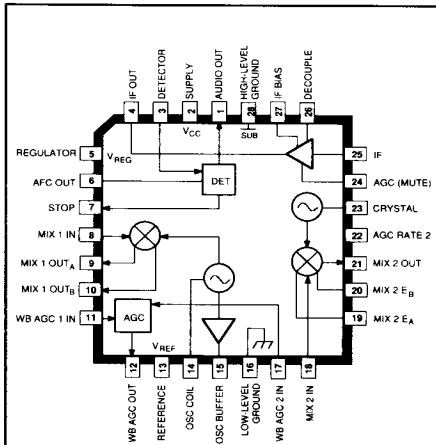


# 3844

## DUAL-CONVERSION AM RECEIVER



Dwg. No. PS-012

### 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

Providing the AM signal processing functions for an electronically tuned AM receiver (ETR), the A3844EEP 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 weather band radio applications.

The A3844EEP 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 criterion) 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. The A3844EEP is an improved, direct replacement for the ULN3847EP.

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. Devices for operation over a temperature range of -40°C to +105°C are available on special order.

### FEATURES

- Low Noise Figure
- High Dynamic Range First Mixer
- Balanced Mixers
- Buffered Oscillators
- Very Effective Stop Detector
- Dual Wide-Band AGC
- Delayed AGC
- Narrow-Band FM Output
- Full-Wave Detector
- Low Temperature Drift
- 6.5 V to 12 V Operating Range

### APPLICATIONS

- Automobile Radios
- High-Quality Home Entertainment Receivers
- World-Band Receivers
- CB Transceivers

Always order by complete part number: **A3844EEP**.

# 3844

## DUAL-CONVERSION AM RECEIVER

**ELECTRICAL CHARACTERISTICS at  $T_A = +25^\circ\text{C}$ ,  $V_{CC} = 10\text{ V}$ ,  $f_o = 1\text{ MHz}$ ,  $f_{if1} = 10.7\text{ MHz}$ ,  $f_{if2} = 450\text{ kHz}$ ,  $f_m = 1\text{ kHz}$**

Characteristic	Symbol	Test Conditions	Limits			
			Min.	Typ.	Max.	Units
Supply Current	$I_{CC}$	$I_2, V_{in} = 0$	—	50	65	mA
		$I_2, V_{in} = 0, V_{24} = 0$ (Muted)	—	3.0	—	mA
Sensitivity	$V_{in}$	$V_{out} = 50\text{ mV}$	—	6.0	—	$\mu\text{V}$
Usable Sensitivity	$V_{in}$	$S + N/N = 20\text{ dB}$	—	14	—	$\mu\text{V}$
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	$V_o$	$V_{15}$	—	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	—	$\mu\text{V}$
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
		First Mixer	—	450	—	mV
-3dB Limiting	$V_{in}$	Mod = 3 kHz peak deviation	—	12	—	$\mu\text{V}$
IF Output Voltage	$V_{out}$	$V_{in} = 1\text{ mV}$	—	197	—	mV
FM Recovered Audio	$V_{out}$	$V_6$ , Mod = 3 kHz peak deviation	—	380	—	mV
Signal to Noise Ratio	S+N/N	$V_{in} = 1\text{ mV}$	—	55	—	dB
		$V_{in} = 10\text{ mV}$	—	60	—	dB
AGC Figure of Merit	FOM	Ref. at $V_{in} = 5\text{ mV}$ , $V_{in}$ or $V_{out} = -10\text{ dB}$	—	30	—	$\mu\text{V}$
Regulator Voltage	$V_{REG}$	$V_5$	—	5.1	—	V
		$V_5, V_{24} = 0$ (Muted)	—	0	0.2	V
Reference Voltage	$V_{REF}$	$V_{13}$	—	3.5	—	V