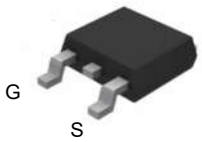
WNM6010

Single N-Channel, 60V, 76A, Power MOSFET

Http://www.omnivision-group.com

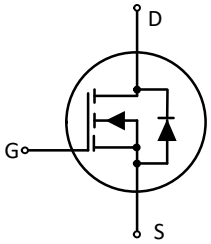
V_{DS} (V)	Max. $R_{DS(on)}$ (mΩ)
60	5.4 @ V_{GS}=10V
	8.8 @ V_{GS}=6V



T0-252E-2L

Description

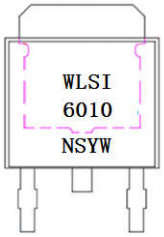
The WNM6010 is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product WNM6010 is in compliance with RoHS.



Pin configuration (Top view)

Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance
- Package TO-252E-2L



WLSI = Company Code
6010 = Device Code
NS = Special 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
WNM6010-3/TR	TO-252E-2L	2500/Tape&Reel

Absolute Maximum ratings

Parameter		Symbol	Maximum	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current [d]	T_C=25°C	I_D	76	A
	T_C=100°C		48	A
Pulsed Drain Current [c]		I_{DM}	310	A
Continuous Drain Current	T_A=25°C	I_{DSM}	32	A
	T_A=70°C		26	
Avalanche Energy L=0.3mH		E_{AS}	200	mJ
Power Dissipation [b]	T_C=25°C	P_D	53	W
	T_C=100°C		21	
Power Dissipation [a]	T_A=25°C	P_{DSM}	9.6	W
	T_A=70°C		6.2	
Operating Junction Temperature		T_J	-55 to 150	°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	$R_{\theta JA}$	11	13	°C/W
	Steady State		35	42	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	2.3	2.7	

Note:

a FR-4 board (38mm X 38mm X t1.6mm, 70um Copper) partially covered with copper (645mm^2 area).

b The power dissipation P_D is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heat sinking is used.

c Repetitive rating, ~10us pulse width, duty cycle ~1%, keep initial T_J =25°C, the maximum allowed junction temperature of 150°C.

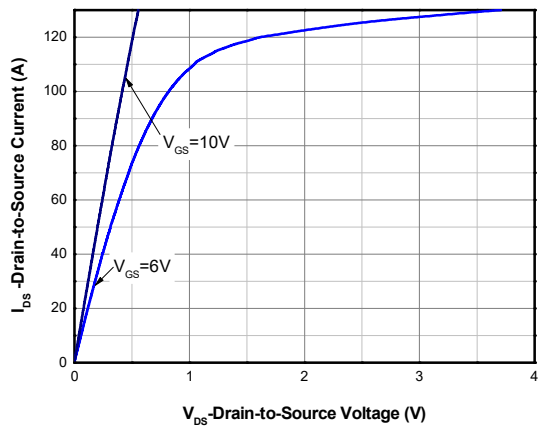
d The power dissipation P_{DSM} is based on Junction-to-Ambient thermal resistance $R_{\theta JA}$ t≤10s value and the $T_{J(MAX)}$=150°C.

e The static characteristics are obtained using ~380us pulses, duty cycle ~1%.

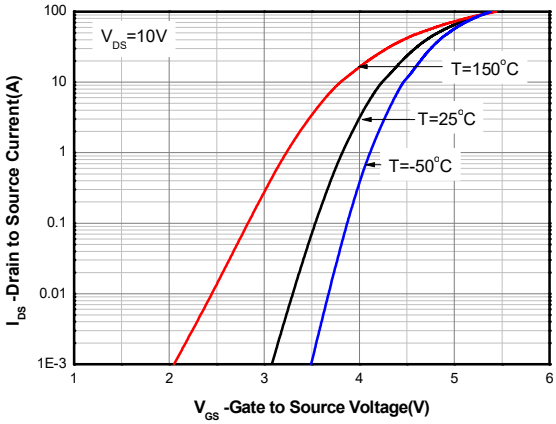
Electronics Characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0 V, I_D = 250uA	60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =48V, V_{GS} = 0V			1	uA
Gate-to-source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = 250uA	2.0	3.0	4.0	V
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =15A		4.1	5.4	mΩ
		V_{GS} = 6V, I_D = 10A		6.0	8.8	
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS}=0 V, f = 1.0MHz, V_{DS} = 30V		2844		pF
Output Capacitance	C_{OSS}			1835		
Reverse Transfer Capacitance	C_{RSS}			63		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = 10 V, V_{DS} = 30 V, I_D =15 A		44		nC
Threshold Gate Charge	$Q_{G(TH)}$			8.8		
Gate-to-Source Charge	Q_{GS}			14.3		
Gate-to-Drain Charge	Q_{GD}			7.9		
Gate Resistance	R_g	f=1MHz		1.2		Ω
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(ON)	V_{GS}=10V,V_{DS}=30V, I_D=15A,R_G=25Ω		41		ns
Rise Time	tr			52		
Turn-Off Delay Time	td(OFF)			100		
Fall Time	tf			68		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = 15A		0.8	1.2	V

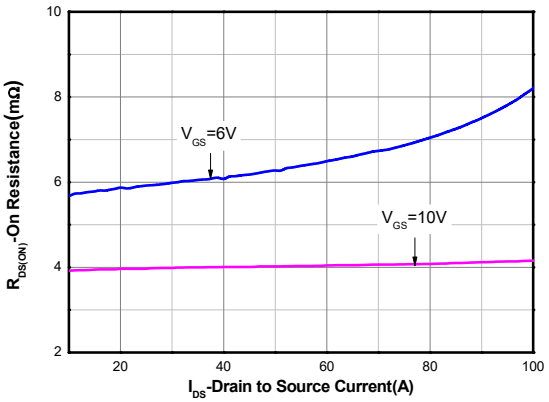
Typical Characteristics (Ta=25°C, unless otherwise noted)



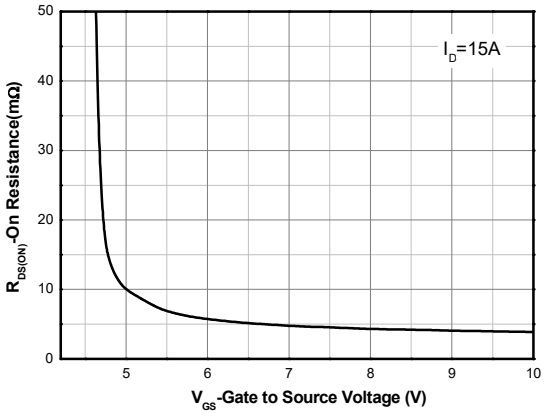
Output Characteristics [e]



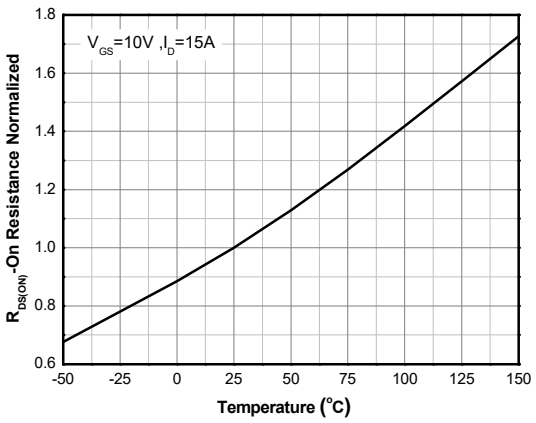
Transfer Characteristics [e]



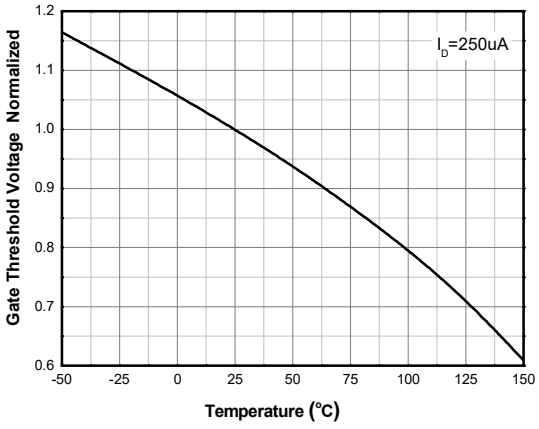
On-Resistance vs. Drain Current [e]



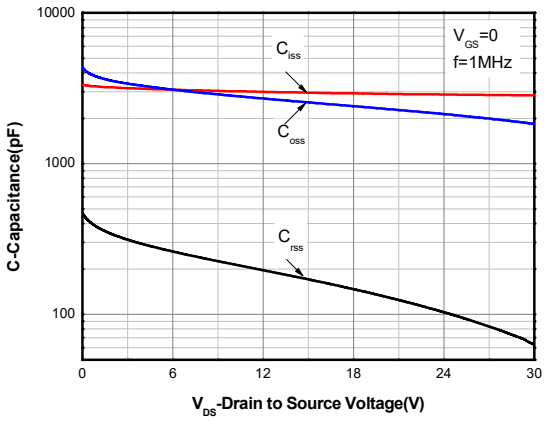
On-Resistance vs. Gate-to-Source Voltage [e]



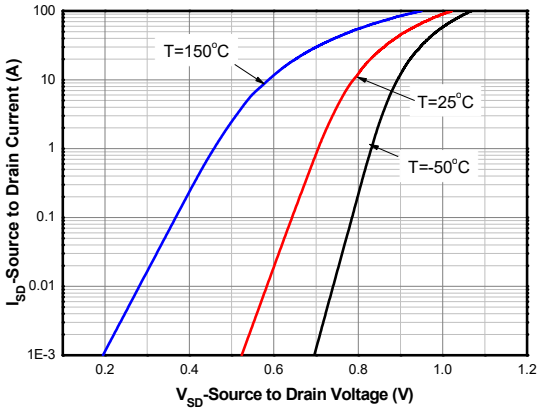
On-Resistance vs. Junction Temperature [e]



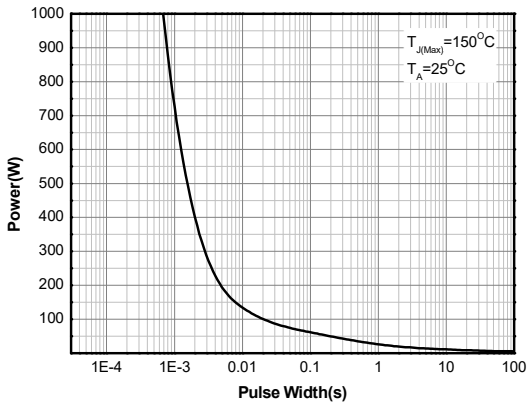
Threshold Voltage vs. Temperature



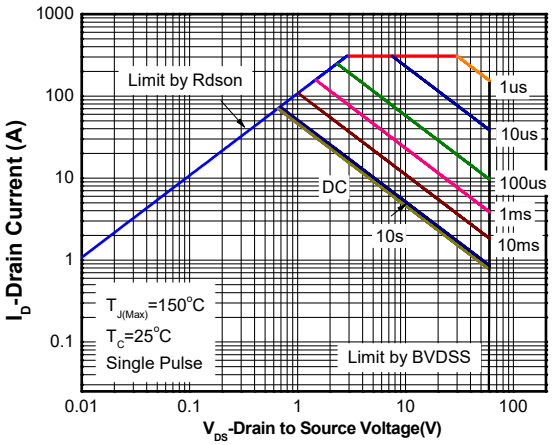
Capacitance



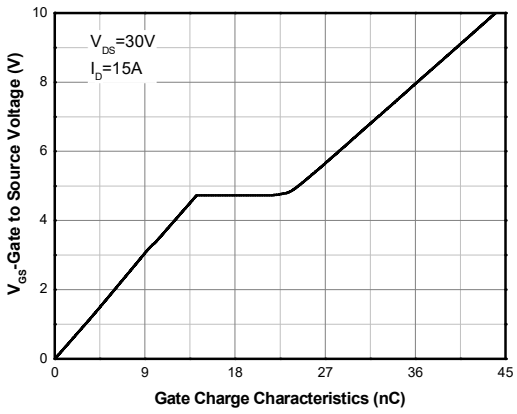
Body Diode Forward Voltage [e]



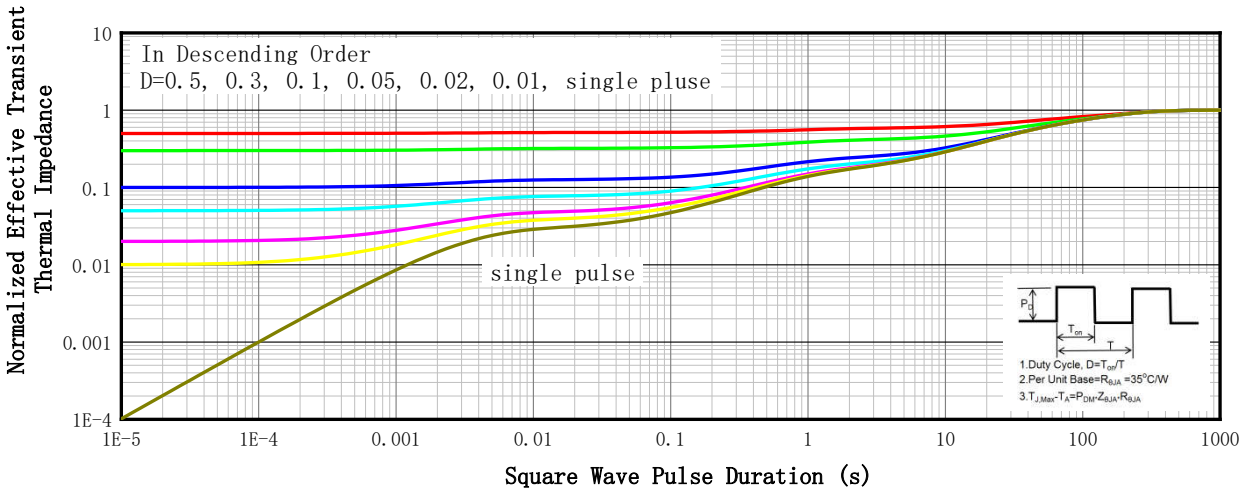
Single Pulse power



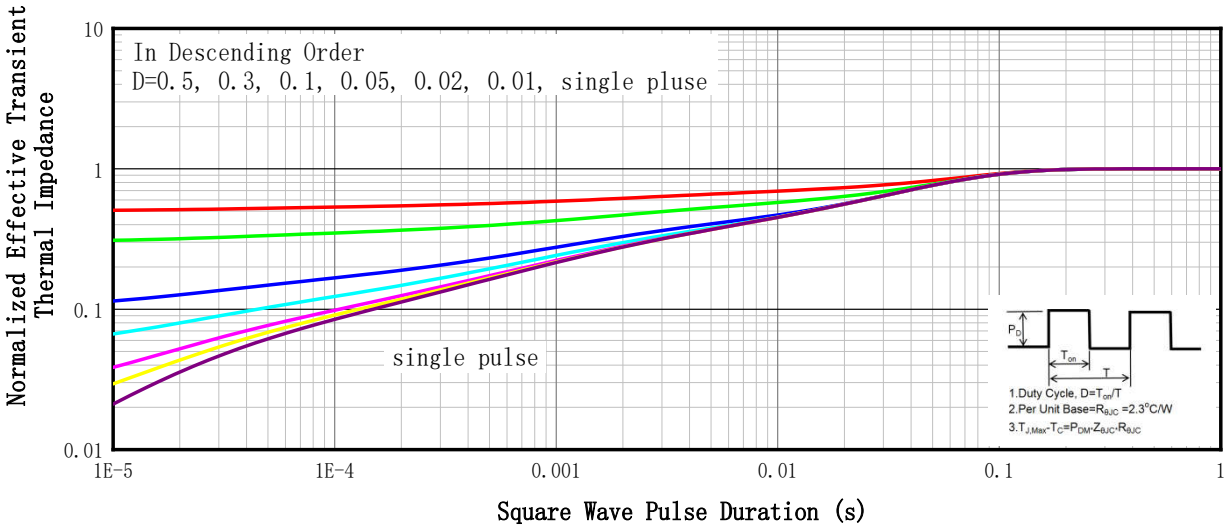
Safe Operating Power



Gate Charge Characteristics



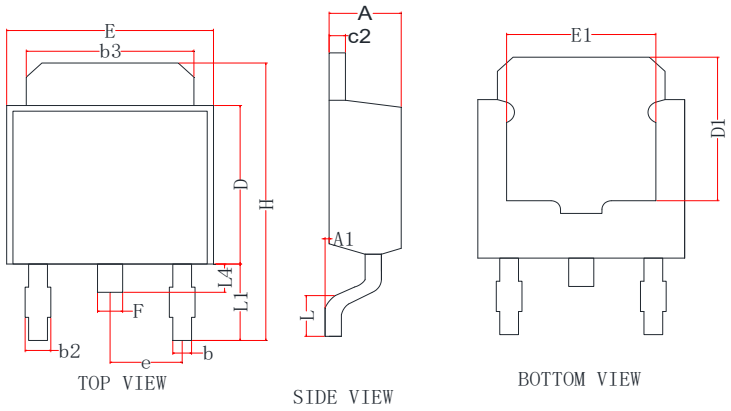
Transient Thermal Response (Junction-to-Case)

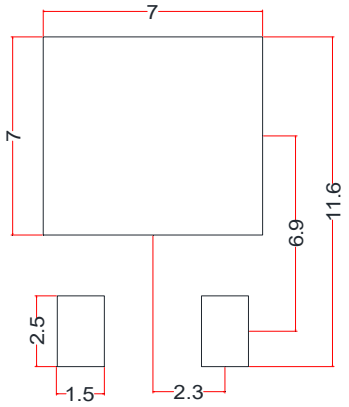


Transient Thermal Response (Junction-to-Ambient)

PACKAGE OUTLINE DIMENSIONS

TO–252E–2L



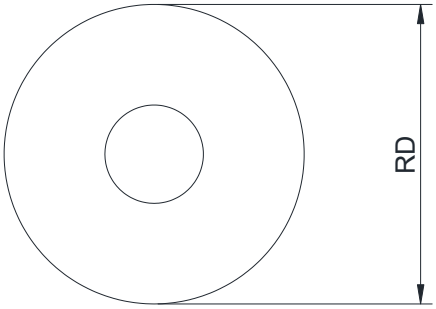


RECOMMENDED LAND PATTERN(Unit:mm)

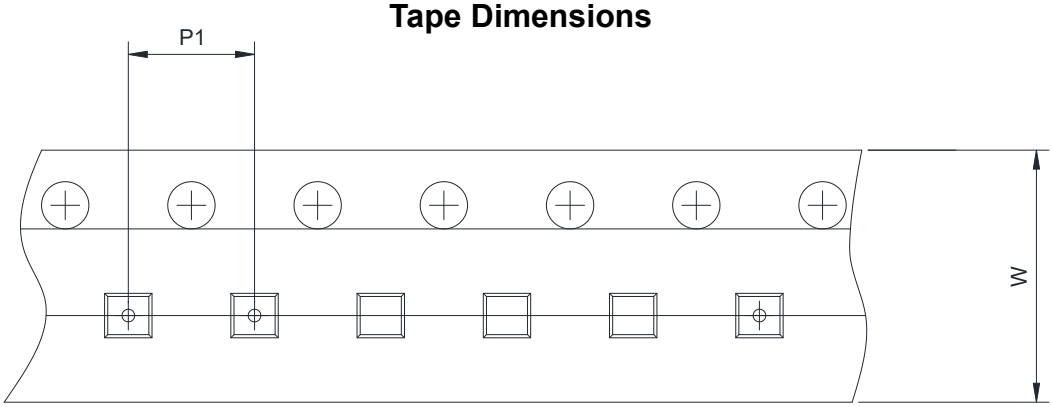
Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	2.20	2.30	2.40
A1	0	0.08	0.15
b	0.50	0.60	0.70
b 2	0.60	0.75	0.90
b 3	5.20	5.35	5.50
c 2	0.45	0.50	0.55
D	5.40	5.60	5.80
D1	4.57	--	--
E	6.40	6.60	6.80
E1	3.81	--	--
e	2.30 Ref.		
F	0.70	0.80	0.90
H	9.40	9.80	10.20
L	1.40	1.59	1.77
L1	2.40	2.70	3.00
L4	0.80	1.00	1.20

TAPE AND REEL INFORMATION

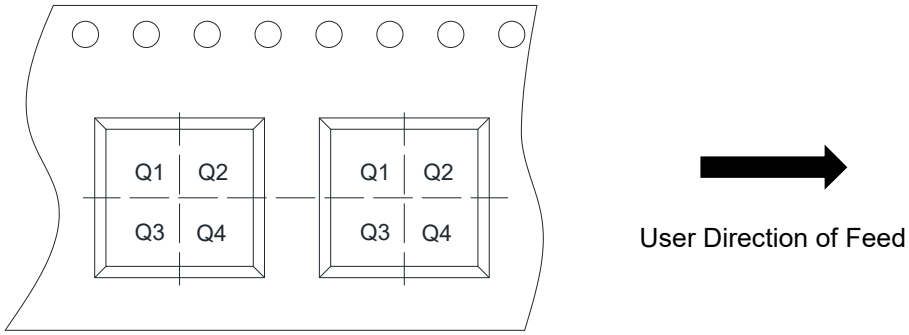
Reel Dimensions



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