

Features

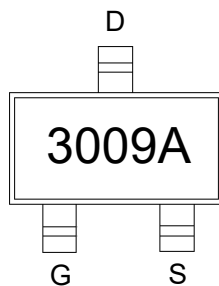
- Trench Power LV MOSFET technology
- High density cell design for Low $R_{DS(ON)}$
- High Speed switching

Product Summary

V_{DS}	$R_{DS(ON)}$ TYP	I_D
-30V	15m Ω @-10V	-9A
	20m Ω @-4.5V	

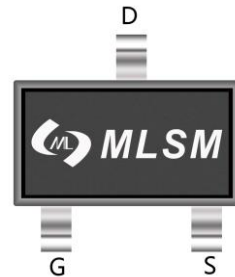
Application

- Battery protection
- Power management
- Load switch

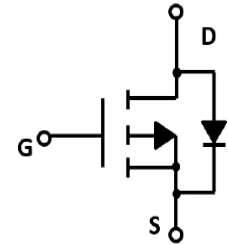


3009A: Device code

Marking and pin assignment



SOT-23-3L top view



Schematic diagram



Pb-Free



RoHS



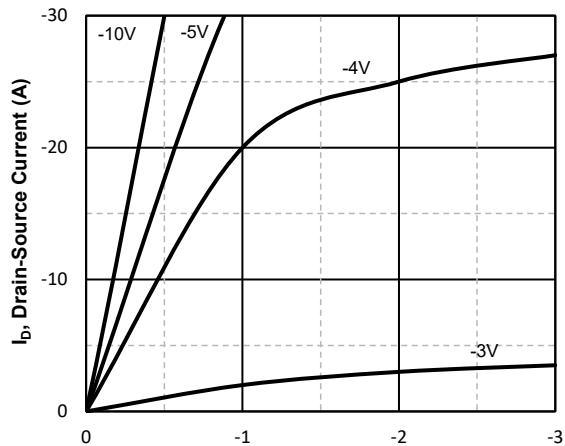
Halogen-Free

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	-9	$T_c=25^\circ\text{C}$	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested	-38	$T_c=25^\circ\text{C}$	A
I_D	Continuous Drain Current	-9	$T_c=25^\circ\text{C}$	A
P_D	Maximum Power Dissipation	1.7	$T_c=25^\circ\text{C}$	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	315	°C/W	

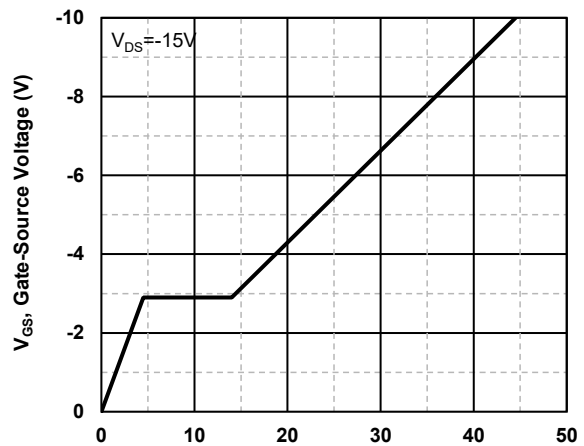
Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MLSK3009P	SOT-23-3L	3009A	3,000	45,000	180,000	7"reel

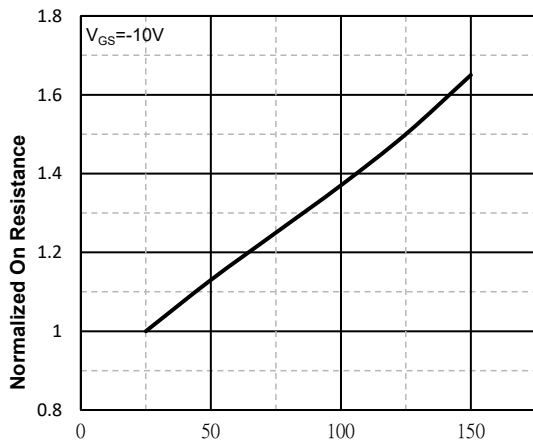
Electrical Characteristics (T_J=25 °C unless otherwise noted)						
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
BV _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-30	--	--	V
I _{DSS}	Zero Gate Voltage 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	-1.2	-1.5	-2.2	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =-10V, I _D =-9A	--	15	18	mΩ
		V _{GS} =-4.5V, I _D =-7A	--	20	25	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C _{ISS}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz	--	2400	--	pF
C _{OSS}	Output Capacitance		--	315	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	260	--	pF
Switching Characteristics						
Q _g	Total Gate Charge	V _{DD} =-15V, I _D =-15A, V _{GS} =-10V	--	44.5	--	nC
Q _{gs}	Gate Source Charge		--	4.5	--	nC
Q _{gd}	Gate Drain Charge		--	10	--	nC
t _{d(on)}	Turn-on Delay Time	V _{DD} =-15V, I _D =-15A, V _{GS} =-10V, R _G =2.5Ω	--	9	--	nS
t _r	Turn-on Rise Time		--	8	--	nS
t _{d(off)}	Turn-Off Delay Time		--	28	--	nS
t _f	Turn-Off Fall Time		--	10	--	nS
Source- Drain Diode Characteristics						
V _{SD}	Forward on voltage	T _J =25°C, I _S =-9A	--	--	-1.2	V

Typical Operating Characteristics


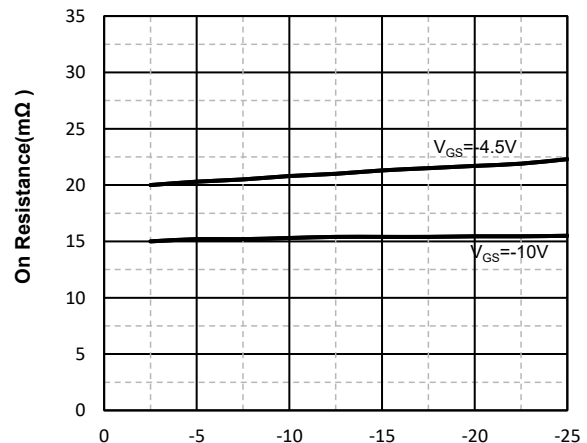
V_{DS} , Drain-Source Voltage (V)
Fig1. Typical Output Characteristics



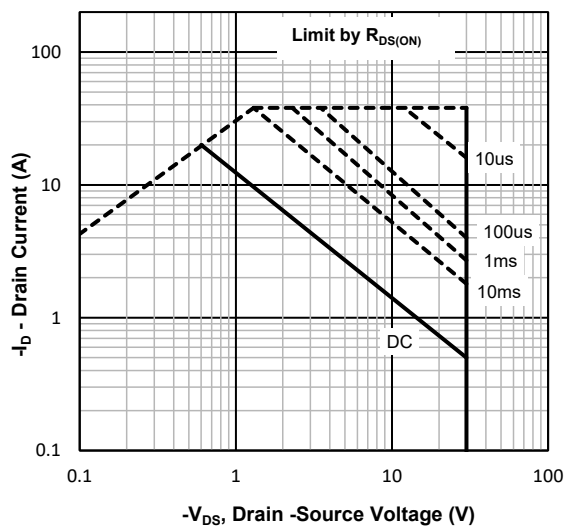
Q_g -Total Gate Charge (nC)
Fig2. Typical Gate Charge Vs. Gate-Source Voltage



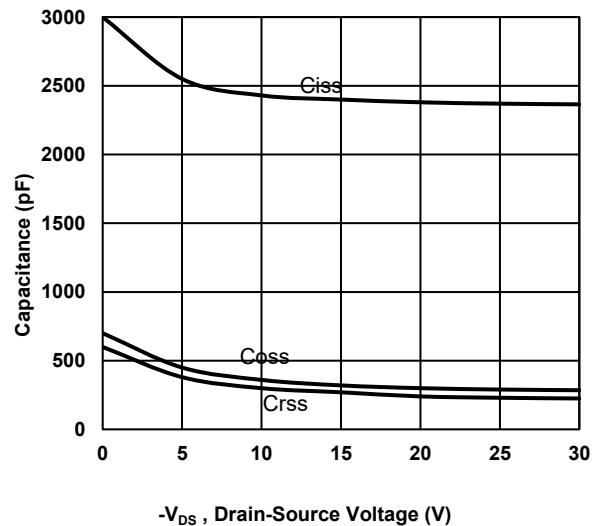
T_j - Junction Temperature ($^{\circ}C$)
Fig3. Normalized On-Resistance Vs. Temperature



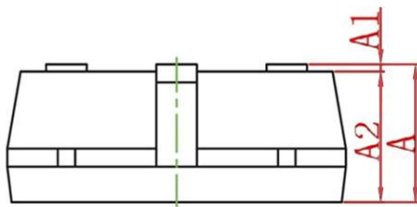
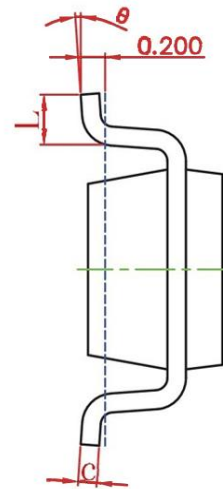
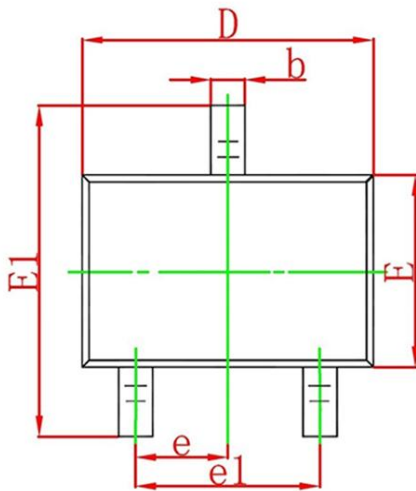
I_D , Drain-Source Current (A)
Fig4. On-Resistance Vs. Drain-Source Current



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



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

SOT-23-3L Package information


Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.042	0.050
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.042	0.046
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.112	0.120
E	1.500	1.700	0.060	0.068
E1	2.650	2.950	0.106	0.118
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°