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## NTE1800 Integrated Circuit TV Multiplex Sound Decoder

**Description:**

The NTE1800 Multiplexed Sound Decoder is a linear integrated circuit in a 30-Lead DIP type package that incorporates the SAP demodulation and the L, R matrix circuits required to demodulate multiplexed sound signals on the US NTSC system.

The NTE1800 also features mode switching to facilitate the use of remote control, and can be interfaced easily to the NTE1801 dbx Noise Reduction Decoder IC.

**Features:**

- Mode switching for remote control
- Built-in muting function
- Pilot cancel circuit
- 8.0 to 13.2V power supply
- 300mV<sub>rms</sub> (MONO) composite signal input voltage
- 30-pin plastic shrink DIP
- Easily interfaced to the NTE1801

**Functions:**

- Pilot signal
- SAP signal
- Stereo demodulation
- SAP demodulation
- Mode switching
- Stereo and SAP display drivers
- Pilot canceler
- On-chip 4fH V<sub>CO</sub>
- On-chip 5fH V<sub>CO</sub>

**Absolute Maximum Ratings:**

Power Supply Voltage, V <sub>CCmax</sub> .....	15V
Input Signal Voltage, V <sub>in</sub> .....	5V <sub>p-p</sub>
Control Signal Voltage, V <sub>in</sub> .....	5V <sub>p-p</sub>
Power Dissipation (T <sub>A</sub> ≤ +70°C), P <sub>Dmax</sub> .....	800mW
Lamp Driver Current, I <sub>lamp</sub> .....	30mA
Operating Temperature Range, T <sub>opg</sub> .....	-20° to +70°C
Storage Temperature Range, T <sub>stg</sub> .....	-40° to +125°C

**Recommended Operating Conditions:** (T<sub>A</sub> = +25°C unless otherwise specified)

Power Supply Voltage, V <sub>CC</sub> .....	8 to 13.2V
Composite Signal Voltage, V <sub>in</sub> .....	300mV <sub>rms</sub>

**Electrical Characteristics:** ( $T_A = +25^\circ\text{C}$ ,  $V_{CC} = 12\text{V}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Circuit Current	$I_{CC}$	$V_{CC} = 12\text{V}$ , no signal	27	39	52	mA
Stereo Capture Range	$CC_1$	Stereo demodulation input pin $30\text{mV}_{\text{rms}}$ pilot signal level	$\pm 1.5$	$\pm 3.0$	–	%
Stereo Switch Input Sensitivity	$SW_{\text{sense}}$	Measure pilot level at stereo demodulation input. Stereo lamp OFF→ON	12	18	22	$\text{mV}_{\text{rms}}$
Stereo Switch Hysteresis	$Hy_1$	Pilot level measured at stereo demodulation input. Stereo lamp ON→OFF, OFF→ON	5	7	9	dB
Stereo Switch L–R Output Voltage	$Vo_{L-R}$	$150\text{mV}_{\text{rms}}$ (MONO) stereo demodulation input voltage	380	430	480	$\text{mV}_{\text{rms}}$
Stereo Demodulation Output L+R Output Voltage	$Vo_{L+R}$	$150\text{mV}_{\text{rms}}$ (MONO) stereo demodulation input voltage	380	430	480	$\text{mV}_{\text{rms}}$
L+R Output Voltage Pilot Cancel Level	$fH_{\text{REJ}}$	$150\text{mV}_{\text{rms}}$ (MONO) stereo demodulation input voltage	30	35	–	dB
L–R Output Distortion	$THDL-R$	$150\text{mV}_{\text{rms}}$ (MONO) stereo demodulation input voltage, $f = 1\text{kHz}$	–	0.2	0.7	%
L +R Output Distortion	$THD_{L+R}$	$150\text{mV}_{\text{rms}}$ (MONO) stereo demodulation input voltage, $f = 1\text{kHz}$	–	0.2	0.7	%
SAP Capture Range	$CC_2$	$90\text{mV}_{\text{rms}}$ SAP input voltage	$\pm 19$	$\pm 25$	–	%
SAP Sensitivity	$SAP_{\text{SENSE}}$	Measure SAP input level. SAP lamp OFF→ON	25	35	45	$\text{mV}_{\text{rms}}$
SAP Switch Hysteresis	$Hy_2$	Measure SAP input level. SAP Lamp OFF→ON, ON→OFF	2.5	4.5	6.5	dB
SAP Output Distortion	$THD_{\text{SAP}}$	$90\text{mV}_{\text{rms}}$ SAP input voltage, $f = 1\text{kHz}$ , $\Delta f = 10\text{kHz}$	–	0.3	1.0	%
SAP Output Voltage	$V_{o\text{SAP}}$	$90\text{mV}_{\text{rms}}$ SAP input voltage, $f = 1\text{kHz}$ , $\Delta f = 10\text{kHz}$	380	430	480	$\text{mV}_{\text{rms}}$
Mode Switch Crosstalk	CT	$150\text{mV}_{\text{rms}}$ stereo input, $90\text{mV}_{\text{rms}}$ SAP input	45	60	–	dB
L,R Matrix Separation	SEP	$150\text{mV}_{\text{rms}}$ (MONO) composite input	30	40	–	dB
Matrix Output Voltage (MONO)	$V_{o\text{MONO}}$	$215\text{mV}_{\text{rms}}$ matrix input. Same phase input	450	500	550	$\text{mV}_{\text{rms}}$
Matrix Output Voltage (STEREO)	$V_{oL}$	$215/2\text{mV}$ matrix input. Same phase input	450	500	550	$\text{mV}_{\text{rms}}$
Matrix Output Voltage (STEREO)	$V_{oR}$	$215/2\text{mV}_{\text{rms}}$ matrix input. Reverse phase input	450	500	550	$\text{mV}_{\text{rms}}$
Matrix Output Voltage (SAP)	$V_{o\text{MSAP}}$	$215\text{mV}_{\text{rms}}$ matrix input.	450	500	550	$\text{mV}_{\text{rms}}$
Matrix Output Voltage (MUTE)	MUTE	Pin17 Open	–	–70	–60	dB

### Pin Connection Diagram

GND	<b>1</b>	<b>30</b>	SAP Lamp
Limiter Amp Input	<b>2</b>	<b>29</b>	Stereo Lamp
Filter Cap	<b>3</b>	<b>28</b>	Phase Comp Cap
Filter Cap	<b>4</b>	<b>27</b>	Phase Comp Cap
5f <sub>h</sub> VCO Cap	<b>5</b>	<b>26</b>	Phase Comp Input
5f <sub>h</sub> Adjust	<b>6</b>	<b>25</b>	Phase Comp
Phase Detector Cap	<b>7</b>	<b>24</b>	Phase Comp
L-R SAP Output	<b>8</b>	<b>23</b>	4f <sub>h</sub> Adjust
Mode Switch	<b>9</b>	<b>22</b>	Pilot Regeneration Cap
Mono Switch	<b>10</b>	<b>21</b>	Pilot Input
L-R SAP Input	<b>11</b>	<b>20</b>	Stereo Input
L-R Input	<b>12</b>	<b>19</b>	Preamplifier Output
R Output	<b>13</b>	<b>18</b>	Preamplifier Input
L Output	<b>14</b>	<b>17</b>	Mute
V <sub>CC</sub>	<b>15</b>	<b>16</b>	L-R Output

