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## NTE15023 Integrated Circuit dbx TV Noise Reduction Integrated Circuit

### Description:

The NTE15023 is an integrated circuit designed for the dbx-TV noise reduction decode circuit for multichannel TV sound systems. This device contains a voltage controlled amplifier, a variable de-emphasis circuit with new configuration and RMS detectors with completely integrated active band pass filters, and offers the complete dbx-TV noise reduction decoder only with a few external components.

### Features:

- Integrated Band Pass Filters using Active Filtering Technique and Thin Film Structure with High Capacitance
- Variable De-emphasis Circuit with New Circuit Configuration
- Minimum Number of External Components
- Wide Operation Voltage Range: 4.7V to 16V

### Absolute Maximum Ratings: ( $T_A = +25^\circ\text{C}$ unless otherwise specified)

Power Supply Voltage,  $V_{CC}$  ..... 17V  
 Allowable Power Dissipation,  $P_D$  ..... 715mW  
 Operating Temperature Range,  $T_{opr}$  .....  $-20^\circ$  to  $+75^\circ\text{C}$   
 Storage Temperature Range,  $T_{stg}$  .....  $-55^\circ$  to  $+150^\circ\text{C}$

### Recommended Operating Voltage:

Power Supply Voltage,  $V_{CC}$  ..... 5V to 15V

### Electrical Characteristics: ( $T_A = +25^\circ\text{C}$ , $V_{CC} = +9\text{V}$ Reference Level: 0dB = $-5\text{dBm}$ (436mVrms) unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Consumption Current	$I_{CC}$	No Signal	4.0	5.0	6.3	mA
Decode Characteristics	$V_{od-1}$	$V_i = -5\text{dB}$ , $f = 300\text{Hz}$	5.5	7.0	8.5	dB
	$V_{od-2}$	$V_i = -15\text{dB}$ , $f = 300\text{Hz}$	-14.5	-13.0	-11.5	dB
	$V_{od-3}$	$V_i = -30\text{dB}$ , $f = 300\text{Hz}$	-44.5	-43.0	-41.5	dB
	$V_{od-4}$	$V_i = 0\text{dB}$ , $f = 1\text{kHz}$	1.3	3.3	5.3	dB
	$V_{od-5}$	$V_i = -10\text{dB}$ , $f = 1\text{kHz}$	-19.4	-17.4	-15.4	dB
	$V_{od-6}$	$V_i = -20\text{dB}$ , $f = 1\text{kHz}$	-39.6	-37.6	-35.6	dB
	$V_{od-7}$	$V_i = 0\text{dB}$ , $f = 8\text{kHz}$	-4.3	-1.8	0.7	dB
	$V_{od-8}$	$V_i = -10\text{dB}$ , $f = 8\text{kHz}$	-30.9	-28.4	-25.9	dB
	$V_{od-9}$	$V_i = -20\text{dB}$ , $f = 8\text{kHz}$	-45.2	-42.7	-40.2	dB

**Electrical Characteristics (Cont'd):** ( $T_A = +25^\circ\text{C}$ ,  $V_{CC} = +9\text{V}$  Reference Level:  $0\text{dB} = -5\text{dBm}$  (436mVrms) unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
VCA Filter Characteristics	$V_{fp-1}$	$f = 3\text{kHz}$ , $V_i = 0\text{dB}$ , refer to 1kHz	-5.5	-4.0	-2.5	dB
	$V_{fp-2}$	$f = 8\text{kHz}$ , $V_i = 0\text{dB}$ , refer to 1kHz	-13.0	-11.0	-9.0	dB
Vemp. Filter Characteristics	$V_{fg-1}$	$f = 5\text{kHz}$ , $V_i = 0\text{dB}$ , refer to 8kHz	-9.4	-7.4	-5.4	dB
	$V_{fg-2}$	$f = 2\text{kHz}$ , $V_i = 0\text{dB}$ , refer to 8kHz	-32.3	-28.8	-25.3	dB
Total Harmonic Distortion Ratio	THD	$f = 1\text{kHz}$ , $V_i = -3\text{dB}$	-	0.1	0.3	%
Maximum Output Voltage	$V_{om-1}$	$f = 300\text{Hz}$ , THD = 1.5%	11.0	12.5	-	dB
	$V_{om-2}$	$f = 8\text{kHz}$ , THD = 1.5%	-2.0	1.0	-	dB
Output Noise Level	$V_{on}$	A weight	-	-104	-80	dB
Timing Current	$I_{time}$		(7.1)	7.5	(7.9)	$\mu\text{A}$
Center Potential	$V_{CC}/2$		4.3	4.5	4.7	V

**Electrical Characteristics:** ( $T_A = +25^\circ\text{C}$ ,  $V_{CC} = +9\text{V}$  Reference Level:  $0\text{dB} = -5\text{dBm}$  (436mVrms) Note 1 unless otherwise specified)

Parameter	Symbol	Switch Condition							
		1	2	3	4	5	6	7	
Consumption Current	$I_{CC}$	OFF	-	-	-	-	b	b	
Decoding Characteristics	300Hz, -5dB	$V_{od-1}$	ON	-	b	b	b	b	b
	300Hz, -15dB	$V_{od-2}$	ON	-	b	b	b	b	b
	300Hz, -30dB	$V_{od-3}$	ON	-	b	b	b	b	b
	1kHz, 0dB	$V_{od-4}$	ON	-	b	b	b	b	b
	1kHz, -10dB	$V_{od-5}$	ON	-	b	b	b	b	b
	1kHz, -20dB	$V_{od-6}$	ON	-	b	b	b	b	b
	8kHz, 0dB	$V_{od-7}$	ON	-	b	b	b	b	b
	8kHz, -10dB	$V_{od-8}$	ON	-	b	b	b	b	b
	8kHz, -15dB	$V_{od-9}$	ON	-	b	b	b	b	b
VCA Filter Characteristics	3kHz	$V_{fp-1}$	ON	a	a	b	b	b	b
	8kHz	$V_{fp-2}$	ON	a	a	b	b	b	b
Vemp Filter Characteristics	5kHz	$V_{fg-1}$	ON	b	a	b	b	b	b
	2kHz	$V_{fg-2}$	ON	b	a	b	b	b	b
Total Harmonic Distortion Ratio	THD	ON	-	b	b	b	b	b	
Maximum Output Voltage	300Hz	$V_{om-1}$	ON	-	b	b	b	b	b
	8kHz	$V_{om-2}$	ON	-	b	b	b	b	b
Output Noise Level	$V_{on}$	OFF	-	b	a	a	b	b	
Middle Point Potential	$V_{CC}/2$	OFF	-	-	-	-	b	b	

Note 1. It suffices that a or b is inserted into (-).

### Pin Connection Diagram

