

45V N-Ch Power MOSFET

Feature

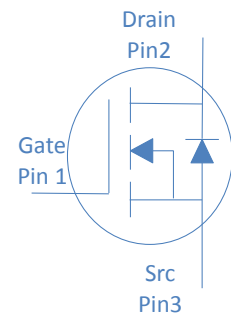
- ◇ Optimized for high speed switching, Logic Level
- ◇ Enhanced Body diode dv/dt capability
- ◇ Enhanced Avalanche Ruggedness
- ◇ 100% UIS Tested, 100% Rg Tested
- ◇ Lead Free, Halogen Free

Application

- ◇ Synchronous Rectification in SMPS
- ◇ Hard Switching and High Speed Circuit
- ◇ Power Tools
- ◇ UPS
- ◇ Motor Control

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 (Silicon Limited)		186	A
I_D (Package Limited)		120	A

TO-220



Part Number	Package	Marking
HGP029NE4SL	TO-220	GP029NE4SL

Absolute Maximum Ratings at $T_j=25^{\circ}C$ (unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Continuous Drain Current (Silicon Limited)	I_D	$T_C=25^{\circ}C$	186	A
		$T_C=100^{\circ}C$	132	
		Continuous Drain Current (Package Limited)	$T_C=25^{\circ}C$	
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}	$L=0.1mH, T_C=25^{\circ}C$	180	mJ
Power Dissipation	P_D	$T_C=25^{\circ}C$	176	W
Operating and Storage Temperature	T_J, T_{stg}	-	-55 to 175	$^{\circ}C$

Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Thermal Resistance Junction-Case	$R_{\theta JC}$	0.85	$^{\circ}C/W$
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	46	$^{\circ}C/W$

Electrical Characteristics at T_j=25°C (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	
Zero Gate Voltage Drain Current	I _{DSS}	V _{GS} =0V, V _{DS} =45V, T _j =25°C	-	-	1	μA
		V _{GS} =0V, V _{DS} =45V, T _j =100°C	-	-	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 TO-220	-	2.5	2.9	mΩ
		V _{GS} =4.5V, I _D =20A TO-220	-	3.2	4.0	mΩ
Transconductance	g _{fs}	V _{DS} =5V, I _D =20A	-	TBD	-	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}		-	10	-	
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