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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 ($T_A \leq$ +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°C unless otherwise specified)
Supply Voltage, V_{CC} . . . . . 7.5 to 14.0V

Electrical Characteristics: (T_A = +25°C, V_{CC} = 8V, f_r = 1MHz, f_m = 400Hz 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	±10kHz 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, ±10kHz	–	300	–	mV_{rms}
IF Rejection Ratio		f_r = 600kHz, 15dBu input	–	91.5	–	dB
Image Rejection Ratio		f_r = 1400kHz, 15dBu input	–	70.5	–	dB

Pin Connection Diagram
(Front View)





