

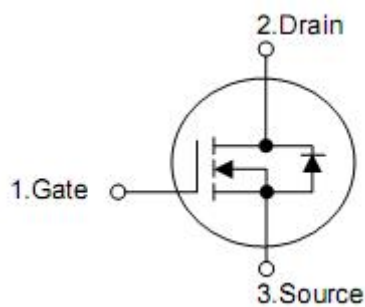
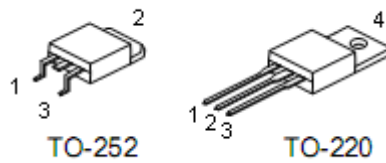
1. Features

- n $R_{DS(on)}=1.0\ \Omega$
- n RoHS compliant
- n Low on resistance
- n Low gate charge
- n Peak current vs pulse width curve

2. Applications

- n Adaptor
- n Charger
- n SMPS standby power

3. Symbol



Pin	Function
1	Gate
2	Drain
3	Source

4. Absolute maximum ratings

Parameter	Symbol	Rating	Units
Drain-source voltage (note*1)	V_{DSS}	500	V
Continuous drain current	I_D	5.0*	A
	$I_D@100^\circ\text{C}$	Figure 3	A
Pulsed drain current, $V_{GS}@10\text{V}$ (note*2)	I_{DM}	Figure 6	A
Power dissipation	P_D	100	W
Derating factor above 25°C		0.8	W/ $^\circ\text{C}$
Gate-source voltage	V_{GS}	± 20	V
Pulse avalanche rating	I_{AS}	Figure 8	A
Peak diode recovery dv/dt (note*3)	dv/dt	5.0	V/ns
Maximum temperature for soldering Leads at 0.063 in (1.6mm) from case for 10 seconds package body for 10 seconds	T_L T_{PKG}	300 260	$^\circ\text{C}$
Operating junction and storage temperature range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

*Drain current limited by maximum junction temperature

Caution: Stresses greater than those listed in the "Absolute maximum ratings" table may cause permanent Damage to the device

5. Thermal characteristics

Parameter	Symbol	Rating	Unit	Test condition
Junction-ambient	$R_{\theta JA}$	100	$^\circ\text{C}/\text{W}$	1 cubic foot chamber, free air
Junction-case	$R_{\theta JC}$	1.25	$^\circ\text{C}/\text{W}$	Drain lead soldered to water cooled heatsink, P_D adjusted for a peak junction temperature of $+150^\circ\text{C}$

6. Electrical characteristics

(T_J=25°C, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V, I _{DS} =250μA	500	-	-	V
Breakdown voltage temperature coefficient, Figure 11	ΔBV _{DSS} /ΔT _J	Reference to 25°C I _D =250uA		0.61		V/°C
Drain-source leakage current	I _{DSS}	V _{DS} =500V, V _{GS} =0V	-	-	1	μA
		V _{DS} =400V, V _{GS} =0V T _J =125°C	-	-	100	
Gate threshold voltage, Figure 12	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2	-	4	V
Gate-source forward leakage	I _{GSS}	V _{GS} =20V	-	-	1	uA
Gate-source reverse leakage		V _{GS} =-20V	-	-	-1	
Static drain-source on-resistance Figure 9 and 10	R _{DS(on)}	V _{GS} =10V, I _D =2.5A (note*4)	-	1	1.5	Ω
Forward transconductance	g _{fs}	V _{DS} =15V, I _D =2.5A (note*4)	-	6	-	S
Input capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V f=1MHz Figure 14	-	730	-	pF
Output capacitance	C _{oss}		-	80	-	
Reverse transfer capacitance	C _{rss}		-	8.0	-	
Turn-on delay time	t _{d(on)}	V _{DD} =250V, I _D =5A, R _G =12Ω, V _{GS} =10V	-	13	-	ns
Rise time	t _r		-	15	-	
Turn-off delay time	t _{d(off)}		-	40	-	
Fall time	t _f		-	20	-	
Total gate charge	Q _g	V _{DD} =250V, I _D =5A, Figure 15	-	20	-	nC
Gate-source charge	Q _{gs}		-	3.0	-	
Gate-drain charge	Q _{gd}		-	8.0	-	
Continuous source current (body biode)	I _S	Integral pn-diode in MOSFET	-	-	5	A
Maximum pulsed current (body biode)	I _{SM}		-	-	20	
Diode forward voltage	V _{SD}	I _S =5A, V _{GS} =0V	-	-	1.5	V
Reverse recovery time	t _{rr}	I _F =5A, V _{GS} =0V di/dt=100A/μs	-	280	-	nS
Reverse recovery charge	Q _{rr}		-	1200	-	nC

Note:1. T_J=25°C to 150°C.

2. Repetitive rating; pulse width limited by maximum junction temperature

3. I_{SD}=5A di/dt≤100A/μs, V_{DD}≤ BV_{DSS}, T_J=150°C.

4. pulse width≤380us; duty cycle≤2%.

7. Typical operating characteristics

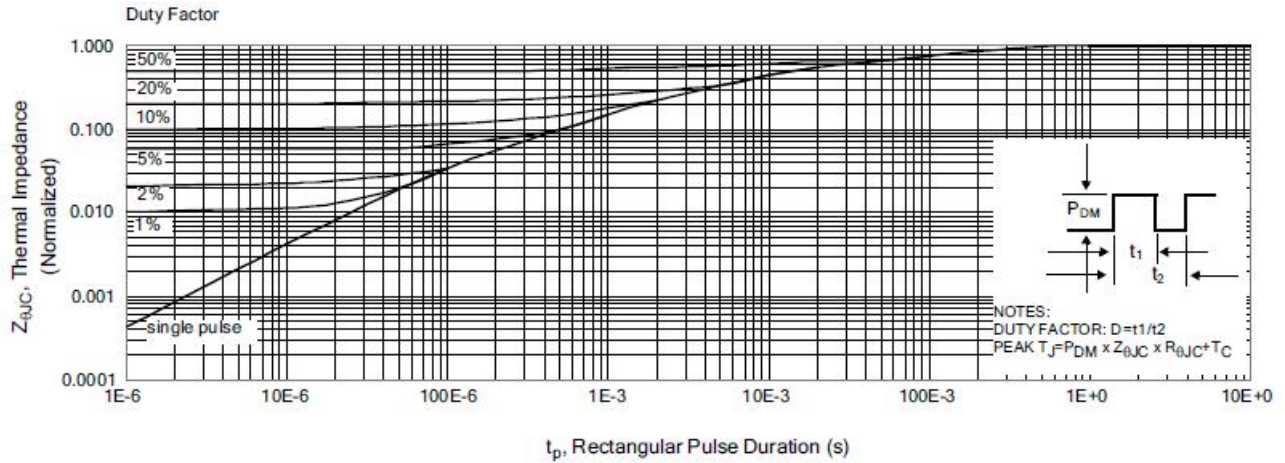


Figure 1. Maximum Effective Thermal Impedance, Junction-to-Case

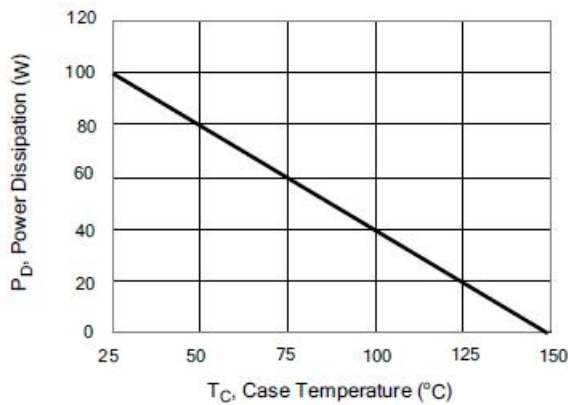


Figure 2. Maximum Power Dissipation vs Case Temperature

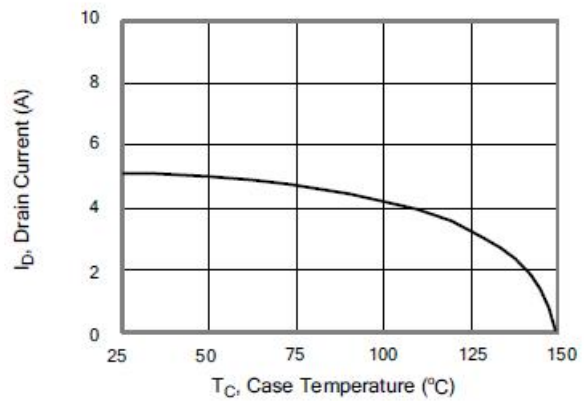


Figure 3. Maximum Continuous Drain Current vs Case Temperature

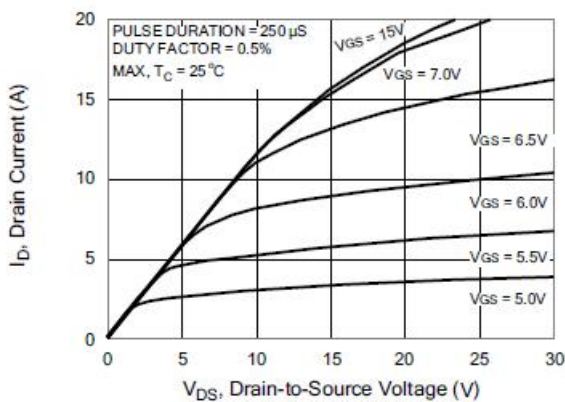


Figure 4. Typical Output Characteristics

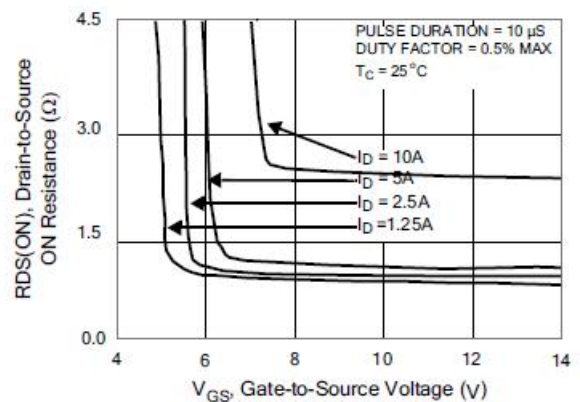


Figure 5. Typical Drain-to-Source ON Resistance vs Gate Voltage and Drain Current

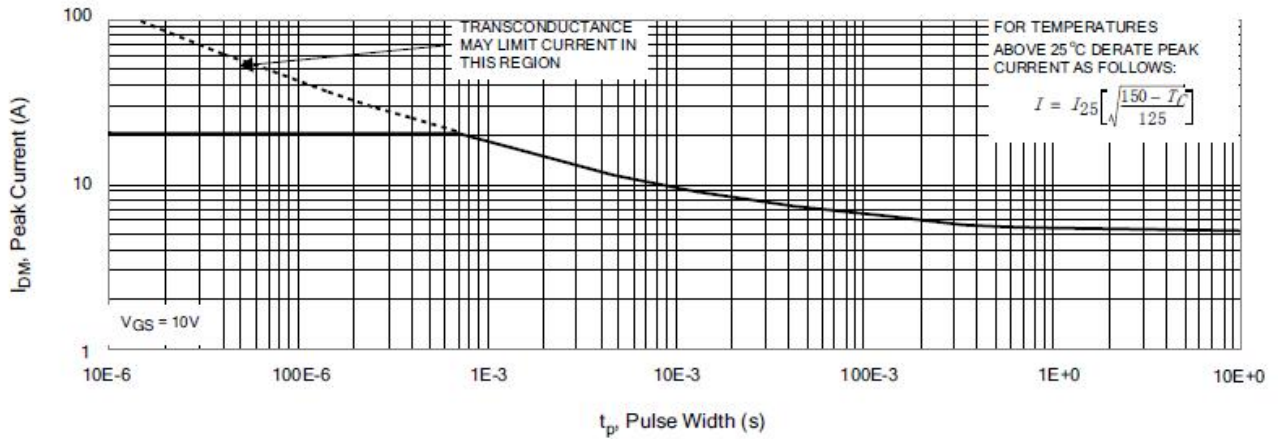


Figure 6. Maximum Peak Current Capability

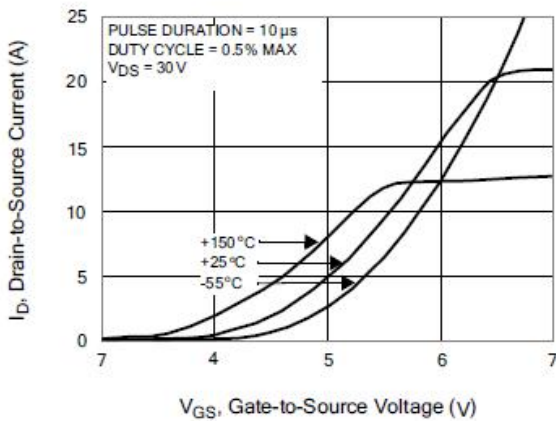


Figure 7. Typical Transfer Characteristics

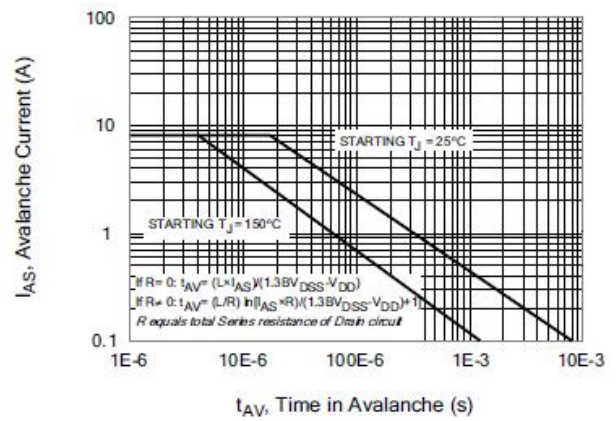


Figure 8. Unclamped Inductive Switching Capability

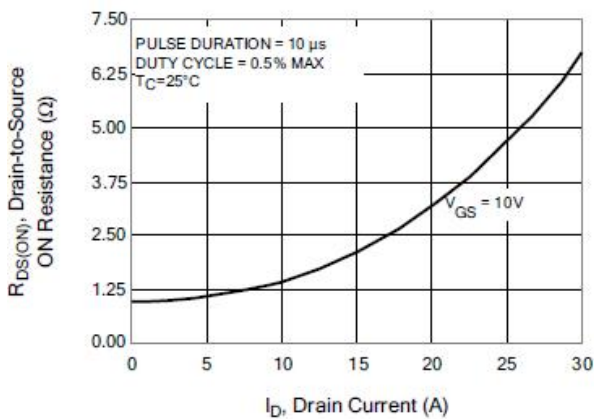


Figure 9. Typical Drain-to-Source ON Resistance vs Drain Current

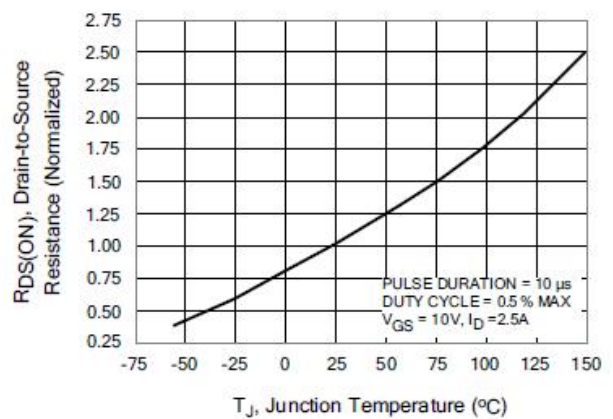


Figure 10. Typical Drain-to-Source ON Resistance vs Junction Temperature

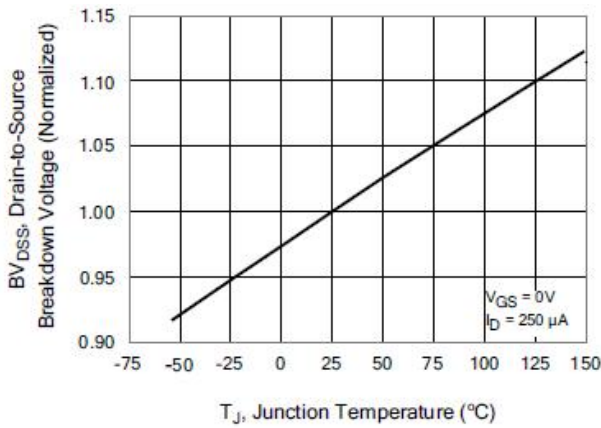


Figure 11. Typical Breakdown Voltage vs Junction Temperature

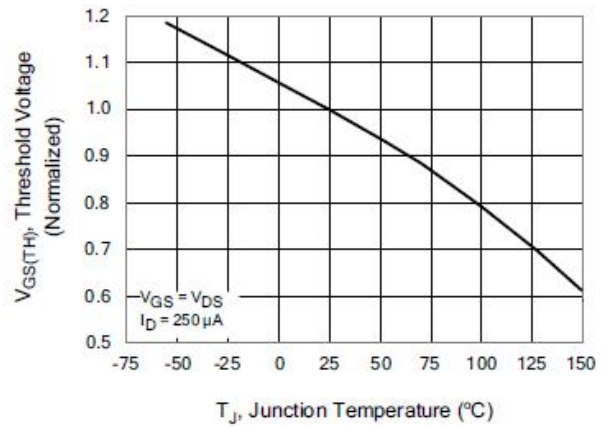


Figure 12. Typical Threshold Voltage vs Junction Temperature

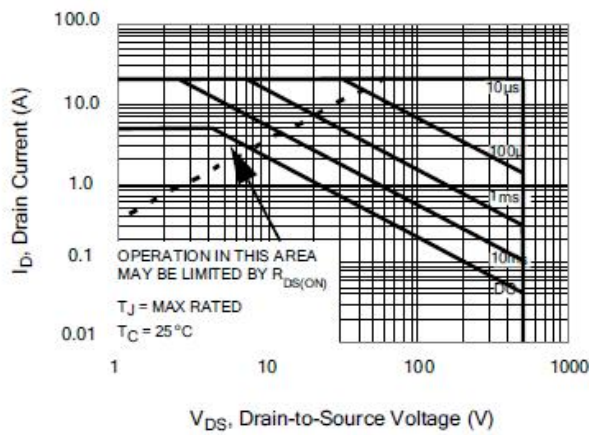


Figure 13. Maximum Forward Bias Safe Operating Area

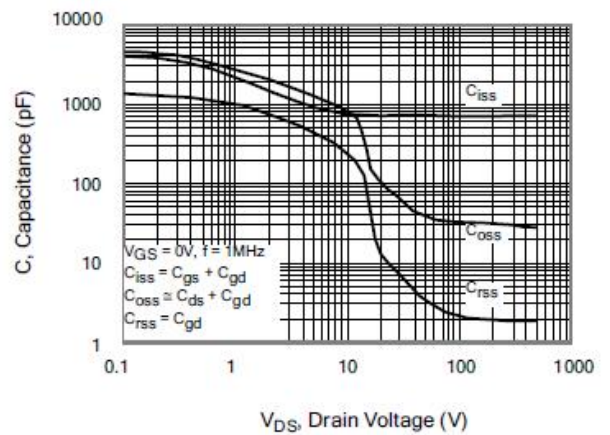


Figure 14. Typical Capacitance vs Drain-to-Source Voltage

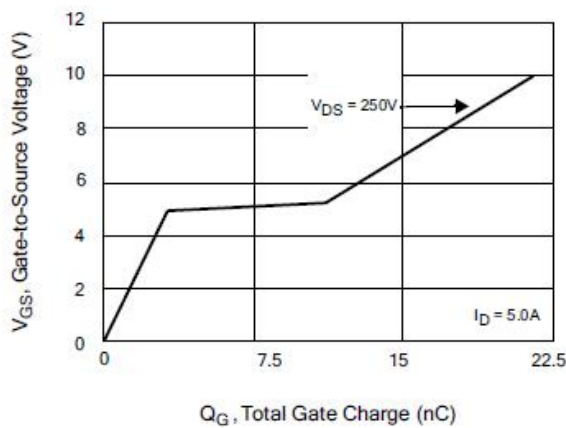


Figure 15. Typical Gate Charge vs Gate-to-Source Voltage

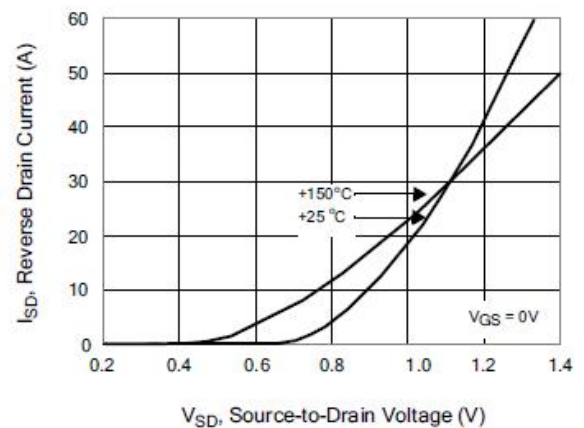


Figure 16. Typical Body Diode Transfer Characteristics

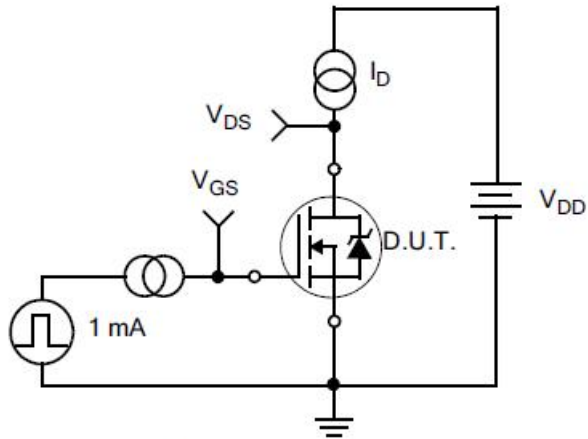


Figure 17. Gate Charge Test Circuit

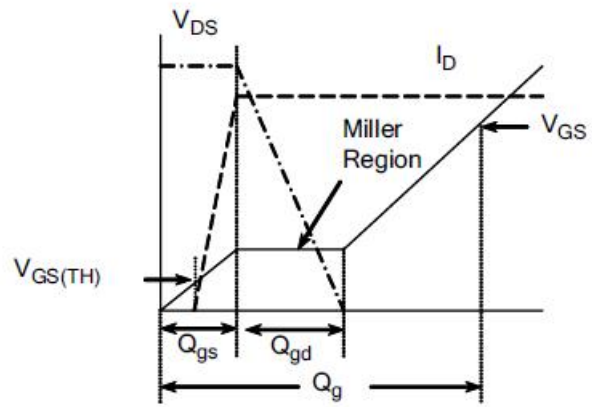


Figure 18. Gate Charge Waveform

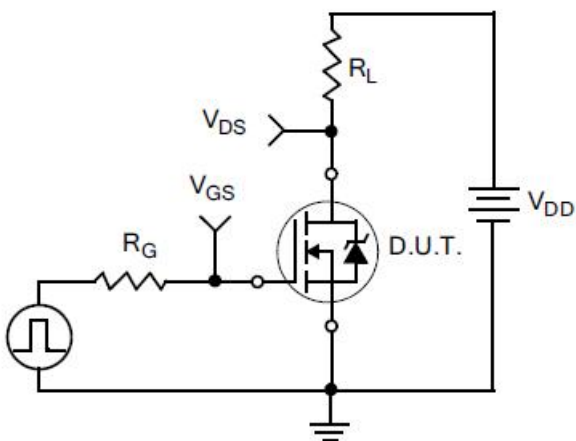


Figure 19. Resistive Switching Test Circuit

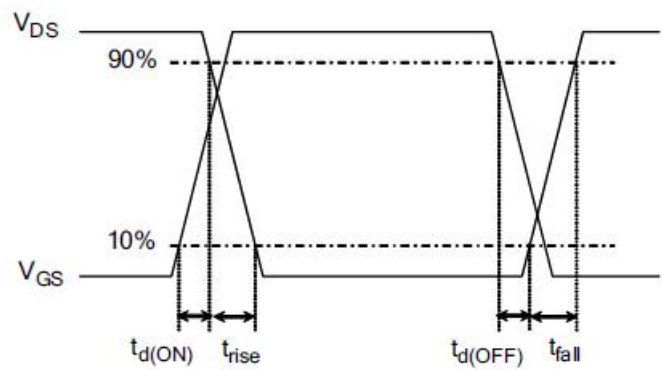


Figure 20. Resistive Switching Waveforms

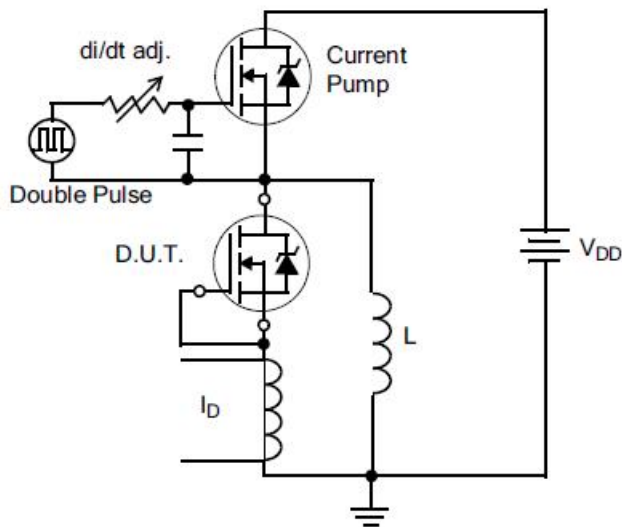


Figure 21. Diode Reverse Recovery Test Circuit

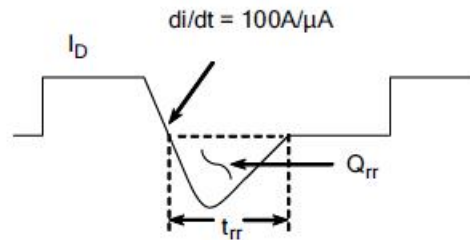


Figure 22. Diode Reverse Recovery Waveform

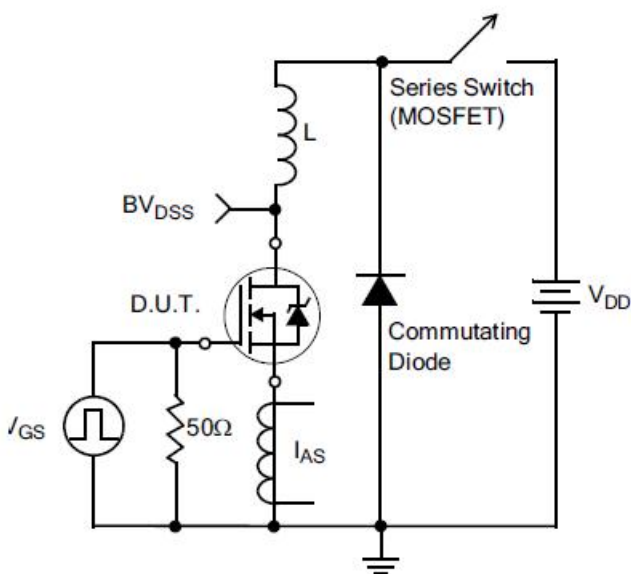


Figure 23. Unclamped Inductive Switching Test Circuit

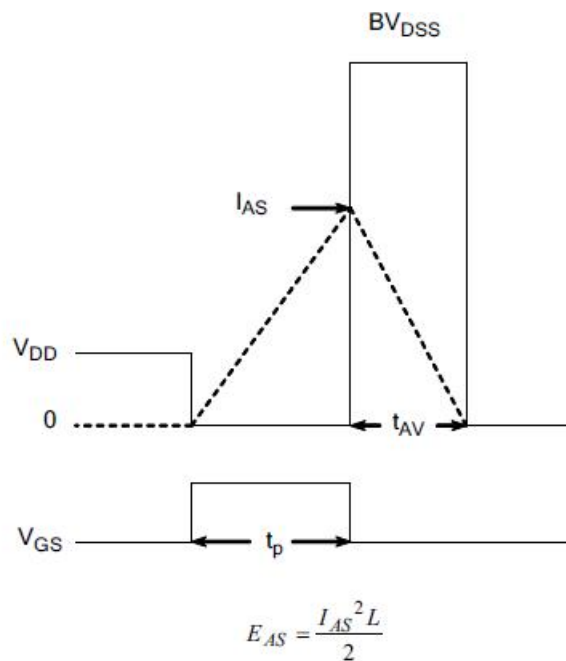


Figure 24. Unclamped Inductive Switching Waveforms