HGN022NE4SL P-1

45V N-Ch Power MOSFET

Feature

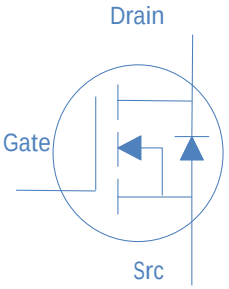
- High Speed Power Switching, Logic Level
- Enhanced Body diode dv/dt capability
- Enhanced Avalanche Ruggedness
- 100% UIS Tested, 100% Rg Tested
- Lead Free, Halogen Free

V_{DS}		45	V
$R_{DS(on),typ}$	V_{GS}=10V	1.85	mΩ
$R_{DS(on),typ}$	V_{GS}=4.5V	2.35	mΩ
$I_{D\ (Sillicon\ Limited)}$		169	A
$I_{D\ (Package\ Limited)}$		60	A

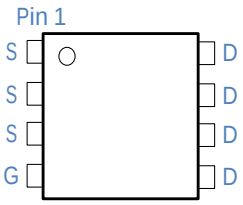
Application

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

DFN5x6



Part Number	Package	Marking
HGN022NE4SL	DFN5*6	GN022NE4SL



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	169	A
		T_C=100	107	
Continuous Drain Current (Package Limited)		T_C=25	60	
Drain to Source Voltage	V_{DS}	-	45	V
Gate to Source Voltage	V_{GS}	-	±20	V
Pulsed Drain Current	I_{DM}	-	450	A
Avalanche Energy, Single Pulse	E_{AS}	L=0.4mH, T_C=25	320	mJ
Power Dissipation	P_D	T_C=25	114	W
Operating and Storage Temperature	T_J, T_{stg}	-	-55 to150	

Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	55	/W
Thermal Resistance Junction-Case	$R_{\theta JC}$	1.1	/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=250μA	45	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250μA	1.0	1.4	2.2	
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=0V, V_{DS}=45V, T_j=25	-	-	1	μA
		V_{GS}=0V, V_{DS}=45V, 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	-	1.85	2.2	mΩ
		V_{GS}=4.5V, I_D=20A	-	2.35	3	
Transconductance	g_{fs}	V_{DS}=5V, I_D=20A	-	90	-	S
Gate Resistance	R_G	V_{GS}=0V, V_{DS} Open, f=1MHz	-	2.0	-	Ω

Dynamic Characteristics

Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=20V, f=1MHz	-	4447	-	pF
Output Capacitance	C_{oss}		-	1829	-	
Reverse Transfer Capacitance	C_{rss}		-	121	-	
Total Gate Charge	Q_g(10V)	V_{DD}=20V, I_D=20A, V_{GS}=10V	-	70	-	nC
Total Gate Charge	Q_g(4.5V)		-	35	-	
Gate to Source Charge	Q_{gs}		-	12	-	
Gate to Drain (Miller) Charge	Q_{gd}		-	10	-	
Turn on Delay Time	$t_{d(on)}$	V_{DD}=20V, I_D=20A, V_{GS}=10V, R_G=10Ω,	-	16	-	ns
Rise time	t_r		-	12	-	
Turn off Delay Time	$t_{d(off)}$		-	60	-	
Fall Time	t_f		-	18	-	

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=30V, I_F=20A, dI_F/dt=200A/μs	-	40	-	ns
Reverse Recovery Charge	Q_{rr}		-	60	-	nC

Fig 1. Typical Output Characteristics

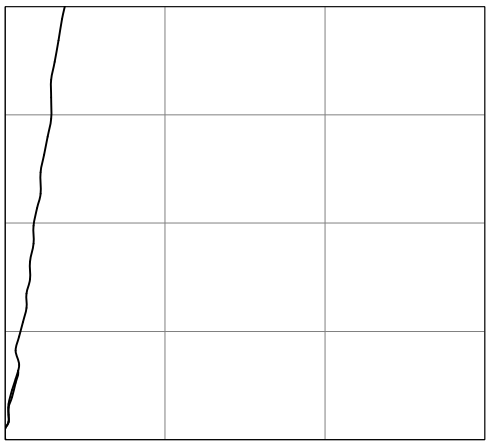


Figure 2. On-Resistance vs. Gate-Source Voltage

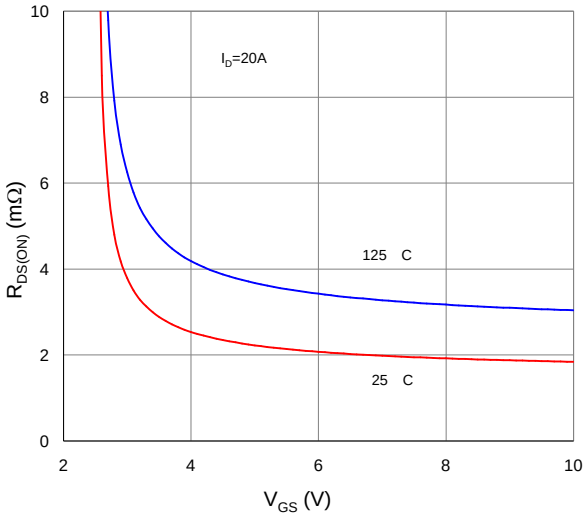


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

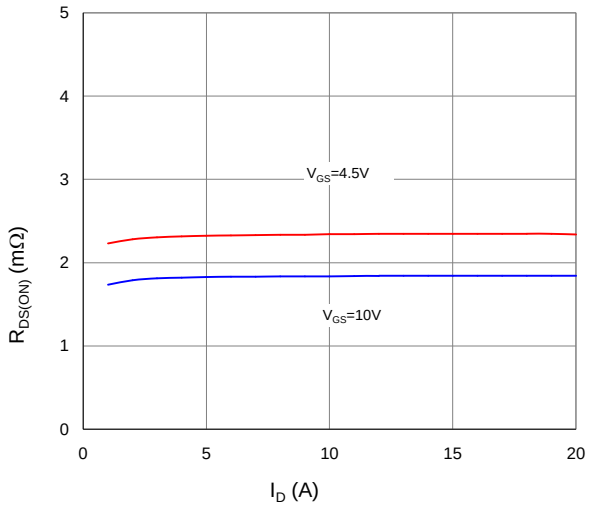


Figure 4. Normalized On-Resistance vs. Junction Temperature

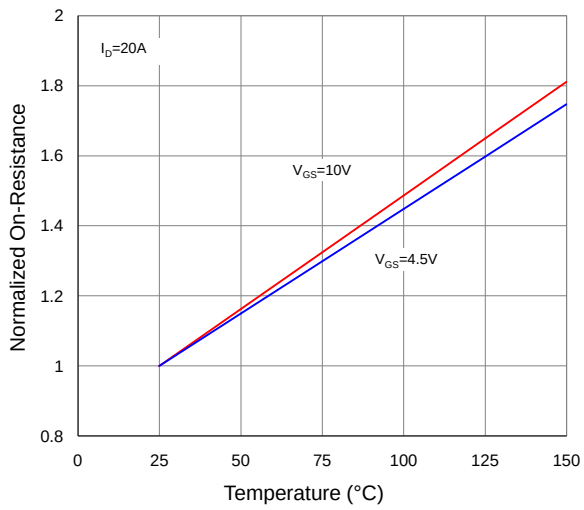


Figure 5. Typical Transfer Characteristics

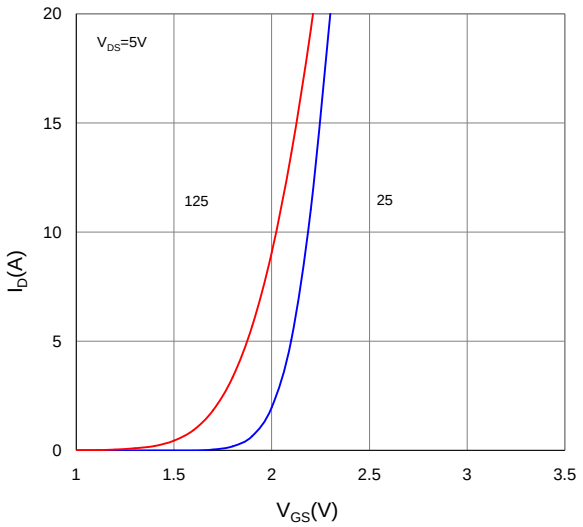


Figure 6. Typical Source-Drain Diode Forward Voltage

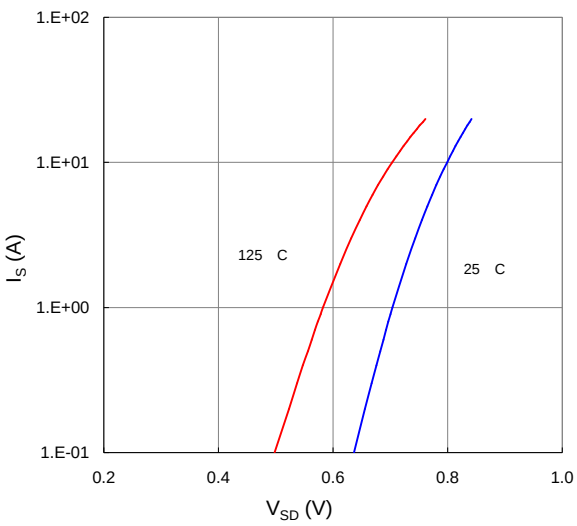


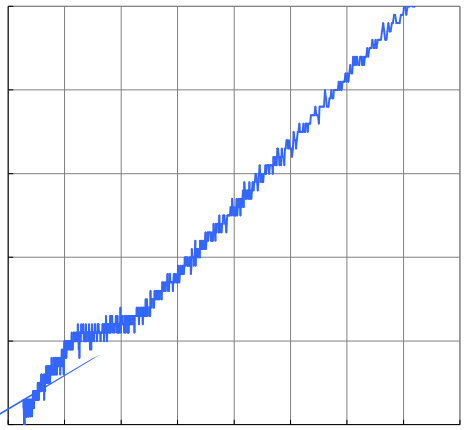
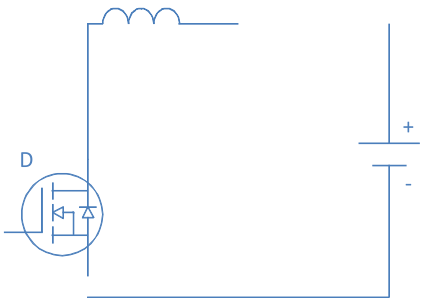
Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage	Figure 8. Typical Capacitance vs. Drain-to-Source Voltage
	

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	

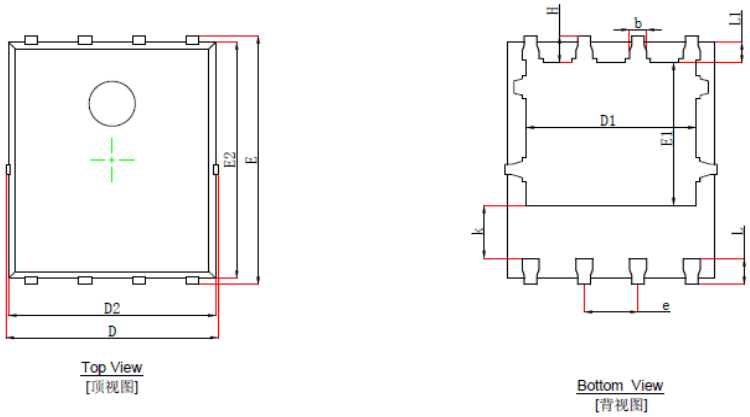
Gate Charge Test	

Uclamped Inductive Switching (UIS) Test	
	

Diode Recovery Test	

Package Outline

DFN5x6_P, 8 Leads



Top View
[顶视图]

Bottom View
[背视图]

Side View
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A3	0.254 REF		0.010REF	
D	4.680	5.120	0.184	0.202
E	5.680	6.120	0.223	0.241
E2	3.610	4.110	0.142	0.162
D1	3.380	3.780	0.133	0.149
E1	4.800	5.000	0.189	0.197
D2	5.674	5.826	0.223	0.229
k	1.100	1.390	0.043	0.055
b	0.330	0.510	0.013	0.020
e	1.270TYP		1.270TYP	
L	0.510	0.711	0.020	0.028
H	0.576	0.017	0.023	L1 0.424
	0.410	0.726	0.016	0.029
θ	0°	12°	0°	12°