GP8404P33

30V N- and P-Channel MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
30V	23mΩ@10V	6A
	30mΩ@4.5V	
-30V	33mΩ@-10V	-5A
	44mΩ@-4.5V	

Feature

- Trench Technology Power MOSFET
- Low $R_{DS(ON)}$
- Low Gate Charge
- 100% UIS Tested
- 100% ΔV_{DS} Tested

Application

- Load Switch
- DC/DC Converter

PDFN3.3×3.3-8L

Schematic diagram

MARKING:

XX = Date Code

Solid Dot = Green Indicater
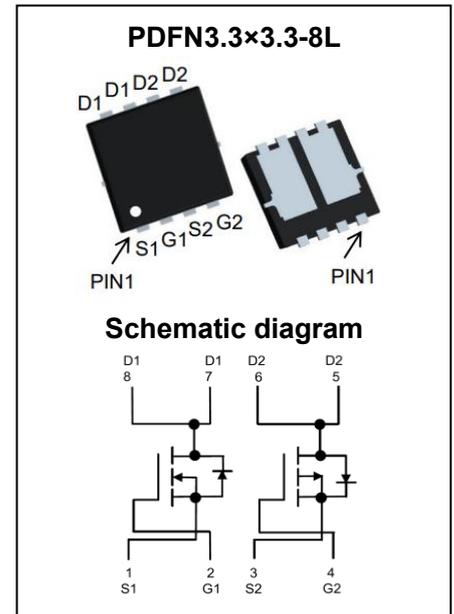
ABSOLUTE MAXIMUM RATINGS (T_A = 25℃ unless otherwise noted)

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]	T_C = 25℃	I_D	6	-5	A
Pulsed Drain Current[2]		I_{DM}	24	-20	A
Single Pulsed Avalanche Current[3]		I_{AS}	7.6	14.9	A
Single Pulsed Avalanche Energy[3]		E_{AS}	14.4	55.5	mJ
Power Dissipation[5]	T_C = 25℃	P_D	28	23	W
Thermal Resistance from Junction to Ambient[6]		$R_{θJC}$	4.5	5.5	℃/W
Junction Temperature		T_J	150	150	℃
Storage Temperature		T_{STG}	-55~ +150	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS (T$_J$ = 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$_{DS}$ = 30V, V$_{GS}$ = 0V			1	µA
Gate - Body Leakage Current	I$_{GSS}$	V$_{GS}$ = ±20V, V$_{DS}$ = 0V			±100	nA
On Characteristics[4]						
Gate Threshold Voltage	V$_{GS(th)}$	V$_{DS}$ = V$_{GS}$, I$_D$ = 250µA	1	1.6	3	V
Drain-source On-resistance	R$_{DS(on)}$	V$_{GS}$ = 10V, I$_D$ = 2.0A		22	33	mΩ
		V$_{GS}$ = 4.5V, I$_D$ = 2.0A		29	48	
Dynamic Characteristics						
Input Capacitance	C$_{iss}$	V$_{DS}$ = 15V, V$_{GS}$ = 0V, f = 1MHz		461		pF
Output Capacitance	C$_{oss}$			62		
Reverse Transfer Capacitance	C$_{rss}$			45		
Gate Resistance	R$_g$	V$_{DS}$ = 0V, V$_{GS}$ = 0V, f = 1MHz		2.1		Ω
Switching Characteristics						
Total Gate Charge	Q$_g$	V$_{DS}$ = 15V, V$_{GS}$ = 10V, I$_D$ = 2A		10.1		nC
Gate-source Charge	Q$_{gs}$			1.4		
Gate-drain Charge	Q$_{gd}$			2.1		
Turn-on Delay Time	t$_{d(on)}$	V$_{DD}$ = 15V, V$_{GS}$ = 10V, I$_D$ = 5.6A, R$_G$ = 3Ω		5		ns
Turn-on Rise Time	t$_r$			26		
Turn-off Delay Ttime	t$_{d(off)}$			13		
Turn-off Fall Time	t$_f$			21		
Source - Drain Diode Characteristics						
Diode Forward Voltage[4]	V$_{SD}$	V$_{GS}$ = 0V, I$_S$ = 1.0A			1.2	V

MOSFET ELECTRICAL CHARACTERISTICS (T_J = 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} = -30V, V_{GS} = 0V			-1	µA
Gate - Body Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
On Characteristics[4]						
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 = -2.0A		31	46	mΩ
		V_{GS} = -4.5V, I_D = -2.0A		43	72	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = -15V, V_{GS} = 0V, f = 1MHz		940		pF
Output Capacitance	C_{oss}			102		
Reverse Transfer Capacitance	C_{rss}			90		
Gate Resistance	R_g	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz		15.1		Ω
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS} = -15V, V_{GS} = -10V, I_D = -2A		20.4		nC
Gate-source Charge	Q_{gs}			2.4		
Gate-drain Charge	Q_{gd}			4.0		
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = -15V, V_{GS} = -10V, I_D = -5.1A, R_G = 3Ω		7.1		ns
Turn-on Rise Time	t_r			36		
Turn-off Delay Ttime	$t_{d(off)}$			31		
Turn-off Fall Time	t_f			42		
Source - Drain Diode Characteristics						
Diode Forward Voltage[4]	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} = ±15V,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 $T_{J(MAX)}$ = 150°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:

Output Characteristics

Transfer Characteristics

$R_{DS(ON)}$ vs I_D

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

I_S vs V_{SD}

Threshold Voltage

Typical Characteristics

PMOS:

Output Characteristics

Transfer Characteristics

$R_{DS(ON)}$ vs I_D

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

I_S vs V_{SD}

Threshold Voltage
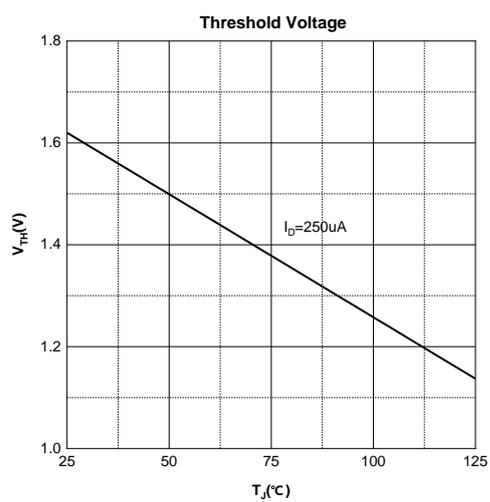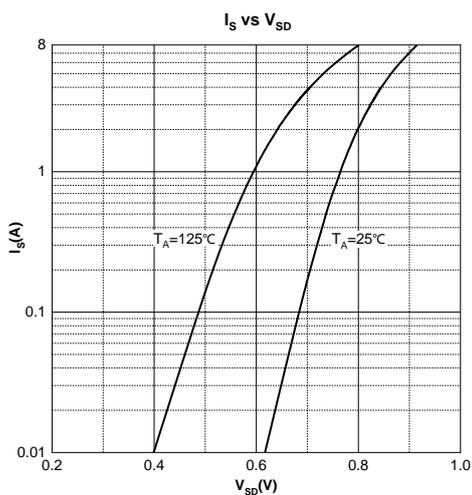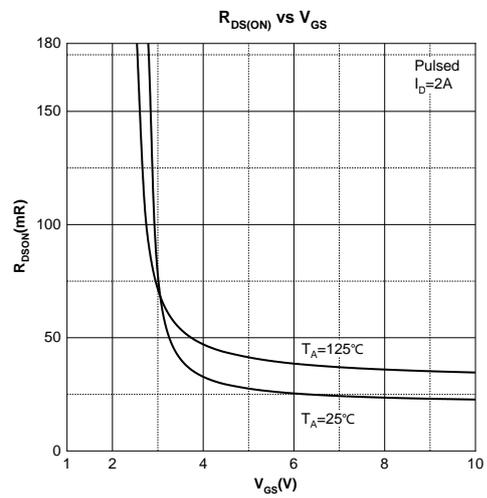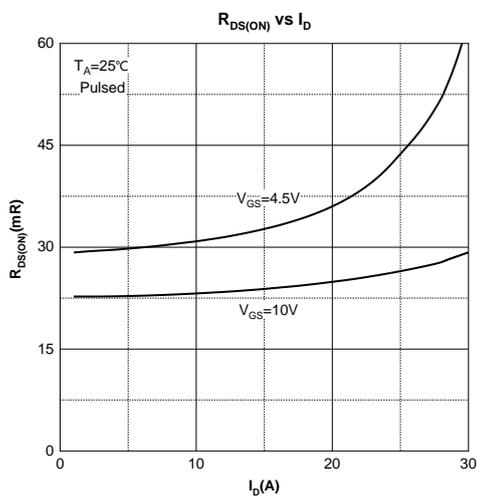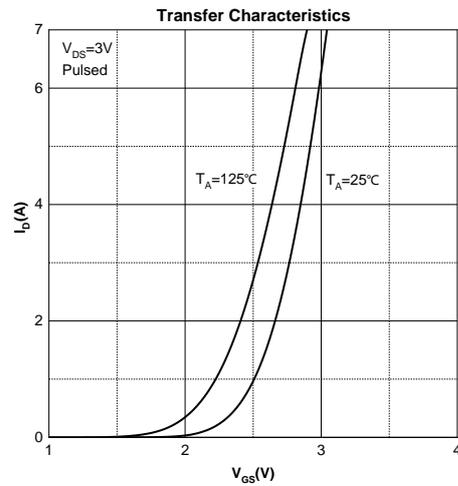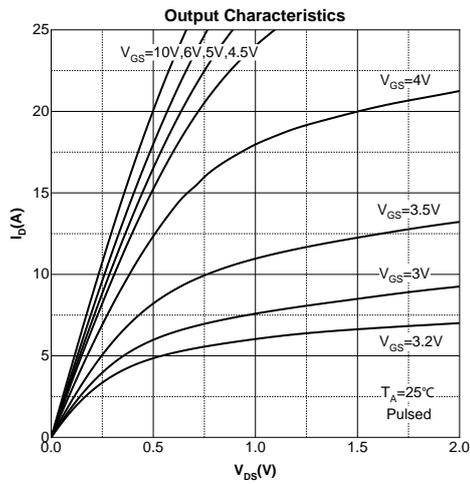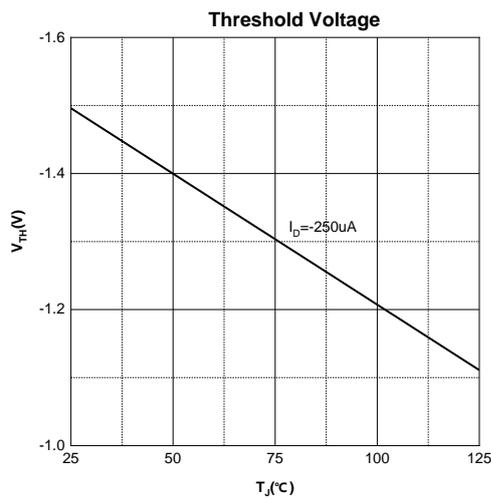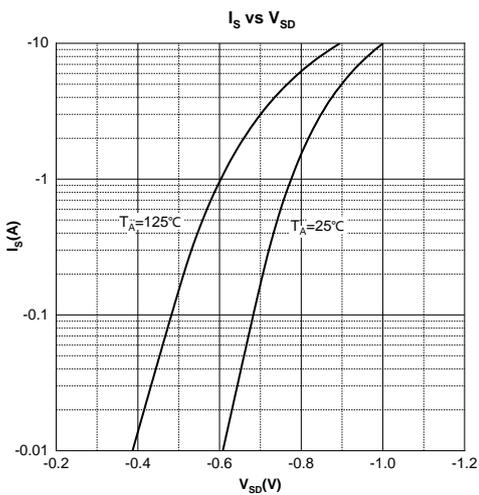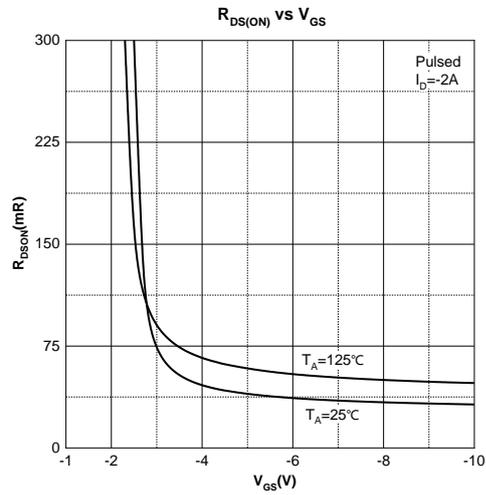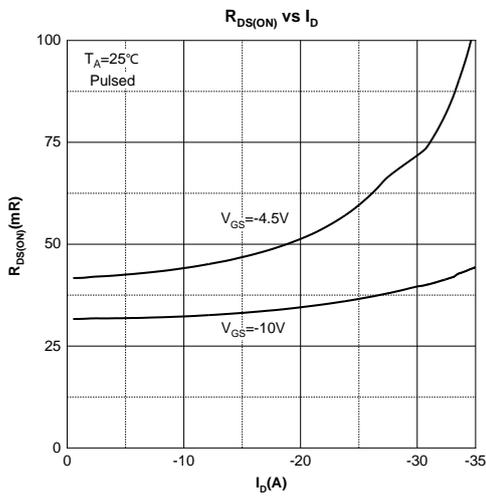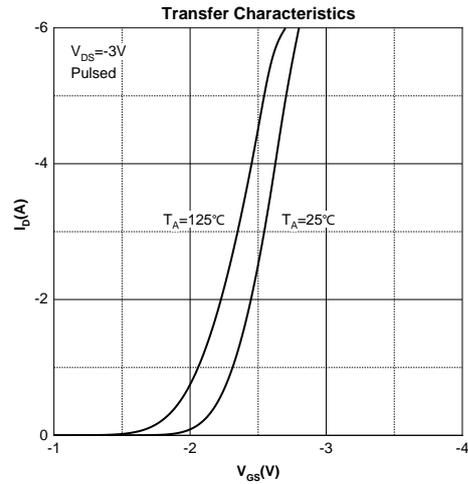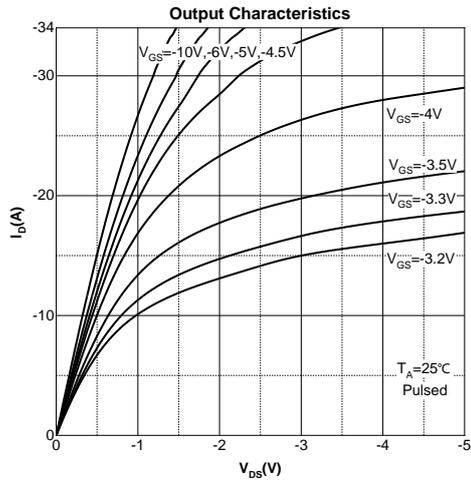
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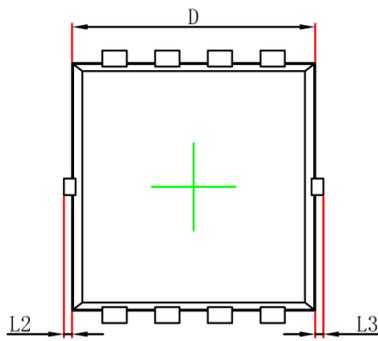
Top View
[顶视图]
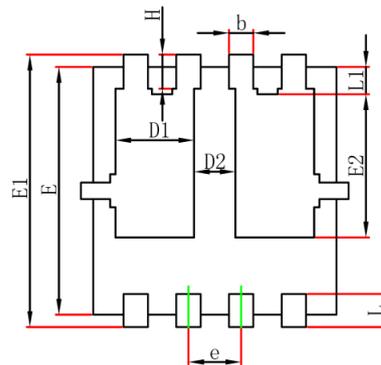
Bottom View
[背视图]
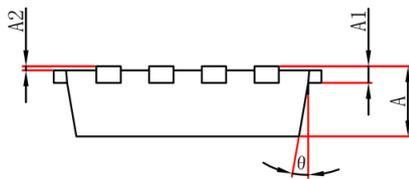
Side View
[侧视图]

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°