

## PROGRAMMABLE PRECISION REFERENCE

## LTL432XXTLT1G

**Description**

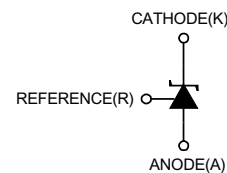
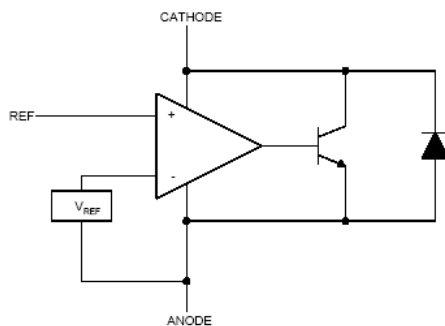
The LTL432XXTLT1G is a three-terminal adjustable regulator with a guaranteed thermal stability over applicable temperature ranges. The output voltage may be set to any value between  $V_{REF}$  (approximately 1.24V/1.25V) and 18V with two external resistors. It provides very wide applications, including shunt regulator, series regulator, switching regulator, voltage reference and others.

**Features:**

- Precise Reference Voltage to 1.24V/1.25V
- Guaranteed 0.5% Reference Voltage Tolerance
- Sink Current Capability, 55 $\mu$ A to 100mA
- Quick Turn-on
- Adjustable Output Voltage,  $V_o = V_{REF}$  to 18V
- 0.05 $\Omega$  Typical Output Impedance
- We declare that the material of product is ROHS compliant and does not contain any Br, Cl, and Sb203
- ESD HBM 7000V



1: Cathode; 2: Ref; 3: Anode



**Absolute Maximum Ratings**

Symbol	Parameter	Rating	Unit
$V_{KA}$	Cathode voltage	20	V
$I_K$	Continuous cathode current range	100	mA
$I_{REF}$	Reference current range	10	mA
$T_j$	Operating Junction Temperature Range	150	°C
$T_{opr}$	Operating Ambient Temperature	- 40 to 125	°C

**Electrical Characteristics**

 (Typical and limits apply for  $T_j=25^\circ\text{C}$  unless otherwise noted.)

Characteristic		Test Circuit	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Reference Voltage	1.24V,0.5%	3	$V_{REF}$	$V_{KA}=V_{REF}, I_{KA}=10\text{mA}$	1.234	1.240	1.246	V
	1.24V,1%				1.228	1.240	1.252	
Reference Voltage	1.25V,0.5%	3	$V_{REF}$	$V_{KA}=V_{REF}, I_{KA}=10\text{mA}$	1.244	1.250	1.256	V
	1.25V,1%				1.238	1.250	1.262	
Deviation of Reference Voltage Over-Temperature		3	$\Delta V_{REF}$	$V_{KA}=V_{REF}$ $I_{KA}=10\text{mA}$	0 to $70^\circ\text{C}$	2	10	mV
					$-20$ to $125^\circ\text{C}$	3	15	
					$-40$ to $125^\circ\text{C}$	8	25	
Ratio of Change in VREF to the Change in Cathode Voltage		4	$\frac{\Delta V_{REF}}{\Delta V_{KA}}$	$\Delta V_{KA}: V_{REF}$ to 16V		-0.5	-1.5	mV/V
Reference Input Current		4	$I_{REF}$	$I_{KA}=10\text{mA}, R_1=10\text{K}\Omega, R_2=\infty$		0.15	0.4	$\mu\text{A}$
Deviation of Reference Current Over Full Temperature Range		4	$\Delta I_{REF}$	$I_{KA}=10\text{mA}, R_1=10\text{K}\Omega, R_2=\infty$ $T_A=-20$ to $85^\circ\text{C}$		0.1	0.4	$\mu\text{A}$
Minimum Cathode Current for Regulation		3	$I_{KA(MIN)}$	$V_{KA}=V_{REF}$		55	80	$\mu\text{A}$
Off-State Cathode Current		5	$I_{KA(OFF)}$	$V_{REF}=0, V_{KA}=18\text{V}$		0.04	0.50	$\mu\text{A}$
				$V_{KA}=6\text{V}, V_{REF}=0$		0.01	0.05	
Dynamic Impedance		3	$Z_{KA}$	$V_{KA}=V_{REF}, I_{KA}=1$ to $100\text{mA}$ $f \leq 1.0\text{kHz}$		0.05	0.15	$\Omega$

**Classification of Vref and package**

Device	Marking	RanK	Vref(V)
LTL432ATLT1G	432	1.0%	1.24
LTL432BTLT1G	8A	0.5%	1.24
LTL432APTLT1G	8B	1.0%	1.25
LTL432BPTLT1G	8C	0.5%	1.25

Package: SOT23

### TEST CIRCUIT

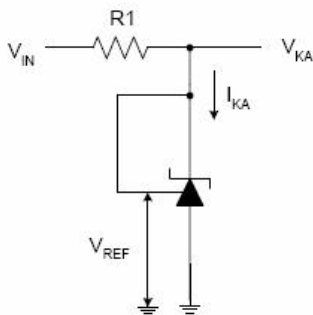


Figure 3 Test Circuit 3 for  $V_{KA}=V_{REF}$

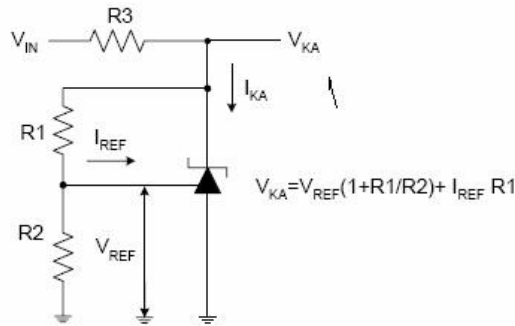


Figure 4. Test Circuit 4 for  $V_{KA}>V_{REF}$

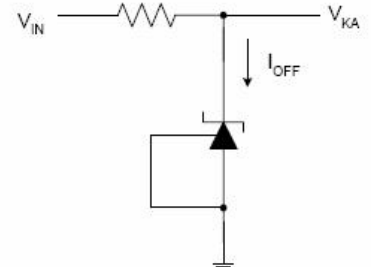


Figure 5. Test Circuit 5 for  $I_{OFF}$

### TYPICAL PERFORMANCE CHARACTERISTICS

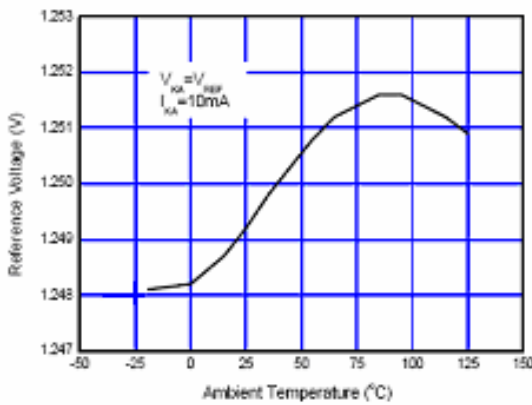


Figure 6. Reference Voltage vs. Ambient Temperature

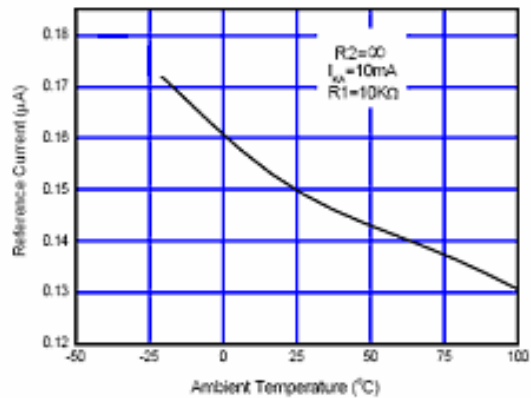


Figure 7. Reference Current vs. Ambient Temperature

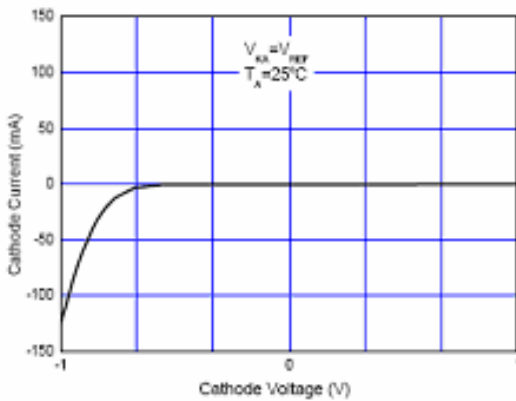


Figure 8. Cathode Current vs. Cathode Voltage

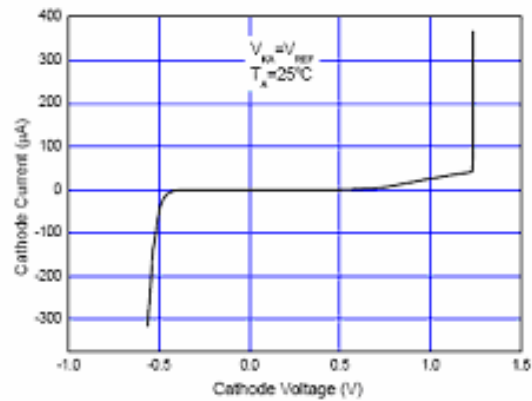


Figure 9. Current vs. cathode Voltage

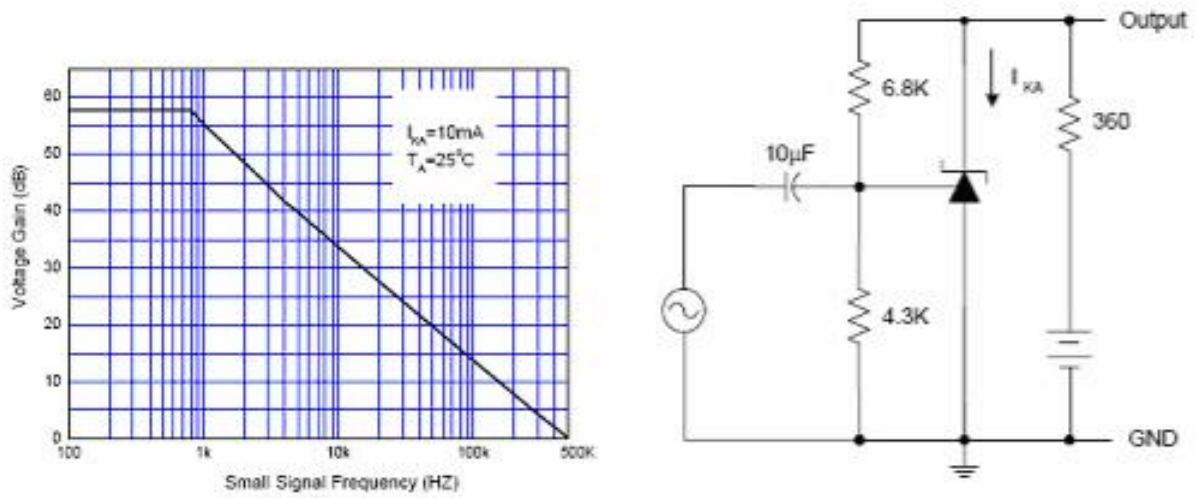


Figure 10. Small Signal Voltage Gain vs. Frequency

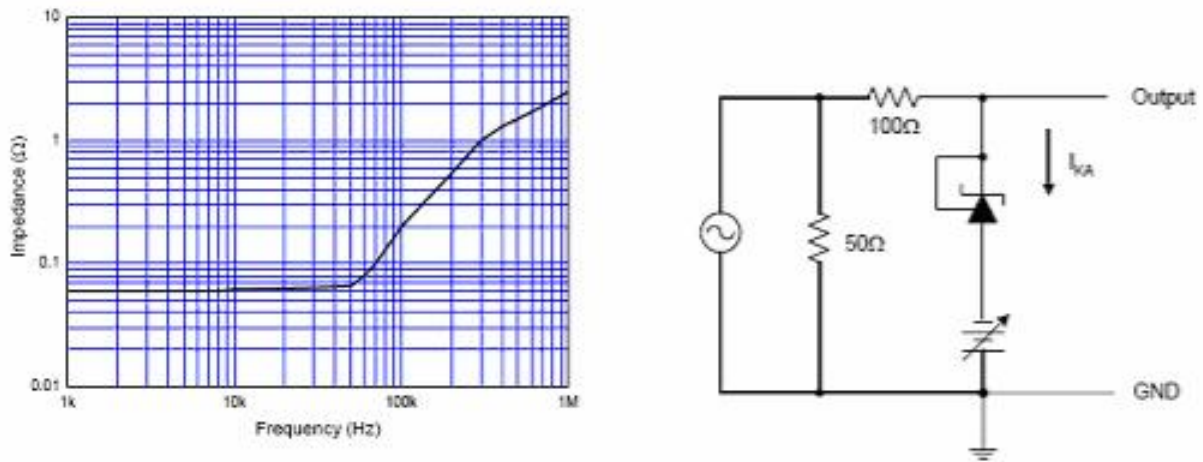


Figure 11. Dynamic Impedance vs. Frequency

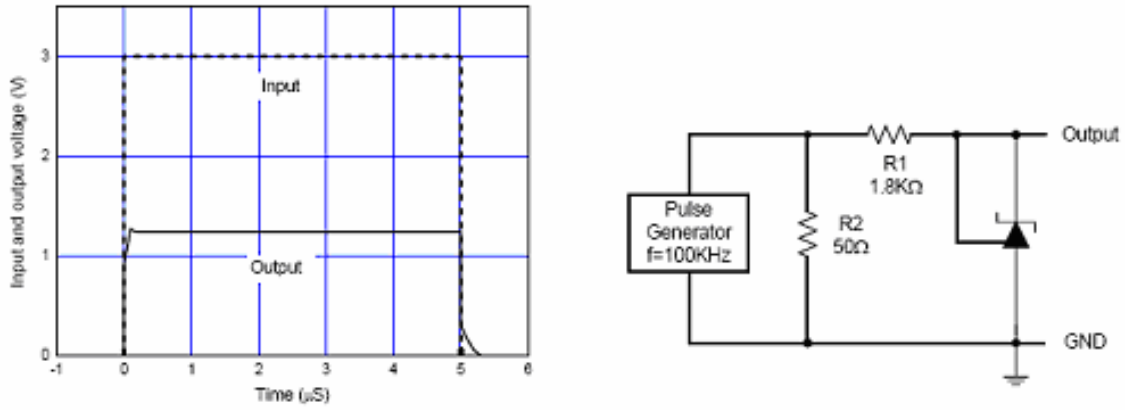


Figure 12. Pulse Response of Input and Output Voltage

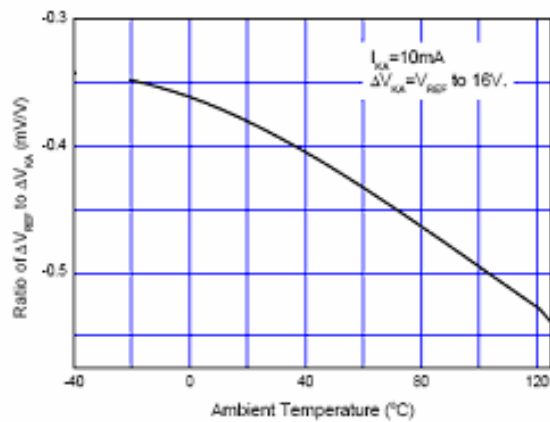


Figure 13. Ratio of Delta Reference Voltage to the Ratio of Delta Cathode Voltage vs. Ambient Temperature

TYPICAL APPLICATIONS

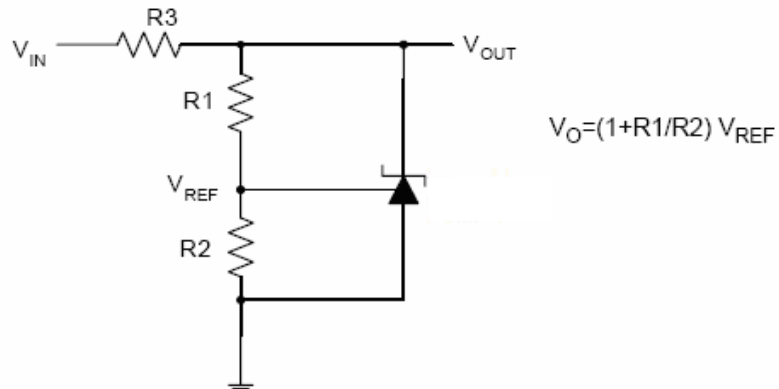


Figure 14: Shunt Regulator

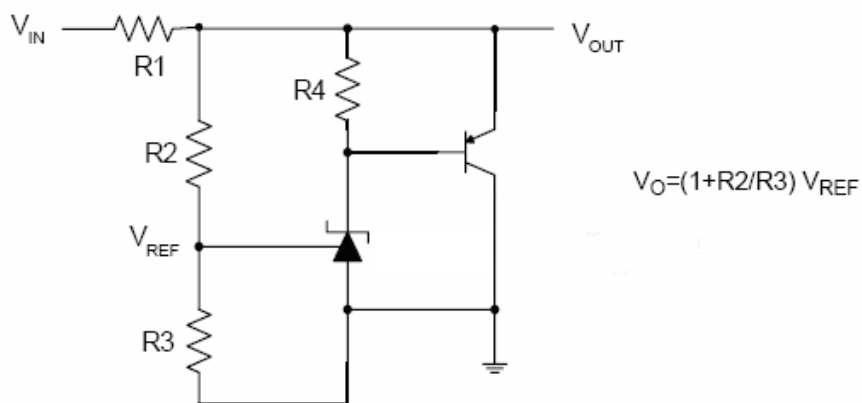


Figure 15: High Current Shunt Regulator

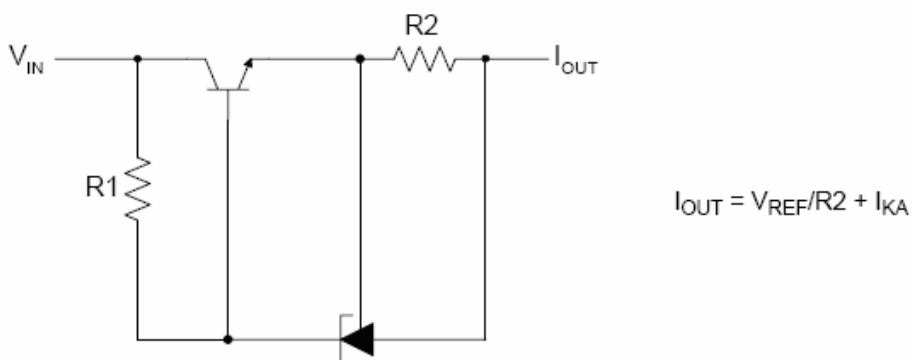


Figure 16: Current Source or Current Limit

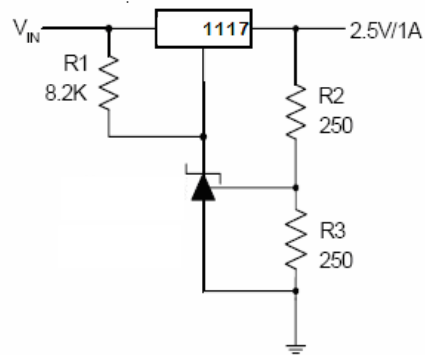


Figure 17 Precision 2.5V/1A Regulator

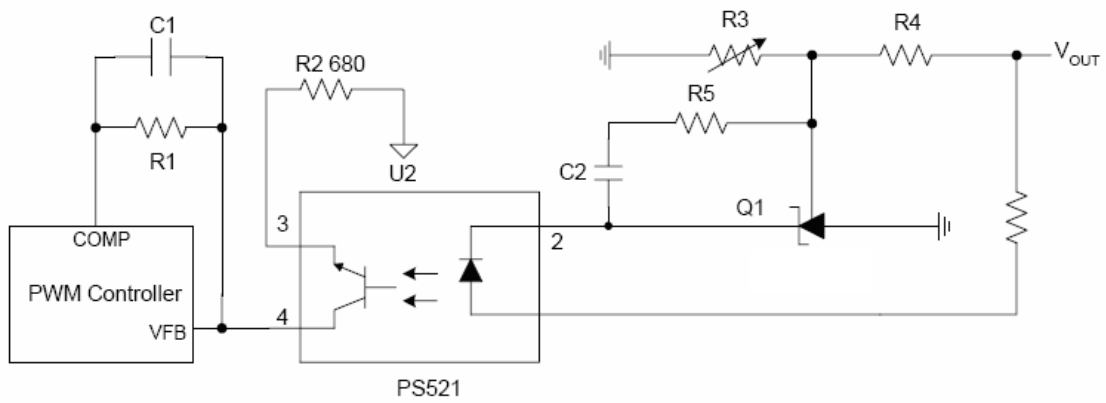
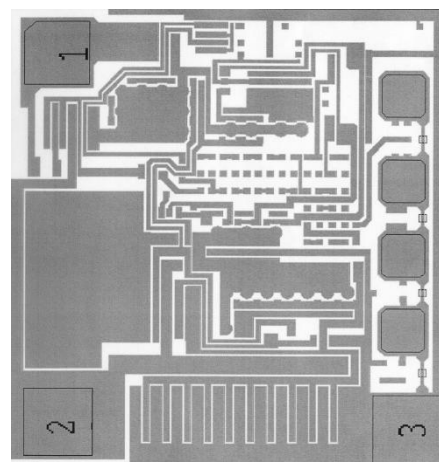
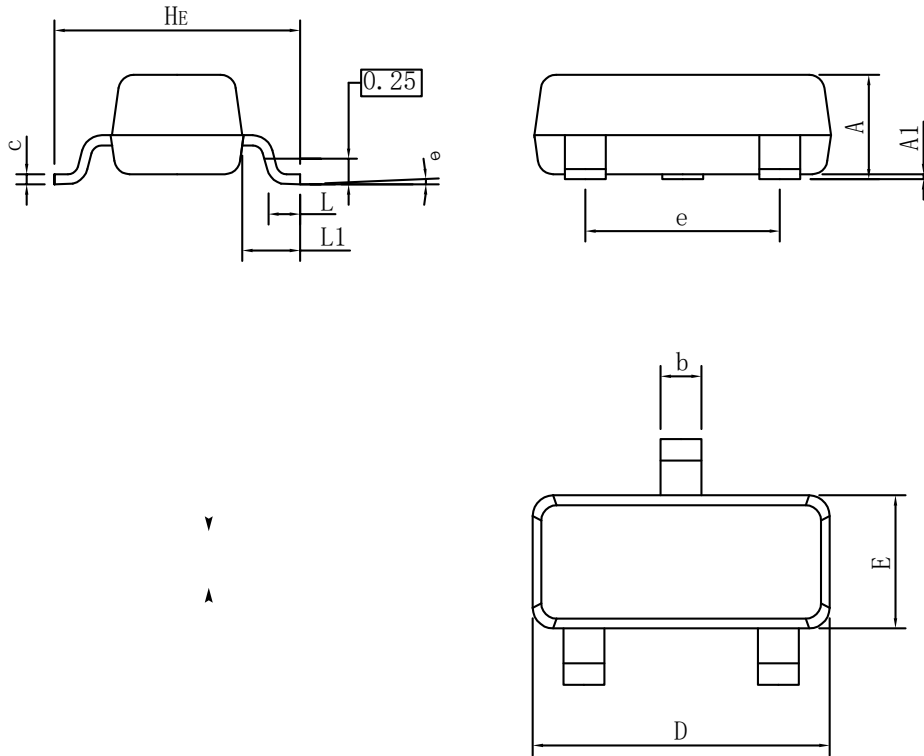


Figure 18: PWM Converter with Reference


 Chip Size(before saw) : 0.72 \* 0.68 (mm)<sup>2</sup>

**SOT-23 PACKAGE OUTLINE DIMENSIONS**


SOT23			
DIM	MIN	NOR	MAX
A	0.90	1.00	1.10
A1	0.01	0.06	0.10
b	0.30	0.40	0.50
c	0.10	0.17	0.20
D	2.80	2.90	3.00
E	1.20	1.30	1.40
e	1.80	1.90	2.00
L	0.20	0.40	0.60
L1	0.60REF		
HE	2.20	2.40	2.60
θ	0°	-	10°
All Dimensions in mm			

**GENERAL NOTES**

1. Top package surface finish Ra0.4±0.2um
2. Bottom package surface finish Ra0.7±0.2um
3. Side package surface finish Ra0.4±0.2um



## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [Voltage References](#) category:*

*Click to view products by [Leshan](#) manufacturer:*

Other Similar products are found below :

[5962-8686103XC](#) [LT1460GIZ-5PBF](#) [LT1009IZPBF](#) [NCV431BVDMR2G](#) [REF01J/883](#) [SC431ILPRAG](#) [AP432AQG-7](#) [LM4040B25QFTA](#)  
[TL431BL3T](#) [BR431M](#) [MC1403BM/TR](#) [HT431BRZ](#) [ME4315AM6G-2](#) [ME4315AM6G-1](#) [TL431A-YK](#) [TL431](#) [TL431-1](#) [TL431](#) [TL431S](#)  
[TL431](#) [XC6206P332MR](#) [HT431CRZ](#) [LM285M-1.2/TR](#) [S-LR431AKLT1G](#) [LR431AKLT1G](#) [TL431ACZ](#) [ME431ATBG](#) [LM385Z-2.5](#)  
[LTL432ATLT1G](#) [LM336Z-2.5](#) [TL431](#) [TP431CS3-1](#) [CBM809MST3](#) [LTL431APTSLT1G](#) [TP431CS3](#) [TL432](#) [TPR3530-S3TR](#) [GN431G](#)  
[0.3%](#) [TL431ACZ](#) [KA431SLMF2TF](#) [KA431SMF2TF](#) [KA431SMFTF](#) [LM4040QCEM3-3.0/NOPB](#) [LM4041C12ILPR](#) [LM4050AIM3X-](#)  
[5.0/NOPB](#) [LM4120AIM5-2.5/NOP](#) [LM431SCCMFX](#) [ZXRE250BSA-7](#) [ZXRE125DN8TA](#) [TS3330AQPR](#)