

DC/DC CONVERTER APPLICATIONS

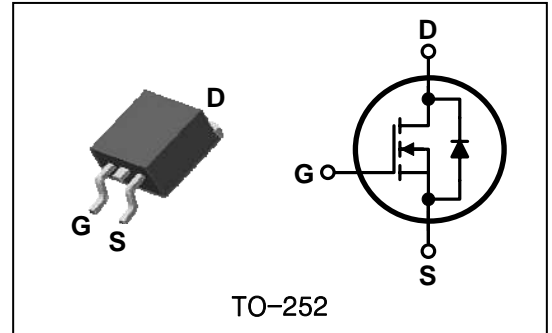
Features

- High Voltage : $BV_{DSS}=100V(\text{Min.})$
- Low C_{RSS} : $C_{RSS}=130pF(\text{Typ.})$
- Low gate charge : $Qg=75nC(\text{Typ.})$
- Low $R_{DS(ON)}$: $R_{DS(ON)}=26m\Omega(\text{Max.})$

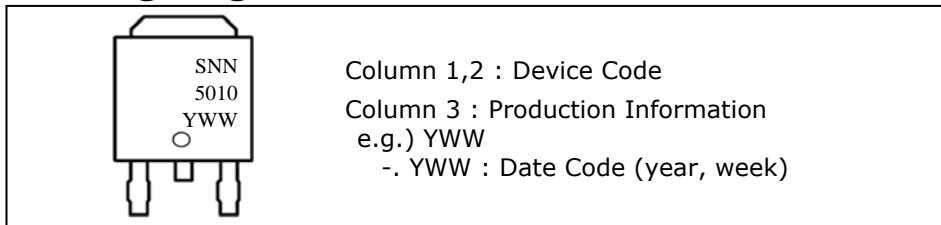
Ordering Information

Type No.	Marking	Package Code
SNN5010D	SNN5010	TO-252

PIN Connection



Marking Diagram



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

Characteristic	Symbol	Rating	Unit
Drain-source voltage	V_{DSS}	100	V
Gate-source voltage	V_{GSS}	± 20	V
Drain current (DC) *	I_D	($T_C=25^\circ\text{C}$)	50
		($T_C=100^\circ\text{C}$)	31
Drain current (Pulsed) *	I_{DM}	150	A
Power dissipation	P_D	65	W
Avalanche current (Single) ②	I_{AS}	25	A
Single pulsed avalanche energy ②	E_{AS}	173	mJ
Avalanche current (Repetitive) ①	I_{AR}	50	A
Repetitive avalanche energy ①	E_{AR}	6.5	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	-	1.92	$^\circ\text{C}/\text{W}$
	Junction-ambient	-	62.5	

Electrical Characteristics (T_C=25°C unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit	
Drain-source breakdown voltage	BV _{DSS}	I _D =250μA, V _{GS} =0	100	-	-	V	
Gate threshold voltage	V _{GS(th)}	I _D =250μA, V _{DS} =V _{GS}	1.7	2.5	3.4	V	
Drain-source cut-off current	I _{DSS}	V _{DS} =100V, V _{GS} =0V	-	-	1	μA	
		V _{DS} =80V, V _{GS} =0V, T _J =125°C	-	-	100		
Gate leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V	-	-	±100	nA	
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =25A	-	21	26	mΩ	
		V _{GS} =4.8V, I _D =1A	-	130	200		
Forward transfer conductance ④	g _{fs}	V _{DS} =40V, I _D =25A	-	30	-	S	
Input capacitance	C _{iss}	V _{GS} =0V, V _{DS} =25V, f=1MHz	-	2100	2310	pF	
Output capacitance	C _{oss}		-	640	704		
Reverse transfer capacitance	C _{rss}		-	130	143		
Turn-on delay time	t _{d(on)}	V _{DD} =50V, I _D =50A R _G =25Ω	-	25	-	ns	
Rise time	t _r		-	250	-		
Turn-off delay time	t _{d(off)}		③④	-	110		-
Fall time	t _f		-	140	-		
Total gate charge	Q _g	V _{DD} =80V, V _{GS} =10V I _D =50A	-	75	83	nC	
Gate-source charge	Q _{gs}		-	13	15		
Gate-drain charge	Q _{gd}		③④	-	36		40

Source-Drain Diode Ratings and Characteristics (T_C=25°C unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Source current	I _S	Integral reverse diode in the MOSFET	-	-	50	A
Source current (Pulsed) ①	I _{SM}		-	-	150	
Forward voltage ④	V _{SD}	V _{GS} =0V, I _S =50A	-	-	1.5	V
Reverse recovery time	t _{rr}	I _S =50A, V _{GS} =0V dI _F /dt=100A/us	-	100	-	ns
Reverse recovery charge	Q _{rr}		-	380	-	uC

Note ;

- ① Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature
- ② L=0.5mH, I_{AS}=25A, V_{DD}=10V, R_G=25Ω , Starting T_J=25°C
- ③ Pulse Test : Pulse Width ≤ 300us, Duty cycle ≤ 2%
- ④ Essentially independent of operating temperature

Electrical Characteristic Curves

Fig. 1 $I_D - V_{DS}$

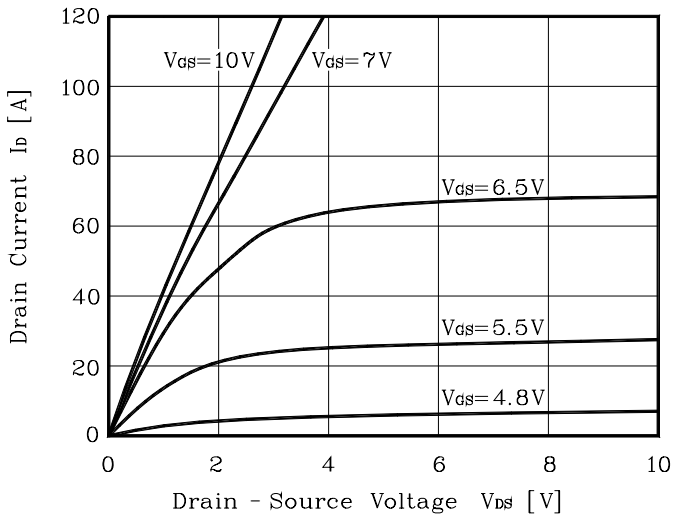


Fig. 2 $I_D - V_{GS}$

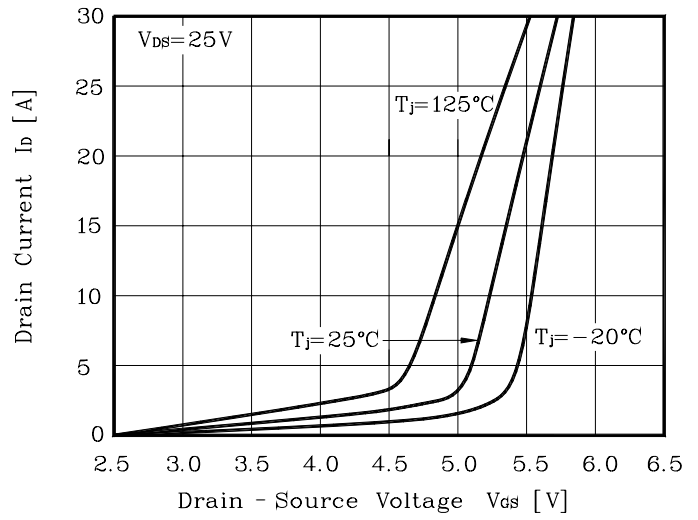


Fig. 3 $R_{DS(on)} - I_D$

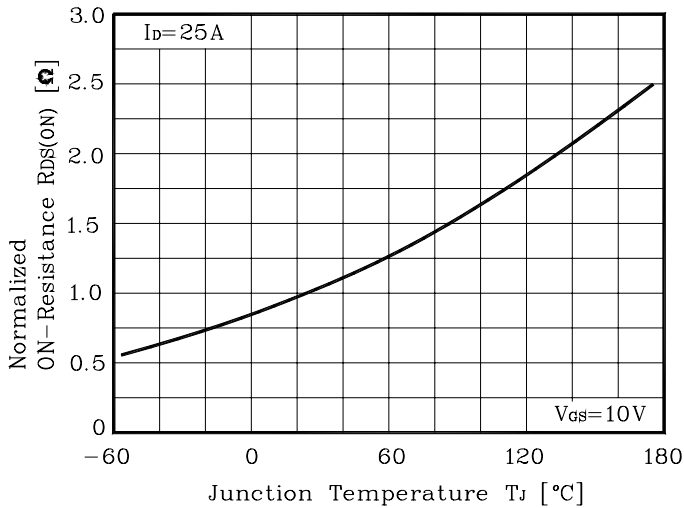


Fig. 4 $I_S - V_{SD}$

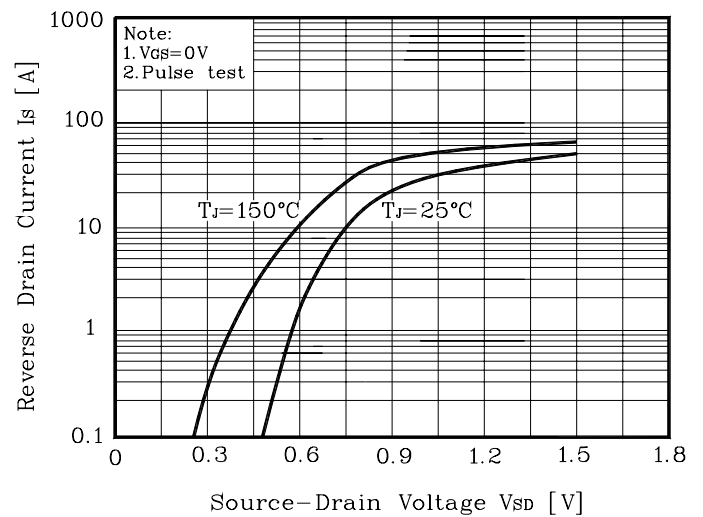


Fig. 5 Capacitance - V_{DS}

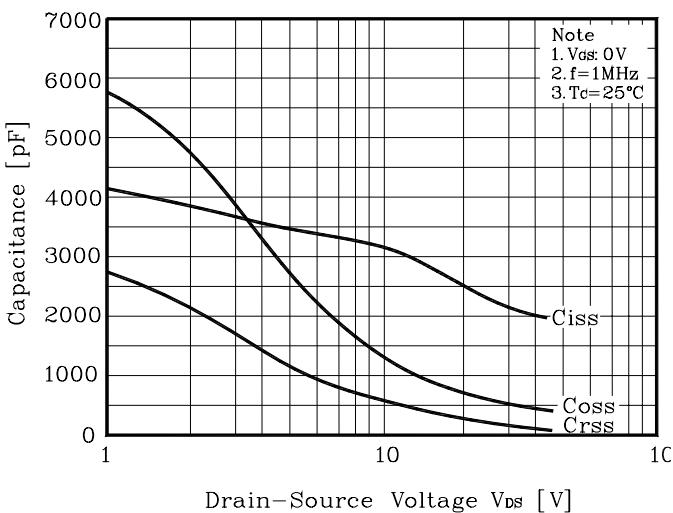
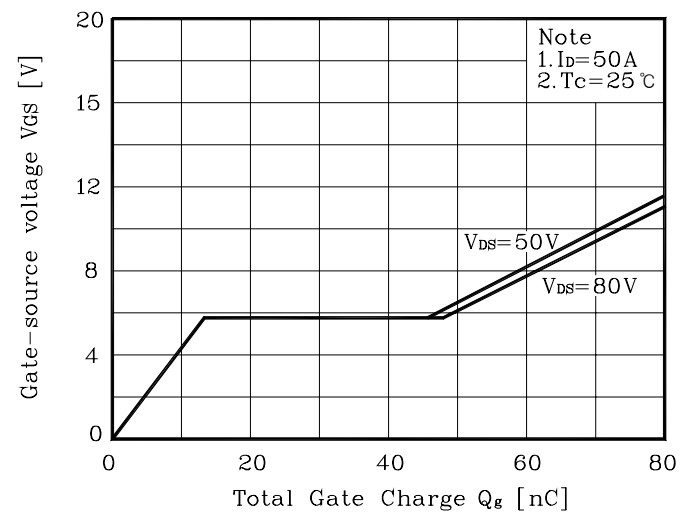


Fig. 6 $V_{GS} - Q_G$



Electrical Characteristic Curves

Fig. 7 $V_{DSS} - T_J$

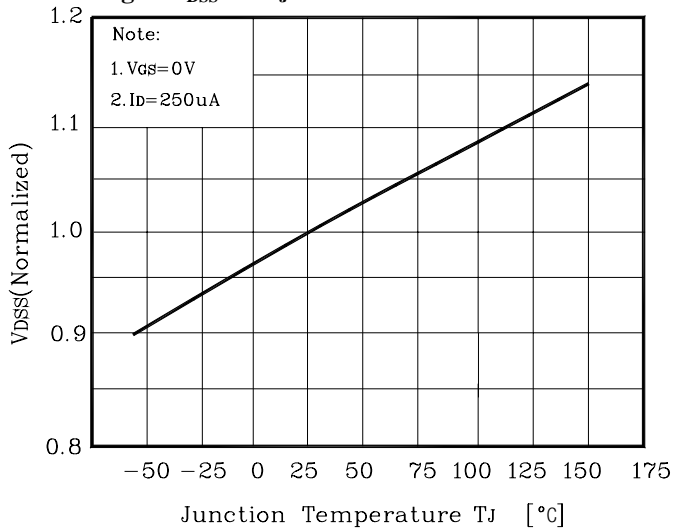


Fig.8 Safe Operating Area

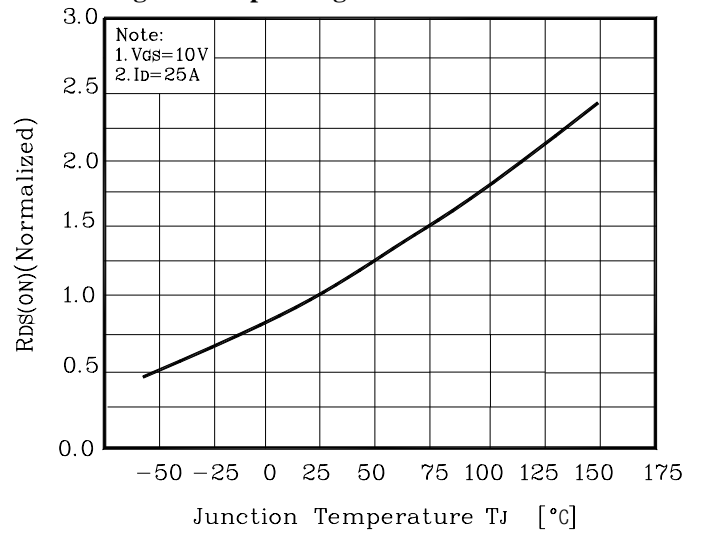


Fig. 9 $I_D - T_C$

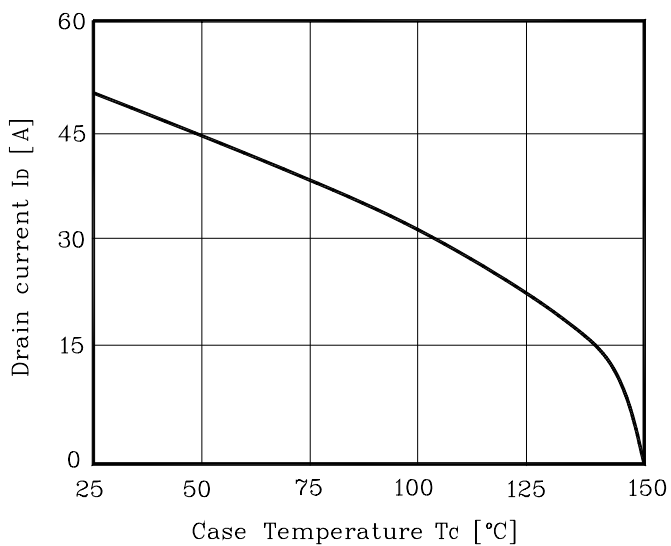


Fig.10 Safe Operating Area

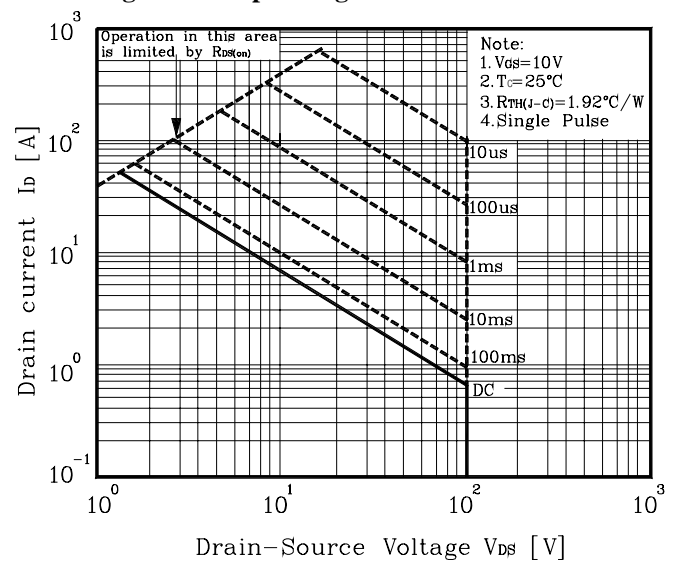


Fig. 11 Gate Charge Test Circuit & Waveform

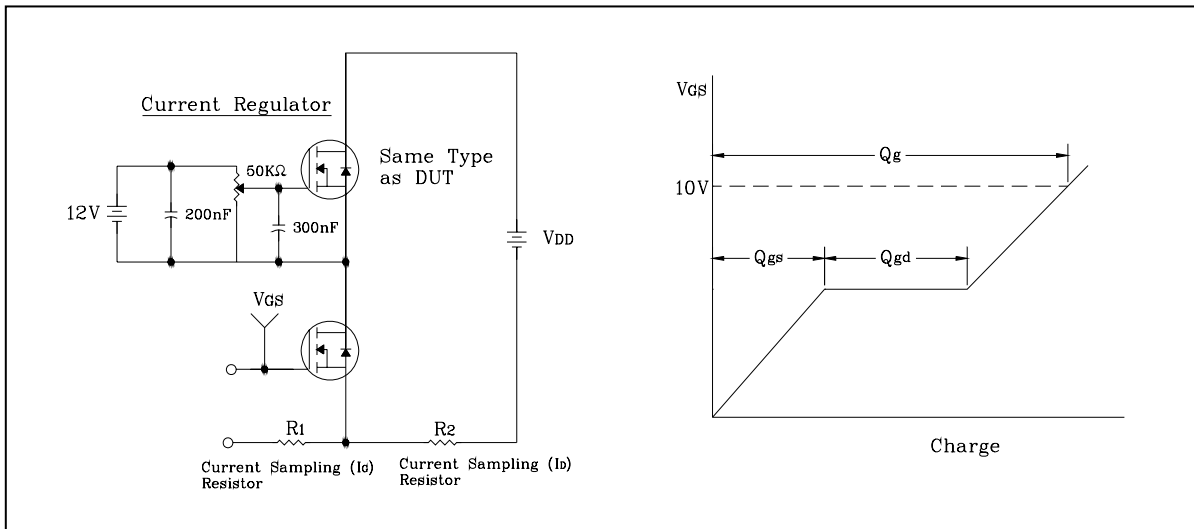


Fig. 12 Resistive Switching Test Circuit & Waveform

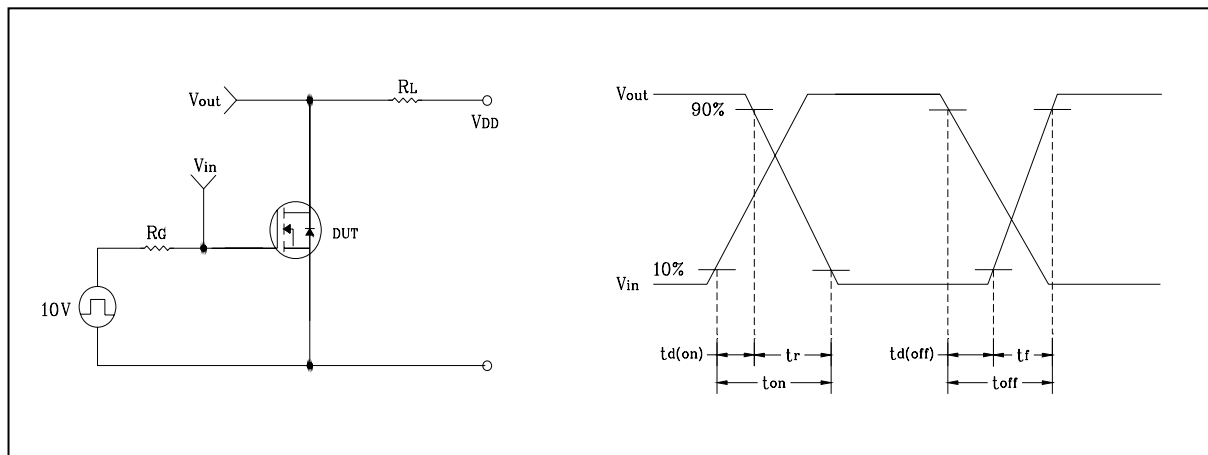


Fig. 13 E_{AS} Test Circuit & Waveform

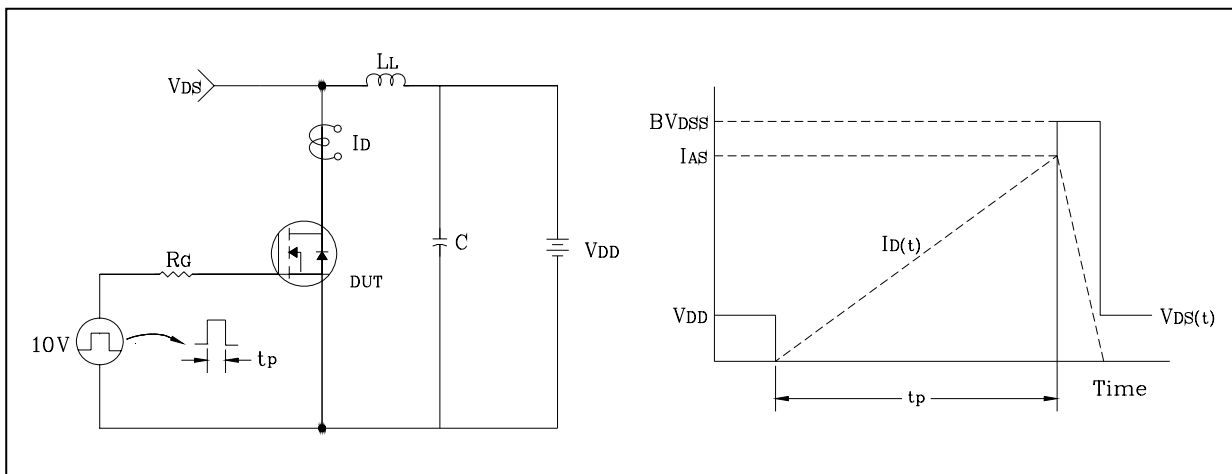
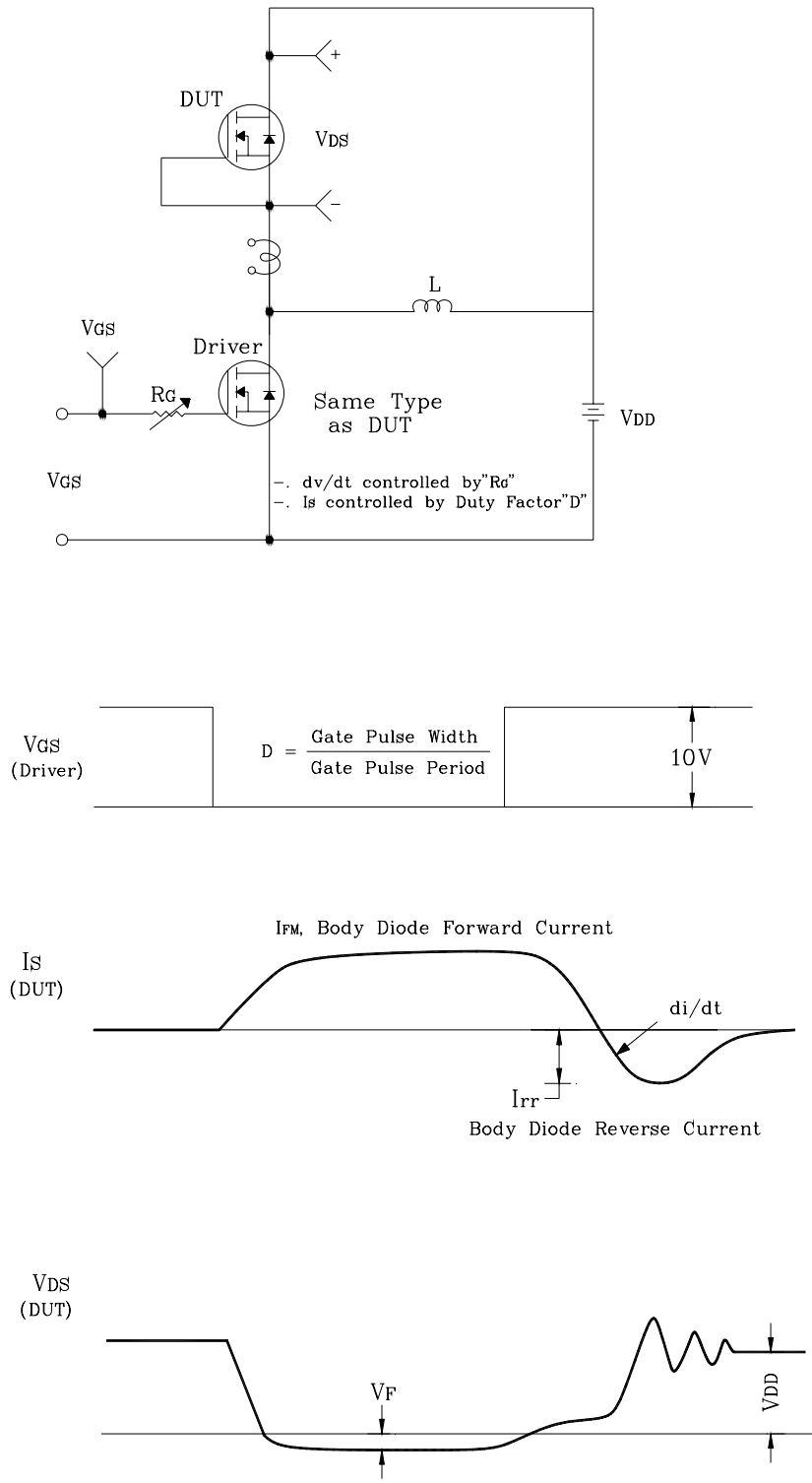
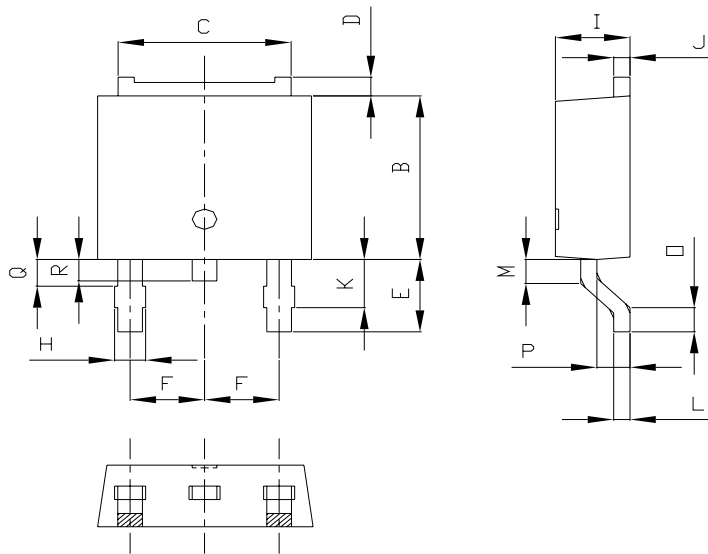


Fig. 14 Diode Reverse Recovery Time Test Circuit & Waveform



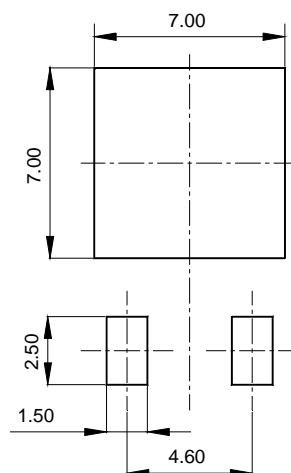
Outline Dimension

unit : mm



SYMBOL	MILLIMETERS			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
A	6.40	6.60	6.80	
B	5.90	6.10	6.30	
C	5.04	5.34	5.64	
D	0.50	0.70	0.90	
E	2.50	2.70	2.90	
F	2.10	2.30	2.50	
H	0.96 MAX			
I	2.20	2.30	2.40	
J	0.40	0.50	0.60	
K	1.60	1.80	2.00	
L	0.40	0.50	0.60	
M	0.81	0.91	1.01	
O	0.80	0.90	1.00	
P	0.90	1.00	1.10	
Q	0.95 MAX			
R	0.60	0.80	1.00	

Recommended Land Pattern [unit: mm]



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