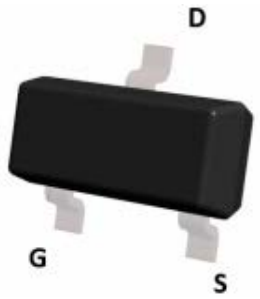
LM3400A

30V N-Channel Enhancement Mode MOSFET

Description

The LM3400A uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

Dimensions SOT-23

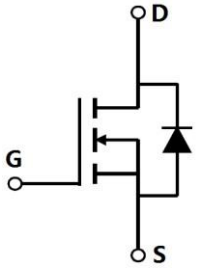


General Features

- V_{DS} = 30V I_D =5.8A

  $R_{DS(ON)}$ < 28mΩ @ V_{GS}=10V

Pin Configuration



Application

- Lithium battery protection
- Wireless impact
- Mobile phone fast charging

Package Marking and Ordering Information

Device	Device Marking	Device Package	Reel Size	Tape width	Quantity
LM3400A	A09T	SOT-23	-	-	3000 units

Absolute Maximum Ratings (TC=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	30	V
VGS	Gate-Source Voltage	±12	V
I_D@T_A=25℃	Continuous Drain Current	5.8	A
I_D@T_A=70℃	Continuous Drain Current	4.9	A
IDM	Pulsed Drain Current[2]	20	A
P_D@T_A=25℃	Total Power Dissipation[3]	1	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
RθJA	Thermal Resistance Junction-ambient [1]	125	℃/W
RθJA	Thermal Resistance Junction-Ambient [1] (t ≤10s)	85	℃/W

Electrical Characteristics (TJ=25℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	30	33	---	V
△BVDSS/△TJ	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.029	---	V/℃
RDS(ON)	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=5.8A	---	20	28	mΩ
RDS(ON)	Static Drain-Source On-Resistance[2]	V_{GS}=4.5V , I_D=5A	---	24	32	mΩ
RDS(ON)	Static Drain-Source On-Resistance[2]	V_{GS}=2.5V , I_D=4A	---	31	55	mΩ
VGS(th)	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	0.5	0.85	1.2	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-2.82	---	mV/℃
IDSS	Drain-Source Leakage Current	V_{DS}=24V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=24V , V_{GS}=0V , T_J=55℃	---	---	5	
IGSS	Gate-Source Leakage Current	V_{GS}=±12V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=5A	---	25	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	1.5	---	Ω
Q_g	Total Gate Charge (4.5V)	V_{DS}=15V , V_{GS}=4.5V , I_D=5.8A	---	11.5	---	nC
Q_{gs}	Gate-Source Charge		---	1.6	---	
Q_{gd}	Gate-Drain Charge		---	2.9	---	
Td(on)	Turn-On Delay Time	V_{DD}=15V , V_{GS}=10V , R_G=3Ω I_D=5A	---	5	---	ns
T_r	Rise Time		---	47.	---	
Td(off)	Turn-Off Delay Time		---	26	---	
T_f	Fall Time		---	8	---	
C_{iss}	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	860	---	pF
Coss	Output Capacitance		---	84	---	
Crss	Reverse Transfer Capacitance		---	70	---	
I_S	Continuous Source Current[1,4]	V_G=V_D=0V , Force Current	---	---	5.8	A
VSD	Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.2	V

Note :

1、.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

2、The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3、The power dissipation is limited by 150℃ junction temperature

4、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Electrical and Thermal Characteristics

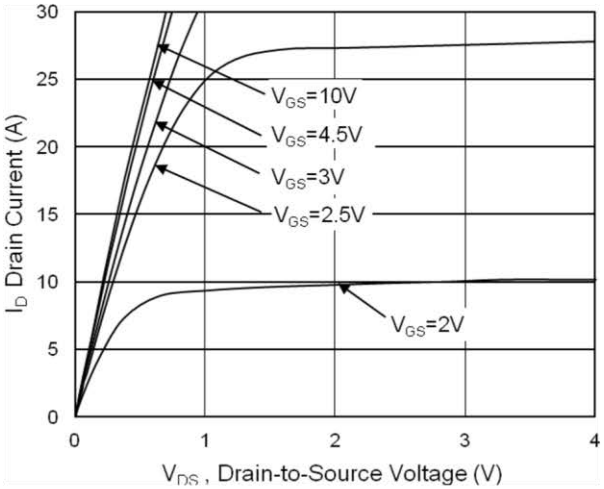


Fig.1 Typical Output Characteristics

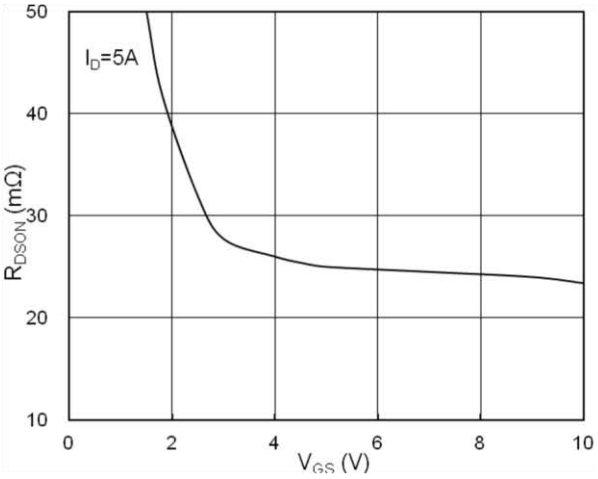


Fig.2 On-Resistance vs. Gate-Source

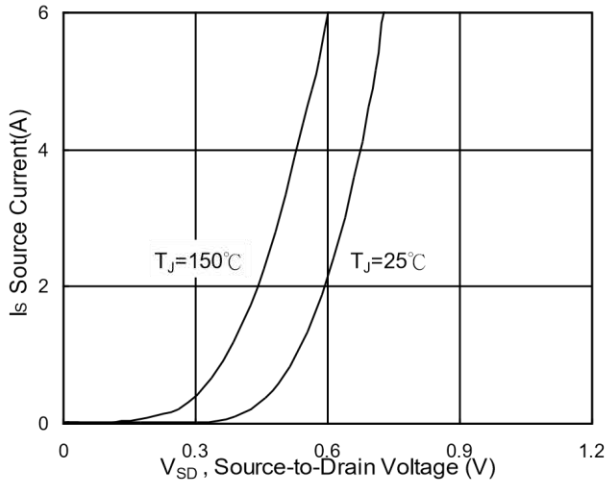


Fig.3 Forward Characteristics Of Reverse

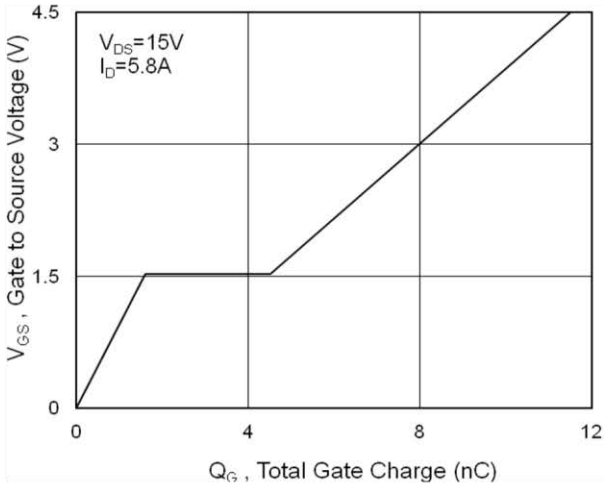


Fig.4 Gate-Charge Characteristics

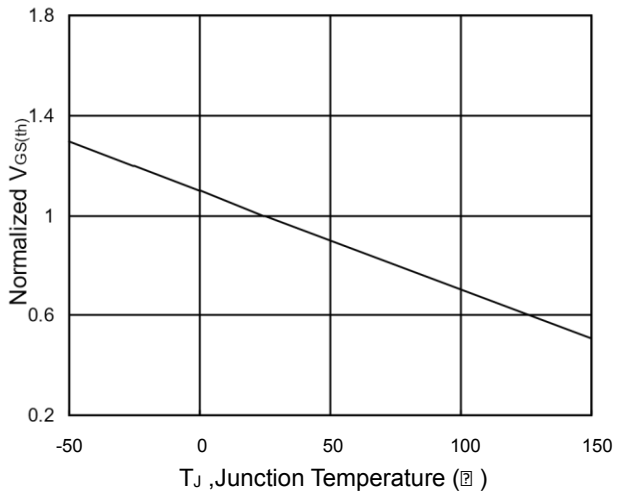


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

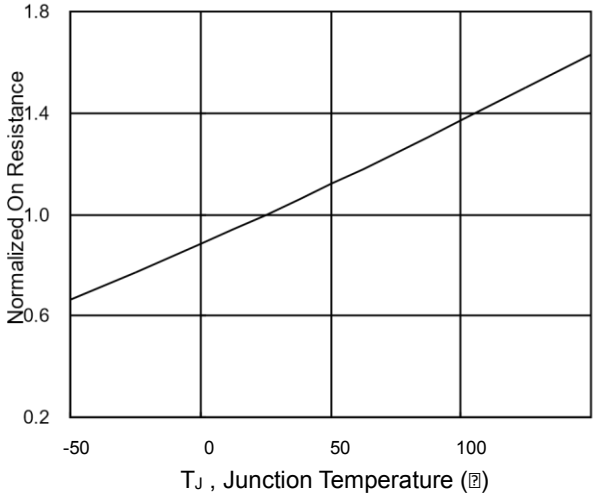


Fig.6 Normalized R_{DSON} vs. T_J

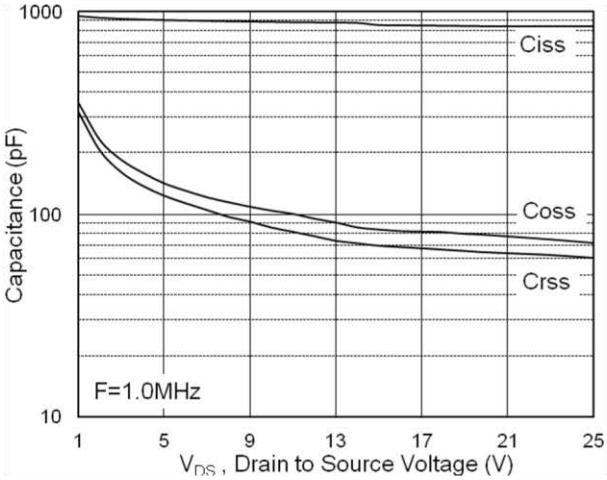


Fig.7 Capacitance

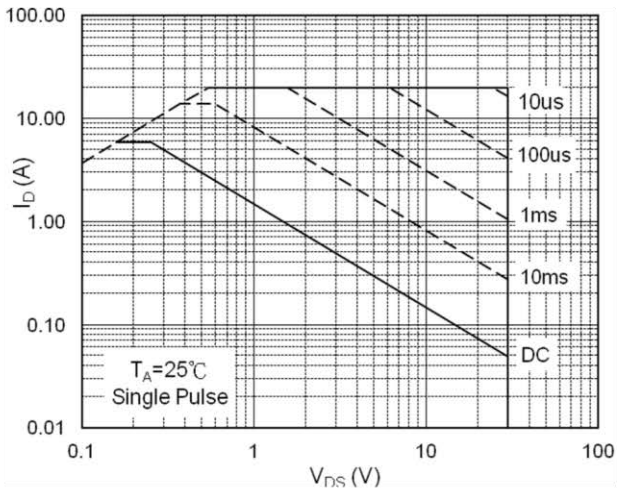


Fig.8 Safe Operating Area

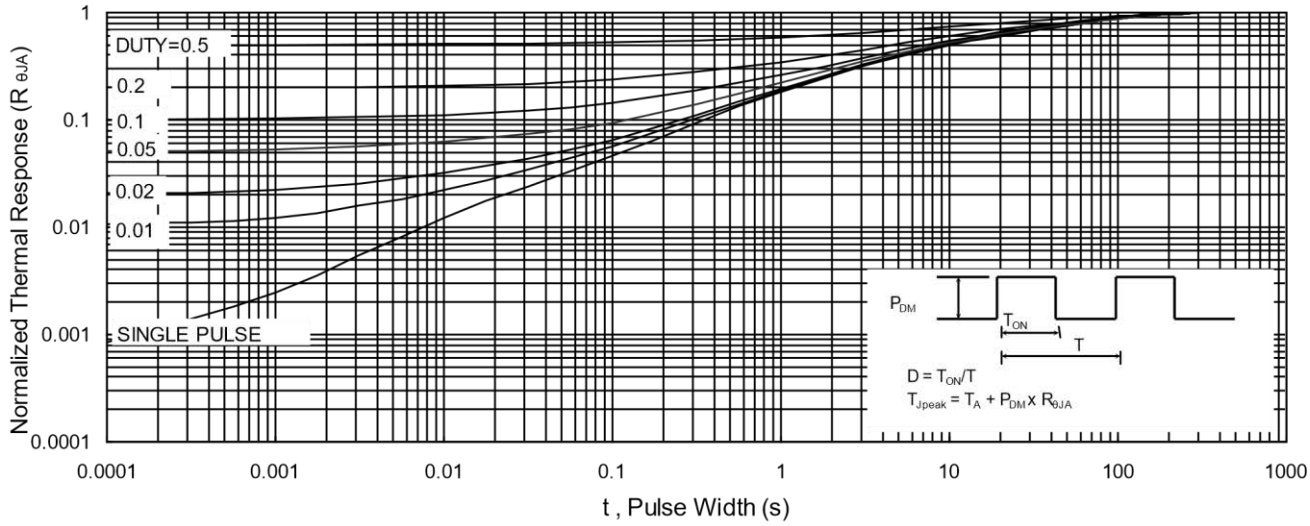


Fig.9 Normalized Maximum Transient Thermal Impedance

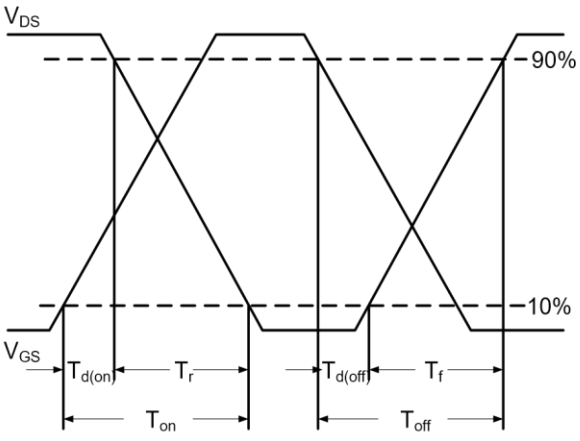


Fig.10 Switching Time Waveform

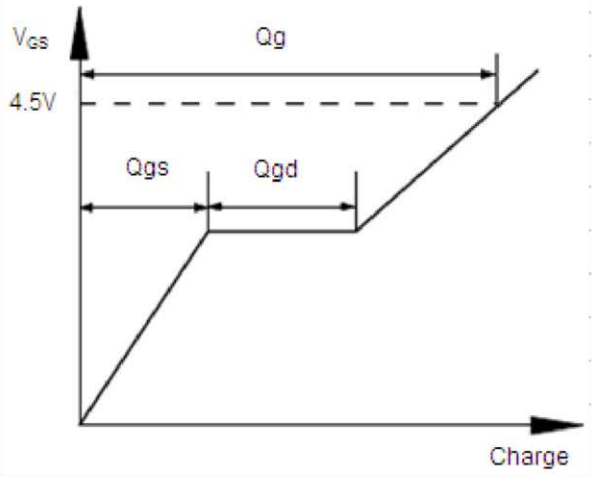
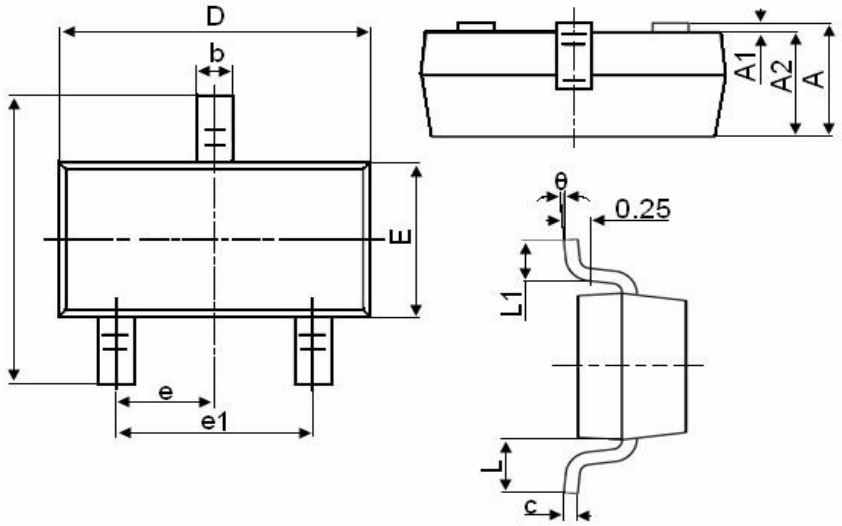


Fig.11 Gate Charge Waveform

Package Mechanical Data-SOT-23



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

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