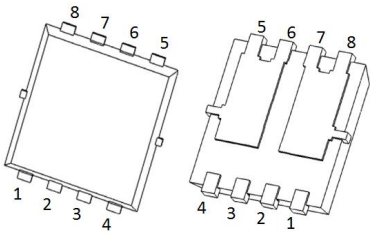
GPM400NP04LNB

40V N- and P-Channel MOSFET

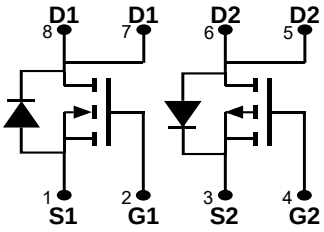
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	20mΩ@10V	14A
	26mΩ@4.5V	
-40V	46mΩ@-10V	-14A
	75mΩ@-4.5V	

PDFN3.3X3.3-8L



Schematic diagram



Feature

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

Application

- PWM Applications
- Loas Switch
- Power Management

MARKING:

M400NP04L = Device Code
XX = Data Code
Solid Dot = Green Device Indicater

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

Parameter		Symbol	NMOS	PMOS	Unit
Drain - Source Voltage		V_{DS}	40	-40	V
Gate - Source Voltage		V_{GS}	±20	±20	V
Continuous Drain Current[1,5]	T_C = 25℃	I_D	14	-14	A
Pulsed Drain Current[2]		I_{DM}	56	-56	A
Single Pulsed Avalanche Current[3]		I_{AS}	10	-11	A
Single Pulsed Avalanche Energy[3]		E_{AS}	28	35	mJ
Power Dissipation[4,5]		P_D	2	3.2	W
Thermal Resistance from Junction to Case[5]		$R_{\theta JC}$	8.8	8.8	℃/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	40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 40V, 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	1.0	2.1	3.0	V
Drain-source On-resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 6.0A		20	36	mΩ
		V_{GS} = 4.5V, I_D = 6.0A		26	56	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 20V, V_{GS} = 0V, f = 1MHz		767		pF
Output Capacitance	C_{oss}			60		
Reverse Transfer Capacitance	C_{rss}			46		
Gate Resistance	Rg	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz		2.3		Ω
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS} = 20V, V_{GS} = 10V, I_D = 6A		15.3		pC
Gate-source Charge	Q_{gs}			2.5		
Gate-drain Charge	Q_{gd}			3.5		
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 20V, V_{GS} = 10V, R_L = 2.5Ω R_G = 3Ω		5		ns
Turn-on Rise Time	t_r			3		
Turn-off Delay Time	$t_{d(off)}$			15		
Turn-off Fall Time	t_f			2		
Source - Drain Diode Characteristics						
Diode Forward Voltage[3]	V_{SD}	V_{GS} = 0V, I_S = 1.0A			1.2	V

PMOS:

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = -250μA	-40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -40V, 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	-1.0	-1.5	-3.0	V
Drain-source On-resistance	$R_{DS(on)}$	V_{GS} = -10V, I_D = -5.0A		46	60	mΩ
		V_{GS} = -4.5V, I_D = -5.0A		75	98	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = -20V, V_{GS} = 0V, f = 1MHz		677		pF
Output Capacitance	C_{oss}			70		
Reverse Transfer Capacitance	C_{rss}			53		
Gate Resistance	Rg	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz		25		Ω
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS} = -20V, V_{GS} = -10V, I_D = -5A		13		pC
Gate-source Charge	Q_{gs}			2.5		
Gate-drain Charge	Q_{gd}			3		
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = -20V, V_{GS} = -10V, R_L = 2.3Ω R_G = 6Ω		8		ns
Turn-on Rise Time	t_r			6		
Turn-off Delay Time	$t_{d(off)}$			20		
Turn-off Fall Time	t_f			7		
Source - Drain Diode Characteristics						
Diode Forward Voltage[3]	V_{SD}	V_{GS} = 0V, I_S = -1.0A			-1.2	V

Notes :

1.The maximum current rating is limited by package.And device mounted on a large heatsink

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

3.E_{AS} condition: V_{DD} = 20V,V_{GS} = 10V, L = 0.5mH, R_G = 25Ω Starting T_J = 25°℃.

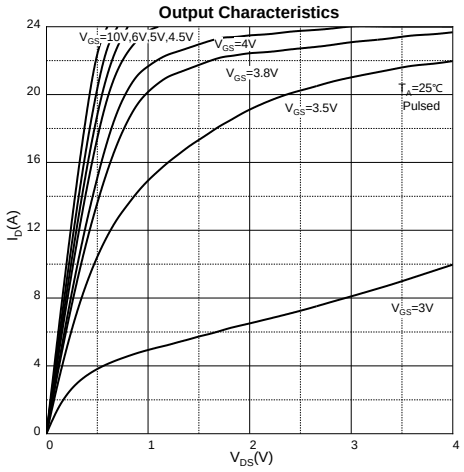
4.Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.

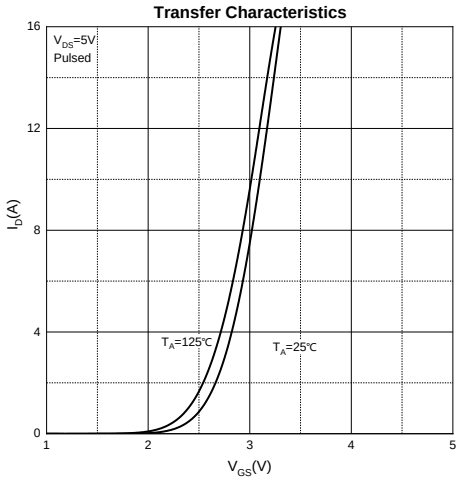
5.The power dissipation P_D is limited by $T_{J(MAX)}$ = 40°C.And device mounted on a large heatsink

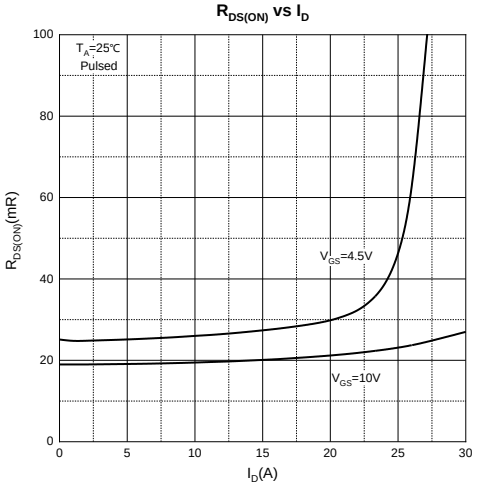
6.Device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

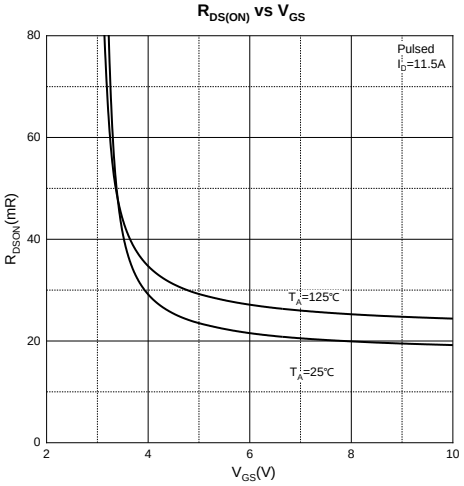
Typical Characteristics

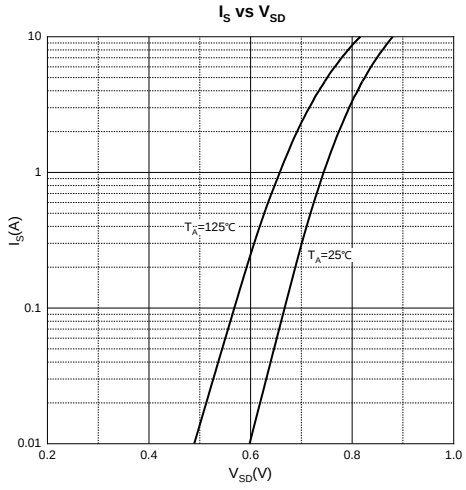
NMOS:

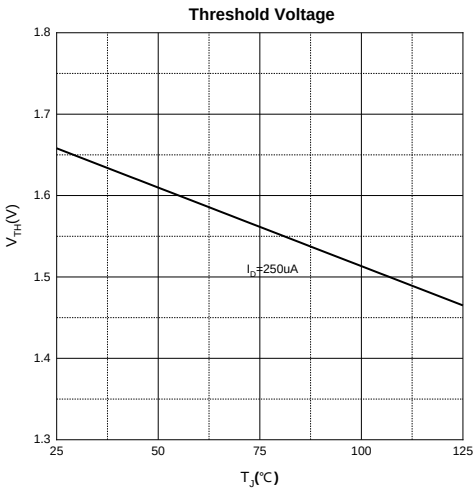












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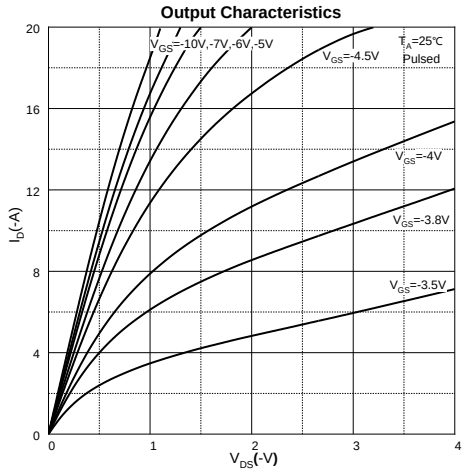
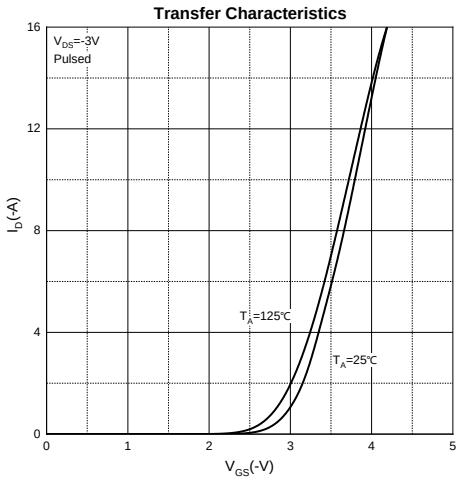
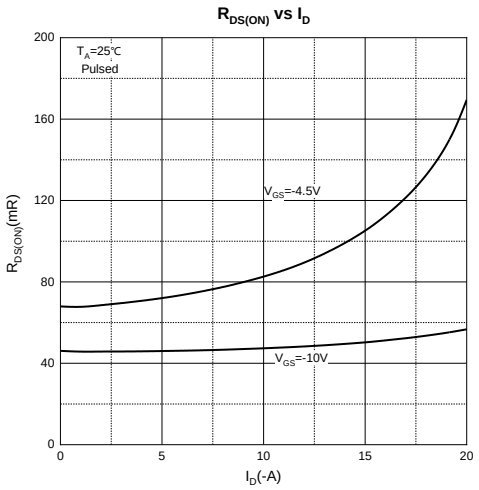
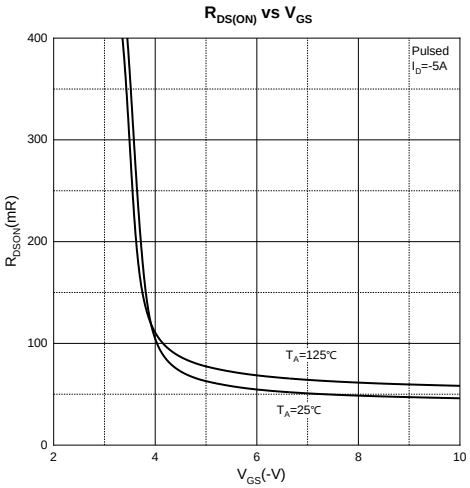
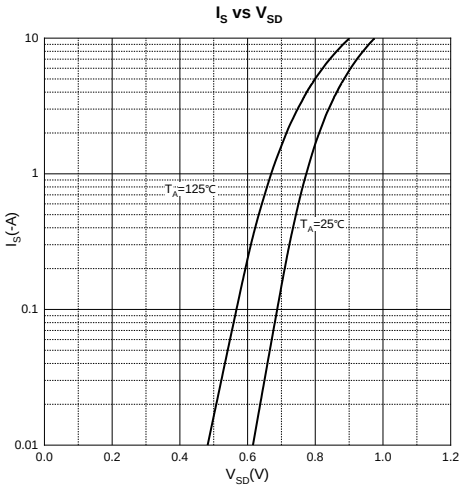
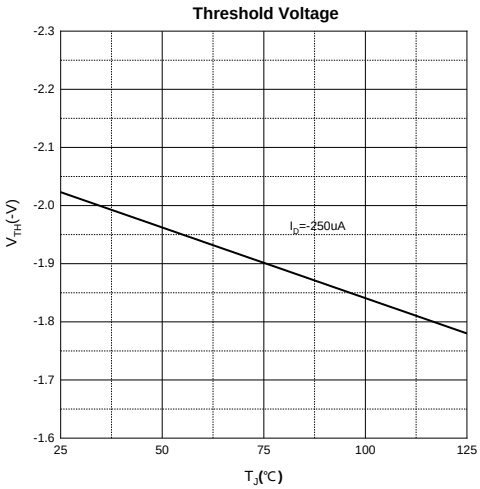




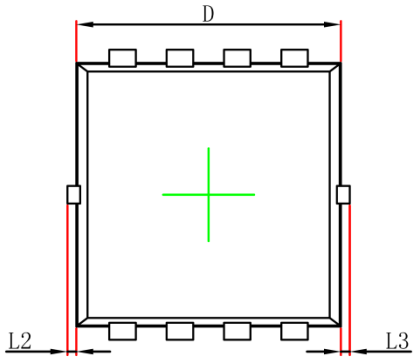




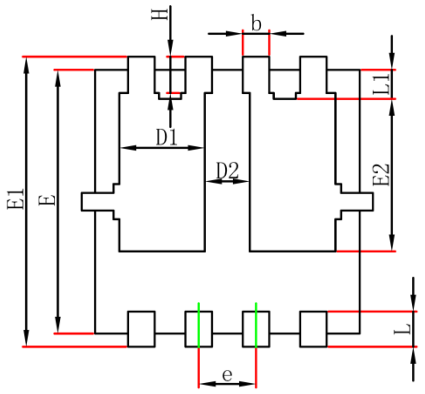




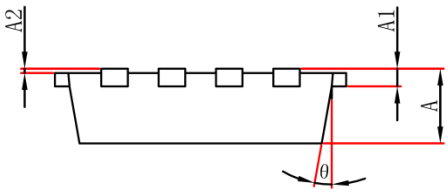
PDFN3.3X3.3-8L Package Information



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°

单击下面可查看定价，库存，交付和生命周期等信息

>>GP(格瑞宝)