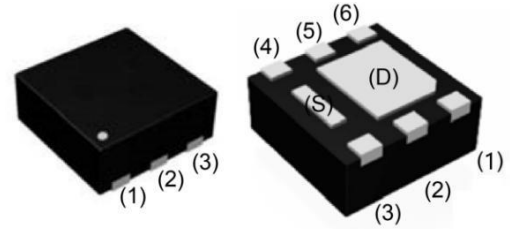


WNM2091A

Single N-Channel, 20V,11.5A, Power MOSFET

<https://www.omnivision-group.com>

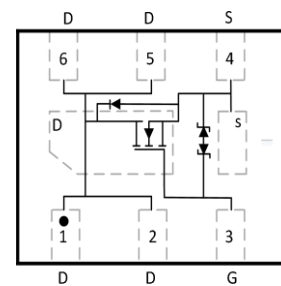
V _{DS} (V)	Typical R _{DS(on)} (mΩ)
20	6.8@V _{GS} =4.5V
	7.2@V _{GS} =3.7V
	8.4@V _{GS} =2.5V
ESD Rating:2000V HBM	



Description

The WNM2091A 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 WNM2091A is Pb-free and Halogen-free.

DFN2X2-6L



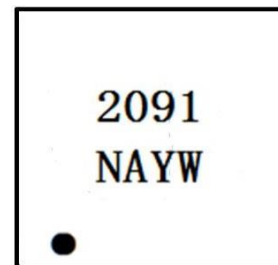
Pin configuration (Top view)

Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance
- Small package DFN2X2-6L

Applications

- DC/DC converters circuit
- Power Management Functions
- Load Switching
- Charging



2091 = Device Code
 NA = Special Code
 Y = Year
 W = Week(A~z)

Marking

Order information

Device	Package	Shipping
WNM2091A-6/TR	DFN2X2-6L	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	$T_A=25^{\circ}\text{C}$	A
		$T_A=70^{\circ}\text{C}$	
Pulsed Drain Current ^c	I_{DM}	50	A
Power Dissipation ^d	P_D	$T_A=25^{\circ}\text{C}$	W
		$T_A=70^{\circ}\text{C}$	
Operating Junction Temperature	T_J	-55 to 150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 to 150	$^{\circ}\text{C}$

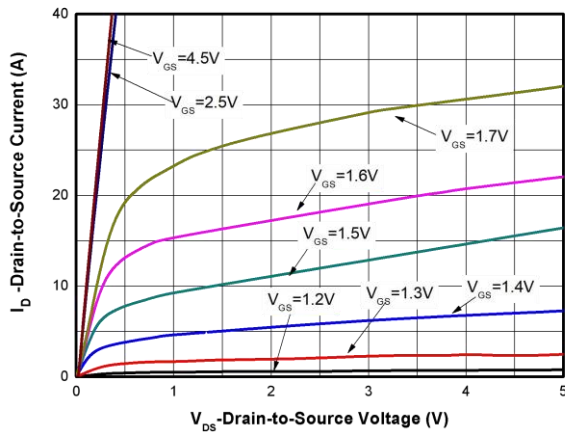
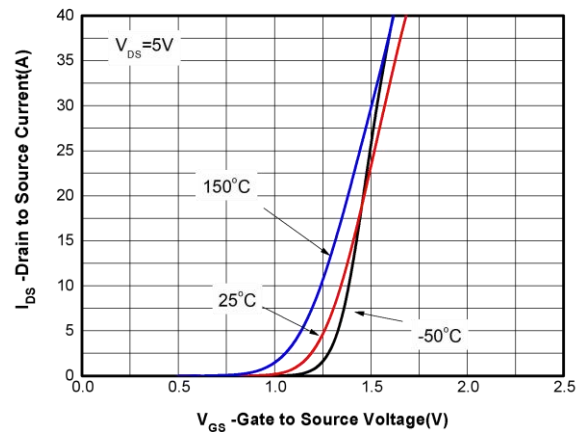
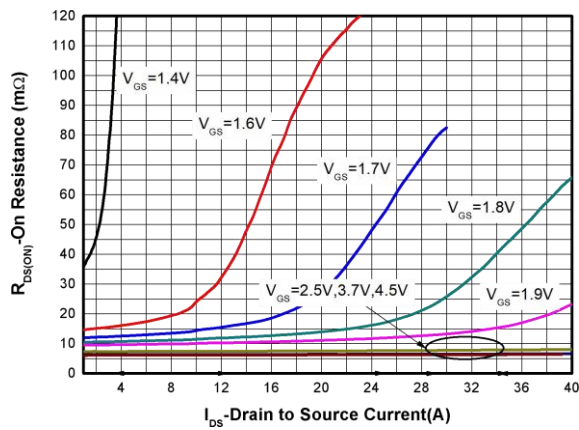
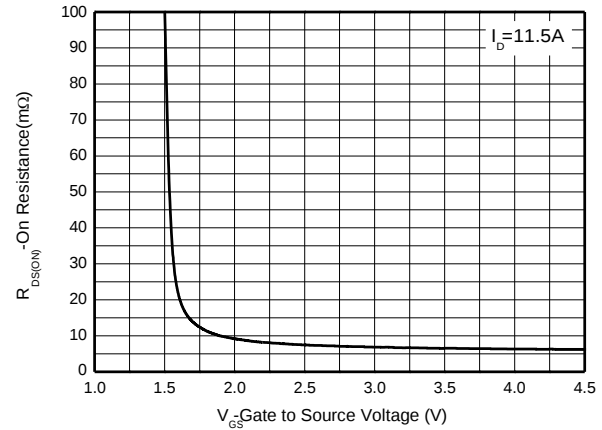
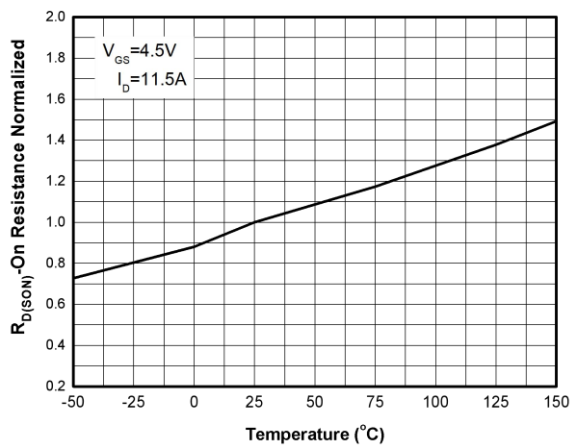
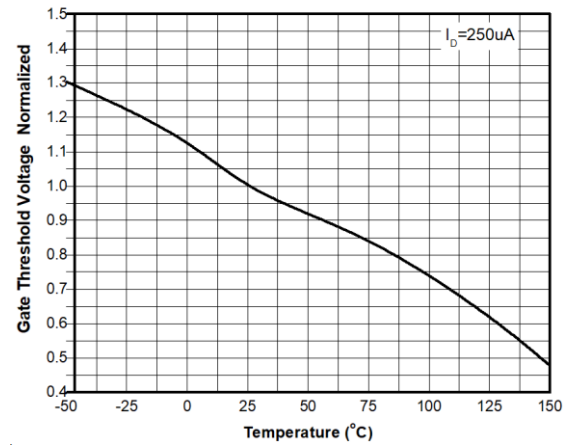
Thermal resistance ratings

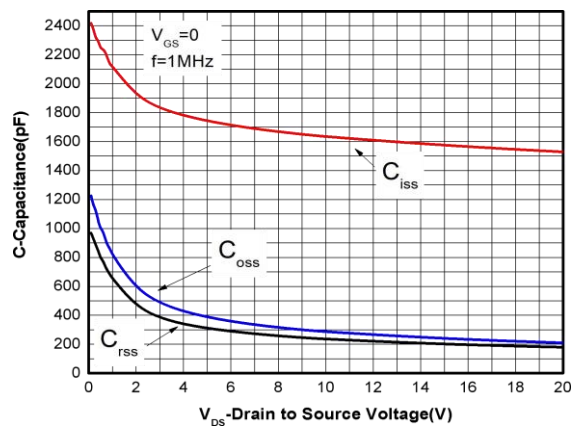
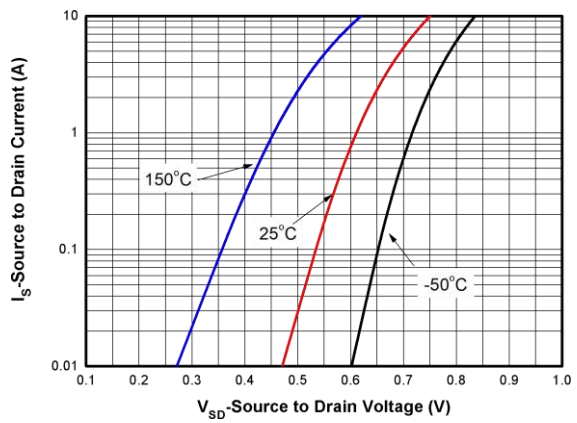
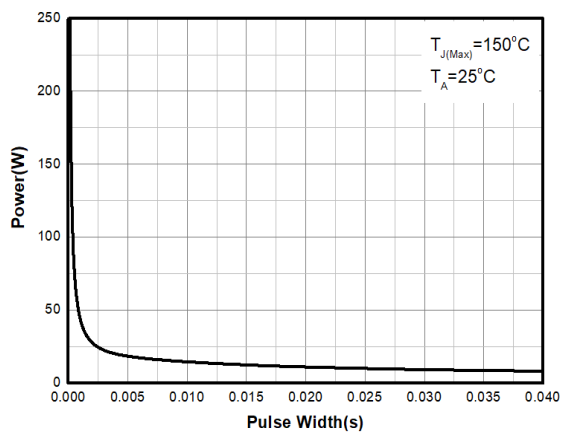
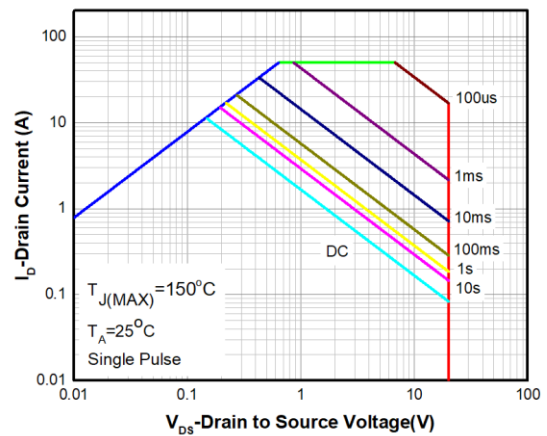
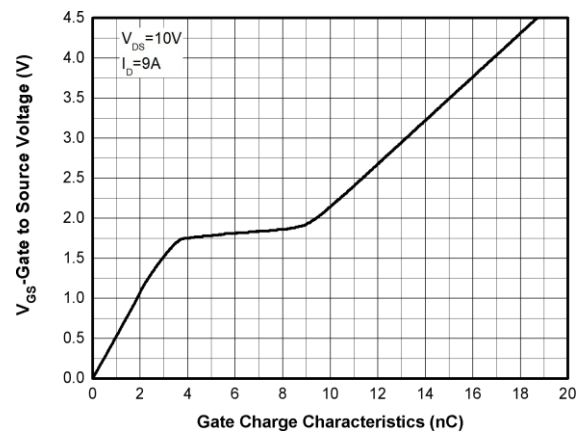
Single Operation					
Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance ^a	$t \leq 10 \text{ s}$	$R_{\theta JA}$	35	44	$^{\circ}\text{C/W}$
	Steady State		60	75	
Junction-to-Ambient Thermal Resistance ^b	$t \leq 10 \text{ s}$	$R_{\theta JA}$	114	143	
	Steady State		172	215	

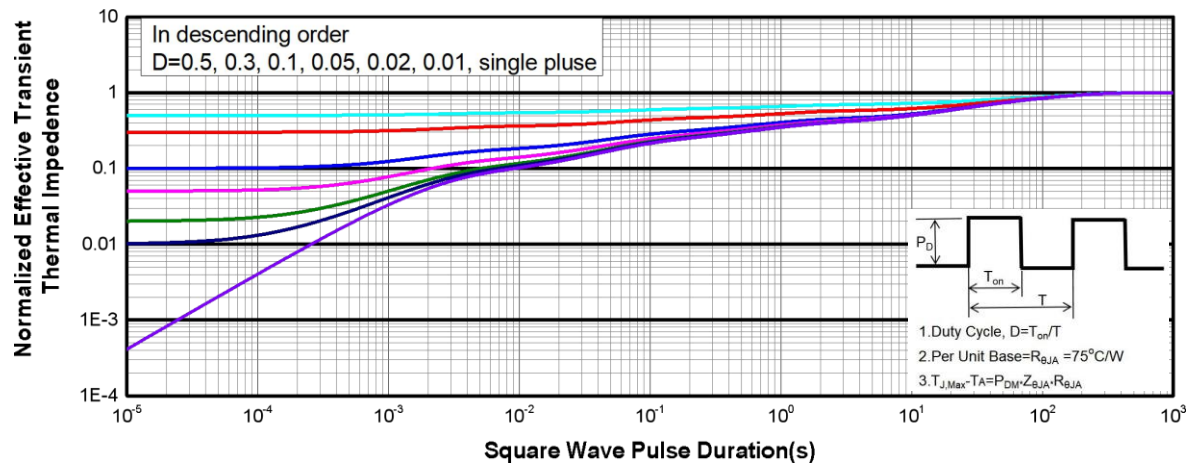
- a Copper pad on a 1.5*1.5 inch², 0.06-inch thick FR4 PCB, in a still air environment with $T_A = 25^{\circ}\text{C}$.
- b The value of $R_{\theta JA}$ is measured with the device mounted on FR-4 minimum pad board, in a still air environment with $T_A = 25^{\circ}\text{C}$.
- c Repetitive rating, ~10us pulse width, duty cycle ~1%, keep initial $T_J = 25^{\circ}\text{C}$, the maximum allowed junction temperature of 150°C .
- d The power dissipation P_D is based on $R_{\theta JA}$ value and the $T_{J(MAX)}=150^{\circ}\text{C}$. The value in any given application is determined by the user's specific board design, and the maximum temperature of 150°C may be used if the PCB allows it to.
- e The static characteristics are obtained using ~380us pulses, duty cycle ~1%..

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

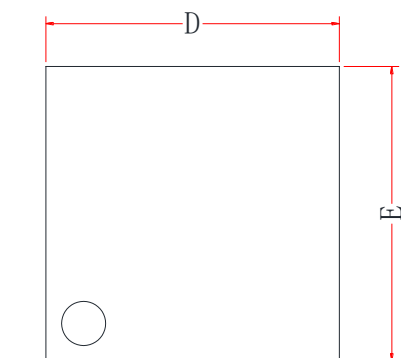
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0 V, I _D = 250uA	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =16V, V _{GS} = 0V			1	μA
Gate-to-source Leakage Current	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±10V			±10	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = 250uA	0.45	0.75	1.0	V
Drain-to-source On-resistance	R _{DS(on)}	V _{GS} = 4.5V, I _D = 11.5A		6.8	8.5	mΩ
		V _{GS} = 3.7V, I _D = 9.0A		7.2	9.0	
		V _{GS} = 2.5V, I _D = 8.0A		8.4	12.5	
		V _{GS} = 1.8V, I _D = 3.5A		12.5	25	
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C _{ISS}	V _{GS} = 0V, f = 1.0MHz, V _{DS} = 10V		1634		pF
Output Capacitance	C _{OSS}			286		
Reverse Transfer Capacitance	C _{RSS}			235		
Total Gate Charge	Q _{G(TOT)}	V _{GS} = 4.5V, V _{DS} =10V, I _D =9A		18.7		nC
Threshold Gate Charge	Q _{G(TH)}			1.4		
Gate-to-Source Charge	Q _{GS}			3.8		
Gate-to-Drain Charge	Q _{GD}			5.2		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td _(ON)	V _{GS} = 4.5V, V _{DS} = 10 V, I _D =9A, , R _G =3Ω		22.8		ns
Rise Time	tr			42.0		
Turn-Off Delay Time	td _(OFF)			87.0		
Fall Time	tf			75.0		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V _{SD}	V _{GS} = 0 V, I _S = 1A			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

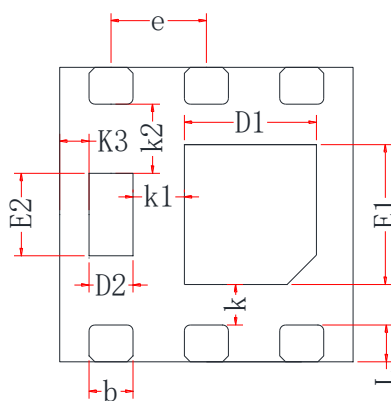

Capacitance

Body Diode Forward Voltage^e

Single Pulse power

Safe Operating Area

Gate Charge Characteris



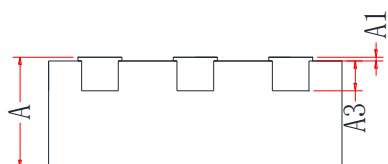
Transient Thermal Response (Junction-to-Ambient)

PACKAGE OUTLINE DIMENSIONS
DFN2x2-6L


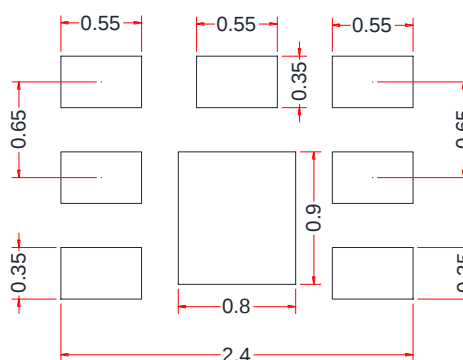
TOP VIEW



BOTTOM VIEW

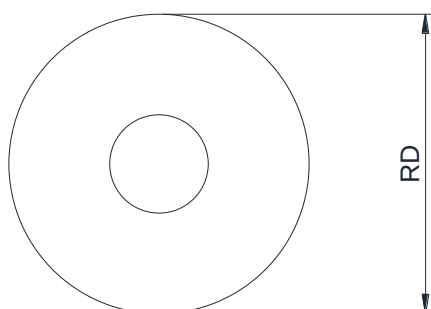
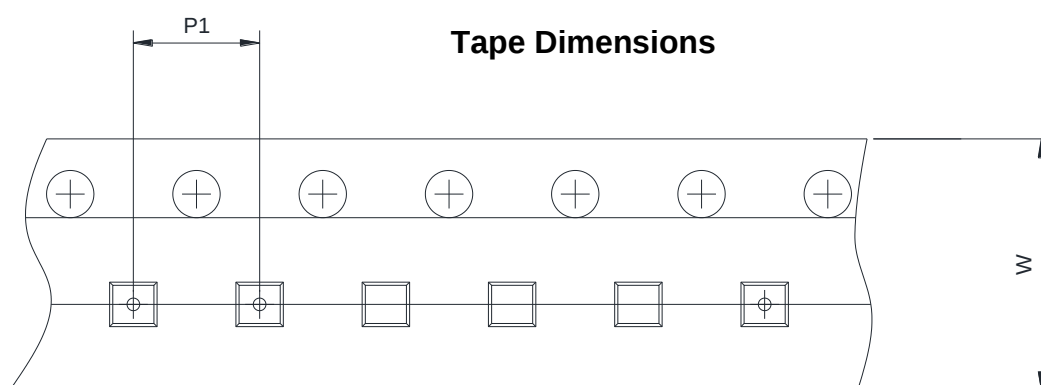
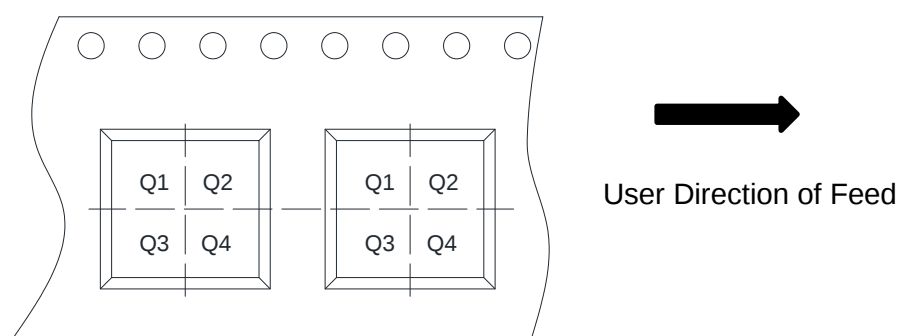


SIDE VIEW



RECOMMENDED LAND PATTERN (Unit:mm)

Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.50	0.55	0.60
A1	0.00	0.02	0.05
A3	0.152 Ref.		
b	0.25	0.30	0.35
D	1.95	2.00	2.05
D1	0.80	0.90	1.00
D2	0.25	0.30	0.35
E	1.95	2.00	2.05
E1	0.80	0.90	1.00
E2	0.46	0.56	0.66
e	0.65 BSC		
L	0.25	0.30	0.35
K	0.20	-	-
K1	0.35	-	-
K2	0.42	-	-
K3	0.20	-	-

TAPE AND REEL INFORMATION
Reel Dimensions

Tape Dimensions

Quadrant Assignments For PIN1 Orientation In Tape


RD	Reel Dimension	☒ 7 inch	☐ 13 inch
W	Overall width of the carrier tape	☒ 8 mm	☐ 12 mm ☐ 16 mm
P1	Pitch between successive cavity centers	☐ 2 mm	☒ 4 mm ☐ 8 mm
Pin1	Pin1 Quadrant	☒ Q1	☐ Q2 ☐ Q3 ☐ Q4