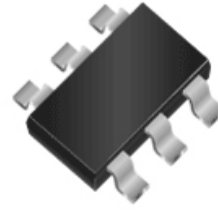


# WNM3011

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

**N-Channel, 30V, 5.7A, Power MOSFET**

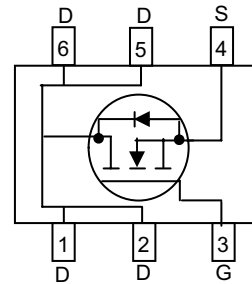
$V_{(BR)DSS}$	$R_{ds(on)}$ ( $\Omega$ )
30V	0.028@ 10V
	0.039@ 4.5V



**SOT-23-6L**

## Descriptions

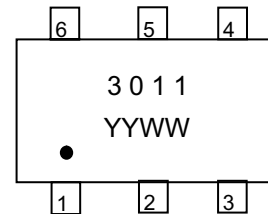
The WNM3011 is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent  $R_{DS(ON)}$  with low gate charge. This device is suitable for use in DC-DC conversion and power switch applications. Standard Product WNM3011 is Pb-free.



**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-23-6L



3011 = Device Code  
 YY = Year  
 WW = Week

## Marking

## Applications

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

## Order Information

Device	Package	Shipping
WNM3011-6/TR	SOT-23-6L	3000/Tape&Reel

**Absolute Maximum ratings**

Parameter		Symbol	10 S	Steady State	Unit
Drain-Source Voltage		$V_{DS}$	30		V
Gate-Source Voltage		$V_{GS}$	$\pm 20$		
Continuous Drain Current <sup>a</sup>	$T_A=25^\circ\text{C}$	$I_D$	5.7	4.9	A
	$T_A=70^\circ\text{C}$		4.6	3.9	
Maximum Power Dissipation <sup>a</sup>	$T_A=25^\circ\text{C}$	$P_D$	1.5	1.1	W
	$T_A=70^\circ\text{C}$		0.9	0.7	
Continuous Drain Current <sup>b</sup>	$T_A=25^\circ\text{C}$	$I_D$	4.9	4.4	A
	$T_A=70^\circ\text{C}$		3.9	3.5	
Maximum Power Dissipation <sup>b</sup>	$T_A=25^\circ\text{C}$	$P_D$	1.1	0.8	W
	$T_A=70^\circ\text{C}$		0.7	0.5	
Pulsed Drain Current <sup>c</sup>		$I_{DM}$	20		A
Operating Junction Temperature		$T_J$	150		$^\circ\text{C}$
Lead Temperature		$T_L$	260		$^\circ\text{C}$
Storage Temperature Range		$T_{stg}$	-55 to 150		$^\circ\text{C}$

**Thermal resistance ratings**

Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance <sup>a</sup>	$t \leq 10 \text{ s}$	$R_{\theta JA}$	71	82	$^\circ\text{C/W}$
	Steady State		91	112	
Junction-to-Ambient Thermal Resistance <sup>b</sup>	$t \leq 10 \text{ s}$	$R_{\theta JA}$	100	110	
	Steady State		125	139	
Junction-to-Case Thermal Resistance		$R_{\theta JC}$	28	40	

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

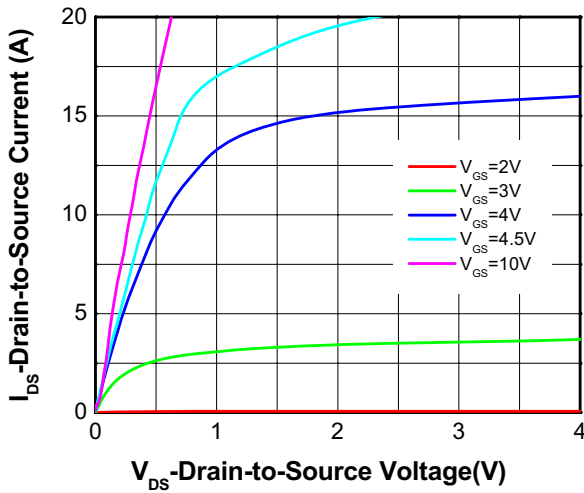
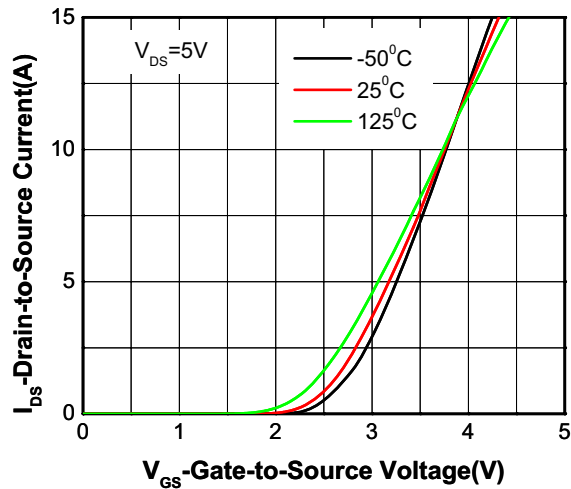
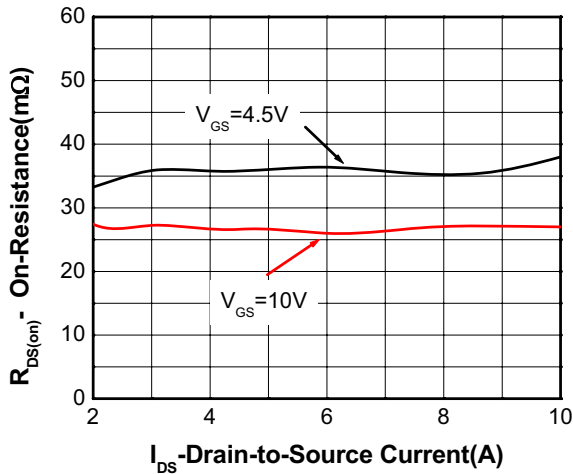
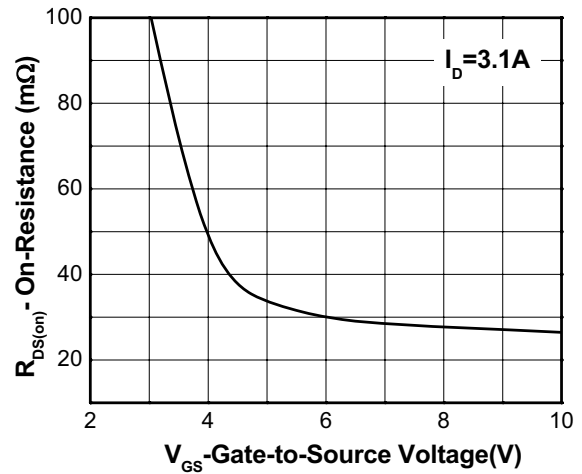
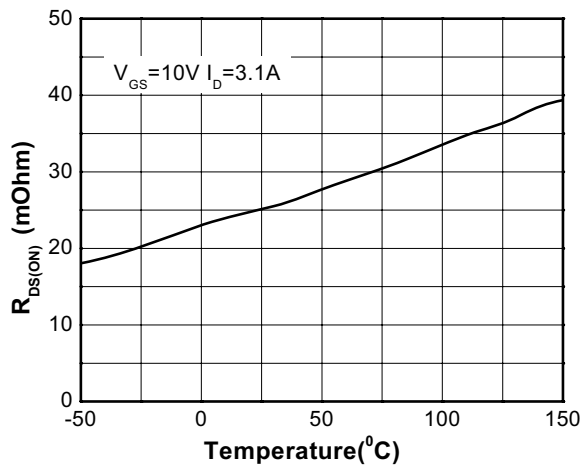
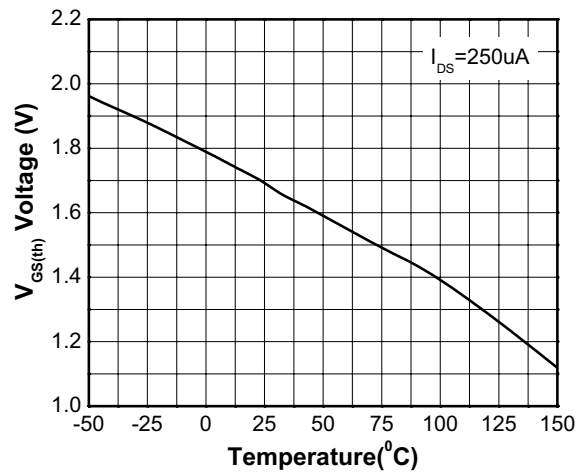
c Repetitive rating, pulse width limited by junction temperature,  $t_p=10\mu\text{s}$ , Duty Cycle=1%

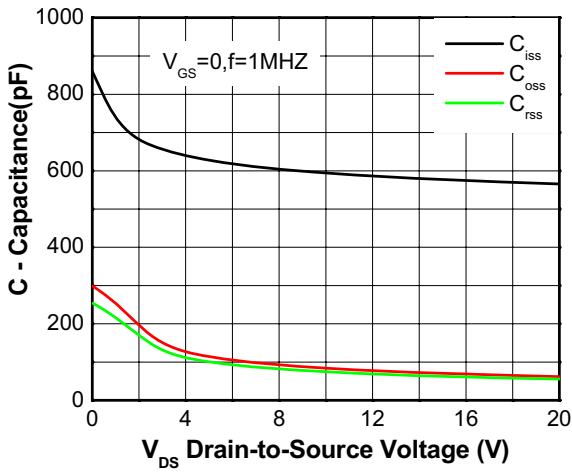
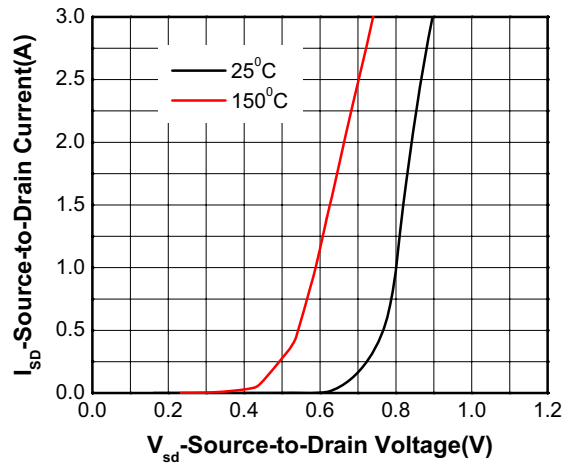
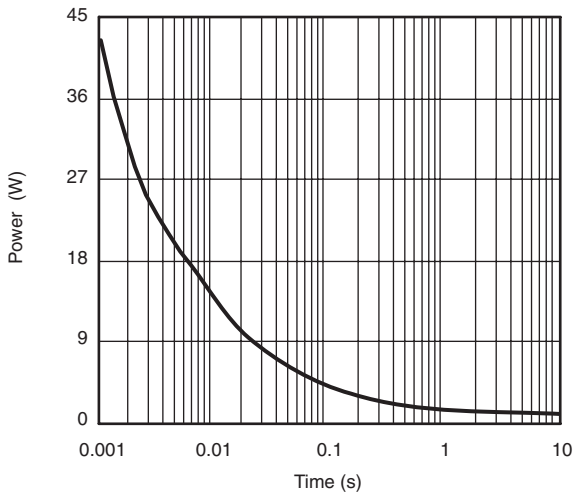
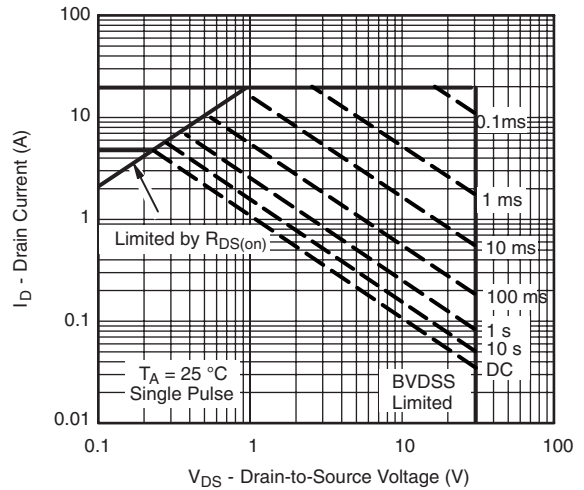
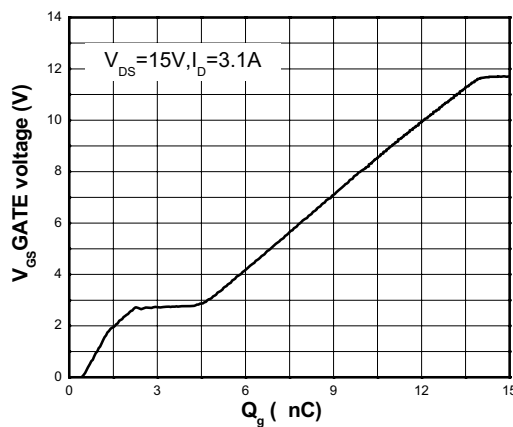
d Repetitive rating, pulse width limited by junction temperature  $T_J=150^\circ\text{C}$ .

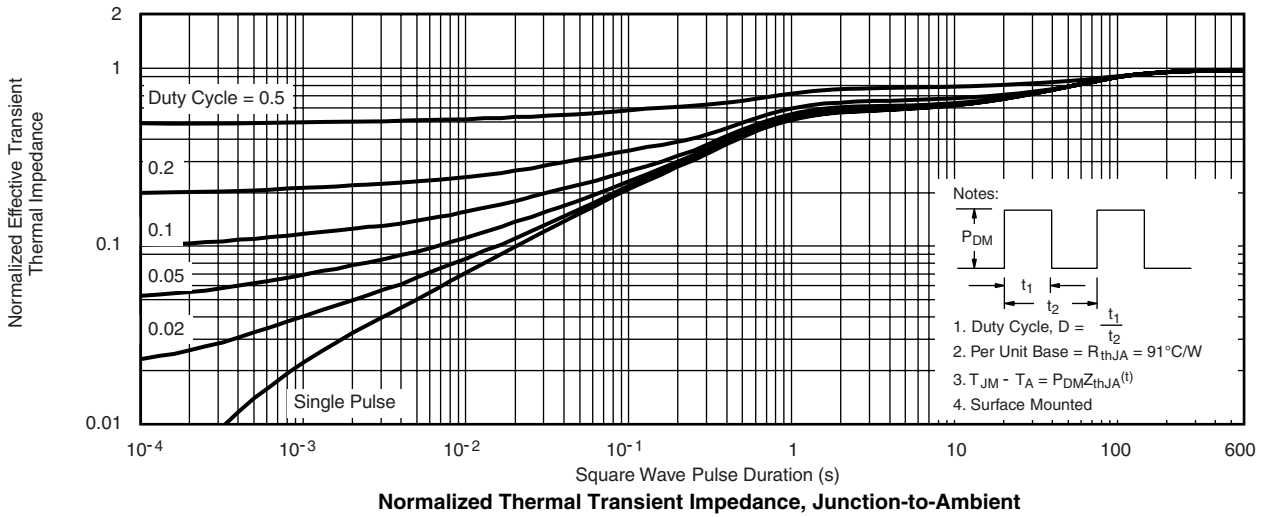
**Electronics Characteristics**

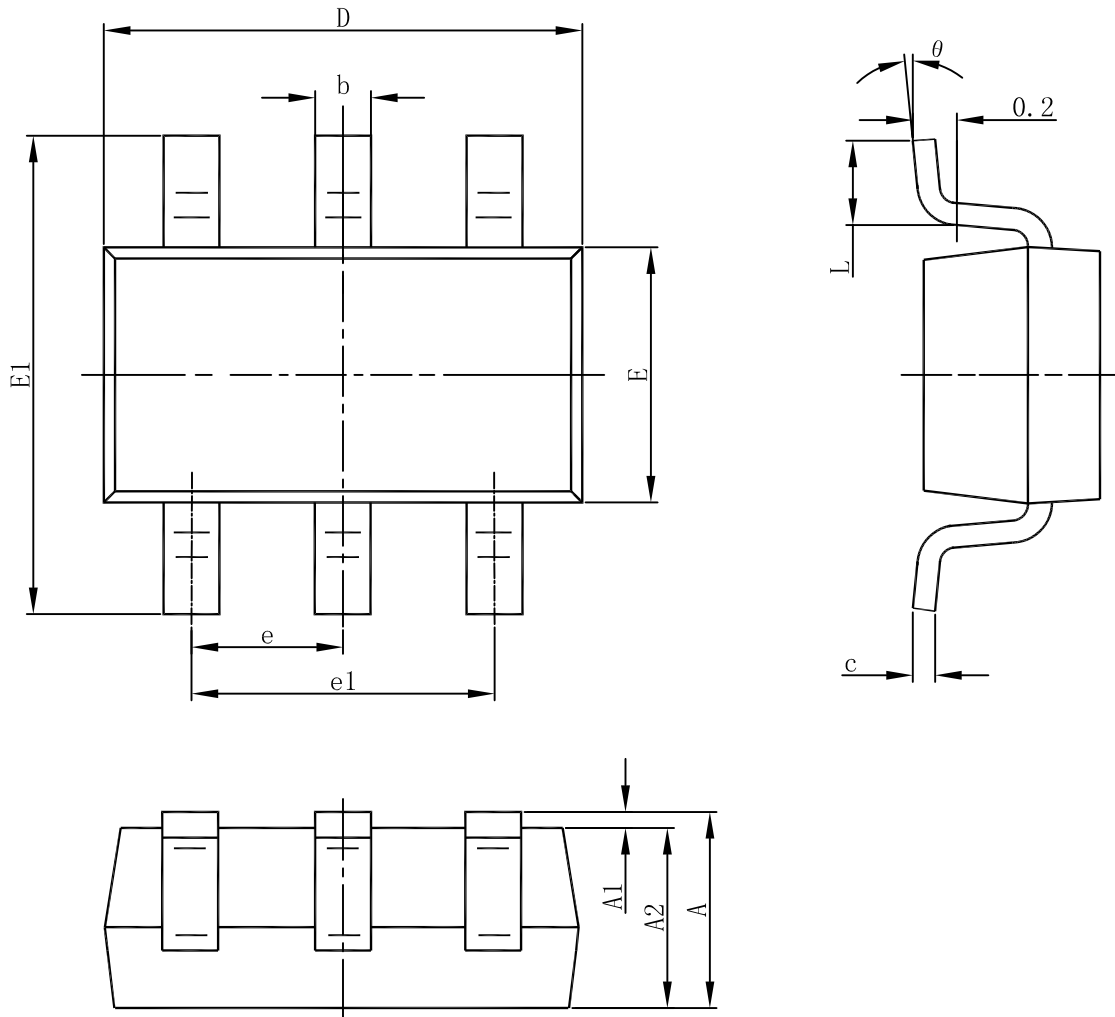
(Ta=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-to-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250uA	30			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 24V, V <sub>GS</sub> = 0V			1	uA
Gate-to-source Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20V			±100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = 250uA	1.0	1.7	3.0	V
Drain-to-source On-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 3.1A		28	47	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 2.0A		39	59	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> = 4.5V, I <sub>D</sub> = 2.8A		5.3		S
<b>CHARGES, CAPACITANCES AND GATE RESISTANCE</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> = 0 V, f = 1.0 MHz, V <sub>DS</sub> = 15 V		570		pF
Output Capacitance	C <sub>OSS</sub>			72		
Reverse Transfer Capacitance	C <sub>RSS</sub>			64		
Total Gate Charge	Q <sub>G(TOT)</sub>	V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 15 V, I <sub>D</sub> = 3.1A		11.6		nC
Threshold Gate Charge	Q <sub>G(TH)</sub>			0.8		
Gate-to-Source Charge	Q <sub>GS</sub>			1.25		
Gate-to-Drain Charge	Q <sub>GD</sub>			3.0		
<b>SWITCHING CHARACTERISTICS</b>						
Turn-On Delay Time	td(ON)	V <sub>GS</sub> = 10 V, V <sub>DS</sub> = 15 V, I <sub>D</sub> = 1A, R <sub>G</sub> = 6 Ω		5		ns
Rise Time	tr			3.3		
Turn-Off Delay Time	td(OFF)			39		
Fall Time	tf			4.4		
<b>BODY DIODE CHARACTERISTICS</b>						
Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> = 0 V, I <sub>S</sub> = 1.5A	0.50	0.84	1.50	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 Dimension**
**SOT-23-6L**


Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	1.050	1.150	1.250
A1	0.000	0.050	0.100
A2	1.050	1.100	1.150
b	0.300	0.400	0.500
c	0.100	0.150	0.200
D	2.820	2.920	3.020
E	1.500	1.600	1.700
E1	2.650	2.800	2.950
e	0.950(BSC)		
e1	1.800	1.900	2.000
L	0.300		0.600
$\theta$	0°		8°