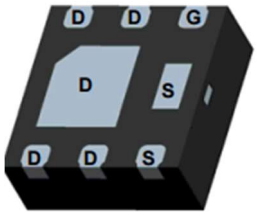
WPM3410

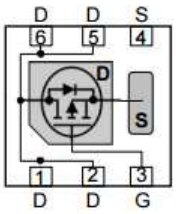
Single P-Channel, -30V, -5.4A, Power MOSFET

http://www.omnivision-group.com/

V_{DS} (V)	Typical $R_{DS(on)}$ (mΩ)
-30	32 @ V_{GS}=-10V
	49 @ V_{GS}=-4.5V



DFN2X2-6L



Pin configuration (Top view)

Descriptions

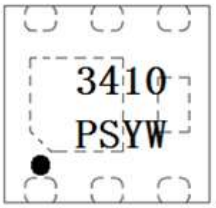
The WPM3410 is P-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product WPM3410 is Pb-free.

Features

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

Applications

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



3410 =Device Code
PS = Special Code
Y = Year
W = Week(A~z)

Marking

Order information

Device	Package	Shipping
WPM3410-6/TR	DFN2X2-6L	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}	±20		
Continuous Drain Current [a d]	T_A=25°C	I_D	-5.4	-4.8	A
	T_A=70°C		-4.3	-3.9	
Maximum Power Dissipation [a d]	T_A=25°C	P_D	1.8	1.4	W
	T_A=70°C		1.1	0.9	
Continuous Drain Current [b d]	T_A=25°C	I_D	-4.8	-4.1	A
	T_A=70°C		-3.8	-3.3	
Maximum Power Dissipation [b d]	T_A=25°C	P_D	1.4	1.0	W
	T_A=70°C		0.9	0.6	
Pulsed Drain Current [c]		I_{DM}	-24		A
Operating Junction Temperature		T_J	-55 to 150		°C
Lead Temperature		T_L	260		°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	$R_{\theta JA}$	57	71	°C/W
	Steady State		70	90	
Junction-to-Ambient Thermal Resistance [b]	t ≤ 10 s	$R_{\theta JA}$	90	115	
	Steady State		126	180	

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

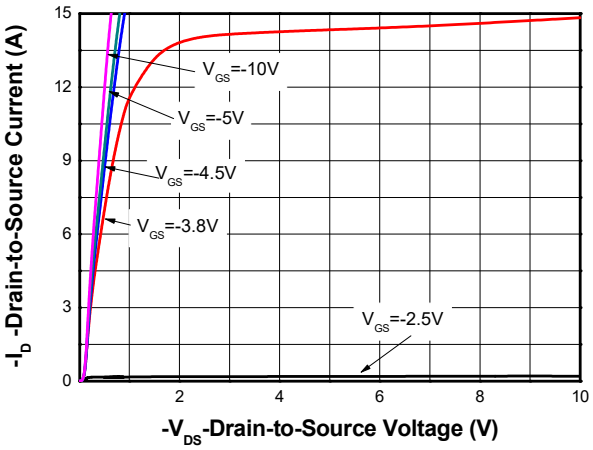
c Repetitive rating, pulse width limited by junction temperature, t_p=10μs, Duty Cycle=1%

d Repetitive rating, pulse width limited by junction temperature T_J=150°C.

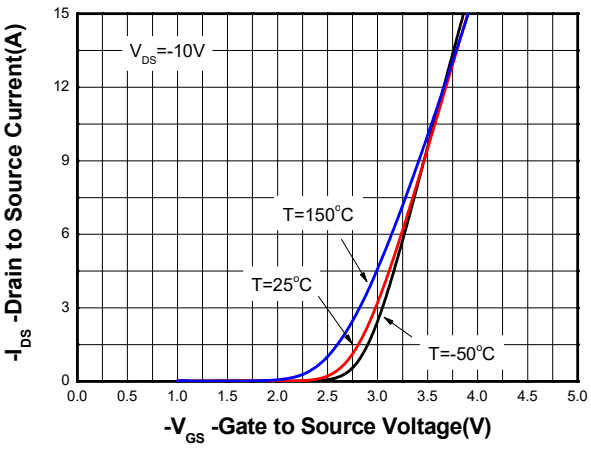
Electronics Characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0 V, I_D = -250uA	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -24V, 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	-1.6	-2.0	-2.4	V
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS} = -10V, I_D = -5A		32	42	mΩ
		V_{GS} = -4.5V, I_D = -4A		49	64	
Forward Transconductance	g_{FS}	V_{DS} = -15 V, I_D = -3.3A		8	18	S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS} = 0 V, F = 1.0MHz, V_{DS} = -15 V		1065		pF
Output Capacitance	C_{OSS}			125		
Reverse Transfer Capacitance	C_{RSS}			103		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = -10 V, V_{DS} = -15 V, I_D = -5 A		18		nC
Threshold Gate Charge	$Q_{G(TH)}$			1.8		
Gate-to-Source Charge	Q_{GS}			3		
Gate-to-Drain Charge	Q_{GD}			3.2		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(ON)	V_{GS} = -10 V, V_{DD} = -15 V, I_D= -5A, R_G= 1Ω		22.4		ns
Rise Time	tr			25.2		
Turn-Off Delay Time	td(OFF)			25.4		
Fall Time	tf			15.8		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = -0.1A		-0.8	-1.0	V

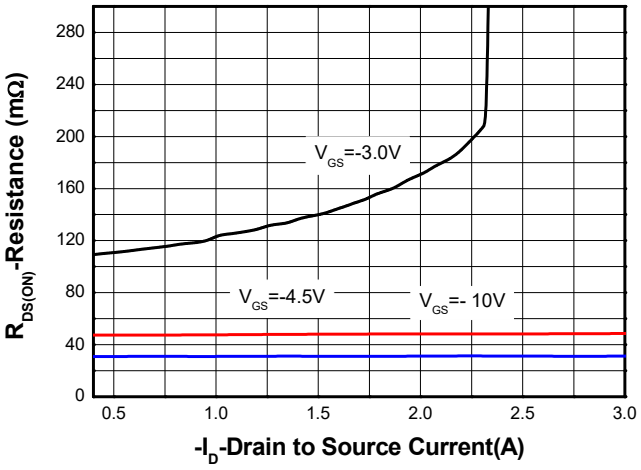
Typical Characteristics (Ta=25°C, unless otherwise noted)



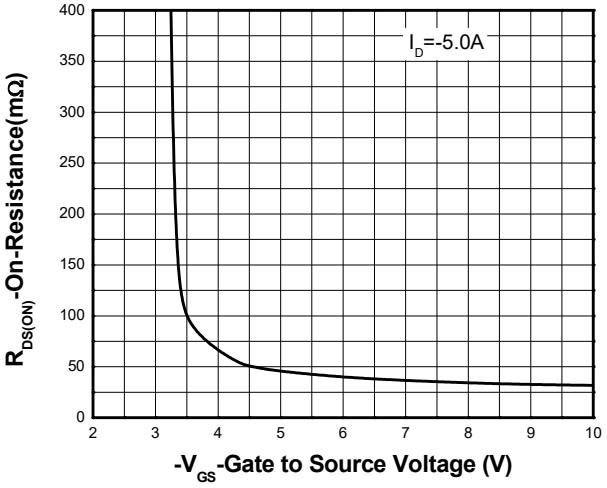
Output characteristics



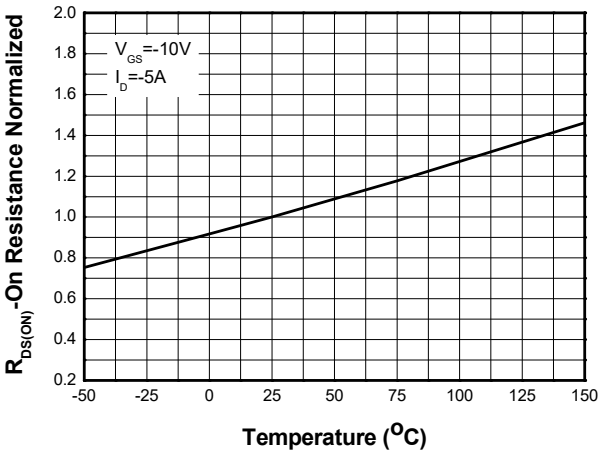
Transfer characteristics



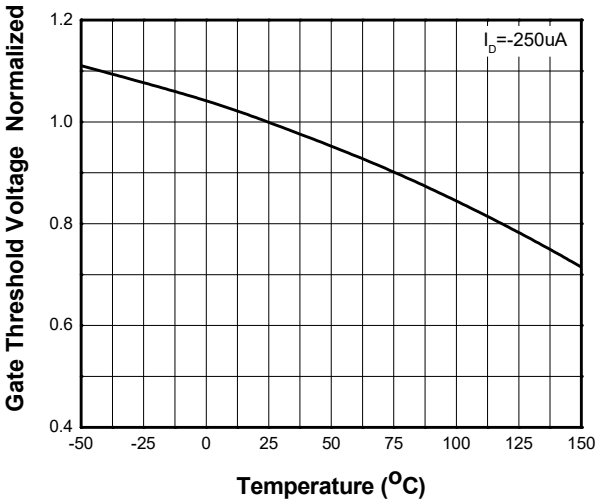
On-Resistance vs. Drain current



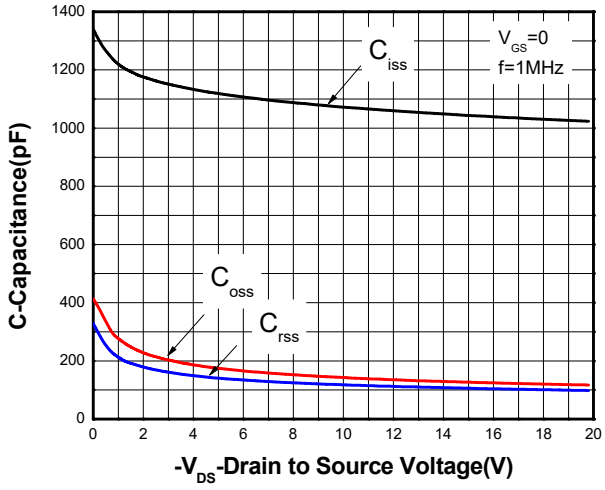
On-Resistance vs. Gate-to-source voltage



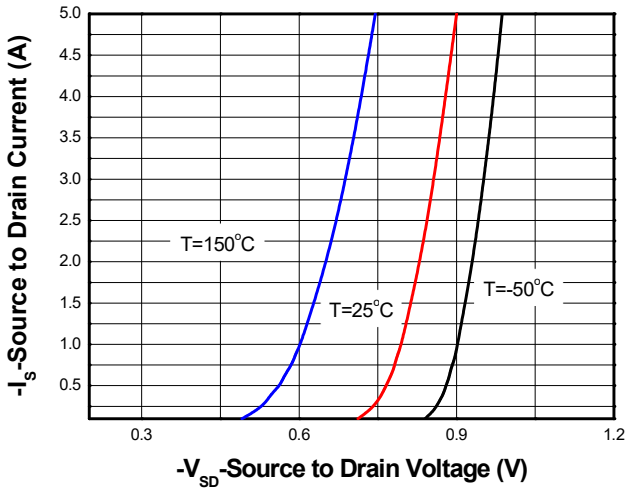
On-Resistance vs. Junction temperature



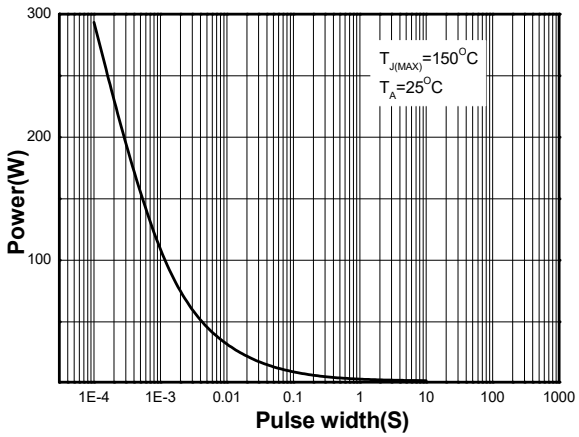
Threshold voltage vs. Temperature



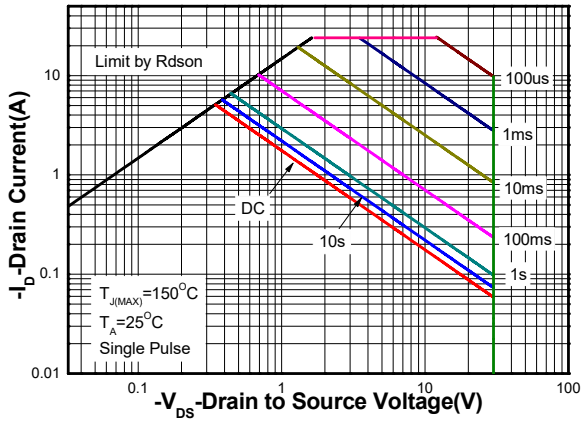
Capacitance



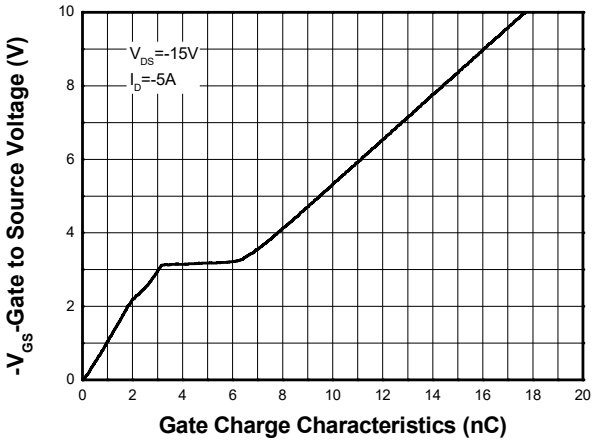
Body diode forward voltage



Single pulse power

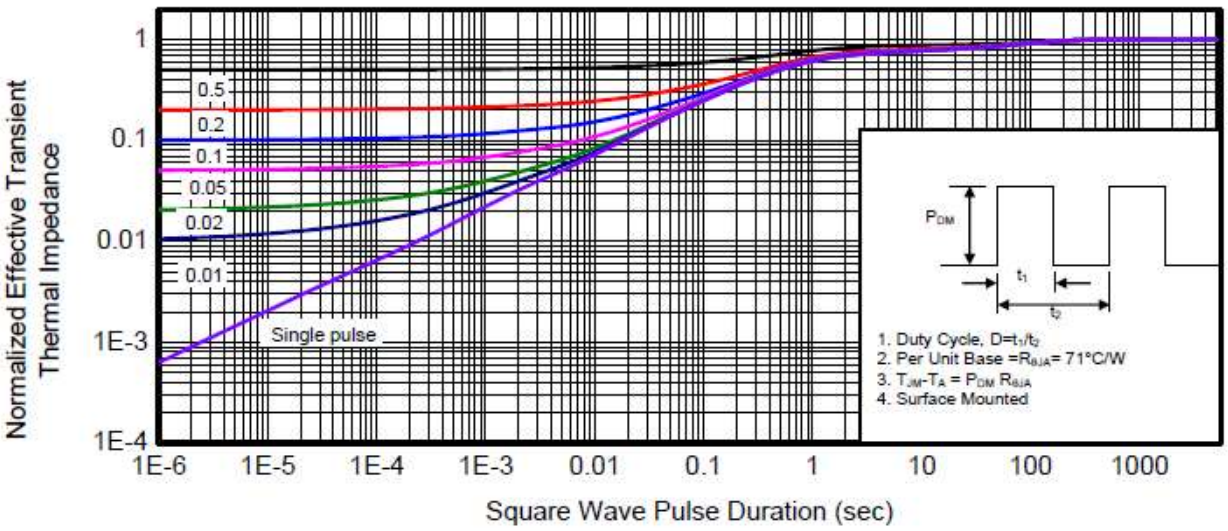


Safe operating power



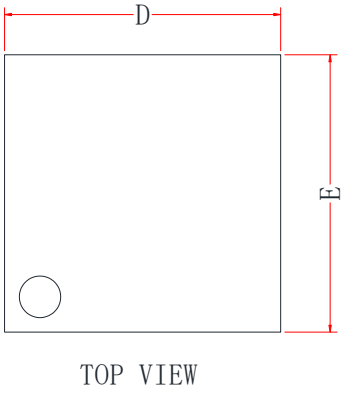
Gate Charge Characteristics

Transient thermal response (Junction-to-Ambient)

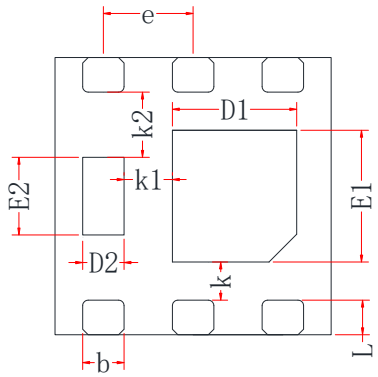


PACKAGE OUTLINE DIMENSIONS

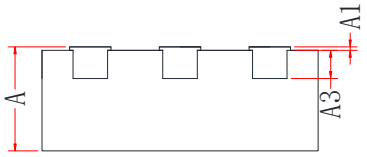
DFN2x2-6L



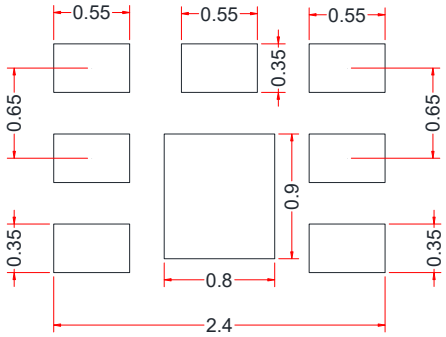
TOP VIEW



BOTTOM VIEW



SIDE VIEW

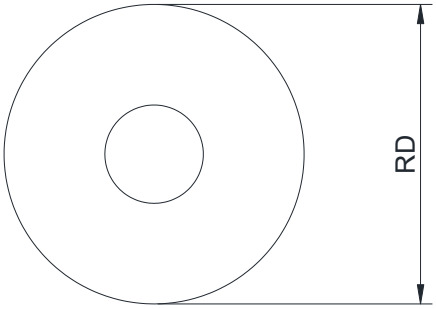


RECOMMENDED LAND PATTERN(Unit:mm)

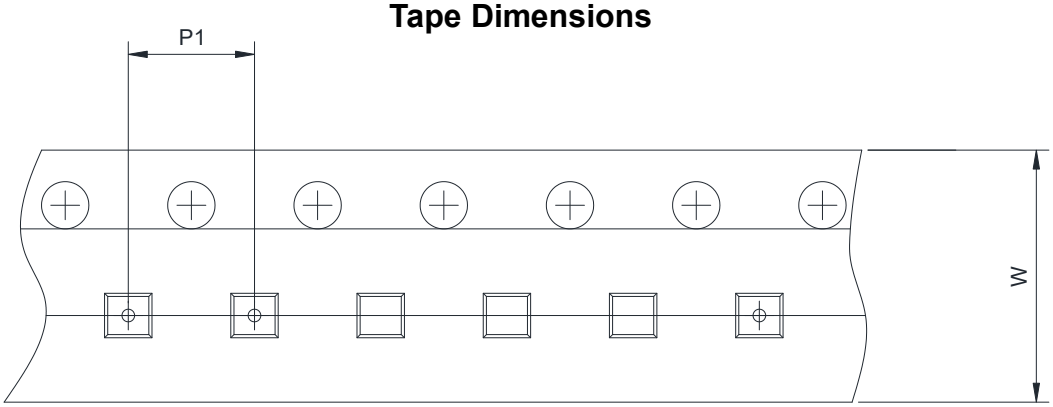
Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
A3		0.203 Ref.	
D	1.90	2.00	2.10
E	1.90	2.00	2.10
D1	0.80	0.90	1.00
E1	0.85	0.95	1.05
D2	0.20	0.30	0.40
E2	0.46	0.56	0.66
b	0.25	0.30	0.35
e		0.65 BSC.	
L	0.17	0.25	0.33
K		0.275 REF.	
K1		0.350 REF.	
K2		0.470 REF.	

TAPE AND REEL INFORMATION

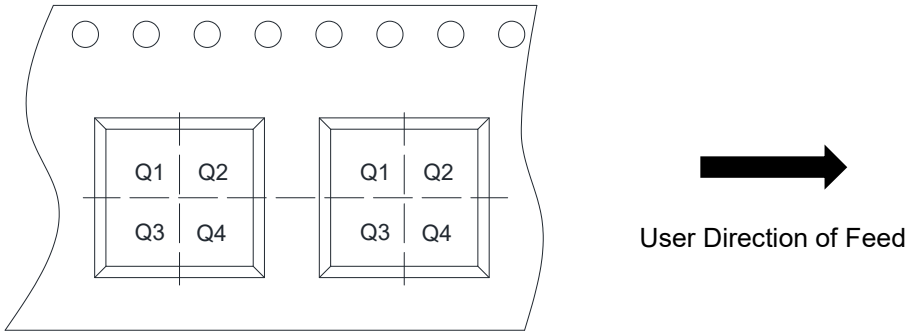
Reel Dimensions



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