

## 150V N-Ch Power MOSFET

$V_{DS}$		150	V
$R_{DS(on),typ}$	TO-263-7	3.8	m
$I_D$ (Silicon Limited)		213	A

Part Number	Package	Marking
HGB041N15S	TO-263-7	GB041N15S

Absolute Maximum Ratings at $T_j = 1$	Symbol	Value	Unit
Continuous Drain Current (Silicon Limited)	$I_D$	213	A
Drain to Source Voltage	$V_{DS}$	150	V
Gate to Source Voltage	$V_{GS}$	20	V
Pulsed Drain Current	$I_{DM}$	650	A
Avalanche Energy, Single Pulse	$E_{AS}$	720	mJ
Power Dissipation	$T P_D$		W
Operating and Storage Temperature	$T_J, T_{stg}$		

**Electrical Characteristics at T<sub>j</sub> 1**
**Static Characteristics**

Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\text{ A}$	150	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\text{ A}$	2	3	4	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{GS}=0V, V_{DS}=150V, T_j\ 1$	-	-	1	A
		$V_{GS}=0V, V_{DS}=150V, T_j\ 0/1$	-	-	100	
Gate to Source Leakage Current	$I_{GSS}$	$V_{GS}\ 1/, V_{DS}=0V$	-	-	100	nA
Drain to Source on Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$	-	3.8	4.3	m
Transconductance	$g_{fs}$	$V_{DS}=5V, I_D=20A$	-	70	-	S
Gate Resistance	$R_G$	$V_{GS}=0V, V_{DS}\text{ Open}, f=1\text{MHz}$	-	4.0	-	

**Dynamic Characteristics**

Input Capacitance	$C_{iss}$		-	5230	-	pF
Output Capacitance	$C_{oss}$	$V_{GS}=0V, V_{DS}=75V, f=1\text{MHz}$	-	745	-	
Reverse Transfer Capacitance	$C_{rss}$		-	11.5	-	
Total Gate Charge	$Q_g$		-	70	-	nC
Gate to Source Charge	$Q_{gs}$	$V_{DD}=75V, I_D=20A, V_{GS}=10V$	-	20	-	
Gate to Drain (Miller) Charge	$Q_{gd}$		-	10	-	
Turn on Delay Time	$t_{d(on)}$		-	19	-	ns
Rise time	$t_r$	$V_{DD}=75V, I_D=20A, V_{GS}=10V,$	-	24	-	
Turn off Delay Time	$t_{d(off)}$	$R_G=10\ \Omega$	-	35	-	
Fall Time	$t_f$		-	11	-	

**Reverse Diode Characteristics**

Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_F=20A$	-	0.9	-	V
Reverse Recovery Time	$t_{rr}$	$V_R=75V, I_F=20A, dI_F/dt=100A/\text{s}$	-	120	-	ns
Reverse Recovery Charge	$Q_{rr}$		-	270	-	nC

Fig 1. Typical Output Characteristics

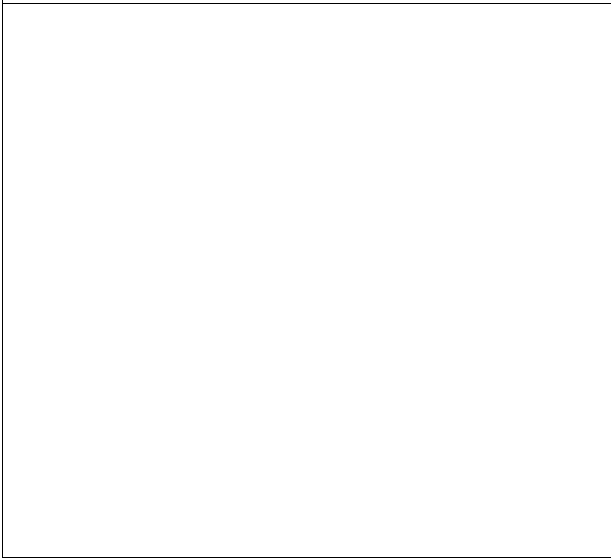


Figure 2. On-Resistance vs. Gate-Source Voltage

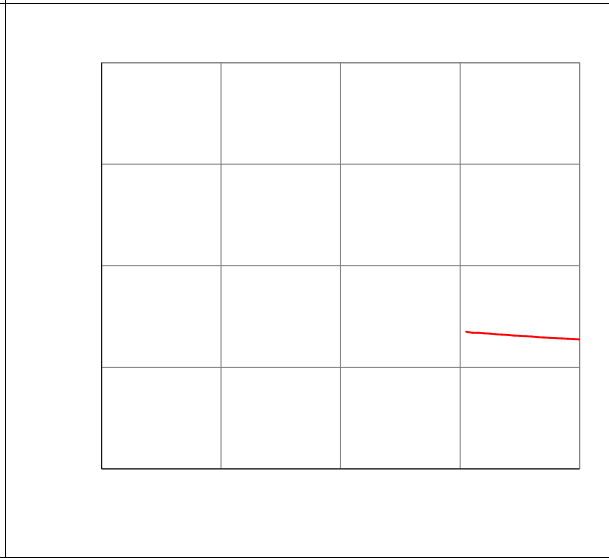


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

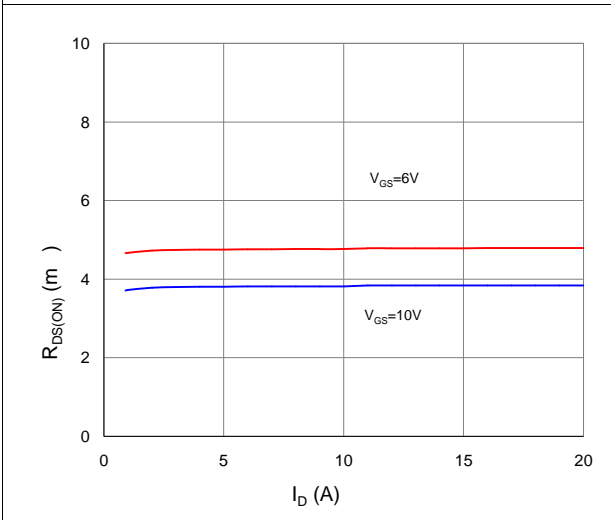


Figure 4. Normalized On-Resistance vs. Junction Temperature

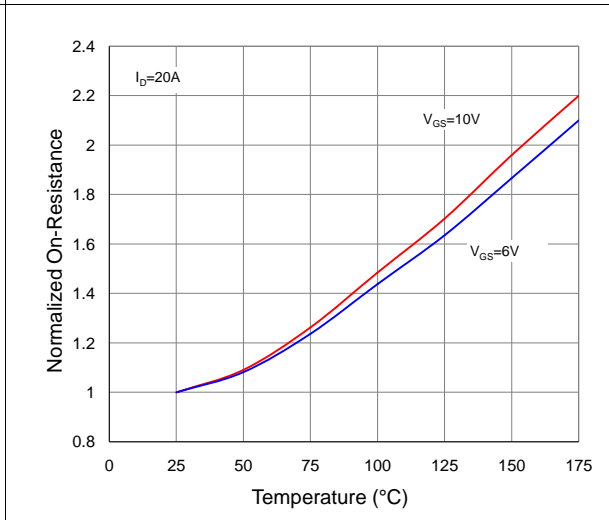


Figure 5. Typical Transfer Characteristics

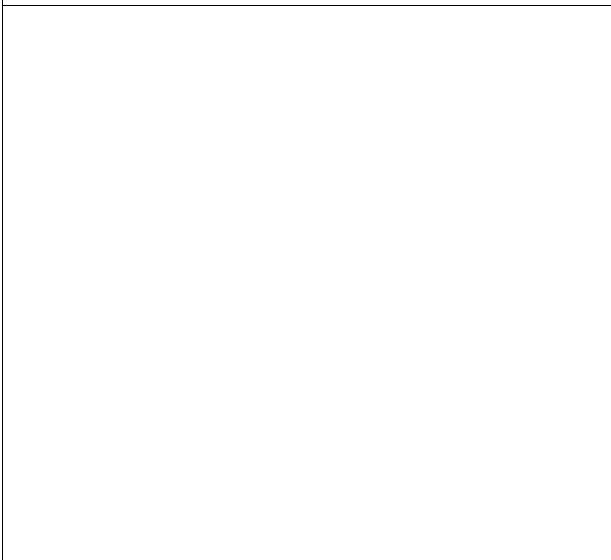


Figure 6. Typical Source-Drain Diode Forward Voltage

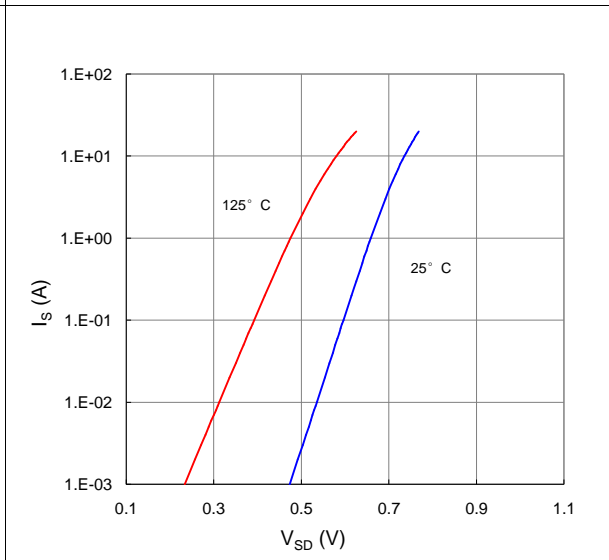


Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

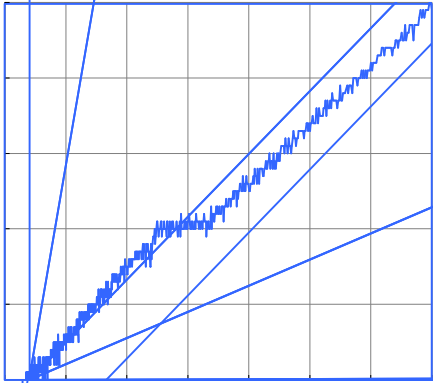


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

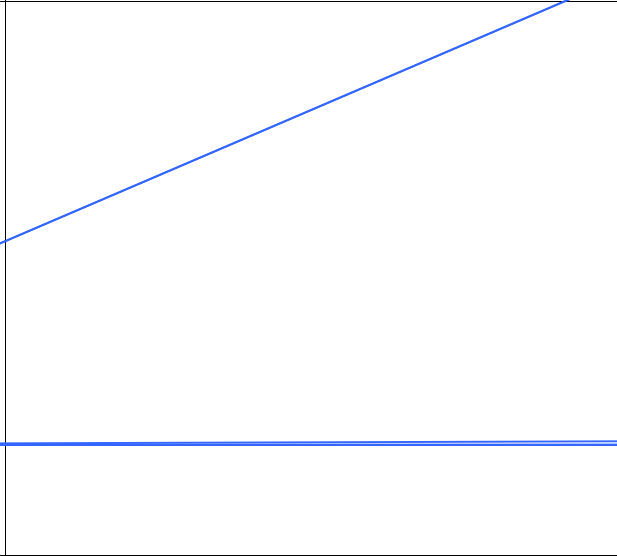


Figure 9. Maximum Safe Operating Area

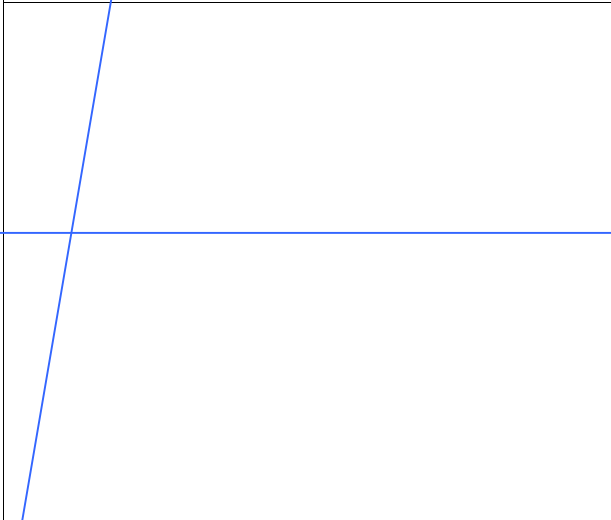


Figure 10. Maximum Drain Current vs. Case Temperature

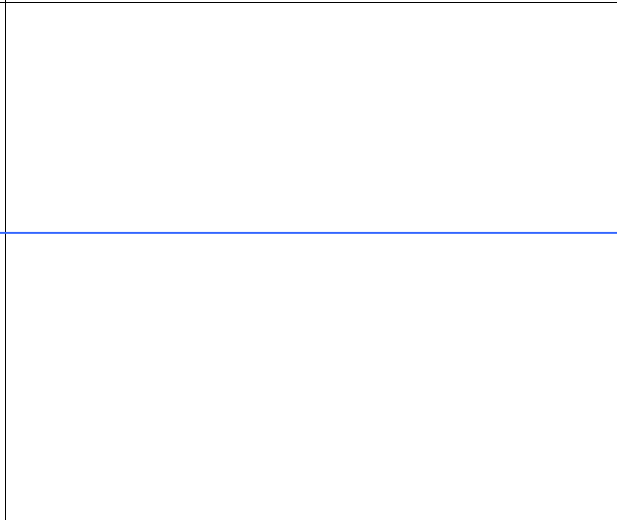
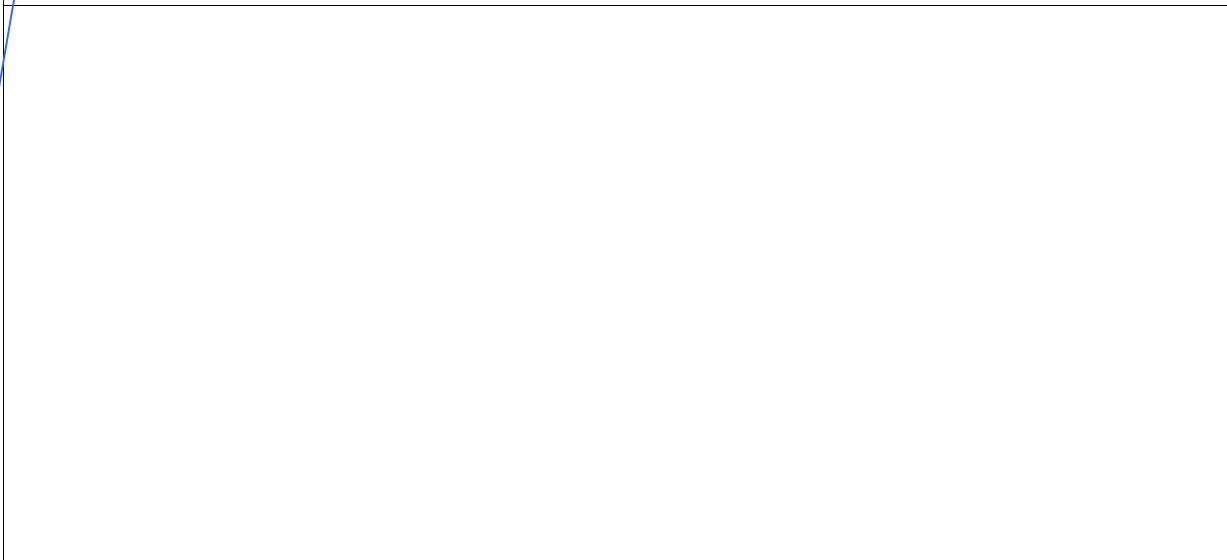
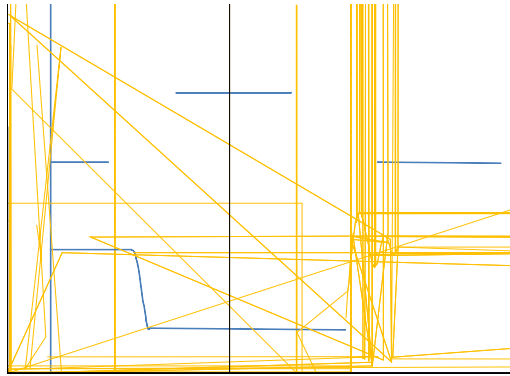


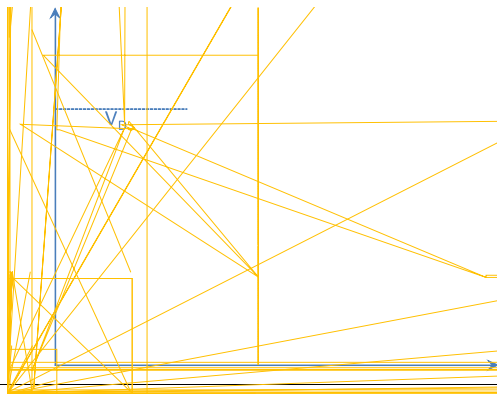
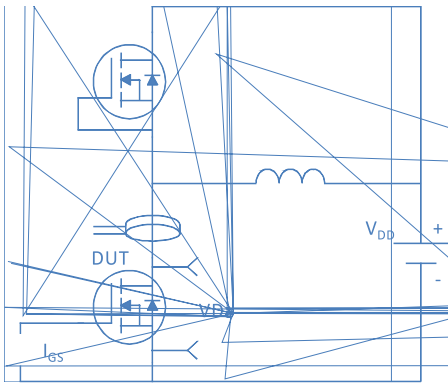
Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case



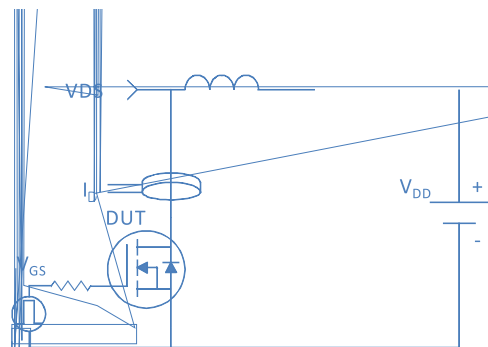
Inductive switching Test



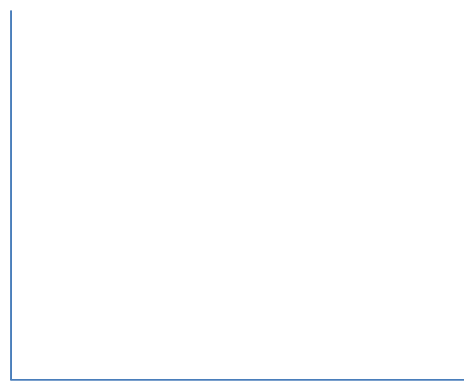
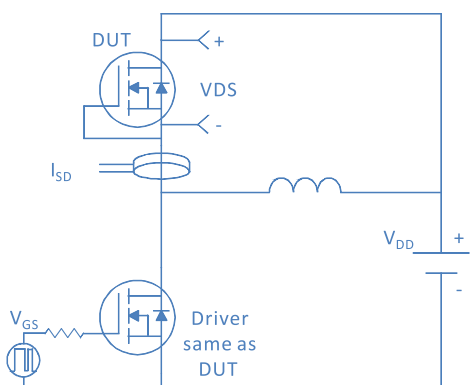
Gate Charge Test



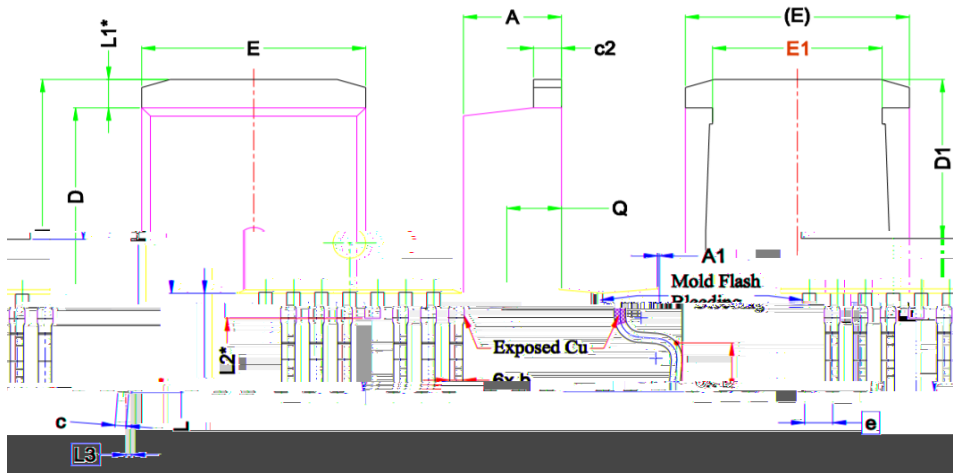
Uclamped Inductive Switching (UIS) Test



Diode Recovery Test



TO-263-7, 7 leads



		DIMENSIONS	
NOM.	MAX.		MIN.
4.44	4.84	A	4.84
0.10	0.25	A1	0.00
0.80	0.70	b	0.50
0.50	0.60	c	0.40
1.27	1.40	c2	1.15
8.92	9.02	D	8.62
7.85	-	D1	6.86
10.16	10.36	E	9.98
7.77	7.89	E1	6.89
27 BSC		e	1.00
15.00	15.88	H	14.61
2.32	2.78	L	1.78
36 REF.		L1	1.00
20 REF.		L2	1.00
25 BSC		L3	0.50
2.00	2.00	Q	2.00