

Features

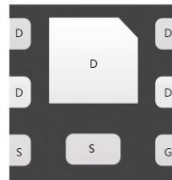
- Trench Power LV MOSFET technology
- High density cell design for Low $R_{DS(ON)}$
- High Speed switching

Product Summary

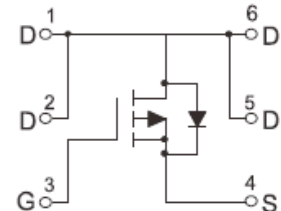
V_{DS}	$R_{DS(ON)}$ TYP	I_D
-30V	15mΩ@-10V	-13A
	27mΩ@-4.5V	

Application

- Battery protection
- Load switch
- Power management

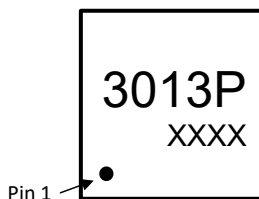


PIN1



DFN2X2-6L view

Schematic diagram



3013P: Device code
 XXXX: Code
 Solid dot: Pin1 indicator

Pin 1

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	-30	V
V_{GS}	Gate-Source Voltage	±20	V
T_J	Maximum Junction Temperature	150	°C
T_{STG}	Storage Temperature Range	-50 to 155	°C
I_S	Diode Continuous Forward Current	$T_C=25^{\circ}C$ -13	A

Mounted on Large Heat Sink

I_{DM}	Pulse Drain Current Tested	$T_C=25^{\circ}C$ -45	A
I_D	Continuous Drain Current	$T_C=25^{\circ}C$ -13	A
P_D	Maximum Power Dissipation	$T_C=25^{\circ}C$ 2.5	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	50	°C/W

Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MLSM3013P	DFN2X2-6L	3013P	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	-30	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-30V, V _{GS} =0V	--	--	-1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-1.0	-1.5	-3.0	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =-10V, I _D =-13A	--	15	18	mΩ
		V _{GS} =-4.5V, I _D =-5A	--	24	36	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C _{ISS}	Input Capacitance	V _{DS} =-20V, V _{GS} =0V, f=1MHz	--	1070	--	pF
C _{OSS}	Output Capacitance		--	85	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	75	--	pF
Q _g	Total Gate Charge	V _{DS} =-15V, I _D =-11A, V _{GS} =-10V	--	18	--	nC
Q _{gs}	Gate Source Charge		--	5.4	--	nC
Q _{gd}	Gate Drain Charge		--	3.1	--	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DS} =-15V, R _L =1.5Ω, V _{GS} =-10V, R _G =3Ω	--	8.7	--	nS
t _r	Turn-on Rise Time		--	8.6	--	nS
t _{d(off)}	Turn-Off Delay Time		--	18	--	nS
t _f	Turn-Off Fall Time		--	7	--	nS
Source- Drain Diode Characteristics						
V _{SD}	Forward on voltage	Tj=25°C, Is=-1A	--	--	-1	V

Typical Operating Characteristics

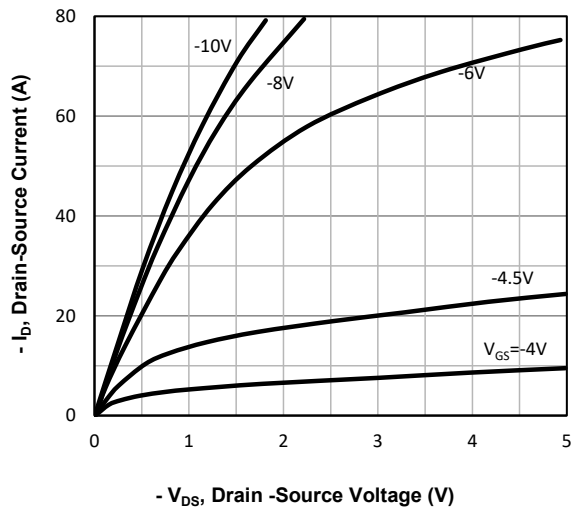


Fig1. Typical Output Characteristics

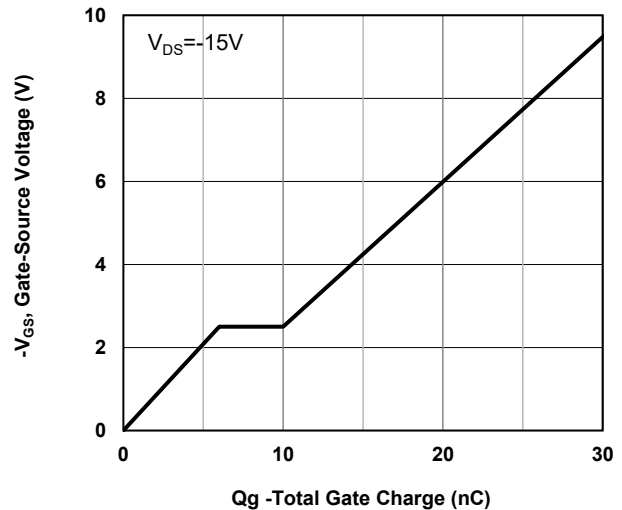


Fig2. Typical Gate Charge Vs. Gate-Source Voltage

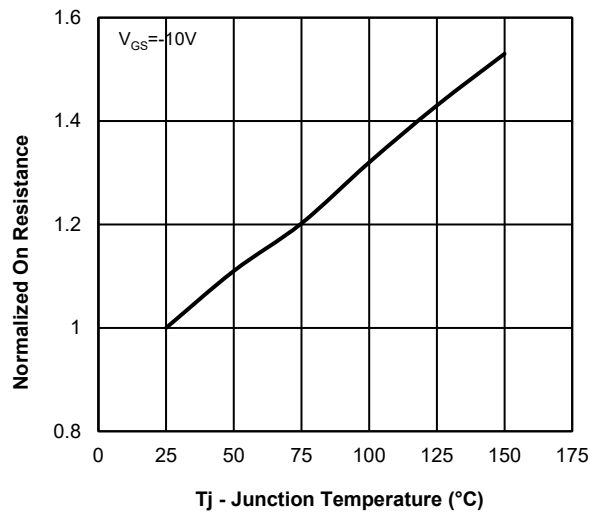


Fig3. Normalized On-Resistance Vs. Temperature

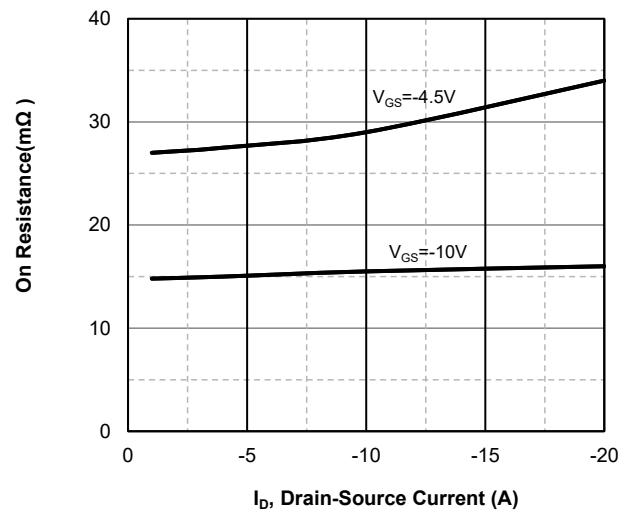


Fig4. On-Resistance Vs. Drain-Source Current

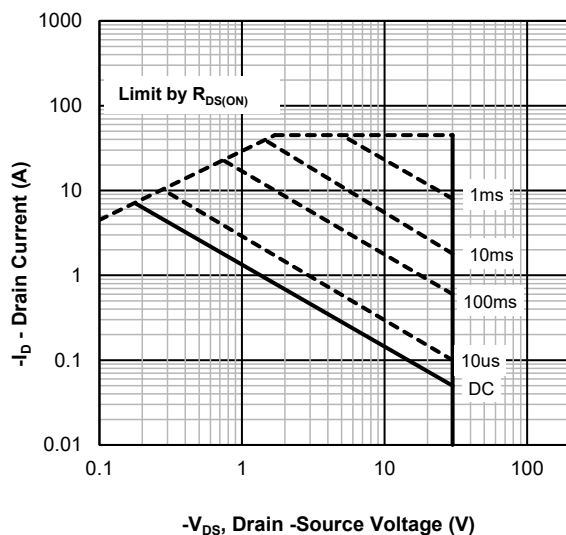


Fig5. Maximum Safe Operating Area

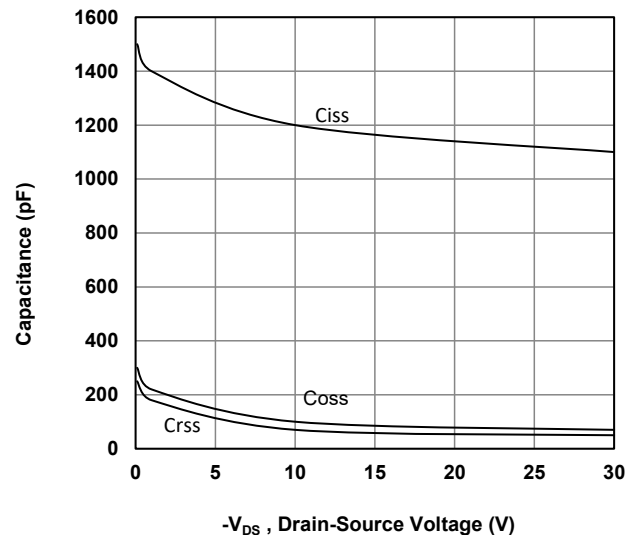
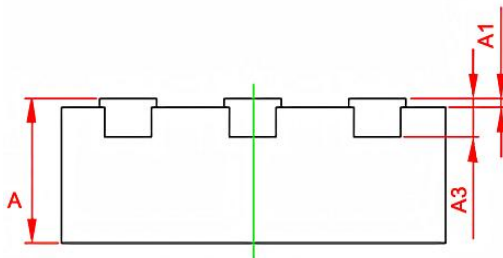
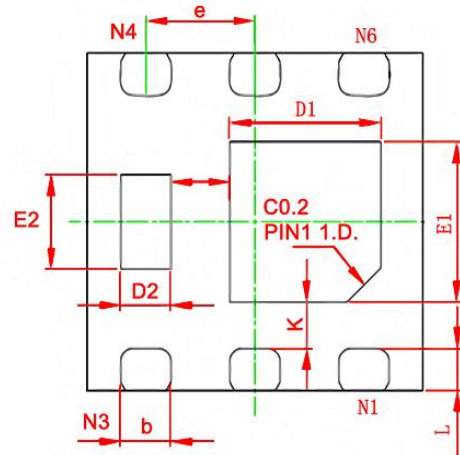
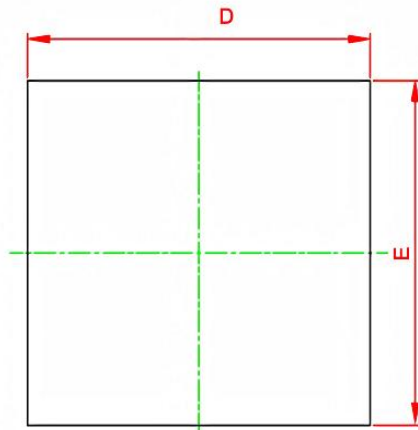


Fig6 Typical Capacitance Vs. Drain-Source Voltage

DFN2X2-6L Package information


Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	0.600	0.700	0.023	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