NXP shunt voltage regulators TL431 & TLVH431 and linear voltage regulator NX1117 portfolio

Standard linear products for voltage regulation in various applications

NXP, your one-stop-shop for high-quality products, supplies an attractive portfolio of standard linear devices, including precision shunt regulators with two different reference voltage levels, and linear voltage regulators with adjustable or fixed output voltages.

Adjustable precision shunt regulators

Key features of TL431 series

- Reference voltage of 2.495 V
- Programmable output voltage up to 36 V
- Three different reference voltage tolerances
- Low typical output impedance of 0.2 Ω
- High sink current capability of 100 mA
- AEC-Q100 qualified (grade 1)
- Small plastic surface-mounted package SOT23

Key features of TLVH431 series

- Low reference voltage of only 1.24 V
- Programmable output voltage down to 1.24 V
- Three different reference voltage tolerances
- Low typical output impedance of 0.2 Ω
- Low minimum cathode current of 80 µA
- AEC-Q100 qualified (grade 1)
- Small plastic surface-mounted package SOT23

Linear voltage regulators

Key features of NX1117 series

- Adjustable version with V_{ref} = 1.25 V
- 9 fixed output voltage versions
- Wide input voltage range up to 20 V
- High maximum output current of 1 A
- 2 output voltage accuracy selections with 1% or 1.25%
- Wide temperature range from -40 to 125 °C
- Output current limiting
- Thermal shutdown
- Safe operation area control
- Medium power plastic package SOT223

SOT23
2.9 x 1.3 x 1.0 mm

SOT223 (SC-73)
6.5 x 3.5 x 1.65 mm

Low-dropout adjustable and fixed linear voltage regulator NX1117

Types in **bold** represent new products

Package				 SOT223 (SC-73)	
Size (mm)				6.5 x 3.5 x 1.65	
P_{tot} (mW)				1700	
V_{max} (V)	I_{max} (A)	V_{out} drop (V) @ 800 mA	V_{out} (V)	V_{out} tolerance	
				1%	1.25%
20	1	1.1	1.25 adjustable	**NX1117CADJZ**	**NX1117CEADJZ**
			1.2	**NX1117C12Z**	**NX1117CE12Z**
			1.5	**NX1117C15Z**	**NX1117CE15Z**
			1.8	**NX1117C18Z**	**NX1117CE18Z**
			1.9	**NX1117C19Z**	**NX1117CE19Z**
			2.0	**NX1117C20Z**	**NX1117CE20Z**
			2.5	**NX1117C25Z**	**NX1117CE25Z**
			2.85	**NX1117C285Z**	**NX1117CE285Z**
			3.3	**NX1117C33Z**	**NX1117CE33Z**
			5.0	**NX1117C50Z**	**NX1117CE50Z**

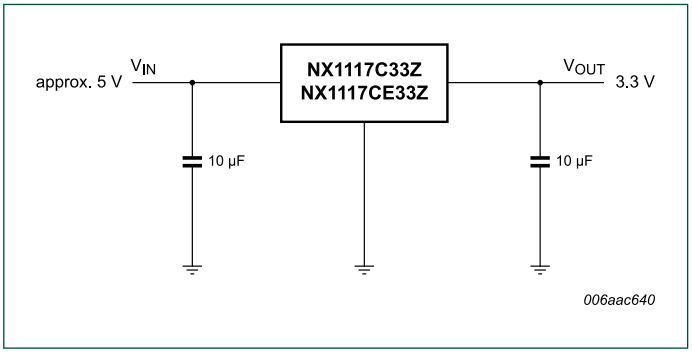
Key applications

- Post regulation for SMPS
- Consumer and industrial equipment point of load
- Battery charger
- Hard drive controllers
- Core voltage supply: FPGA, PLD, DSP, CPU
- LCD TV
- Set top box
- DVD player

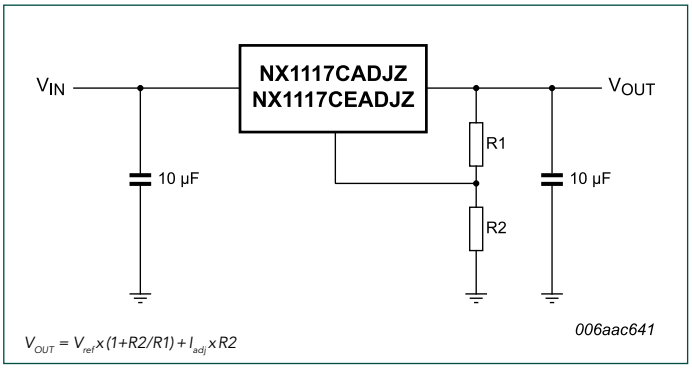
Key benefits

- Wide operation range to 20 V input
- High maximum output current of 1 A
- Excellent load regulation
- Output current limiting
- Thermal shutdown
- Safe operation area control
- Full temperature range from -40 to 125 °C
- Any output voltage in the given range can be set by just two external resistors for the adjustable version
- No minimum load required for fixed output voltage versions

NX1117C33Z and NX1117CE33Z: Typical application for fixed output voltage versions



NX1117CADJZ and NX1117CEADJZ: Typical application for adjustable output voltage versions



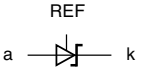
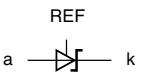
Adjustable shunt voltage regulator TL431 with V_{ref} = 2.495 V

types in **bold** represent new products

Package					 SOT23	
Size (mm)					2.9 x 1.3 x 1.0	
P_{tot} (mW)					580	
Pinning configuration					Normal pinning*	Mirrored pinning*
V_{KA} (V)	I_K (mA)	V_{ref}		T_{amb} (°C)		
36	100	2.495	2%	0 to 70	TL431CDBZR [1]	
				-40 to 85	TL431IDBZR [1]	
				-40 to 125	TL431QDBZR [1]	
					TL431FDT [2]	**TL431MFDT [2]**
					TL431SDT [3]	TL431MSDT [3]
			1%	0 to 70	TL431ACDBZR [1]	
				-40 to 85	TL431AIDBZR [1]	
				-40 to 125	TL431AQDBZR [1]	
					TL431AFDT [2]	**TL431AMFDT [2]**
					TL431ASDT [3]	TL431AMSDT [3]
			0.5%	0 to 70	TL431BCDBZR [1]	
				-40 to 85	TL431BIDBZR [1]	
				-40 to 125	TL431BQDBZR [1]	
					TL431BFDT [2]	**TL431BMFDT [2]**
					TL431BSDT [3]	TL431BMSDT [3]

[1] Offers enhanced stability area and very low load capacity requirement
[2] Offers higher ElectroMagnetic Interference (EMI) ruggedness, e.g. for Switch Mode Power Supply
[3] Is designed for standard requirements and linear applications

* Normal pinning vs. mirrored pinning for TL431

	Pin	Symbol	Description	Simplified outline	Grafic symbol
Normal pinning	1	k	cathode		
	2	REF	reference		
	3	a	anode		
Mirrored pinning	1	REF	reference		
	2	k	cathode		
	3	a	anode		

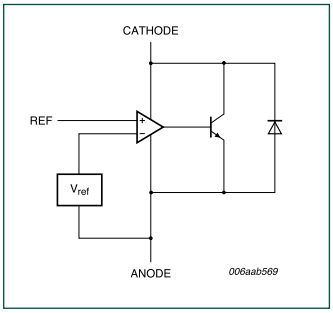
Key applications

- Shunt voltage regulator
- Precision current limiter
- Precision constant current sink
- Isolated feedback loop for Switch Mode Power Supply (SMPS)

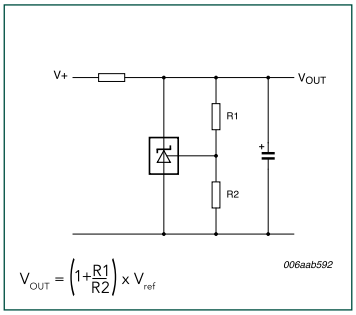
Key benefits

- Simple solution to achive a stabilized voltage
- Any output voltage from 2.5 to 36 V can be set by just two external resistors
- Full temperature range from -40 to 125 °C
- Low temperature drift: typically 6 mV (between 0 and 70 °C)
- Low output noise
- High quality level according AEC-Q100

Functional diagram



Shunt voltage regulator



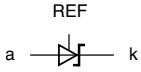
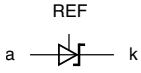
Any voltage in the given range can be set by only 2 external resistors

Adjustable shunt voltage regulator TLVH431 with V_{ref} = 1.24 V

types in **bold** represent new products

Package					 SOT23	
Size (mm)					2.9 x 1.3 x 1.0	
P_{tot} (mW)					580	
Pinning configuration					Normal pinning*	Mirrored pinning*
V_{KA} (V)	I_K (mA)	V_{ref}		T_{amb} (°C)		
20	80	1.24	1.5%	0 to 70	**TLVH431CDBZR**	
				-40 to 85	**TLVH431IDBZR**	
				-40 to 125	**TLVH431QDBZR**	**TLVH431MQDBZR**
			1%	0 to 70	**TLVH431ACDBZR**	
				-40 to 85	**TLVH431AIDBZR**	
				-40 to 125	**TLVH431AQDBZR**	**TLVH431AMQDBZR**
			0.75%	-40 to 125	**TLVH431DQDBZR**	**TLVH431DMQDBZR**

*** Normal pinning vs. mirrored pinning for TLVH431**

	Pin	Symbol	Description	Simplified outline	Grafic symbol
Normal pinning	1	REF	reference		
	2	k	cathode		
	3	a	anode		
Mirrored pinning	1	k	cathode		
	2	REF	reference		
	3	a	anode		

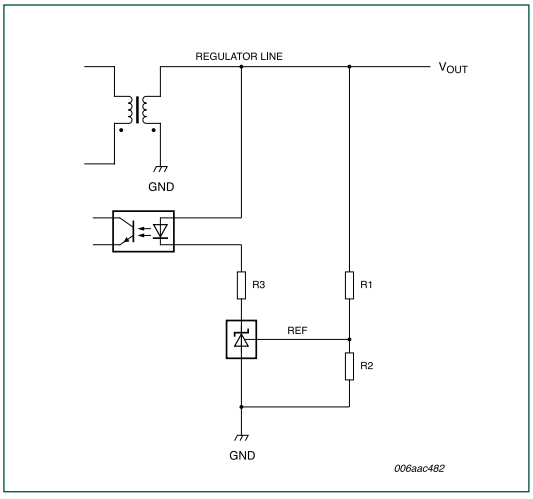
Key applications

- Shunt voltage regulator
- Precision current limiter
- Precision constant current sink
- Isolated feedback loop for Switch Mode Power Supply (SMPS)

Key benefits

- Enabling regulated voltage down to 1.24 V
- Any higher output voltage up to 18 V can be set by just two external resistors
- Supports feedback loop application for 3.3 V SMPS
- Lowest $I_{k(min)}$ value of 55 µA (typical) for improved energy efficiency
- Full temperature range from -40 to 125 °C
- Very low temperature drift: typically 4 mV (between -40 and 125 °C)
- Low output noise
- High quality level according AEC-Q100

Isolated feedback loop for Switch Mode Power Supply (SMPS)



www.nxp.com

© 2011 NXP Semiconductors N.V.
All rights reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent- or other industrial or intellectual property rights.

Date of release: September 2011
Document order number: 9397 750 17148
Printed in the Netherlands

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

NXP:

NX1117C120Z,115