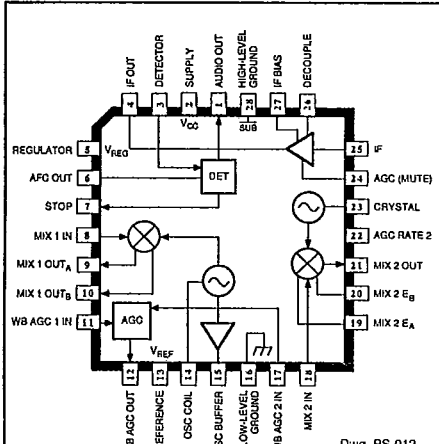


T-77-05-05

3847

DUAL-CONVERSION AM RECEIVER



Dwg. PS-012

Providing the AM signal processing functions for an electronically tuned AM receiver (ETR), the ULN3847EP includes two balanced mixers, a crystal local oscillator, an L/C-tuned local oscillator, oscillator buffer, IF amplifier, AM detector, scan control detectors, and a switchable voltage regulator. This dual-conversion device mixes the incoming RF up to a first IF of 10.7 MHz, then down to 450 kHz, and then detects the audio. The addition of a JFET matched to a whip antenna, RF low-pass filter, IF selectivity, and audio stages gives a complete AM radio which can be used in automotive receivers. The frequency-detecting stop circuit is also capable of recovering narrow-band FM, making it useful for scanners or weatherband radio applications.

The ULN3847EP has a greatly improved stop detection system over other existing devices. It uses the dual criteria of frequency and amplitude for establishing a valid stop. Tuning accuracy (frequency criteria) is established by evaluating phase shift across the detector coil. The circuitry is similar to that used in FM discriminators. Since this detection system is phase operated, it remains effective even in the presence of strong signals, which can cause false stops in systems using narrow-band filters. The amplitude criterion for stop is determined by evaluating the IF level. It includes a unique circuit that removes the effect of the AGC action. This allows the AGC tuning components to be selected for low-frequency audio performance without compromising scanning speed.

This AM signal processor is packaged in a 28-lead plastic leaded chip carrier (PLCC) for surface-mount applications and is rated for operation over the temperature range of -40°C to +85°C.

FEATURES

- Low Noise Figure
- Balanced Mixers
- Buffered Oscillators
- Very Effective Stop Detector
- Dual Wide-Band AGC
- Delayed AGC
- Narrow-Band FM Output
- 6.5 V to 12 V Operating Range

APPLICATIONS

- Automobile Radios
- High-Quality Home Entertainment Receivers

ABSOLUTE MAXIMUM RATINGS

Supply Voltage, V_{CC}	12 V
Package Power Dissipation, P_D	1.2 W
Operating Temperature Range, T_A	-40°C to +85°C
Storage Temperature Range, T_S	-65°C to +150°C

Always order by complete part number: **ULN3847EP**.

3847
DUAL-CONVERSION AMPLIFIER

T-77-05-05

ELECTRICAL CHARACTERISTICS at $T_A = +25^\circ\text{C}$, $V_{CC} = 10\text{ V}$

Characteristic	Symbol	Test Conditions	Limits			
			Min.	Typ.	Max.	Units
Supply Current	I_{CC}	$I_2, V_{in} = 0$	—	45	65	mA
Sensitivity	V_{in}	$V_{out} = 50\text{ mV}$	—	6.0	—	μV
Recovered Audio	V_{out}	$V_{in} = 1\text{ mV}$	200	250	—	mV
Total Harmonic Dist.	THD	$V_{in} = 1\text{ mV}$, Mod = 80%	—	0.4	1.5	%
Oscillator Output	V_o	V_{15}	180	300	—	mV
Stop Output Voltage	V_{STP}	$V_7, V_{in} = 0$	—	4.8	—	V
		$V_7, V_{in} = 1\text{ mV}$	—	0.05	—	V
Stop Sensitivity	V_{stp}	$V_{11} = 2.5\text{ V}$, Mod = 0%	—	100	—	μV
Stop Bandwidth	BW_{STP}	$V_{in} = 1\text{ mV}$, $V_{11} = 1.5\text{ V}$, Mod = 0%	—	10.2	—	kHz
Wide-Band AGC	V_{AGC}	$V_{in} = 0$	—	7.5	—	V
		$V_{in} = 18\text{ mV}$	—	6.5	—	V
		$V_{in} = 60\text{ mV}$	—	1.0	—	V
Overload	V_{in}	$V_{out} = 10\%$ THD, Mod = 80%	—	200	—	mV
-3dB Limiting	V_{in}	Mod = 3 kHz peak deviation	—	12	—	μV
FM Recovered Audio	V_{out}	V_6 , Mod = 3 kHz peak deviation	—	380	—	mV
Signal to Noise Ratio	S+N/N	$V_{in} = 250\text{ }\mu\text{V}$	—	50	—	dB
		$V_{in} = 10\text{ mV}$	—	60	—	dB
AGC Figure of Merit	FOM	Ref. at $V_{in} = 5\text{ mV}$, V_{in} or $V_{out} = -10\text{ dB}$	—	20	—	μV
Regulator Voltage	V_{REG}	V_5	—	5.1	—	V
		$V_5, V_{24} = 0$ (Muted)	—	0	0.2	V
Reference Voltage	V_{REF}	V_{13}	—	3.7	—	V