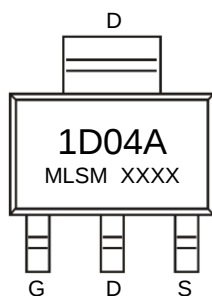


Features

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

Application

- CoBattery protection
- Load switch
- Power management



Marking and pin assignment

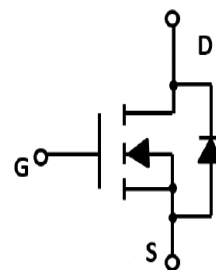
1D04A: Device code
XXXX: Code

Product Summary

V_{DS}	$R_{DS(ON)}$ TYP	I_D
130V	220mΩ@10V	4A
	245mΩ@4.5V	



SOT-223 top view



Schematic diagram



Pb-Free



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	130	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	$T_C=25^\circ\text{C}$ 4	A

Mounted on Large Heat Sink

I_{DM}	Pulse Drain Current Tested	$T_C=25^\circ\text{C}$ 15	A
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$ 4	A
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 1.4	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	150	°C/W

Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MT1D04A	SOT-223	1D04A	2,500	5,000	35,000	13"reel

Electrical Characteristics (TJ=25℃ unless otherwise noted)						
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ TJ = 25℃ (unless otherwise stated)						
BV _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	130	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =130V, 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	1.8	2.5	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =4A	--	220	270	mΩ
		V _{GS} =4.5V, I _D =3A	--	245	300	mΩ
Dynamic Electrical Characteristics @ TJ = 25℃ (unless otherwise stated)						
C _{ISS}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, f=1MHz	--	124	--	pF
C _{OSS}	Output Capacitance		--	33	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	4.3	--	pF
Switching Characteristics						
Q _g	Total Gate Charge	V _{DS} =50V, I _D =2A, V _{GS} =10V	--	2.3	--	nC
Q _{gs}	Gate Source Charge		--	0.4	--	nC
Q _{gd}	Gate Drain Charge		--	0.7	--	nC
t _{d(on)}	Turn-on Delay Time	V _{DS} =50V, I _D =2A, V _{GS} =10V, R _G =2Ω	--	8.3	--	nS
t _r	Turn-on Rise Time		--	1.5	--	nS
t _{d(off)}	Turn-Off Delay Time		--	6.1	--	nS
t _f	Turn-Off Fall Time		--	0.72	--	nS
Source- Drain Diode Characteristics						
V _{SD}	Forward on voltage	Tj=25℃, Is=4A	--	--	1.2	V

Typical Operating Characteristics

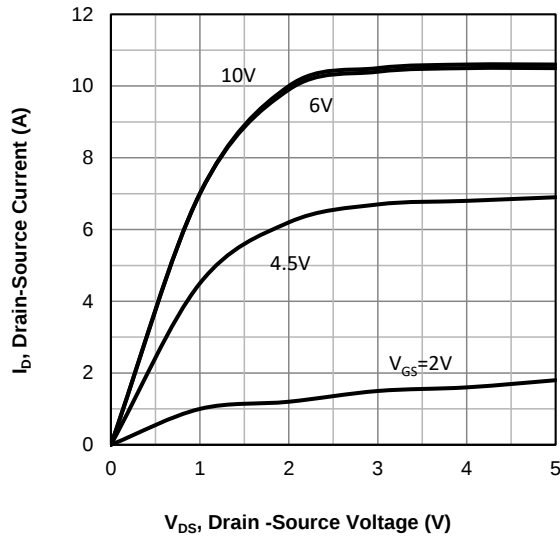


Fig1. Typical Output Characteristics

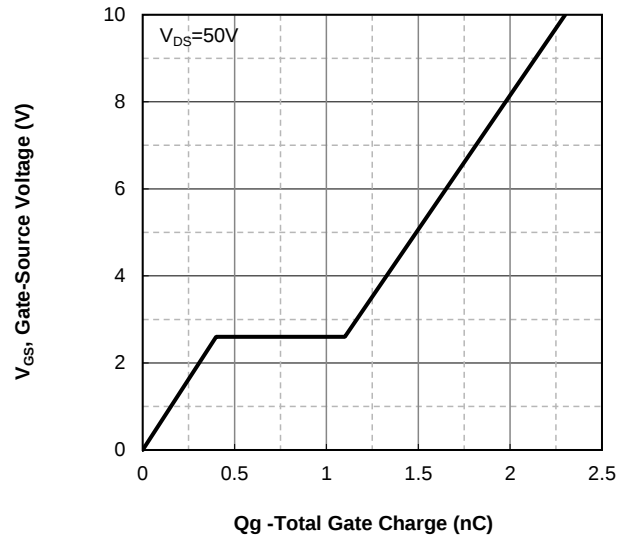


Fig2. Typical Gate Charge Vs. Gate-Source Voltage

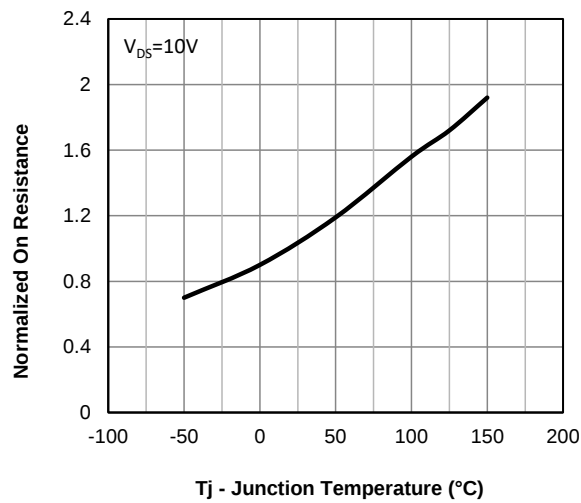


Fig3. Normalized On-Resistance Vs. Temperature

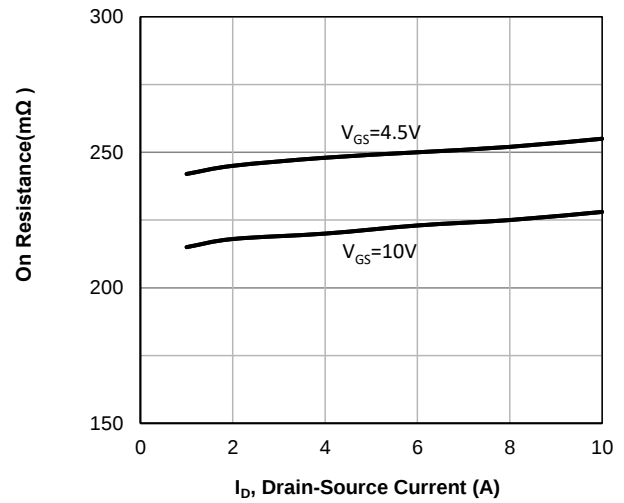


Fig4. On-Resistance Vs. Drain-Source Current

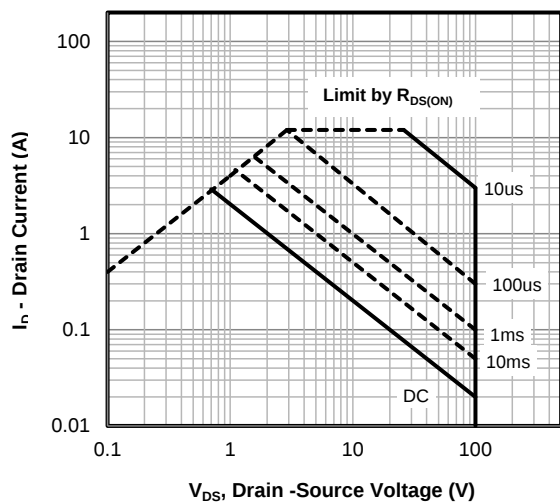


Fig5. Maximum Safe Operating Area

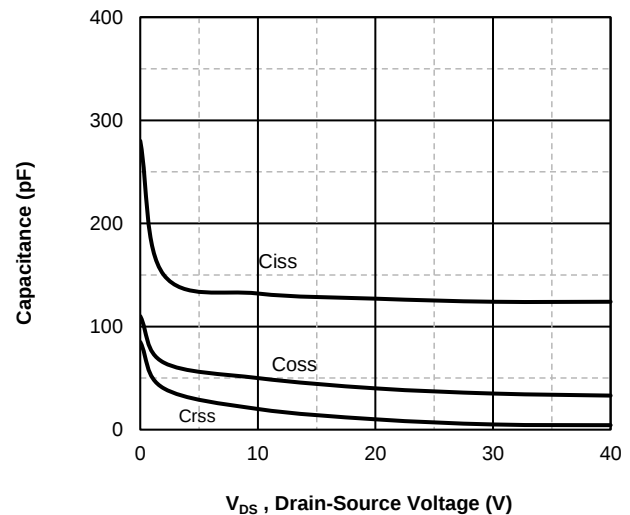
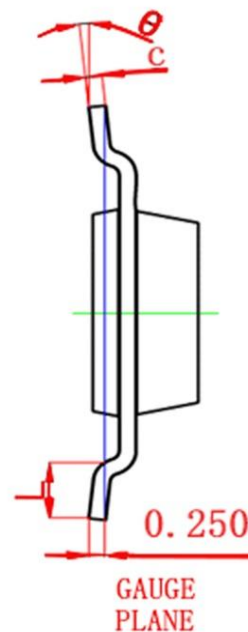
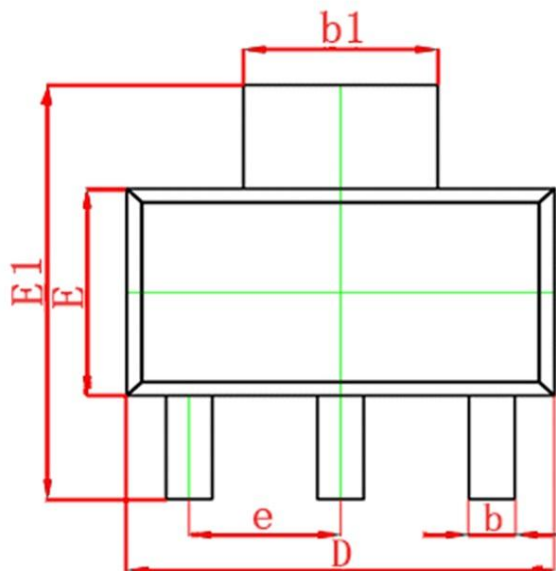


Fig6 Typical Capacitance Vs. Drain-Source Voltage

SOT-223 Package information



Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	--	1.800	--	0.071
A1	0.020	0.100	0.001	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.840	0.026	0.033
b1	2.900	3.100	0.114	0.122
c	0.230	0.350	0.009	0.014
D	6.300	6.700	0.248	0.264
E	3.300	3.700	0.130	0.146
E1	6.700	7.300	0.264	0.287
e	2.300(BSC)		0.091(BSC)	
L	0.750	--	0.030	--
θ	0°	10°	0°	10°