KODENSHI AUK

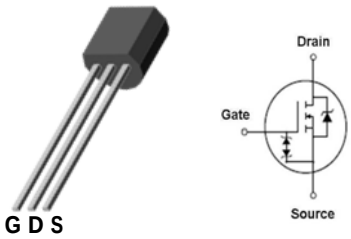
SMNY2Z30

Advanced N-Ch Power MOSFET

SWITCHING REGULATOR APPLICATION

Features

- High voltage: BV_{DDS}=300V (Min.)
- Low gate charge: Q_g=2.9nC (Typ.)
- Low drain-source On resistance: $R_{DS(on)}$=8Ω (Max.)
- Built-in protection zener diode
- RoHS compliant device

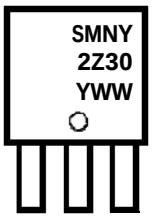


TO-92

Ordering Information

Part Number	Marking	Package
SMNY2Z30	SMNY2Z30	TO-92

Marking Information



Column 1, 2: Device Code
Column 3: Production Information
e.g.) YWW
-. YWW: Date Code (year, week)

Absolute maximum ratings (T_a=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_a=25°C	0.2	A
		T_a=100°C	0.12	A
Drain current (Pulsed) *	I_{DM}		1	A
Avalanche current (Note 2)	I_{AS}		1.3	A
Single pulsed avalanche energy (Note 2)	E_{AS}		182.6	mJ
Repetitive avalanche current (Note 1)	I_{AR}		0.2	A
Repetitive avalanche energy (Note 1)	E_{AR}		1.5	mJ
Power dissipation	P_D		0.6	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. 200	°C/W

Electrical Characteristics (T_a=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	300	-	-	V
Gate threshold voltage	$V_{GS(th)}$	I_D=250uA, V_{DS}=V_{GS}	1.5	2	2.5	V
Drain-source cut-off current	I_{DSS}	V_{DS}=300V, V_{GS}=0V	-	-	1	uA
Gate leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±10V	-	-	±10	nA
Drain-source on-resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=100mA	-	6	8	Ω
Forward transfer conductance (Note 3)	g_{fs}	V_{DS}=10V, I_D=100mA	-	0.4	-	S
Input capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1MHz	-	101	130	pF
Output capacitance	C_{oss}		-	15	20	
Reverse transfer capacitance	C_{rss}		-	3.2	5	
Turn-on delay time (Note 3,4)	$t_{d(on)}$	V_{DD}=150V, I_D=0.2A R_G=25Ω	-	5	-	ns
Rise time (Note 3,4)	t_r		-	17	-	
Turn-off delay time (Note 3,4)	$t_{d(off)}$		-	21	-	
Fall time (Note 3,4)	t_f		-	35	-	
Total gate charge (Note 3,4)	Q_g	V_{DS}=240V, V_{GS}=10V I_D=0.2A	-	2.9	4.5	nC
Gate-source charge (Note 3,4)	Q_{gs}		-	0.4	-	
Gate-drain charge (Note 3,4)	Q_{gd}		-	0.7	-	

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

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Source current (DC)	I_S	Integral reverse diode in the MOSFET	-	-	0.2	A
Source current (Pulsed)	I_{SM}		-	-	1	A
Forward voltage	V_{SD}	V_{GS}=0V, I_S=8A	-	-	1.4	V
Reverse recovery time (Note 3,4)	t_{rr}	I_S=0.2A, V_{GS}=0V dI_F/dt=100A/us	-	270	-	ns
Reverse recovery charge (Note 3,4)	Q_{rr}		-	0.27	-	uC

Gate to Source Zener Diode Characteristic (T_a=25°C unless otherwise noted)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Gate-Source breakdown voltage	IG=±1mA, VDS=0V	±20	±24	-	V

Note:
1. Repeated rating: Pulse width limited by safe operating area
2. L=8.9mH, I_{AS}=8A, 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 Characteristic Curves

Fig. 1 I_D - V_{DS}

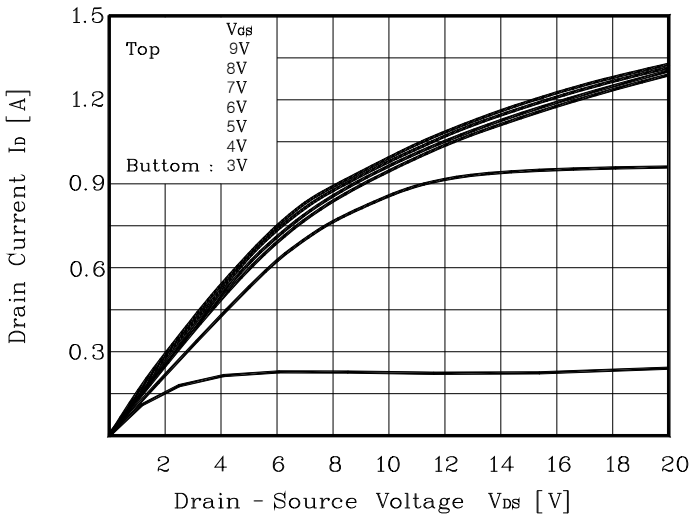


Fig. 2 I_D – V_{GS}

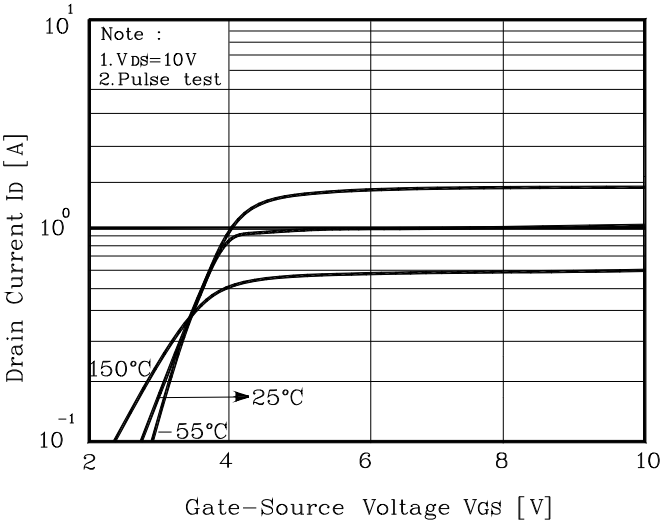


Fig. 3 $R_{DS(ON)}$ - I_D

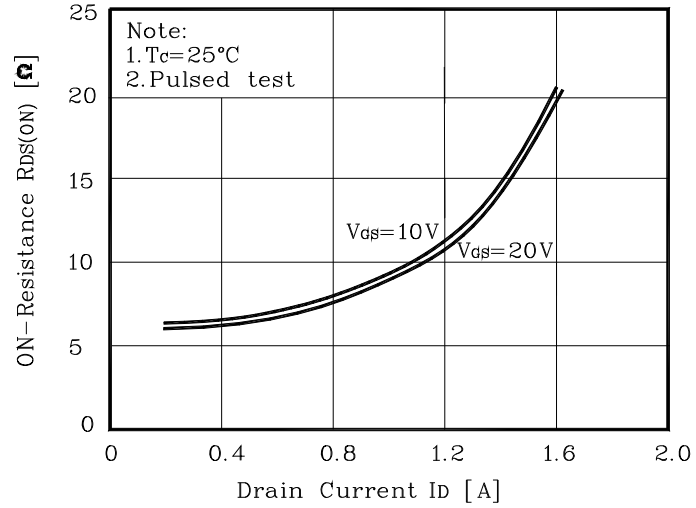


Fig. 4 I_S - V_{SD}

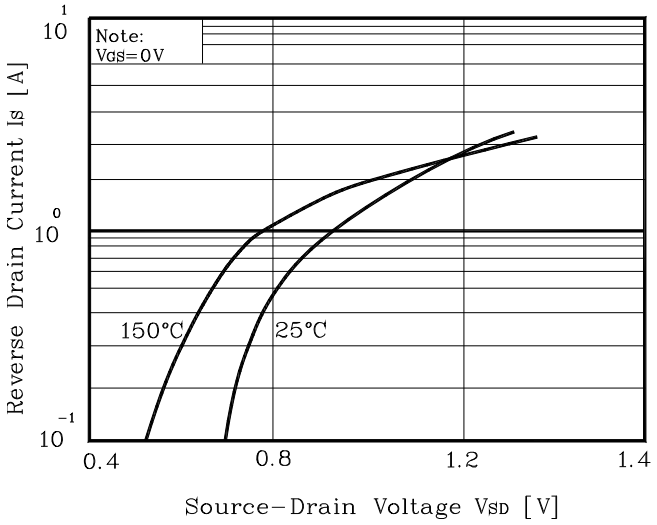


Fig. 5 Capacitance - V_{DS}

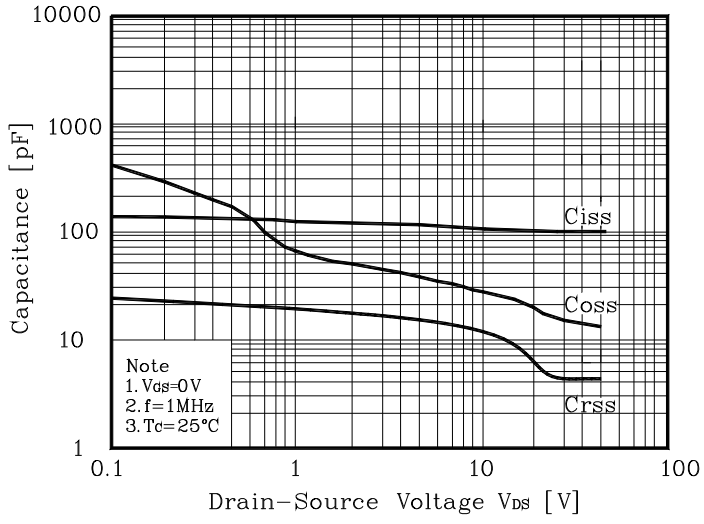
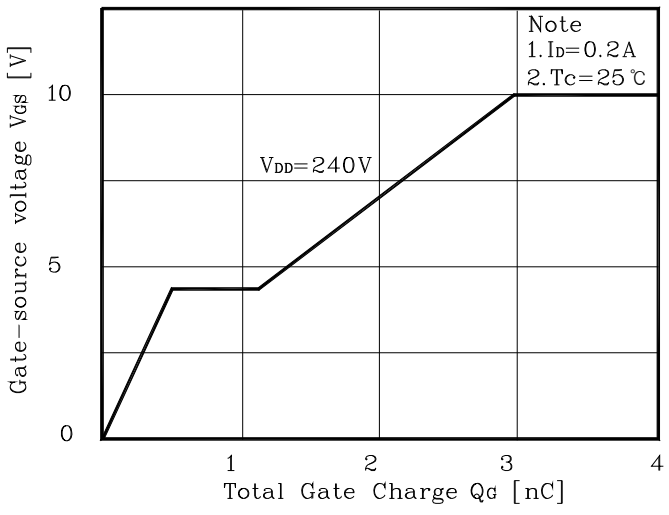


Fig. 6 V_{GS} - Q_G



Electrical Characteristic Curves (Continue)

Fig. 7 BV_{DSS} - T_J

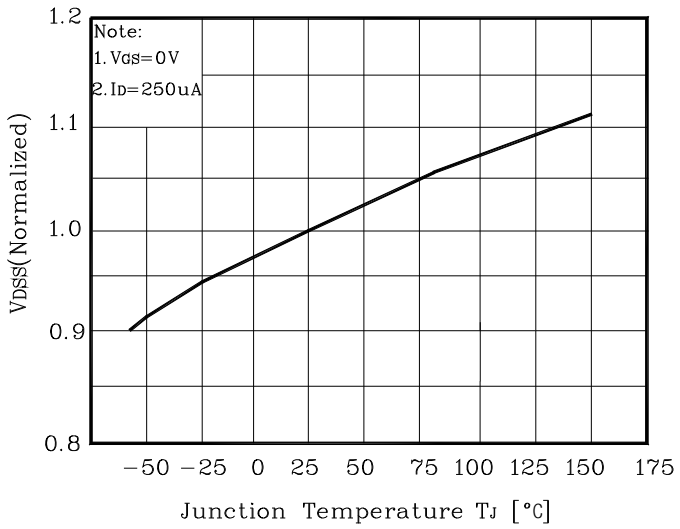


Fig. 8 $R_{DS(ON)}$ - T_J

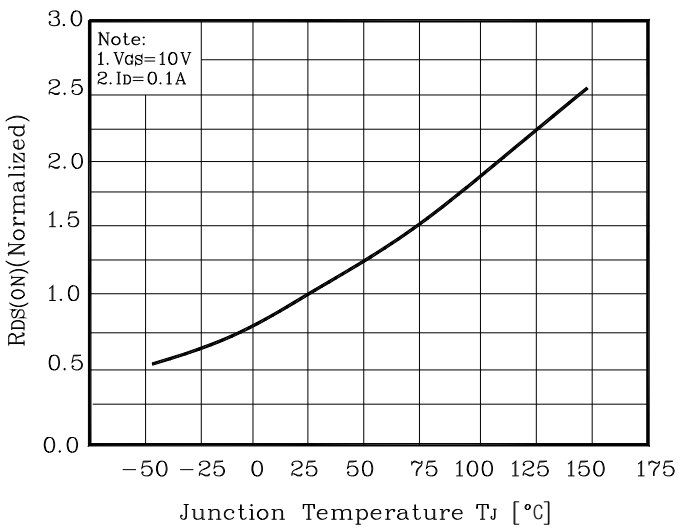


Fig. 9 I_D - T_C

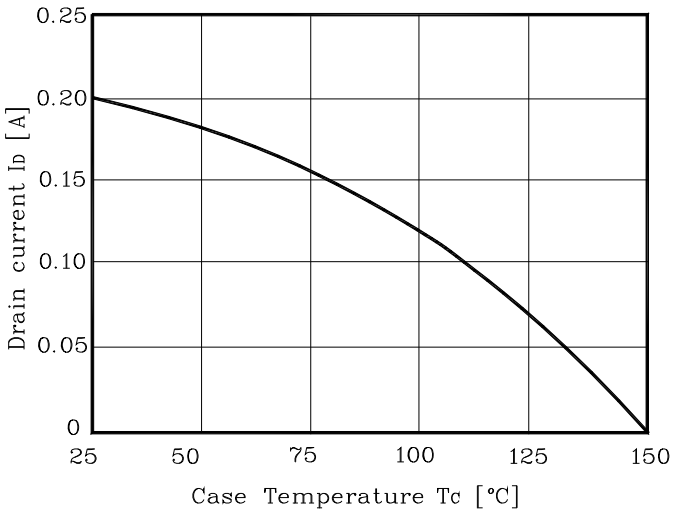


Fig. 10 Safe Operating Area

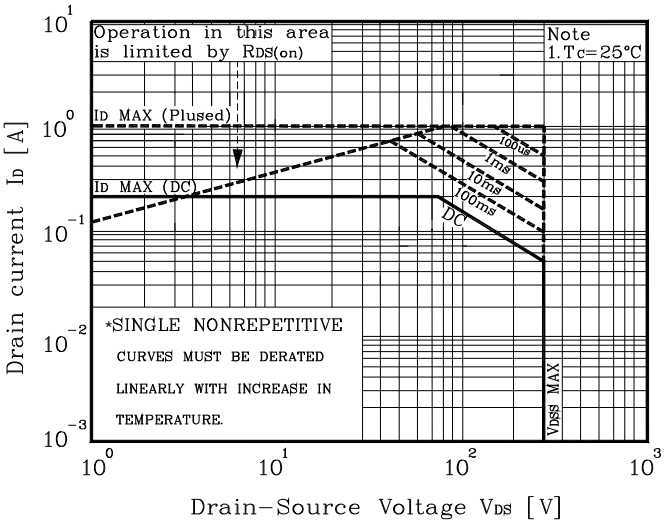
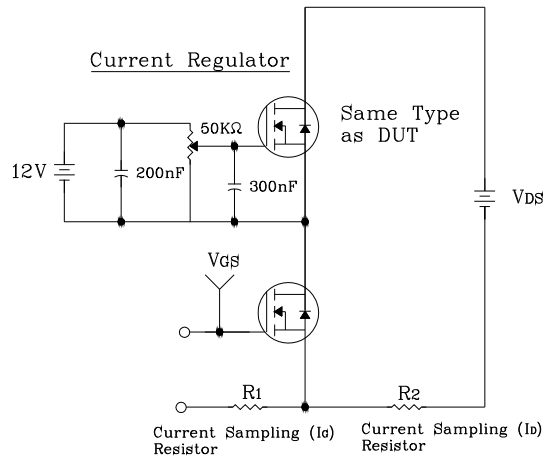


Fig. 11 Gate Charge Test Circuit & Waveform



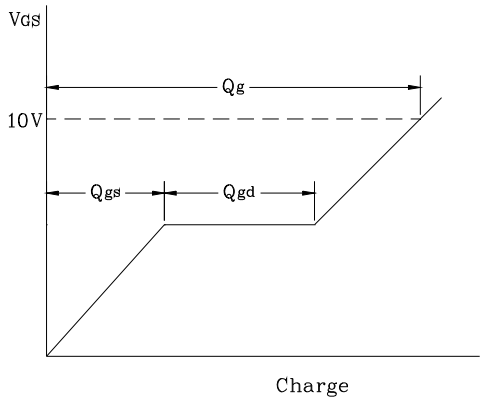
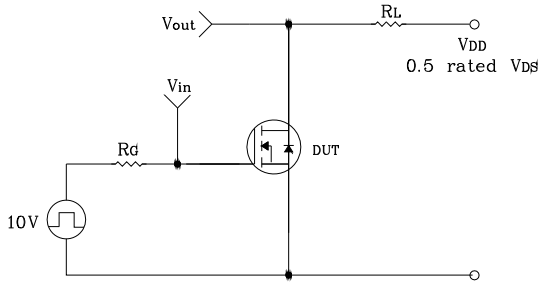


Fig. 12 Resistive Switching Test Circuit & Waveform



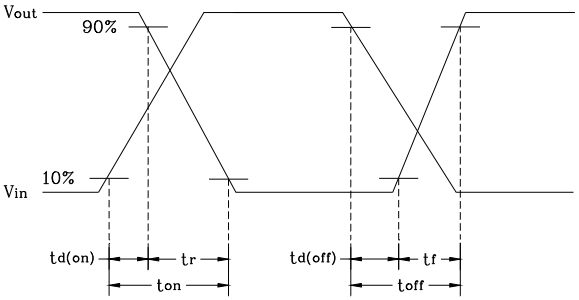
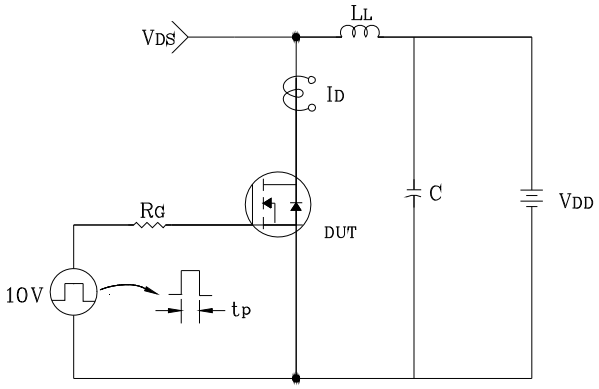


Fig. 13 E_{AS} Test Circuit & Waveform



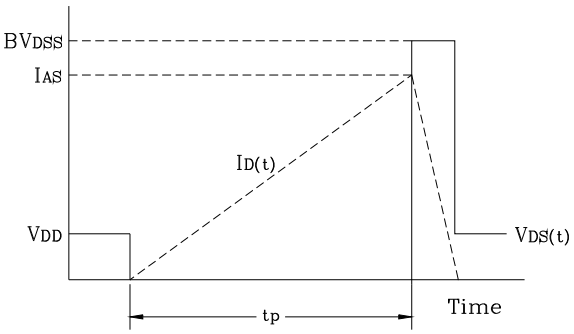
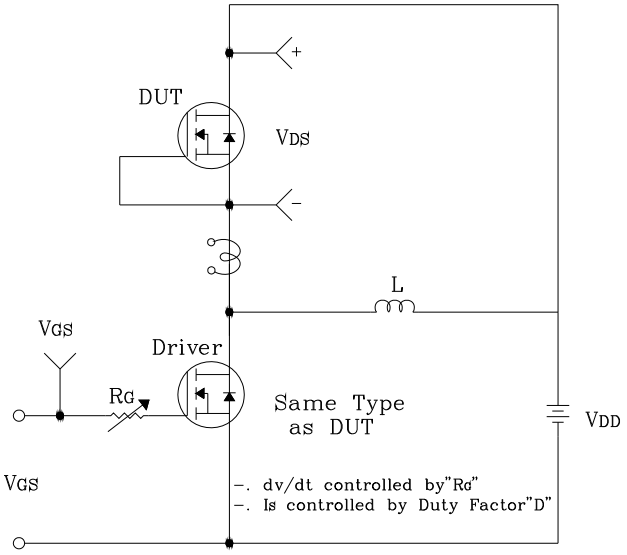
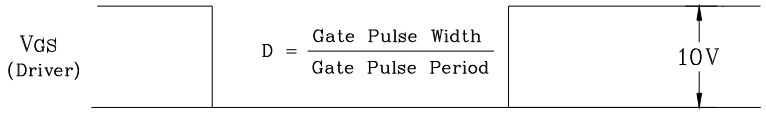
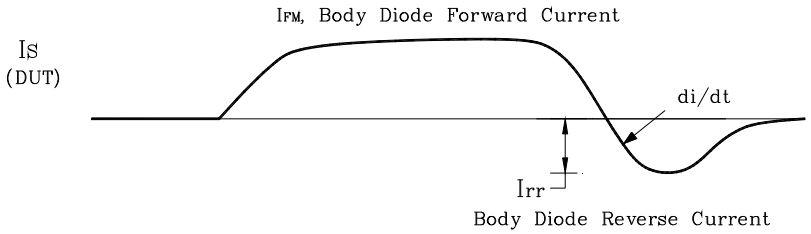
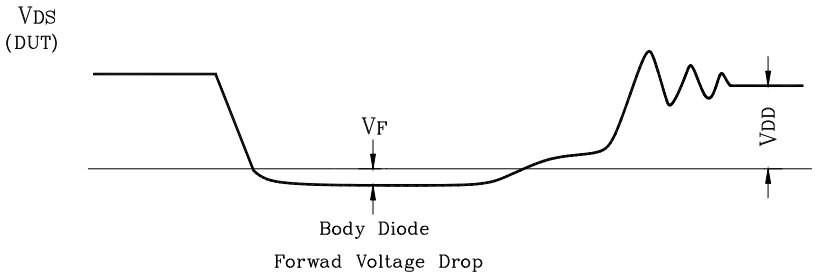


Fig. 14 Diode Reverse Recovery Time Test Circuit & Waveform

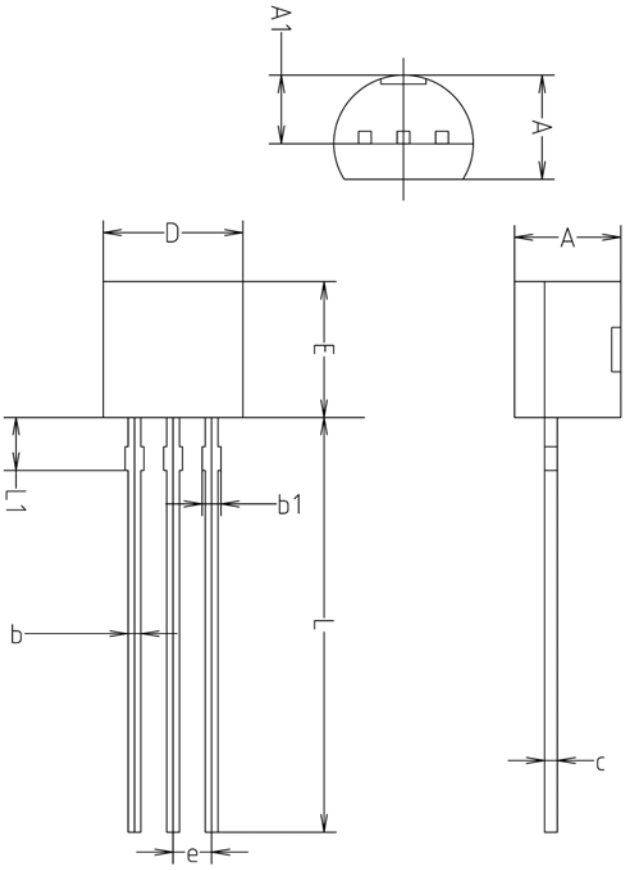








Package Outline Dimensions



SYMBOL	MILLMETERS(mm)		
	MINIMUM	NOMINAL	MAXIMUM
A	3.40	3.50	3.66
A1	2.46	2.51	2.59
b	0.39	0.44	0.53
b1	0.39	–	0.63
c	0.35	0.42	0.47
D	4.48	4.60	4.70
E	4.48	4.60	4.70
e	1.17	1.27	1.37
L	13.70	14.00	14.77
L1	1.55	1.70	2.15

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