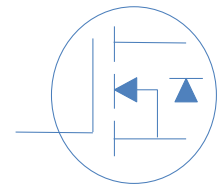


60V N-Ch Power MOSFET

V_{DS}			60	V
$R_{DS(on),typ}$	TO-263	$V_{GS}=10V$	1.8	m Ω
$R_{DS(on),typ}$		$V_{GS}=4.5V$	2.7	m Ω
$R_{DS(on),typ}$	TO-220	$V_{GS}=10V$	2.1	m Ω
$R_{DS(on),typ}$		$V_{GS}=4.5V$	3.0	m Ω
I_D (Silicon Limited)			198	A
I_D (Package Limited)			120	A



Part Number	Package	Marking
HGB029N06SL	TO-263	GB029N06SL
HGP029N06SL	TO-220	GP029N06SL

Absolute Maximum Ratings at $T_J=25$ (unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Continuous Drain Current (Silicon Limited)	I_D	$T_C=25$	198	A
		$T_C=100$	140	
		$T_C=25$	120	
Continuous Drain Current (Package Limited)		$T_C=25$	120	
Drain to Source Voltage	V_{DS}	-	60	V
Gate to Source Voltage	V_{GS}	-	± 20	V
Pulsed Drain Current	I_{DM}	-	500	A
Avalanche Energy, Single Pulse	E_{AS}	$L=0.5mH, T_C=25$	625	mJ
Power Dissipation	P_D	$T_C=25$	250	W
Operating and Storage Temperature	T_J, T_{stg}	-	-55 to 175	

Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Thermal Resistance Junction-Case	$R_{\theta JC}$	0.6	/W
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	60	/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	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1	1.9	2.4	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS}=0V, V_{DS}=60V, T_j=25$	-	-	1	μA
		$V_{GS}=0V, V_{DS}=60V, T_j=100$	-	-	100	μA
Gate to Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Drain to Source on Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$ TO-263	-	1.8	2.6	$m\Omega$
		$V_{GS}=4.5V, I_D=20A$ TO-263	-	2.7	3.9	$m\Omega$
Drain to Source on Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$ TO-220	-	2.1	2.9	$m\Omega$
		$V_{GS}=4.5V, I_D=20A$ TO-220	-	-	4.2	$m\Omega$
Gate Resistance	R_G	$V_{GS}=0V, V_{DS}$ Open, $f=1MHz$	-	70	-	S
			-	0.7	-	Ω

Dynamic Characteristics

Input Capacitance	C_{iss}		-	5400	-	
Output Capacitance	C_{oss}	$V_{GS}=0V, V_{DS}=30V, f=1MHz$	-	1900	-	pF
Total Gate Charge (4.5V)	$Q_g(4.5V)$			14		
Turn on Delay Time	$t_{d(on)}$		-			
Rise time	t_r	$V_{DD}=30V, I_D=20A, V_{GS}=10V, R_G=10\Omega,$	-	67		
			t_f	-		

V

Fig 1. Typical Output Characteristics



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

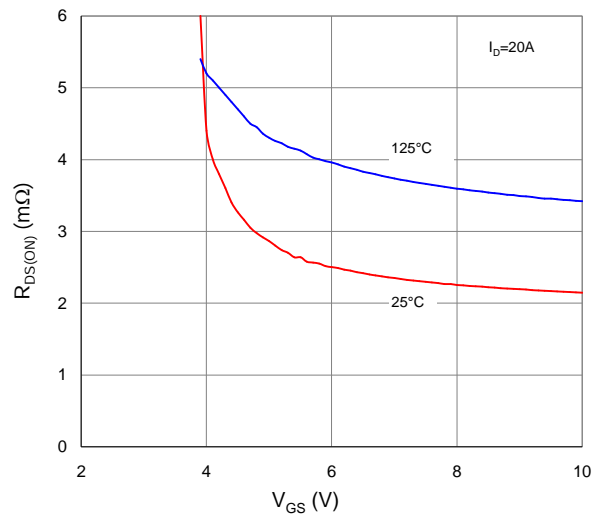


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

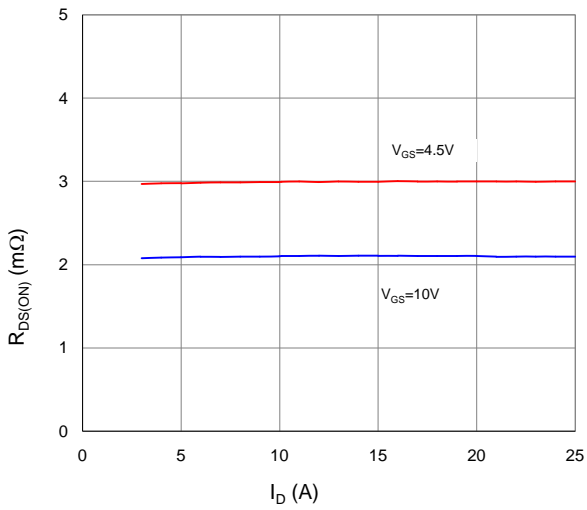


Figure 4. Normalized On-Resistance vs. Junction Temperature

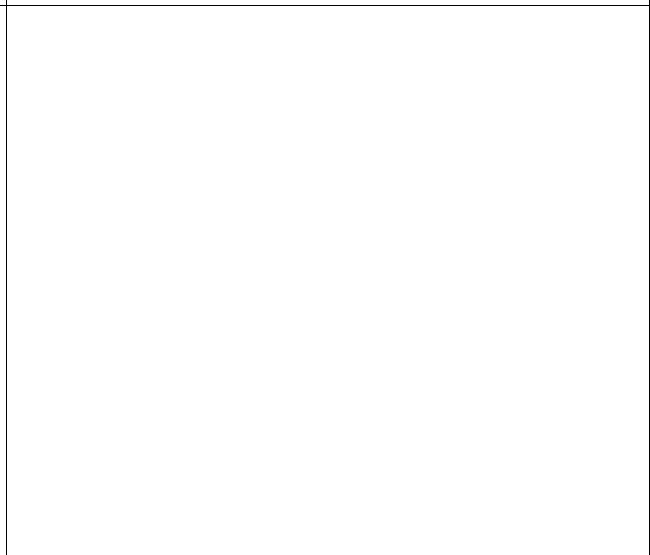


Figure 5. Typical Transfer Characteristics

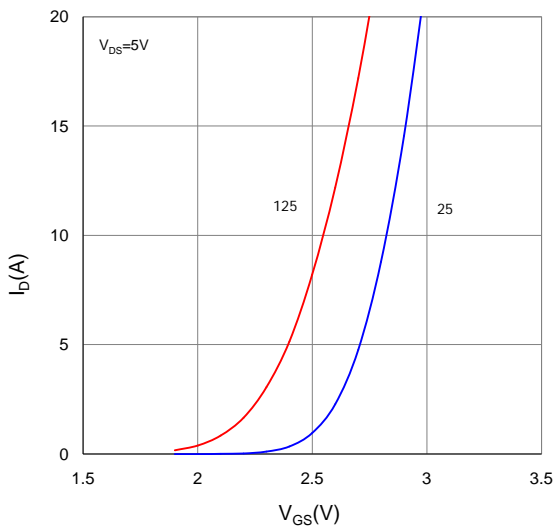


Figure 6. Typical Source-Drain Diode Forward Voltage

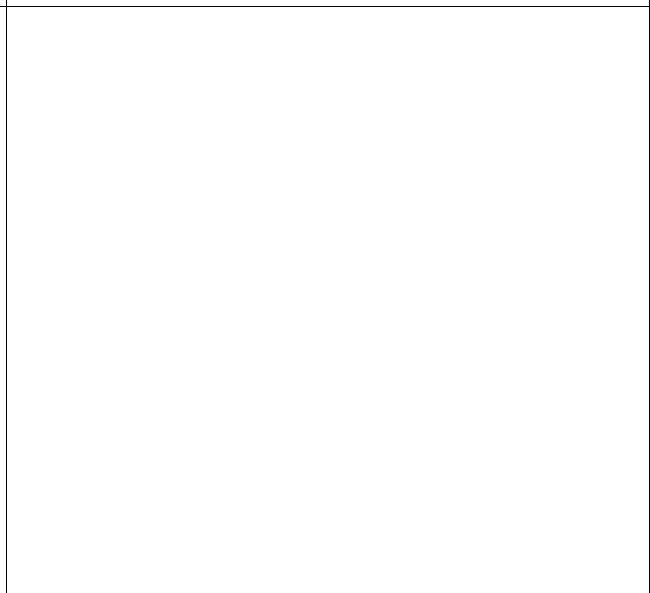


Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

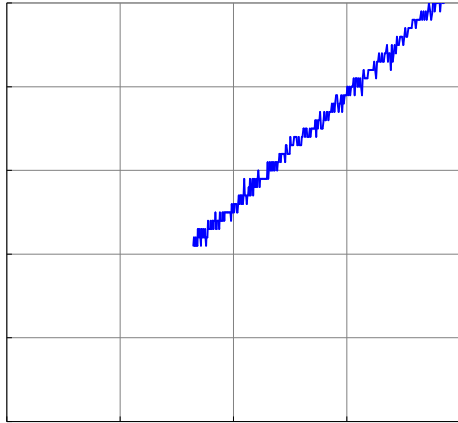


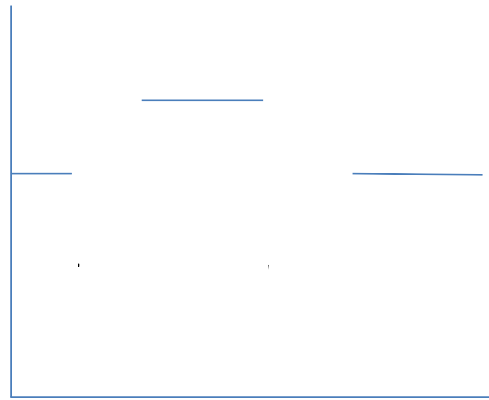
Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

Figure 9. Maximum Safe Operating Area

Figure 10. Maximun Drain Current vs. Case Temperature

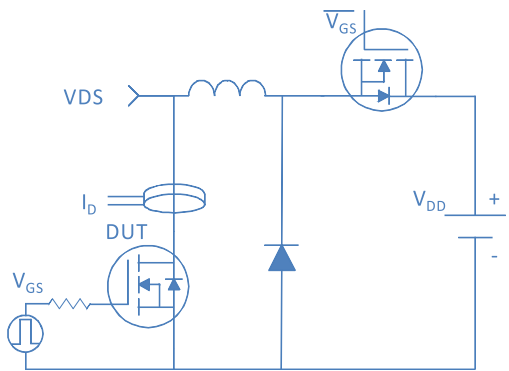
Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case

Inductive switching Test



Gate Charge Test

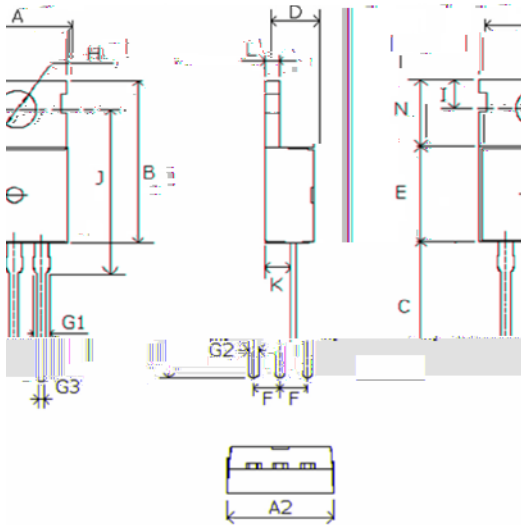
Uclamped Inductive Switching (UIS) Test



Diode Recovery Test

Package Outline

TO-220, 3 leads



Dimensions 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

TO-263, 2 leads

Dimensions in mm unless otherwise specified

Symbol	Min	Nom	Max
A	9.66	9.97	10.28
B	1.02	1.17	1.32
C	8.59	9.00	9.40
D1	1.14	1.27	1.40
D2	0.70	0.83	0.95
D3		5.08	
E	15.09	15.24	15.39
F	1.15	1.28	1.40
G	4.30	4.50	4.70
H	2.29	2.54	2.79
I		0.25	
K	1.30	1.45	1.60
a1	0.45	0.55	0.65
a2(degree)	0°		8°