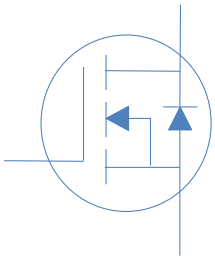
200V N-Ch Power MOSFET

V_{DS}		200	V
$R_{DS(on),typ}$	V_{GS}=10V	95	mΩ
$R_{DS(on),typ}$	V_{GS}=4.5V	106	mΩ
I_D		18	A



Part Number	Package	Marking
HGP1K2N20ML	TO-220	GP1K2N20ML

Absolute Maximum Ratings at T_j=25 (unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Continuous Drain Current	I_D	T_C=25	18.2	A
		T_C=100	12.8	
Drain to Source Voltage	V_{DS}	-	200	V
Gate to Source Voltage	V_{GS}	-	±20	V
Pulsed Drain Current	I_{DM}	-	25	A
Avalanche Energy, Single Pulse	E_{AS}	L=0.4mH, T_C=25	5	mJ
Power Dissipation	P_D	T_C=25	88	W
Operating and Storage Temperature	T_J, T_{stg}	-	-55 to175	

Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Thermal Resistance Junction-Case	$R_{\Theta JC}$	1.7	/W
Thermal Resistance Junction-Ambient	$R_{\Theta JA}$	65	/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	200	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250μA	1	2.1	3	
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=0V, V_{DS}=200V, T_j=25	-	-	1	μA
		V_{GS}=0V, V_{DS}=200V, 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	-	95	120	mΩ
	$R_{DS(on)}$	V_{GS}=4.5V, I_D=3A	-	106	140	mΩ
Transconductance	g_{fs}	V_{DS}=5V, I_D=20A	-	15	-	S
Gate Resistance	R_G	V_{GS}=0V, V_{DS} Open, f=1MHz	-	5.5	-	Ω

Dynamic Characteristics

Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=100V, f=1MHz	-	491	-	pF
Output Capacitance	C_{oss}		-	22	-	
Reverse Transfer Capacitance	C_{rss}		-	5.5	-	
Total Gate Charge	Q_g (10V)	V_{DD}=100V, I_D=5A, V_{GS}=10V	-	9.8	-	nC
Total Gate Charge	Q_g (4.5V)		-	5.8	-	
Gate to Source Charge	Q_{gs}		-	1.6	-	
Gate to Drain (Miller) Charge	Q_{gd}		-	3.2	-	
Turn on Delay Time	$t_{d(on)}$	V_{DD}=100V, I_D=5A, V_{GS}=10V, R_G=10Ω,	-	9	-	ns
Rise time	t_r		-	5	-	
Turn off Delay Time	$t_{d(off)}$		-	13	-	
Fall Time	t_f		-	4	-	

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=100V, I_F=5A, dI_F/dt=100A/μs	-	60	-	ns
Reverse Recovery Charge	Q_{rr}		-	126	-	nC

Fig 1. Typical Output Characteristics

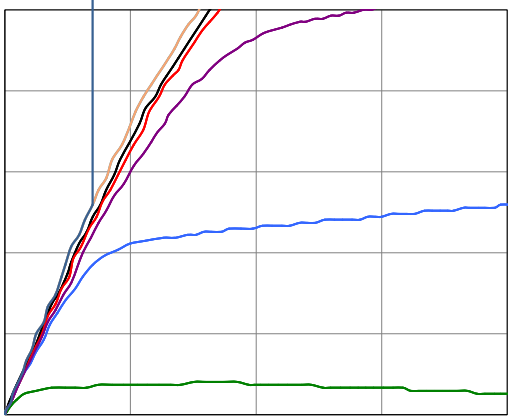


Figure 2. On-Resistance vs. Gate-Source Voltage

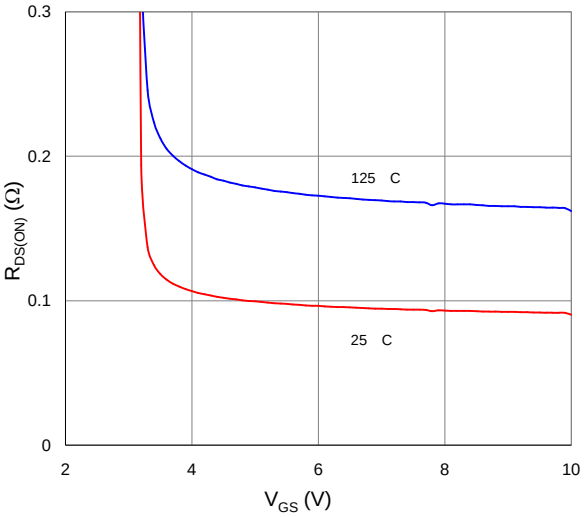


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

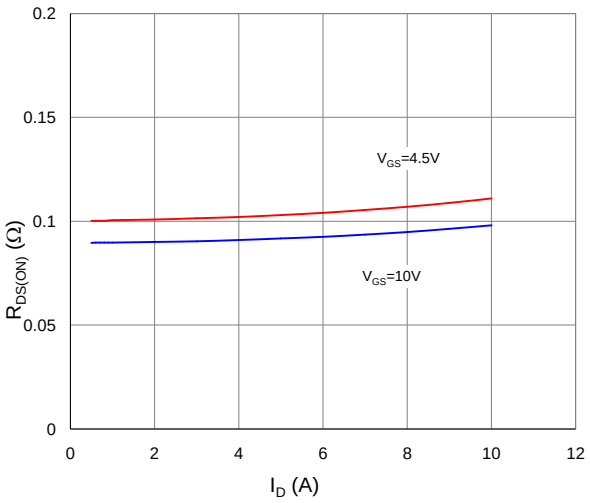


Figure 4. Normalized On-Resistance vs. Junction Temperature

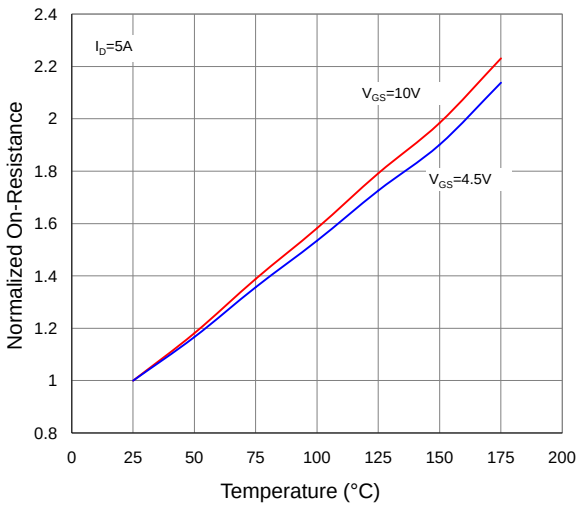


Figure 5. Typical Transfer Characteristics

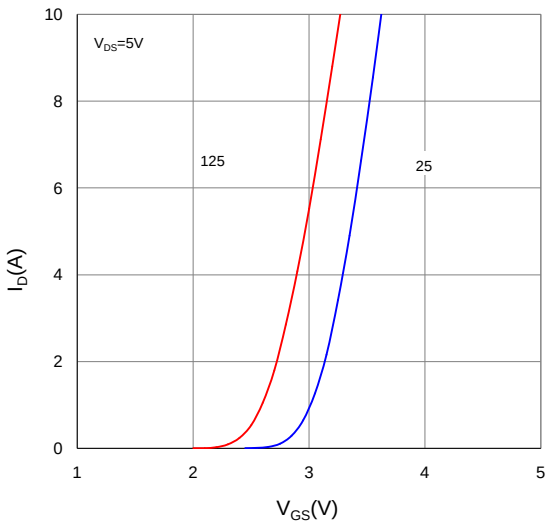


Figure 6. Typical Source-Drain Diode Forward Voltage

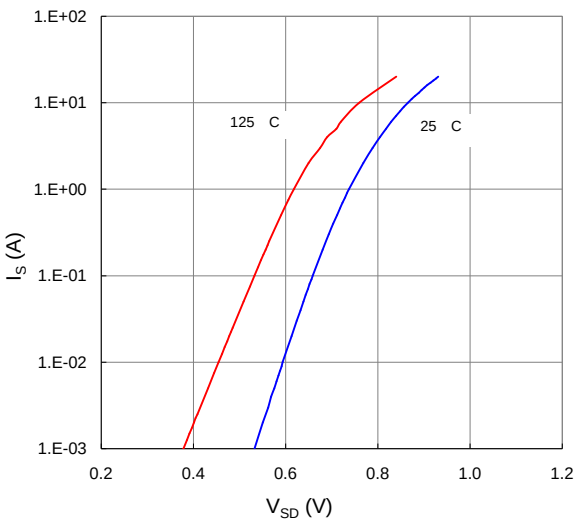


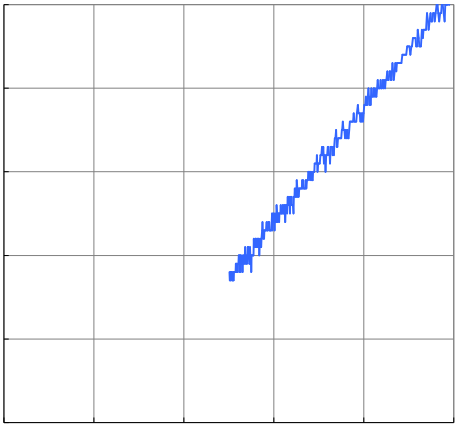
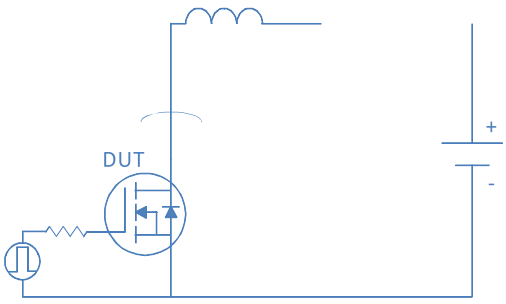
Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage	Figure 8. Typical Capacitance vs. Drain-to-Source Voltage
	

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

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

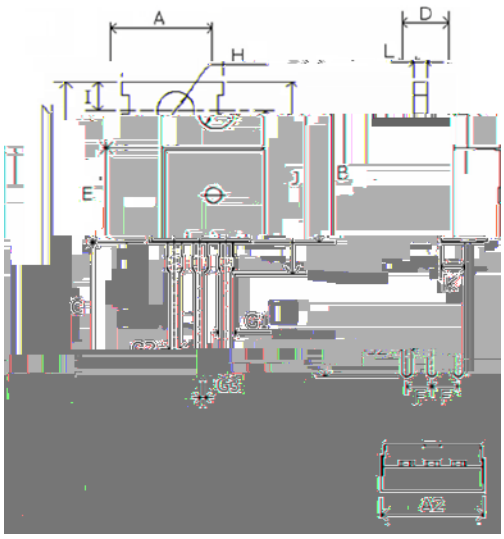
Inductive switching Test	

Gate Charge Test	

Uclamped Inductive Switching (UIS) Test	
	

Diode Recovery Test	

TO-220, 3 leads



Dimentions in mm unless otherwise specified

Symbol	Min	Nom	Max
A	9.66	9.97	10.28
A2	9.80	10.00	10.20
B	15.60	15.70	15.80
C	12.70	13.48	14.27
D	4.30	4.50	4.70
E	9.00	9.20	9.40
F		2.54	
G1	1.32	1.52	1.72
G2	0.70	0.82	0.95
G3	0.45	0.52	0.60
H	3.50	3.60	3.70
I	2.70	2.80	2.90
J	15.70	15.97	16.25
K	2.20	2.40	2.60
L	1.15	1.27	1.40
N	6.40	6.60	6.80