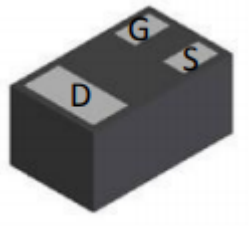
WNM2096

Single N-Channel, 20V, 0.8A, Power MOSFET

Http://www.sh-willsemi.com

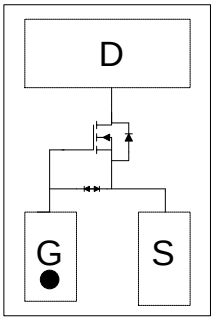
V_{DS} (V)	Typical $R_{DS(on)}$ (mΩ)
20	325 @ V_{GS}=4.5V
	370 @ V_{GS}=3.1V
	420 @ V_{GS}=2.5V
	560 @ V_{GS}=1.8V
ESD Rating：2000V HBM	



DFN1006-3L

Description

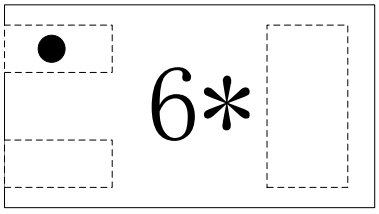
The WNM2096 is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product WNM2096 is Pb-free.



Pin configuration (Top view)

Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance
- Extremely Low Threshold Voltage
- Small package DFN1006-3L



6 = Device Code
* = Month (A~z)

Marking

Applications

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

Order information

Device	Package	Shipping
WNM2096-3/TR	DFN1006-3L	10K/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 [d]	T_A=25°C	I_D	800	mA
	T_A=70°C		640	
Pulsed Drain Current [c]		I_{DM}	3000	mA
Power Dissipation [a]	T_A=25°C	P_D	480	mW
	T_A=70°C		305	
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**	**Maximum**	**Unit**
Junction-to-Ambient Thermal Resistance [a]	t ≤ 10 s	$R_{\theta JA}$	216	°C/W
	Steady State		262	
Junction-to-Ambient Thermal Resistance [b]	t ≤ 10 s	$R_{\theta JA}$	464	
	Steady State		580	

a 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°C. The power dissipation P_D is based on $R_{\theta JA}$ value and the $T_{J(MAX)}$=150°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.

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°C. The power dissipation P_D is based on $R_{\theta JA}$ value and the $T_{J(MAX)}$=150°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.

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

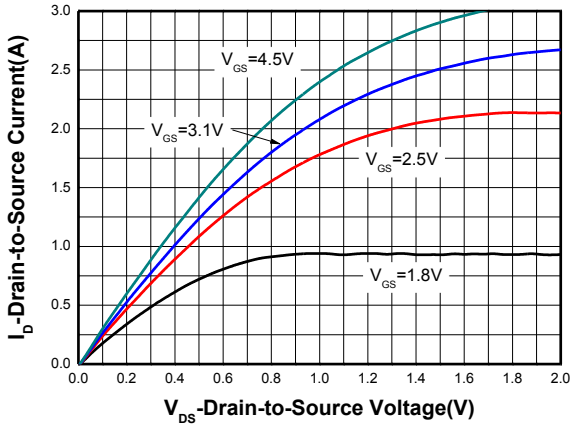
d The maximum current rating by source bonding technology

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

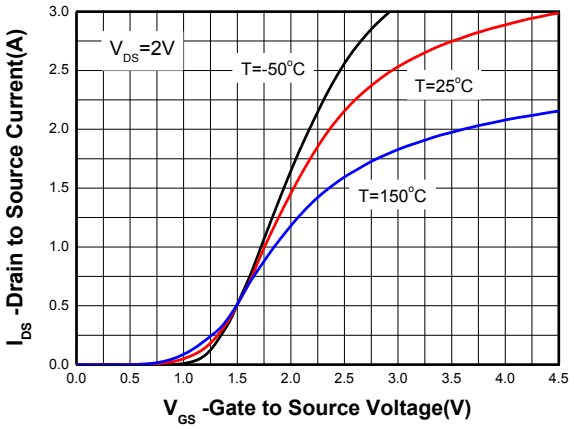
Electronics Characteristics (Ta=25°C, unless otherwise noted)

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	uA
Gate-to-source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±10V			±10	uA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = 250uA	0.4	0.7	1.0	V
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS} =4.5V, I_D =0.55A		325	500	mΩ
		V_{GS} =3.1V, I_D =0.35A		370	570	
		V_{GS} =2.5V, I_D =0.25A		420	700	
		V_{GS} =1.8V, I_D =0.15A		560	1500	
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 1.0MHz, V_{DS} = 10 V		29		pF
Output Capacitance	C_{OSS}			11		
Reverse Transfer Capacitance	C_{RSS}			4		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = 4.5 V, V_{DS} = 10V, I_D =0.55 A		1.1		nC
Threshold Gate Charge	$Q_{G(TH)}$			0.11		
Gate-to-Source Charge	Q_{GS}			0.15		
Gate-to-Drain Charge	Q_{GD}			0.32		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(ON)	V_{GS} = 4.5 V, V_{DS} = 10 V, I_D=0.55A , R_G=6Ω		5		ns
Rise Time	tr			5.8		
Turn-Off Delay Time	td(OFF)			15.4		
Fall Time	tf			3.6		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = 0.8A		0.9	1.1	V

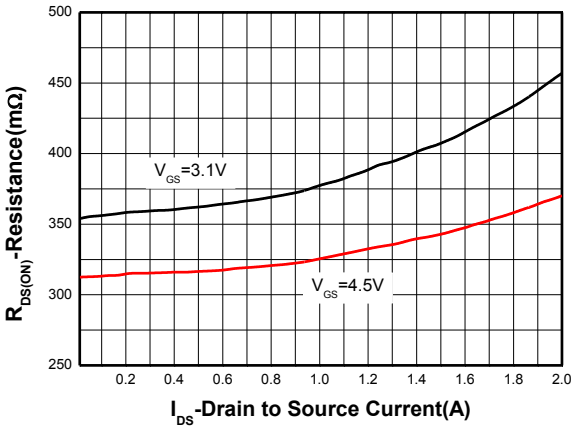
Typical Characteristics (Ta=25°C, unless otherwise noted)



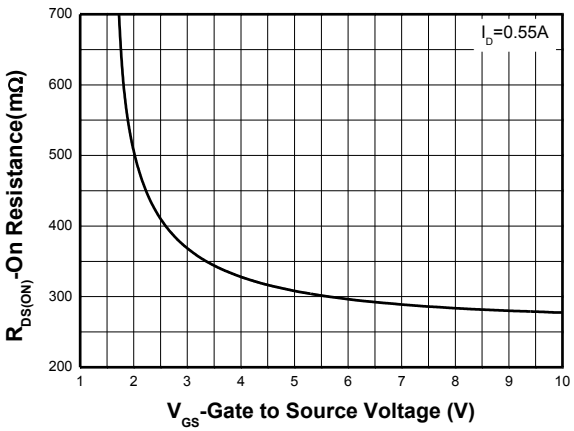
Output Characteristics [e]



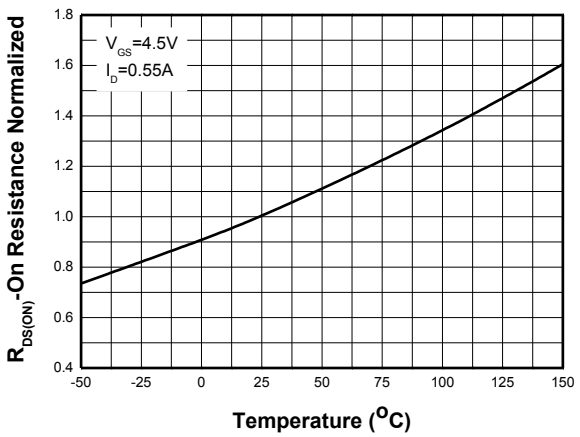
Transfer Characteristics [e]



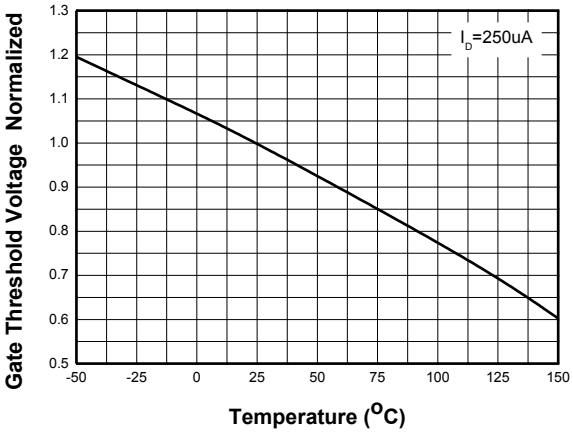
On-Resistance vs. Drain Current [e]



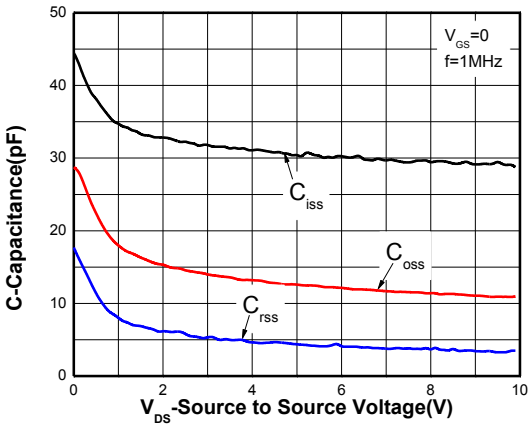
On-Resistance vs. Gate-to-Source Voltage [e]



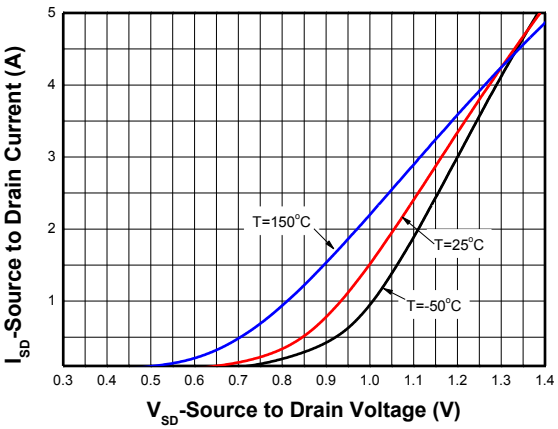
On-Resistance vs. Junction Temperature [e]



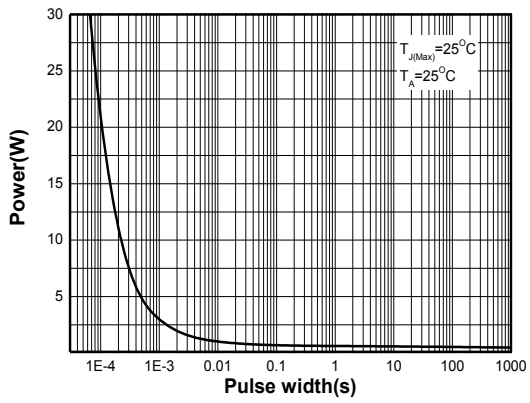
Threshold Voltage vs. Temperature



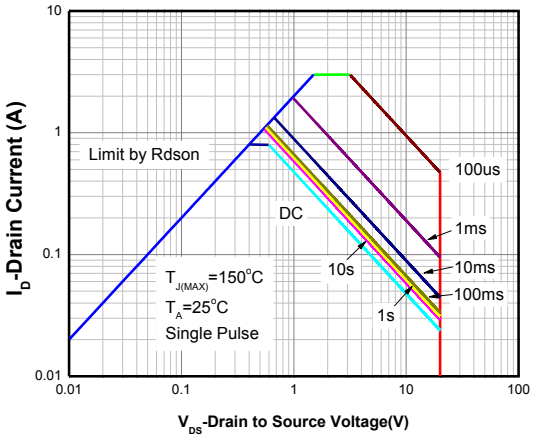
Capacitance



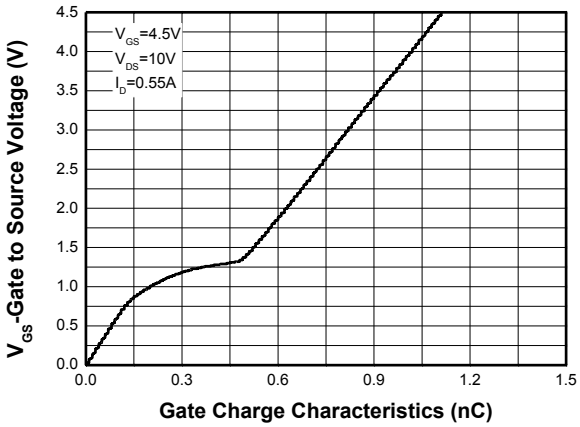
Body Diode Forward Voltage [e]



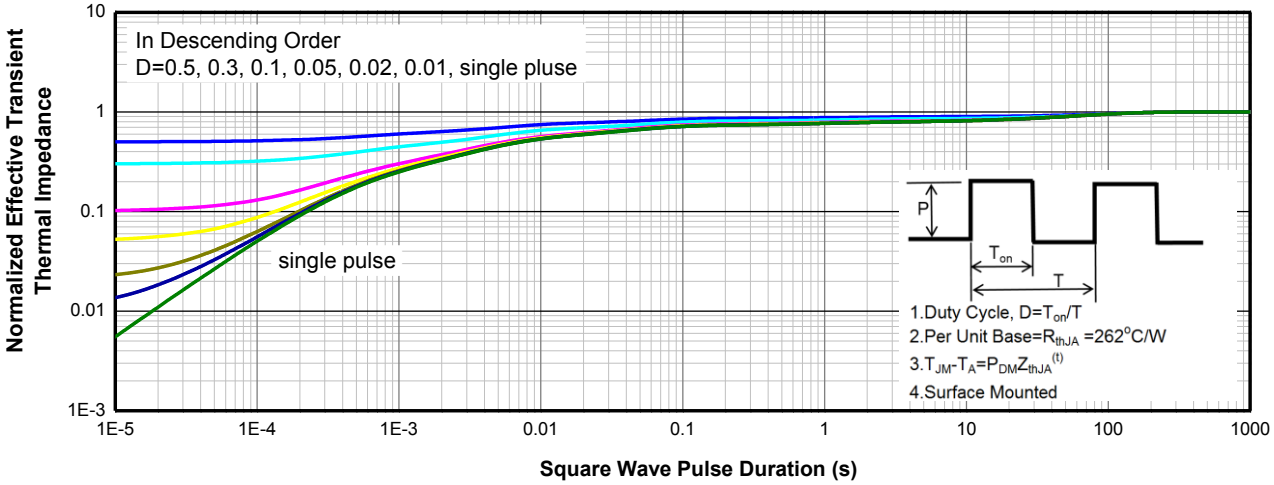
Single Pulse power



Safe Operating Power



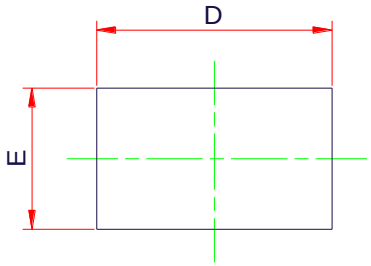
Gate Charge Characteristics



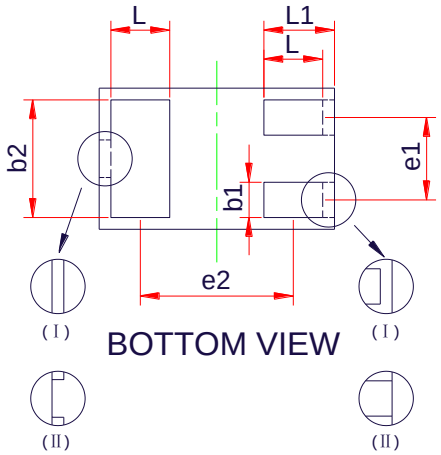
Transient Thermal Response (Junction-to-Ambient)

PACKAGE OUTLINE DIMENSIONS

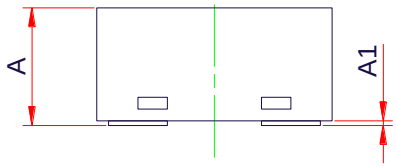
DFN1006-3L



TOP VIEW



BOTTOM VIEW

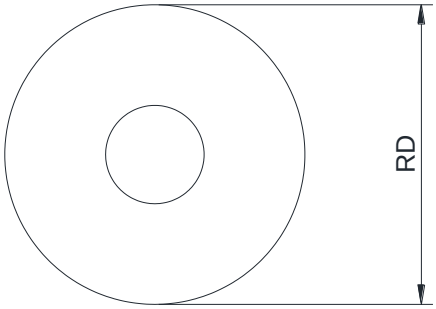


SIDE VIEW

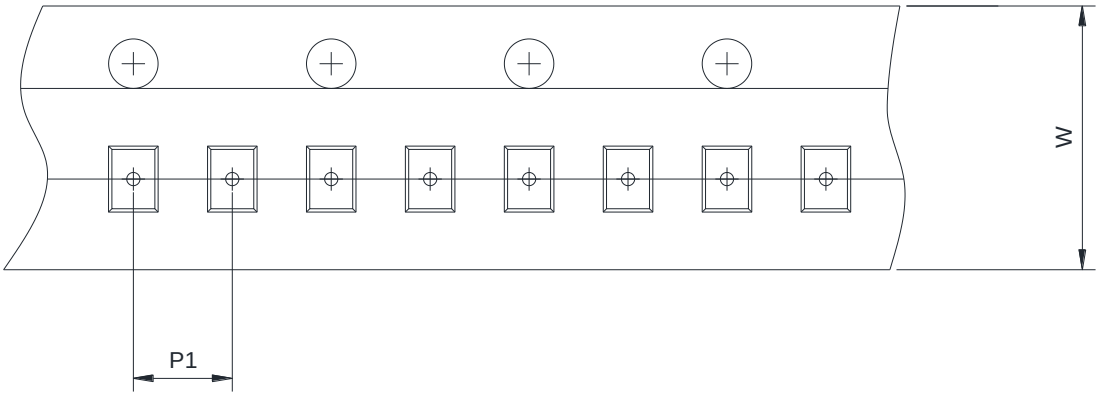
Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.36	-	0.50
A1	0.00	-	0.05
D	0.95	1.00	1.05
E	0.55	0.60	0.65
b1	0.10	0.15	0.20
b2	0.40	0.50	0.60
L	0.20	0.25	0.30
L1	0.20	0.30	0.40
e1	0.35Ref		
e2	0.65 Ref		

TAPE AND REEL INFORMATION

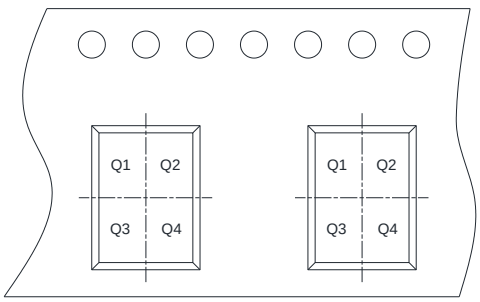
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape



User Direction of Feed

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

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