45V N-Ch Power MOSFET

V_{DS}		45	V
$R_{DS(on),typ}$	V_{GS}=10V	2.5	mΩ
$R_{DS(on),typ}$	V_{GS}=4.5V	3.2	mΩ
I_D (Sillicon Limited)		140	A
I_D (Package Limited)		60	

Part Number	Package	Marking
HGN029NE4SL	DFN5x6	GN029NE4SL

Parameter	Symbol		Value	
Continuous Drain Current (Silicon Limited)		T_C=25		
			89	
Continuous Drain Current (Package Limited)		T_C=25	60	
Drain to Source Voltage	V_{DS}	-	45	
Gate to Source Voltage	V_{GS}	-		
Pulsed Drain Current	I_{DM}	-	350	A
Avalanche Energy, Single Pulse	E_{AS}	L=0.5mH, T_C=25	100	mJ
Power Dissipation	P_D			
Operating and Storage Temperature	T_J, T_{stg}	-		

Absolute Maximum Ratings

Parameter	Symbol	Max
Thermal Resistance Junction-Case	$R_{\theta JC}$	
Thermal Resistance Junction-Ambient		

Ver.1.0

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	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	-	2.5	2.9	mΩ
		V_{GS}=4.5V, I_D=20A	-	3.2	4.0	mΩ
Transconductance	g_{fs}	V_{DS}=5V, I_D=20A	-	65	-	S
Gate Resistance	R_G	V_{GS}=0V, V_{DS} Open, f=1MHz	-	1.6	-	Ω

Dynamic Characteristics

Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=20V, f=1MHz	-	3322	-	pF
Output Capacitance	C_{oss}		-	1367	-	
Reverse Transfer Capacitance	C_{rss}		-	96	-	
Total Gate Charge (10V)	Q_g (10V)	V_{DD}=20V, I_D=20A, V_{GS}=10V	-	50	-	nC
Total Gate Charge (4.5V)	Q_g (4.5V)		-	25	-	
Gate to Source Charge	Q_{gs}		-	8	-	
Gate to Drain (Miller) Charge	Q_{gd}		-	9.5	-	
Turn on Delay Time	$t_{d(on)}$	V_{DD}=20V, I_D=20A, V_{GS}=10V, R_G=10Ω,	-	14	-	ns
Rise time	t_r		-	12	-	
Turn off Delay Time	$t_{d(off)}$		-	57	-	
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=20V, I_F=20A, dI_F/dt=200A/µs	-	40	-	ns
Reverse Recovery Charge	Q_{rr}		-	64	-	nC

Fig 1. Typical Output Characteristics

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

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

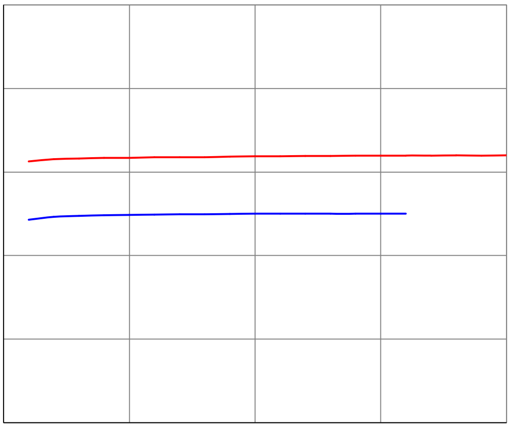

Figure 4. Normalized On-Resistance vs. Junction Temperature

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-Case