

**Features**

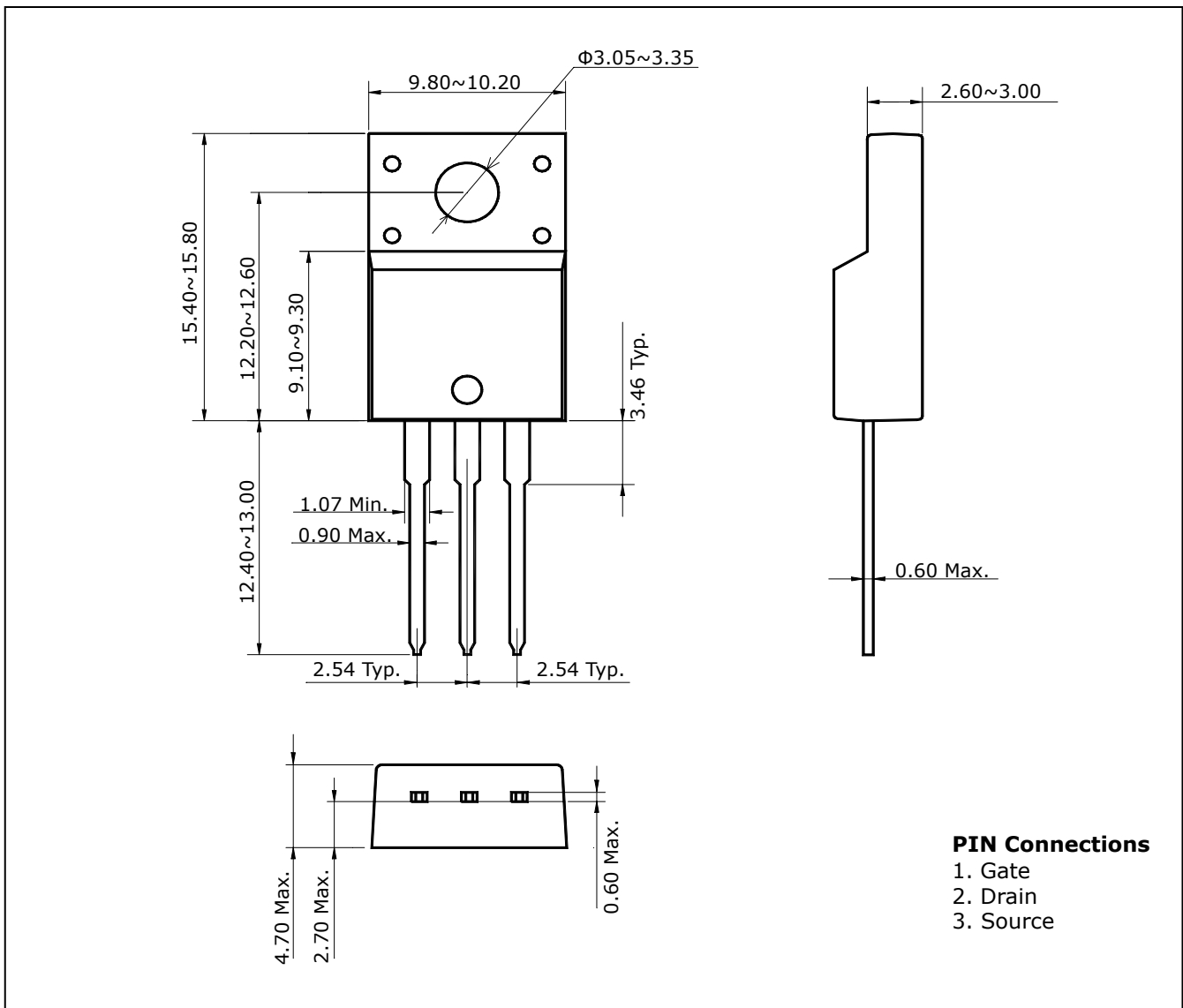
- Low Crss
- Low gate charge.
- Low leakage current

**Ordering Information**

Type NO.	Marking	Package Code
STK0765F	STK0765	TO-220F-3L

**Outline Dimensions**

unit : mm



**PIN Connections**

1. Gate
2. Drain
3. Source

## Absolute maximum ratings

(T<sub>C</sub>=25°C)

Characteristic	Symbol	Rating	Unit
Drain-source voltage	V <sub>DSS</sub>	650	V
Gate-source voltage	V <sub>GSS</sub>	±30	V
Drain current (DC) *	I <sub>D</sub>	T <sub>C</sub> =25°C	7
		T <sub>C</sub> =100°C	4.4
Drain current (Pulsed) *	I <sub>DP</sub>	28	A
Drain power dissipation (T <sub>C</sub> =25°C)	P <sub>D</sub>	40	W
Single pulsed avalanche energy ②	E <sub>AS</sub>	420	mJ
Avalanche current (Repetitive) ①	I <sub>AR</sub>	5.2	A
Repetitive avalanche energy ①	E <sub>AR</sub>	14.7	mJ
Junction temperature	T <sub>J</sub>	150	°C
Storage temperature range	T <sub>stg</sub>	-55~150	°C

\* Limited by maximum junction temperature

## Thermal Resistance

Characteristic	Symbol	Typ.	Max	Units
Thermal resistance junction-case	R <sub>th(J-C)</sub>	-	3.125	°C/W
Thermal resistance Junction-ambient	R <sub>th(J-A)</sub>	-	62.5	

## Electrical Characteristics

(T<sub>c</sub>=25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> =250 μA, V <sub>GS</sub> =0	650	-	-	V
Gate threshold voltage	V <sub>GS(th)</sub>	I <sub>D</sub> =250 μA, V <sub>DS</sub> =V <sub>GS</sub>	2.0	-	4.0	V
Drain-source cut-off current	I <sub>DSS</sub>	V <sub>DS</sub> =650V, V <sub>GS</sub> =0	-	-	10	μA
Gate leakage current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±30V	-	-	±100	nA
Static drain-source on-resistance ④	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =3.5A	-	-	1.2	Ω
Forward transfer conductance ④	g <sub>fs</sub>	V <sub>DS</sub> =5V, I <sub>D</sub> =3.5A	3.9	6.4	-	S
Input capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V f=1 MHz	-	881	-	pF
Output capacitance	C <sub>oss</sub>		-	123	-	
Reverse transfer capacitance	C <sub>rss</sub>		-	19	-	
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =325V, I <sub>D</sub> =7A R <sub>G</sub> =25Ω Fig. 13	-	18	-	ns
Rise time	t <sub>r</sub>		-	19	-	
Turn-off delay time	t <sub>d(off)</sub>		-	72	-	
Fall time	t <sub>f</sub>		-	28	-	
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> =520V, V <sub>GS</sub> =10V, I <sub>D</sub> =7A Fig. 12	-	49	-	nC
Gate-source charge	Q <sub>gs</sub>		-	8.4	-	
Gate-drain charge	Q <sub>gd</sub>		-	22.1	-	

## Source-Drain Diode Ratings and Characteristics

(T<sub>c</sub>=25°C)

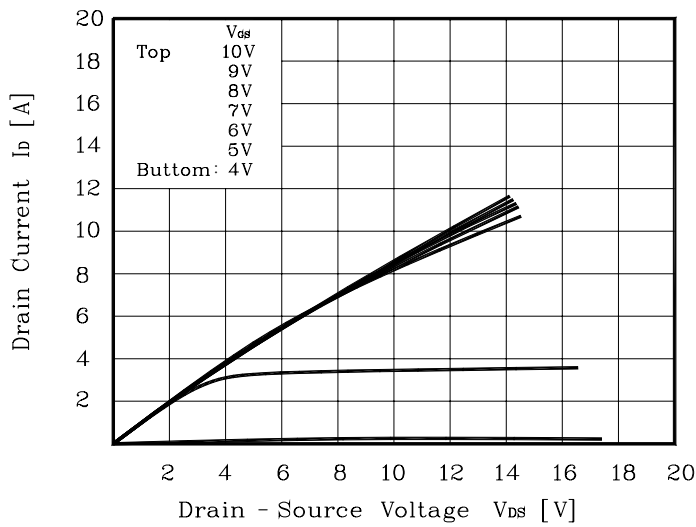
Characteristic	Symbol	Test Condition	Min	Typ	Max	Units
Source current (DC)	I <sub>S</sub>	Integral reverse diode in the MOSFET	-	-	7	A
Source current (Pulsed) ①	I <sub>SP</sub>		-	-	28	
Diode forward voltage ④	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =7A	-	-	1.4	V
Reverse recovery time	t <sub>rr</sub>	I <sub>S</sub> =7A, V <sub>GS</sub> =0V dI <sub>S</sub> /dt=100A/μs	-	320	-	ns
Reverse recovery charge	Q <sub>rr</sub>		-	2.4	-	uC

Note ;

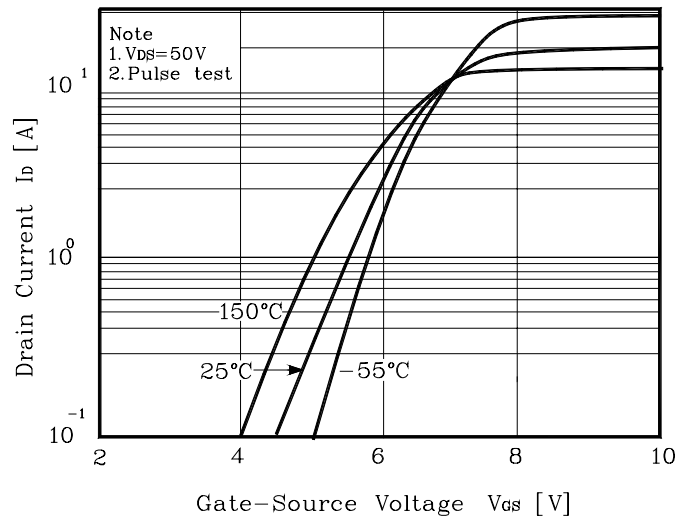
- ① Repetitive rating : Pulse width limited by maximum junction temperature
- ② L=15.7mH, I<sub>AS</sub>=7A, V<sub>DD</sub>=50V, R<sub>G</sub>=27Ω
- ③ Pulse Test : Pulse width ≤ 400 μs, Duty cycle ≤ 2%
- ④ Essentially independent of operating temperature

## Electrical Characteristic Curves

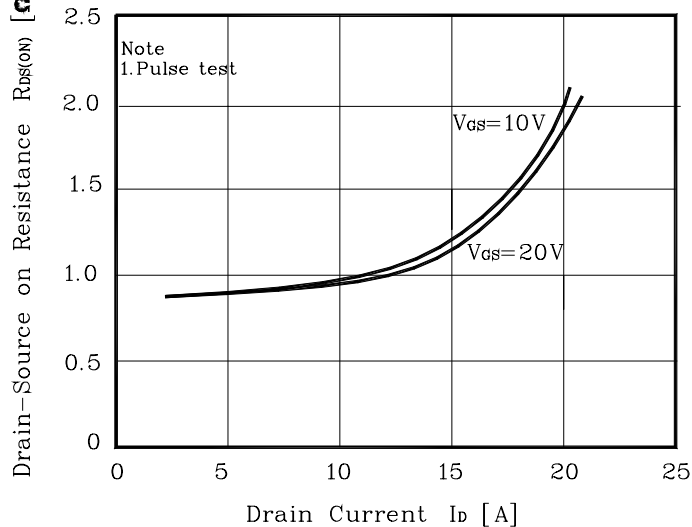
**Fig. 1  $I_D - V_{DS}$**



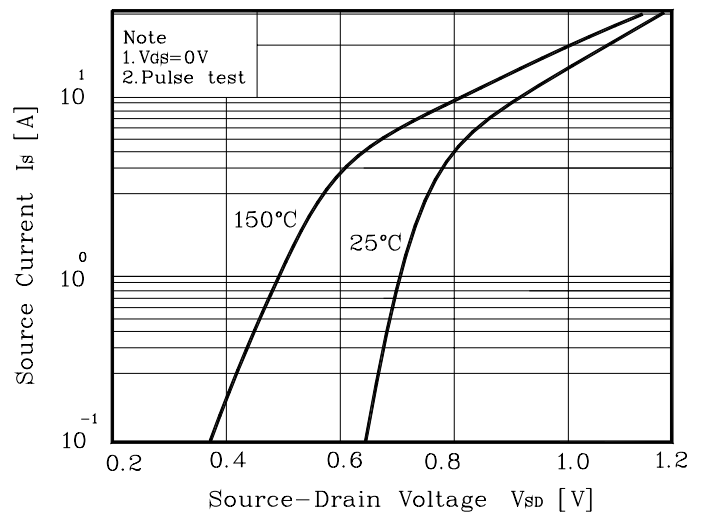
**Fig. 2  $I_D - V_{GS}$**



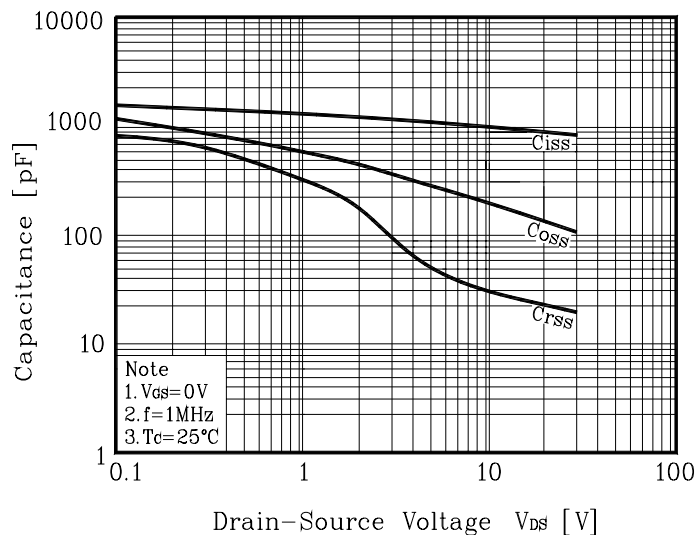
**Fig. 3  $R_{DS(on)} - I_D$**



**Fig. 4  $I_S - V_{SD}$**



**Fig. 5 Capacitance -  $V_{DS}$**



**Fig. 6  $V_{GS} - Q_G$**

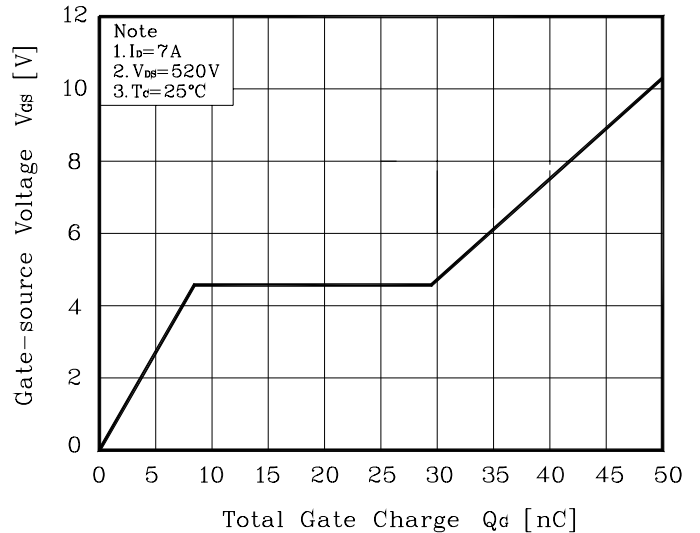


Fig. 7  $V_{(BR)DSS} - T_C$

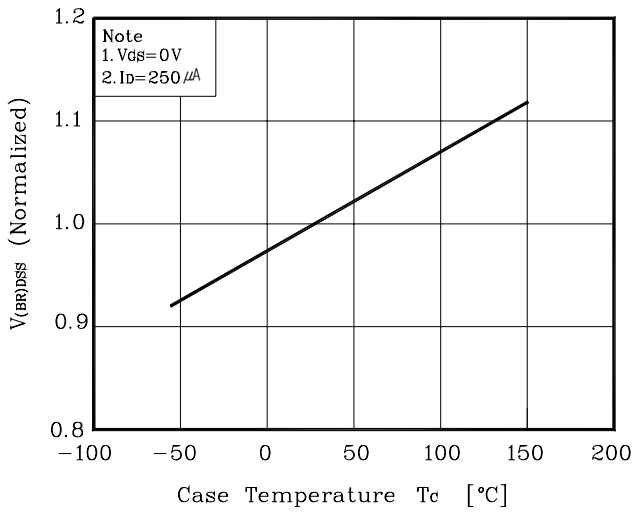


Fig. 8 Safe Operating Area

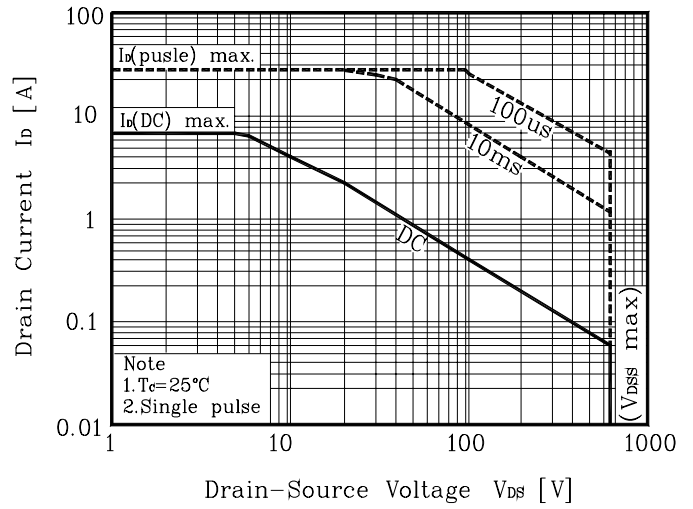


Fig. 11 Thermal Response

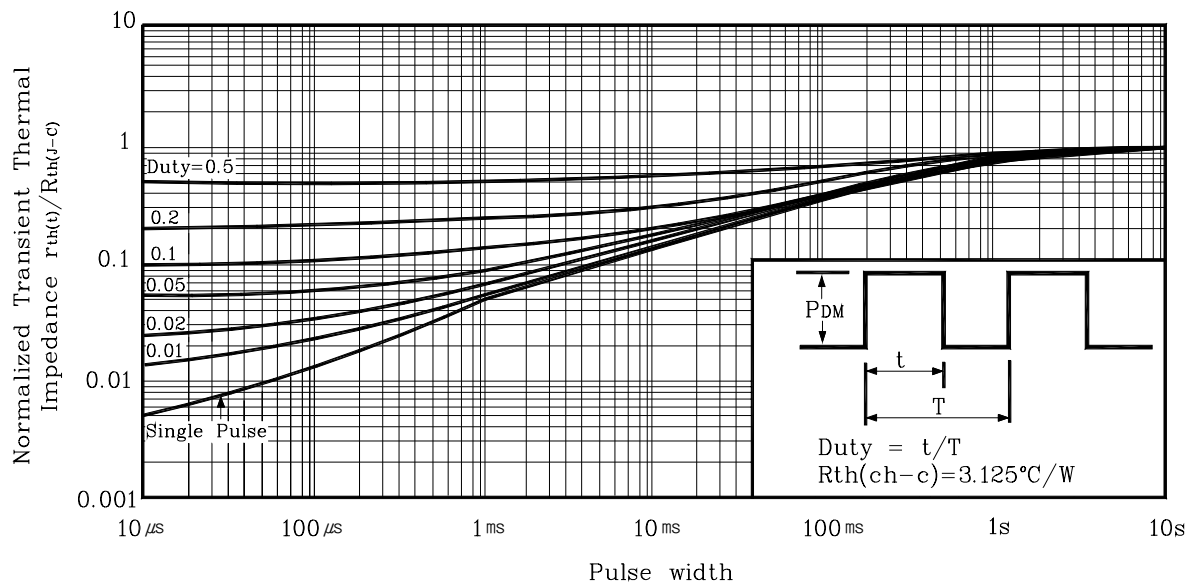


Fig. 12 Gate Charge Test Circuit & Waveform

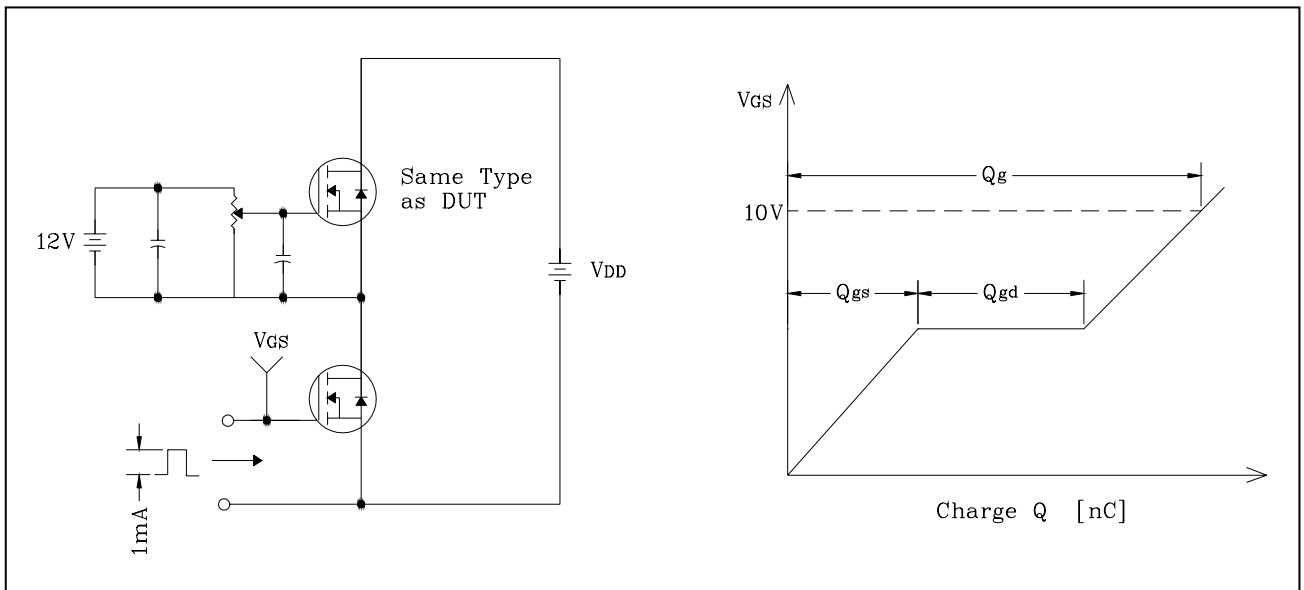


Fig. 13 Switching Time Test Circuit & Waveform

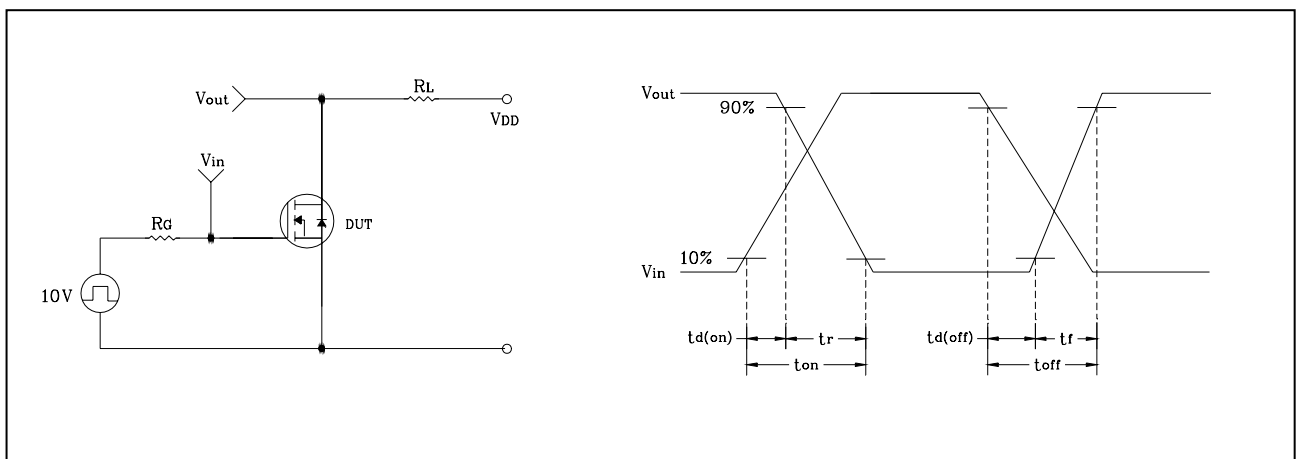


Fig. 14  $E_{AS}$  Test Circuit & Waveform

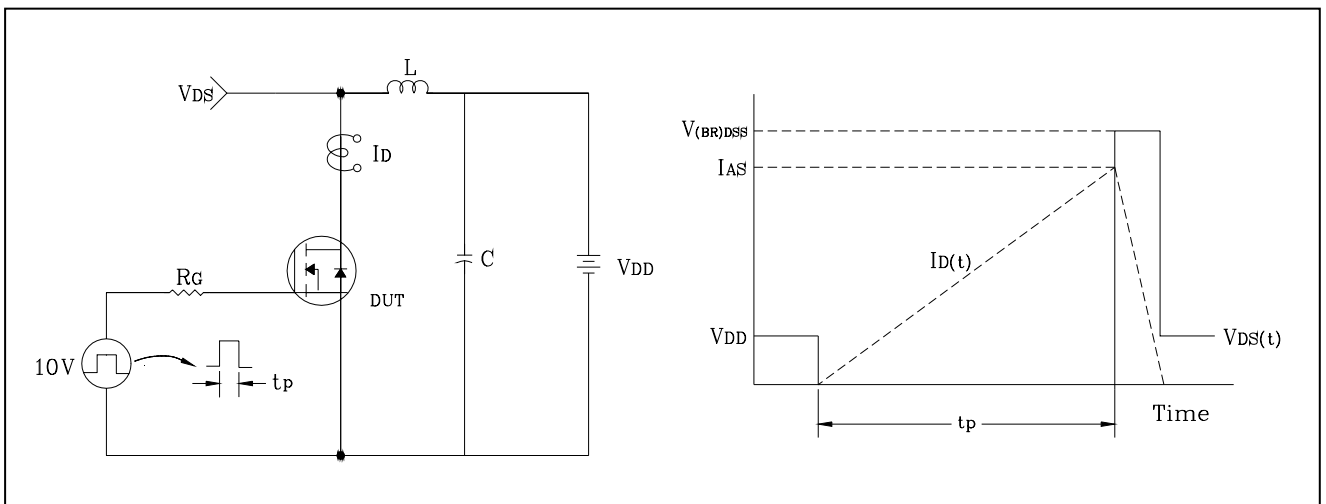
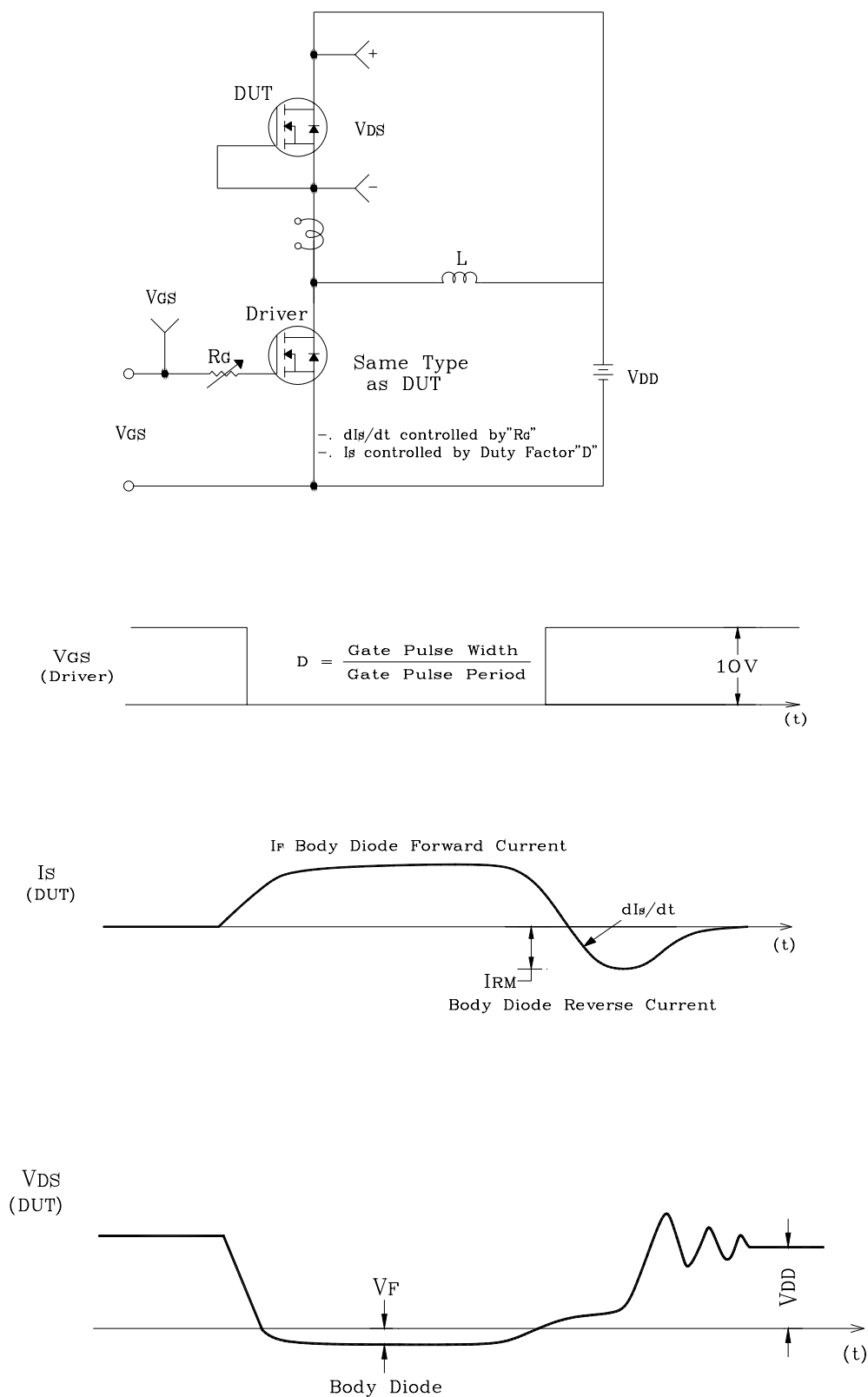


Fig. 15 Peak Diode Recovery dv/dt Test Circuit & Waveform



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