

N-Channel 20V(D-S) MOSFET

Product summary		
V_{DS}	20	V
$R_{DS(ON)}$ (at $V_{GS}=4.5V$) Typ.	4.9	m Ω
$R_{DS(ON)}$ (at $V_{GS}=2.5V$) Typ.	6.9	m Ω
I_D ($T_A=25^\circ C$)	18	A

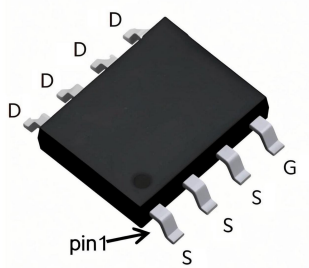
Features

- Very Low $R_{DS(ON)}$
- Fast switching

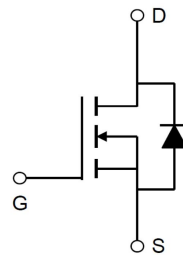
Applications

- Load Switch
- PWM Application

Pin Configuration



SOP8



Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECHA2018	SOP8	13"	4000pcs

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		± 12	V
I_D	Continuous Drain Current	$T_A=25^\circ C$	18	A
		$T_A=100^\circ C$	11.4	A
I_{DM}	Pulse Drain Current ^A		75	A
E_{AS}	Single Pulse Avalanche Energy ^B		40	mJ
P_D	Power Dissipation ^C		3.1	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 ^C	40.3	$^\circ C/W$

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	$V_{DS}=0V, V_{GS}=\pm 12V$	--	--	± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.4	0.67	1.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance ^D	$V_{GS}=4.5V, I_D=15A$	--	4.9	6.3	m Ω
		$V_{GS}=2.5V, I_D=15A$	--	6.9	8.7	m Ω
V_{SD}	Diode Forward Voltage	$I_S=18A, V_{GS}=0V$	--	--	1.2	V
Dynamic Parameters ^E						
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=10V$ $f=1\text{MHz}$	--	1610	--	pF
C_{oss}	Output Capacitance		--	275	--	pF
C_{rss}	Reverse Transfer Capacitance		--	260	--	pF
Q_g	Total Gate Charge	$V_{DS}=10V, I_D=18A$ $V_{GS}=10V$	--	43.3	--	nC
Q_{gs}	Gate-Source Charge		--	2.9	--	nC
Q_{gd}	Gate-Drain Charge		--	11.2	--	nC
$t_{D(on)}$	Turn-on Delay Time	$V_{DS}=10V$ $I_D=18A, R_G=3\Omega,$ $V_{GS}=4.5V$	--	18	--	ns
t_r	Turn-on Rise Time		--	48	--	ns
$t_{D(off)}$	Turn-off Delay Time		--	72	--	ns
t_f	Turn-off Fall Time		--	25	--	ns

A. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

B. The EAS data shows Max. Rating, The test condition is $T_J=25^{\circ}\text{C}$, $V_{DD}=10V, V_G=10V, L=0.5\text{mH}$.

C. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.

D. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

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

Typical Characteristics

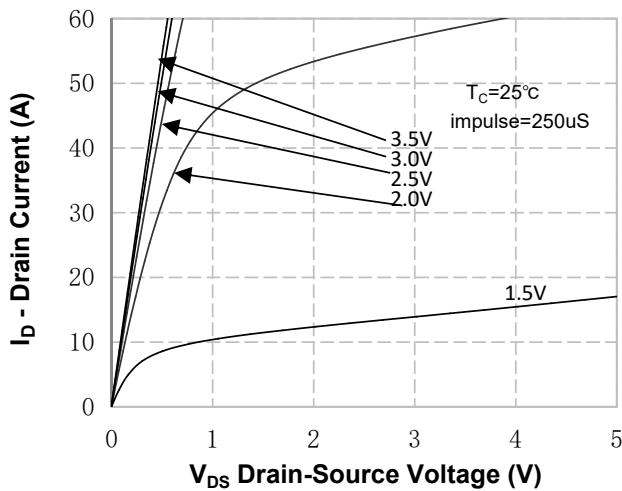


Figure 1. On-Region Characteristics

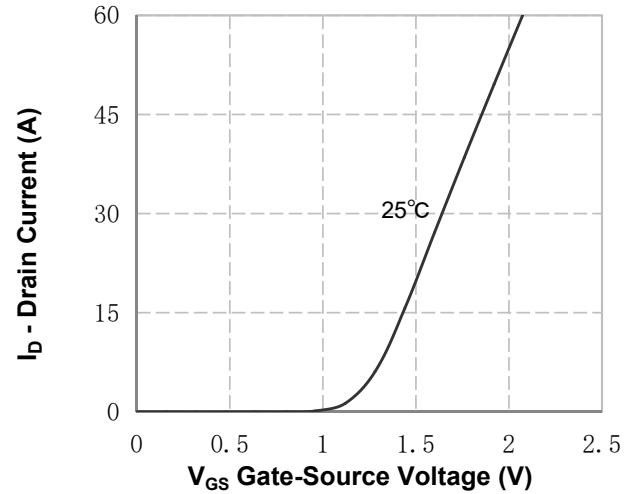


Figure 2. Transfer Characteristics

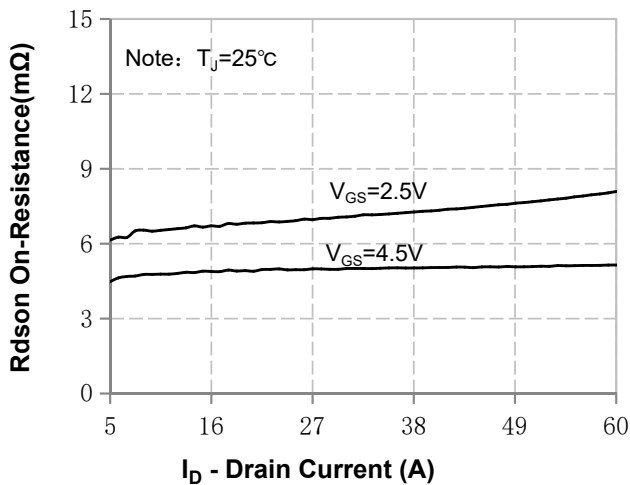


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

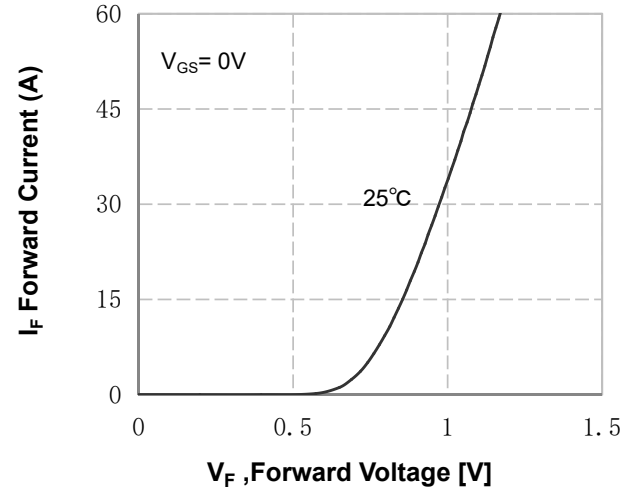


Figure 4. Body Diode Forward Voltage Variation with Source Current

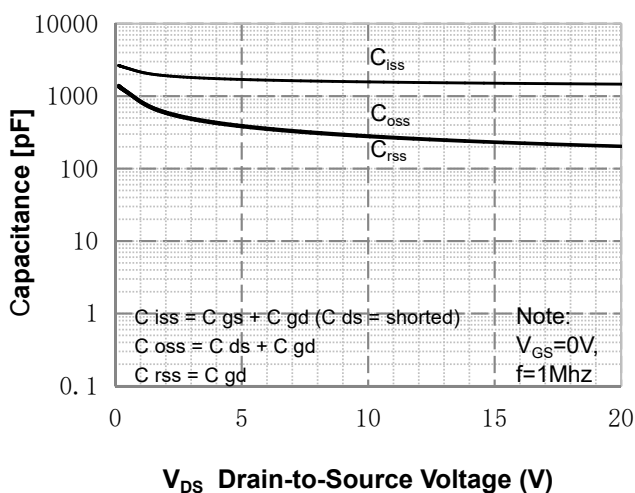


Figure 5. Capacitance Characteristics

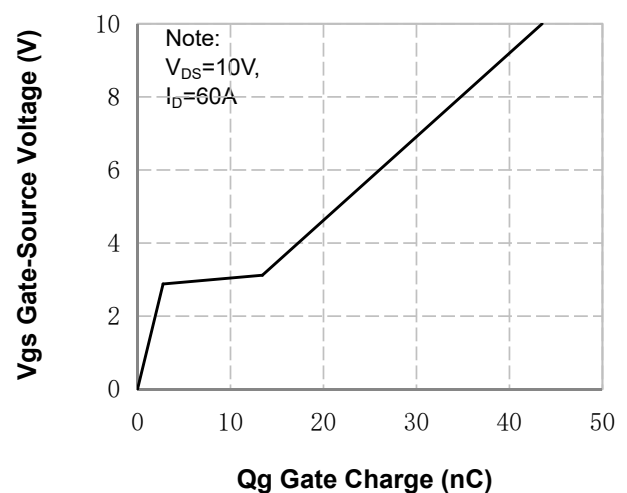


Figure 6. Gate Charge Characteristics

Typical Characteristics

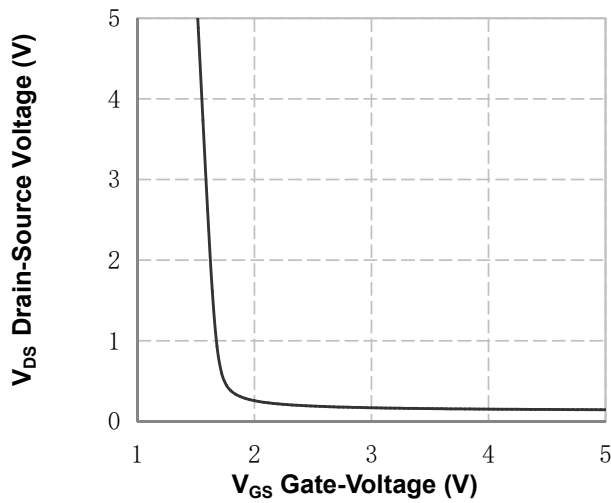


Figure 7. Vds Drain-Source Voltage vs Gate Voltage

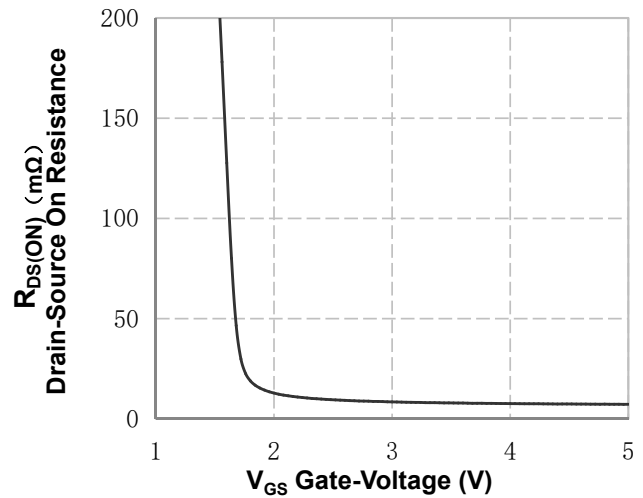


Figure 8. On-Resistance vs Gate Voltage

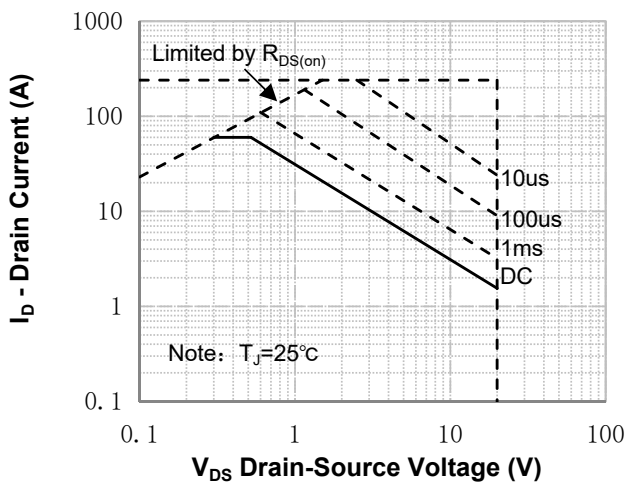


Figure 9. Maximum Safe Operating Area

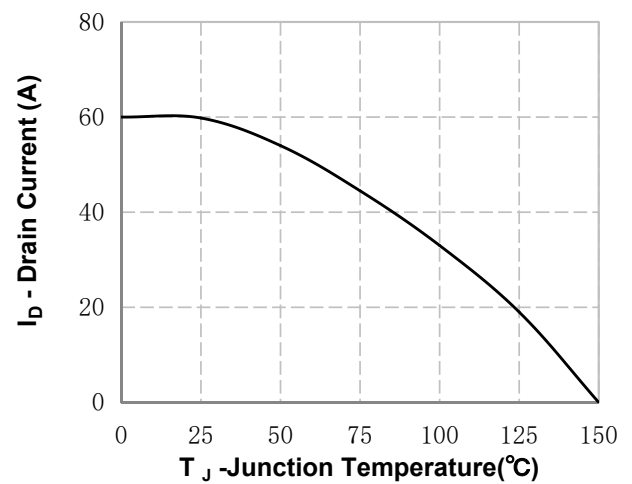


Figure 10. Maximum Continuous Drain Current vs Case Temperature

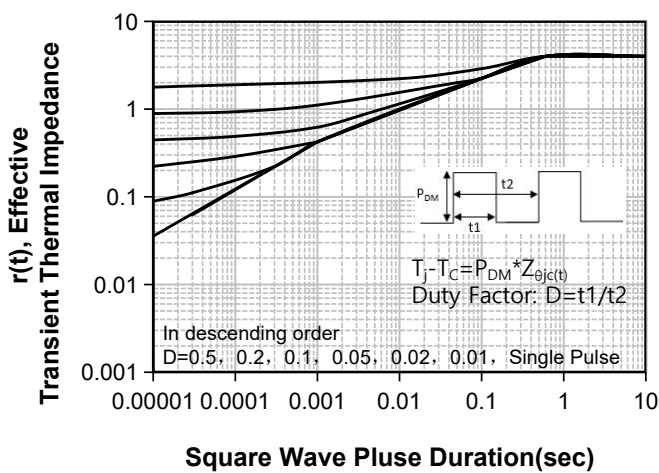
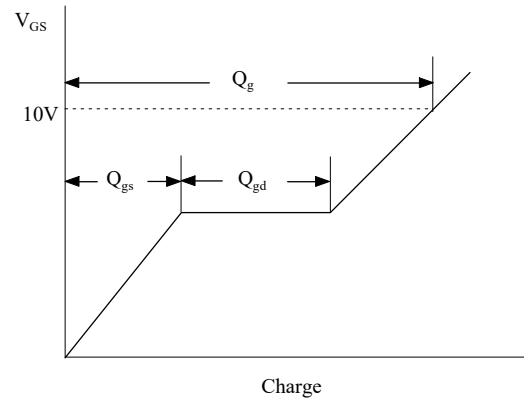
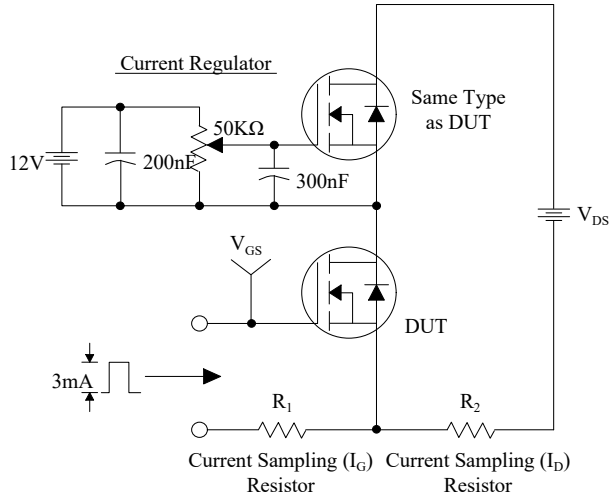


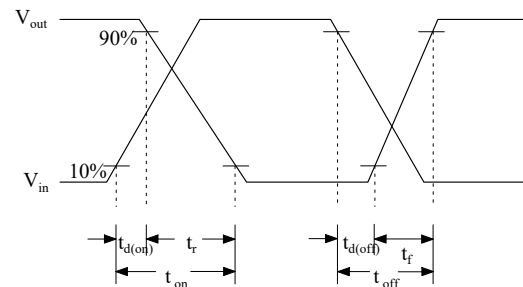
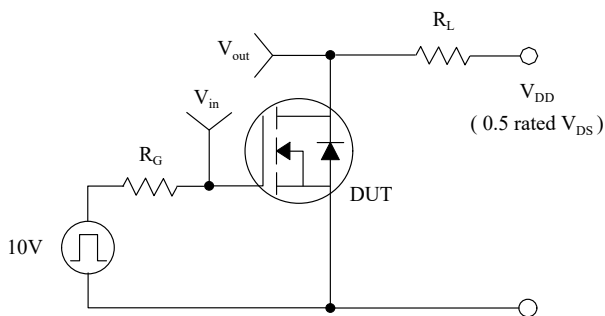
Figure 11. Transient Thermal Response Curve

Test Circuit

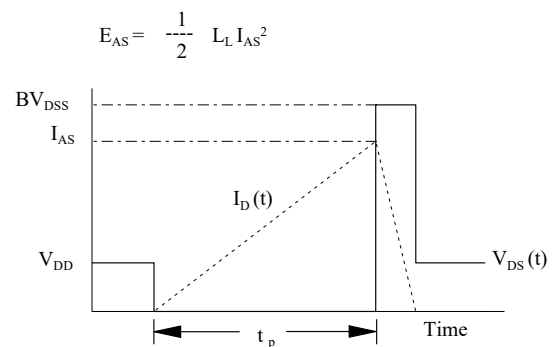
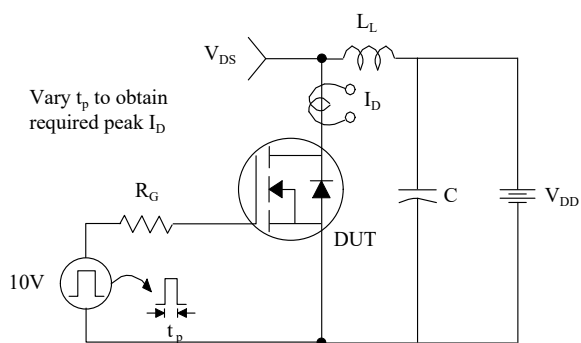
Gate Charge Test Circuit & Waveform



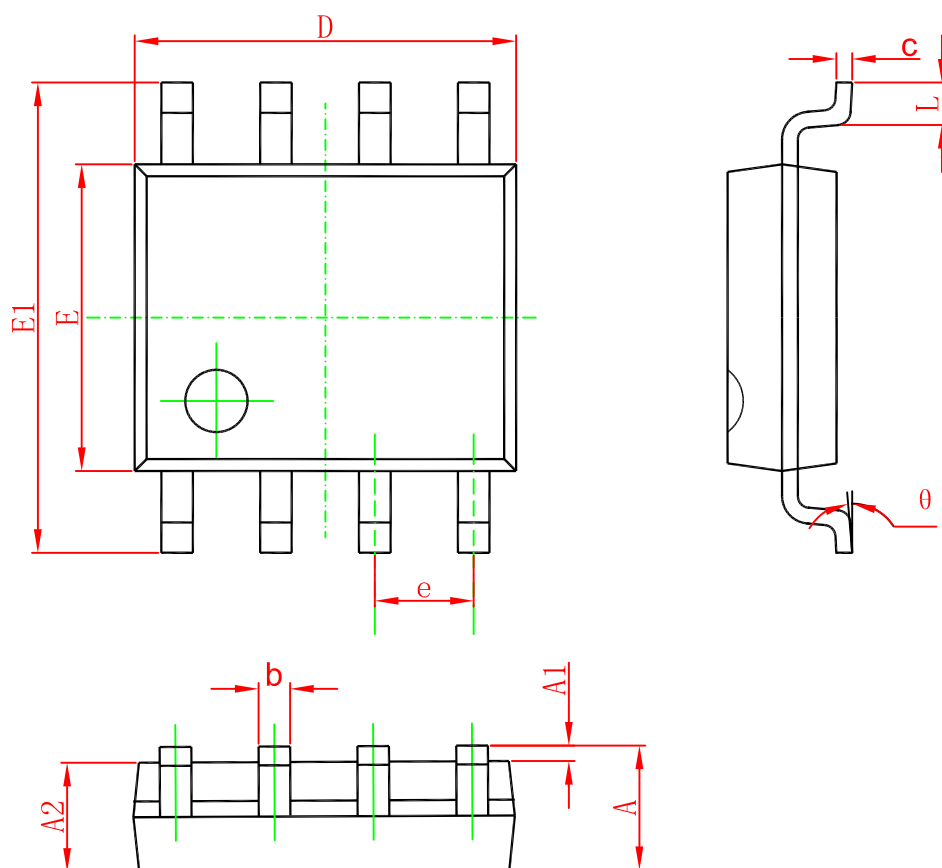
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



SOP8 Package Information(mm)



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°