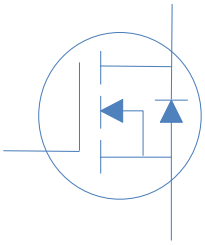
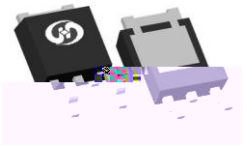
150V N-Ch Power MOSFET

V_{DS}		150	V
$R_{DS(on),typ}$	V_{GS}=10V	58	m
$R_{DS(on),typ}$	V_{GS}=4.5V	66	m
I_D		18	A





Part Number	Package	Marking
HGD650N15SL	TO-252	GD650N15SL

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℃	18	A
		T_C=100℃	12	
Drain to Source Voltage	V_{DS}	-	150	V
Gate to Source Voltage	V_{GS}	-	±20	V
Pulsed Drain Current	I_{DM}	-	60	A
Avalanche Energy, Single Pulse	E_{AS}	L=0.4mH, T_C=25℃	5	mJ
Power Dissipation	P_D	T_C=25℃	50	W
Operating and Storage Temperature	T_J, T_{stg}	-	-55 to 175	℃

Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Thermal Resistance Junction-Ambient	R_{JA}	50	℃/W
Thermal Resistance Junction-Case	R_{JC}	3	℃/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	150	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250 A	1	2.1	3	
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=0V, V_{DS}=150V, T_j=25℃	-	-	1	A
		V_{GS}=0V, V_{DS}=150V, 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=10A	-	58	65	m
Drain to Source on Resistance	$R_{DS(on)}$	V_{GS}=4.5V, I_D=5A	-	66	82	m
Transconductance	g_{fs}	V_{DS}=5V, I_D=10A	-	25	-	S
Gate Resistance	R_G	V_{GS}=0V, V_{DS} Open, f=1MHz	-	3.90	-	

Dynamic Characteristics

Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=75V, f=1MHz	-	635	-	pF
Output Capacitance	C_{oss}		-	43	-	
Reverse Transfer Capacitance	C_{rss}		-	4.3	-	
Total Gate Charge	Q_g(10V)	V_{DD}=75V, I_D=10A, V_{GS}=10V	-	8.2	-	nC
Total Gate Charge	Q_g(4.5V)		-	3.7	-	
Gate to Source Charge	Q_{gs}		-	2.3	-	
Gate to Drain (Miller) Charge	Q_{gd}		-	0.8	-	
Turn on Delay Time	$t_{d(on)}$	V_{DD}=75V, I_D=10A, V_{GS}=10V, R_G=10 ,	-	8	-	ns
Rise time	t_r		-	4	-	
Turn off Delay Time	$t_{d(off)}$		-	12	-	
Fall Time	t_f		-	3	-	

Reverse Diode Characteristics

Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_F=20A	-	0.9	1.2	V
Reverse Recovery Time	t_{rr}	V_R=75V, I_F=10A, dI_F/dt=100A/ s	-	48	-	ns
Reverse Recovery Charge	Q_{rr}		-	54	-	nC

Fig 1. Typical Output Characteristics

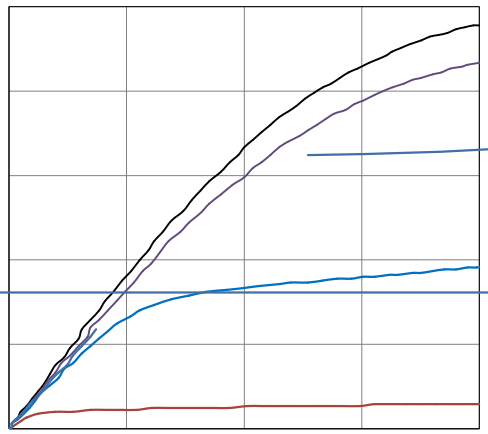


Figure 2. On-Resistance vs. Gate-Source Voltage

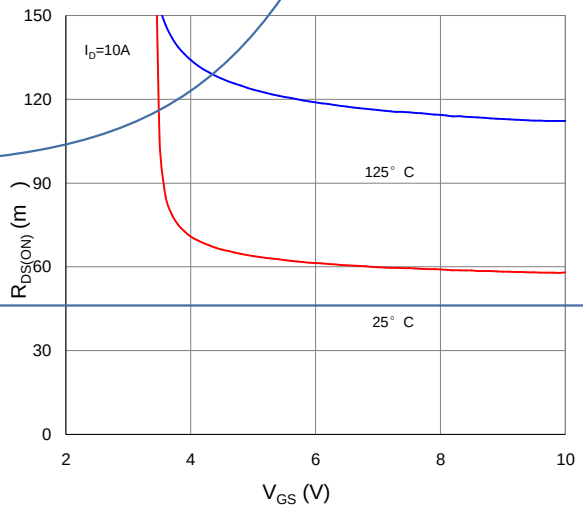


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

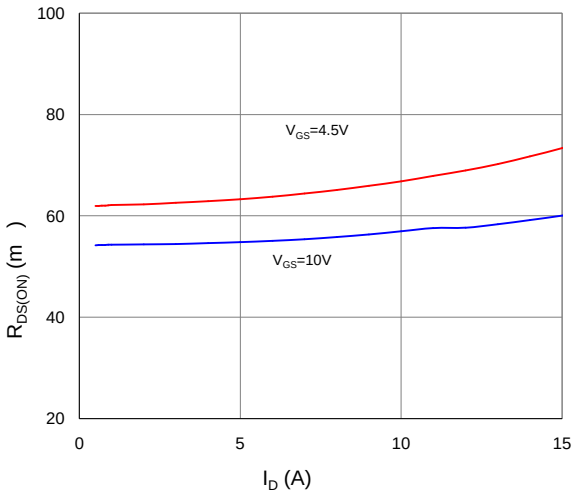


Figure 4. Normalized On-Resistance vs. Junction Temperature

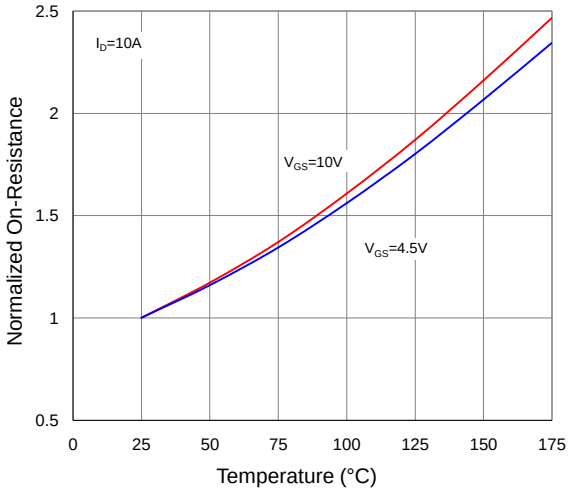


Figure 5. Typical Transfer Characteristics

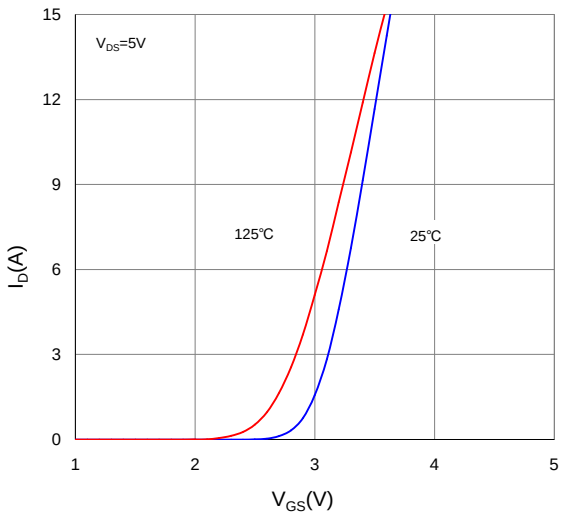


Figure 6. Typical Source-Drain Diode Forward Voltage

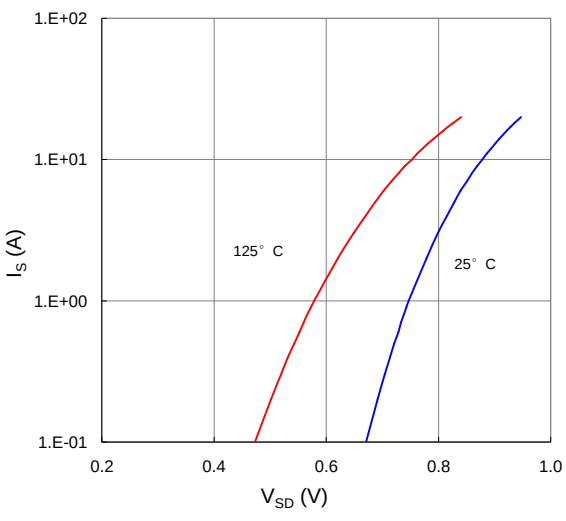


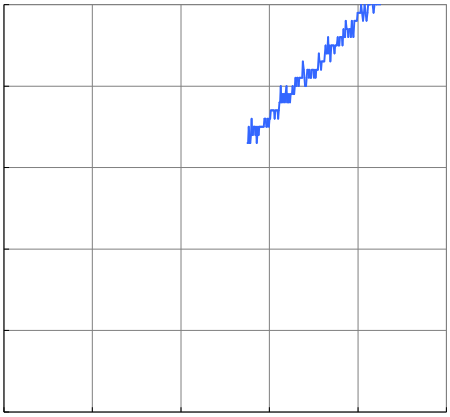
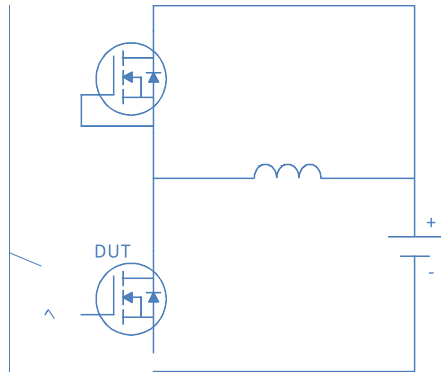
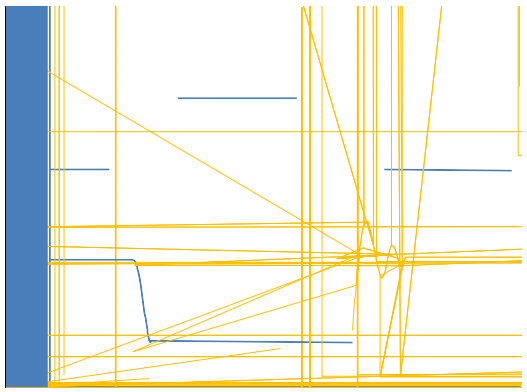
Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage	Figure 8. Typical Capacitance vs. Drain-to-Source Voltage
	

Figure 9. Maximum Safe Operating Area	Figure 10. Maximun Drain Current vs. Case Temperature

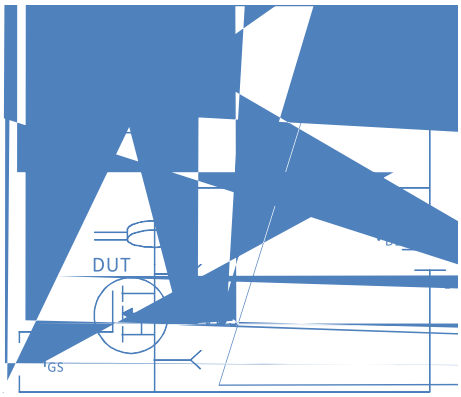
Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient

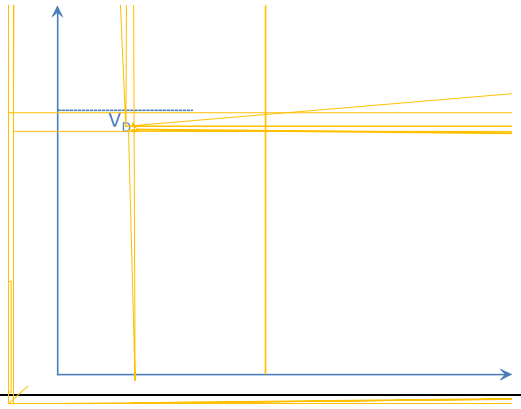
Inductive switching Test



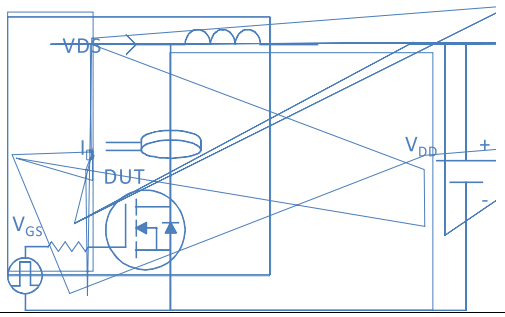


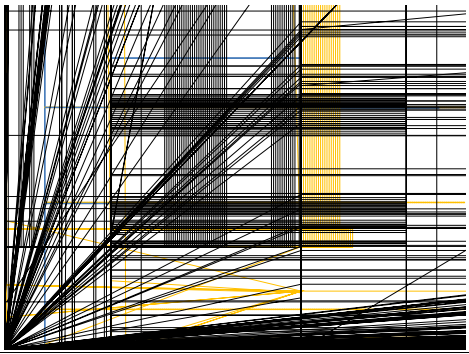
Gate Charge Test



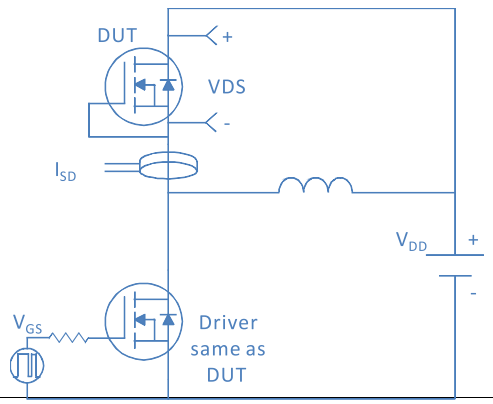


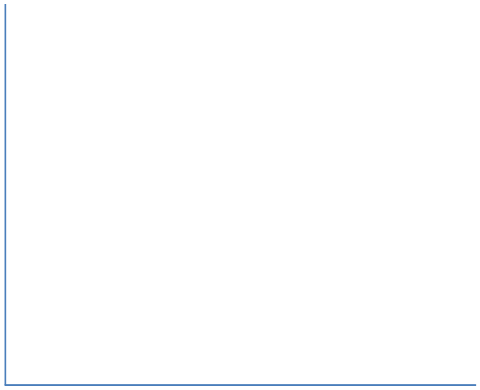
Uclamped Inductive Switching (UIS) Test





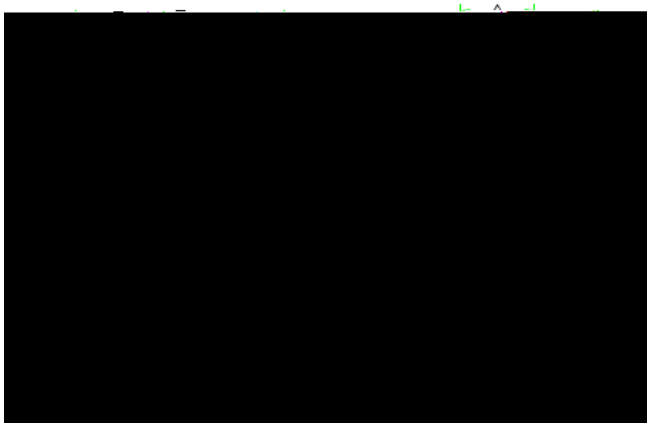
Diode Recovery Test





Package Outline

TO-252, 3 leads



SYMBOL	DIMENSIONAL REQMTS		
	MIN	NOM	MAX
E	6.40	6.60	6.731
L	1.40	1.52	1.77
L1		2.743 REF	
L2		0.508 BSC	
L3	0.89	--	1.27
L4	0.64	--	1.01
L5	--	--	--
D	6.00	6.10	6.223