Adjustable Precision Shunt Regulator

Features

- Precise Reference Voltage to 1.240V
- Guaranteed 1% and 1.5% Reference Voltage Tolerance
- Sink Current Capability, 0.1mA to 20mA
- Quick Turn-on
- Adjustable Output Voltage, $V_o = V_{ref}$ to 6V
- Low Operational Cathode Current, 42μA Typical
- 0.1Ω Typical Output Impedance
- TO-92 and SOT-23 Package

Applications

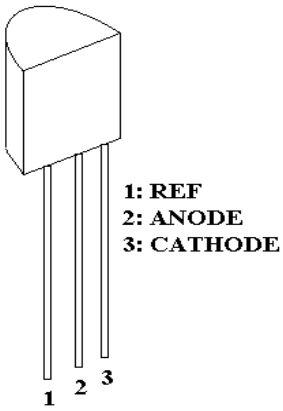
- Linear Regulators
- Adjustable Power Supply
- Switching Power Supply

General Description

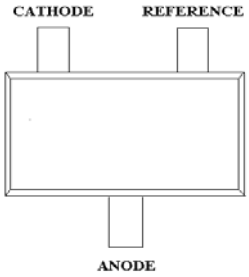
The WSL432 is a 3 terminal adjustable voltage reference with specified thermal stability over applicable commercial temperature ranges. Output voltage may be set to any value between Vref (1.24V) and 6V with two external resistors (see Figure 2).

When used with a photo-coupler, the WSL432 is an ideal voltage reference in isolated feedback circuits for 1.24V to 6V switching-mode power supplies.

This device has a typical output impedance of 0.1Ω. Active output circuitry provides a very sharp turn-on characteristic, making the WSL432 excellent replacements for zener diodes in many applications, including on-board regulation and adjustable power supplies.



TO-92



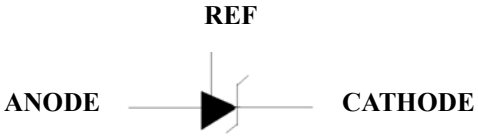
SOT-23 (Top View)

Winson reserves the right to make changes to improve reliability or manufacturability.

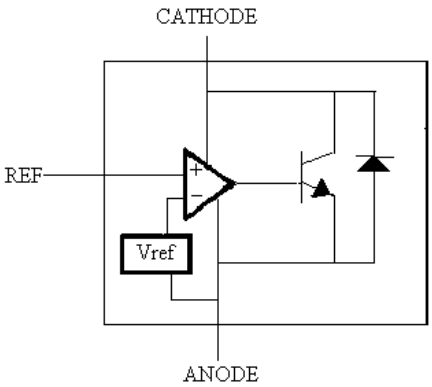
Ordering Information

WSL432-XP□ □ Elect. Grade Package Code	Elect. Grade 3: 1% Reference Voltage Tolerance 5: 1.5% Reference Voltage Tolerance Package Code A: TO-92 C: SOT-23

Symbol



Functional Diagram



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Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
V_{KA}	Cathode voltage	7	V
I_K	Continuous cathode current range	30	mA
Iref	Reference current range	3	mA
T_A	Ambient temperature range	0 to 85	˚C
T_J	Junction temperature range	0 to 125	˚C
T_{STG}	Storage Temperature Range	-65 to 150	˚C
T_{SO}	Lead temperature range, T_s (Soldering, 10sec)	260	˚C

Electrical Characteristics T_A= 25˚C (unless otherwise noted)

Symbol	Parameter	Test Conditions	WSL432			Unit
			Min.	Typ.	Max.	
Vref	V_{KA}=Vref, I_K=10mA.	WSL432 (1%)	1.228	1.24	1.252	V
		WSL432 (1.5%)	1.222	1.24	1.258	V
ΔVref/T	Reference Voltage Drift over Temp. range	T_A=0 to 85°C*1 , I_k =10mA.		4	20	mV
ΔVref /ΔV_{KA}	Voltage Ration (open loop gain)	I_K=10 mA, V_{KA}=Vref to 6V*2		0.8	2.7	mV/V
Iref	Reference Current	I_K=10mA, R_1=10KΩ, R_2=open*2		0.15	0.5	µA
$Iref_{(dev)}$	Iref deviation	I_K=10mA, R_1=10KΩ, R_2=open*2		0.1	0.4	uA
ΔIref/T	Reference Current Drift	I_K=10 mA, R_1=10KΩ, R_2=open, TA=0 to 85°C*2		0.4	1.2	µA
$I_{K(min)}$	Min. Cathode Current	V_{KA}=Vref*1		42	80	uA
$I_{K(off)}$	Off-state Cathode Current	V_{KA}=6V, Vref=0V*3		0.001	0.1	µA
Z_{KA}	Dynamic Impedance	V_{KA}=Vref, IK=0.1 mA to 20mA, f=1k Hz*1		0.1	0.4	Ω

Notes: *1: use Figure 1

*2: use Figure 2

*3: use Figure 3

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Test figures

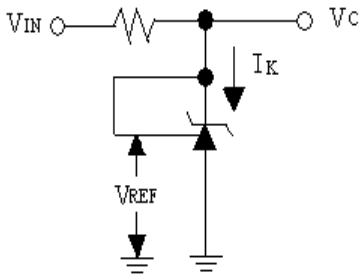


Figure 1. Test Circuit for $V_{KA}=V_{REF}$
$V_O=V_{KA}=V_{REF}$

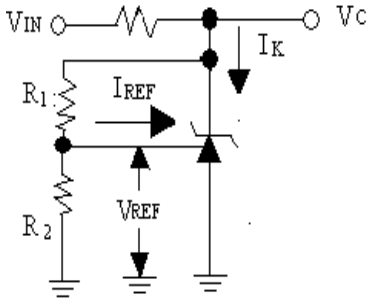


Figure 2. Test Circuit for $V_{KA}<V_{REF}$,
$V_O=V_{KA}=V_{REF}\times(1+R_1/R_2)+I_{REF}\times R_1$

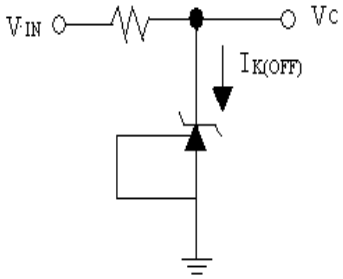
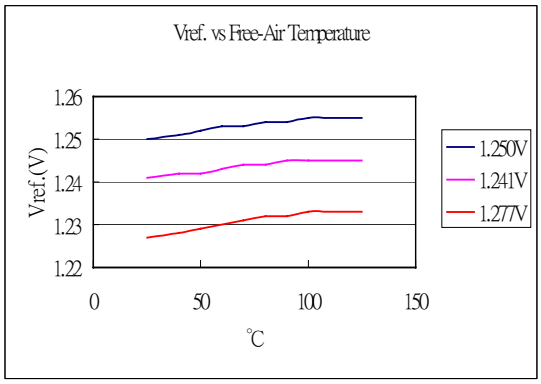
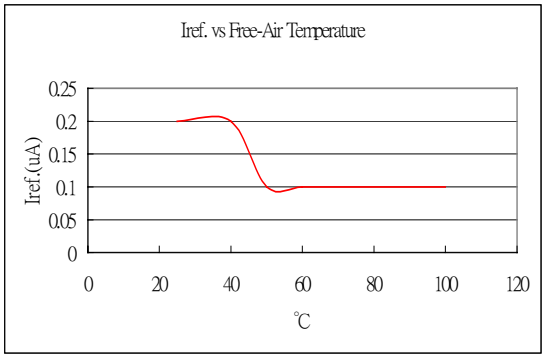
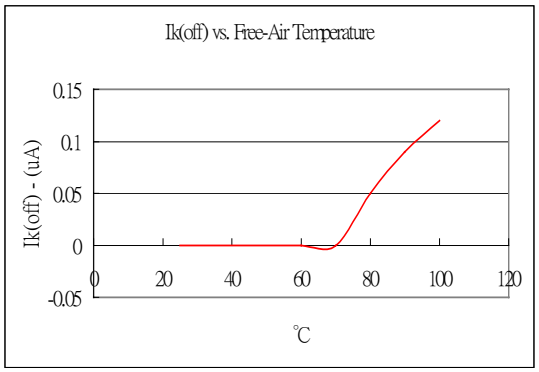


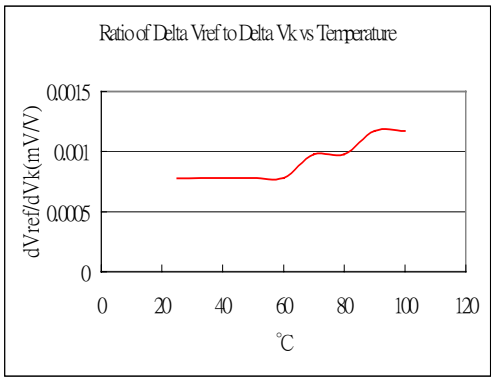
Figure 3. Test Circuit for $I_{k(off)}$

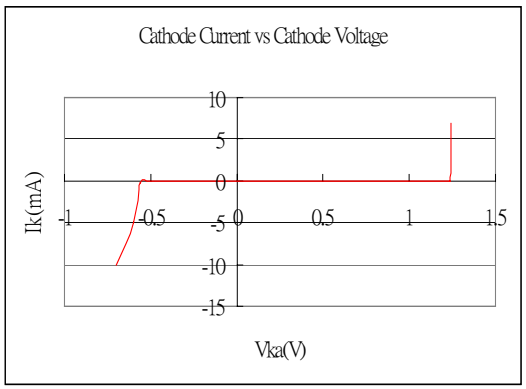
TYPICAL CHARACTERISTICS











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Application schematics

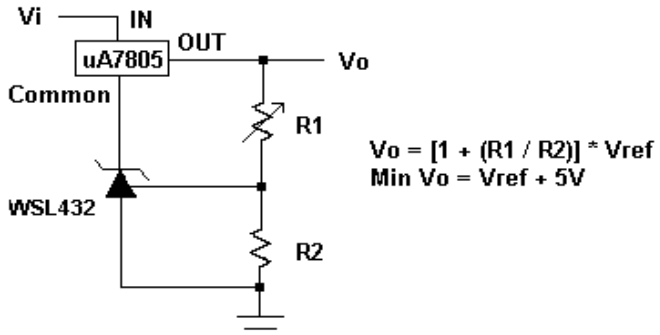

Figure 4.

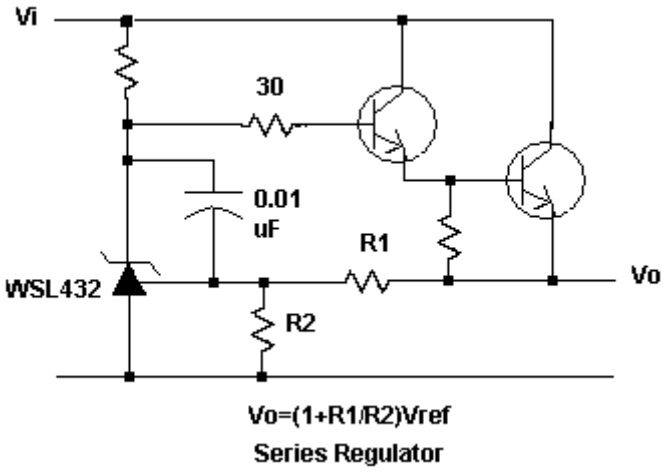

Figure 5.

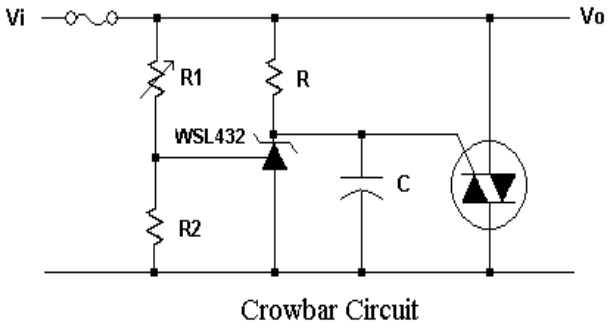

Figure 6.

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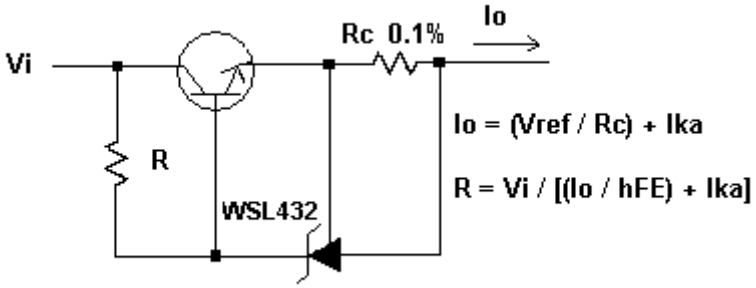
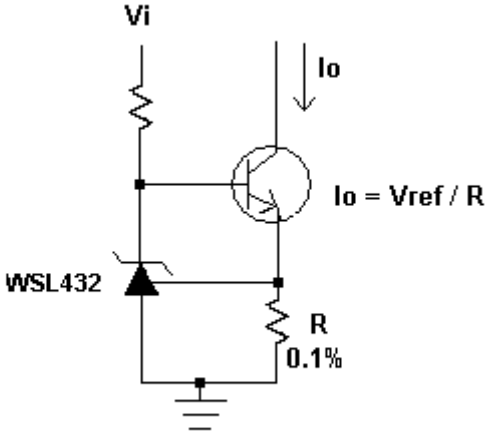


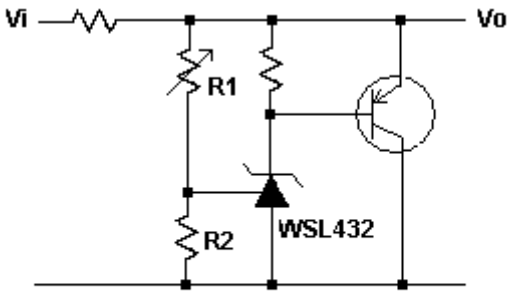
Precision Current Limiter

Figure 7.



Precision Constant-Current Sink

Figure 8.



Vo=(1+R1/R2)Vref

High Current Shunt Regulator

Figure 9.