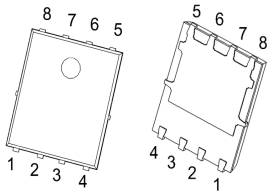
GPM060P03LNC

30V P-Channel MOSFET

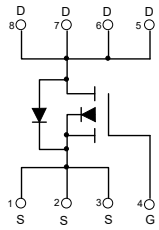
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-30V	6.0mΩ@-10V	-60A
	9.5mΩ@-4.5V	

PDFN5X6-8L



Schematic diagram



Feature

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

Application

- Power Management
- Load Switching

Package Marking and Ordering Information

Part Number	Package	Marking	Packing	Reel Size	Tape Width	Qty
GPM060P03LNC	PDFN5X6-8L	M060P03L	Reel & Tape	330mm	12mm	5000pcs

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current[1]	T_C = 25°C	I_D	-60	A
	T_C = 100°C		-38	
Pulsed Drain Current[2]		I_{DM}	-240	A
Single Pulsed Avalanche Current[3]		I_{AS}	-35	A
Single Pulsed Avalanche Energy[3]		E_{AS}	306	mJ
Power Dissipation[5]	T_C = 25°C	P_D	48	W
Thermal Resistance from Junction to Ambient[6]		$R_{\theta JA}$	42	°C/W
Thermal Resistance from Junction to Case		$R_{\theta JC}$	2.6	°C/W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~ +150	°C

MOSFET ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

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	-1.2	-1.7	-2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = -10V, I_D = -20A		6	7.8	mΩ
		V_{GS} = -4.5V, I_D = -15A		9.5	13	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = -15V, V_{GS} = 0V, f = 1MHz		3022		pF
Output Capacitance	C_{oss}			490		
Reverse Transfer Capacitance	C_{rss}			428		
Gate Resistance	R_g	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz		4.4		Ω
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS} = -25V, V_{GS} = -10V, I_D = -20A		66		nC
Gate-Source Charge	Q_{gs}			8		
Gate-Drain Charge	Q_{gd}			19		
Gate Plateau Voltage	$V_{plateau}$			-2.9		V
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = -15V, V_{GS} = -10V, R_G = 3Ω, I_D = -20A		10		ns
Turn-On Rise Time	t_r			12		
Turn-Off Delay Time	$t_{d(off)}$			67		
Turn-Off Fall Time	t_f			31		
Source-Drain Diode Characteristics						
Diode Forward Voltage[4]	V_{SD}	V_{GS} = 0V, I_S = -15A			-1.2	V
Diode Continuous Forward Current[1]	I_S	T_C = 25℃			-60	A
Diode Pulse Forward Current[2]	I_{SM}				-240	A

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%.

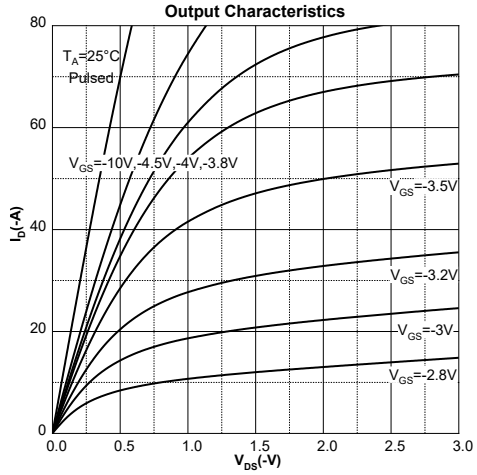
3.E_{AS} condition: V_{DD} = -15V, V_{GS} = -10V, L = 0.5mH, R_G = 25Ω Starting T_J = 25°C .

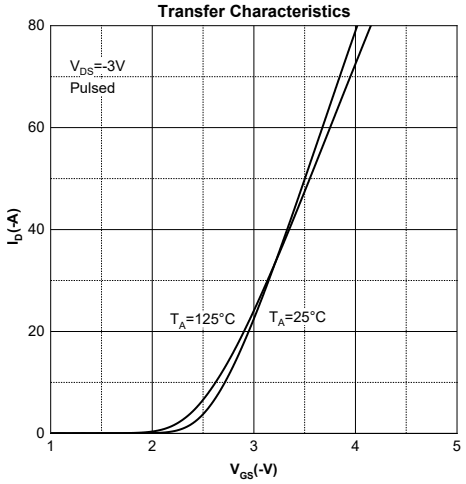
4.Pulse Test: Pulse Width ≤ 300μs, duty cycle ≤ 2%.

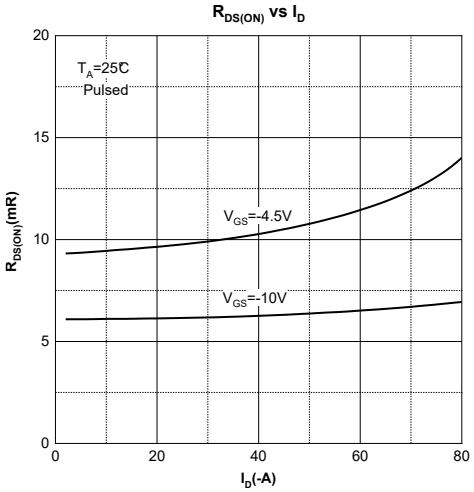
5.The power dissipation P_D is limited by $T_{J(MAX)}$ = 150°C. And device mounted on a large heatsink.

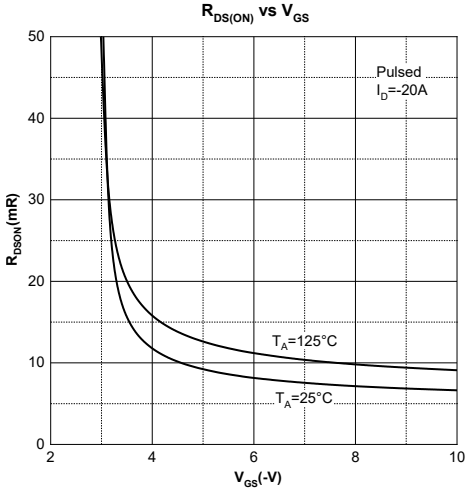
6.Device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A = 25°C.

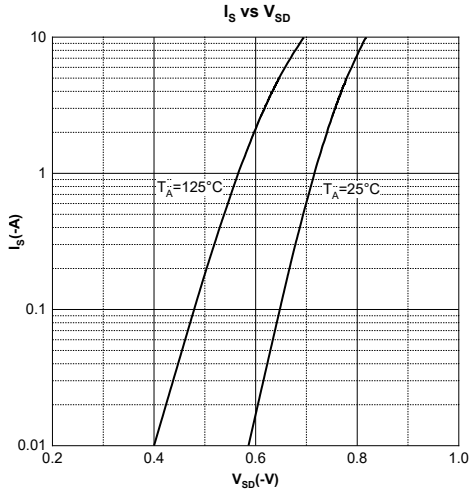
Typical Characteristics

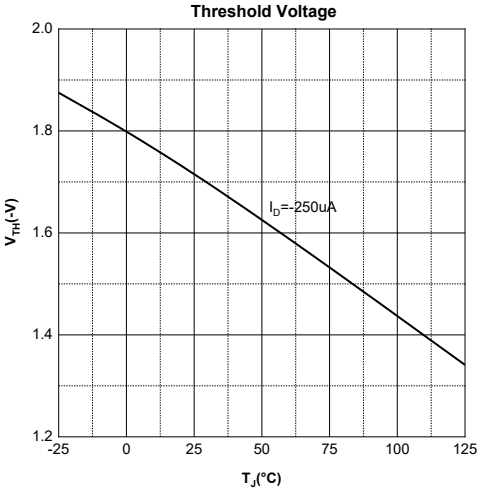


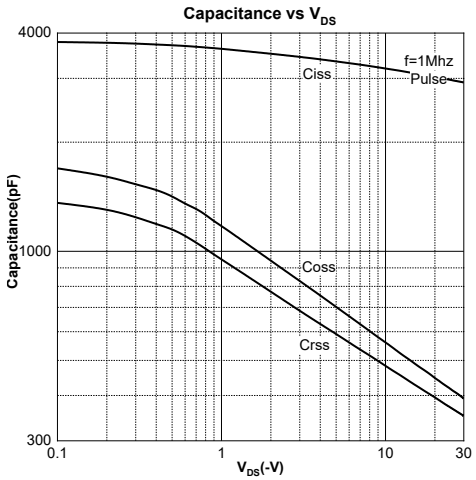


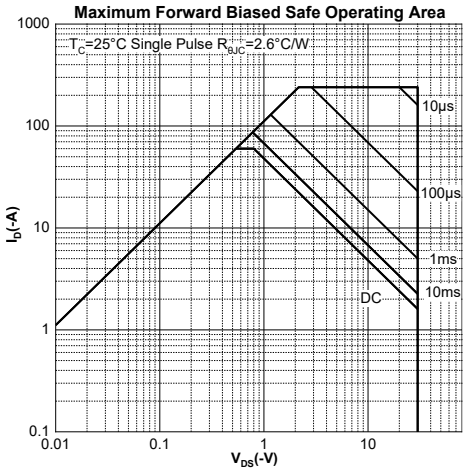


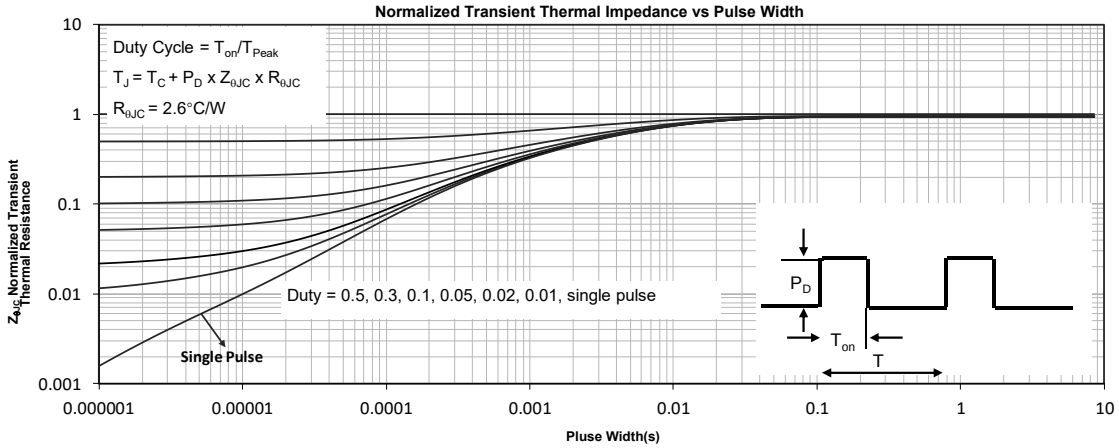






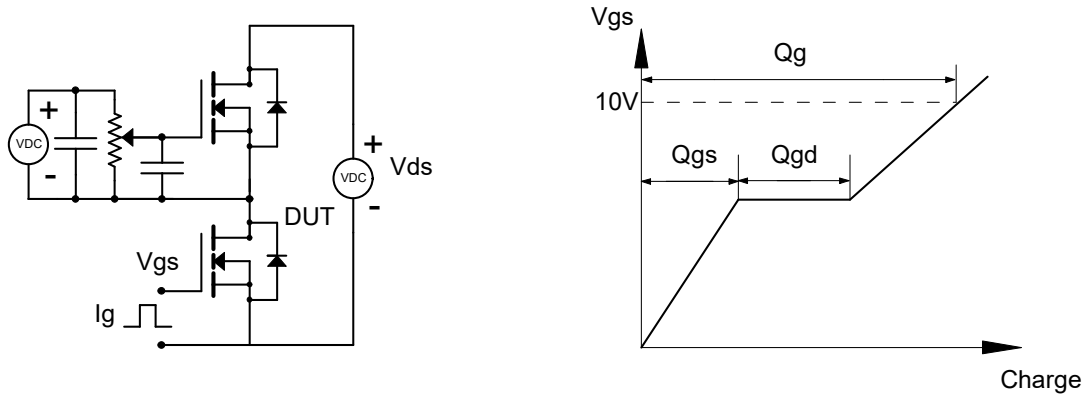

Capacitance vs V_{DS}
4000
1000
300
0.1
1
10
30
Capacitance(pF)
V_{DS}(-V)
f=1Mhz
Pulse
Ciss
Coss
Crss


Maximum Forward Biased Safe Operating Area
T_C=25°C Single Pulse $R_{\theta JC}$=2.6°C/W
1000
100
10
1
0.1
0.01
0.1
1
10
I_D(-A)
V_{DS}(-V)
10μs
100μs
1ms
10ms
DC

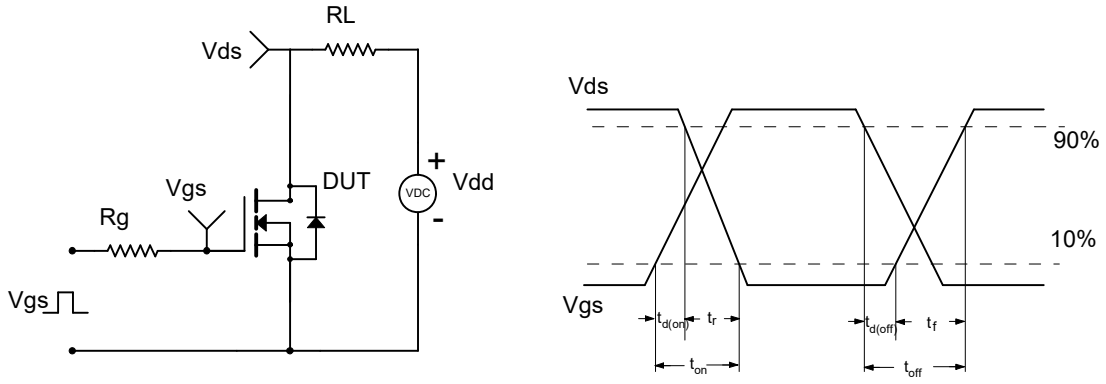

Normalized Transient Thermal Impedance vs Pulse Width
Duty Cycle = T_{on}/T_{Peak}
$T_J = T_C + P_D \times Z_{\theta JC} \times R_{\theta JC}$
$R_{\theta JC}$ = 2.6°C/W
Duty = 0.5, 0.3, 0.1, 0.05, 0.02, 0.01, single pulse
Single Pulse
P_D
T_{on}
T
$Z_{\theta JC}$ Normalized Transient Thermal Resistance
Pluse Width(s)
10
1
0.1
0.01
0.001
0.000001
0.00001
0.0001
0.001
0.01
0.1
1
10

Test Circuit

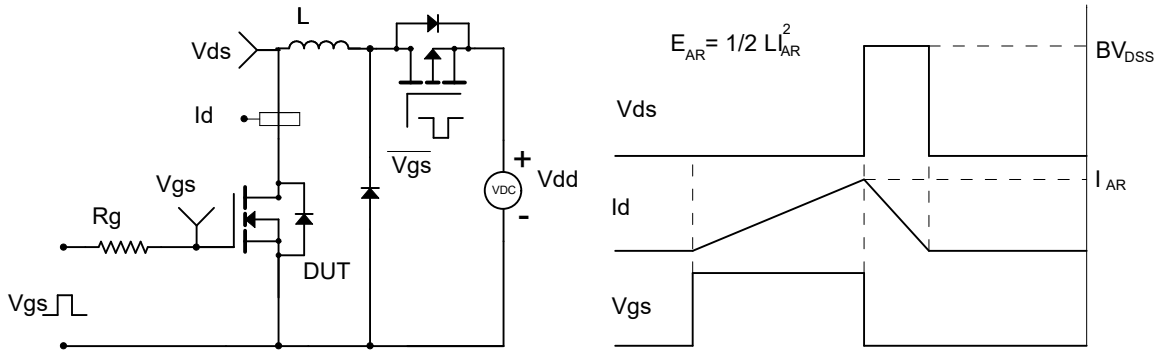
Gate Charge Test Circuit & Waveform



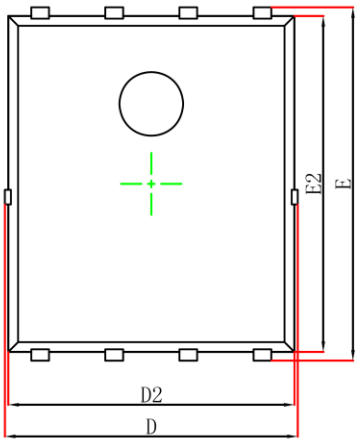
Resistive Switching Test Circuit & Waveform



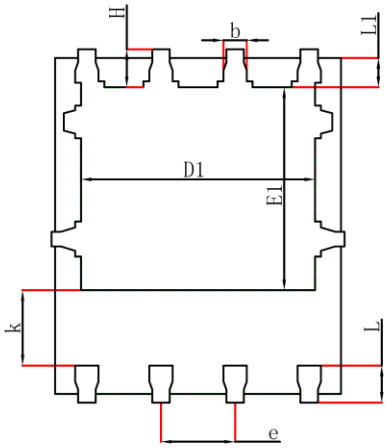
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



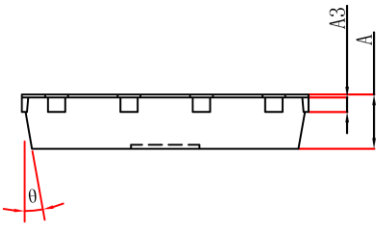
PDFN5X6-8L Package Information



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	0.900	1.10	0.035	0.043
A3	0.254REF		0.010REF	
D	4.700	5.260	0.185	0.207
E	5.750	6.250	0.226	0.246
D1	3.560	4.500	0.140	0.177
E1	3.180	3.660	0.125	0.144
D2	4.700	5.100	0.185	0.201
E2	5.600	6.000	0.220	0.236
k	1.100	-	0.043	-
b	0.300	0.500	0.012	0.020
e	1.270TYP		0.050TYP	
L	0.510	0.710	0.020	0.028
L1	0.424	0.576	0.017	0.023
H	0.510	0.710	0.020	0.028
θ	8°	12°	8°	12°

Attention：

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- Any and all semiconductor products have certain probability to fail or malfunction, which may result in personal injury, death or property damage. Customer are solely responsible for providing adequate safe measures when design their systems.
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