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NTE7014 Integrated Circuit TV FM Multiplex Sound Decoder

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

Supply Voltage, V_{CC}	16V
Power Dissipation, P_D	1W
Derate Above 25°	10mW/ $^\circ\text{C}$
Operating Temperature Range, T_{opr}	-20° to $+75^\circ\text{C}$
Storage Temperature Range, T_{stg}	-40° to $+125^\circ\text{C}$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Circuit Current	I_{CC}		14	22	29	mA
Regulated Voltage, Pin12	V_{REG}		3.9	4.1	4.4	V
Pin2 Voltage	V_2		2.3	2.5	2.7	V
Pin3 Voltage	V_3		2.3	2.5	2.7	V
Pin4 Voltage	V_4		2.3	2.5	2.7	V
Pin5 Voltage	V_5		2.3	2.5	2.7	V
Pin6 Voltage	V_6		2.3	2.6	2.9	V
Pin7 Voltage	V_7		2.0	4.0	6.0	V
Pin9 Voltage	V_9		4.0	5.0	6.0	V
Pin10 Voltage	V_{10}		4.0	5.0	6.0	V
Pin13 Voltage	V_{13}		1.7	2.0	2.3	V
Pin18 Voltage	V_{18}		1.2	1.5	1.8	V
Pin25 Voltage	V_{25}		5.7	6.0	6.3	V
Pin26 Voltage	V_{26}		5.7	6.0	6.3	V
Pin27 Voltage	V_{27}		5.7	6.0	6.3	V
Pin28 Voltage	V_{28}		5.7	6.0	6.3	V
Pin30 Voltage	V_{30}		5.7	6.0	6.3	V
Pin31 Voltage	V_{31}		5.7	6.0	6.3	V
Pin32 Voltage	V_{32}		5.7	6.0	6.3	V
Pin33 Voltage	V_{33}		5.7	6.0	6.3	V
Pin34 Voltage	V_{34}		5.7	6.0	6.3	V
Pin35 Voltage	V_{35}		5.7	6.0	6.3	V

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
L + R Amplifier Gain	G_{AL+R}		6.0	8.0	10.0	dB
Stereo Demodulator						
VCO Free-Run Frequency	f_O		52.9	62.9	72.9	kHz
Capture Range	f_{CR}		± 600	± 800	± 1000	Hz
Lock Range	f_{LR}		± 1.6	± 2.3	± 3.0	kHz
Pilot Signal Sensitivity	V_{P1}		24	35	46	mV _{P-P}
	V_{P2}		18	32	-	mV _{P-P}
L - R Output Level	V_{OL-R}		200	260	320	mV _{rms}
Pilot Cancel Level	G_{CP1}		-	-10	-6	dB
Stereo Display Saturation Voltage	V_{SAT11}		-	1.3	1.6	V
SAP Demodulation						
Output Level	V_{OSAP}		40	50	60	mV _{rms}
Carrier Level Sensitivity	V_{CS}		70	100	130	mV _{P-P}
Carrier Frequency Sensitivity	f_{CS}		57	62	67	kHz
Carrier Frequency Detection Level	V_{fCS}		1.2	1.5	1.8	V
SAP Display Saturation Voltage	V_{SAT19}		-	1.3	1.6	V
Control Circuit						
Stereo → Monaural Switch Voltage	V_{21MO}		0.7	1.0	1.3	V
Monaural → SAP Switch Voltage	V_{21SA}		2.3	2.6	2.9	V
SAP → Monaural/SAP Switch Voltage	V_{21MS}		3.8	4.1	4.4	V
Stereo Mode Display Saturation Voltage	V_{SAT24}		-	1.3	1.6	V
Monaural Mode Display Saturation Voltage	V_{SAT23}		-	1.3	1.6	V
SAP Mode Display Saturation Voltage	V_{SAT22}		-	1.3	1.6	V
SAP Amplifier Gain	G_{ASAP}		19	21	23	dB
L - R/SAP Switch						
L - R Switch Gain	G_{SL-R}		4	6	8	dB
SAP Switch Gain	G_{SSAP}		4	6	8	dB
L Output (Matrix, Analog Switch)						
Monaural Output Level	V_{LMO}		500	600	700	mV _{rms}
Stereo Output Level	V_{LST}		500	600	700	mV _{rms}
SAP Output Level	V_{LSA}		500	600	700	mV _{rms}
Monaural Output Distortion	D_{LMO}		-	0.3	1.0	%
Stereo Output Distortion	D_{LST}		-	0.5	1.0	%
SAP Output Distortion	D_{LSA}		-	0.5	1.0	%
Output Noise	V_{LN}		-	-70	-64	dBm
Mute Level	M_{UL}		-	-75	-70	dB
SAP → MAIN Crosstalk	C_{TLa}		-	-60	-50	dB
MAIN → SAP Crosstalk	C_{TLb}		-	-60	-50	dB

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
L Output (Matrix, Analog Switch)						
Monaural Output Level	V_{RMO}		500	600	700	mV_{rms}
Stereo Output Level	V_{RST}		500	600	700	mV_{rms}
SAP Output Level	V_{RSA}		500	600	700	mV_{rms}
Monaural Output Distortion	D_{RMO}		–	0.3	1.0	%
Stereo Output Distortion	D_{RST}		–	0.5	1.0	%
SAP Output Distortion	D_{RSA}		–	0.5	1.0	%
Output Noise	V_{RN}		–	–70	–64	dBm
Mute Level	M_{UR}		–	–75	–70	dB
SAP → MAIN Crosstalk	C_{TRa}		–	–60	–50	dB
MAIN → SAP Crosstalk	C_{TRb}		–	–60	–50	dB
L, R Output Channel Balance	C_{BAL}		–	0.5	1.2	dB
Stereo Separation	S_{EP}		35	40	–	dB
Inverter Output (Analog Switch)						
Monaural Output Level	V_{INMO}		500	600	700	mV_{rms}
SAP Output Level	V_{INSA}		500	600	700	mV_{rms}
Monaural Output Distortion	D_{INMO}		–	0.4	1.0	%
SAP Output Distortion	D_{INSA}		–	0.6	1.0	%
Output Noise	V_{INN}		–	–70	–64	dBm
Mute Level	M_{UIN}		–	–75	–70	dB
SAP → MAIN Crosstalk	C_{TINa}		–	–60	–50	db
MAIN → SAP Crosstalk	C_{TINb}		–	–60	–50	dB
L Output Dynamic Range	V_{DRL}		3.3	4.0	–	V_{P-P}
R Output Dynamic Range	V_{DRR}		3.3	4.0	–	V_{P-P}
Inverter Output Dynamic Range	V_{DRIN}		3.3	4.0	–	V_{P-P}
VCO Frequency Supply Voltage Characteristics	V_{foD}		–	40	–	Hz/V
VCO Frequency Temperature Characteristics	V_{foD}		–	20	–	Hz/ $^{\circ}C$

Pin Connection Diagram

VCO Adjust	1	36	V _{CC}
Phase Detection	2	35	Matrix L + R Input
Phase Detection	3	34	Matrix L - R Input
Stereo Signal Input	4	33	L Output
Pilot Cancel Input	5	32	R Output
L + R Det Output	6	31	Inverter Output
L - R Det Output	7	30	SAP Inverter Input
Pilot Cancel Wave Generation	8	29	Mute
Pilot Detection	9	28	SAP Amp Input
Pilot Detection	10	27	SAP Amp Output
Stereo Display	11	26	L - R/SAP Switch Output
Reference Voltage	12	25	Switch L - R Input
SAP Signal Input	13	24	Stereo Mode Display
SAP Detection Time Constant	14	23	Monaural Mode Display
SAP Detection Output	15	22	SAP Mode Display
SAP Carrier Det 1	16	21	Control Input
SAP Carrier Det 2	17	20	GND
SAP Carrier Level Detection	18	19	SAP Display

