AUK Semiconductor

STK0765BP

Advanced Power MOSFET

SWITCHING REGULATOR APPLICATIONS

Features

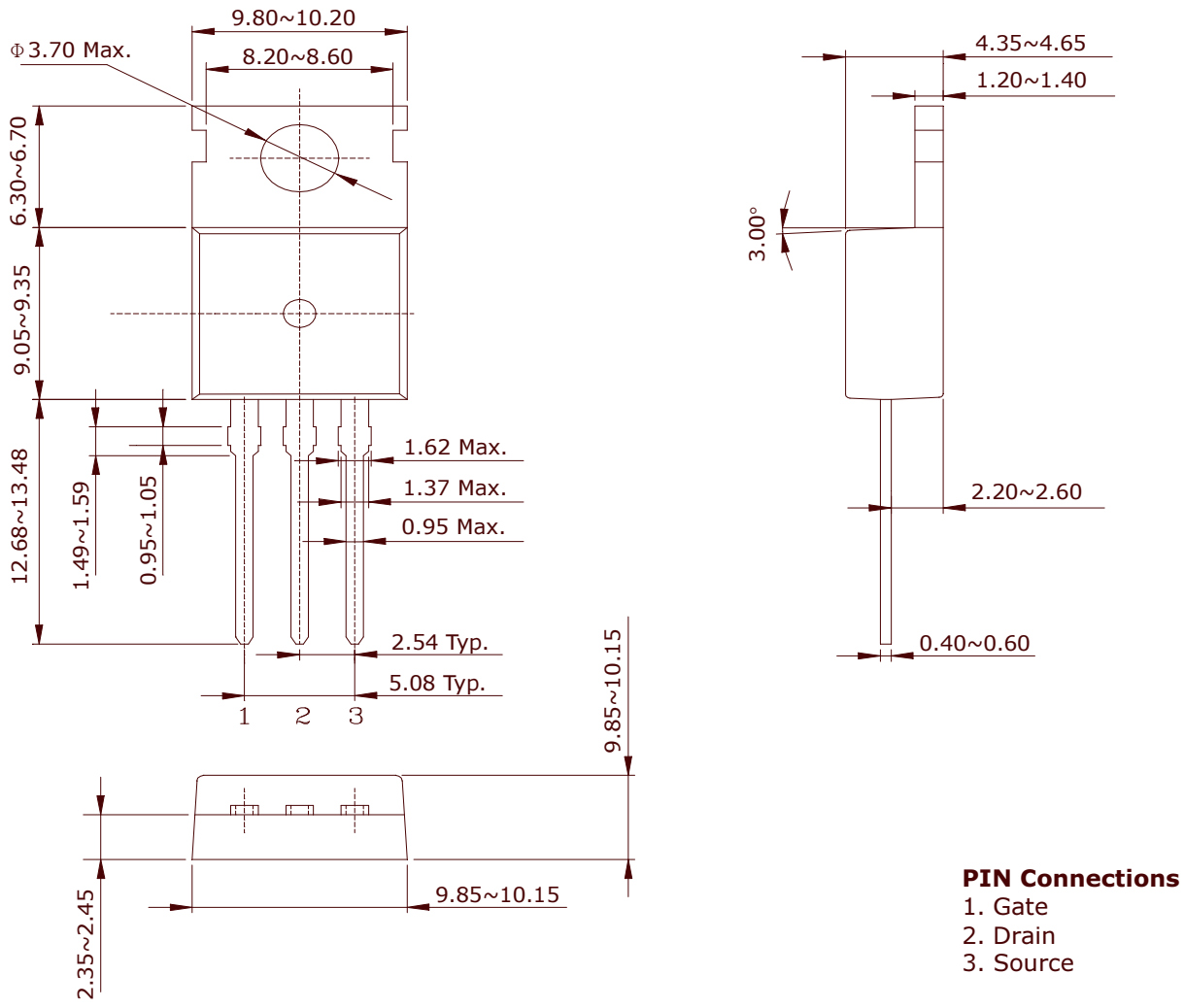
- High Voltage: BV_{DSS}=650V(Min.)
- Low C_{rss} : C_{rss}=13pF(Typ.)
- Low gate charge : Qg=32nC(Typ.)
- Low $R_{DS(on)}$:$R_{DS(on)}$=1.2Ω(Typ.)

Ordering Information

Type NO.	Marking	Package Code
STK0765BP	STK0765	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}		650	V
Gate-source voltage		V_{GSS}		±30	V
Drain current (DC)		I_D	(Tc=25℃)	7	A
			(Tc=100℃)	4.4	A
Drain current (Pulsed) *		I_{DM}		28	A
Drain power dissipation		P_D		100	W
Avalanche current (Single)	②	I_{AS}		7	A
Single pulsed avalanche energy	②	E_{AS}		420	mJ
Avalanche current (Repetitive)	①	I_{AR}		7	A
Repetitive avalanche energy	①	E_{AR}		14.7	mJ
Junction temperature		T_J		150	°C
Storage temperature range		T_{stg}		-55~150	

* Limited by maximum junction temperature

Characteristic		Symbol	Typ.	Max	Unit
Thermal resistance	Junction-case	$R_{th(J-C)}$	-	1.25	℃/W
	Junction-ambient	$R_{th(J-a)}$	-	83.3	

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	650	-	-	V
Gate threshold voltage	$V_{GS(th)}$	I_D=250μA, V_{DS}= V_{GS}	2.0	-	4.0	V
Drain-source cut-off current	I_{DSS}	V_{DS}=650V, V_{GS}=0V	-	-	1	μA
Gate leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±30V	-	-	±100	nA
Drain-source on-resistance ④	$R_{DS(ON)}$	V_{GS}=10V, I_D=3.5A	-	1.2	1.6	Ω
Forward transfer conductance ④	g_{fs}	V_{DS}=10V, I_D=5.0A	-	8.1	-	S
Input capacitance	Ciss	V_{GS}=0V, V_{DS}=25V f=1MHz	-	974	1460	pF
Output capacitance	Coss		-	105	236	
Reverse transfer capacitance	Crss		-	13	20	
Turn-on delay time	$t_{d(on)}$	V_{DD}=325V, I_D=7A R_G=25Ω ③④	-	18	-	ns
Rise time	t_r		-	19	-	
Turn-off delay time	$t_{d(off)}$		-	72	-	
Fall time	t_f		-	28	-	
Total gate charge	Q_g	V_{DS}=325V, V_{GS}=10V I_D=7A ③④	-	32	48	nC
Gate-source charge	Q_{gs}		-	6.5	9.8	
Gate-drain charge	Q_{gd}		-	11	17	

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

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Source current (DC)	I_S	Integral reverse diode in the MOSFET	-	-	7	A
Source current (Pulsed) ①	I_{SM}		-	-	28	
Forward voltage ④	V_{SD}	V_{GS}=0V, I_S=7A	-	-	1.4	V
Reverse recovery time	t_{rr}	I_s=7A, V_{GS}=0, di_S/dt=100A/ us	-	648	-	ns
Reverse recovery charge	Q_{rr}		-	4.8	-	uC

Note ;

① Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature

② L=15.7mH, I_{AS}=7A, V_{DD}=50V, R_G=27Ω

③ Pulse Test : Pulse Width < 300us, Duty cycle≤ 2%

④ Essentially independent of operating temperature

Electrical Characteristic Curves

Fig. 1 I_D - V_{DS}

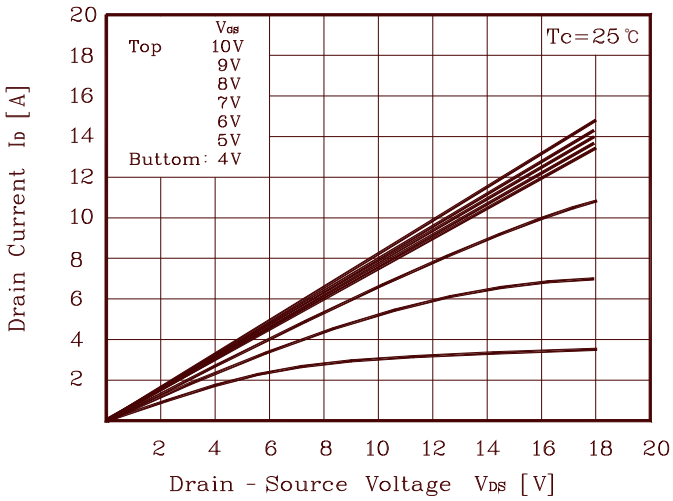


Fig. 2 I_D - V_{GS}

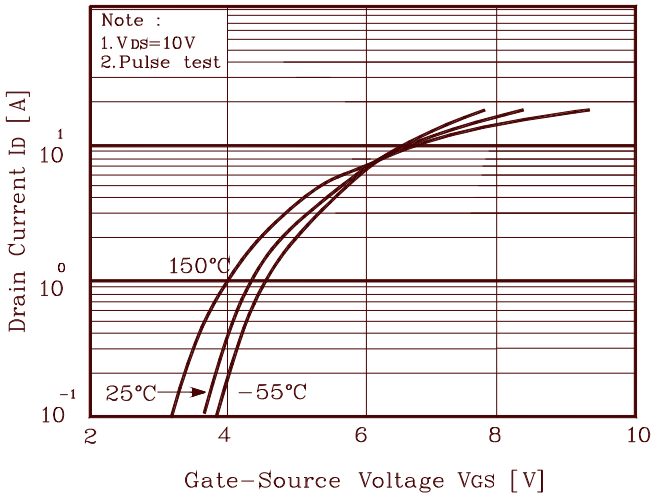


Fig. 3 $R_{DS(on)}$ - I_D

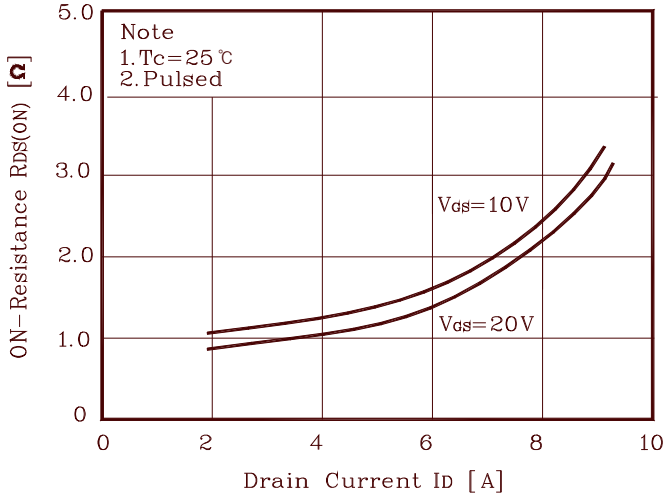


Fig. 4 I_S - V_{SD}

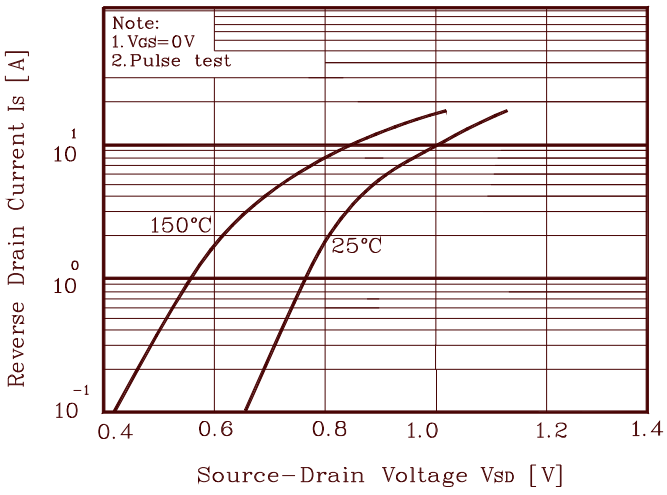


Fig. 5 Capacitance - V_{DS}

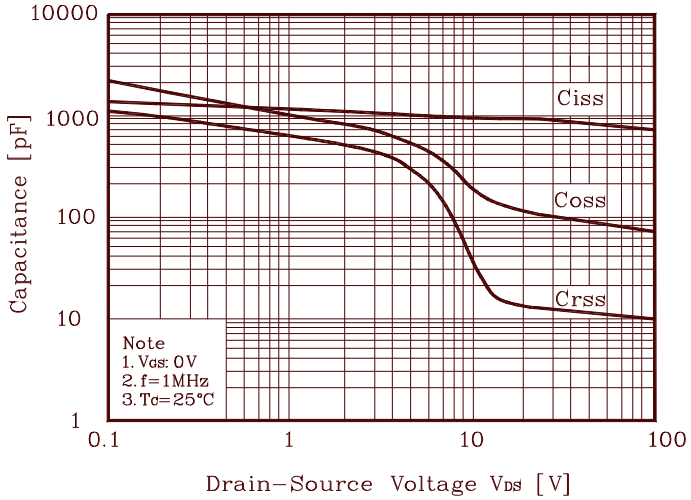


Fig.6 V_{GS} - Q_G

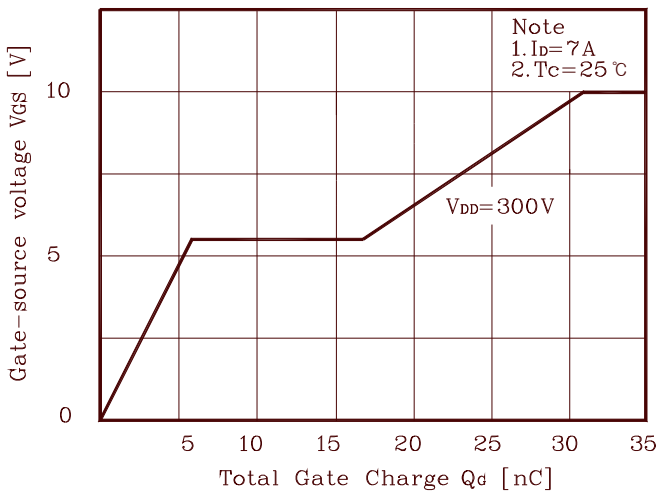


Fig. 7 V_{DSS} - T_J

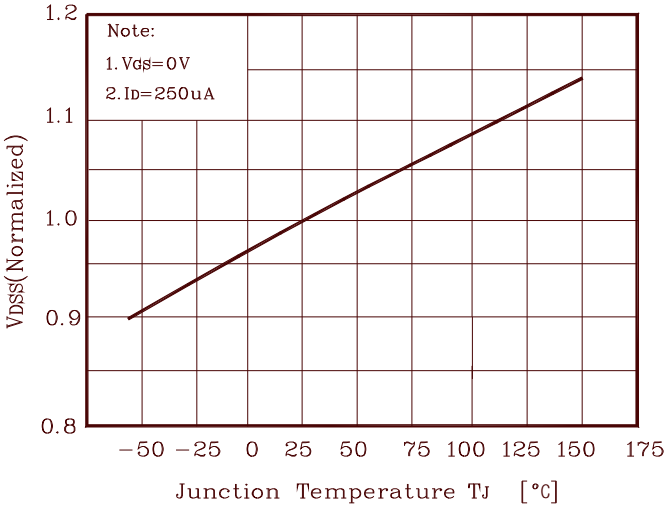


Fig.8 $R_{DS(on)}$ - T_J

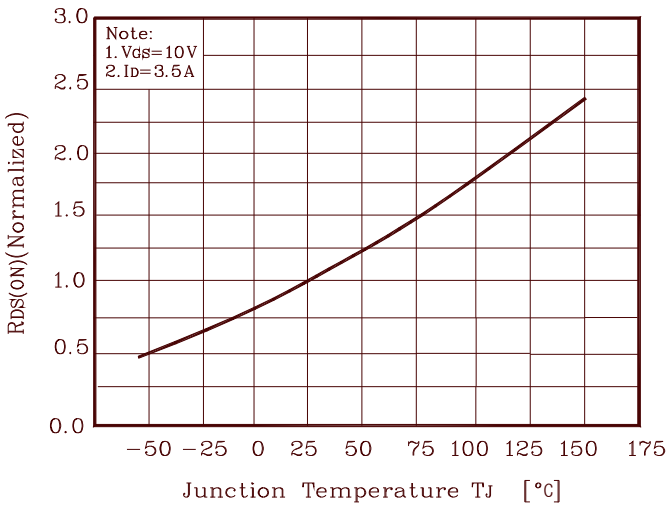


Fig. 9 I_D - T_C

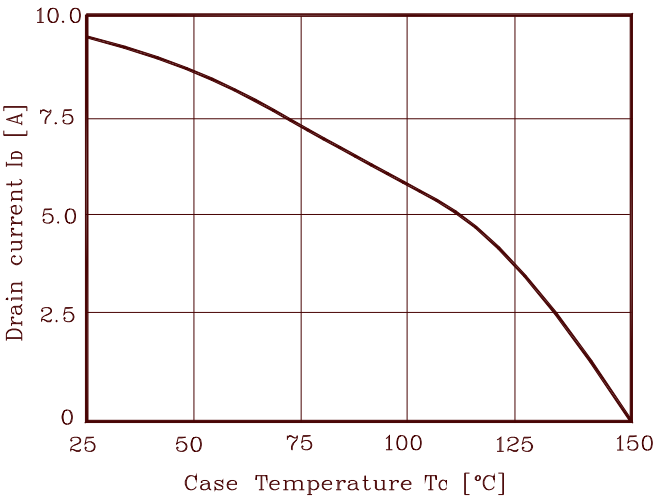


Fig. 10 Safe Operating Area

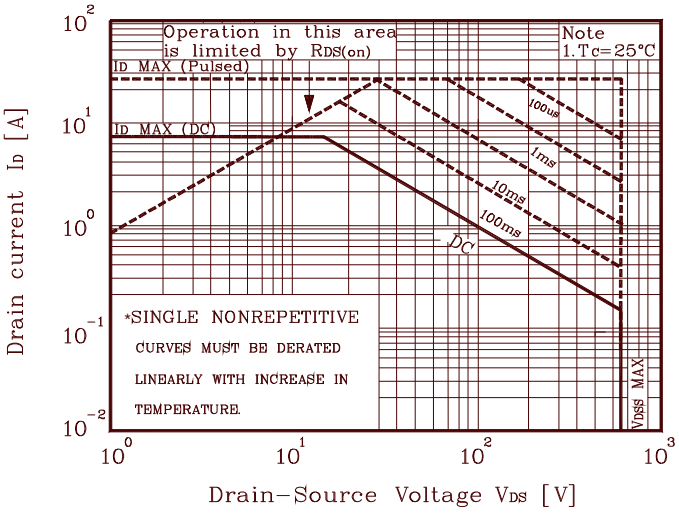


Fig. 10 Gate Charge Test Circuit & Waveform

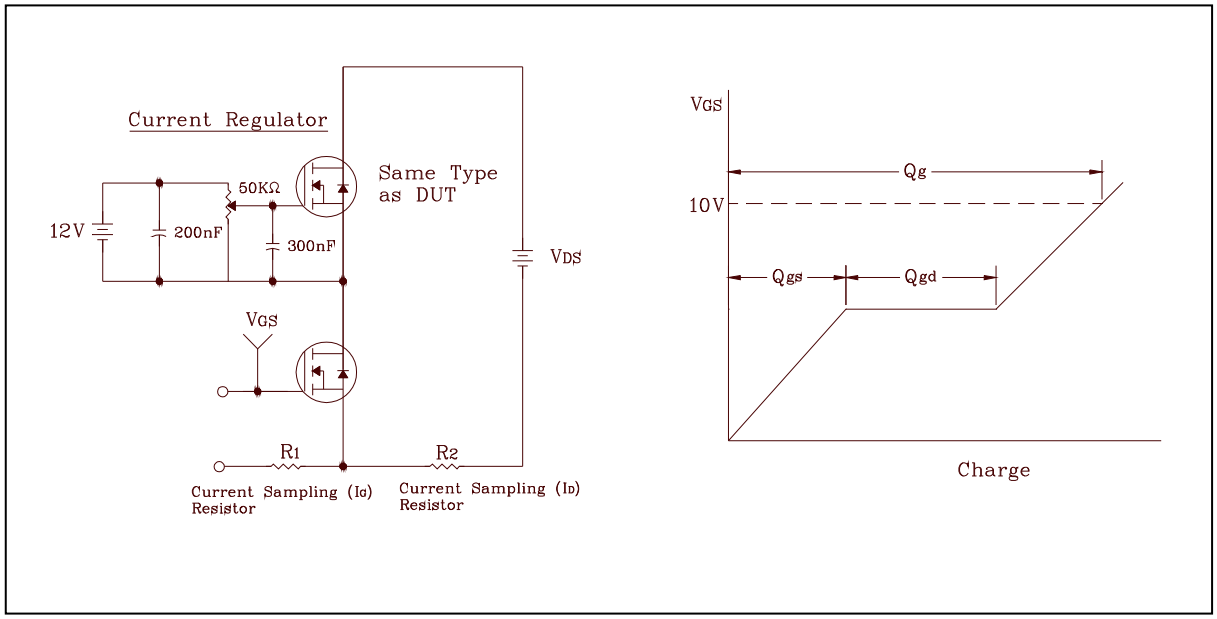


Fig. 11 Resistive Switching Test Circuit & Waveform

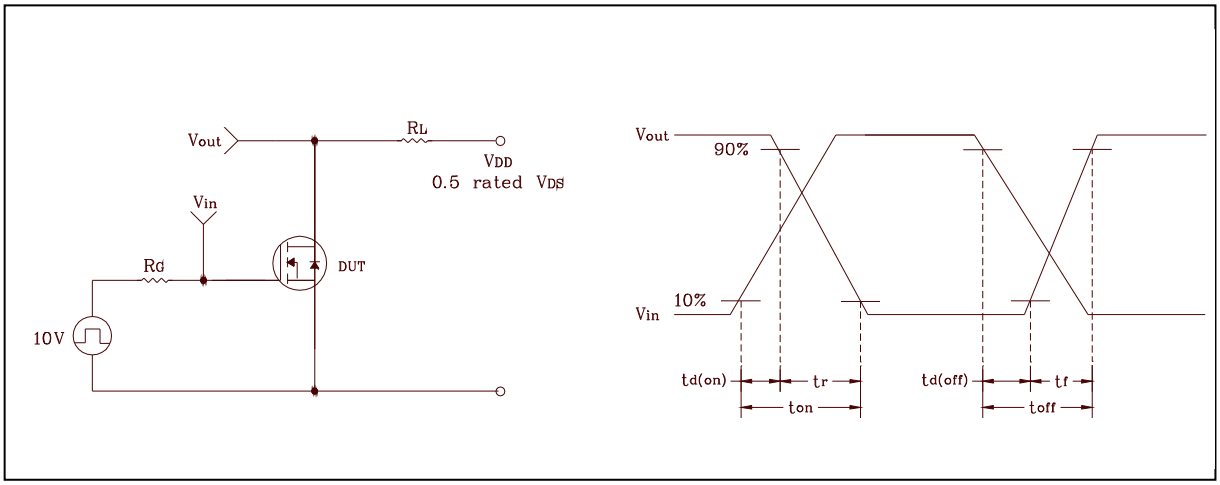


Fig. 12 E_{AS} Test Circuit & Waveform

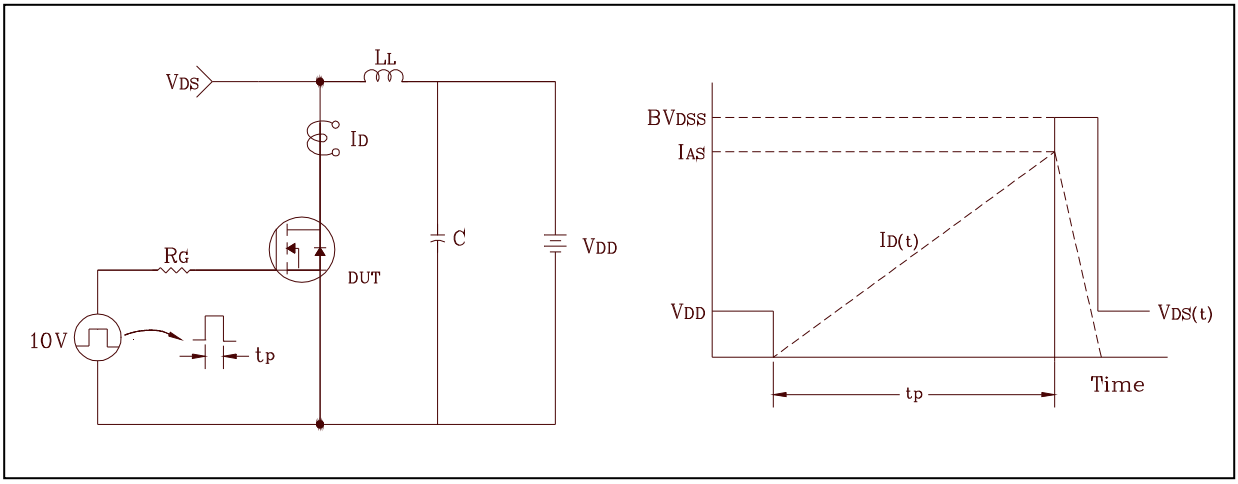
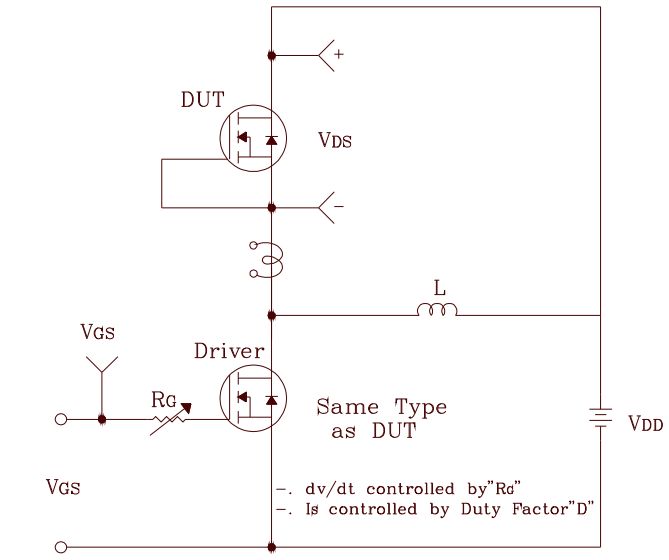
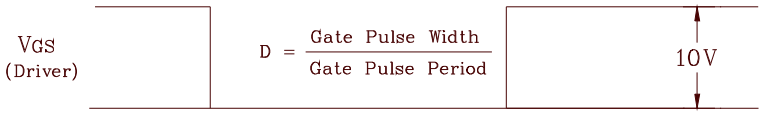
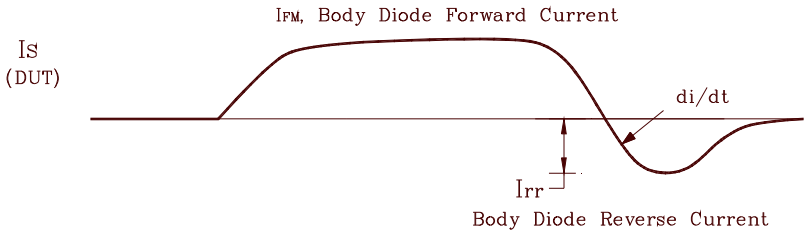
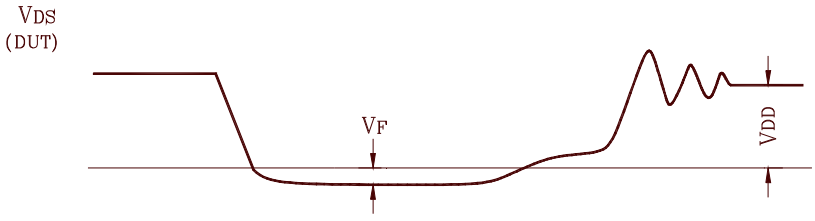


Fig. 13 Diode Reverse Recovery Time Test Circuit & Waveform









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