

### NH431AK,BK



Three-terminal precision voltage regulator

<b>VOLTAGE:</b> 36 Volts	<b>CURRENT:</b> 150 mA	<b>SOT-23</b>	<b>Marking and Polarity</b>
--------------------------	------------------------	---------------	-----------------------------

**FEATURES**

- Programmable output Voltage to 36V.
- Sink current capability of 1 to 100mA.
- ESD:HBM 4000V

**DESCRIPTION**

The NH431 series is a Three-terminal precision voltage regulator with a guaranteed thermal stability over applicable temperature ranges. The output voltage may be set to any value between  $V_{ref}$ (app. 2.5V) and 36v with two external resistors. It provides very wide applications, including shunt regulator, series regulator, switching regulator, voltage reference and others.

**DEVICE MARKING**

Device	RanK	Marking
NH431AK	±0.5%	RAS
NH432BK	±1%	RBS

**Absolute Maximum Ratings (Ratings at 25°C ambient temperature unless otherwise specified.)**

Parameter	Symbol	Value	Unit
Cathode Voltage	$V_{KA}$	36	V
Cathode Current(Continuous)	$I_{KA}$	-100~+150	mAdc
Reference Input Current Range	$I_{REF}$	-0.05~+10	mAdc

**Recommended Operating Conditions**

Parameter	Symbol	NH431AK,BK			Unit
		Min.	Typ.	Max.	
Cathode Voltage	$V_{KA}$	2.5	-	36	V
Cathode Current	$I_{KA}$	0.5	-	100	mAdc

**Thermal Characteristics**

Parameter	Symbol	NH431AK,BK	Unit
Thermal Resistance,Junction to Ambient	$R_{\theta JA}$	206	°C/W
Operating Ambient Temperature	$T_{OPR}$	-40 to +125	°C
Junction Temperature	$T_j$	150	
Storage Temperature	$T_{Stg}$	-65 to +150	



**NH431AK,BK**

Three-terminal precision voltage regulator



**ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)**

Characteristic	Test Condition	Symbol	Min.	Typ.	Max.	Unit
Reference Input Voltage	Vka=Vref, IKA=10mA	$V_{REF}$	2.488	2.5	2.512	Vdc
			2.475	2.5	2.525	
Deviation of reference Input Voltage Over Temperature	Vka=Vref, IKA=10mA, . $\cong Ta \cong Tmax.$	$\Delta V_{REF}$	-	4.5	25	mV
Ratio of Change in Reference Input Voltage to the Change in Cathode Voltage	IKA=10mA, $\Delta VKA=10V-VREF$ IKA=10mA, $\Delta VKA=36V-10V$	$\frac{\Delta V_{REF}}{\Delta V_{KA}}$	-	-1	-2.7	mV/V
			-	-0.5	-2.0	
Reference Input Current	IKA=10mA, R1=10K $\Omega$ , R2= $\infty$	$I_{REF}$	-	1	2	$\mu A_{dc}$
Deviation of reference Input Current Over Full Temperature Range	IKA=10mA, R1=10K $\Omega$ , R2= $\infty$	$\Delta I_{REF} / \Delta T$	-	0.2	0.4	
Min. Cathode Current for regulation	VKA=Vref	$I_{KA} (min.)$	-	0.3	0.5	mA
Off-state Cathode Current	VKA=36V, Vref=0V	$I_{KA} (OFF)$		0.05	0.5	$\mu A$
Dynamic Impedance	VKA=Vref, IKA=1~100mA, f $\cong$ 1KHz	$Z_{KA}$		0.15	0.5	$\Omega$

NH431AK,BK

Three-terminal precision voltage regulator



RATING AND CHARACTERISTIC CURVES

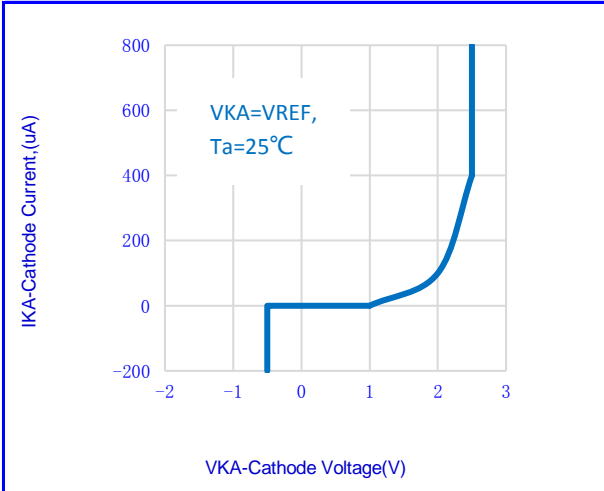


Fig.1-Cathode Current Vs Cathode Voltage

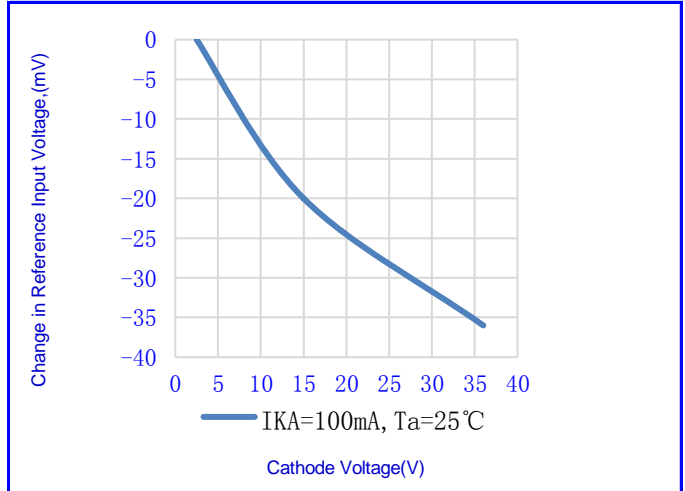


Fig.2-CHANGE IN REFERENCE INPUT VOLTAGE VS CATHODE VOLTAGE

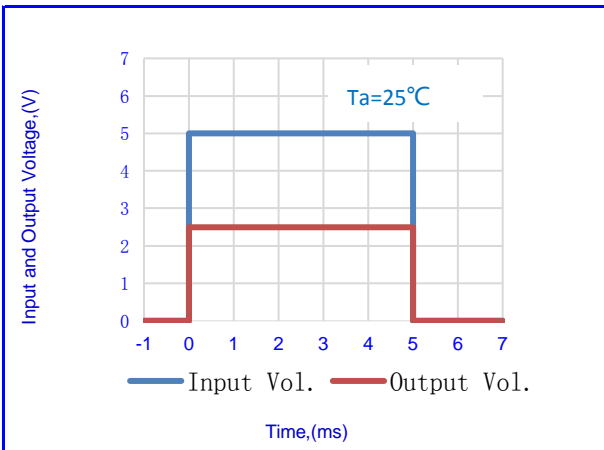


Fig.3- PULSE RESPONSE

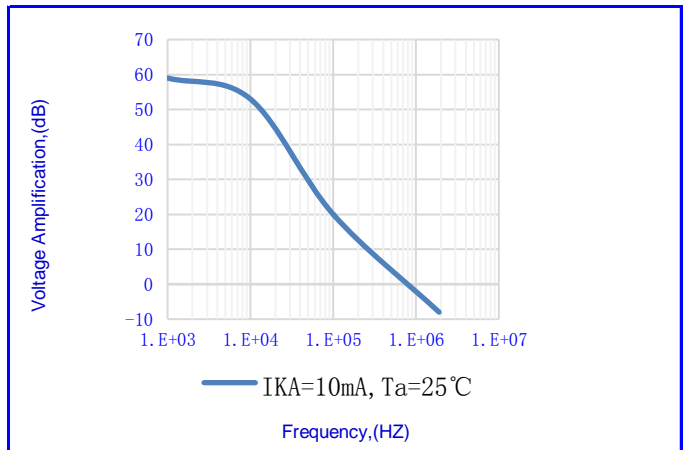


Fig.4- SMALL SIGNAL VOLTAGE AMPLIFICATION VS FREQUENCY

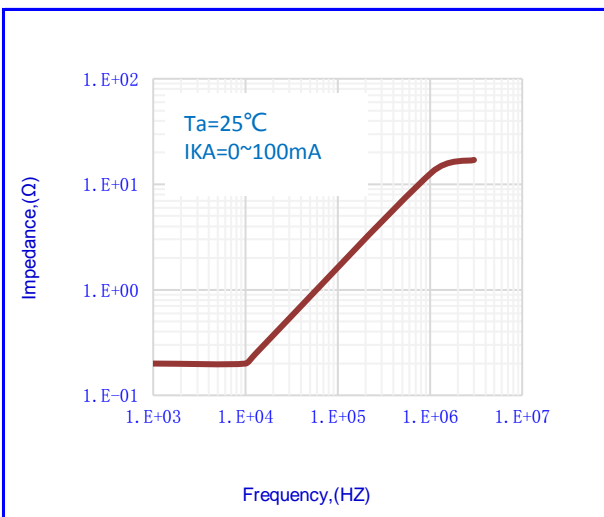


Fig.5--DYNAMIC IMPEDANCE VS FREQUENCY

NH431AK,BK

Three-terminal precision voltage regulator



TEST CIRCUIT

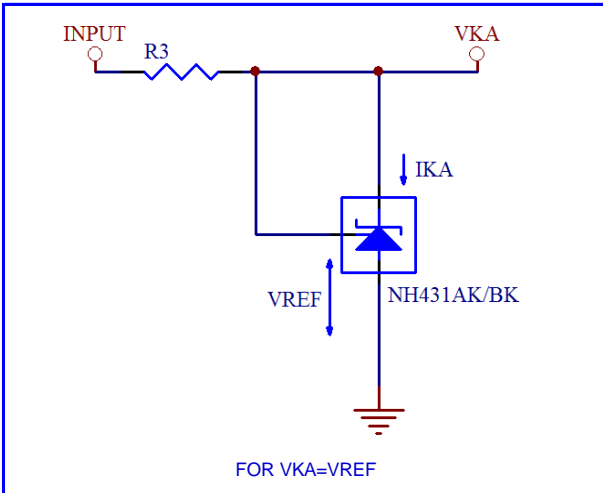


Fig.7-TEST CIRCUIT

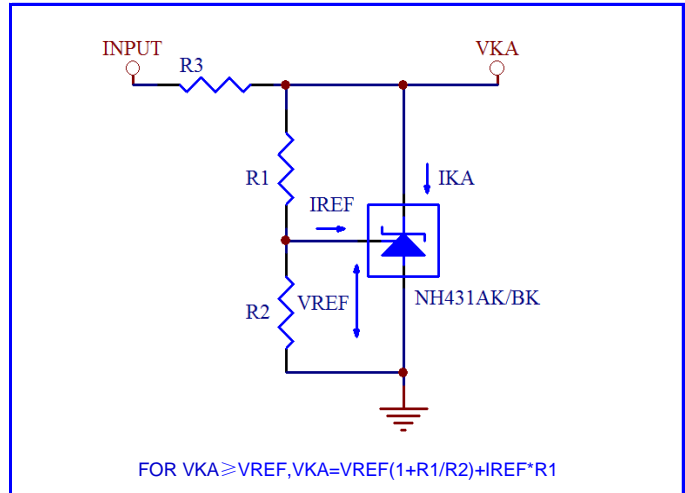


Fig.8-TEST CIRCUIT

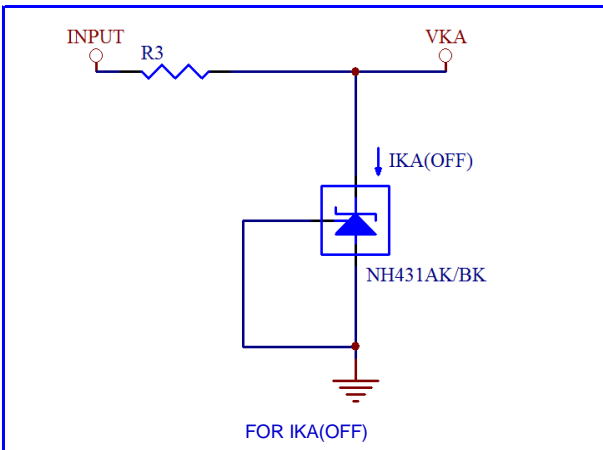


Fig.9-TEST CIRCUIT

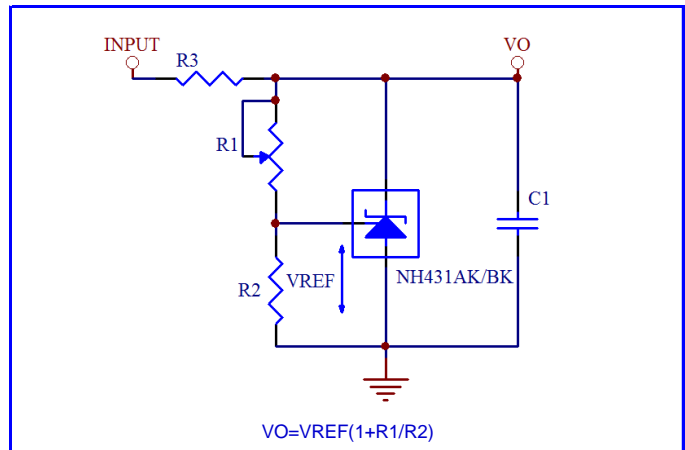


Fig.10- APPLICATION CIRCUIT, SHORTDOWN REGULATOR

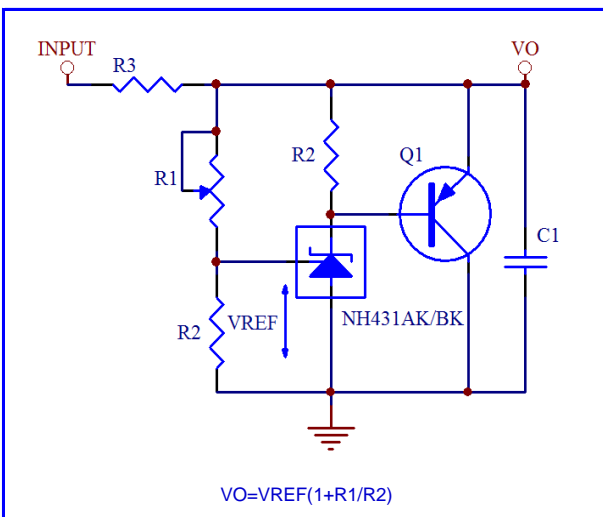


Fig.11- APPLICATION CIRCUIT, HIGH-CURRENT SHORTDOWN REGULATOR

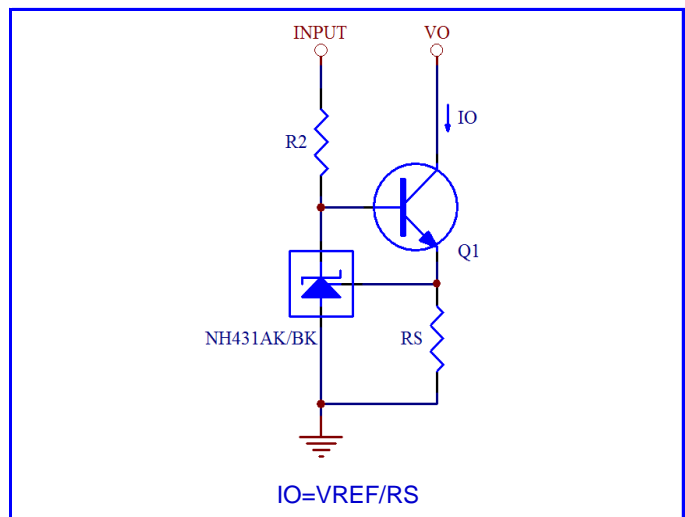


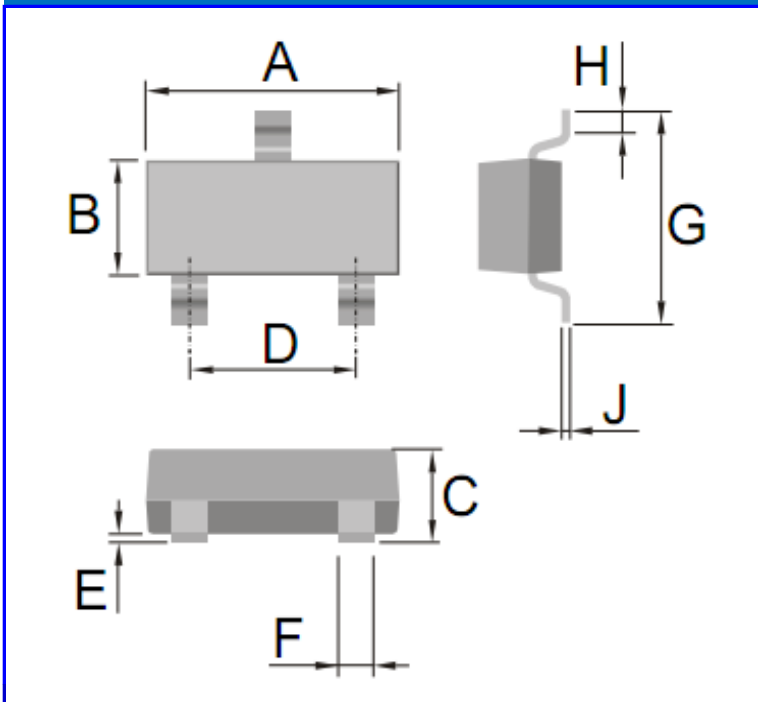
Fig.12- APPLICATION CIRCUIT, CONSTANT-CURRENT SINK

NH431AK,BK

Three-terminal precision voltage regulator

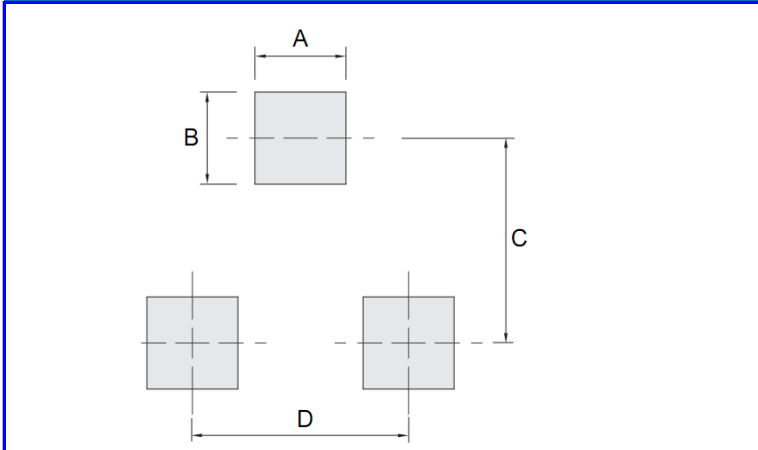


**OUTLINE DRAWINGS** **SOT-23**



OUTLINE DIMENSIONS						
Dim.	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.800	-	3.020	0.1102	-	0.1189
B	1.200	-	1.400	0.0472	-	0.0551
C	0.890	-	1.110	0.0350	-	0.0437
D	1.780	-	2.040	0.0701	-	0.0803
E	0.000	-	0.100	0.0000	-	0.0039
F	0.300	-	0.500	0.0118	-	0.0197
G	2.100	-	2.640	0.0827	-	0.1039
H	0.300	-	0.600	0.0118	-	0.0236
J	0.100	-	0.200	0.0039	-	0.0079

**RECOMMENDED LAYOUT DRAWINGS** **SOT-23**



RECOMMENDED MOUNTING PAD DIMENSIONS						
Dim.	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	-	0.600	-	-	0.0236	-
B	-	0.800	-	-	0.0315	-
C	-	2.000	-	-	0.0787	-
D	-	1.900	-	-	0.0748	-

**PACKING INFORMATION** **SOT-23**

Package Method	Reel Size (mm)	Quantity (pcs/reel)	Inner Box Size LxWxH(mm)	Quantity (pcs/Inner Box)	Carton Size LxWxH(mm)	Quantity (pcs/carton)
Tape Reel	Φ180	3000	201x190x70	15000	455x455x240	180000

**NH431AK,BK**

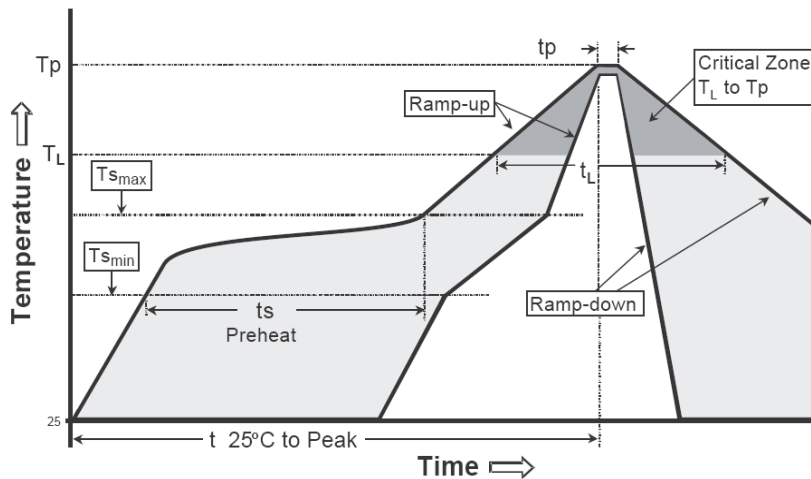
Three-terminal precision voltage regulator



**Recommended wave soldering condition**

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

**Recommended temperature profile for IR reflow**



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmmax to Tp)	3°C/second max.	3°C/second max.
Preheat -Temperature Min(TS min) -Temperature Max(TS max) -Time(ts min to ts max)	100°C 150°C 60-120 seconds	150°C 200°C 60-180 seconds
Time maintained above: -Temperature (TL) - Time (tL)	183°C 60-150 seconds	217°C 60-150 seconds
Peak Temperature(TP)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.

**NH431AK,BK**

Three-terminal precision voltage regulator



**Disclaimer**

- Reproducing and modifying information of the document is prohibited without permission from niuhang electronics co., LTD.
- Niuhan Electronics co., LTD. reserves the rights to make changes of the content herein the document anytime without notification.
- Niuhan Electronics co., LTD. disclaims any and all liability arising out of the application or use of any product including damages incidentally and consequentially occurred.
- Niuhan Electronics co., LTD. does not assume any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.
- Applications shown on the herein document are examples of standard use and operation. Customers are responsible in comprehending the suitable use in particular applications. Niuhan Electronics co., LTD. makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.
- The products shown herein are not designed and authorized for equipments requiring high level of reliability or relating to human life and for any applications concerning life-saving or life-sustaining, such as medical instruments, transportation equipment, aerospace machinery et cetera. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Niuhan Electronics co., LTD. for any damages resulting from such improper use or sale.
- When the appearance of the product and chip size does not change, in order to product the customer. quality, change the internal structure and the production process niuhang can not notify

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

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

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

Other Similar products are found below :

[5962-8686103XC](#) [LT1021DCS8-5PBF](#) [LT1236AIS8-10PBF](#) [LTC6655CHMS8-2.048PBF](#) [MSB-T](#) [REF01J/883](#) [LM4040B25QFTA](#)  
[NJM2823F-TE1](#) [EL5226IR](#) [EL5326IR](#) [EL5326IRZ](#) [ISL21007DFB825Z](#) [ISL21009BFB812Z](#) [ISL21009CFB812Z](#) [ISL60002BIH312](#)  
[TS3320AMR](#) [TS3325AMR](#) [TS3330AMR](#) [TS3333AMR](#) [X60003CIG3-41](#) [X60003DIG3Z-41T1](#) [X60250V8I](#) [REF3025TB-GT3](#)  
[SC432BVSNT1G](#) [TL431CPG](#) [ADR4520ARZ-R7](#) [ADR4533BRZ-R7](#) [LT1027CCS8-5#TRPBF](#) [REF35102QDBVR](#) [AD587KRZ-REEL](#)  
[ADR425ARZ-REEL7](#) [CA-HP6025S](#) [CA-HP6041S](#) [JTL431A](#) [TLVH431NAQDBZRR](#) [REF2033QDDCRQ1](#) [REF35330QDBVR](#)  
[LT1236BCS8-5#TRPBF](#) [ADR435BRMZ-REEL7](#) [CA-HP6050S](#) [TL431](#) [BR431RM](#) [MSR025](#) [MC1403BN](#) [LM285Z-2.5](#) [LM385B-ADJ](#)  
[LM385B-2.5](#) [HT385R-1.2](#) [HT336R-2.5](#) [RS3450XH6-Q1](#)