ITW30N50R

N-Channel MOSFET

Lead Free Package and Finish

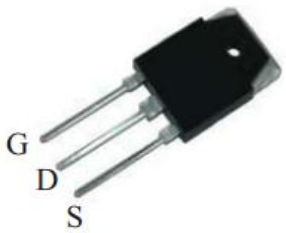
Applications:

- Adaptor
- Charger
- SMPS

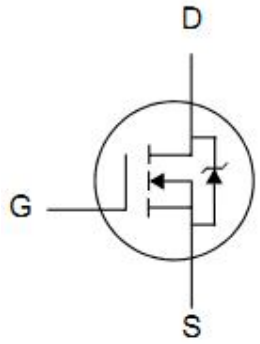
V_{DSS}	$R_{DS(ON)}$(Typ.)	I_D
500V	0.09Ω	30A

Features:

- RoHS Compliant
- Low ON Resistance
- Low Gate Charge
- Peak Current vs Pulse Width Curve
- Inductive Switching Curves



TO-3P
Not to Scale



Ordering Information

PART NUMBER	PACKAGE	BRAND
ITW30N50R	TO-3P	***IPS***

Absolute Maximum Ratings

T_C=25℃ unless otherwise specified

Symbol	Parameter	ITW30N50R	Units
V_{DSS}	Drain-to-Source Voltage	500	V
I_D	Continuous Drain Current	30	A
	Continuous Drain Current T_C =100℃	18.6	A
I_{DM}	Pulsed Drain Current, V_{GS}@10V (NOTE *1)	120	A
P_D	Power Dissipation	250	W
	Derating Factor above 25℃	2	W/℃
V_{GS}	Gate-to-Source Voltage	±30	V
E_{AS}	Single Pulse Avalanche Energy(NOTE *2)	3200	mJ
dv/dt	Peak Diode Recovery dv/dt(NOTE *3)	5	V/ns
T_L	Maximum Temperature for Soldering	300	℃
T_J and T_{STG}	Operating Junction and Storage Temperature Range	150，-55 to150	

Thermal Resistance

Symbol	Parameter	Max.	Units	Test Conditions
$R_{\theta JC}$	Junction-to-Case	0.5	℃/W	Water cooled heatsink, P_D adjusted for a peak junction temperature of +150℃.
$R_{\theta JA}$	Junction-to-Ambient	40		1 cubic foot chamber, free air.

OFF Characteristics T_C=25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	500	--	--	V	V_{GS}=0V, I_D=250μA
I_{DSS}	Drain-to-Source Leakage Current	--	--	1	μA	V_{DS}=500V, V_{GS}=0V T_J=25℃
		--	--	100		V_{DS}=400V, V_{GS}=0V T_J=125℃
I_{GSS}	Gate-to-Source Forward Leakage	--	--	+100	nA	V_{GS}=+30V
	Gate-to-Source Reverse Leakage	--	--	-100		V_{GS}= -30V

ON Characteristics T_J=25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
$R_{DS(ON)}$	StaticDrain-to-Source On-Resistance	--	0.09	0.12	Ω	V_{GS}=10V, I_D=15A
$V_{GS(TH)}$	Gate Threshold Voltage	2	--	4	V	V_{DS}=V_{GS},I_D=250μA
g_{fs}	Forward Transconductance	--	33	--	S	V_{DS}=15V, I_D=10A
Pulse width ≤300μs; duty cycle≤ 2%						

Source-Drain Diode Characteristics Tc=25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	--	--	30	A	T_C=25℃
I_{SM}	Maximum Pulsed Current (Body Diode)	--	--	120	A	
V_{SD}	Diode Forward Voltage	--	--	1.5	V	I_{SD}=30A, V_{GS}=0V
Pulse width ≤300μs; duty cycle ≤ 2%						

Notes:

*1. Repetitive rating; pulse width limited by maximum junction temperature.

*2. L=10mH, I_D=25.3A, Start T_J=25℃

*3. I_{SD} =30A,di/dt ≤100A/us,V_{DD}≤$BV_{DS,}$ Start T_J=25℃

Test Circuits and Waveforms

Figure 17. Gate Charge Test Circuit

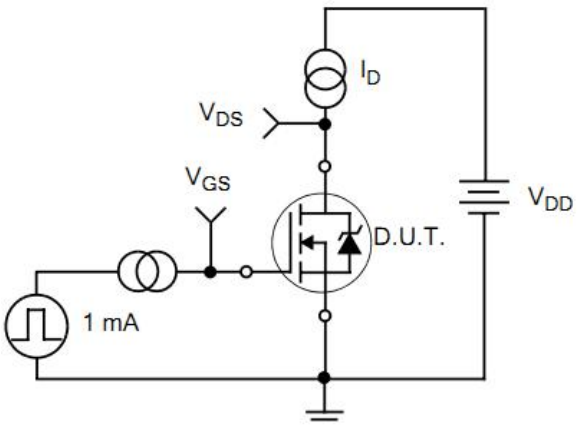


Figure 18. Gate Charge Waveforms

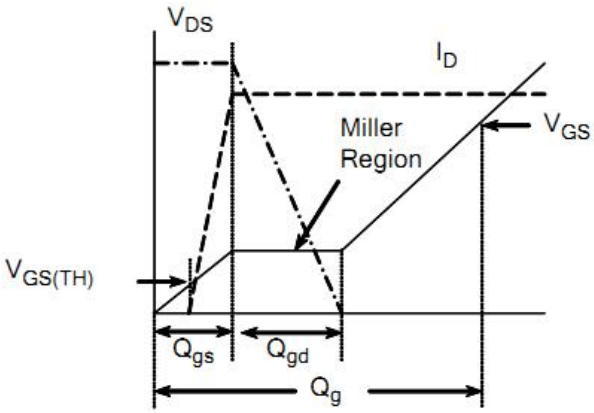


Figure 19. Resistive Switching Test Circuit

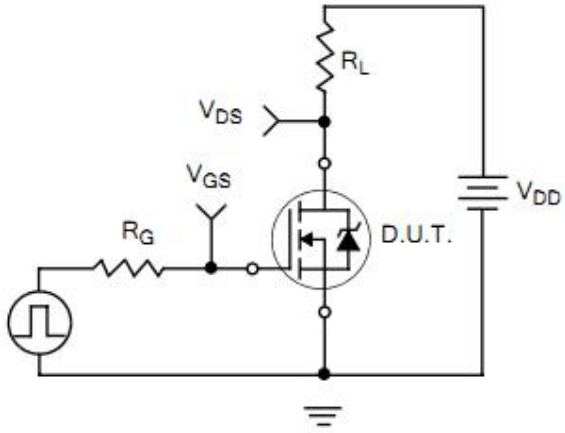


Figure 20. Resistive Switching Waveforms

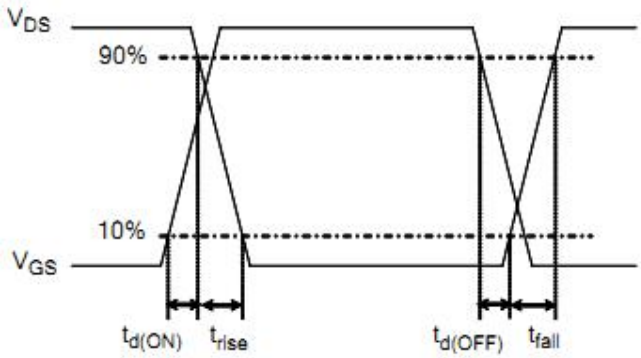


Figure 21. Diode Reverse Recovery Test Circuit

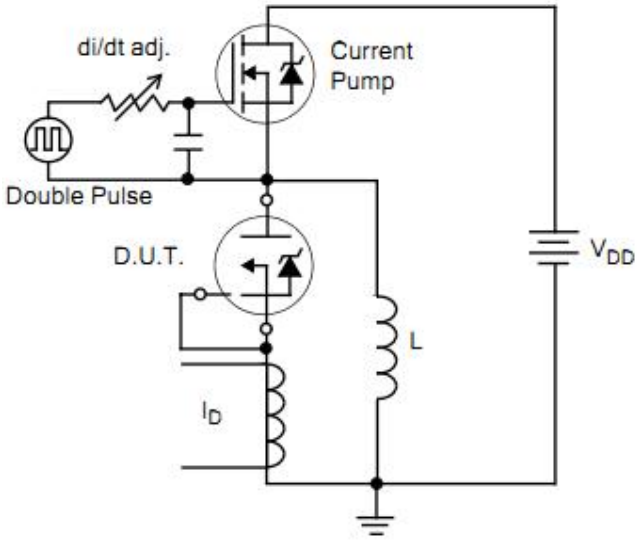


Figure 22. Diode Reverse Recovery Waveform

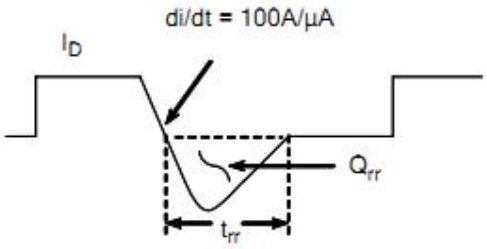


Figure23.Unclamped Inductive Switching Test Circuit

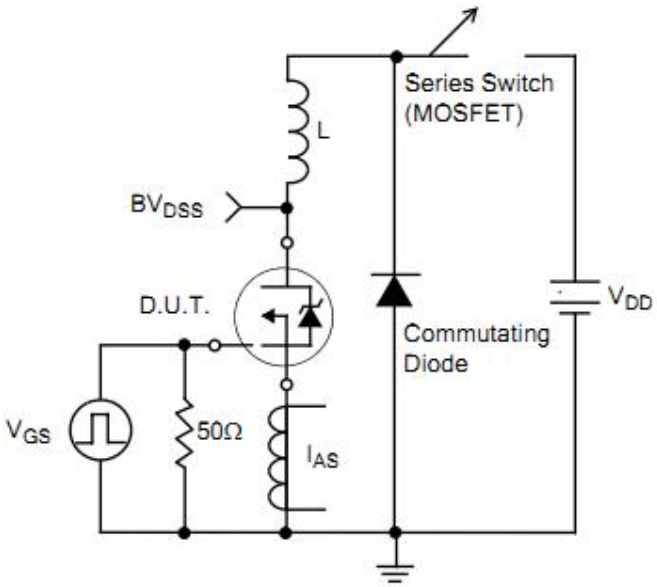
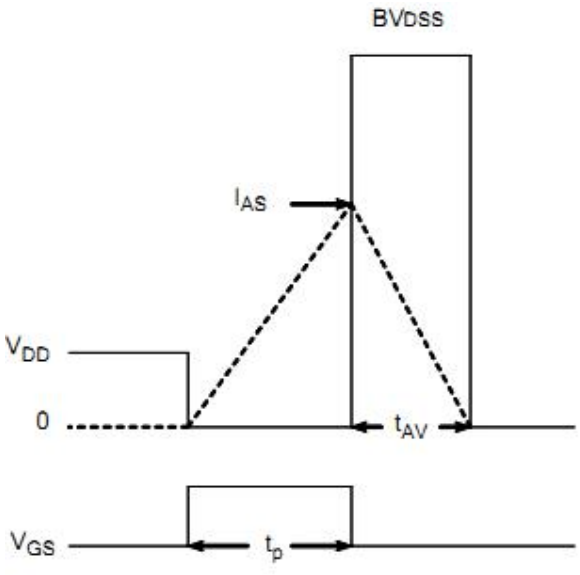


Figure24.Unclamped Inductive Switching Waveform



$$E_{AS} \quad \frac{I_{AS}^{2} L}{2}$$

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   b. support or sustain life,
   c. whose failure to perform when properly used in accordance with instructions for used provided in the labeling, can be reasonably expected to result in significant injury to the user.

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