AUK Semiconductor

STK7006P

Advanced Power MOSFET

SWITCHING REGURATOR APPLICATIONS

Features

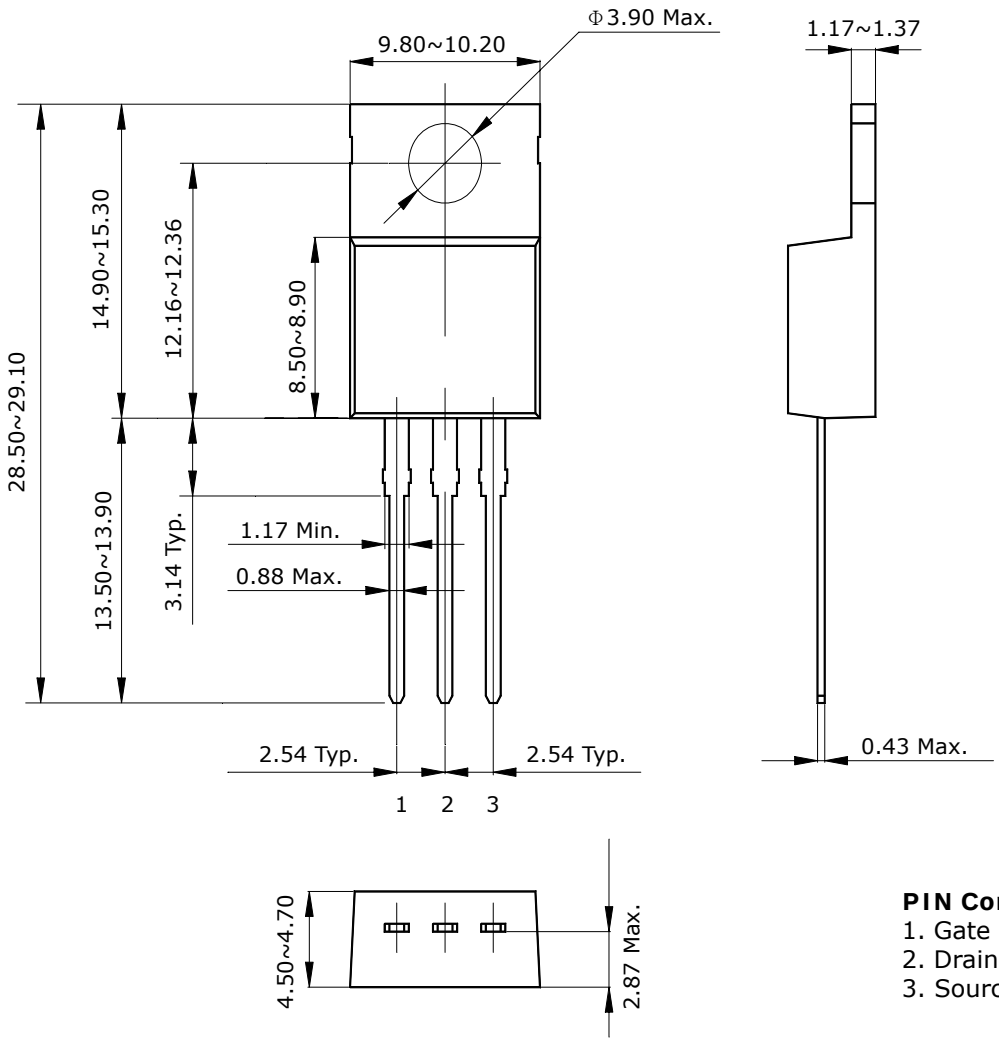
- High Voltage: BV_{DSS}=60V(Min.)
- Low C_{rss} : C_{rss}=84pF(Typ.)
- Low gate charge : Qg=26.7nC(Typ.)
- Low $R_{DS(on)}$:$R_{DS(on)}$=16mΩ(Max.)

Ordering Information

Type NO.	Marking	Package Code
STK7006P	STK7006	TO-220AB-3L

Outline Dimensions

unit : mm



PIN Connections
1. Gate
2. Drain
3. Source

Absolute maximum ratings (Tc=25°C)

Characteristic	Symbol	Rating	Unit
Drain-Source voltage	V_{DSS}	60	V
Gate-Source voltage	V_{GSS}	±20	V
Continuous Drain current (Tc=25℃)	I_D	70	A
Continuous Drain current (Tc=100℃)	I_D	48	A
Drain Current-Pulsed ①	I_{DM}	280	A
Power Dissipation (Tc=25℃)	P_D	147	W
Single Pulsed Avalanche Energy ②	E_{AS}	754	mJ
Avalanche current ①	I_{AR}	70	A
Repetitive Avalanche Energy ①	E_{AR}	14.7	mJ
Junction temperature	T_J	175	°C
Storage temperature range	T_{stg}	-55~175	

Thermal Resistance

Characteristic	Symbol	Typ.	Max	Units
Junction to Case	$R_{th(J-C)}$	-	1.02	℃/W
Junction to Ambient	$R_{th(J-a)}$	-	62.5	

Electrical Characteristics (Tc=25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Drain-Source breakdown voltage	BV_{DSS}	I_D=250μA, V_{GS}=0	60	-	-	V
Gate-Threshold voltage	$V_{GS(th)}$	I_D=250μA, V_{DS}= V_{GS}	2.0	-	4.0	V
Drain-source leakage current	I_{DSS}	V_{DS}=60V, V_{GS}=0V	-	-	1	μA
Gate-source leakage	I_{GSS}	V_{DS}=0V, V_{GS}=±20V	-	-	±100	nA
Drain-Source on-resistance ④	$R_{DS(ON)}$	V_{GS}=10V, I_D=35A	-	13	16	mΩ
Forward transfer admittance ④	g_{fs}	V_{DS}=20V, I_D=35A	-	22	-	S
Input capacitance	Ciss	V_{GS}=0V, V_{DS}=25V, f=1MHz	-	2273	2935	pF
Output capacitance	Coss		-	722	940	
Reverse transfer capacitance	Crss		-	83	108	
Turn-on delay time	$t_{d(on)}$	V_{DD}=30V, I_D=35A R_G=25Ω ④⑤	-	20	50	ns
Rise time	t_r		-	200	420	
Turn-off delay time	$t_{d(off)}$		-	55	120	
Fall time	t_f		-	75	160	
Total gate charge	Q_g	V_{DS}=48V, V_{GS}=10V, I_D=70A ④⑤	-	43	56	nC
Gate-source charge	Q_{gs}		-	7.9	-	
Gate-drain("Miller")charge	Q_{gd}		-	15.0	-	

Source-Drain Diode Ratings and Characteristics (Tc=25°C)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Units
Continuous source current	I_S	Integral reverse diode in the MOSFET	-	-	70	A
Pulsed-source current ①	I_{SM}		-	-	280	
Diode forward voltage ④	V_{SD}	V_{GS}=0V, I_S=70A	-	-	1.5	V
Reverse recovery time	t_{rr}	I_s=70A di_F/dt=100A/us ④	-	95	-	ns
Reverse recovery charge	Q_{rr}		-	150	-	uC

Note ;

① Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature

② L=180μH I_{AS}=70A, V_{DD}=25V, R_G=25Ω , starting T_J=25℃

③ I_S ≤ 50A, di/dt≤ 300A/us, V_{DD}≤ BV_{DSS}, starting T_J=25℃

④ Pulse Test : Pulse Width < 300us, Duty cycle≤ 2%

⑤ Essentially independent of operating temperature

Electrical Characteristic Curves

Fig. 1 I_D - V_{DS}

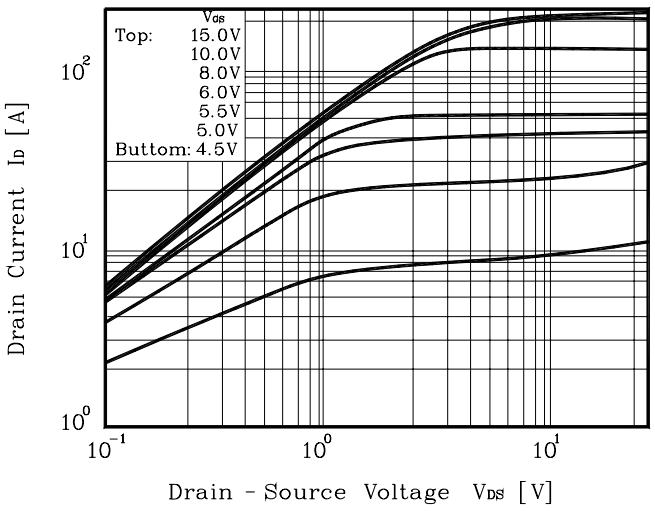


Fig. 2 I_D - V_{GS}

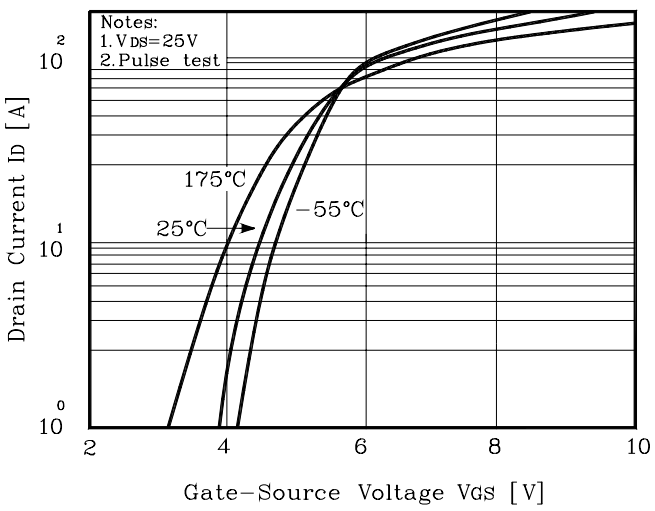


Fig. 3 $R_{DS(on)}$ - I_D

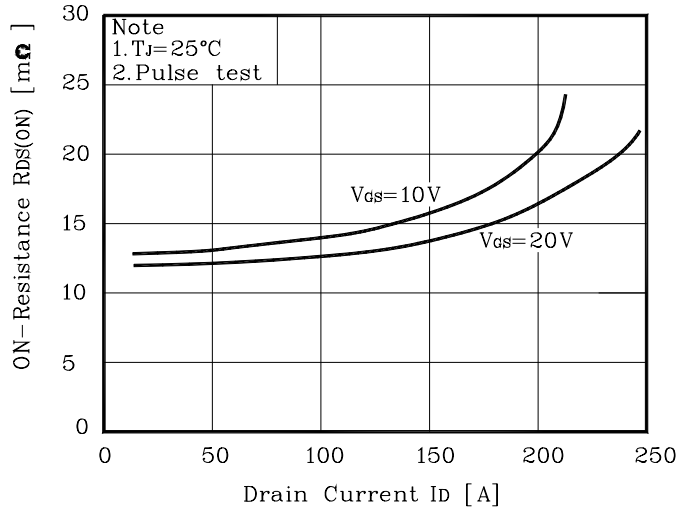


Fig. 4 I_S - V_{SD}

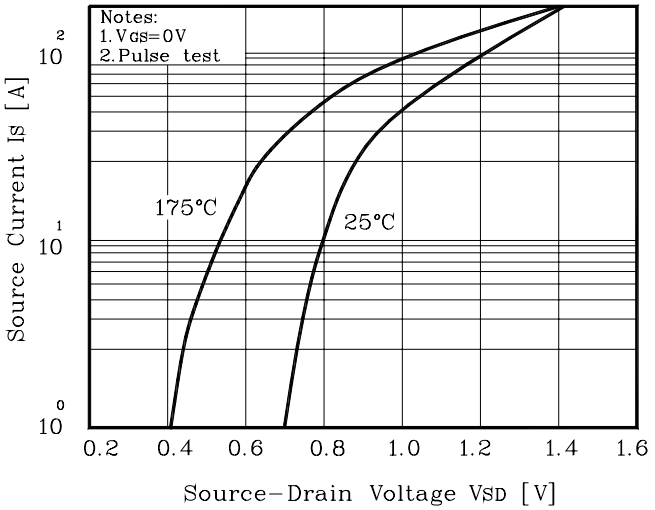


Fig. 5 Capacitance - V_{DS}

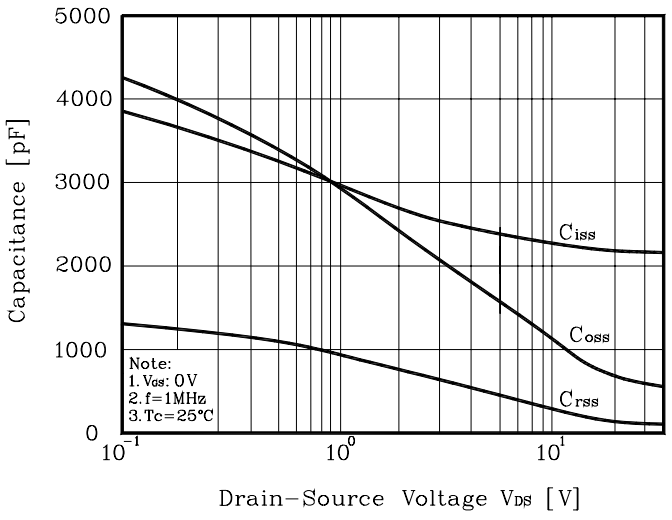


Fig.6 V_{GS} - Q_G

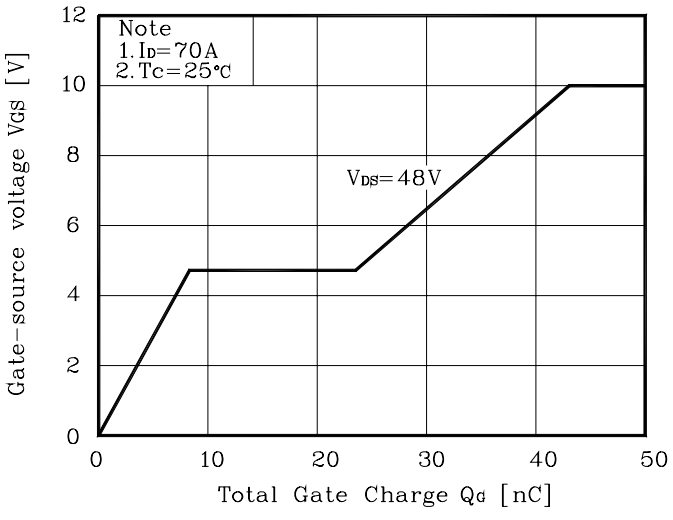


Fig. 7 V_{DSS} - T_J

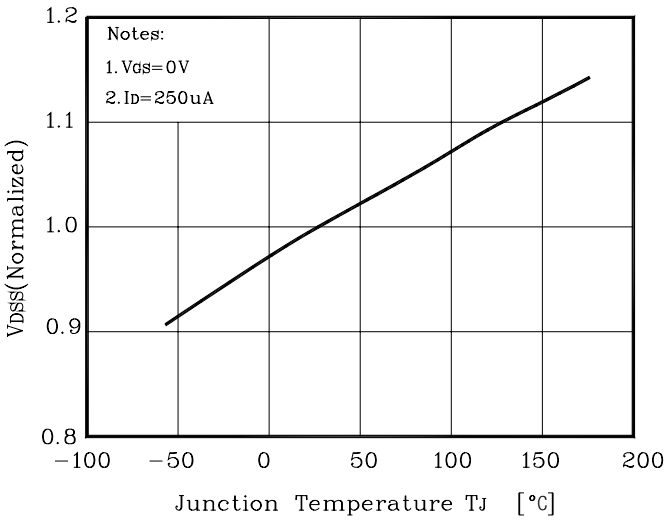


Fig.8 $R_{DS(on)}$ - T_J

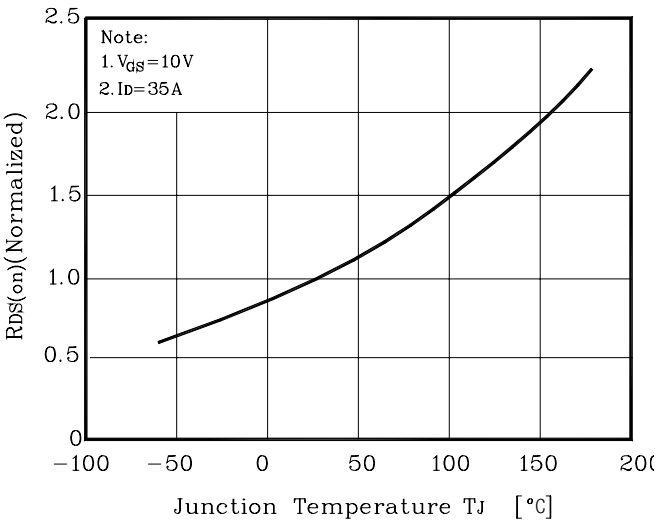


Fig. 9 I_D - T_C

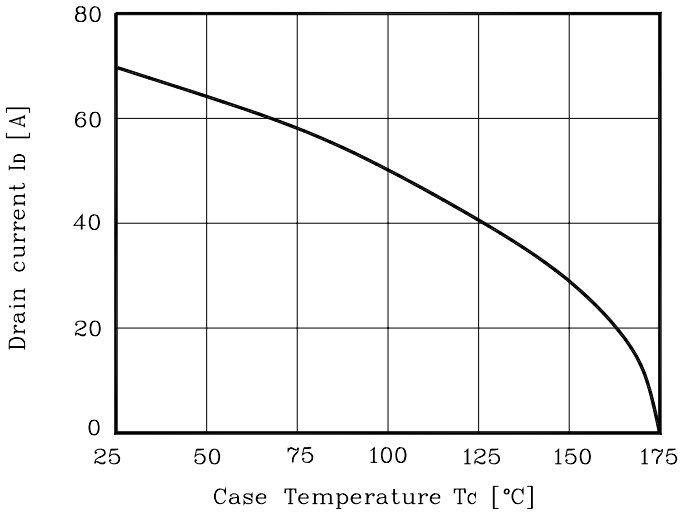


Fig. 10 Safe Operating Area

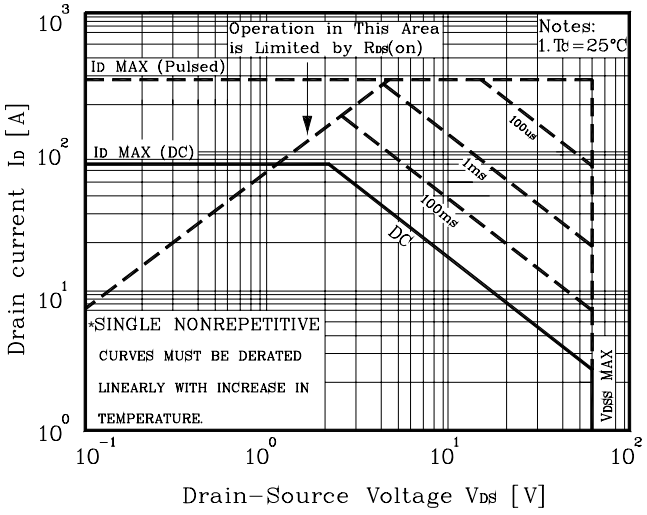


Fig. 10 Gate Charge Test Circuit & Waveform

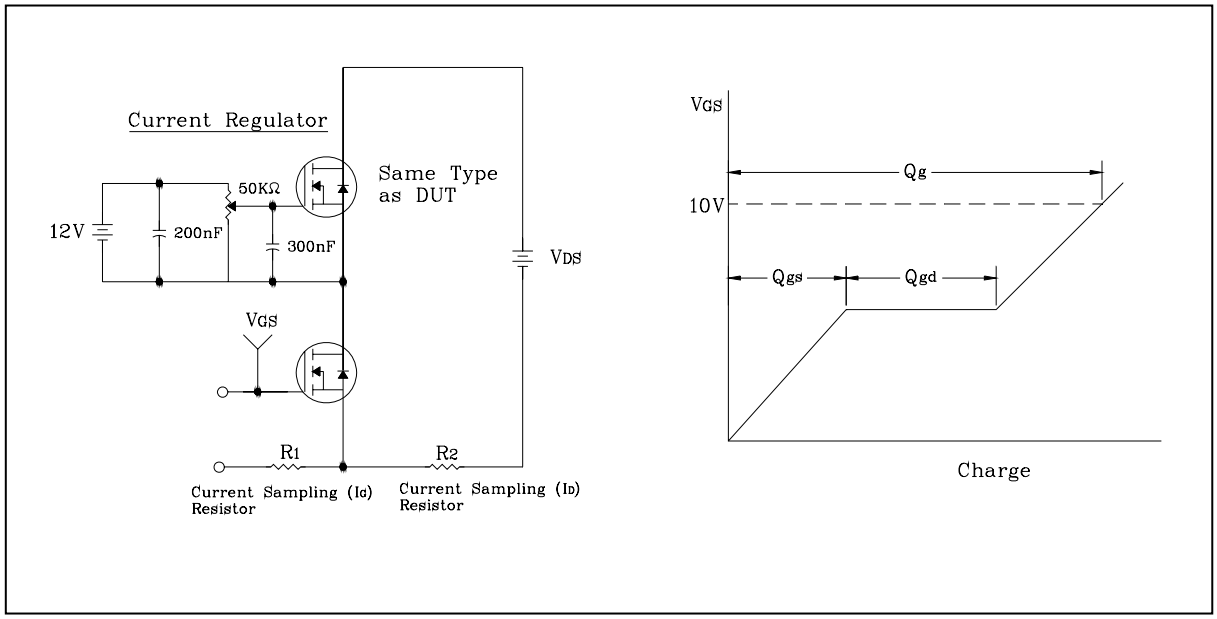


Fig. 11 Resistive Switching Test Circuit & Waveform

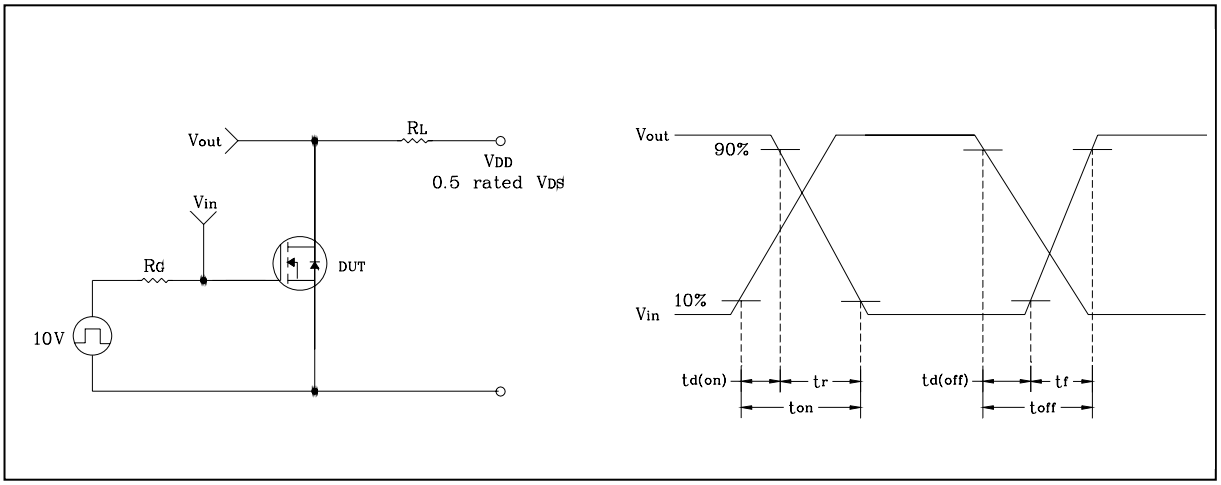


Fig. 12 E_{AS} Test Circuit & Waveform

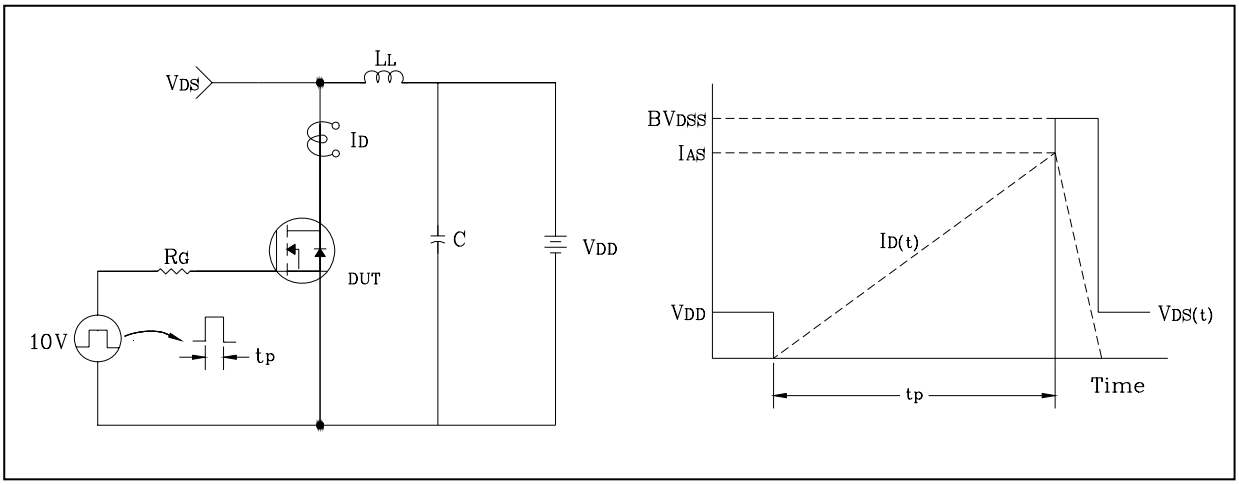
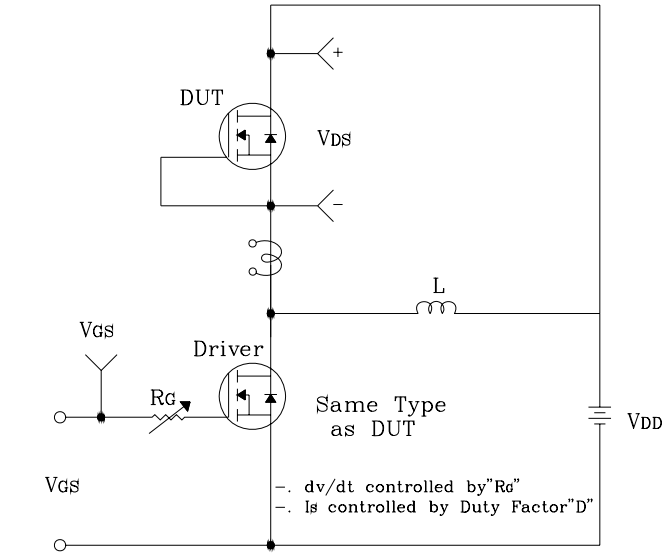
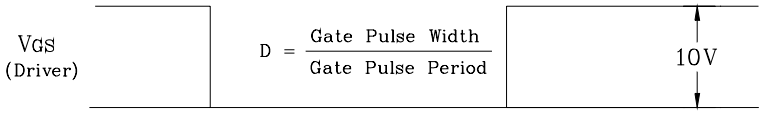
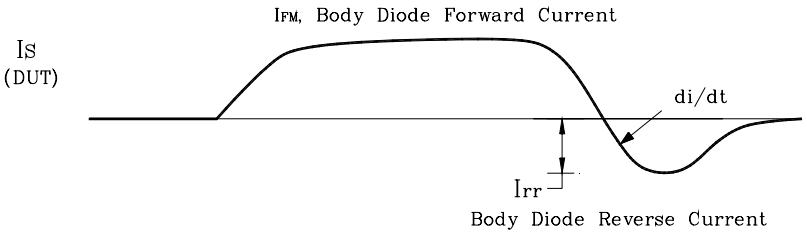
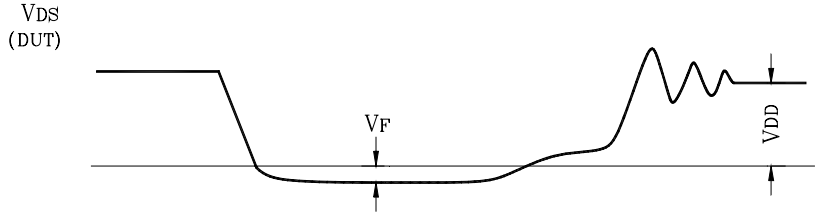


Fig. 13 Diode Reverse Recovery Time Test Circuit & Waveform









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