

**Low-Power Reset Circuits with
 Capacitor-Adjustable Reset Timeout Delay**

CE8818 Series

■ **Introduction**

The **CE8818 Series** is a high-precision voltage detector developed using CMOS process. The detection voltage is fixed internally with an accuracy of 2%. A time delayed reset can be accomplished with the addition of an external capacitor. Two output forms, Nch open-drain and CMOS output, are available.

■ **Features**

- Ultra-low current consumption: 1.0 μ A
- High-precision detection voltage: 2%
- Operating voltage range: 0.7 V to 7.0 V
- Hysteresis characteristics: 5% typ.
- Detection voltage: 0.8V to 5.0 V (0.01 V step)
- Output forms:
 - Nch open-drain output (Active Low)
 - CMOS output (Active Low)
- Lead-free products

■ **Applications**

- Power supply monitor for portable equipment such as notebook PCs, digital still cameras, PDAs and cellular phones
- Constant voltage power monitor for cameras, video equipment and communication equipment
- Power monitor and reset for CPUs and microcomputers

■ **ORDER INFORMATION**

CE8818①②③④⑤

DESIGNATOR	SYMBOL	DESCRIPTION
①	C	CMOS
	N	NMOS open drain
②③④	Integer	Detection Voltage (1.50V~6.00V), “④”elide when it is “0” e.g. 3.0V=②:3, ③:0 2.93V=②:2, ③:9, ④:3
⑤	M	Package: SOT-23-5
	N	Package: SOT-343 (SC-82)

■ Pin Configurations

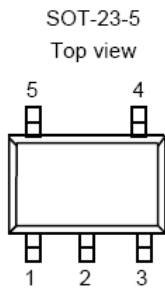
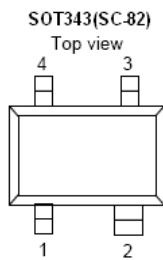


Table 1 CE8818 Series (SOT-23-5)

PIN NO.	PIN NAME	FUNCTION
1	OUT	Reset Signal Output Pin
2	V _{DD}	Power Input
3	GND	Ground
4	NC	No connection
5	C _D	Capacitor Connect Pin with Delay



CE8818Series (SOT343)

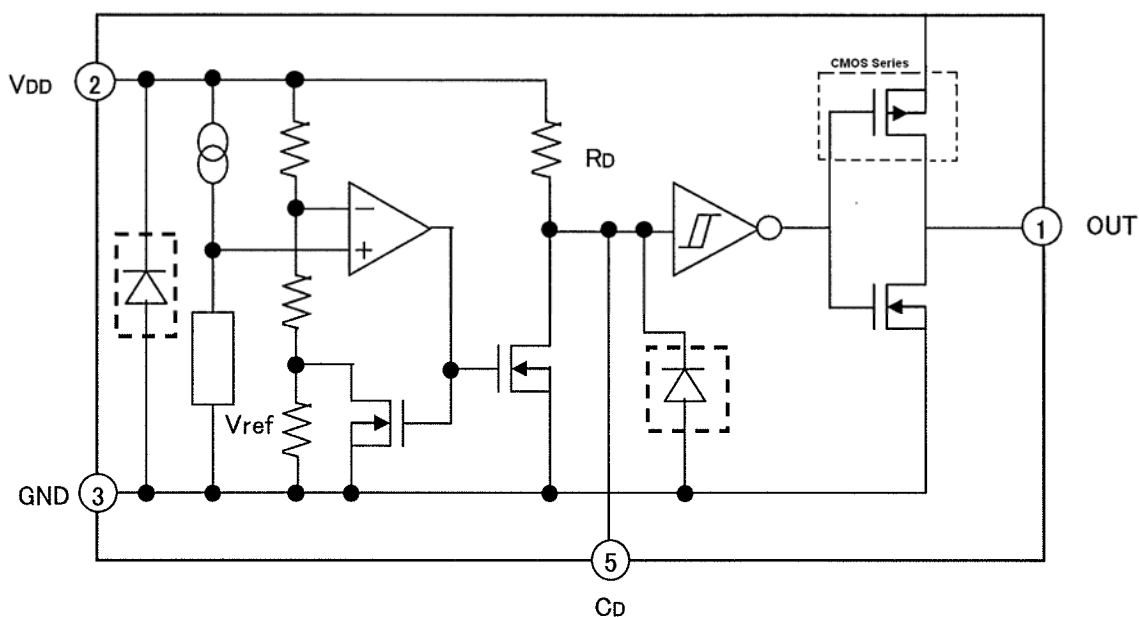
PIN NO.	PIN NAME	FUNCTION
1	V _{DD}	Power Input
2	GND	Ground
3	C _D	Capacitor Connect Pin with Delay
4	OUT	Reset Signal Output Pin

■ Absolute Maximum Ratings

(Ta=25°C unless otherwise specified)

Item	Symbol	Absolute Maximum Ratings	Unit
Power supply voltage	V _{DD}	V _{SS} -0.3 ~ V _{SS} +8	V
Output voltage	V _{OUT}	V _{SS} -0.3 ~ V _{SS} +8	V
Power dissipation	SOT-23-5	PD	250
	SOT343	PD	250
Operating ambient temperature	T _{opr}	-40 ~+85	°C
Storage temperature	T _{stg}	-40 ~+125	°C

■ Block Diagram



■ Electrical Characteristics

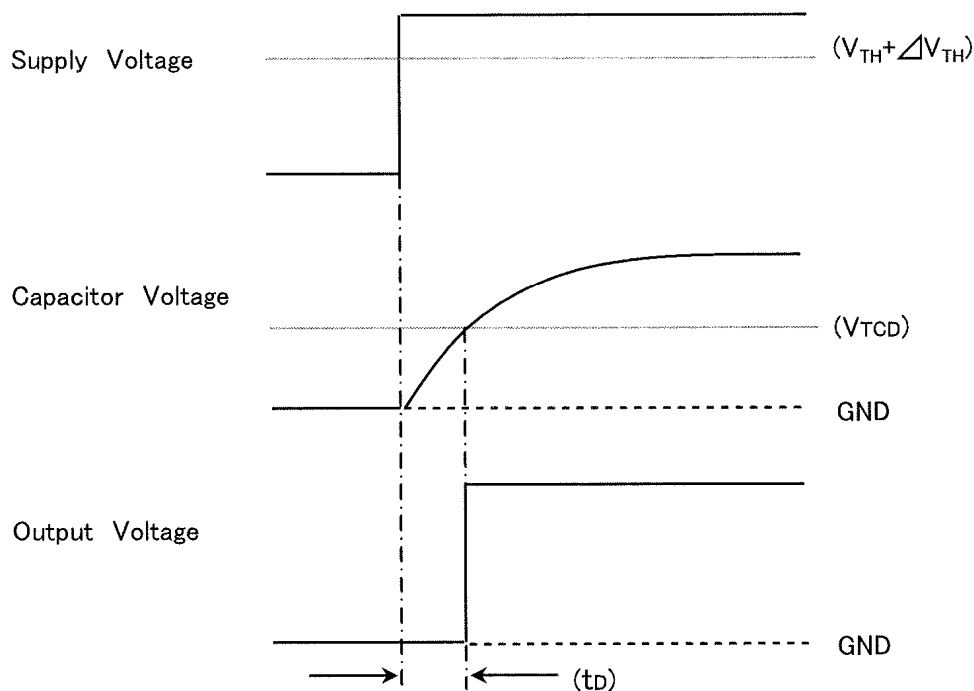
(Ta=25°C unless otherwise specified)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	
Detection voltage*1	V_{TH}	—	$V_{TH(S)} \times 0.98$	$V_{TH(S)}$	$V_{TH(S)} \times 1.02$	V	
Hysteresis width	ΔV_{TH}	—	$0.02 \times V_{TH(S)}$	$0.05 \times V_{TH(S)}$	$0.08 \times V_{TH(S)}$	V	
Current consumption	I_{SS}	$V_{DD} = V_{TH(S)} + 0.5V$		1.0	2.0	uA	
Operating voltage	V_{DD}	—	0.7	—	7	V	
Output current	I_{OUT}	NCH: $V_{OUT} = 0.5V$ $V_{DD} = V_{TH(S)} - 0.5V$	CE8818_20~26	3.0	13.0	20	mA
			CE8818_26~39	3.0	15.0	20	mA
			CE8818_39~60	3.0	18.0	20	mA
		CMOS: $V_{DD} - V_{OUT} = 0.5V$ $V_{DD} = V_{TH(S)} + 0.5V$	CE8818_20~26	1.5	4.0	10	mA
			CE8818_26~39	1.5	6.0	10	mA
			CE8818_39~60	1.5	8.0	10	mA
Leakage current	I_{LEAK}	Only for Nch open-drain output products, Nch, $V_{DD} = 7.0V, V_{OUT} = 7.0V$		0.1	1	uA	
temperature coefficient		$T_a = -40^\circ C \sim +85^\circ C$		± 100		ppm/ °C	
CD PIN resistance	R_D	$V_{DD} = 5V, V_{CD} = 0V$	6	9	12	MΩ	
CD Delay Pin Threshold Voltage	V_{TCD}		$0.30 \times V_{DD}$	$0.5 \times V_{DD}$	$0.60 \times V_{DD}$	V	
CD Delay Time	T	$T = -\ln(1 - V_{TCD}/V_{DD}) \times RC$	$0.35RC$	$0.69RC$	$0.92RC$	S	
L transfer delay time	t_{PHL}	$V_{DD} = V_{TH} + 0.4V \rightarrow V_{TH} - 0.4V$ (note 2)	2	15	100	uS	
H transfer delay time	t_{PLH}	$V_{DD} = V_{TH} - 0.4V \rightarrow V_{TH} + 0.4V$ (note 2)	2	15	100	uS	

*1. V_{TH} : Actual detection voltage value, $V_{TH(S)}$: Specified detection voltage value

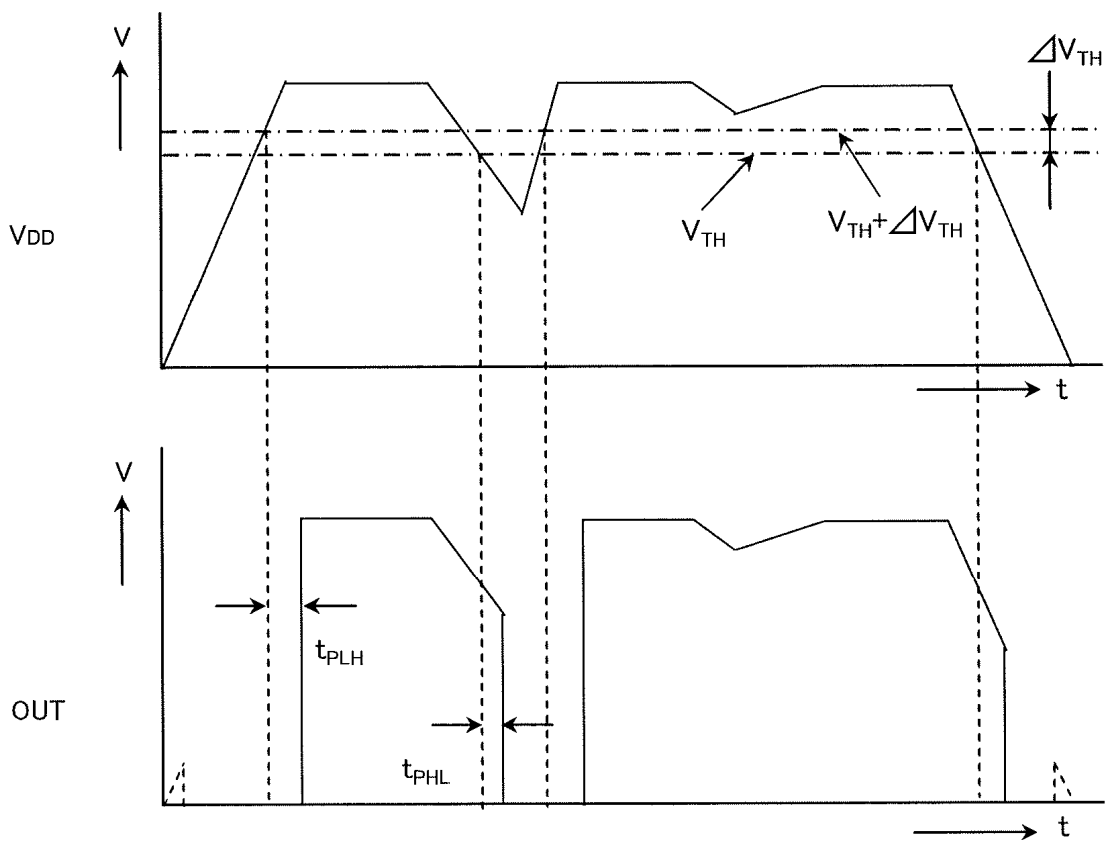
*2. The parameter is guaranteed by design.

Timing Chart

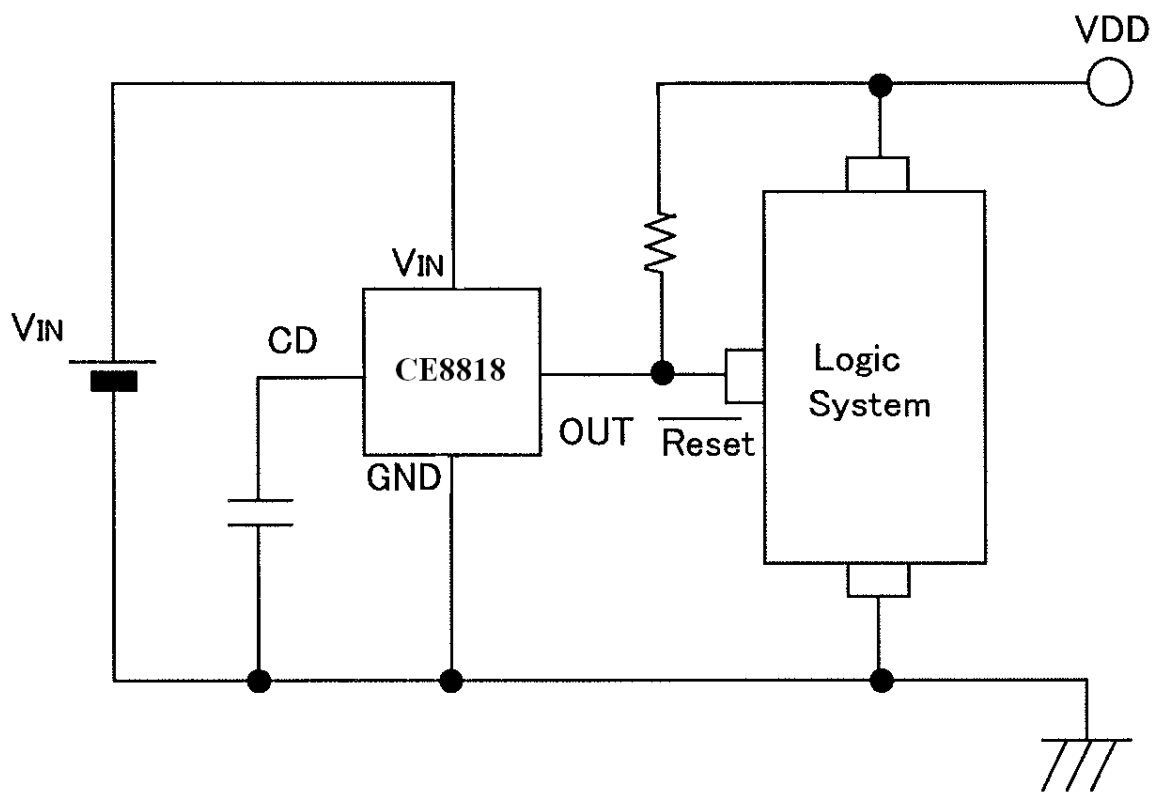
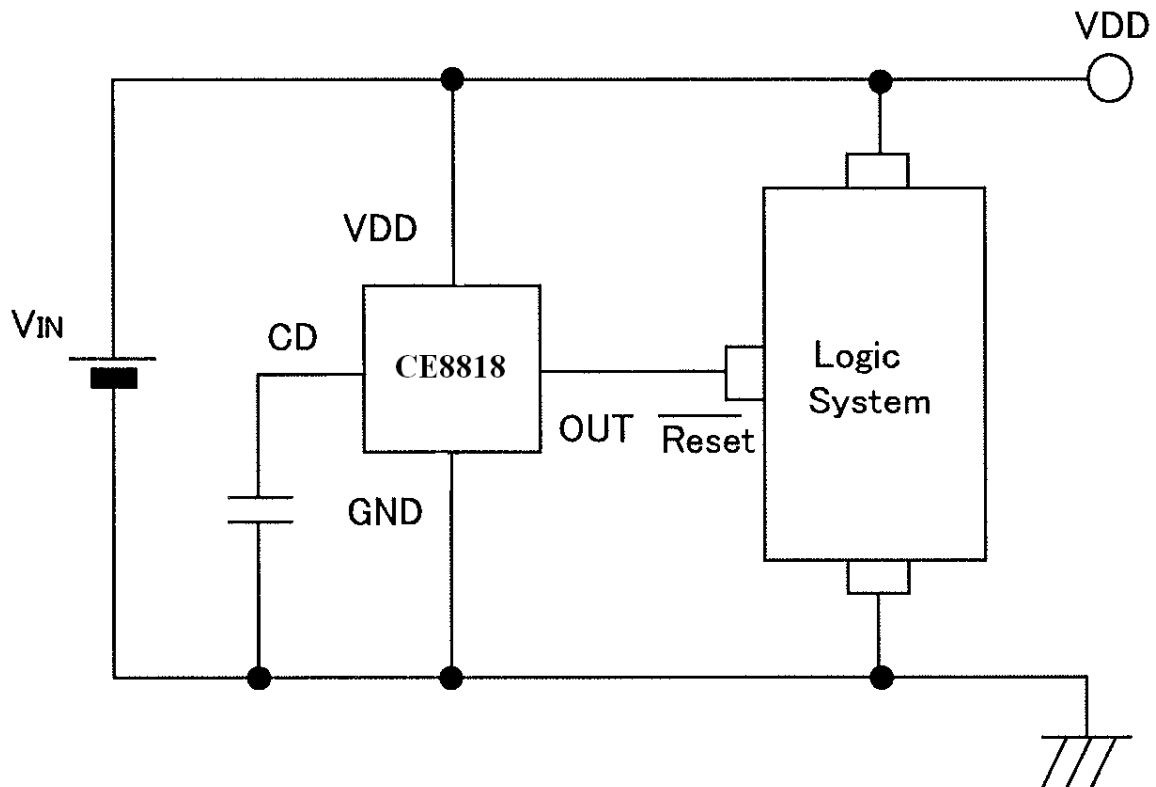


(t_d) Delay Time $t_d \doteq 0.69 \times R_D \times C_D(F)$ (s)

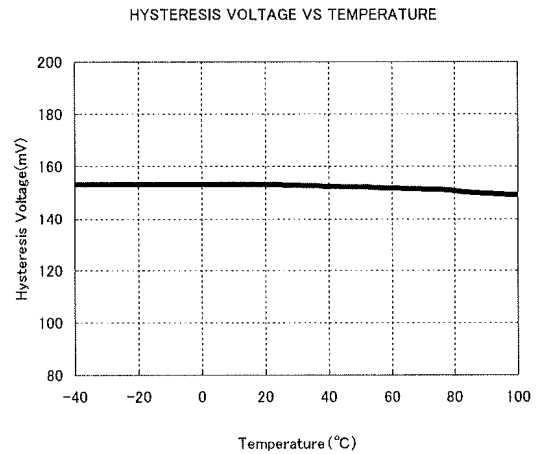
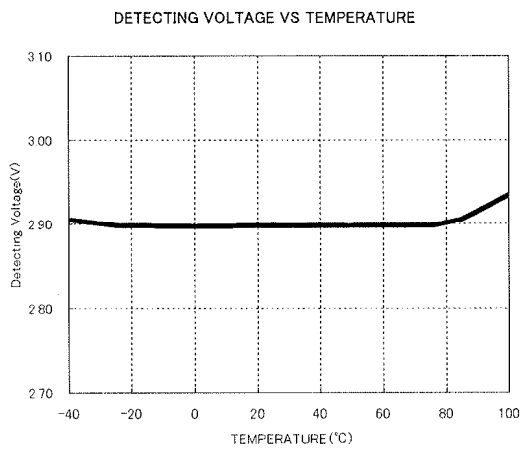
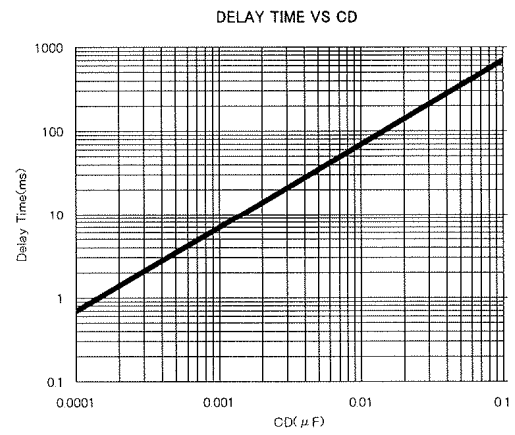
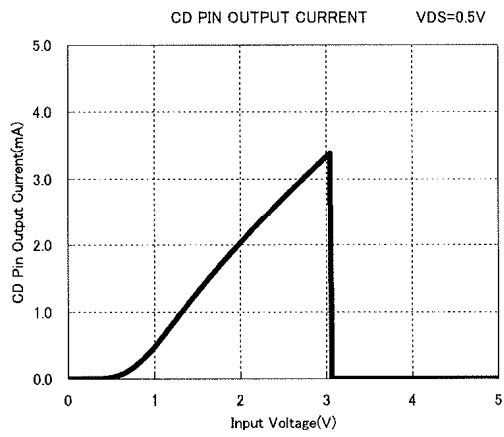
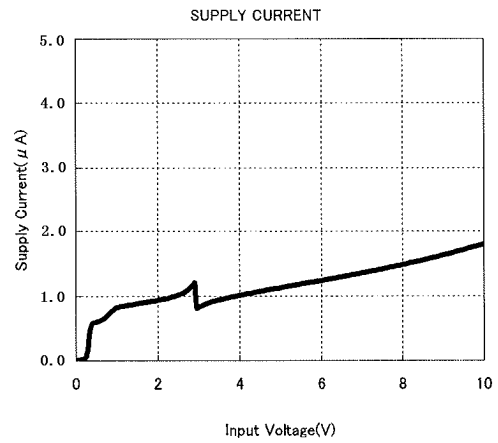
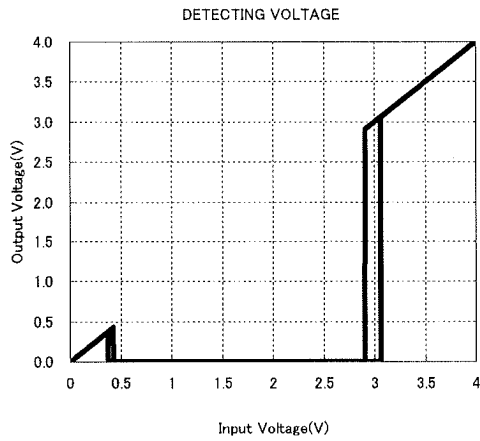
 R_D : C_D Pin Resistance
 C_D : Capacitor



■ Typical Application Circuit

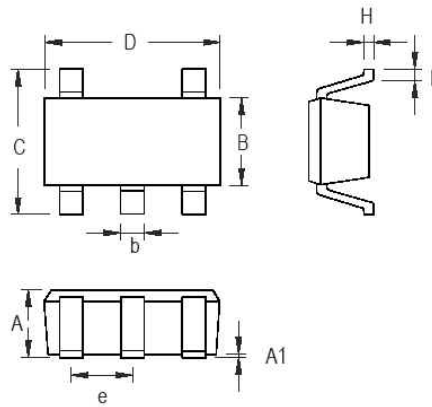


■ Typical Performance Characteristics



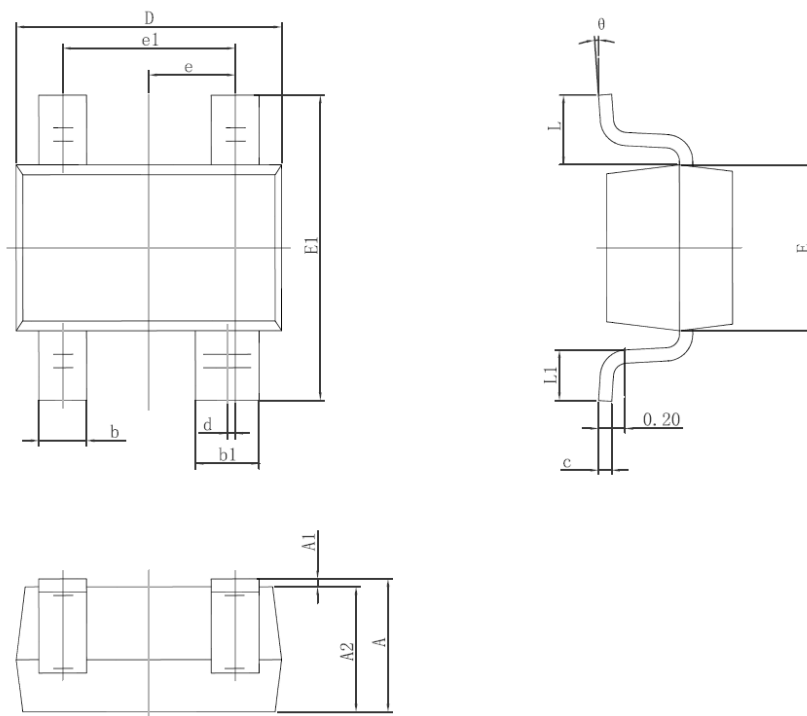
● Package information

● SOT-23-5



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.889	1.295	0.035	0.051
A1	0.000	0.152	0.000	0.006
B	1.397	1.803	0.055	0.071
b	0.356	0.559	0.014	0.022
C	2.591	2.997	0.102	0.118
D	2.692	3.099	0.106	0.122
e	0.838	1.041	0.033	0.041
H	0.080	0.254	0.003	0.010
L	0.300	0.610	0.012	0.024

• SOT343



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.250	0.400	0.010	0.016
b1	0.350	0.500	0.014	0.020
c	0.080	0.150	0.003	0.006
d	0.050 TYP.		0.002 TYP.	
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP.		0.026 TYP.	
e1	1.200	1.400	0.047	0.055
L	0.525 REF.		0.021 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

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