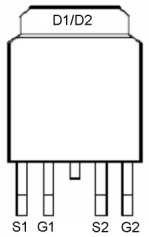
GPM240NP04LTG

40V N- and P-Channel MOSFET

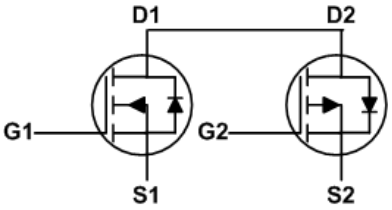
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	14mΩ@10V	30A
	18mΩ@4.5V	
-40V	24mΩ@-10V	-28A
	31mΩ@-4.5V	

TO-252-4L



Schematic diagram



Feature

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

Application

- Loas Switch
- Power management
- PWM Application

Package Marking and Ordering Information

Part Number	Package	Marking	Packing	Reel Size	Tape Width	Qty
GPM240NP04LTG	TO-252-4L	M240NP04L	Tape & Reel	330mm	16mm	2500pcs

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]	T_C = 25℃	I_D	30	-28	A
	T_C = 100℃	I_D	19	-18	A
Pulsed Drain Current[2]		I_{DM}	120	-112	A
Single Pulsed Avalanche Current[3]		I_{AS}	13	-15	A
Single Pulsed Avalanche Energy[3]		E_{AS}	42	56	mJ
Power Dissipation[5]	T_C = 25℃	P_D	23	25	W
Thermal Resistance from Junction to Ambient[6]		$R_{\theta JA}$	60	60	℃/W
Thermal Resistance from Junction to Case		$R_{\theta JC}$	5.5	5	℃/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[4]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1	1.7	3	V
Drain-source On-resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 12A		14	18	mΩ
		V_{GS} = 4.5V, I_D = 10A		18	27	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 20V, V_{GS} = 0V, f = 1MHz		1412		pF
Output Capacitance	C_{oss}			90		
Reverse Transfer Capacitance	C_{rss}			71		
Gate Resistance	R_g	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz		2.5		
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS} = 20V, V_{GS} = 10V, I_D = 12A		28		nC
Gate-source Charge	Q_{gs}			5.1		
Gate-drain Charge	Q_{gd}			5.3		
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 20V, V_{GS} = 10V, I_D = 1A, R_G = 3.3Ω		8.9		ns
Turn-on Rise Time	t_r			2.2		
Turn-off Delay Time	$t_{d(off)}$			41		
Turn-off Fall Time	t_f			2.7		
Source - Drain Diode Characteristics						
Diode Forward Voltage[4]	V_{SD}	V_{GS} = 0V, I_S = 1A			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[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 = -8A		24	34	mΩ
		V_{GS} = -4.5V, I_D = -4A		31	47	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = -20V, V_{GS} = 0V, f = 1MHz		1096		pF
Output Capacitance	C_{oss}			102		
Reverse Transfer Capacitance	C_{rss}			86		
Gate Resistance	R_g	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz		19		Ω
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS} = -20V, V_{GS} = -10V, I_D = -5A		25		nC
Gate-source Charge	Q_{gs}			3.5		
Gate-drain Charge	Q_{gd}			4.9		
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = -15V, V_{GS} = -10V, I_D = -1A, R_G = 3.3Ω		19.2		ns
Turn-on Rise Time	t_r			12.8		
Turn-off Delay Time	$t_{d(off)}$			48.6		
Turn-off Fall Time	t_f			4.6		
Source - Drain Diode Characteristics						
Diode Forward Voltage[4]	V_{SD}	V_{GS} = 0V, I_S = -1A			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°℃.

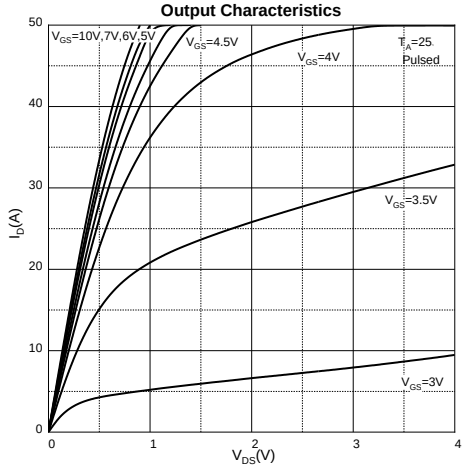
4.Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.

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

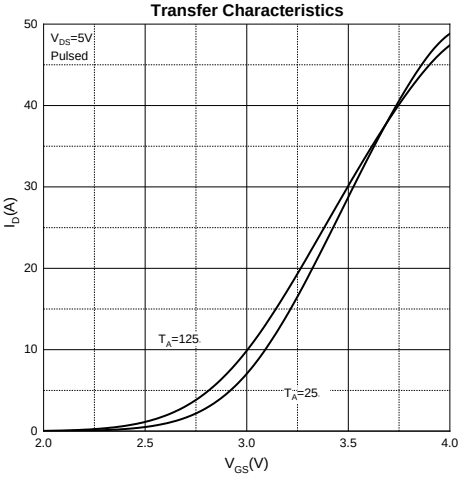
6.Device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

Typical Characteristics

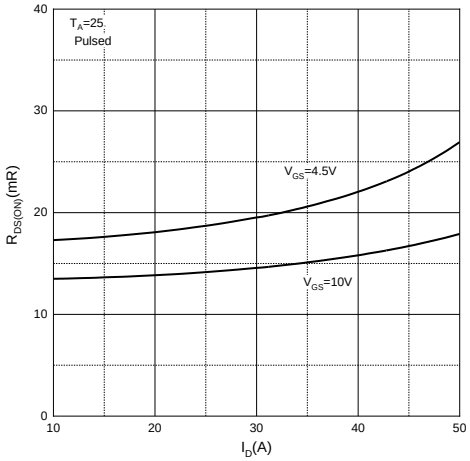
Output Characteristics



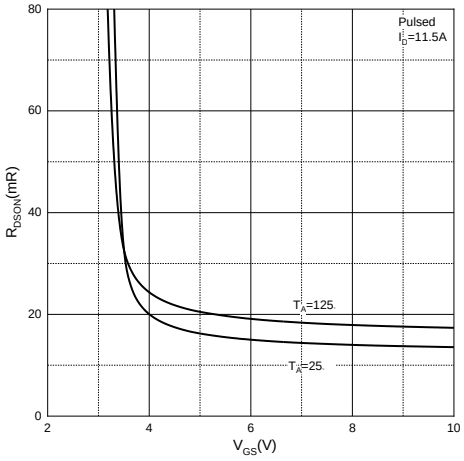
Transfer Characteristics



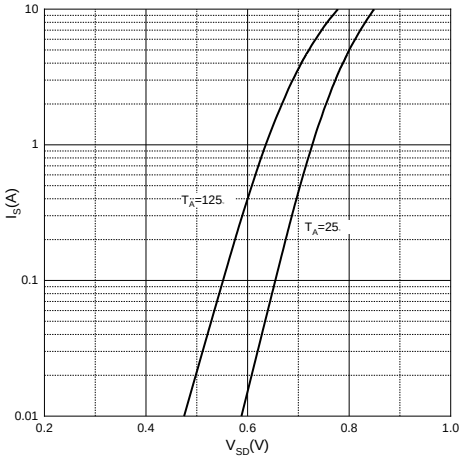
$R_{DS(ON)}$ vs I_D



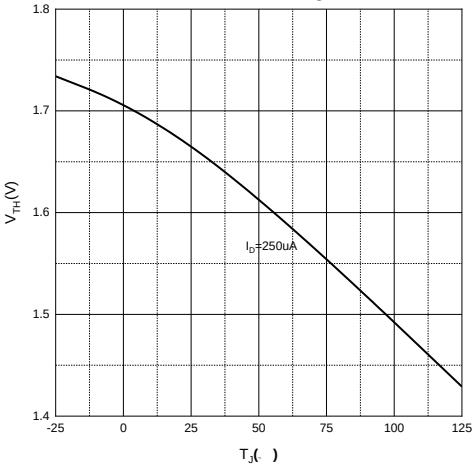
$R_{DS(ON)}$ vs V_{GS}



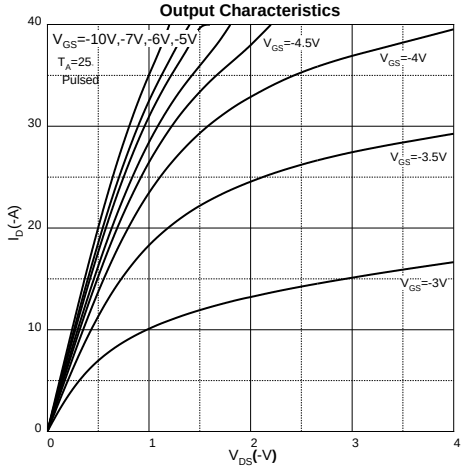
I_S vs V_{SD}



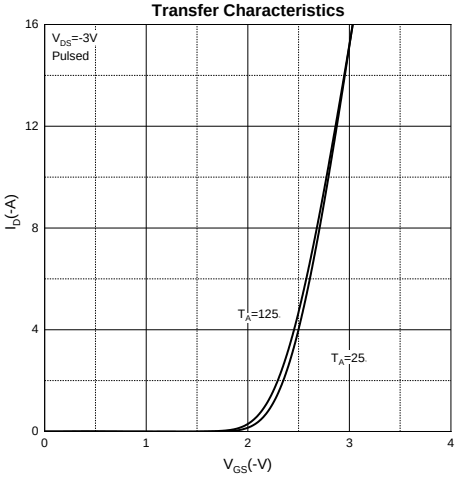
Threshold Voltage



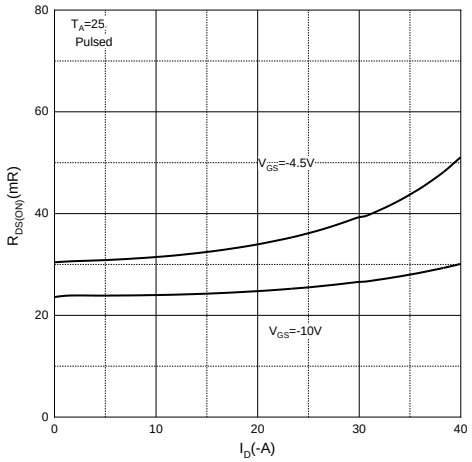
Output Characteristics



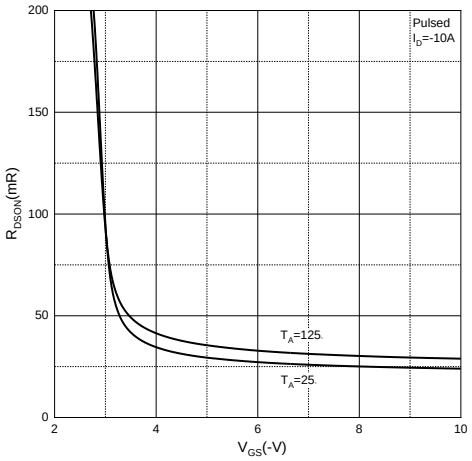
Transfer Characteristics



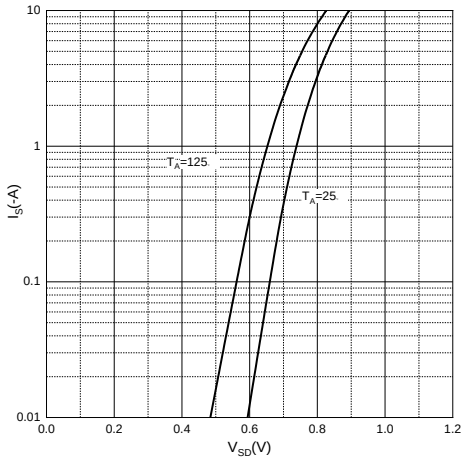
$R_{DS(ON)}$ vs I_D



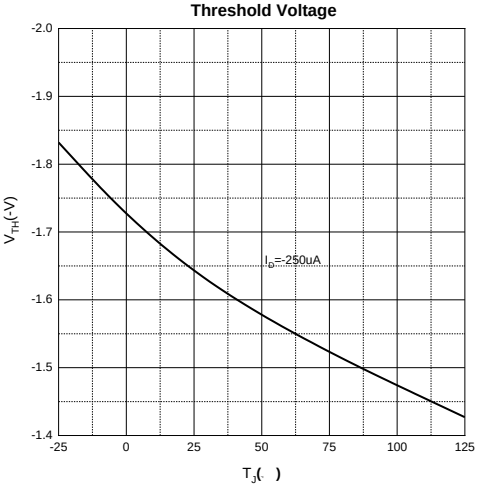
$R_{DS(ON)}$ vs V_{GS}



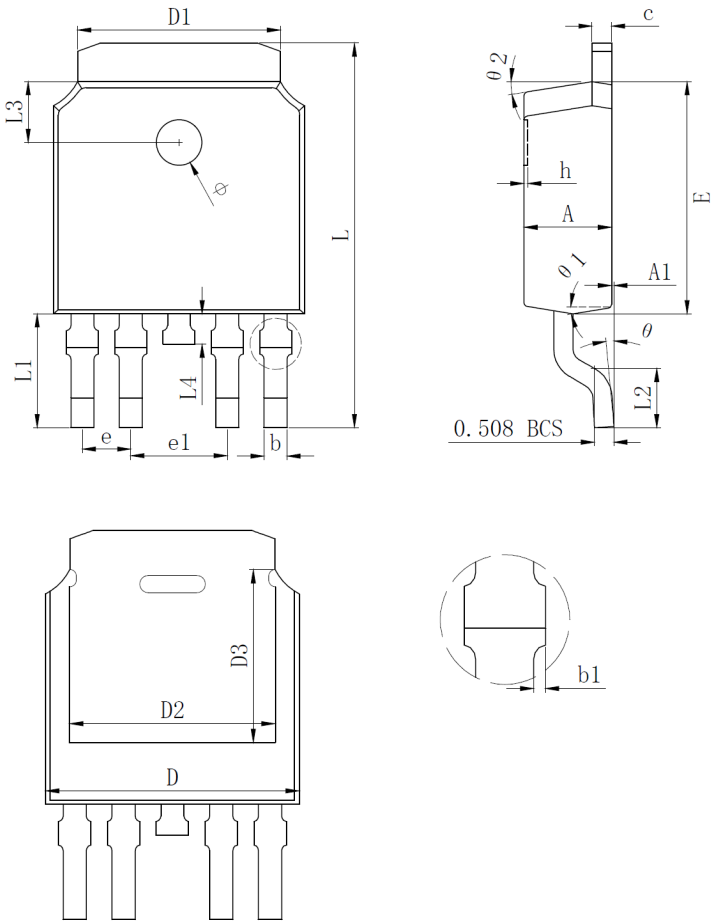
I_S vs V_{SD}



Threshold Voltage



TO-252-4L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.550	0.650	0.022	0.026
b1	0.000	0.120	0.000	0.005
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.334REF		0.210REF	
D2	5.346REF		0.210REF	
D3	4.490REF		0.177REF	
E	6.000	6.200	0.236	0.244
e	1.270TYP		0.050TYP	
e1	2.540TYP		0.100TYP	
h	0.000	0.200	0.000	0.008
L	9.900	10.300	0.390	0.406
L1	2.988REF		0.118REF	
L2	1.400	1.700	0.055	0.067
L3	1.600REF		0.063REF	
L4	0.700	0.900	0.028	0.035
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
θ1	9°TYP		9°TYP	
θ2	9°TYP		9°TYP	

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