

# Low-Power $\mu$ P Reset Circuit with Capacitor-Adjustable Reset Timeout Delay

## 1 FEATURES

- **Operating Voltage Range: 1.2V to 5.5V**
- **Low Quiescent Current: 6 $\mu$ A (Max)**
- **Adjustable Reset Timeout Period**
- **Guaranteed RESET Valid at V<sub>cc</sub>=1.2V**
- **Operating Temperature Range: -40°C to 125°C**
- **Push-Pull RESET Output**
- **Available in Green Package: SOT-143, SC70-4**

## 2 APPLICATIONS

- **Computers**
- **Battery-Powered Applications**
- **Portable Equipment**
- **Controllers**
- **Intelligent Instruments**
- **Critical  $\mu$ P Power Monitoring**

## 3 DESCRIPTIONS

The RS802 can monitor system voltages from 1.2V to 5.5V. When V<sub>CC</sub> voltage drops below the reset threshold, the device will send a reset signal. When V<sub>CC</sub> voltage rises to the reset threshold, the reset output remains high within a user-adjustable reset timeout period set by an external capacitor. The RS802 also features an excellent transient immunity to ignore fast V<sub>CC</sub> transients.

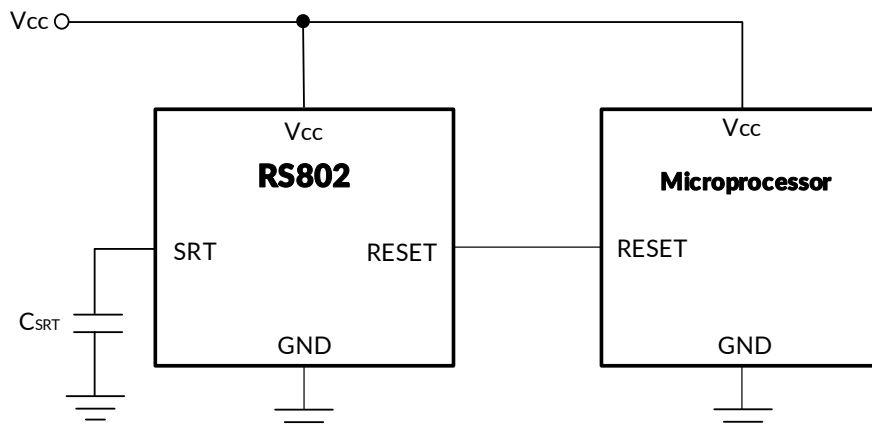
The RS802 is available in Green SOT-143 and SC70-4 package. It operates over an ambient temperature range of -40°C to 125°C.

**Device Information** <sup>(1)</sup>

PART NUMBER	PACKAGE	BODY SIZE (NOM)
RS802	SOT-143	2.90mm x 1.30mm
	SC70-4	2.10mm x 1.25mm

(1) For all available packages, see the orderable addendum at the end of the data sheet.

## 4 TYPICAL APPLICATION



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## 5 REVISION HISTORY

Note: Page numbers for previous revisions may differ from page numbers in the current version.

Version	Change Date	Change Item
A.0	2024/01/30	Preliminary version completed
A.0.1	2024/02/26	Modify packaging naming
A.1	2024/12/17	Initial version completed

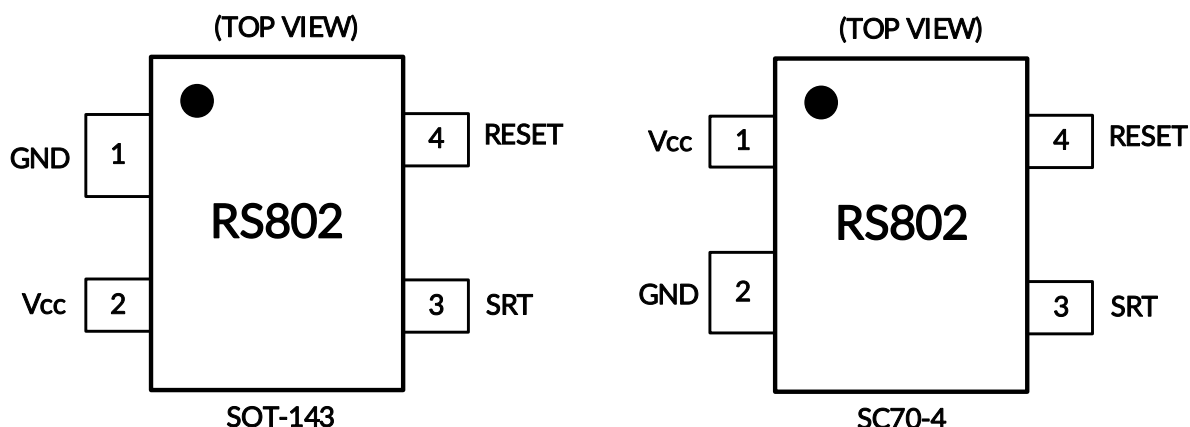
**6 PACKAGE/ORDERING INFORMATION (1)**

PRODUCT	ORDERING NUMBER	TEMPERATURE RANGE	PACKAGE LEAD	PACKAGE MARKING (2/3)	MSL (4)	PACKAGE OPTION
RS802	RS802-2.63XA4	-40°C ~125°C	SOT-143	802B	MSL3	Tape and Reel,3000
	RS802-2.93XA4	-40°C ~125°C	SOT-143	802C	MSL3	Tape and Reel,3000
	RS802-3.08XA4	-40°C ~125°C	SOT-143	802D	MSL3	Tape and Reel,3000
	RS802-4.00XA4	-40°C ~125°C	SOT-143	802E	MSL3	Tape and Reel,3000
	RS802-4.65XA4	-40°C ~125°C	SOT-143	802G	MSL3	Tape and Reel,3000
	RS802-2.63XC4	-40°C ~125°C	SC70-4 (5)	802B	MSL3	Tape and Reel,3000
	RS802-2.93XC4	-40°C ~125°C	SC70-4 (5)	802C	MSL3	Tape and Reel,3000
	RS802-3.08XC4	-40°C ~125°C	SC70-4 (5)	802D	MSL3	Tape and Reel,3000
	RS802-4.00XC4	-40°C ~125°C	SC70-4 (5)	802E	MSL3	Tape and Reel,3000
	RS802-4.65XC4	-40°C ~125°C	SC70-4 (5)	802G	MSL3	Tape and Reel,3000

**NOTE:**

- (1) This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the right-hand navigation.
- (2) There may be additional marking, which relates to the lot trace code information(data code and vendor code), the logo or the environmental category on the device.
- (3) B, C, D, E, G represents different Reset Thresholds.
- (4) RUNIC classify the MSL level with using the common preconditioning setting in our assembly factory conforming to the JEDEC industrial standard J-STD-20F, Please align with RUNIC if your end application is quite critical to the preconditioning setting or if you have special requirement.
- (5) Equivalent to SOT343.

## 7 PIN CONFIGURATIONS



## PIN DESCRIPTION

PIN		NAME	FUNCTION
SOT-143	SC70-4		
1	2	GND	Ground Pin.
2	1	V <sub>CC</sub>	Supply Voltage Pin.
3	3	SRT	Set Reset Timeout Input Pin. Set a capacitor between SRT and GND to adjust the timeout period ( $t_{RP}$ ). It is determined by: $t_{RP}(\mu s) = 4.5 \times 10^6 \times C_{SRT}(\mu F) + 50\mu s$
4	4	RESET	Active-Low Reset Output. If V <sub>CC</sub> is lower than the reset threshold, the RESET goes high. If V <sub>CC</sub> voltage is higher than the reset threshold, the reset output remains high within $t_{RP}$ .

## 8 SPECIFICATIONS

### 8.1 Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted) <sup>(1)(2)</sup>

		MIN	MAX	UNIT
V <sub>CC</sub>	Supply voltage range	-0.5	6.0	V
V <sub>I</sub>	Input voltage range <sup>(2)</sup>	-0.5	6.0	V
V <sub>O</sub>	Voltage range applied to any output in the high-impedance or power-off state <sup>(2)</sup>	-0.5	6.0	V
V <sub>O</sub>	Voltage range applied to any output in the high or low state <sup>(2)(3)</sup>	-0.5	V <sub>CC</sub> +0.5	V
I <sub>IK</sub>	Input clamp current	V <sub>I</sub> <0	-20	mA
I <sub>OK</sub>	Output clamp current	V <sub>O</sub> <0	-20	mA
I <sub>O</sub>	Continuous output current		±20	mA
	Continuous current through V <sub>CC</sub> or GND		±20	mA
θ <sub>JA</sub>	Package thermal impedance <sup>(4)</sup>	SOT-143	195	°C/W
		SC70-4	625	
T <sub>J</sub>	Junction temperature <sup>(5)</sup>	-65	150	°C
T <sub>stg</sub>	Storage temperature	-65	150	°C
T <sub>A</sub>	Operating temperature	-40	125	°C

- (1) Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under Recommended Operating Conditions is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- (2) The input and output negative-voltage ratings may be exceeded if the input and output current ratings are observed.
- (3) The value of V<sub>CC</sub> is provided in the Recommended Operating Conditions table.
- (4) The package thermal impedance is calculated in accordance with JESD-51.
- (5) The maximum power dissipation is a function of T<sub>J(MAX)</sub>, R<sub>θJA</sub>, and T<sub>A</sub>. The maximum allowable power dissipation at any ambient temperature is P<sub>D</sub> = (T<sub>J(MAX)</sub> - T<sub>A</sub>) / R<sub>θJA</sub>. All numbers apply for packages soldered directly onto a PCB.

### 8.2 ESD Ratings

The following ESD information is provided for handling of ESD-sensitive devices in an ESD protected area only.

		VALUE	UNIT
V <sub>(ESD)</sub>	Electrostatic discharge	Human-body model (HBM), MIL-STD-883K METHOD 3015.9	±4000
		Machine model (MM), JESD22-A115C (2010)	±200



#### ESD SENSITIVITY CAUTION

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

### 8.3 ELECTRICAL CHARACTERISTICS

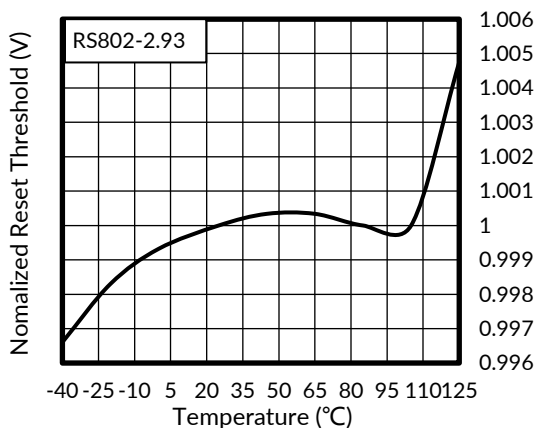
( $V_{CC} = 2.74V$  to  $5.5V$  for RS802-2.63;  $V_{CC} = 3.05V$  to  $5.5V$  for RS802-2.93;  $V_{CC} = 3.21V$  to  $5.5V$  for RS802-3.08;  $V_{CC} = 4.17V$  to  $5.5V$  for RS802-4.00;  $V_{CC} = 4.84V$  to  $5.5V$  for RS802-4.65;  $T_A = -40^{\circ}C$  to  $125^{\circ}C$ , unless otherwise noted, typical at  $25^{\circ}C$ .)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage Range	$V_{CC}$		1.2		5.5	V
Supply Current	$I_{SUPPLY}$			3	6	$\mu A$
Reset Threshold	$V_{RT}$	RS802-2.63	2.50	2.63	2.74	V
		RS802-2.93	2.80	2.93	3.05	
		RS802-3.08	2.94	3.08	3.21	
		RS802-4.00	3.82	4.00	4.17	
		RS802-4.65	4.44	4.65	4.84	
Reset Threshold Hysteresis		RS802-2.63		12		mV
		RS802-2.93		14		
		RS802-3.08		15		
		RS802-4.00		20		
		RS802-4.65		23		
Reset Threshold Temperature Coefficient <sup>(1)</sup>				30		ppm/ $^{\circ}C$
$V_{CC}$ to Reset delay	$t_{RD}$	$V_{CC}=3.3V$ , RS802-2.93		33		$\mu s$
Reset Timeout Period	$t_{RP}$	$C_{SRT} = 1500pF$ , $V_{CC}=5V$	4.0	6.8	12.5	ms
		$C_{SRT} = 0$ , $V_{CC}=5V$		50		$\mu s$
$V_{SRT}$ Ramp Current	$I_{RAMP}$	$V_{SRT}=0.65V$ , $V_{CC}=5V$		260	500	nA
$V_{SRT}$ Ramp Threshold	$V_{TH-RAMP}$	$V_{CC} = 1.6V$ to $5V$ ( $V_{RAMP}$ rising)		1.2		V
Reset Output voltage	High	$I_{SOURCE} = 500\mu A$	$0.7 \times V_{CC}$			V
	Low	$I_{SINK} = 1.2mA$			0.4	

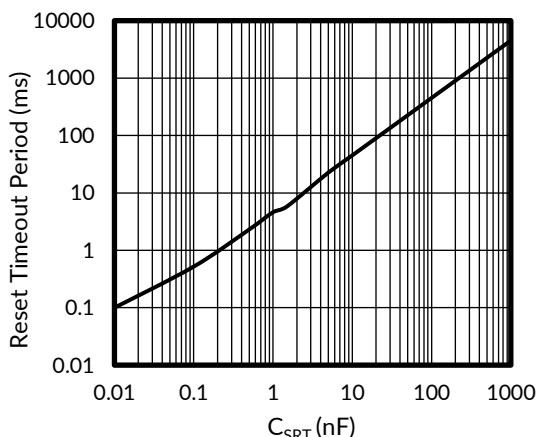
(1) This parameter is ensured by design and/or characterization and is not tested in production.

## 8.4 TYPICAL OPERATING CHARACTERISTICS

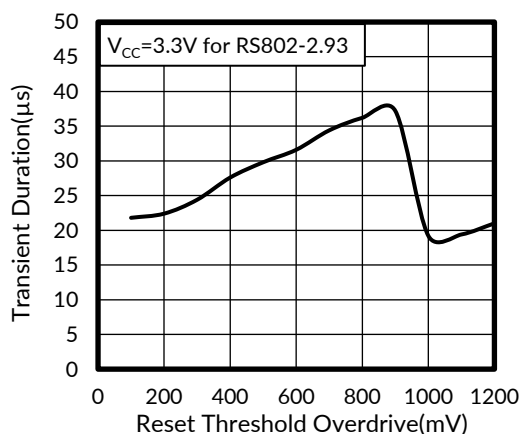
NOTE: The graphs and tables provided following this note are a statistical summary based on a limited number of samples and are provided for informational purposes only.



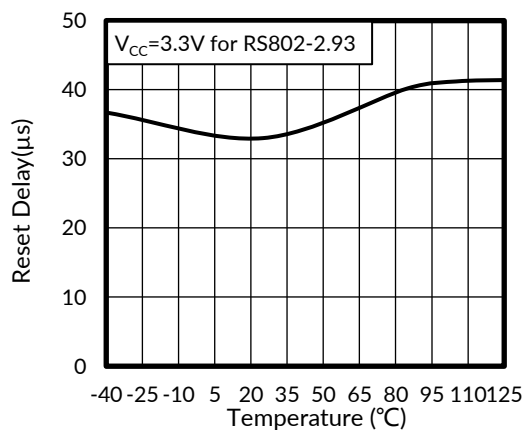
**Figure 1. Normalized Reset Threshold vs Temperature**



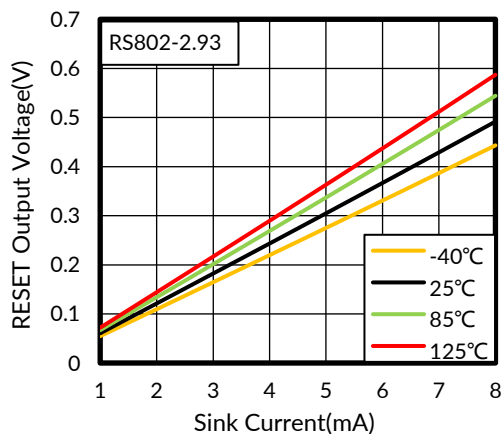
**Figure 2. Reset Timeout Period vs  $C_{SRT}$**



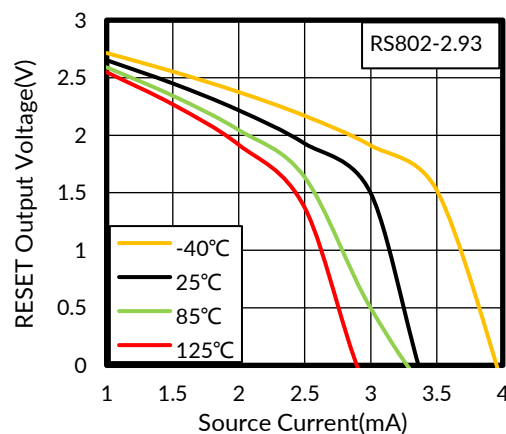
**Figure 3. Transient Duration vs Reset Threshold Overdrive**



**Figure 4. Reset Delay vs Temperature**



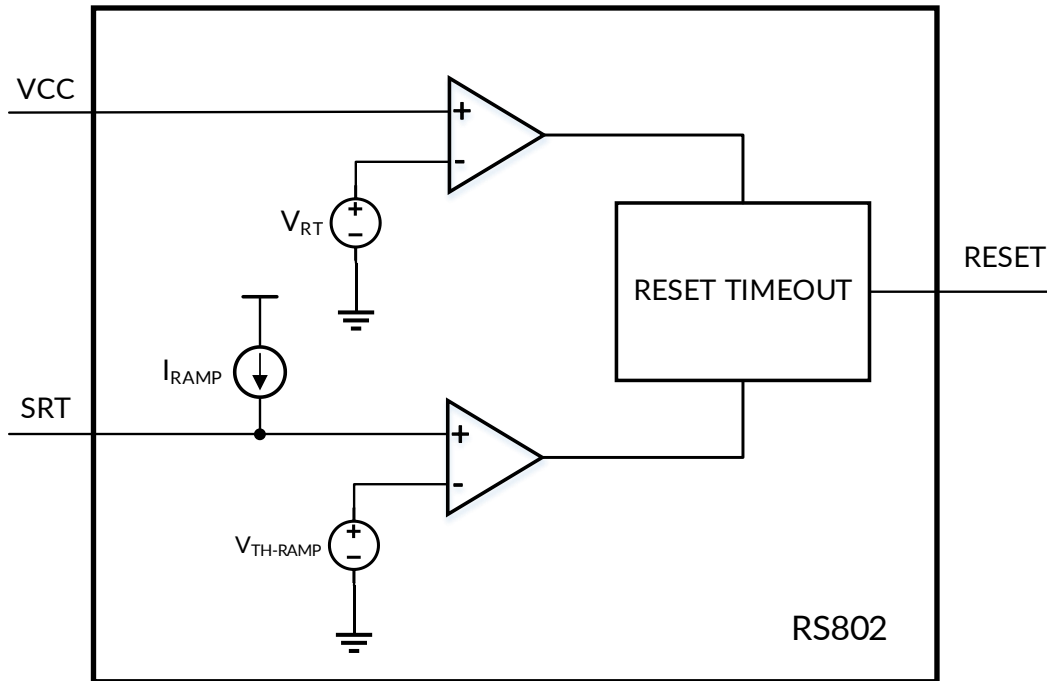
**Figure 5. RESET Output Voltage vs Sink Current**



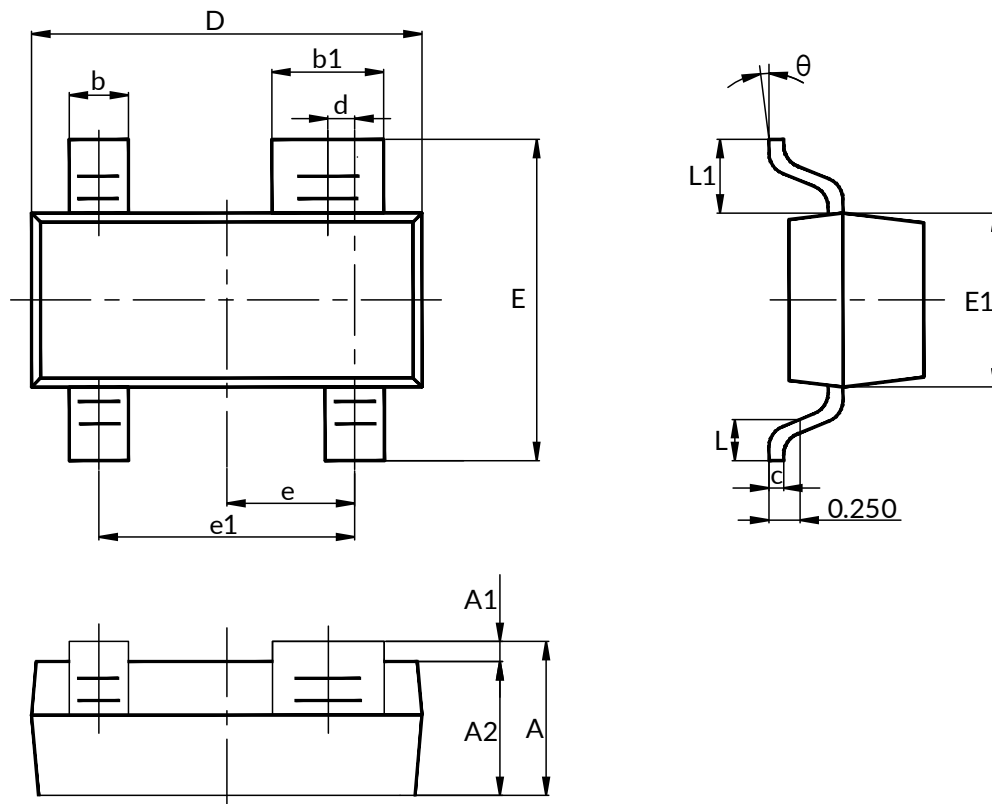
**Figure 6. RESET Output Voltage vs Source Current**



### 9 FUNCTION BLOCK DIAGRAM



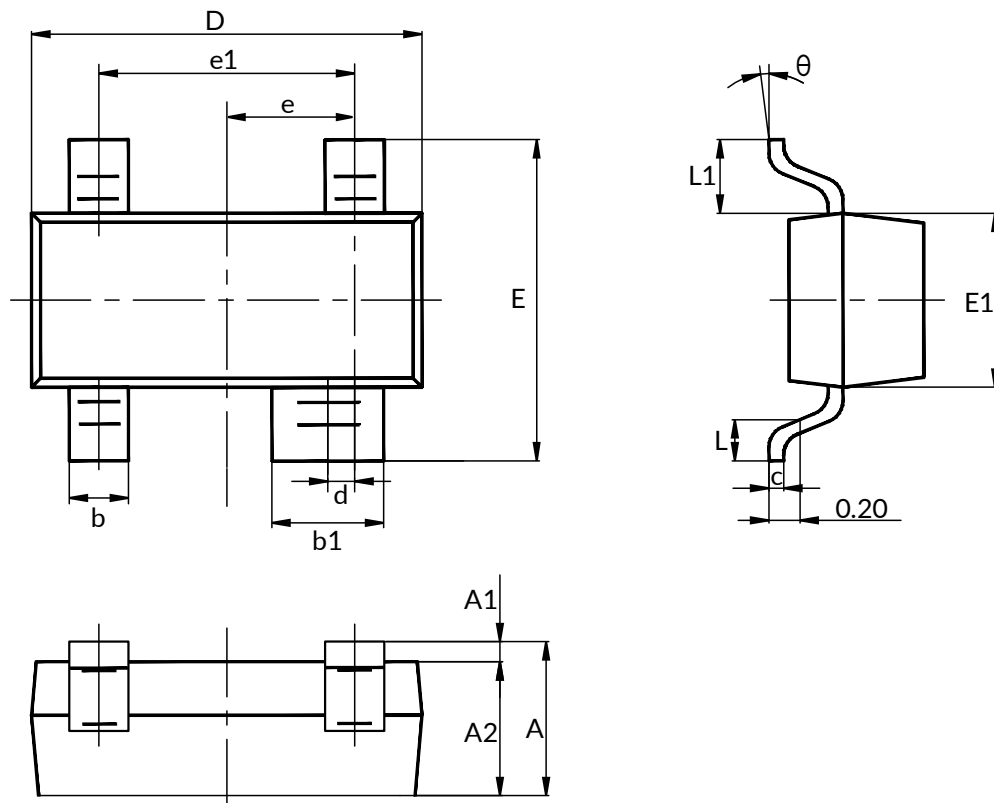
# 10 PACKAGE OUTLINE DIMENSIONS

**SOT-143 <sup>(3)</sup>**


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A <sup>(1)</sup>	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
b1	0.750	0.900	0.030	0.035
c	0.080	0.150	0.003	0.006
D <sup>(1)</sup>	2.800	3.000	0.110	0.118
d	0.200 (TYP)		0.008 (TYP)	
E	2.250	2.550	0.089	0.100
E1 <sup>(1)</sup>	1.200	1.400	0.047	0.055
e	0.950 (TYP)		0.037 (TYP)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.500	0.012	0.020
L1	0.550 (REF) <sup>(2)</sup>		0.022 (REF) <sup>(2)</sup>	
theta	0°	8°	0°	8°

**NOTE:**

1. Plastic or metal protrusions of 0.15mm maximum per side are not included.
2. REF is the abbreviation for Reference.
3. This drawing is subject to change without notice.

**SC70-4 (3)**


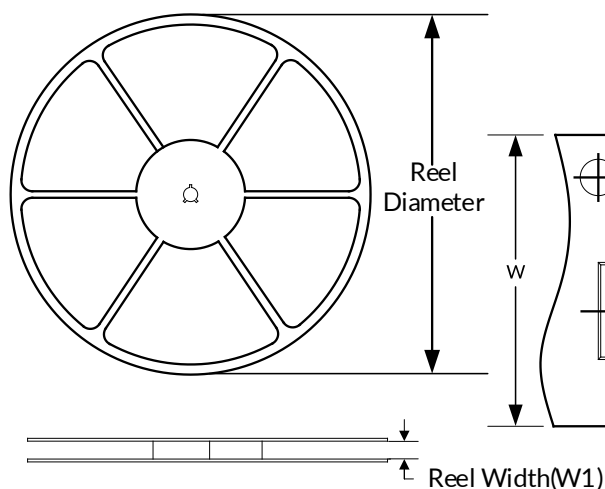
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A <sup>(1)</sup>	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.800	1.000	0.031	0.039
b	0.250	0.400	0.010	0.016
b1	0.350	0.500	0.014	0.020
c	0.080	0.150	0.003	0.006
D <sup>(1)</sup>	2.000	2.200	0.079	0.087
d	0.050 (TYP)		0.002 (TYP)	
E	2.000	2.450	0.079	0.096
E1 <sup>(1)</sup>	1.150	1.350	0.045	0.053
e	0.650 (TYP)		0.026 (TYP)	
e1	1.200	1.400	0.047	0.055
L	0.260	0.460	0.010	0.018
L1	0.525 (REF) <sup>(2)</sup>		0.021 (REF) <sup>(2)</sup>	
theta	0°	8°	0°	8°

**NOTE:**

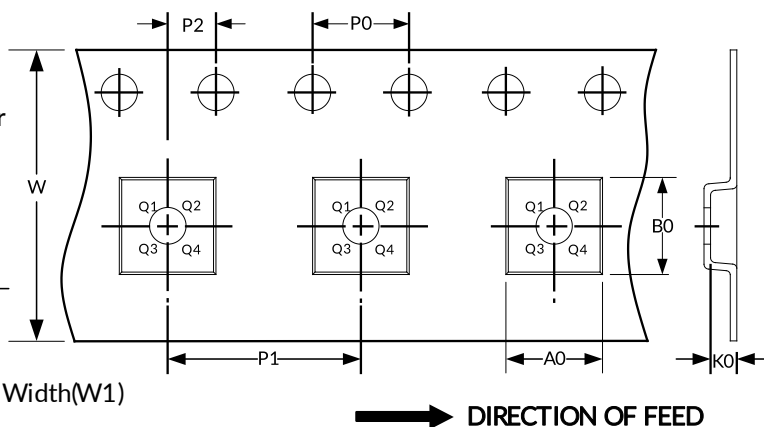
1. Plastic or metal protrusions of 0.15mm maximum per side are not included.
2. REF is the abbreviation for Reference.
3. This drawing is subject to change without notice.

# 11 TAPE AND REEL INFORMATION

## REEL DIMENSIONS



## TAPE DIMENSION



NOTE: The picture is only for reference. Please make the object as the standard.

## KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width(mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
SOT-143	7"	8.30	3.19	2.80	1.31	4.0	4.0	2.0	8.0	Q3
SC70-4	7"	9.50	2.25	2.55	1.20	4.0	4.0	2.0	8.0	Q3

NOTE:

1. All dimensions are nominal.
2. Plastic or metal protrusions of 0.15mm maximum per side are not included.

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