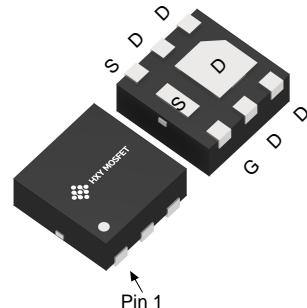




Description

The WPM1481-6 uses advanced trench technology to provide excellent $R_{DS(ON)}$. This device is suitable for use as a load switch or in PWM applications.



General Features

$V_{DS} = -15V, I_D = -16A$

$R_{DS(ON)} < 18m\Omega @ V_{GS}=-4.5V$

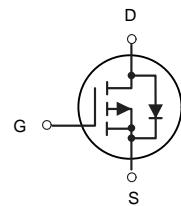
DFN2X2B-6L

Application

Battery protection

Load switch

Uninterruptible power supply



P-Channel MOSFET

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
WPM1481-6	DFN2X2B-6L	HXY MOSFET	5000

Absolute Maximum Ratings ($T_A=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage	-15	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Drain Current-Continuous	-16	A
I_{DM}	Drain Current-Pulsed (Note 1)	-65	A
P_D	Maximum Power Dissipation	2.8	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	50	$^\circ C/W$



Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$\text{V}_{\text{GS}}=0\text{V}$, $\text{I}_{\text{D}}=-250\text{uA}$	-15	-18	---	V
$\Delta \text{BV}_{\text{DSS}}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $\text{I}_{\text{D}}=-1\text{mA}$	---	-0.022	---	$^\circ\text{C}$
$\text{R}_{\text{DS}(\text{ON})}$	Static Drain-Source On-Resistance ²	$\text{V}_{\text{GS}}=-10\text{V}$, $\text{I}_{\text{D}}=-15\text{A}$	---	11	18	$\text{m}\Omega$
		$\text{V}_{\text{GS}}=-4.5\text{V}$, $\text{I}_{\text{D}}=-10\text{A}$	---	14	22	
$\text{V}_{\text{GS}(\text{th})}$	Gate Threshold Voltage	$\text{V}_{\text{GS}}=\text{V}_{\text{DS}}$, $\text{I}_{\text{D}}=-250\text{uA}$	-1.0	---	---	V
$\Delta \text{V}_{\text{GS}(\text{th})}$	$\text{V}_{\text{GS}(\text{th})}$ Temperature Coefficient		---	4.6	---	$\text{mV}/^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$\text{V}_{\text{DS}}=-24\text{V}$, $\text{V}_{\text{GS}}=0\text{V}$, $T_J=25^\circ\text{C}$	---	---	-1	uA
		$\text{V}_{\text{DS}}=-24\text{V}$, $\text{V}_{\text{GS}}=0\text{V}$, $T_J=55^\circ\text{C}$	---	---	-5	
I_{GSS}	Gate-Source Leakage Current	$\text{V}_{\text{GS}}=\pm 25\text{V}$, $\text{V}_{\text{DS}}=0\text{V}$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$\text{V}_{\text{DS}}=-5\text{V}$, $\text{I}_{\text{D}}=-15\text{A}$	---	19	---	S
R_{g}	Gate Resistance	$\text{V}_{\text{DS}}=0\text{V}$, $\text{V}_{\text{GS}}=0\text{V}$, $f=1\text{MHz}$	---	13	---	Ω
Q_{g}	Total Gate Charge (-4.5V)	$\text{V}_{\text{DS}}=-15\text{V}$, $\text{V}_{\text{GS}}=-4.5\text{V}$, $\text{I}_{\text{D}}=-15\text{A}$	---	35	---	nC
Q_{gs}	Gate-Source Charge		---	5	---	
Q_{gd}	Gate-Drain Charge		---	10	---	
$\text{T}_{\text{d}(\text{on})}$	Turn-On Delay Time	$\text{V}_{\text{DD}}=-15\text{V}$, $\text{V}_{\text{GS}}=-10\text{V}$, $\text{R}_{\text{G}}=3.3\Omega$, $\text{I}_{\text{D}}=-15\text{A}$	---	11	---	ns
T_{r}	Rise Time		---	35	---	
$\text{T}_{\text{d}(\text{off})}$	Turn-Off Delay Time		---	30	---	
T_{f}	Fall Time		---	10	---	
C_{iss}	Input Capacitance	$\text{V}_{\text{DS}}=-15\text{V}$, $\text{V}_{\text{GS}}=0\text{V}$, $f=1\text{MHz}$	---	2600	---	pF
C_{oss}	Output Capacitance		---	670	---	
C_{rss}	Reverse Transfer Capacitance		---	560	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_{s}	Continuous Source Current ^{1,5}	$\text{V}_{\text{G}}=\text{V}_{\text{D}}=0\text{V}$, Force Current	---	---	-16	A
V_{SD}	Diode Forward Voltage ²	$\text{V}_{\text{GS}}=0\text{V}$, $\text{I}_{\text{s}}=-1\text{A}$, $T_J=25^\circ\text{C}$	---	---	-1.2	V

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width $\leq 300\text{us}$, duty cycle $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is $\text{V}_{\text{DD}}=-25\text{V}$, $\text{V}_{\text{GS}}=-10\text{V}$, $\text{L}=0.1\text{mH}$, $\text{I}_{\text{AS}}=-38\text{A}$
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I_{D} and I_{DM} , in real applications , should be limited by total power dissipation.



Typical Electrical and Thermal Characteristics

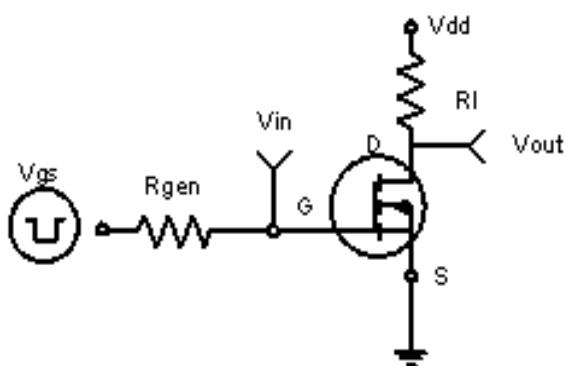


Figure 1: Switching Test Circuit

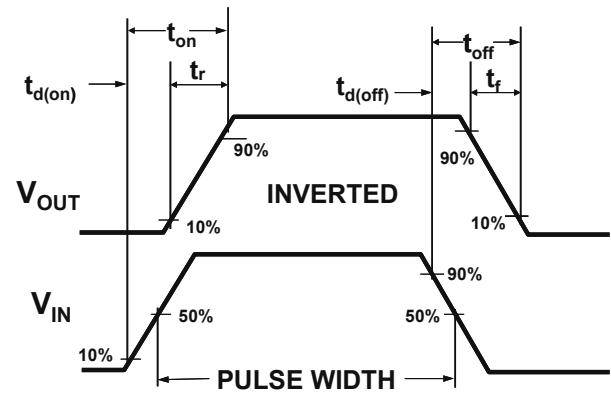


Figure 2: Switching Waveforms

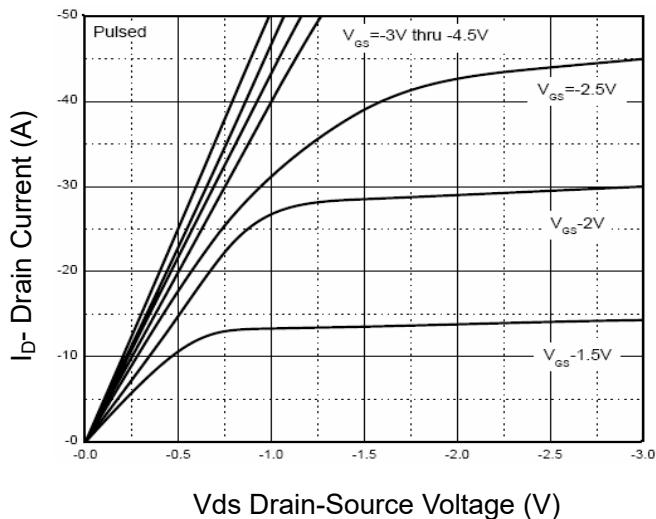
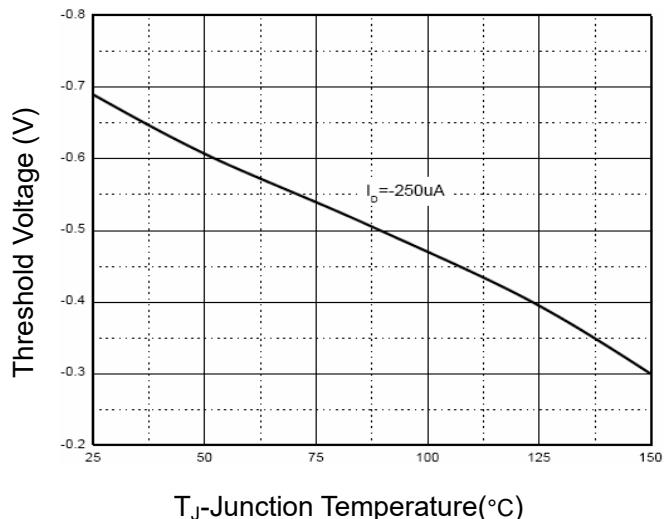
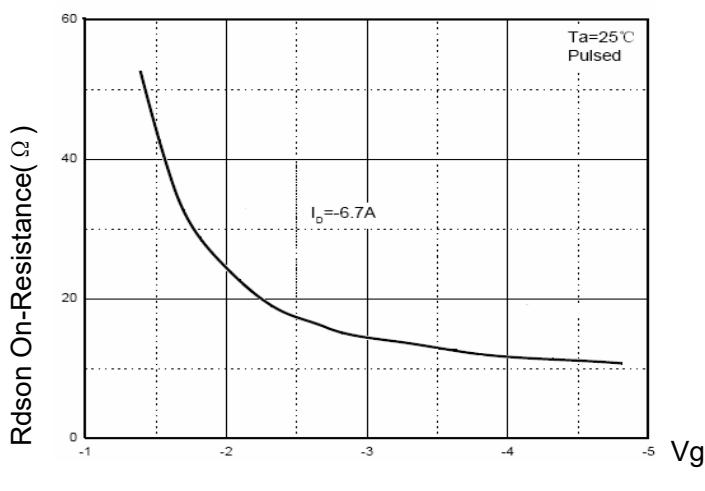


Figure 3 Output Characteristics



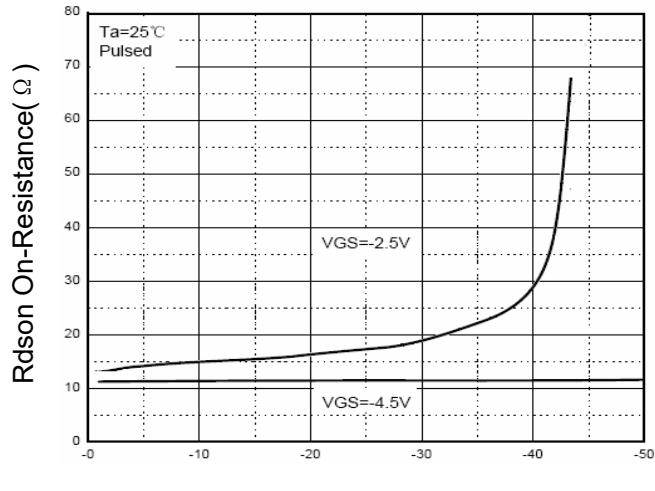
T_J-Junction Temperature(°C)

Figure 4 Drain Current



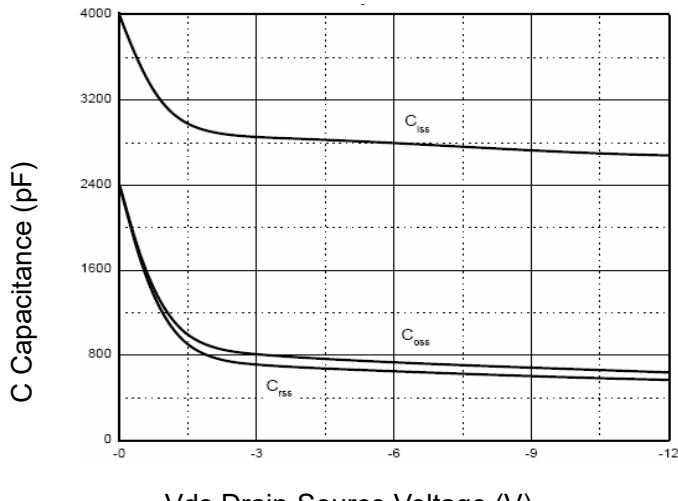
s Gate-Source Voltage (V)

Figure 5 Rdson vs Vgs



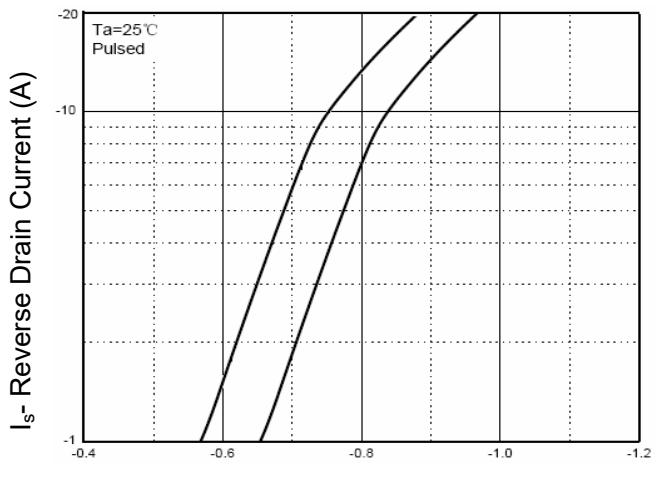
I_D- Drain Current (A)

Figure 6 Drain-Source On-Resistance



Vds Drain-Source Voltage (V)

Figure 7 Capacitance vs Vds

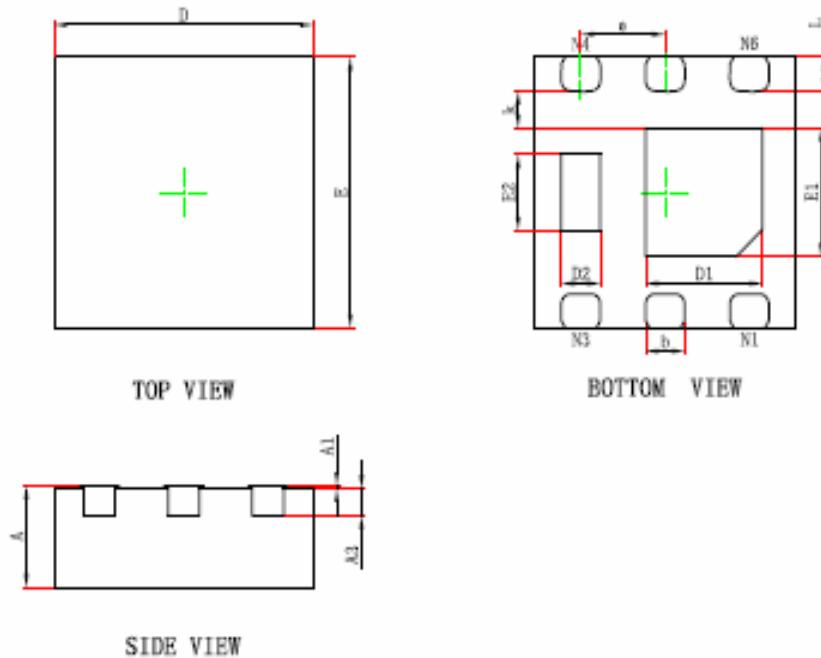


Vsd Source-Drain Voltage (V)

Figure 8 Source- Drain Diode Forward



DFN2X2B-6L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	1.924	2.076	0.076	0.082
E	1.924	2.076	0.076	0.082
D1	0.800	1.000	0.031	0.039
E1	0.850	1.050	0.033	0.041
D2	0.200	0.400	0.008	0.016
E2	0.460	0.660	0.018	0.026
k	0.200MIN.		0.008MIN.	
b	0.250	0.350	0.010	0.014
e	0.650TYP.		0.026TYP.	
L	0.174	0.326	0.007	0.013



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