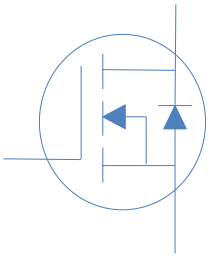
120V N-Ch Power MOSFET

V_{DS}		120	V
$R_{DS(on),typ}$	V_{GS}=10V	10	m
$I_{D\ (Sillicon\ Limited)}$		73.8	A
$I_{D\ (Package\ Limited)}$		120	A



Part Number	Package	Marking
HGW130N12S	TO-262	GW130N12S

Absolute Maximum Ratings at T_j=25℃ (unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Continuous Drain Current (Silicon Limited)	I_D	T_C=25℃	74	A
		T_C=100℃	52	
Continuous Drain Current (Package Limited)		T_C=25℃	120	
Drain to Source Voltage	V_{DS}	-	120	V
Gate to Source Voltage	V_{GS}	-	±20	V
Pulsed Drain Current	I_{DM}	-	260	A
Avalanche Energy, Single Pulse	E_{AS}	L=0.4mH, T_C=25℃	320	mJ
Power Dissipation	P_D	T_C=25℃	96	W
Operating and Storage Temperature	T_J, T_{stg}	-	-55 to175	℃

Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Thermal Resistance Junction-Ambient	R_{JA}	46	℃/W
Thermal Resistance Junction-Case	R_{JC}	1	℃/W

Electrical Characteristics at T_j=25℃ (unless otherwise specified)

Static Characteristics

Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250 A	120	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250 A	2	3	4	
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=0V, V_{DS}=120V, T_j=25℃	-	-	1	A
		V_{GS}=0V, V_{DS}=120V, T_j=100℃	-	-	100	
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Drain to Source on Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=20A	-	10.3	12.5	m
Transconductance	g_{fs}	V_{DS}=5V, I_D=20A	-	55	-	S
Gate Resistance	R_G	V_{GS}=0V, V_{DS} Open, f=1MHz	-	2.2	-	

Dynamic Characteristics

Parameter	Symbol	Conditions	min	typ	max	Unit
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=60V, f=1MHz	-	1986	-	pF
Output Capacitance	C_{oss}		-	230	-	
Reverse Transfer Capacitance	C_{rss}		-	8.6	-	
Total Gate Charge	Q_g(10V)	V_{DD}=60V, I_D=20A, V_{GS}=10V	-	26	-	nC
Gate to Source Charge	Q_{gs}		-	9	-	
Gate to Drain (Miller) Charge	Q_{gd}		-	3.5	-	
Turn on Delay Time	$t_{d(on)}$	V_{DD}=60V, I_D=20A, V_{GS}=10V, R_G=10 ,	-	9	-	ns
Rise time	t_r		-	9	-	
Turn off Delay Time	$t_{d(off)}$		-	15	-	
Fall Time	t_f		-	10	-	

Reverse Diode Characteristics

Parameter	Symbol	Conditions	min	typ	max	Unit
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_F=20A	-	0.9	1.2	V
Reverse Recovery Time	t_{rr}	V_R=60V, I_F=20A, dI_F/dt=100A/ s	-	50	-	ns
Reverse Recovery Charge	Q_{rr}		-	100	-	nC

Fig 1. Typical Output Characteristics

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

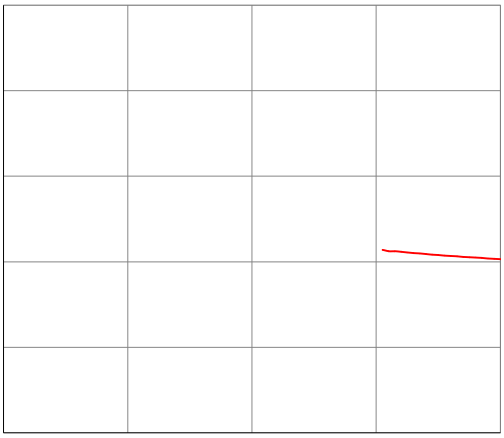


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

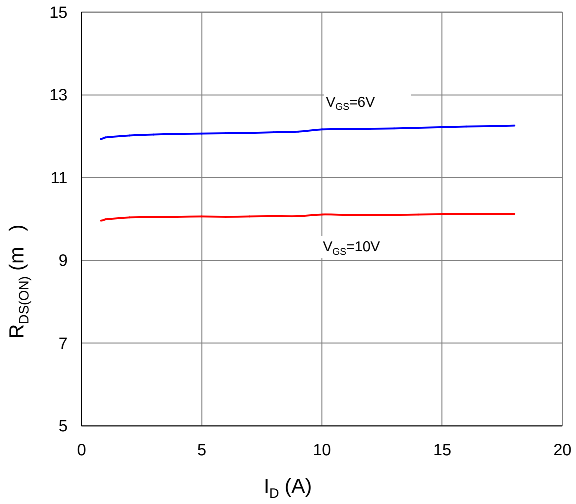


Figure 4. Normalized On-Resistance vs. Junction Temperature

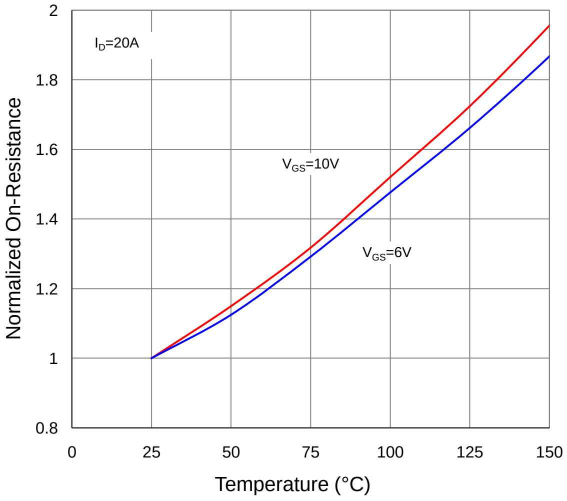


Figure 5. Typical Transfer Characteristics

Figure 6. Typical Source-Drain Diode Forward Voltage

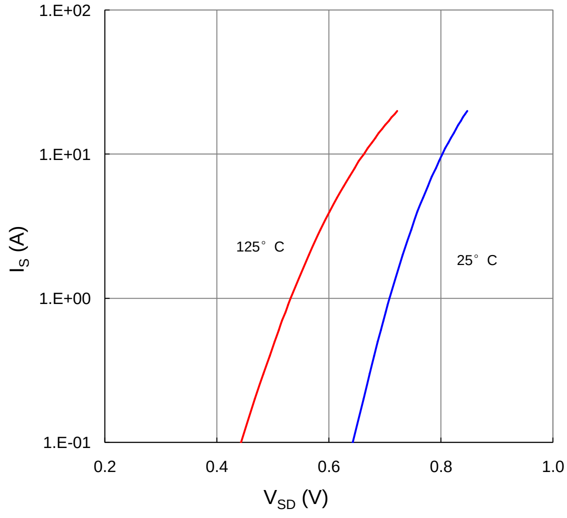


Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

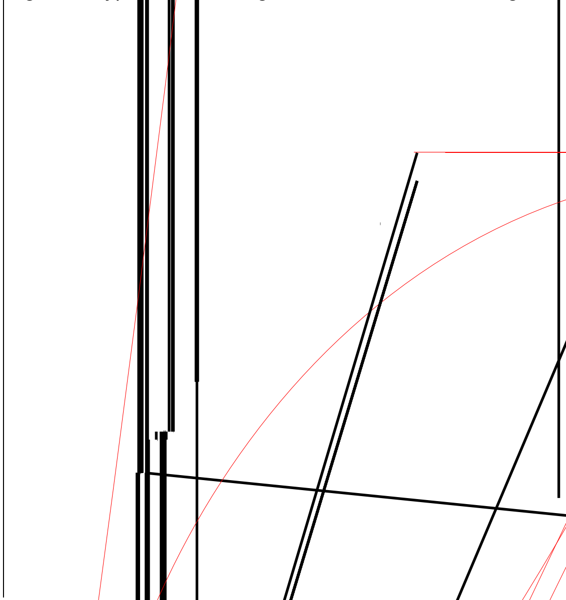


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

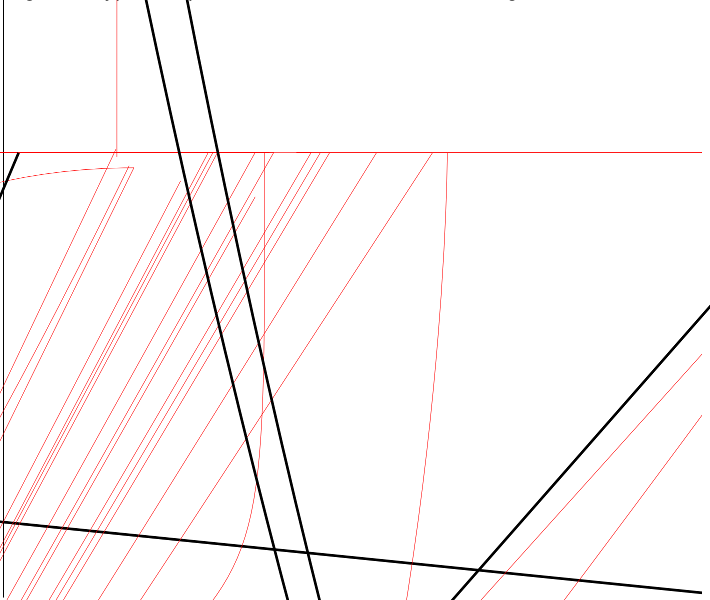


Figure 9. Maximum Safe Operating Area

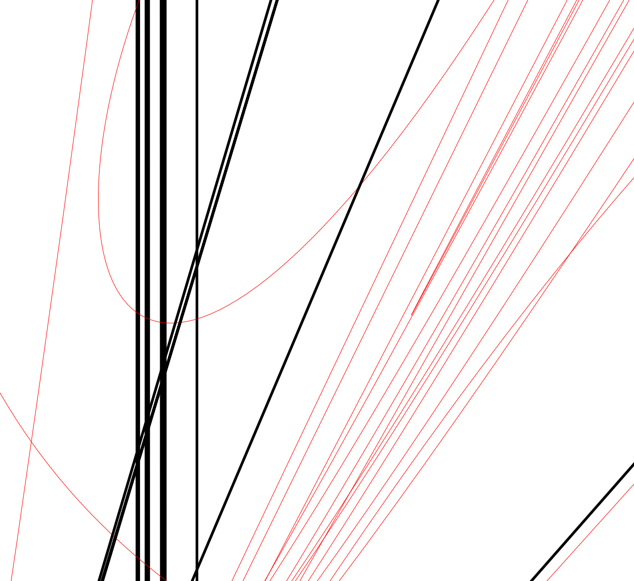


Figure 10. Maximun Drain Current vs. Case Temperature

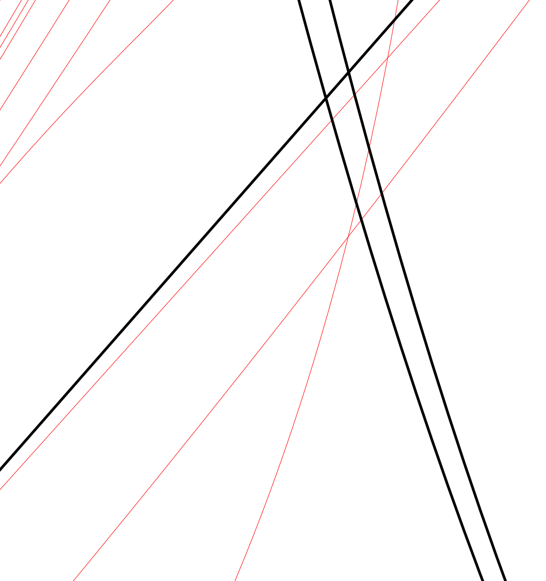
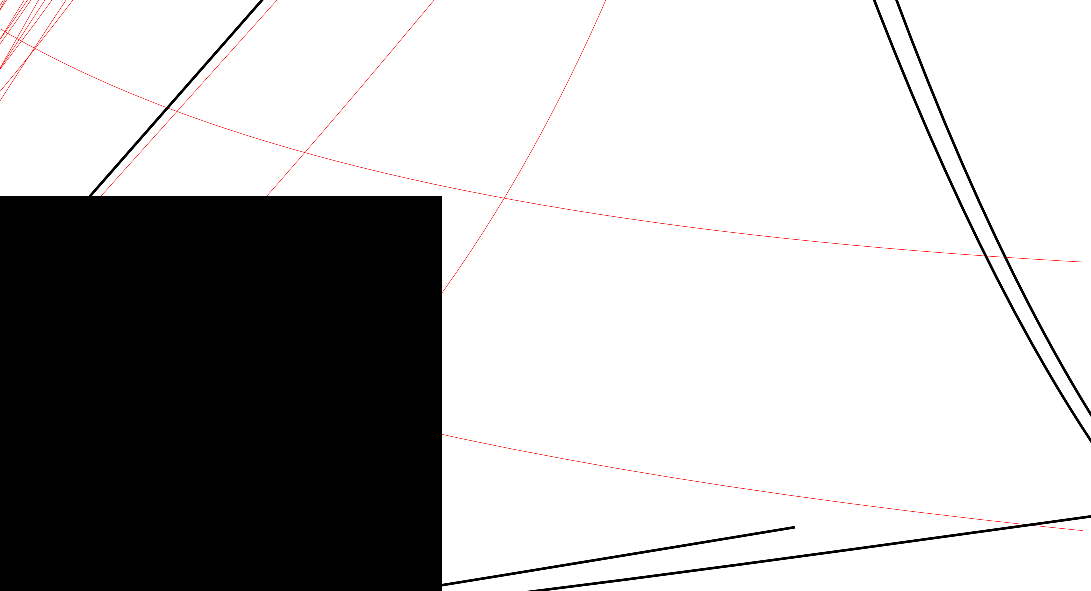
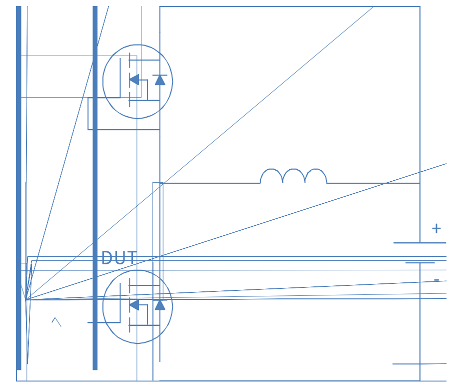
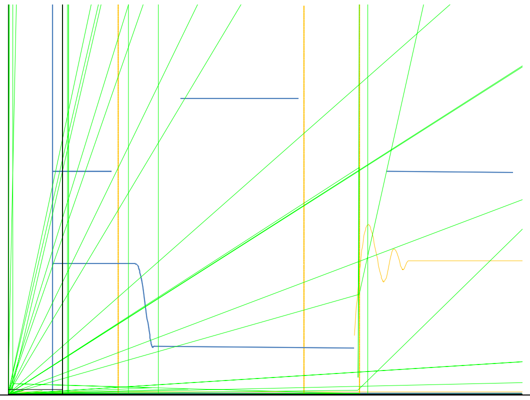


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient

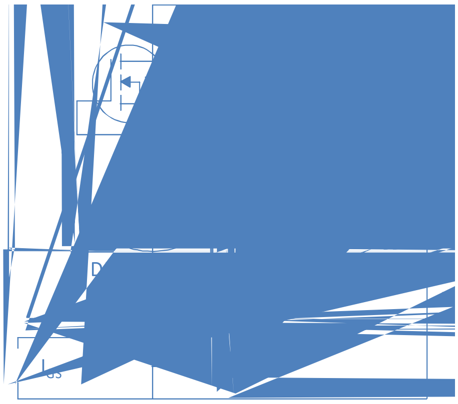


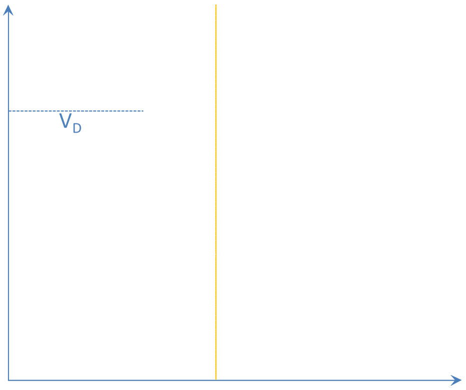
Inductive switching Test



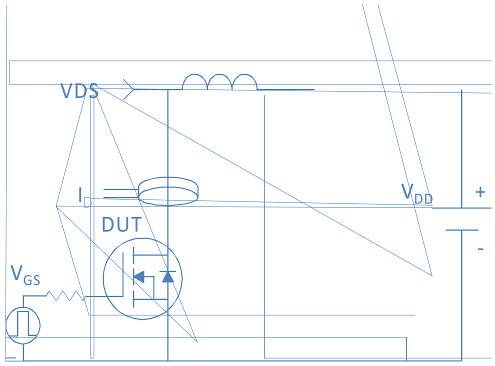


Gate Charge Test

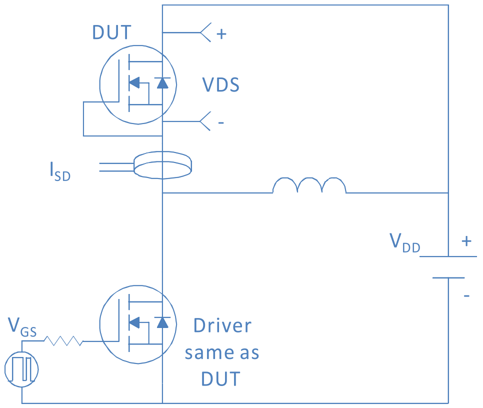


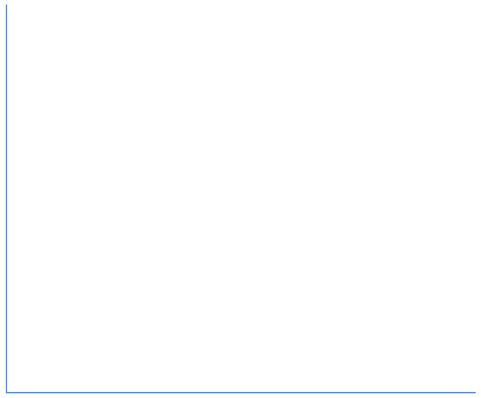


Uclamped Inductive Switching (UIS) Test



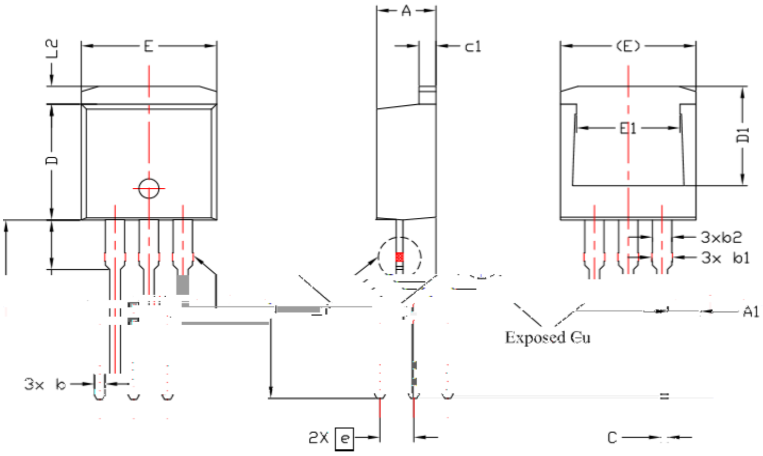
Diode Recovery Test





Package Outline

TO-262, 3 Leads



SYMBOL	DIMENSIONS		
	MIN.	NOM.	MAX.
A	4.24	4.44	4.64
A1	2.30	2.48	2.70
b	0.70	0.80	0.90
b1	1.20	1.55	1.75
b2	1.20	1.45	1.70
c	0.40	0.50	0.60
c1	1.15	1.27	1.40
D	8.82	8.92	9.02
D1	6.86	7.65	-------
E	9.96	10.16	10.36
E1	6.86	7.77	8.89
e	2.54 BSC		
L	13.47	13.72	13.97
L1	3.60	3.80	4.00
L2	1.36 REF.		