KODENSHI AUK

SMK1430DI

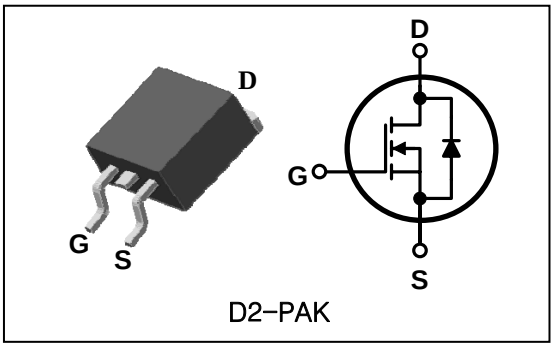
Advanced N-Ch Power MOSFET

SWITCHING REGURATOR APPLICATIONS

Features

- High Voltage : BV_{DSS}=300V(Min.)
- Low C_{rss} : C_{rss}=19pF(Typ.)
- Low gate charge : Qg=24nC(Typ.)
- Low $R_{DS(on)}$: $R_{DS(on)}$=0.29Ω(Max.)

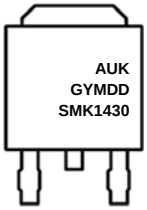
PIN Connection



Ordering Information

Type No.	Marking	Package Code
SMK1430DI	SMK1430	D2-PAK

Marking Diagram



Column 1 : Manufacturer

Column 2 : Production Information
e.g.) GYMDD
-. G : Factory management code
-. YMDD : Date Code (year, month, date)

Column 3 : Device Code

Absolute maximum ratings (T_C=25°C unless otherwise noted)

Characteristic	Symbol		Rating	Unit
Drain-source voltage	V_{DSS}		300	V
Gate-source voltage	V_{GSS}		±30	V
Drain current (DC) *	I_D	T_C=25°C	14	A
		T_C=100°C	8.4	A
Drain current (Pulsed) *	I_{DM}		90	A
Power dissipation	P_D		140	W
Avalanche current (Single) ②	I_{AS}		14	A
Single pulsed avalanche energy ②	E_{AS}		800	mJ
Avalanche current (Repetitive) ①	I_{AR}		14	A
Repetitive avalanche energy ①	E_{AR}		25	mJ
Junction temperature	T_J		150	°C
Storage temperature range	T_{stg}		-55~150	

* Limited by maximum junction temperature

Characteristic		Symbol	Typ.	Max.	Unit
Thermal resistance	Junction-case	$R_{th(J-C)}$	-	0.89	°C/W
	Junction-ambient	$R_{th(J-A)}$	-	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=250uA, V_{GS}=0V	300	-	-	V
Gate threshold voltage	$V_{GS(th)}$	I_D=250uA, V_{DS}=V_{GS}	3.0	-	5.0	V
Drain-source cut-off current	I_{DSS}	V_{DS}=300V, V_{GS}=0V	-	-	1	uA
		V_{DS}=300V, T_C=125℃	-	-	200	
Gate leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±30V	-	-	±100	nA
Drain-source on-resistance ④	$R_{DS(on)}$	V_{GS}=10V, I_D=7A	-	0.24	0.29	Ω
Forward transfer conductance ④	g_{fs}	V_{DS}=5V, I_D=7A	-	7.8	-	S
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V f=1 MHz	-	1075	1344	pF
Output capacitance	C_{oss}		-	182	228	
Reverse transfer capacitance	C_{rss}		-	19	23.8	
Turn-on delay time	$t_{d(on)}$	V_{DD}=150V, I_D=14A R_G=25Ω ③④	-	22	-	ns
Rise time	t_r		-	145	-	
Turn-off delay time	$t_{d(off)}$		-	45	-	
Fall time	t_f		-	70	-	
Total gate charge	Q_g	V_{DS}=240V, V_{GS}=10V I_D=14A ③④	-	24	30	nC
Gate-source charge	Q_{gs}		-	8.5	-	
Gate-drain charge	Q_{gd}		-	9.5	-	

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

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Source current (DC)	I_S	Integral reverse diode in the MOSFET	-	-	14	A
Source current (Pulsed) ①	I_{SM}		-	-	56	
Forward voltage ④	V_{SD}	V_{GS}=0V, I_S=14A	-	-	1.4	V
Reverse recovery time	t_{rr}	I_S=14A, V_{GS}=0V dI_F/dt=100A/us	-	235	-	ns
Reverse recovery charge	Q_{rr}		-	1.6	-	uC

Note ;

① Repetitive rating : Pulse width limited by maximum junction temperature

② L=6.8mH, I_{AS}=14A, V_{DD}=50V, R_G=25Ω, Starting T_J=25℃

③ Pulse Test : Pulse width≤300us, Duty cycle≤2%

④ Essentially independent of operating temperature

Electrical Characteristic Curves

Fig. 1 I_D - V_{DS}

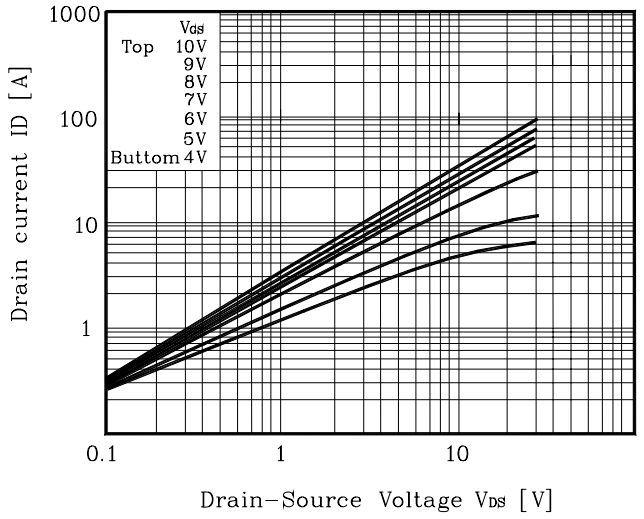


Fig. 2 I_D - V_{GS}

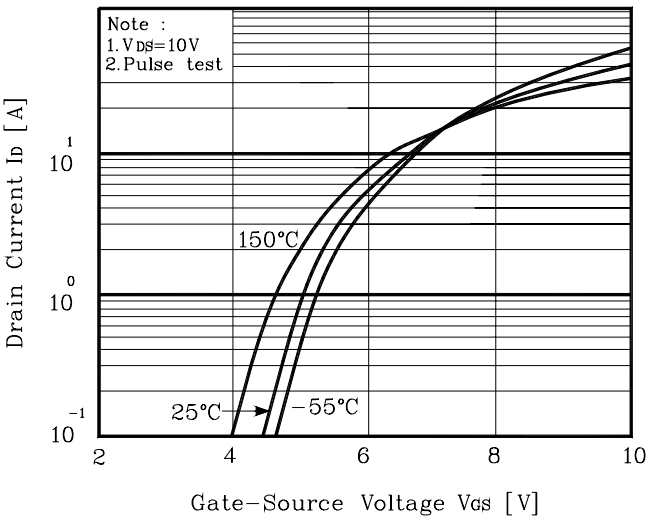


Fig. 3 $R_{DS(on)}$ - I_D

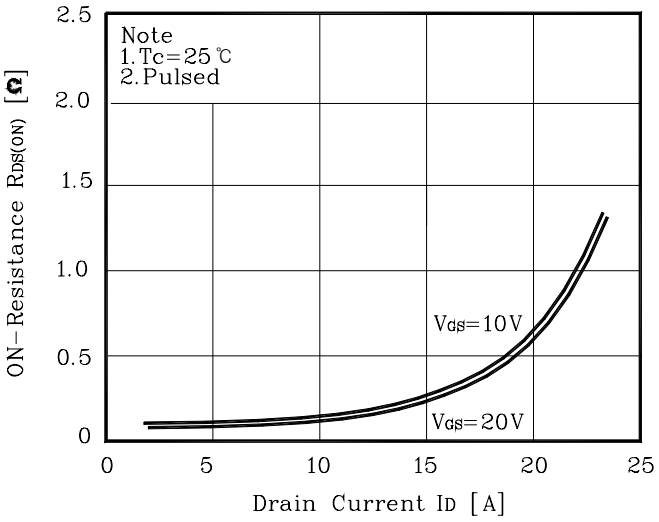


Fig. 4 I_S - V_{SD}

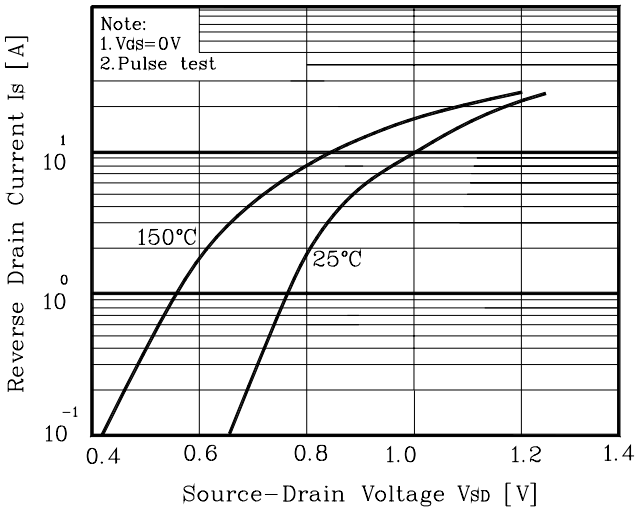


Fig. 5 Capacitance - V_{DS}

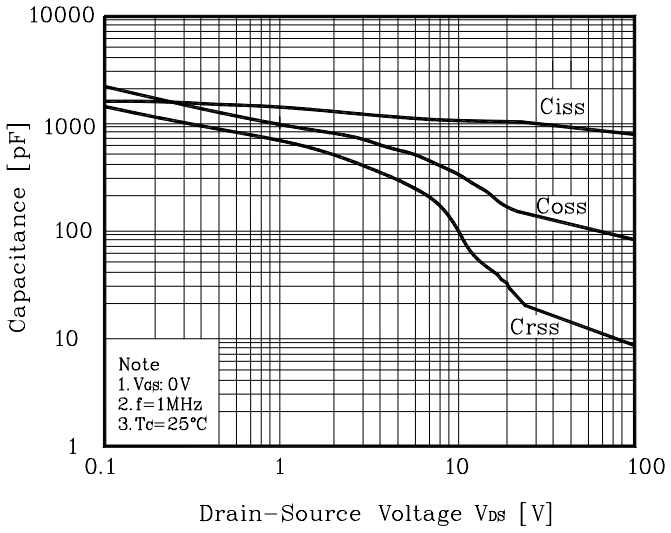


Fig. 6 V_{GS} - Q_G

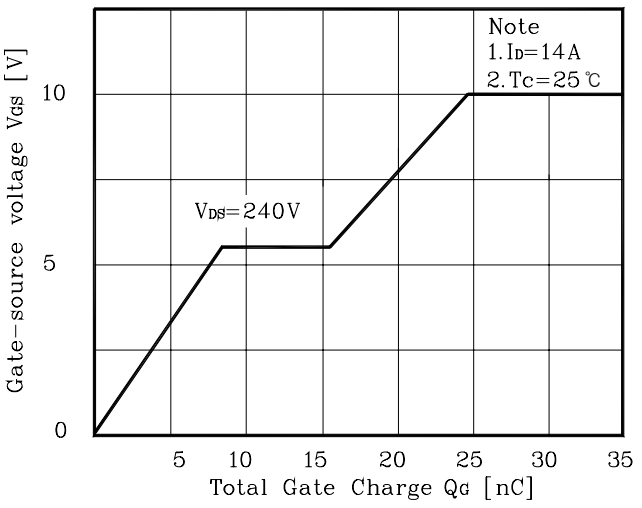


Fig. 7 V_{DSS} - T_J

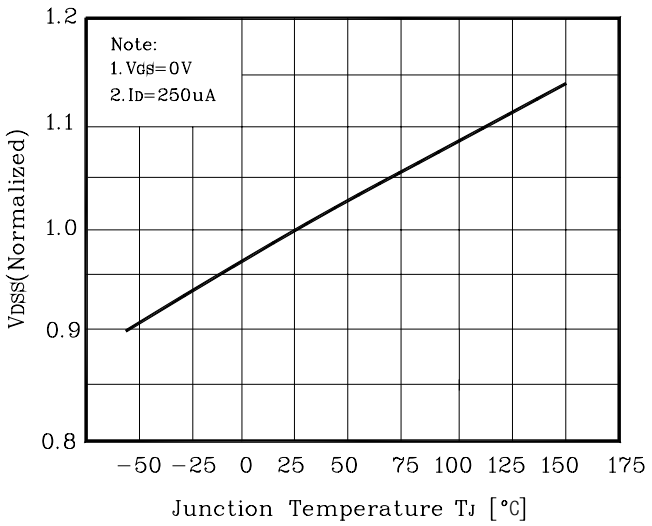


Fig. 8 $R_{DS(on)}$ - T_J

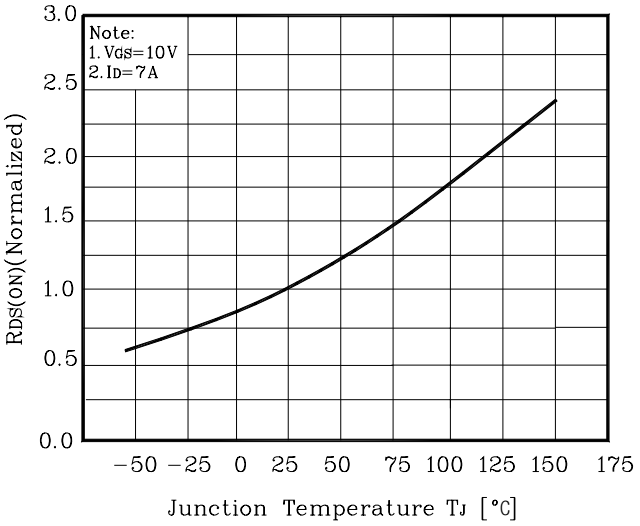


Fig. 9 I_D - T_C

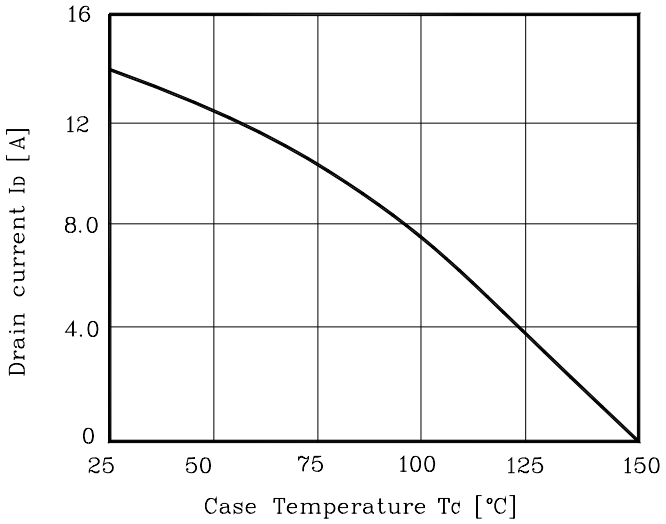


Fig. 10 Safe Operating Area

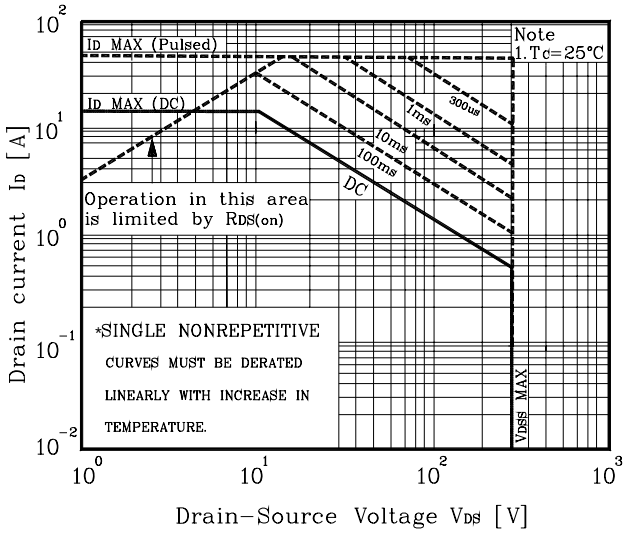


Fig. 11 Transient Thermal Impedance

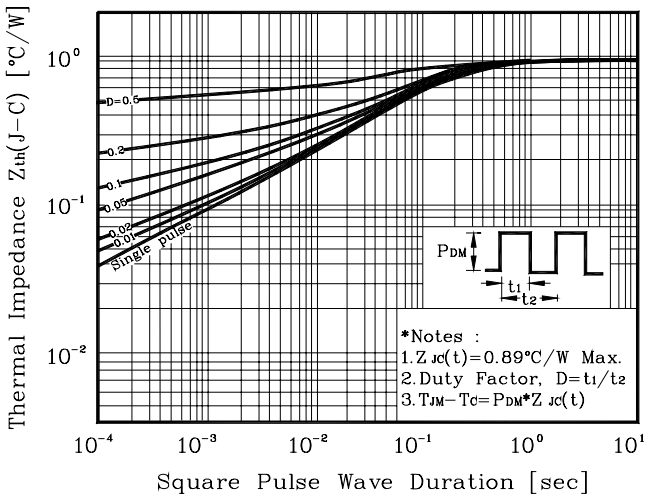


Fig. 11 Gate Charge Test Circuit & Waveform

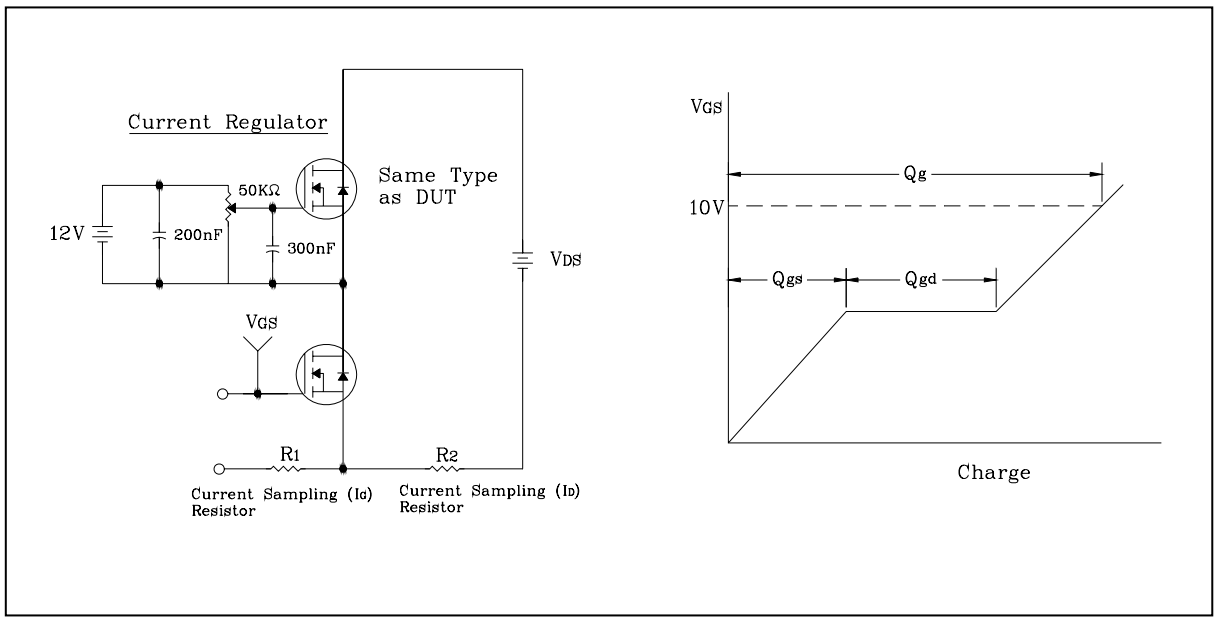


Fig. 12 Resistive Switching Test Circuit & Waveform

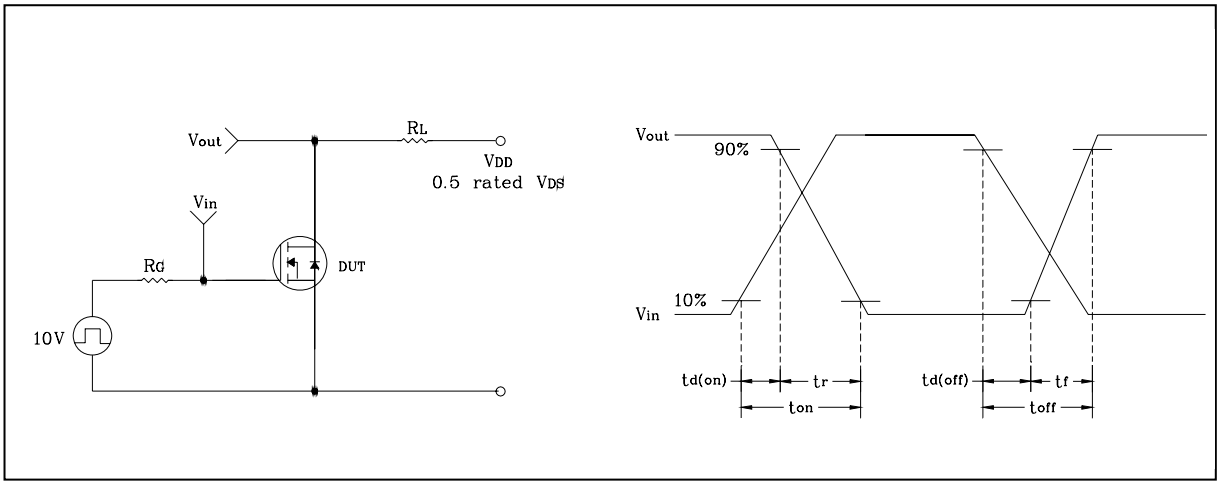


Fig. 13 E_{AS} Test Circuit & Waveform

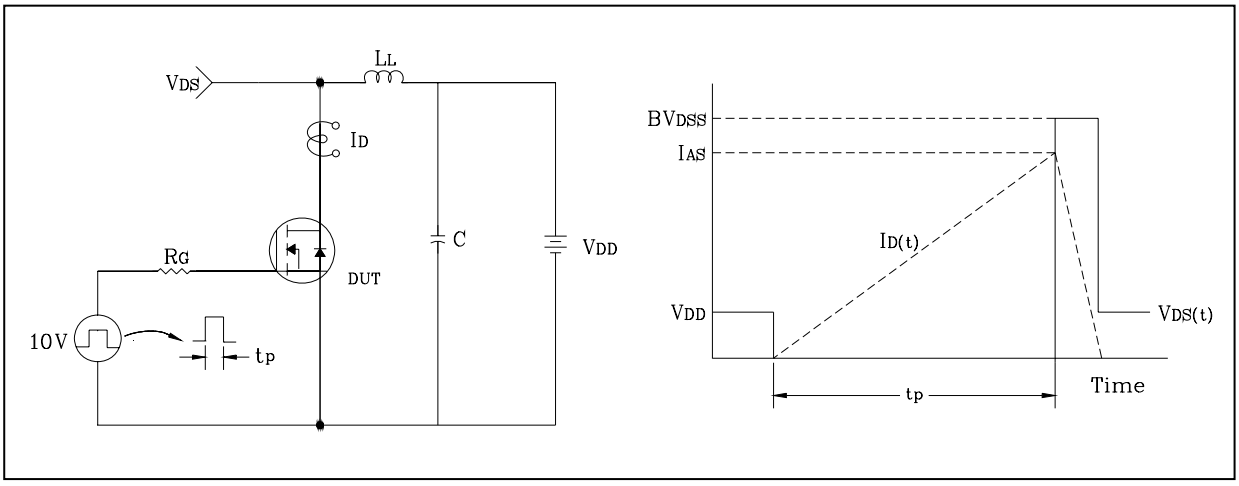
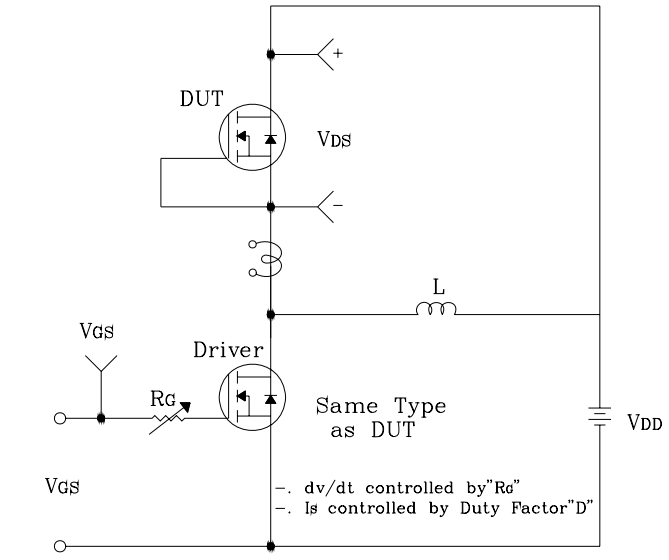
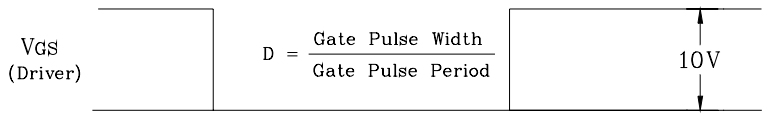
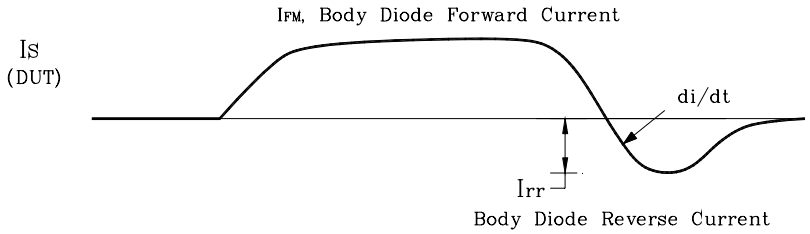
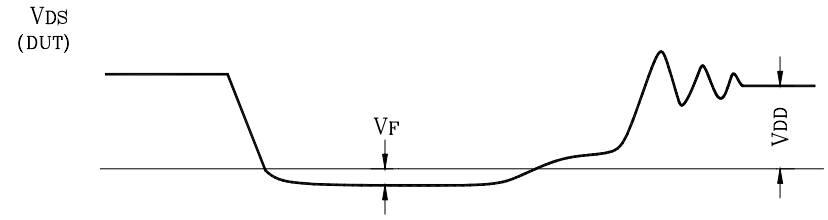


Fig. 14 Diode Reverse Recovery Time Test Circuit & Waveform



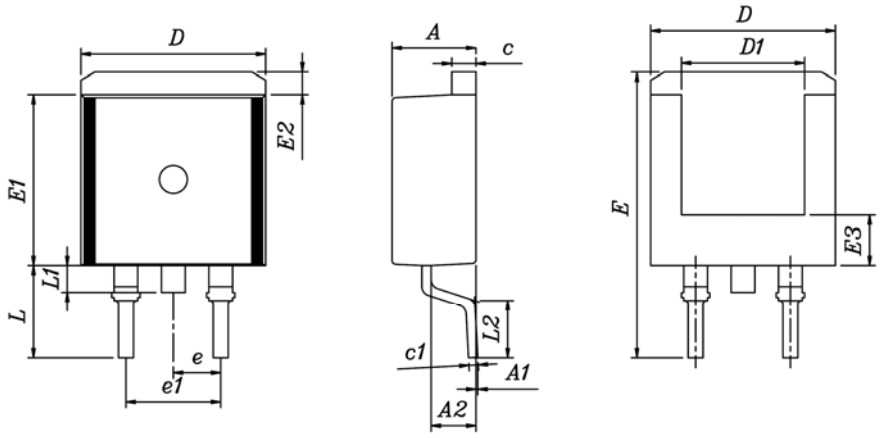






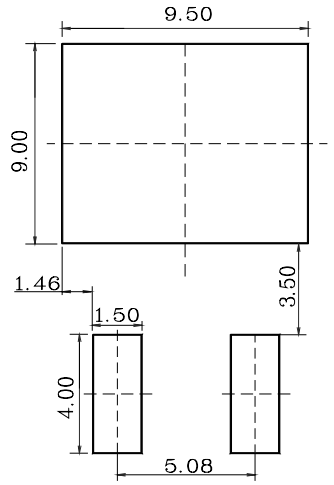
Outline Dimension

unit: mm



SYMBOL	MILLIMETERS			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
A	4.35	4.50	4.65	
A1	–	–	0.15	
A2	2.20	2.40	2.60	
c	1.20	1.30	1.40	
c1	0.40	0.50	0.60	
D	9.80	10.00	10.20	
D1	6.40	6.60	6.80	
E	15.00	15.40	15.80	
E1	9.05	9.20	9.35	
E2	1.00	1.20	1.40	
E3	2.50	2.70	2.90	
e	2.34	2.54	2.74	
e1	4.88	5.08	5.28	
L	4.60	5.00	5.40	
L1	1.40	1.45	1.50	
L2	2.50	–	–	

※ Recommended Land Pattern [unit: mm]



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