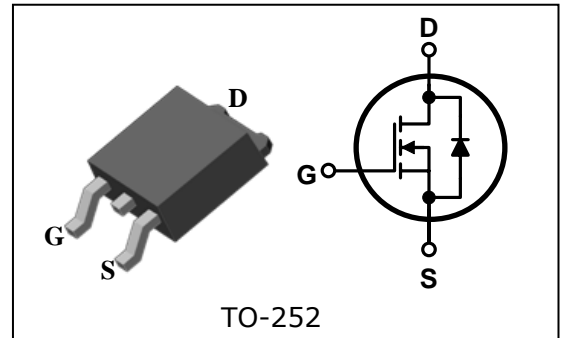


SWITCHING REGULATOR APPLICATIONS

Features

- High Voltage : $BV_{DSS}=600V(\text{Min.})$
- Low C_{RSS} : $C_{RSS}=7.6pF(\text{Typ.})$
- Low gate charge : $Qg=15.3nC(\text{Typ.})$
- Low $R_{DS(on)}$: $R_{DS(on)}=5.0\Omega (\text{Max.})$

PIN Connection



Ordering Information

Type No.	Marking	Package Code
MU2N60	MU2N60	TO-252

Absolute maximum ratings ($T_C=25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Rating	Unit	
Drain-source voltage	V_{DSS}	600	V	
Gate-source voltage	V_{GSS}	± 30	V	
Drain current (DC) *	I_D	($T_C=25^\circ\text{C}$)	2.0	A
		($T_C=100^\circ\text{C}$)	1.3	A
Drain current (Pulsed) *	I_{DM}	6.0	A	
Power dissipation	P_D	46	W	
Avalanche current (Single) ②	I_{AS}	2.0	A	
Single pulsed avalanche energy ②	E_{AS}	120	mJ	
Avalanche current (Repetitive) ①	I_{AR}	2.0	A	
Repetitive avalanche energy ①	E_{AR}	5.4	mJ	
Junction temperature	T_J	150	$^\circ\text{C}$	
Storage temperature range	T_{stg}	-55~150		

* Limited by maximum junction temperature

Characteristic	Symbol	Typ.	Max.	Unit
Thermal resistance	Junction-case	-	2.7	$^\circ\text{C}/\text{W}$
	Junction-ambient	-	62.5	

Electrical Characteristics ($T_C=25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit	
Drain-source breakdown voltage	BV_{DSS}	$I_D=250\mu\text{A}, V_{GS}=0$	600	-	-	V	
Gate threshold voltage	$V_{GS(th)}$	$I_D=250\mu\text{A}, V_{DS}=V_{GS}$	2.0	-	4.0	V	
Drain-source cut-off current	I_{DSS}	$V_{DS}=600\text{V}, V_{GS}=0\text{V}$	-	-	10	μA	
Gate leakage current	I_{GSS}	$V_{DS}=0\text{V}, V_{GS}=\pm 30\text{V}$	-	-	± 100	nA	
Drain-source on-resistance ④	$R_{DS(on)}$	$V_{GS}=10\text{V}, I_D=1\text{A}$	-	3.9	5.0	Ω	
Forward transfer conductance ④	g_{fs}	$V_{DS}=50\text{V}, I_D=1\text{A}$	-	2.05	-	S	
Input capacitance	C_{iss}	$V_{GS}=0\text{V}, V_{DS}=25\text{V},$ $f=1\text{MHz}$	-	380	490	pF	
Output capacitance C_{oss} -	C_{oss}		-	35	46		
Reverse transfer capacitance	C_{rss}		-	7.6	9.9		
Turn-on delay time	$t_{d(on)}$	$V_{DD}=300\text{V}, I_D=2.0\text{A}$ $R_G=25\Omega$	-	5.5	-	ns	
Rise time	t_r		-	16	40		
Turn-off delay time	$t_{d(off)}$		③④	-	40		90
Fall time	t_f		-	40	90		
Total gate charge	Q_g	$V_{DS}=320\text{V}, V_{GS}=10\text{V}$ $I_D=2.0\text{A}$	-	15.3	19	nC	
Gate-source charge	Q_{gs}		-	1.8	-		
Gate-drain charge	Q_{gd}		③④	-	7.2		-

Source-Drain Diode Ratings and Characteristics ($T_C=25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Source current (DC)	I_S	Integral reverse diode in the MOSFET	-	-	2.0	A
Source current (Pulsed) ①	I_{SM}		-	-	6.0	
Forward voltage ④	V_{SD}	$V_{GS}=0\text{V}, I_S=1.0\text{A}$	-	-	1.4	V
Reverse recovery time	t_{rr}	$I_S=1.0\text{A}, V_{GS}=0\text{V}$ $dI_F/dt=100\text{A}/\mu\text{s}$	-	250	-	ns
Reverse recovery charge	Q_{rr}		-	1.31	-	μC

Note ;

- ① Repetitive rating : Pulse width limited by maximum junction temperature
- ② $L=1080\text{mH}, I_{AS}=0.3\text{A}, V_{DD}=50\text{V}, R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$
- ③ Pulse Test : Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$
- ④ Essentially independent of operating temperature

Electrical Characteristic Curves

Fig. 1 $I_D - V_{DS}$

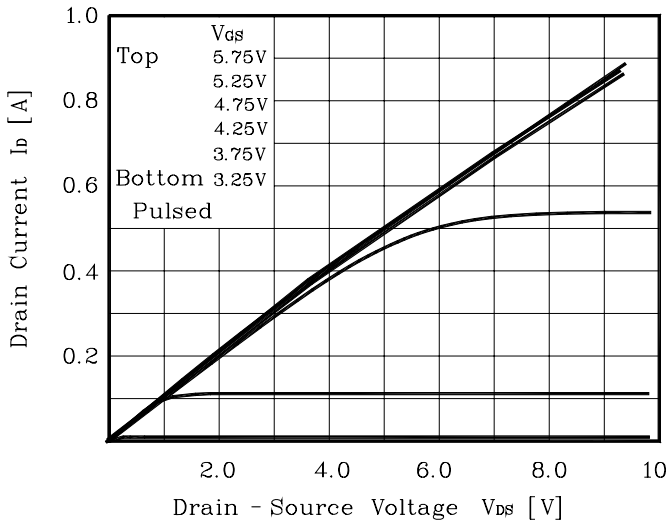


Fig. 2 $I_D - V_{GS}$

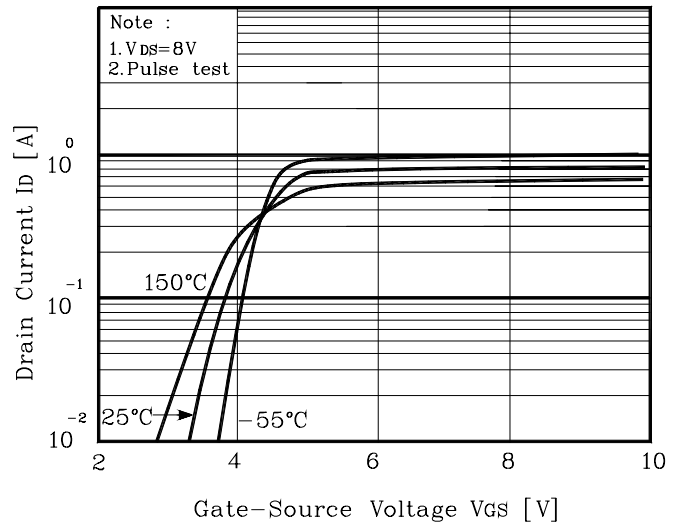


Fig. 3 $R_{DS(on)} - I_D$

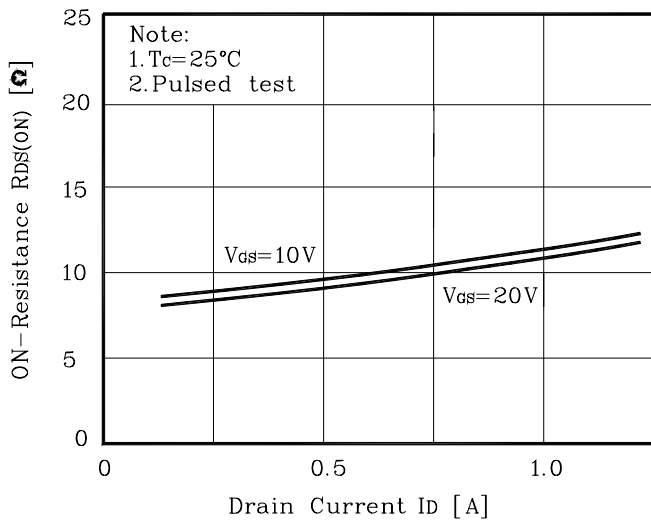


Fig. 4 $I_S - V_{SD}$

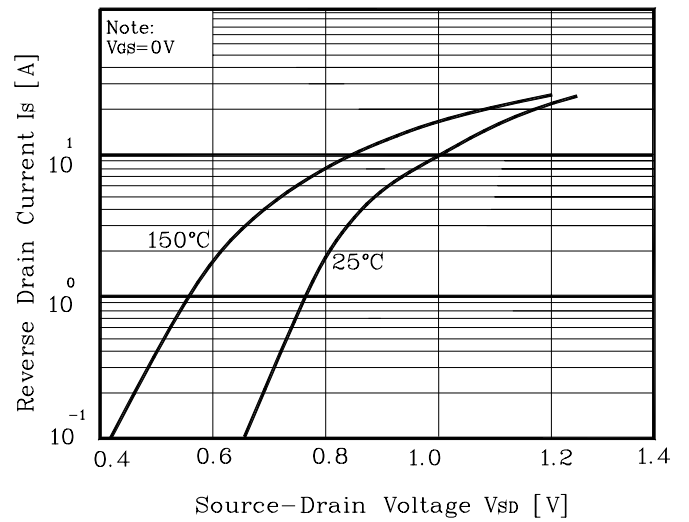


Fig. 5 Capacitance - V_{DS}

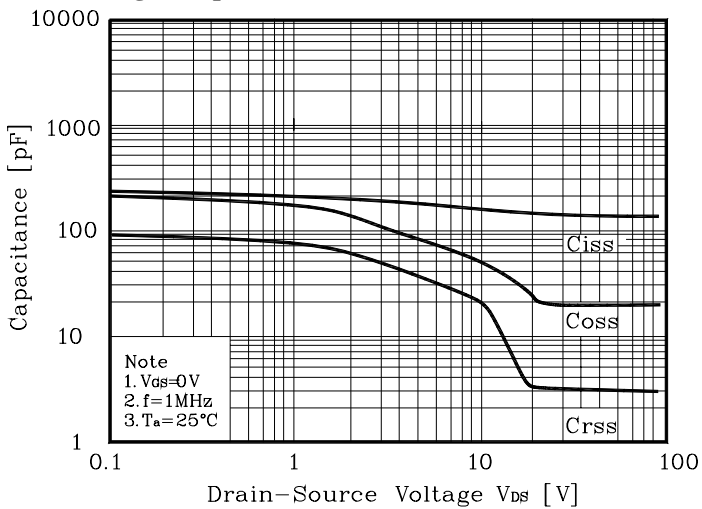


Fig. 6 $V_{GS} - Q_G$

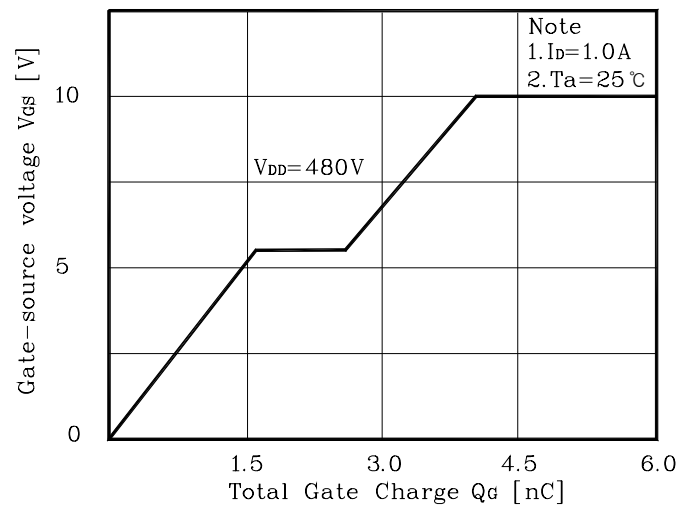


Fig. 7 $V_{DSS} - T_J$

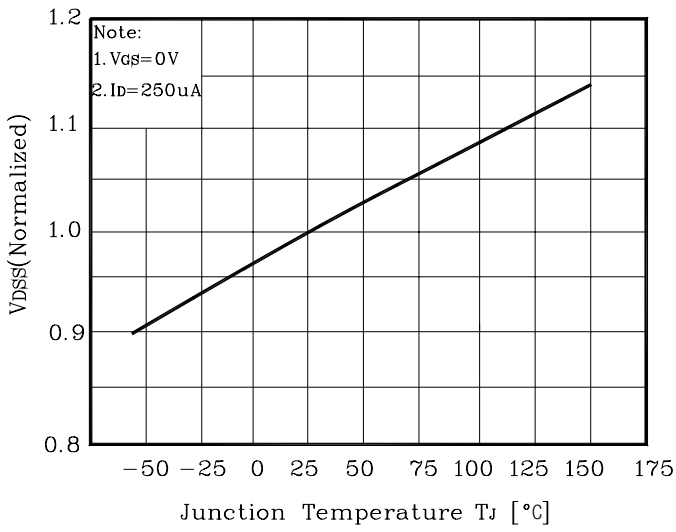


Fig. 8 $R_{DS(on)} - T_J$

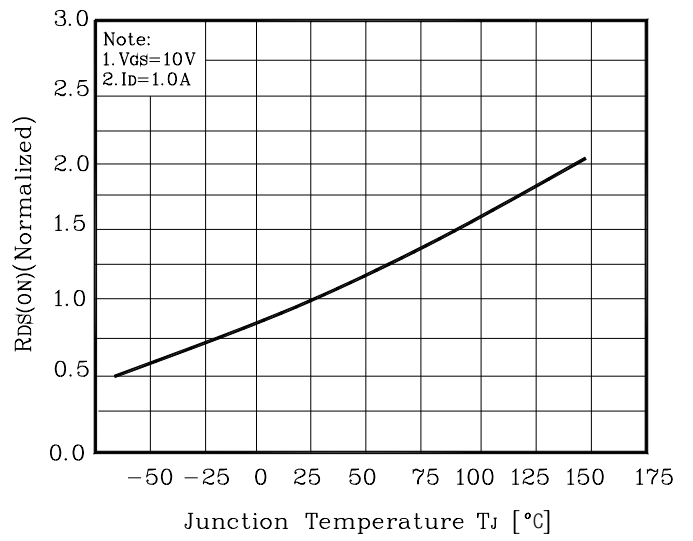


Fig. 9 $I_D - T_c$

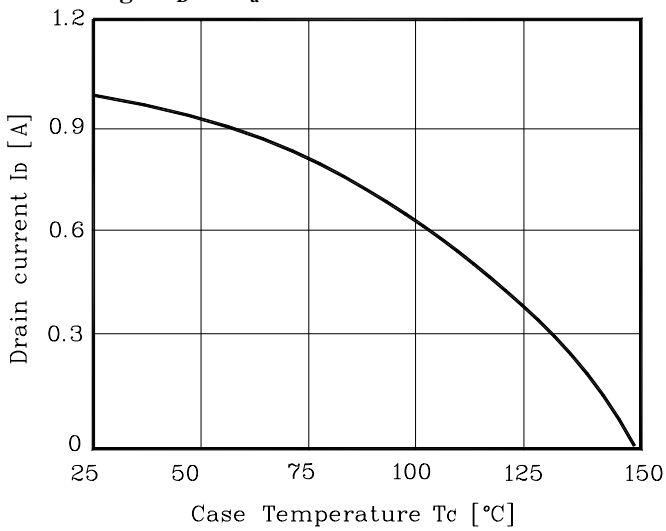


Fig. 10 Safe Operating Area

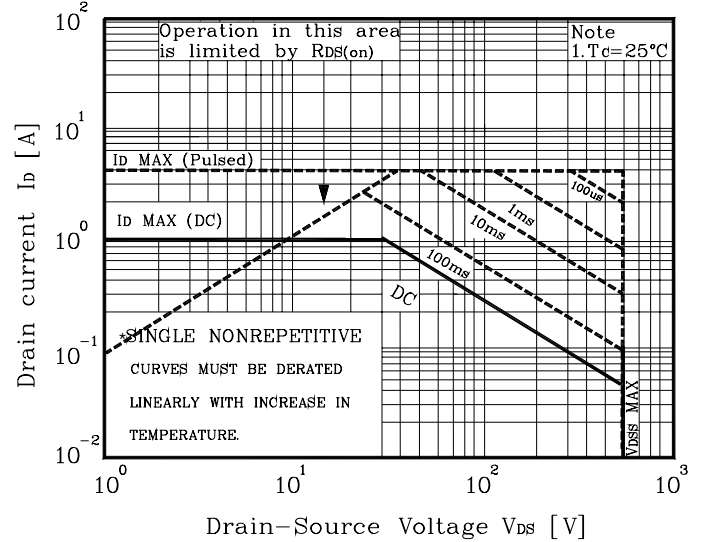


Fig. 11 Gate Charge Test Circuit & Waveform

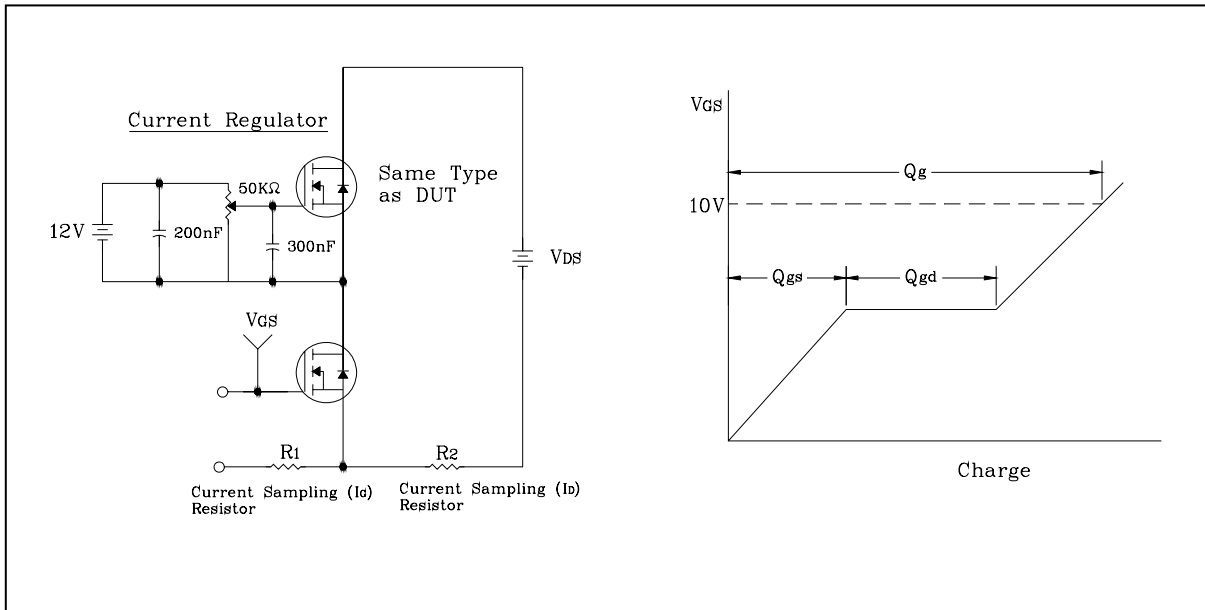


Fig. 12 Resistive Switching Test Circuit & Waveform

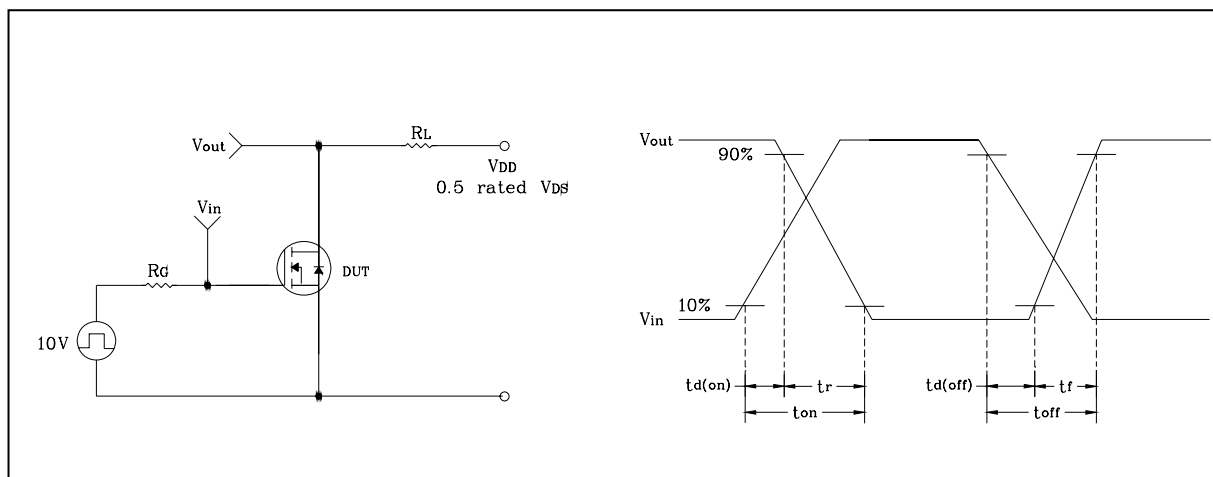


Fig. 13 E_{AS} Test Circuit & Waveform

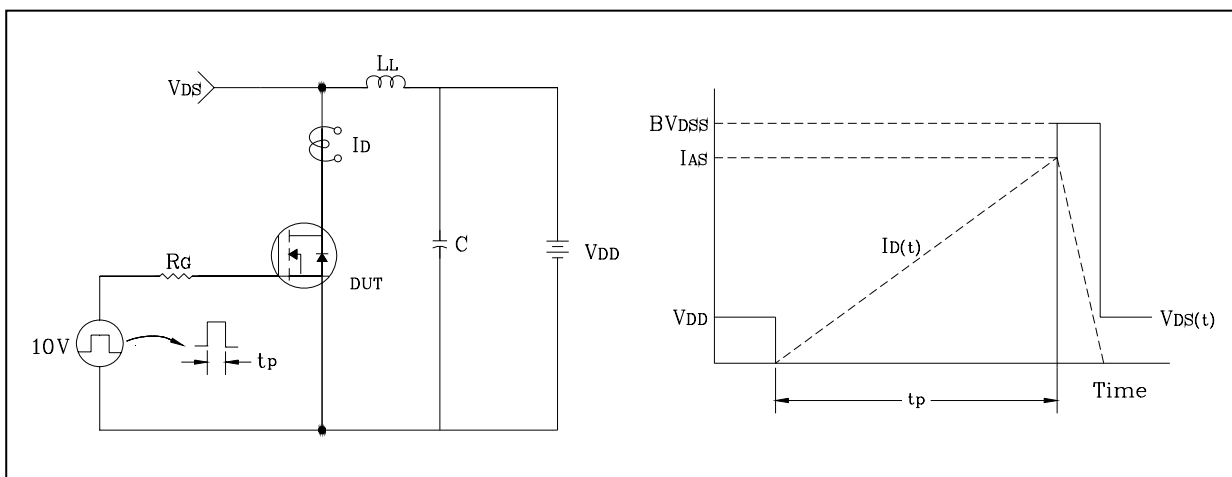
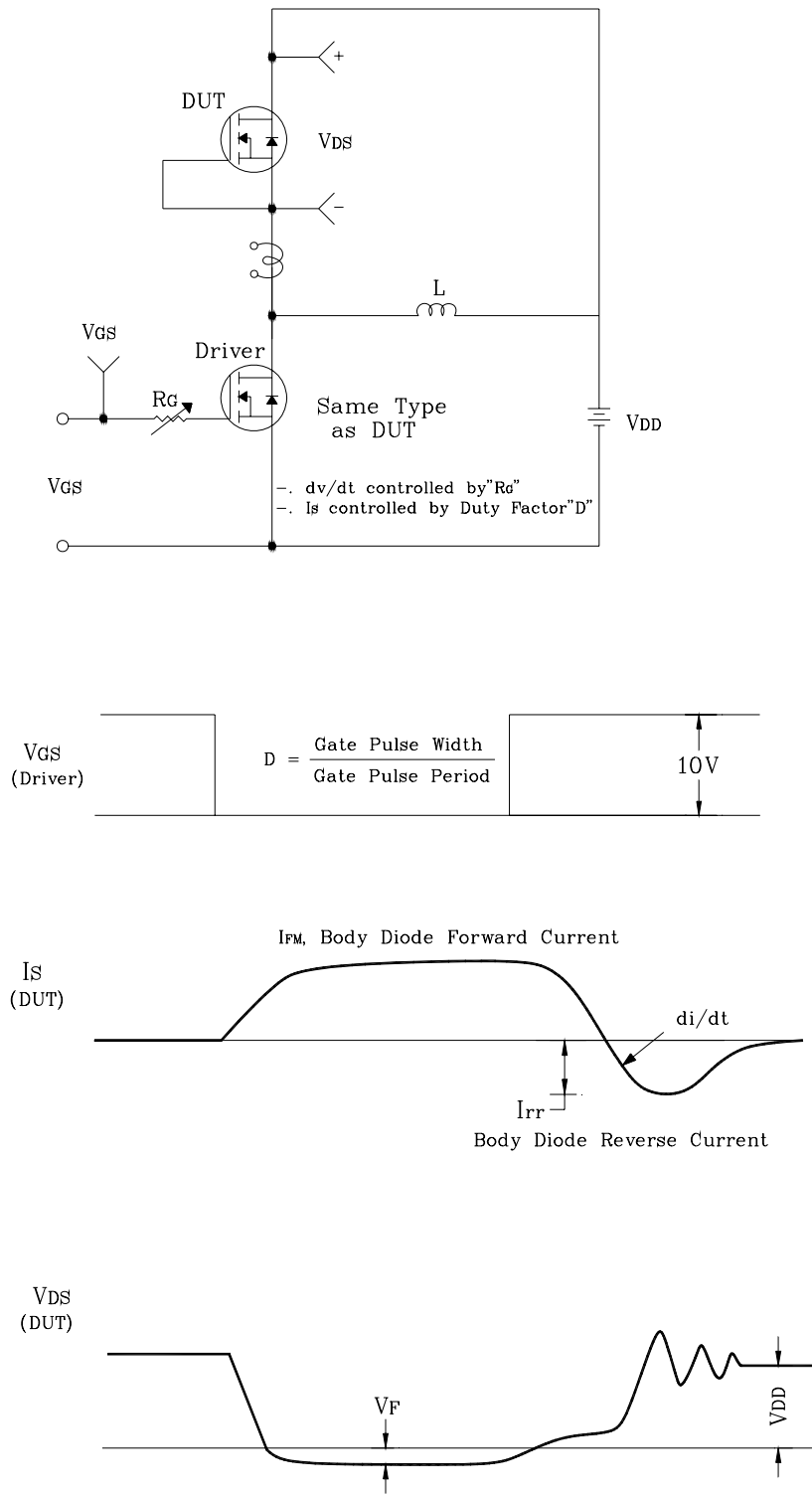


Fig. 14 Diode Reverse Recovery Time Test Circuit & Waveform



Outline Dimension

unit: mm

