

---

**ZLNB254**  
**Dual DiSEqC™ Interface IC**

---

**SUMMARY**

The ZLNB254 is a dual channel DiSEqC™ interface for Satellite Low Noise Blocks (LNB's) and distribution systems. Providing two accurate DiSEqC™ detectors the ZLNB254 converts the DiSEqC™ signals into logic level representations enabling reliable and easy detection for a microprocessor. Packaged in a small footprint DFN and only requiring two external components per channel the complete solution is cost effective and requires minimal PCB space.



**FEATURES**

- Dual Channel DiSEqC™ interface
- Reliable and accurate detectors
- High channel isolation
- Compatible with Eutelsat and US specifications
- Simple and easy to design in.
- Outputs compatible with LSTTL and CMOS loads
- Operates over a wide supply voltage
- Temperature compensated

**APPLICATIONS**

- DiSEqC™ controlled LNB's
- Satellite distribution systems
- Mono Block LNB's
- DiSEqC Actuators
- Set-Top Boxes
- Satellite Test Equipment
- AC satellite control signal detection

## DESCRIPTION

The ZLNB254 is a dual DiSEqC™ tone detector IC for multiple output LNBs, satellite distribution systems, set-top boxes and DiSEqC™ peripherals. Although intended for use with 22kHz DiSEqC™ signals, the ZLNB254 can be used over the frequency range of 10kHz to 60kHz so it can detect standard 22kHz satellite band control signals as well as regional variations such as those in Japan.

The minimum of external components are required to enable this two-channel tone filter and fast envelope detector. The ZLNB254 is particularly suited to low signal level, high distortion DiSEqC™ signal detecting applications.

The ZLNB254 includes circuitry necessary to detect the presence of a 22kHz tones modulated on the supply inputs to a LNB or switchbox. The TD outputs are set low on detection of a valid tone or DiSEqC™ signal when applied to the FIN inputs.

To enable system flexibility user control is given over the gain and the lower frequency limit of the filter by using a single external resistor and capacitor per channel. The higher frequency limit of the filters is set

internally above 60kHz. The remaining detector circuits utilises no other external components.

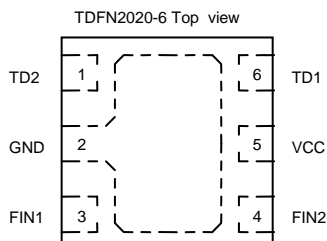
The tone detector can be used to sense either continuous tones or coded tone bursts such as used in DiSEqC™ and similar control systems. To ensure system reliability the tone detector rejects unwanted signals including transients from other parts of the LNB system without the use of any external components.

The TD outputs are designed to be compatible with LSTTL and CMOS loads so can drive a microcontroller or other logic directly.

To give further protection the resistor which is used to set the filter gain also provides ESD protection.

The ZNBL254 provides a small simple solution and is packaged in the TDFN2020-6 surface mount package.

## Pinout Diagram



# ZLNB254

## Absolute Maximum Ratings

Supply Voltage	-0.6V to +15V
Supply Current	50mA
Power Dissipation	350mW
Operating Temperature Range	-40°C to +85°C
Storage Temperature Range	-40°C to +125°C

## Electrical Characteristics

Measured at Tamb = 25°C, Vcc = 5V unless otherwise specified.

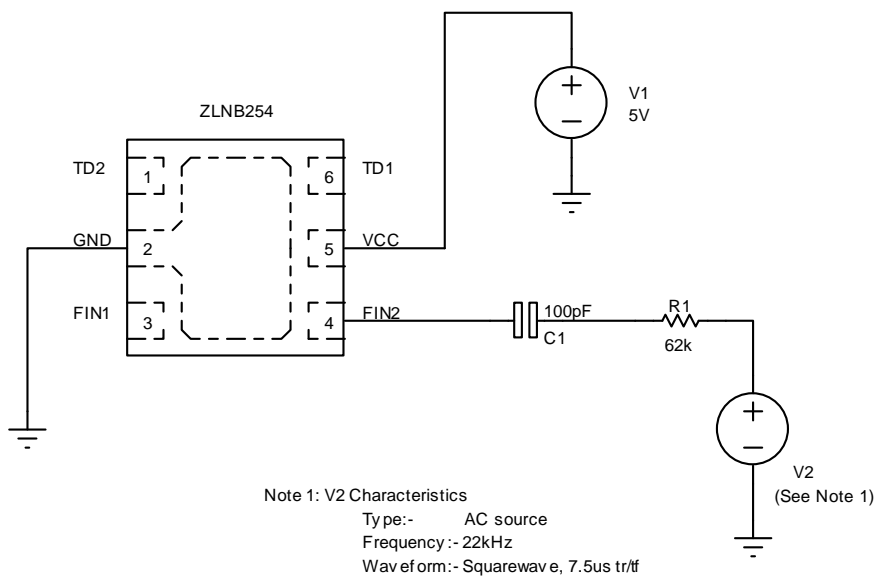
Parameter	Conditions	Limits			Units
		Min	Typ	Max	
Supply Voltage Operating Range		3.0		8	V
Supply Current	All outputs unloaded, any combination of valid inputs.		0.7	2	mA

Tone Detectors					
AC Thresh <sup>(1)</sup>	Test Circuit 1	100	140	200	mVp/p
Switching Delay	TD outputs, Test Circuit 2		100	150	us

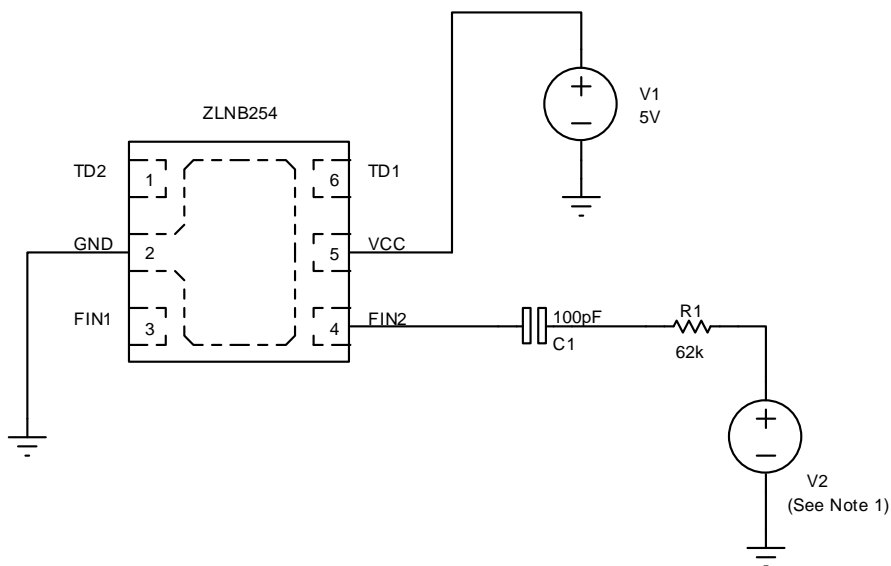
TD Outputs					
Voltage High	ITD = -2mA, Test Circuit 1, Tone disabled	Vcc-0.5	Vcc-0.2	Vcc	V
Voltage Low	ITD = 5mA, Test Circuit 1, Tone enabled	0	0.29	0.5	V

**Notes:** 1. The tone detector threshold is Vcc dependent. See Application section for details.

## Test Circuit 1

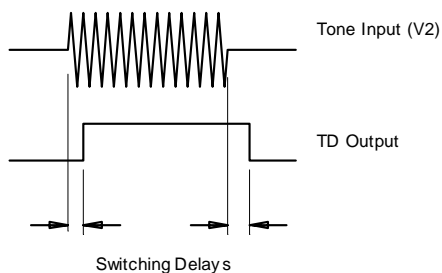


## Test Circuit 2

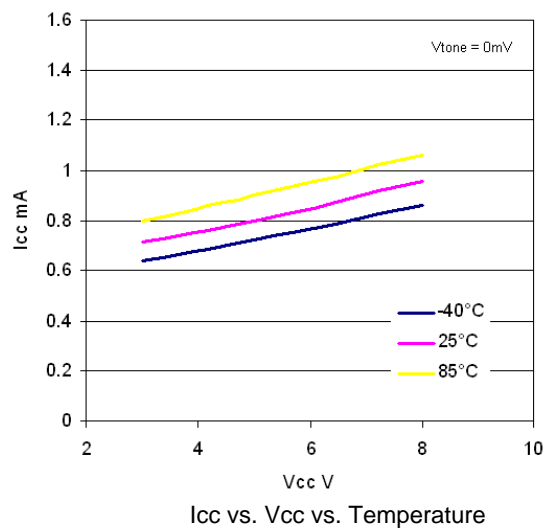
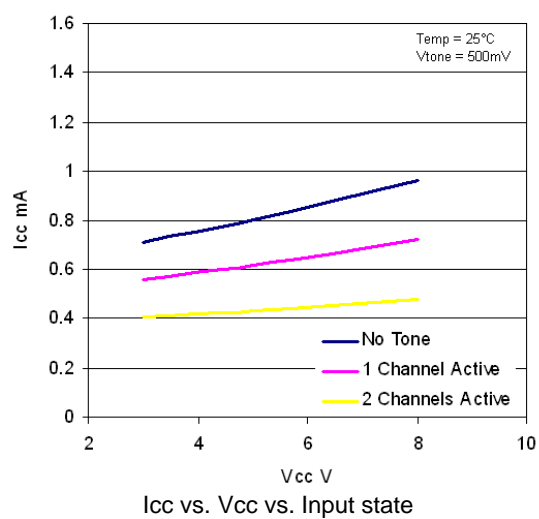


Note 1: V2 Characteristics

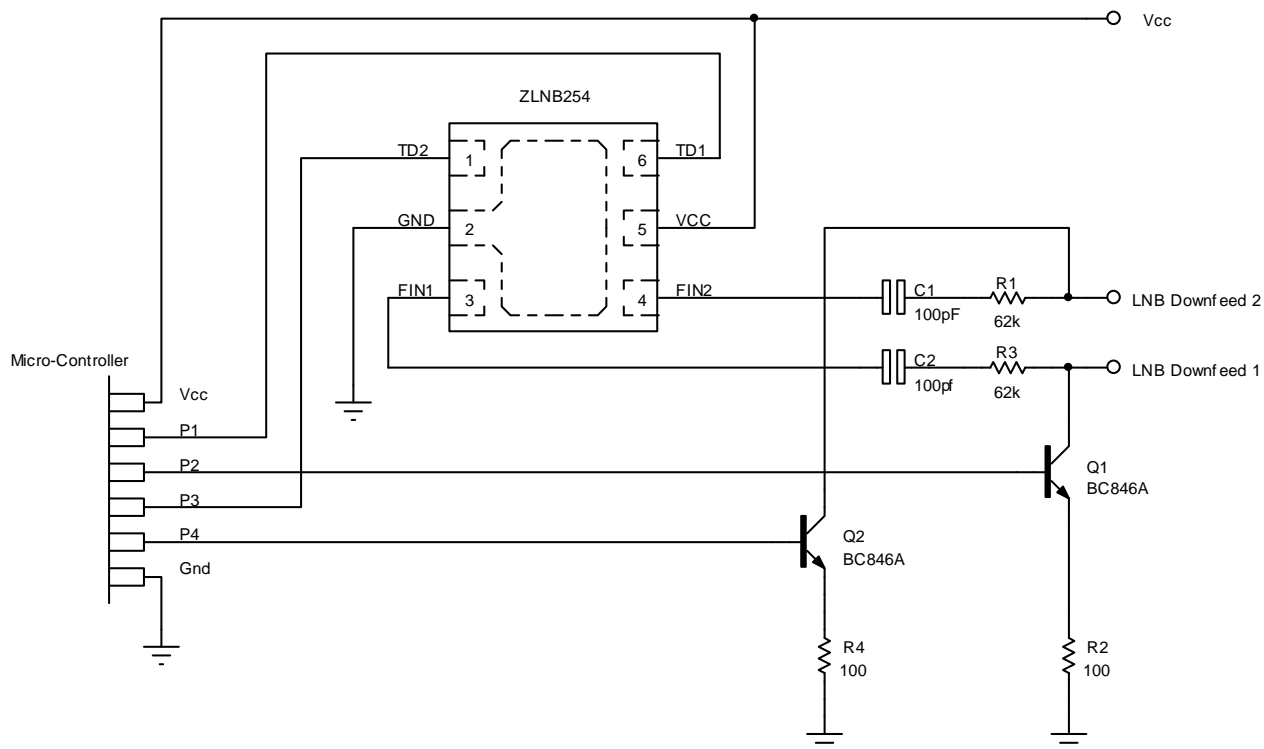
Type:- AC source  
 Frequency:- 22kHz  
 Voltage:- 300mVp/p Enabled  
 Zero Disabled



## Typical Characteristics



## APPLICATIONS INFORMATION



The above circuit shows the additional components that will be used in a typical ZLNB254 application operating at a Vcc of 5V and detecting 22kHz tones/tone bursts. The transistors Q1 and Q2 are not required for the ZLNB254 operation, they demonstrate how a DiSEqC 2.X (2 way communication) could be achieved.

The two detectors of the ZLNB254 are well matched to each other but thresholds of the tone detectors are dependent on Vcc. The table below shows the recommended external input resistor (R1/R3 in above diagram) values needed to meet the guaranteed threshold levels for a range of supply voltages.

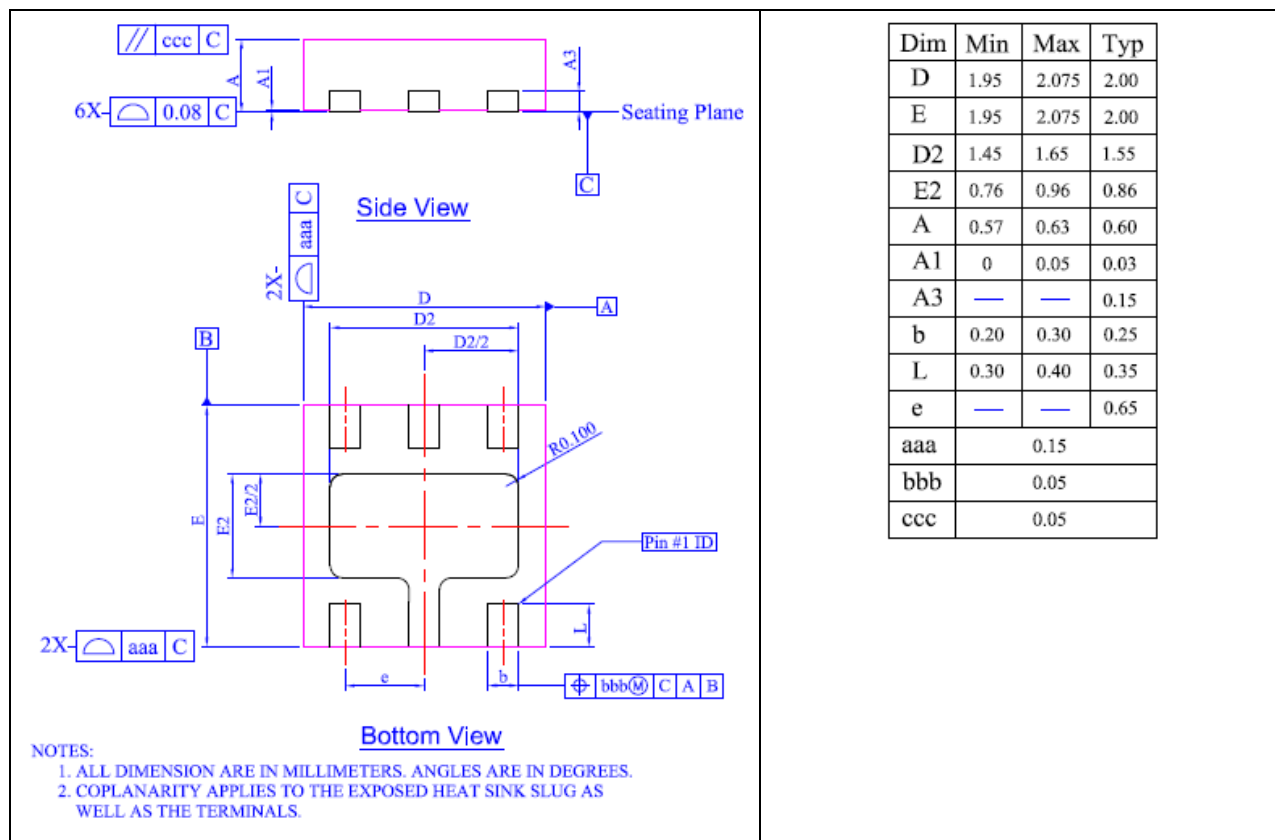
**Recommended Input Resistor Value vs Vcc Table**

Vcc	R1 and R3	C1 and C2
3.3V	82K	100pF
5V	62K	100pF
6V	51K	100pF

**Functional Table**

FIN	TD Out
0 kHz	High
22 kHz	Low

## PACKAGE OUTLINE – TDFN2020-6



## ORDERING INFORMATION

DEVICE	PACKAGE	PART MARK	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZLNB254DEETA	TDFN2020-6	254	7"	8mm	3000 Units

## ACKNOWLEDGEMENTS

DiSEqC™ is a trademark of Eutlesat

**IMPORTANT NOTICE**

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel.

Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

**LIFE SUPPORT**

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

A. Life support devices or systems are devices or systems which:

1. are intended to implant into the body, or
2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

Copyright © 2009, Diodes Incorporated

**[www.diodes.com](http://www.diodes.com)**