KODENSHI AUK

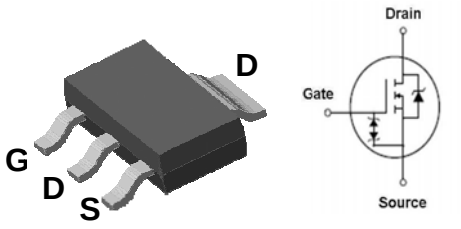
SNN01Z60Q

Logic Level N-Ch Power MOSFET

Logic Level Gate Drive Application

Features

- Logic level gate drive
- Max. $R_{DS(ON)}$ = 135mΩ at V_{GS} = 10V, I_D = 0.5A
- Low $R_{DS(on)}$ provides higher efficiency
- ESD protected: 1000V (HBM ±500V)
- Halogen free and RoHS compliant device

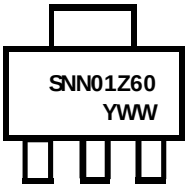


SOT-223

Ordering Information

Part Number	Marking	Package
SNN01Z60Q	SNN01Z60	SOT-223

Marking Information



Column 1: Device Code
Column 2: Production Information
e.g.) YWW
-. Y: Year Code
-. WW: Week Code

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

Characteristic	Symbol		Rating	Unit
Drain-source voltage	V_{DSS}		60	V
Gate-source voltage	V_{GSS}		±20	V
Drain current (DC) *	I_D	T_c=25°C	1	A
		T_c=100°C	0.63	A
Drain current (Pulsed) *	I_{DM}		4	A
Single pulsed avalanche energy (Note 2)	E_{AS}		35	mJ
Repetitive avalanche current (Note 1)	I_{AR}		1	A
Repetitive avalanche energy (Note 1)	E_{AR}		0.18	mJ
Power dissipation	P_D		1.8	W
Junction temperature	T_J		150	°C
Storage temperature range	T_{stg}		-55~150	°C

* Limited only maximum junction temperature

Thermal Characteristics

Characteristic	Symbol	Rating	Unit
Thermal resistance, junction to ambient	$R_{th(j-a)}$	Max. 69	°C/W

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

Electrical Characteristics (T_j=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	60	-	-	V
Gate threshold voltage	$V_{GS(th)}$	I_D=250uA, V_{DS}=V_{GS}	1	-	2.5	V
Drain-source cut-off current	I_{DSS}	V_{DS}=60V, V_{GS}=0V	-	-	1	uA
Gate leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V	-	-	±10	uA
Drain-source on-resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=0.5A	-	90	135	mΩ
		V_{GS}=4.5V, I_D=0.5A		109	165	mΩ
Forward transfer conductance (Note 3)	g_{fs}	V_{DS}=10V, I_D=0.5A	-	3	-	S
Input capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1MHz	-	314	-	pF
Output capacitance	C_{oss}		-	28	-	
Reverse transfer capacitance	C_{rss}		-	21	-	
Turn-on delay time (Note 3,4)	$t_{d(on)}$	V_{DS}=30V, I_D=1A, R_G=25Ω	-	4.7	-	ns
Rise time (Note 3,4)	t_r		-	6.9	-	
Turn-off delay time (Note 3,4)	$t_{d(off)}$		-	22.1	-	
Fall time (Note 3,4)	t_f		-	6.1	-	
Total gate charge (Note 3,4)	Q_g	V_{DS}=48V, V_{GS}=10V, I_D=1A	-	8	10	nC
Gate-source charge (Note 3,4)	Q_{gs}		-	1.1	-	
Gate-drain charge (Note 3,4)	Q_{gd}		-	1.7	-	

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	-	-	1	A
Source current (Pulsed)	I_{SM}		-	-	4	A
Forward voltage	V_{SD}	V_{GS}=0V, I_S=1A	-	-	1.2	V
Reverse recovery time (Note 3,4)	t_{rr}	I_S=1A, V_{GS}=0V, dI_S/dt=-100A/us	-	25	-	ns
Reverse recovery charge (Note 3,4)	Q_{rr}		-	18.8	-	uC

Note:
1. Repeated rating: Pulse width limited by safe operating area
2. L=35mH, I_{AS}=1A, V_{DD}=50V, R_G=25Ω, Starting T_J=25°C
3. Pulse test: Pulse width≤300us, Duty cycle≤2%
4. Essentially independent of operating temperature typical characteristics

Electrical Characteristics Curves

Fig. 1 I_D - V_{DS}

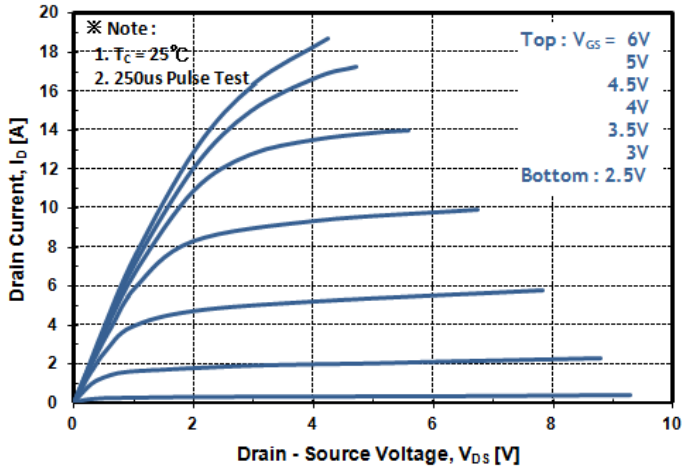


Fig. 2 I_D – V_{GS}

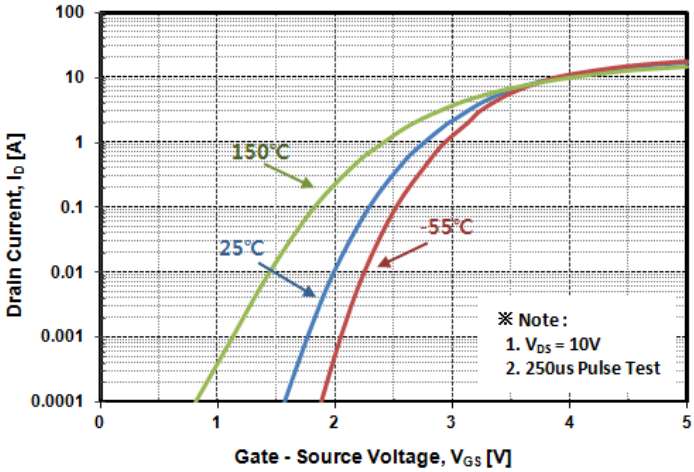


Fig. 3 $R_{DS(ON)}$ - I_D

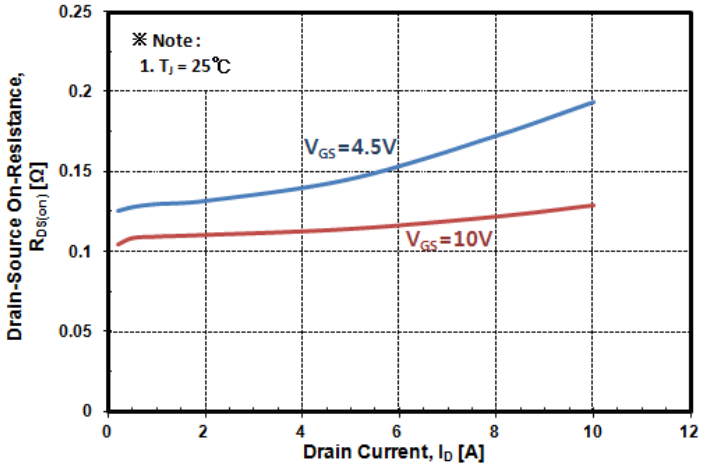


Fig. 4 I_S - V_{SD}

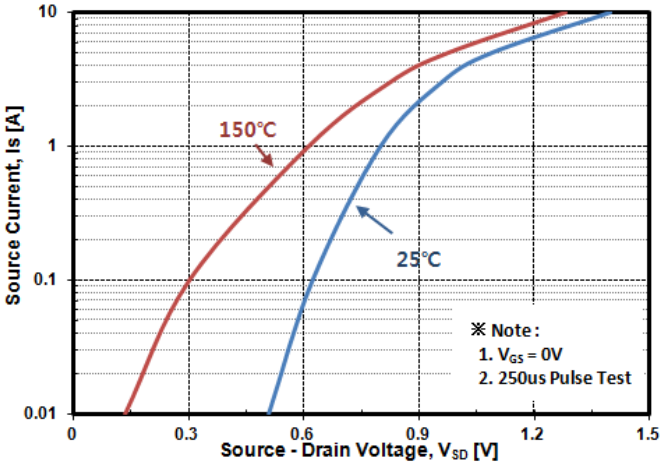


Fig. 5 Capacitance - V_{DS}

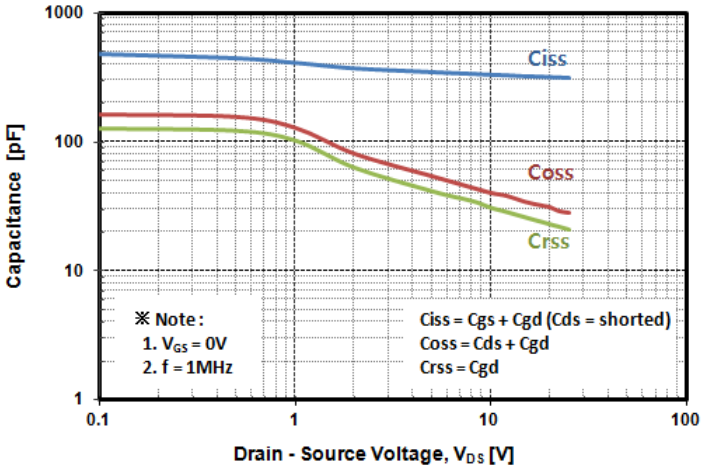


Fig. 6 V_{GS} - Q_G

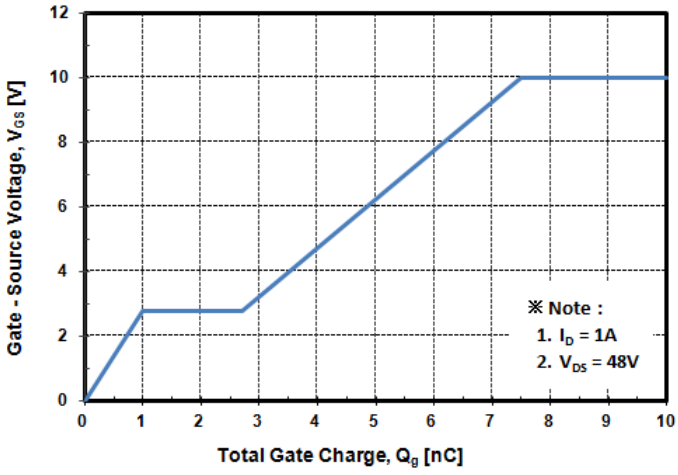


Fig. 7 BV_{DSS} - T_J

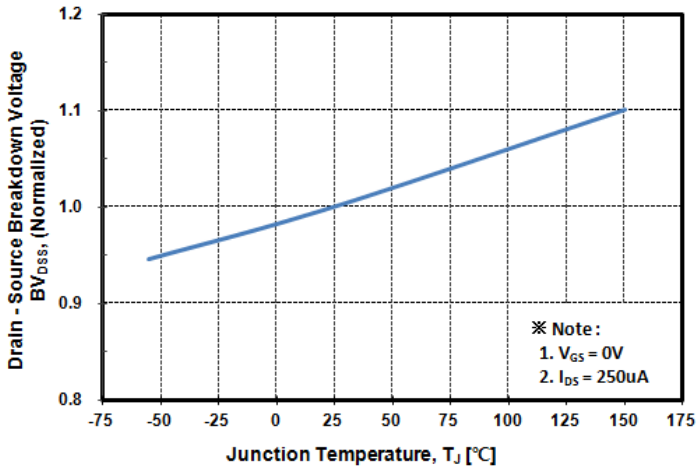


Fig. 8 $R_{DS(on)}$ – T_J

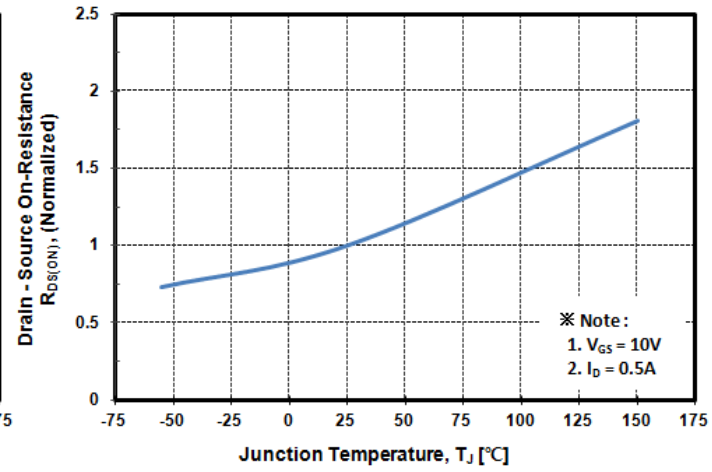


Fig. 9 I_D - T_C

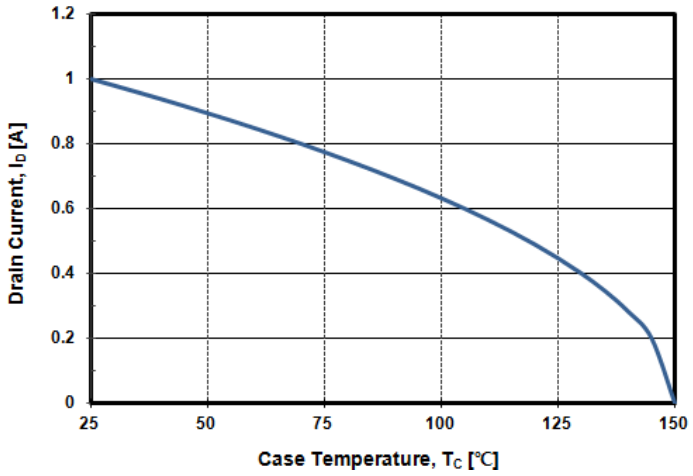


Fig. 10 Safe Operating Area

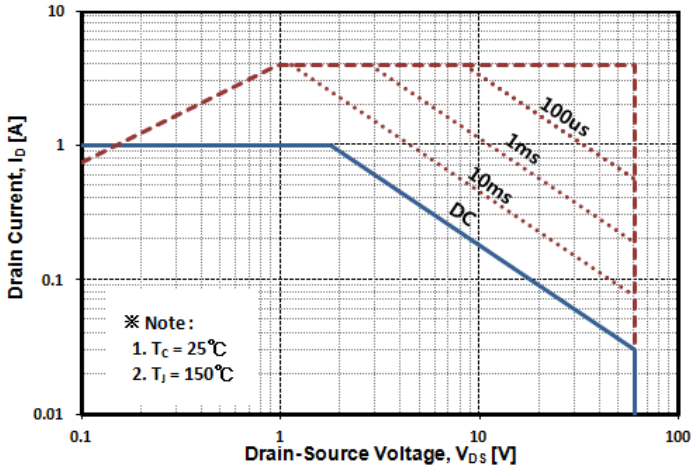


Fig. 11 Transient Thermal Impedance

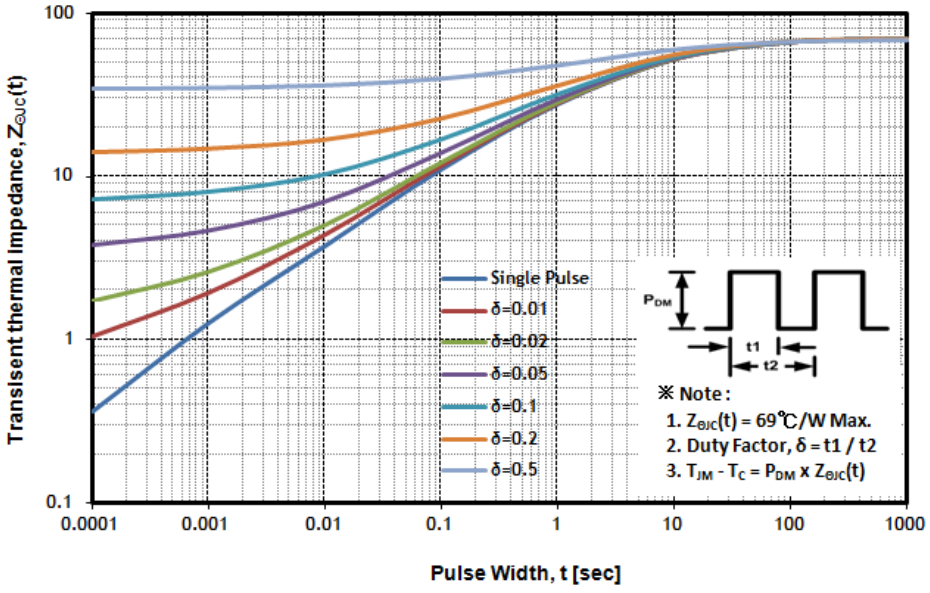
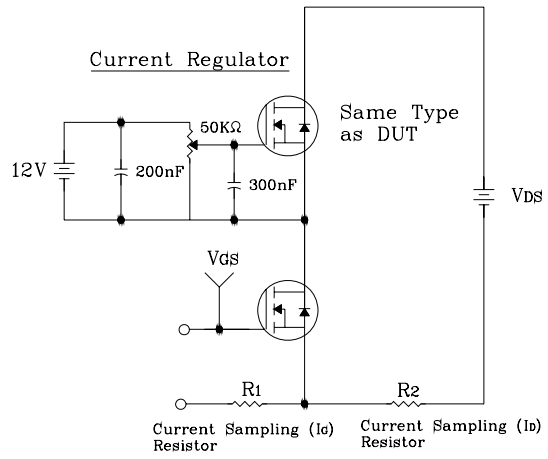


Fig. 12 Gate Charge Test Circuit & Waveform



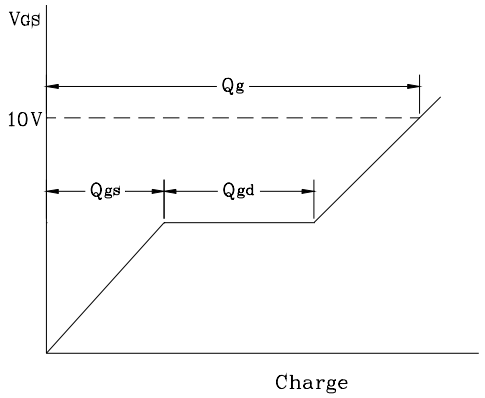
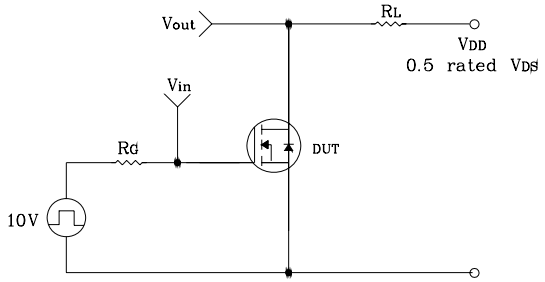


Fig. 13 Resistive Switching Test Circuit & Waveform



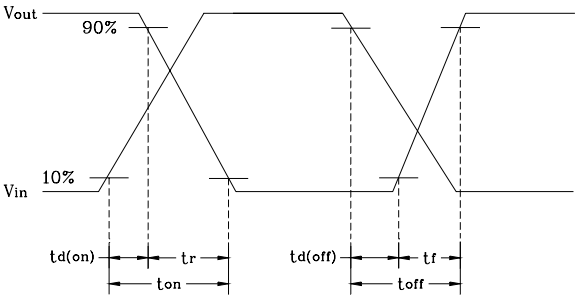
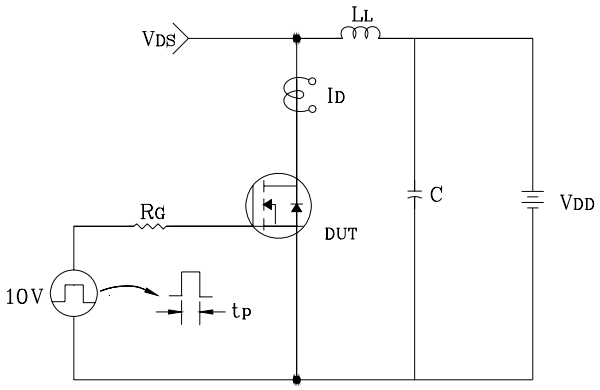


Fig. 14 E_{AS} Test Circuit & Waveform



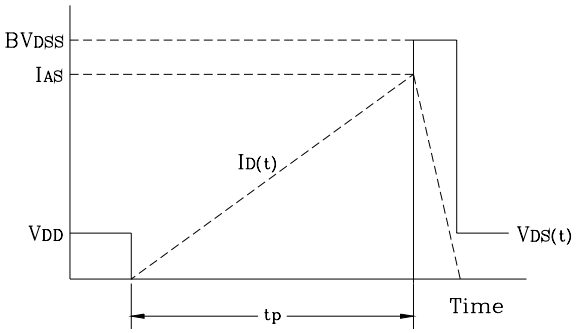
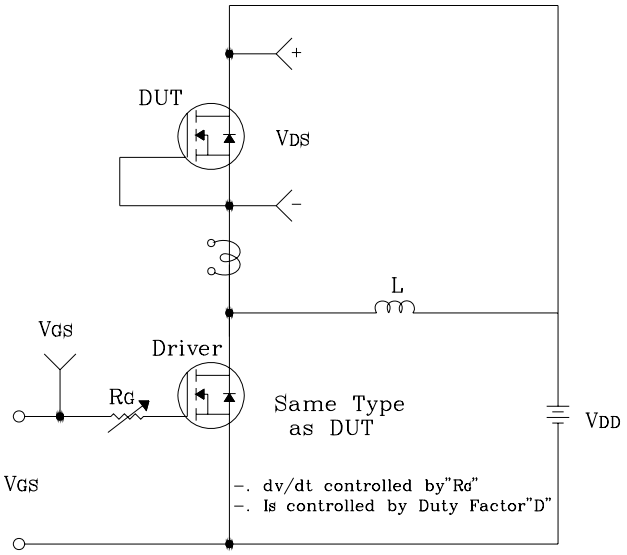
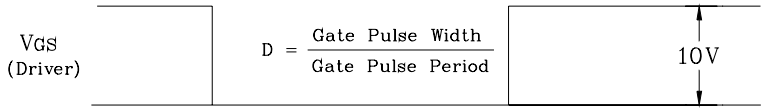
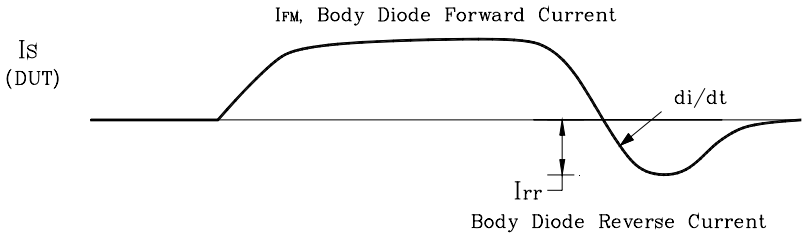
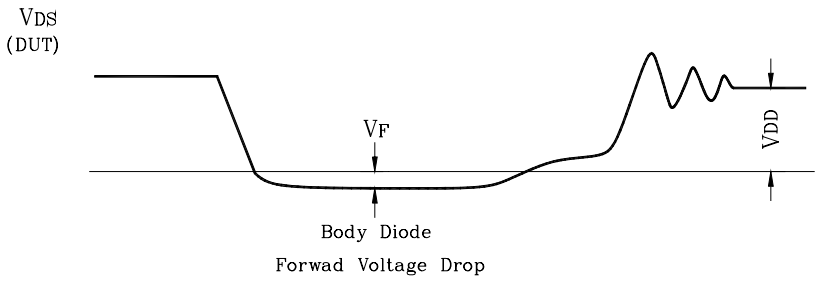


Fig. 15 Diode Reverse Recovery Time Test Circuit & Waveform

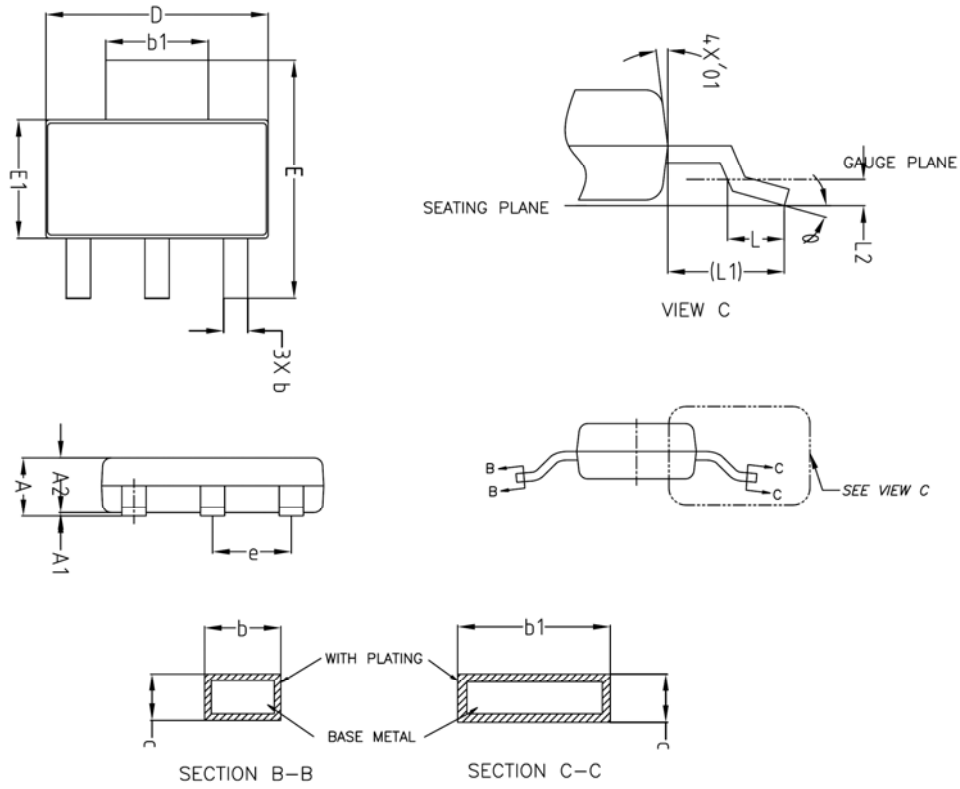






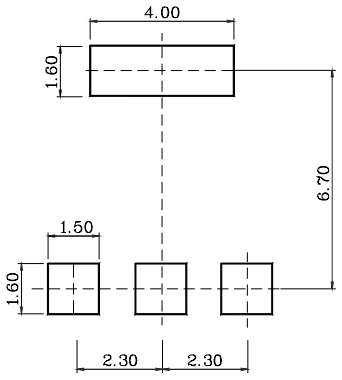


Package Outline Dimensions



SYMBOL	MILLIMETERS			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
A	–	–	1.80	
A1	0.00	–	0.10	
A2	1.60	1.65	1.70	
b	0.68	–	0.76	
b1	2.95	–	3.07	
c	0.23	–	0.28	
D	6.40	6.50	6.60	
E	6.80	7.00	7.20	
E1	3.40	3.50	3.60	
e	2.30 BSC			
L	0.45	–	0.65	
L1	1.75 REF			
L2	0.10 BSC			
θ	0°	–	10°	
θ1	5°	–	10°	

※ Recommended Land Pattern (unit: mm)



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