Minos
迈诺斯科技

MPT037N08

MOSFET

1. Description

MPT037N08, the N-channel Enhanced Power MOSFETs, is obtained by advanced double trench technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. This is suitable device for BMS and high current switching applications.

KEY CHARACTERISTICS

Parameter	Value	Unit
V_{DSS}	85	V
I_D	185	A
$R_{DS(on).typ}$	3	mΩ

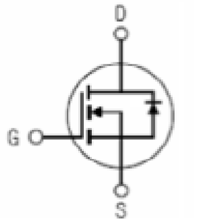
FEATURES

- Fast Switching
- Low On-Resistance ($R_{DS(on)}$≤4mΩ)
- Low Gate Charge
- Low Reverse transfer capacitances
- High avalanche ruggedness
- RoHS product

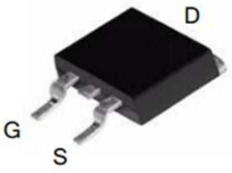
APPLICATIONS

- BMS
- Motor drivers

Inner Equivalent Principium Chart



TO-263

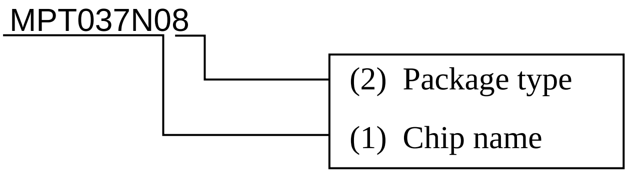


TO-220

1.Gate 2. Drain 3. Source

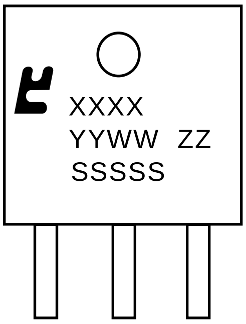
ORDERING INFORMATION

Ordering Codes	Package	Product Code	Packing
MPT037N08-P	TO-220	037N08	Tube
MPT037N08-S	TO-263	037N08	Tube



(1)MPT037N08：3mΩ/85V

(2) P：TO-220 B：TO-263



XXXX：Product Code

YYWW：Year&Week

ZZ：Assembly Code

SSSSS：Lot Code

2. ABSOLUTE RATINGS

at T_C=25°C，unless otherwise specified

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-Source Voltage	85	V
I_D	Continuous Drain Current, Silicon Limited	185	A
	Continuous Drain Current, Package Limited	120	A
	Continuous Drain Current @T_C=100°C, Silicon Limited	117.2	A
I_{DM} Note1	Pulsed Drain Current	480	A
V_{GS}	Gate-Source Voltage	±20	V
E_{AS} Note2	Avalanche Energy	240.2	mJ
P_D	Power Dissipation	208.3	W
	Derating Factor above 25°C	1.67	W/℃
T_J， T_{stg}	Operating Junction and Storage Temperature Range	150，–55 to 150	℃
T_L	Maximum Temperature for Soldering	260	℃

Note1：Repetitive Rating：Pulse width limited by maximum junction temperature

Note2：L=0.5mH, Ias=31A, Start T_J=25℃

3. Thermal characteristics

Symbol	Parameter	Max	Units
$R_{\theta JC}$	thermal resistance, Junction-Case	0.6	℃/W
$R_{\theta JA}$	thermal resistance, Junction-Ambient	62.5	℃/W

4. Electrical Characteristics

at T_C=25°C, unless otherwise specified

OFF Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min	Typ	Max	
V_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	85	95	--	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=85V, V_{GS}=0V	--	--	1	μA
		V_{DS}=68V, V_{GS}=0V @T_C=125°C	--	--	100	μA
$I_{GSS(F)}$	Gate-Source Forward Leakage	V_{GS}=+20V	--	--	100	nA
$I_{GSS(R)}$	Gate-Source Reverse Leakage	V_{GS}=-20V	--	--	-100	nA

ON Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min	Typ	Max	
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=10V, I_D=50A	--	3	3.5	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250µA	2	3	4	V
Pulse width tp≤300µs, δ≤2%						

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min	Typ	Max	
C_{iss}	Input Capacitance	V_{DS}=42.5V, V_{GS}=0, f=1MHz	--	6234	--	pF
C_{oss}	Output Capacitance		--	1181	--	
C_{rss}	Reverse Transfer Capacitance		--	97	--	
Q_g	Total Gate Charge	V_{DD}=42.5V, I_D=50A, V_{GS}=10V	--	124	--	nC
Q_{gs}	Gate-Source charge		--	31.2	--	
Q_{gd}	Gate-Drain charge		--	39.2	--	
R_G	Gate resistance	V_{GS}=0, V_{DS}=0		1.75		Ω

Switching Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min	Typ	Max	
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=42.5V, I_D=10A, V_{GS}=10V, R_G=3Ω, Resistive Load	--	41	--	ns
t_r	Rise Time		--	68	--	
$t_{d(off)}$	Turn-Off Delay Time		--	76	--	
t_f	Fall Time		--	44	--	

Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min	Typ	Max	
I_S	Continuous Source Current		--	--	120	A
I_{SM}	Maximum Pulsed Current		--	--	480	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V, I_S=50A	--	--	1.2	V
T_{rr}	Reverse Recovery Time	I_s=30A, V_{GS}=0, di/dt=100A/us	--	80	--	ns
Q_{rr}	Reverse Recovery Charge		--	112	--	nC

5. Characteristics Curves

Figure 1. Safe Operating Area

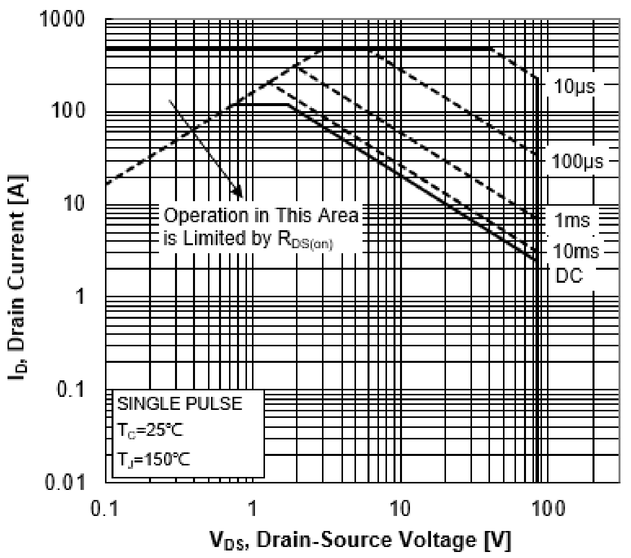


Figure 2. Maximum Power Dissipation vs Case Temperature

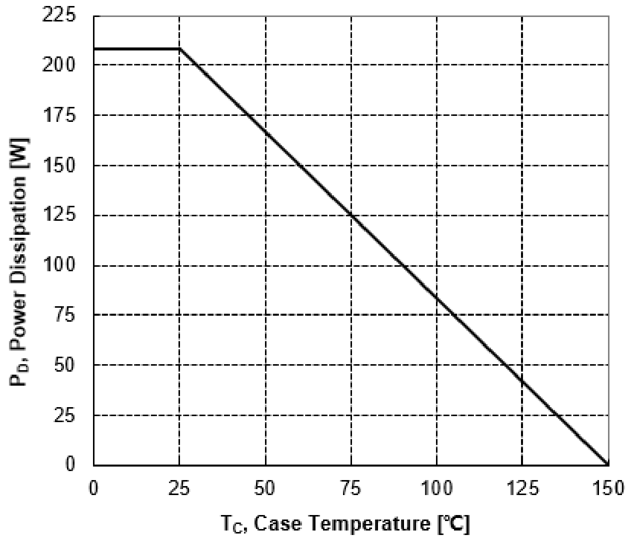


Figure 3. Maximum Continuous Drain Current vs Case Temperature

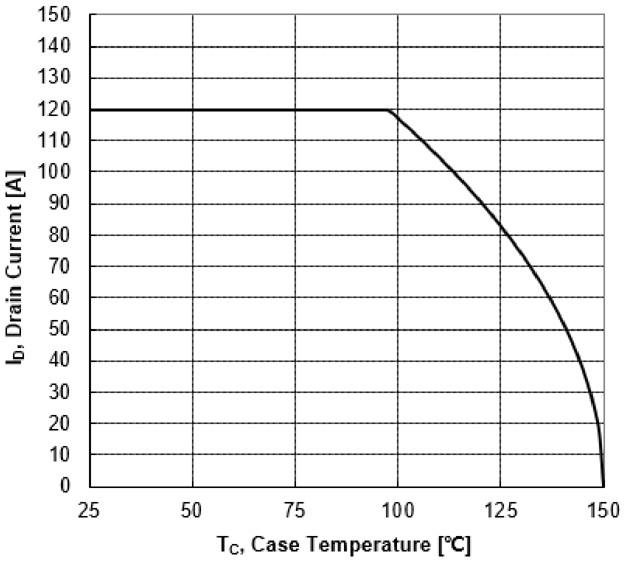


Figure 4. Typical Output Characteristics

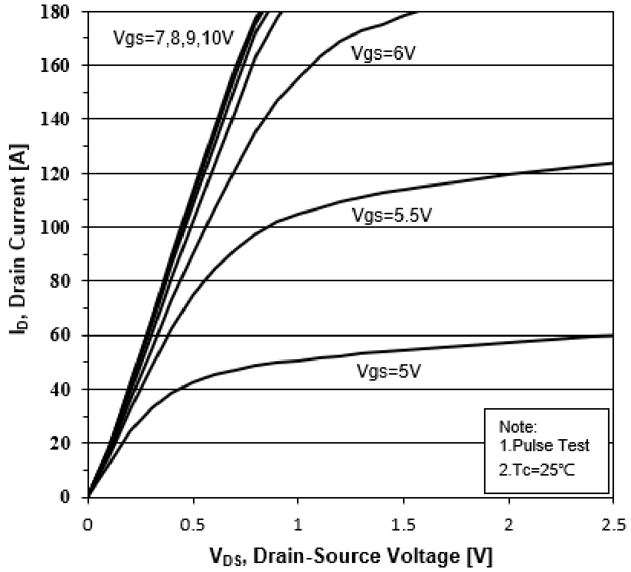


Figure 5. Transient Thermal Impedance

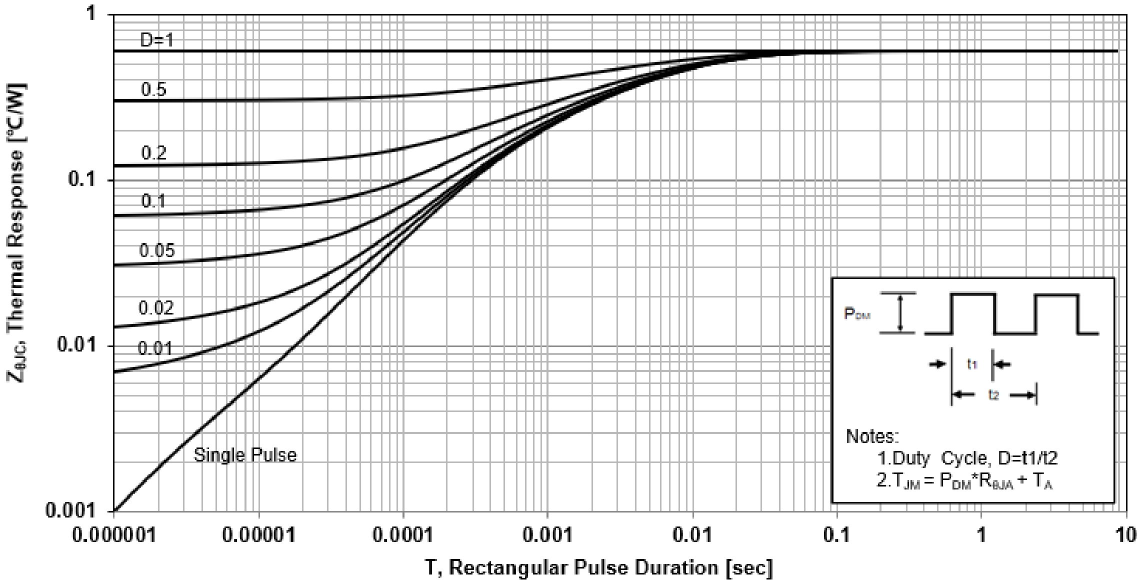


Figure 6. Typical Transfer Characteristics

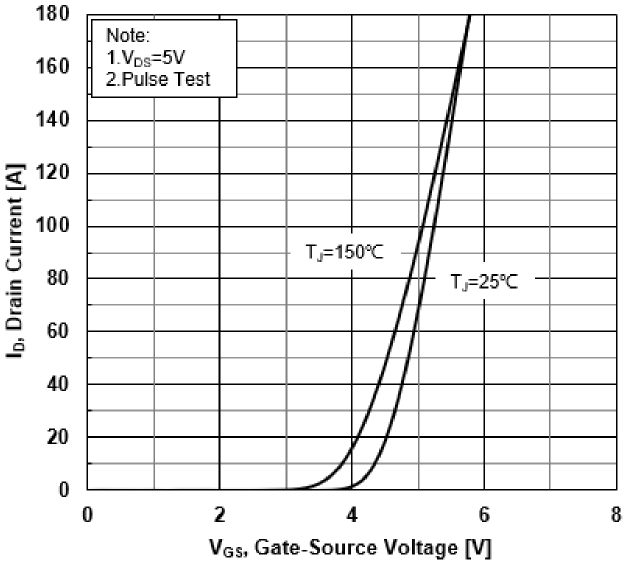


Figure 7. Source-Drain Diode Forward Characteristics

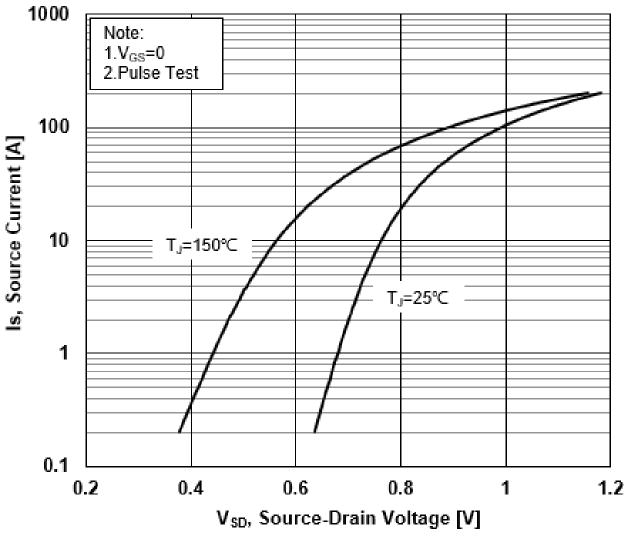


Figure 8. Drain-Source On-Resistance vs Drain Current

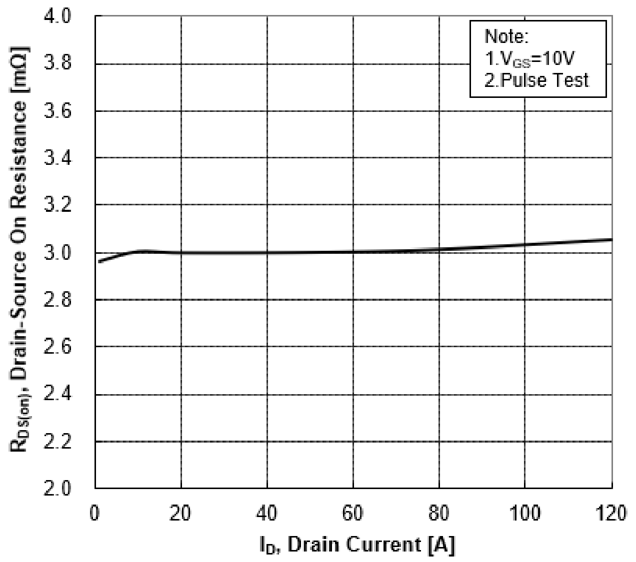


Figure 9. Normalized On-Resistance vs Junction Temperature

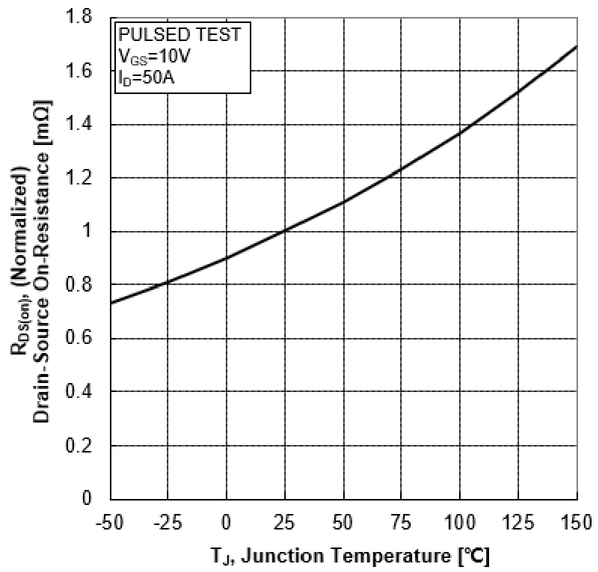


Figure 10. Normalized Threshold Voltage vs Junction Temperature

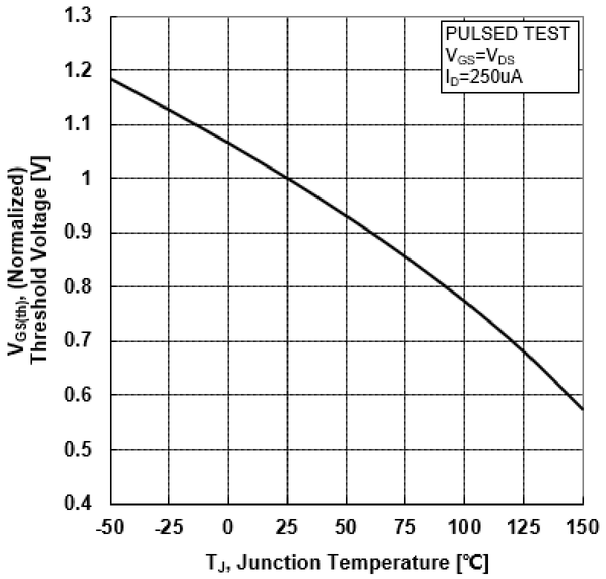


Figure 11. Normalized Breakdown Voltage vs Junction Temperature

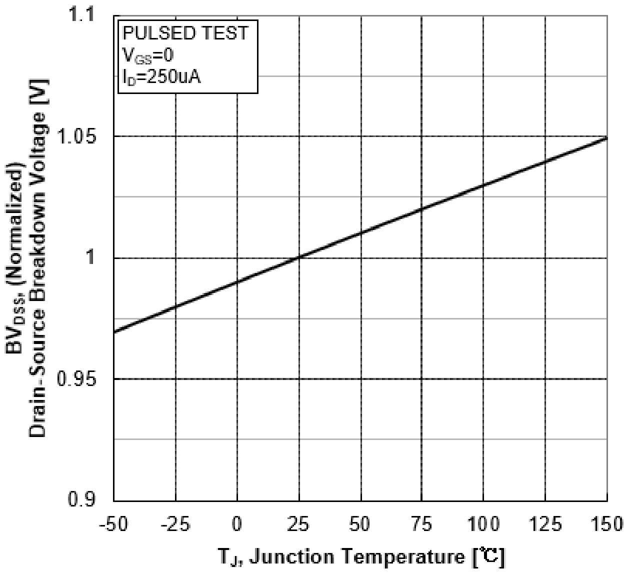
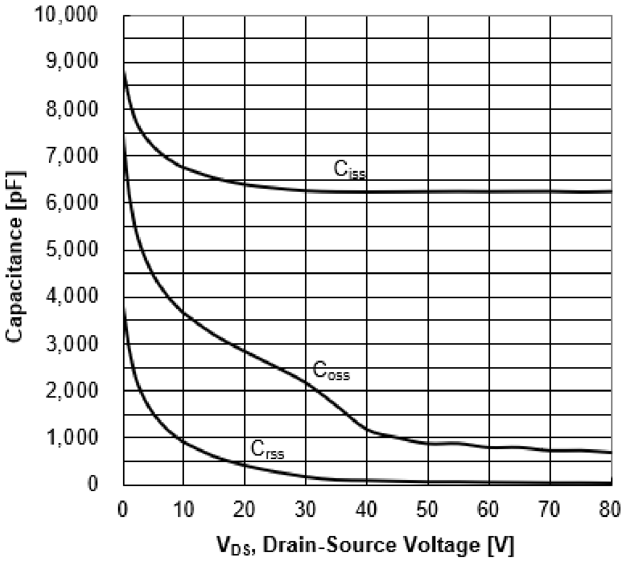
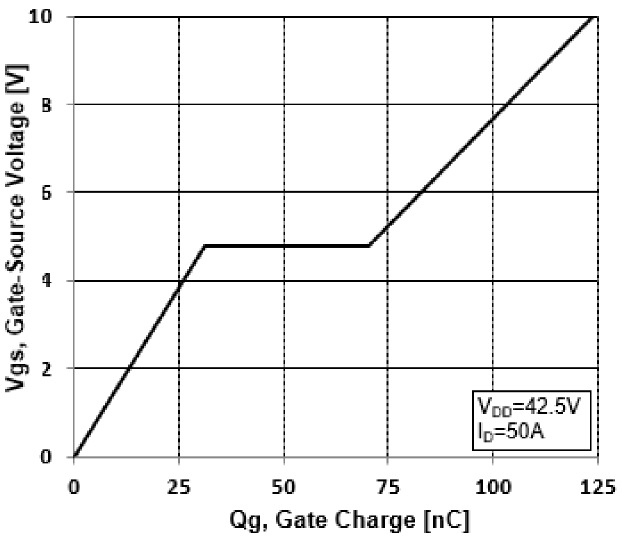


Figure 12. Capacitance Characteristics	Figure 13. Typical Gate Charge vs Gate-Source Voltage
	

6. Test Circuit and Waveform

Figure 14. Resistive Switching Test Circuit

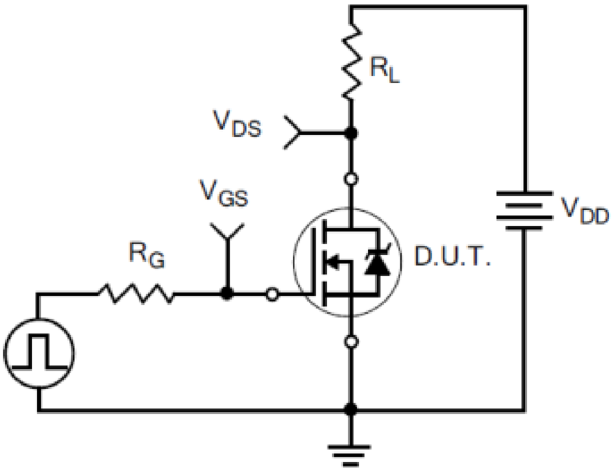


Figure 15. Resistive Switching Waveforms

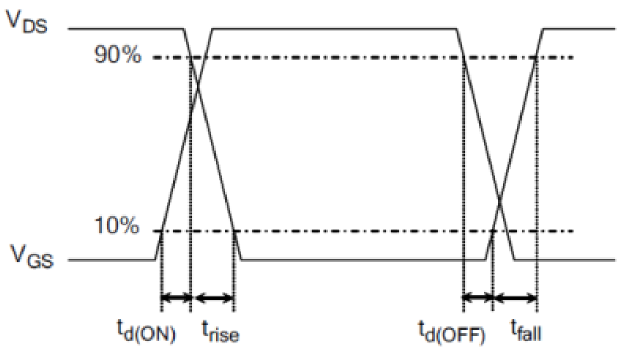


Figure 16. Gate Charge Test Circuit

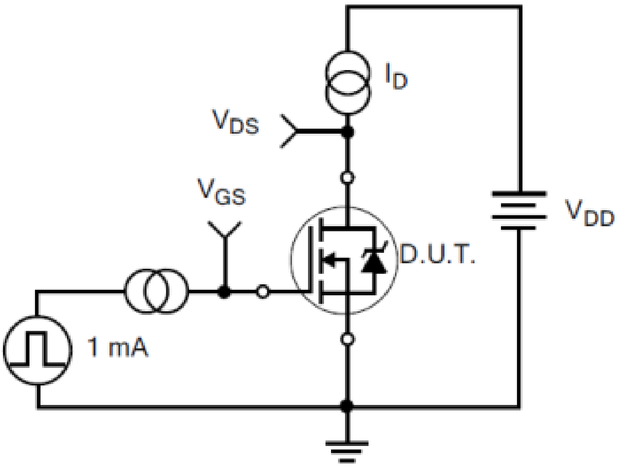


Figure 17. Gate Charge Waveforms

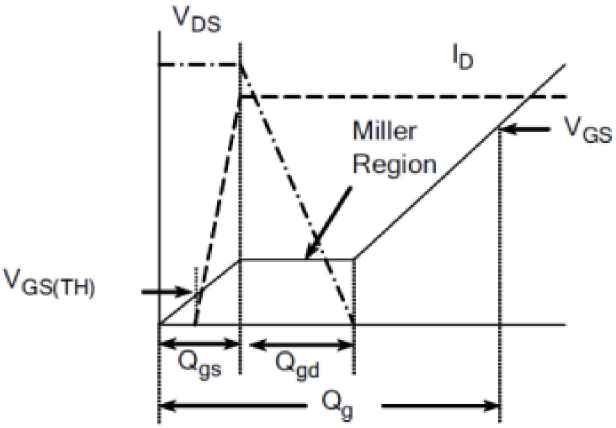


Figure 18. Diode Reverse Recovery Test Circuit

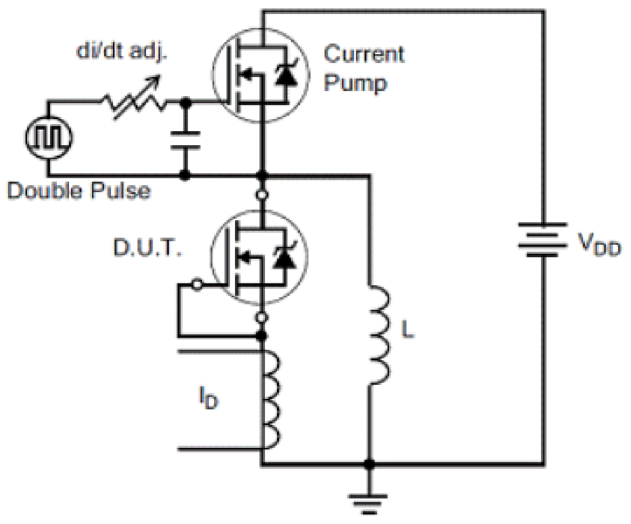


Figure 19. Diode Reverse Recovery Waveform

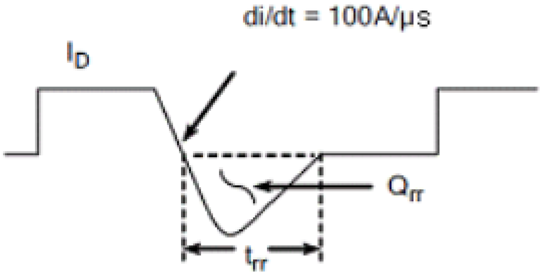


Figure 20. Unclamped Inductive Switching Test Circuit

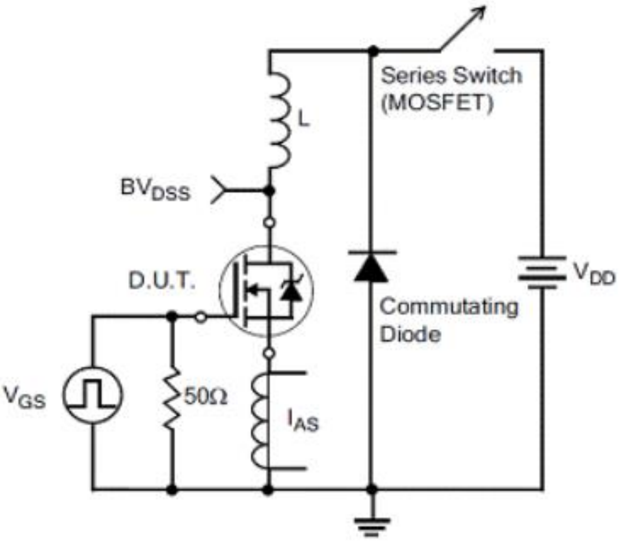


Figure 21. Unclamped Inductive Switching Waveform