

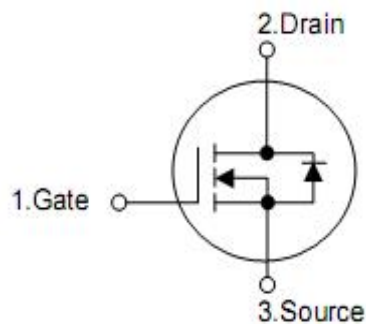
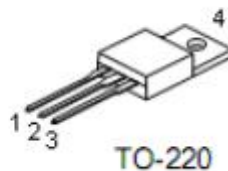
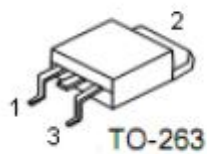
1. General Features

- n Proprietary New Trench Technology
- n $R_{DS(ON),typ.}=5.0m\Omega@V_{GS}=10V$
- n Low Gate Charge Minimize Switching Loss
- n Fast Recovery Body Diode

2. Applications

- n High efficiency DC/DC converters
- n Synchronous Rectification
- n UPS Inverter

3. Pin configuration



Pin	Function
1	Gate
2	Drain
3	Source
4	Drain

4. Ordering Information

Part Number	Package	Brand
KNB2908A	TO-263	KIA
KNP2908A	TO-220	KIA

5. Absolute maximum ratings

(T_c= 25 °C , unless otherwise specified)

Symbol	Parameter	Rating	Unit
V _{DSS}	Drain-to-Source Voltage ^[1]	85	V
V _{GSS}	Gate-to-Source Voltage	±20	
I _D	Continuous Drain Current ^[2]	130	A
	Continuous Drain Current @T _c =100 °C ^[2]	85	
I _{DM}	Pulsed Drain Current at V _{GS} =10V ^[2,4]	480	
E _{AS}	Single Pulse Avalanche Energy	882	mJ
dv /dt	Peak Diode Recovery dv/dt ^[3]	5.0	V/ns
P _D	Power Dissipation	221	W
	Derating Factor above 25 °C	1.5	W/ °C
T _L T _{PAK}	Maximum Temperature for Soldering Leads at 0.063in (1.6mm) from Case for 10 seconds, Package Body for 10 seconds	300 260	°C
T _J &T _{STG}	Operating and Storage Temperature Range	-55 to 175	

Caution: Stresses greater than those listed in the “Absolute Maximum Ratings” may cause permanent damage to the device.

6. Thermal characteristics

Symbol	Parameter	Rating	Unit
R _{θJC}	Thermal Resistance, Junction-to-Case	0.68	°C /W
R _{θJA}	Thermal Resistance, Junction-to-Ambient	62	

6. Electrical characteristics

OFF Characteristics		(T _J =25°C, unless otherwise specified)				
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-to-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	85	--	--	V
I _{DSS}	Drain-to-Source Leakage Current	V _{DS} =80V, V _{GS} =0V	--	--	1	uA
		V _{DS} =64V, V _{GS} =0V, T _J =125°C	--	--	100	
I _{GSS}	Gate-to-Source Leakage Current	V _{GS} =+20V, V _{DS} =0V	--	--	+100	nA
		V _{GS} =-20V, V _{DS} =0V	--	--	-100	
ON Characteristics		(T _J =25°C, unless otherwise specified)				
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
R _{DS(ON)}	Static Drain-to-Source On-Resistance	V _{GS} =10V, I _D =24A ^[5]	--	5.0	6.0	mΩ
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	2.0	--	4.0	V
Dynamic Characteristics		Essentially independent of operating temperature				
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =25V, f=1.0MHZ	--	5000	--	pF
C _{oss}	Output Capacitance		--	595	--	
C _{rss}	Reverse Transfer Capacitance		--	340	--	
R _g	Gate Series Resistance	f=1.0MHZ	--	1.1	--	Ω
Q _g	Total Gate Charge	V _{DD} =40V, I _D =80A, V _{GS} =0 to 10V	--	100	--	nC
Q _{gs}	Gate-to-Source Charge		--	19	--	
Q _{gd}	Gate-to-Drain (Miller) Charge		--	33	--	
Resistive Switching Characteristics		Essentially independent of operating temperature				
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t _{d(ON)}	Turn-on Delay Time	V _{DD} =40V, I _D =80A, V _{GS} = 10V, R _G =2.5Ω	--	27	--	nS
t _{rise}	Rise Time		--	65	--	
t _{d(OFF)}	Turn-Off Delay Time		--	140	--	
t _{fall}	Fall Time		--	52	--	
Source-Drain Body Diode Characteristics		(T _J =25°C, unless otherwise specified)				
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Unit
I _{SD}	Continuous Source Current ^[2]	Integral PN-diode in MOSFET	--	--	130	A
I _{SM}	Pulsed Source Current ^[2]		--	--	480	
V _{SD}	Diode Forward Voltage	I _S =80A, V _{GS} =0V	--	0.9	1.5	V
t _{rr}	Reverse recovery time	V _{GS} =0V, I _F =20A, diF/dt=100A/μs	--	60	--	ns
Q _{rr}	Reverse recovery charge		--	30	--	uC

Note:

[1] T_J = +25 °C to +175 °C.

[2] Silicon limited current only.

[3] Package limited current 80A.

[4] Repetitive rating; pulse width limited by maximum junction temperature.

[5] Pulse width ≤ 380μs; duty cycle ≤ 2%.

7. Test circuits and waveforms

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

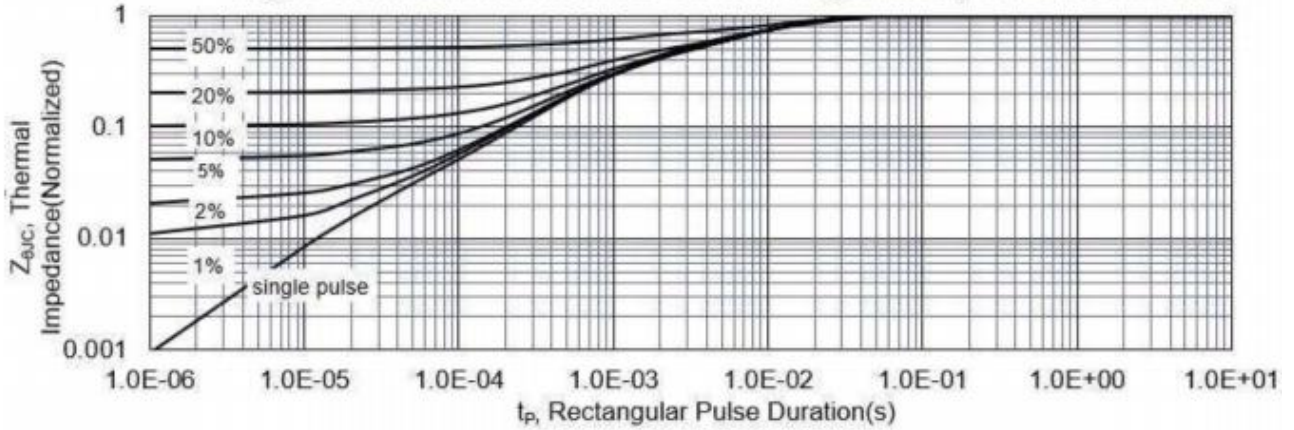


Figure 2. Maximum Power Dissipation vs. Case Temperature

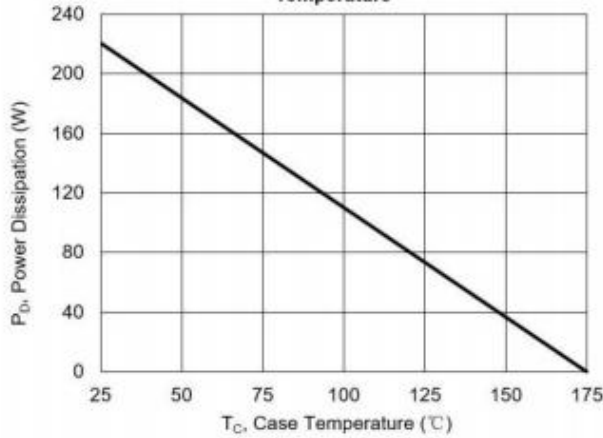


Figure 3. Maximum Continuous Drain Current vs Tc

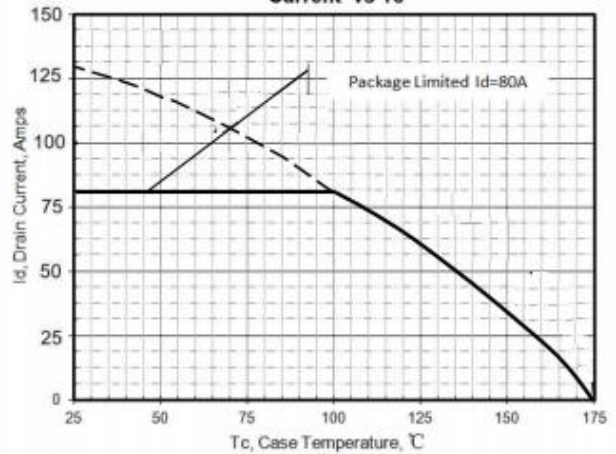


Figure 4. Typical Output Characteristics

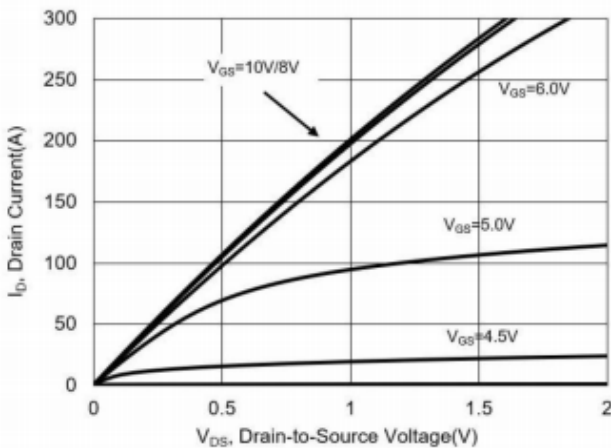


Figure 5. Typical Drain-to-Source ON Resistance vs. Gate Voltage

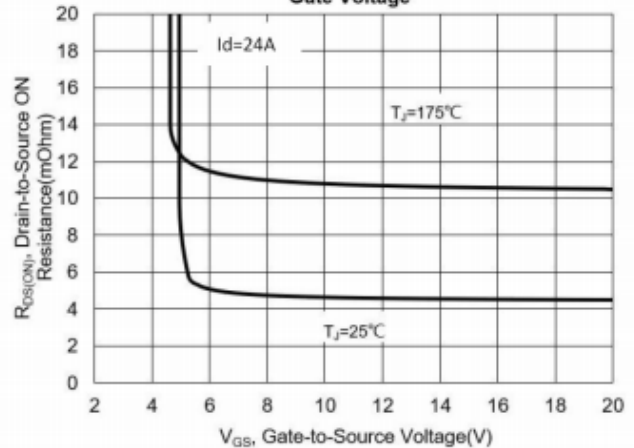


Figure 6. Maximum Peak Current Capability

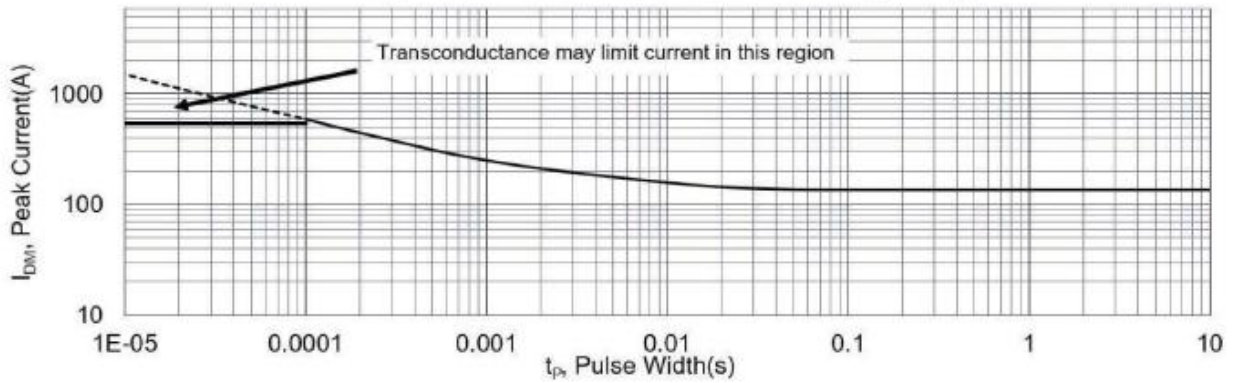


Figure 7. Typical Transfer Characteristics

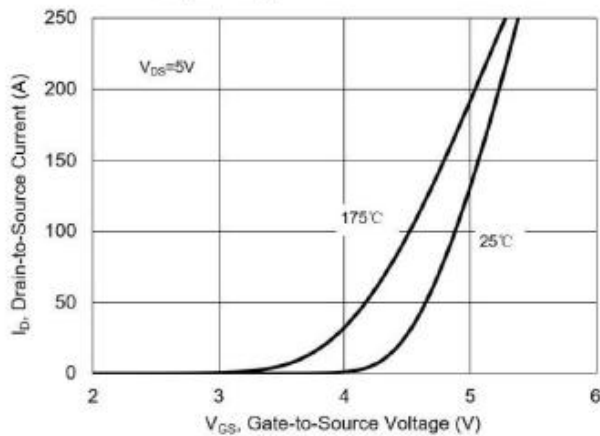


Figure 8. Unclamped Inductive Switching Capability

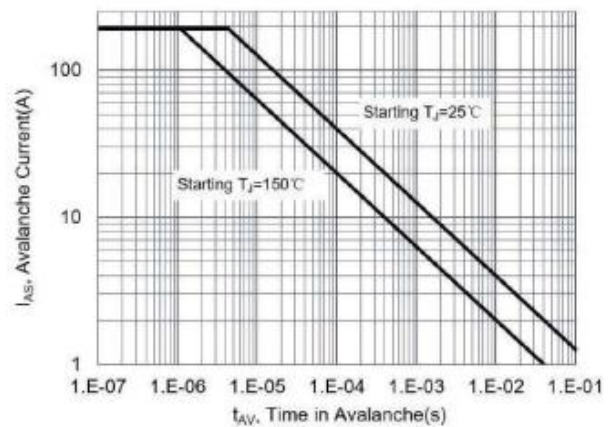


Figure 9. Typical Drain-to-Source ON Resistance

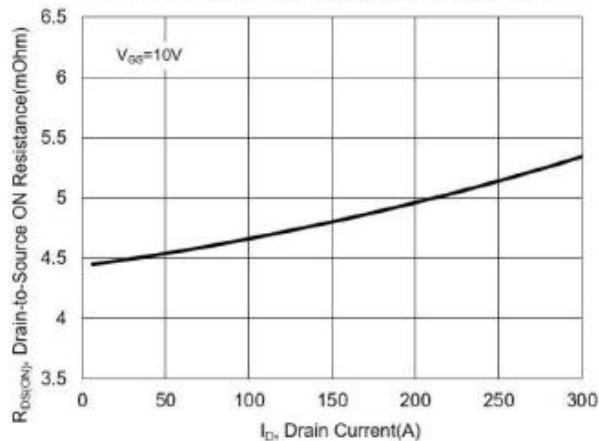
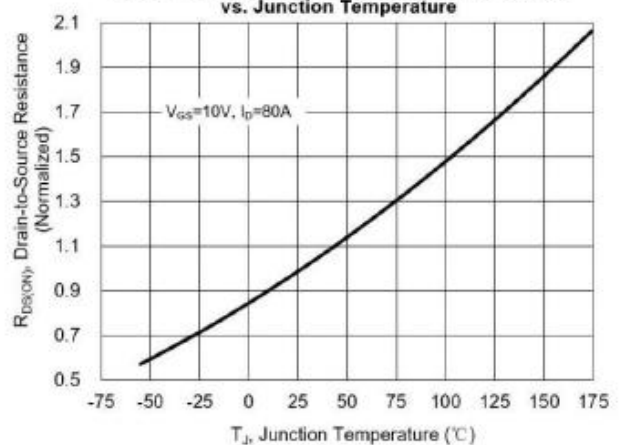
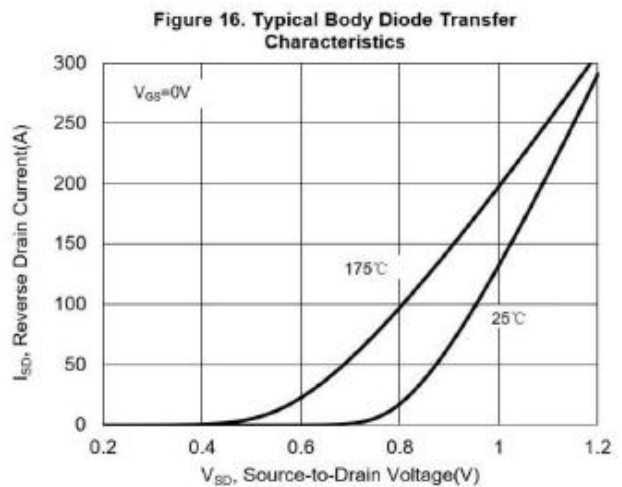
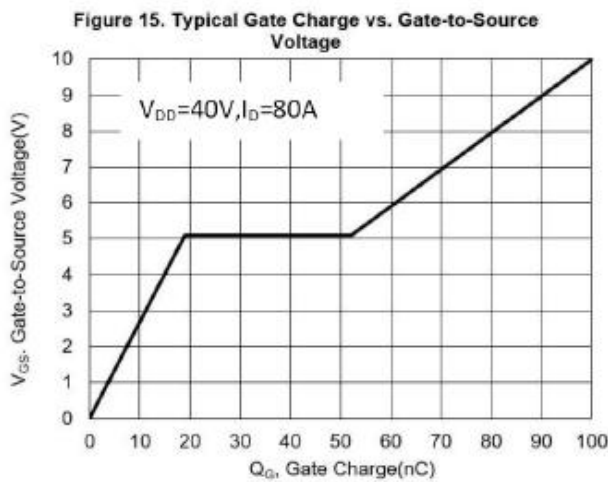
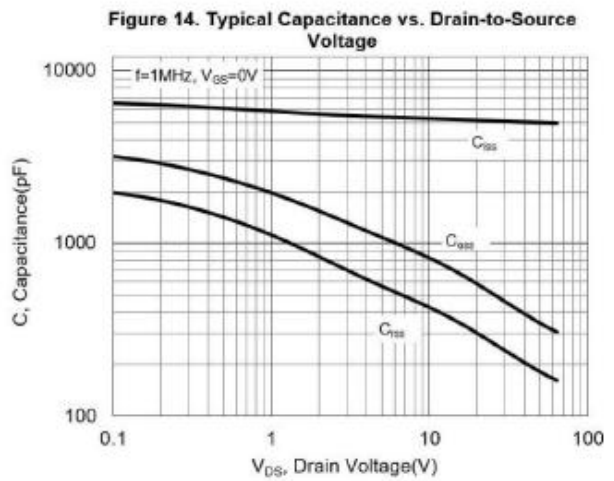
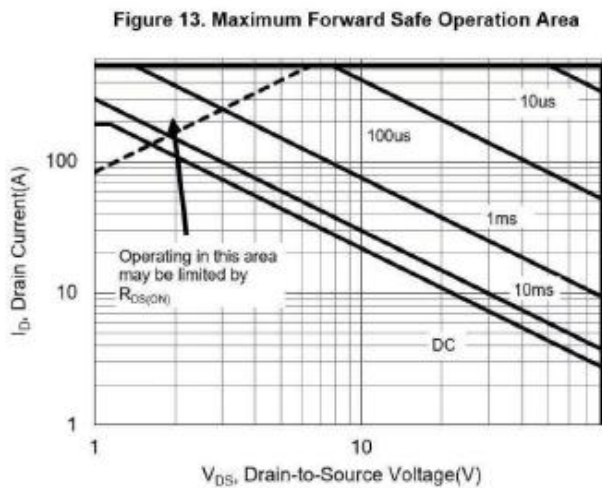
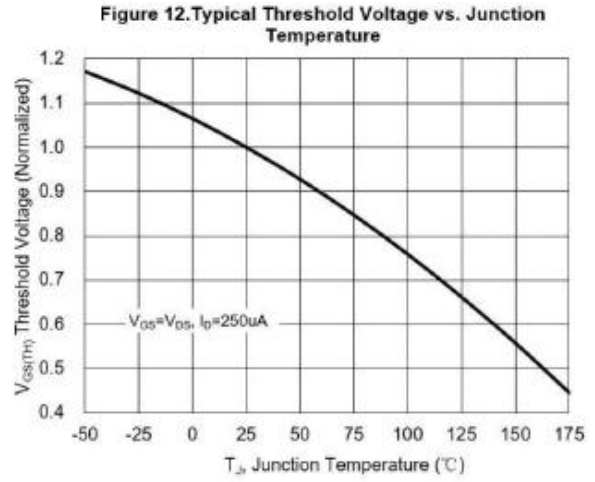
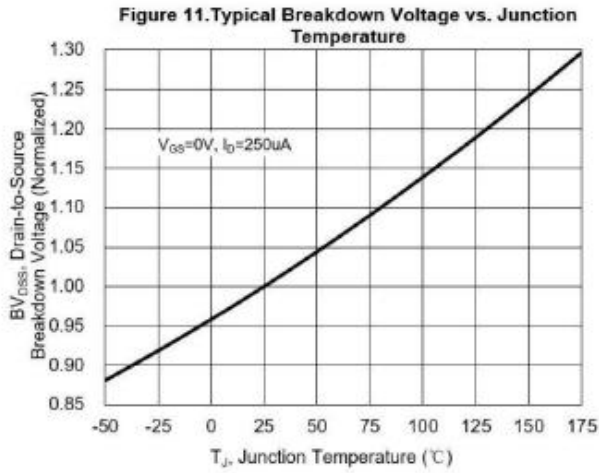


Figure 10. Typical Drain-to-Source On Resistance vs. Junction Temperature





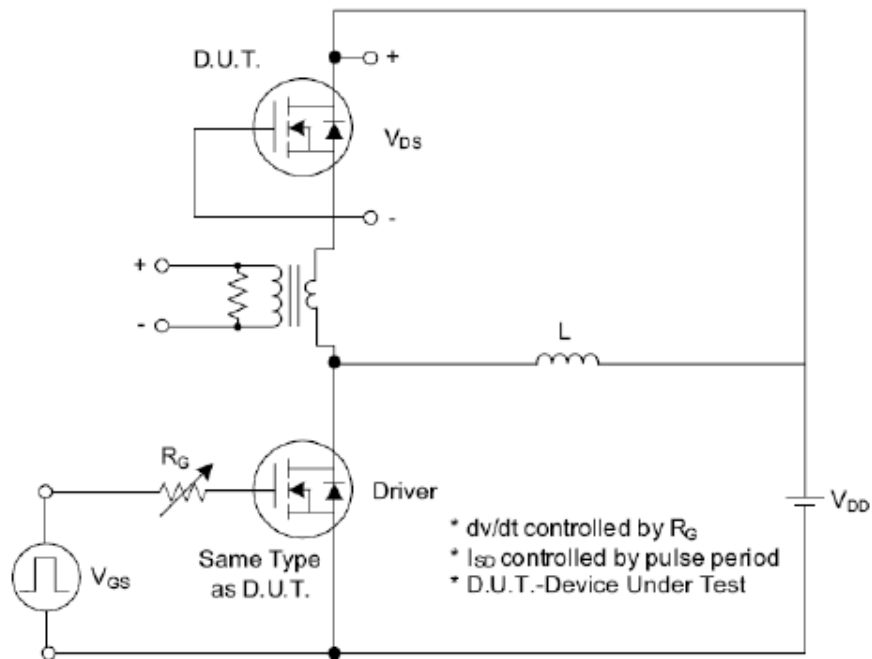


Fig. 1.1 Peak Diode Recovery dv/dt Test Circuit

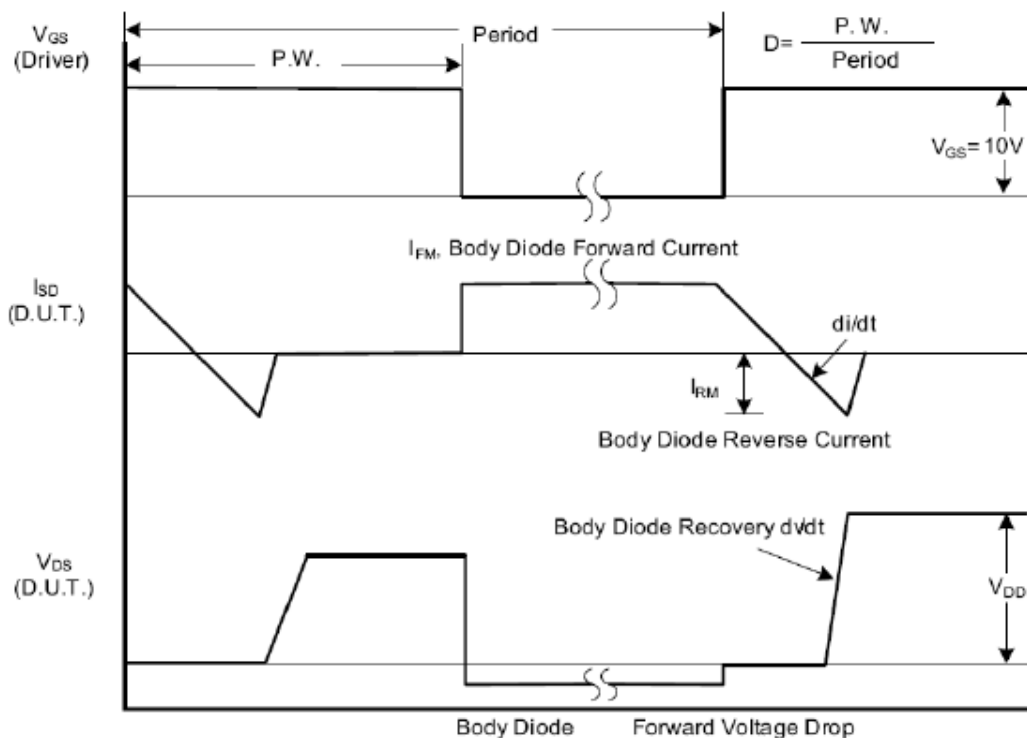


Fig. 1.2 Peak Diode Recovery dv/dt Waveforms

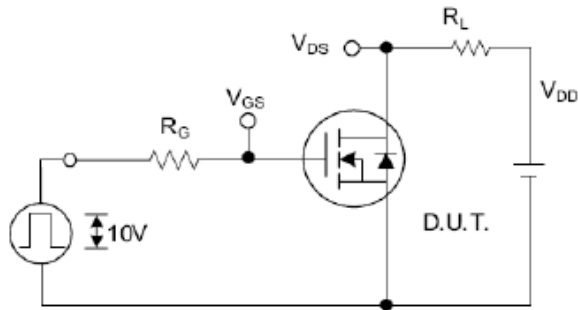


Fig. 2.1 Switching Test Circuit

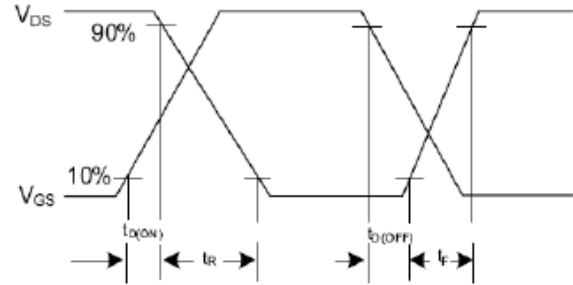


Fig. 2.2 Switching Waveforms

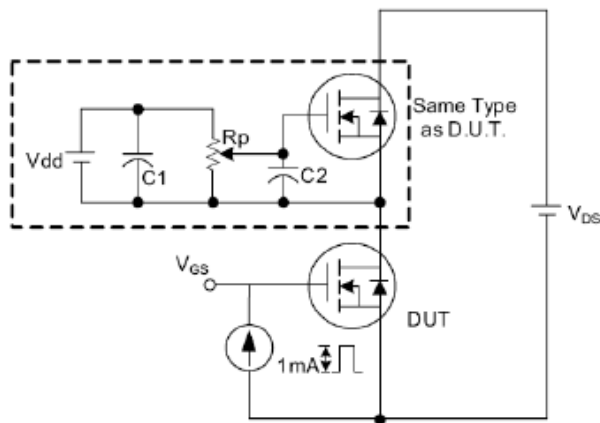


Fig. 3. 1 Gate Charge Test Circuit

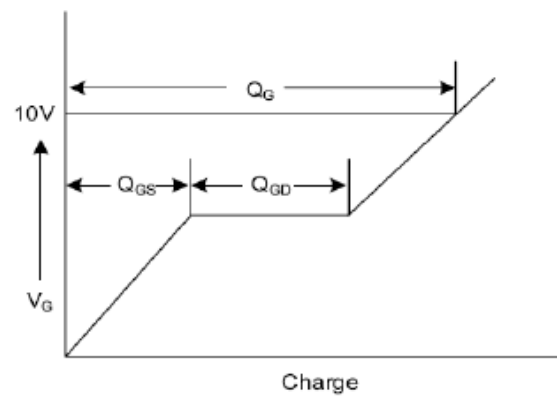


Fig. 3. 2 Gate Charge Waveform

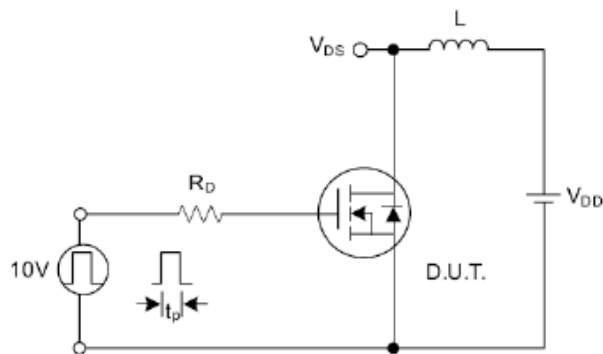


Fig. 4.1 Unclamped Inductive Switching Test Circuit

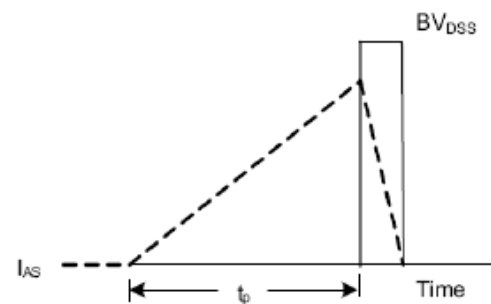


Fig. 4.2 Unclamped Inductive Switching Waveforms