KTK001SF

Advanced N-Ch Trench MOSFET

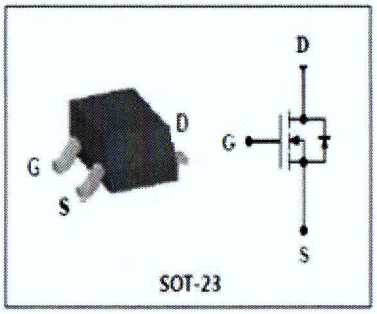
N 沟道 MOSFET

PORTABLE EQUIPMENT APPLICATION 便携设备应用

Features 特性

Low Voltage 低电压: BV_{DSS}=20V(Min.)
Low $V_{GS(th)}$: $V_{GS(th)}$=0.6~1.2V
Small footprint due to small package 小尺寸封装
Low $R_{DS(on)}$: $R_{DS(on)}$=33mΩ(Typ.)

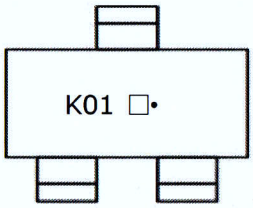
PIN Connection



Ordering Information 订购须知

Type NO	Marking	Package Code
KTK001S	K01 □ • (① ②)	SOT-23

Marking Diagram



K01 : Specific Device Code
□ : Year & Week Code Marking
• Da Lian

Absolute maximum ratings 绝对最大额定值 (T_A=25℃ unless otherwise noted 除非另有说明)

Characteristic 特性	Symbol 标志	Rating 额定功率	Unit 单位
Drain-source voltage 漏-源电压	V_{DSS}	20	V
Gate-source voltage 栅-源电压	V_{GSS}	±12	V
Drain current (DC) * 漏极电流（直流）	I_D	3.2	A
Drain current (Pulsed) * 漏极电流（脉冲）	I_{DM}	12.8	A
Power dissipation ** 功耗	P_D	0.35	W
Avalanche current (Single) 雪崩电流（单） ②	I_{AS}	3.2	A
Single pulsed avalanche energy 单脉冲雪崩能量②	E_{AS}	30	mJ
Avalanche current (Repetitive) 雪崩电流（重复）①	I_{AR}	3.2	A
Repetitive avalanche energy 重复雪崩能量 ①	E_{AR}	2.5	mJ
Junction temperature 结温	T_J	150	℃
Storage temperature range 存储温度范围	T_{stg}	-55~150	

Characteristic		Symbol	Typ.	Max.	Unit
Thermal resistance	Junction-ambient	$R_{th(J-A)}$	-	357	℃/W

Electrical Characteristics 电特性 (T_A=25℃ unless otherwise noted 除非另有说明)

Characteristic 特性	Symbol 标志	Test Condition 测试条件	Min. 最小	Typ.典型	Max.最大	Unit 单位
Drain-source breakdown voltage 漏源击穿电压	BV_{DSS}	I_D=250μA, V_{GS}=0	20	-	-	V
Gate threshold voltage 栅阀值电压	$V_{GS(th)}$	I_D=250μA, V_{DS}=V_{GS}	0.6	-	1.2	V
Drain-source cut-off current 漏源截止电流	I_{DSS}	V_{DS}=20V, V_{GS}=0V	-	-	1	μA
Gate leakage current 栅漏电流	I_{GSS}	V_{DS}=0V, V_{GS}=±12V	-	-	±10	μA
Drain-source on-resistance 漏源导通电阻 ④	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=1.6A	-	33	50	mΩ
		V_{GS}=2.5V, I_D=1.6A	-	46	70	
Forward transfer conductance 正向传输电导 ④	g_{fs}	V_{DS}=5V, I_D=3.2A	-	10.5		S
Input capacitance 输入电容	Ciss	V_{GS}=0V, V_{DS}=10V, f=1MHz	-	395	-	pF
Output capacitance 输出电容	Coss		-	97	-	
Reverse transfer capacitance 反向传输电容	Crss		-	44	-	
Turn-on delay time 开机延迟时间	$t_{d(on)}$	V_{DD}=10V, I_D=3.2A R_G=10Ω ③④	-	3.2	-	ns
Rise time 上升时间	t_r		-	2.8	-	
Turn-off delay time 断开延迟时间	$t_{d(off)}$		-	20	-	
Fall time 下降时间	t_f		-	2.8	-	
Total gate charge 总闸极电荷	Q_g	V_{DD}=10V, V_{GS}=4.5V I_D=3.2A ③④	-	6.8	10	nC
Gate-source charge 栅源电荷	Q_{gs}		-	0.8	1.2	
Gate-drain charge 栅漏电荷	Q_{gd}		-	0.9	1.1	

Source-Drain Diode Ratings and Characteristics 源漏二极管额定值和特性

(T_A=25℃ unless otherwise noted 除非另有说明)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Continuous source current 连续源电流	I_S	Integral reverse diode in the MOSFET	-	-	0.5	A
Source current (Pulsed)源电流（脉冲） ①	I_{SM}		-	-	2.0	
Forward voltage 正向电压 ④	V_{SD}	V_{GS}=0V, I_S=0.5A	-	0.7	1.2	V
Reverse recovery time 反向恢复时间	t_{rr}	I_S=3.2A, V_{DD}=10V dIs/dt=70A/us	-	24	-	ns
Reverse recovery charge 反向恢复电荷	Q_{rr}		-	120	-	uC

Note ;

① Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature
重复额定值：最大结温规定的脉冲宽度

② L=3.0mH, IAS=3.8A, VDD=10V, RG=25

③ Pulse Test 脉冲测试 : Pulse width 脉冲宽度≤300us, Duty cycle≤2%

④ Essentially independent of operating temperature 本质上独立于操作温度

Electrical Characteristic Curves 电特性曲线

Fig. 1 I_D - V_{DS}

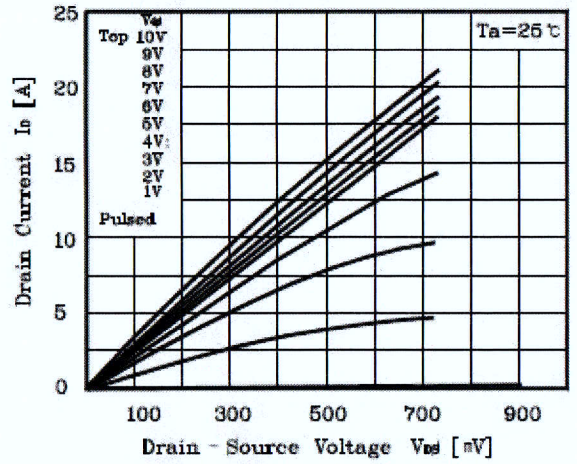


Fig. 2 I_D - V_{GS}

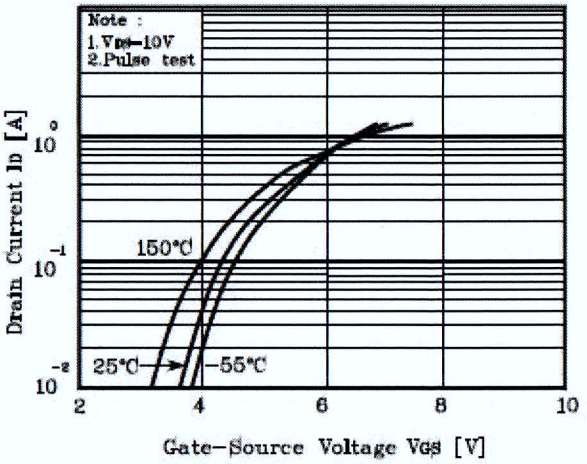


Fig. 3 $R_{DS(on)}$ - I_D

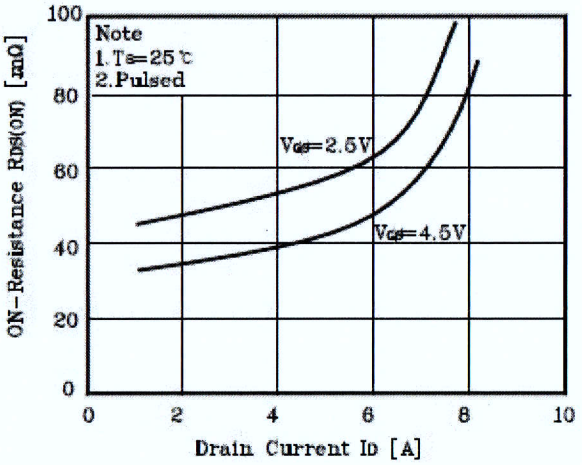


Fig. 4 I_S - V_{SD}

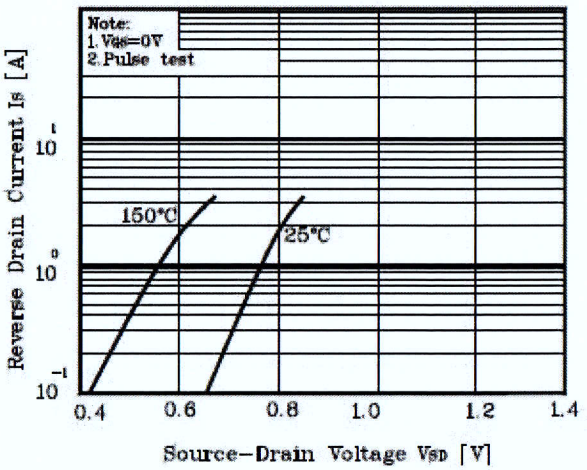


Fig. 5 Capacitance - V_{DS}

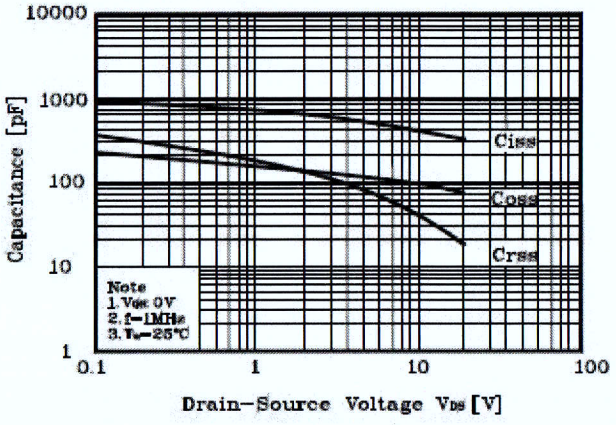


Fig. 6 V_{GS} - Q_G

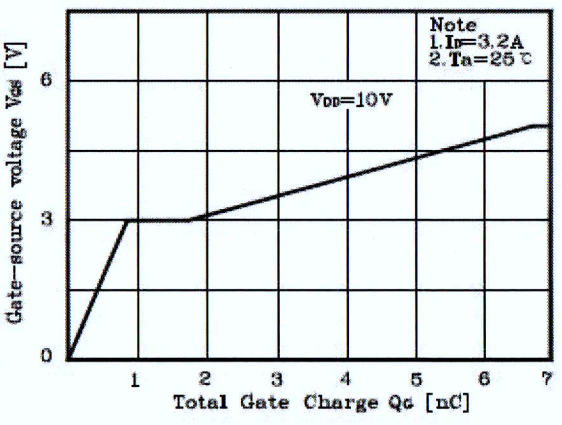


Fig. 7 V_{DSS} - T_J

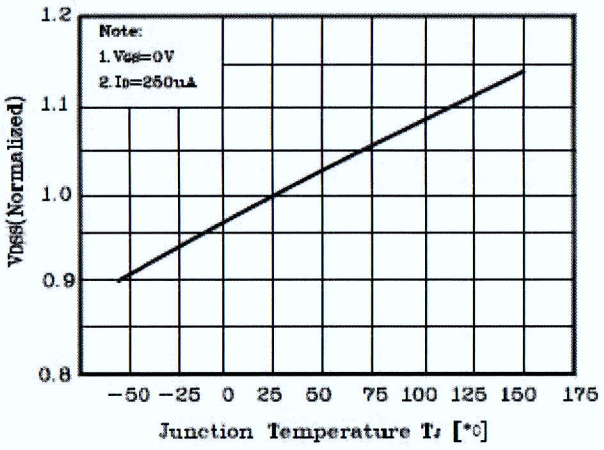


Fig. 8 $R_{DS(on)}$ - T_J

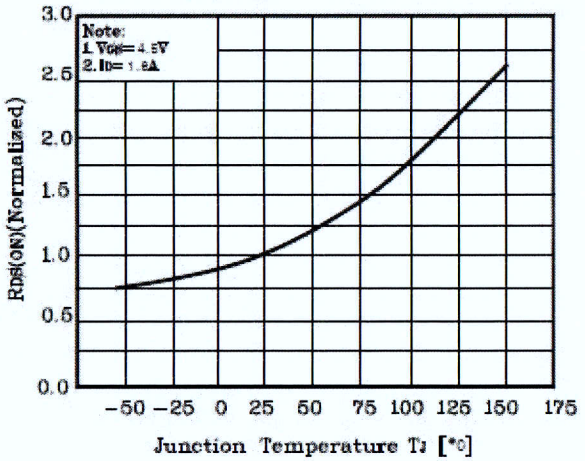


Fig. 9 I_D - T_a

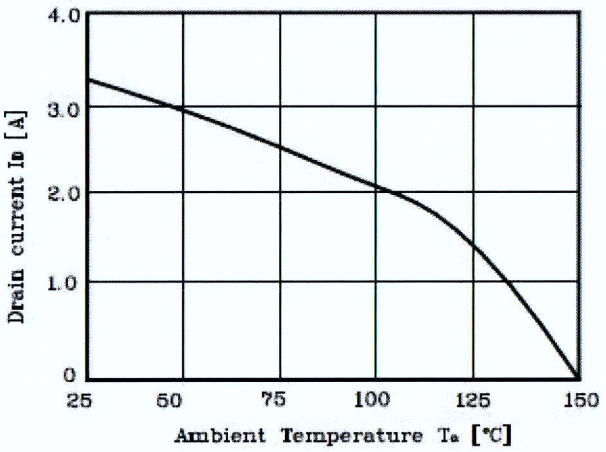


Fig. 10 Safe Operating Area

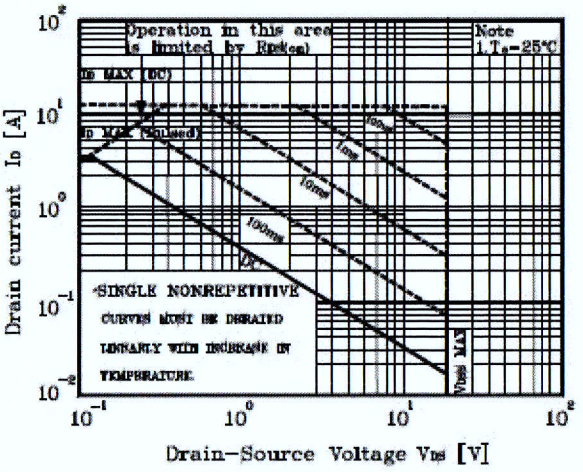


Fig. 11 Gate Charge Test Circuit & Waveform

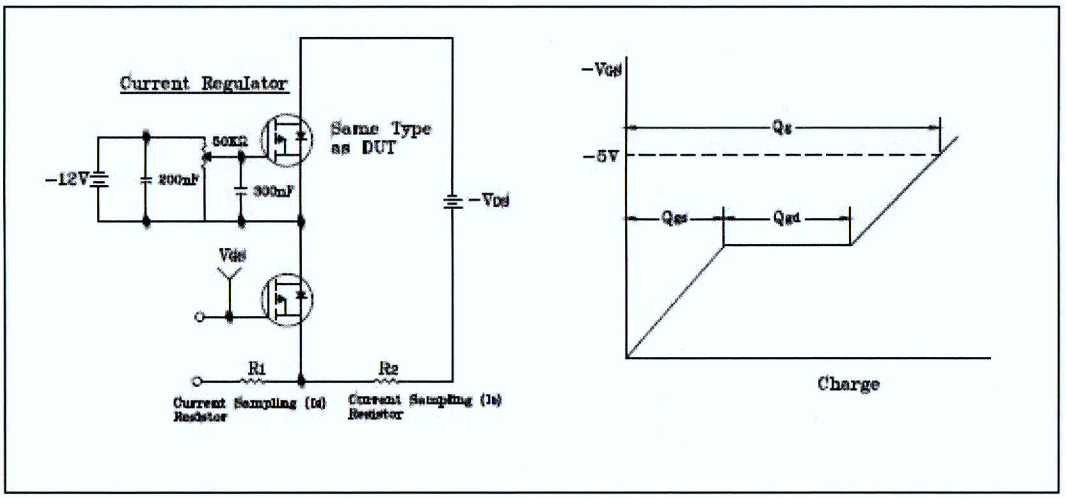


Fig. 12 Resistive Switching Test Circuit & Waveform

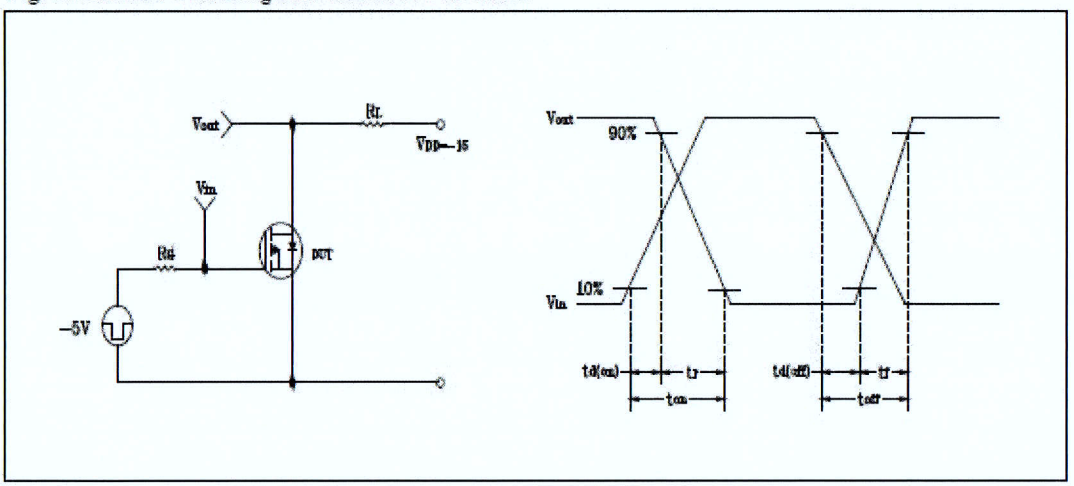


Fig. 13 E_{AS} Test Circuit & Waveform

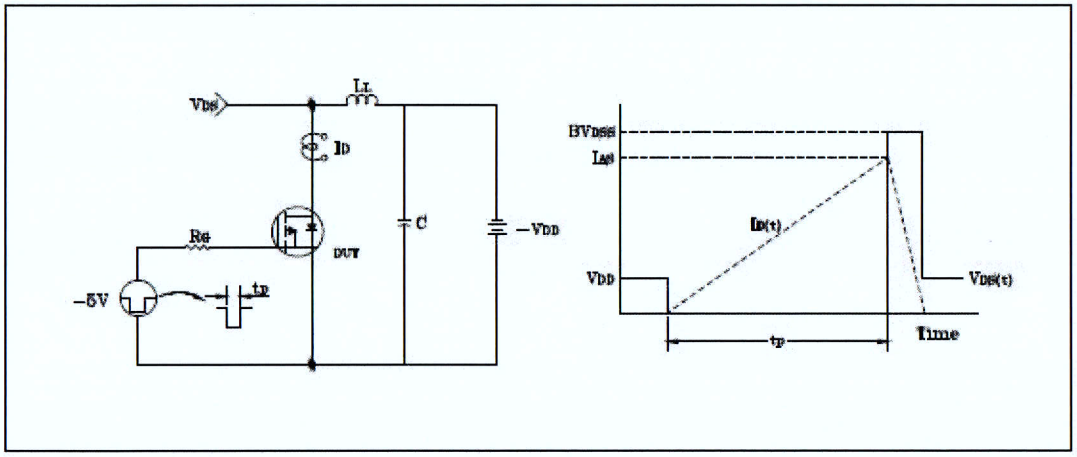
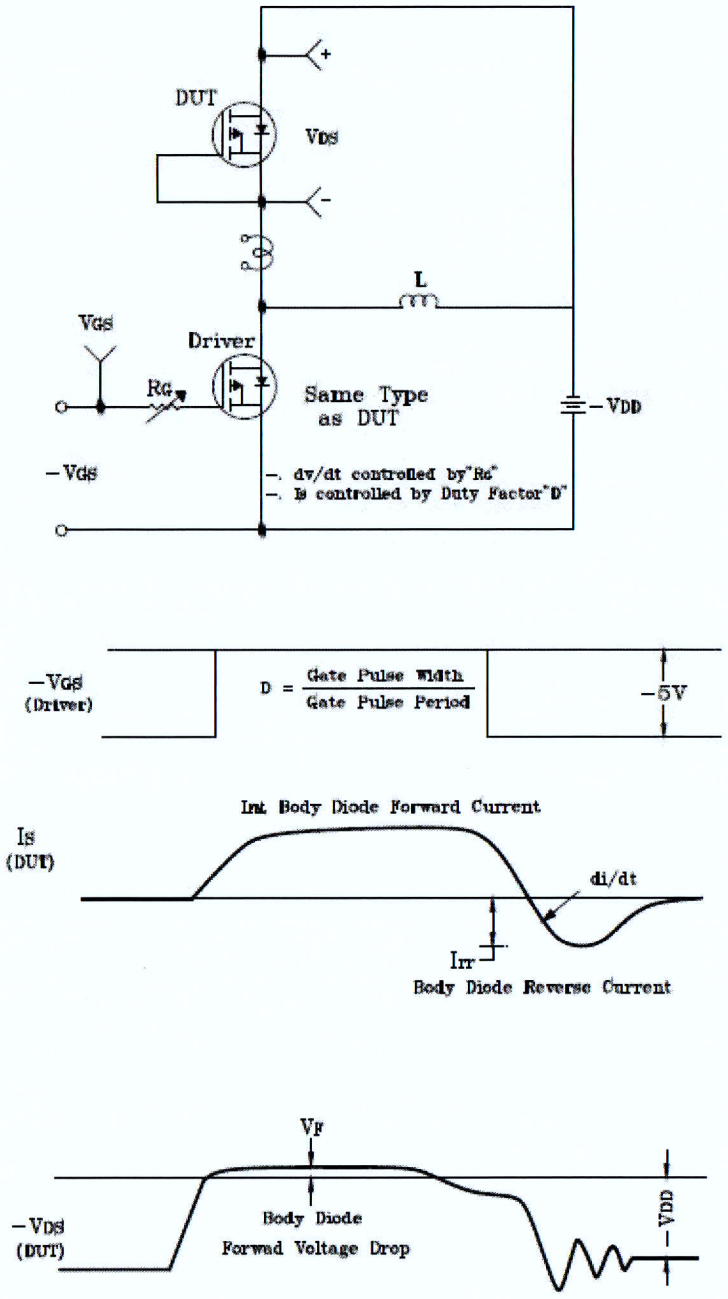
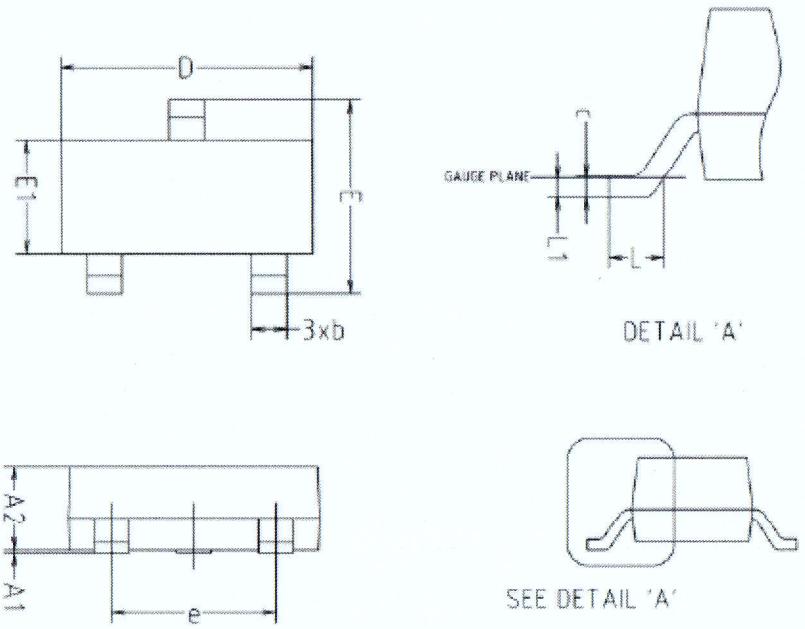


Fig. 14 Diode Reverse Recovery Time Test Circuit & Waveform



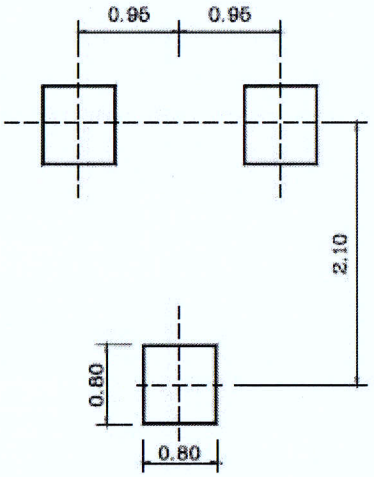
Outline Dimension 外形尺寸

unit 单位: mm 毫米



SYMBOL	MILLIMETERS			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
A1	0.00	-	0.10	
A2	0.82	-	1.02	
b	0.39	0.42	0.45	
c	0.09	0.12	0.15	
D	2.80	2.90	3.00	
E	2.20	2.40	2.60	
E1	1.20	1.30	1.40	
e	1.90BSC			
L	0.20	-	-	
L1	0.12BSC			

Recommend PCB Solder Land Dimension (Unit : mm)



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