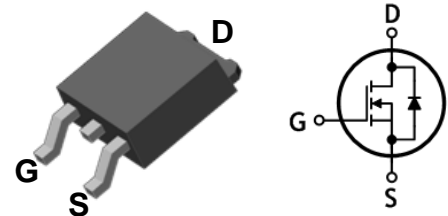


Power Switching Application

Features

- Drain-source breakdown voltage: $BV_{DSS}=100V$
- Low gate charge device
- Low drain-source On resistance: $R_{DS(on)}=25m\Omega$ (Typ.)
- Advanced trench process technology
- High avalanche energy, 100% test

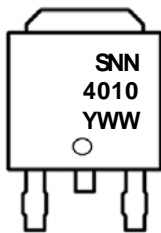


Ordering Information

Part Number	Marking	Package
SNN4010D	SNN4010	TO-252

TO-252

Marking Information



Column 1, 2: Device Code
 Column 3: Production Information
 e.g.) YWW
 -. YWW: Date Code (year, week)

Absolute maximum ratings ($T_C=25^\circ C$ 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	$T_C=25^\circ C$	45	A
		$T_C=100^\circ C$	35	A
Drain current (Pulsed) *	I_{DM}	180	A	
Single pulsed avalanche energy ^(Note 1)	E_{AS}	163	mJ	
Single avalanche current	I_{AS}	25.5	A	
Power dissipation	P_D	84	W	
Operating junction temperature	T_J	150	$^\circ C$	
Storage temperature range	T_{stg}	-55 to 150	$^\circ C$	

* Limited only maximum junction temperature

Thermal Characteristics

Characteristic	Symbol	Rating	Unit
Thermal resistance, junction to case	$R_{th(j-c)}$	Max. 1.48	°C/W
Thermal resistance, junction to ambient	$R_{th(j-a)}$	Max. 62	

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}	$I_D=250\mu\text{A}, V_{GS}=0$	100	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$I_D=250\mu\text{A}, V_{DS}=V_{GS}$	2	-	4	V
Drain-source cut-off current	I_{DSS}	$V_{DS}=100\text{V}, V_{GS}=0\text{V}$	-	-	1	uA
		$V_{DS}=100\text{V}, V_{GS}=0\text{V},$ (@ $T_J=125^\circ\text{C}$)	-	-	50	
Gate leakage current	I_{GSS}	$V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$	-	-	± 100	nA
Drain-source on-resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}, I_D=30\text{A}$	-	25	30	mΩ
Forward transfer conductance (Note 2)	g_{fs}	$V_{DS}=5\text{V}, I_D=30\text{A}$	-	50	-	S
Input capacitance	C_{iss}	$V_{DS}=25\text{V}, V_{GS}=0\text{V},$ $f=1\text{MHz}$	-	2042	-	pF
Output capacitance	C_{oss}		-	144	-	
Reverse transfer capacitance	C_{rss}		-	114	-	
Turn-on delay time (Note 2, 3)	$t_{d(on)}$	$V_{DD}=30\text{V}, I_D=2\text{A}$ $R_G=2.5\Omega, V_{GS}=10\text{V}$	-	13.9	-	ns
Rise time (Note 2, 3)	t_r		-	13.2	-	
Turn-off delay time (Note 2, 3)	$t_{d(off)}$		-	37.8	-	
Fall time (Note 2, 3)	t_f		-	11.1	-	
Total gate charge (Note 2, 3)	Q_g	$V_{DS}=30\text{V}, V_{GS}=10\text{V}$ $I_D=30\text{A}$	-	46.3	-	nC
Gate-source charge (Note 2, 3)	Q_{gs}		-	12	-	
Gate-drain charge (Note 2, 3)	Q_{gd}		-	16.9	-	

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	-	-	45	A
Source current (Pulsed)	I_{SM}		-	-	180	A
Forward voltage	V_{SD}	$V_{GS}=0\text{V}, I_S=30\text{A}$	-	-	1.3	V
Reverse recovery time (Note 2, 3)	t_{rr}	$I_S=30\text{A}, V_{GS}=0\text{V}$ $di_S/dt=-100\text{A/us}$	-	57	-	ns
Reverse recovery charge (Note 2, 3)	Q_{rr}		-	107	-	uC

Note:

1. $L=0.27\text{mH}, I_{AS}=25.5\text{A}, V_{DD}=50\text{V}, R_G=25\Omega,$ Starting $T_J=25^\circ\text{C}$
2. Pulse test: Pulse width $\leq 300\mu\text{s},$ Duty cycle $\leq 1.5\%$
3. Essentially independent of operating temperature typical characteristics

Electrical Characteristics Curves

Fig. 1 Typical output characteristics

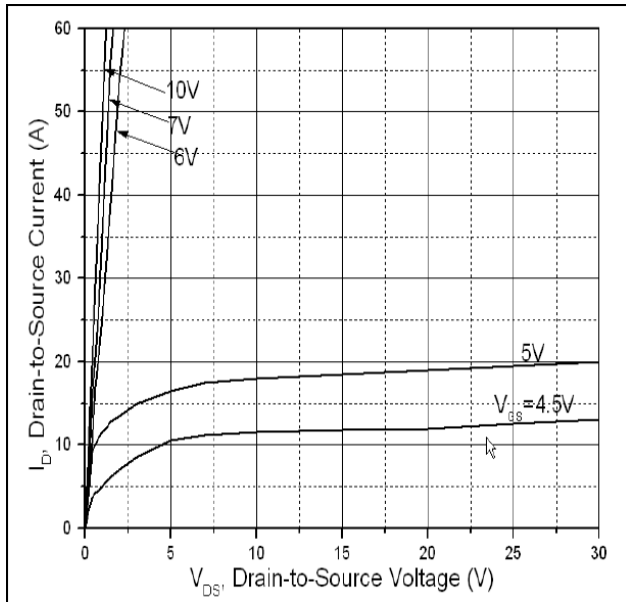


Fig. 2 Gate to source cut-off voltage

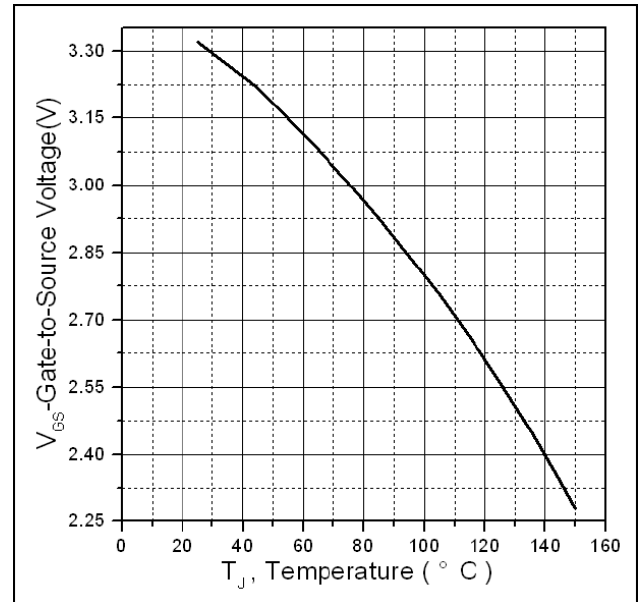


Fig. 3 Drain to source breakdown voltage vs. Case temperature

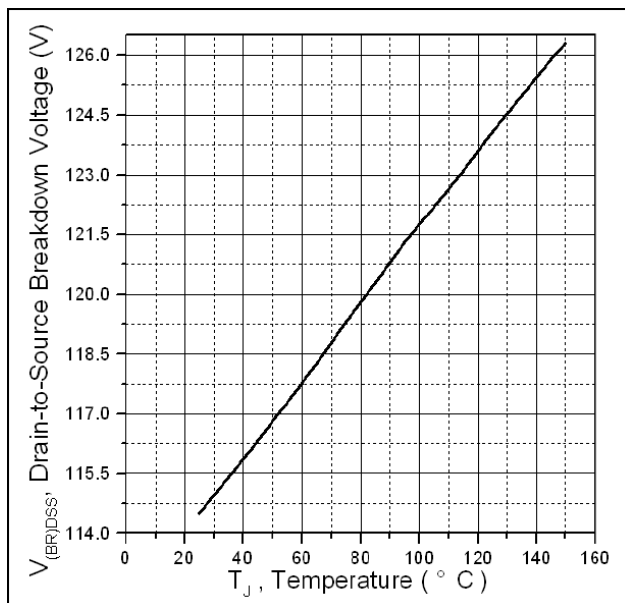
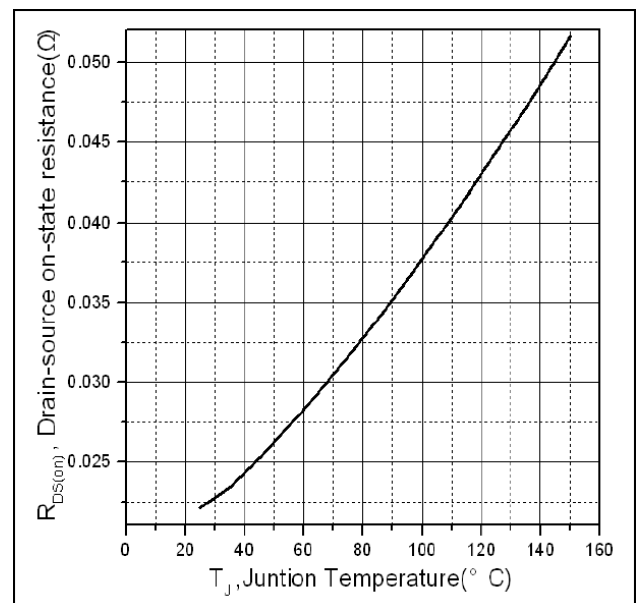


Fig. 4 Normalized On-resistance vs. Case temperature



Electrical Characteristics Curves

Fig. 5 Maximum drain current vs. Case temperature

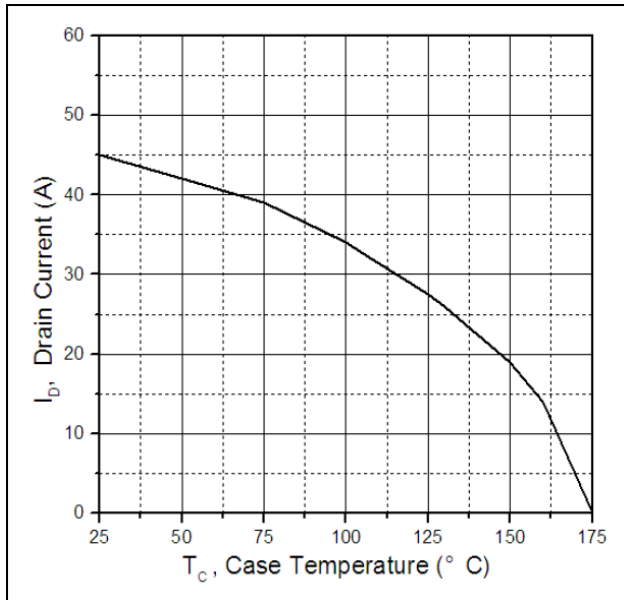


Fig. 6 Typical capacitance vs. Drain to source voltage

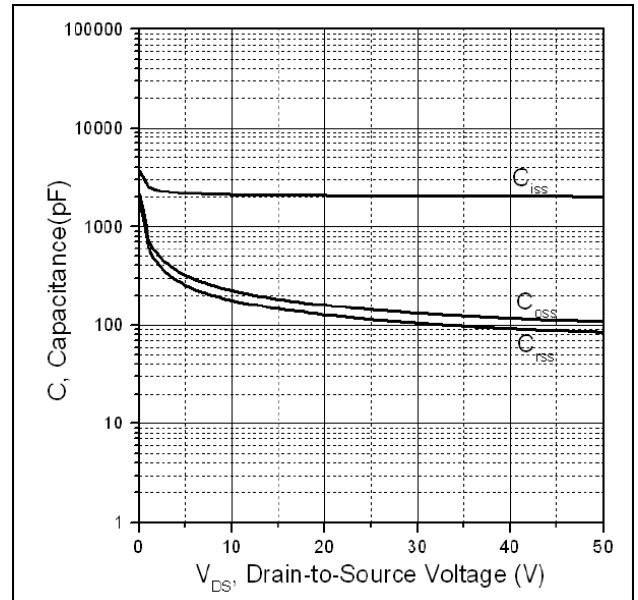


Fig. 7 Typical total gate charge vs. Gate to source voltage

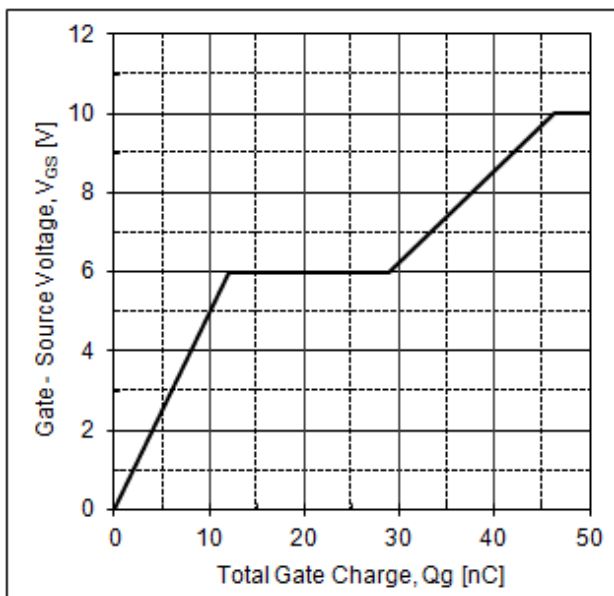
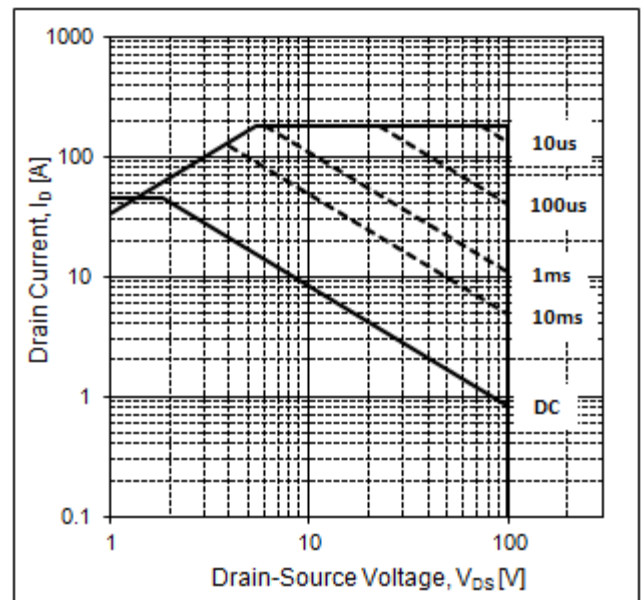
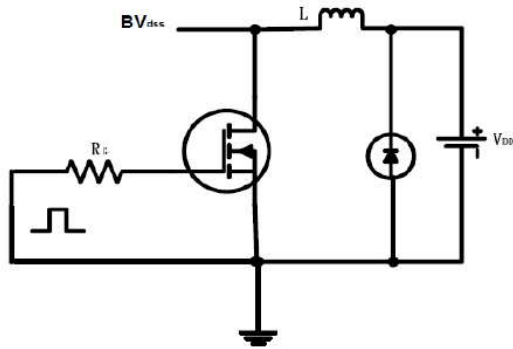


Fig. 6 Maximum Safe Operating Area

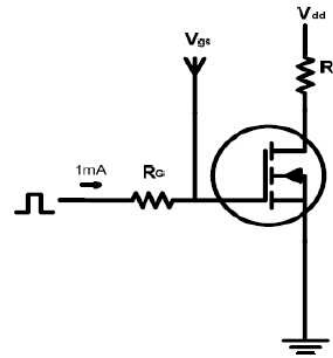


Test circuit

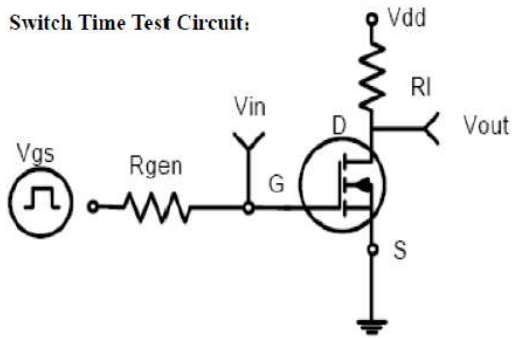
EAS test circuits:



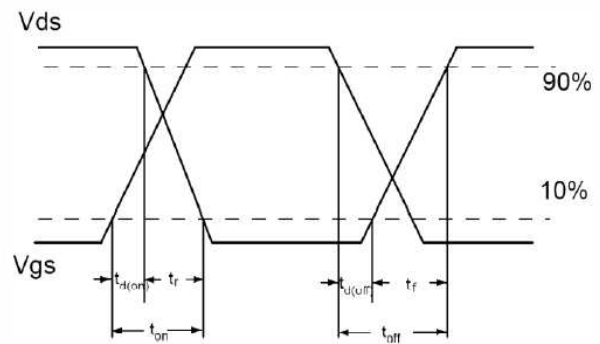
Gate charge test circuit:



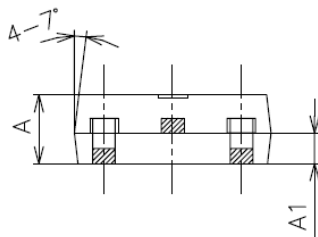
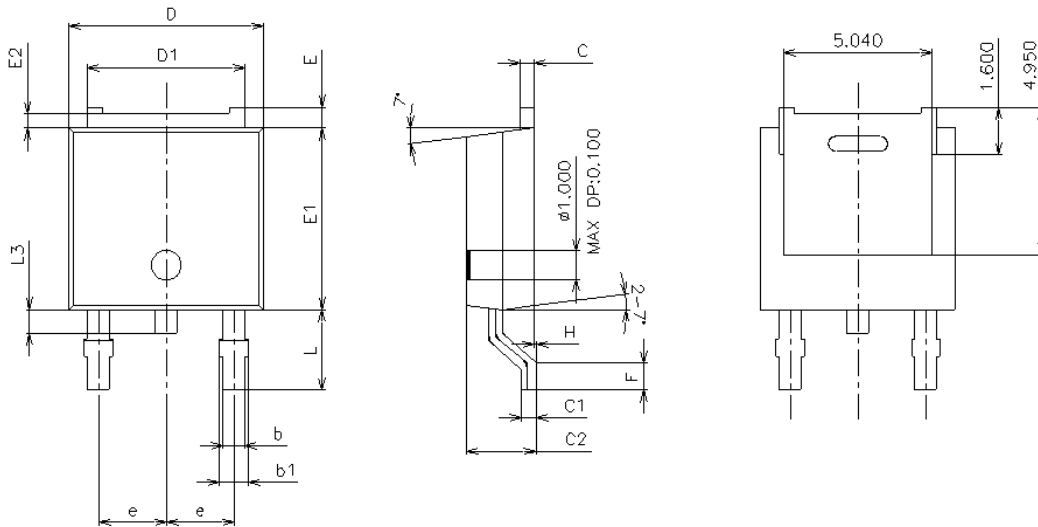
Switch Time Test Circuit:



Switch Waveforms:

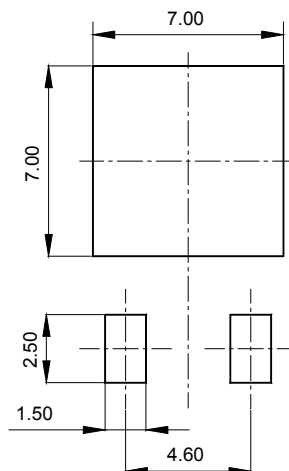


Package Outline Dimensions



SYMBOL	MILLIMETERS			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
D	6.40	6.60	6.80	
D1	5.14	5.34	5.54	
E	0.50	0.70	0.90	
E1	5.90	6.10	6.30	
E2	0.50 TYP			
A	2.20	2.30	2.40	
A1	0.87	1.07	1.27	
C	0.40	0.50	0.60	
C1	0.40	0.50	0.60	
C2	2.10	2.30	2.50	
L	2.50	2.70	2.90	
L3	0.60	0.80	1.00	
b	0.66	0.76	0.86	
b1	0.96 MAX			
e	2.10	2.30	2.50	
F	0.80 MIN			
H	0.00	-	0.10	

Recommended Land Pattern [unit: mm]



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