Features

- Low voltage drop: 0.17V@100mA
- High input voltage: 15V
- Low temperature coefficient
- Large Output Current: >0.35A
- Low Quiescent Current: 1.0uA
- Output voltage accuracy: tolerance ±2%
- Built-in current limiter
- SOT89,SOT89-5,SOT23-3 and SOT23-5 packages

Applications

- Battery-powered equipment
- Hand-Hold Equipment
- GRS Receivers
- Wireless LAN

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General Description

The AP2204K series is a group of positive voltage output, three-pin regulators, that provide a high current even when the input/output voltage differential is small. Low power consumption and high accuracy is achieved through CMOS and laser trimming technologies.

The AP2204K consists of a high-precision voltage reference, an error amplification circuit, and a current limited output driver. Transient response to load variations have improved in comparison to the existing series. SOT89, SOT89-5,SOT23-3 and SOT23-5 packages are available.

Selection Table

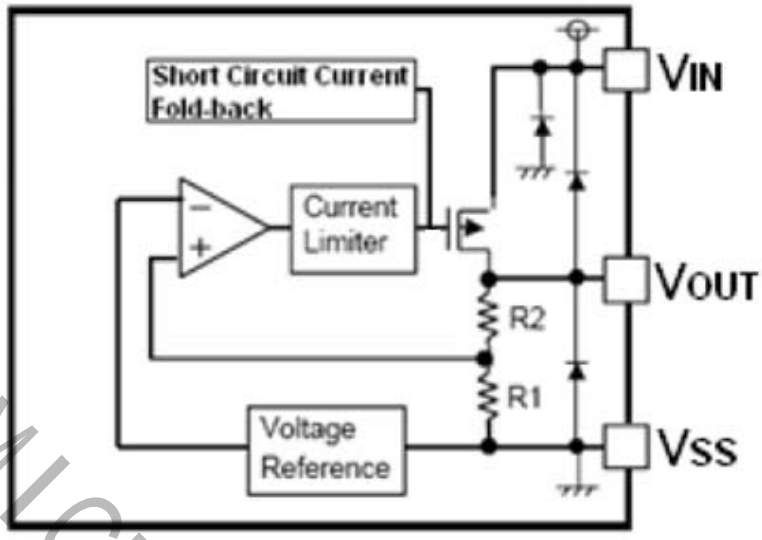
Part No.	Output Voltage	Package Opetion	Package Description	Marking Information
AP2204K	1.8V	Tape and Reel ,3000	SOT23-5	Refer to Marking rule
AP2204K	2.5V			
AP2204K	2.8V			
AP2204K	3.0V			
AP2204K	3.3V			
AP2204K	5.0V			

Order Information

Designator	Symbol	Description
①②	Integer	Output Voltage(1.8~5.0V)
③	P	Package:SOT89
	P5	Package:SOT89-5
	M	Package:SOT23-3
	M5	Package:SOT23-5
	M5B	Package:SOT23-5B
④	R	ROHS/Pb Free
	G	Halogen Free

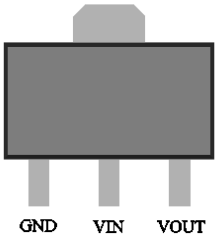
Note:" ①②" stands for output voltages. Other voltages can be specially customized

Block Diagram

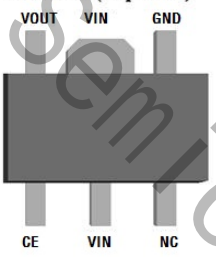


Pin Assignment

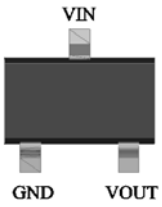
SOT89 (Top view)



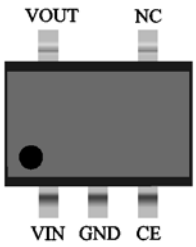
SOT89-5 (Top view)



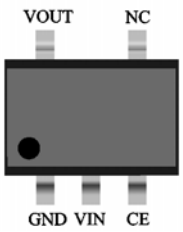
SOT23-3 (Top view)



SOT23-5 (Top view)



SOT23-5B (Top view)



Absolute Maximum Ratings

- Supply Voltage .....-0.3V to 18V
- Operating Temperature .....-40℃ to 85℃
- Storage Temperature .....-40℃ to 125℃

Note: These are stress ratings only. Stresses exceeding the range specified under "Absolute Maximum Ratings" may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

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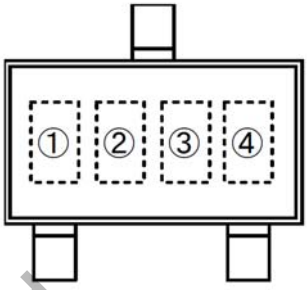
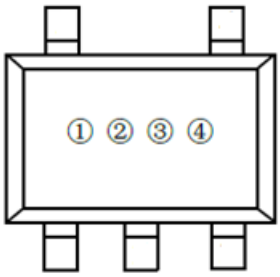
Marking Rule SOT23-3/SOT23-5



SOT-23
(TOP VIEW)



SOT23-5
(TOP VIEW)

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List of Product Name vs. Product Code

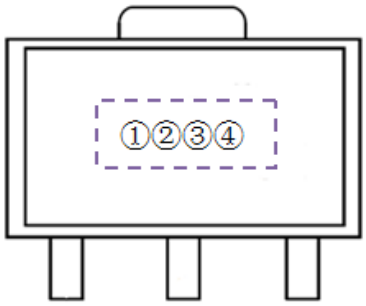
Product Name	Product Code		
	(1)	(2)	(3)
AP2204K-1.2V	S	A	A
AP2204K-1.3V	S	A	B
AP2204K-1.4V	S	A	C
AP2204K-1.5V	S	A	D
AP2204K-1.6V	S	A	E
AP2204K-1.7V	S	A	F
AP2204K-1.8V	S	A	G
AP2204K-1.9V	S	A	I
AP2204K-2.0V	S	A	J
AP2204K-2.1V	S	A	K
AP2204K-2.2V	S	A	L
AP2204K-2.3V	S	A	M
AP2204K-2.4V	S	A	N
AP2204K-2.5V	S	A	O
AP2204K-2.6V	S	A	P
AP2204K-2.7V	S	A	Q
AP2204K-2.8V	S	A	R
AP2204K-2.9V	S	A	T
AP2204K-3.0V	S	A	U
AP2204K-3.1V	S	A	V

Product Name	Product Code		
	(1)	(2)	(3)
AP2204K-3.2V	S	A	W
AP2204K-3.3V	S	A	X
AP2204K-3.4V	S	A	Y
AP2204K-3.5V	S	A	Z
AP2204K-3.6V	S	B	A
AP2204K-3.7V	S	B	B
AP2204K-3.8V	S	B	C
AP2204K-3.9V	S	B	D
AP2204K-4.0V	S	B	E
AP2204K-4.1V	S	B	F
AP2204K-4.2V	S	B	J
AP2204K-4.3V	S	B	H
AP2204K-4.4V	S	B	I
AP2204K-4.5V	S	B	J
AP2204K-4.6V	S	B	K
AP2204K-4.7V	S	B	L
AP2204K-4.8V	S	B	M
AP2204K-4.9V	S	B	N
AP2204K-5.0V	S	B	O

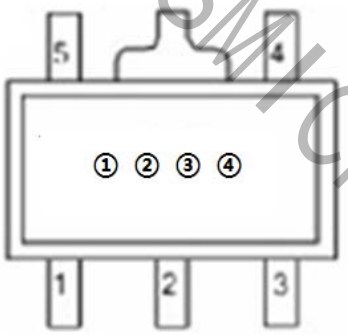
NOTE: SOT23-5,the last is Z

SOT23-5B,the last is Y

SOT89 and SOT89-5



SOT-89
(TOP VIEW)



SOT89-5
(TOP VIEW)

Vout	Code	Vout	Code	Vout	Code
1.5V	1	2.7V	C	3.9V	O
1.6V	2	2.8V	D	4.0V	P
1.7V	3	2.9V	E	4.1V	Q
1.8V	4	3.0V	F	4.2V	R
1.9V	5	3.1V	G	4.3V	S
2.0V	6	3.2V	H	4.4V	I
2.1V	7	3.3V	I	4.5V	U
2.2V	8	3.4V	J	4.6V	V
2.3V	9	3.5V	K	4.7V	W
2.4V	0	3.6V	L	4.8V	X
2.5V	A	3.7V	M	4.9V	Y
2.6V	B	3.8V	N	5.0V	Z

Note: The last two of them are based on the time of this product which is the first time into production, and the third is the launch of this product ,it can be in 1 ~ 9 , which is expressed in "0" in October, in November with an "A", in December with "B"; the fourth is of the launch of the product, such as expressed in "0" in 2010, in "3" in 2013. For example: EZ81 represents 7250PR product is first put into production in August in 2011.

Electrical Characteristics(AP2204K for any output voltage (Ta=25℃)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Output Voltage	Vout	Vin=Vout+1V 1.0mA≤Iout≤30mA	Vout×0.98	--	Vout×1.02	V
Output Current*1	Iout	Vin-Vout=1V	--	250	--	mA
Low dropout*2	Vdrop	Refer to the next table				
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	1.6V≤Vin≤8V Iout=100mA	--	0.05	0.2	%/V
Load Regulation	▵ Vout	Vin= Vout+1V 1.0mA≤Iout≤100mA	--	12	30	mV

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Output voltage Temperature Coefficiency	$\frac{\Delta V_{OUT}}{\Delta Ta}$	Iout=30mA 0℃≤Ta≤70℃	--	±100	--	Ppm/℃
PSRR	PSRR	F=1KHz Vin=Vout+1V	--	40	--	dB
Supply Current	Iss1	--	--	1	2	uA
Input Voltage	Vin	--	--	--	15	V

Electrical Characteristics by Output Voltage

Output Voltage Vout(V)	Dropout Voltage Vdif (V)		
	Conditions	Typ.	Max.
Vout≤2.0V	Iout=60 mA	0.1	0.12
2.0<Vout≤3.0	Iout=80 mA	0.12	0.14
3.0<Vout≤4.0	Iout=100 mA	0.16	0.18
4.0<Vout≤5.0		0.17	0.18
3.0<Vout≤4.0	Iout=200 mA	0.21	0.24
4.0<Vout≤5.0		0.20	0.22
3.0<Vout≤4.0	Iout=350 mA	0.7	0.75
4.0<Vout≤5.0		0.72	0.76

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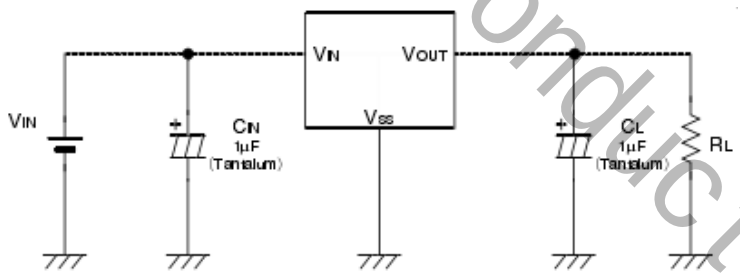
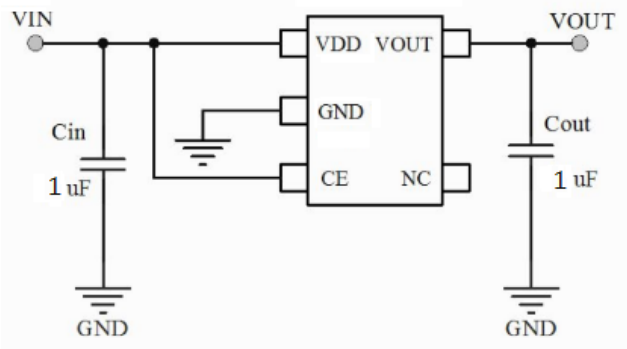
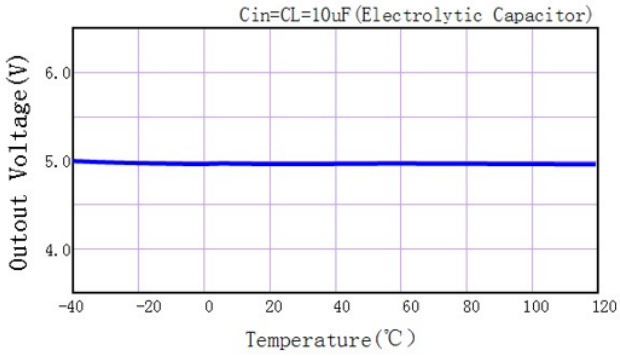
Typical Application



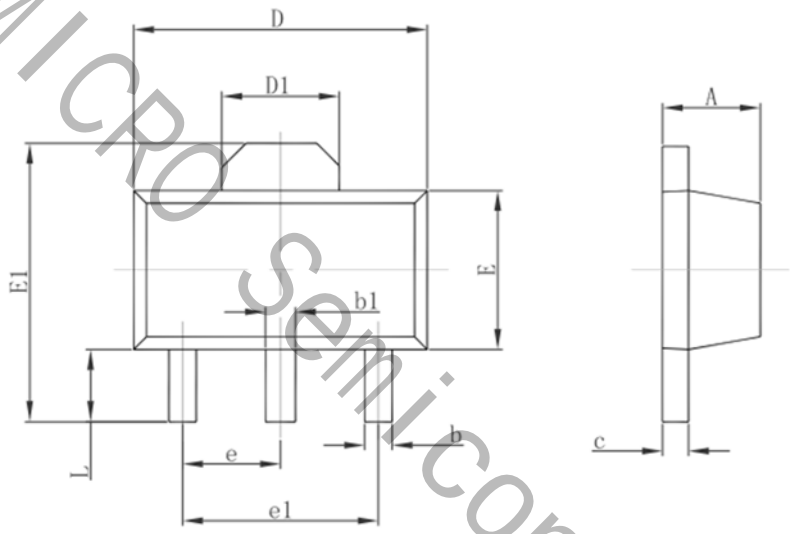


Note1:Input capacitor C_{IN}=1uF.
Note2:Ouput capacitor C_{OUT}=1uF/6.8uF(1uF Tantalum capacitor or 6.8uF ceramic capacitor is recommended).

Output Voltage vs.Ambient Temperature



SOT89



Symbol	Dimensions In Millimeters		Dimensions In Millimeters	
	MIN	MAX	MIN	MAX
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060 TYP	
e1	3.000 TYP		0.118 TYP	
L	0.900	1.200	0.035	0.047

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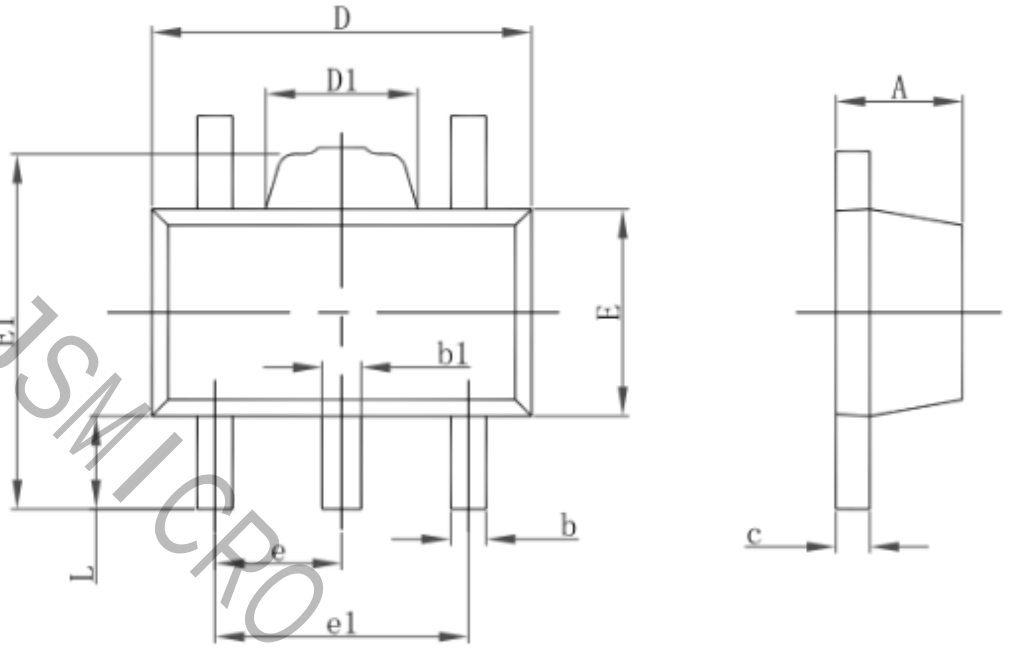
SOT89-5



Symbol	Dimensions In Millimeters		Dimensions In Millimeters	
	MIN	MAX	MIN	MAX
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060 TYP	
e1	3.000 TYP		0.118 TYP	
L	0.900	1.200	0.035	0.047

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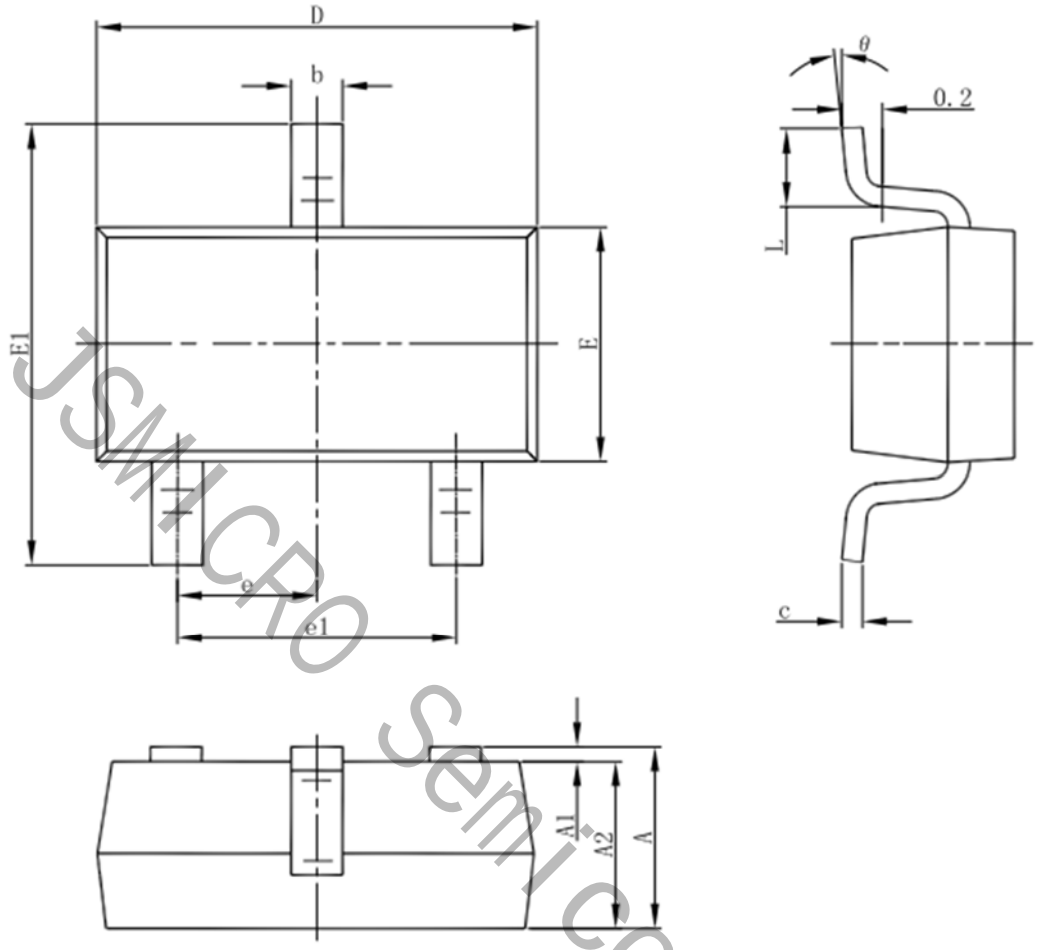
SOT23-3



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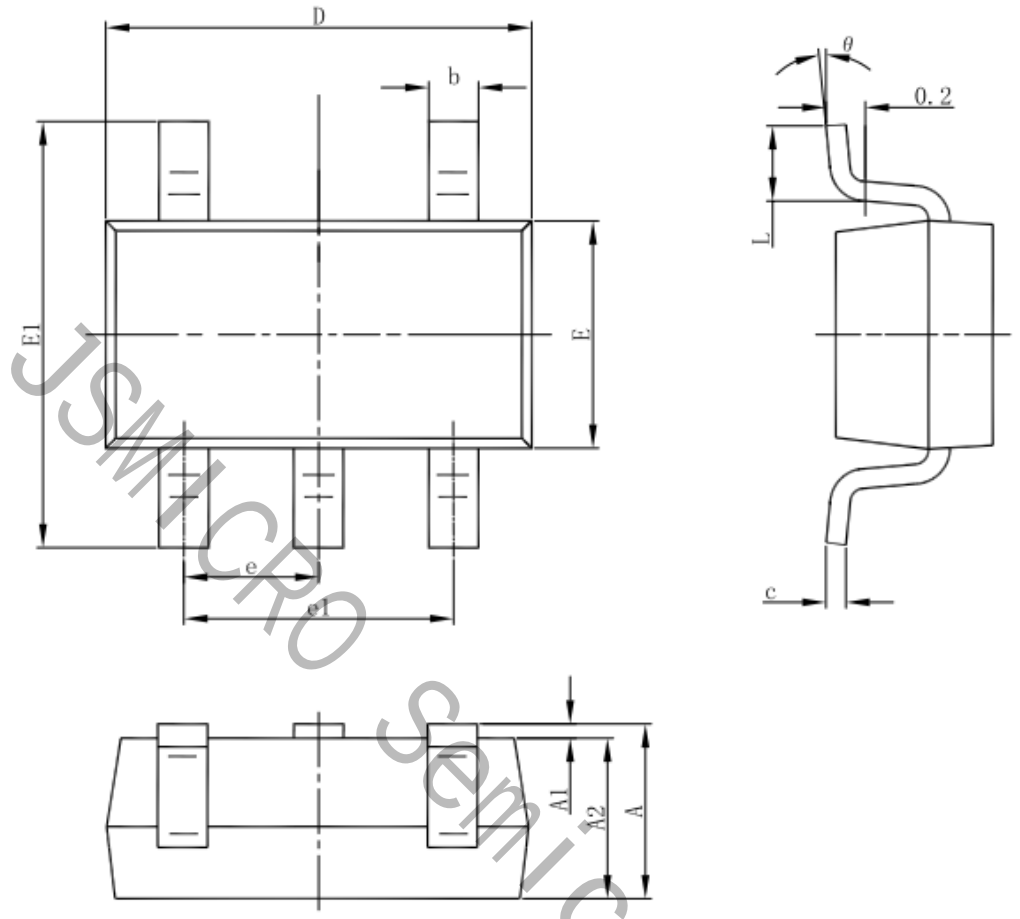
Symbol	Dimensions In Millimeters		Dimensions In Millimeters	
	MIN	MAX	MIN	MAX
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950BSC		0.037BSC	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

SOT23-5



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Symbol	Dimensions In Millimeters		Dimensions In Millimeters	
	MIN	MAX	MIN	MAX
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950BSC		0.037BSC	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°