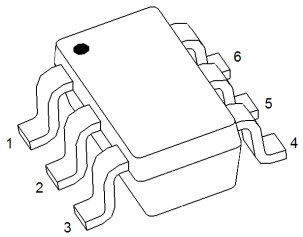
GPM1K1NP02USE

20V N- and P-Channel MOSFET

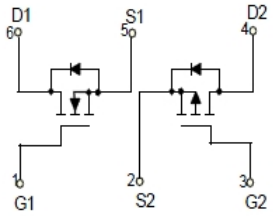
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
20V	32mΩ@4.5V	3.5A
	50mΩ@2.5V	
-20V	85mΩ@-4.5V	-2.1A
	115mΩ@-2.5V	

SOT-23-6L



Schematic diagram



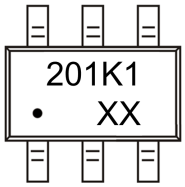
Feature

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

Application

- Power Switching Application

MARKING:



201K1 = Device Code

XX = Date Code

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

Parameter		Symbol	Value	Value	Unit
Drain - Source Voltage		V_{DS}	20	-20	V
Gate - Source Voltage		V_{GS}	±10	±10	V
Continuous Drain Current[1]	T_A = 25℃	I_D	3.5	-2.1	A
Pulsed Drain Current[2]		I_{DM}	14	-8	A
Power Dissipation[4]	T_A = 25℃	P_D	0.8	0.8	W
Thermal Resistance from Junction to Ambient[5]		$R_{\theta JA}$	156	156	℃/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	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20V, V_{GS} = 0V			1	μA
Gate - Body Leakage Current	I_{GSS}	V_{GS} = ±10V, V_{DS} = 0V			±100	nA
On Characteristics[3]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	0.6	1.0	1.2	V
Drain-source On-resistance	$R_{DS(on)}$	V_{GS} = 4.5V, I_D = 3.6A		32	43	mΩ
		V_{GS} = 2.5V, I_D = 3.1A		50	68	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 10V, V_{GS} = 0V, f = 1MHz		252		pF
Output Capacitance	C_{oss}			52		
Reverse Transfer Capacitance	C_{rss}			45		
Gate Resistance	R_g	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz		2.8		Ω
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS} = 10V, V_{GS} = 4.5V, I_D = 3.6A		4		nC
Gate-source Charge	Q_{gs}			0.6		
Gate-drain Charge	Q_{gd}			1.6		
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 10V, V_{GS} = 4.5V, R_L = 3.3Ω R_G = 6Ω		2.6		ns
Turn-on Rise Time	t_r			3.3		
Turn-off Delay Time	$t_{d(off)}$			22		
Turn-off Fall Time	t_f			4		
Source - Drain Diode Characteristics						
Diode Forward Voltage[3]	V_{SD}	V_{GS} = 0V, I_S = 0.94A			1.2	V

MOSFET ELECTRICAL CHARACTERISTICS (T_A = 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	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -20V, V_{GS} = 0V			-1	μA
Gate - Body Leakage Current	I_{GSS}	V_{GS} = ±10V, V_{DS} = 0V			±100	nA
On Characteristics[3]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-0.4	-0.7	-1.0	V
Drain-source On-resistance	$R_{DS(on)}$	V_{GS} = -10V, I_D = -2.8A		85	111	mΩ
		V_{GS} = -4.5V, I_D = -2A		115	150	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = -20V, V_{GS} = 0V, f = 1MHz		394		pF
Output Capacitance	C_{oss}			49		
Reverse Transfer Capacitance	C_{rss}			40		
Gate Resistance	R_g	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz		30		Ω
Switching Characteristics						
Total Gate Charge	Q_g	V_{DS} = -10V, V_{GS} = -4.5V, I_D = -2.8A		4.5		nC
Gate-source Charge	Q_{gs}			1.0		
Gate-drain Charge	Q_{gd}			1.1		
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = -10V, V_{GS} = -4.5V, R_L = 5Ω, R_G = 3Ω		12		ns
Turn-on Rise Time	t_r			5.6		
Turn-off Delay Time	$t_{d(off)}$			23		
Turn-off Fall Time	t_f			9		
Source - Drain Diode Characteristics						
Diode Forward Voltage[3]	V_{SD}	V_{GS} = 0V, I_S = -0.7A			-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%.

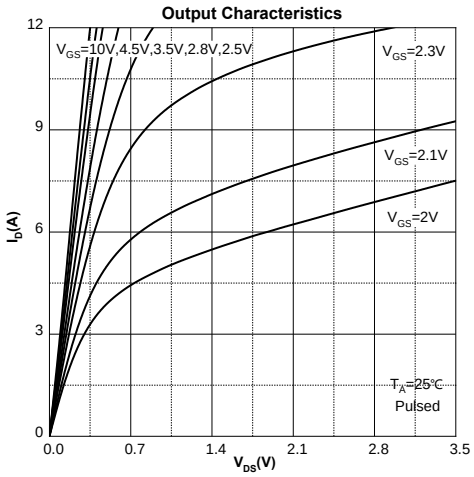
3.Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.

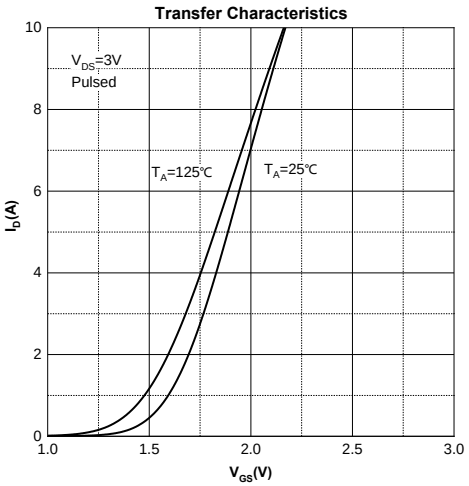
4.The power dissipation P_D is limited by $T_{J(MAX)}$ = 150°C.And device mounted on a large heatsink

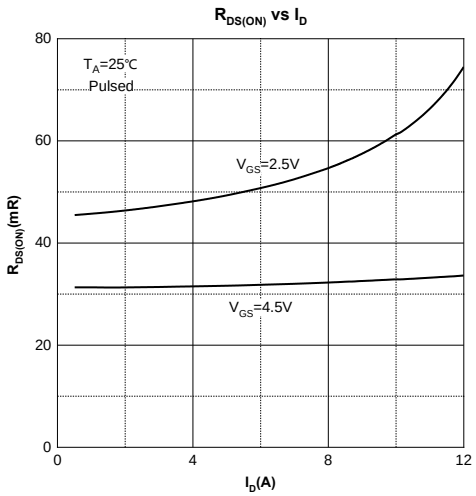
5.Device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

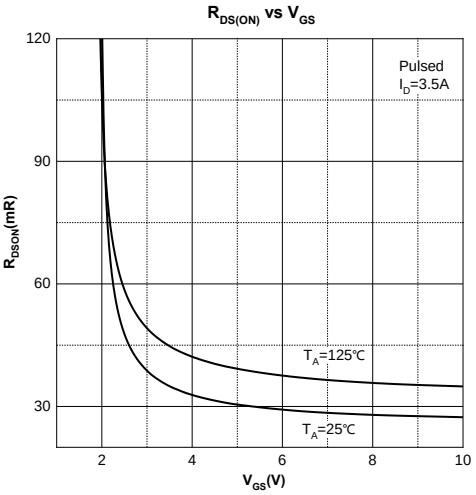
Typical Characteristics

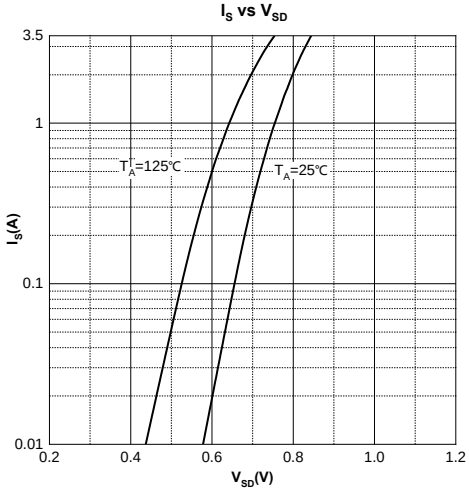
NMOS:

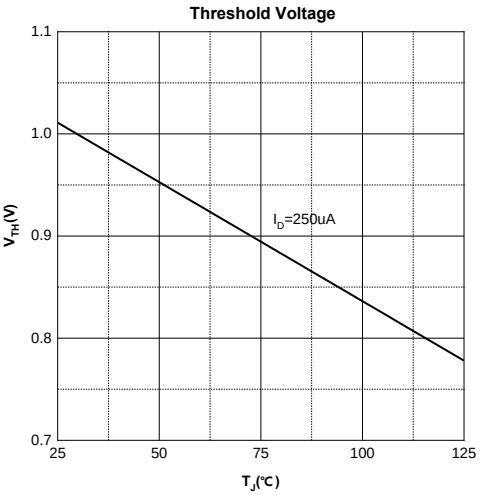






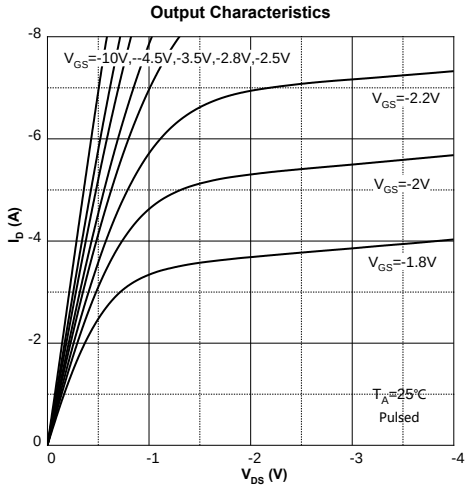


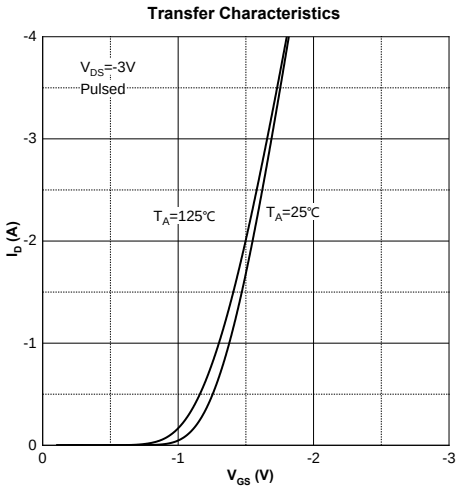


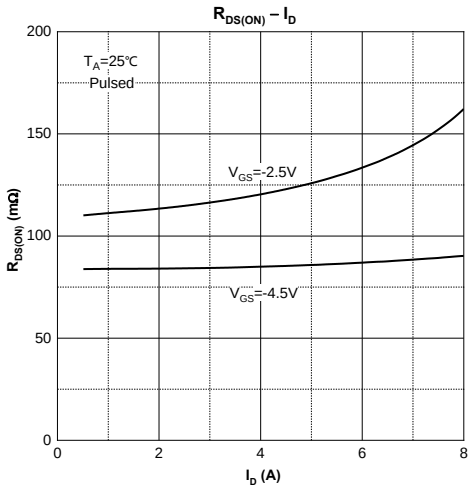


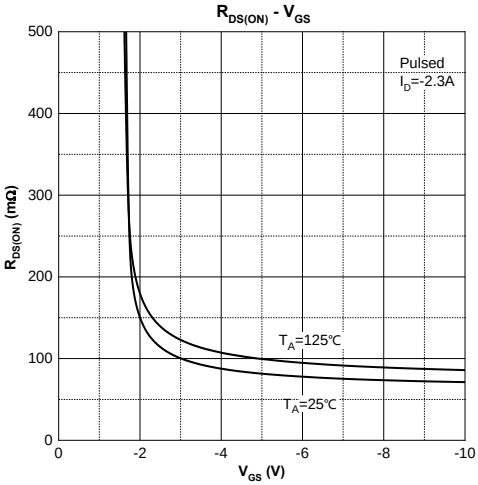
Typical Characteristics

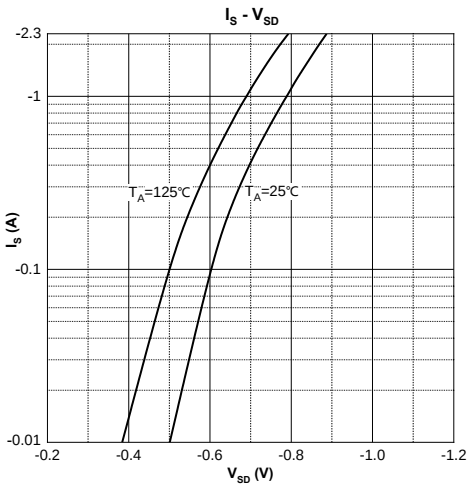
PMOS:

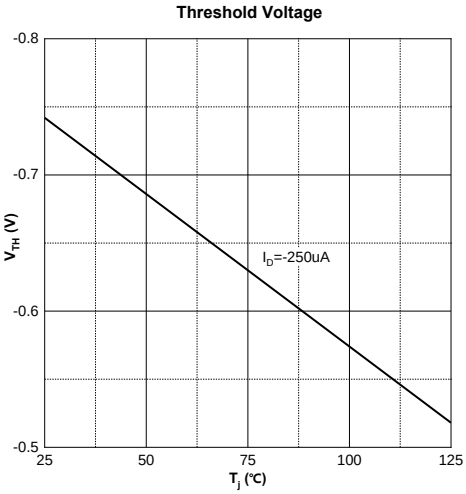




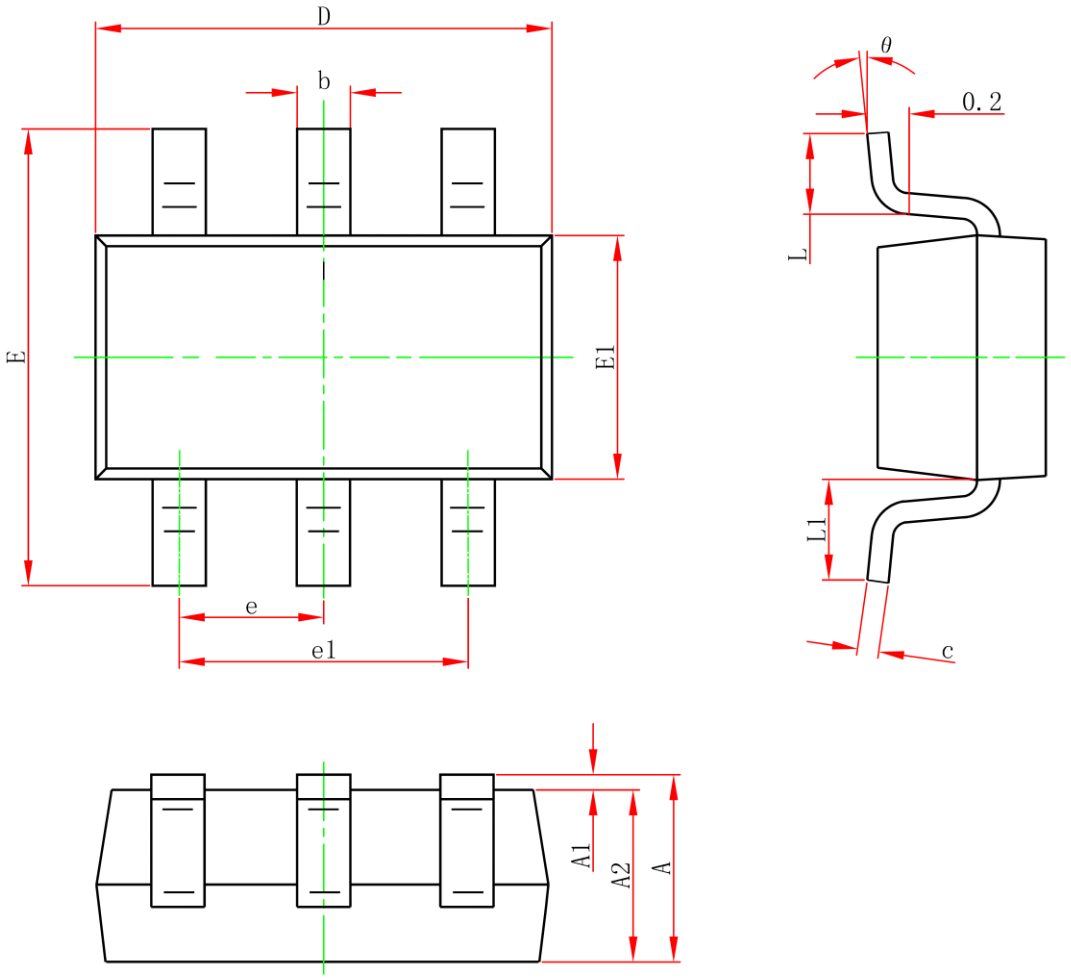








SOT-23-6L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0	0.150	0.000	0.006
A2	1.050	1.250	0.041	0.049
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	2.650	2.950	0.104	0.116
E1	1.500	1.700	0.059	0.067
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
L1	0.600REF		0.024REF	
θ	0°	8°	0°	8°