N-Channel 30V(D-S) MOSFET

Product summary		
V_{DS}	30	V
$R_{DS(ON)}$(at V_{GS}=10V) Typ.	6.2	mΩ
$R_{DS(ON)}$(at V_{GS}=4.5V) Typ.	10	mΩ
I_D(T_A=25℃)	20	A

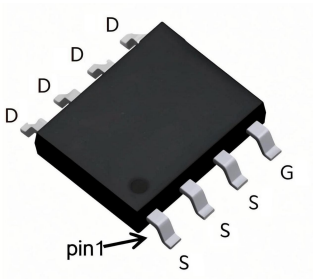
Features

- Low Gate Charge
- Advanced Trench Technology

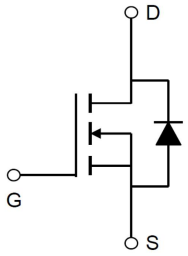
Applications

- Load Switch
- PWM Application

Pin Configuration



SOP8



Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECHA20N03A	SOP8	13″	4000pcs

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

Symbol	Parameter		Rating	Units
V_{DS}	Drain-Source Voltage		30	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_A=25℃	20	A
		T_A=100℃	12.7	A
I_{DM}	Pulse Drain Current [A]		65	A
E_{AS}	Single Pulse Avalanche Energy [B]		39	mJ
P_D	Power Dissipation [C]		3.5	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 [C]	35.7	℃/W

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	30	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V,V_{GS}=0V	--	--	1	uA
I_{GSS}	Gate-Body Leakage Current	V_{DS}=0V,V_{GS}=±20V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	1.0	1.5	2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance [D]	V_{GS}=10V,I_D=15A	--	6.2	8	mΩ
		V_{GS}=4.5V,I_D=10A	--	10	14	mΩ
V_{SD}	Diode Forward Voltage	I_S=20A,V_{GS}=0V	--	--	1.2	V
I_S	Maximum Continuous Drain to Source Diode Forward Current	V_G=V_D=0V	--	--	20	A
Dynamic Parameters [E]						
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=15V f=1MHZ	--	1116	--	pF
C_{oss}	Output Capacitance		--	187	--	pF
C_{rss}	Reverse Transfer Capacitance		--	152	--	pF
Q_g	Total Gate Charge	V_{DS}=15V,I_D=8A V_{GS}=10V	--	13.3	--	nC
Q_{gs}	Gate-Source Charge		--	3.1	--	nC
Q_{gd}	Gate-Drain Charge		--	5	--	nC
$t_{D(on)}$	Turn-on Delay Time	V_{DS}=15V I_D=15A,R_{GEN}=3Ω, V_{GS}=10V	--	15	--	ns
t_r	Turn-on Rise Time		--	19	--	ns
$t_{D(off)}$	Turn-off Delay Time		--	35	--	ns
t_f	Turn-off Fall Time		--	21	--	ns
t_{rr}	Reverse Recovery Time	I_F=15A di/dt=100A/us	--	14	--	ns
Q_{rr}	Reverse Recovery Charge		--	4.1	--	nC

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

B. The EAS data shows Max. Rating,The test condition is T_J=25℃, V_{GS}=15V, R_G=25Ω, L=0.5mH, I_{AS}=12.6A.

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

D. The data tested by pulsed , pulse width≦300us , duty cycle≦2%.

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

Typical Characteristics

Figure1: Output Characteristics

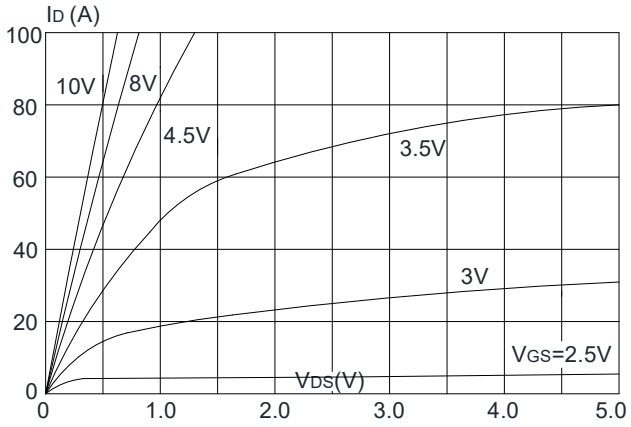


Figure 2: Typical Transfer Characteristics

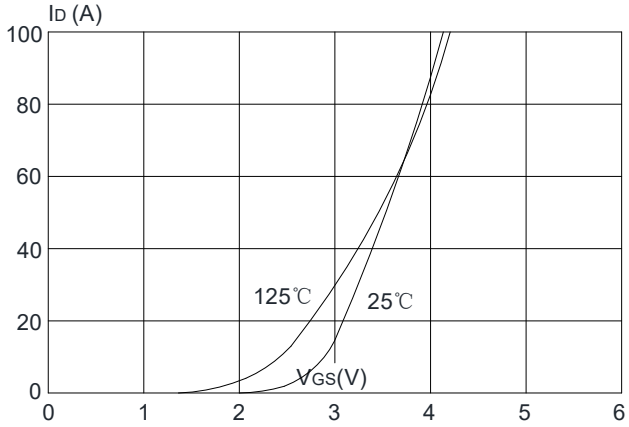


Figure 3: On-resistance vs. Drain Current

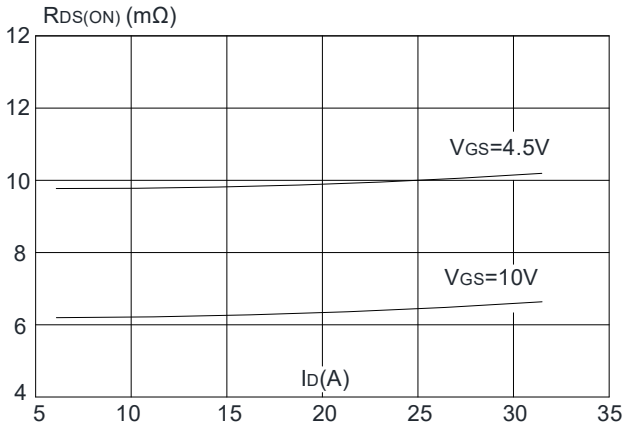


Figure 4: Body Diode Characteristics

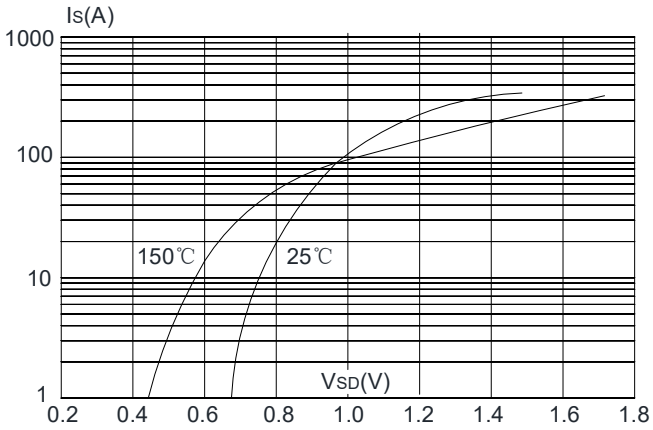


Figure 5: Gate Charge Characteristics

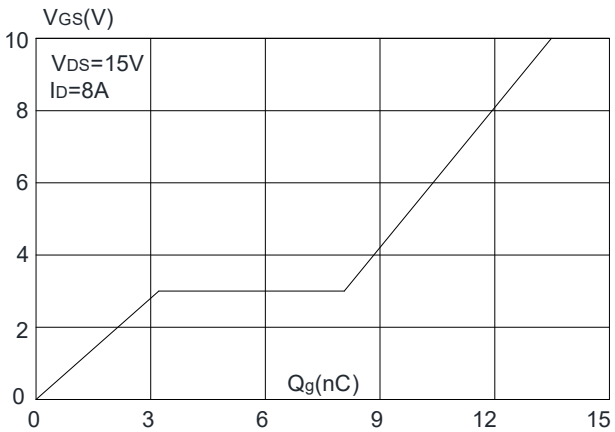
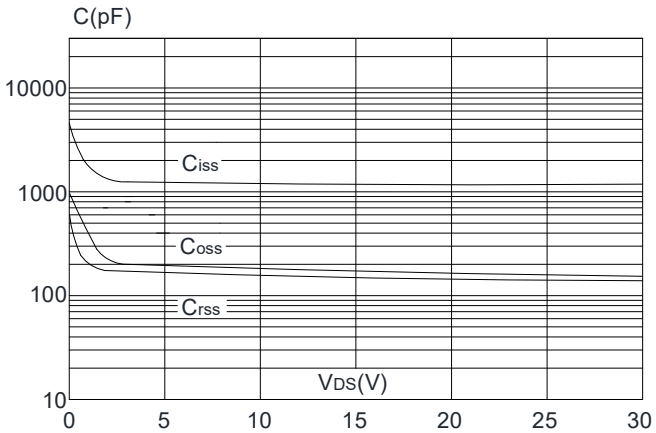


Figure 6: Capacitance Characteristics



Typical Characteristics

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

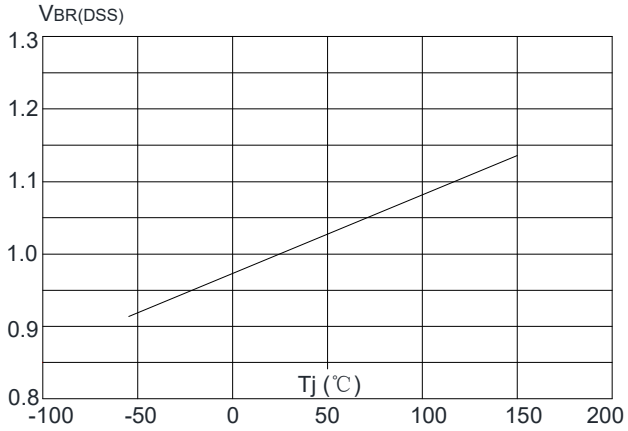


Figure 8: Normalized on Resistance vs. Junction Temperature

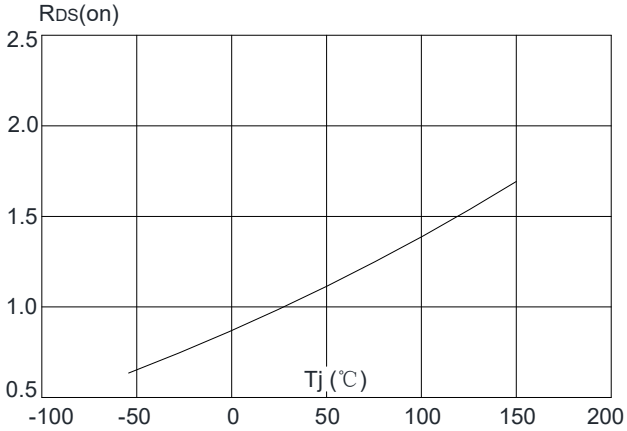


Figure 9: Maximum Safe Operating Area

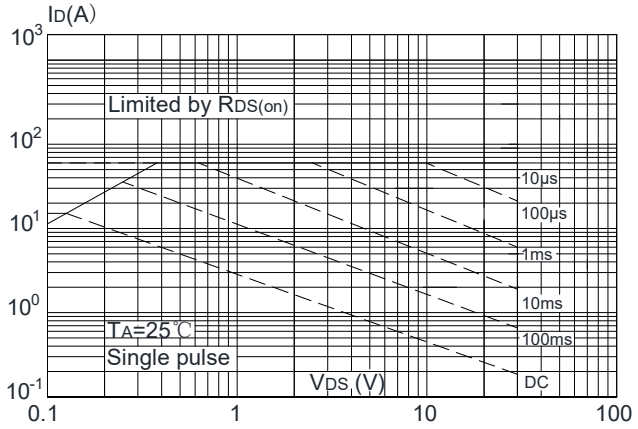


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

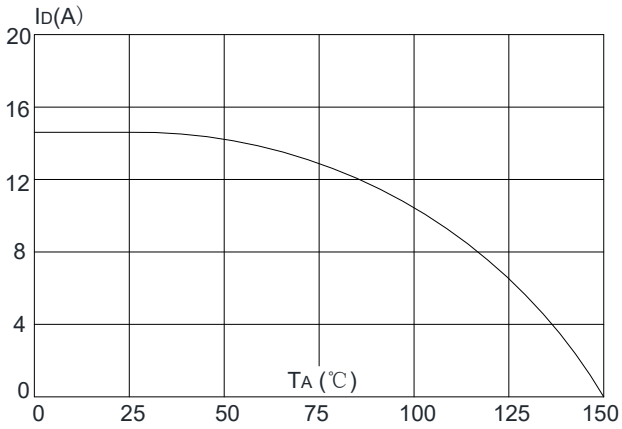
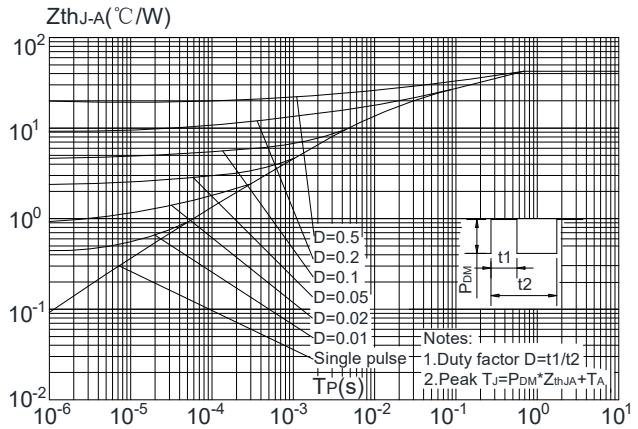


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



Test Circuit

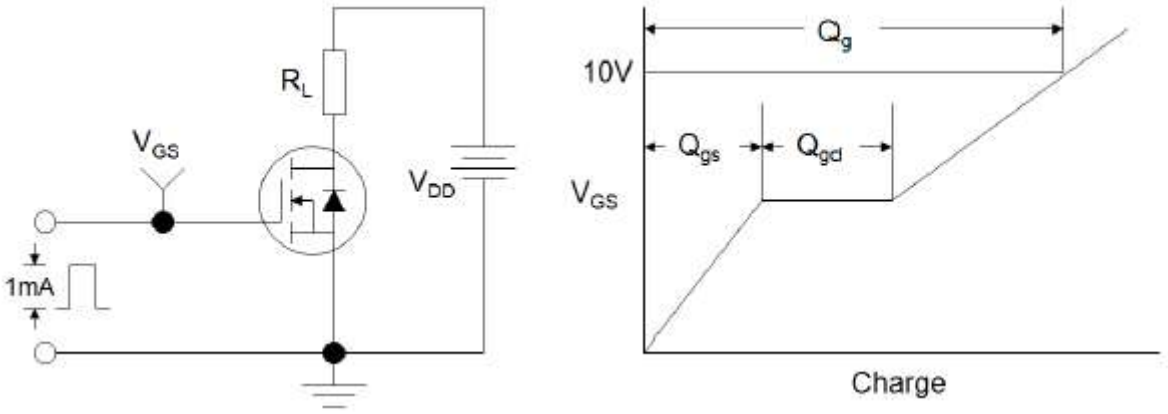


Figure1:Gate Charge Test Circuit & Waveform

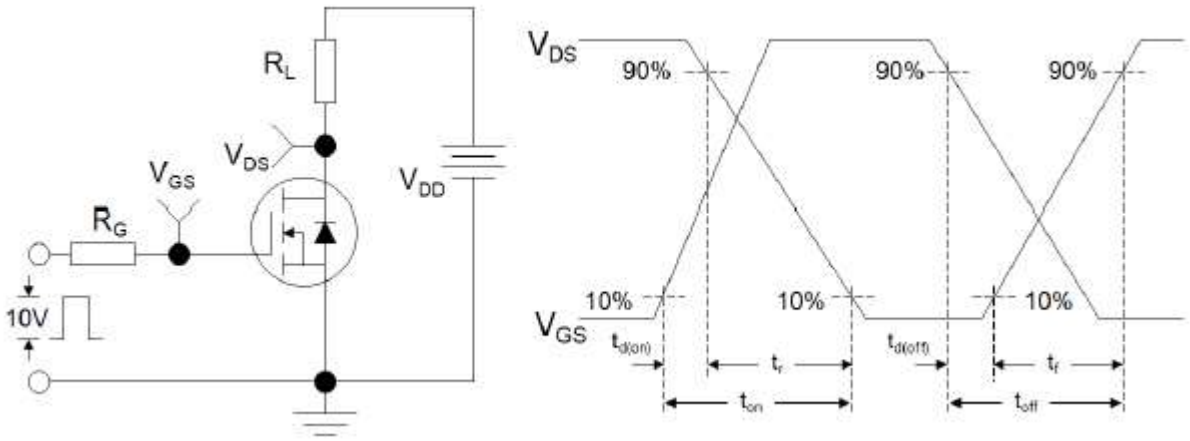


Figure 2: Resistive Switching Test Circuit & Waveforms

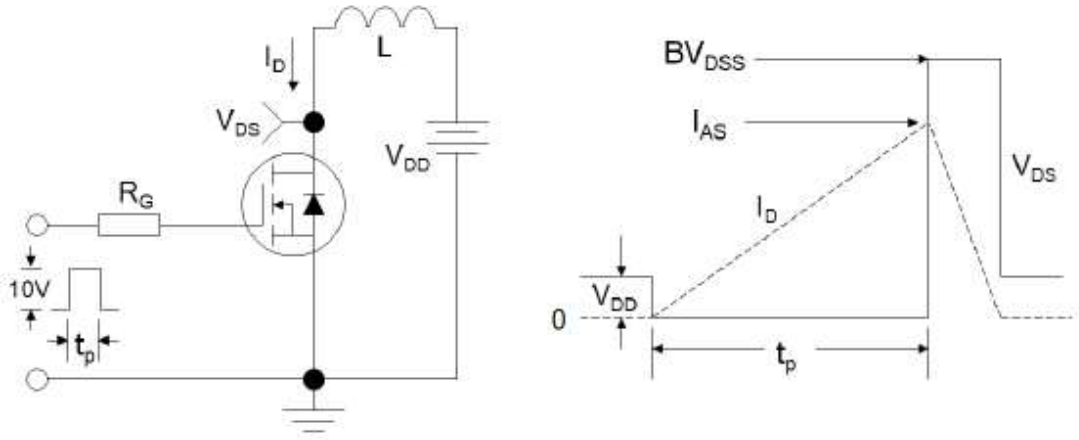
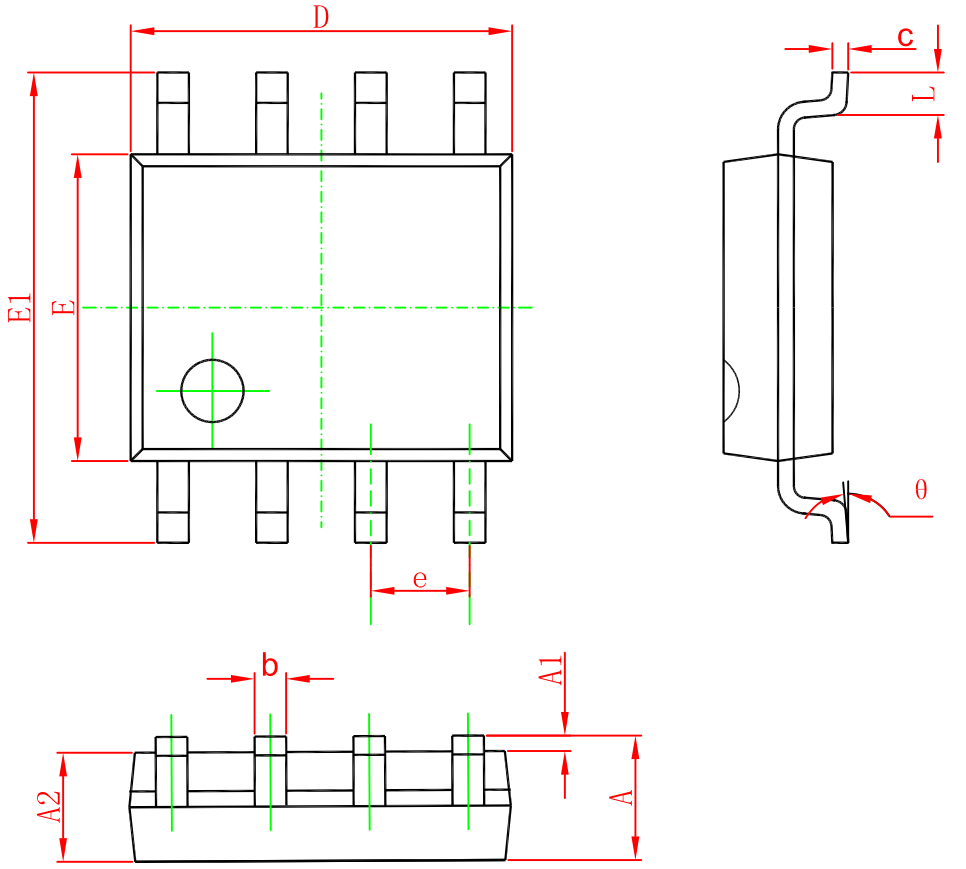


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

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°