

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

Product summary		
$V_{DS}$	-20	V
$R_{DS(ON)}$ (at $V_{GS}=-4.5V$ ) Typ.	33	m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=-2.5V$ ) Typ.	39	m $\Omega$
$I_D$ ( $T_A=25^\circ C$ )	-5.4	A

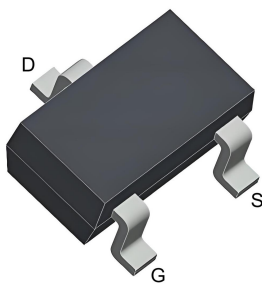
### Features

- Trench Power LV MOSFET technology
- High Speed switching
- Low  $R_{DS(ON)}$

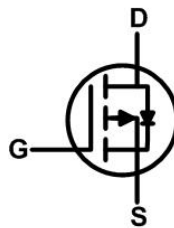
### Applications

- Power management
- Load switch

### Pin Configuration



SOT-23



### Packing Information

Device	Reel Size	Quantity(Min. Package)
ECG2305B	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 $V_{GS}=-10V$	$T_A=25^\circ C$	-5.4	A
		$T_A=70^\circ C$	-4.2	A
$I_{DM}$	Pulse Drain Current Tested <sup>A</sup>	-22	A	
$P_D$	Power Dissipation	$T_A=25^\circ C$	1.1	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>	113	$^\circ C/W$

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

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
<b>Static Parameters</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-20	--	--	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-20V, V_{GS}=0V$	--	--	-1	$\mu A$
$I_{GSS}$	Gate-Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 10V$	--	--	$\pm 100$	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4	--	-1.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=-4.5V, I_D=-5.4A$	--	33	42	m $\Omega$
		$V_{GS}=-2.5V, I_D=-4A$	--	39	55	m $\Omega$
		$V_{GS}=-1.8V, I_D=-3A$	--	49	75	m $\Omega$
$V_{SD}$	Forward Voltage	$I_{SD}=-5.4A, V_{GS}=0V$	--	--	-1.2	V
<b>Dynamic Parameters</b>						
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=-10V$ $f=1\text{MHZ}$	--	825	--	pF
$C_{oss}$	Output Capacitance		--	130	--	pF
$C_{rss}$	Reverse Transfer Capacitance		--	85	--	pF
<b>Switching Parameters</b>						
$Q_g$	Total Gate Charge	$V_{DS}=-10V, I_D=-4A$ $V_{GS}=-4.5V$	--	7.2	--	nC
$Q_{gs}$	Gate-Source Charge		--	1.3	--	nC
$Q_{gd}$	Gate-Drain Charge		--	1.5	--	nC
$t_{D(on)}$	Turn-on Delay Time	$V_{DD}=-10V$ $R_L=2.5\Omega, R_{GEN}=3\Omega,$ $V_{GS}=-4.5V$	--	15	--	nS
$t_r$	Turn-on Rise Time		--	65	--	nS
$t_{D(off)}$	Turn-off Delay Time		--	22	--	nS
$t_f$	Turn-off Fall Time		--	13	--	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

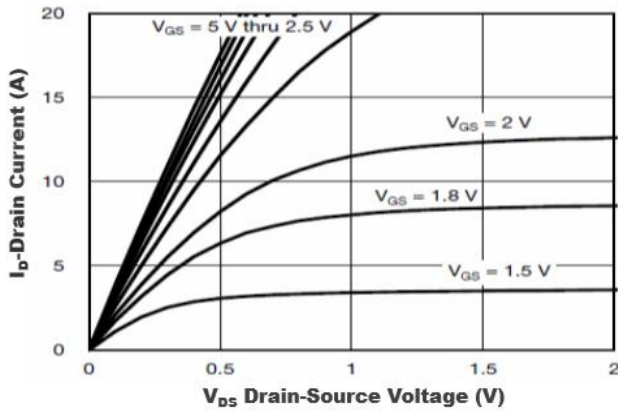


Figure1. Output Characteristics

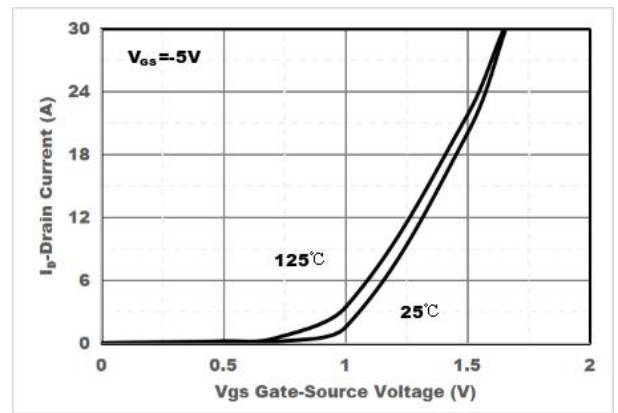


Figure2. Transfer Characteristics

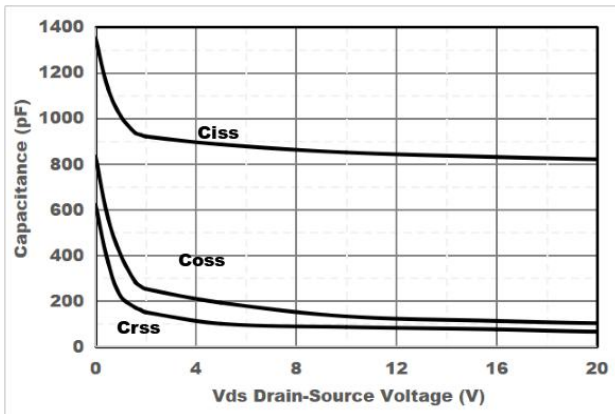


Figure3. Capacitance Characteristics

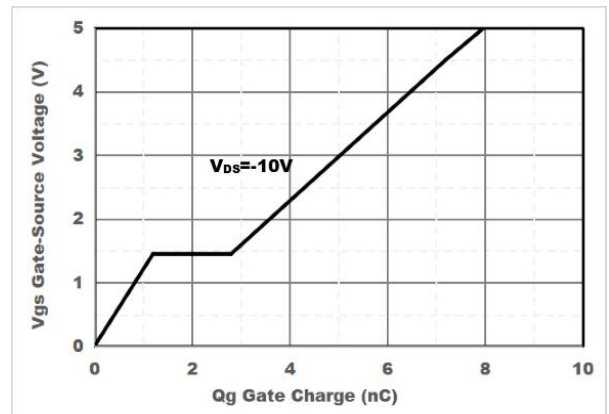


Figure4. Gate Charge

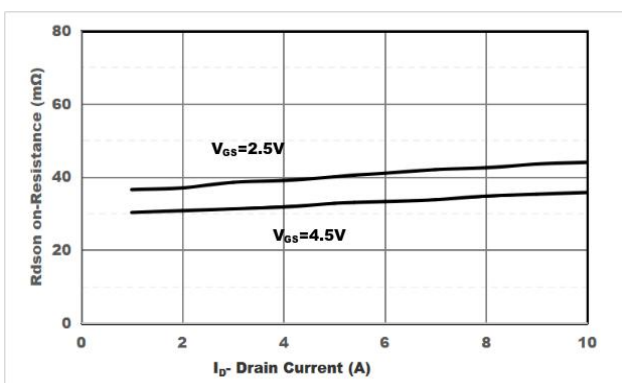


Figure5. Drain-Source on Resistance

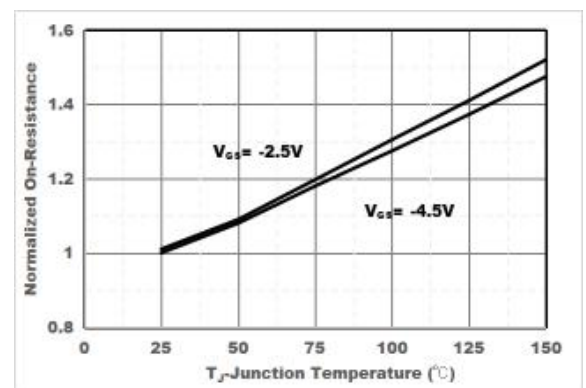


Figure6. Drain-Source on Resistance

Typical Characteristics

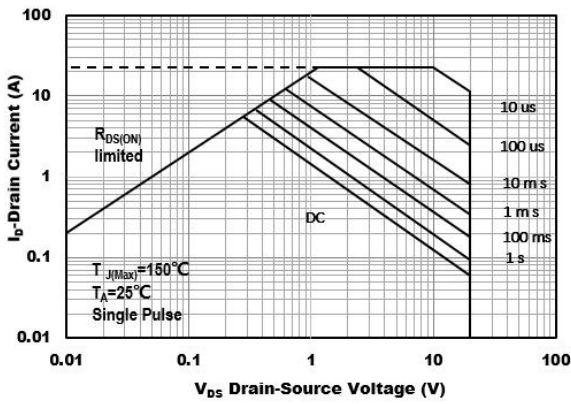


Figure7. Safe Operation Area

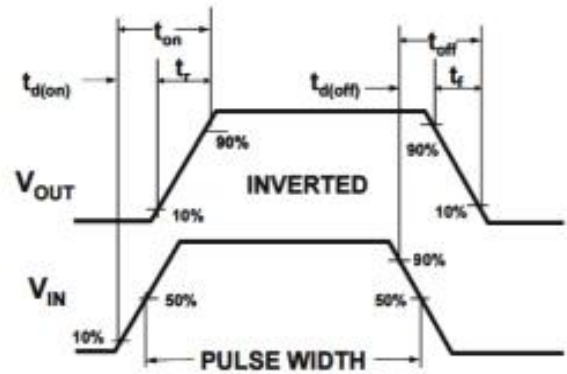
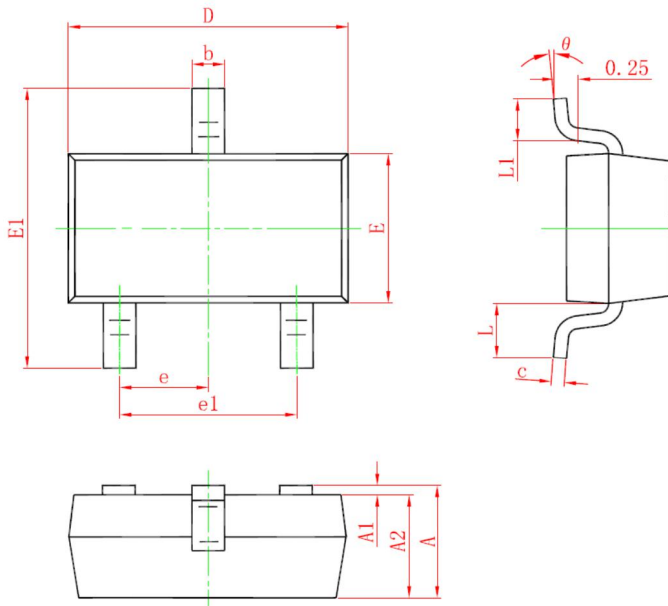


Figure8. Switching wave

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
$\theta$	0°	8°	0°	8°