

N-Channel 60V(D-S) MOSFET

Product summary		
V_{DS}	60	V
$R_{DS(ON)}$ (at $V_{GS}=10V$) Typ.	86	m Ω
$R_{DS(ON)}$ (at $V_{GS}=4.5V$) Typ.	92	m Ω
I_D ($T_A=25^\circ C$)	3	A

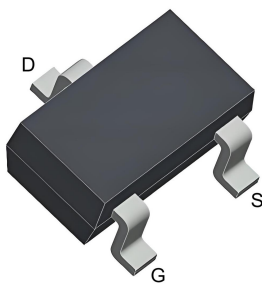
Features

- High density cell design for low $R_{DS(ON)}$
- Trench Power MV MOSFET technology
- RoHS Compliant

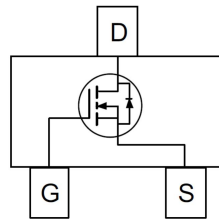
Applications

- DC-DC Converters
- Power management functions

Pin Configuration



SOT-23



Packing Information

Device	Marking	Reel Size	Quantity(Min. Package)
ECDA03N06A	S10.	7"	3000pcs

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current at $V_{GS}=10V$	$T_A=25^\circ C$	3
		$T_A=70^\circ C$	2.4
I_{DM}	Pulse Drain Current Tested ^A	12	A
P_D	Power Dissipation	$T_C=25^\circ C$	1.2
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	105	$^\circ C/W$

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	$V_{GS}=0V, I_D=250\mu A$	60	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=60V, V_{GS}=0V$	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	--	--	± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.3	2.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=10V, I_D=3A$	--	86	100	m Ω
		$V_{GS}=4.5V, I_D=2A$	--	92	120	m Ω
V_{SD}	Forward Voltage	$I_{SD}=3A, V_{GS}=0V$	--	--	1.2	V
Dynamic Parameters						
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=30V$ $f=1\text{MHz}$	--	330	--	pF
C_{oss}	Output Capacitance		--	90	--	pF
C_{rss}	Reverse Transfer Capacitance		--	18	--	pF
Switching Parameters						
Q_g	Total Gate Charge	$V_{DS}=30V, I_D=3A$ $V_{GS}=10V$	--	5.1	--	nC
Q_{gs}	Gate-Source Charge		--	1.2	--	nC
Q_{gd}	Gate-Drain Charge		--	1.7	--	nC
$t_{D(on)}$	Turn-on Delay Time	$V_{DD}=30V$ $R_L=1\Omega, R_{GEN}=3\Omega,$ $V_{GS}=10V$	--	12	--	nS
t_r	Turn-on Rise Time		--	51	--	nS
$t_{D(off)}$	Turn-off Delay Time		--	19	--	nS
t_f	Turn-off Fall Time		--	11	--	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

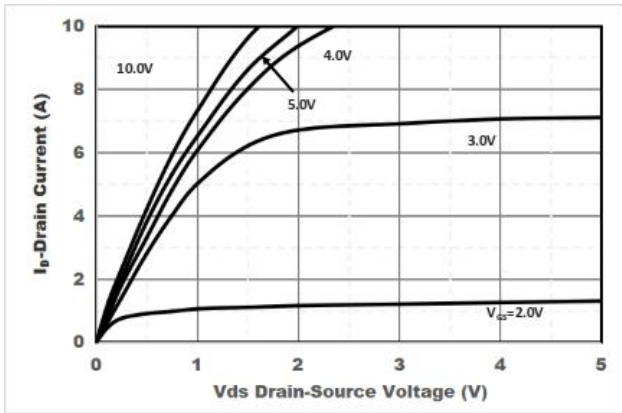


Figure1. Output Characteristics

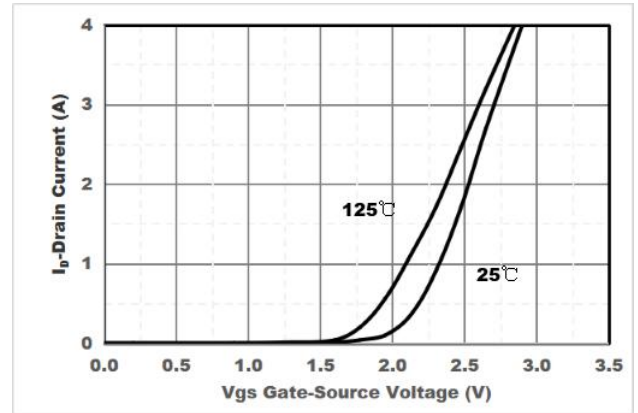


Figure2. Transfer Characteristics

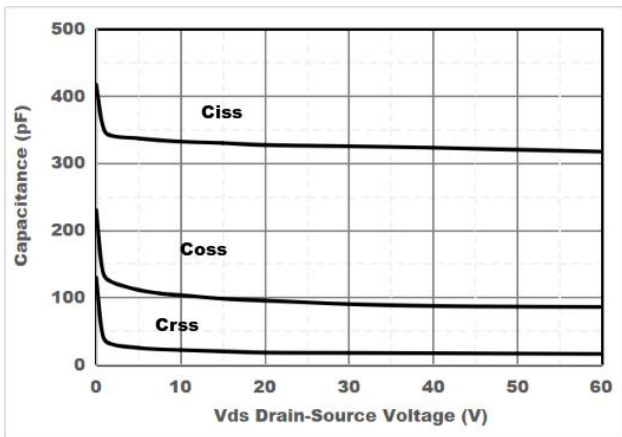


Figure3. Capacitance Characteristics

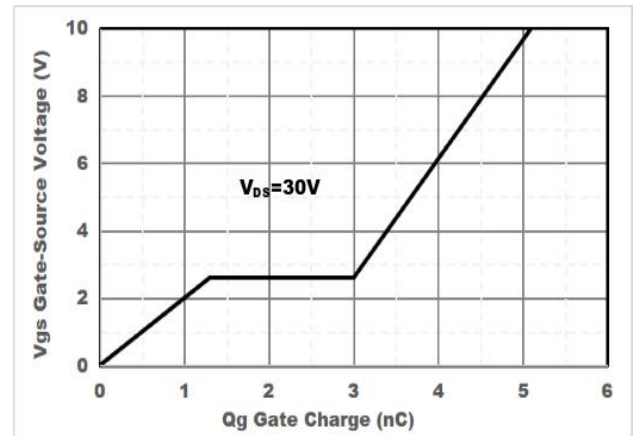


Figure4. Gate Charge

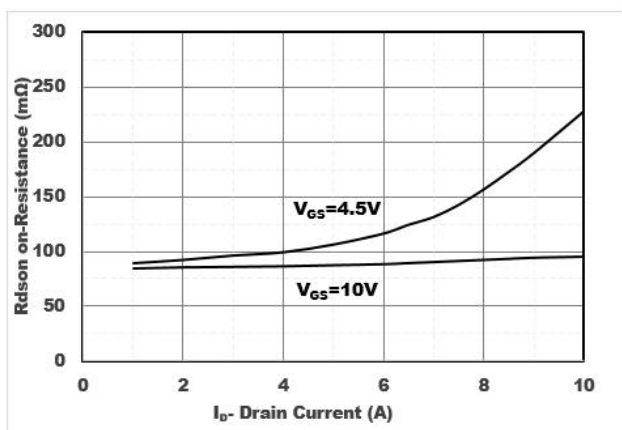


Figure5. Drain-Source on Resistance

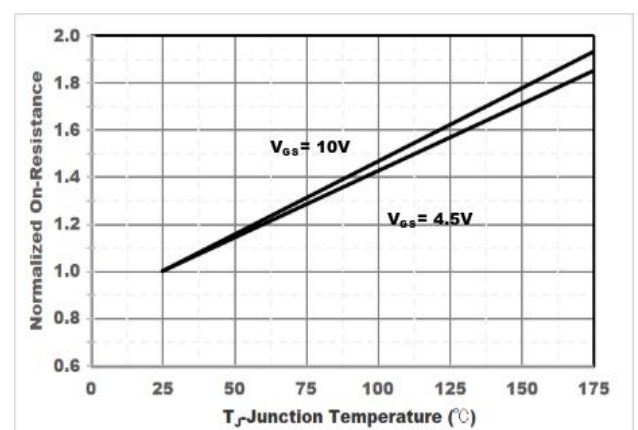


Figure6. Drain-Source on Resistance

Typical Characteristics

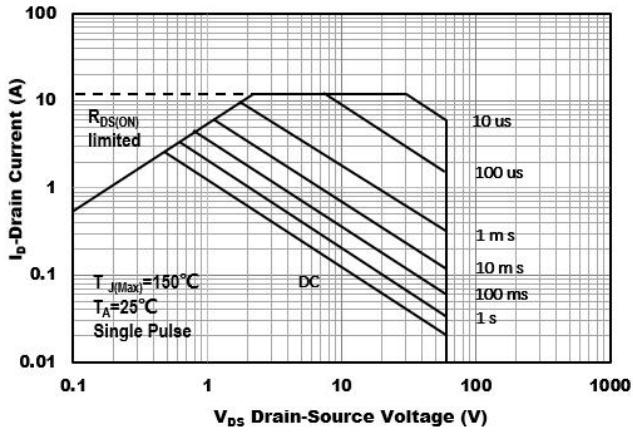


Figure7. Safe Operation Area

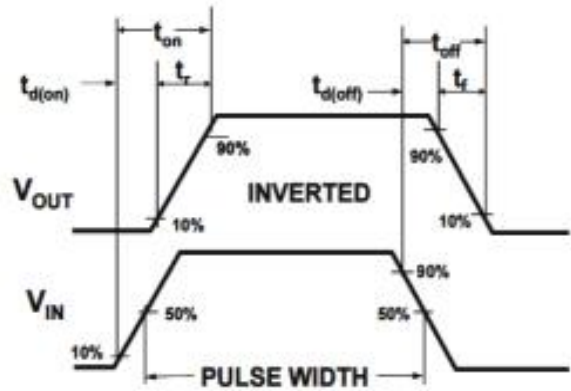
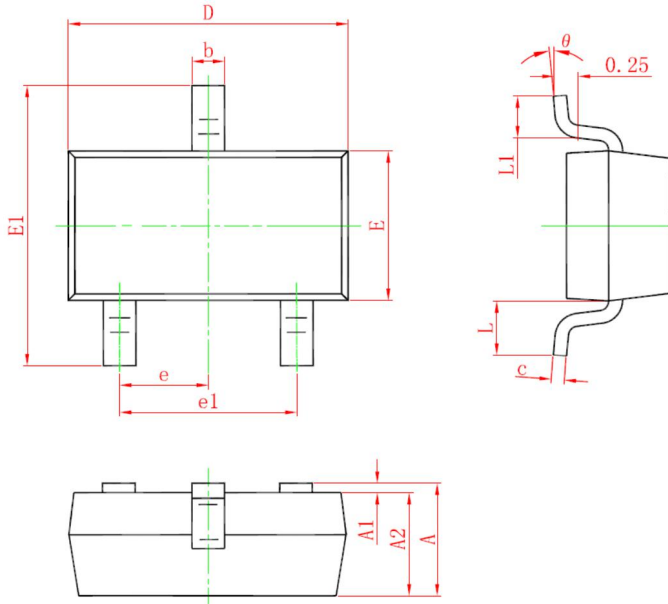


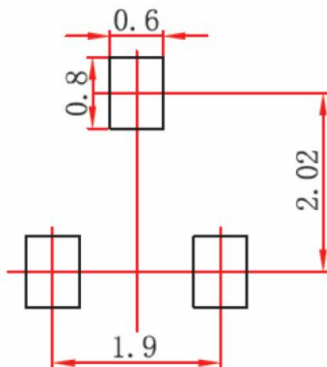
Figure8. Switching wave

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°

Recommended Pad outline



Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.