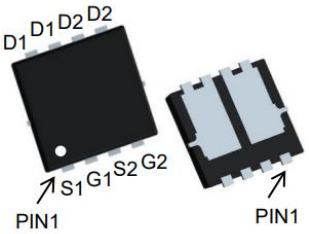
GP30NP16P33

30V N- and P- Channel MOSFET

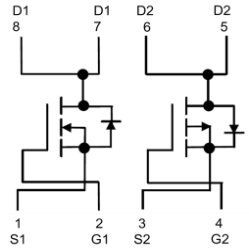
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
30V	10mΩ@10V	31A
	17mΩ@4.5V	
-30V	12mΩ@-10V	-30A
	17mΩ@-4.5V	

PDFN3.3X3.3-8L



Schematic diagram



Feature

- Trench Technology Power MOSFET
- Low $R_{DS(ON)}$
- Low Gate Charge

Application

- Load Switch
- DC/DC Converter

MARKING:

30NP16 = Device Code
XX = Date Code
Solid dot = Green Device

ABSOLUTE MAXIMUM RATINGS (T_A = 25℃ unless otherwise noted)

Parameter		Symbol	Value	Value	Unit
Drain - Source Voltage		V_{DS}	30	-30	V
Gate - Source Voltage		V_{GS}	±20	±20	V
Continuous Drain Current[1,5]	T_A = 25℃	I_D	14	-14	A
	T_C = 25℃	I_D	31	-30	A
	T_C = 100℃	I_D	20	-20	A
Pulsed Drain Current[2]		I_{DM}	120	-120	A
Power Dissipation[4]	T_C= 25℃	P_D	13.6		W
	T_A = 25℃		2.8		
Thermal Resistance from Junction to Ambient[5]		$R_{\theta JA}$	44.6		℃/W
Thermal Resistance from Junction to Case		$R_{\theta JC}$	9.2		℃/W
Junction Temperature		T_J	150	150	℃
Storage Temperature		T_{STG}	-55~ +150	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS (T_A = 25℃ unless otherwise noted)

NMOS:

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 24V, V_{GS} = 0V			1	μA
Gate - Body Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
On Characteristics[3]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1	1.5	3	V
Drain-source On-resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 5A		10	14	mΩ
		V_{GS} = 4.5V, I_D = 5A		17	26	
Forward tranconductance	g_{FS}	I_S = 5A, V_{GS} = 0V	10	43		S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 15V, V_{GS} = 0V, f = 1MHz		968		pF
Output Capacitance	C_{oss}			146		
Reverse Transfer Capacitance	C_{rss}			136		
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS} = 15V, V_{GS} = 10V, I_D = 10A		13		nC
Gate-source Charge	Q_{gs}			3		
Gate-drain Charge	Q_{gd}			4.5		
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 15V, V_{GS} = 10V, R_L = 1.8Ω, R_G = 1.8Ω			10	ns
Turn-on Rise Time	t_r				8	
Turn-off Delay Time	$t_{d(off)}$				30	
Turn-off Fall Time	t_f				5	
Source - Drain Diode Characteristics						
Diode Forward Voltage[3]	V_{SD}	V_{GS} = 0V, I_S = 5A			1.2	V

MOSFET ELECTRICAL CHARACTERISTICS (T_A = 25℃ unless otherwise noted)

PMOS:

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = -250μA	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -24V, V_{GS} = 0V			-1	μA
Gate - Body Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
On Characteristics[3]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-1	-1.5	-3	V
Drain-source On-resistance	$R_{DS(on)}$	V_{GS} = -10V, I_D = -5A		12	16	mΩ
		V_{GS} = -4.5V, I_D = -5A		17	26	
Forward tranconductance	g_{FS}	I_S = -5A, V_{GS} = 0V	5	16		S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = -15V, V_{GS} = 0V, f = 1MHz		1350		pF
Output Capacitance	C_{oss}			215		
Reverse Transfer Capacitance	C_{rss}			185		
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS} = -15V, V_{GS} = -4.5V, I_D = -9.1A		15		nC
Gate-source Charge	Q_{gs}			4		
Gate-drain Charge	Q_{gd}			7.5		
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = -15V, V_{GS} = -10V, R_L = 15Ω, R_G = 1Ω			15	ns
Turn-on Rise Time	t_r				15	
Turn-off Delay Time	$t_{d(off)}$				70	
Turn-off Fall Time	t_f				25	
Source - Drain Diode Characteristics						
Diode Forward Voltage[3]	V_{SD}	V_{GS} = 0V, I_S = -5A			-1.2	V

Notes :

1.The maximum current rating is limited by package.

2.Pulse Test : Pulse Width ≤ 10μs, duty cycle ≤ 1%.

3.Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.

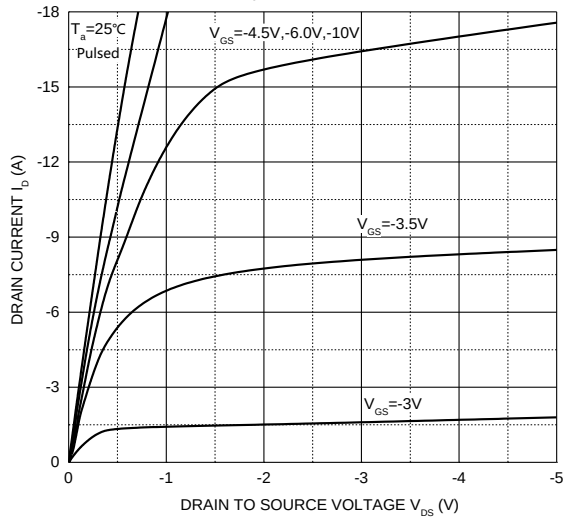
4.The power dissipation P_D is limited by $T_{J(MAX)}$ = 150°C.

5.Device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

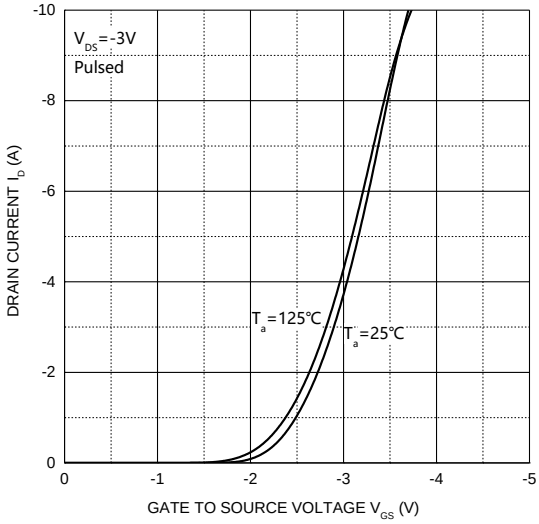
Typical Electrical and Thermal Characteristics

P-Channel MOS

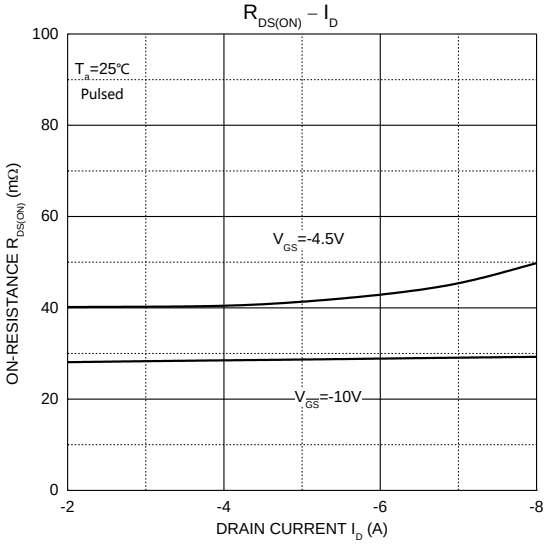
Output Characteristics



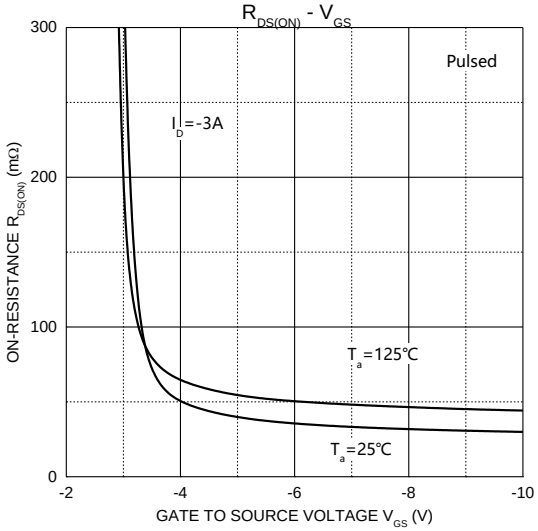
Transfer Characteristics



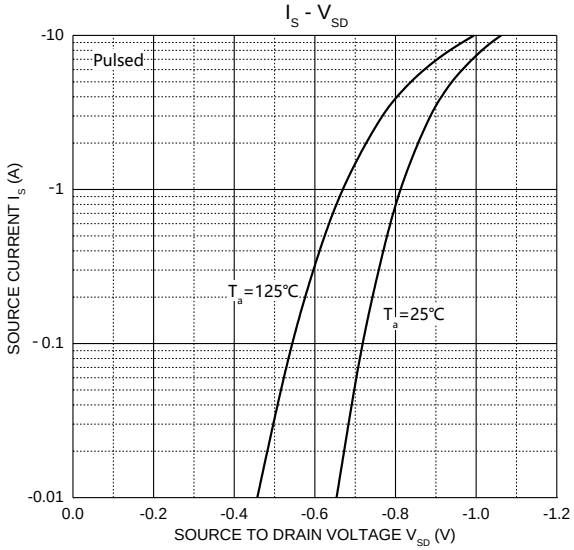
$R_{DS(ON)}$ – I_D



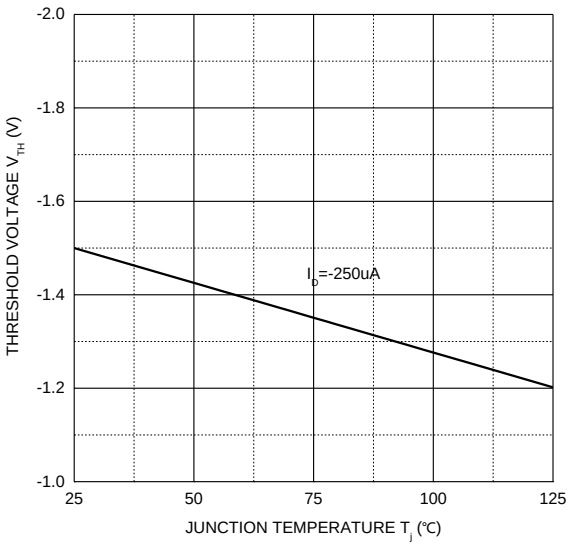
$R_{DS(ON)}$ - V_{GS}



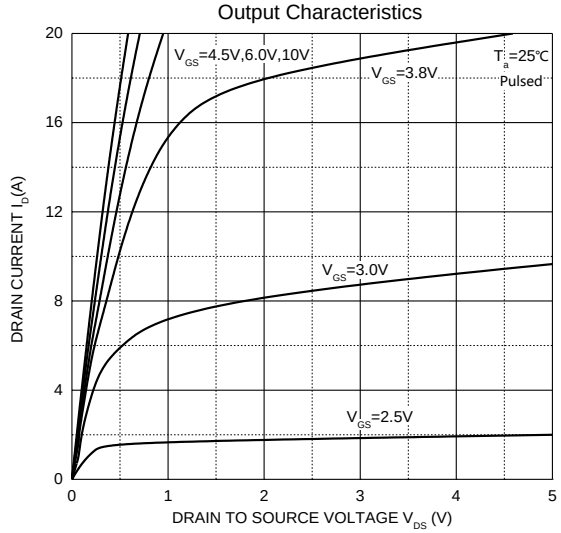
I_S - V_{SD}



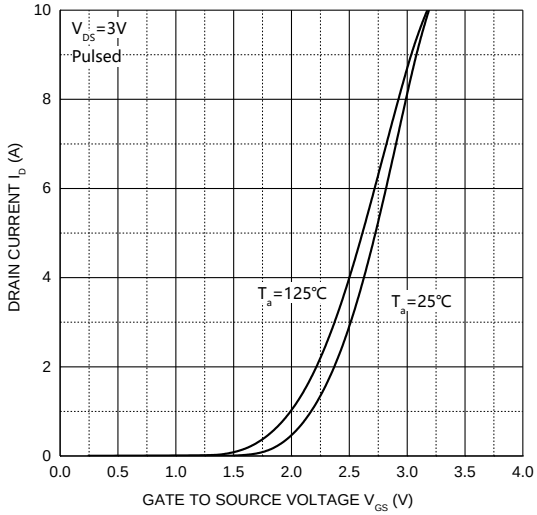
Threshold Voltage



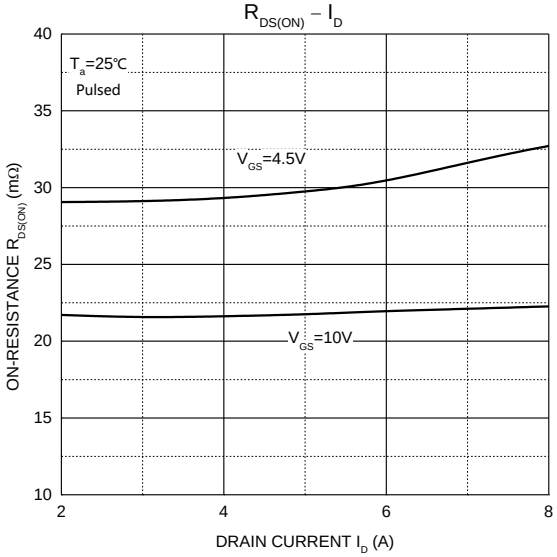
Output Characteristics



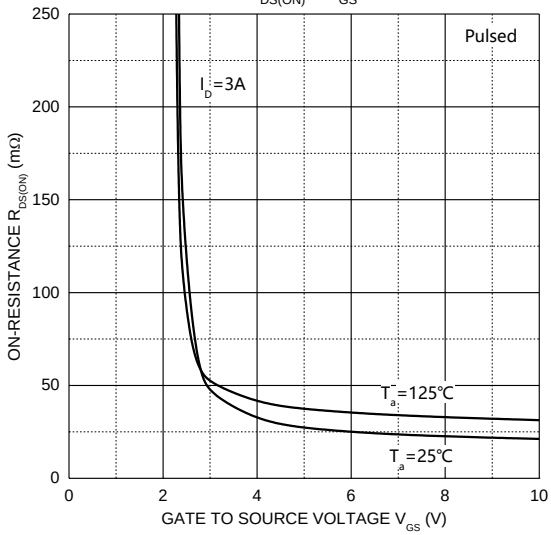
Transfer Characteristics



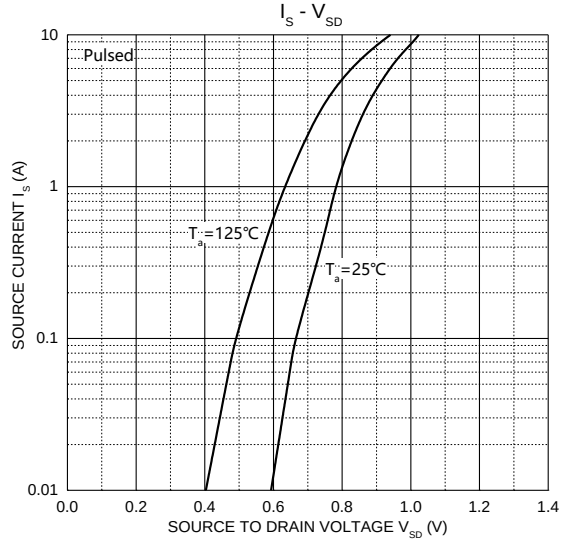
$R_{DS(ON)}$ – I_D



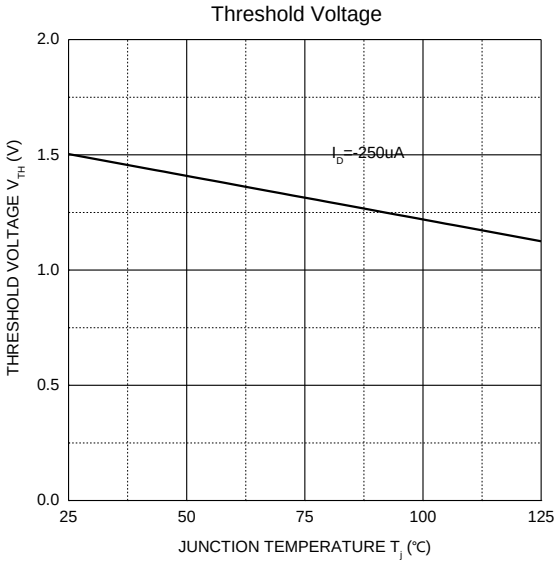
$R_{DS(ON)}$ - V_{GS}



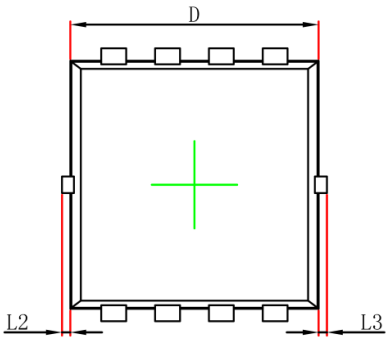
I_S - V_{SD}



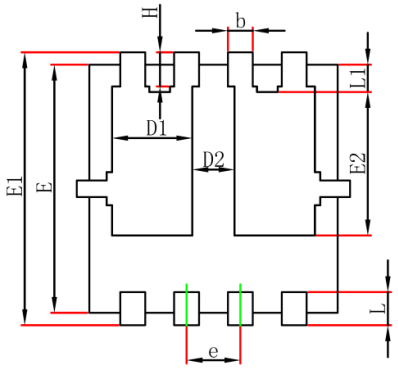
Threshold Voltage



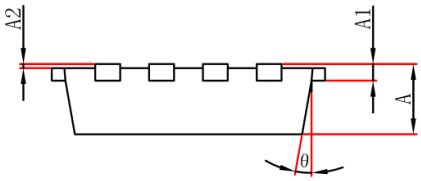
PDFN3.3X3.3-8L Package Information



Top View
[顶视图]



Bottom View
[背视图]



Side View
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.152REF		0.006REF	
A2	0.000	0.050	0.000	0.002
D	2.900	3.200	0.114	0.126
D1	0.935	1.135	0.037	0.045
D2	0.280	0.480	0.011	0.019
E	2.900	3.200	0.114	0.126
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0.000	0.100	0.000	0.004
L3	0.000	0.100	0.000	0.004
H	0.315	0.515	0.012	0.020
θ	0°	12°	0°	12°