

30V, 5.8A N-channel Trench MOSFET

Features

- Low drain-source On-resistance:
 $R_{DS(on)}=24m\Omega$ @ $V_{GS}=10V$, $I_D=2.9A$
- Low gate charge: $Q_g=79.5nC$ (Typ.)
- High power and current handing capability
- Lead free product is acquired

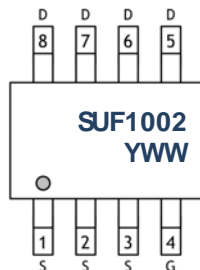


SOP-8

Ordering Information

Part Number	Marking Code	Package	Packaging
SUF1002	SUF1002	SOP-8	Tape & Reel

Marking and Pin Assignment



Column 1: Device Code
 Column 2: Production Information
 - YWW: Year & Week Code

Absolute Maximum Ratings ($T_{amb}=25^{\circ}C$, Unless otherwise noted)

Characteristic	Symbol	Ratings	Unit
Drain-source voltage	V_{DSS}	30	V
Gate-source voltage	V_{GSS}	± 20	V
Drain current (DC)	I_D	5.8	A
Drain current (Pulsed) *	I_{DP}	23.2	A
Total power dissipation ¹⁾	P_D	3	W
Avalanche current (Single) ³⁾	I_{AS}	5.8	A
Single pulsed avalanche energy ³⁾	E_{AS}	72	mJ
Avalanche current (Repetitive) ²⁾	I_{AR}	5.8	A
Repetitive avalanche energy ²⁾	E_{AR}	3.4	mJ
Operating junction temperature	T_j	150	$^{\circ}C$
Storage temperature range	T_{stg}	-55 ~ 150	$^{\circ}C$

* Limited by maximum junction temperature

Thermal Characteristics (T_{amb}=25 °C, Unless otherwise noted)

Characteristic	Symbol	Ratings	Unit
Thermal resistance, junction to ambient ¹⁾	R _{th(j-a)}	62.5	°C/W

Electrical Characteristics (T_{amb}=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	30	-	-	V
Gate threshold voltage	V _{GS(th)}	I _D =250uA, V _{DS} =V _{GS}	1	-	3	V
Drain-source cut-off current	I _{DSS}	V _{DS} =30V, V _{GS} =0V	-	-	1	uA
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 =2.9A	-	24	30	mΩ
		V _{GS} =5V, I _D =2.9A	-	28	34	
Forward transfer conductance ⁵⁾	g _{fs}	V _{DS} =5V, I _D =5.8A	-	12	-	S
Input capacitance	C _{iss}	V _{GS} =0V, V _{DS} =10V, f=1MHz	-	370	560	pF
Output capacitance	C _{oss}		-	60	90	
Reverse transfer capacitance	C _{rss}		-	36	54	
Turn-on delay time ^{4, 5)}	t _{d(on)}	V _{DS} =15V, I _D =5.8A, R _G =10Ω	-	1.2	-	ns
Rise time ^{4, 5)}	t _r		-	1.1	-	
Turn-off delay time ^{4, 5)}	t _{d(off)}		-	2.5	-	
Fall time ^{4, 5)}	t _f		-	1.1	-	
Total gate charge ^{4, 5)}	Q _g	V _{DS} =15V, V _{GS} =5V I _D =18A	-	4.2	6.3	nC
Gate-source charge ^{4, 5)}	Q _{gs}		-	0.9	1.4	
Gate-drain charge ^{4, 5)}	Q _{gd}		-	1.4	2.1	

Source-Drain Diode Rating and Characteristics (T_{amb}=25 °C, Unless otherwise specified)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Maximum diode forward current	I _S	Integral reverse diode in the MOSFET	-	-	1.5	A
Source current (Pulsed) ²⁾	I _{SM}		-	-	6	A
Forward voltage ⁵⁾	V _{SD}	V _{GS} =0V, I _S =1A	-	-	1	V
Reverse recovery time	t _{rr}	I _S =1.5A, di _s /d _t =100A/us	-	90	-	Ns
Reverse recovery charge	Q _{rr}		-	0.5	-	uC

*** Note:**

- 1) Device mounted on a glass-epoxy board
- 2) Repetitive rating: Pulse width limited by maximum junction temperature.
- 3) L=3.4mH, I_{AS}=5.8A, V_{DD}=15V, R_G=25Ω
- 4) Pulse Test: Pulse width ≤ 300us, Duty cycle ≤ 2%.
- 5) Essentially independent of operating temperature

Electrical Characteristic Curves

Fig. 1 $I_D - V_{DS}$

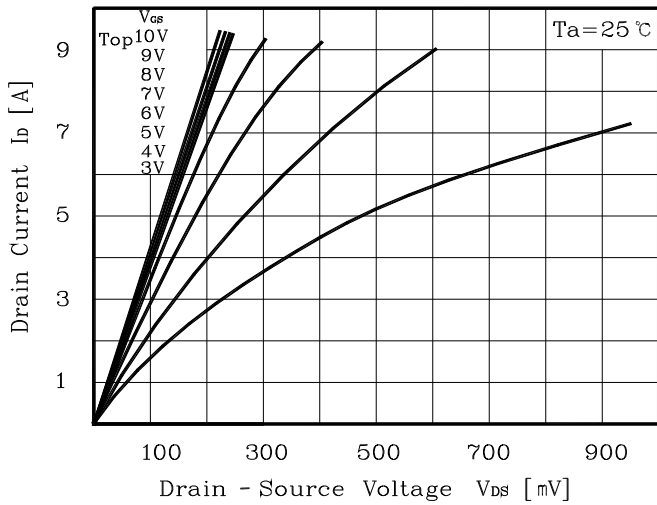


Fig. 2 $I_D - V_{GS}$

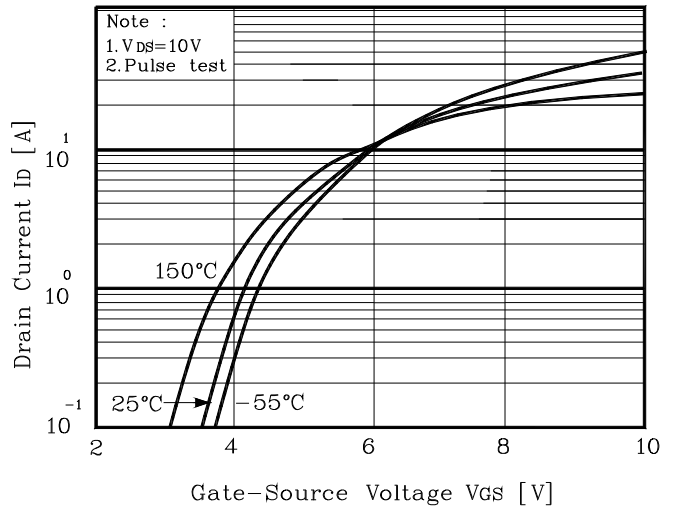


Fig. 3 $R_{DS(on)} - I_D$

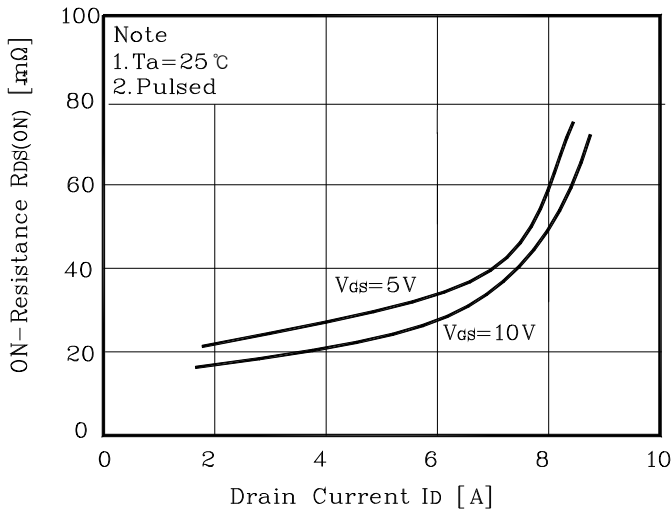


Fig. 4 $I_S - V_{SD}$

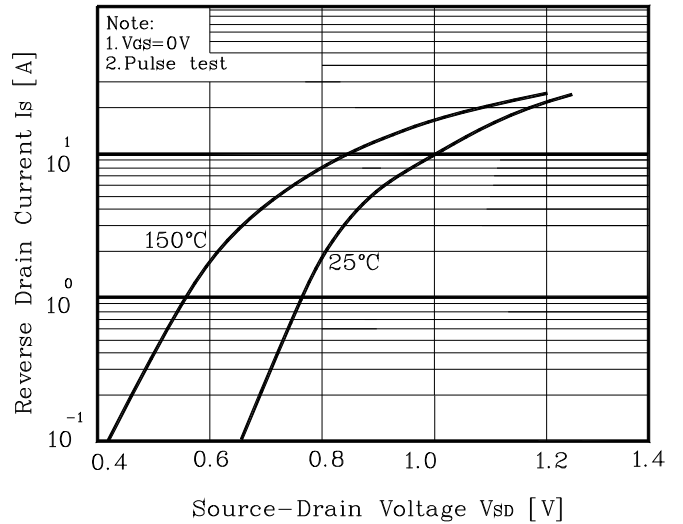


Fig. 5 Capacitance - V_{DS}

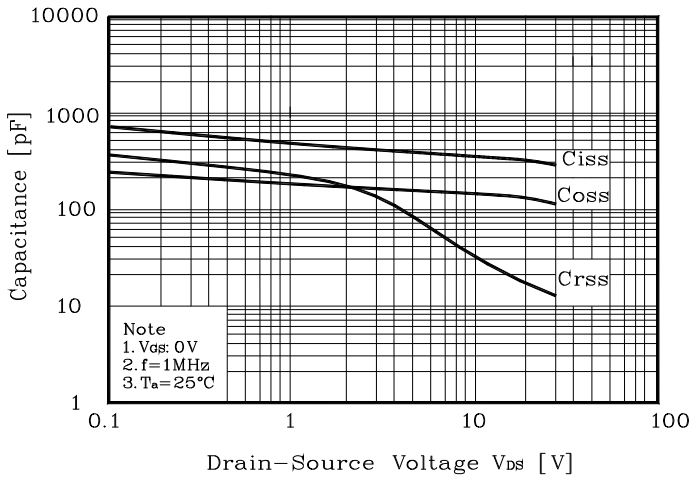


Fig. 6 $V_{GS} - Q_G$

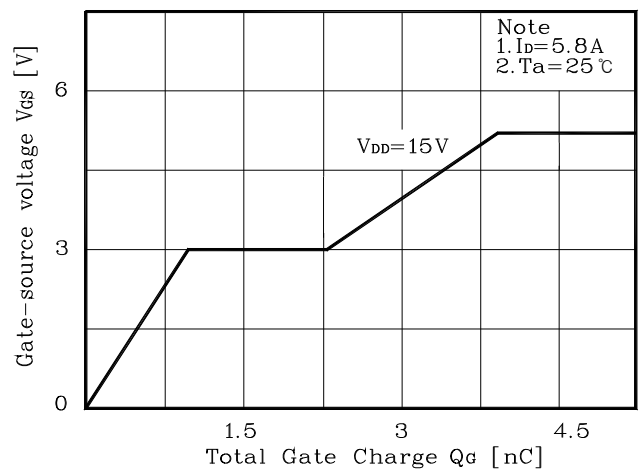


Fig. 7 $V_{DSS} - T_J$

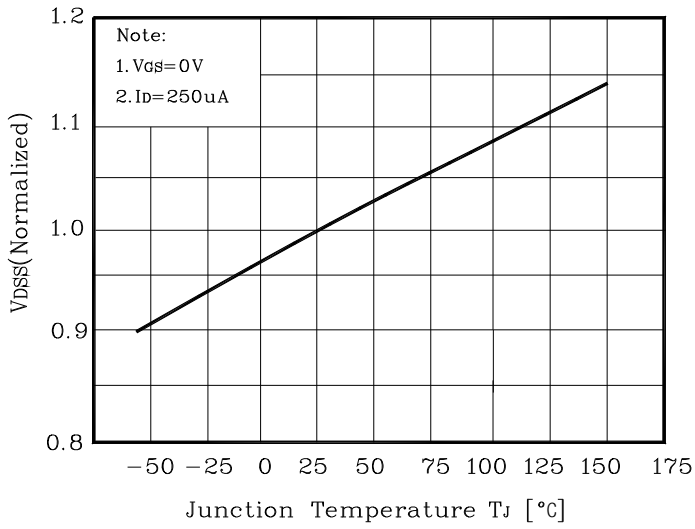


Fig. 8 $R_{DS(on)} - T_J$

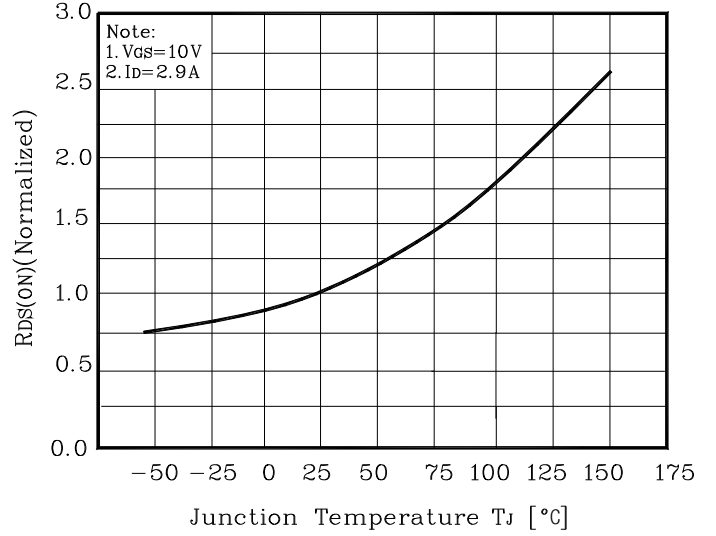


Fig. 9 $I_D - T_a$

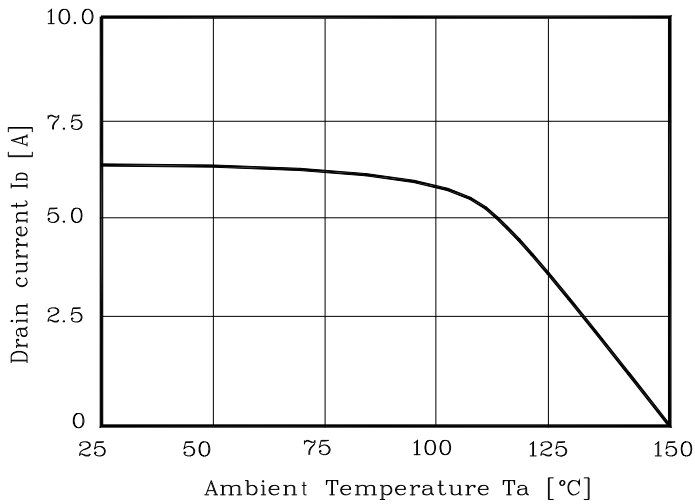


Fig. 10 Safe Operating Area

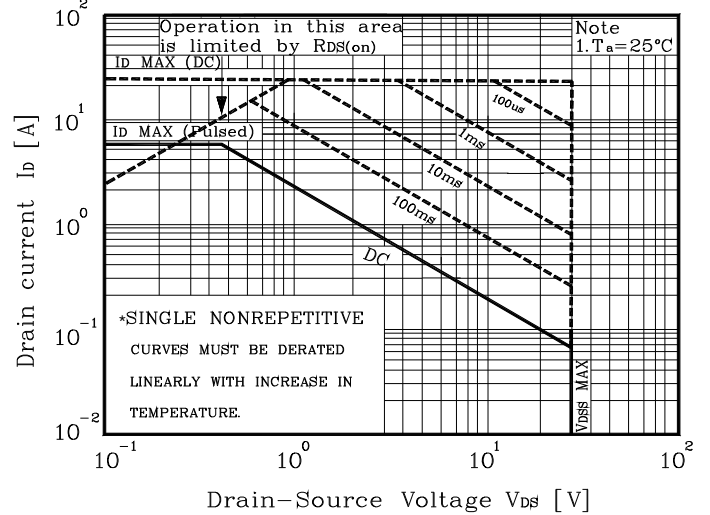


Fig. 11 Gate Charge Test Circuit & Waveform

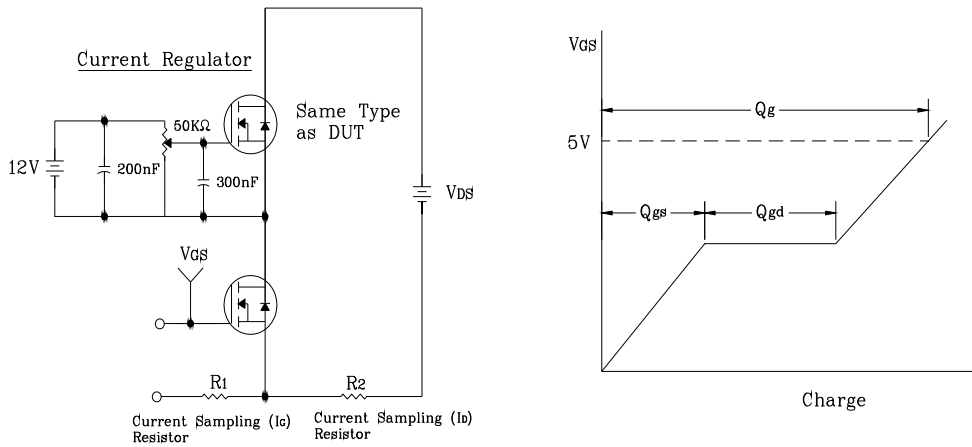


Fig. 12 Resistive Switching Test Circuit & Waveform

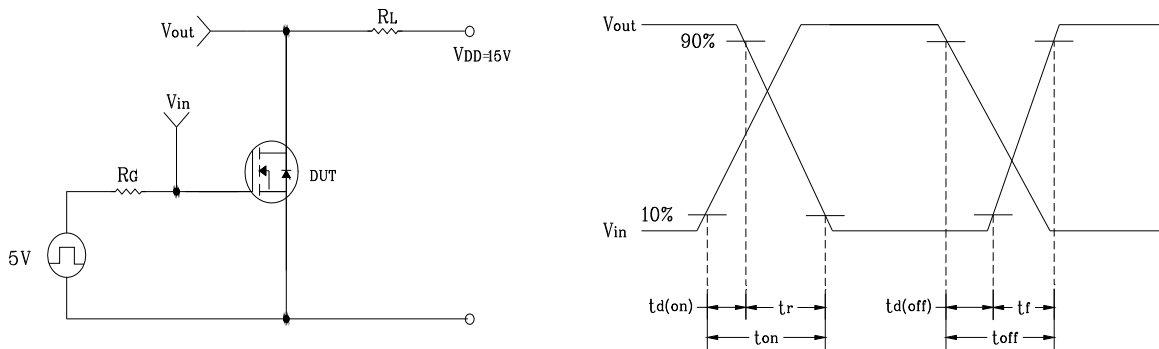


Fig. 13 EAS Test Circuit & Waveform

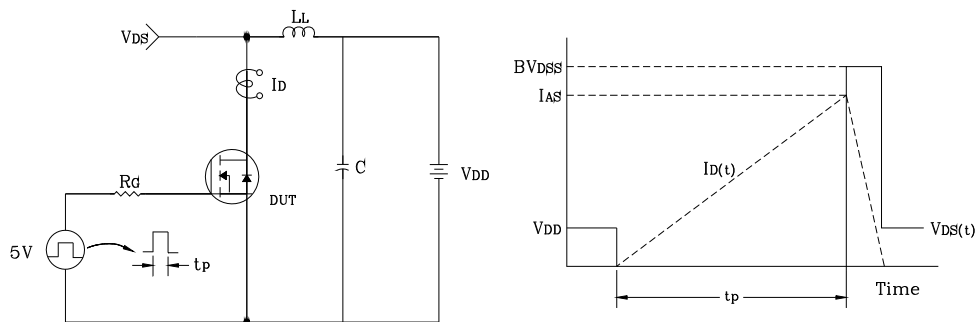
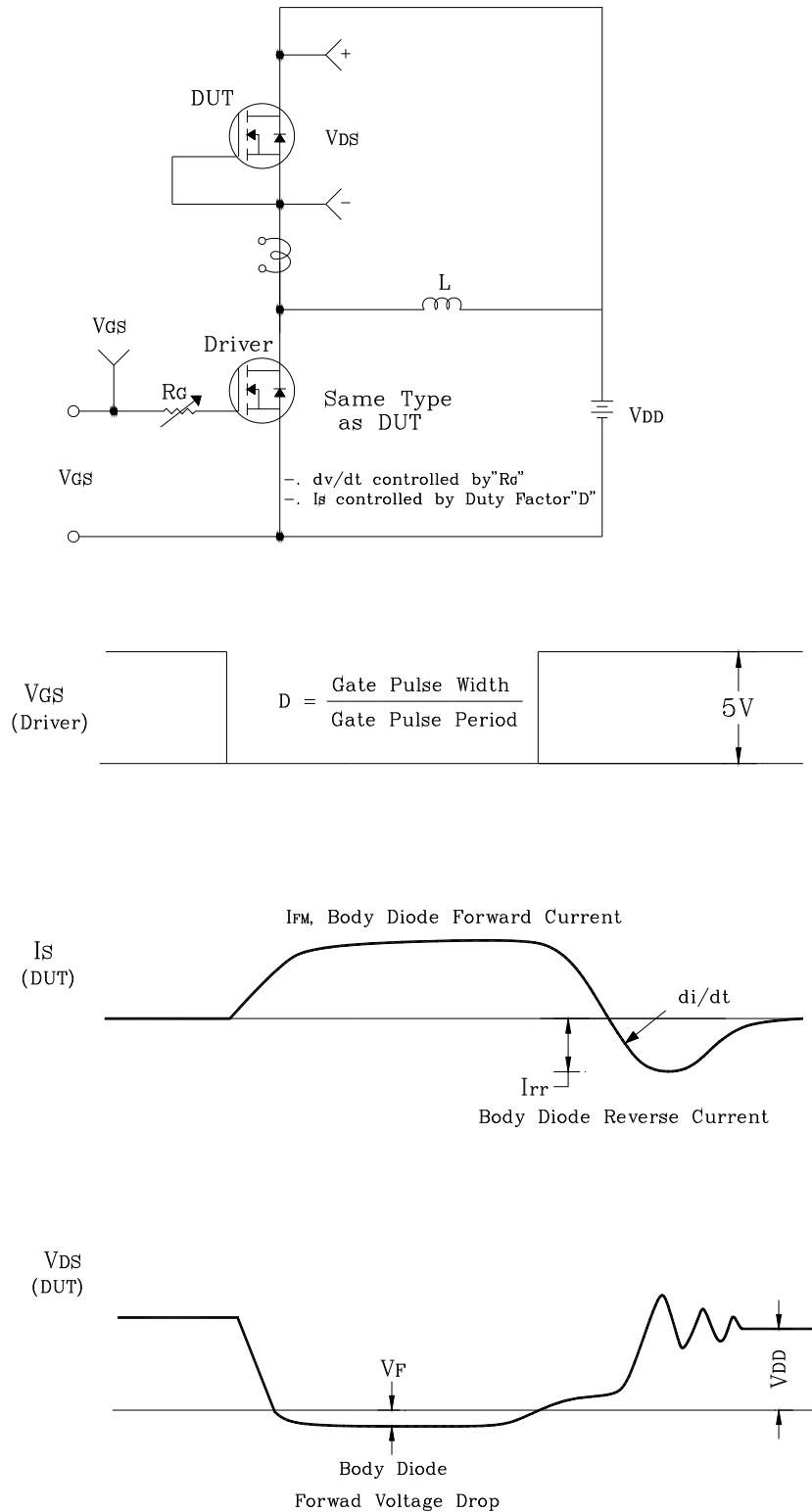
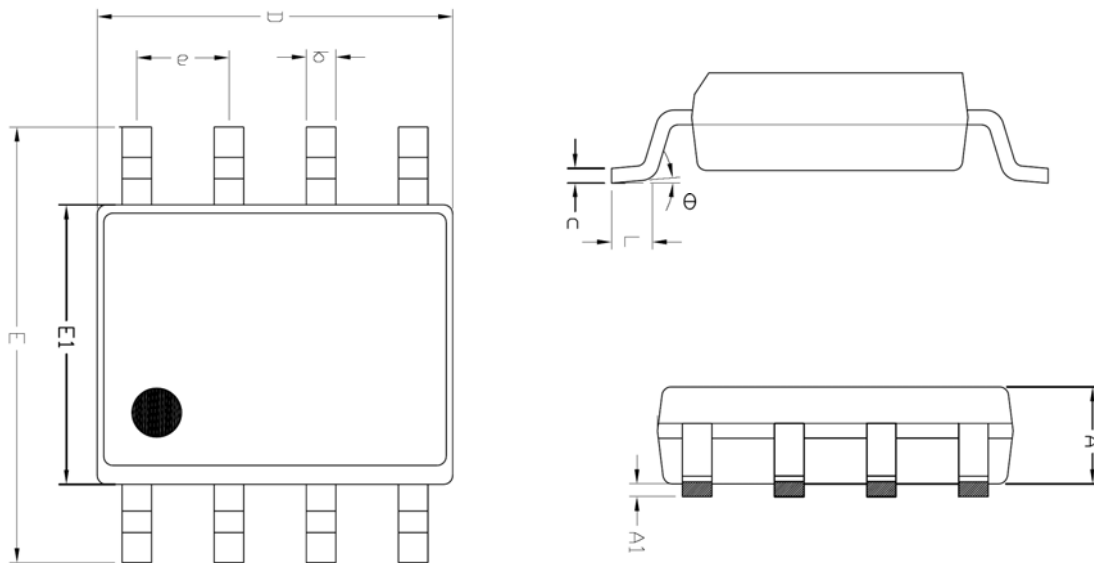


Fig. 14 Diode Reverse Recovery Time Test Circuit & Waveform

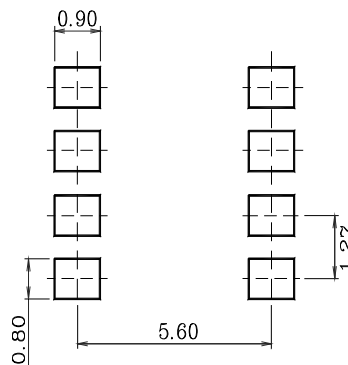


Package Outline Dimensions



SYMBOL	MILLIMETER(mm)			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
A	1.245	—	1.445	
A1	0.125	0.175	0.275	
b	0.320	0.420	0.520	
c	0.170	0.220	0.270	
D	4.802	4.902	5.002	
E	5.870	6.020	6.170	
E1	3.761	3.861	3.961	
e	1.270 BSC			
L	0.462	0.562	0.662	
theta	0 °	—	8 °	

※ Recommended Land Pattern [unit: mm]



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