Features

- Super Low Gate Charge
- Green Device Available
- Excellent Cdv/dt effect decline
- Advanced high cell density Trench technology
- 100% EAS Guaranteed

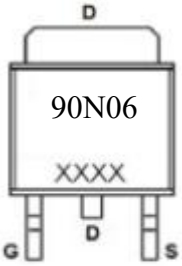
Bvdss	Rdson	ID
60V	4.8mΩ	90A

Application

- PWM applications
- Load Switch
- Power management

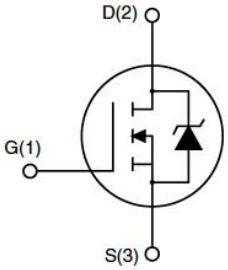
RoHS

Package



Marking and pin assignment

TO252-3L top view



Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
90N06	90N06	TO252-3L	2500

Absolute Maximum Ratings (T_C=25℃unless otherwise specified)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current,V_{GS}@10V[1]	T_C=25℃	I_D	90	A
	T_C=100℃		63	A
Pulsed Drain Current[2]		I_{DM}	360	A
Avalanche Current		I_{AS}	--	A
Single Pulsed Avalanche Energy[3]		EAS	400	mJ
Power Dissipation		P_D	88	W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 ~ 150	℃

Thermal Resistance Ratings

Parameter	Symbol	Value	Max.	Unit
Thermal Resistance Junction-Ambient[1]	$R_{\theta JA}$	-	-	℃/W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	-	1.7	℃/W

Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
HL90N06	TO-252	1	2	3	Tape Reel

Electrical Characteristics (T_j=25℃unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250uA,V_{GS}=0V	60	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=60V,V_{GS}=0V	-	-	1	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS},I_D=250uA	2	-	4	V
Static Drain-Source On-Resistance[2]	$R_{DS(on)}$	V_{GS}=10V,I_D=23A	-	4.8	6.2	mΩ
		-	-	-	-	
Input Capacitance	C_{iss}	V_{DS}=30V,V_{GS}=0V,f=1MHz	-	4762	-	pF
Output Capacitance	C_{oss}		-	265	-	
Reverse Transfer Capacitance	C_{rss}		-	230	-	
Forward Transconductance	gfs	V_{DS}=10V,I_D=23A	-	36.5	-	S
Gate Resistance	R_g	V_{DS}=0V,V_{GS}=0V,f=1MHz	-	0.86	-	Ω
Total Gate Charge	Q_g	V_{GS}=10V,V_{DS}=30V,I_D=23A	-	76	-	nC
Gate-Source Charge	Q_{gs}		-	21	-	
Gate-Drain Charge	Q_{gd}		-	24	-	
Turn-On Delay Time	$t_{d(on)}$	V_{GS}=10V,V_{DS}=30V, R_L=1.5Ω,R_G=3Ω	-	20	-	ns
Turn-On Rise Time	t_r		-	90	-	
Turn-Off Delay Time	$t_{r(off)}$		-	37	-	
Turn-Off Fall Time	t_f		-	85	-	
Maximum Continuous Drain to Source Diode Forward Current[1]		I_S	-	-	90	A
Maximum Pulsed Drain to Source Diode Forward Current		I_{SM}	-	-	-	A
Diode Forward Voltage[2]	V_{GS}=0V,I_S=23A	V_{SD}	-	-	1.2	V
Reverse Recovery Time[1]	I_F=23A,dI/dt=100A/μs	t_{rr}	-	25	-	ns
Reverse Recovery Charge[1]		Q_{rr}	-	30	-	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature .

2. EAS condition : T_J=25℃,V_{DD}=40V,V_G=10V,L=0.5mH, Rg=25Ω.

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

Typical Performance Characteristics

Figure 1. Output Characteristics

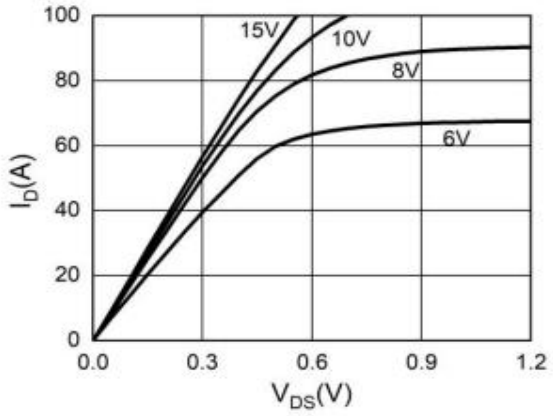


Figure 2. Transfer Characteristics

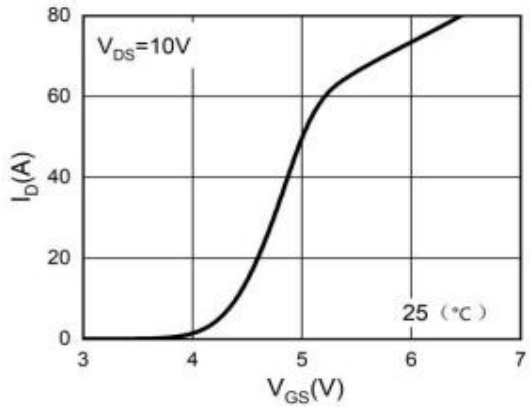


Figure 3. Power Dissipation

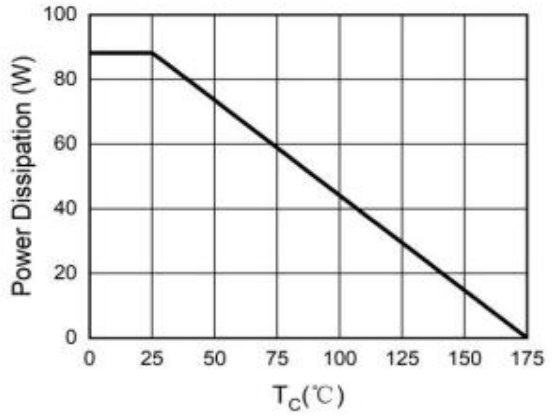


Figure 4. Drain Current

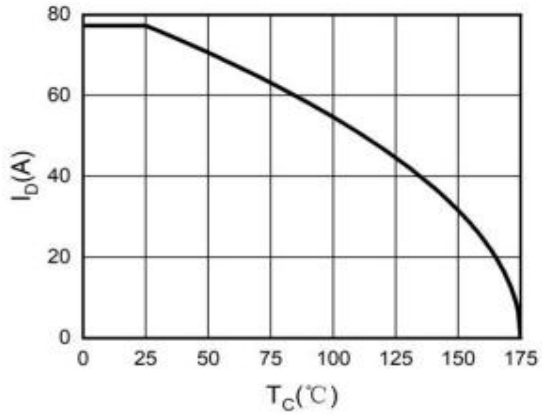


Figure 5. BV_{DSS} vs Junction Temperature

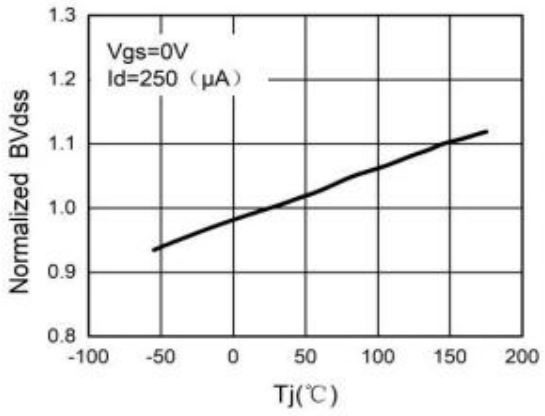


Figure 6. $R_{DS(ON)}$ vs Junction Temperature

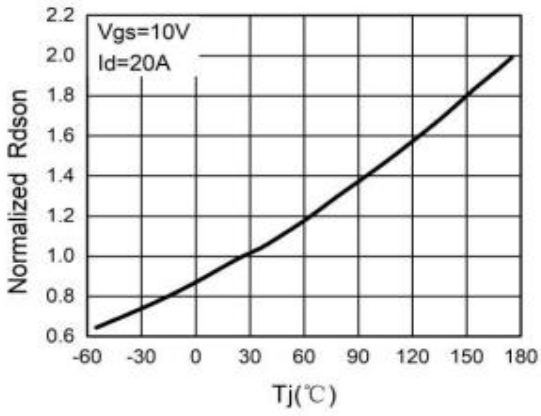


Figure 7. Gate Charge Waveforms

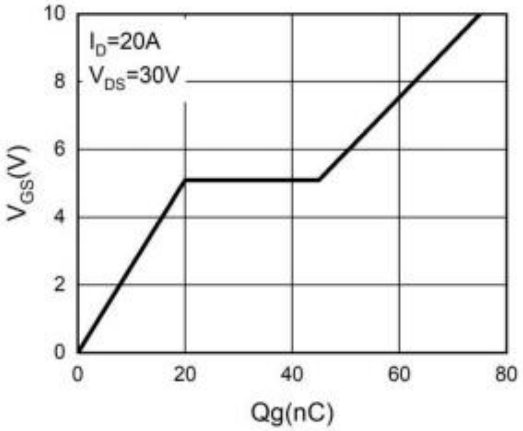


Figure 8. Capacitance

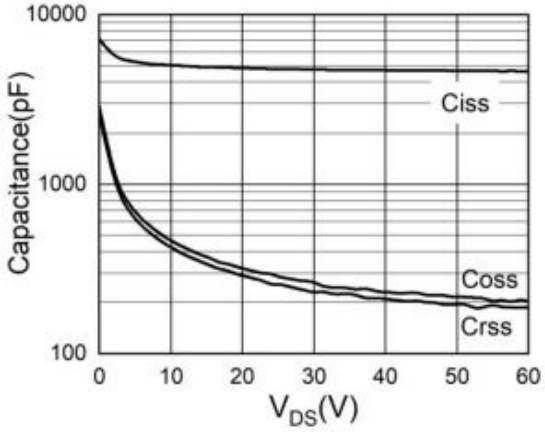


Figure 9. Body-Diode Characteristics

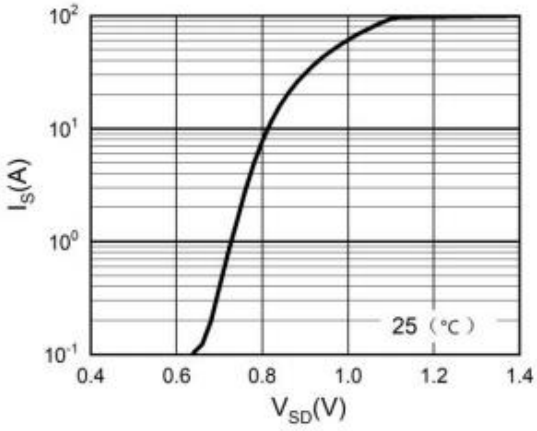
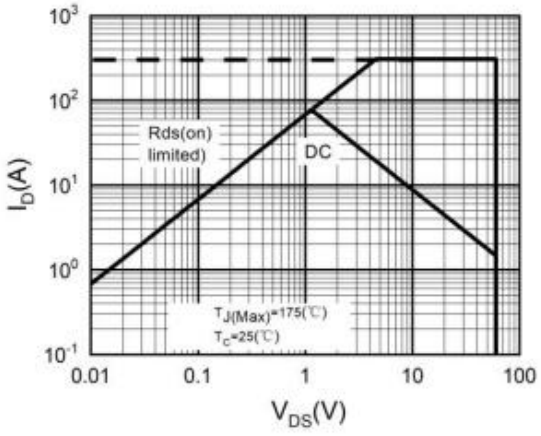


Figure 10. Maximum Safe Operating Area



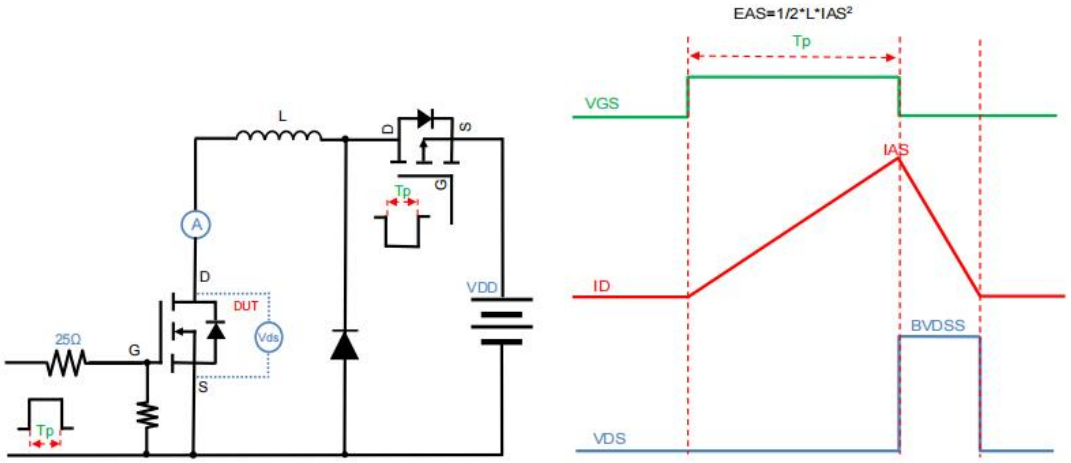


Figure A. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

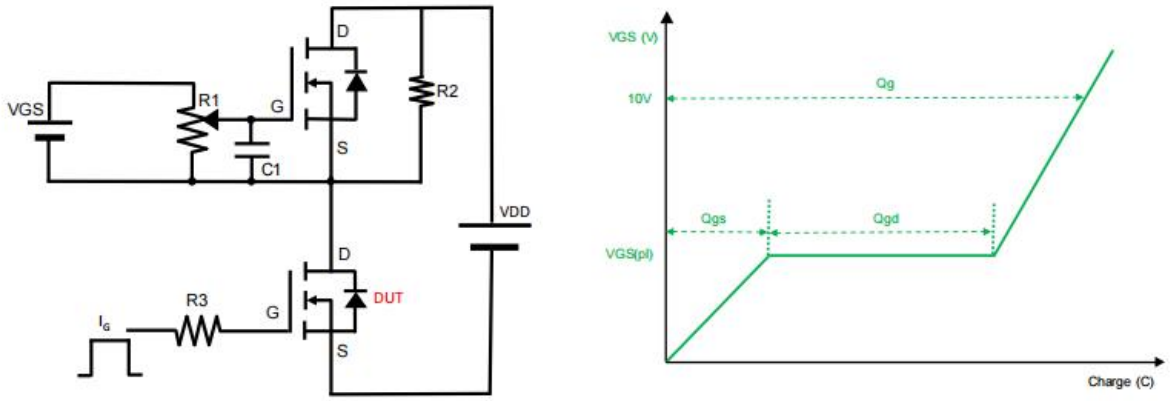


Figure B. Gate Charge Test Circuit & Waveform

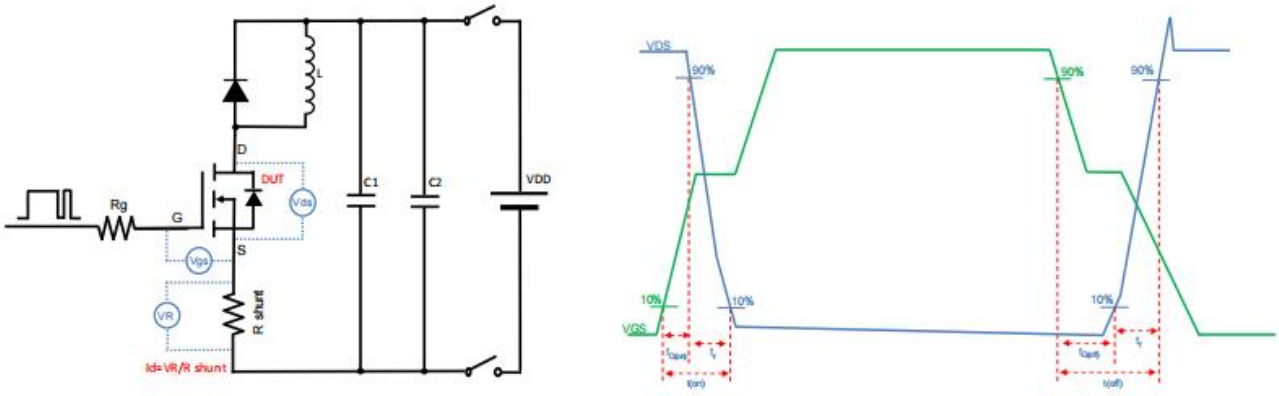


Figure C. Resistive Switching Test Circuit & Waveform

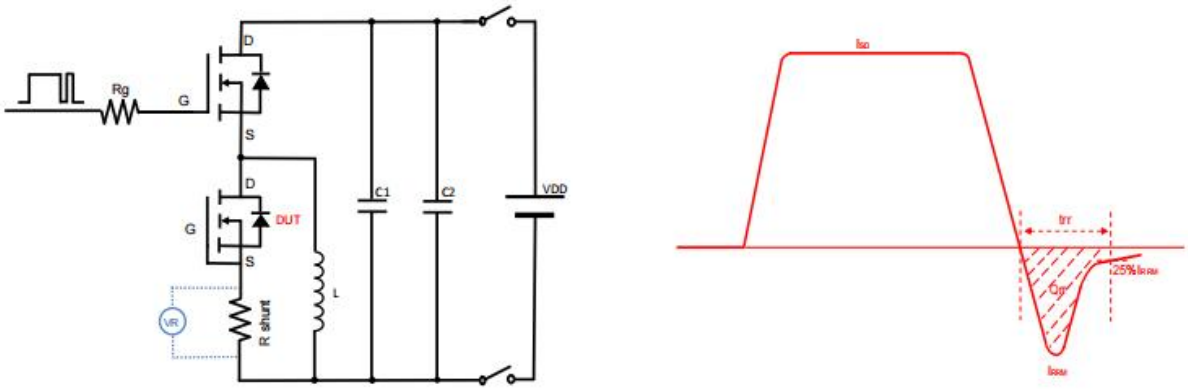
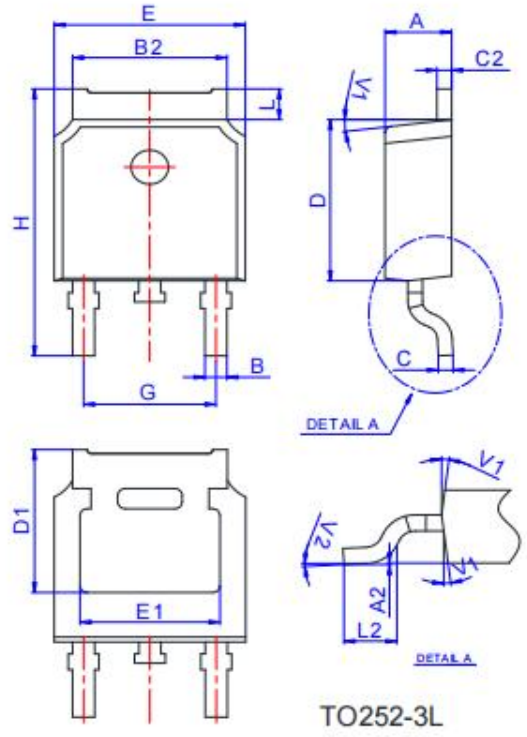


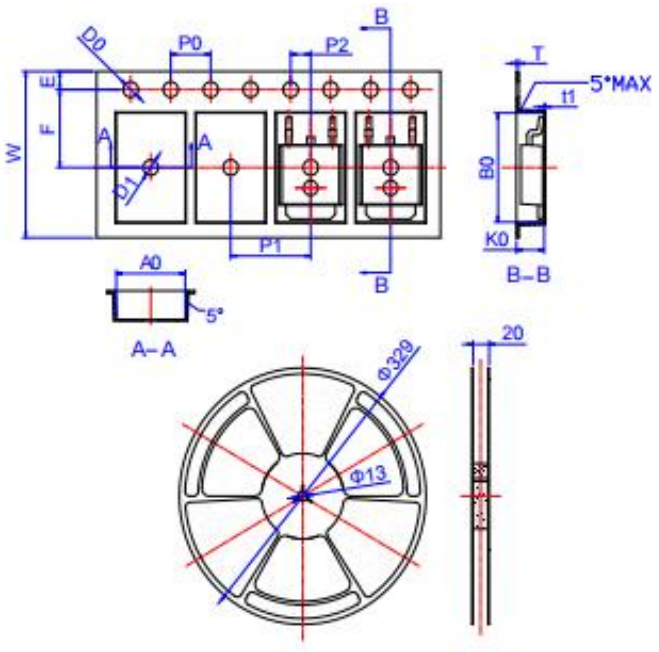
Figure D. Diode Recovery Test Circuit & Waveform

Package Mechanical Data TO252-3L



TO252-3L

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.90	16.00	16.10	0.626	0.630	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
D0	1.40	1.50	1.60	0.055	0.059	0.063
D1	1.40	1.50	1.60	0.055	0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
A0	6.85	6.90	7.00	0.270	0.271	0.276
B0	10.45	10.50	10.60	0.411	0.413	0.417
K0	2.68	2.78	2.88	0.105	0.109	0.113
T	0.24		0.27	0.009		0.011
t1	0.10			0.004		
10P0	39.80	40.00	40.20	1.567	1.575	1.583

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