AUK Semiconductor

STK630F

Power MOSFET

Features

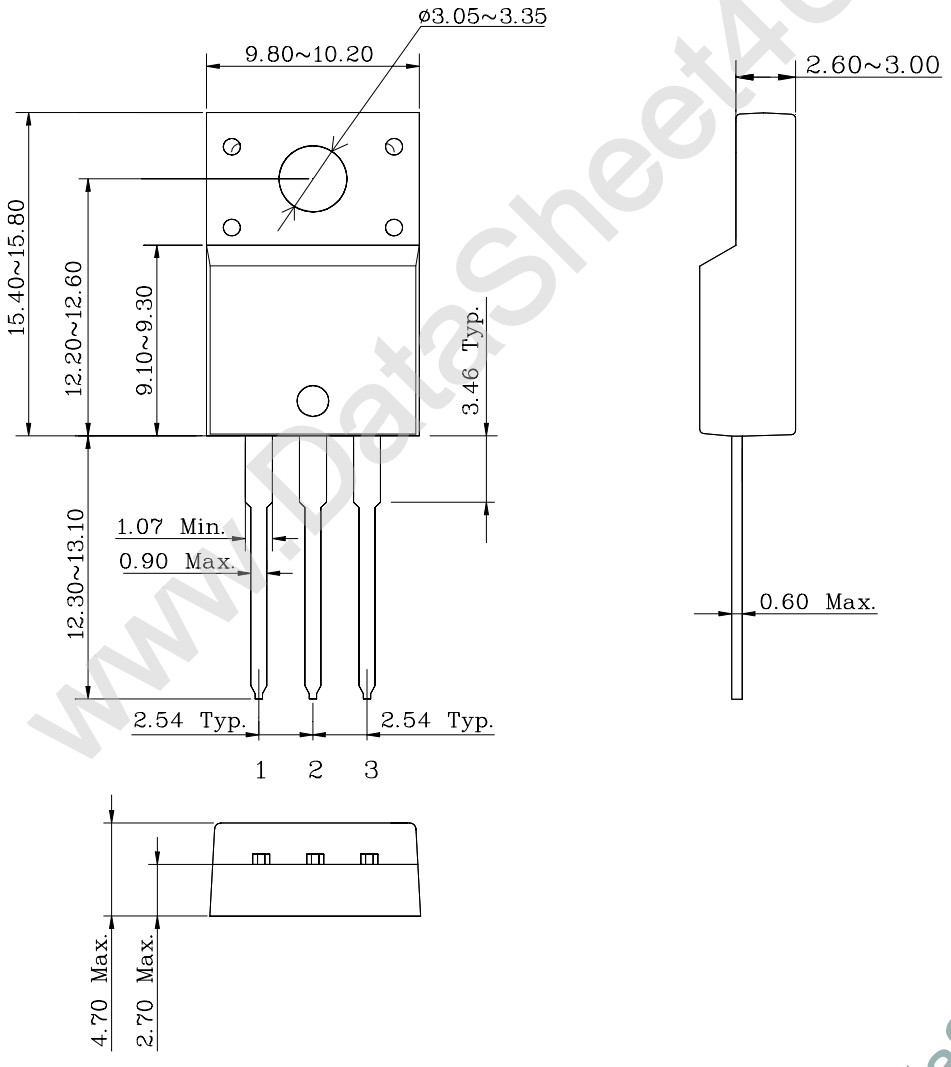
- Avalanche rugged technology.
- Low input capacitance.
- Low leakage current : 10 ㎂ (Max.) @ V_{DS}=200V.
- Low $R_{DS(on)}$: 0.30Ω(Typ.)

Ordering Information

Type NO.	Marking	Package Code
STK630F	STK630	TO-220F-3L

Outline Dimensions

unit : mm



PIN Connections
1. Gate
2. Drain
3. Source

Absolute maximum ratings

Characteristic	Symbol	Rating		Unit
Drain-source voltage	V_{DSS}	200		V
Gate-source voltage	V_{GSS}	±30		V
Drain current (DC) *	I_D	T_C=25℃	9	A
		T_C=100℃	5.7	A
Drain current (Pulsed) *	I_{DP}	36		A
Drain power dissipation (T_C=25℃)	P_D	30		W
Single pulsed avalanche energy ②	E_{AS}	162		mJ
Avalanche current (Repetitive) ①	I_{AR}	9		A
Repetitive avalanche energy ①	E_{AR}	7.2		mJ
Peak diode recovery dv/dt ③	dv/dt	5.0		V/ns
Junction temperature	T_J	150		°C
Storage temperature range	T_{stg}	-55~150		°C

* Limited by maximum junction temperature

Thermal Resistance

Characteristic	Symbol	Typ.	Max.	Units
Thermal resistance junction-case	$R_{th(J-C)}$	-	4.16	℃/W
Thermal resistance junction-ambient	$R_{th(J-A)}$	-	62.5	

Electrical Characteristics (Tc=25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	$V_{(BR)DSS}$	I_D=250 ㎂, V_{GS}=0V	200	-	-	V
Gate threshold voltage	$V_{GS(th)}$	I_D=250 ㎂, V_{DS}=V_{GS}	2.0	-	4.0	V
Drain-source cut-off current	I_{DSS}	V_{DS}=200V, V_{GS}=0V	-	-	10	㎂
Gate leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±30V	-	-	±100	nA
Static drain-source on-resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=4.5A ④	-	-	0.4	Ω
Forward transfer conductance	g_{fs}	V_{DS}=40V, I_D=4.5A ④	-	3.87	-	S
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V f=1 ㎒	-	550	-	pF
Output capacitance	C_{oss}		-	110	-	
Reverse transfer capacitance	C_{rss}		-	40	-	
Turn-on delay time	$t_{d(on)}$	V_{DD}=100V, I_D=9A R_G=12Ω Fig 13. ④⑤	-	13	-	ns
Rise time	t_r		-	13	-	
Turn-off delay time	$t_{d(off)}$		-	30	-	
Fall time	t_f		-	18	-	
Total gate charge	Q_g	V_{DS}=160V, V_{GS}=10V, I_D=9A Fig 12. ④⑤	-	22	-	nC
Gate-source charge	Q_{gs}		-	4.3	-	
Gate-drain charge	Q_{gd}		-	10.9	-	

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

Characteristic	Symbol	Test Condition	Min	Typ	Max	Units
Source current (DC)	I_S	Integral reverse diode in the MOSFET	-	-	9	A
Source current (Pulsed) ①	I_{SP}		-	-	36	
Diode forward voltage ④	V_{SD}	V_{GS}=0V, I_S=9A	-	-	1.5	V
Reverse recovery time	t_{rr}	I_F=9A dI_S/dt=100A/㎲ ④	-	140	-	ns
Reverse recovery charge	Q_{rr}		-	0.87	-	uC

Note ;

① Repetitive rating : Pulse width limited by maximum junction temperature

② L=3mH, I_{AS}=9A, V_{DD}=50V, R_G=27Ω , starting T_J=25℃

③ I_{SD} ≤ 9A, di/dt≤ 220A/㎲, V_{DD}=100V, starting T_J=25℃

④ Pulse Test : Pulse Width≤ 400 ㎲, Duty cycle≤ 2%

⑤ Essentially independent of operating temperature

Electrical Characteristic Curves

Fig. 1 I_D - V_{DS}

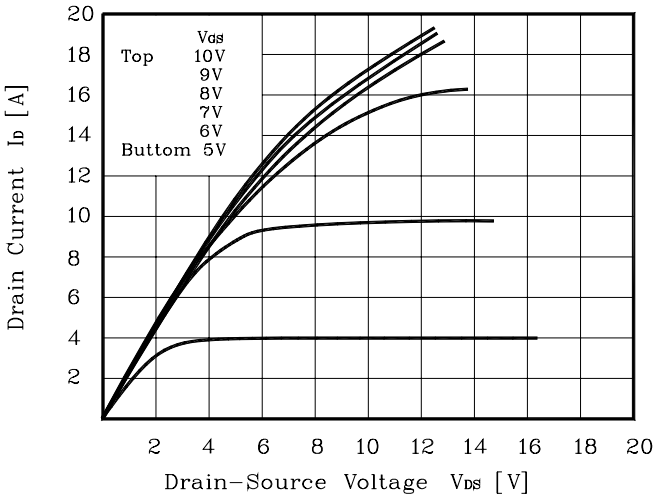


Fig. 2 I_D - V_{GS}

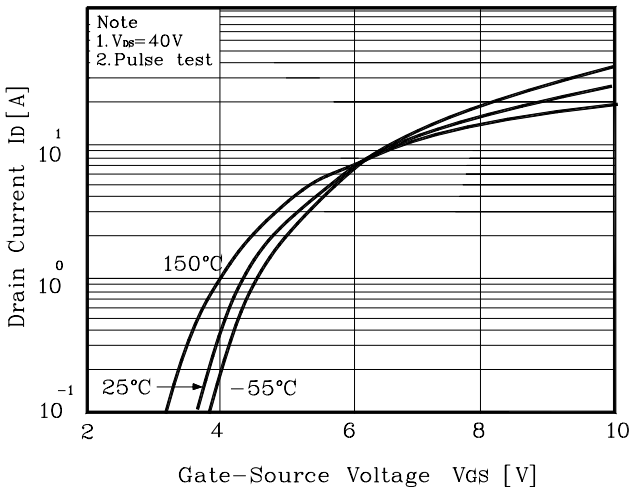


Fig. 3 $R_{DS(on)}$ - I_D

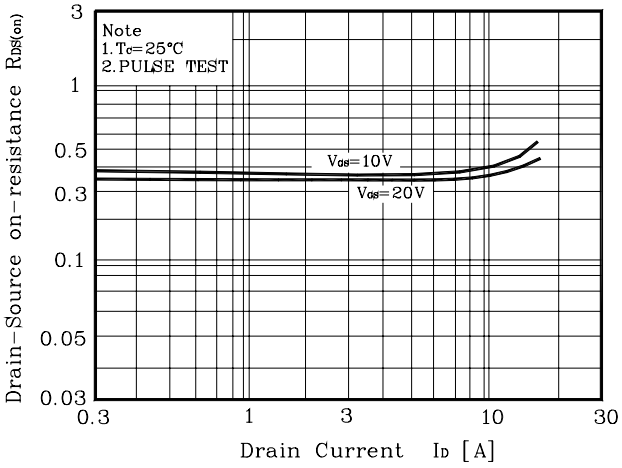


Fig. 4 I_S - V_{SD}

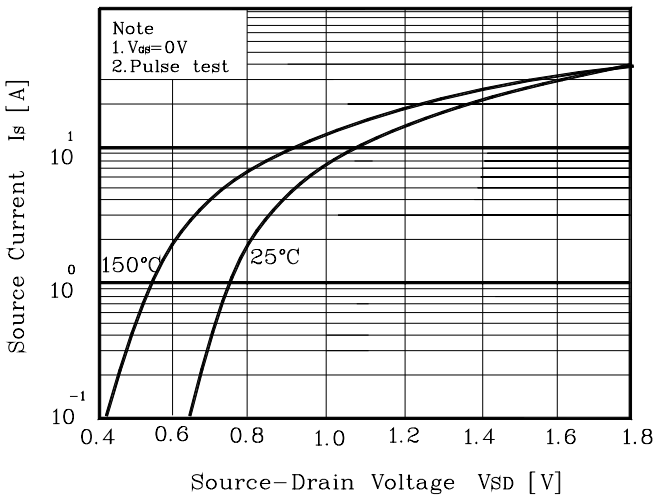


Fig. 5 V_{GS} - Q_G

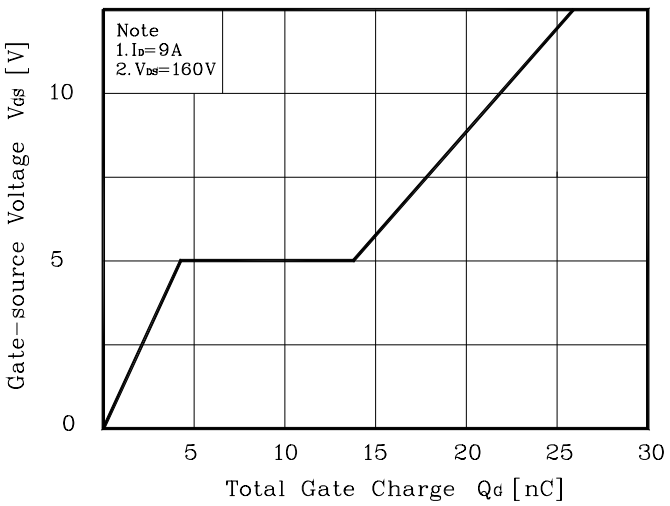


Fig. 6 Capacitance - V_{DS}

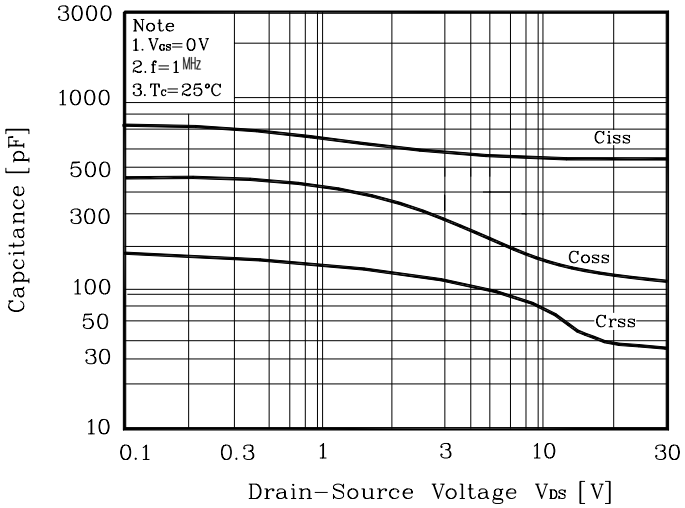


Fig. 7 $V_{(BR)DSS}$ - T_J

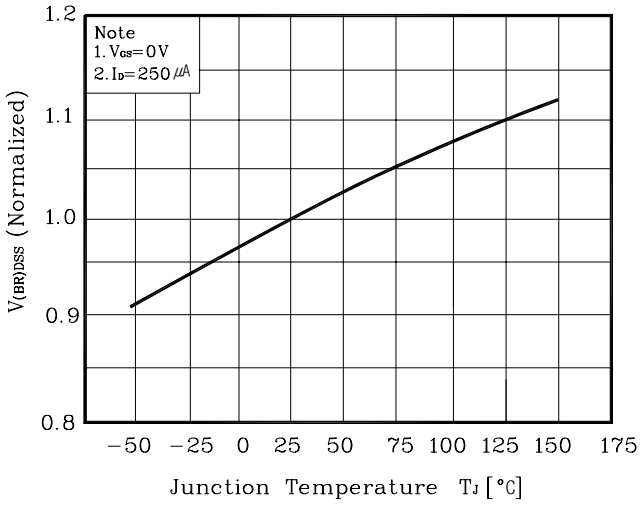


Fig. 8 $R_{DS(on)}$ - T_J

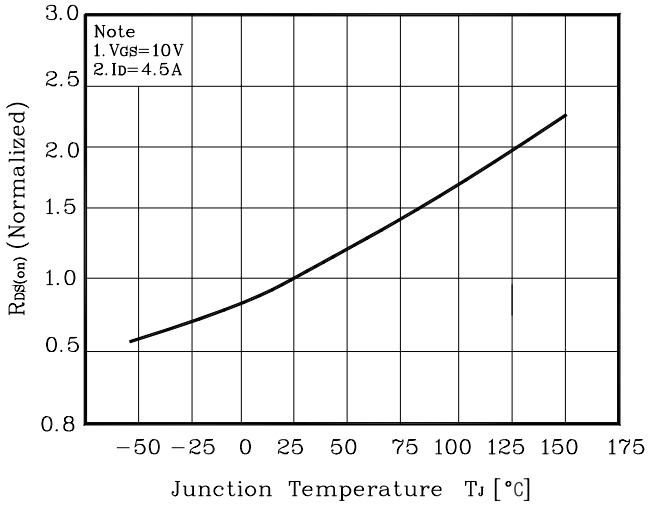


Fig. 9 I_D - T_C

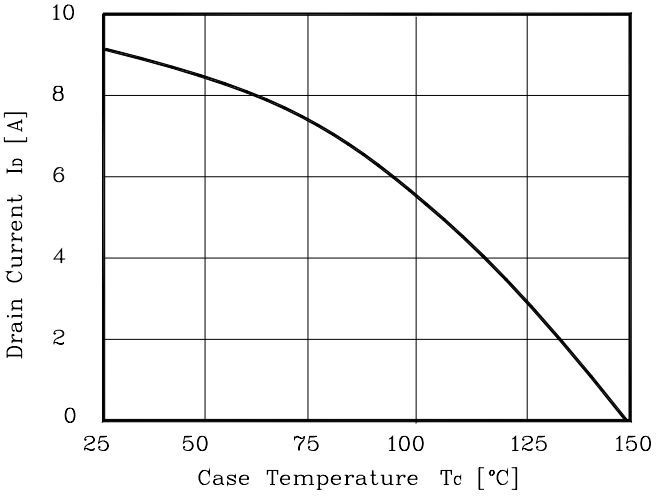


Fig. 10 Safe operating Area

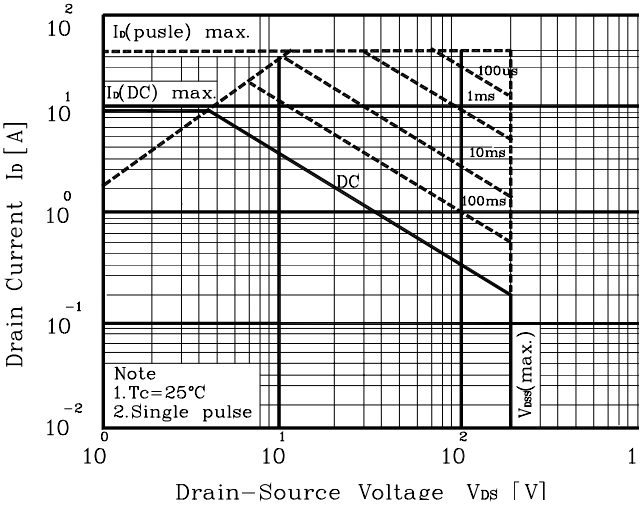


Fig. 11 Thermal Response

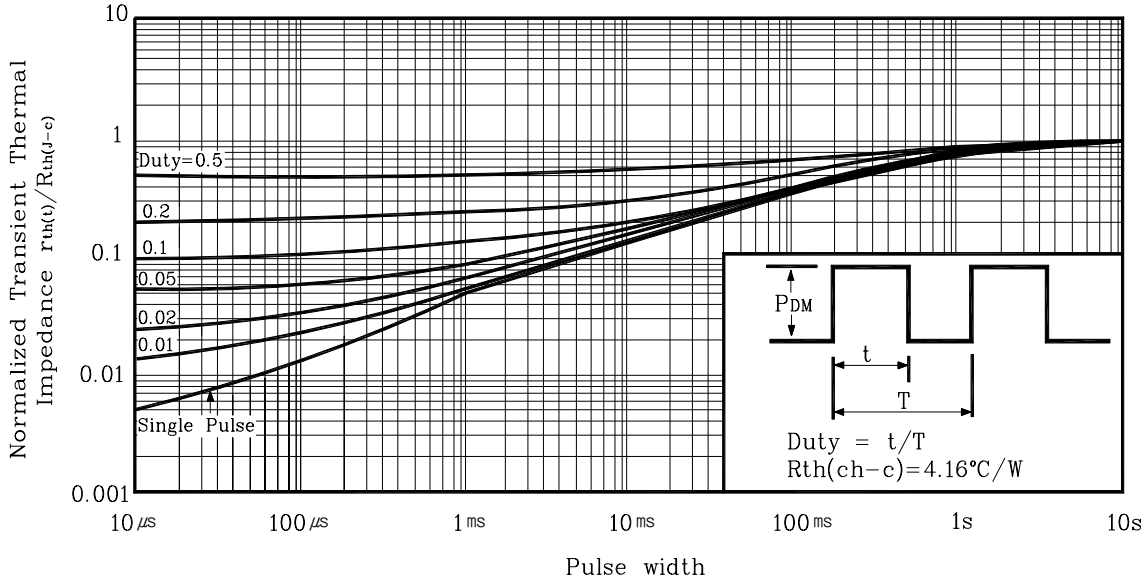


Fig. 12 Gate Charge Test Circuit & Waveform

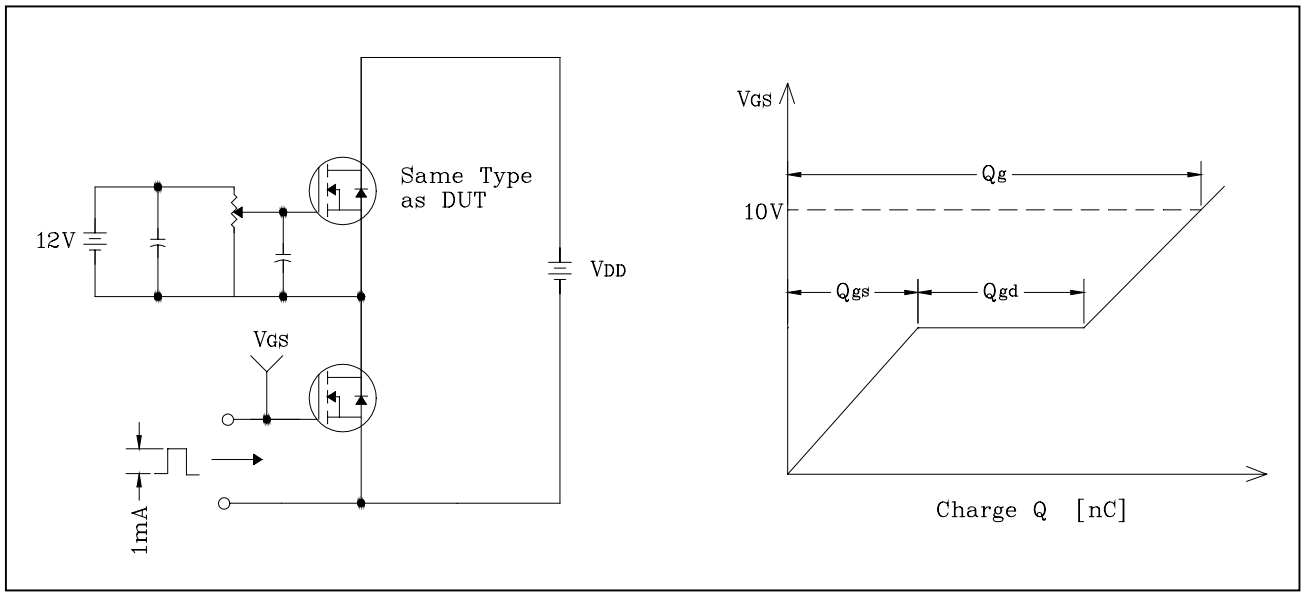


Fig. 13 Switching Time Test Circuit & Waveform

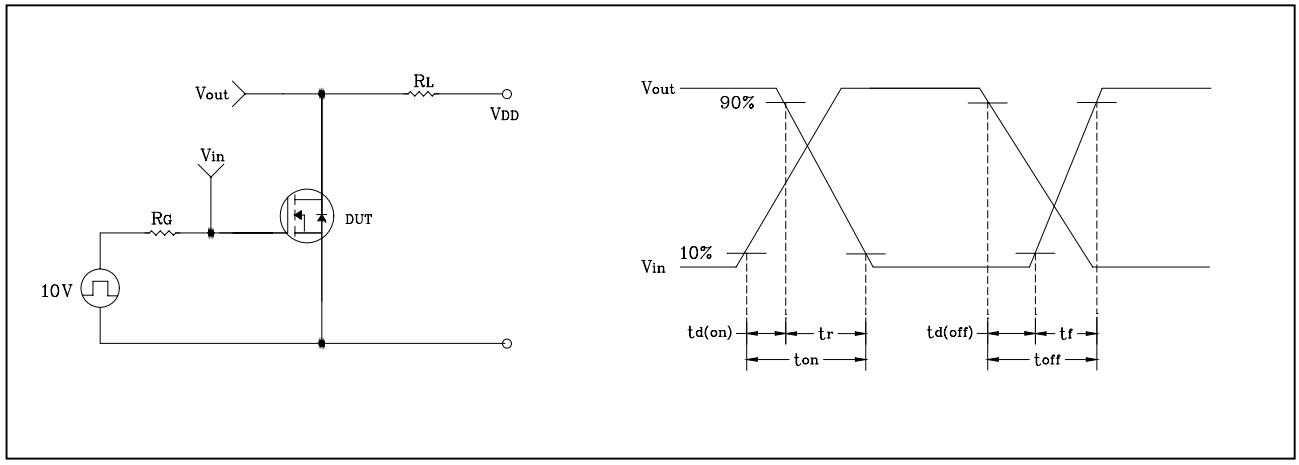


Fig. 14 E_{AS} Test Circuit & Waveform

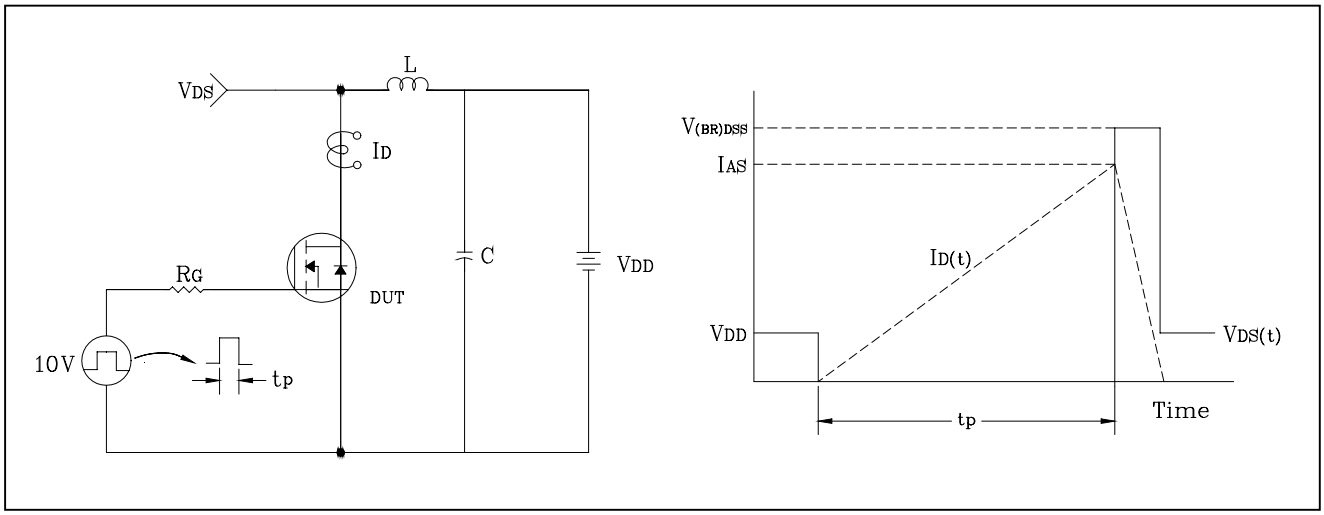
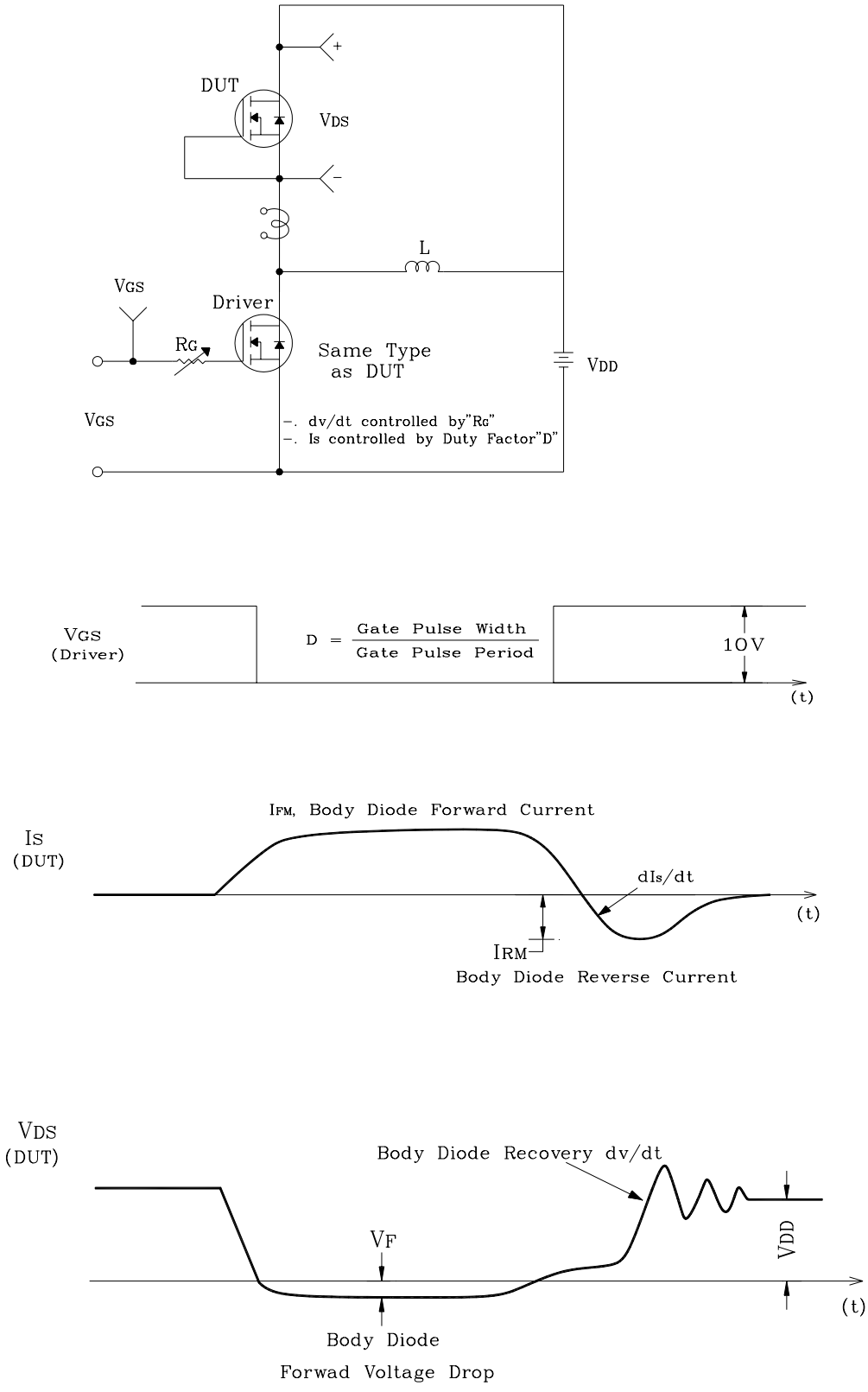


Fig. 15 Peak Diode Recovery dv/dt Test Circuit & Waveform



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