

Features

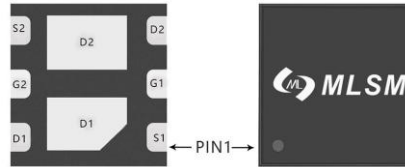
- Trench Power LV MOSFET technology
- High Density Cell Design for Low $R_{DS(ON)}$
- High Speed switching

Product Summary

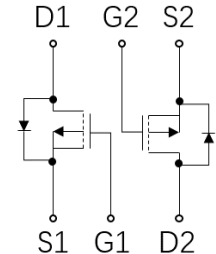
V_{DS}	$R_{DS(ON)}$ TYP	I_D
-20V	33m Ω @-4.5V	-4.5A
	45m Ω @-2.5V	

Application

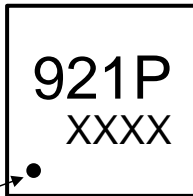
- Battery protection
- Load switch
- Power management



DFN2X2-6L view



Schematic diagram



Pin 1

921P: Device code
 XXXX: Code
 Solid dot: Pin1 indicator

Marking and pin assignment



Halogen-Free

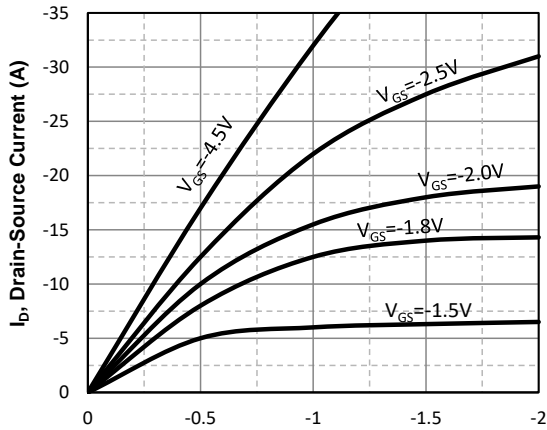
Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Symbol	Parameter	Rating	Unit
Common Ratings (TC=25°C Unless Otherwise Noted)			
V_{DS}	Drain-Source Breakdown Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 10	V
T_J	Maximum Junction Temperature	150	°C
T_{STG}	Storage Temperature Range	-55 to 150	°C
I_S	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ -4.5	A
Mounted on Large Heat Sink			
I_{DM}	Pulse Drain Current Tested	$T_C=25^\circ\text{C}$ -18	A
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$ -4.5	A
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 1.5	W
$R_{\theta JA}$	Thermal Resistance Junction-to-Ambient	85	°C/W

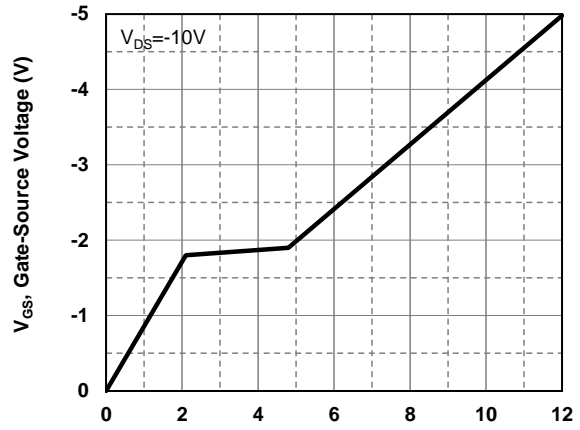
Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MLSM921P	DFN2X2-6L	921P	3,000	45,000	180,000	7" reel

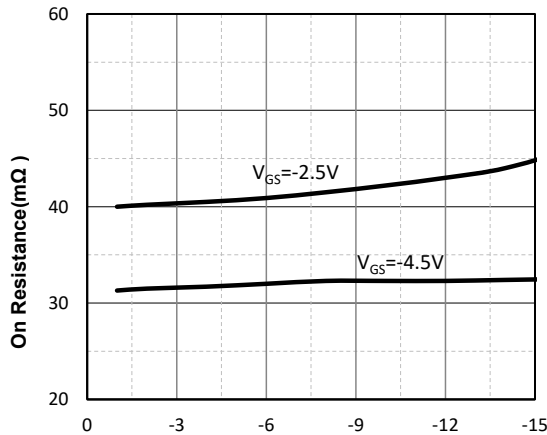
Electrical Characteristics (T _J =25°C unless otherwise noted)						
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
BV _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-20	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-20V, V _{GS} =0V	--	--	-1.0	uA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±10V, V _{DS} =0V	--	--	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-0.45	-0.6	-1.0	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =-4.5V, I _D =-3.6A	--	33	59	mΩ
		V _{GS} =-2.5V, I _D =-1.5A	--	45	98	mΩ
		V _{GS} =-1.8V, I _D =-1.0A	--	65	120	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C _{ISS}	Input Capacitance	V _{DS} =-10V, V _{GS} =0V, f=1MHz	--	1010	--	pF
C _{OSS}	Output Capacitance		--	130	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	105	--	pF
Switching Characteristics						
Q _g	Total Gate Charge	V _{DS} =-10V, I _D =-4A, V _{GS} =-4.5V	--	11	--	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} =-10V, I _D =-1A, 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	T _J =25°C, I _S =-4.5A,	--	--	-1.2	V

Typical Operating Characteristics


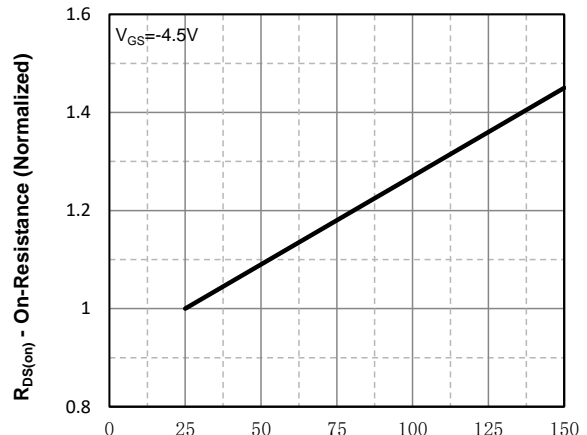
V_{DS} , Drain-Source Voltage (V)
 Fig1. Typical Output Characteristics



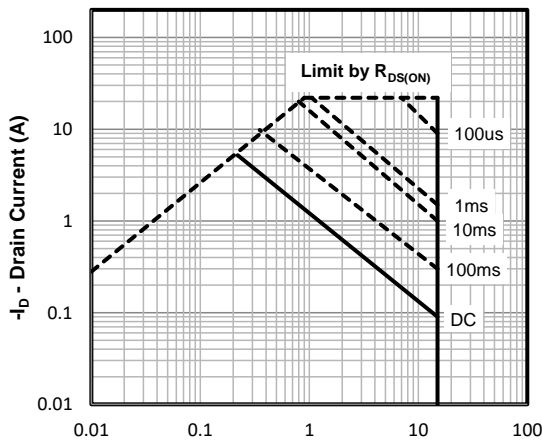
Qg -Total Gate Charge (nC)
 Fig2. Typical Gate Charge Vs. Gate-Source Voltage



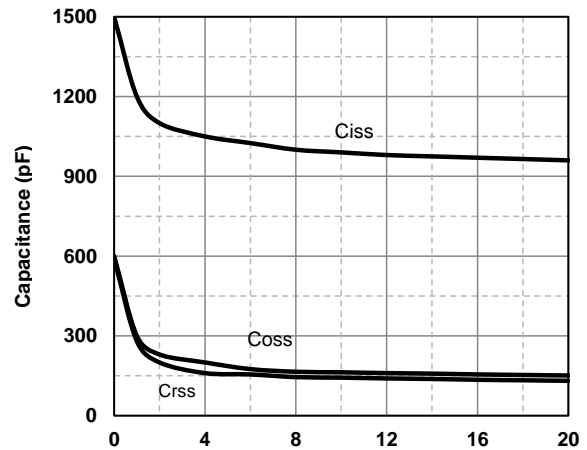
I_D , Drain-Source Current (A)
 Fig3. Drain-Source on Resistance



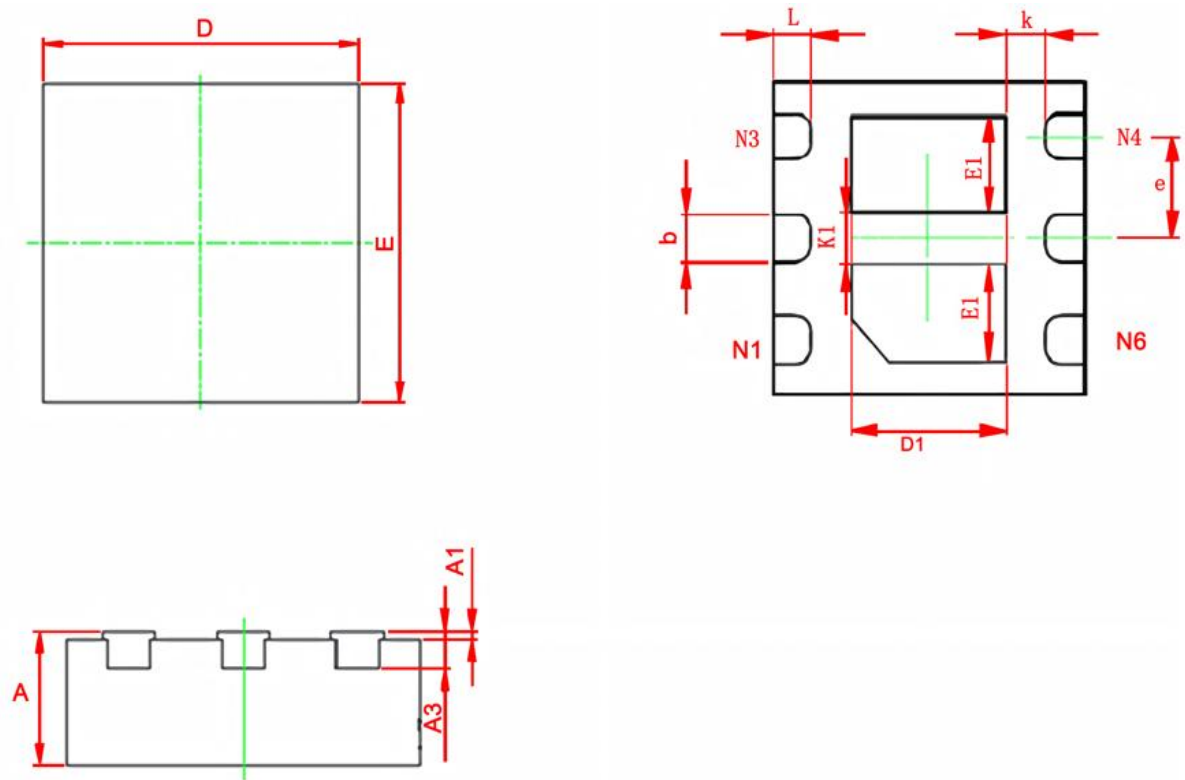
T_j - Junction Temperature (°C)
 Fig4. Normalized On-Resistance Vs. Temperature



$-V_{DS}$, Drain-Source Voltage (V)
 Fig5. Maximum Safe Operating Area



$-V_{DS}$, Drain-Source Voltage (V)
 Fig6. Typical Capacitance Vs. Drain-Source Voltage

DFN2X2-6L Package information


Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	0.600	0.700	0.024	0.027
A1	0.000	0.050	0.000	0.001
A3	0.203REF		0.007REF	
b	0.230	0.330	0.009	0.012
D	1.924	2.076	0.075	0.081
E	1.924	2.076	0.075	0.081
e	0.650TYP		0.025TYP	
L	0.224	0.376	0.008	0.014
k	0.200	-	0.007	-
E1	0.520	0.720	0.020	0.028
D1	0.800	1.000	0.031	0.039
K1	0.320TYP		0.012TYP	