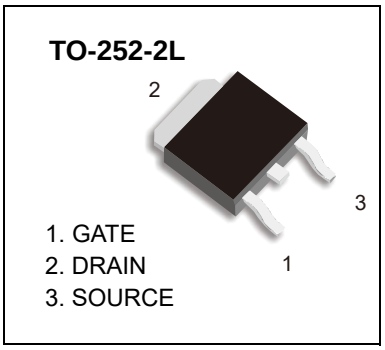
TO-252-2L Plastic-Encapsulate MOSFETS

N-Channel Power MOSFET

$V_{(BR)DSS}$	$R_{DS(on)}$MAX	I_D
650V	2.5Ω@10V	4A



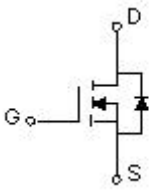
GENERAL DESCRIPTION

The 4N65 is an N-channel mode power MOSFET using advanced technology to provide costomers with planar stripe. This technology specializes in allowing a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode. The 4N65 is universally applied in high efficiency switch mode power supply.

FEATURE

- Excellent package for good heat dissipation
- High switching speed
- 100% avalanche tested

EQUIVALENT CIRCUIT



APPLICATION

- Power switching application
- DC/DC converters

Absolute Maximum Ratings (Ta=25℃ unless otherwise noted)

Symbol	Parameter		Value	Unit
V_{DSS}	Drain-Source Voltage		650	V
I_D	Drain Current	T_j=25℃	4.0	A
		T_j=100℃	2.7	
V_{GSS}	Gate - Source voltage		30	V
E_{AS}	Single Pulse Avalanche Energy (note1)		120	mJ
I_{AR}	Avalanche Current (note2)		4.0	A
P_D	Power Dissipation (Tj=25 ℃)		50	W
T_j	Junction Temperature(Max)		150	℃
T_{stg}	Storage Temperature		-55~+150	℃
TL	Maximum lead temperature for soldering purpose,1/8″from case for 5 seconds		300	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance,Junction to Case	-	2.4	℃/W
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient		62.5	℃/W

Typical Characteristics

Electrical Characteristics (Ta=25℃ unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Off Chara cteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	I_D=250μA，V_{GS}=0	650	-	-	V
△BVDSS/ △TJ	Breakdown Voltage Temperature Coefficient	I_D=250 μA ,Reference to 25℃	-	0.67	-	V/℃
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=650V, V_{GS}=0V	-	-	10	μA
		V_{DS} =520V, Tj=125℃			100	
I_{GSSF}	Gate-body leakage Current, Forward	V_{GS}=+30V, V_{DS}=0V	-	-	100	nA
I_{GSSR}	Gate-body leakage Current, Reverse	V_{GS}=-30V, V_{DS}=0V	-	-	-100	
On Characteristics						
$V_{GS(TH)}$	Date ThresholdVoltage	I_D=250μA,V_{DS}=V_{GS}	2	-	4	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	I_D=2.0A,V_{GS}=10V	-		2.5	Ω
Dynamic Characteristics						
Ciss	Input Capacitance	V_{DS}=25V，V_{GS} =0，f=1.0MHz	-	560	-	pF
Coss	Output Capacitance		-	48	-	
Crss	Reverse Transfer Capacitance		-	5.4	-	
Sw itchingCharacteristics						
Td(on)	Turn-On Delay Time	V_{DD}=325V，I_D=4A R_G=25Ω (Note 3,4)	-	25		nS
Tr	Turn-On Rise Time		-	45		
Td(off)	Turn-Off Delay Time		-	25		
Tf	Turn-Off Rise Time		-	35		
Qg	Total Gate Charge	V_{DS}=520V,V_{GS} =10V， I_D=4A (Note3,4)	-	14 .3		nC
Qgs	Gate-Source Charge		-	2.8	-	
Qgd	Gate-Drain Charge		-	4.5	-	
Drain-Source Diode Characteristics and Maximum Ratings						
Is	Max. Diode ForwardCurrent	-		- -	4	A
I_{SM}	Max. Pulsed Forward Current	-		- -	16	
V_{SD}	Diode Forward Voltage	I_D=4A	-	-	1.4	V
Trr	Reverse Recovery Time	I_S=4A,V_{GS} =0V diF/dt=100A/μs (Note3)	-	393	-	nS
Qrr	Reverse Recovery Charge		-	1.5	-	μC

Notes : 1, L=0.5mH, IAS= 4A, VDD=50V, RG=25Ω , Starting TJ =25℃

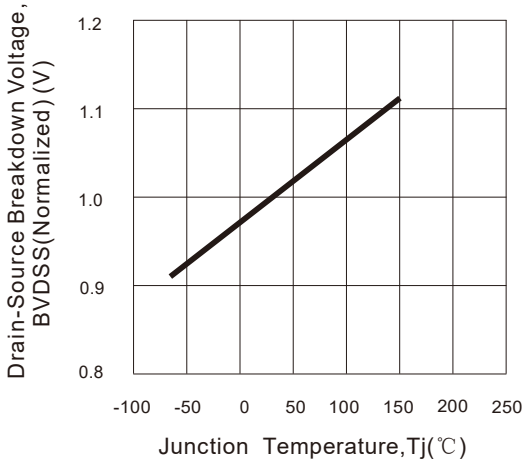
2, Repetitive Rating : Pulse width limited by maximum junction temperature

3, Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%

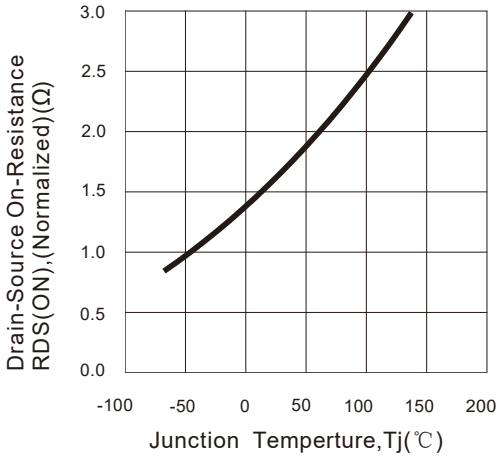
4, Essentially Independent of Operating Temperature

Typical Characteristics

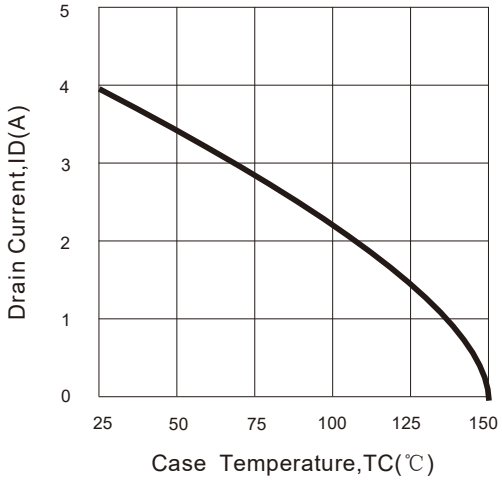
Breakdown Voltage Variation
VS. Temperayure



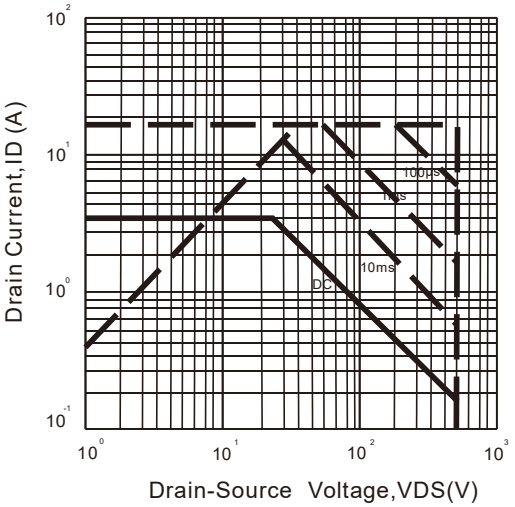
On-Resistance Junction
Temperature



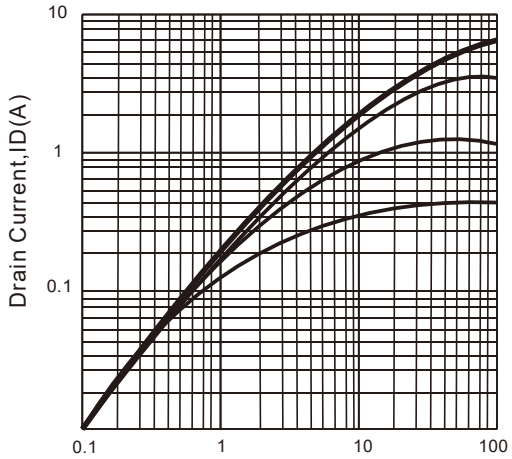
Maximum Drain Current
VS.Case Temperature



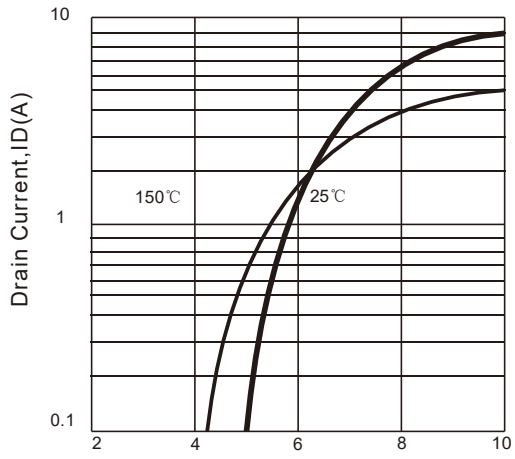
Maximum Safe Operating Area



On-State Characteristics

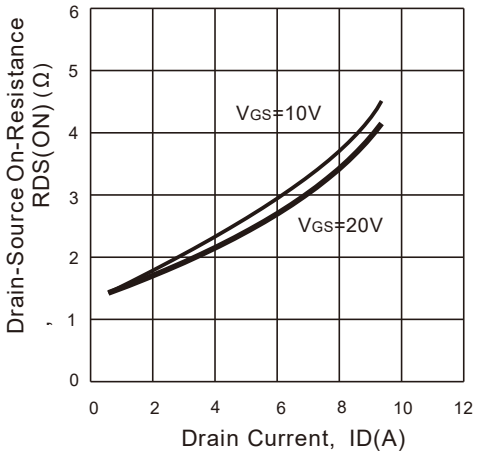


Transfer Characteristics

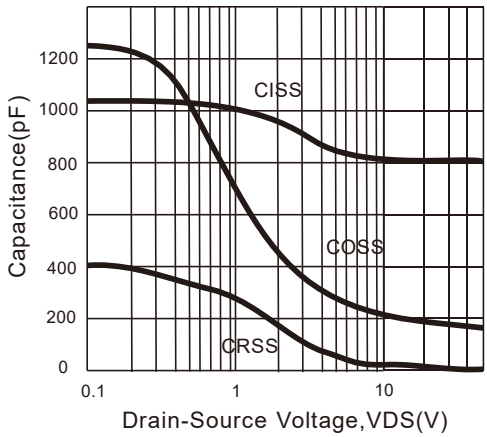


Typical Characteristics

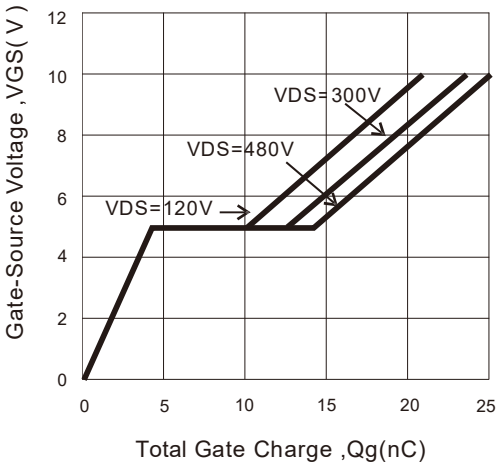
On-Resistance Variation vs.
Drain Currentand Gate Voltage



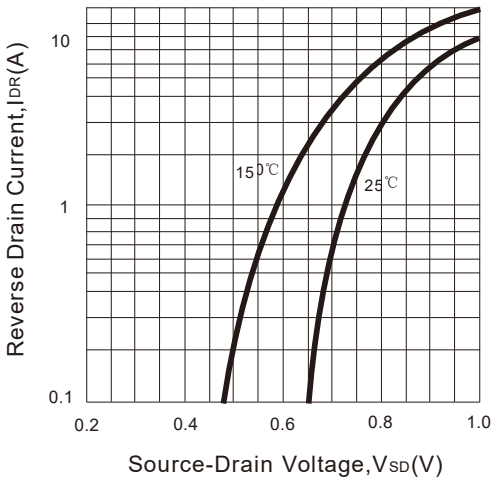
Capacitance Characteristics
(Non-Repetitive)



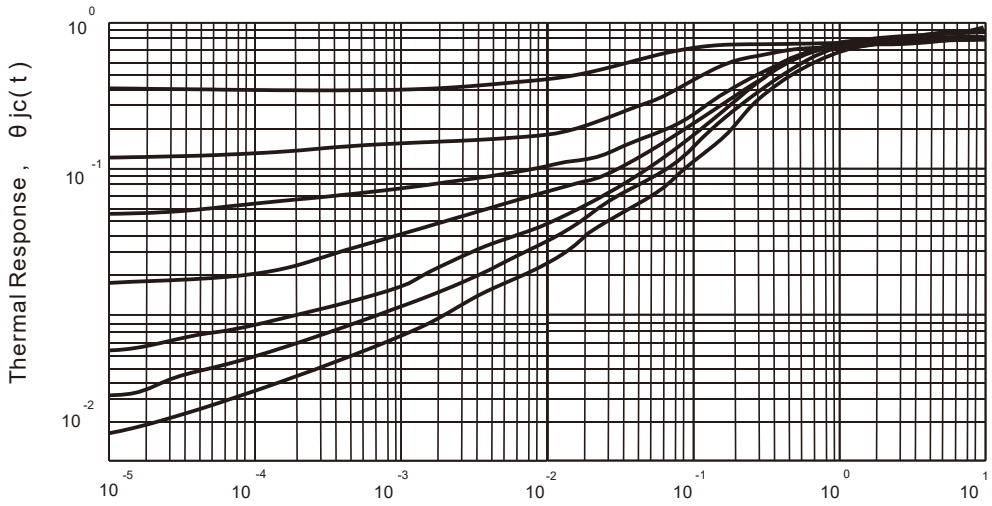
Gate Charge Characteristics



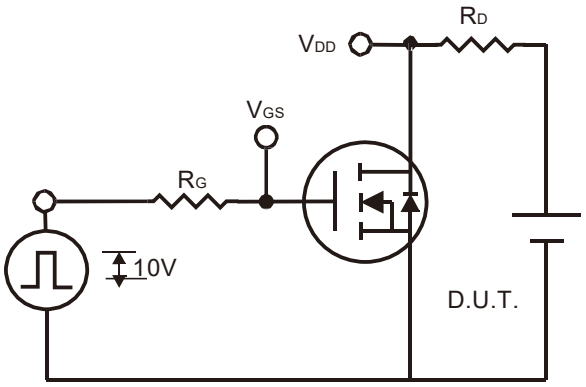
Body Diode Forward Voltage Variation
With Source Current and Temperature



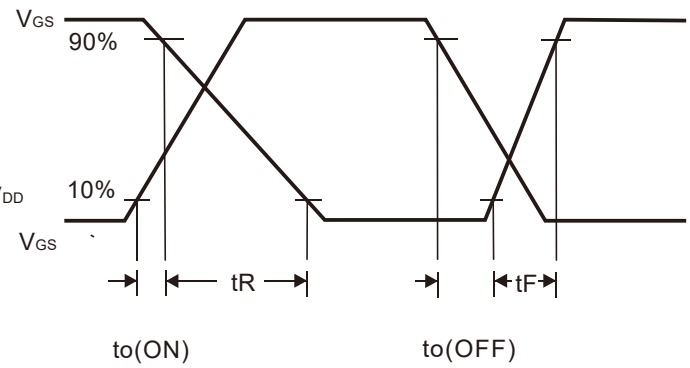
Transient Thermal Response Curve



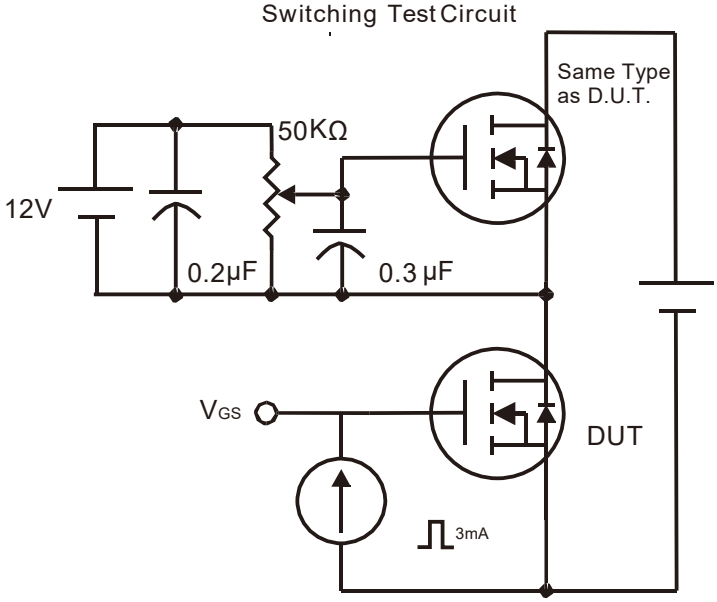
Gate Charge Test Circuit & Waveform



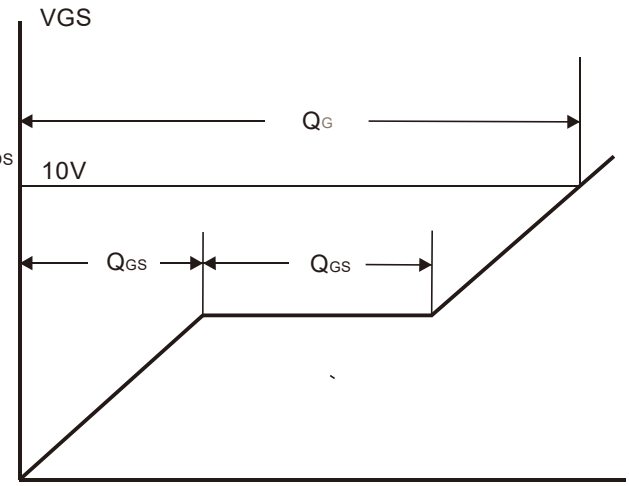
Switching Test Circuit



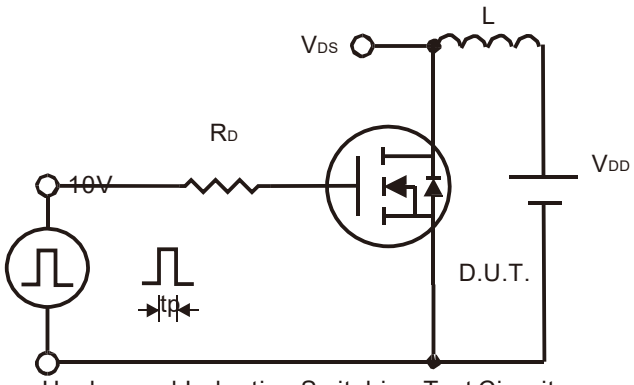
Switching Waveforms



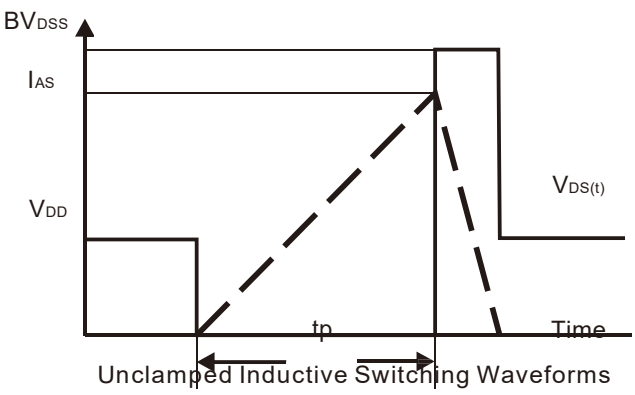
Gate Charge Test Circuit



Gate Charge Waveform

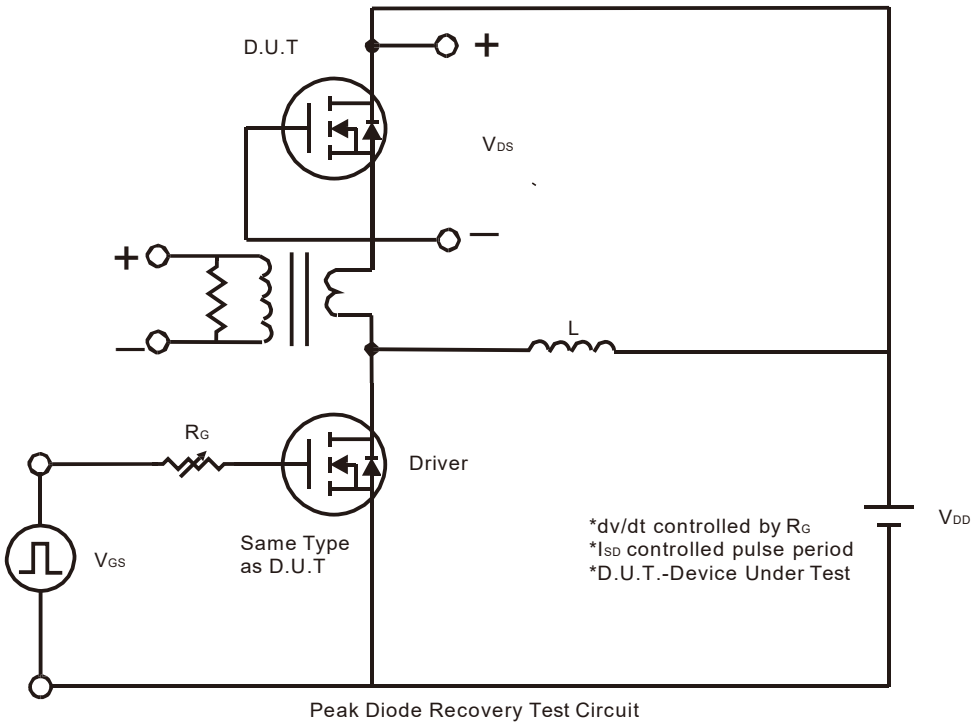


Unclamped Inductive Switching Test Circuit

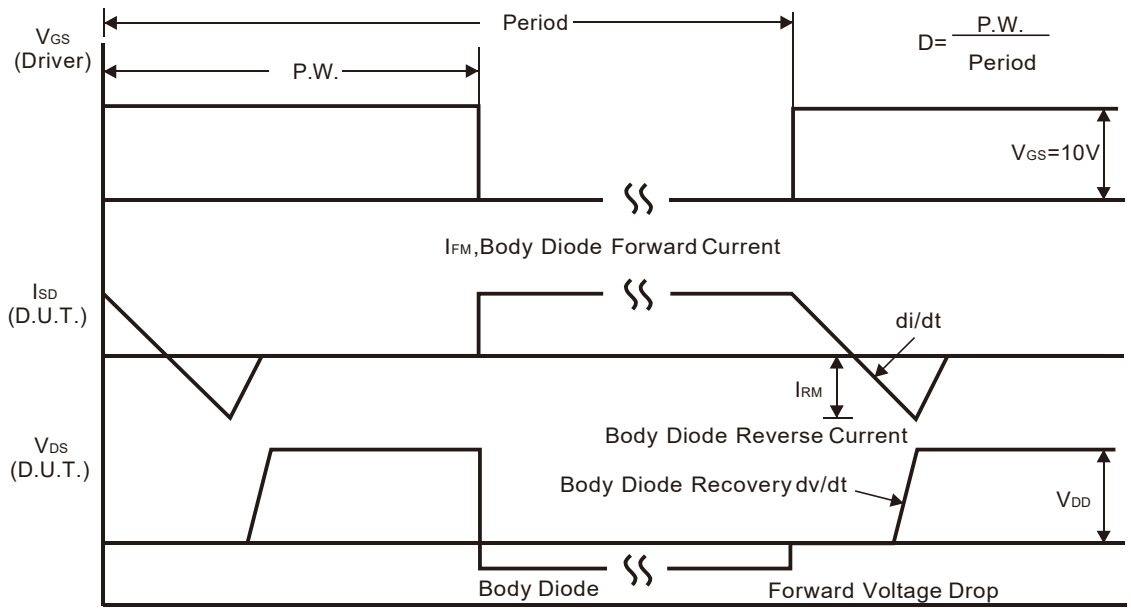


Unclamped Inductive Switching Waveforms

Peak Diode Recovery dv/dt Test Circuit & Waveform

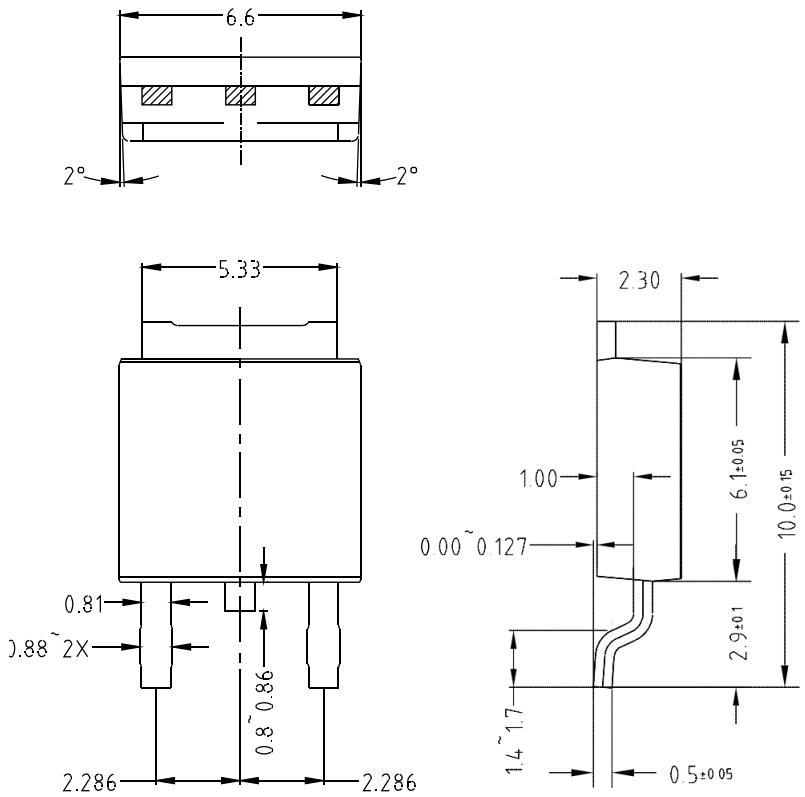


Peak Diode Recovery Test Circuit

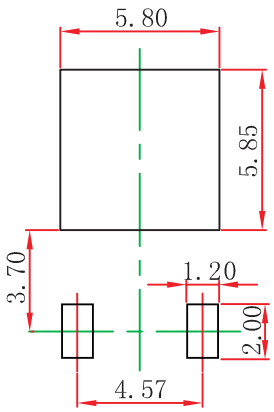


Peak Diode Recovery dv/dt Waveforms

TO-252-2L Package Outline Dimensions



TO-252-2L Suggested Pad Layout

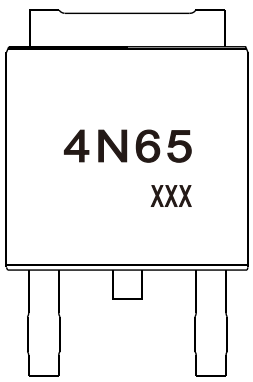


Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

Ordering Information

Part Number	Package	Shipping Quantity
4N65	TO-252-2L	2500/tape&Reel

Marking Diagram



XXX =Date Code