

Features

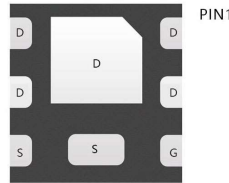
- Trench Power LV MOSFET technology
- High Density Cell Design for Low $R_{DS(ON)}$
- High Speed switching

Product Summary

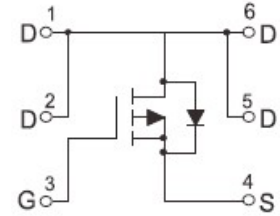
V_{DS}	$R_{DS(ON)}$ MAX	I_D MAX
-20V	32mΩ@-4.5V	-9A
	41mΩ@-2.5V	

Application

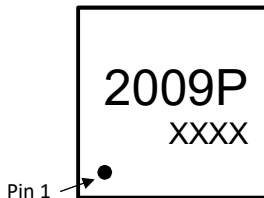
- Battery protection
- Load switch
- Power management



DFN2X2-6L view



Schematic diagram



Pin 1

Marking and pin assignment

2009P: Device code
 XXXX: Code
 Solid dot: Pin1 indicator



Pb-Free



Halogen-Free

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Symbol	Parameter	Rating	Unit
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Common Ratings (TC=25°C Unless Otherwise Noted)

V_{DS}	Drain-Source Breakdown Voltage	-20	V
V_{GS}	Gate-Source Voltage	±8	V
T_J	Maximum Junction Temperature	150	°C
T_{STG}	Storage Temperature Range	-55 to 150	°C
I_S	Diode Continuous Forward Current	$T_C=25^{\circ}C$ -9	A

Mounted on Large Heat Sink

I_{DM}	Pulse Drain Current Tested	$T_C=25^{\circ}C$ -40	A
I_D	Continuous Drain Current	$T_C=25^{\circ}C$ -9	A
P_D	Maximum Power Dissipation	$T_C=25^{\circ}C$ 1.2	W
$R_{\theta JA}$	Thermal Resistance Junction-to-Ambient	136	°C/W

Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MLSM2009P	DFN2X2-6L	2009P	3,000	45,000	180,000	7"reel

Electrical Characteristics (TJ=25°C unless otherwise noted)						
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
BV _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-20	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-20V, V _{GS} =0V	--	--	-1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±8V, V _{DS} =0V	--	--	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-0.4	-0.7	-1.0	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =-4.5V, I _D =-9A	--	26	32	mΩ
		V _{GS} =-2.5V, I _D =-5A	--	34	41	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C _{ISS}	Input Capacitance	V _{DS} =-9V, V _{GS} =0V, f=1MHz	--	1015	--	pF
C _{OSS}	Output Capacitance		--	138	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	105	--	pF
Switching Characteristics						
Q _g	Total Gate Charge	V _{DS} =-9V, I _D =-5A, V _{GS} =-4.5V	--	11.3	--	nC
Q _{gs}	Gate Source Charge		--	2.3	--	nC
Q _{gd}	Gate Drain Charge		--	2.4	--	nC
t _{d(on)}	Turn-on Delay Time	V _{DD} =-9V, I _D =-5A, V _{GS} =-4.5V, R _G =2.5Ω	--	8.5	--	nS
t _r	Turn-on Rise Time		--	35.5	--	nS
t _{d(off)}	Turn-Off Delay Time		--	78	--	nS
t _f	Turn-Off Fall Time		--	58	--	nS
Source- Drain Diode Characteristics						
V _{SD}	Forward on voltage	Tj=25°C, Is=-9A	--	--	-1.2	V

Typical Operating Characteristics

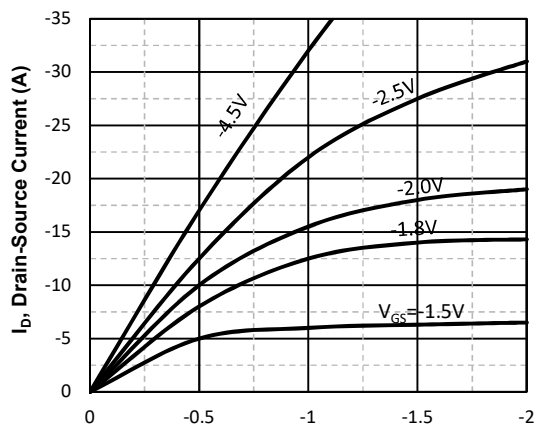


Fig1. Typical Output Characteristics

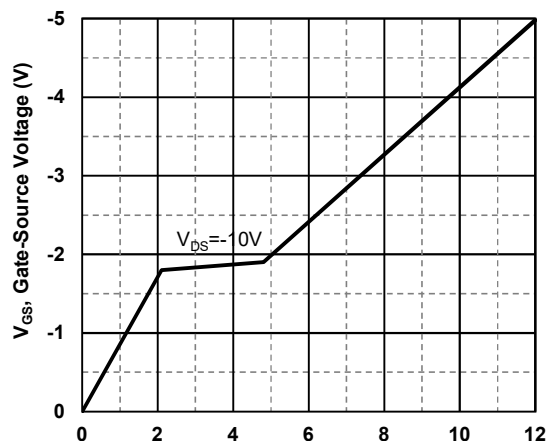


Fig2. Typical Gate Charge Vs. Gate-Source Voltage

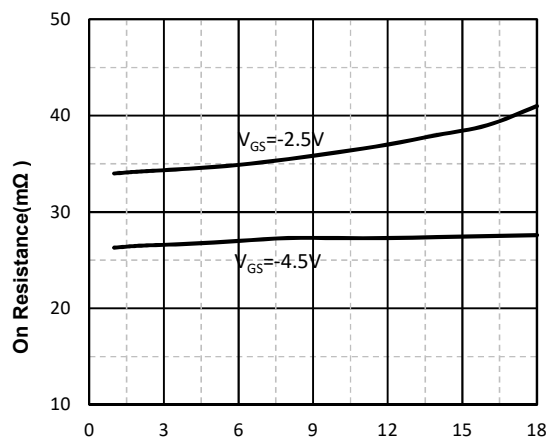


Fig3. Drain-Source on Resistance

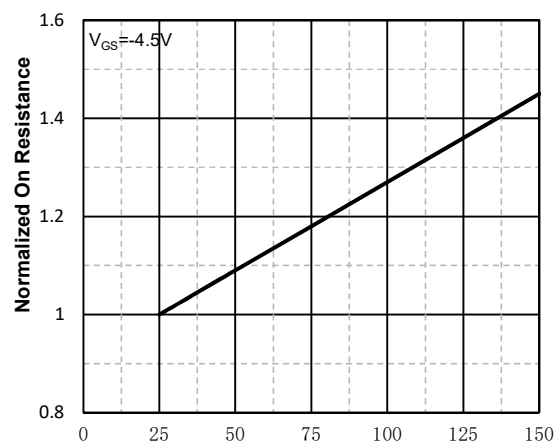


Fig4. Normalized On-Resistance Vs. Temperature

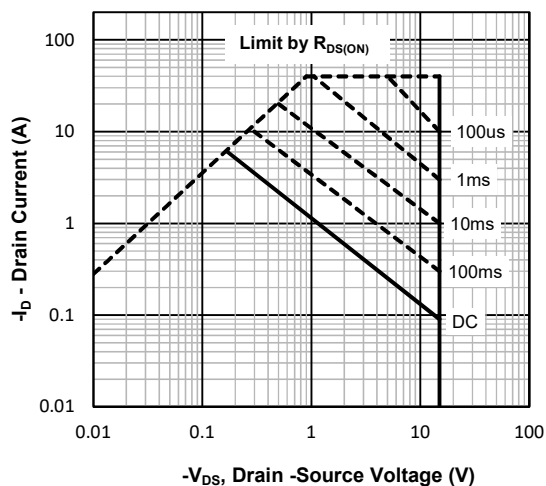


Fig5. Maximum Safe Operating Area

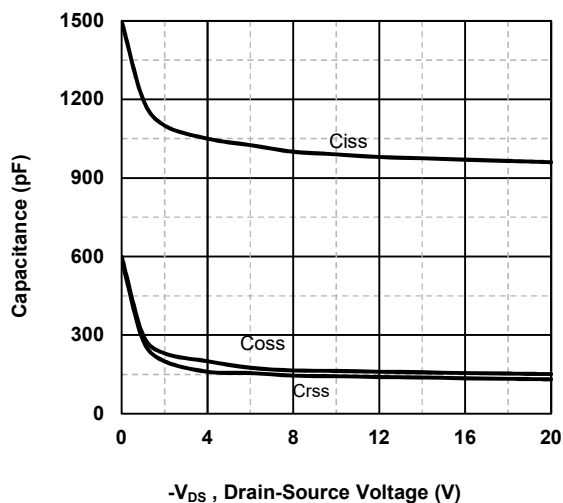
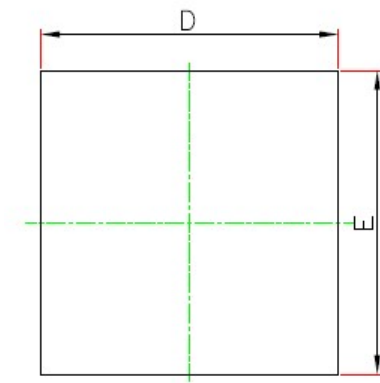
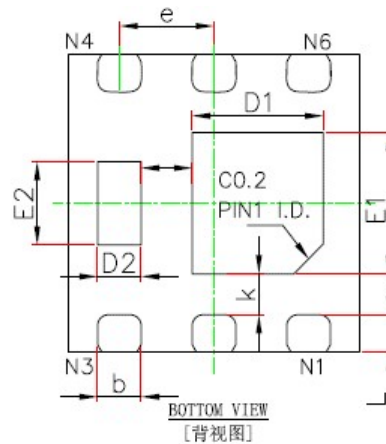


Fig6 Typical Capacitance Vs. Drain-Source Voltage

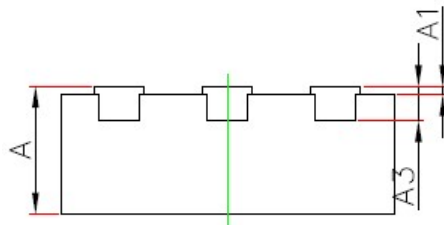
DFN2X2-6L Package information



TOP VIEW
[顶视图]



BOTTOM VIEW
[背视图]



SIDE VIEW
[侧视图]

Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	0.600	0.700	0.023	0.027
A1	0.000	0.050	0.000	0.001
A3	0.203REF		0.007REF	
b	0.315	0.415	0.012	0.016
D	1.924	2.076	0.075	0.081
E	1.924	2.076	0.075	0.081
e	0.650TYP		0.225TYP	
L	0.224	0.376	0.008	0.014
k	0.200	-	0.007	-
E1	1.000	1.200	0.039	0.047
D1	0.900	1.100	0.035	0.043
E2	0.700	0.900	0.027	0.035
D2	0.150	0.350	0.005	0.013