N-Channel 60V(D-S) MOSFET

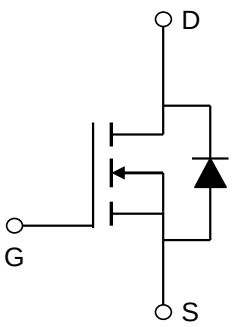
Product summary		
V_{DS}	60	V
$R_{DS(ON)}$(at V_{GS}=10V) Typ.	19	mΩ
$R_{DS(ON)}$(at V_{GS}=4.5V) Typ.	25	mΩ
I_D(Tc=25℃)	50	A

Features
- High Speed Power Switching
- Excellent Cdv/dt effect decline
- Super Low Gate Charge

Applications
- Power Tools
- Hard Switching and High Speed Circuit

Pin Configuration

TO-252



Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECG60N50C	TO-252	13″	2500pcs

Absolute Maximum Ratings (at TA=25℃ 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_C=25℃	50	A
		T_C=100℃	30	A
I_{DM}	Pulse Drain Current Tested		100	A
P_D	Power Dissipation	T_C=25℃	50	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	62	℃/W

Electrical Characteristics (at TJ =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	60	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V,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	1.8	3.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V,I_D=15A	--	19	25	mΩ
		V_{GS}=4.5V,I_D=8A	--	25	35	mΩ
V_{SD}	Forward Voltage	I_{SD}=5A,V_{GS}=0V	--	--	1.2	V
Dynamic Parameters						
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=15V f=1MHZ	--	3096	--	pF
C_{oss}	Output Capacitance		--	242	--	pF
C_{rss}	Reverse Transfer Capacitance		--	175	--	pF
Q_g	Total Gate Charge	V_{DS}=48V,I_D=15A V_{GS}=4.5V	--	28.3	--	nC
Q_{gs}	Gate-Source Charge		--	11.2	--	nC
Q_{gd}	Gate-Drain Charge		--	10.4	--	nC
Switching Parameters						
$t_{D(on)}$	Turn-on Delay Time	V_{DD}=30V,I_D=15A R_G=3.3Ω,V_{GS}=10V	--	10.7	--	nS
t_r	Turn-on Rise Time		--	8.9	--	nS
$t_{D(off)}$	Turn-off Delay Time		--	62	--	nS
t_f	Turn-off Fall Time		--	5.4	--	nS
t_{rr}	Reverse Recovery Time	I_F=15A di/dt=100A/us	--	18	--	nS
Q_{rr}	Reverse Recovery Charge		--	14	--	nC

Typical Characteristics

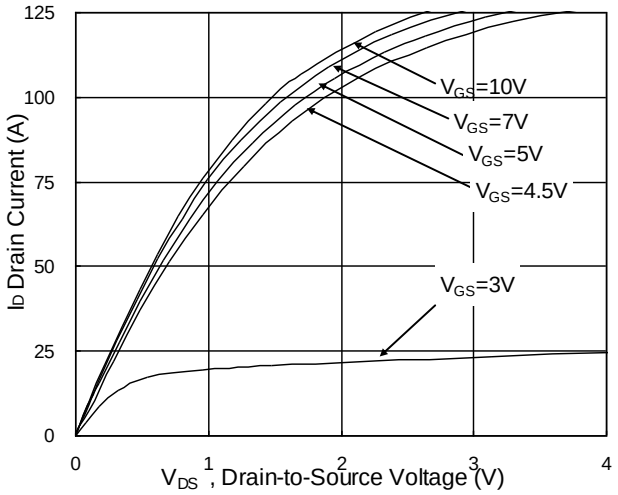


Fig.1 Typical Output Characteristics

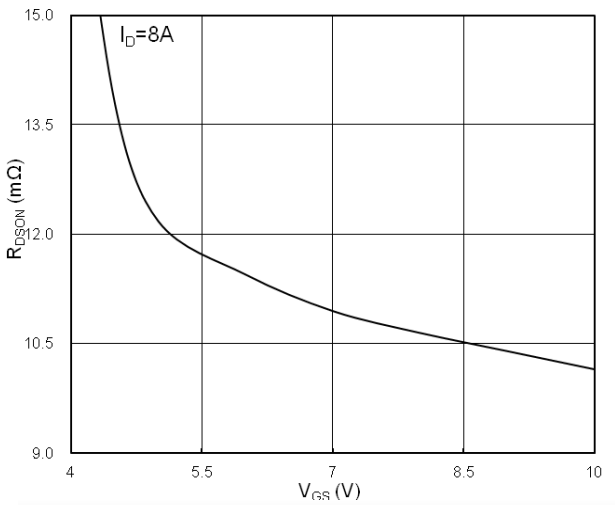


Fig.2 On-Resistance vs. Gate-Source Voltage

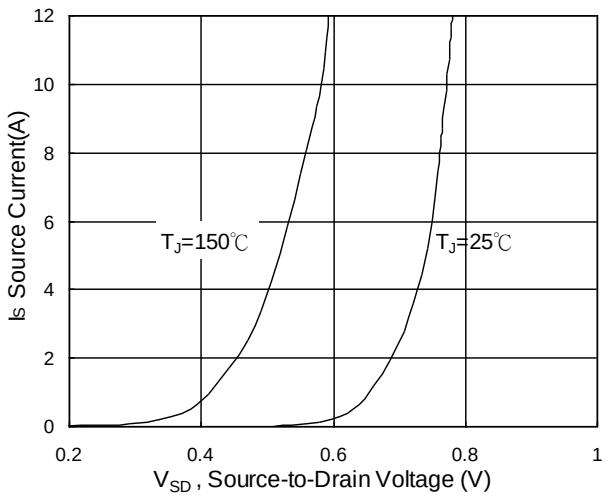


Fig.3 Forward Characteristics of Reverse

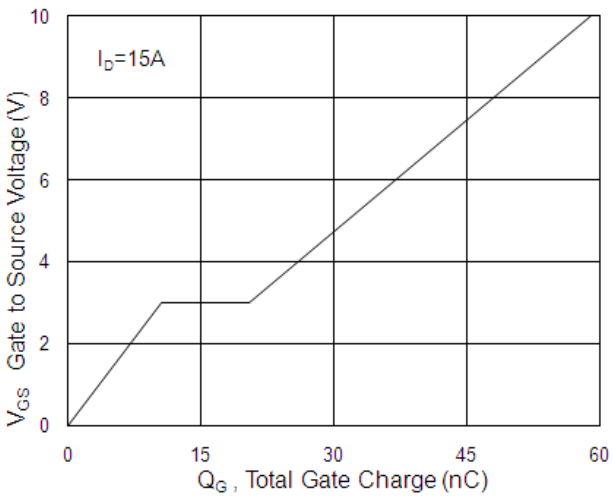


Fig.4 Gate-Charge Characteristics

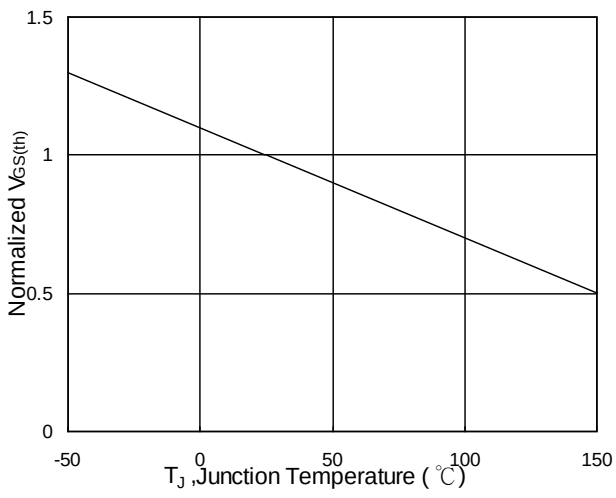


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

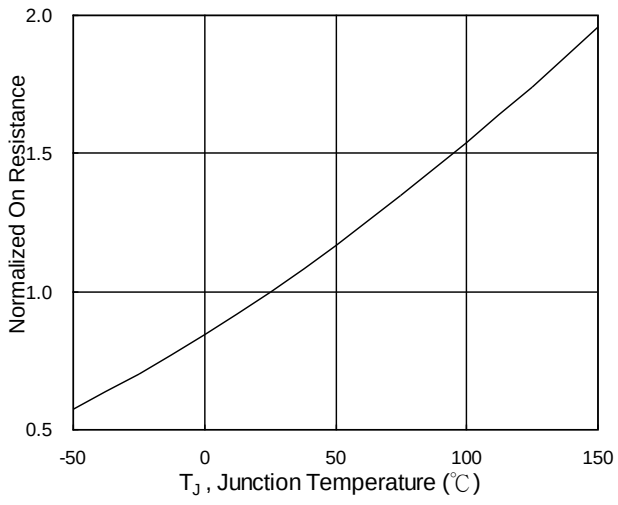


Fig.6 Normalized R_{DSON} vs. T_J

Typical Characteristics

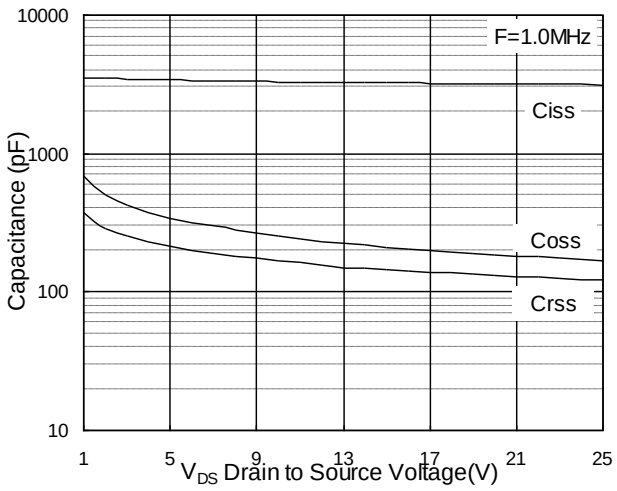


Fig.7 Capacitance

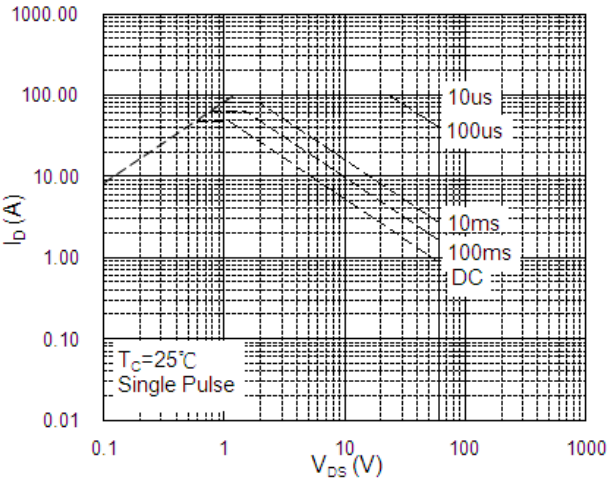


Fig.8 Safe Operating Area

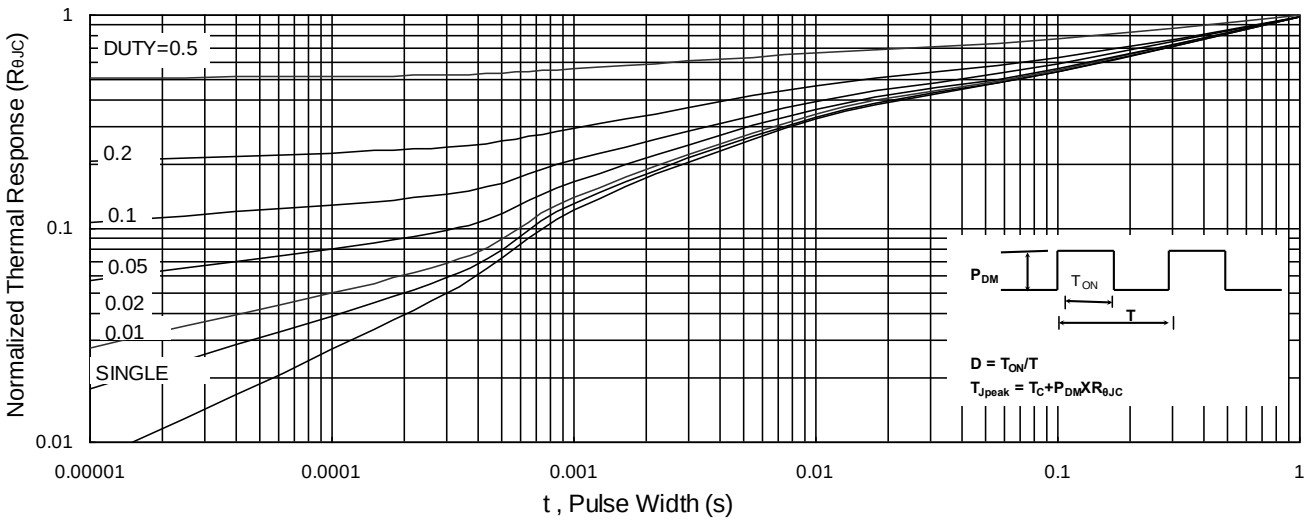


Fig.9 Normalized Maximum Transient Thermal Impedance

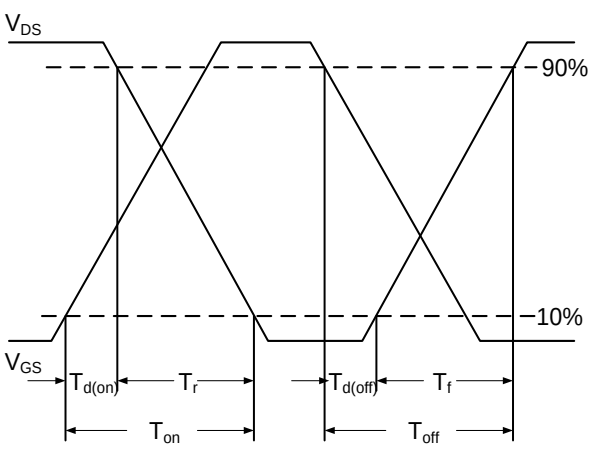


Fig.10 Switching Time Waveform

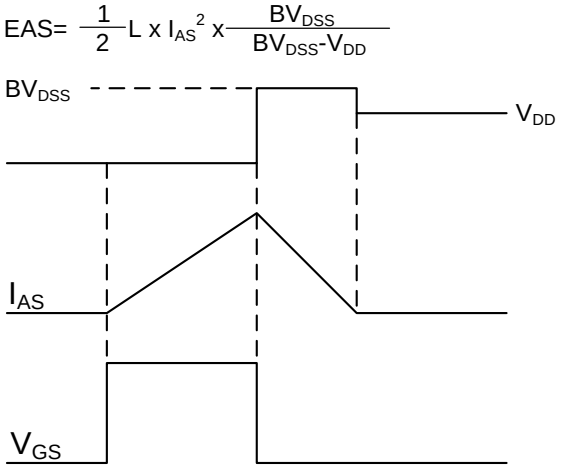
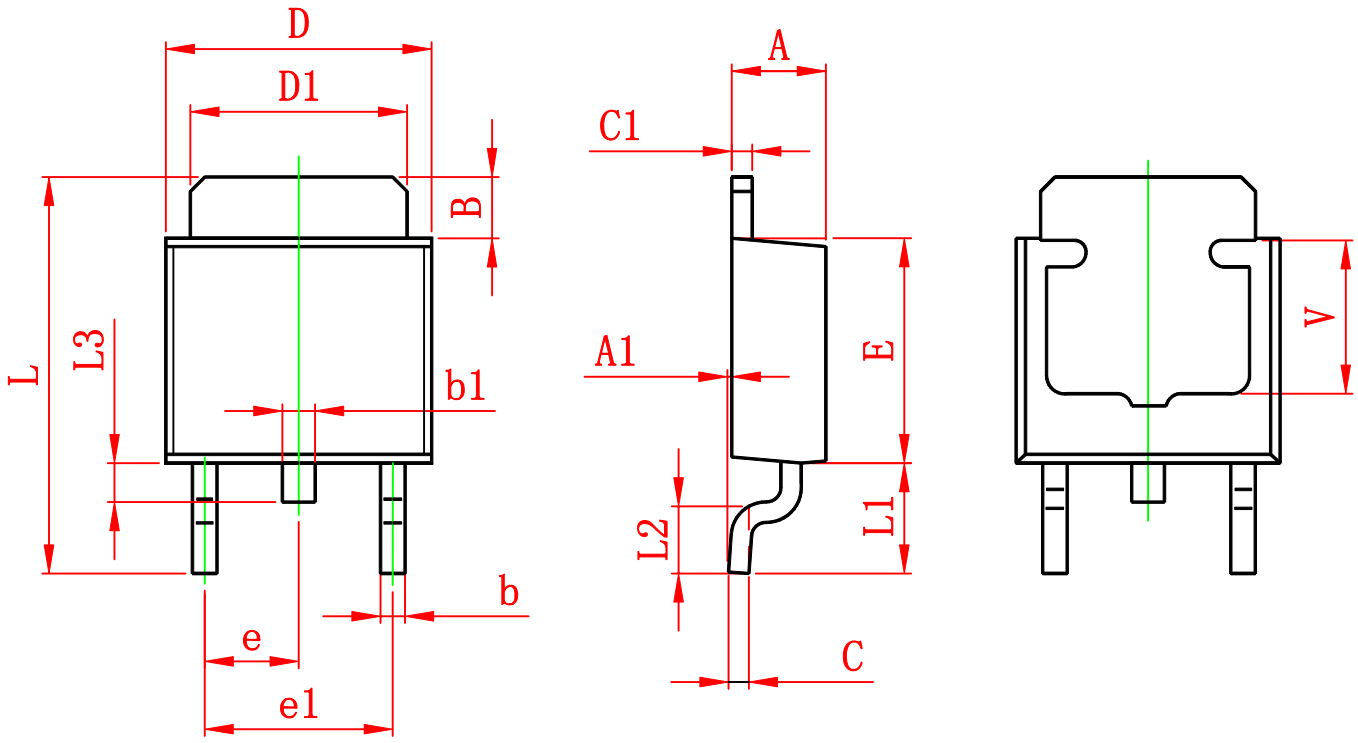


Fig.11 Unclamped Inductive Switching Waveform

TO-252 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
L	9.500	9.900	0.374	0.390
L1	2.550	2.900	0.100	0.114
L2	1.400	1.780	0.055	0.070
L3	0.600	0.900	0.024	0.035
V	3.800 REF.		0.150 REF.	