

N-Channel 20V(D-S) MOSFET

Product summary		
V_{DS}	20	V
$R_{DS(ON)}$ (at $V_{GS}=4.5V$) Typ.	170	m Ω
$R_{DS(ON)}$ (at $V_{GS}=2.5V$) Typ.	240	m Ω
I_D ($T_A=25^{\circ}C$)	0.5	A

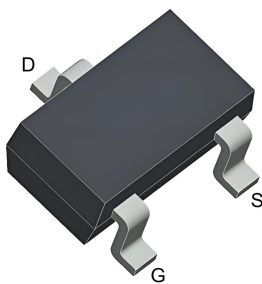
Features

- Operated at Low Logic Level Gate Drive
- Low $R_{DS(on)}$
- ESD protection up to 2 kV

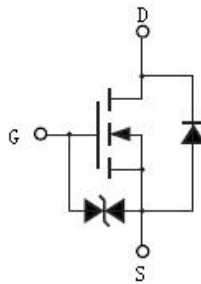
Applications

- Load Switching
- Logic Level Shift

Pin Configuration



SOT-23



Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECDA1012E	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 ^A	T _A =25℃	0.5	A
		T _A =70℃	0.4	A
I _{DM}	Pulse Drain Current Tested ^B		2.3	A
P _D	Power Dissipation ^A	T _A =25℃	0.32	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 ^A	390	$^{\circ}C/W$

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

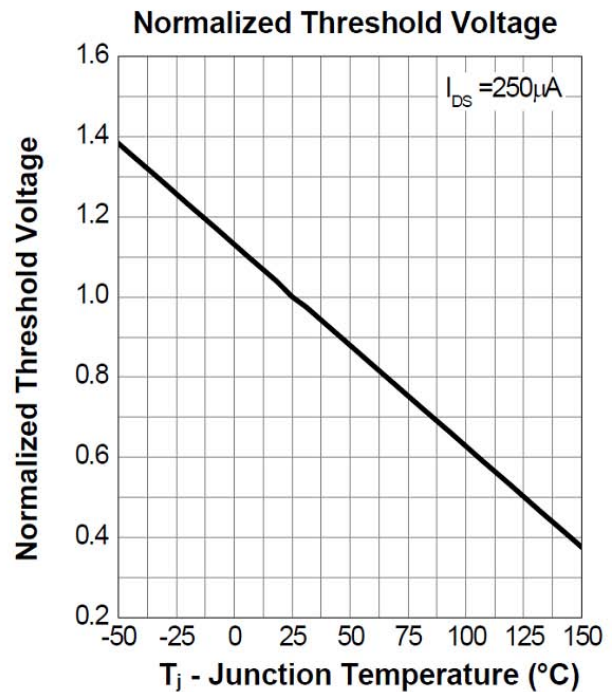
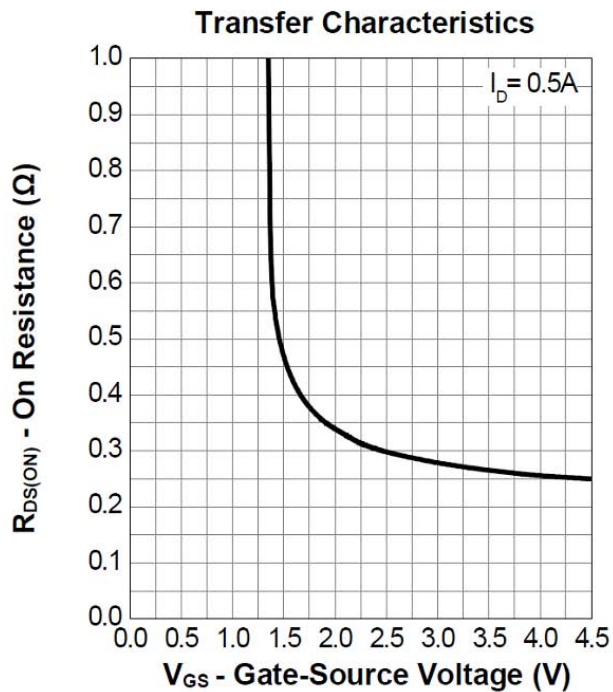
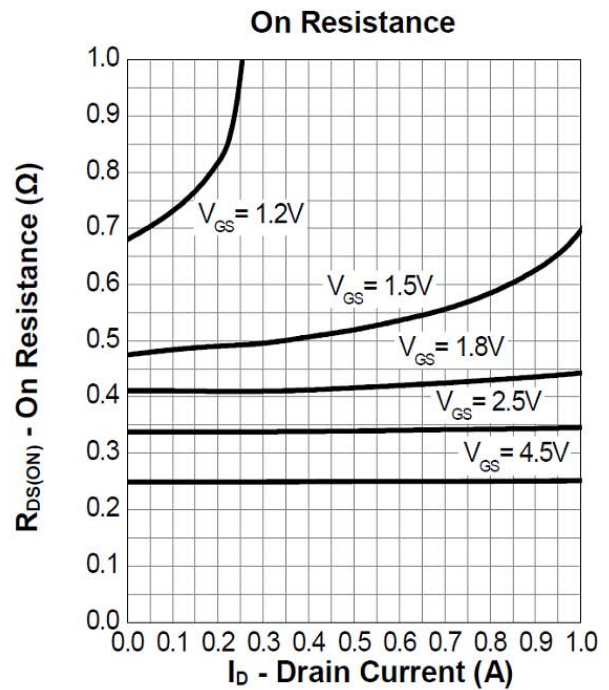
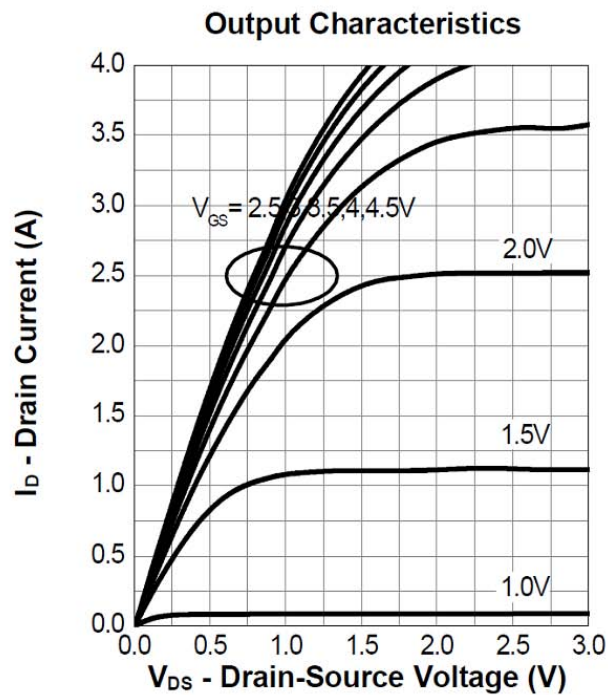
Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V$	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 10V$	--	± 2	± 10	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.35	0.75	1.1	V
$R_{DS(on)}$	Drain-Source On-State Resistance ^B	$V_{GS}=4.5V, I_D=0.5A$	--	170	220	m Ω
		$V_{GS}=2.5V, I_D=0.4A$	--	240	350	m Ω
V_{SD}	Forward Voltage	$I_{SD}=0.5A, V_{GS}=0V$	--	--	1.2	V
Dynamic Parameters ^C						
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=10V$ $f=1MHz$	--	67	--	pF
C_{oss}	Output Capacitance		--	18	--	pF
C_{rss}	Reverse Transfer Capacitance		--	6	--	pF
Q_g	Total Gate Charge	$V_{DS}=10V, I_D=0.5A$ $V_{GS}=4.5V$	--	1.4	--	nC
Q_{gs}	Gate-Source Charge		--	0.21	--	nC
Q_{gd}	Gate-Drain Charge		--	0.21	--	nC
$t_{D(on)}$	Turn-on Delay Time	$V_{DD}=10V$ $I_D=0.15A,$ $R_{GEN}=10\Omega,$ $V_{GS}=4.5V$	--	2.8	--	nS
t_r	Turn-on Rise Time		--	20	--	nS
$t_{D(off)}$	Turn-off Delay Time		--	23	--	nS
t_f	Turn-off Fall Time		--	24	--	nS

A. The data tested by surface mounted on a 1 inch x 1 inch FR-4 board with 20Z copper.

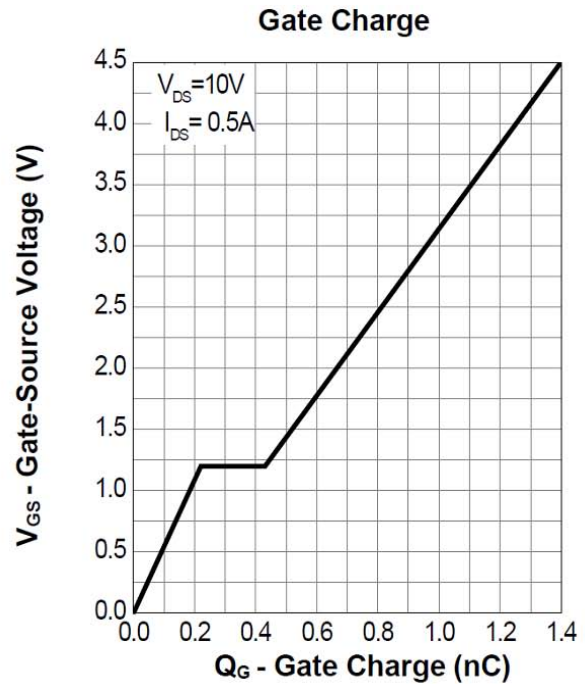
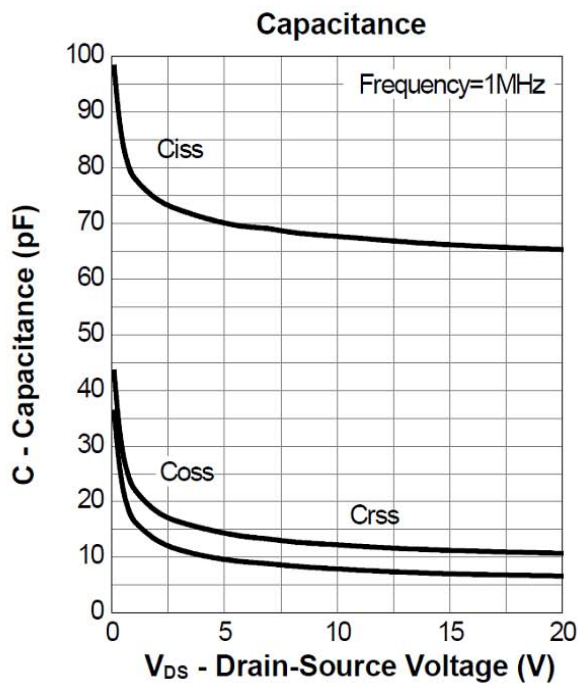
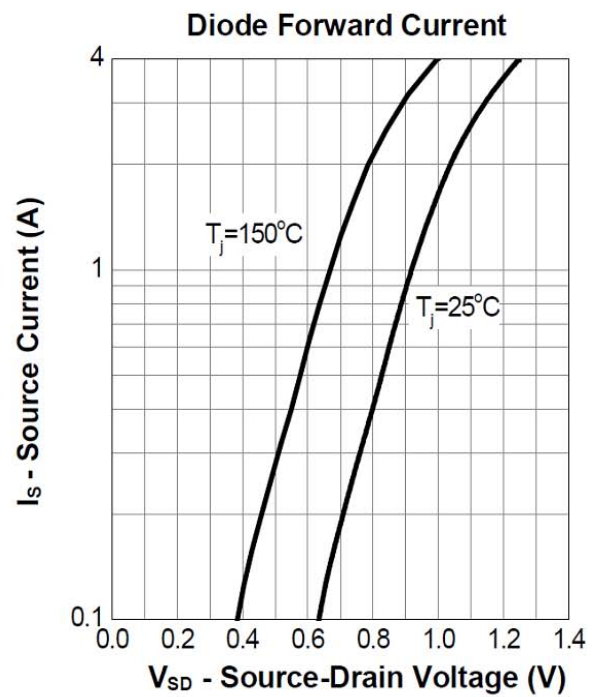
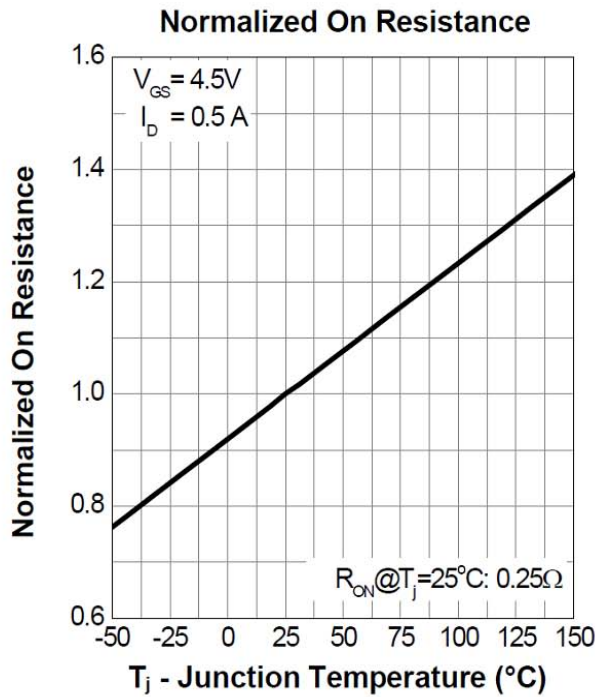
B. Pulse Test: Pulse Width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

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

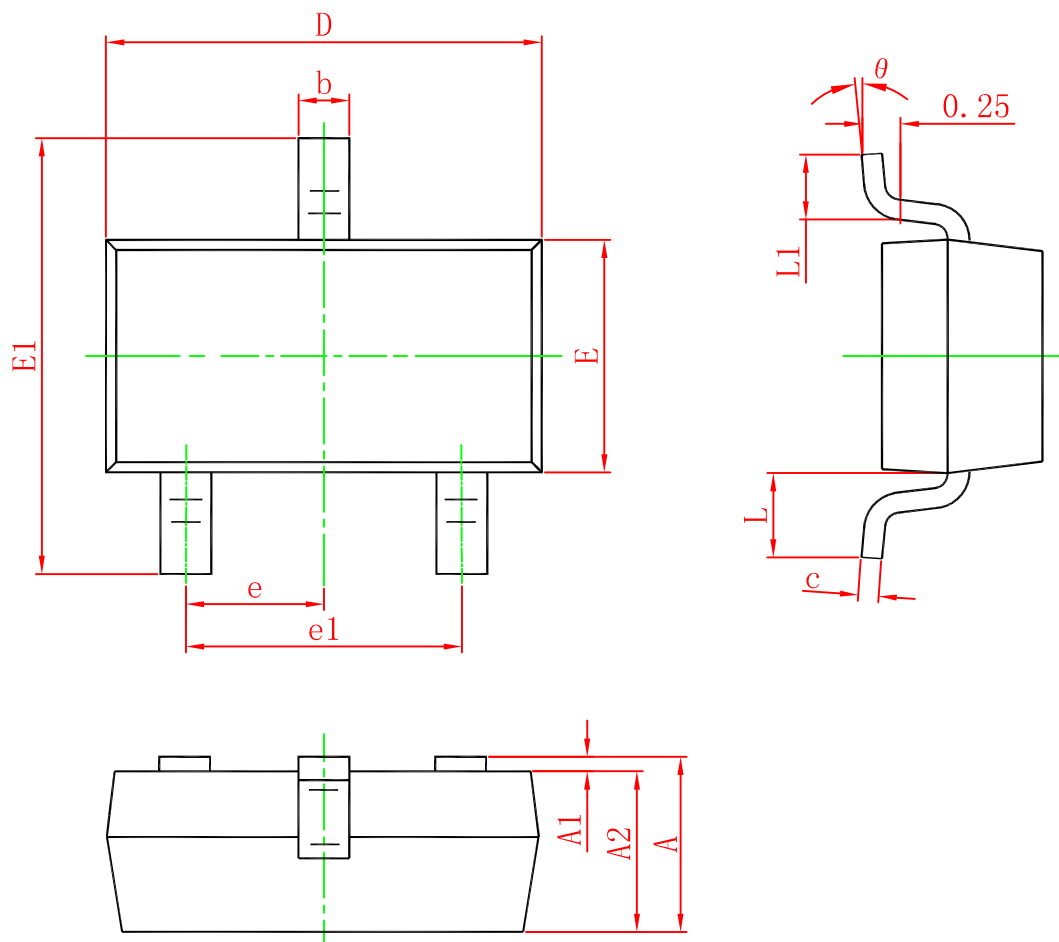
Typical Characteristics



Typical Characteristics



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°