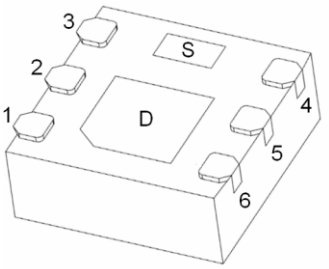
GP20N09D22

20V N-Channel MOSFET

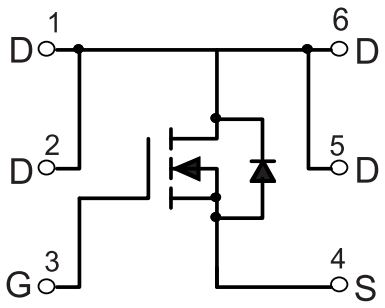
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
20V	6.0mΩ@4.5V	15A
	6.6mΩ@4.0V	
	6.7mΩ@3.8V	
	7.2mΩ@3.1V	
	7.0mΩ@2.5V	

DFN2X2-6L



Schematic diagram



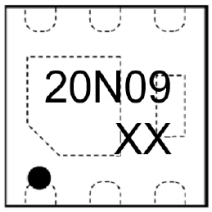
FEATURES

- TrenchFET Power MOSFET
- Excellent $R_{DS(on)}$
- Low Gate Charge
- High Power and Current Handing Capability

APPLICATION

- Battery Protection
- Load Switch
- Power Management

MARKING:



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current[1,2]	I_D	15	A
Plused Drain Current	I_{DM}	56	A
Power Dissipation	P_D	2.2	W
Thermal Resistance from Junction to Ambient[1,2]	$R_{\theta JA}$	57	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS(T_A=25℃ 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	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 16V,V_{GS} = 0V			1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±12V, V_{DS} = 0V			±100	nA
On Characteristics						
Gate Threshold Voltage[3]	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	0.4	0.7	1	V
Drain-Source On-Resistance[3]	$R_{DS(on)}$	V_{GS} = 4.5V, I_D = 5A		6.0	8.0	mΩ
		V_{GS} = 4.0V, I_D = 5A		6.6	8.5	
		V_{GS} = 3.8V, I_D = 5A		6.7	9.0	
		V_{GS} = 3.1V, I_D = 5A		7.2	10.0	
		V_{GS} = 2.5V, I_D = 5A		7.0	11.0	
Forward Tranconductance[3]	g_{FS}	V_{DS} =5V, I_D = 5A	5			S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 10V,V_{GS} = 0V,f = 1MHz		1750		pF
Output Capacitance	C_{oss}			230		
Reverse Transfer Capacitance	C_{rss}			200		
Total Gate Charge	Q_g	V_{DS} = 10V,V_{GS} = 4.5V,I_D = 7A		16		nC
Gate-Source Charge	Q_{gs}			2.4		
Gate-Drain Charge	Q_{gd}			6.3		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{d(on)}$	V_{GEN} = 5V,V_{DD} = 10V, R_g = 3Ω, R_L = 1.2Ω		2.0		ns
Turn-On Rise Time	t_r			6		
Turn-Off Delay Time	$t_{d(off)}$			35		
Turn-Off Fall Time	t_f			77		
Drain Source Diode Characteristics						
Diode Forward Current	I_S				14	A
Diode Forward Voltage	V_{SD}	V_{GS} = 0V, I_S = 10A			1.2	V

Notes:

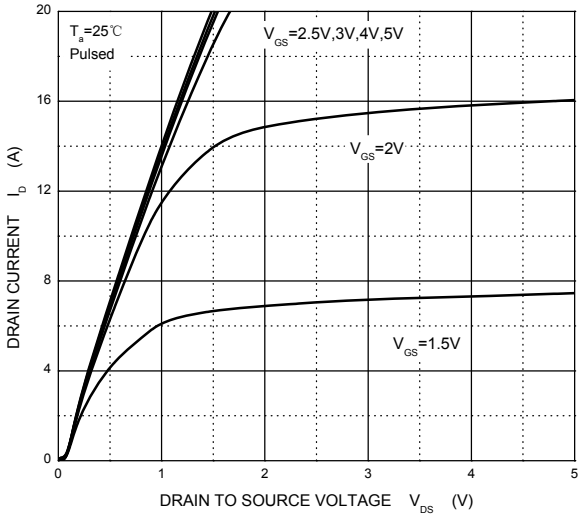
1.$R_{\theta JA}$ is measured with the device mounted on 1 in^2 FR4 board with 1oz. single side copper, in a still air environment with T_A = 25°C.

2. $R_{\theta JA}$ is measured in the steady state

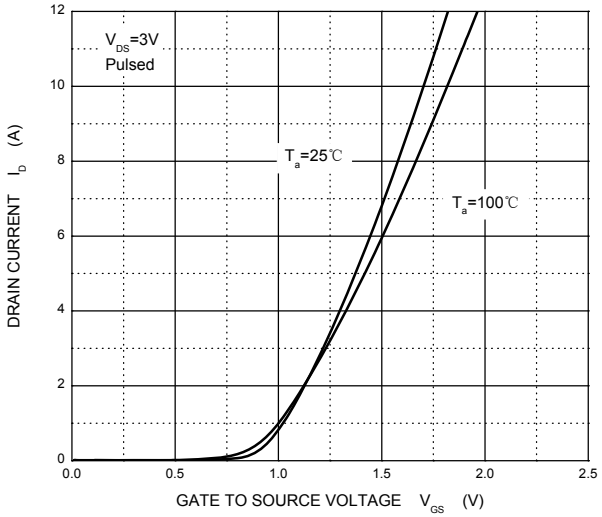
3.Pulse test : Pulse width ≤ 380μs, duty cycle ≤ 2%.

Typical Electrical and Thermal Characteristics

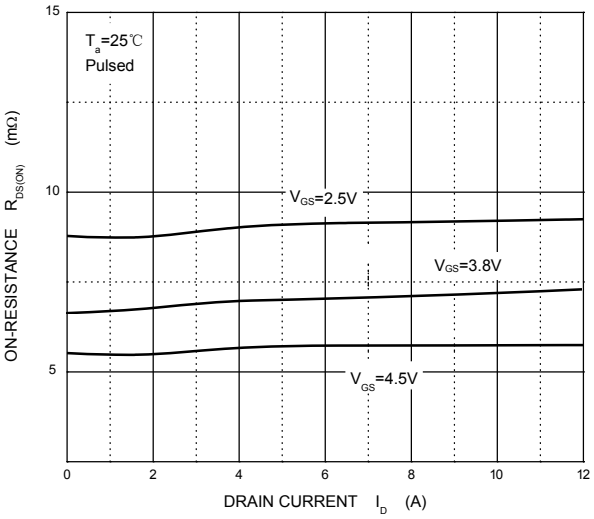
Output Characteristics



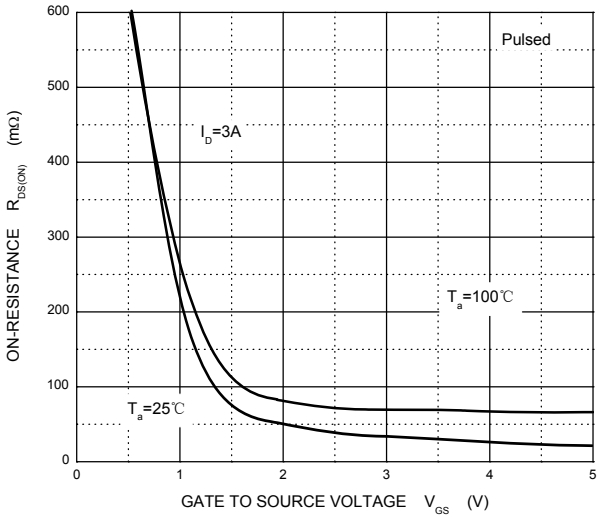
Transfer Characteristics



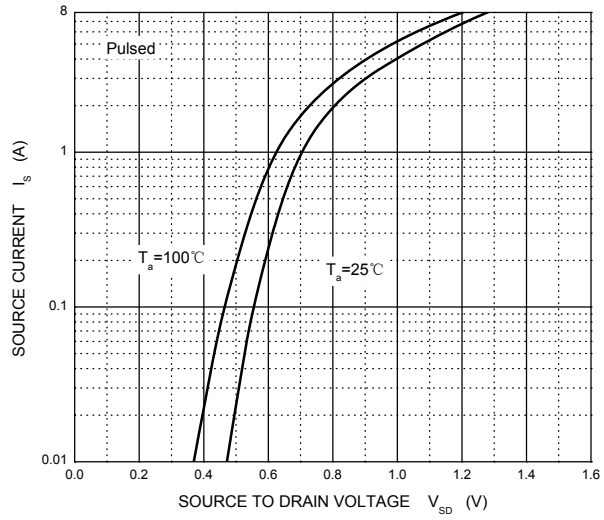
$R_{DS(ON)}$ —— I_D



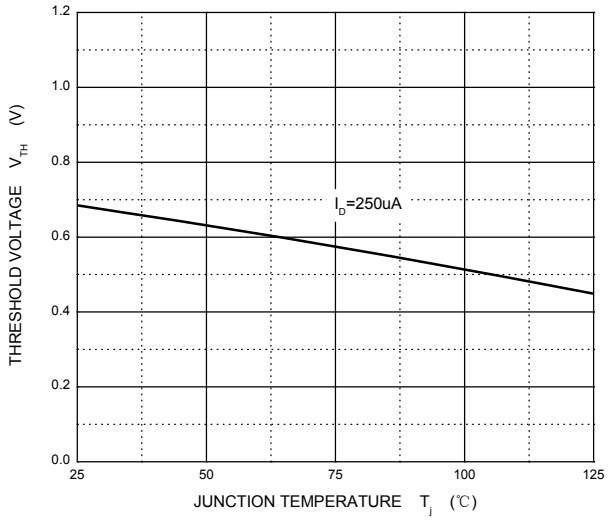
$R_{DS(ON)}$ —— V_{GS}



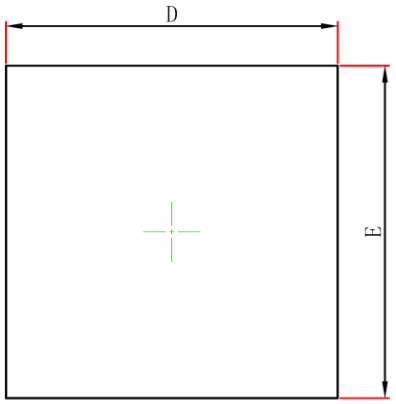
I_S —— V_{SD}



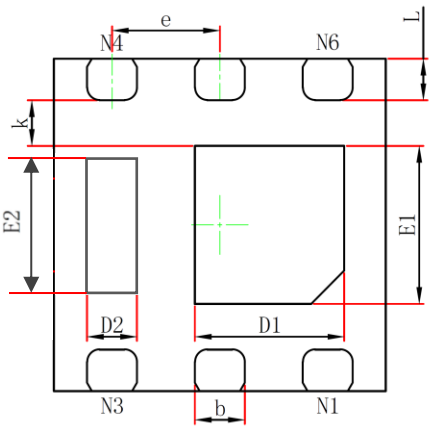
Threshold Voltage



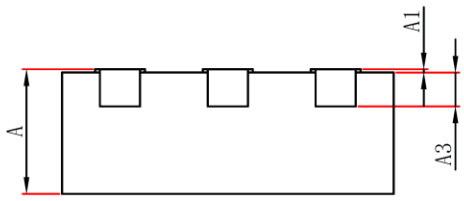
DFN2X2-6L- Package Information



TOP VIEW



BOTTOM VIEW



SIDE VIEW

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.850	0.028	0.033
A1	0	0.050	0	0.002
A3	0.120	0.220	0.005	0.009
D	1.900	2.100	0.075	0.083
E	1.900	2.100	0.075	0.083
D1	0.800	1.050	0.031	0.041
E1	0.800	1.050	0.031	0.041
D2	0.200	0.400	0.008	0.016
E2	0.450	0.850	0.018	0.033
k	0.200MIN		0.008MIN	
b	0.250	0.350	0.010	0.014
e	0.65BSC		0.026TYP	
L	0.174	0.326	0.007	0.013

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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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