Features

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

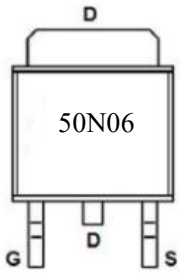
Bvdss	Rdson	ID
60V	8.6mΩ	50A

Application

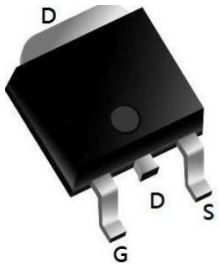
- PWM applications
- Load Switch
- Power management

RoHS

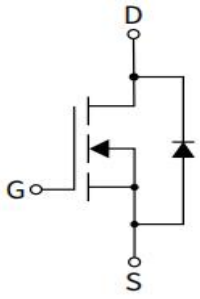
Package



Marking and pin assignment



TO252-3L top view



Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
50N06	50N06	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	50	A
	T_C = 100℃		31	A
Pulsed Drain Current[2]		I_{DM}	200	A
Single Pulsed Avalanche Energy[3]		EAS	169	mJ
Total Power Dissipation[4]	T_C = 25℃	P_D	57	W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 ~ 150	℃

Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Thermal Resistance Junction to Ambient[1]	$R_{\theta JA}$	--	℃/W
Thermal Resistance Junction to Case[1]	$R_{\theta JC}$	2.2	℃/W

Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
HL50N06	TO252-3L	1	2	3	Tape Reel

Electrical Characteristics (T_J=25℃,unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D = 250μA	60	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=60V,V_{GS}=0V,T_J=25℃	-	-	1	μA
		V_{DS}=60V,V_{GS}=0V,T_J=100℃	-	-	100	
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=250μA	1	-	2.5	V
Drain-Source On-Resistance[2]	$R_{DS(on)}$	V_{GS}=10V, I_D=10A	-	8.6	11	mΩ
		V_{GS}=4.5V, I_D=5A	-	10.5	14	
Forward Transconductance	gfs	V_{DS}=5V,I_D=10A	-	35	-	S
Gate Resistance	R_g	V_{DS}=0V,V_{GS}=0V,f=1MHz	-	1.4	-	Ω
Total Gate Charge	Q_g	V_{DS}=30V,V_{GS}=10V, I_D=20A	-	47.5	-	nC
Gate-Source Charge	Q_{gs}		-	14.5	-	
Gate-Drain Charge	Q_{gd}		-	12.7	-	
Turn-On Delay Time	$t_{d(on)}$	V_{GS}=10V,V_{DD}=30V, R_G=1.5Ω,I_D=10A	-	4.3	-	ns
Rise Time	t_r		-	6.5	-	
Turn-Off Delay Time	$t_{d(off)}$		-	24	-	
Fall Time	t_f		-	7.6	-	
Input Capacitance	C_{iss}	V_{DS}=30V, V_{GS}=0V,f=1MHz	-	2411	-	pF
Output Capacitance	C_{oss}		-	124	-	
Reverse Transfer Capacitance	C_{rss}		-	116	-	
Continuous Source Current[1,4]	I_S	V_G=V_D=0V,Force Current	-	-	50	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V,I_S=10A,T_J=25℃	-	-	1.2	V
Reverse Recovery Time	t_{rr}	I_F=10A,dI/dt=100A/μs,T_J=25℃	-	24	-	ns
Reverse Recovery Charge	Q_{rr}		-	9.3	-	nC

Note :

1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2O2 copper.

2.The data tested by pulsed , pulse width ≤300us , duty cycle ≤2%.

3.The EAS data shows Max.'rating . The test condition is V_{DD}=40V, V_{GS}=10V,L=0.5mH.

4.The power dissipation is limited by 150c junction temperature.

5.The data is theoretically the same as lo and low , in real applications , should be limited by total power dissipation.

Typical Characteristics

Figure 1. Output Characteristics

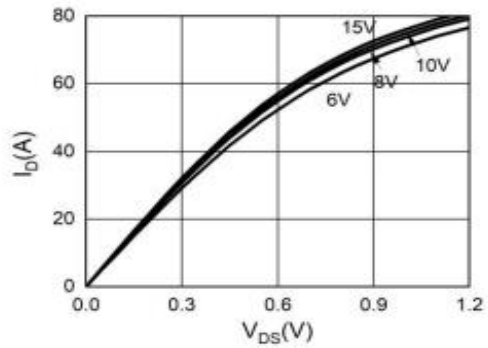


Figure 2. Transfer Characteristics

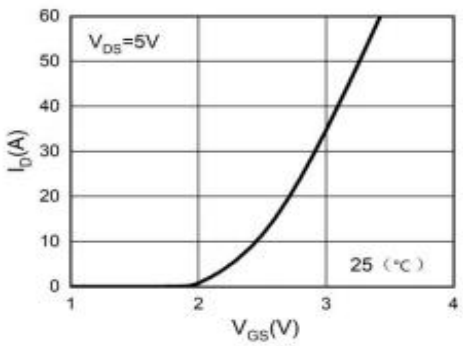


Figure 3. Power Dissipation

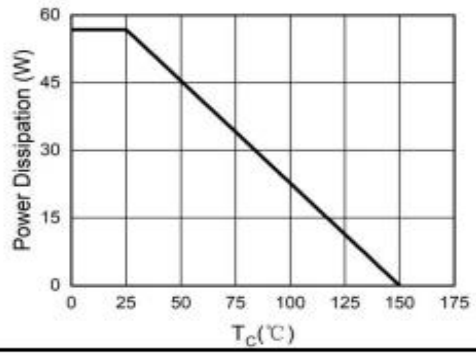


Figure 4. Drain Current

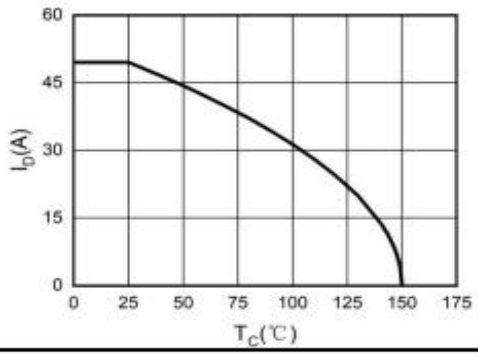


Figure 5. BV_{DSS} vs Junction Temperature

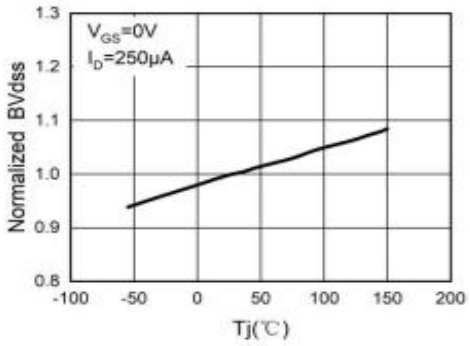


Figure 6. $R_{DS(ON)}$ vs Junction Temperature

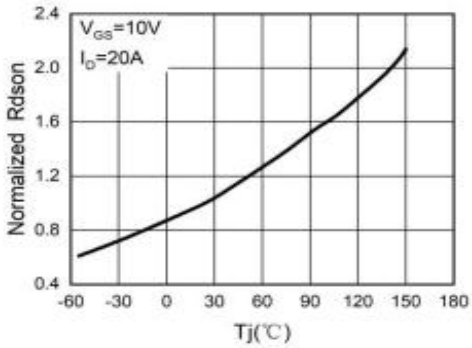


Figure 7. Gate Charge Waveforms

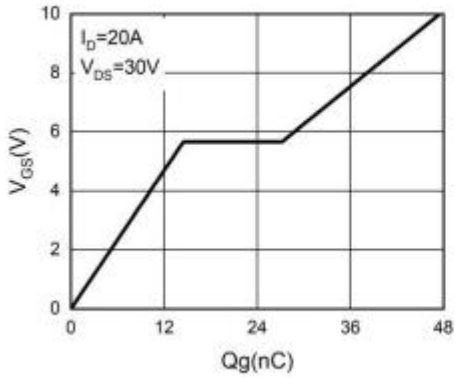


Figure 8. Capacitance

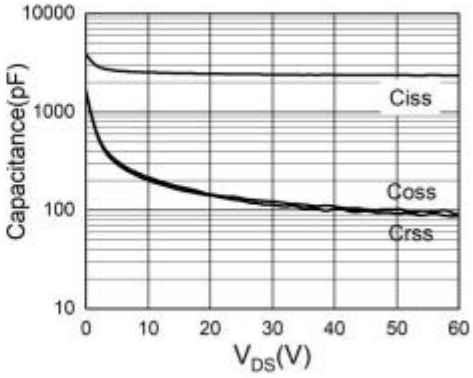


Figure 9. Body-Diode Characteristics

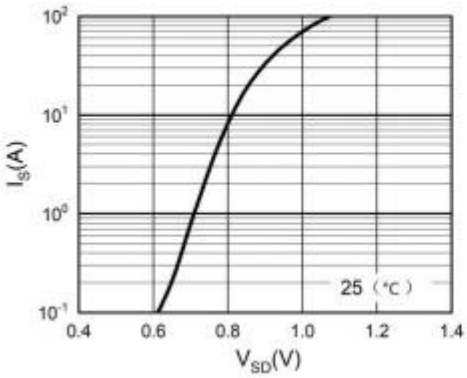
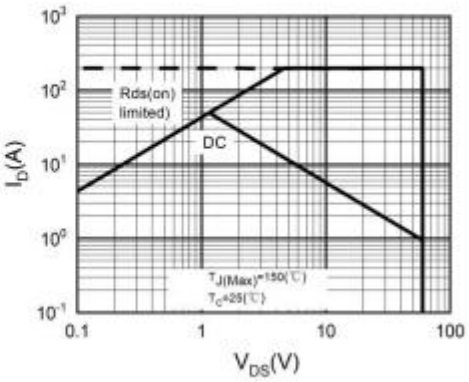
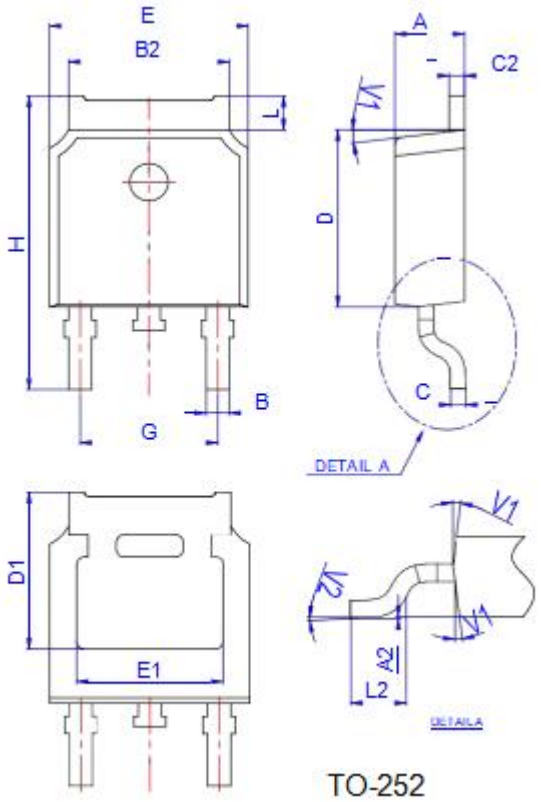


Figure 10. Maximum Safe Operating Area

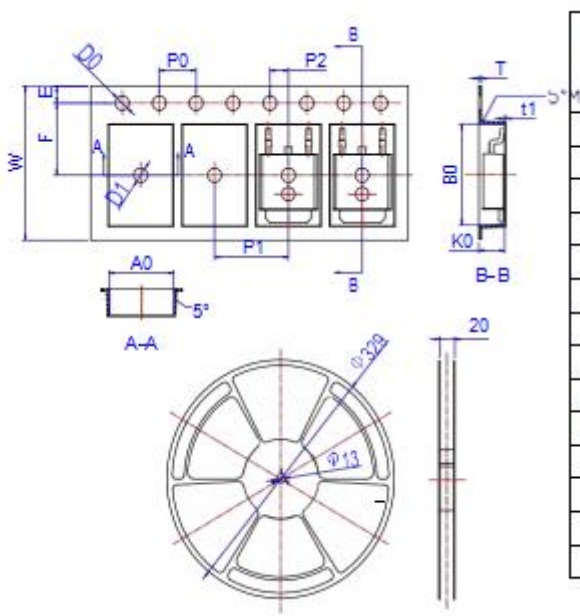


Package Mechanical Data TO252-3L



TO-252

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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