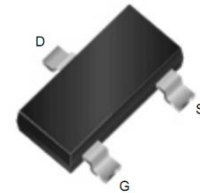


WNM2016A

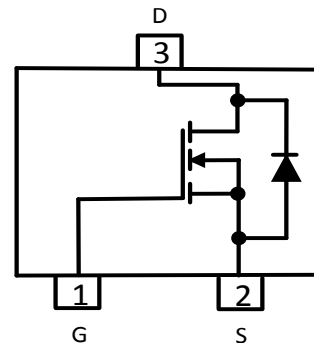
Single N-Channel, 20V, 4.7A, Power MOSFET

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

V _{DS} (V)	Typical R _{DS(on)} (mΩ)
20	33@ V _{GS} =4.5V
	39@ V _{GS} =3.1V
	44@ V _{GS} =2.5V
	66@ V _{GS} =1.8V



SOT-23



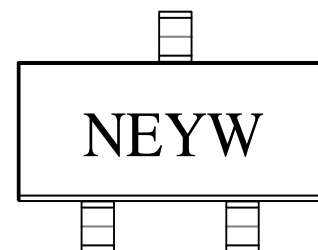
Pin configuration (Top view)

Description

The WNM2016A 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 WNM2016A is Pb-free and Halogen-free.

Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance
- Extremely Low Threshold Voltage
- Small package SOT-23



NE = Device Code
 Y = Year
 W = Week(A~Z)

Marking

Applications

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

Order information

Device	Package	Shipping
WNM2016A-3/TR	SOT-23	3000/Tape&Reel

Absolute Maximum ratings

Parameter	Symbol	Maximum	Unit	
Drain-Source Voltage	V_{DS}	20	V	
Gate-Source Voltage	V_{GS}	± 12		
Continuous Drain Current	I_D	$T_A=25^\circ\text{C}$	4.7	A
		$T_A=70^\circ\text{C}$	3.7	
Pulsed Drain Current ^c	I_{DM}	24		
Maximum Power Dissipation ^b	P_D	$T_A=25^\circ\text{C}$	1.4	W
		$T_A=70^\circ\text{C}$	0.9	
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

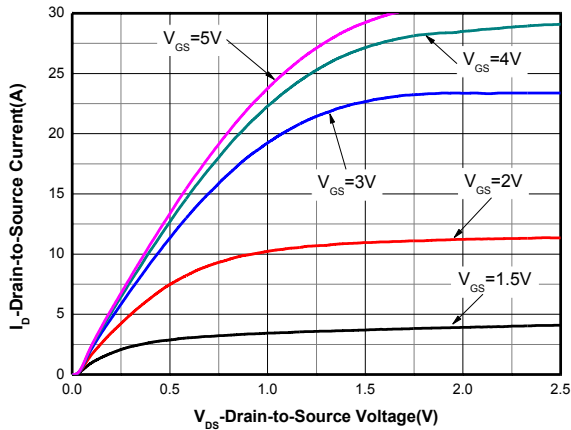
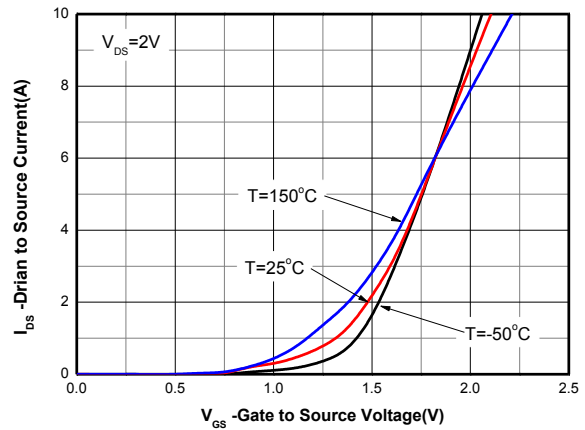
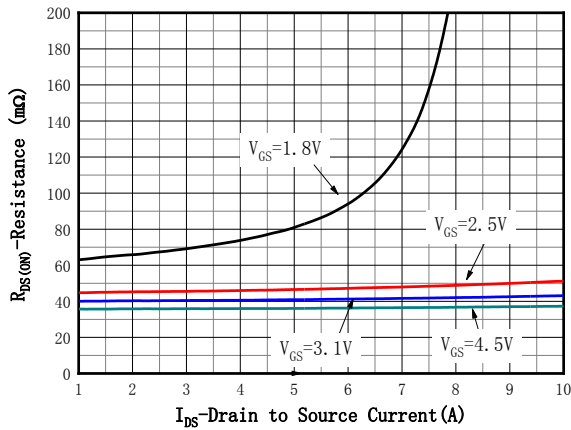
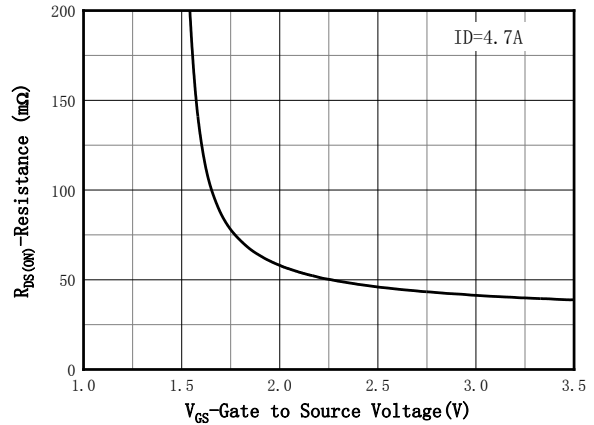
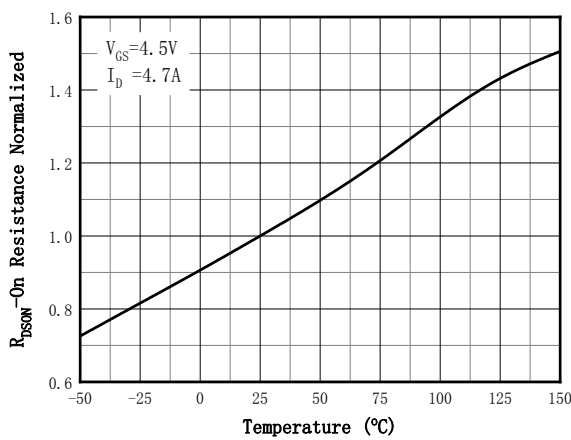
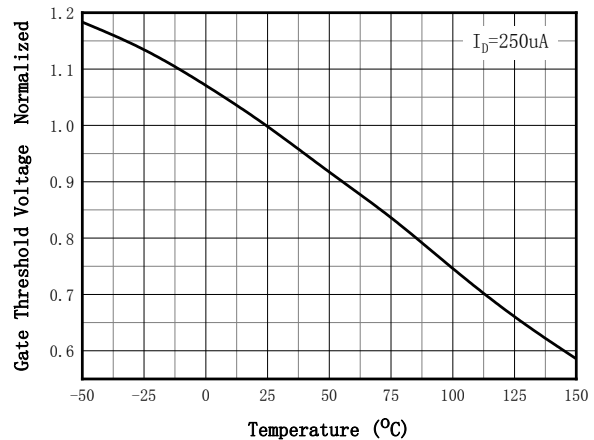
Single Operation					
Parameter	Symbol	Typical	Maximum	Unit	
Junction-to-Ambient Thermal Resistance ^a	$R_{\theta JA}$	72	90	$t \leq 10 \text{ s}$	$^\circ\text{C/W}$
				Steady State	
Junction-to-Lead Thermal Resistance	$R_{\theta JL}$	42	54	Steady State	

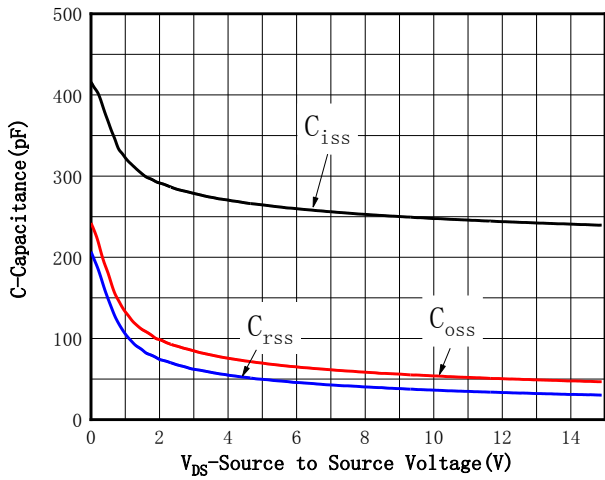
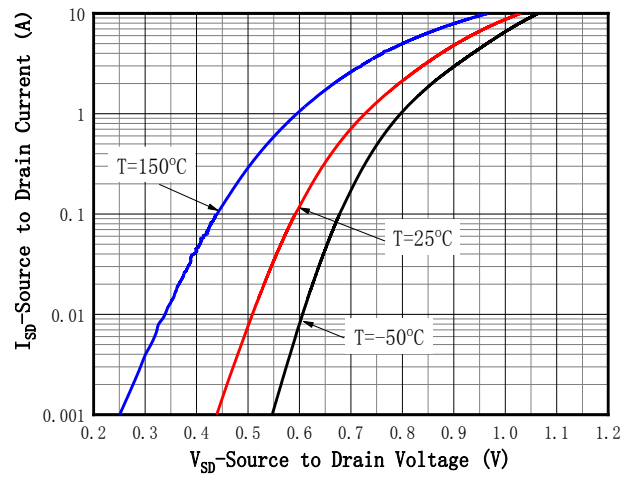
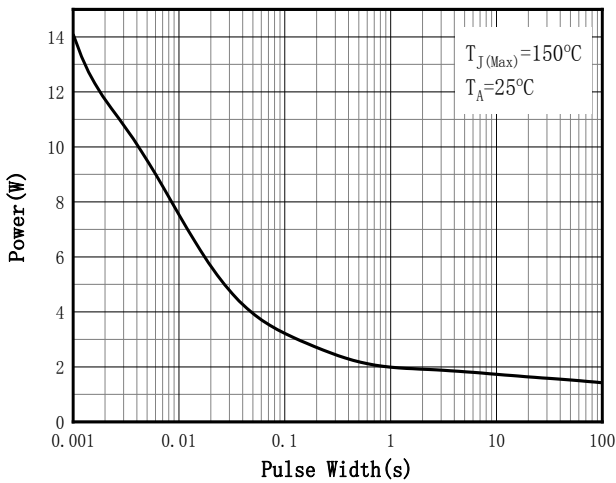
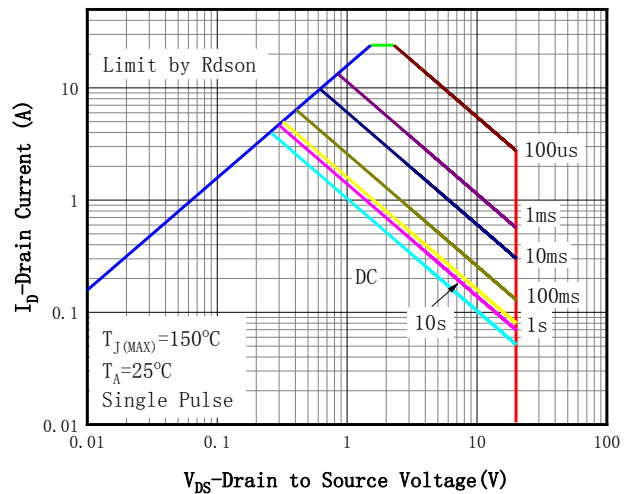
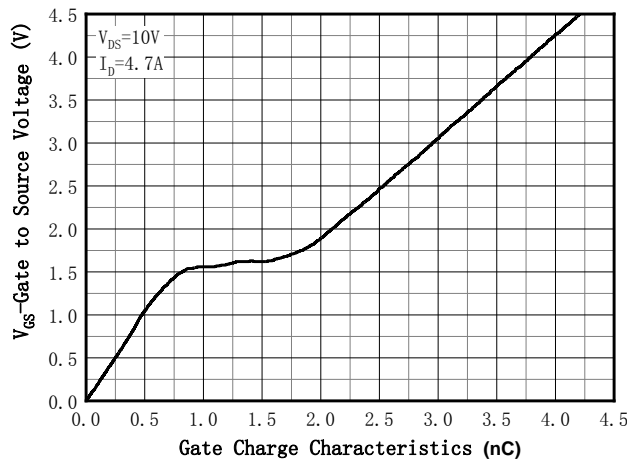
Note:

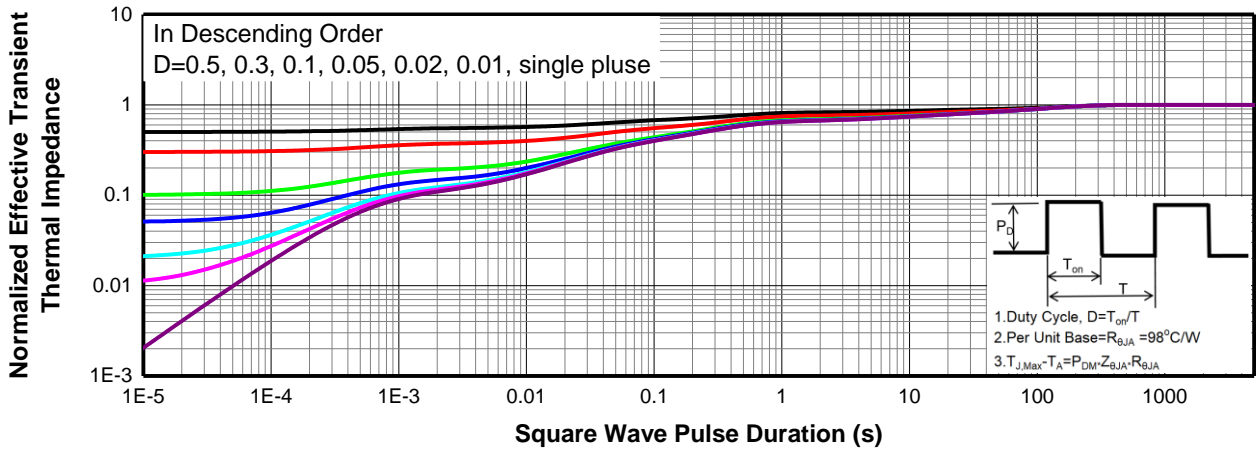
- The value of $R_{\theta JA}$ is measured with the device mounted on 1-inch² (6.45cm²) with 2oz. (0.071mm thick) Copper pad on a 1.5*1.5 inch², 0.06-inch thick FR4 PCB, in a still air environment with $T_A = 25^\circ\text{C}$. The value in any given application is determined by the user's specific board design
- The power dissipation P_D is based on Junction-to-Ambient thermal resistance $R_{\theta JA}$ $t \leq 10\text{s}$ value and the $T_{J(\text{MAX})} = 150^\circ\text{C}$.
- Repetitive rating, ~10us pulse width, duty cycle ~1%, keep initial $T_J = 25^\circ\text{C}$, the maximum allowed junction temperature of 150°C .
- The static characteristics are obtained using ~380us pulses, duty cycle ~1%.

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

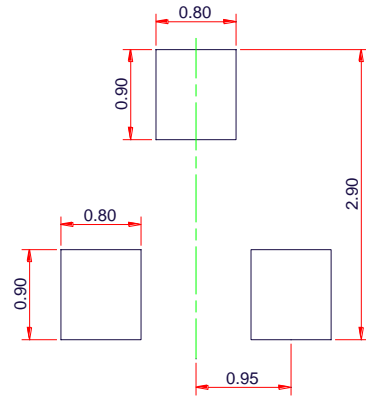
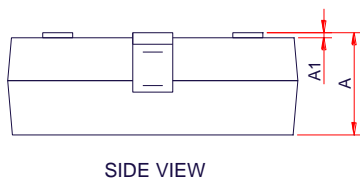
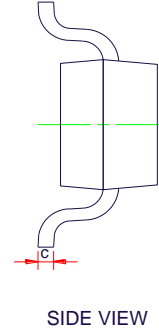
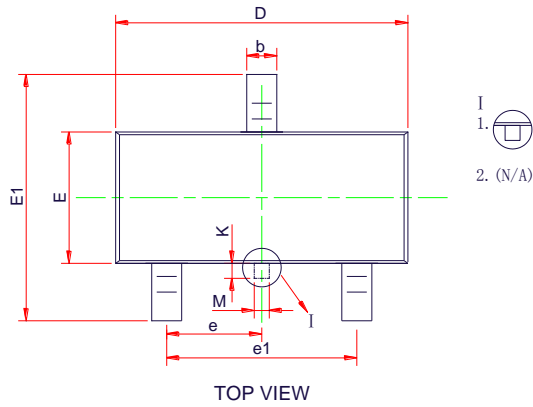
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0\text{ V}, I_D = 250\mu\text{A}$	20			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 16\text{ V}, V_{GS} = 0\text{ V}$			1	μA
Gate-to-source Leakage Current	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 12\text{ V}$			± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = 250\mu\text{A}$	0.45	0.65	1.0	V
Drain-to-source On-resistance	$R_{DS(on)}$	$V_{GS} = 4.5\text{ V}, I_D = 4.7\text{ A}$		34	42	m Ω
		$V_{GS} = 3.1\text{ V}, I_D = 3.5\text{ A}$		39	52	
		$V_{GS} = 2.5\text{ V}, I_D = 2.5\text{ A}$		44	63	
		$V_{GS} = 1.8\text{ V}, I_D = 2.0\text{ A}$		66	118	
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	$V_{GS} = 0\text{ V}, f = 1.0\text{ MHz}, V_{DS} = 10\text{ V}$		247		pF
Output Capacitance	C_{OSS}			53		
Reverse Transfer Capacitance	C_{RSS}			36		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = 4.5\text{ V}, V_{DS} = 10\text{ V}, I_D = 4.7\text{ A}$		4.2		nC
Threshold Gate Charge	$Q_{G(TH)}$			0.3		
Gate-to-Source Charge	Q_{GS}			0.8		
Gate-to-Drain Charge	Q_{GD}			1.0		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_d(ON)$	$V_{GS} = 4.5\text{ V}, V_{DS} = 10\text{ V}, R_L = 3.5\Omega, R_G = 6\Omega$		5.3		ns
Rise Time	t_r			12.6		
Turn-Off Delay Time	$t_d(OFF)$			25		
Fall Time	t_f			9.9		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	$V_{GS} = 0\text{ V}, I_S = 1\text{ A}$		0.7	1.2	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

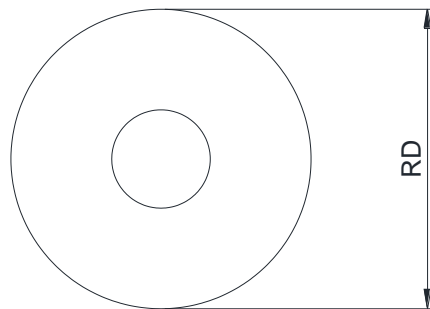
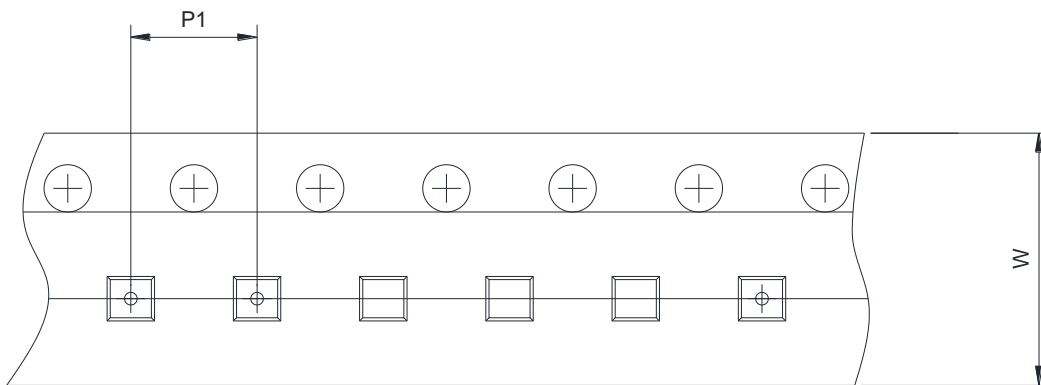
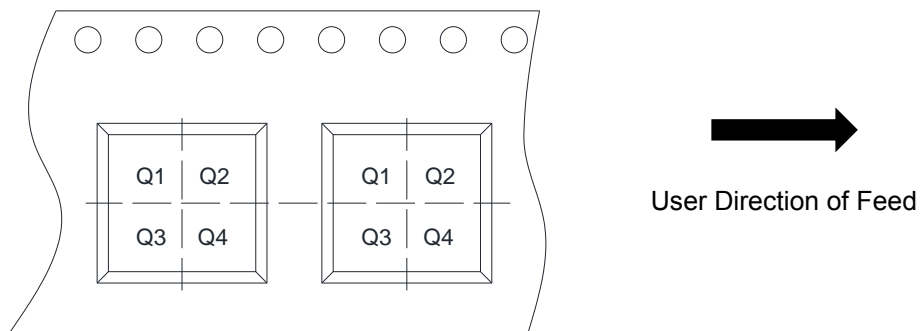

Capacitance

Body Diode Forward Voltage

Single Pulse power

Safe Operating Power

Gate Charge Characteristics



Transient Thermal Response (Junction-to-Ambient)

PACKAGE OUTLINE DIMENSIONS
SOT-23


Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.89	1.10	1.30
A1	0.00	-	0.10
b	0.30	0.43	0.55
c	0.05	-	0.21
D	2.70	2.90	3.10
E	1.15	1.33	1.50
E1	2.10	2.40	2.70
e	0.95 Typ.		
e1	1.70	1.90	2.10
M	0.10	0.15	0.25
K	0.00	-	0.25

TAPE AND REEL INFORMATION
Reel Dimensions

Tape Dimensions

Quadrant Assignments For PIN1 Orientation In Tape


RD	Reel Dimension	<input checked="" type="checkbox"/> 7inch	<input type="checkbox"/> 13inch
W	Overall width of the carrier tape	<input checked="" type="checkbox"/> 8mm	<input type="checkbox"/> 12mm <input type="checkbox"/> 16mm
P1	Pitch between successive cavity centers	<input type="checkbox"/> 2mm	<input checked="" type="checkbox"/> 4mm <input type="checkbox"/> 8mm
Pin1	Pin1 Quadrant	<input type="checkbox"/> Q1	<input type="checkbox"/> Q2 <input checked="" type="checkbox"/> Q3 <input type="checkbox"/> Q4