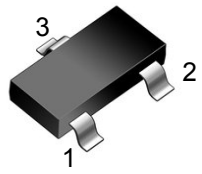
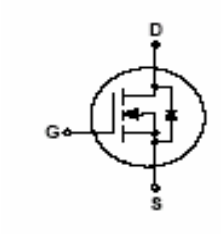
SOT-23





MARKING: J1.Y.

Features

- *Low $R_{DS(on)}$ @V_{GS}=10V*
- *3.3V Logic Level Control*
- *N Channel SOT23 Package*
- *Pb−Free, RoHS Compliant*

Applications

- *LED Lighting Application,*
- *ON/OFF switch*
- *Networking*

Summary of Packing Options

Package	Packing Description	Packing Quantity	Industry Standard
SOT-23	Tape/Reel,7" reel	3000	EIA-481-1

Maximum Ratings & Thermal Characteristics

(Ratings at 25℃ ambient temperature unless otherwise specified.)

Symbol	Parameter		Rating	Unit
V_{GS}	Gate-Source Voltage		±12	V
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		50	V
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-50 to 150	°C
I_{DM}	Pulse Drain Current Tested①	T_A =25°C	1.8	A
I_D	Continuous Drain Current	T_A =25°C	0.5	A
		T_A =70°C	0.4	
P_D	Maximum Power Dissipation	T_A =25°C	0.3	W
		T_A =70°C	0.2	
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		400	°C/W

Notes: ① Pulse width limited by maximum allowable junction temperature

Electrical Characteristics

(Ratings at 25℃ ambient temperature unless otherwise specified).

Symbol	Parameter	Condition	Min	Typ	Max	Unit
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=250μA	50	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current(T_A=25℃)	V_{DS}=50V, V_{GS}=0V	--	--	1	μA
	Zero Gate Voltage Drain Current(T_A=125℃)	V_{DS}=40V, V_{GS}=0V	--	--	100	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±12V, V_{DS}=0V	--	--	±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	0.6	1.0	1.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=10V, I_D=0.5A	--	1.0	2	Ω
		V_{GS}=4.5V, I_D=0.3A	--	1.2	2.5	Ω
		V_{GS}=3.3V, I_D=0.2A	--	1.6	4	Ω

Notes: ②Pulse test ; Pulse width≤300μs, duty cycle≤2%.

Electrical Characteristics

(Ratings at 25℃ ambient temperature unless otherwise specified).

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Dynamic Electrical Characteristics						
C_{iss}	Input Capacitance	V_{DS}=30V, V_{GS}=0V, f=1MHz	--	23	--	pF
C_{oss}	Output Capacitance		--	3.8	--	pF
C_{rss}	Reverse Transfer Capacitance		--	1.5	--	pF
Q_g	Total Gate Charge	V_{DS}=30V I_D=0.5A, V_{GS}=10V	--	0.91	--	nC
Q_{gs}	Gate Source Charge		--	0.18	--	nC
Q_{gd}	Gate Drain Charge		--	0.3	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn on Delay Time	V_{DD}=30V, I_D=0.3A, R_G=3.3Ω, V_{GS}=10V	--	6	--	ns
t_r	Turn on Rise Time		--	3.5	--	ns
$t_{d(off)}$	Turn Off Delay Time		--	20	--	ns
t_f	Turn Off Fall Time		--	5.9	--	ns
Source Drain Diode Characteristics						
I_{SD}	Source drain current(Body Diode)	T_A=25℃	--	--	0.2	A
V_{SD}	Forward on voltage②	Tj=25℃, I_{SD}=0.5A, V_{GS}=0V	--	0.78	1.2	V

Ratings and Characteristic Curves

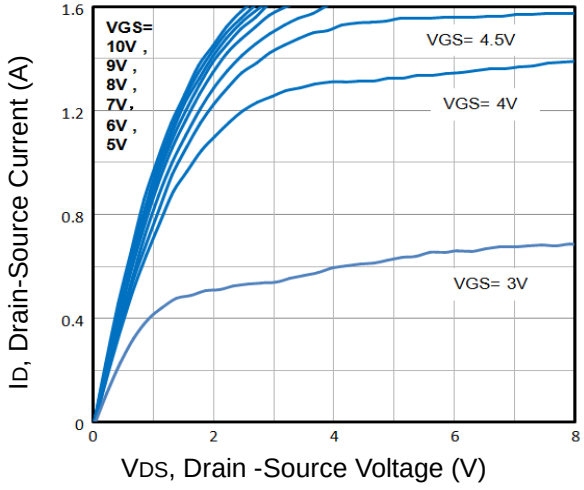


Fig1. Typical Output Characteristics

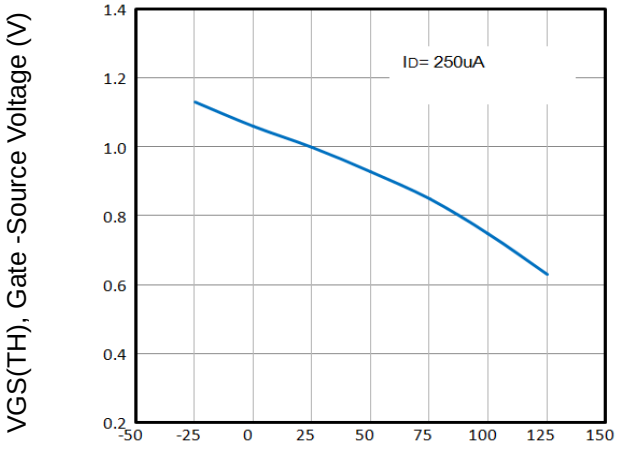


Fig2. Normalized Threshold Voltage Vs. Temperature

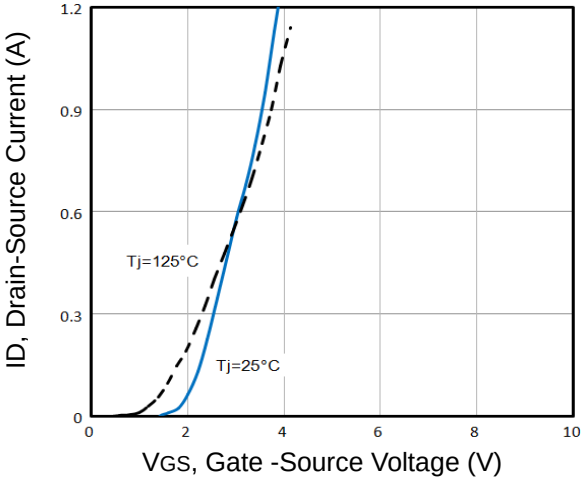


Fig3. Typical Transfer Characteristics

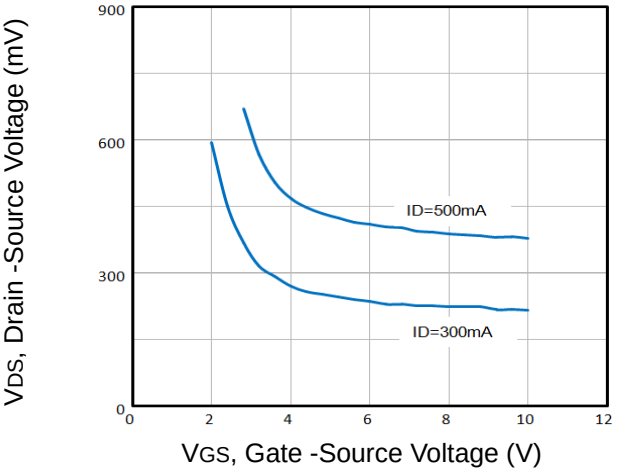


Fig4. Drain -Source Voltage vs Gate -Source Voltage

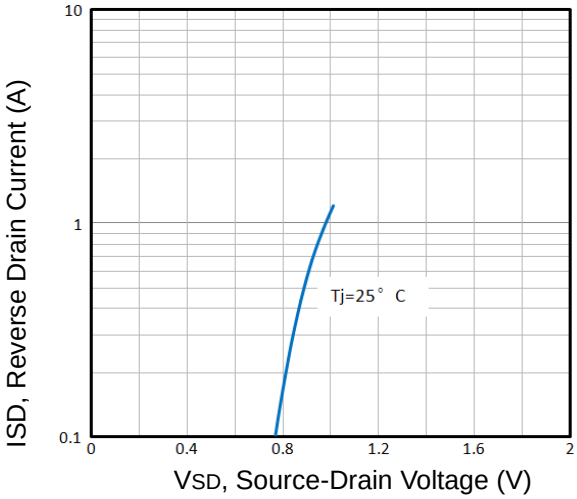


Fig5. Typical Source-Drain Diode Forward Voltage

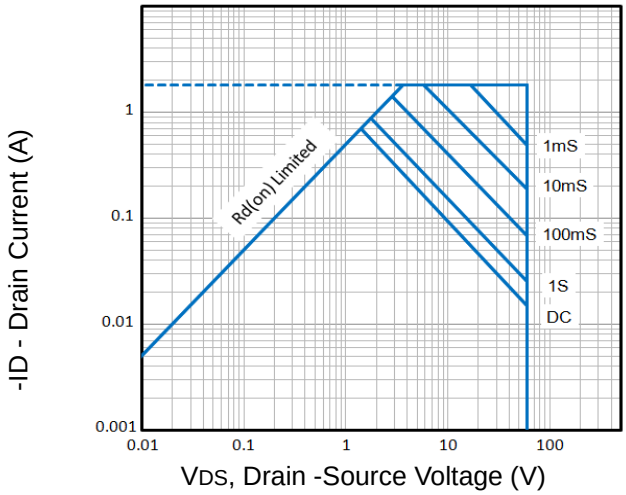


Fig6. Maximum Safe Operating Area

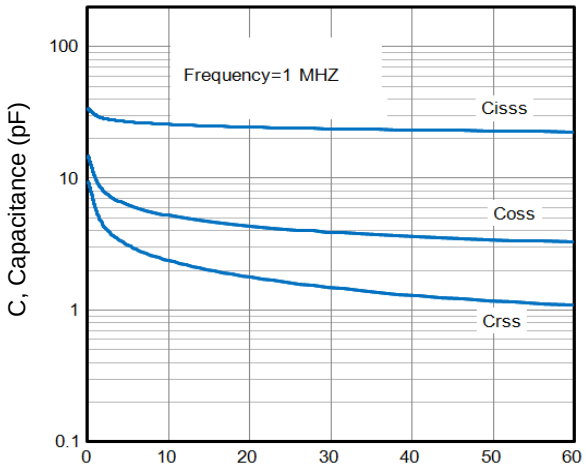


Fig7. Typical Capacitance Vs. Drain-Source Voltage

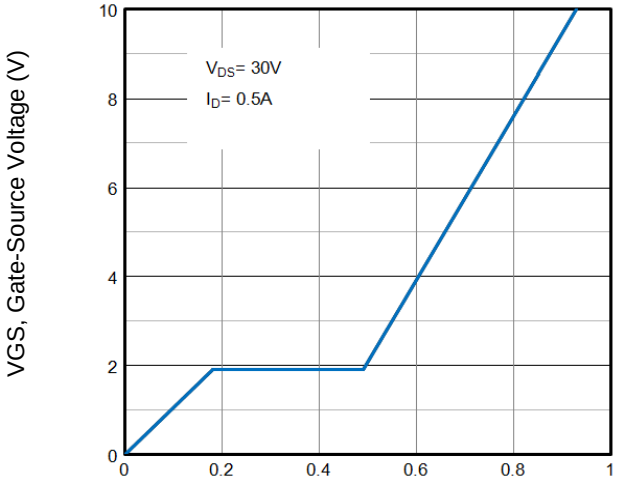
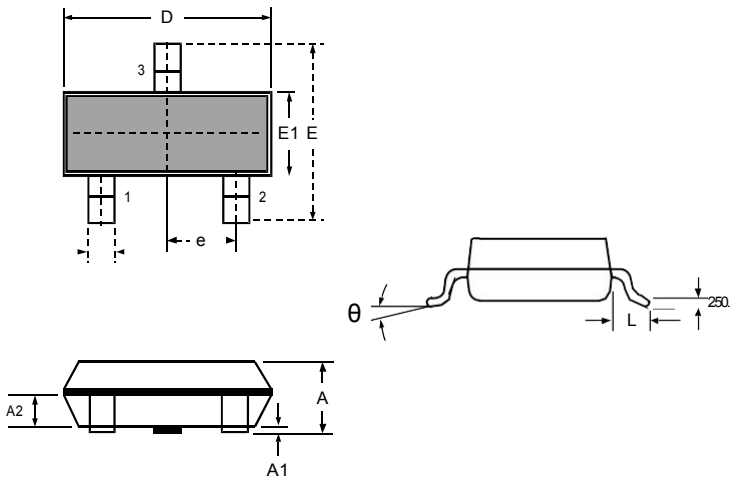


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

Package Outline Dimensions: SOT-23



DIMENSIONS

SYMBOL	MILLIMETER		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
D	2.800	3.000	0.110	0.118
b	0.300	0.500	0.012	0.020
E	2.250	2.550	0.089	0.100
E1	1.200	1.400	0.047	0.055
e	0.950 BSC		0.037 BSC	
L	0.300	0.500	0.012	0.020
θ	0	8°	0	8°