

## N-Channel 20V(D-S) MOSFET

Product summary		
$V_{DS}$	20	V
$R_{DS(ON)}$ (at $V_{GS}=4.5V$ ) Typ.	13.5	m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=2.5V$ ) Typ.	17	m $\Omega$
$I_D$ ( $T_A=25^\circ C$ )	6.8	A

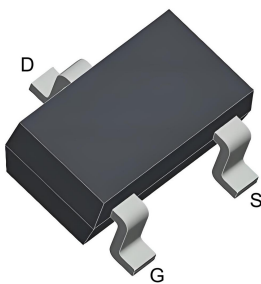
### Features

- High Power and current handing capability
- Trench Power LV MOSFET technology
- RoHS Compliant

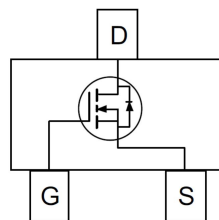
### Applications

- Load Switch
- PWM application

### Pin Configuration



SOT-23



### Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECG2312A	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	$\pm 10$	V	
$I_D$	Continuous Drain Current at $V_{GS}=10V$	$T_A=25^\circ C$	6.8	A
		$T_A=70^\circ C$	5.4	A
$I_{DM}$	Pulse Drain Current Tested <sup>A</sup>	27	A	
$P_D$	Power Dissipation	$T_A=25^\circ C$	1.2	W
$T_J, T_{STG}$	Junction and Storage Temperature Range	-55 to +150	$^\circ C$	

### Thermal Characteristics

Symbol	Parameter	Typical	Units
$R_{\theta JA}$	Thermal Resistance-Junction to ambient <sup>B</sup>	104	$^\circ C/W$

**Electrical Characteristics (at T<sub>J</sub> =25°C Unless Otherwise Noted)**

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
<b>Static Parameters</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	20	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V	--	--	1	uA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±10V	--	--	±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	0.45	0.62	1.0	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =6.8A	--	13.5	18	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =3.0A	--	17	22	mΩ
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =2.5A	--	27	39	mΩ
V <sub>SD</sub>	Forward Voltage	I <sub>S</sub> =6.8A, V <sub>GS</sub> =0V	--	--	1.2	V
I <sub>S</sub>	Diode Forward Voltage		--	--	6.8	A
<b>Dynamic and Switching Parameters</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =10V f=1MHZ	--	900	--	pF
C <sub>oss</sub>	Output Capacitance		--	165	--	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		--	75	--	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =10V, I <sub>D</sub> =6.8A V <sub>GS</sub> =4.5V	--	9.2	--	nC
Q <sub>gs</sub>	Gate-Source Charge		--	1.7	--	nC
Q <sub>gd</sub>	Gate-Drain Charge		--	2.9	--	nC
t <sub>D(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =10V R <sub>L</sub> =1.5Ω, R <sub>GEN</sub> =3Ω, V <sub>GS</sub> =4.5V	--	12	--	nS
t <sub>r</sub>	Turn-on Rise Time		--	52	--	nS
t <sub>D(off)</sub>	Turn-off Delay Time		--	17	--	nS
t <sub>f</sub>	Turn-off Fall Time		--	10	--	nS

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

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

Typical Characteristics

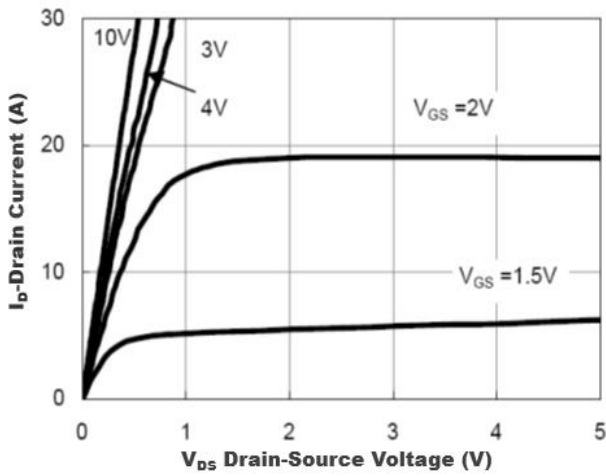


Figure1. Output Characteristics

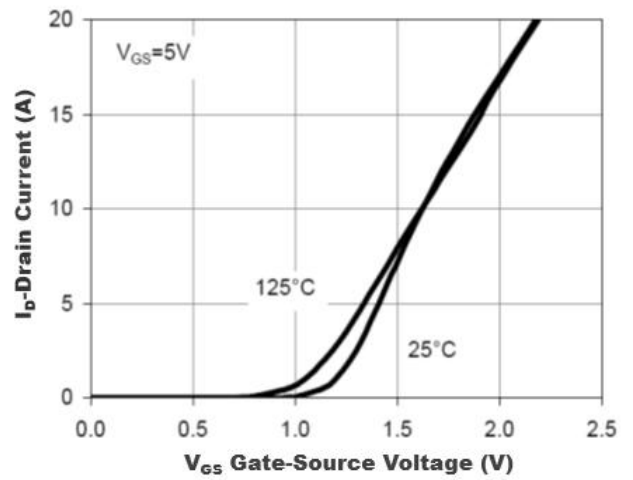


Figure2. Transfer Characteristics

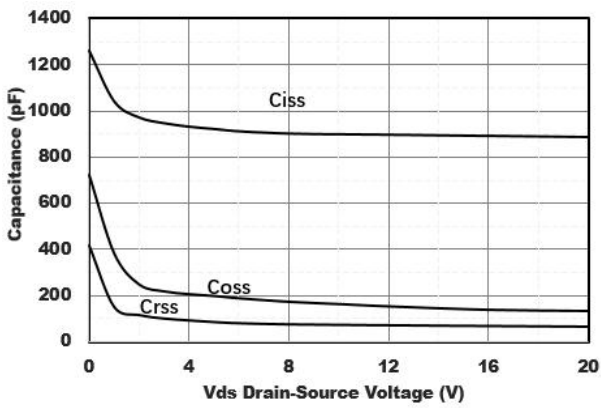


Figure3. Capacitance Characteristics

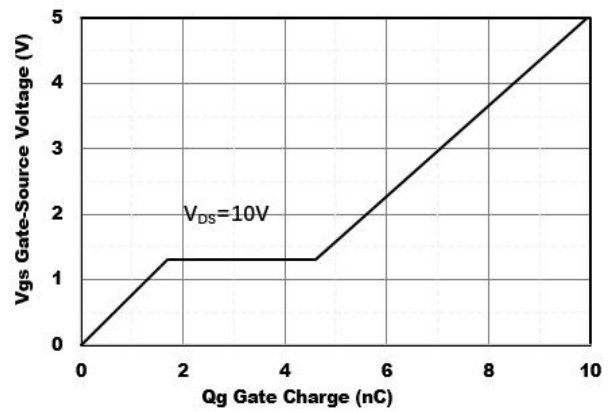


Figure4. Gate Charge

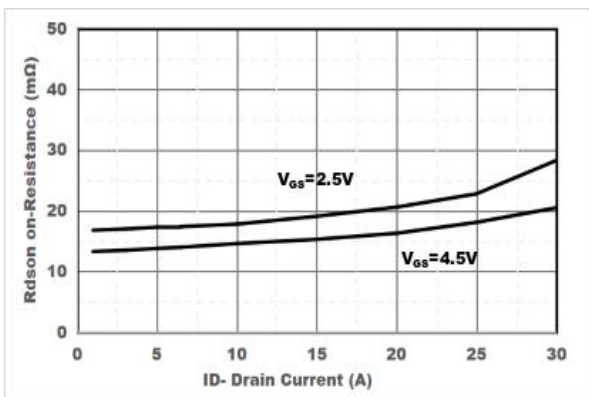


Figure5. Drain-Source on Resistance

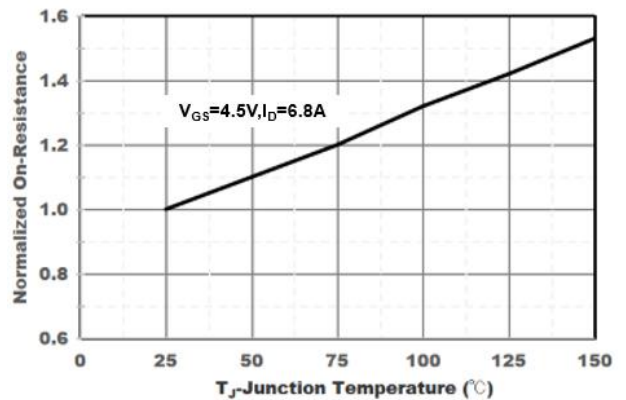


Figure6. Drain-Source on Resistance

Typical Characteristics

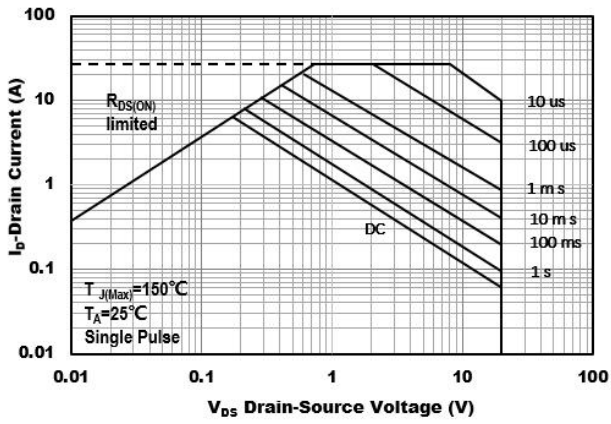


Figure7. Safe Operation Area

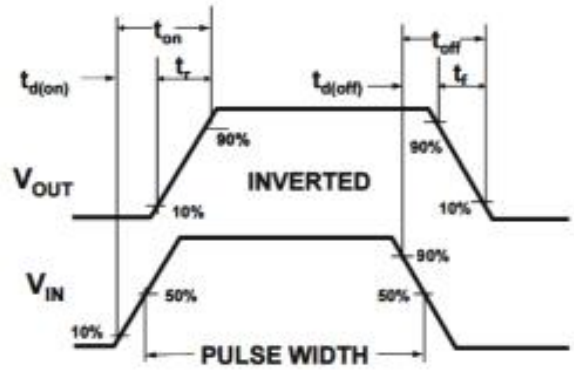
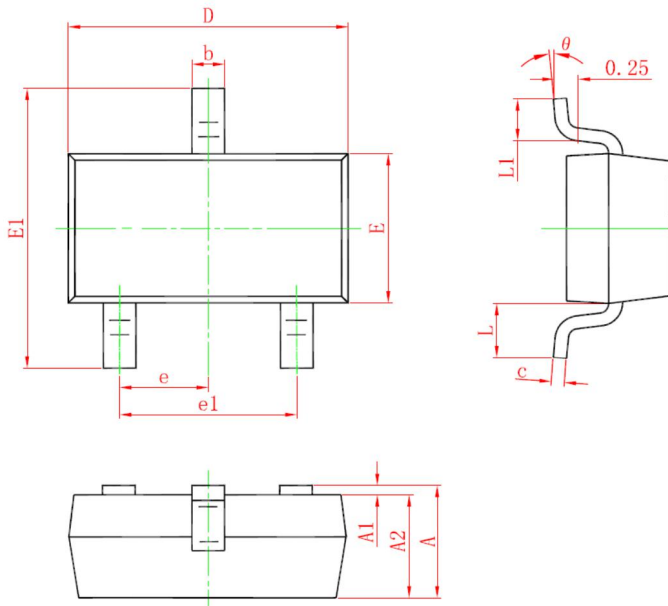


Figure8. Switching wave

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
theta	0°	8°	0°	8°