80V N-Ch Power MOSFET

V_{DS}		80	V
$R_{DS(on),typ}$	V_{GS}=10V	4.3	mΩ
$R_{DS(on),typ}$	V_{GS}=4.5V	5.9	mΩ
$I_{D\ (Sillicon\ Limited)}$		63	A

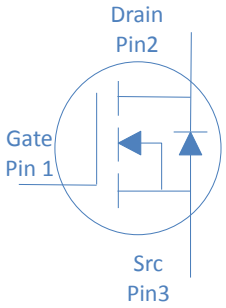
Feature

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

Application

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

TO-220F



Part Number	Package	Marking
HGA058N08SL	TO-220F	GA058N08SL

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℃	63	A
		T_C=100℃	45	
Drain to Source Voltage	V_{DS}	-	80	V
Gate to Source Voltage	V_{GS}	-	±20	V
Pulsed Drain Current	I_{DM}	-	380	A
Avalanche Energy, Single Pulse	E_{AS}	L=0.3mH, T_C=25℃	240	mJ
Power Dissipation	P_D	T_C=25℃	41.7	W
Operating and Storage Temperature	T_J, T_{stg}	-	-55 to175	℃

Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Thermal Resistance Junction-Case	$R_{\Theta JC}$	3.6	℃/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		80	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250μA		1	1.7	2.4	
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=0V, V_{DS}=80V, T_j=25℃		-	-	1	μA
		V_{GS}=0V, V_{DS}=80V, 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	TO-220F	-	4.3	5.8	mΩ
		V_{GS}=4.5V, I_D=20A	TO-220F	-	5.9	8.0	mΩ
Transconductance	g_{fs}	V_{DS}=5V, I_D=20A		-	65	-	S
Gate Resistance	R_G	V_{GS}=0V, V_{DS} Open, f=1MHz		-	1.5	-	Ω

Dynamic Characteristics

Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=40V, f=1MHz	-	3130	-	pF
Output Capacitance	C_{oss}		-	385	-	
Reverse Transfer Capacitance	C_{rss}		-	18	-	
Total Gate Charge (10V)	Q_g (10V)	V_{DD}=40V, I_D=20A, V_{GS}=10V	-	46	-	nC
Total Gate Charge (4.5V)	Q_g (4.5V)		-	22	-	
Gate to Source Charge	Q_{gs}		-	9	-	
Gate to Drain (Miller) Charge	Q_{gd}		-	8	-	
Turn on Delay Time	$t_{d(on)}$	V_{DD}=40V, I_D=20A, V_{GS}=10V, R_G=10Ω,	-	11	-	ns
Rise time	t_r		-	7	-	
Turn off Delay Time	$t_{d(off)}$		-	38	-	
Fall Time	t_f		-	9	-	

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=40V, I_F=20A, dI_F/dt=400A/μs	-	48	-	ns
Reverse Recovery Charge	Q_{rr}		-	190	-	nC

Fig 1. Typical Output Characteristics

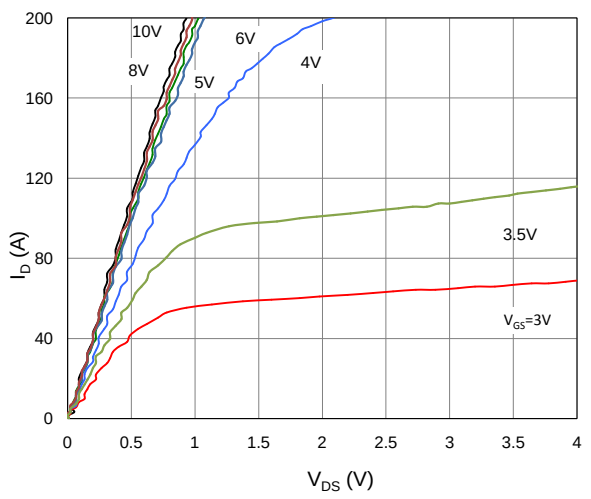


Figure 2. On-Resistance vs. Gate-Source Voltage

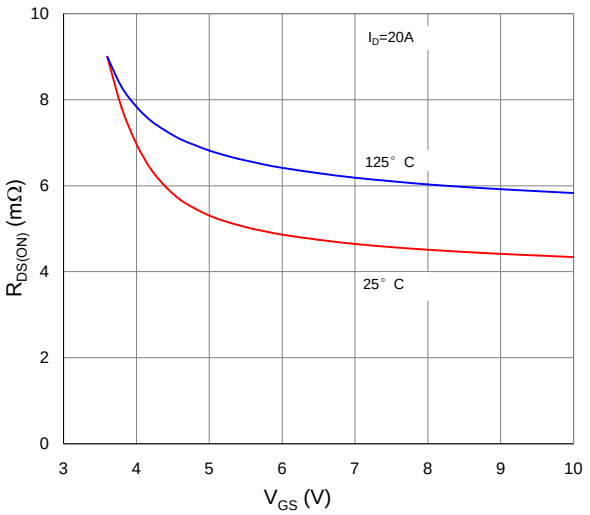


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

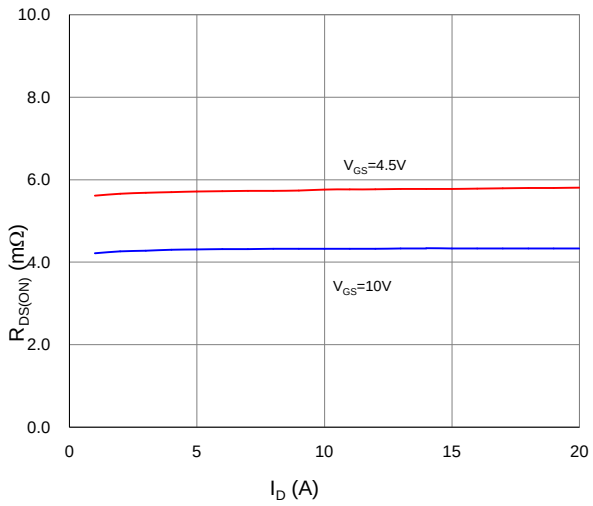


Figure 4. Normalized On-Resistance vs. Junction Temperature

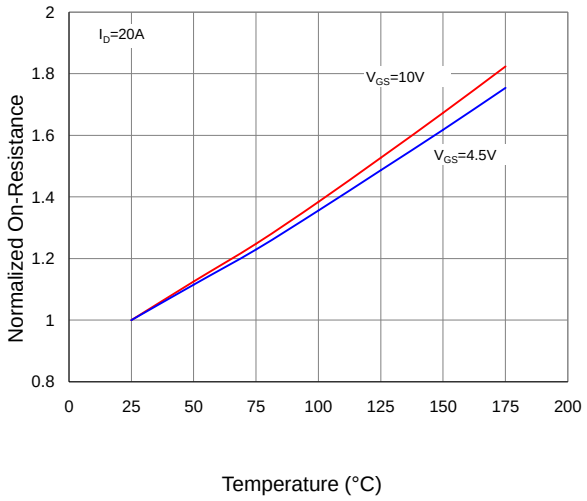


Figure 5. Typical Transfer Characteristics

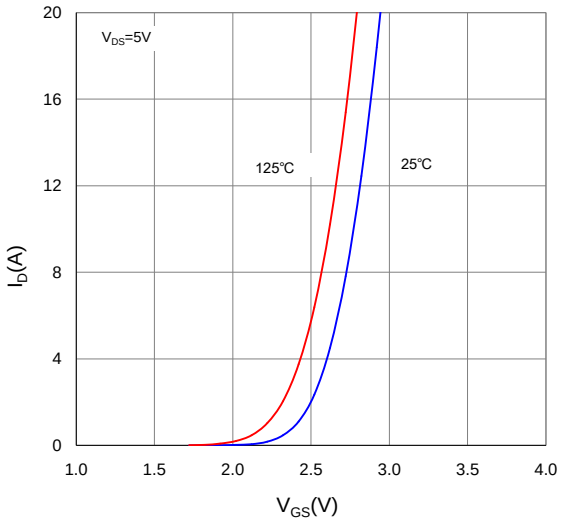


Figure 6. Typical Source-Drain Diode Forward Voltage

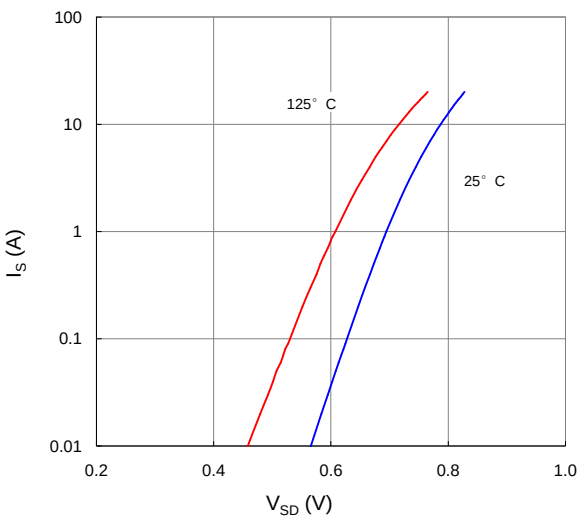


Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

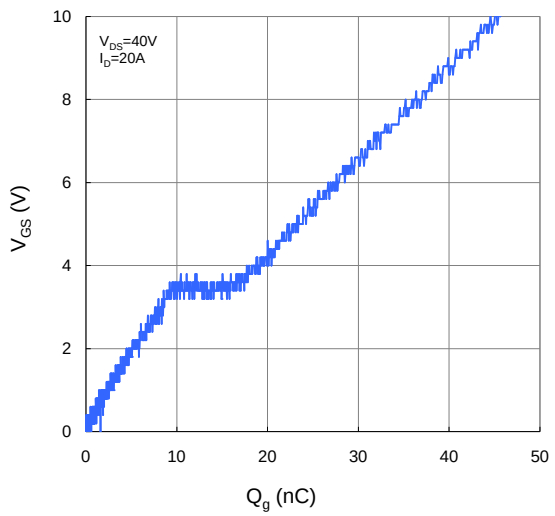


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

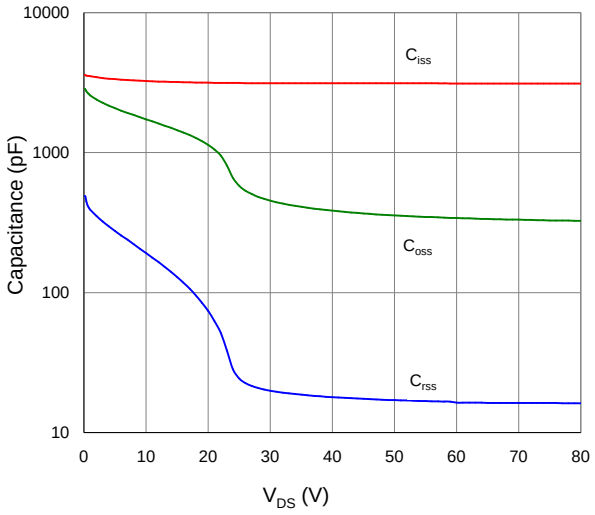


Figure 9. Maximum Safe Operating Area

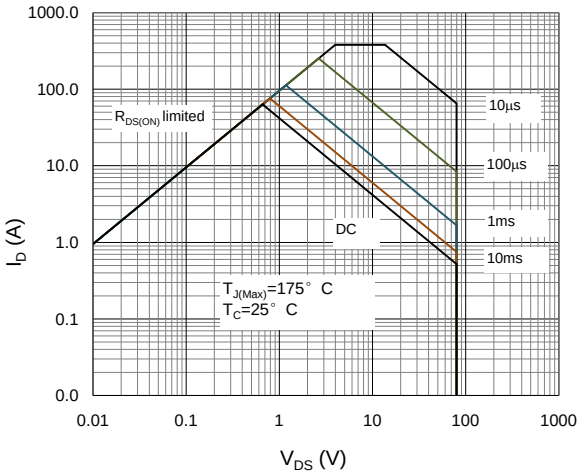


Figure 10. Maximun Drain Current vs. Case Temperature

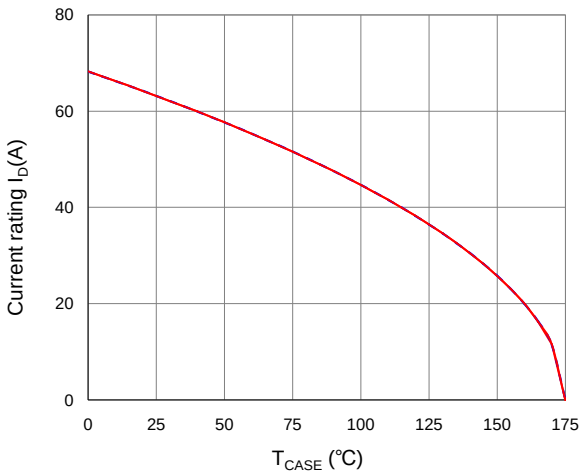
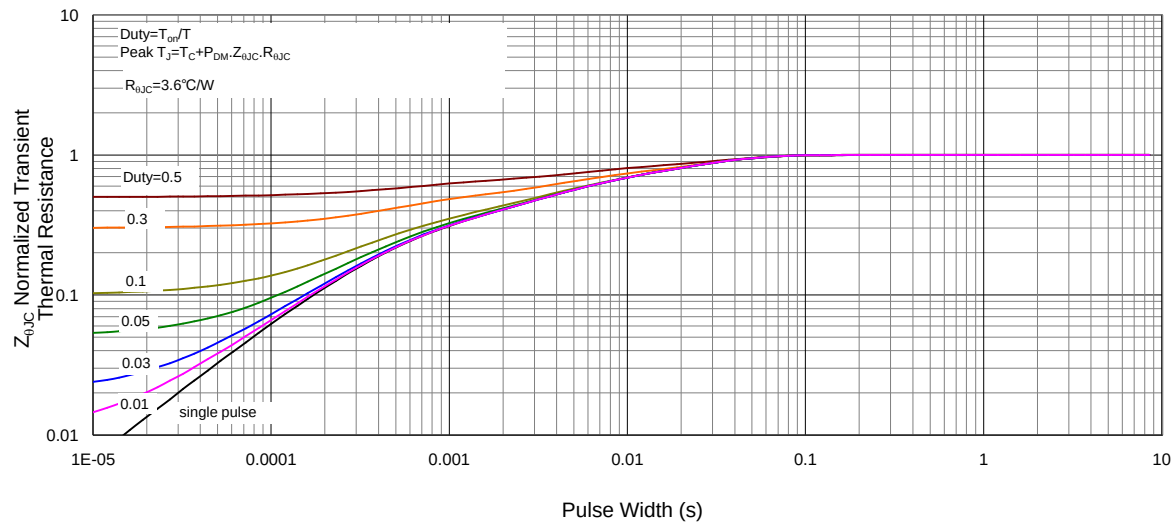
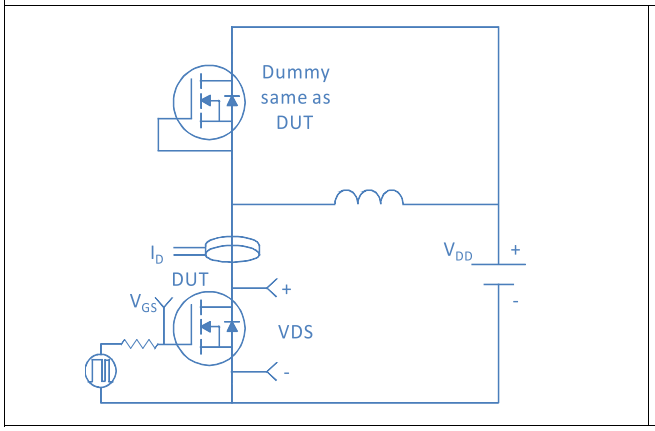
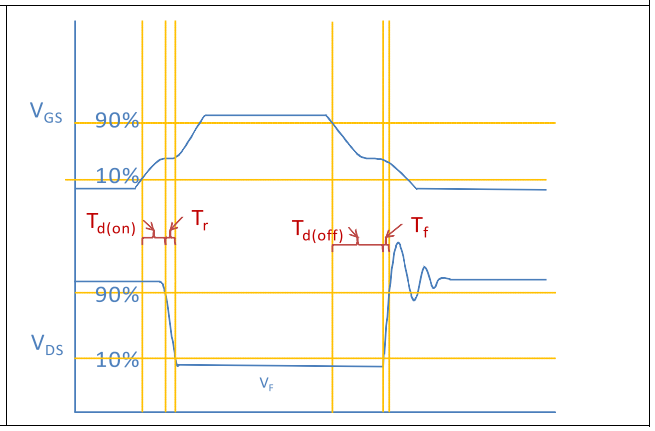


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case

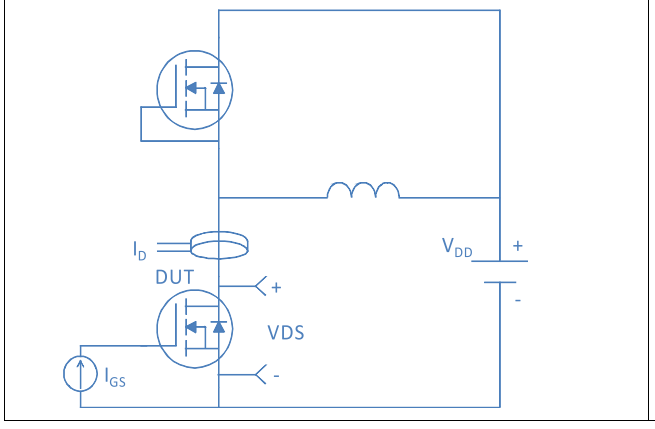


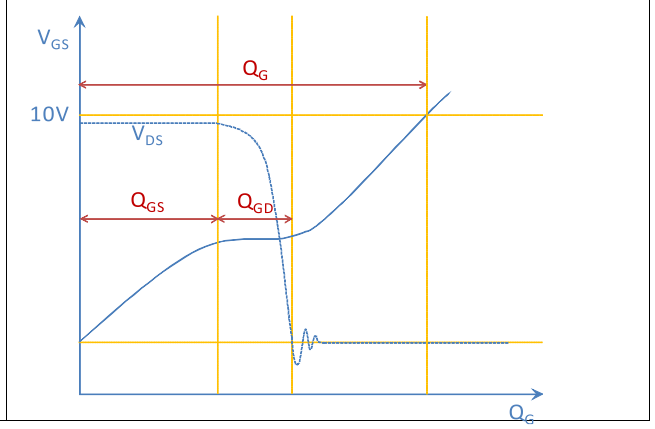
Inductive switching Test



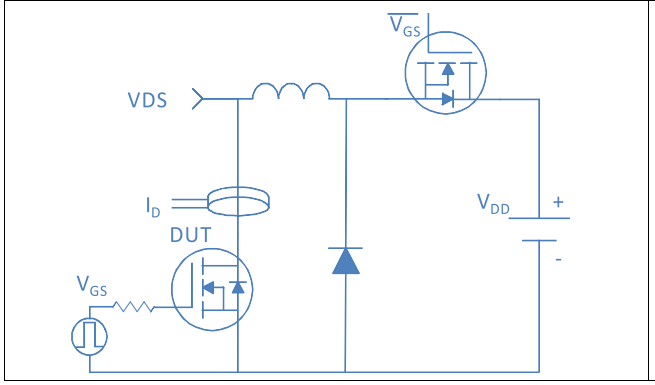


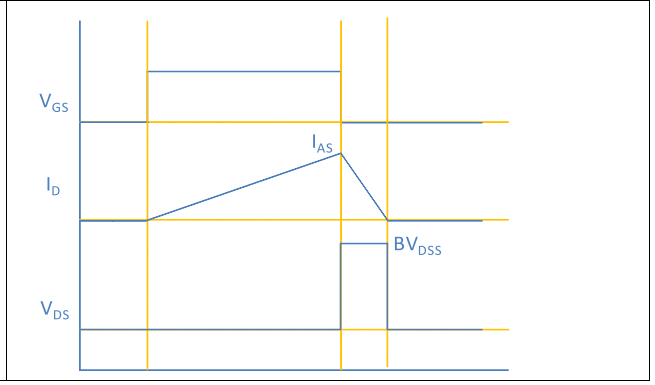
Gate Charge Test



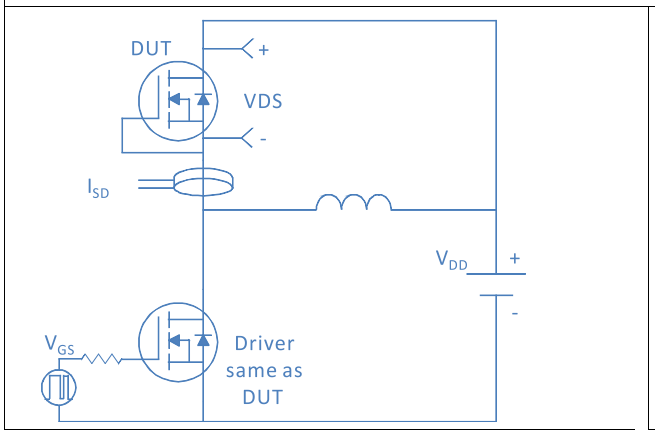


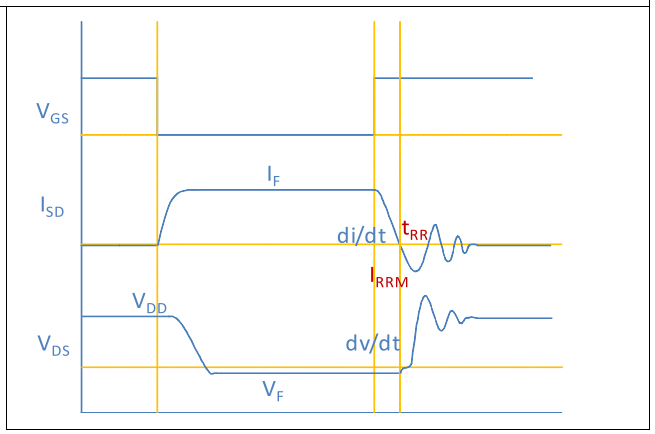
Uclamped Inductive Switching (UIS) Test



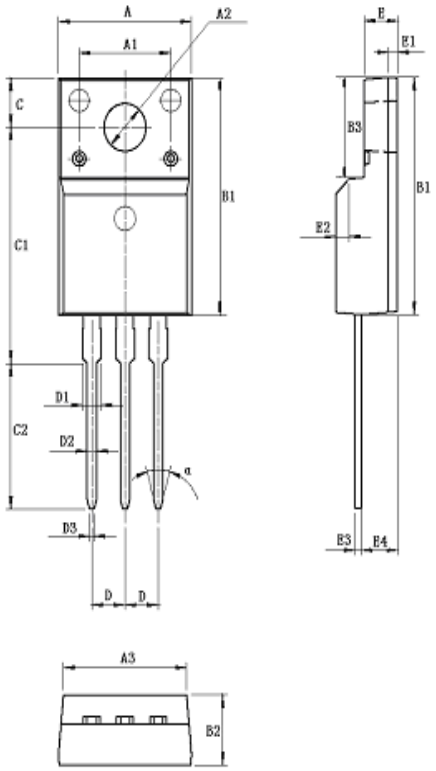


Diode Recovery Test





TO-220F, 3 leads



Dimentions in mm unless otherwise specified

Symbol	Min	Nom	Max
A	9.96	10.16	10.36
A1		7	
A2	3.08	3.18	3.28
A3	9.26	9.46	9.66
B1	15.67	15.87	16.07
B2	4.50	4.70	4.90
B3	6.48	6.68	6.88
C	3.20	3.30	3.40
C1	15.60	15.80	16.00
C2	9.55	9.75	9.95
D		2.54	
D1			1.47
D2	0.70	0.80	0.90
D3	0.25	0.35	0.45
E	2.34	2.54	2.74
E1		0.70	
E2		1.0x45°	
E3	0.45	0.50	0.60
E4	2.56	2.76	2.96
α (degree)		30°	