

SWITCHING REGURATOR APPLICATIONS

Features

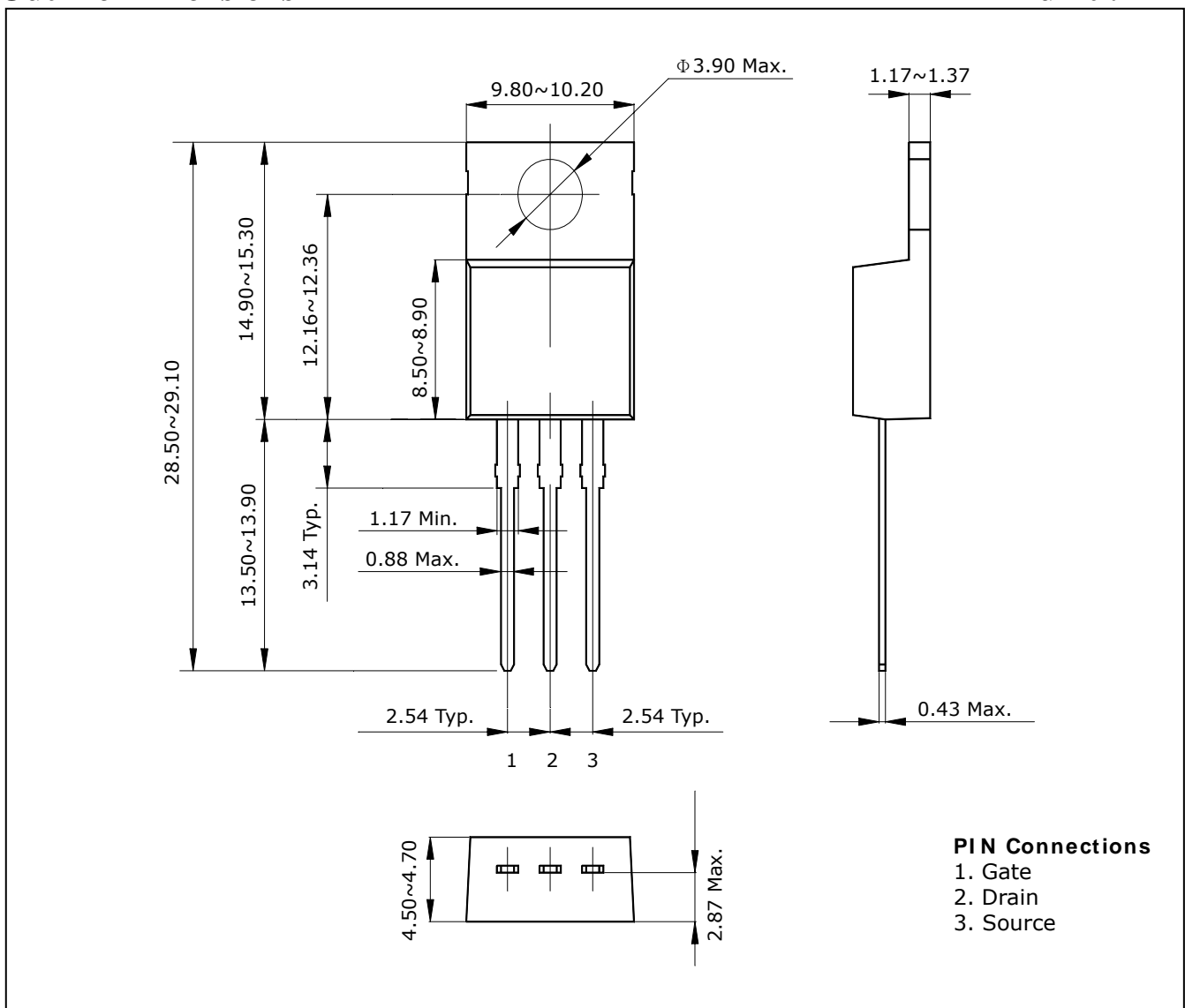
- High Voltage: $BV_{DSS}=60V(\text{Min.})$
- Low C_{rSS} : $C_{rSS}=84pF(\text{Typ.})$
- Low gate charge : $Qg=26.7nC(\text{Typ.})$
- Low $R_{DS(on)}$: $R_{DS(on)}=16m\Omega(\text{Max.})$

Ordering Information

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

Outline Dimensions

unit : mm



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°C)	I_D	70	A
Continuous Drain current (Tc=100°C)	I_D	48	A
Drain Current-Pulsed ①	I_{DM}	280	A
Power Dissipation (Tc=25°C)	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	°C/W
Junction to Ambient	$R_{th(J-a)}$	-	62.5	

Electrical Characteristics (T_c=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	C _{iss}	V _{GS} =0V, V _{DS} =25V, f=1MHz	-	2273	2935	pF	
Output capacitance	C _{oss}		-	722	940		
Reverse transfer capacitance	C _{rss}		-	83	108		
Turn-on delay time	t _{d(on)}	V _{DD} =30V, I _D =35A R _G =25Ω	-	20	50	ns	
Rise time	t _r		-	200	420		
Turn-off delay time	t _{d(off)}		④ ⑤	-	55		120
Fall time	t _f		-	75	160		
Total gate charge	Q _g	V _{DS} =48V, V _{GS} =10V, I _D =70A	-	43	56	nC	
Gate-source charge	Q _{gs}		-	7.9	-		
Gate-drain("Miller")charge	Q _{gd}		④ ⑤	-	15.0		-

Source-Drain Diode Ratings and Characteristics (T_c=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	-	95	-	ns
Reverse recovery charge	Q _{rr}		④	-	150	-

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°C
- ③ I_S ≤ 50A, di/dt ≤ 300A/us, V_{DD} ≤ BV_{DSS}, starting T_J=25°C
- ④ Pulse Test : Pulse Width < 300us, Duty cycle ≤ 2%
- ⑤ Essentially independent of operating temperature

Electrical Characteristic Curves

Fig. 1 $I_D - V_{DS}$

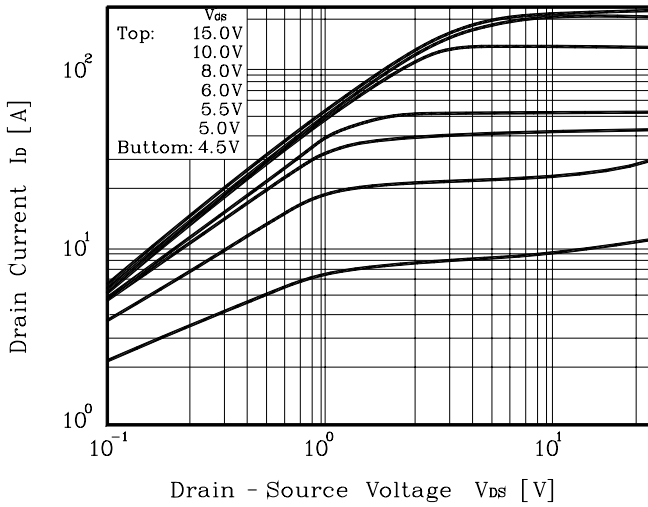


Fig. 2 $I_D - V_{GS}$

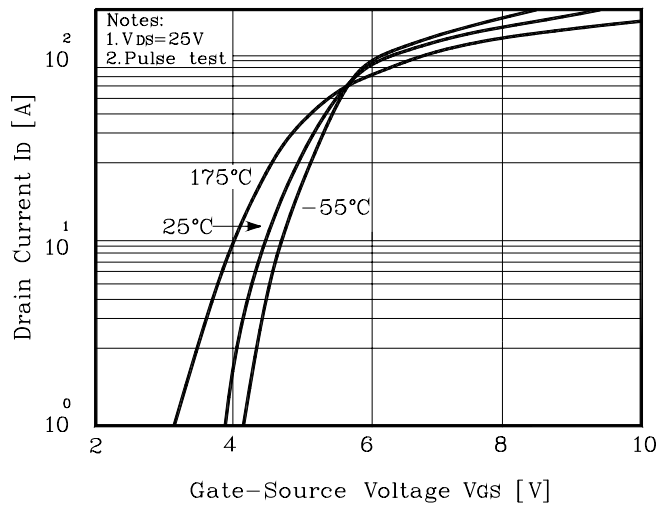


Fig. 3 $R_{DS(on)} - I_D$

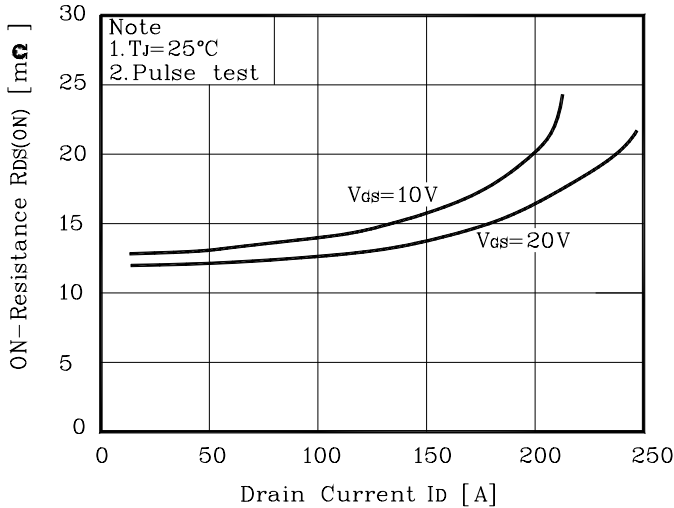


Fig. 4 $I_S - V_{SD}$

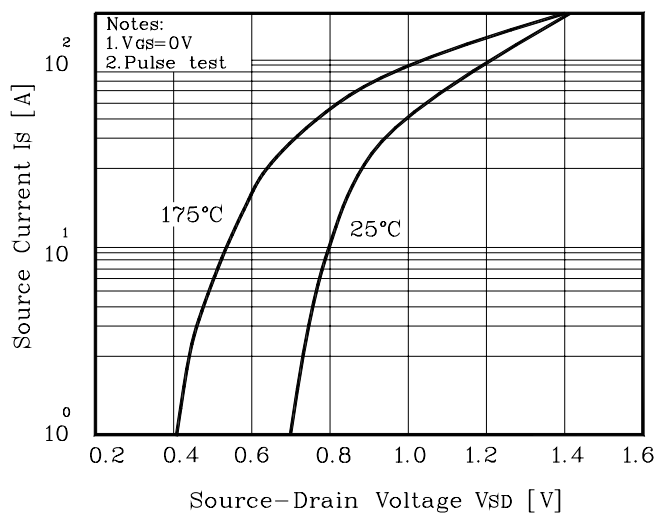


Fig. 5 Capacitance - V_{DS}

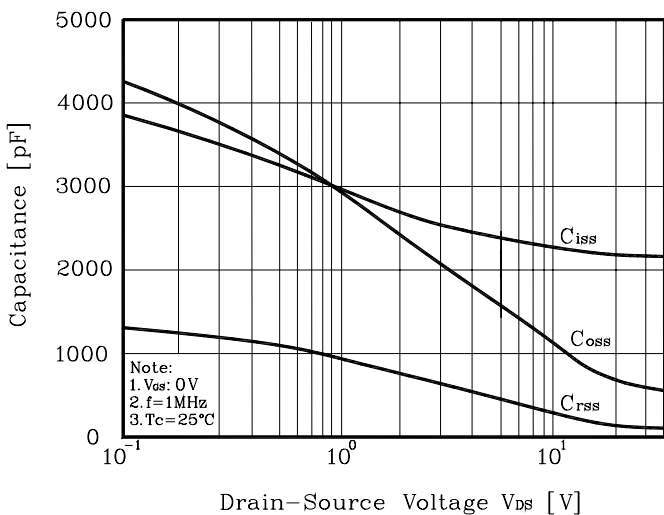


Fig. 6 $V_{GS} - Q_G$

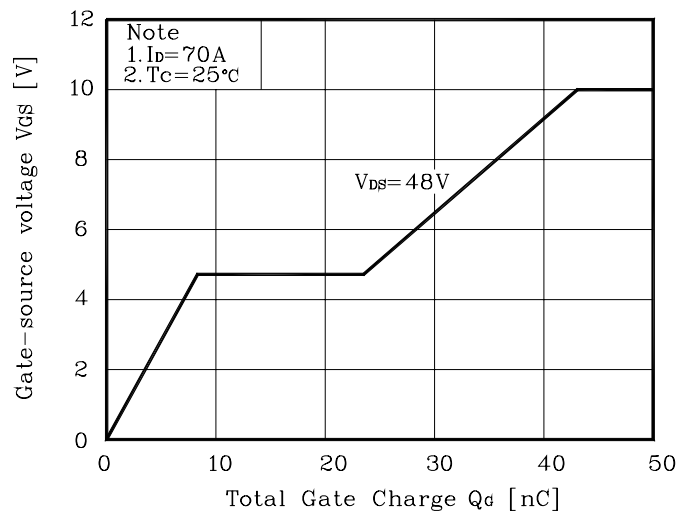


Fig. 7 $V_{DSS} - T_J$

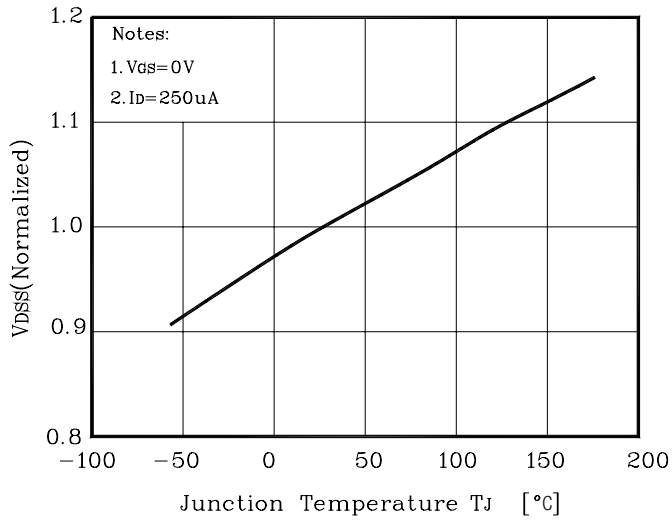


Fig. 8 $R_{DS(on)} - T_J$

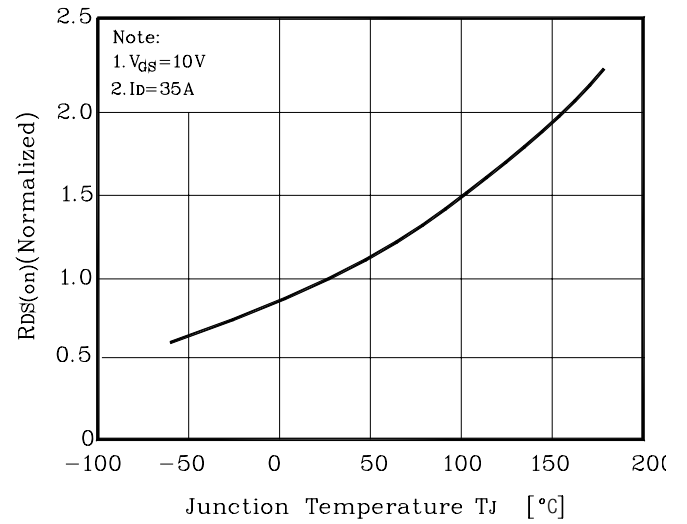


Fig. 9 $I_D - T_C$

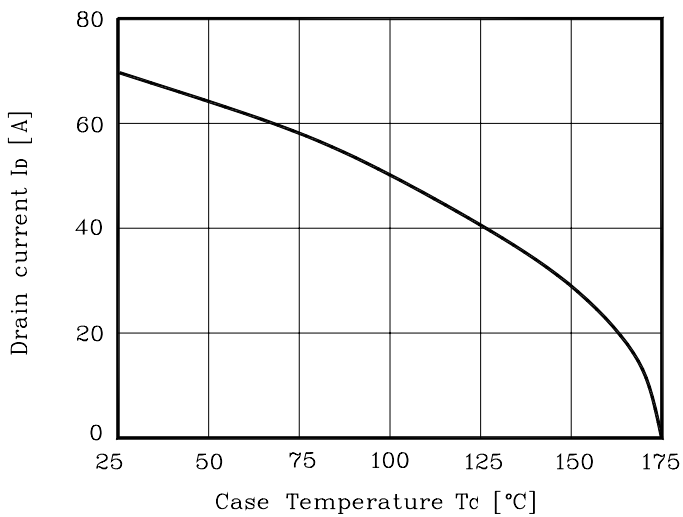


Fig. 10 Safe Operating Area

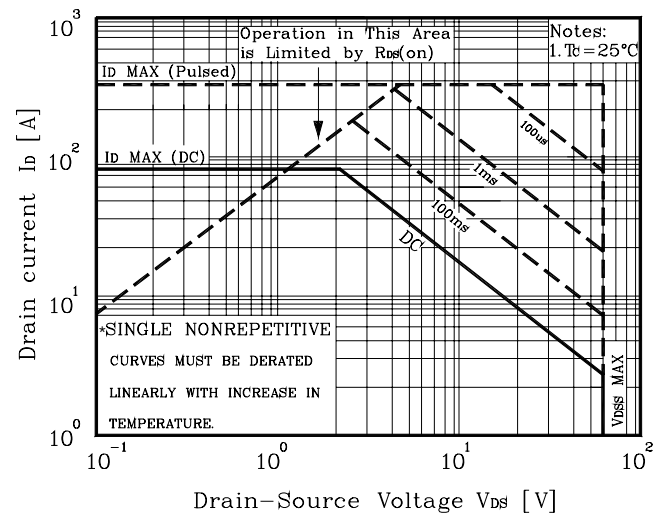


Fig. 10 Gate Charge Test Circuit & Waveform

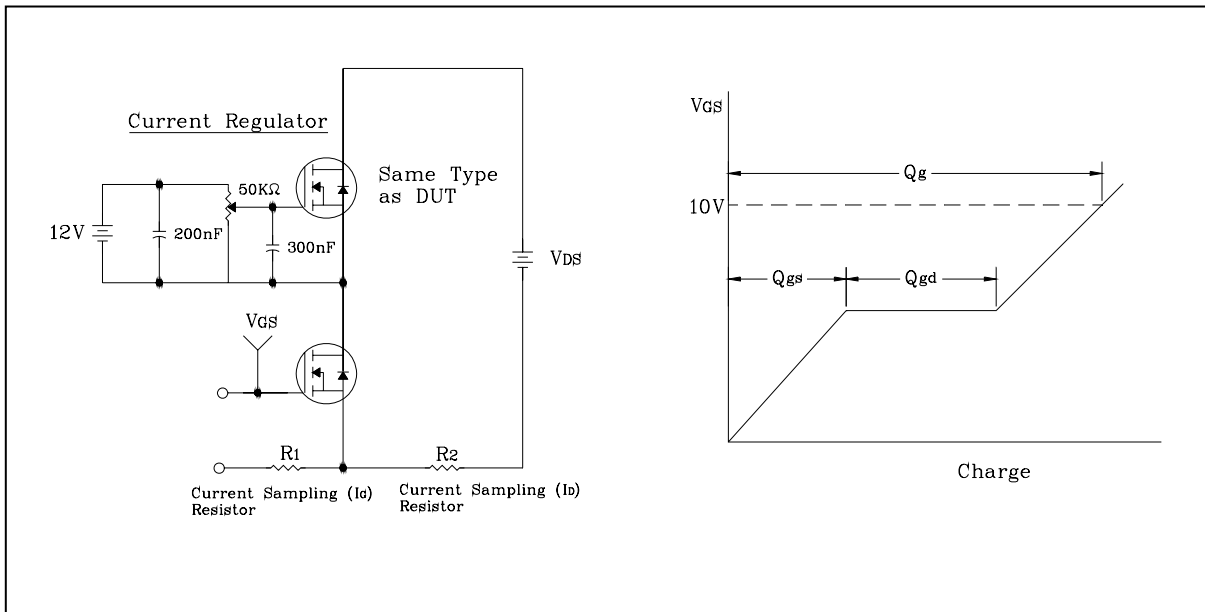


Fig. 11 Resistive Switching Test Circuit & Waveform

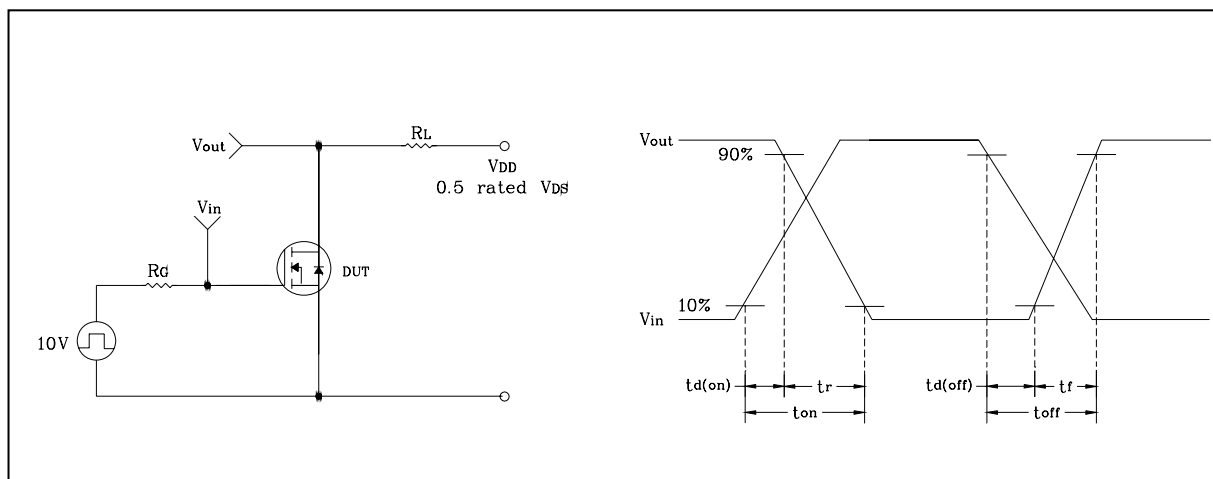


Fig. 12 E_{AS} Test Circuit & Waveform

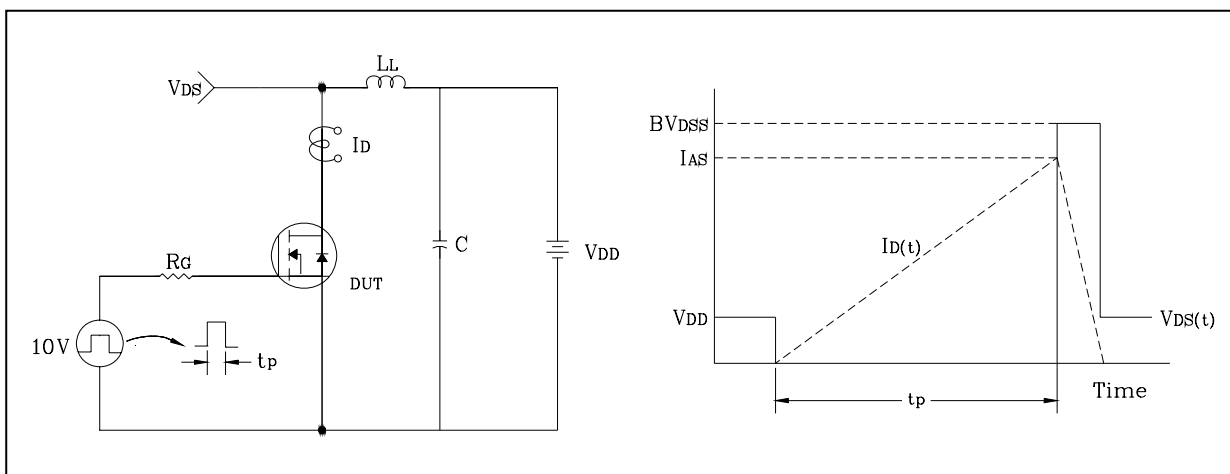
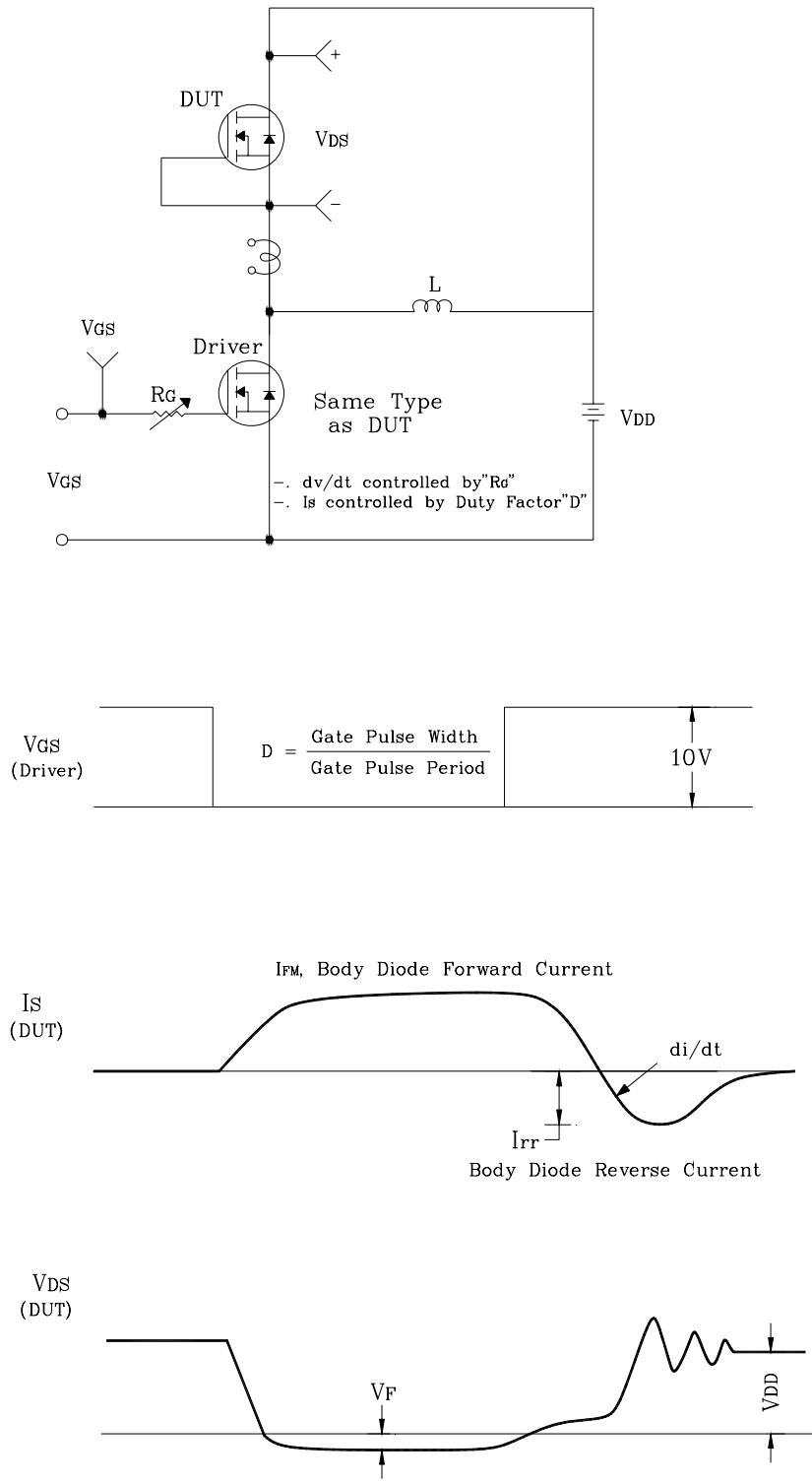


Fig. 13 Diode Reverse Recovery Time Test Circuit & Waveform



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