

P-Channel 20V(D-S) MOSFET

Product summary		
V_{DS}	-20	V
$R_{DS(ON)}$ (at $V_{GS}=-4.5V$) Typ.	90	m Ω
$R_{DS(ON)}$ (at $V_{GS}=-2.5V$) Typ.	115	m Ω
I_D ($T_A=25^{\circ}C$)	-2	A

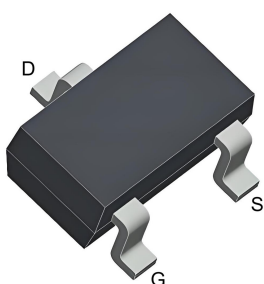
Features

- Trench Power LV MOSFET technology
- Low Gate Charge
- Low $R_{DS(ON)}$

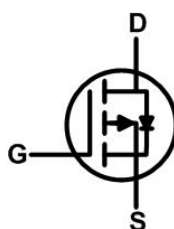
Applications

- Power management
- Video monitor

Pin Configuration



SOT-23



Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECG2301F	SOT-23	7"	3000pcs

Absolute Maximum Ratings (at $T_A=25^{\circ}C$ Unless Otherwise Noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 10	V
I_D	Continuous Drain Current at $V_{GS}=-10V$	$T_A=25^{\circ}C$	-2.0
		$T_A=70^{\circ}C$	-1.6
I_{DM}	Pulse Drain Current Tested ^A	-8	A
P_D	Power Dissipation	$T_A=25^{\circ}C$	0.7
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to +150	$^{\circ}C$

Thermal Characteristics

Symbol	Parameter	Typical	Units
$R_{\theta JA}$	Thermal Resistance-Junction to ambient ^B	178	$^{\circ}C/W$

Electrical Characteristics (at $T_J = 25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V,I _D =-250uA	-20	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-20V,V _{GS} =0V	--	--	-1	uA
I _{GSS}	Gate-Body Leakage Current	V _{DS} =0V,V _{GS} =±10V	--	--	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} ,I _D =-250uA	-0.4	-0.6	-1.0	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =-4.5V,I _D =-1.5A	--	90	120	mΩ
		V _{GS} =-2.5V,I _D =-1.5A	--	115	150	mΩ
		V _{GS} =-1.8V,I _D =-1.5A	--	165	250	mΩ
V _{SD}	Forward Voltage	I _S =-2A,V _{GS} =0V	--	--	-1.2	V
Dynamic Parameters						
C _{iss}	Input Capacitance	V _{GS} =0V,V _{DS} =-10V f=1MHZ	--	288	--	pF
C _{oss}	Output Capacitance		--	47	--	pF
C _{rss}	Reverse Transfer Capacitance		--	28	--	pF
Switching Parameters						
Q _g	Total Gate Charge	V _{DS} =-10V,I _D =-2A V _{GS} =-4.5V	--	3.8	--	nC
Q _{gs}	Gate-Source Charge		--	0.7	--	nC
Q _{gd}	Gate-Drain Charge		--	0.9	--	nC
t _{D(on)}	Turn-on Delay Time	V _{DD} =-10V I _D =-1A R _{GEN} =2.5Ω, V _{GS} =-4.5V	--	13	--	nS
t _r	Turn-on Rise Time		--	55	--	nS
t _{D(off)}	Turn-off Delay Time		--	15	--	nS
t _f	Turn-off Fall Time		--	9	--	nS

A. Pulse Test: Pulse Width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

B. Device mounted on FR-4 PCB, 1 inch x 1 inch x 0.062 inch.

Typical Characteristics

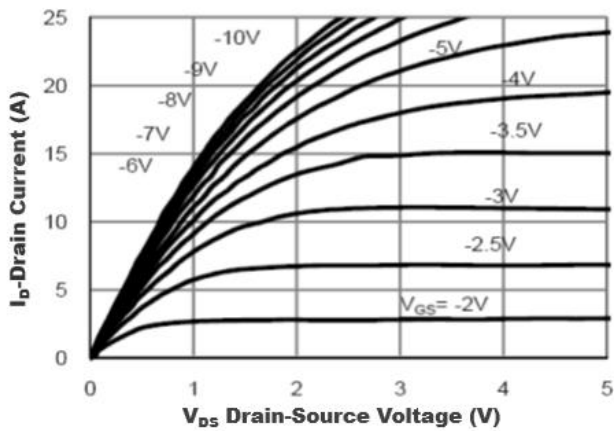


Figure1. Output Characteristics

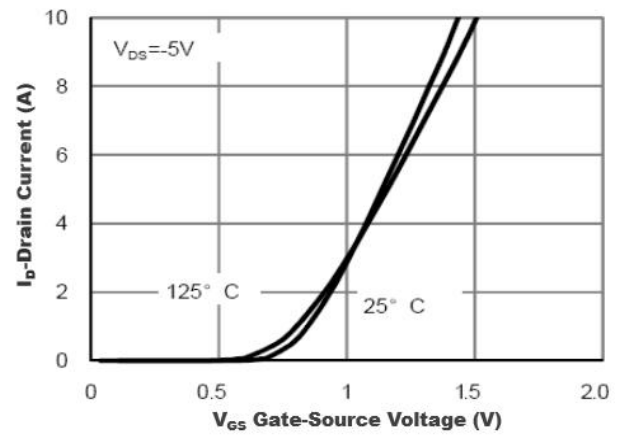


Figure2. Transfer Characteristics

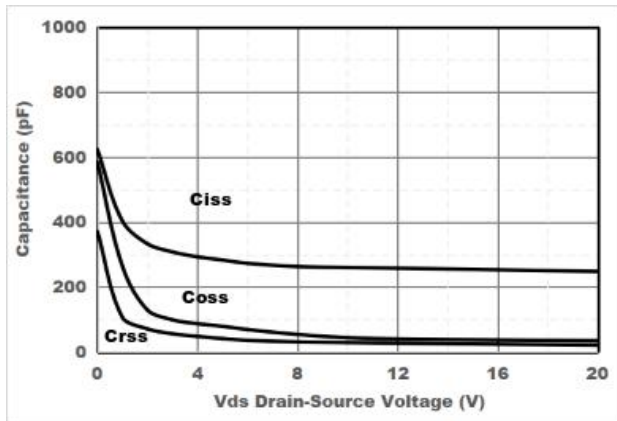


Figure3. Capacitance Characteristics

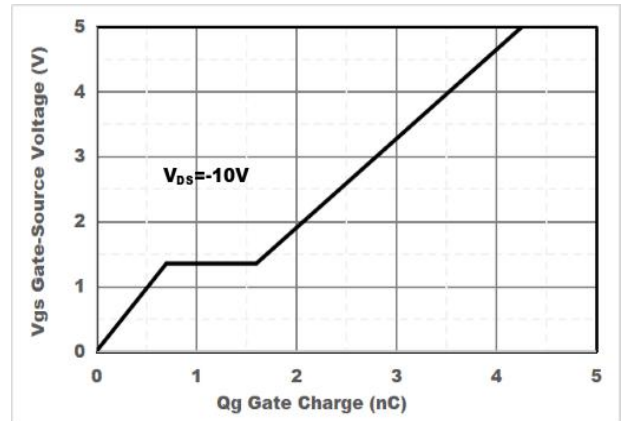


Figure4. Gate Charge

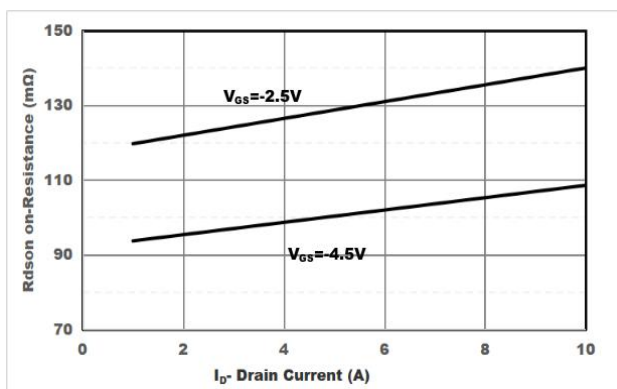


Figure5. Drain-Source on Resistance

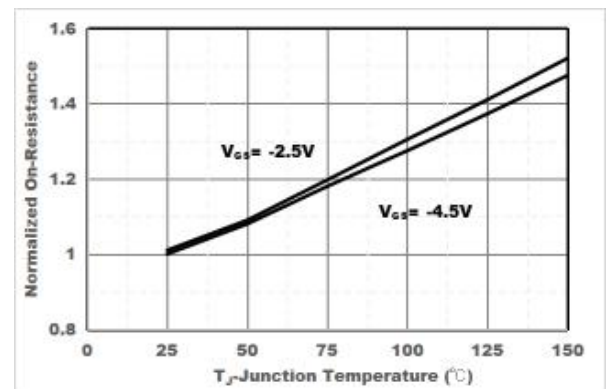


Figure6. Drain-Source on Resistance

Typical Characteristics

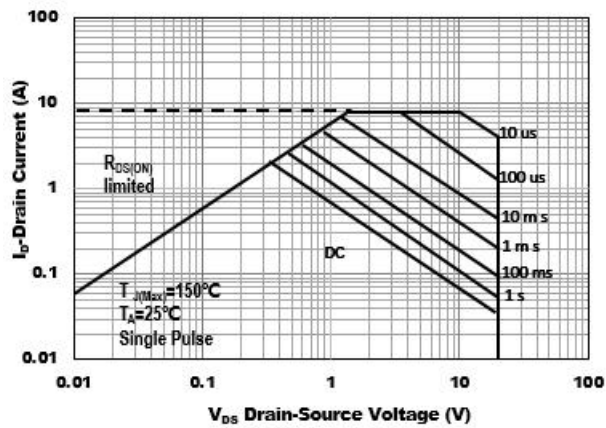


Figure7. Safe Operation Area

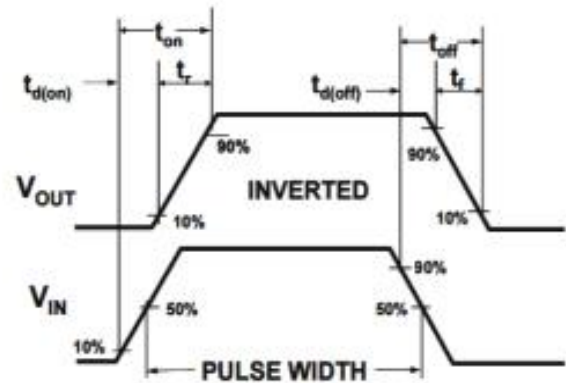
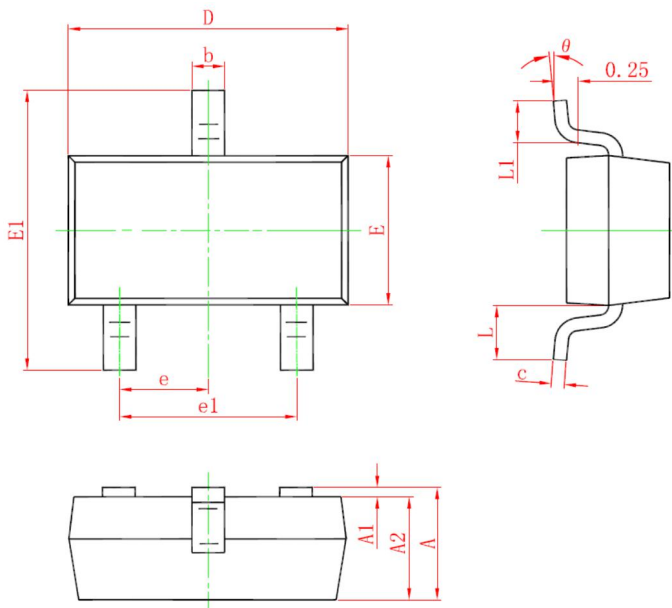


Figure8. Switching wave

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°