

Description

The PPM6N12V5 uses advanced trench technology to provide excellent $R_{DS(on)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a load switch or in PWM applications..

MOSFET Product Summary

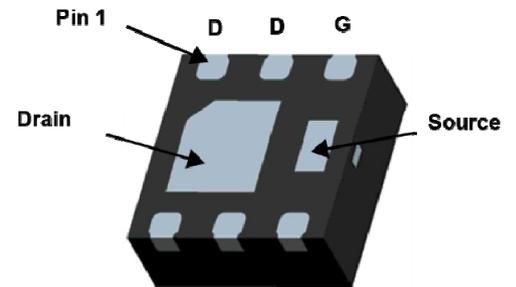
$V_{DS}(V)$	$R_{DS(on)}(m\Omega)$	$I_D(A)$
-12	52 @ $V_{GS}=-4.5V$	-5A
	70 @ $V_{GS}=-2.5V$	

Feature

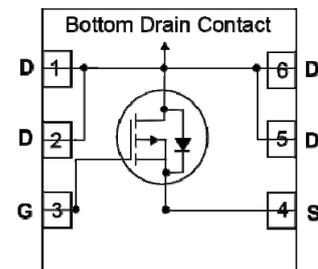
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

Applications

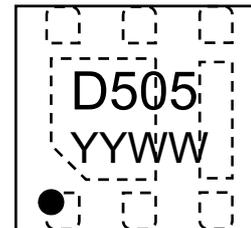
- PWM applications
- Load switch
- Power management



Bottom View



Circuit Diagram



Marking (Top View)

Absolute maximum rating@25°C

Rating		Symbol	Value	Units
Drain-source Voltage		V_{DS}	-12	V
Gate-source Voltage		V_{GS}	± 10	V
Drain Current	$T_C=25^\circ C$	I_D	-5.0	A
	$T_C=70^\circ C$		-3.2	
	$T_A=25^\circ C$		-3	
	$T_A=70^\circ C$		-2.3	
Pulsed Drain Current ¹⁾		I_{DM}	-15	A
Total Power Dissipation		P_D	1.7	W
Thermal Resistance Junction-to-Ambient @ Steady State ²⁾		$R_{\theta JA}$	357	$^\circ C/W$
Junction and Storage Temperature Range		T_J, T_{STG}	-55~+150	$^\circ C$

Electrical characteristics per line@25°C (unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = -250\mu A$	-12	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -12V, V_{GS} = 0V$	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS} = \pm 10V, V_{DS} = 0V$	-	-	± 100	nA
On Characteristics ³⁾						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.45	-0.7	-1.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -4.5A$	-	39	52	m Ω
		$V_{GS} = -2.5V, I_D = -3A$	-	58	70	
		$V_{GS} = -1.8V, I_D = -2A$	-	90	110	
Forward Transconductance	g_{FS}	$V_{DS} = -5V, I_D = -3.5A$	-	8.5	-	S
Dynamic Parameters ⁴⁾						
Input Capacitance	C_{iss}	$V_{DS} = -4V, V_{GS} = 0V,$ $f = 1MHz$	-	740	-	pF
Output Capacitance	C_{oss}		-	290	-	
Reverse Transfer Capacitance	C_{rss}		-	190	-	
Switching Parameters ⁴⁾						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = -4V, I_D = -3.3A,$ $R_L = -1.2\Omega, V_{GEN} = -4.5V,$ $R_g = 1\Omega$	-	12	-	ns
Turn-on Rise Time	t_r		-	35	-	
Turn-Off Delay Time	$t_{d(off)}$		-	30	-	
Turn-Off Fall Time	t_f		-	10	-	
Total Gate Charge	Q_g	$V_{DS} = -4V, I_D = -4.1A,$ $V_{GS} = -4.5V$	-	7.8	-	nC
Gate-Source Charge	Q_{gs}		-	1.2	-	
Gate-Drain Charge	Q_{gd}		-	1.6	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage ³⁾	V_{SD}	$V_{GS} = 0V, I_S = -1.6A$	-	-	-1.2	V
Diode Forward Current ²⁾	I_S		-	-	1.6	A

Notes:

Repetitive Rating: Pulse width limited by maximum junction temperature.

Surface Mounted on FR4 Board, $t \leq 10$ sec.

Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

Guaranteed by design, not subject to production

Typical Characteristics

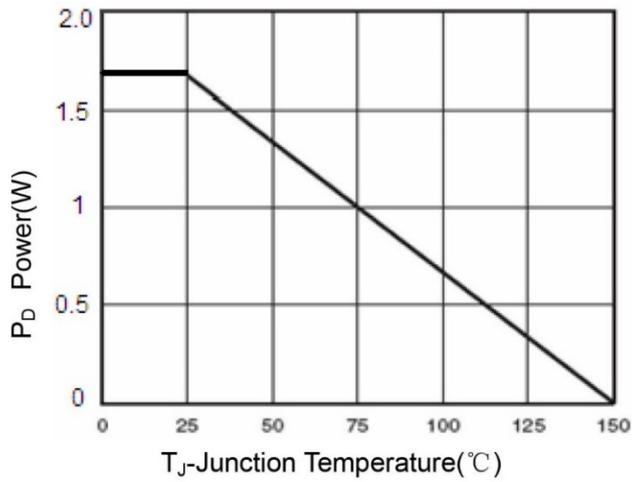


Figure 1 Power Dissipation

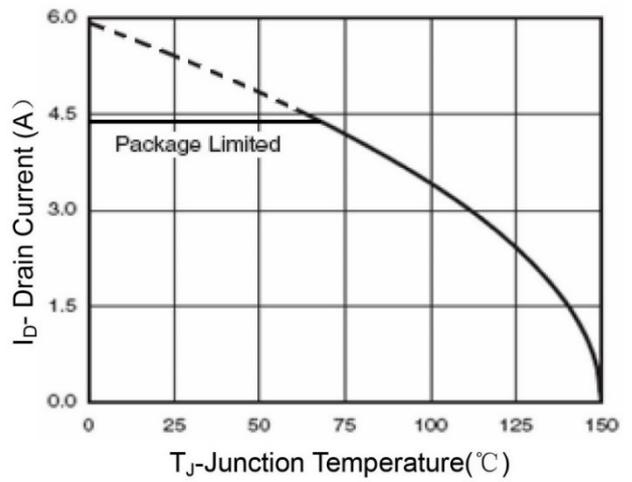


Figure 2 Drain Current

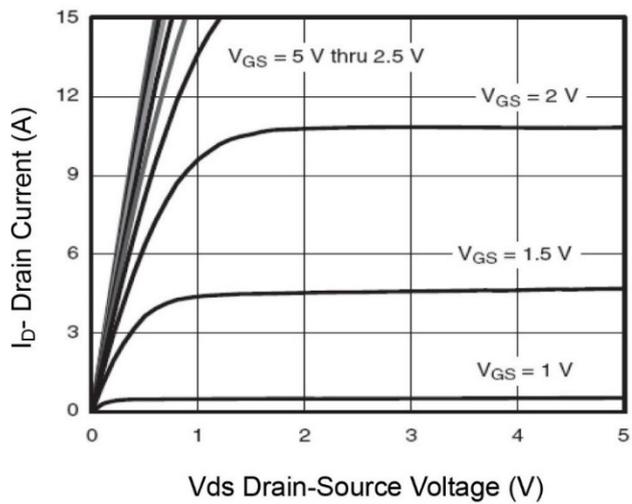


Figure 3 Output Characteristics

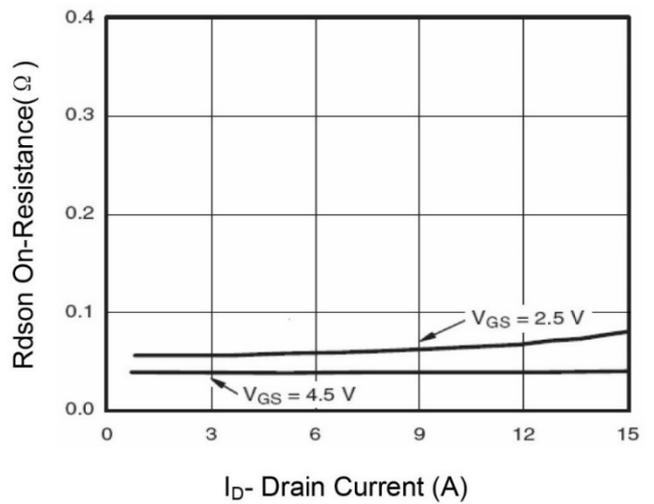


Figure 4 Drain-Source On-Resistance

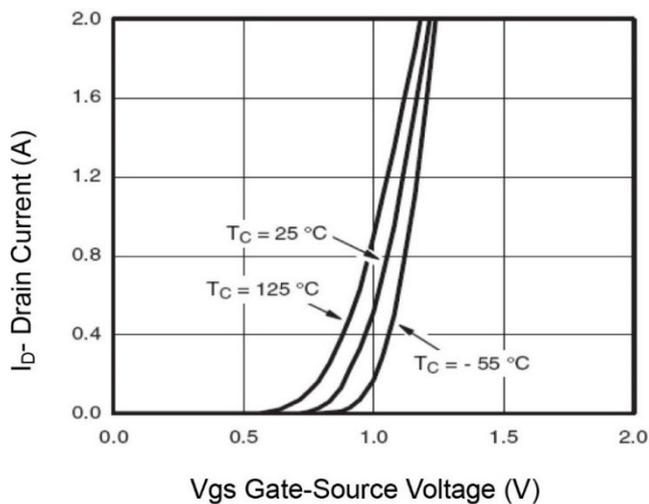


Figure 5 Transfer Characteristics

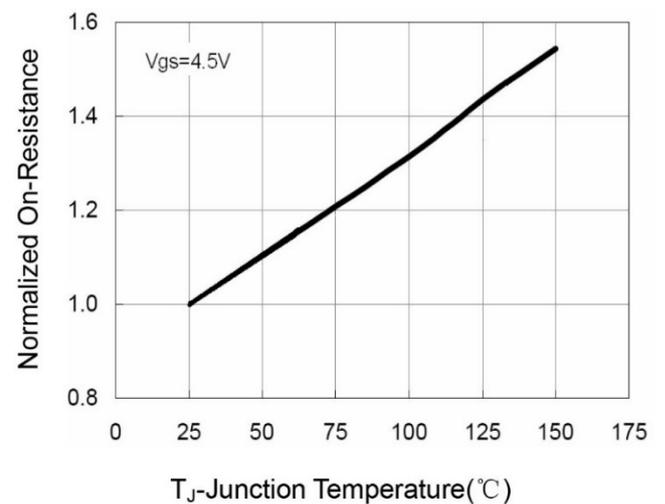
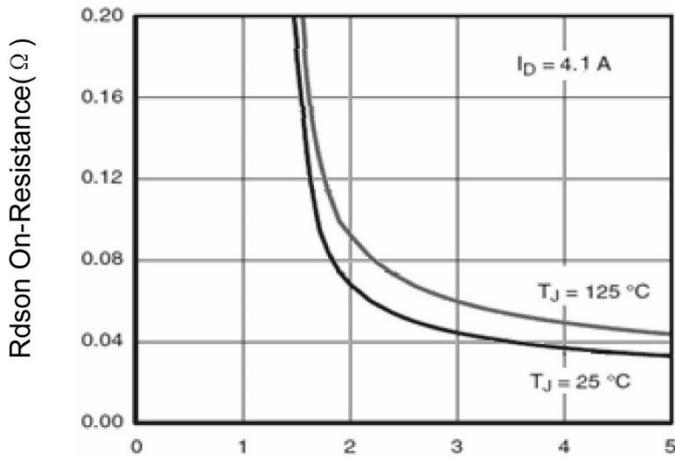
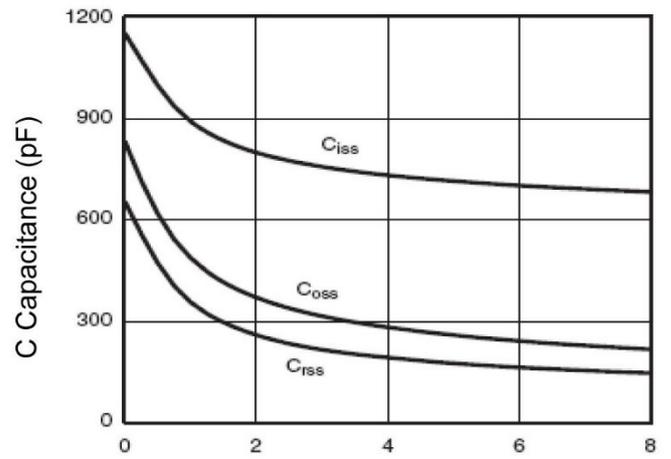


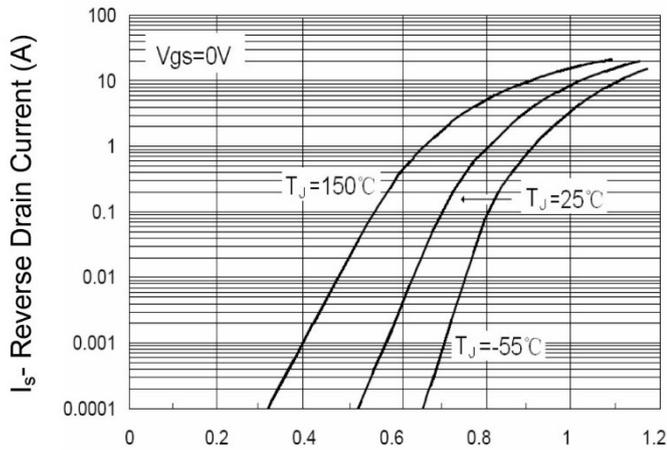
Figure 6 Drain-Source On-Resistance



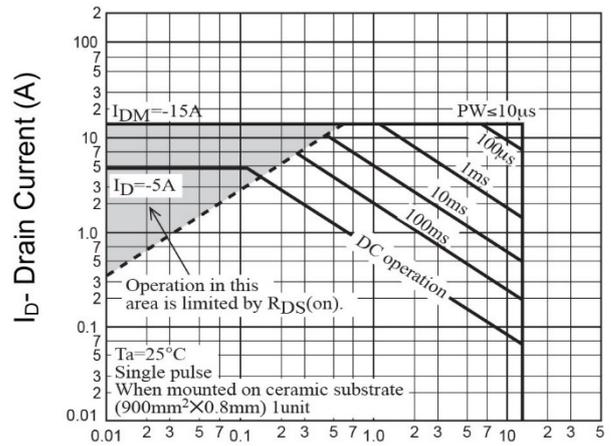
Vgs Gate-Source Voltage (V)
Figure 7 Rdson vs Vgs



Vds Drain-Source Voltage (V)
Figure 8 Capacitance vs Vds



Vsd Source-Drain Voltage (V)
Figure 9 Source- Drain Diode Forward



Vds Drain-Source Voltage (V)
Figure 10 Safe Operation Area

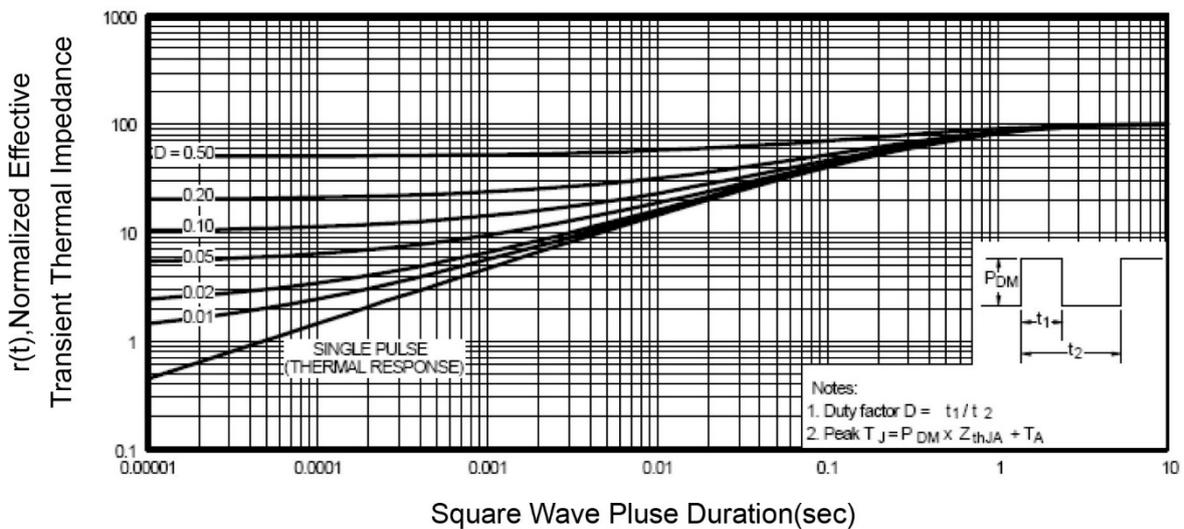
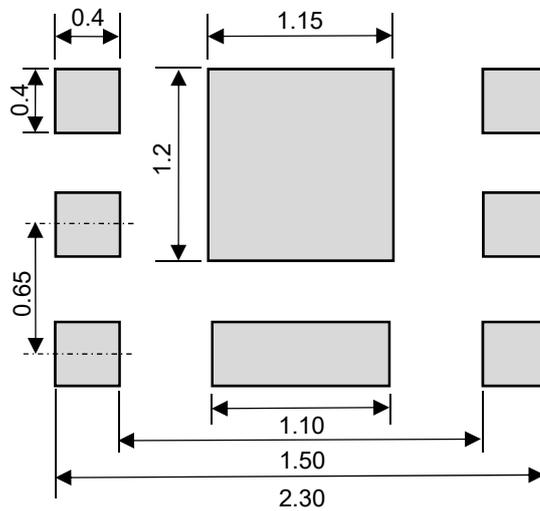
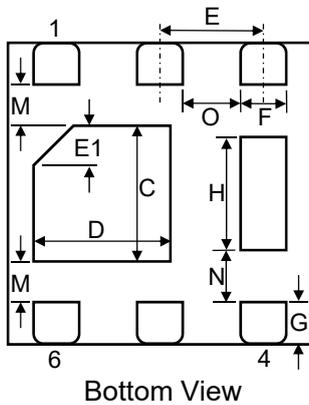
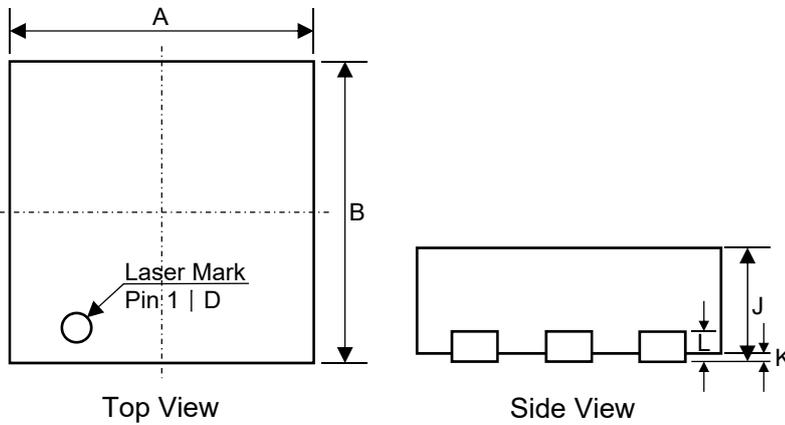


Figure 11 Normalized Maximum Transient Thermal Impedance

Product dimension (DFN2X2-6L)



Dim	Millimeters	
	Min	Max
A	1.90	2.10
B	1.90	2.10
C	0.95	1.05
D	0.80	1.00
E	0.55	0.75
E1	0.25Ref.	
F	0.25	0.35
G	0.25	0.35
H	0.50	1.00
J	0.60	0.80
K	0.00	0.05
F	0.300	0.500
L	0.20Ref.	
M	0.15	-
N	0.20	-
O	0.25	-

Unit:mm

Suggested PCB Layout

Ordering information

Device	Package	Reel	Shipping
PPM6N12V5	DFN2X2-6L (Pb-Free)	7"	3000 / Tape & Reel

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