120V N-Ch Power MOSFET

V_{DS}		120	V
$R_{DS(on),typ}$	V_{GS}=10V	20.0	mΩ
$R_{DS(on),typ}$	V_{GS}=4.5V	25.0	mΩ
$I_{D\ (Sillicon\ Limited)}$		8	A

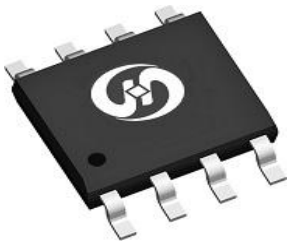
Feature

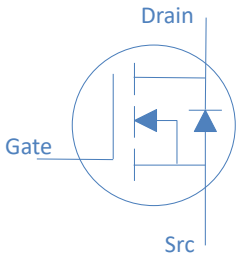
- ◇ High Speed Power Switching, Logic Level
- ◇ Enhanced Body diode dv/dt capability
- ◇ Enhanced Avalanche Ruggedness
- ◇ 100% UIS Tested, 100% Rg Tested
- ◇ Lead Free, Halogen Free

Application

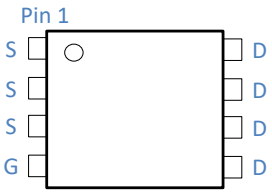
- ◇ Synchronous Rectification in SMPS
- ◇ Hard Switching and High Speed Circuit
- ◇ DC/DC in Telecoms and Inductrial

SOIC-8





Part Number	Package	Marking
HGS210N12SL	SOIC-8	GS210N12SL



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℃	8	A
		T_C=100℃	5	
Drain to Source Voltage	V_{DS}	-	120	V
Gate to Source Voltage	V_{GS}	-	±20	V
Pulsed Drain Current	I_{DM}	-	50	A
Avalanche Energy, Single Pulse	E_{AS}	L=0.1mH, T_C=25℃	5	mJ
Power Dissipation	P_D	T_C=25℃	3.1	W
Operating and Storage Temperature	T_J, T_{stg}	-	-55 to150	℃

Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Thermal Resistance Junction-Lead	$R_{\theta JL}$	23	℃/W
Thermal Resistance Junction-Ambient (t≤10s)	$R_{\theta JA}$	40	℃/W
Thermal Resistance Junction-Ambient (steady state)		75	℃/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=250μA	120	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250μA	1.4	2.0	2.4	
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=0V, V_{DS}=120V, T_j=25℃	-	-	1	μA
		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=5A	-	20	25	mΩ
Drain to Source on Resistance	$R_{DS(on)}$	V_{GS}=4.5V, I_D=5A	-	25	31	mΩ
Transconductance	g_{fs}	V_{DS}=5V, I_D=5A	-	20	-	S
Gate Resistance	R_G	V_{GS}=0V, V_{DS} Open, f=1MHz	-	8.5	-	Ω

Dynamic Characteristics

Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=60V, f=1MHz	-	977	-	pF
Output Capacitance	C_{oss}		-	143	-	
Reverse Transfer Capacitance	C_{rss}		-	6.2	-	
Total Gate Charge	Q_g(10V)	V_{DD}=60V, I_D=5A, V_{GS}=10V	-	13.5	-	nC
Total Gate Charge	Q_g(4.5V)		-	7.6	-	
Gate to Source Charge	Q_{gs}		-	2.8	-	
Gate to Drain (Miller) Charge	Q_{gd}		-	2.0	-	
Turn on Delay Time	$t_{d(on)}$	V_{DD}=60V, I_D=5A, V_{GS}=10V, R_G=10Ω,	-	8	-	ns
Rise time	t_r		-	8	-	
Turn off Delay Time	$t_{d(off)}$		-	14	-	
Fall Time	t_f		-	9	-	

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=60V, I_F=5A, dI_F/dt=500A/μs	-	25	-	ns
Reverse Recovery Charge	Q_{rr}		-	91	-	nC

Fig 1. Typical Output Characteristics

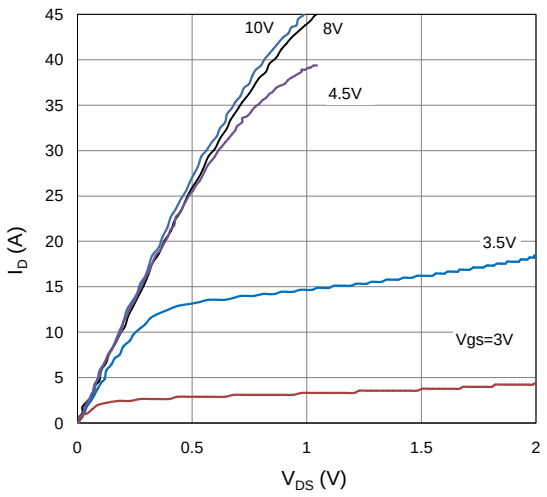


Figure 2. On-Resistance vs. Gate-Source Voltage

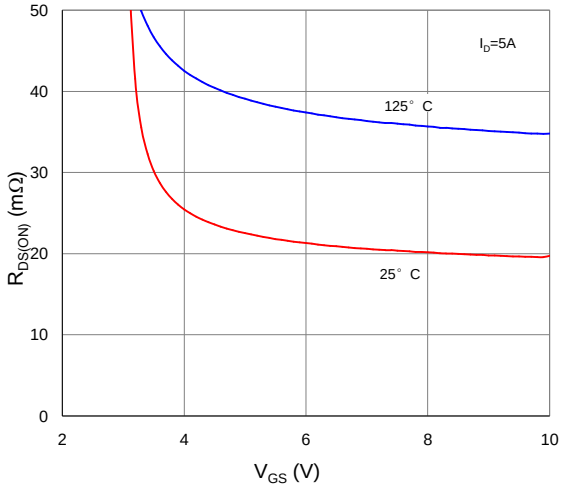


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

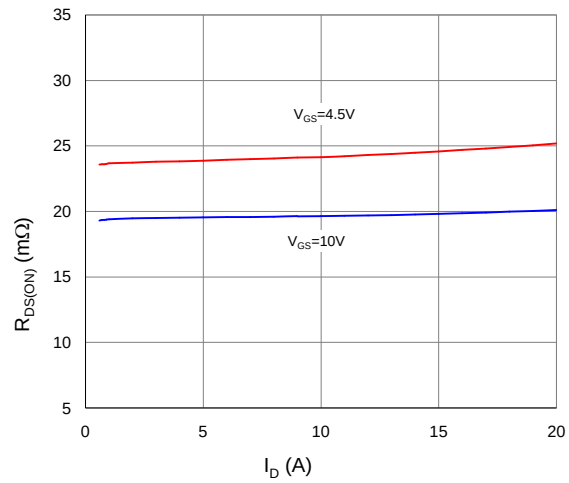


Figure 4. Normalized On-Resistance vs. Junction Temperature

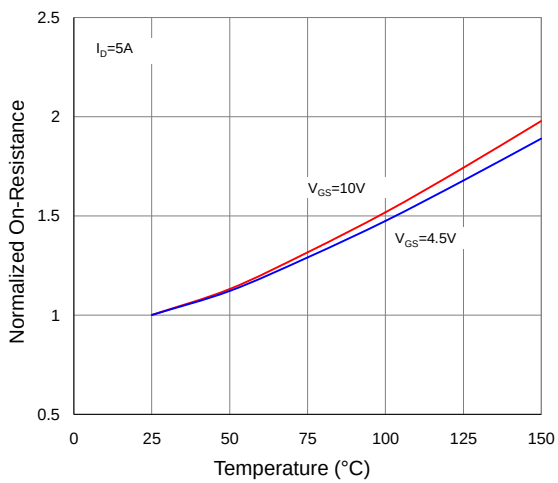


Figure 5. Typical Transfer Characteristics

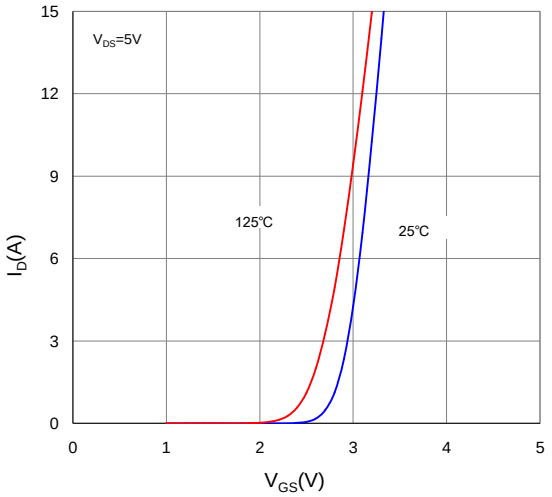


Figure 6. Typical Source-Drain Diode Forward Voltage

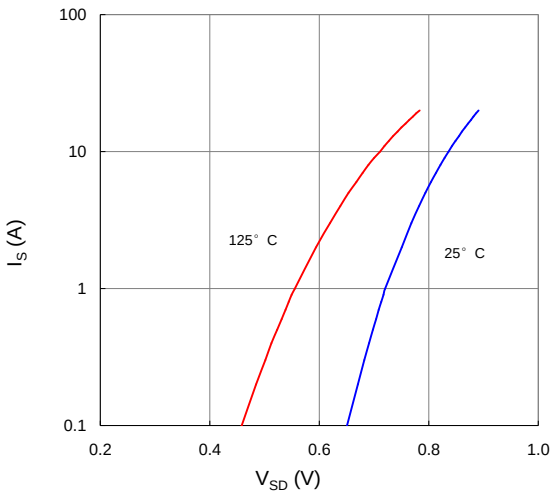


Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

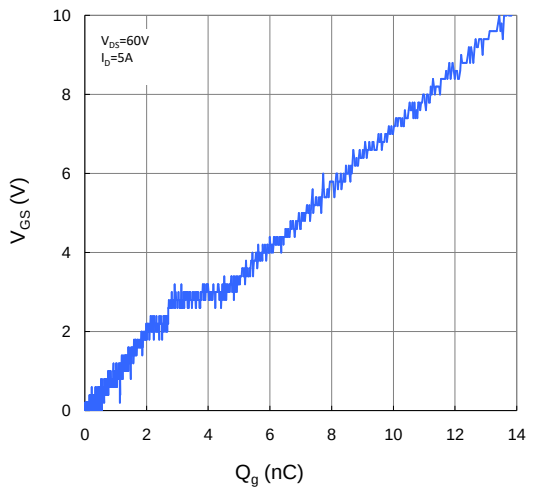


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

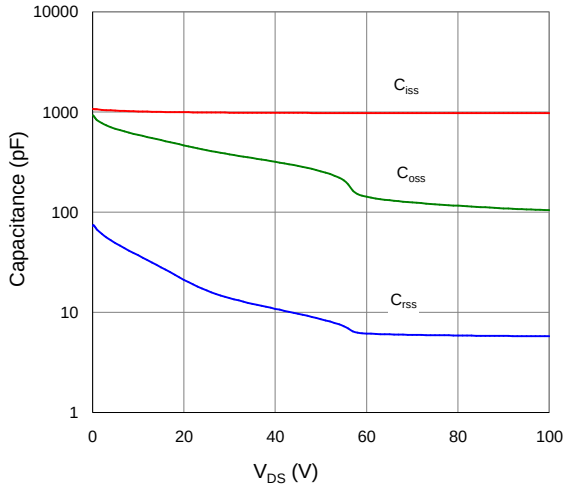


Figure 9. Maximum Safe Operating Area

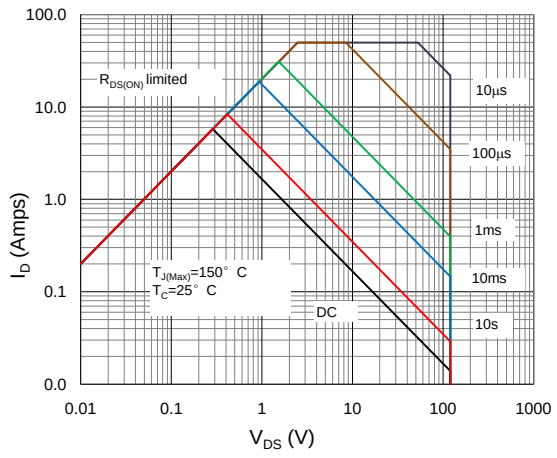


Figure 10. Maximun Drain Current vs. Case Temperature

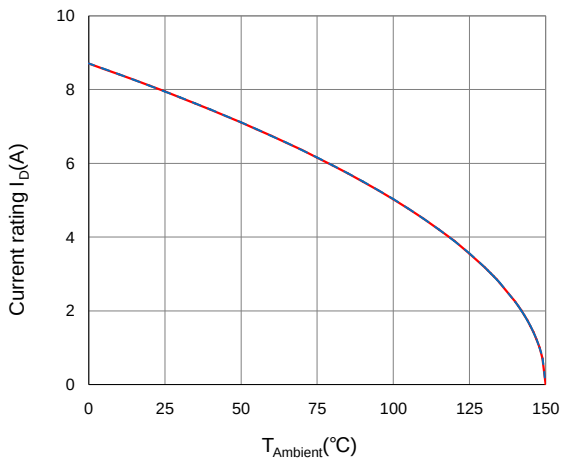
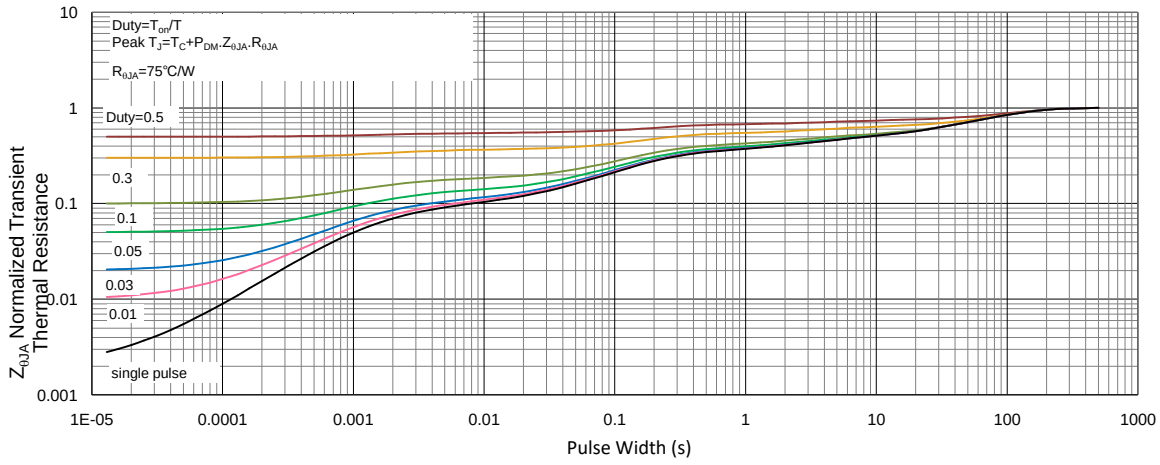
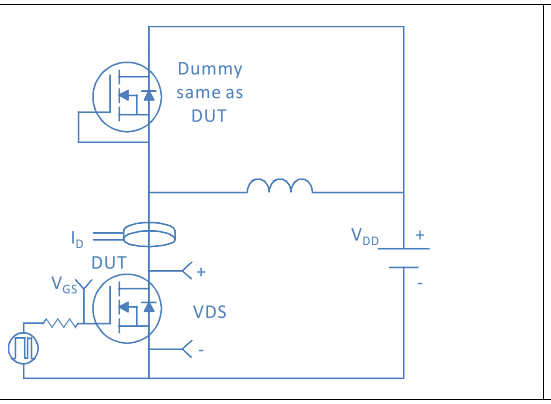
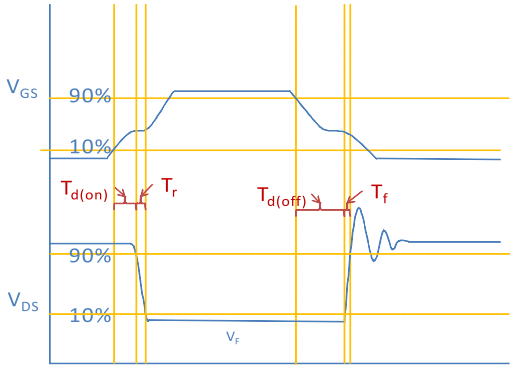


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient

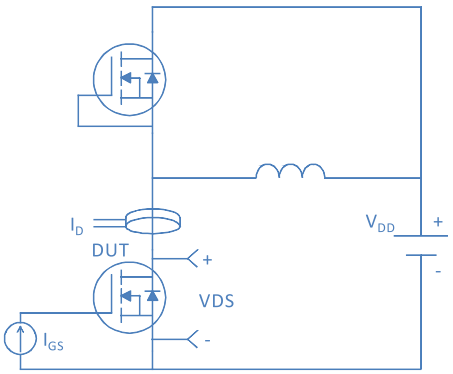


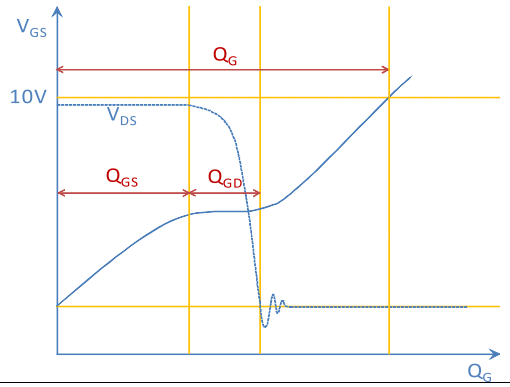
Inductive switching Test



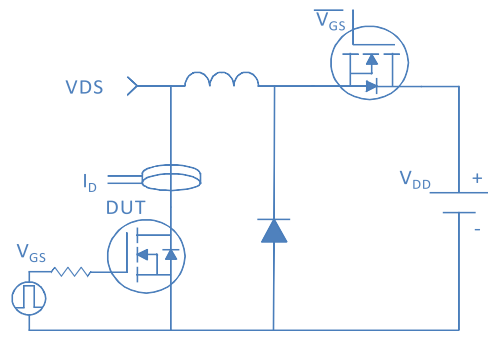


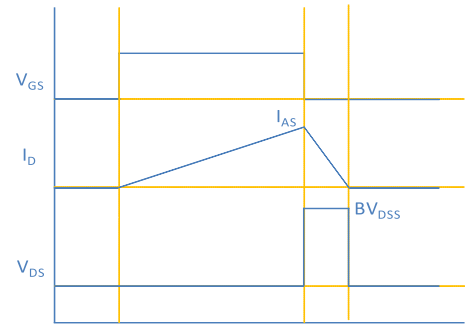
Gate Charge Test



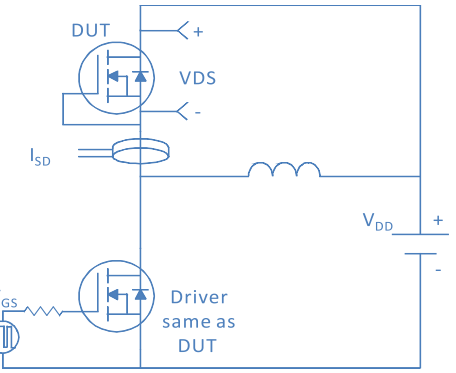


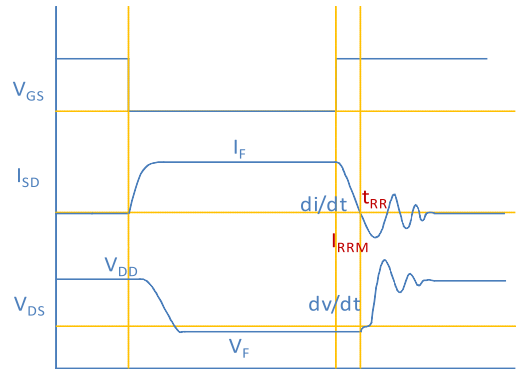
Uclamped Inductive Switching (UIS) Test





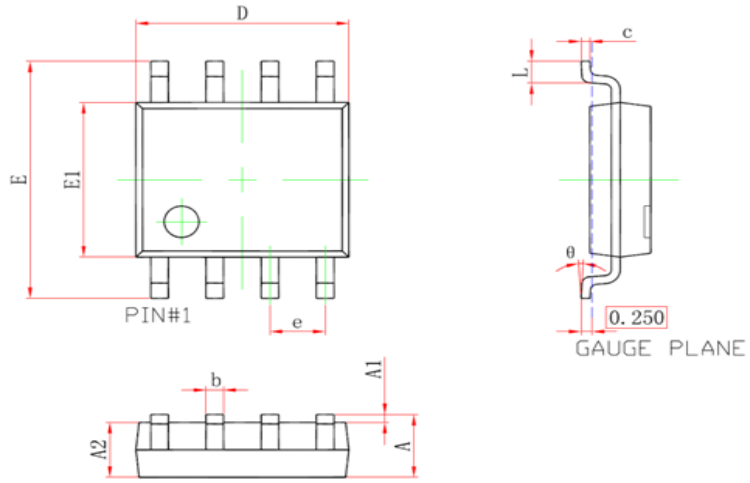
Diode Recovery Test





Package Outline

SOIC-8, 8 leads



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	1.250	1.650	0.049	0.065
b	0.310	0.510	0.012	0.020
c	0.170	0.250	0.007	0.010
D	4.800	5.000	0.189	0.197
e	1.270 (BSC)		0.050 (SBC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.031
θ	0°	8°	0°	8°