

## Dual N-Channel 30V(D-S) MOSFET

Product summary		
$V_{DS}$	30	V
$R_{DS(ON)}$ (at $V_{GS}=10V$ ) Typ.	9	m $\Omega$
$R_{DS(ON)}$ (at $V_{GS}=4.5V$ ) Typ.	11	m $\Omega$
$I_D$ ( $T_C=25^\circ C$ )	12	A

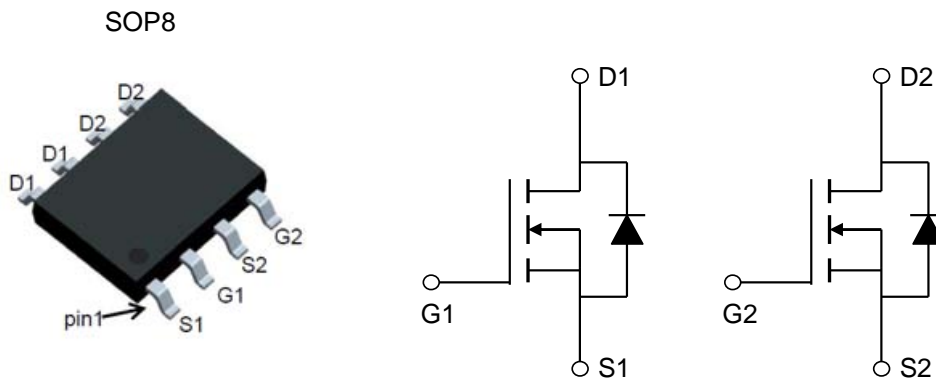
### Features

- High density cell design for low  $R_{ds(on)}$
- Trench Power LV MOSFET technology
- RoHS and Halogen-Free compliant

### Applications

- Load switching
- Battery protection
- Uninterruptible power supply

### Pin Configuration



### Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECS12N03A	SOP8	13"	4000pcs

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

Symbol	Parameter	Rating	Units	
$V_{DS}$	Drain-Source Voltage	30	V	
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V	
$I_D$	Continuous Drain Current at $V_{GS}=10V$	$T_C=25^\circ C$	12	A
		$T_C=70^\circ C$	9.6	A
$I_{DM}$	Pulse Drain Current Tested	45	A	
$P_D$	Power Dissipation	$T_C=25^\circ C$	2.4	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	52	$^\circ C/W$

## 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	$V_{GS}=0V, I_D=250\mu A$	30	--	--	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V$	--	--	1	$\mu A$
$I_{GSS}$	Gate-Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	--	--	$\pm 100$	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.5	2.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance	$V_{GS}=10V, I_D=8A$	--	9	12	$m\Omega$
		$V_{GS}=4.5V, I_D=6A$	--	11	15	$m\Omega$
$V_{SD}$	Forward Voltage	$I_{SD}=15A, V_{GS}=0V$	--	0.9	1.2	V
<b>Dynamic Parameters</b>						
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=15V$ $f=1MHz$	--	972	--	pF
$C_{oss}$	Output Capacitance		--	201	--	pF
$C_{rss}$	Reverse Transfer Capacitance		--	131	--	pF
$Q_g$	Total Gate Charge	$V_{DS}=15V, I_D=12A$ $V_{GS}=10V$	--	27	--	nC
$Q_{gs}$	Gate-Source Charge		--	8	--	nC
$Q_{gd}$	Gate-Drain Charge		--	7	--	nC
<b>Switching Parameters</b>						
$t_{D(on)}$	Turn-on Delay Time	$V_{DD}=20V, I_D=2A$ $R_G=3\Omega, V_{GS}=10V$	--	8.1	--	nS
$t_r$	Turn-on Rise Time		--	15	--	nS
$t_{D(off)}$	Turn-off Delay Time		--	18	--	nS
$t_f$	Turn-off Fall Time		--	7.2	--	nS
$t_{rr}$	Reverse Recovery Time	$I_F=12A$ $di/dt=100A/\mu s$	--	24	--	nS
$Q_{rr}$	Reverse Recovery Charge		--	28	--	nC

Typical Characteristics

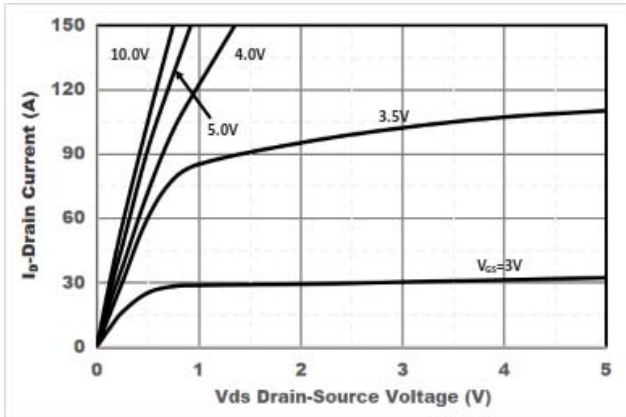


Figure1. Output Characteristics

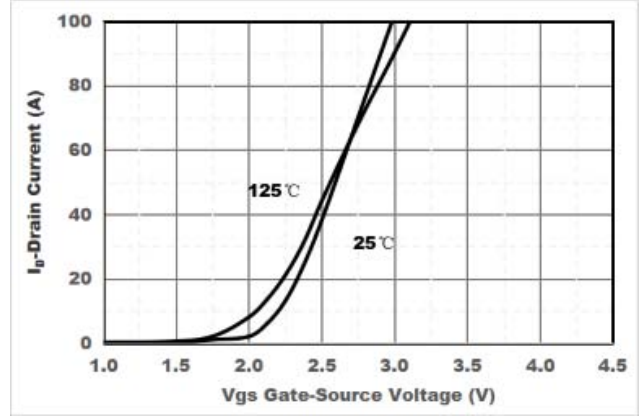


Figure2. Transfer Characteristics

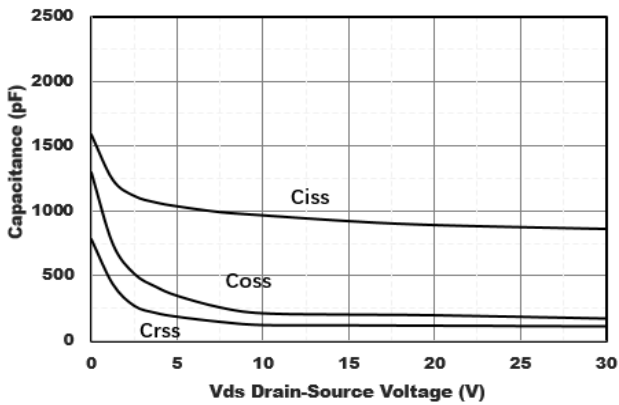


Figure3. Capacitance Characteristics

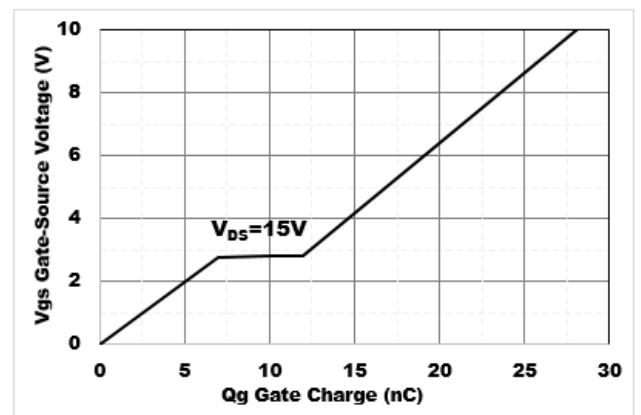


Figure4. Gate Charge

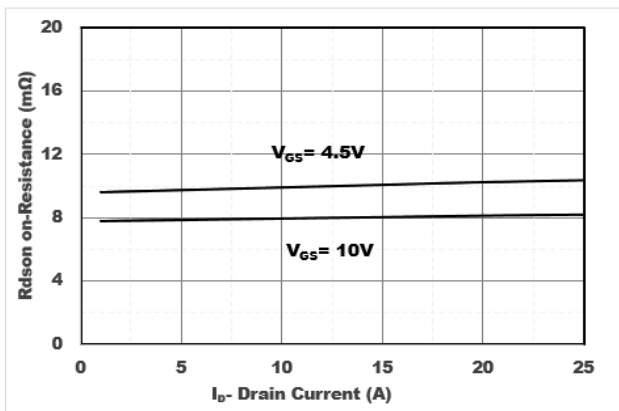


Figure5. Drain-Source on Resistance

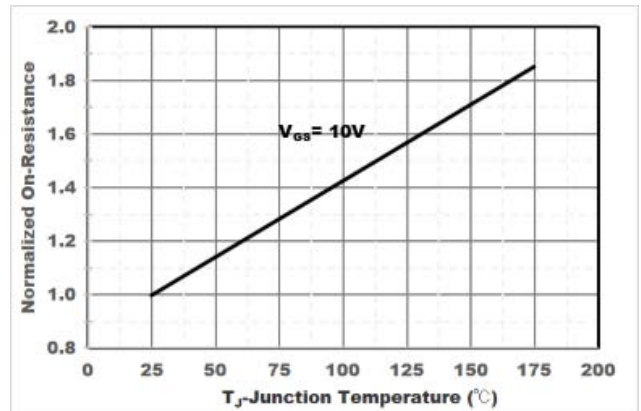


Figure6. Drain-Source on Resistance

Typical Characteristics

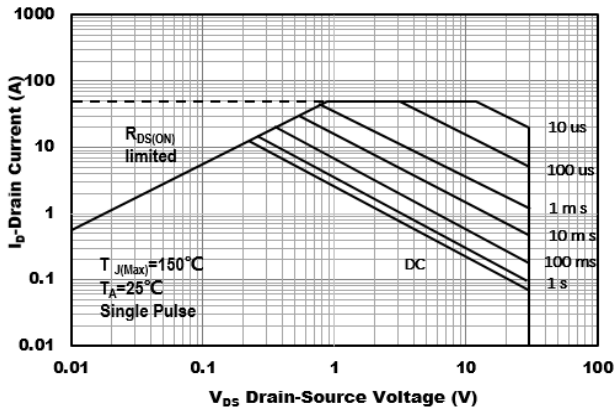


Figure7. Safe Operation Area

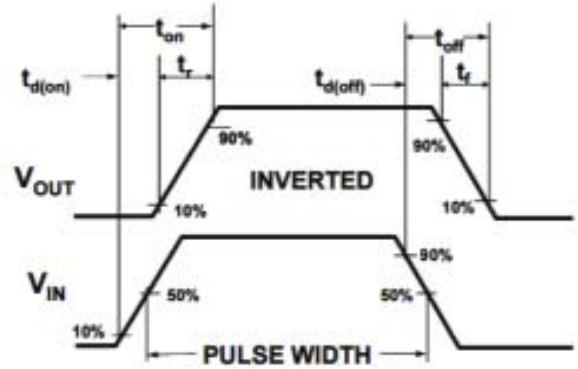
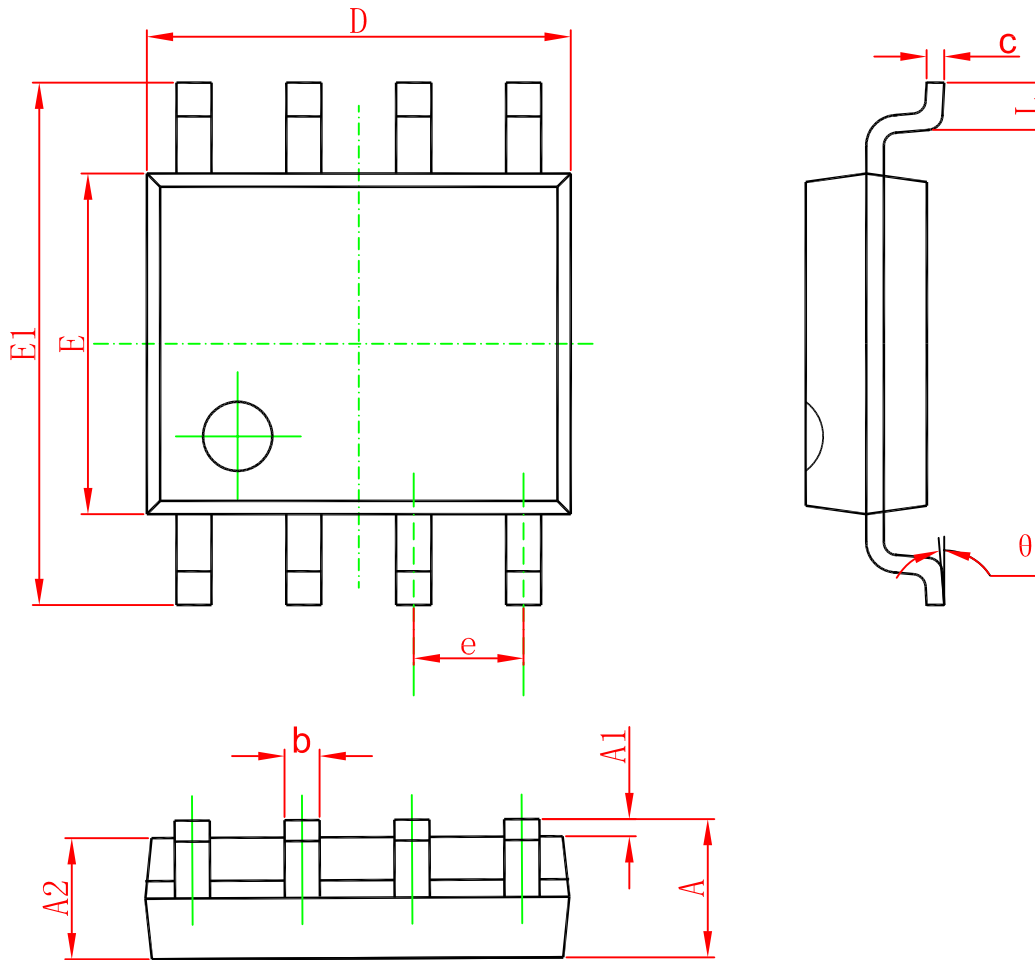


Figure8. Switching wave

SOP8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°