



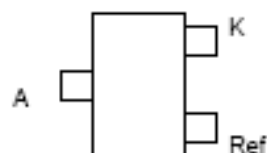
FEATURES

- On-wafer V_{ref} trimming $\pm 0,3\%$
- Adjustable Output Voltage
- Fast Turn-On Response
- Sink Current Capability 1mA to 100mA
- Low Output Noise
- Industrial temperature range

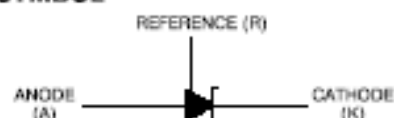
DESCRIPTION

The 431DMK are three-terminal adjustable shunt regulators with a specified thermal stability. The output voltage may be set to any value between V_{ref} (approximately 2.5V) and 36V with two external resistors. The active output circuitry provides a very sharp turn-on characteristic, making these devices an excellent replacement for zener diodes in many applications.

Pin Configuration

(TOP VIEW)
SOT-23

SYMBOL



Absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Parameter	Value	Units
Cathode voltage (see Note 1)	37	V
Continuous cathode current range	-100 to 150	mA
Reference input current range	-50 μ A to 10mA	
Operating free-air temperature range	-40 to 125	$^{\circ}$ C
Lead temperature (1.6mm aside from the case, 10 seconds)	260	

Note 1: The voltage values are with respect to the anode terminal unless otherwise noted.

Recommended operating conditions

Parameter	MIN	MAX	UNIT
Cathode voltage, V_{KA}	V_{ref}	36	V
Cathode current, I_K (for regulation)	1	100	mA

Electrical characteristics at 25 $^{\circ}$ C free-air temperature (unless otherwise noted)

Parameter	Symbol	Test Circuit	Test Conditions	MIN	TYP	MAX	UNIT
Reference voltage accuracy at wafer testing	dVref	1	Wafer testing $V_{KA} = V_{ref}$	-0.3%	0%	0.3%	%
Ref input voltage	V_{ref}	1	$V_{KA} = V_{ref}$, $I_K = 10\text{mA}$	2470	2495	2520	mV
Deviation of Ref input voltage over full temperature range	$V_{ref(dev)}$	1	$V_{KA} = V_{ref}$, $I_K = 10\text{mA}$, $T_A = 0$ to 70 $^{\circ}$ C		8	17	
Ref input voltage-to-Cathode voltage change ratio	$\Delta V_{ref}/\Delta V_{KA}$	2	$I_K = 10\text{mA}$, $\Delta V_{KA} = 10\text{V}$ to V_{ref}	-2,7	-1.0		mV/V
			$\Delta V_{KA} = 36\text{V}$ to 10V	-2	-0.4		
Ref input current	I_{ref}	2	$I_K = 10\text{mA}$, $R_1 = 10\text{k}\Omega$, $R_2 = \infty$		0.5	1.2	μ A
Deviation of Ref input current over full temperature range	$I_{ref(dev)}$	2	$I_K = 10\text{mA}$, $R_1 = 10\text{k}\Omega$, $R_2 = \infty$, $T_A = \text{full range}$		0.4	1.2	
Minimum Cathode current for regulation	I_{min}	1	$V_{KA} = V_{ref}$		0.4	1.0	mA
Off-state Cathode current	I_{off}	3	$V_{KA} = 36\text{V}$, $V_{ref} = 0$		0.1	1	μ A
Dynamic impedance	$ Z_{KA} $	1	$V_{KA} = V_{ref}$, $I_K = 1\text{mA}$ to 100mA, $f \leq 1\text{kHz}$		0.25	0.5	Ω



PARAMETER MEASUREMENT INFORMATION

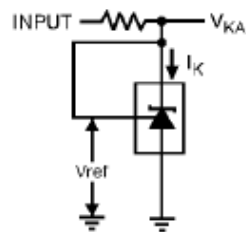


FIGURE 1. TEST CIRCUIT FOR $V_{KA} = V_{ref}$

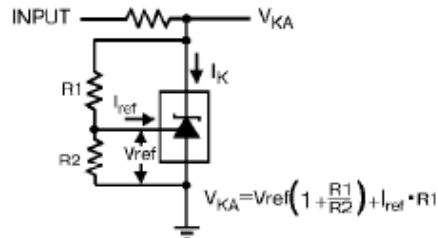


FIGURE 2. TEST CIRCUIT FOR $V_{KA} > V_{ref}$

$$V_{KA} = V_{ref} \left(1 + \frac{R1}{R2} \right) + I_{ref} \cdot R1$$

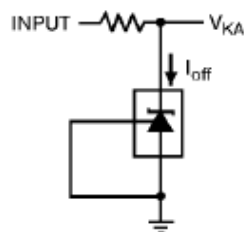


FIGURE 3. TEST CIRCUIT FOR I_{off}

TYPICAL CHARACTERISTICS

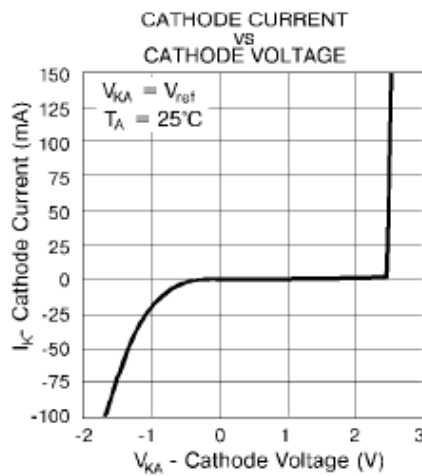


FIGURE 1

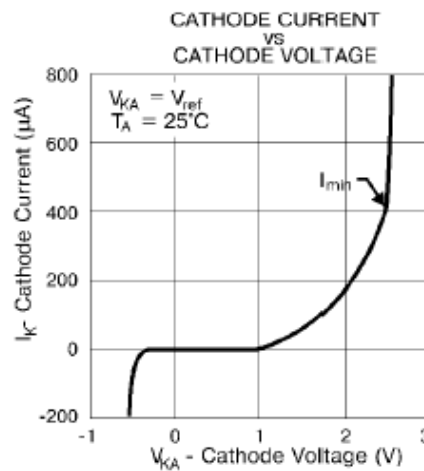


FIGURE 2

TYPICAL APPLICATIONS

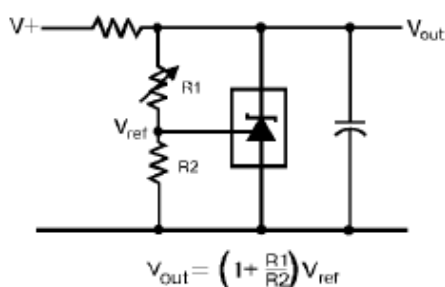


FIGURE 1. SHUNT REGULATOR

$$V_{out} = \left(1 + \frac{R1}{R2} \right) V_{ref}$$

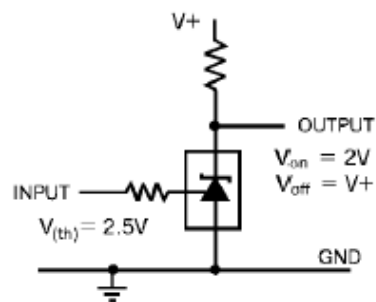


FIGURE 2. SINGLE-SUPPLY COMPARATOR WITH TEMPERATURE-COMPENSATED THRESHOLD

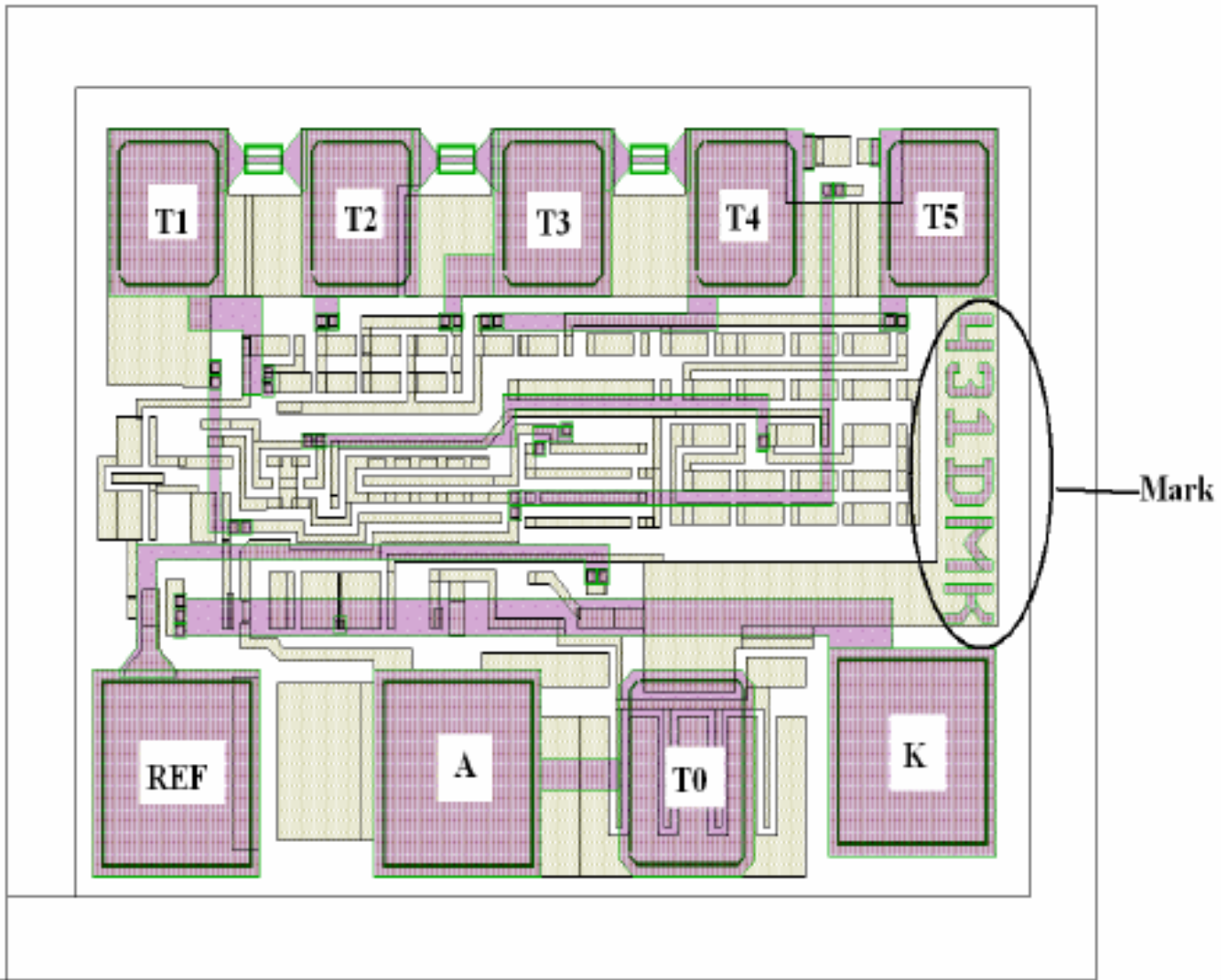
Adjustable Precision Shunt Regulators



VSP MIKRON

431DMK

431DMK PAD LOCATION



Chip size: 0.65 mm x 0.47 mm

Pad name	Pad centre (μm)		Pad size (passivation) (μm)	
	X	Y	X	Y
REF (Reference)	100	100	90	90
A (Anode)	268	100	90	90
K (Cathode)	540	110	90	90
T0	406	100	60	70
T1	94	370	60	70
T2	210	370	60	70
T3	327	370	60	70
T4	440	370	60	70
T5	555	370	60	70

Pads T0 to T5 are used for probe testing only.



431DMK BONDING DIAGRAM

Package SOT-23
(Bottom view)

