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NTE1533 Integrated Circuit AM Tuner for Car Radio

Description:

The NTE1533 is developed for Tuning AM on a Car Radio. It uses low voltage oscillation to achieve varactor diode tuning instead of variable inductance tuning.

Functions:

- An RF Amplifier
- A Mixer
- An Oscillator with Automatic Level Control (ALC)
- An IF Amplifier
- A Detector
- Normal AGC
- Wide Band AGC on an RF Amplifier

Features:

- Double Balanced Mixer: Recovers IF and Spurious Interference.
- Normal AGC: Less Influence of Detector Output against Varying Input.
- RF Wide Band AFC: Low Operating Level (300mV_{RMS}) Recovers Intermodulation Distortion, Large Input Characteristic at Tuning Case of Varactor Diodes.
- AGC Driving Output to FET: Applies AGC to the Input FET at Varactor Diode Tuning.
- Automatic Level Control at Oscillator: Recovers a Tracking Error because an Oscillation Output is Stabilized at Low Voltage Level (350mV_{RMS}) for Varactor Diode Tuning.
- Reference Voltage Output: 5.6V Reference Voltage for Other Uses.
- Compensation for V_{CC} error: Lower gain error and distortion over 7.5V to 16.0V.
- Lower Ripple Voltage: Less Modulation of Carrier by Supply Voltage Ripples.
- Low Pop Noise: Of Time Constant of AGC at V_{CC} On and Mode Switch On.

Absolute Maximum Ratings: (T_A = +25°C unless otherwise specified)

Maximum Supply Voltage (Pin7, Pin13), V _{CCmax}	16V
Maximum Output Voltage (Pin5), V _{O5}	17V
Maximum Output Voltage (Pin8, Pin11), V _{O8} , V _{O11}	24V
Maximum Input Voltage (Pin2), V _{Imax}	5.6V
Maximum Supply Current (Pin5, Pin7, Pin8, Pin11, Pin13 summed), I _{CCmax}	35mA
Maximum Flow Out Current (Pin3), I ₃	6mA
Allowable Power Dissipation (T _A ≤ +45°C) , P _{dmax}	520mW
Operating Temperature Range, T _{opg}	-20° to +70°C
Storage Temperature Range, T _{stg}	-40° to +125°C

Recommended Operation Condition: ($T_A = +25^\circ\text{C}$ unless otherwise specified)Supply Voltage, V_{CC} 7.5 to 14.0V**Electrical Characteristics:** ($T_A = +25^\circ\text{C}$, $V_{CC} = 8\text{V}$, $f_r = 1\text{MHz}$, $f_m = 400\text{Hz}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Current Dissipation	I_{CC}	Quiescent	12.5	18.0	24.5	mA
		120dBu input	14.0	20.0	26.5	mA
Detector Output	V_O	24dBu input, 30% mod.	-31.0	-26.5	-22.0	dBu
		74dBu input, 30% mod.	-18.0	-15.5	-12.0	dBu
Signal-to-Noise Ratio	S/N	24dBu input, 30% mod.	16	20	-	dB
		74dBu input, 30% mod.	46	50	-	dB
Total Harmonic Distortion	THD	74dBu input, 30% mod.	-	0.35	1.0	%
		74dBu input, 80% mod.	-	0.35	1.5	%
		120dBu input, 30% mod.	-	0.35	2.0	%
RF AGC Voltage for Reference	V_{16}	Quiescent	5.2	5.6	5.9	V
Signal-to-Noise Ratio	S/N	35dBu input, 30% mod.	-	31	-	dB
Total Harmonic Distortion	THD	128dBu input, 80% mod.	-	0.58	-	%
Detector Output Drift	ΔV_O	(120dBu)/ v_o (74dBu)	-	0.4	-	dB
Bandwidth		6dB width, 15dBu input 30% mod.	-	7	-	kHz
		60dB width, 15dBu input 30% mod.	-	30	-	kHz
Selectivity (1 signal)	ACA	$\pm 10\text{kHz}$ off tuning, 15dBu input, 30% mod.	-	40	-	dB
Ripple Rejection Ratio		100dBu input, IF V_{CC} (Pin13) Ripple Level 50Hz - 15dBm	-	40.5	-	dB
Local Oscillation Voltage	V_{OSC}		-	350	-	mV_{rms}
Local Osc Drift	ΔV_{OSC}	V_{OSCL} (515kHz) - V_{OSCH} (1660kHz)	-	20	-	mV_{rms}
Whistle, 2 fitweet		74dBu input, 400Hz beat max.	-	-33	-	dB
RF AGC Voltage	V_{16}	120dBu input	-	1	-	V
RF Output Voltage	V_{ORF}	100dBu input, $\pm 10\text{kHz}$	-	300	-	mV_{rms}
IF Rejection Ratio		$f_r = 600\text{kHz}$, 15dBu input	-	91.5	-	dB
Image Rejection Ratio		$f_r = 1400\text{kHz}$, 15dBu input	-	70.5	-	dB

Pin Connection Diagram
(Front View)



