Product Clip

Standard Linear and Logic

Precision Shunt Reference Solutions:
LM404x and TL43x/TLV43x/TLVH43x

LM4040, LM4041

The Texas Instruments (TI) LM404x series of shunt voltage references are versatile, easy-to-use references for a vast array of applications, including data-acquisition systems, power supplies and power-supply monitors, instrumentation and test equipment, and battery-powered portable electronics. These shunt voltage references require no external capacitors for operation and are stable with all capacitive loads. Additionally, the reference offers low dynamic impedance, low noise and a low temperature coefficient to ensure a stable output voltage over a wide range of operating current and temperatures.

	Adjustable	1.225V	2.048V	2.5V	3.0V	4.096V	5.0V	8.192V	10V
0.1%	LM4041A	LM4041A12	LM4040A20	LM4040A25	LM4040A30	LM4040A41	LM4040A50	LM4040A82*	LM4040A10*
0.2%	LM4041B	LM4041B12	LM4040B20	LM4040B25	LM4040B30	LM4040B41	LM4040B50	LM4040B82*	LM4040B10*
0.5%	LM4041C	LM4041C12	LM4040C20	LM4040C25	LM4040C30	LM4040C41	LM4040C50	LM4040C82*	LM4040C10*
1.0%	LM4041D	LM4041D12	LM4040D20	LM4040D25	LM4040D30	LM4040D41	LM4040D50	LM4040D82*	LM4040D10*

*Planned release in 2Q06.

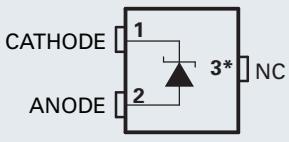
Device	V_{KA} (V)	25°C Accuracy Max (%)	Tempco Typ/Max (ppm/°C)	I_{KA} Range (mA)	Packages
LM4040	2.048 2.5 3.0 4.096 5.0 **8.192*** **10***	A = 0.1 B = 0.2 C = 0.5 D = 1	A, B, C Grades: 15/100 D Grade: 15/150	0.045 (typ) to 15	SOT23-3, SC-70
LM4041	1.225 Adj: 1.225 to 10			0.045 (typ) to 12	

*Planned release in 2Q06.

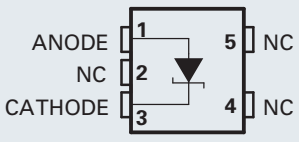
must have

Packages and Pinouts

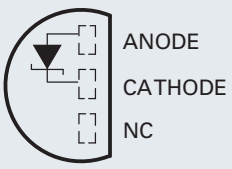
DBZ (SOT-23) PACKAGE (TOP VIEW)



DCK (SC-70) PACKAGE (TOP VIEW)



LP (TO-92/TO-226) PACKAGE (TOP VIEW)

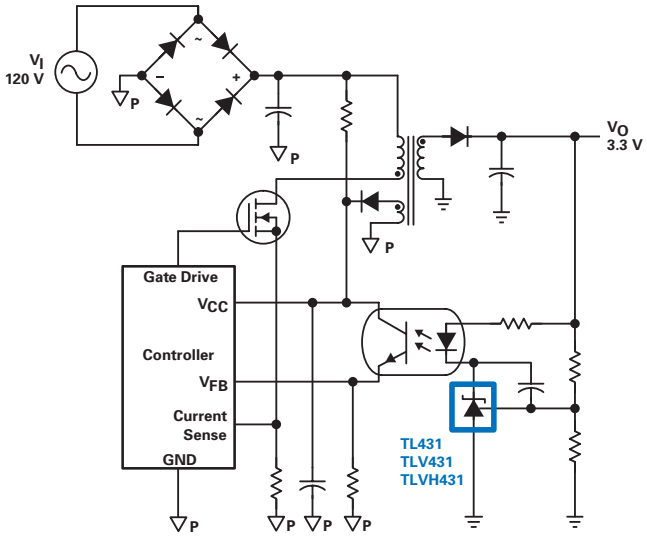


TL431, TL432, TLV431 and TLVH431/432

TI offers the most comprehensive portfolio of 431-type shunt regulators with its TL431/2, TLV431 and TLVH431/2 families. All are adjustable shunt regulators that offer a wide range of cathode voltage (V_{KA} = 1.24V to 36V) and current (I_{KA} = 0.1 mA to 100 mA). With sharp turn-on characteristics, low dynamic impedances to ensure excellent load regulation, and initial accuracies ranging from 0.4% to 2%, these regulators offer specified thermal stability over three separate temperature ranges to suit commercial, industrial and automotive needs. Applications include switching power supplies, linear regulators, references, amplifiers, constant current source/sinks, crowbars, under-/over-voltage protection and voltage monitors.

Device	V_{KA} (V)	V_{KA} 25°C Accuracy Max (%)	Drift Over Temp Typ/Max (mV)	I_{KA} Range (mA)	Packages
TL431, TL432	2.5 to 36	Standard: 2 A:1 B:0.5	6/16 (0 to 70°C) 14/334 (-40 to 85°C) 14/34 (-40 to 125°C)	1 to 100	SOT23-3, SOT23-5, SOT-89, TO-92, SC-70, SOIC, TSSOP, PDIP, SOP
TL431	2.5 to 36	0.4	4/20 (0 to 70°C) 17/55 (-40 to 125°C) 17/55 (-55 to 125°C)	1 to 100	SOIC, SSOP, TO-92, CDIP, LCCC
TLV431	1.24 to 6	Standard: 1.5 A: 1 B: 0.5	4/12 (0 to 70°C) 6/20 (-40 to 85°C) 11/31 (-40 to 125°C)	0.1 to 15	SOT23-3, SOT23-5, TO-92, SOIC, SC-70
TLVH431, TLVH432	1.24 to 18	Standard: 1.5 A: 1 B: 0.5	4/12 (0 to 70°C) 6/20 (-40 to 85°C) 11/31 (-40 to 125°C)	0.1 to 80	SOT23-3, SOT23-5, SOT-89, TO-92, SC-70

Flyback With Isolation Using TLV431 as Voltage Reference and Error Amplifier



Benefits

- Multiple initial tolerances from 0.4% to 2%
- Three temperature ranges: including –40 to 125°C
- Alternate pinouts with TL432 and TLVH432 (for SOT23-3, SOT23-5 and SOT-89 packages) to accomodate different board layouts
  - **TL432:** same as TL431, but has different pinouts for SOT23-3 and SOT23-5
  - **TLVH432:** same as TLVH431, but has different pinouts for SOT23-3 and SOT-89
- SOT-89: best thermal performance
- SC-70: smallest plastic package with ~40% space savings vs. SOT23-3

TEXAS INSTRUMENTS