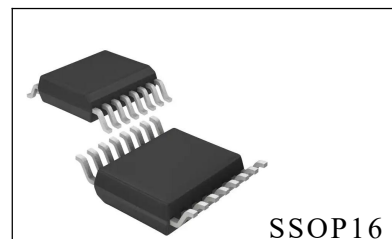




### General Description:

The D8012 is design to be fully compatible with ZLNB2012.

It is available in the space saving SSOP16 surface mount package.



SSOP16

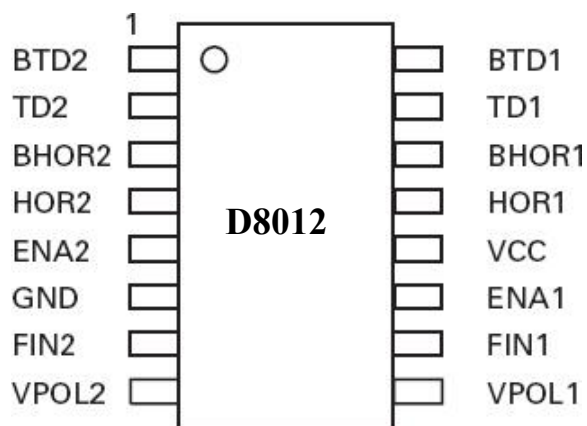
### Features

- Dual polarisation and tone switch
- Reduced Cost Solution, only 2 external components per channel
- Close tolerance (14-14.5V) and temperature compensated polarisation switch
- Multiplexer IC direct drive
- Tone and pol. Outputs are TTL, CMOS, Pin diode and IF amp capable
- Transient resistant inputs
- Includes Receiver-Off detector
- User adjustable filter centre frequency and bandwidth
- Low frequency and DiSEqC control signals rejection
- Eliminates many close tolerance discrete components
- Wide supply operating range
- Low quiescent current

### Applications

- Twin Universal LNB's
- Quad Universal LNB's
- Multi Feed Universal LNB's
- LNB switch boxes

### Pin Description



### Package Information

Part NO.	Order NO.	Package Description	Package Marking	Package Option
D8012	D8012	SSOP16	CHMC SXXXX D8012	50/Tube 4000/Reel

CHMC:Trademark      D8012:Part NO.      SXXXX:Lot NO.

**Absolute Maximum Ratings** (Ta=25 °C)

Characteristic	Symbol	Min.	Max.	Unit
Supply voltage	V <sub>CC</sub>	-0.6	12	V
Supply current	I <sub>CC</sub>		500	mA
Input voltage	V <sub>OP L1</sub> , V <sub>OP L2</sub>	25 V continuous		V
Power dissipation	P <sub>D</sub>	500		mW
Operating temperature	T <sub>opr</sub>	-40	+80	°C
Storage temperature	T <sub>stg</sub>	-40	+85	°C

**Electrical Characteristics**(unless otherwise noted, Ta=25 °C and V<sub>CC</sub>=5.0V)

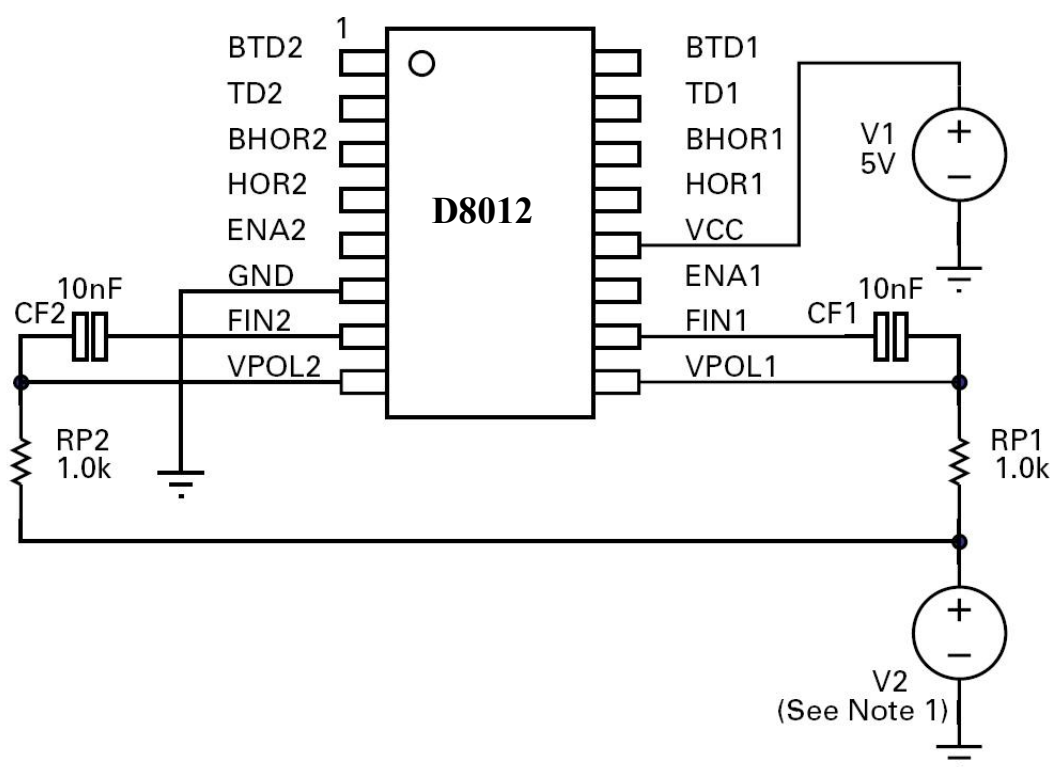
Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Supply voltage	V <sub>CC</sub>		5		8	V
Supply current	I <sub>CC</sub>	HOR <sub>1,2</sub> =BHOR <sub>1,2</sub> =TD <sub>1,2</sub> = BTD <sub>1,2</sub> =0mA V <sub>POL 1</sub> =V <sub>POL 2</sub> =Don't care F <sub>IN 1</sub> =F <sub>IN 2</sub> =Don't care		9	12	mA
V <sub>POL 1</sub> and V <sub>POL 2</sub> input current Threshold voltage Switching speed	I <sub>POL</sub> V <sub>TPOL</sub> T <sub>SPO L</sub>	V <sub>POL 1</sub> =V <sub>POL 2</sub> =25V T <sub>amb</sub> =- 40 °C to 80 °C	100 14	200 14.25	240 14.5 100	μA V μs
HOR <sub>OUT 1</sub> and HOR <sub>OUT 2</sub> outputs Voltage high Voltage low	V <sub>HOR HIGH</sub> V <sub>HOR LOW</sub>	I <sub>HOR OUT 1,2</sub> =-100μA, V <sub>POL 1,2</sub> =14.5V I <sub>HOR OUT 1,2</sub> =5mA, V <sub>POL 1,2</sub> =14V	V <sub>CC</sub> -1.0 0	V <sub>CC</sub> -0.7 0.30	V <sub>CC</sub> 0.5	V
BHOR <sub>OUT 1</sub> and BHOR <sub>OUT 2</sub> outputs Voltage high Voltage low	V <sub>BHOR HIGH</sub> V <sub>BHOR LOW</sub>	I <sub>BHOR OUT 1,2</sub> =-100μA, V <sub>POL 1,2</sub> =14.0V I <sub>BHOR OUT 1,2</sub> =5mA, V <sub>POL 1,2</sub> =14.5V	V <sub>CC</sub> -1.0 0	V <sub>CC</sub> -0.7 0.30	V <sub>CC</sub> 0.5	V
Enable <sub>1,2</sub> outputs Voltage high Voltage low	V <sub>EN HI GH</sub> V <sub>EN LO W</sub>	I <sub>Enable1,2</sub> =-100μA, V <sub>PO L 1,2</sub> =10V I <sub>Enable1,2</sub> =500μA, V <sub>PO L 1,2</sub> =8.0V	V <sub>CC</sub> -1.0 0	V <sub>CC</sub> -0.7 0.30	V <sub>CC</sub> 0.5	V
Filter amplifier bias voltage	V <sub>OUT</sub>	I <sub>f in</sub> =0	1.75	1.95	2.15	V
Input impedance	F <sub>IN Z</sub>	V <sub>F IN</sub> =100 mV <sub>pp</sub>		150		Ω
Amplifier gain	A <sub>G</sub>	V <sub>F IN</sub> =100 mV <sub>pp</sub>		30		V/mA
V threshold	F <sub>V T</sub>		100	170	350	mV <sub>pp</sub>
TD <sub>1,2</sub> Outputs Voltage high Voltage low	V <sub>V HI GH</sub> V <sub>V LO W</sub>	I <sub>TD1,2</sub> =-100μA, test circuit Tone enabled I <sub>TD1,2</sub> =15mA, test circuit Tone disabled	V <sub>CC</sub> -1.0 0	V <sub>CC</sub> -0.7 0.30	V <sub>CC</sub> 0.5	V
BTD <sub>1,2</sub> outputs Voltage high Voltage low	V <sub>V HI GH</sub> V <sub>V LO W</sub>	I <sub>BTD1,2</sub> =-100μA, test circuit, Tone enabled I <sub>BTD1,2</sub> =15mA, test circuit Tone disabled	V <sub>CC</sub> -1.0 0	V <sub>CC</sub> -0.7 0.30	V <sub>CC</sub> 0.5	V

\* The parameters Filter Amplifier  $V_{OUT}$ ,  $I_{OUT}$ , Rectifier  $V_{OUT}$  and Comparator Threshold Voltage are all directly ( linearly) related to  $V_{CC}$ .

\*\* Applied via 1k resistors

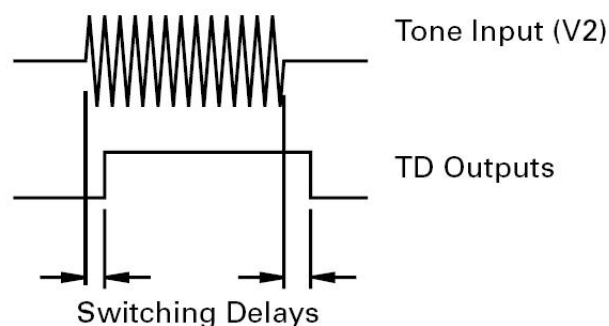
\*\*\* These parameters are linear related to  $V_{CC}$

## Test Circuit (D8012 pinout for SSOP16 package designator)



### Note 1: V2 Characteristics

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

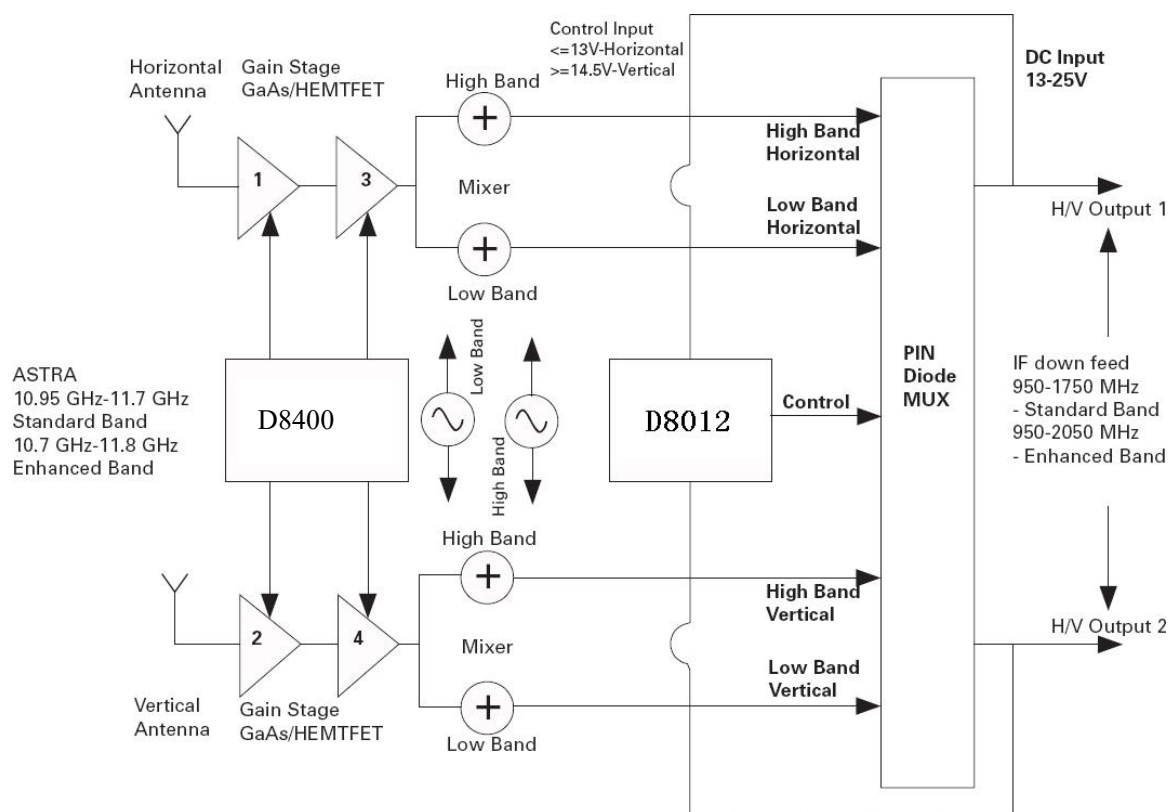


The following diagram shows a typical block diagram for a twin universal LNB design.

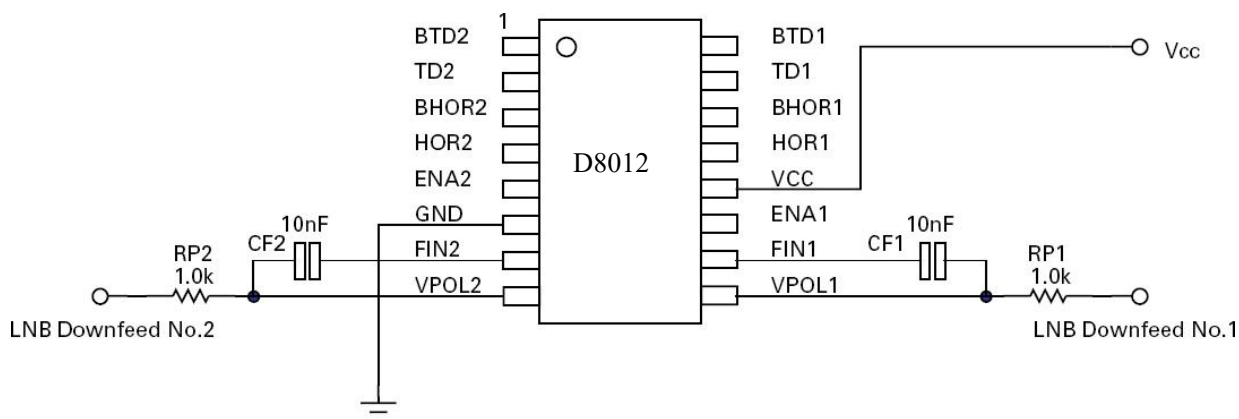
The D8012 device provides the two polarity and two tone switches required to decode the

two independent receiver feeds. The device is also able to detect the absence of a receiver connection to either port of the LNB providing all outputs to go high hence disabling of the port. This allows the avoidance of unwanted signal reflections from an unterminated down feed cable.

Additionally the front end bias requirements of the LNB are provided by the D8400 or D8600 offering a very efficient and cost effective solution



## Application Summary



## Application Summary

Inputs Vpol1 and Vpol2 are designed to be wired to the power inputs of an LNB via a high value (1K) resistors. Input Vpol1 controls outputs HOR1, BHOR1 and ENA1. Input Vpol2 controls outputs HOR2, BHOR2 and ENA2. With either input voltage set at or below 14V, the corresponding HOR pin will be active and the corresponding BHOR pin will be the inverse of HOR. With either input voltage at 14.5V or higher, the corresponding HOR pin will be active and the corresponding BHOR pin will be the inverse. Should the voltage applied to either Vpol input fall below 8V, the corresponding ENA (enable) pin will be low, otherwise these outputs will remain high. Any input or output may be left open circuit without any effect on the remaining circuitry.

The D8012 includes all the circuitry necessary to detect the presence of a 22kHz tone modulated on the supply input to the LNB. The main elements of the detector are an op-amp, a rectifier/smoothener and a comparator. The op-amp has a pre-set internal feedback resistor so that just a simple RC network wired to the input gives user defined gain and low frequency cut filter characteristics.

The RC network components also serve two other purposes. The resistor provides overvoltage protection for the Vpol pin and the capacitor minimises tone interference of the Vpol threshold. The upper frequency roll-off of the op-amp has been set internally at above 100kHz to allow the amplifier to be used with other common tone switch frequencies.

The rectifier/smoothener/comparator function is provided by a complex propriety circuit that allows the D8012 to reliably detect wanted tones whilst ignoring low frequency square wave switch box signals, DiSEqC™ bursts and supply switching transients common when using DiSEqC-2™ ready set-top boxes. This is all achieved without the need for any further external components. The threshold of the comparator is supply dependent, hence the gain of the preceding op-amp must be adjusted in line with supply voltage.

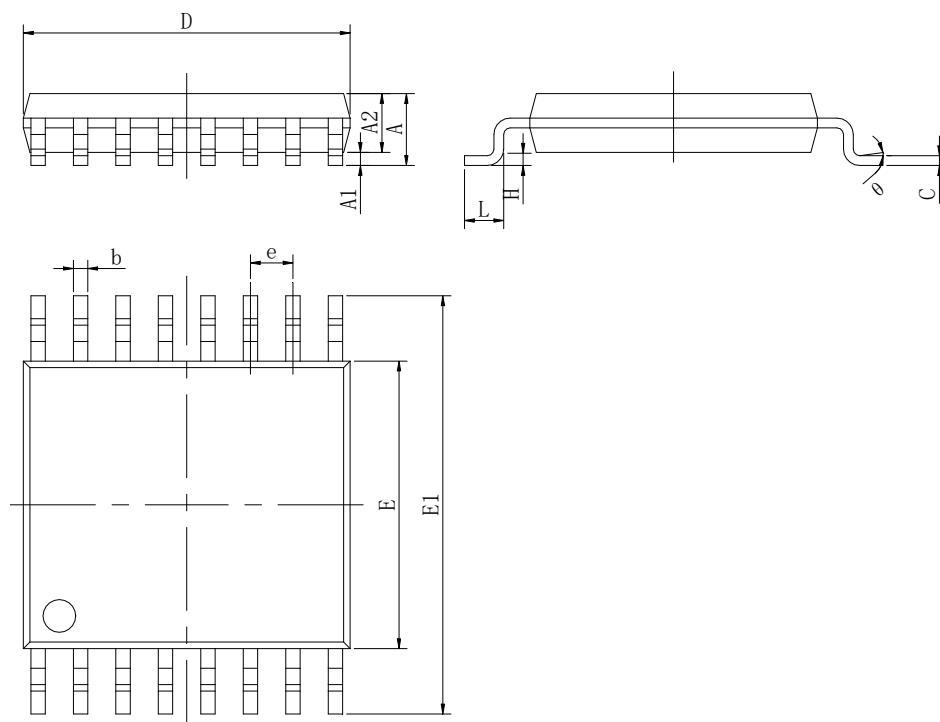
## Output Truth Table

The D8012 includes two independent channels, each containing a voltage detector and tone detector. The following truth table applies to each channel:-

Tone	V <sub>pol</sub>	TD	BTD	HOR	BHOR	ENA
Off	$\leq 14V$	Low	High	Low	High	High
Off	$\geq 14.5V$	Low	High	High	Low	High
On	$\leq 14V$	High	Low	Low	High	High
On	$\geq 14.5V$	High	Low	High	Low	High
-	<8V	-	-	Low	High	Low

## Outline Dimensions

## SSOP16



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
D	4.800	5.000	0.188	0.196
E	3.800	4.000	0.149	0.157
b	0.230	0.310	0.009	0.012
c	0.200	0.240	0.007	0.010
E1	5.800	6.200	0.228	0.244
A		1.750		0.069
A2	1.300	1.500	0.051	0.059
A1	0.100	0.225	0.003	0.009
e	0.635 (BSC)		0.025(BSC)	
L	0.750	1.050	0.019	0.031
H	0.25(TYP)		0.01(TYP)	
θ	0°	8°	0°	8°

## Statements

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