

Features

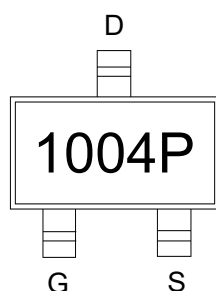
- High density cell design for Low $R_{DS(ON)}$
- High Speed switching
- Excellent stability and uniformity

Product Summary

V_{DS}	$R_{DS(ON)}$ TYP	I_D
-100V	220mΩ@-10V	-4A
	240mΩ@-4.5V	

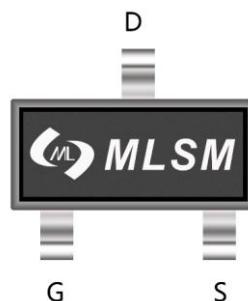
Application

- Battery protection
- Load switch
- Power management

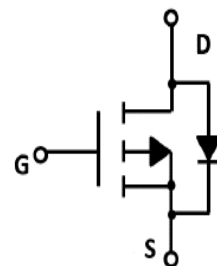


1004P: Device code

Marking and pin assignment



SOT-23 top view



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	-100	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	Tc=25°C -4	A

Mounted on Large Heat Sink

I_{DM}	Pulse Drain Current Tested	Tc=25°C -10	A
I_D	Continuous Drain Current	Tc=25°C -4	A
P_D	Maximum Power Dissipation	Tc=25°C 1.8	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
MLS1004P	SOT-23	1004P	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	-100	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-100V, 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	-2.5	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =-10V, I _D =-4A	--	220	350	mΩ
		V _{GS} =-4.5V, I _D =-2A	--	240	450	mΩ

Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)

C _{ISS}	Input Capacitance	V _{DS} =-50V, V _{GS} =0V, f=1MHz	--	740	--	pF
C _{OSS}	Output Capacitance		--	30	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	20.5	--	pF
Q _g	Total Gate Charge	V _{DS} =-50V, I _D =-6A, V _{GS} =-10V	--	15	--	nC
Q _{gs}	Gate Source Charge		--	2	--	nC
Q _{gd}	Gate Drain Charge		--	2.5	--	nC

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t _{d(on)}	Turn-on Delay Time	V _{DS} =-50V, I _D =-3A, V _{GS} =-10V, R _G =3Ω	--	8	--	nS
t _r	Turn-on Rise Time		--	6.5	--	nS
t _{d(off)}	Turn-Off Delay Time		--	29	--	nS
t _f	Turn-Off Fall Time		--	8.5	--	nS

Source- Drain Diode Characteristics

V _{SD}	Forward on voltage	T _J =25°C, I _S =-4A	--	--	-1.2	V
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Typical Operating Characteristics

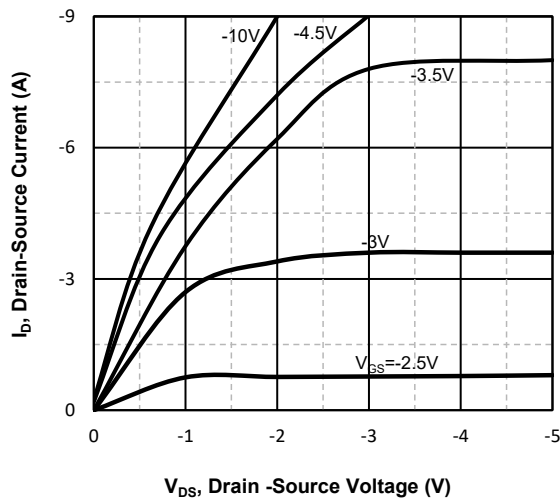


Fig1. Typical Output Characteristics

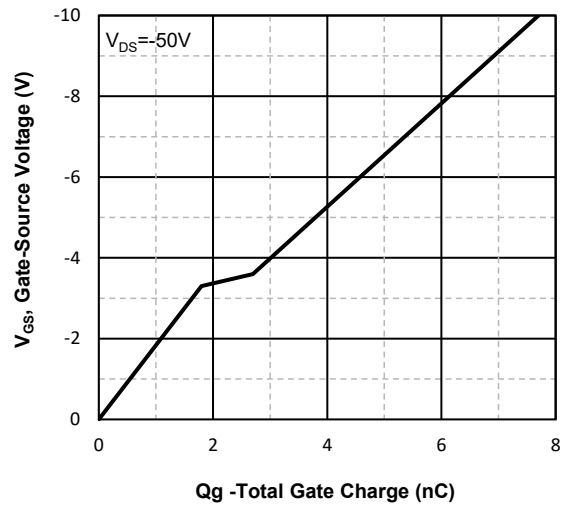


Fig2. Typical Gate Charge Vs. Gate-Source Voltage

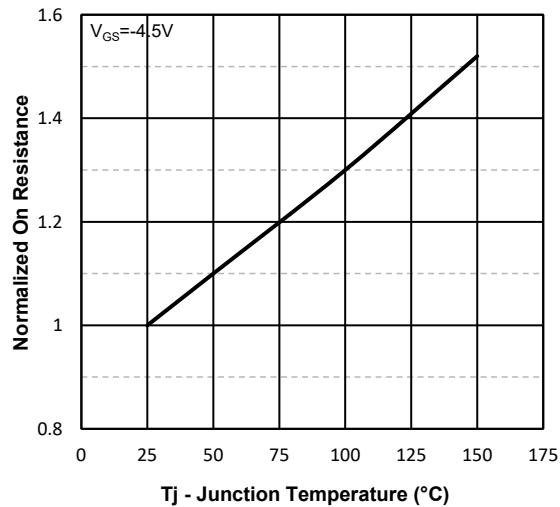


Fig3. Normalized On-Resistance Vs. Temperature

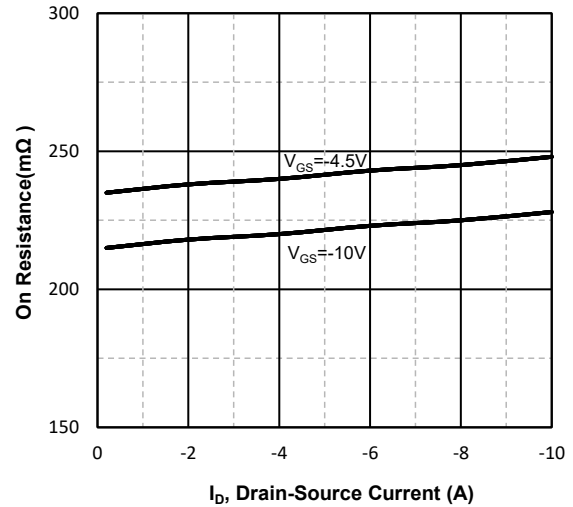


Fig4. On-Resistance Vs. Drain-Source Current

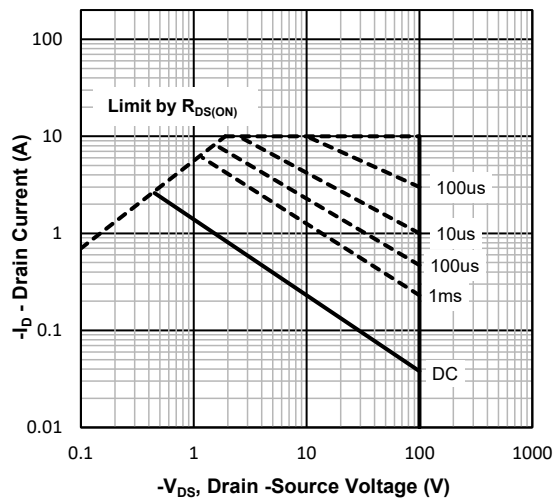


Fig5. Maximum Safe Operating Area

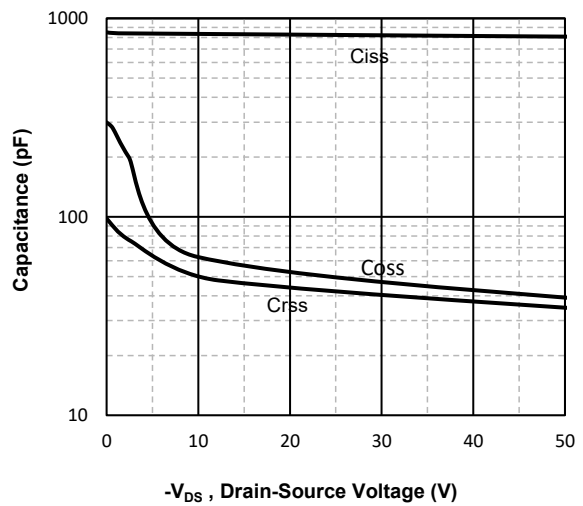
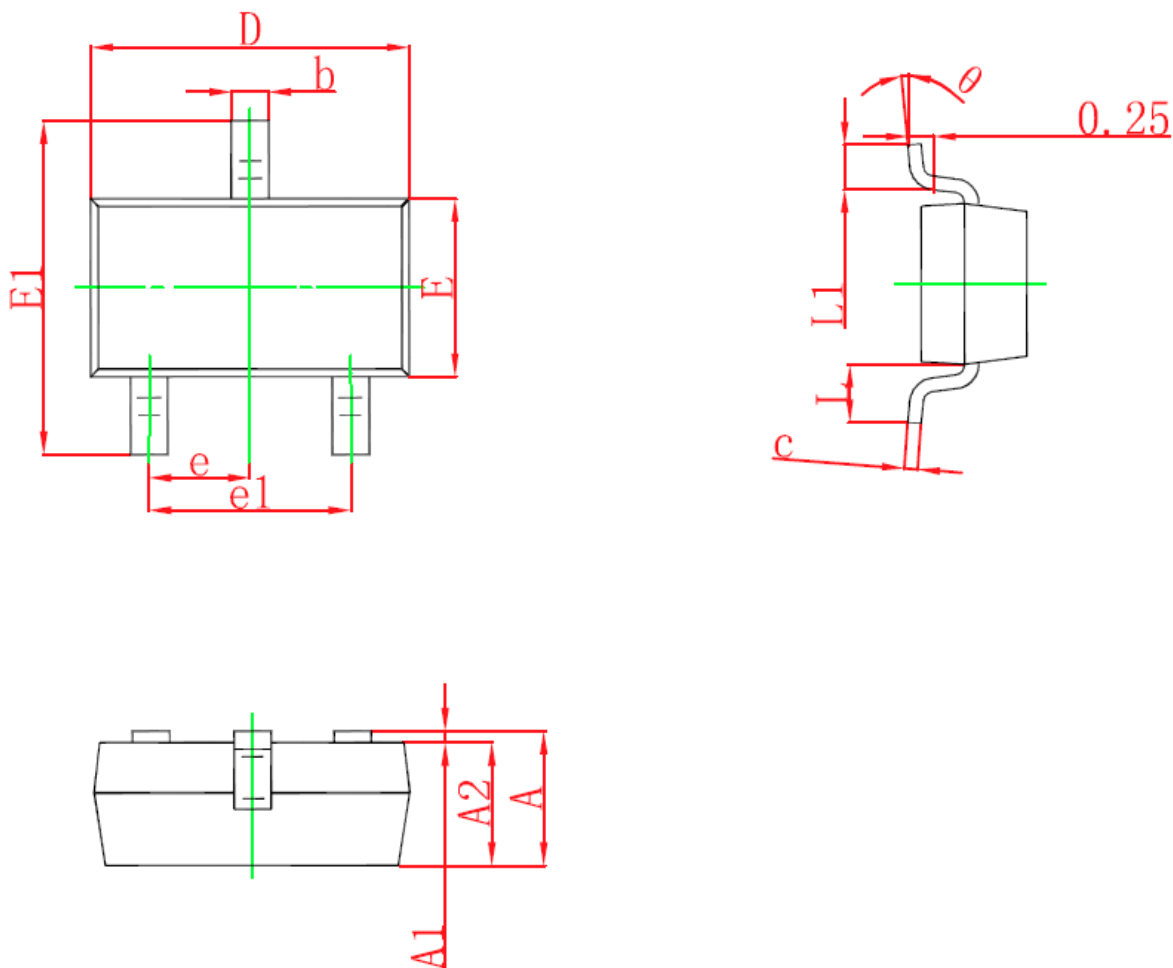


Fig6 Typical Capacitance Vs. Drain-Source

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
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.550REF		0.022REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°