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NTE1657 Integrated Circuit Phase Lock Loop (PLL) FM Stereo Multiplex

Description:

The NTE1657 is a PLL FM stereo multiplex integrated circuit in a 9-Lead SIP type package suitable for automotive applications and portable radio applications because of space merit by the package and wide supply voltage range.

Features:

- Excellent Pilot Lamp Sensitivity: $V_{L(ON)} = 9mV_{rms}$ (Typ)
- Suitable for LED Driving: $I_{LAMP} = 20mA$ (Max)
- Recommended Input Voltage Range: $V_{IN} = 200$ to $500mV_{rms}$
- Operating Supply Voltage Range: $V_{CC} = 3.5$ to $12V$
- Excellent Channel Separation Through Entire Audio Frequency Range: $Sep = 45dB$ (Typ)
- Low Distortion: $THD = 0.08\%$ (Typ) @ $V_{IN} = 200mV_{rms}$ (Stereo)
- VCO Stop Capability (The VCO is stopped when the pin 7 is connected with the power supply line and then the stereo indicator is turn off).
- Easy Adjustment (The monitored free running frequency of VCO is $38kHz$ @ Pin6).

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

Supply Voltage, V_{CC}	12V
Lamp Voltage, V_{LAMP}	16V
Lamp Current, I_{LAMP}	
Continuous	20mA
Peak	40mA
Power Dissipation, P_D	500mW
Derate Above $25^\circ C$	4mW/ $^\circ C$
Operating Temperature Range, T_{opr}	-30° to $+75^\circ C$
Storage Temperature Range, T_{stg}	-55° to $+150^\circ C$

DC Characteristics: ($V_{CC} = 8V$, Pin Voltage at No Signal, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input (Pin1)	V_1		–	3.5	–	V
LP Filter 1 (Pin2)	V_2		–	6.6	–	V
V_{CC} (Pin3)	V_3		–	8.0	–	V
VCO (Pin4)	V_4		–	7.1	–	V
GND (Pin5)	V_5		–	0	–	V
Stereo Lamp (Pin6)	V_6		–	–	–	V
LP Filter 2	V_7		–	7.4	–	V
Left Channel Output (Pin8)	V_8		–	4.0	–	V
Right Channel Output (Pin9)	V_9		–	4.0	–	V

AC Electrical Characteristics: ($T_A = +25^\circ C$, $V_{CC} = 8V$, $f = 1kHz$, unless otherwise specified)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit	
Supply Current	I_{CC}	at Lamp Off	–	11	18	mA	
Input Resistance	R_{IN}		–	33	–	$k\Omega$	
Max Composite Signal Input Voltage	V_{IN} Max Stereo	$L + R = 90\%$, $P = 10\%$	–	550	–	mV_{rms}	
Separation	Sep	$L - R = 180mV_{rms}$, $P = 20mV_{rms}$	36	45	–	dB	
Total Harmonic Distortion Monaural	THD	$V_{IN} = 200mV_{rms}$	–	0.08	0.3	%	
Stereo		$L + R = 180mV_{rms}$, $P = 20mV_{rms}$	–	0.08	–	%	
Voltage Gain	G_V	$V_{IN} = 200mV_{rms}$	–2.0	0.5	+2.0	dB	
Channel Balance	CB	$V_{IN} = 200mV_{rms}$	–	0	1.5	dB	
Lamp Sensitivity ON	$V_{L(ON)}$	Pilot Input	–	10	15	mV_{rms}	
OFF	$V_{L(OFF)}$		2	6	–	mV_{rms}	
Stereo Lamp Hysteresis	V_H	To Turn Off From Lamp Turn On	–	3	–	mV_{rms}	
Capture Range	CR	$P = 20mV_{rms}$	–	± 3	–	%	
Carrier Leak 9kHz	CL	$L + R = 180mV_{rms}$, $P = 20mV_{rms}$	–	34	–	dB	
38kHz			–	42	–	dB	
SCA Rejection Ratio	SCA Rej	$L + R = 160mV_{rms}$, $P = 20mV_{rms}$ $SCA = 20mV_{rms}$, $f_{SCA} = 67kHz$	–	70	–	dB	
Signal-to-Noise Ratio	S/N	$V_{IN} = 180mV_{rms}$, $f = 1kHz$, $R_g = 620\Omega$	–	74	–	dB	
Output Current (Pin8, Pin9)	I_{OUT}	$R_L = 3.3k\Omega$	$V_{CC} = 3.5V$	–	0.3	0.6	mA
			$V_{CC} = 8V$	–	1.2	1.8	mA
			$V_{CC} = 12V$	–	1.4	2.1	mA

Pin Connection Diagram
(Front View)

