



ST36N06



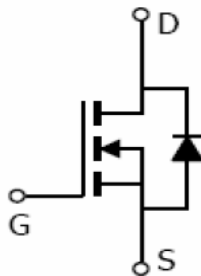
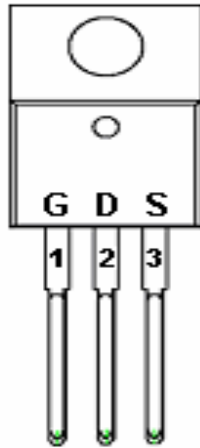
N Channel Enhancement Mode MOSFET

36.0A

DESCRIPTION

ST36N06 is used trench technology to provide excellent $R_{DS(on)}$ and gate charge. Those devices are suitable for use as load switch or in PWM applications.

PIN CONFIGURATION TO220-3L



FEATURE

- 60V/20.0A, $R_{DS(ON)} = 30m\Omega$ (Typ.) @ $V_{GS} = 10V$
- 60V/20.0A, $R_{DS(ON)} = 45m\Omega$ @ $V_{GS} = 4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- TO-220 package design



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ABSOLUTE MAXIMUM RATINGS (Ta = 25°C Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	VDSS	60	V
Gate-Source Voltage	VGSS	±20	V
Continuous Drain Current (TJ=150°C)	ID	TA=25°C 36.0	A
		TA=70°C 26.0	
Pulsed Drain Current	IDM	60	A
Avalanche Current	IAS	70	A
Power Dissipation	PD	TA=25°C 62.5	W
Operation Junction Temperature		TJ	
Storage Temperature Range	TSTG	-55/175	°C
Thermal Resistance-Junction to Ambient	RθJA	62	°C/W



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ELECTRICAL CHARACTERISTICS (Ta = 25°C Unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1		3	V
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=48V, V_{GS}=0V$			1	uA
		$V_{DS}=48V, V_{GS}=0V$ $T_J=55^\circ C$			5	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 5V, V_{GS}=10V$	60			A
Drain-source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$		30	37	mΩ
		$V_{GS}=4.5V, I_D=20A$		45	55	
Forward Transconductance	g_{fs}	$V_{DS}=5V, I_D=20A$		65		S
Diode Forward Voltage	V_{SD}	$I_S=1.0A, V_{GS}=0V$		0.7	1.0	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=10V, V_{GS}=30V$ $I_D=20A$			20	nC
Gate-Source Charge	Q_{gs}				7	
Gate-Drain Charge	Q_{gd}				9	
Input Capacitance	C_{iss}	$V_{DS}=20V, V_{GS}=0V$ $F=1MHz$		1080		pF
Output Capacitance	C_{oss}			160		
Reverse Transfer Capacitance	C_{rss}			58		
Turn-On Time	$t_{d(on)}$	$V_{DD}=20V, R_L=4\Omega$ $I_D=5.0A, V_{GEN}=10V$ $R_G=1\Omega$		20		nS
	t_r			25		
Turn-Off Time	$t_{d(off)}$			40		
	t_f			42		

TYPICAL CHARACTERISTICS

Figure 1. Safe operating area

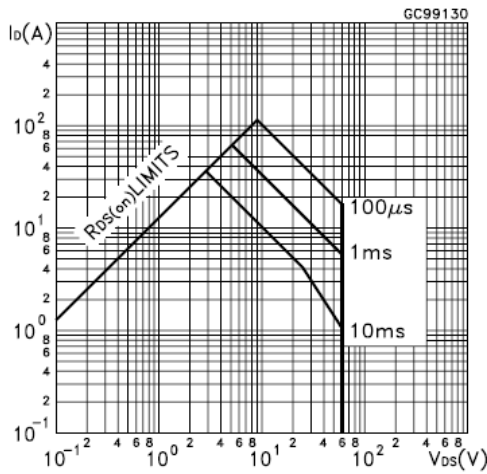


Figure 2. Thermal impedance

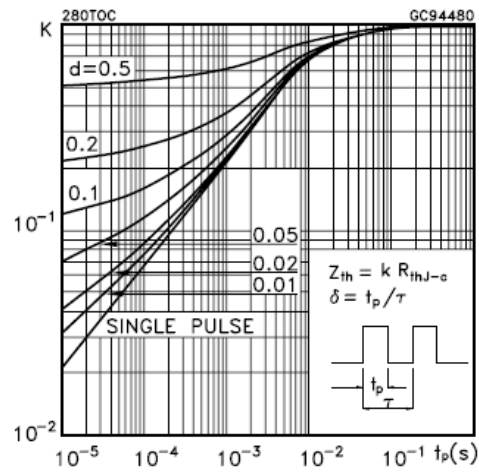


Figure 3. Output characteristics

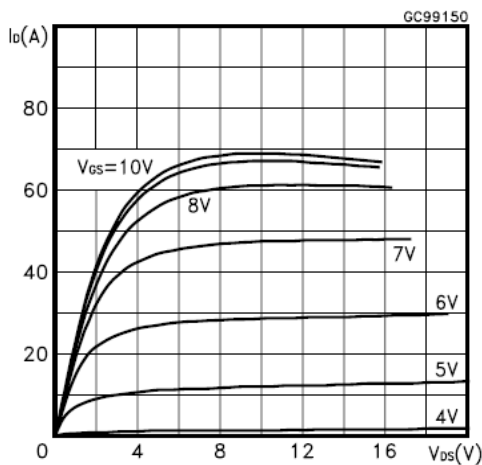


Figure 4. Transfer characteristics

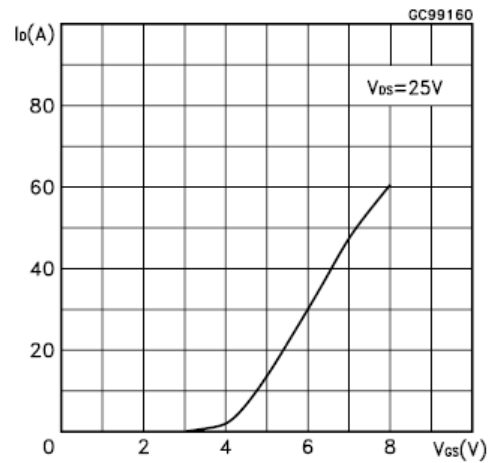


Figure 5. Transconductance

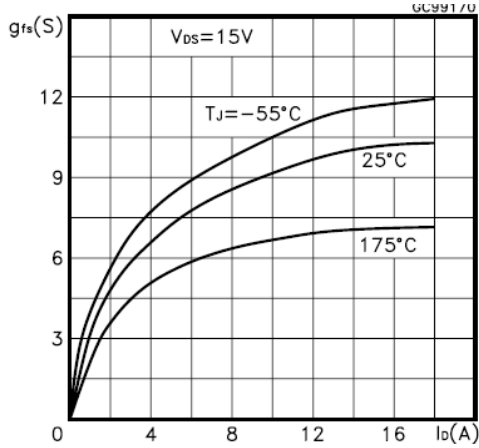


Figure 6. Static drain-source on resistance

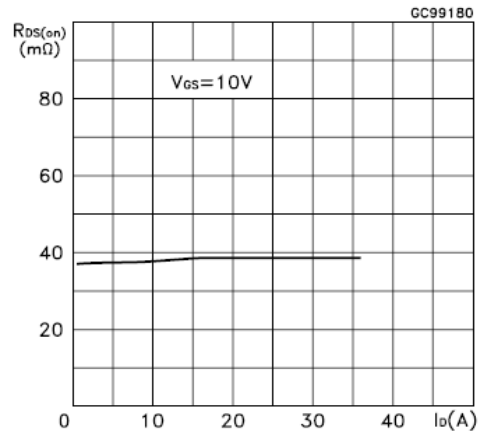


Figure 7. Gate charge vs. Gate-source voltage

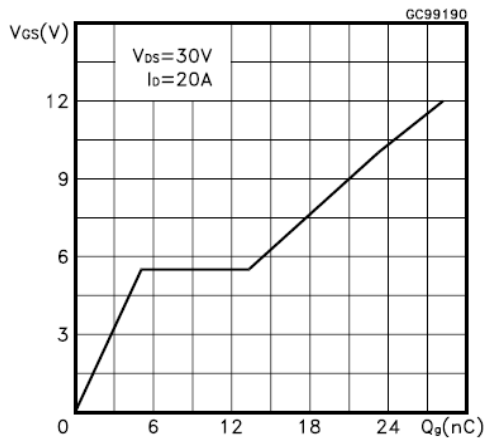


Figure 8. Capacitance variations

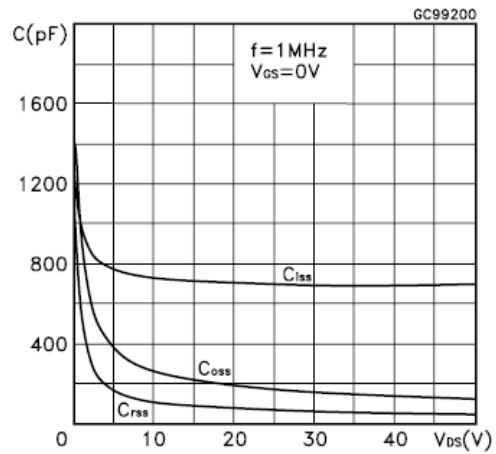


Figure 9. Normalized gate threshold voltage vs. temperature

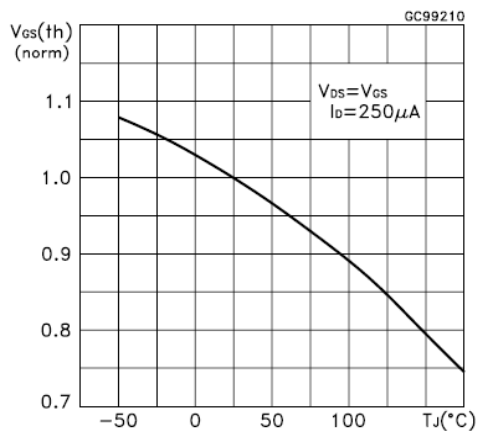


Figure 10. Normalized on resistance vs. temperature

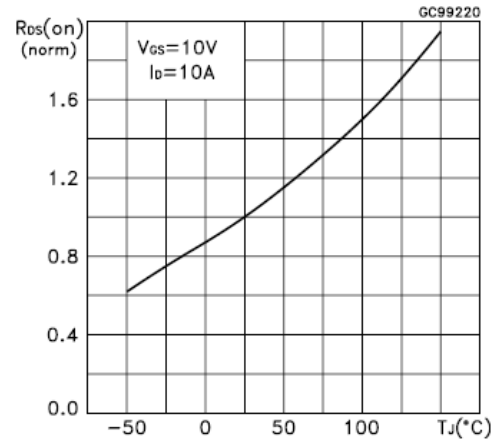


Figure 11. Source-drain diode forward characteristics

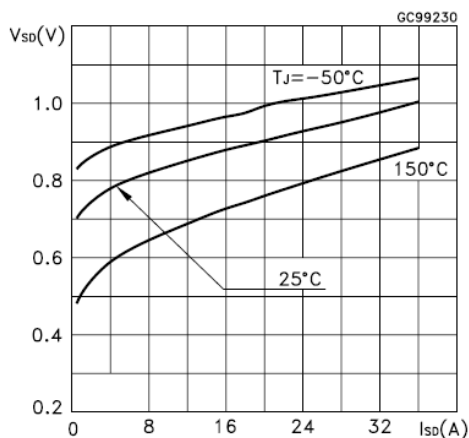


Figure 12 Normalized BVDSS vs. Temperature

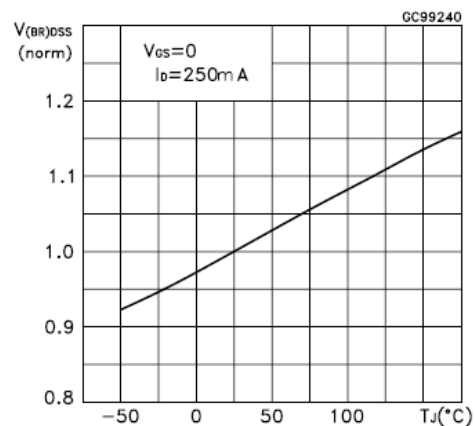


Figure 13. Switching times test circuit for resistive load

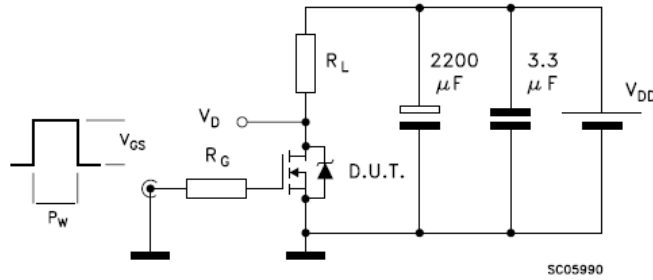


Figure 14. Gate charge test circuit

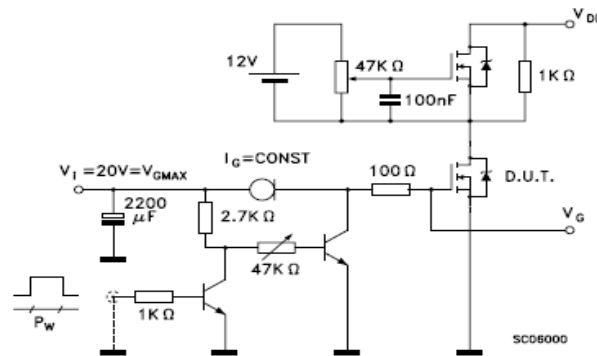


Figure 15. Test circuit for inductive load switching and diode recovery times

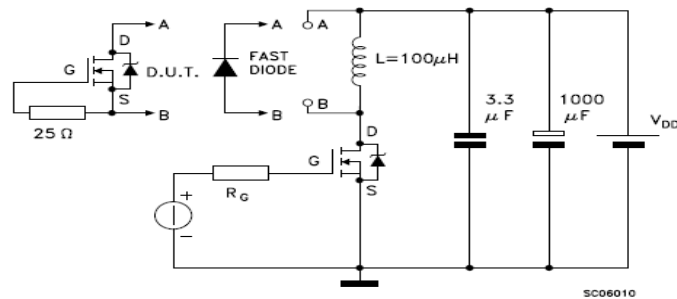


Figure 16. Unclamped Inductive load test circuit

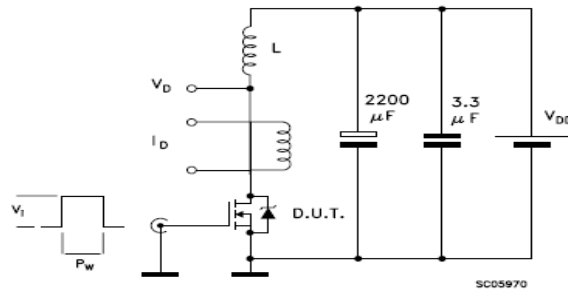


Figure 17. Unclamped inductive waveform

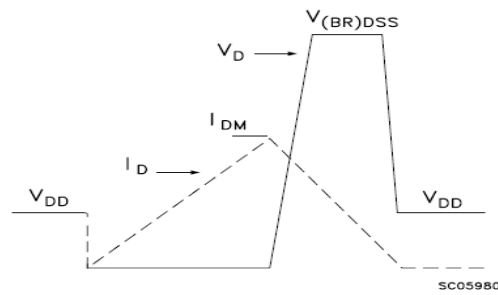
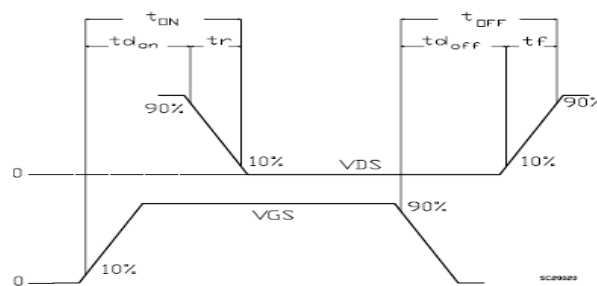
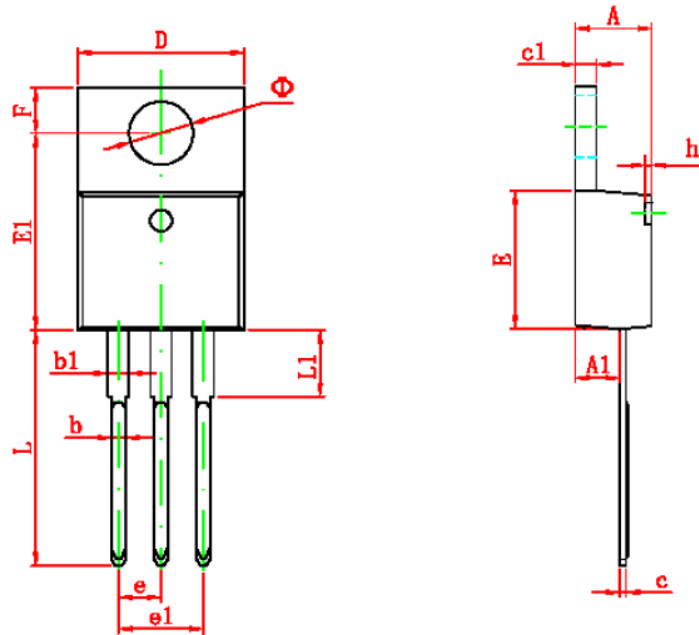


Figure 18. Switching time waveform



TO220-3L PACKAGE OUTLINE



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.470	4.670	0.176	0.184
A1	2.520	2.820	0.099	0.111
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
E1	12.060	12.460	0.475	0.491
e	2.540 TYP		0.100 TYP	
e1	4.980	5.180	0.196	0.204
F	2.590	2.890	0.102	0.114
h	0.000	0.300	0.000	0.012
L	13.400	13.800	0.528	0.543
L1	3.560	3.960	0.140	0.156
• •	3.735	3.935	0.147	0.155