

## General Description

The MY4N65D is silicon N-channel Enhanced VDMOSFETS, obtained by the self-aligned planar Technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy.

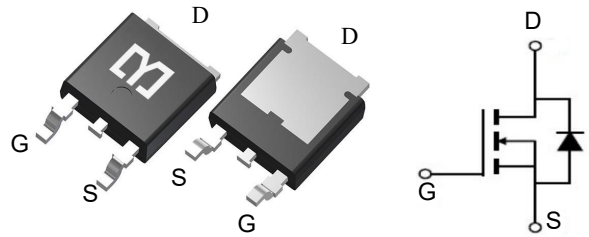


## Features

$V_{DSS}$	650	V
$I_D$	4	A
$P_D$ ( $T_C = 25\text{ }^\circ\text{C}$ )	36	W
$R_{DS(ON)}$ (at $V_{GS} = 10\text{V}$ )	<2.8	$\Omega$

## Application

- High efficiency switch mode power supplies
- Power factor correction
- Electronic lamp ballast



## Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
MY4N65D	TO-252	MY4N65D	1000

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

Symbol	Parameters	Ratings	Unit
$V_{DSS}$	Drain-Source Voltage	650	V
$V_{GS}$	Gate-Source Voltage-Continuous	$\pm 30$	V
$I_D$	Drain Current-Continuous (Note 2)	4	A
$I_{DM}$	Drain Current-Single Plused (Note 1)	16	A
$P_D$	Power Dissipation (Note 2)	36	W
$T_j$	Max.Operating junction temperature	150	$^\circ\text{C/W}$

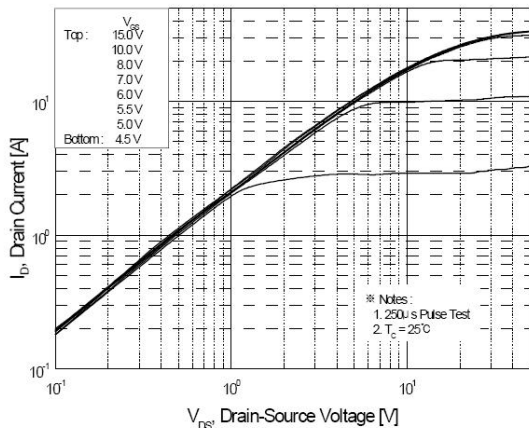
**Electrical Characteristics ( $T_c=25\text{ }^\circ\text{C}$ , unless otherwise noted)**

Symbol	Parameters	Min	Typ	Max	Units	Conditions
<b>Static Characteristics</b>						
$B_{VDSS}$	Drain-Source Breakdown Voltage Current (Note 1)	650	--	--	mA	$I_D=250\mu\text{A}$ $V_{GS}=0\text{V}$ , $T_J=25^\circ\text{C}$
$V_{GS(th)}$	Gate Threshold Voltage	2.0	--	4.0	V	$V_{DS}=V_{GS}$ , $I_D=250\mu\text{A}$
$R_{DS(on)}$	Drain-Source On-Resistance	--	2.5	2.8	$\Omega$	$V_{GS}=10\text{V}$ , $I_D=2\text{A}$
$I_{GSS}$	Gate-Body Leakage Current	--	--	$\pm 100$	nA	$V_{GS}=\pm 30\text{V}$ , $V_{DS}=0$
$I_{DSS}$	Zero Gate Voltage Drain Current	--	--	1	$\mu\text{A}$	$V_{DS}=650\text{V}$ , $V_{GS}=0$
gfs	Forward Transconductance	1.2	--	--	S	$V_{DS}=15\text{V}$ , $I_D=2\text{A}$
<b>Switching Characteristics</b>						
$T_{d(on)}$	Turn-On Delay Time	--	13	35	ns	$V_{DS}=325\text{V}$ , $I_D=4\text{A}$ , $R_G=25\Omega$ (Note 2)
$T_r$	Rise Time	--	45	100	ns	
$T_{d(off)}$	Turn-Off Delay Time	--	25	70	ns	
$T_f$	Fall Time	--	35	85	ns	
$Q_g$	Total Gate Charge	--	15	20	nC	$V_{DS}=520$ , $V_{GS}=10\text{V}$ , $I_D=4\text{A}$ (Note 2)
$Q_{gs}$	Gate-Source Charge	--	3.4	--	nC	
$Q_{gd}$	Gate-Drain Charge	--	7.1	--	nC	
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	--	520	670	pF	$V_{DS}=25\text{V}$ , $V_{GS}=0$ , $f=1\text{MHz}$
$C_{oss}$	Output Capacitance	--	70	90	pF	
$C_{rss}$	Reverse Transfer Capacitance	--	8	12	pF	
$I_S$	Continuous Drain-Source Diode Forward Current (Note 2)	--	--	4	A	
$V_{SD}$	Diode Forward On-Voltage	--	--	1.4	V	$I_S=4\text{A}$ , $V_{GS}=0$
$R_{th(j-c)}$	Thermal Resistance, Junction to Case	--	--	3.47	$^\circ\text{C/W}$	

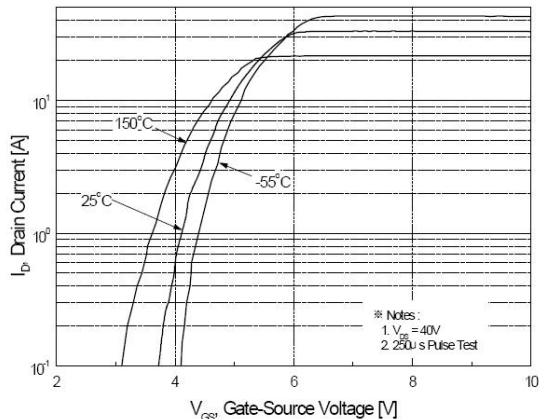
Note 1: Repetitive Rating : Pulse width limited by maximum junction temperature

Note 2: Pulse test:  $PW \leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .

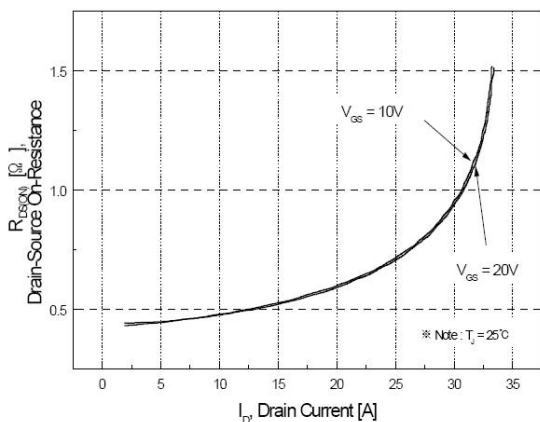
**Ratings and Characteristic curves**



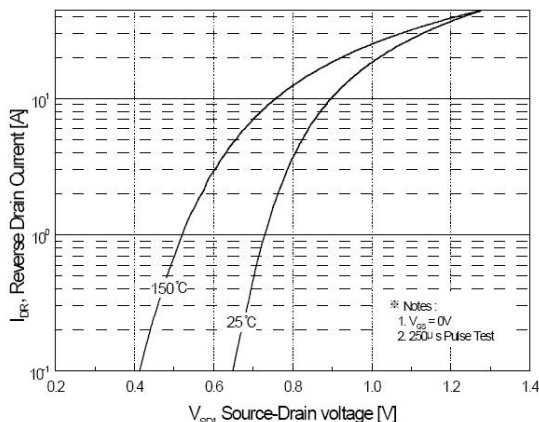
**Figure 1. On-Region Characteristics**



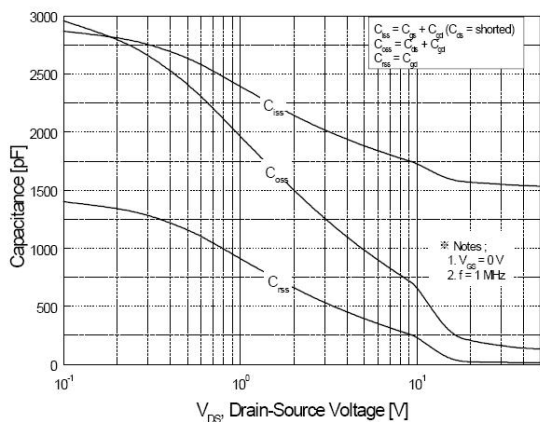
**Figure 2. Transfer Characteristics**



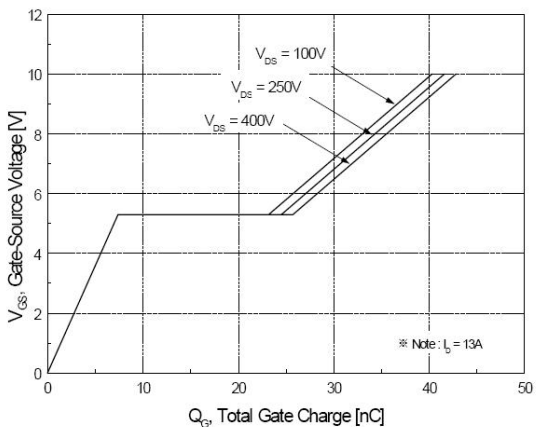
**Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage**



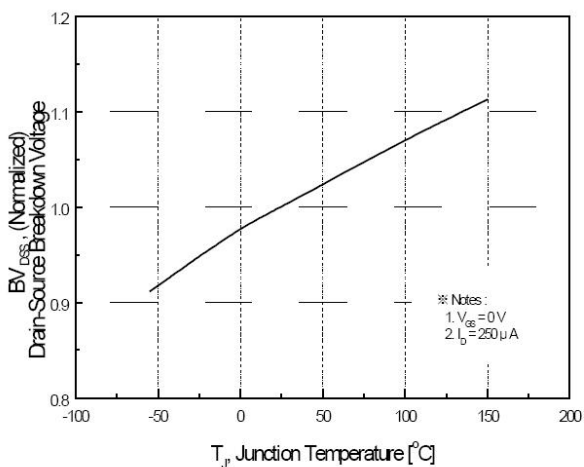
**Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature**



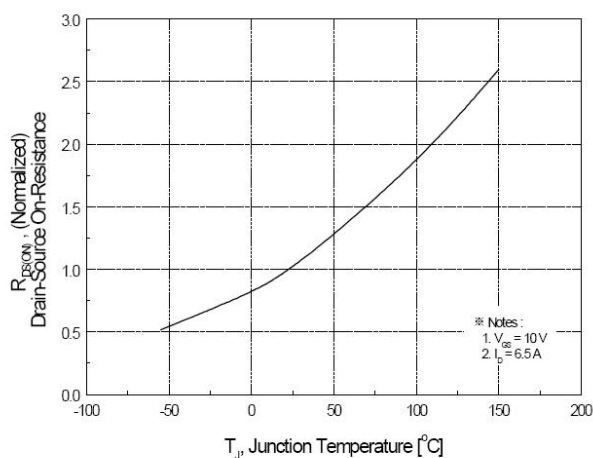
**Figure 5. Capacitance Characteristics**



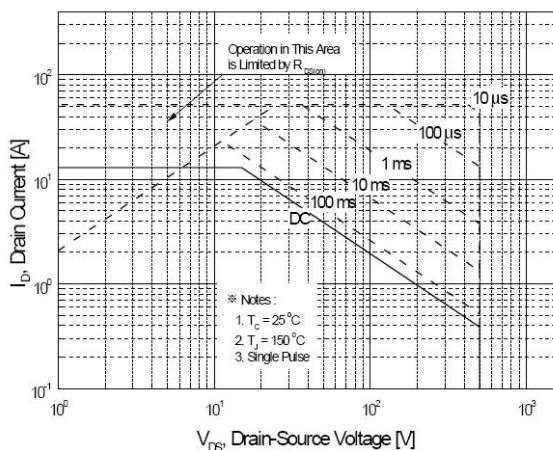
**Figure 6. Gate Charge Characteristics**



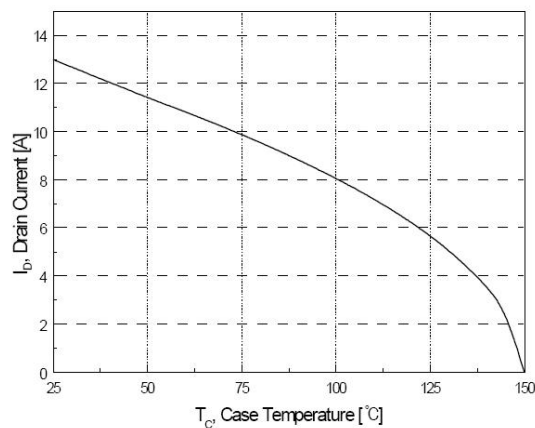
**Figure 7. Breakdown Voltage Variation vs Temperature**



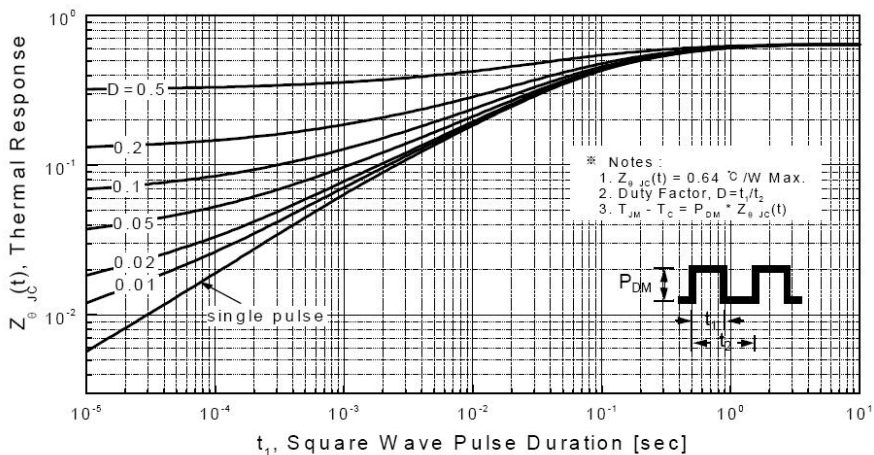
**Figure 8. On-Resistance Variation vs Temperature**



**Figure 9. Maximum Safe Operating Area**



**Figure 10. Maximum Drain Current vs Case Temperature**



**Figure 11. Transient Thermal Response Curve**

Fig 12. Gate Charge Test Circuit & Waveform

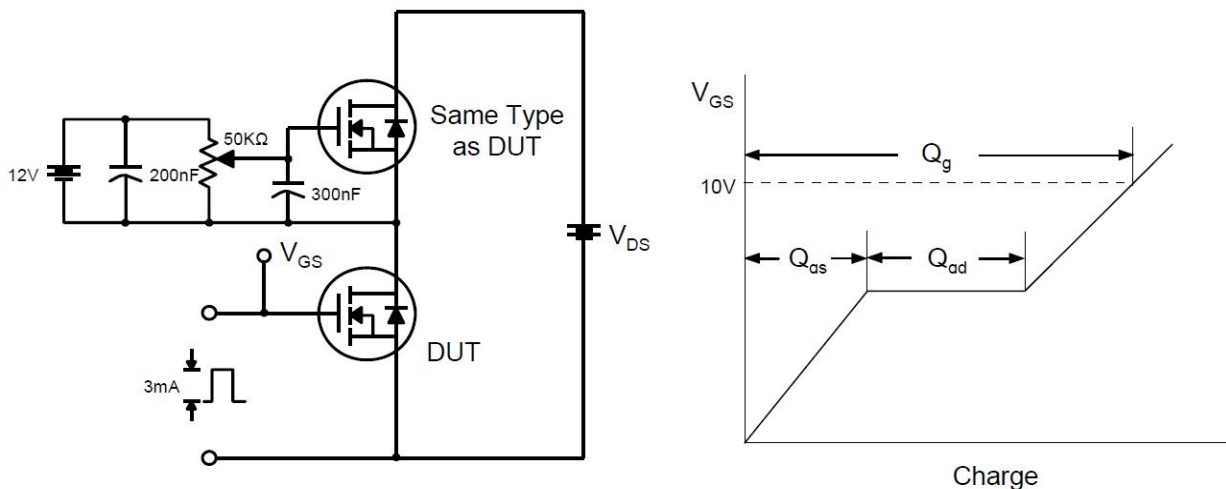


Fig 13. Resistive Switching Test Circuit & Waveforms

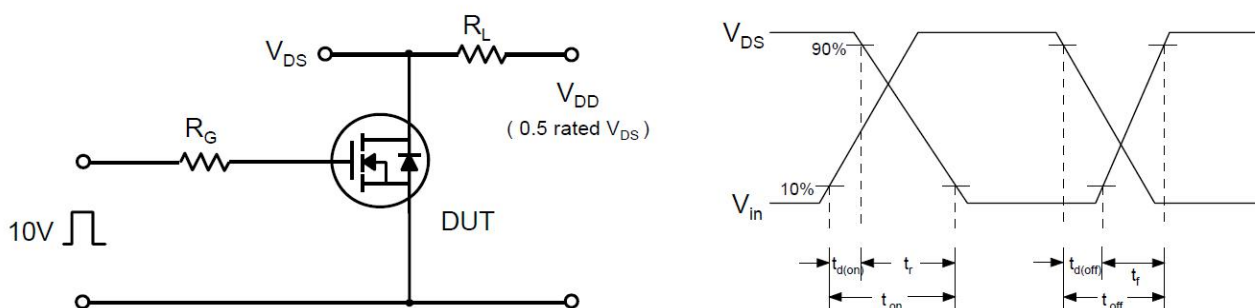


Fig 14. Unclamped Inductive Switching Test Circuit & Waveforms

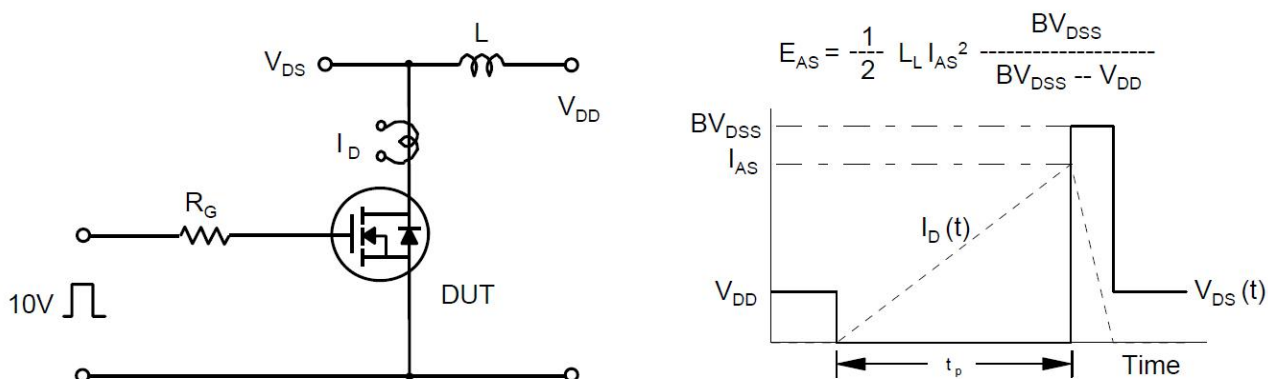
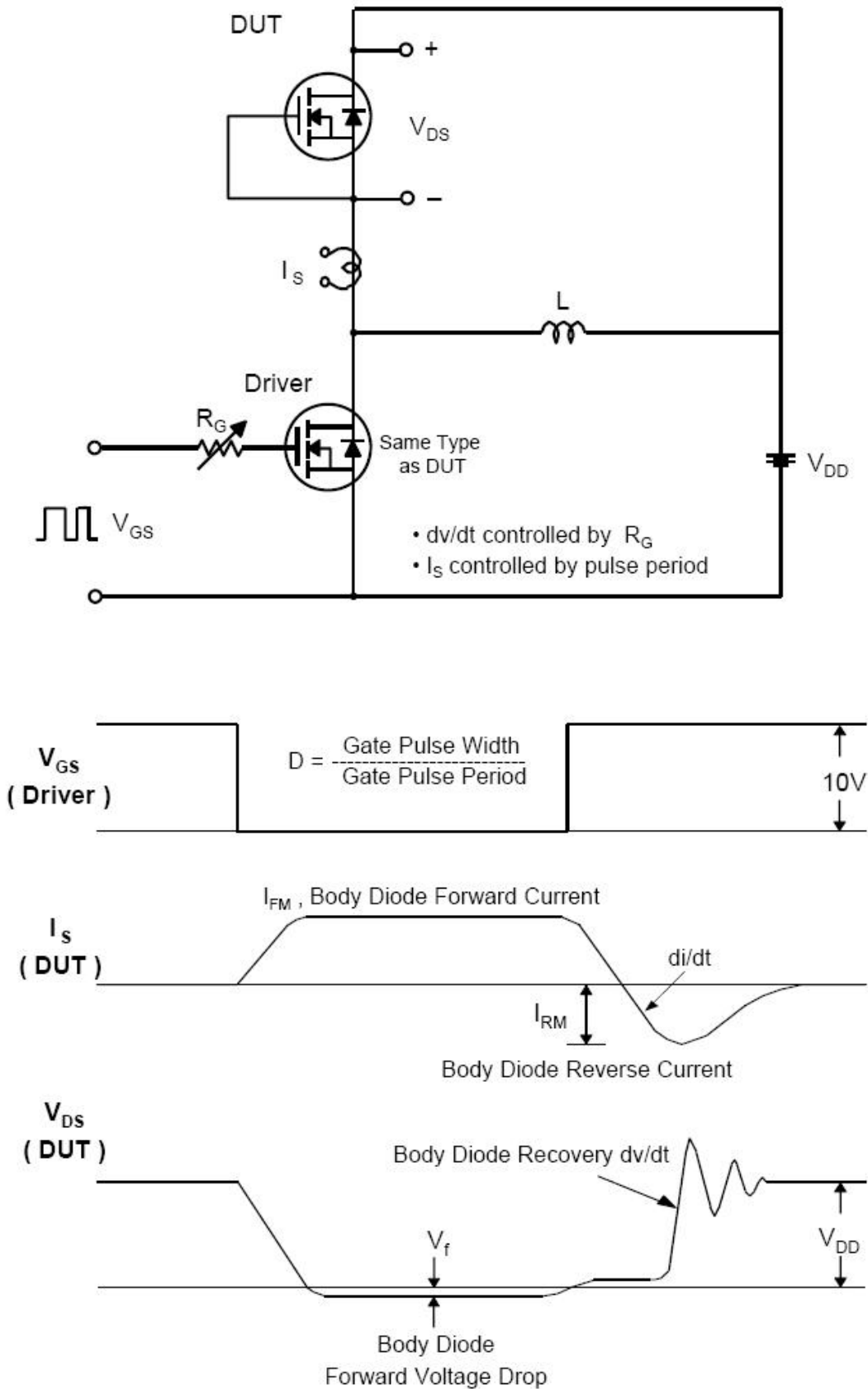
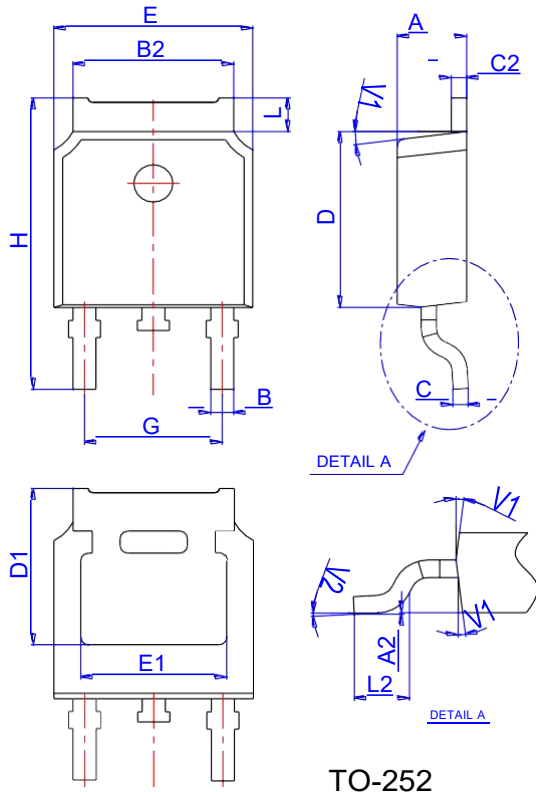


Fig 15. Peak Diode Recovery dv/dt Test Circuit & Waveforms



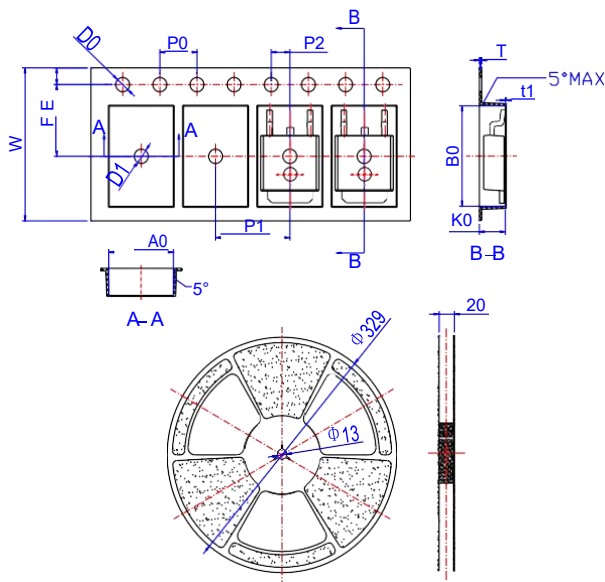


**Package Mechanical Data-TO-252-JQ Single**



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