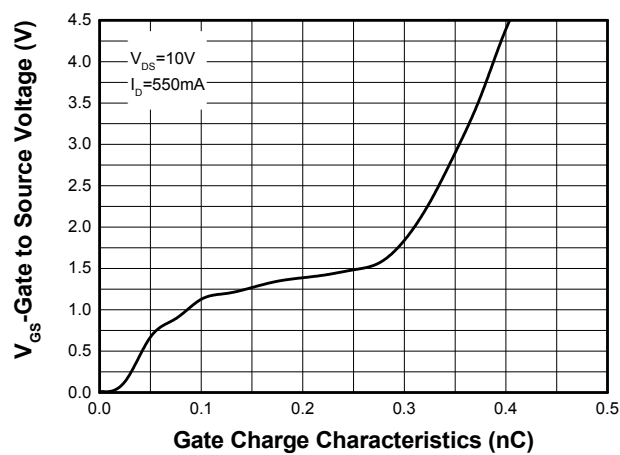
Note:

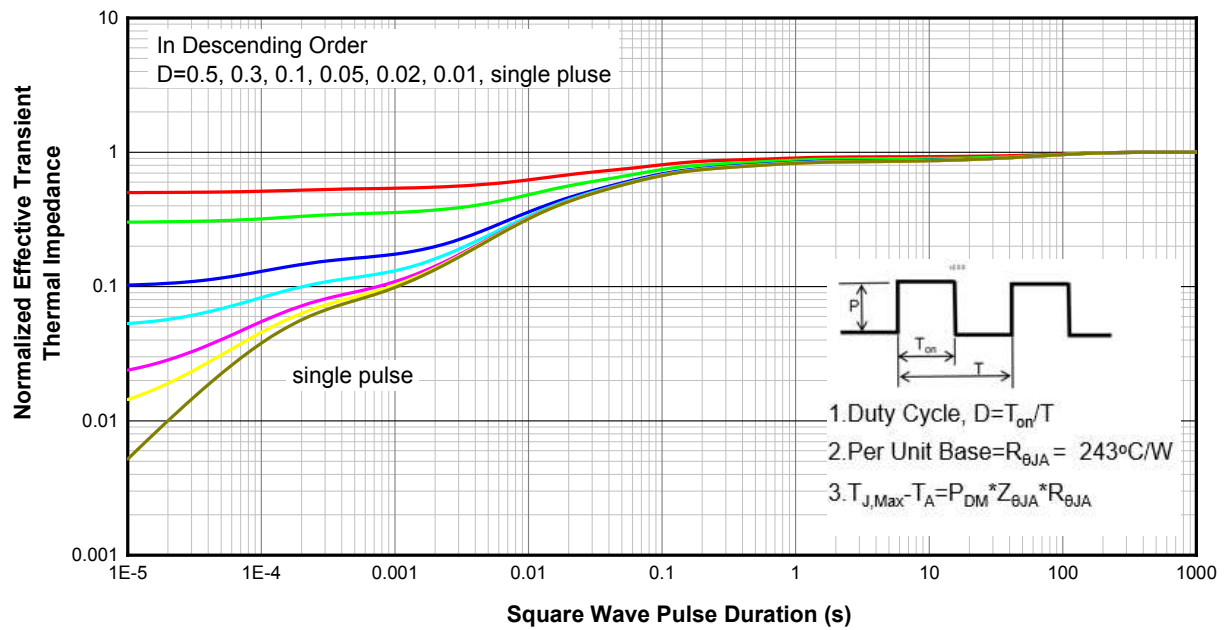
- a FR-4 board (38mm X 38mm X t1.6mm, 70um Copper) partially covered with copper (645mm² area)
- b FR-4 board (38mm X 38mm X t1.6mm, 70um Copper) minimum pad covered with copper
- c Repetitive rating, ~10us pulse width, duty cycle ~1%, keep initial $T_J = 25^{\circ}\text{C}$, the maximum allowed junction temperature of 150°C .
- d The static characteristics are obtained using ~380us pulses, duty cycle ~1%.

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

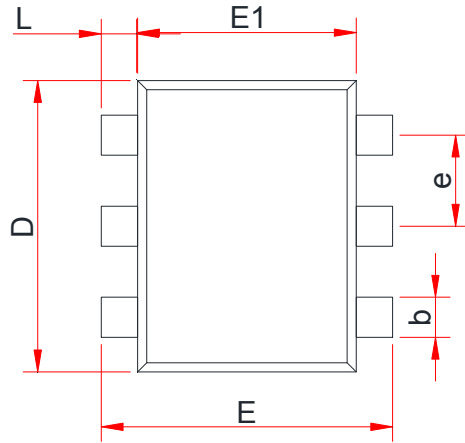
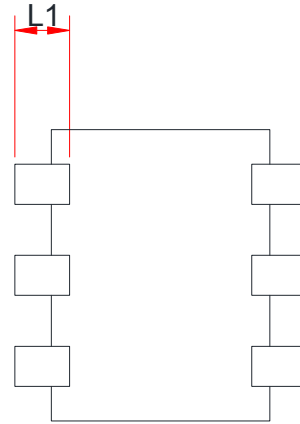
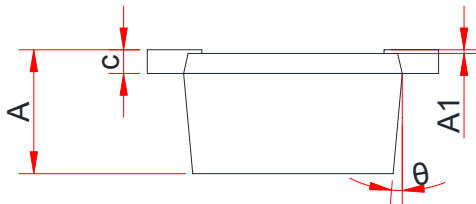
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0 V, I _D = 250uA	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =16V, V _{GS} = 0V			1	uA
Gate-to-source Leakage Current	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±10V			±10	uA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = 250uA	0.4	0.7	1.0	V
Drain-to-source On-resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =800mA		360	550	mΩ
		V _{GS} =3.1V, I _D =600mA		400	710	
		V _{GS} =2.5V, I _D =300mA		440	900	
		V _{GS} =1.8V, I _D =200mA		560	1400	
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C _{ISS}	V _{GS} = 0 V, f = 1.0MHz, V _{DS} = 10 V		29		pF
Output Capacitance	C _{OSS}			11		
Reverse Transfer Capacitance	C _{RSS}			4		
Total Gate Charge	Q _{G(TOT)}	V _{GS} = 4.5 V, V _{DS} = 10V, I _D =550mA		0.42		nC
Gate-to-Source Charge	Q _{GS}			0.1		
Gate-to-Drain Charge	Q _{GD}			0.16		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(ON)	V _{GS} = 4.5 V, V _{DS} = 10 V, I _D =550mA , R _G =6Ω		5.9		ns
Rise Time	tr			4.8		
Turn-Off Delay Time	td(OFF)			15.5		
Fall Time	tf			3.9		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V _{SD}	V _{GS} = 0 V, I _S = 800mA		0.9	1.2	V

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


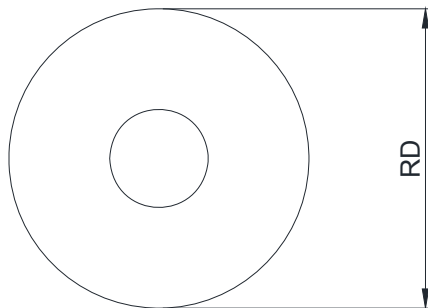
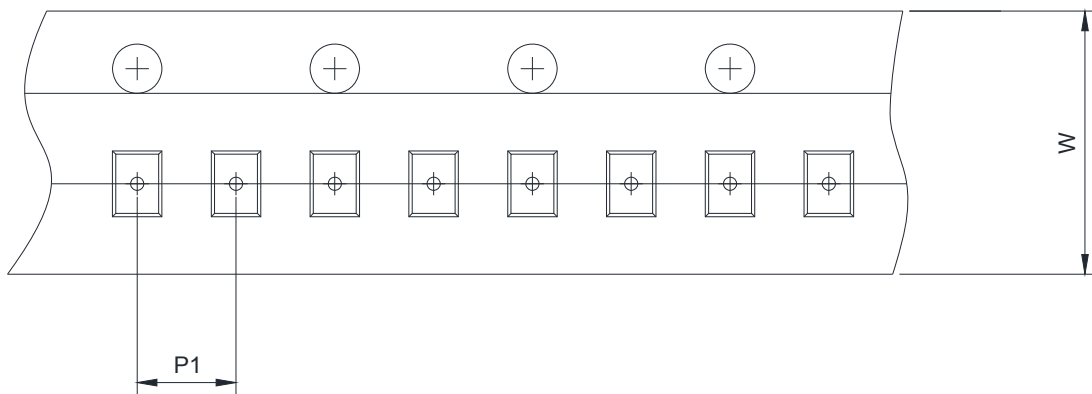
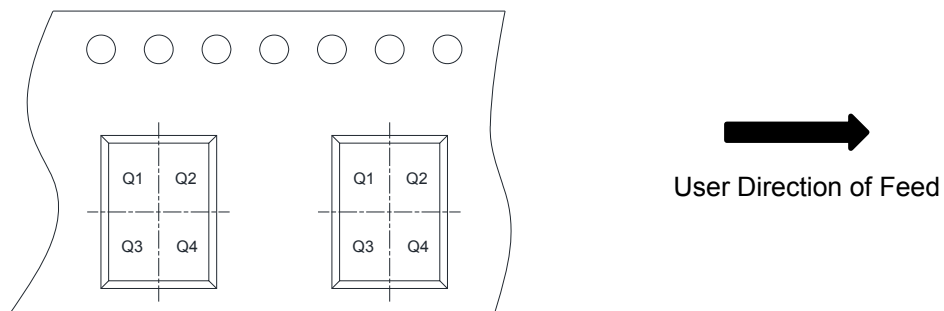

Capacitance

Body Diode Forward Voltage

Single Pulse power

Safe Operating Power

Gate Charge Characteristics



Transient Thermal Response (Junction-to-Ambient)

PACKAGE OUTLINE DIMENSIONS
SOT-563

TOP VIEW

BOTTOM VIEW

SIDE VIEW

Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.52	0.56	0.60
A1	0.00	-	0.05
e	0.50BSC		
c	0.09	—	0.16
D	1.50	1.60	1.70
E	1.50	1.60	1.70
E1	1.10	1.20	1.30
b	0.17	0.22	0.27
L	0.10	0.20	0.30
L1	0.20	0.30	0.40
θ	7° Ref		

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