

Features

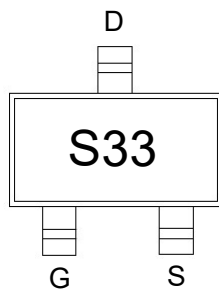
- Trench Power LV MOSFET technology
- High Density Cell Design for Low $R_{DS(ON)}$
- High Speed switching

Product Summary

V_{DS}	$R_{DS(ON)}$ MAX	I_D MAX
-15V	28mΩ@-4.5V	-6A
	40mΩ@-2.5V	

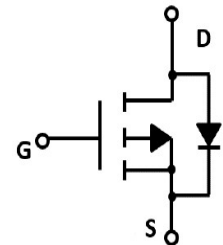
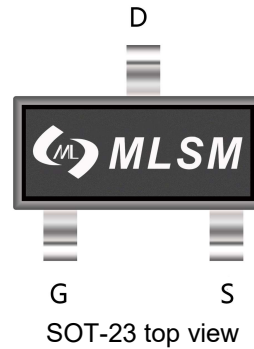
Application

- Battery protection
- Load switch
- Power management



S33: Device code

Marking and pin assignment



Schematic diagram



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		-15	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	Tc=25°C	-6	A

Mounted on Large Heat Sink

I_{DM}	Pulse Drain Current Tested	$T_c=25^\circ\text{C}$	-25	A
I_D	Continuous Drain Current	$T_c=25^\circ\text{C}$	-6	A
P_D	Maximum Power Dissipation	$T_c=25^\circ\text{C}$	1.2	W
$R_{\theta JA}$	Thermal Resistance Junction-to-Ambient		105	°C/W

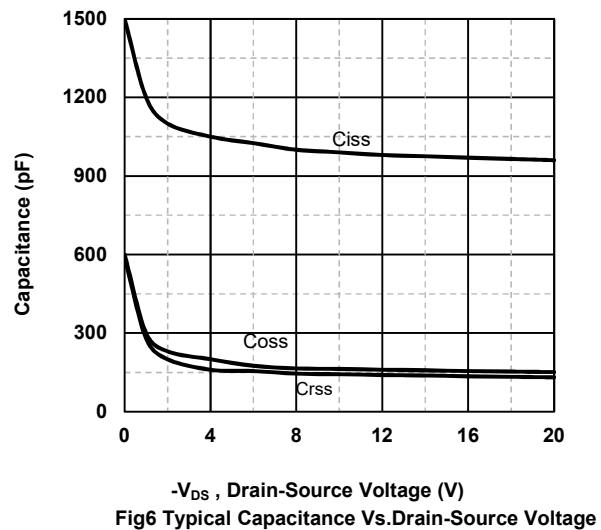
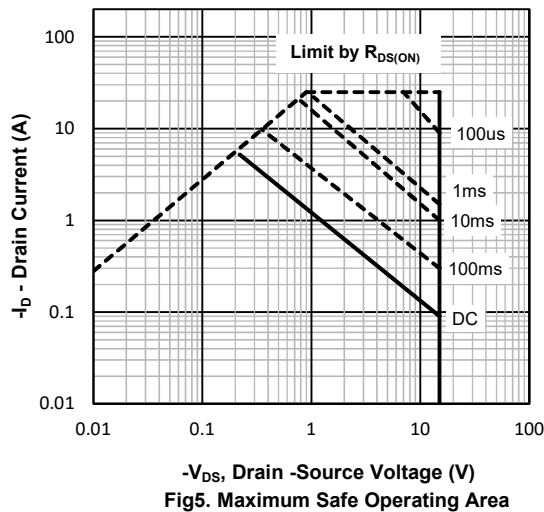
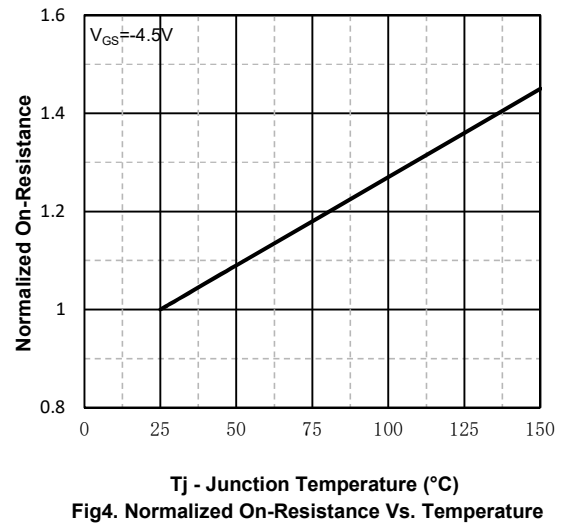
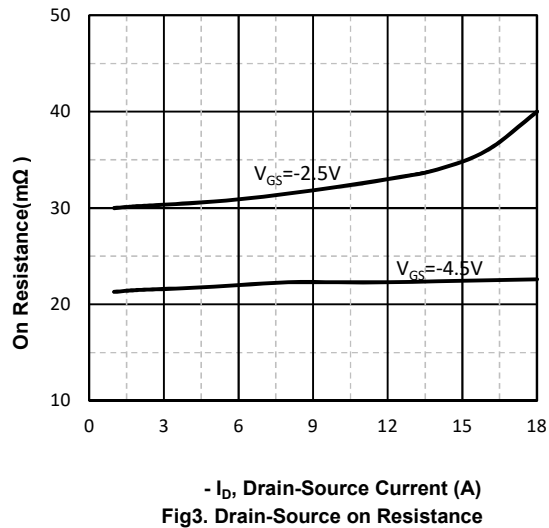
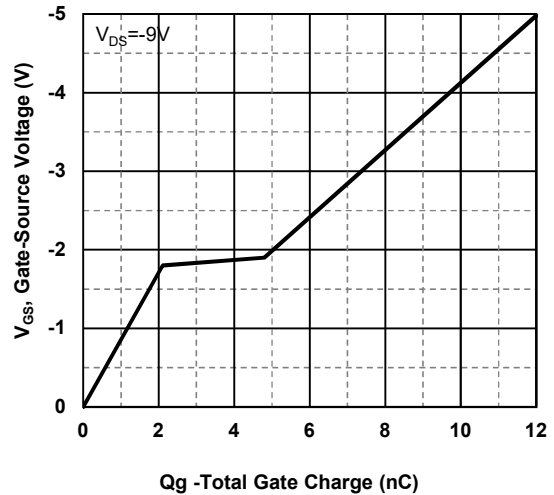
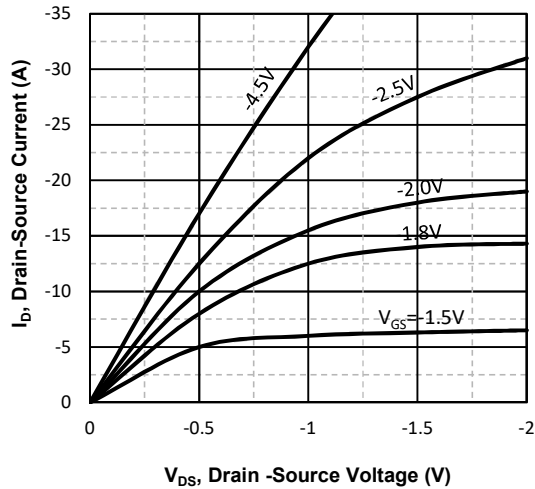
Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MLS2333	SOT-23	S33	3,000	45,000	180,000	7"reel

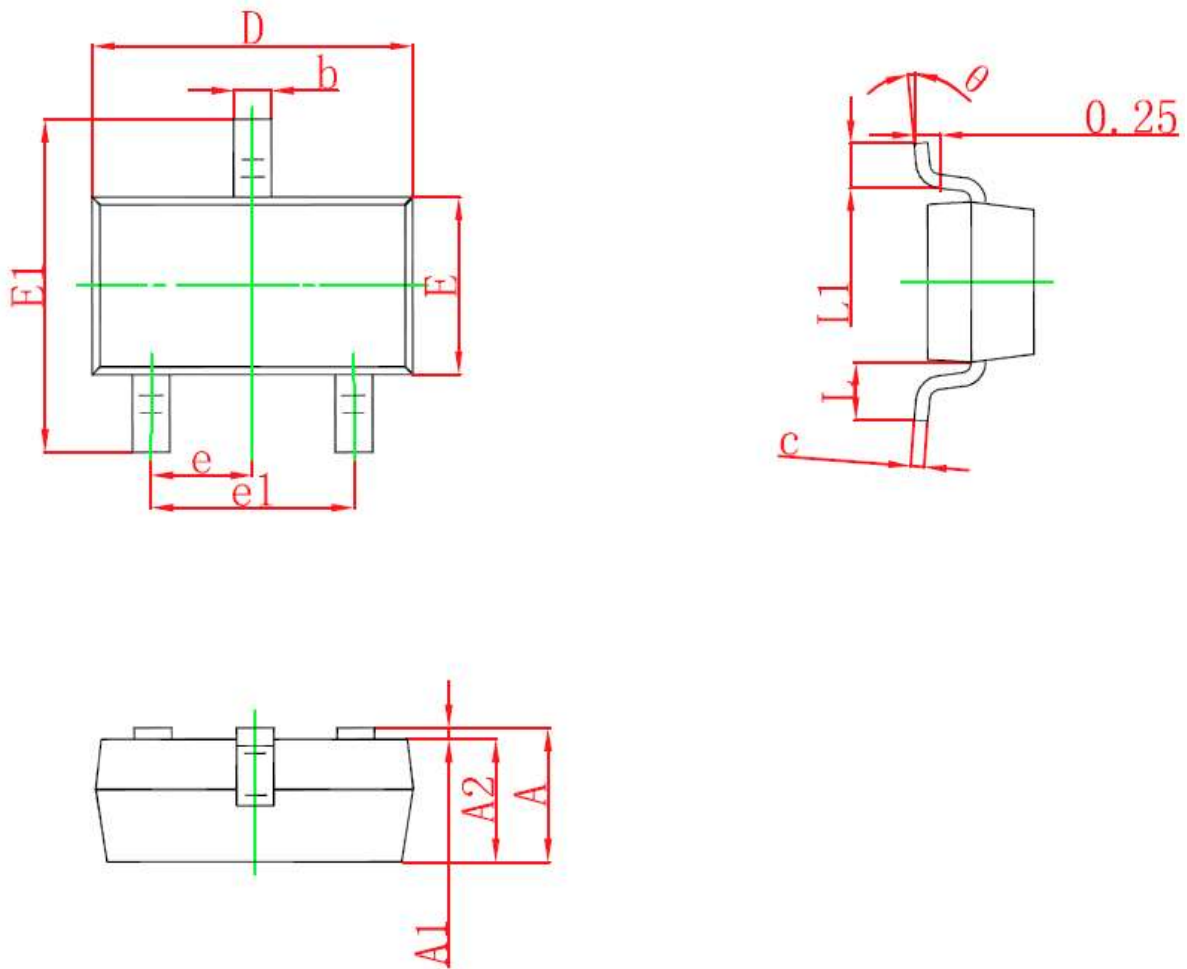
Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
BV(BR)DSS	Drain-Source Breakdown Voltage	VGS=0V, ID=-250μA	-15	–	–	V
IDSS	Zero Gate Voltage Drain Current	VDS=-15V, VGS=0V	--	–	-1	μA
IGSS	Gate-Body Leakage Current	VGS=±8V, VDS=0V	--	–	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS, ID=-250μA	-0.4	-0.7	-1.0	V
RDS(on)	Drain-Source On-State Resistance	VGS=-4.5V, ID=-5.1A	--	23	28	mΩ
		VGS=-2.5V, ID=-4.5A	--	33	40	mΩ
		VGS=-1.8V, ID=-2.0A	--	48	63	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
CISS	Input Capacitance	VDS=-9V, VGS=0V, f=1MHz	–	1015	–	pF
COSS	Output Capacitance		–	138	–	pF
CRSS	Reverse Transfer Capacitance		–	105	–	pF
Switching Characteristics						
Qg	Total Gate Charge	VDS=-9V, ID=-5.6A, VGS=-4.5V	–	11.3	–	nC
Qgs	Gate Source Charge		–	2.3	–	nC
Qgd	Gate Drain Charge		–	2.4	–	nC
td(on)	Turn-on Delay Time	VDD=-9V, ID=-1A, VGS=-4.5V, RG=2.5Ω	--	8.5	–	nS
tr	Turn-on Rise Time		–	35.5	–	nS
td(off)	Turn-Off Delay Time		–	78	–	nS
tf	Turn-Off Fall Time		–	58	–	nS
Source- Drain Diode Characteristics						
VSD	Forward on voltage	TJ=25°C, Is=-6A	--	–	-1.2	V

Typical Operating Characteristics



SOT-23 Package information



Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E1	2.250	2.550	0.088	0.100
E	1.200	1.400	0.047	0.055
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°