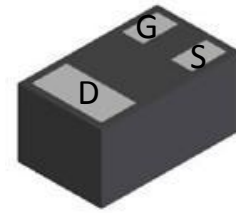


WNM2046C

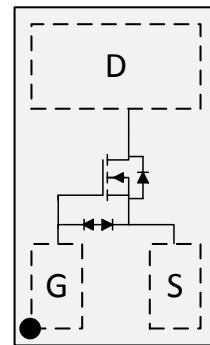
Single N-Channel, 20V, 0.6A, Power MOSFET

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

V_{DS} (V)	Typical $R_{DS(on)}$ (Ω)
20	0.42 @ $V_{GS}=4.5V$
	0.58 @ $V_{GS}=2.5V$
	0.84 @ $V_{GS}=1.8V$



DFN1006-3L



Descriptions

The WPM2046C 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 WNM2046C is Pb-free.

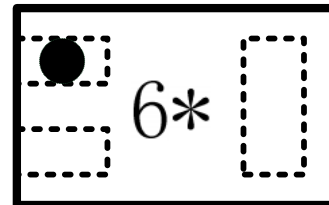
Features

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

Applications

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

Pin configuration (Top view)



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

Marking

Order information

Device	Package	Shipping
WNM2046C-3/TR	DFN1006-3L	10K/Tape&Reel

Absolute Maximum ratings

Parameter	Symbol	10 s	Steady State	Unit	
Drain-Source Voltage	V_{DS}	20		V	
Gate-Source Voltage	V_{GS}	± 10			
Continuous Drain Current ^{a d}	$T_A=25^{\circ}\text{C}$	I_D	0.6	0.55	A
	$T_A=70^{\circ}\text{C}$		0.48	0.44	
Maximum Power Dissipation ^{a d}	$T_A=25^{\circ}\text{C}$	P_D	0.32	0.27	W
	$T_A=70^{\circ}\text{C}$		0.21	0.18	
Continuous Drain Current ^{b d}	$T_A=25^{\circ}\text{C}$	I_D	0.57	0.52	A
	$T_A=70^{\circ}\text{C}$		0.45	0.42	
Maximum Power Dissipation ^{b d}	$T_A=25^{\circ}\text{C}$	P_D	0.29	0.25	W
	$T_A=70^{\circ}\text{C}$		0.18	0.16	
Pulsed Drain Current ^c	I_{DM}	1.4		A	
Operating Junction Temperature	T_J	-55 to 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

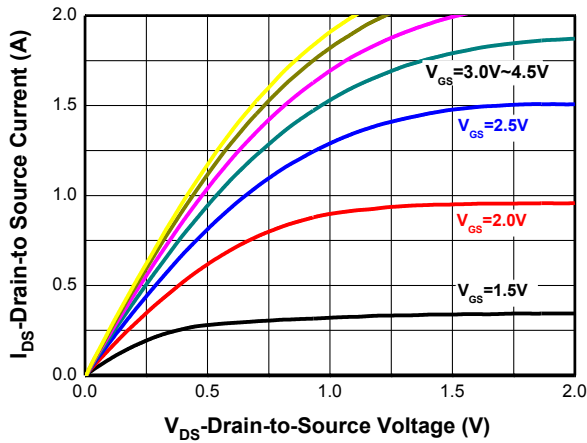
Parameter	Symbol	Typical	Maximum	Unit	
Junction-to-Ambient Thermal Resistance ^a	$t \leq 10 \text{ s}$	$R_{\theta JA}$	350	390	$^{\circ}\text{C/W}$
	Steady State		395	455	
Junction-to-Ambient Thermal Resistance ^b	$t \leq 10 \text{ s}$	$R_{\theta JA}$	397	435	
	Steady State		445	505	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	240	280	

- Surface mounted on FR4 Board using 1 in sq pad size, 1oz Cu.
- Surface mounted on FR4 board using the minimum recommended pad size, 1oz Cu.
- Repetitive rating, pulse width limited by junction temperature, $t_p=10\mu\text{s}$, Duty Cycle=1%.
- Repetitive rating, pulse width limited by junction temperature $T_J(\text{MAX})=150^{\circ}\text{C}$.

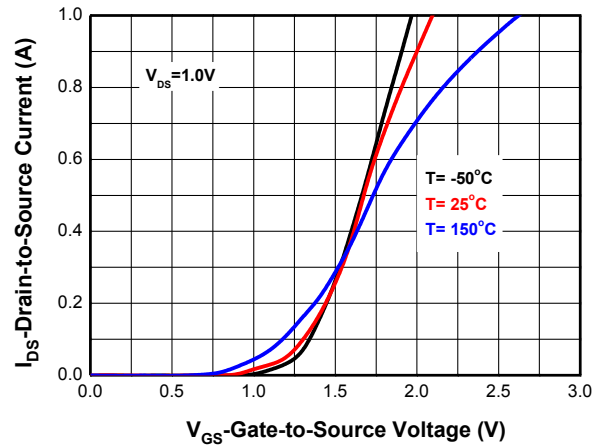
Electronics Characteristics (Ta=25°C, unless otherwise noted)

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} = 16V, V _{GS} = 0V			1	uA
Gate-to-source Leakage Current	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±10V			±5	uA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = 250uA	0.45	0.70	1.0	V
Drain-to-source On-resistance	R _{DS(on)}	V _{GS} = 4.5V, I _D = 0.35A		420	600	mΩ
		V _{GS} = 3.1V, I _D = 0.20A		500	700	
		V _{GS} = 2.5V, I _D = 0.20A		580	800	
		V _{GS} = 1.8V, I _D = 0.20A		840	1300	
		V _{GS} = 1.5V, I _D = 0.04A		1100	1600	
Forward Transconductance	g _{FS}	V _{DS} = 10 V, I _D = 0.35A		0.85		S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C _{ISS}	V _{GS} = 0 V, f = 1.0MHz, V _{DS} = 10 V		30		pF
Output Capacitance	C _{OSS}			7		
Reverse Transfer Capacitance	C _{RSS}			5		
Total Gate Charge	Q _{G(TOT)}	V _{GS} = 4.5 V, V _{DS} = 10 V, I _D = 0.54 A		1.07		nC
Threshold Gate Charge	Q _{G(TH)}			0.12		
Gate-to-Source Charge	Q _{GS}			0.32		
Gate-to-Drain Charge	Q _{GD}			0.14		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(ON)	V _{GS} = 4.5 V, V _{DS} = 10 V, I _D = 0.54A, R _G = 6Ω		7.2		ns
Rise Time	tr			9.5		
Turn-Off Delay Time	td(OFF)			19.6		
Fall Time	tf			4.6		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V _{SD}	V _{GS} = 0 V, I _S = 0.3A		0.85	1.5	V

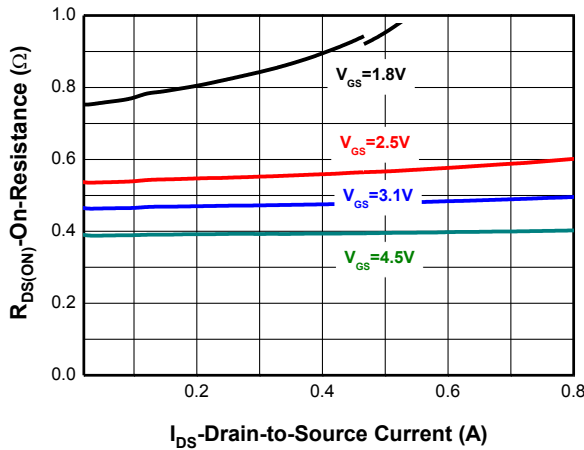
Typical Characteristics (Ta=25°C, unless otherwise noted)



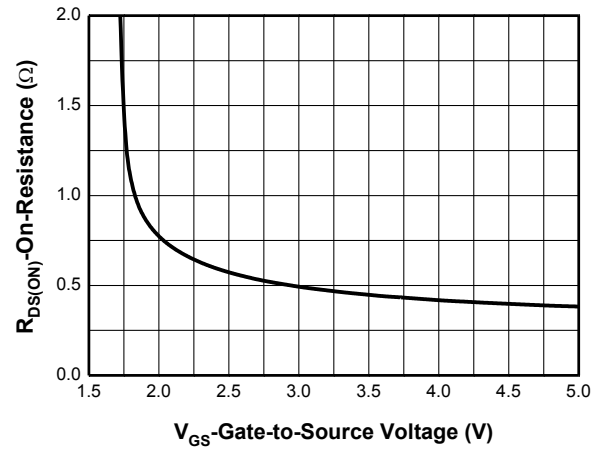
Output characteristics



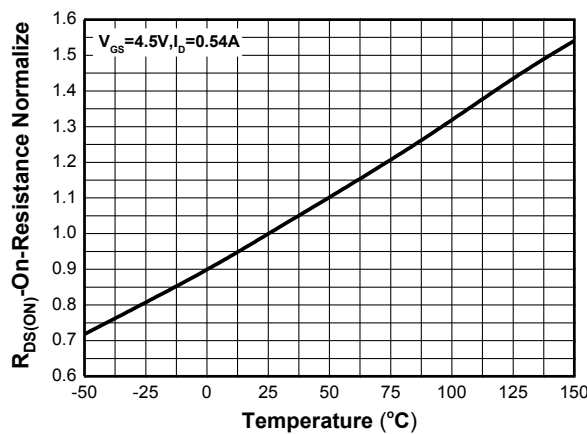
Transfer characteristics



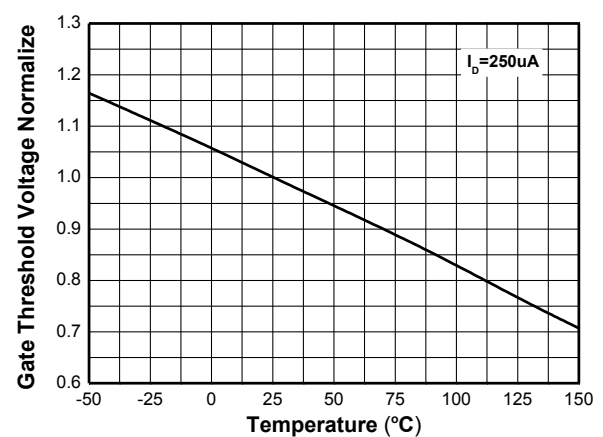
On-Resistance vs. Drain current



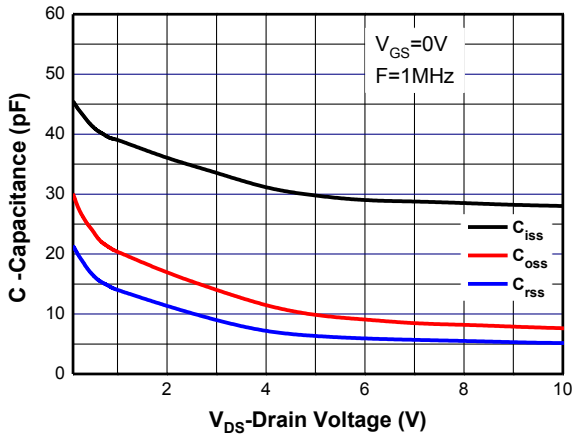
On-Resistance vs. Gate-to-source voltage



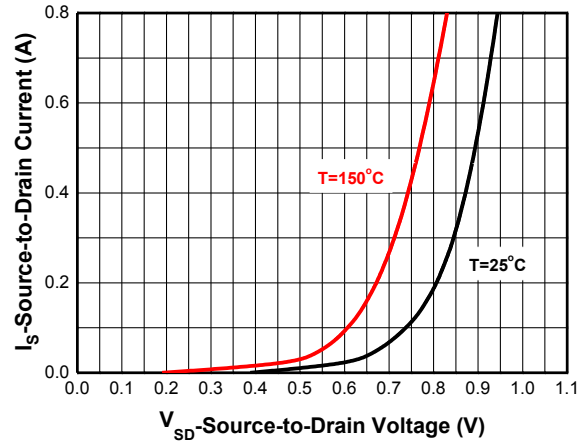
On-Resistance vs. Junction temperature



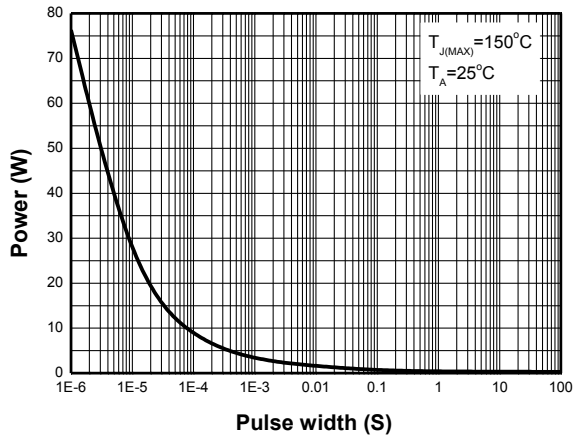
Threshold voltage vs. Temperature



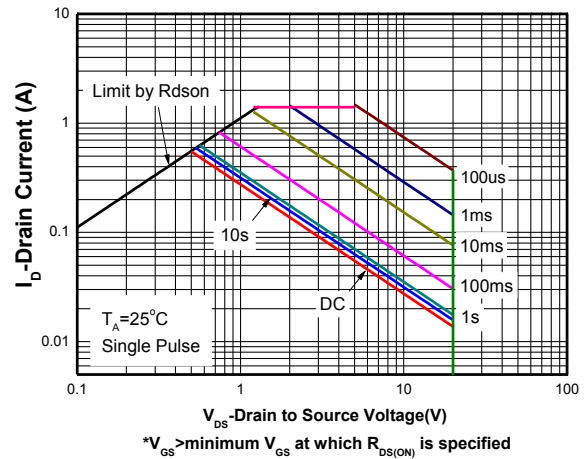
Capacitance



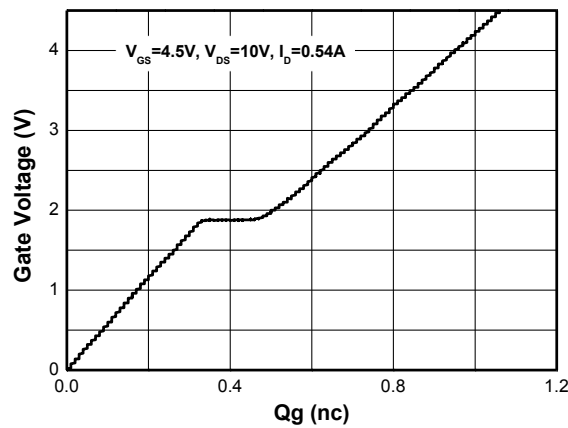
Body diode forward voltage



Single pulse power

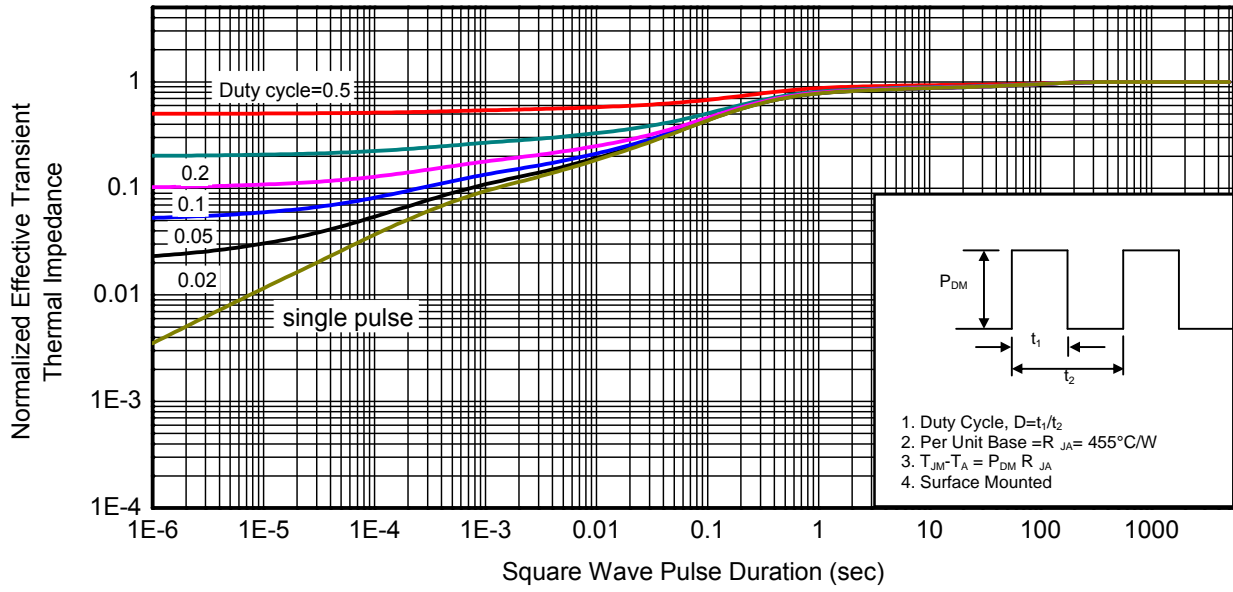


Safe operating Area



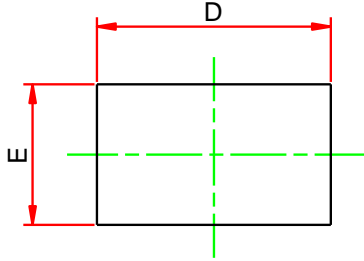
Gate Charge Characteristics

Transient thermal response (Junction-to-Ambient)

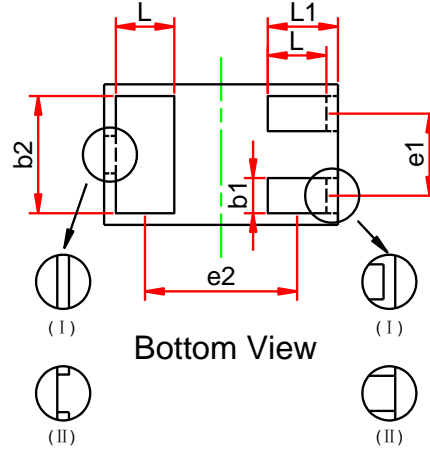


PACKAGE OUTLINE DIMENSIONS

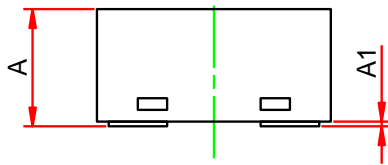
DFN1006-3L



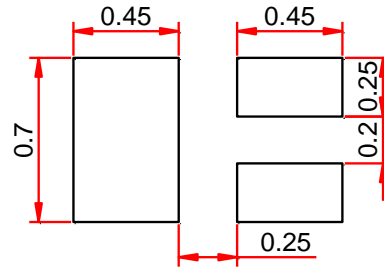
Top View



Bottom View



Side View

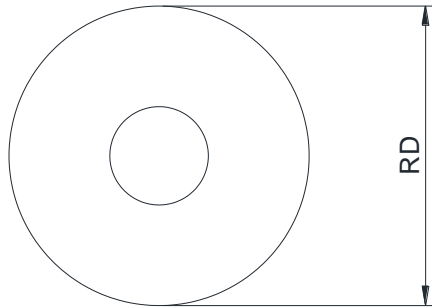


RECOMMENDED LAND PATTERN(Unit:mm)

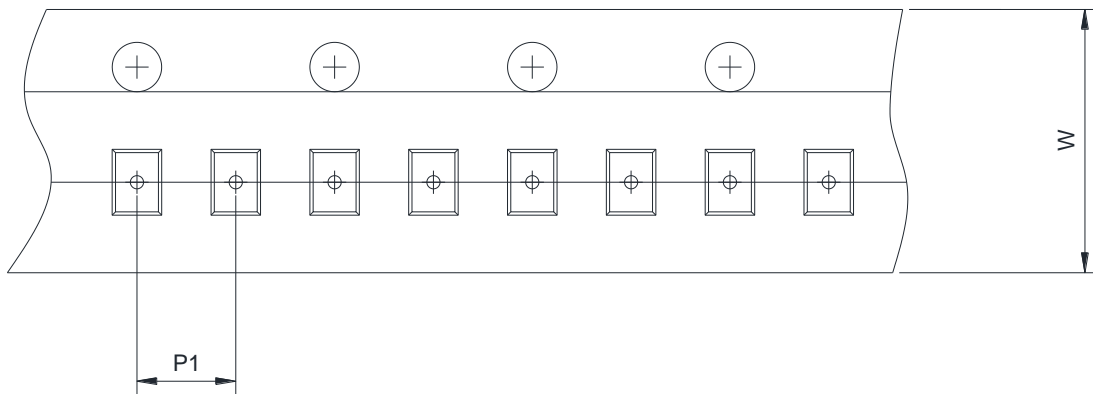
Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.31	-	0.40
A1	0.00	-	0.05
D	0.95	1.00	1.05
E	0.55	0.60	0.65
b1	0.10	0.15	0.20
b2	0.45	0.50	0.60
L	0.20	0.25	0.30
L1	0.20	0.30	0.40
e1	0.35Ref		
e2	0.65 Ref		

TAPE AND REEL INFORMATION

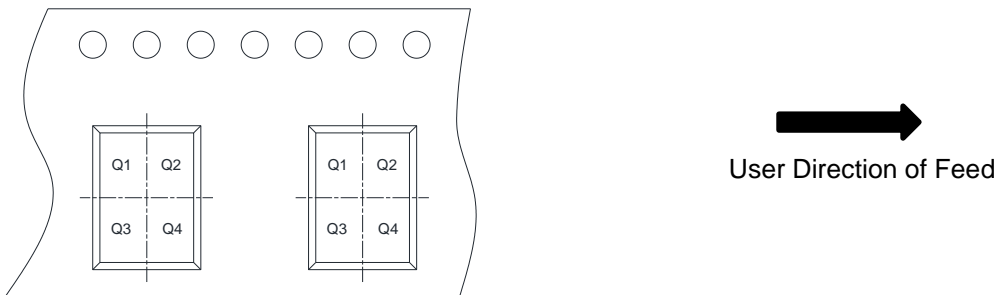
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape



RD	Reel Dimension	<input checked="" type="checkbox"/> 7 inch	<input type="checkbox"/> 13 inch
W	Overall width of the carrier tape	<input checked="" type="checkbox"/> 8 mm	<input type="checkbox"/> 12 mm <input type="checkbox"/> 16 mm
P1	Pitch between successive cavity centers	<input checked="" type="checkbox"/> 2 mm	<input type="checkbox"/> 4 mm <input type="checkbox"/> 8 mm
Pin1	Pin1 Quadrant	<input type="checkbox"/> Q1	<input checked="" type="checkbox"/> Q2 <input type="checkbox"/> Q3 <input type="checkbox"/> Q4