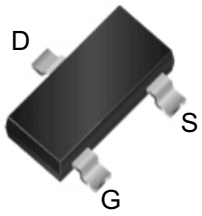
WNM2016

N-Channel, 20V, 3.2A, Power MOSFET

Http://www.sh-willsemi.com

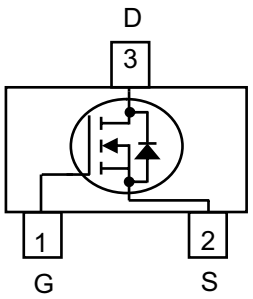
V_{DS} (V)	Typical $R_{DS(on)}$ (mΩ)
20	40 @ V_{GS}=4.5V
	47 @ V_{GS}=2.5V
	55 @ V_{GS}=1.8V



SOT-23

Descriptions

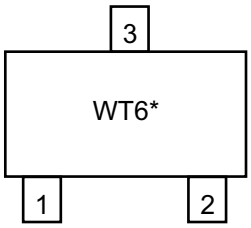
The WNM2016 is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS\ (ON)}$ with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product WNM2016 is Pb-free and Halogen-free.



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-23



WT6 = Device Code
* = Month (A~Z)

Marking

Applications

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

Order Information

Device	Package	Shipping
WNM2016-3/TR	SOT-23	3000/Tape&Reel

ABSOLUTE MAXIMUM RATINGS TA = 25 °C, unless otherwise noted					
Parameter		**Symbol**	**10 S**	**Steady State**	**Unit**
Drain-Source Voltage		V_{DS}	20		V
Gate-Source Voltage		V_{GS}	±8		
Continuous Drain Current (T_J = 150 °C)[a]	T_A=25°C	I_D	3.2	2.9	A
	T_A=70°C		2.5	2.3	
Maximum Power Dissipation [a]	T_A=25°C	P_D	0.8	0.7	W
	T_A=70°C		0.5	0.4	
Continuous Drain Current (T_J = 150 °C)[b]	T_A=25°C	I_D	2.9	2.7	A
	T_A=70°C		2.3	2.1	
Maximum Power Dissipation [b]	T_A=25°C	P_D	0.6	0.5	W
	T_A=70°C		0.4	0.3	
Pulsed Drain Current [c]		I_{DM}	10		A
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150		°C

THERMAL RESISTANCE RATINGS					
Parameter		**Symbol**	**Typical**	**Maximum**	**Unit**
Junction-to-Ambient Thermal Resistance [a]	t ≤ 10 s	$R_{\theta JA}$	125	150	°C/W
	Steady State		140	175	
Junction-to-Ambient Thermal Resistance [b]	t ≤ 10 s	$R_{\theta JA}$	150	180	
	Steady State		165	210	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	60	76	

a Surface mounted on FR4 Board using 1 in sq pad size, 1oz Cu.

b Surface mounted on FR4 board using the minimum recommended pad size, 1oz Cu.

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

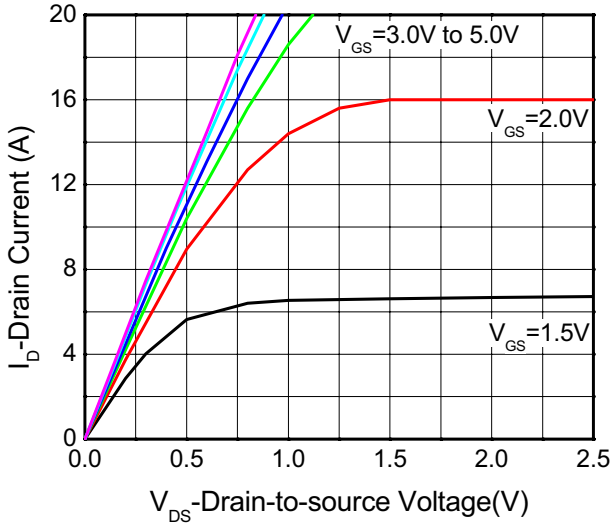
d Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.

Electronics Characteristics

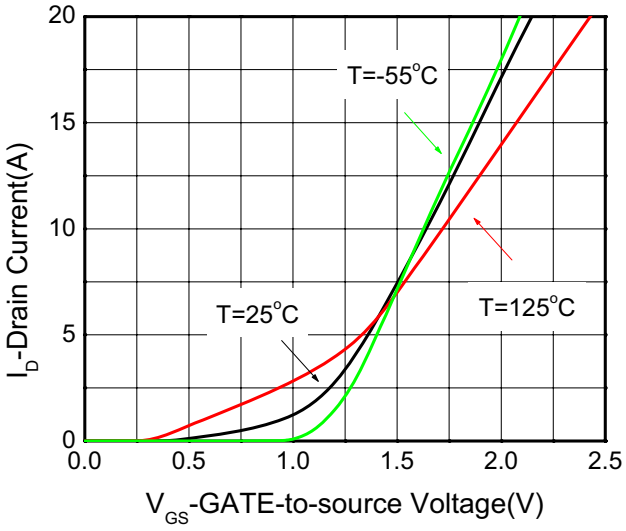
(Ta=25°C, unless otherwise noted)

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} = ±8.0V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = 250uA	0.4	0.6	1	V
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS} = 4.5V, I_D = 3.6A		40	47	mΩ
		V_{GS} = 2.5V, I_D = 3.1A		47	55	
		V_{GS} = 1.8V, I_D = 1.0A		55	66	
Forward Transconductance	g_{FS}	V_{DS} = 5 V, I_D = 3.1A		8.5		S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 1.0 MHz, V_{DS} = 10 V		500		pF
Output Capacitance	C_{OSS}			62		
Reverse Transfer Capacitance	C_{RSS}			58		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = 4.5 V, V_{DS} = 10 V, I_D = 3.1 A		8.5		nC
Threshold Gate Charge	$Q_{G(TH)}$			0.45		
Gate-to-Source Charge	Q_{GS}			0.65		
Gate-to-Drain Charge	Q_{GD}			3.1		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(ON)	V_{GS} = 4.5 V, V_{DS} = 10 V, R_L=3.5Ω, R_G=6 Ω		12		ns
Rise Time	tr			20.8		
Turn-Off Delay Time	td(OFF)			38.8		
Fall Time	tf			10.8		
DRAIN−SOURCE DIODE CHARACTERISTICS						
Forward Recovery Voltage	V_{SD}	V_{GS} = 0 V, I_S = 1.0A		0.62	1.5	V

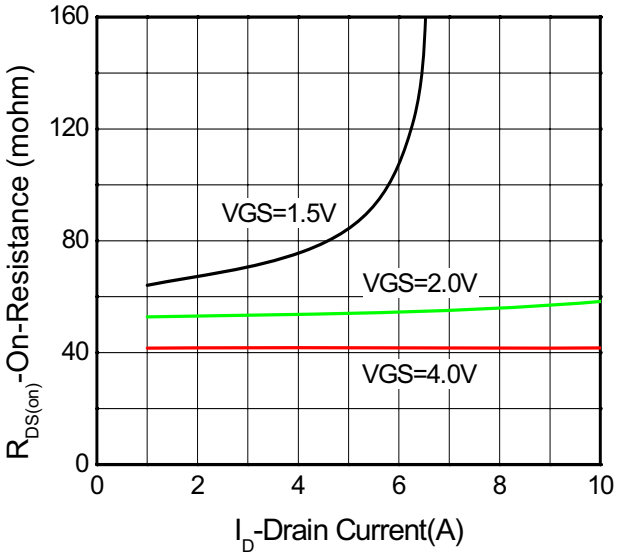
Typical Performance Graph



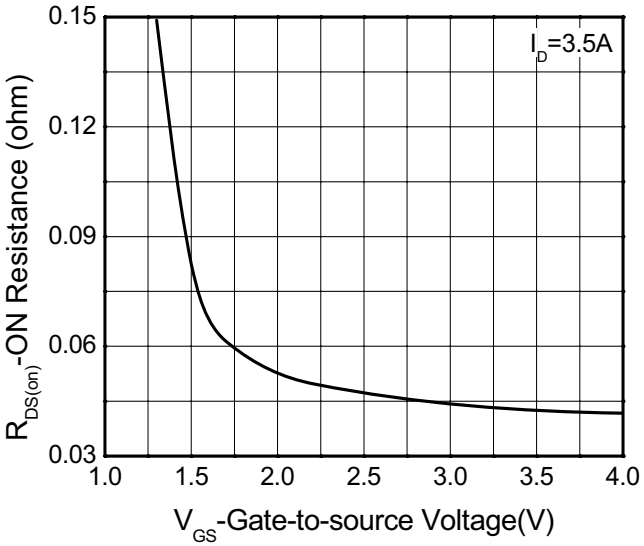
Output Characteristics



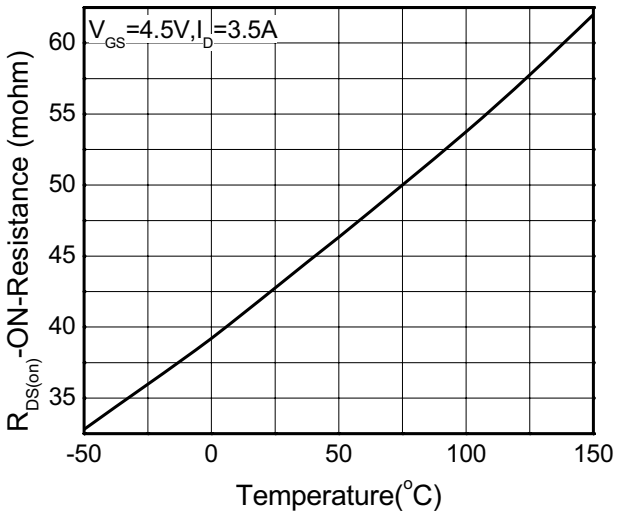
Transfer Characteristics



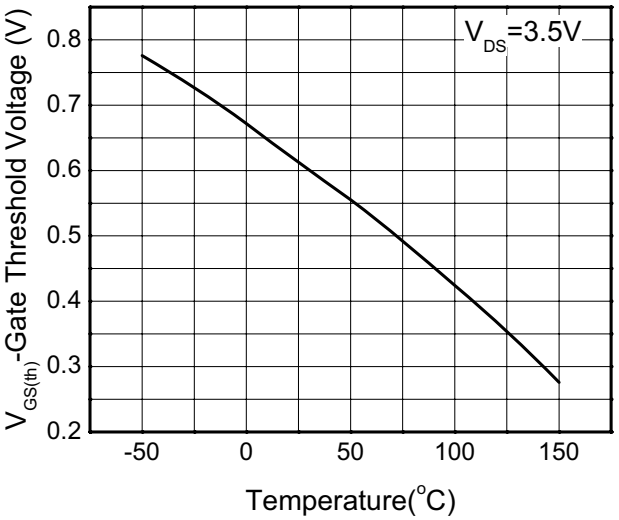
Rds(on) vs. Drain Current



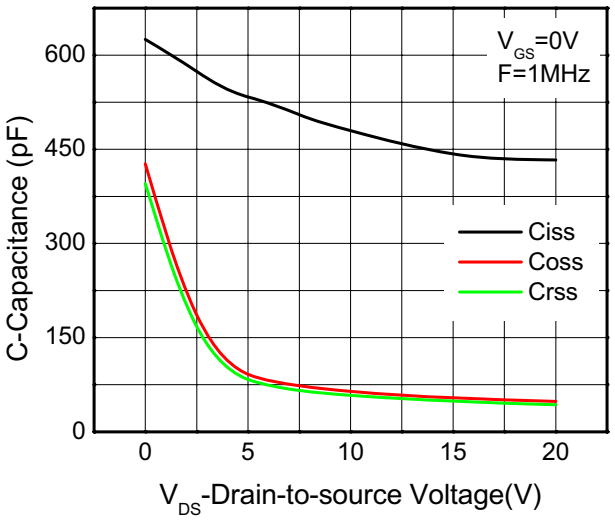
Rds(on) vs. Gate to Source Voltage



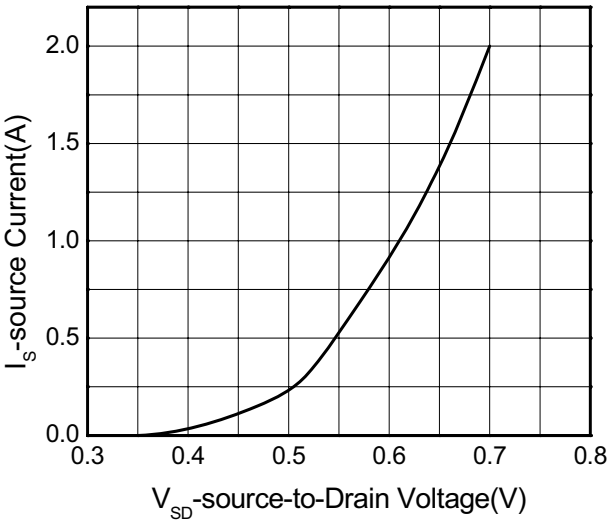
Rds(on) vs. Junction Temperature



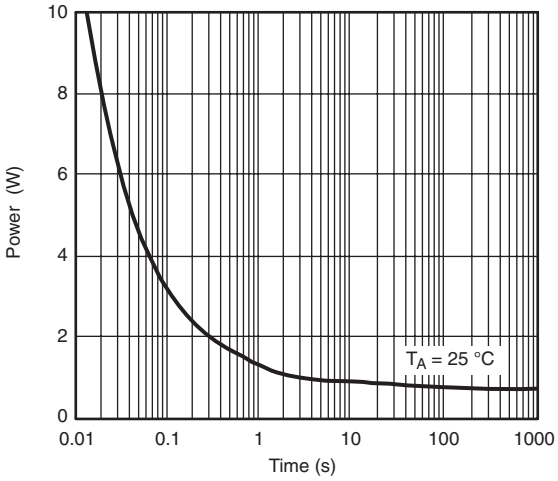
Threshold voltage vs. Temperature



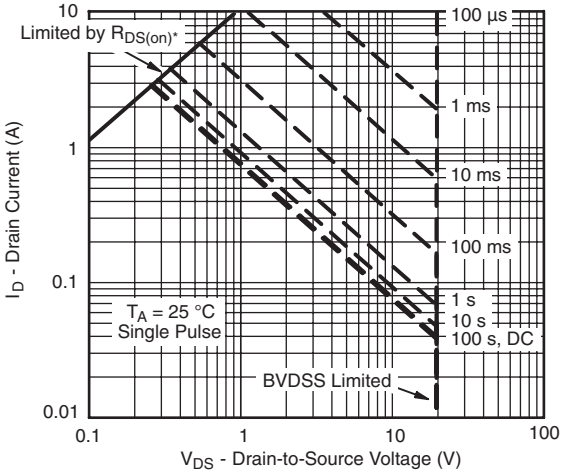
Capacitance



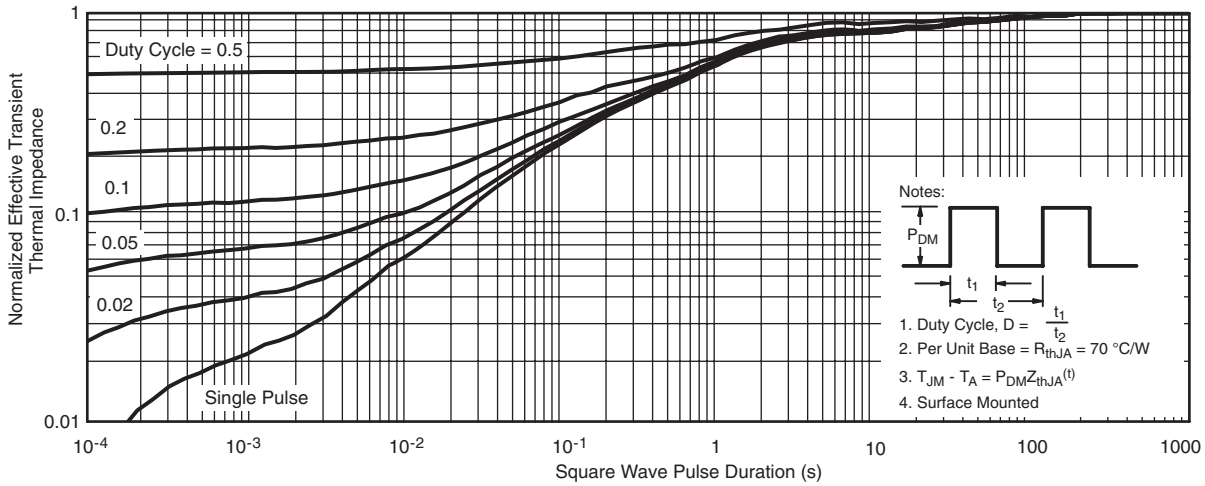
Source to Drain Diode Forward Voltage



Single Pulse Power



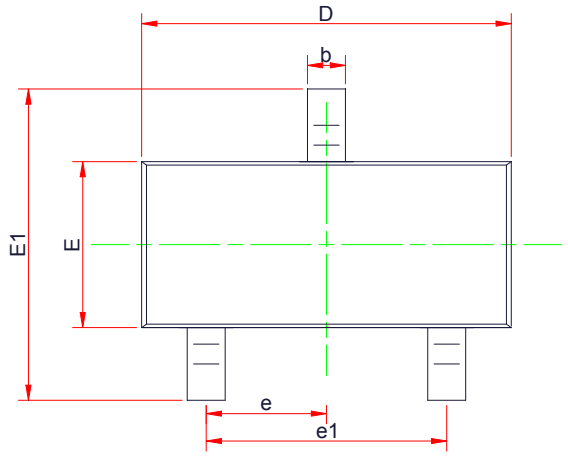
Safe Operating Area



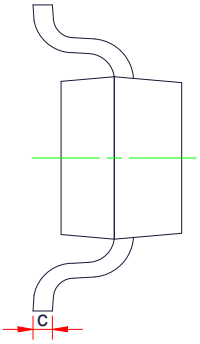
Transient Thermal Response

Package Outline Dimension

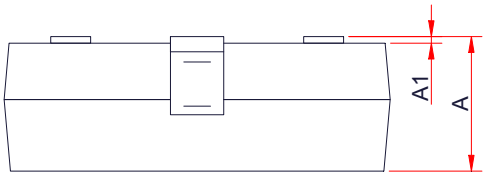
SOT-23



TOP VIEW



SIDE VIEW

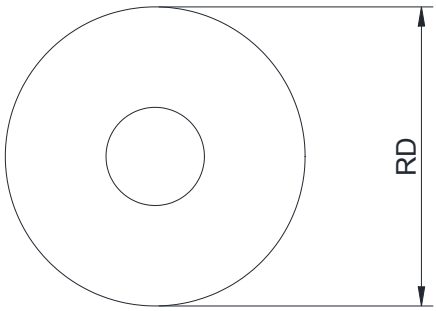


SIDE VIEW

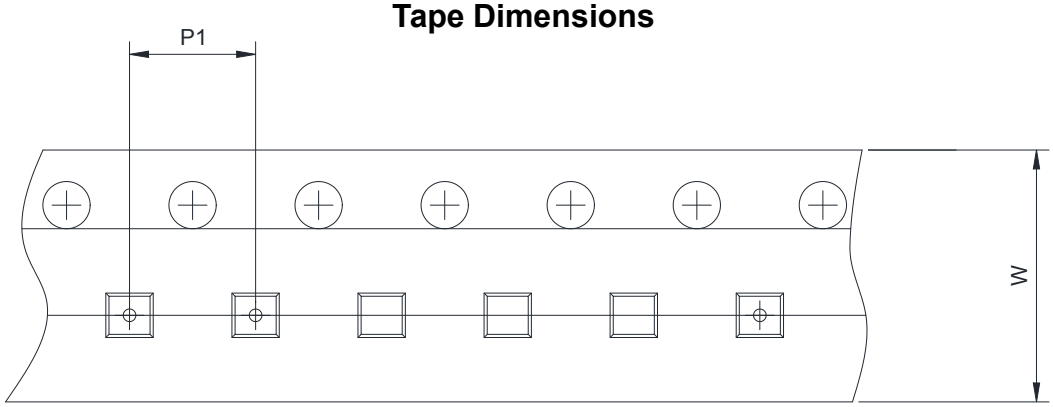
Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.89	1.10	1.30
A1	0.00	-	0.10
b	0.30	0.43	0.55
c	0.05	-	0.20
D	2.70	2.90	3.10
E	1.15	1.33	1.50
E1	2.10	2.40	2.70
e	0.95 Typ.		
e1	1.70	1.90	2.10

TAPE AND REEL INFORMATION

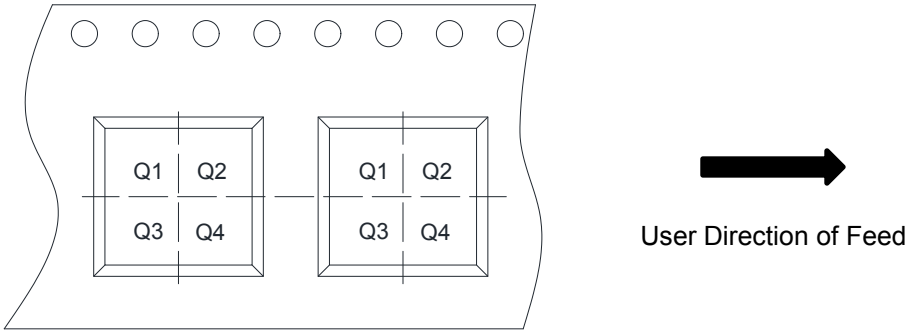
Reel Dimensions



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