P-Channel 60V(D-S) MOSFET

Product summary		
V_{DS}	-60	V
$R_{DS(ON)}$(at V_{GS}=-10V) Typ.	150	mΩ
$R_{DS(ON)}$(at V_{GS}=-4.5V) Typ.	200	mΩ
I_D(T_A=25℃)	-2	A

Features

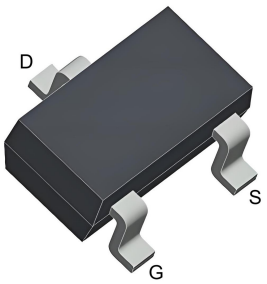
- Low Gate Charge
- Low $R_{DS(ON)}$

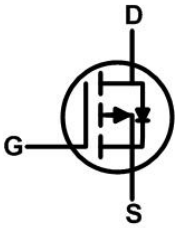
Applications

- Load Switch
- Switching Circuits
- High Speed line Driver

Pin Configuration

SOT-23





Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECG2309	SOT-23	7″	3000pcs

Absolute Maximum Ratings (at T_A=25℃ Unless Otherwise Noted)

Symbol	Parameter		Rating	Units
V_{DS}	Drain-Source Voltage		-60	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_A=25℃	-2	A
		T_A=70℃	-1.6	A
I_{DM}	Pulse Drain Current Tested [A]		-8	A
P_D	Power Dissipation [B]	T_A=25℃	1	W
T_J,T_{STG}	Junciton and Storage Temperature Range		-55 to +150	℃

Thermal Characteristics

Symbol	Parameter	Typical	Units
$R_{\theta JA}$	Thermal Resistance-Junction to ambient [B]	125	℃/W

Electrical Characteristics (at T_J =25℃ Unless Otherwise Noted)

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=-250uA	-60	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-60V,V_{GS}=0V	--	--	-1	uA
I_{GSS}	Gate-Body Leakage Current	V_{DS}=0V,V_{GS}=±20V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250uA	-1.0	-1.5	-2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance [C]	V_{GS}=-10V,I_D=-2A	--	150	195	mΩ
		V_{GS}=-4.5V,I_D=-1A	--	200	290	mΩ
V_{SD}	Diode Forward Voltage	I_{SD}=-2A,V_{GS}=0V	--	--	-1.2	V
Dynamic Parameters [D]						
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=-30V f=1MHZ	--	310	--	pF
C_{oss}	Output Capacitance		--	22	--	pF
C_{rss}	Reverse Transfer Capacitance		--	15	--	pF
Q_g	Total Gate Charge	V_{DS}=-30V,I_D=-2A V_{GS}=-10V	--	5.4	--	nC
Q_{gs}	Gate-Source Charge		--	1.1	--	nC
Q_{gd}	Gate-Drain Charge		--	1.6	--	nC
$t_{D(on)}$	Turn-on Delay Time	V_{DD}=-30V I_D=-2A,R_G=3.3Ω, V_{GS}=-10V	--	41	--	ns
t_r	Turn-on Rise Time		--	22	--	ns
$t_{D(off)}$	Turn-off Delay Time		--	25	--	ns
t_f	Turn-off Fall Time		--	32	--	ns

A. Pulse width limited by maximum allowable junction temperature.

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

C. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.

D. Guaranteed by design, not subject to production testing.

Typical Characteristics

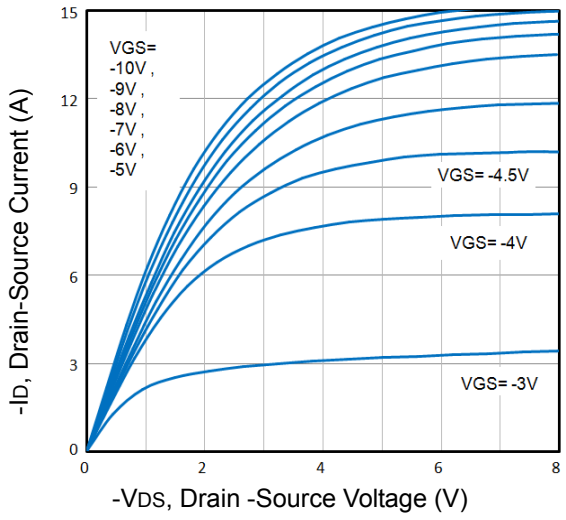


Fig1. Typical Output Characteristics

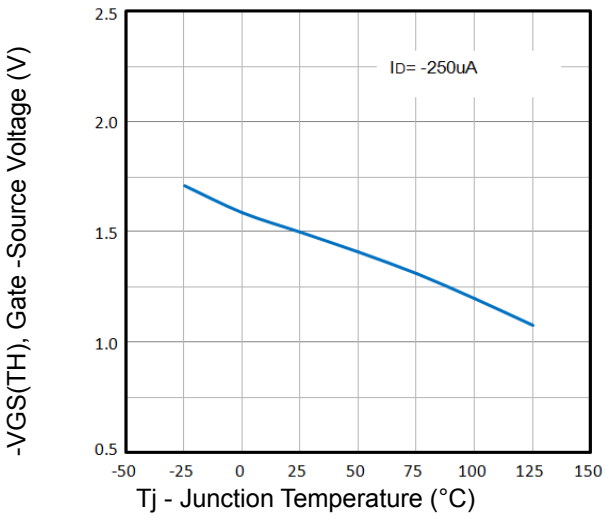


Fig2. Normalized Threshold Voltage Vs. Temperature

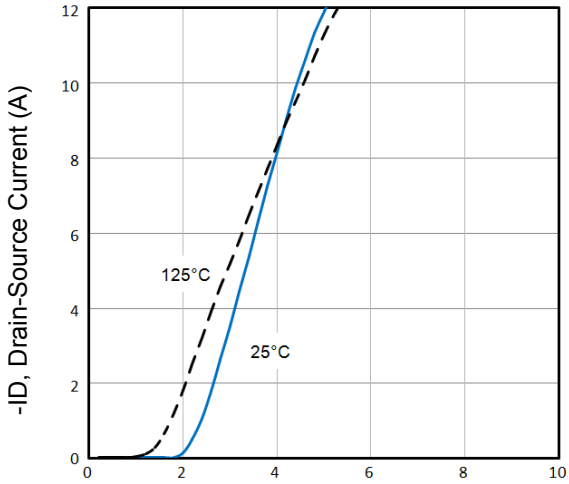


Fig3. Typical Transfer Characteristics

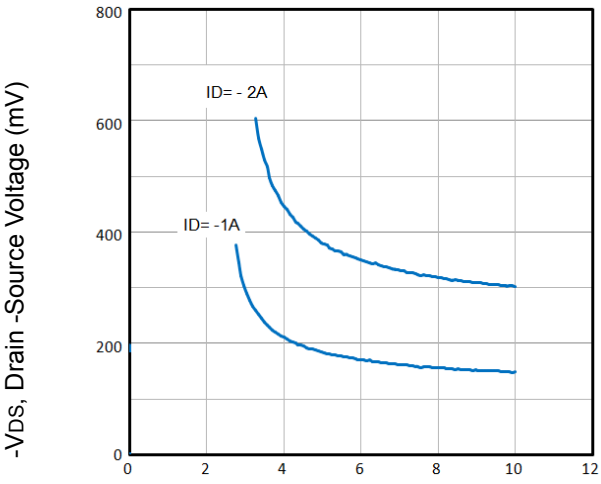


Fig4. Drain -Source Voltage vs Gate -Source Voltage

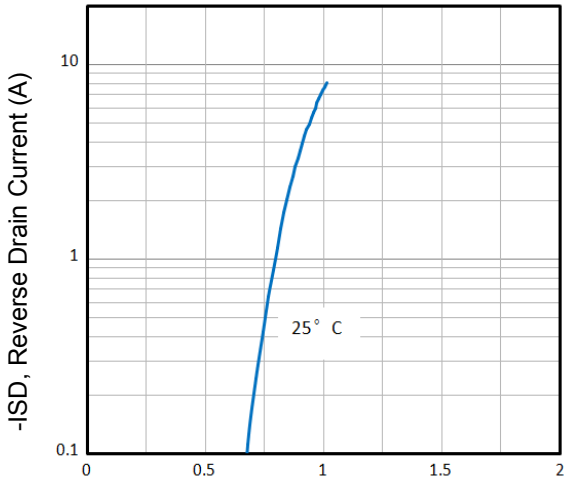


Fig5. Typical Source-Drain Diode Forward Voltage

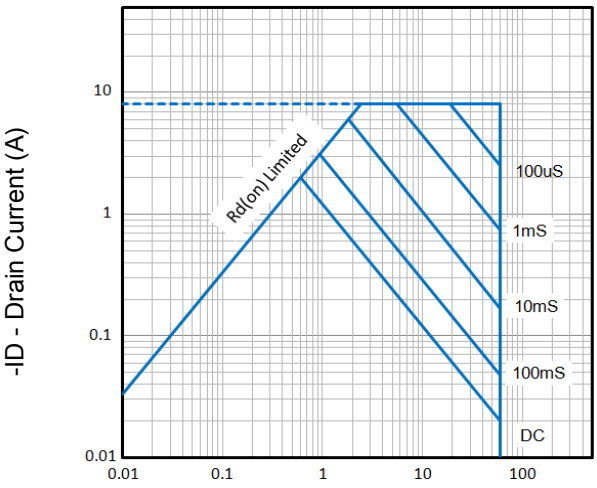


Fig6. Maximum Safe Operating Area

Typical Characteristics

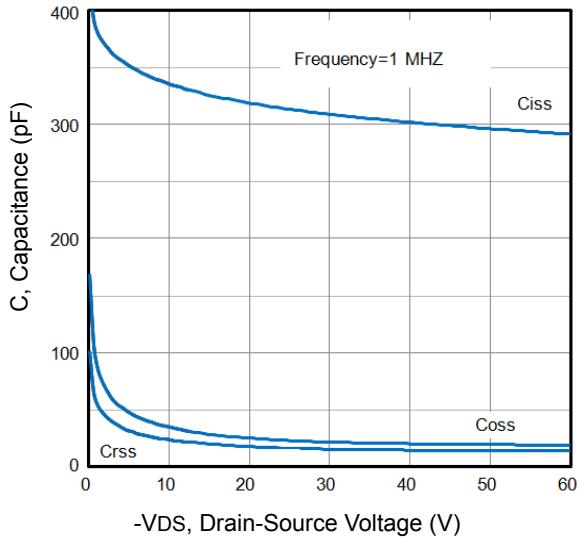


Fig7. Typical Capacitance Vs. Drain-Source Voltage

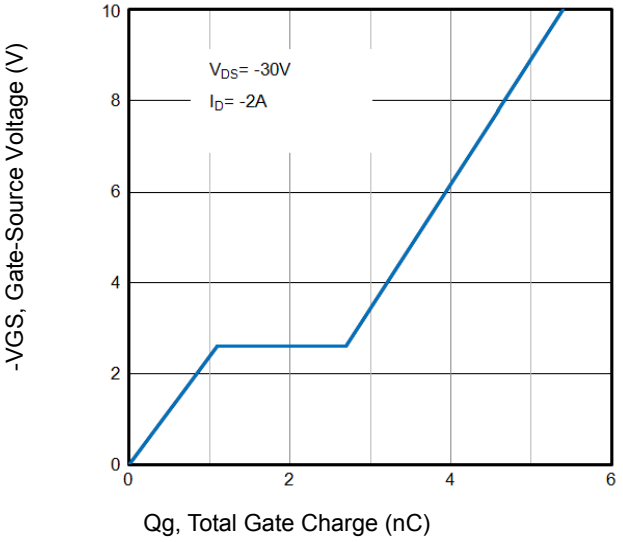


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

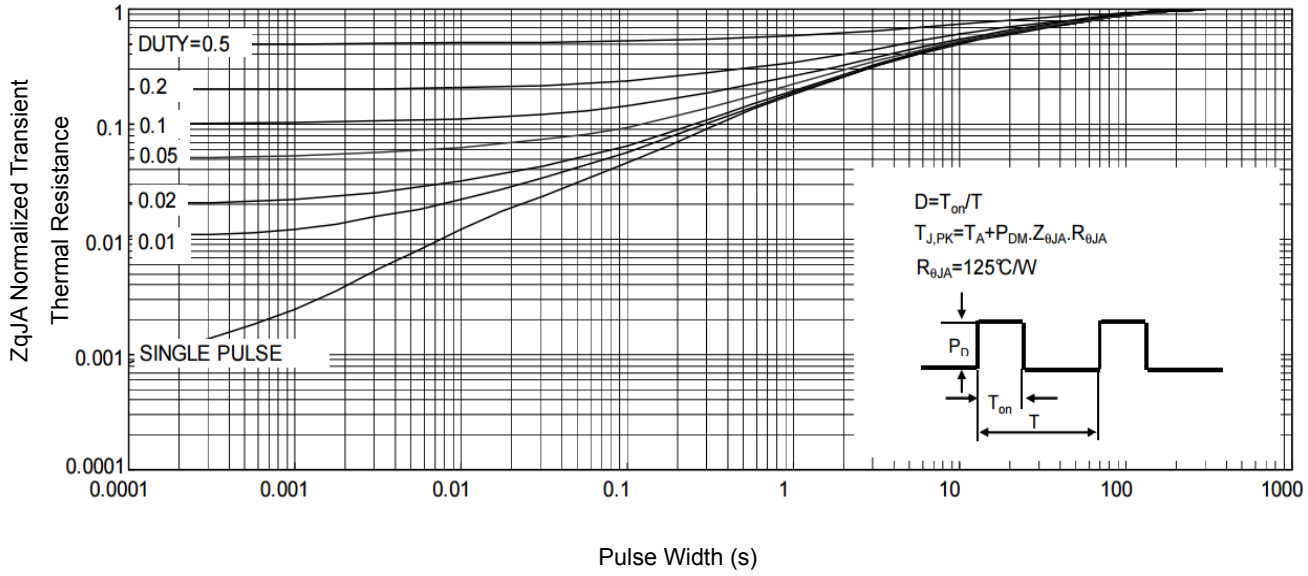


Fig9. Normalized Maximum Transient Thermal Impedance

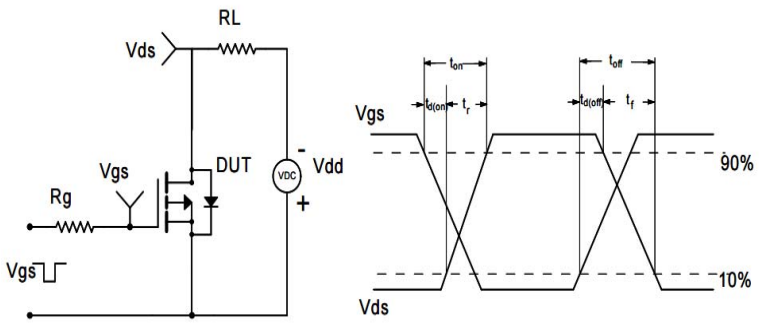
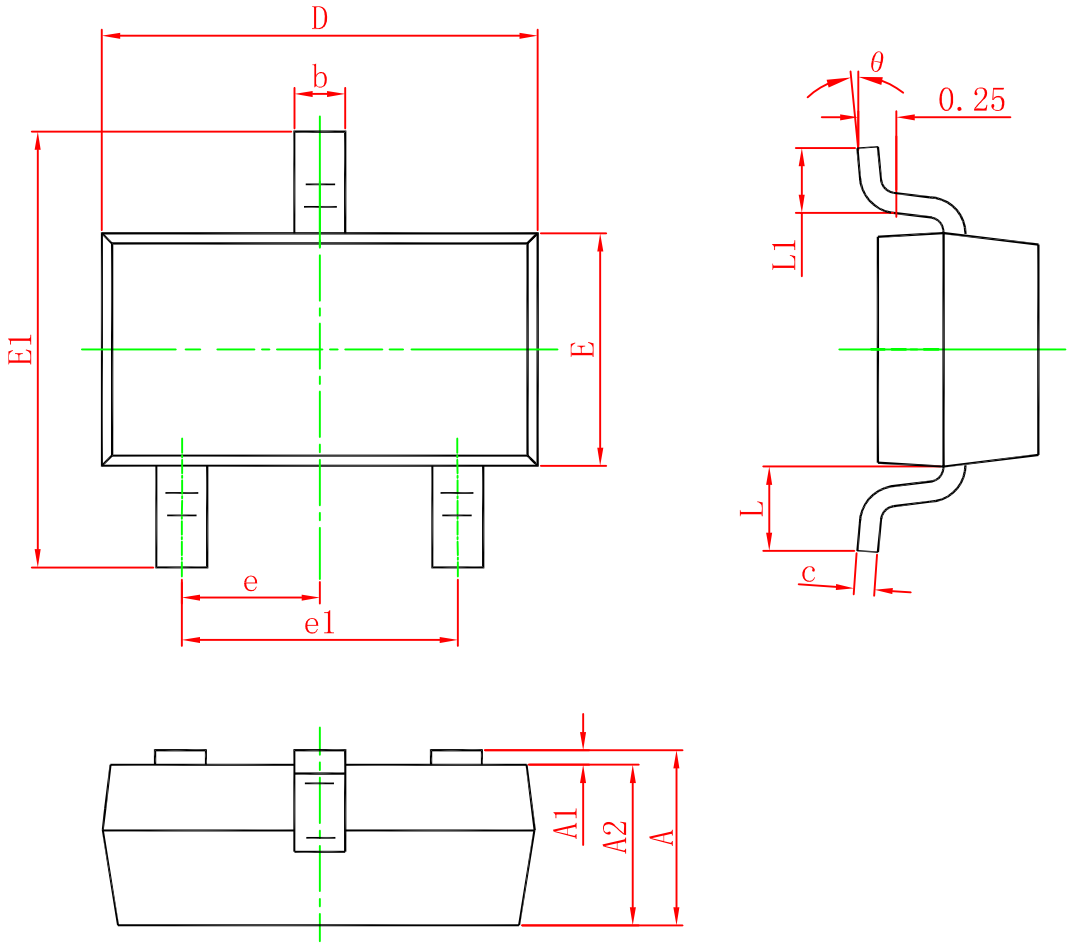


Fig10. Switching Time Test Circuit and waveforms

SOT-23 Package Information



Symbol	Dimensions In Millimeters		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	0.950 TYP.		0.037 TYP.	
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°