SSC432 Precision Programmable Reference

Description

The SSC432 are three-terminal adjustable shunt regulators with guaranteed thermal stability over a full operation range. It features sharp turn-on characteristics, low temperature coefficient and low output impedance, which make it ideal substitutes for Zener diodes in applications such as switching power supply, charger and other adjustable regulators.

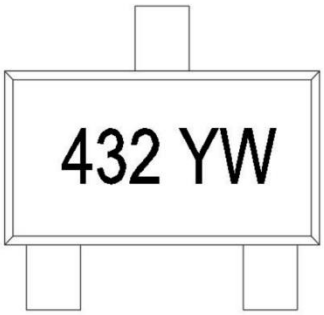
The output voltage of SSC432 can be set to any value between Vref (1.25V) and the corresponding maximum cathode voltage (18V).

This IC are available in SOT-23 package.

Applications

- Charger
- Shunt Regulator
- Precision Current Limiter
- High-Current Shunt Regulator

Device Information



Top view

Marking (Y: year/W: week)

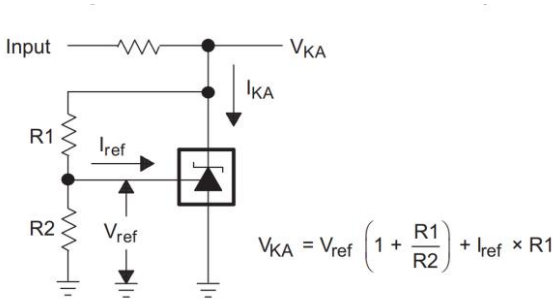
Ordering Information

Marking	Product	Package	Tape and Reel
432 YW	SSC432	SOT23	3000 pcs

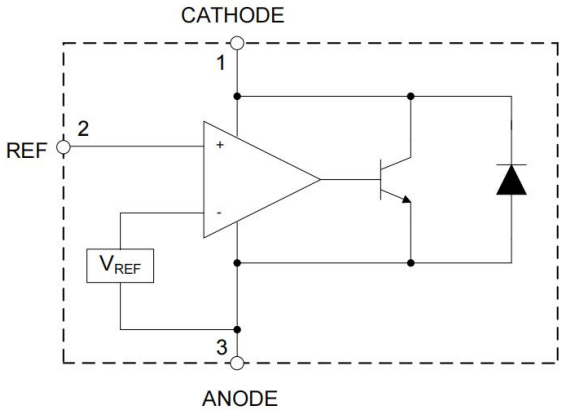
Features

- Adjustable output voltage: 1.25V to 18 V
- Wide Operating Range of −40°C to 125°C
- Low Equivalent Full-range Temperature Coefficient with 20 PPM/°C Typical
- Low Output Noise
- Low Dynamic Output Resistance: 0.05Ω Typical
- Sink-current capability:1.0 mA to 100 mA

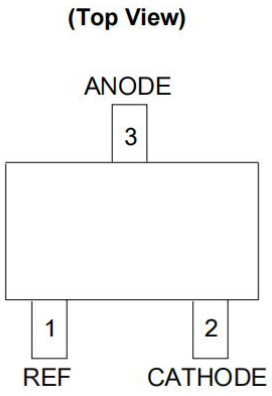
Typical Application



Functional Block Diagram



Pin Configuration



SSC432

Pin configuration

SSC432	Symbol	Description
1	REF	Threshold relative to common anode
2	CATHODE	Shunt Current/Voltage input
3	ANODE	Common pin, normally connected to ground

Absolute Maximum Ratings(1)

(Unless otherwise specified, all voltage are with respect to GND, TA=25°C)

Symbol	Parameter	Rating	Unit
V_{KA}	Cathode Voltage(2)	20	V
I_{KA}	Cathode Current Range (Continuous)	-100 to 100	mA
I_{REF}	Reference Input Current Range	10	mA
P_D	Power Dissipation(3)	370	mW
T_J	Junction Temperature	+150	° C
T_{opr}	Operating Temperature	-40 to +125	° C
T_{STG}	Storage Temperature Range	-65 to +150	° 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 my affect device reliability.
(2) All voltage values are with respect to ANODE, unless otherwise noted.
(3) Maximum power dissipation is a function of $T_{J(max)}$, θ_{JA}, and T_A. The maximum allowable power dissipation at any allowable ambient temperature is $P_D = (T_{J(max)} - T_A)/\theta_{JA}$. Operating at the absolute maximum T_J of 150°C can affect reliability.

Recommend Operating Conditions

(Ta=25℃, unless otherwise noted)

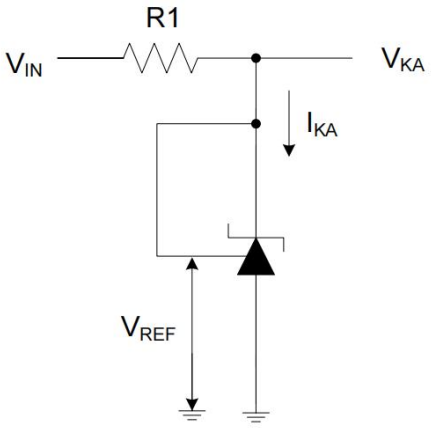
Symbol	Parameter	Min	Max	Unit
V_{KA}	Cathode Voltage	VREF	18	V
I_{KA}	Cathode Current	1.0	100	mA

Electrical Characteristics

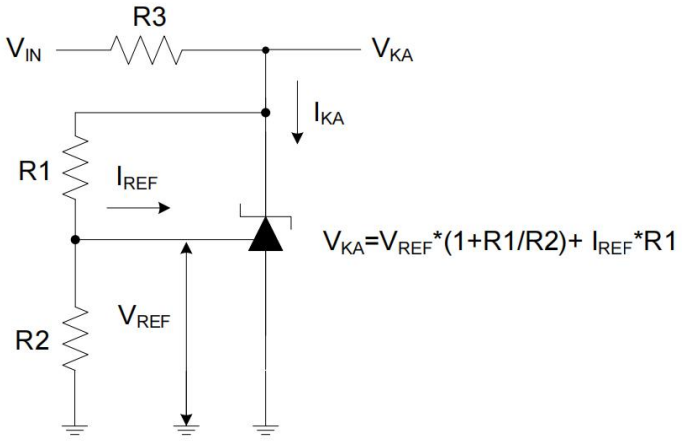
Over recommended operating conditions, TA = 25°C (unless otherwise noted)

Symbol	Parameter	Test Circuit	Conditions		Min	Typ	Max	Unit
V_{REF}	Reference Voltage	4	$V_{KA}=V_{REF}, I_{KA}$ =10mA		1.238	1.25	1.262	V
ΔV_{REF}	Deviation of Reference Voltage Over Full Temperature Range	4	$V_{KA}=V_{REF}, I_{KA}$=10mA TA= -40 to +125°C		–	4	15	mV
$\frac{\Delta V_{REF}}{\Delta V_{KA}}$	Ratio of Change in reference Voltage to the Change in Cathode Voltage	5	I_{KA}=10mA	ΔV_{KA}=18V to V_{REF}	–	-0.5	-1.5	mV/V
I_{REF}	Reference Current	5	I_{KA}=10mA, R1=10K, R2=∞		–	0.15	0.4	μA
ΔI_{REF}	Deviation of Reference Current Over Full Temperature Range	5	I_{KA}=10mA, R1=10K, R2=∞, T_A= -40 to +125°C		–	0.1	0.4	μA
I_{KA} (Min)	Minimum Cathode Current for Regulation	4	$V_{KA} = V_{REF}$		–	55	80	μA
I_{KA} (Off)	Off-state Cathode Current	6	V_{KA} = 18V, V_{REF} = 0		–	0.04	0.1	μA
Z_{KA}	Dynamic Impedance	4	$V_{KA}=V_{REF}, I_{KA}$=1to100mA, f ≤ 1.0KHz		–	0.05	0.15	Ω
θ_{JA}	Thermal Resistance	–	SOT-23		–	337	–	℃/W

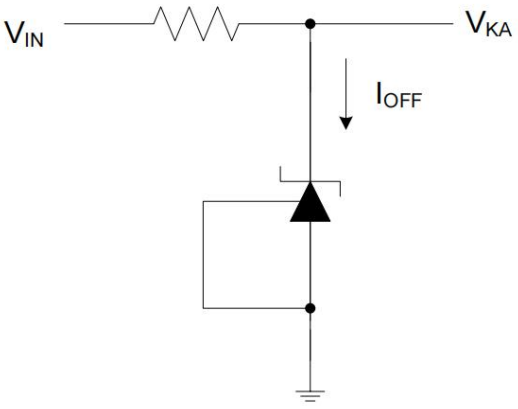
Typical Applications Circuit



Test Circuit 4 for $V_{KA}=V_{REF}$

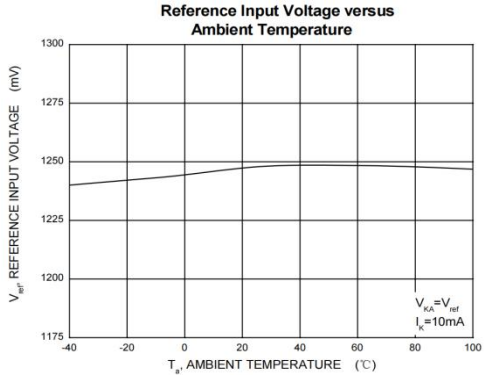


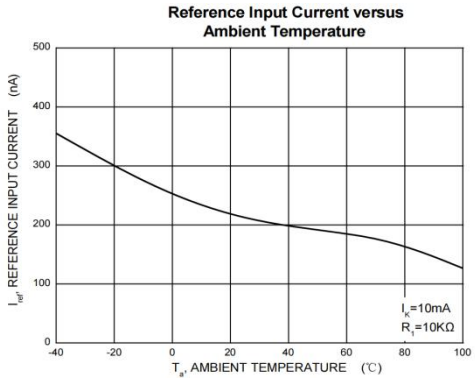
Test Circuit 5 for $V_{KA}>V_{REF}$

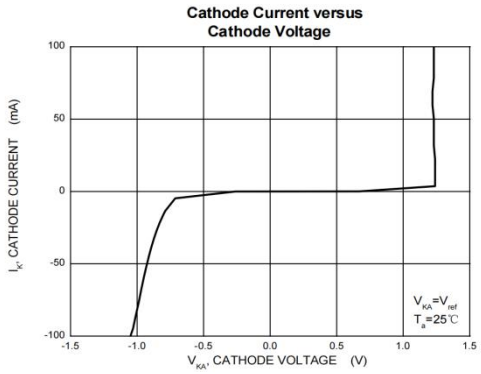


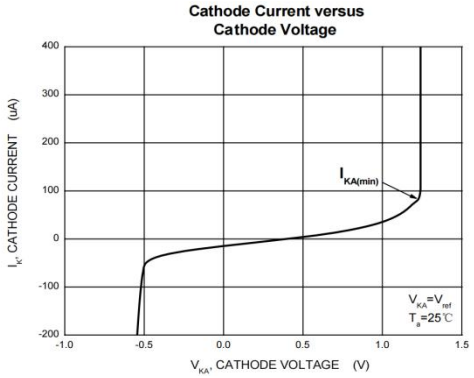
Test Circuit 6 for I_{OFF}

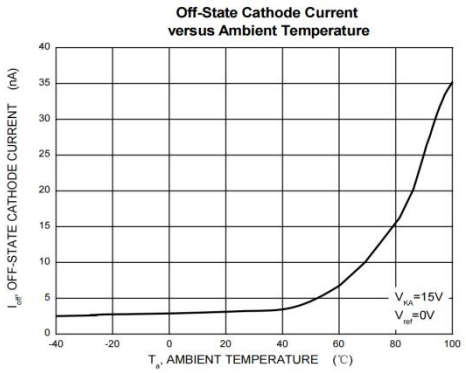
Typical characteristic



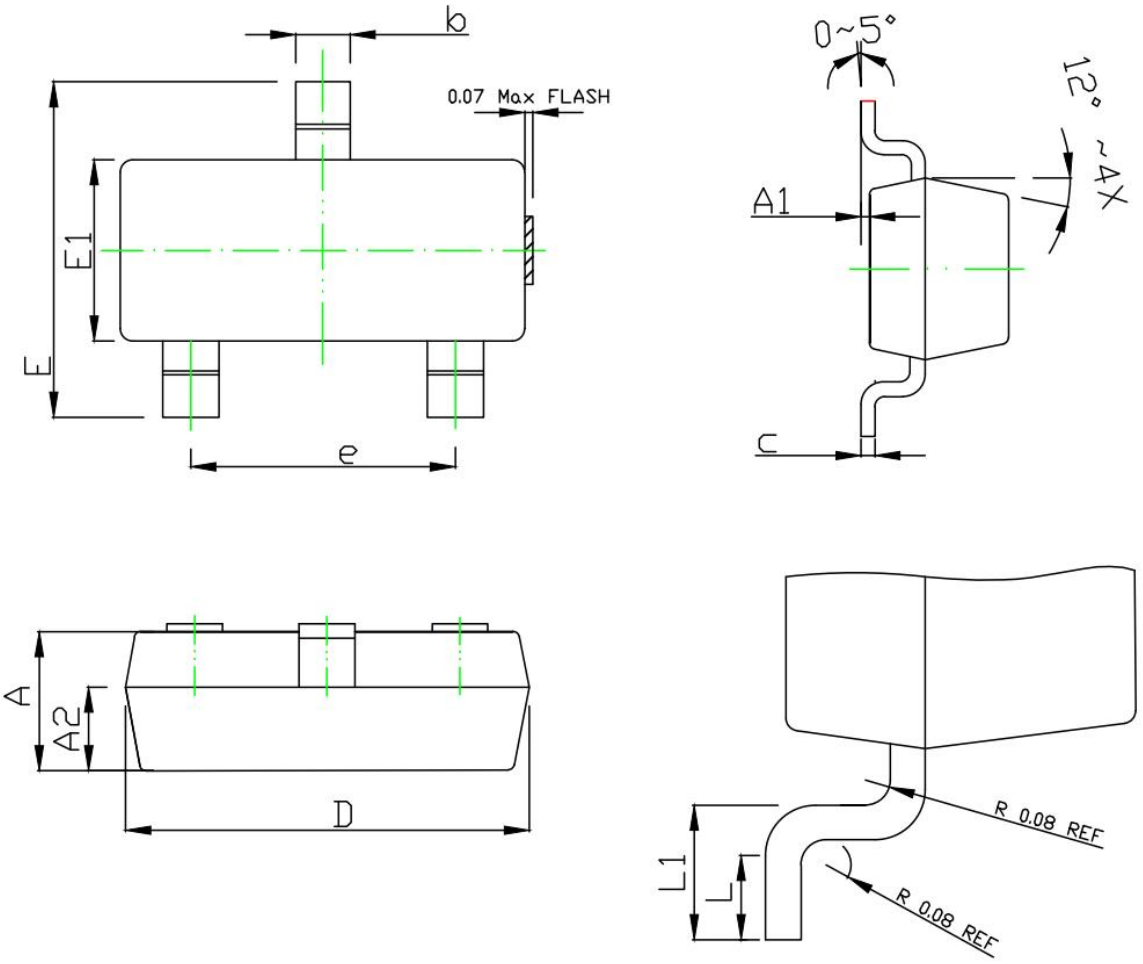






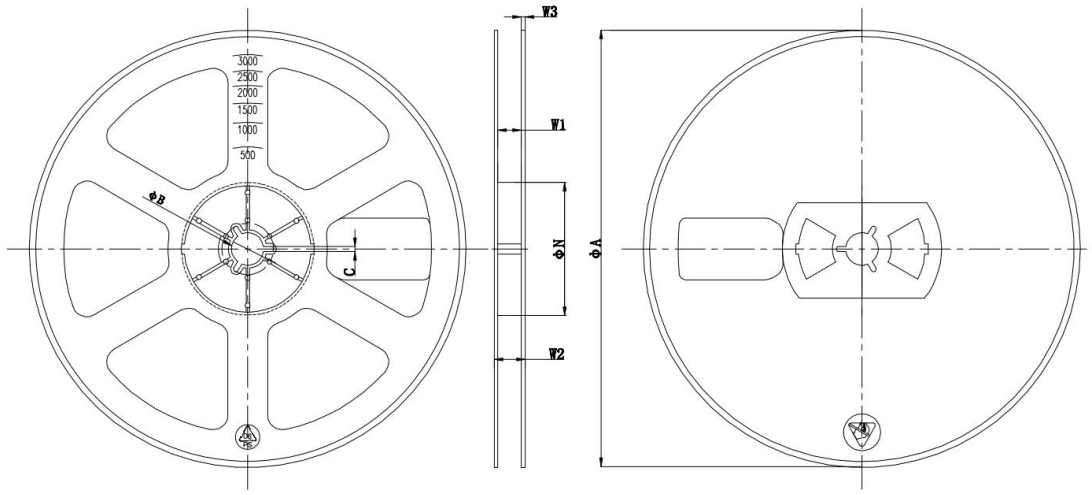


Package Outline

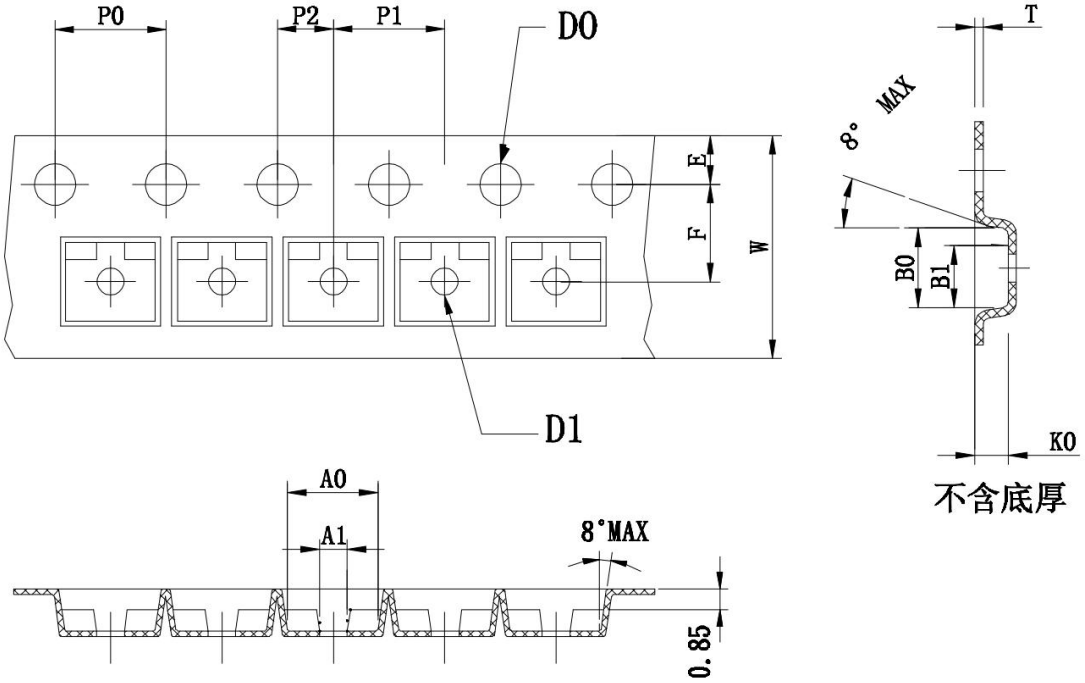


SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.95	1.00	1.05
A1	0.01	0.05	0.10
b	0.35	0.40	0.45
c		0.11 BSC	
D	2.80	2.90	3.00
E	2.30	2.40	2.50
E1	1.20	1.30	1.40
e		1.90 BSC	
L	0.20	-	-
L1	0.30	0.40	0.50
A2		0.60 REF	

Tape and Reel



ΦA	ΦN	ΦB	C	W1	W2	W3
178±2	54±2	13.2±$^{0.3}_{0.2}$	2.2±0.3	9.5±1	13max	1.4±0.4



Symbol	A0	A1	B0	B1	K0	D0	D1	P0
Spec	3.15±0.10	1.15±0.10	2.80±0.10	2.15±0.10	1.30±0.10	1.55±0.10	1.10±0.10	4.00±0.10
Symbol	P1	W	E	P2	T	10*P0	F	
Spec	4.00±0.10	8.00±0.10	1.75±0.10	2.00±0.10	0.21±0.02	40.00±0.10	3.50±0.10	

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