N-Channel and P-Channel 20V(D-S) MOSFET

Product summary			
V_{DS}	20	-20	V
$R_{DS(ON)}$(at V_{GS}=4.5V) Typ.	19.5	42	mΩ
$R_{DS(ON)}$(at V_{GS}=2.5V) Typ.	25	55	mΩ
I_D(T_A=25℃)	4.5	-3.4	A

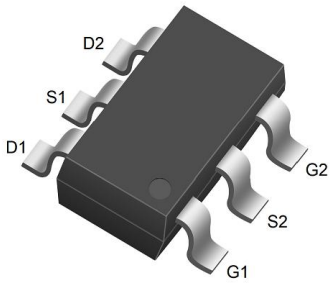
Features

- Super Low Gate Charge
- Trench Power LV MOSFET technology

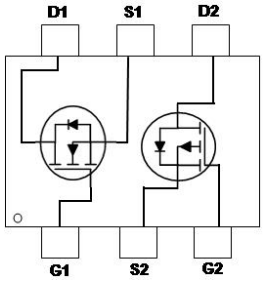
Applications

- Power management functions
- Load switch

Pin Configuration



SOT23-6



Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECDE04C02C	SOT23-6	7″	3000pcs

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

Symbol	Parameter		N-Rating	P-Rating	Units
V_{DS}	Drain-Source Voltage		20	-20	V
V_{GS}	Gate-Source Voltage		±10	±10	V
I_D	Continuous Drain Current [A]	T_A=25℃	4.5	-3.4	A
		T_A=70℃	3.6	-2.7	A
I_{DM}	Pulse Drain Current Tested [B]		18	-14	A
P_D	Power Dissipation [A]		1.2	1.2	W
T_J,T_{STG}	Junciton and Storage Temperature Range		-55 to +150	-55 to +150	℃

Thermal Characteristics

Symbol	Parameter	Typical	Units
$R_{\theta JA}$	Thermal Resistance-Junction to ambient [A]	104	℃/W

N-Channel 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	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	0.45	0.63	1.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance [B]	V_{GS}=4.5V,I_D=4.5A	--	19.5	25	mΩ
		V_{GS}=2.5V,I_D=3A	--	25	32	mΩ
		V_{GS}=1.8V,I_D=2.7A	--	33	49	mΩ
V_{SD}	Diode Forward Voltage	I_S=4.5A,V_{GS}=0V	--	--	1.2	V
I_S	Maximum Body-Diode Continuous Current		--	--	4.5	A
Dynamic Parameters [C]						
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=10V f=1MHZ	--	620	--	pF
C_{oss}	Output Capacitance		--	114	--	pF
C_{rss}	Reverse Transfer Capacitance		--	64	--	pF
Q_g	Total Gate Charge	V_{DS}=10V,I_D=4.5A V_{GS}=4.5V	--	7.1	--	nC
Q_{gs}	Gate-Source Charge		--	1.4	--	nC
Q_{gd}	Gate-Drain Charge		--	1.9	--	nC
$t_{D(on)}$	Turn-on Delay Time	V_{DD}=10V R_L=1.5Ω,R_G=3Ω, V_{GS}=4.5V	--	13	--	nS
t_r	Turn-on Rise Time		--	54	--	nS
$t_{D(off)}$	Turn-off Delay Time		--	18	--	nS
t_f	Turn-off Fall Time		--	11	--	nS

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

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

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

P-Channel 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	-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	-0.63	-1.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance [B]	V_{GS}=-4.5V,I_D=-3.4A	--	42	60	mΩ
		V_{GS}=-2.5V,I_D=-3A	--	55	75	mΩ
		V_{GS}=-1.8V,I_D=-2.5A	--	74	110	mΩ
V_{SD}	Diode Forward Voltage	I_S=-3.4A,V_{GS}=0V	--	--	-1.2	V
I_{SM}	Maximum Body-Diode Continuous Current		--	--	-3.4	A
Dynamic Parameters [C]						
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=-10V f=1MHZ	--	550	--	pF
C_{oss}	Output Capacitance		--	89	--	pF
C_{rss}	Reverse Transfer Capacitance		--	65	--	pF
Q_g	Total Gate Charge	V_{DS}=-10V,I_D=-3.4A V_{GS}=-4.5V	--	4.3	--	nC
Q_{gs}	Gate-Source Charge		--	0.8	--	nC
Q_{gd}	Gate-Drain Charge		--	1.1	--	nC
$t_{D(on)}$	Turn-on Delay Time	V_{DD}=-10V I_D=-1A,R_G=2.5Ω, V_{GS}=-4.5V	--	12	--	nS
t_r	Turn-on Rise Time		--	54	--	nS
$t_{D(off)}$	Turn-off Delay Time		--	15	--	nS
t_f	Turn-off Fall Time		--	9	--	nS

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

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

N-Channel Typical Characteristics

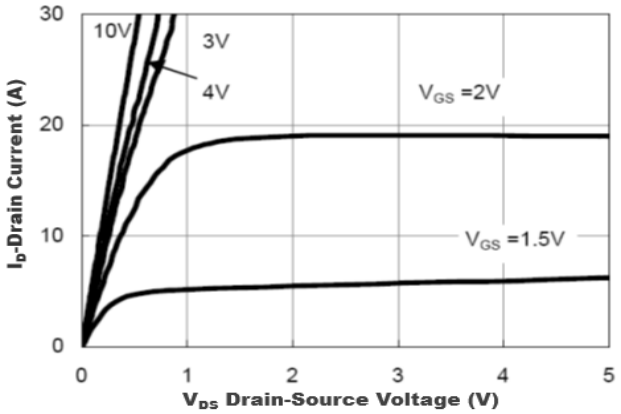


Figure1. Output Characteristics

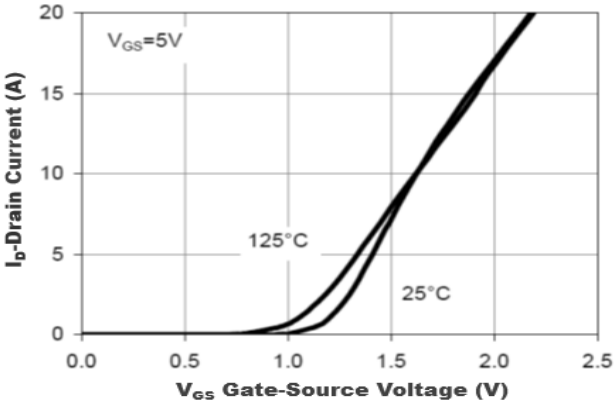


Figure2. Transfer Characteristics

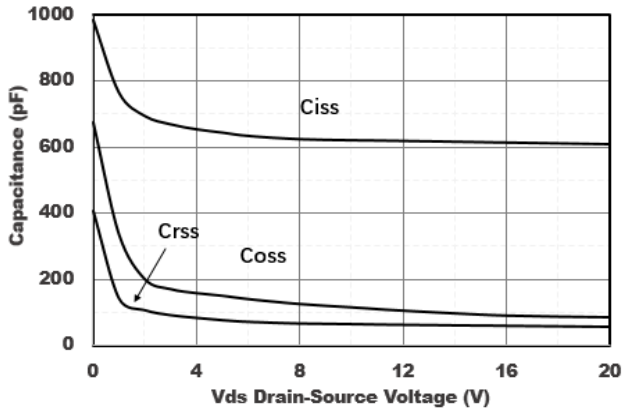


Figure3. Capacitance Characteristics

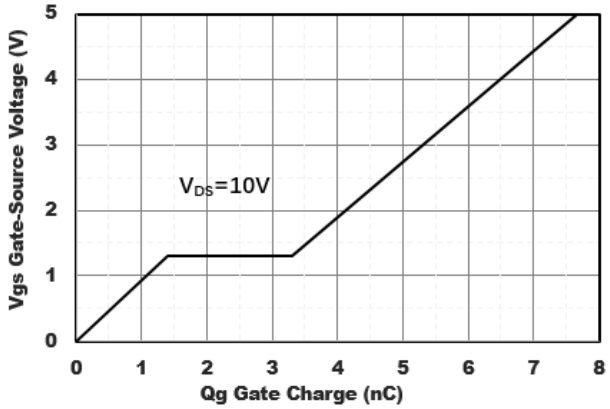


Figure4. Gate Charge

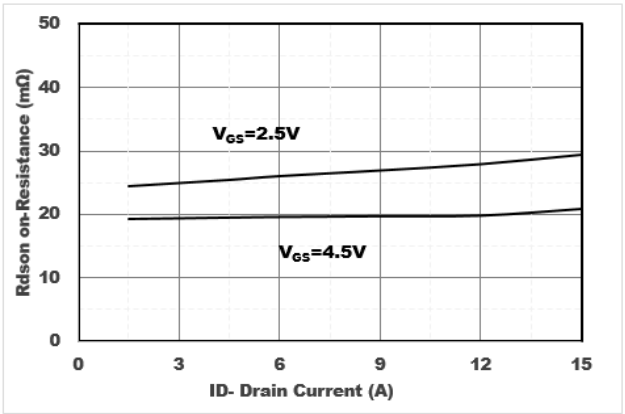


Figure5. Drain-Source on Resistance

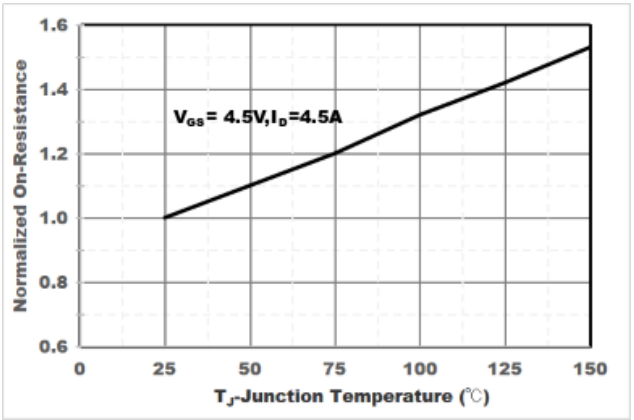


Figure6. Drain-Source on Resistance

N-Channel Typical Characteristics

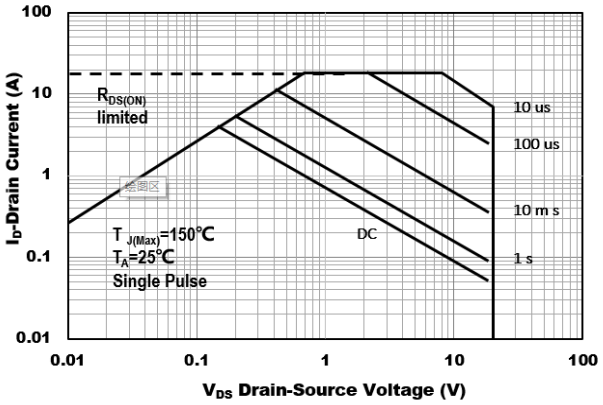


Figure7. Safe Operation Area

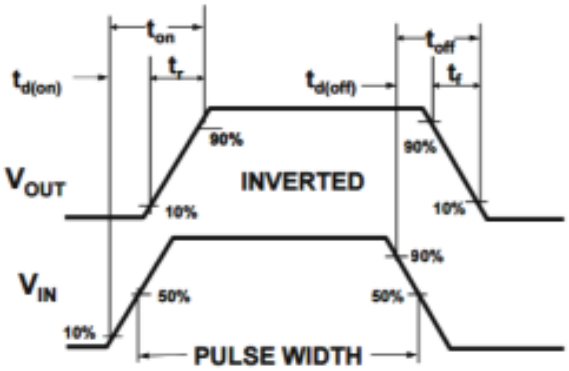


Figure8. Switching wave

P-Channel Typical Characteristics

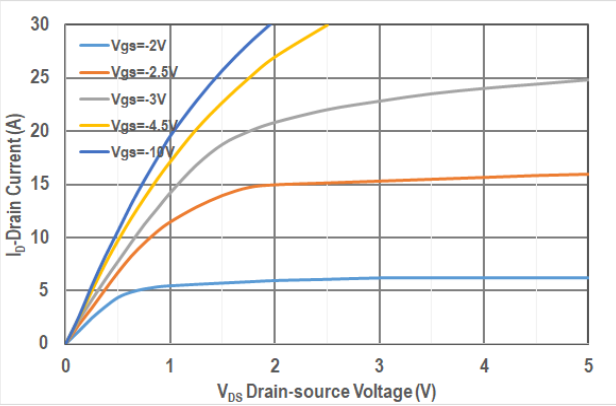


Figure1. Output Characteristics

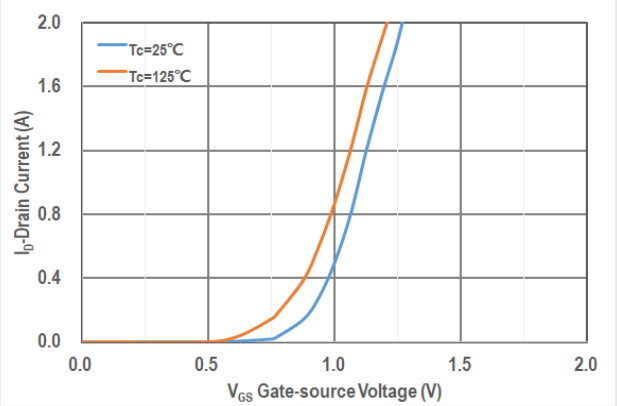


Figure2. Transfer Characteristics

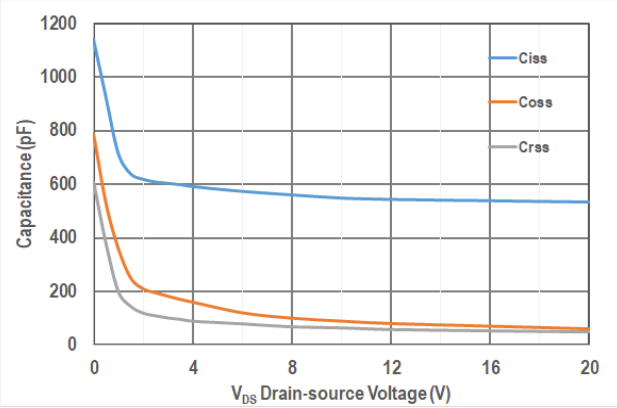


Figure3. Capacitance Characteristics

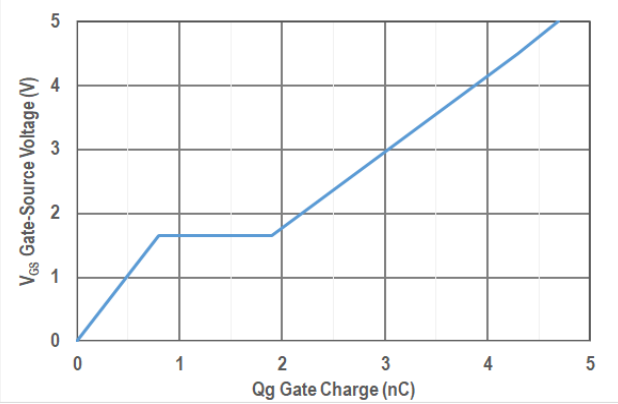


Figure4. Gate Charge

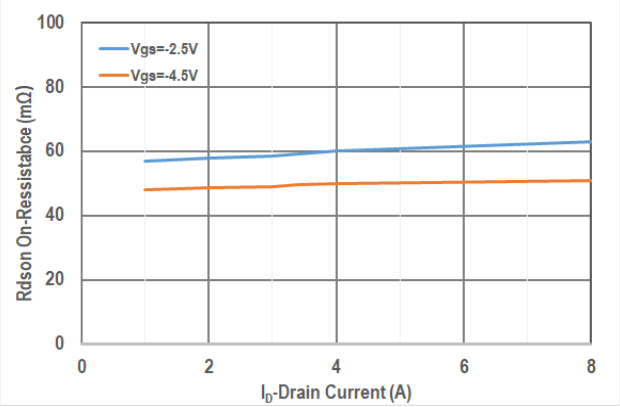


Figure5. Drain-Source on Resistance

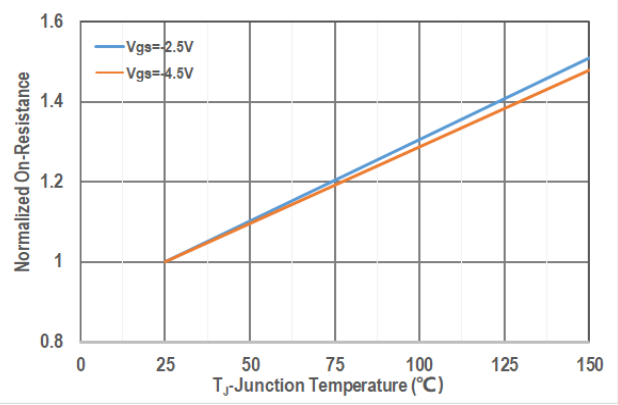


Figure6. Drain-Source on Resistance

P-Channel Typical Characteristics

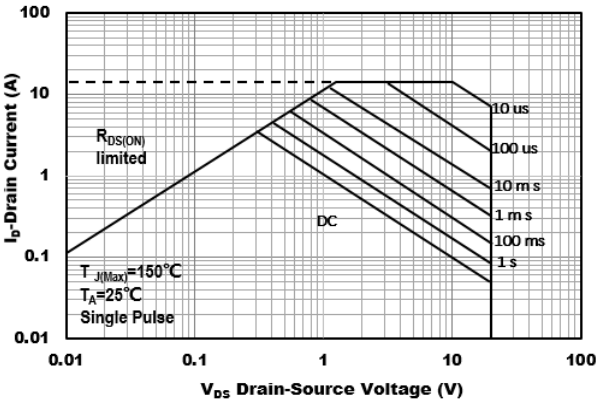


Figure7. Safe Operation Area

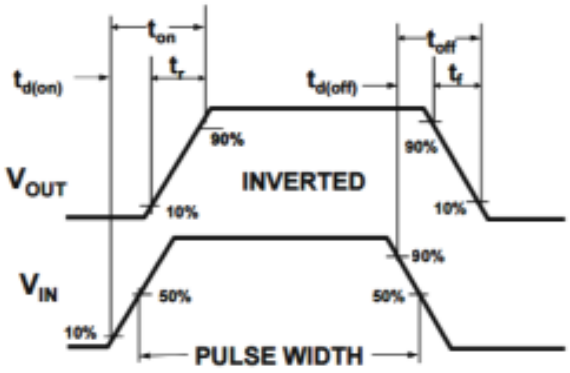
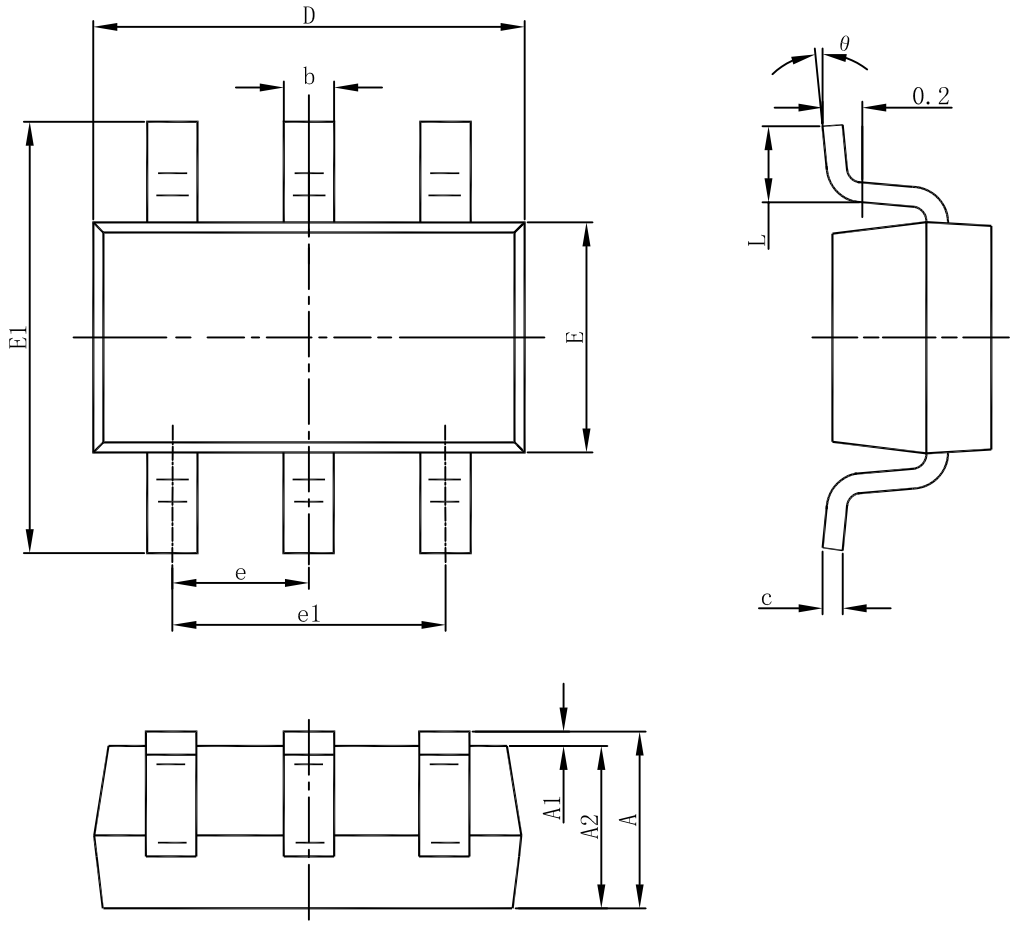


Figure8. Switching wave

SOT23-6 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°