

General Description

The MY9N50D is silicon N-CH Enhanced VDMOSFETS is obtained by the self-aligned planar Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency.

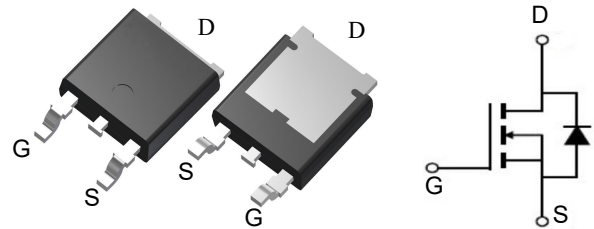


Features

V_{DSS}	500	V
I_D	9	A
$P_D(T_C=25^\circ\text{C})$	150	W
$R_{DS(ON)}(at V_{GS}=4.5V)$	<0.84	Ω

Application

- Uninterruptible Power Supply(UPS)
- Power Factor Correction (PFC)
- Switch Mode Power Supply (SMPS)



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
MY9N50D	TO-252-2L	MY9N50D	2500

Absolute Maximum Ratings ($T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		500	V
V_{GSS}	Gate-Source Voltage		± 30	V
I_D	Continuous Drain Current	$T_C = 25^\circ\text{C}$	9	A
		$T_C = 100^\circ\text{C}$	5.4	A
I_{DM}	Pulsed Drain Current ^{note1}		36	A
E_{AS}	Single Pulsed Avalanche Energy ^{note2}		198	mJ
P_D	Power Dissipation	$T_C = 25^\circ\text{C}$	150	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		1.25	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		100	$^\circ\text{C/W}$
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	$^\circ\text{C}$

Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	500	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 500V, V _{GS} = 0V, T _J = 25°C	-	-	1	μA
I _{GSS}	Gate to Body Leakage Current	V _{GS} =0V, V _{GS} = ±30V	-	-	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D = 250μA	2.0	-	4.0	V
R _{DS(on)}	Static Drain-Source	V _{GS} =10V, I _D =4.5A	-	0.67	0.84	Ω
C _{iss}	Input Capacitance	V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz	-	891	-	pF
C _{oss}	Output Capacitance		-	110	-	pF
C _{rss}	Reverse Transfer Capacitance		-	14	-	pF
Q _g	Total Gate Charge	V _{DD} =400V, I _D =9A, V _{GS} =10V	-	22	-	nC
Q _{gs}	Gate-Source Charge		-	4.3	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	13	-	nC
t _{d(on)}	Turn-On Delay Time	V _{DD} = 250V, I _D =9A, R _G =25Ω	-	15	-	ns
t _r	Turn-On Rise Time		-	18	-	ns
t _{d(off)}	Turn-Off Delay Time		-	80	-	ns
t _f	Turn-Off Fall Time		-	35	-	ns
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	9	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	36	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0V, I _{SD} =9A, T _J = 25°C	-	-	1.4	V
t _{rr}	Reverse Recovery Time	V _{GS} = 0V, I _S =9A, di/dt =100A/μs	-	300	-	ns
Q _{rr}	Reverse Recovery Charge		-	4.1	-	μC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $I_{AS} = 4.5A, V_{DD} = 50V, R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$
3. Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 1\%$

Typical Characteristics

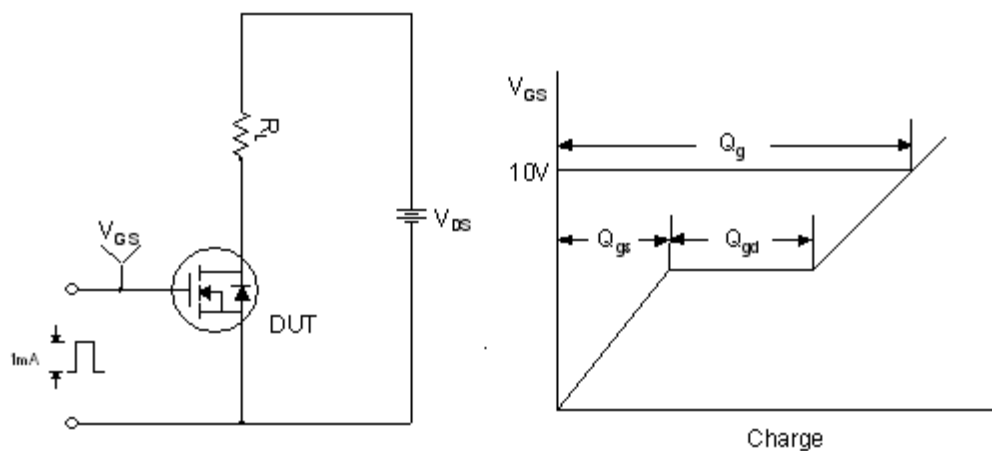


Figure 1. Gate Charge Test Circuit & Waveform

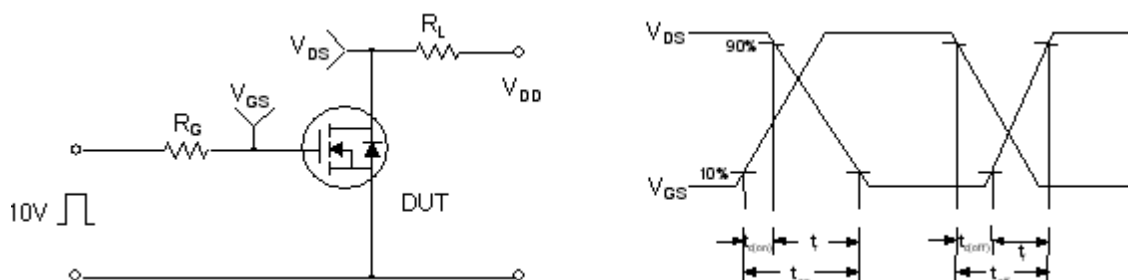


Figure 2. Resistive Switching Test Circuit & Waveforms

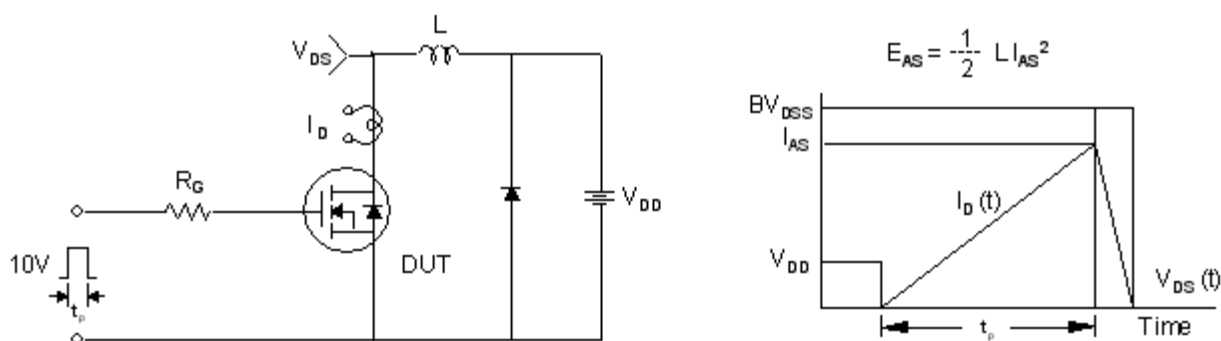
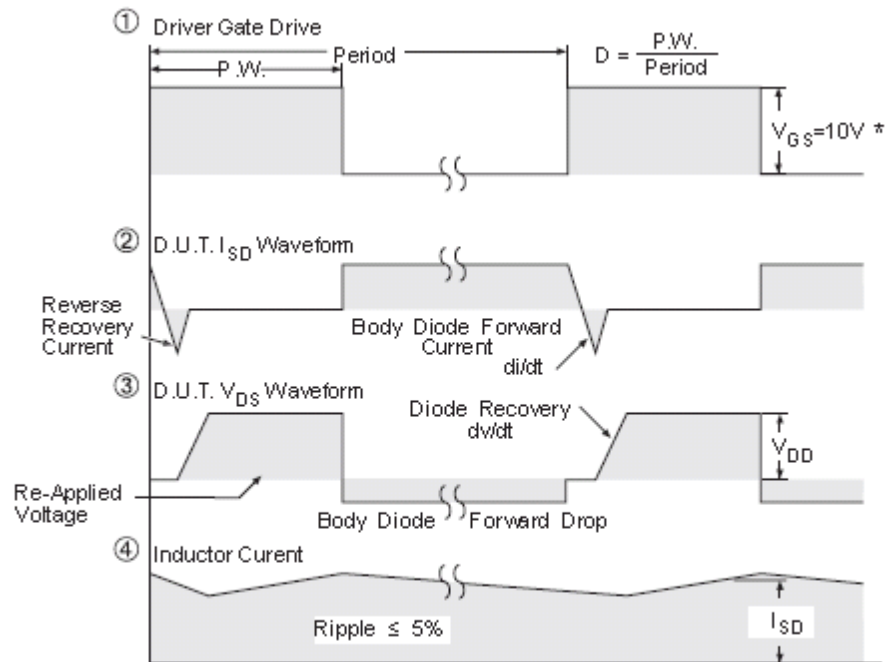
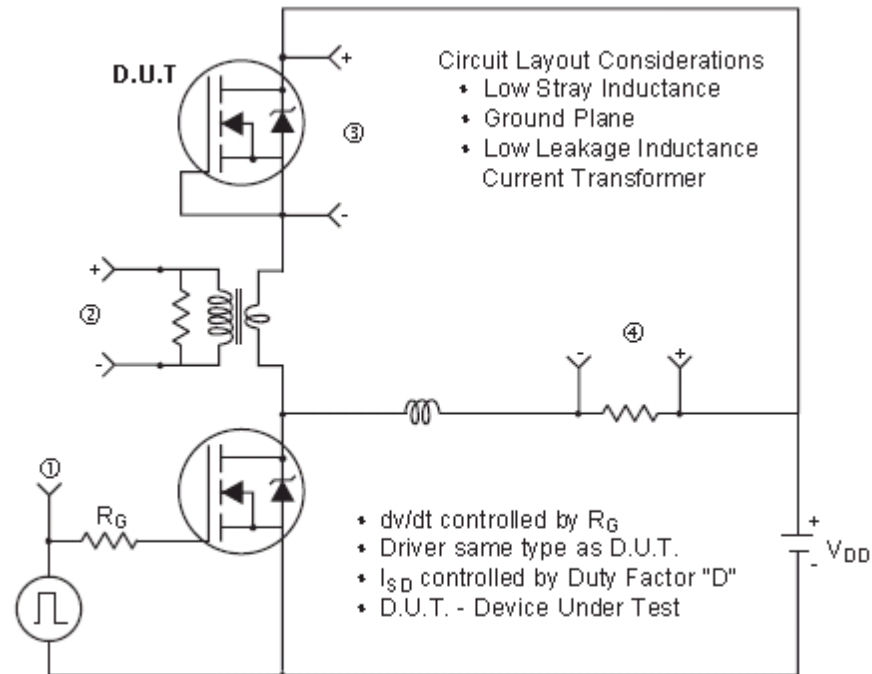


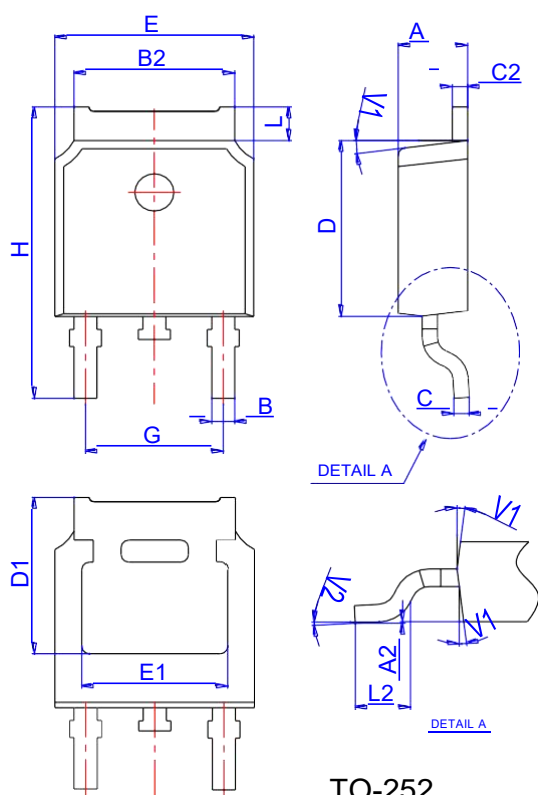
Figure 3. Unclamped Inductive Switching Test Circuit & Waveforms



* $V_{GS} = 5V$ for Logic Level Devices

Figure 4. Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)

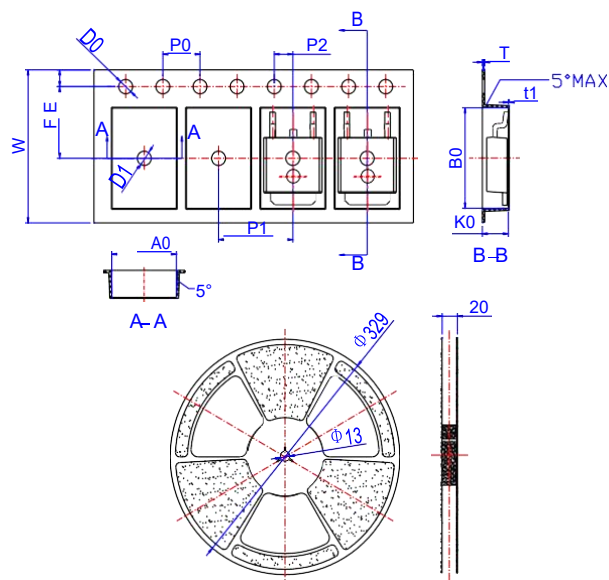
Package Mechanical Data-TO-252-JQ Single



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°

Reel Specification-TO-252



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