

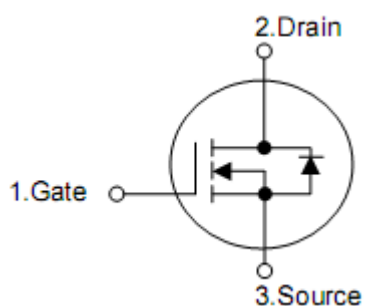
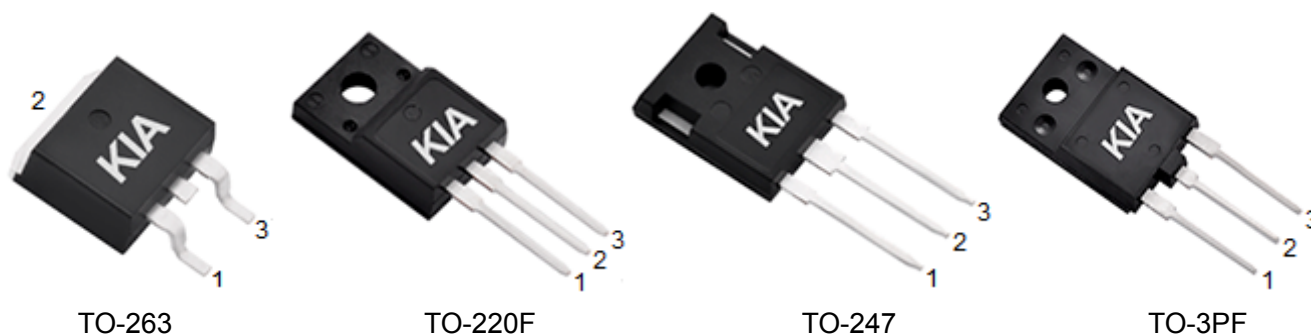
1. Features

- High speed switching
- $R_{DS(ON)}=5.5\Omega(\text{typ.}) @ V_{GS}=10V$
- Full isolated plastic package

2. Applications

- Adaptor
- Charger
- SMPS Standby Power

3. Pin configuration



Pin	Function
1	Gate
2	Drain
3	Source

4. Ordering Information

Part Number	Package	Brand
KNB42150A	TO-263	KIA
KNF42150A	TO-220F	KIA
KNM42150A	TO-247	KIA
KNL42150A	TO-3PF	KIA

5. Absolute maximum ratings

(T_c= 25°C, unless otherwise specified)

Parameter	Symbol	Ratings			Unit
		TO-263/ TO-3PF	TO-220F	TO-247	
Drain-to-Source Voltage	V _{DSS}	1500			V
Gate-to-Source Voltage	V _{GSS}	±30			
Continuous Drain Current	I _D	3.0			A
Pulsed Drain Current at V _{GS} =10V	I _{DM}	12			A
Single Pulse Avalanche Energy, L=30mH	EAS	500			mJ
Power Dissipation	P _D	90	35	186	W
Derating Factor above 25°C		0.72	0.28	1.49	W/°C
Soldering Temperature Distance of 1.6mm from case for 10 seconds	T _L	300			°C
Operating and Storage Temperature Range	T _J &T _{STG}	-55 to 150			°C

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

6. Thermal characteristics

Parameter	Symbol	Ratings				Unit
		TO-263	TO-220F	TO-247	TO-3PF	
Thermal Resistance, Junction-to-Case	R _{θJC}	1.38	3.75	0.67	1.6	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θJA}	65	100	55	50	

7. Electrical characteristics

(T_J=25°C, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-to-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =1mA	1500	-	-	V
Drain-to-Source Leakage Current	I _{DSS}	V _{DS} =1500V, V _{GS} =0V	-	-	1	uA
		V _{DS} =1200V, T _J =125°C	-	-	500	uA
Gate-to-Source Leakage Current	I _{GSS}	V _{GS} =±30V, V _{DS} =0V	-	-	±100	nA
Integrated Gate Resistor	R _g	f=1MHz Gate DC Bias=0 Test signal level=20mV open drain	-	4.5	--	Ω
Drain-to-Source ON Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =1.3A	-	5.5	8.2	Ω
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250uA	2.5	-	4.5	V
Forward Transconductance	g _{fs}	V _{DS} =15V, I _D =3A	-	3.0	-	S
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =25V, f=1.0MHZ	-	1500	-	pF
Reverse Transfer Capacitance	C _{rss}		-	30	-	
Output Capacitance	C _{oss}		-	93	-	
Total Gate Charge	Q _g	V _{DD} =750V, I _D =3A, V _{GS} =0~10V	-	35	-	nC
Gate-to-Source Charge	Q _{gs}		-	9	-	
Gate-to-Drain (Miller) Charge	Q _{gd}		-	10	-	
Turn-on Delay Time	t _{d(ON)}	V _{DD} =750V, I _D =3A, R _G =4.7Ω, V _{GS} =10V	-	28	-	nS
Rise Time	t _r		-	50	-	
Turn-Off Delay Time	t _{d(OFF)}		-	55	-	
Fall Time	t _f		-	53	-	
Continuous Source Current ²⁾	I _{SD}	Integral pn-diode in MOSFET	-	-	3	A
Pulsed Source Current ²⁾	I _{SM}		-	-	12	A
Forward Voltage	V _{SD}	I _S =3A, V _{GS} =0V	-	-	1.6	V
Reverse recovery time	t _{rr}	V _{GS} =0V, I _F =3A, di/dt=-100A/μs	-	255	-	ns
Reverse recovery charge	Q _{rr}		-	1.1	-	uC

1) T_J=+25°C, to +150°C

2) Pulse width≤380μs; duty cycle≤2%.

8. Test circuits and waveforms

Figure 1. Maximum Transient Thermal Impedance

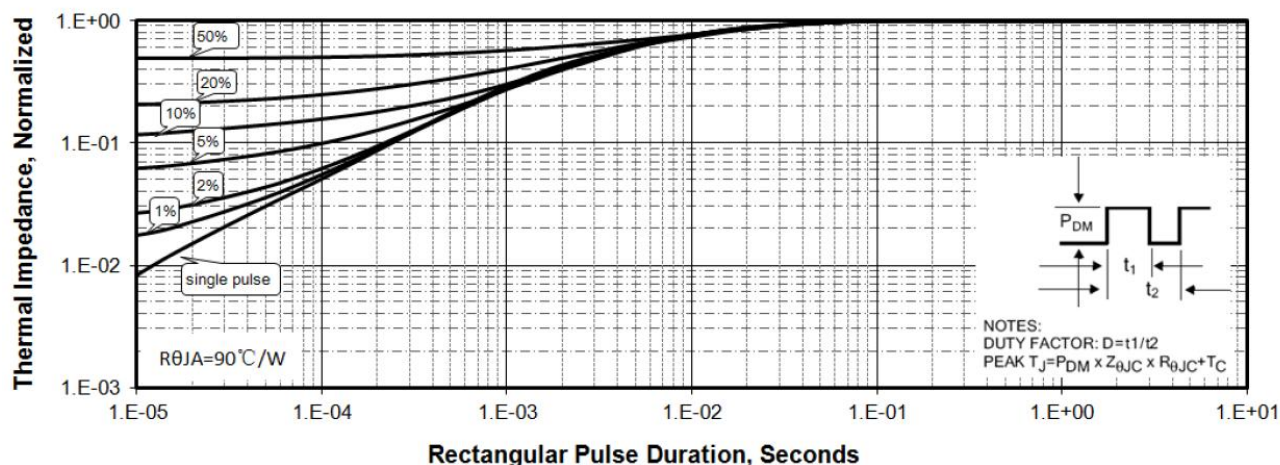


Figure 2.1. Max. Power Dissipation vs Case Temperature

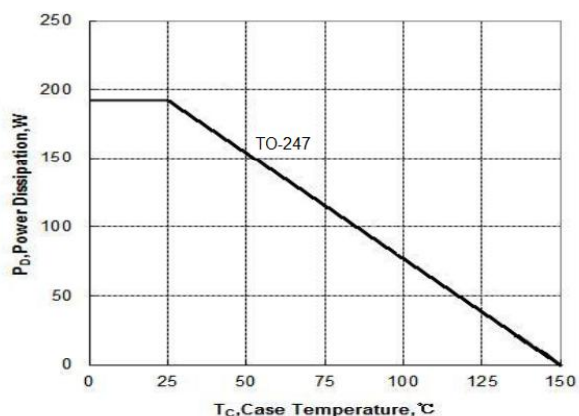


Figure 2.2. Max. Power Dissipation vs Case Temperature

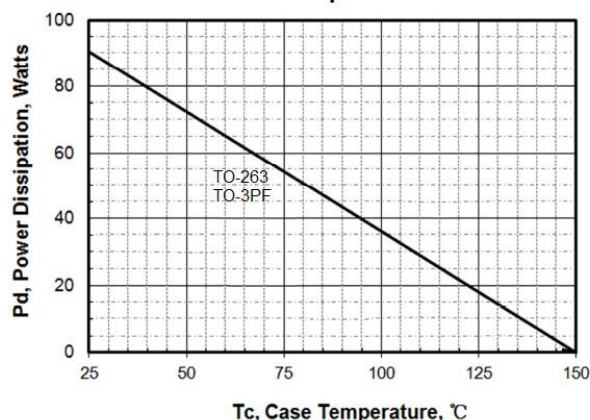


Figure 3. Maximum Continuous Drain Current vs T_C

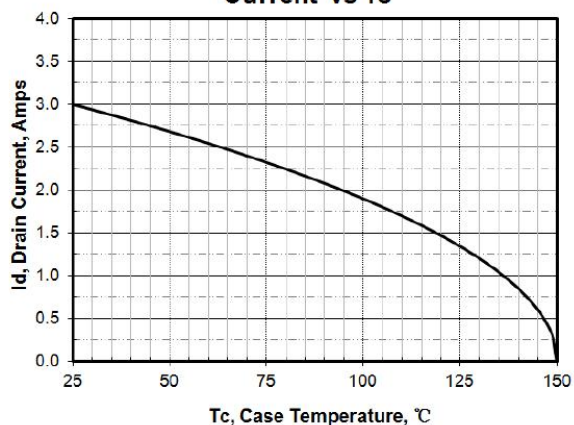


Figure 4. Output Characteristics

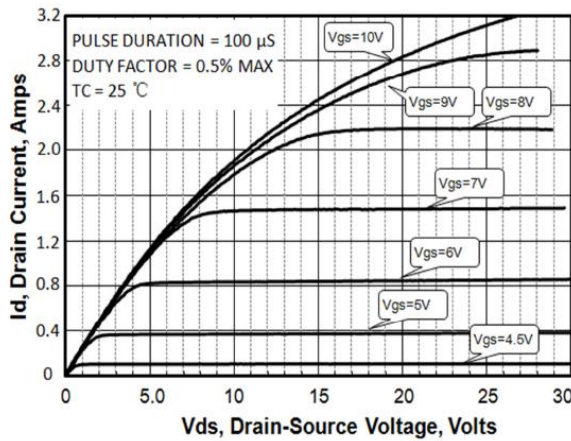


Figure 5. Rds(on) vs Gate Voltage

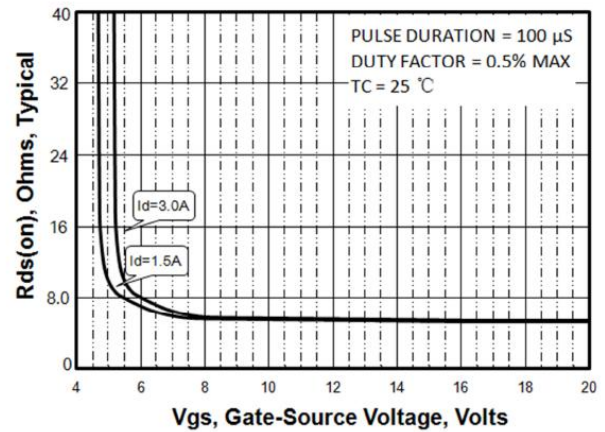


Figure 6. Peak Current Capability

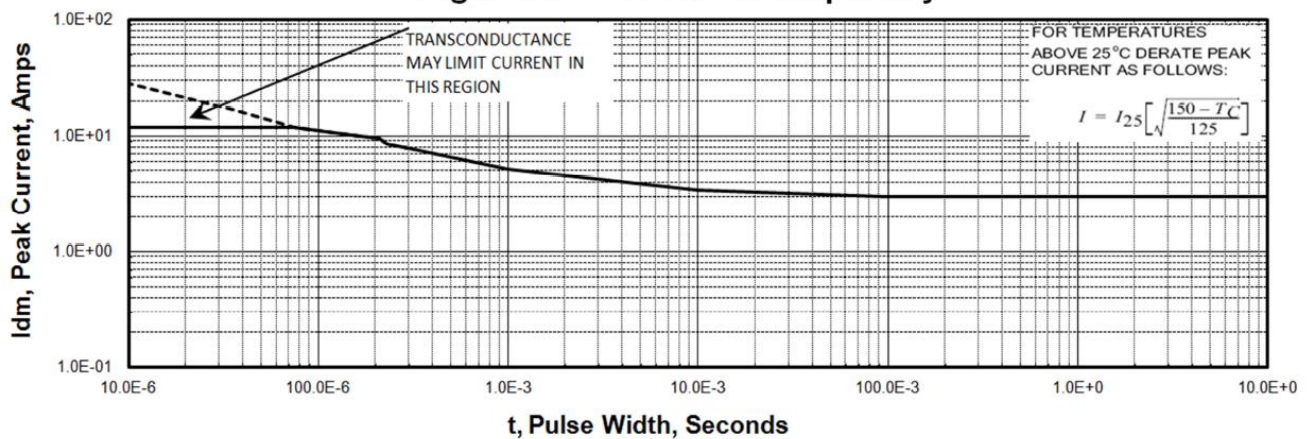


Figure 7. Transfer Characteristics

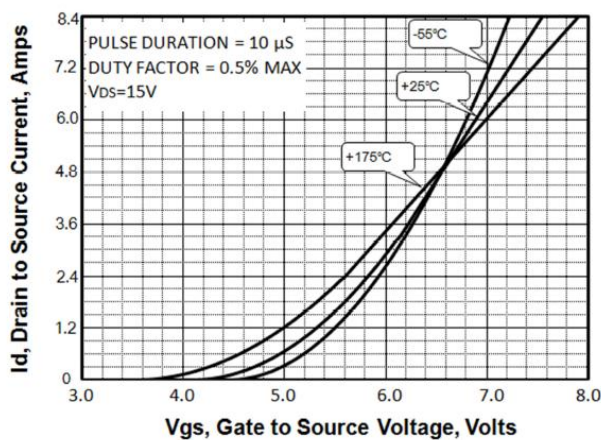


Figure 8. Unclamped Inductive Switching Capability

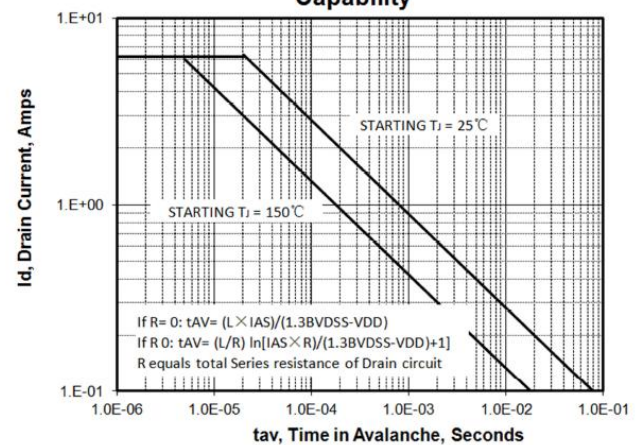


Figure 9. Drain to Source ON Resistance vs Drain Current

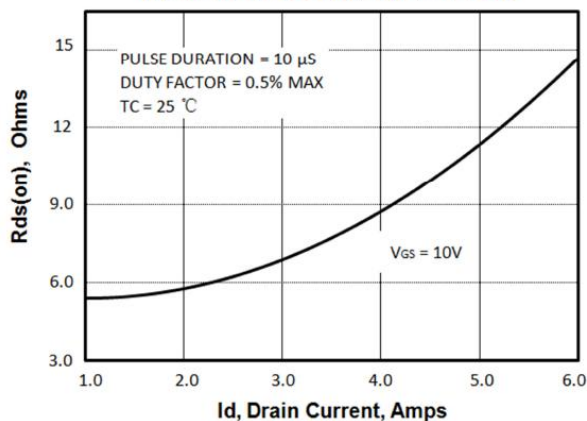


Figure 10. $R_{ds(on)}$ vs Junction Temperature

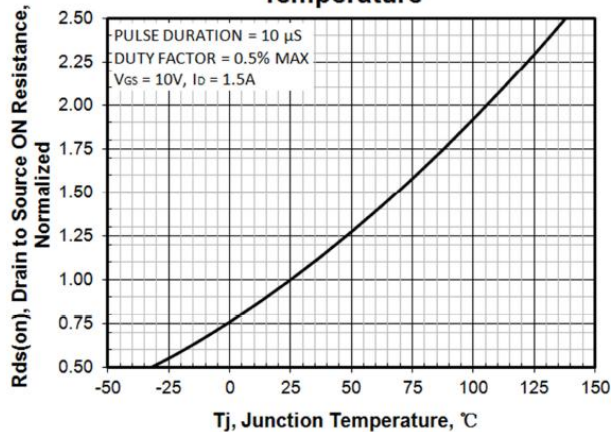


Figure 11. Breakdown Voltage vs Temperature

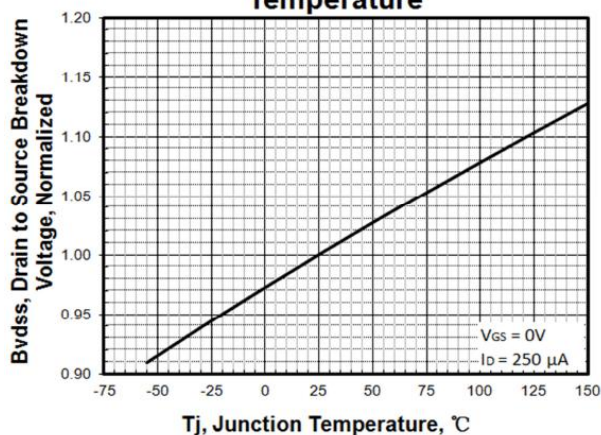


Figure 12. Threshold Voltage vs Temperature

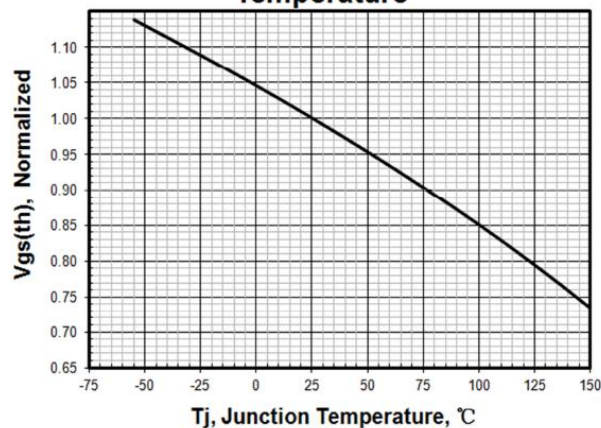


Figure 13 . Maximum Safe Operating Area

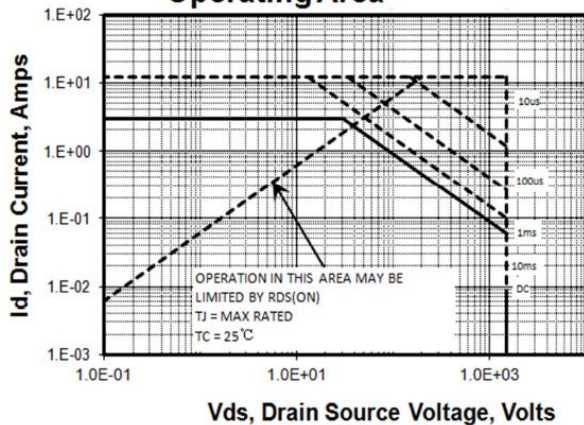


Figure 14. Body Diode Transfer Characteristics

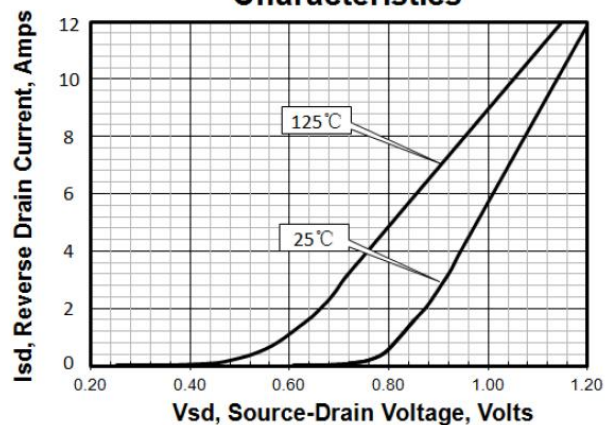


Figure 15. Capacitance vs Vds

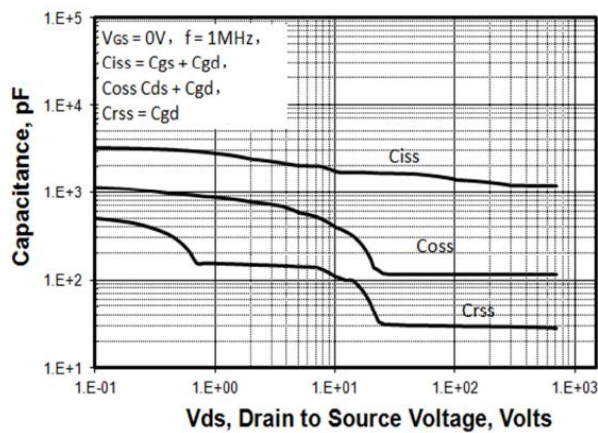
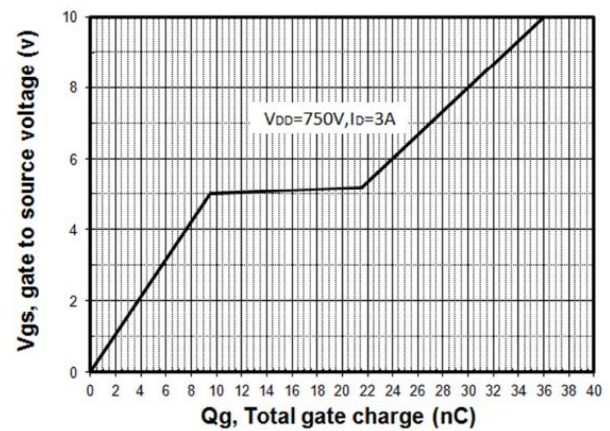


Figure 16 .Typical Gate Charge



9. Test Circuits and Waveforms

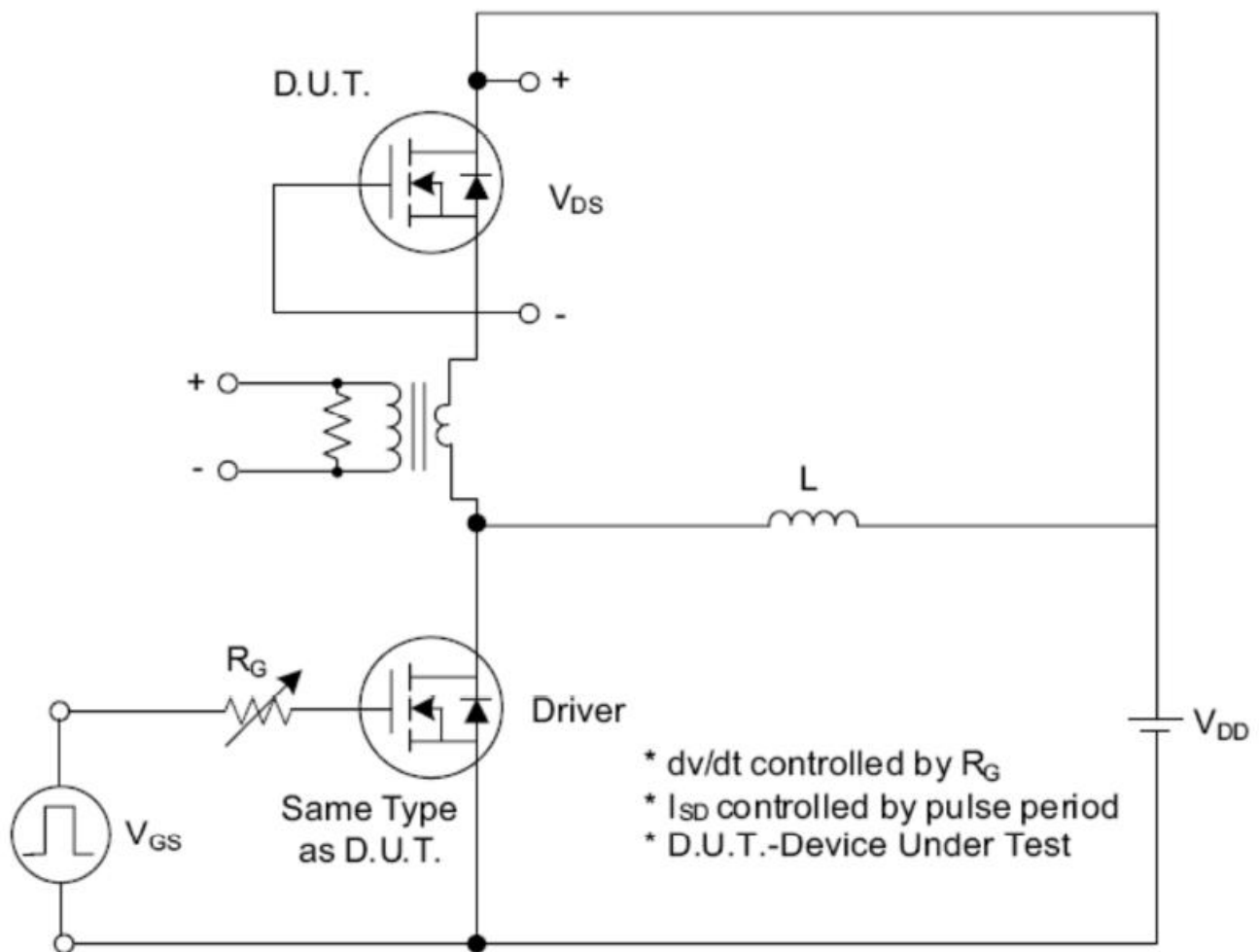


Fig. 1.1 Peak Diode Recovery dv/dt Test Circuit

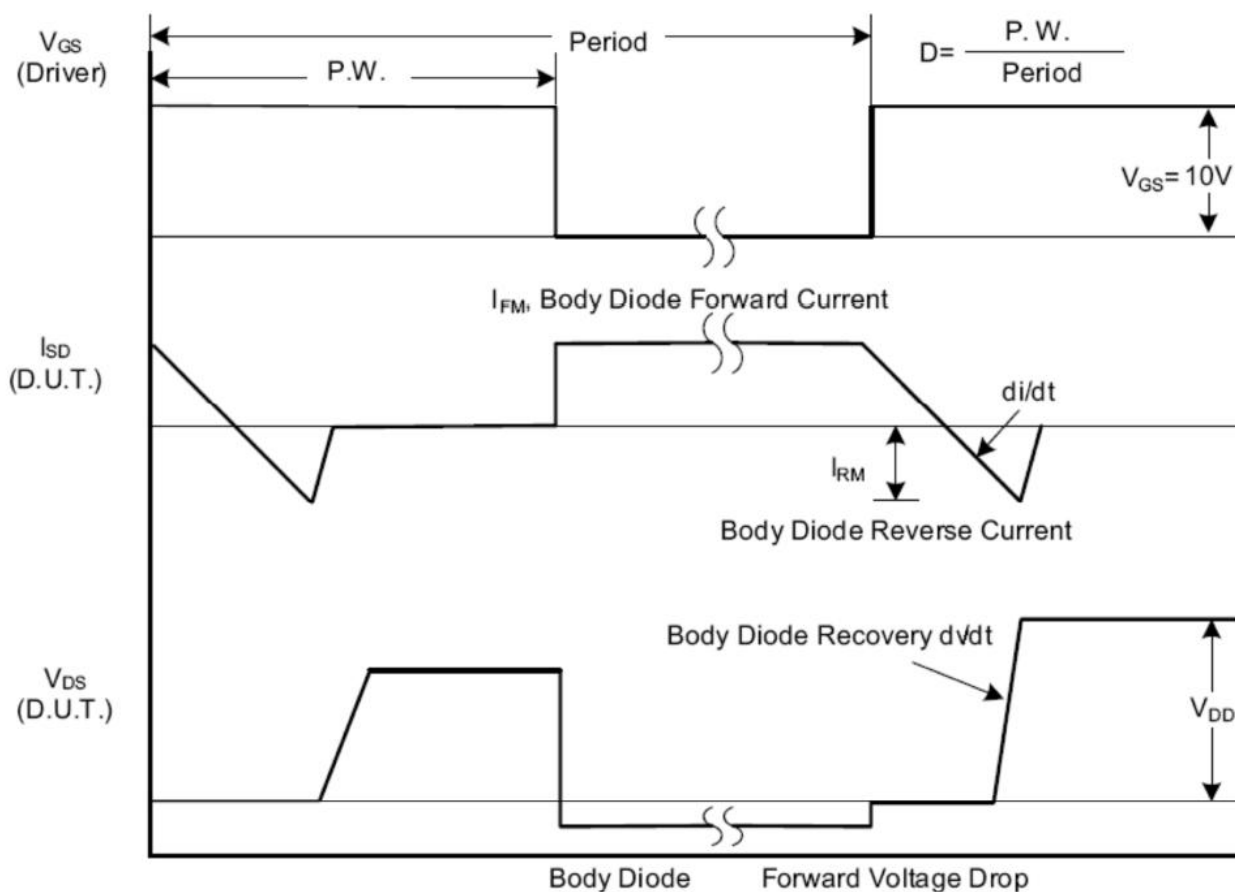


Fig. 1.2 Peak Diode Recovery dv/dt Waveforms

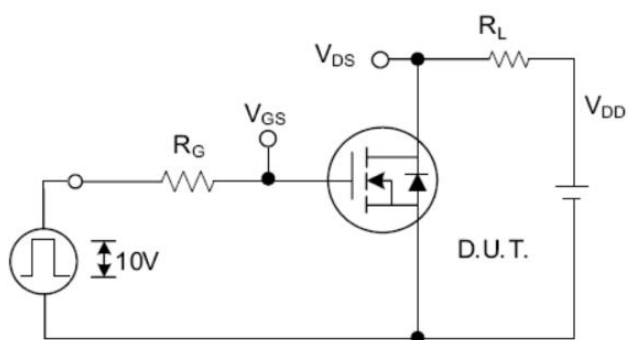


Fig. 2.1 Switching Test Circuit

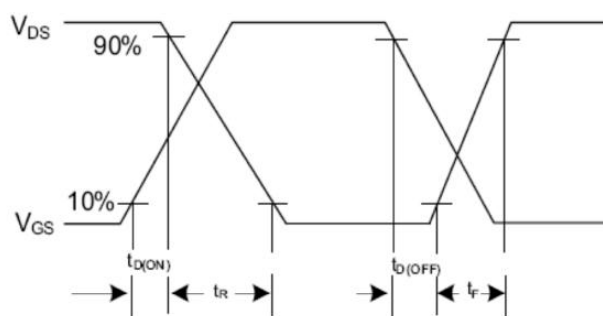


Fig. 2.2 Switching Waveforms

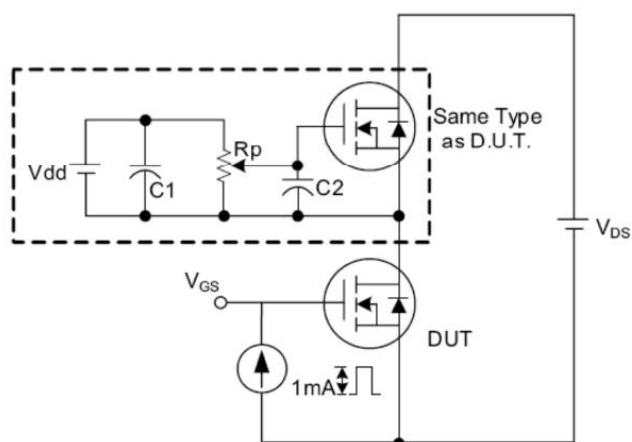


Fig. 3.1 Gate Charge Test Circuit

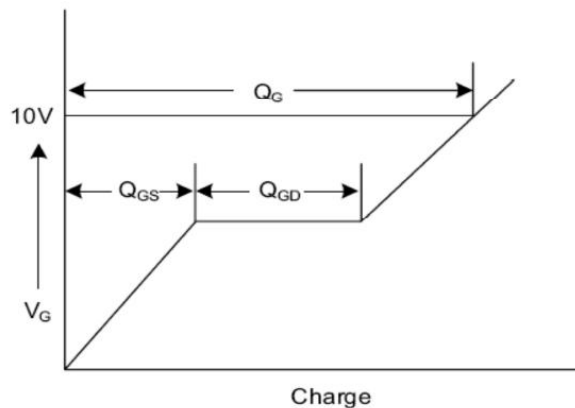


Fig. 3.2 Gate Charge Waveform

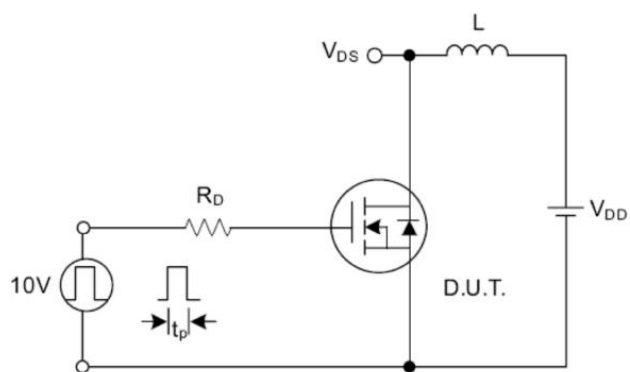


Fig. 4.1 Unclamped Inductive Switching Test Circuit

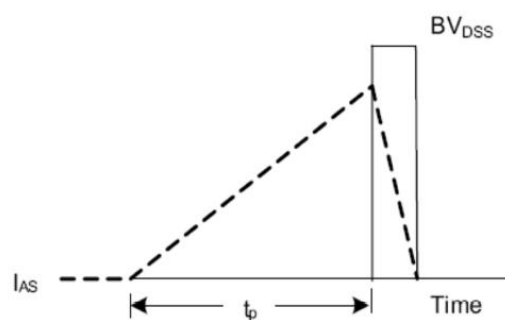


Fig. 4.2 Unclamped Inductive Switching Waveforms