KODENSHI AUK

KMK830D

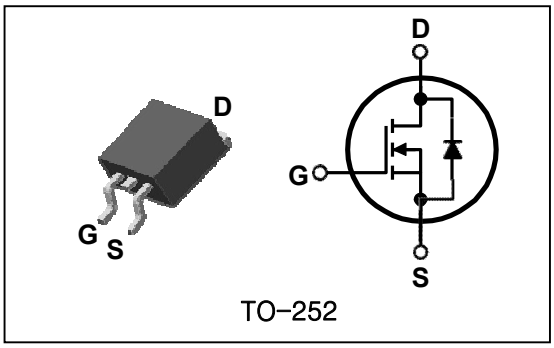
Advanced N-Ch Power MOSFET

SWITCHING REGULATOR APPLICATIONS

Features

- High Voltage : BV_{DSS}=500V(Min.)
- Low C_{rss} : C_{rss}=33pF(Typ.)
- Low gate charge : Qg=16nC(Typ.)
- Low $R_{DS(on)}$: $R_{DS(on)}$=1.5Ω(Max.)

PIN Connection



Ordering Information

Type No.	Marking	Package Code
KMK830D	KMK830.	TO-252

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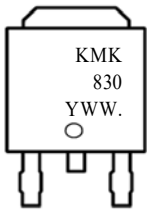
Marking Diagram



Column 1,2 : Device Code

Column 3 : Production Information
e.g.) YWW
-. YWW : Date Code (year, week)
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Absolute maximum ratings (T_C=25°C unless otherwise noted)

Characteristic	Symbol		Rating	Unit
Drain-source voltage	V_{DSS}		500	V
Gate-source voltage	V_{GSS}		±30	V
Drain current (DC) *	I_D	(Tc=25℃)	4.5	A
		(Tc=100℃)	2.9	A
Drain current (Pulsed) *	I_{DM}		18	A
Power dissipation	P_D		48	W
Avalanche current (Single) ②	I_{AS}		4.5	A
Single pulsed avalanche energy ②	E_{AS}		250	mJ
Avalanche current (Repetitive) ①	I_{AR}		4.5	A
Repetitive avalanche energy ①	E_{AR}		5.0	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	$R_{th(J-C)}$	-	2.6	°C/W
	Junction-ambient **	$R_{th(J-A)}$	-	50	

** When mounted on the minimum pad size recommended (PCB Mount)

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}=0	500	-	-	V
Gate threshold voltage	$V_{GS(th)}$	I_D=250uA, V_{DS}=V_{GS}	2.0	-	4.0	V
Drain-source cut-off current	I_{DSS}	V_{DS}=500V, V_{GS}=0V	-	-	1	uA
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=2.25A	-	1.2	1.5	∧
Forward transfer conductance ④	g_{fs}	V_{DS}=10V, I_D=2.25A	-	5.2	-	S
Input capacitance	Ciss	V_{GS}=0V, V_{DS}=25V, f=1MHz	-	745	930	pF
Output capacitance	Coss		-	82	102	
Reverse transfer capacitance	Crss		-	33	42	
Turn-on delay time	$t_{d(on)}$	V_{DD}=250V, I_D=4.5A R_G=25Ω ③④	-	12	-	ns
Rise time	t_r		-	46	-	
Turn-off delay time	$t_{d(off)}$		-	50	-	
Fall time	t_f		-	48	-	
Total gate charge	Q_g	V_{DS}=400V, V_{GS}=10V I_D=4.5A ③④	-	16	20	nC
Gate-source charge	Q_{gs}		-	5.5	-	
Gate-drain charge	Q_{gd}		-	4.0	-	

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	-	-	4.5	A
Source current (Pulsed) ①	I_{SM}		-	-	18	
Forward voltage ④	V_{SD}	V_{GS}=0V, I_S=4.5A	-	-	1.4	V
Reverse recovery time	t_{rr}	I_S=4.5A, V_{GS}=0V dI_F/dt=100A/us	-	263	-	ns
Reverse recovery charge	Q_{rr}		-	1.9	-	uC

Note ;

① Repetitive rating : Pulse width limited by maximum junction temperature

② L=22.2mH, I_{AS}=4.5A, 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}

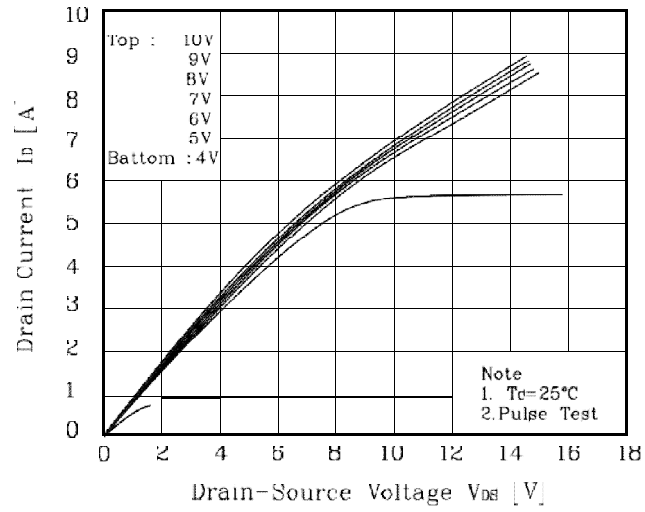


Fig. 2 I_D - V_{GS}

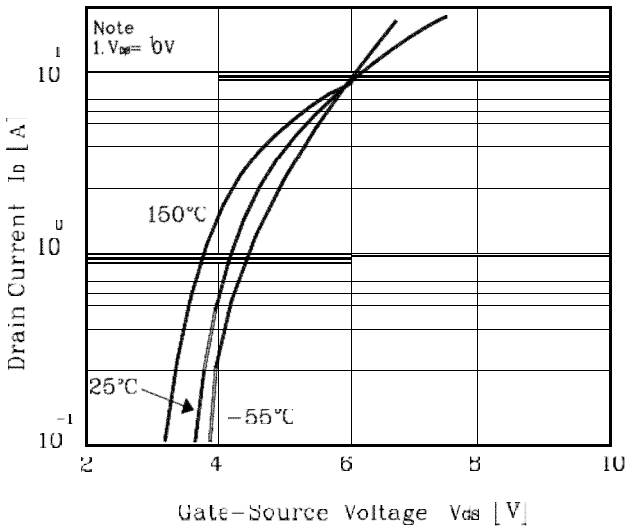


Fig. 3 $R_{DS(on)}$ - I_D

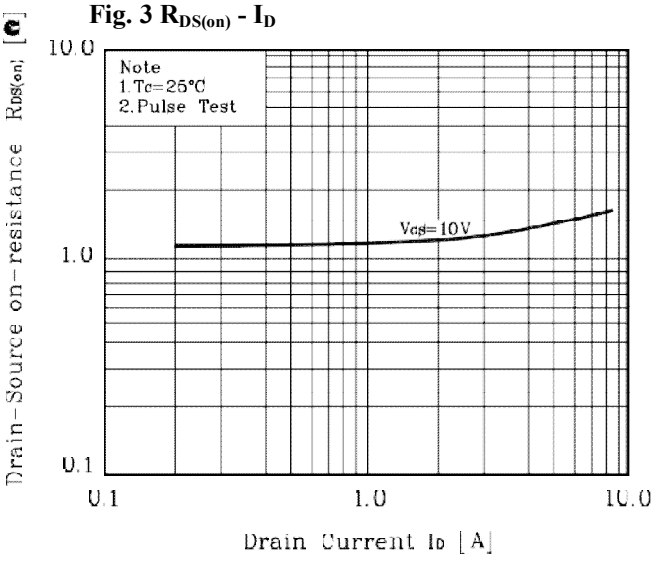


Fig. 4 I_S - V_{SD}

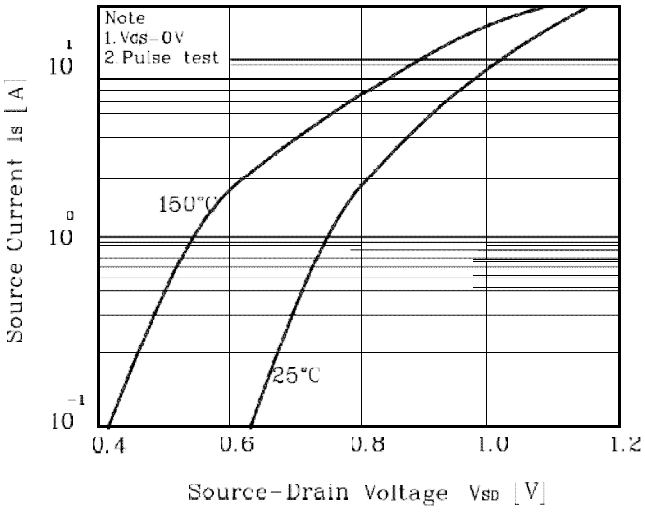


Fig. 5 Capacitance - V_{DS}

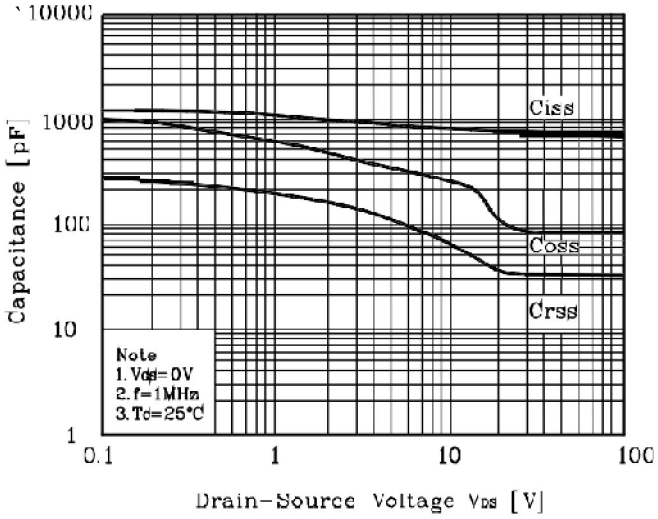


Fig. 6 V_{GS} - Q_G

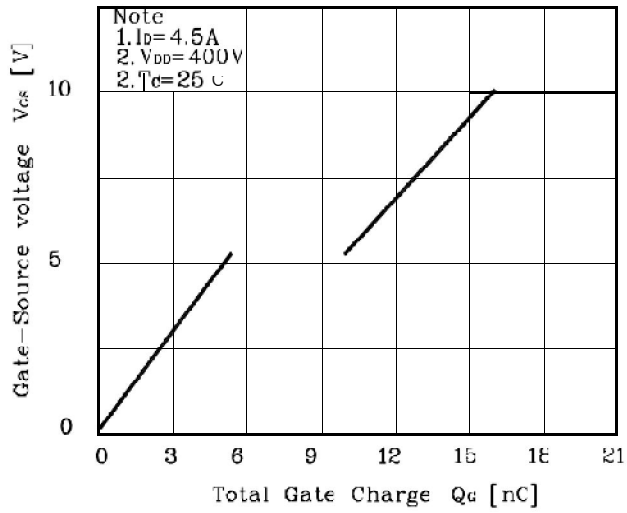


Fig. 7 $V_{(BR)DSS}$ - T_J

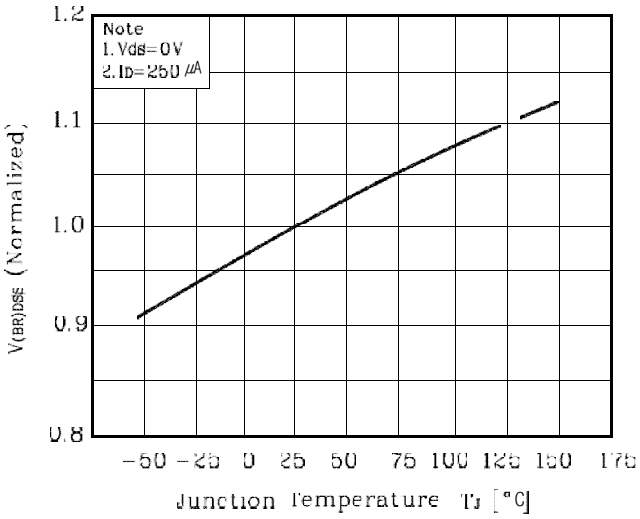


Fig. 8 $R_{DS(on)}$ - T_J

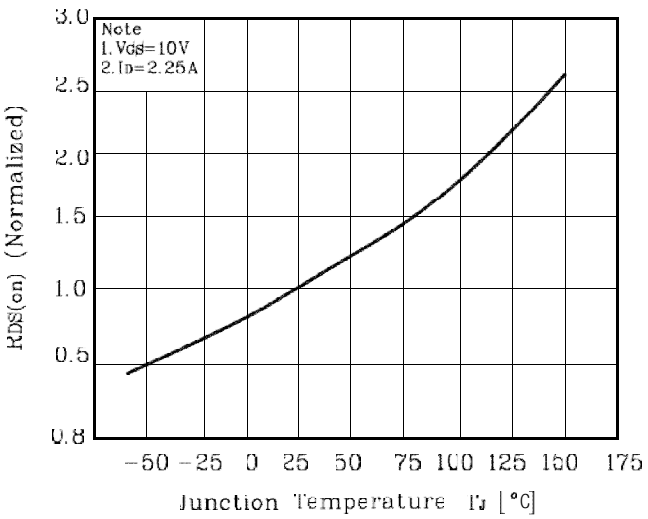


Fig. 9 I_D - T_C

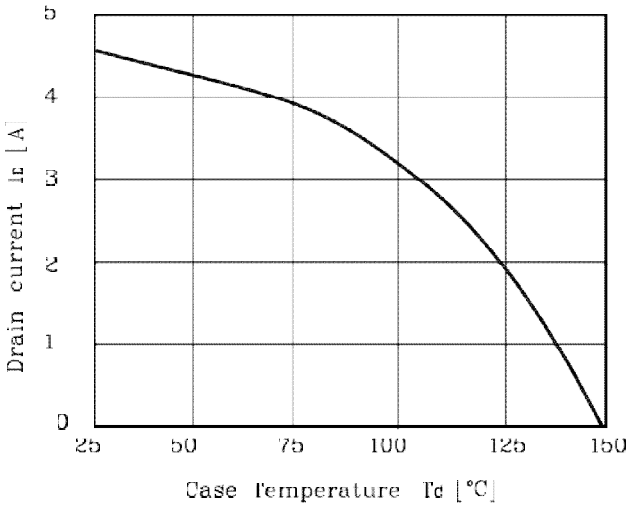


Fig. 10 Safe Operating Area

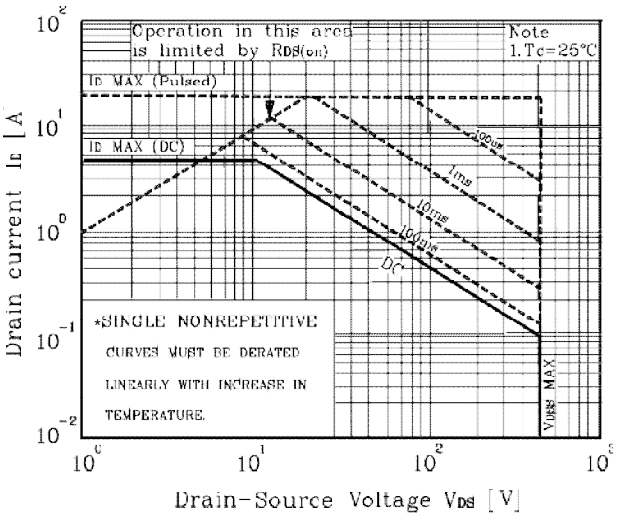


Fig. 11 Gate Charge Test Circuit & Waveform

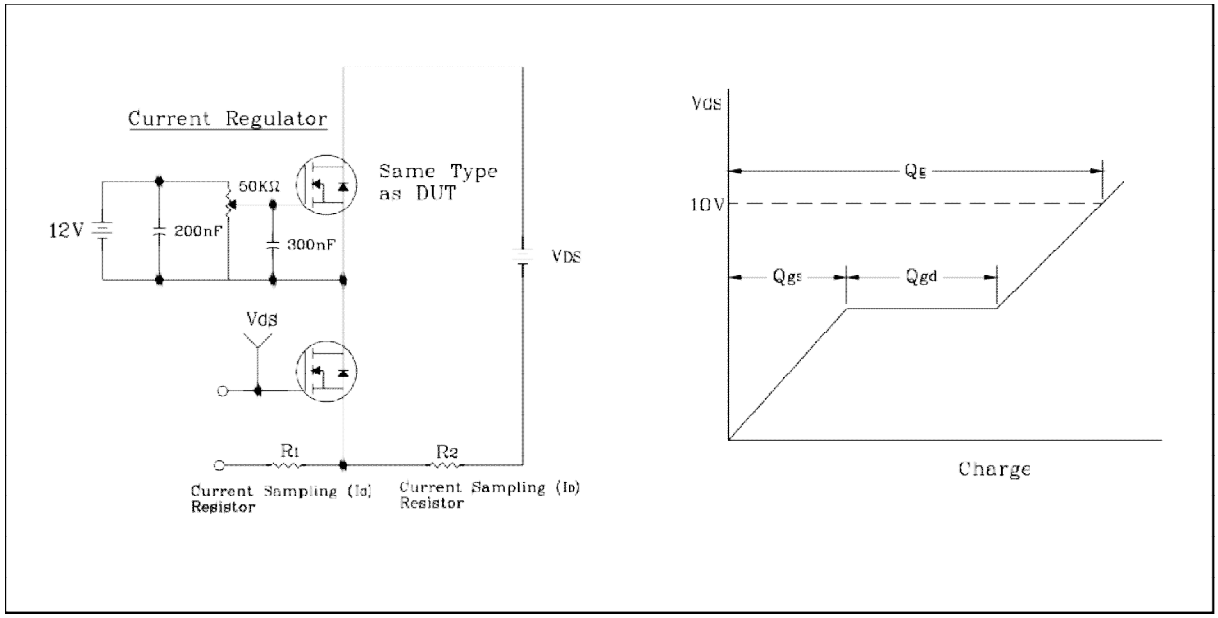


Fig. 12 Resistive Switching Test Circuit & Waveform

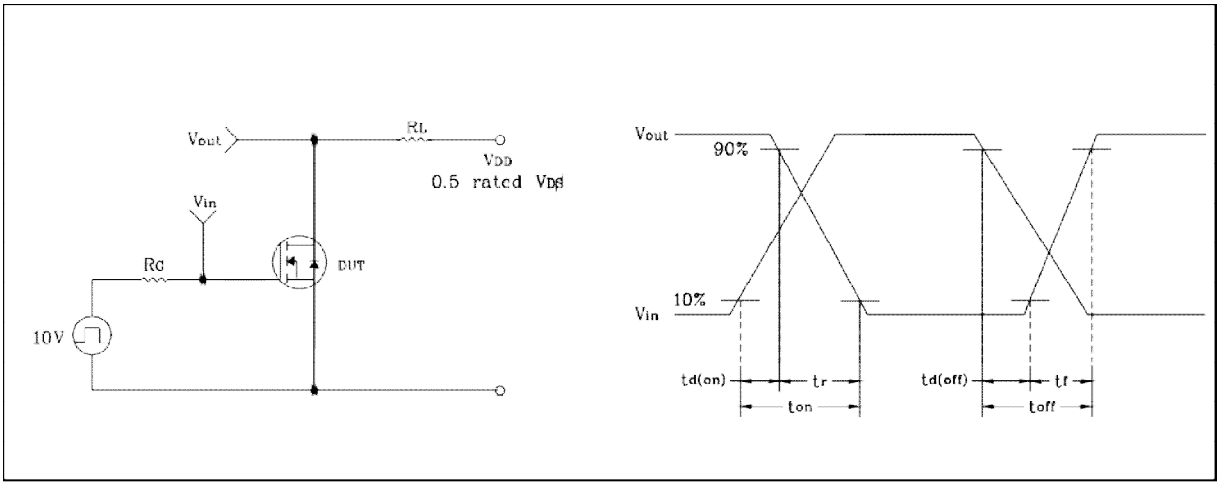


Fig. 13 E_{AS} Test Circuit & Waveform

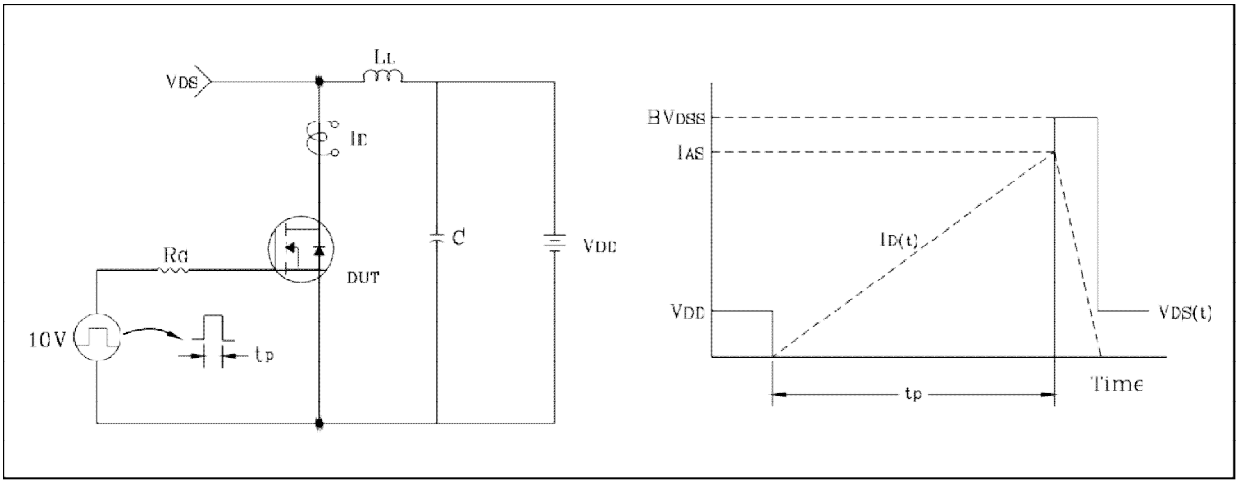
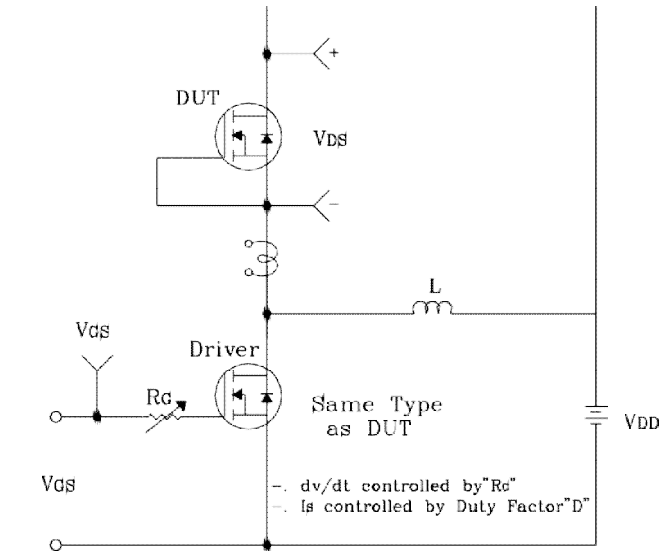
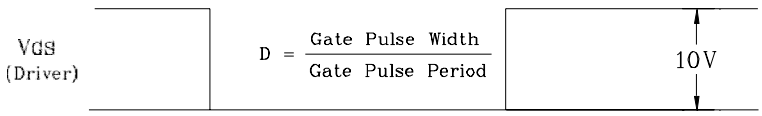
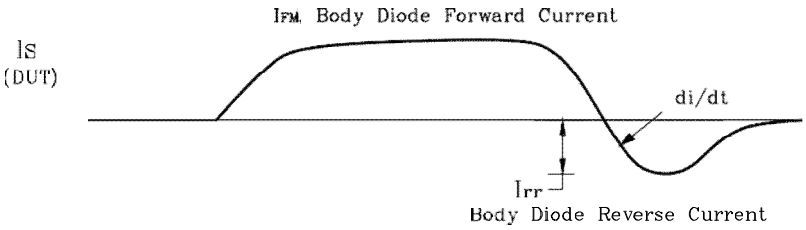
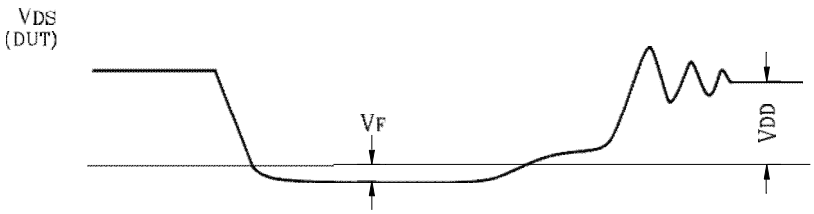


Fig. 14 Diode Reverse Recovery Time Test Circuit & Waveform



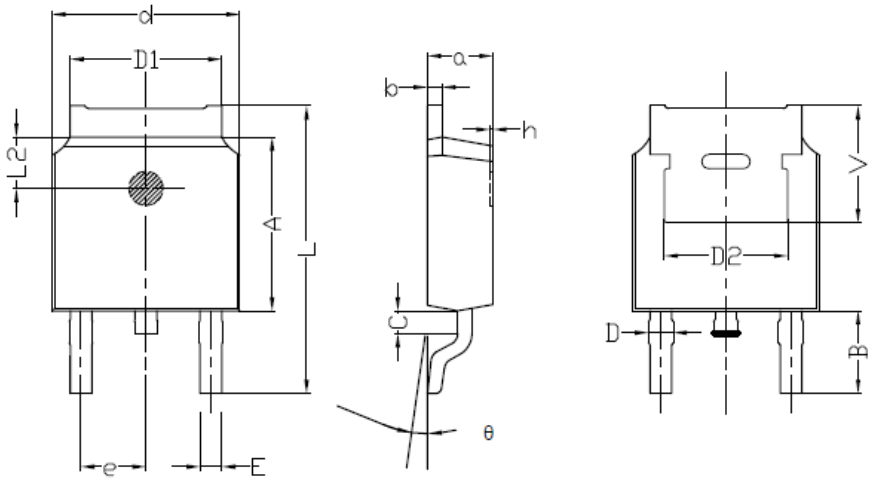






Outline Dimension

unit: mm



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
a	2.20	2.40	0.087	0.095
b	0.46	0.58	0.018	0.023
c	0.70	0.90	0.028	0.035
D	0.80	1.00	0.032	0.039
d	6.30	6.70	0.248	0.264
D1	5.00	5.50	0.197	0.217
D2	TYP 4.83		TYP 0.190	
A	5.80	6.20	0.228	0.244
e	2.19	2.39	0.086	0.094
L	9.40	10.40	0.370	0.409
B	2.6	3.2	0.102	0.126
L2	1.5	1.8	0.059	0.071
θ	0	8	0	8
h	0	0.3	0	0.012
V	5.25	5.85	0.207	0.230
E	0.6	0.8	0.024	0.032

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