



Product Summary

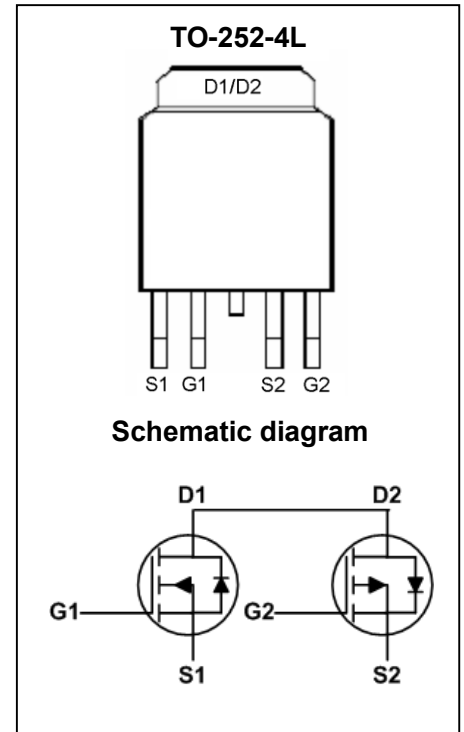
$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	14mΩ@10V	30A
	18mΩ@4.5V	
-40V	24mΩ@-10V	-28A
	31mΩ@-4.5V	

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 ($T_A = 25^\circ\text{C}$ 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	$T_C = 25^\circ\text{C}$	I_D	30	-28	A
	$T_C = 100^\circ\text{C}$	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	$T_C = 25^\circ\text{C}$	P_D	23	25	W
Thermal Resistance from Junction to Ambient ⁶	$R_{\theta JA}$	60	60	$^\circ\text{C/W}$	
Thermal Resistance from Junction to Case	$R_{\theta JC}$	5.5	5	$^\circ\text{C/W}$	
Junction Temperature	T_J	150	150	$^\circ\text{C}$	
Storage Temperature	T_{STG}	-55~ +150	-55~ +150	$^\circ\text{C}$	

MOSFET ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

NMOS:

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	40			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 40V, V_{GS} = 0V$			1	μA
Gate - Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
On Characteristics⁴						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.7	3	V
Drain-source On-resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 12A$		14	18	m Ω
		$V_{GS} = 4.5V, I_D = 10A$		18	27	
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 20V, V_{GS} = 0V, f = 1MHz$		720		pF
Output Capacitance	C_{oss}			66		
Reverse Transfer Capacitance	C_{rss}			53		
Gate Resistance	R_g	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$		3.9		
Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS} = 20V, V_{GS} = 10V, I_D = 10A$		17		nC
Gate-source Charge	Q_{gs}			2.3		
Gate-drain Charge	Q_{gd}			4.2		
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 20V, V_{GS} = 10V, I_D = 1A,$ $R_G = 3.3\Omega$		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

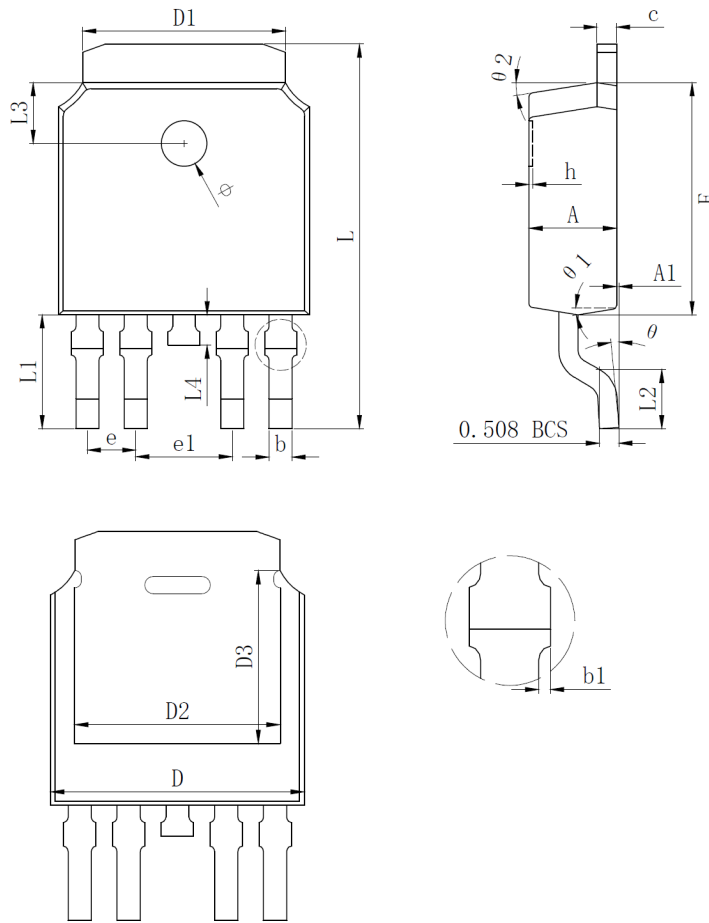
PMOS:

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-40			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -40V, V_{GS} = 0V$			-1	μA
Gate - Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
On Characteristics⁴						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1	-1.6	-3	V
Drain-source On-resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -8A$		24	34	m Ω
		$V_{GS} = -4.5V, I_D = -4A$		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	$t_{d(on)}$	$V_{DD} = -15V, V_{GS} = -10V, I_D = -1A,$ $R_G = 3.3\Omega$		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 $\leq 10\mu s$, duty cycle $\leq 1\%$.
- 3.EAS condition: $V_{DD} = \pm 20V, V_{GS} = \pm 10V, L = 0.5mH, R_G = 25\Omega$ Starting $T_J = 25^\circ C$.
- 4.Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 5.The power dissipation P_D is limited by $T_{J(MAX)} = 150^\circ C$.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 $T_A = 25^\circ C$.

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°
$\theta 1$	9°TYP		9°TYP	
$\theta 2$	9°TYP		9°TYP	

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