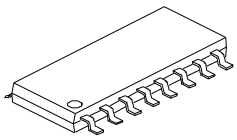
AUTO SEARCH TUNING FM RADIO RECEIVER

DESCRIPTION

The SC1088 is a bipolar integrated circuit for use in mono portable and pocket radios. It is used when a minimum of peripheral components (of small dimensions and low costs) is important. The circuit contains a frequency-locked-loop(FLL) system with an intermediate frequency(IF) of about 70kHz. Selectivity is achieved by active RC-filters. De-tuning related to the IF and too weak input signal is suppressed by the mute circuit.



SOP-16-225-1.27

FEATURES

* Equipped with all stages of a mono receiver from antenna to audio output.
* Mute Circuit
* Search tuning with a single varicap diode
* Mechanical tuning with integrating AFC
* AM application supported
* Power supply polarity protection
* Power supply voltage down to 1.8V

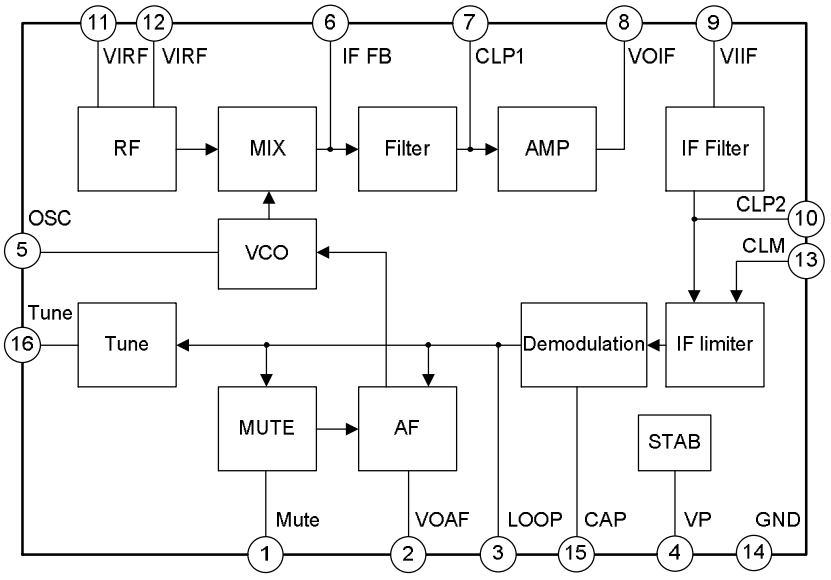
ORDERING INFORMATION

Part No.	Package
SC1088	SOP-16-225-1.27

APPLICATION

1. Mechanical tuning: This is possible with or without integrated AFC circuit
2. Electrical tuning: This is realized by one directional(band-up) search tuning facility, including RESET to the lower-band limit.

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Characteristics	Symbol	Value	Unit
Supply Voltage	Vp	5	V
Operating Temperature	Tamb	-10 ~ +70	°C
Storage Temperature	Tstg	-55 ~ +150	°C

DC ELECTRICAL CHARACTERISTICS (Tamb=25°C, Vp=3V, Unless otherwise specified)

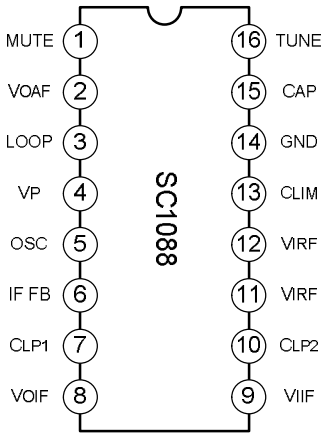
Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Supply Voltage(pin 4)	Vp		1.8	3.0	5.0	V
Supply Current(Pin 4)	Icc		4.2	5.2	6.6	mA
DC Voltage of Pin 1	V1		2.50	2.55	2.60	V
DC Voltage of Pin 3	V3		2.64	2.69	2.74	V
DC Voltage of Pin 6 and 7	V6,7		2.38	2.44	2.50	V
DC Voltage of Pin 8	V8		1.60	1.67	1.74	V
DC Voltage of Pin 9,10 and 13	V9,10,13		2.42	2.47	2.52	V
DC Voltage of Pin 11 and 12	V11,12		0.91	0.94	0.98	V
DC Voltage of Pin 15	V15		2.06	2.12	2.18	V
AF Output Current on Pin 2	I2		45	60	80	μA
Oscillator Current on Pin 5	I5		275	375	500	μA

AC ELECTRICAL CHARACTERISTICS

Tamb=25°C, Vp=3V, Firf=96MHz modulated with Δf=±22.5kHz and fm=1kHz deviation; EMF=0.3mV(e.m.f. at a source impedance of 75Ω),and measurement taken in fig.2 Unless otherwise specified

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
RF Sensitivity input voltage	Vi(rms)	VoAF=-3dB;VoAF=0dB at Vi=1mV;see Fig. 1				
		Mute OFF		3	6	μV
		Mute ON	3	6	12	μV
		(S+N)/N=26dB		5	10	μV
Signal handling		THD<10%,Δf=±75kHz	100	200	—	mV
Signal-to -noise ratio	(S+N)/N	See fig.1	52	56	—	dB
Total Harmonic distortion	THD	Δf=±22.5kHz	—	1	1.4	%
		Δf=±75kHz		2.4	3.3	%
AM suppression of output voltage	AMS	FM: 1kHz; ±75kHz AM: 1kHz; MOD=80%	47	52		dB
Ripple rejection	RR	ΔVp=100mVrms,f=1kHz	7	10		dB
Audio output signal	Vo(rms)	RL=22kΩ	60	85	120	mV
Search Tuning(with V101 and C16=0.1μF) See Fig.4						
Minimum output voltage on pin 16	V16	Limiting point		Vp-1.85		V
Tuning steepness	ΔV/Δt	Voltage at pin 16	95	210	420	mV/sec
Oscillator steepness	Δfosc/Δ t		1.25	2.83	5.6	MHz/sec
AFC steepness	ΔIAFC/ΔV3	Voltage at pin 3	4.75	9.5	19	μs

PIN CONFIGURATIONS



PIN DESCRIPTIONS

Pin No.	Symbol	I/O	Pin Description
1	MUTE	O	Mute output
2	VOAF	O	Audio frequency output signal
3	LOOP	O	AF loop filter
4	Vp	--	Supply voltage
5	OSC	I	Oscillator resonate circuit
6	IF FB	I/O	IF feedback
7	CLP1	I/O	Low-pass capacitor of 1dB amplifier
8	VOIF	O	IF output to external coupling capacitor(high-pass)
9	ViIF	I	IF input to limiter amplifier
10	CLP2	I/O	Low-pass capacitor of IF limiter amplifier
11	VIRF	I	Radio frequency input
12	VIRF	I	Radio frequency input
13	CLIM	O	Limiter offset voltage capacitor
14	GND	--	Ground
15	CAP	O	All-pass filter capacitor. input for search tuning
16	TUNE	O	Electrical tuning/AFC output

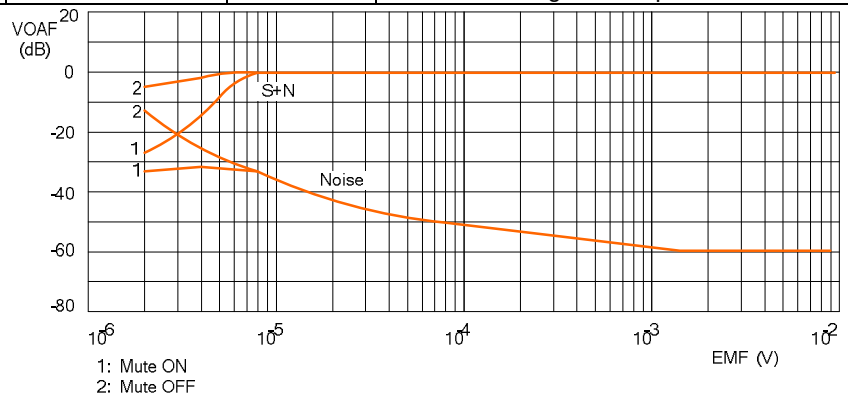


Fig. 1 Input sensitivity

TEST AND APPLICATION CIRCUIT

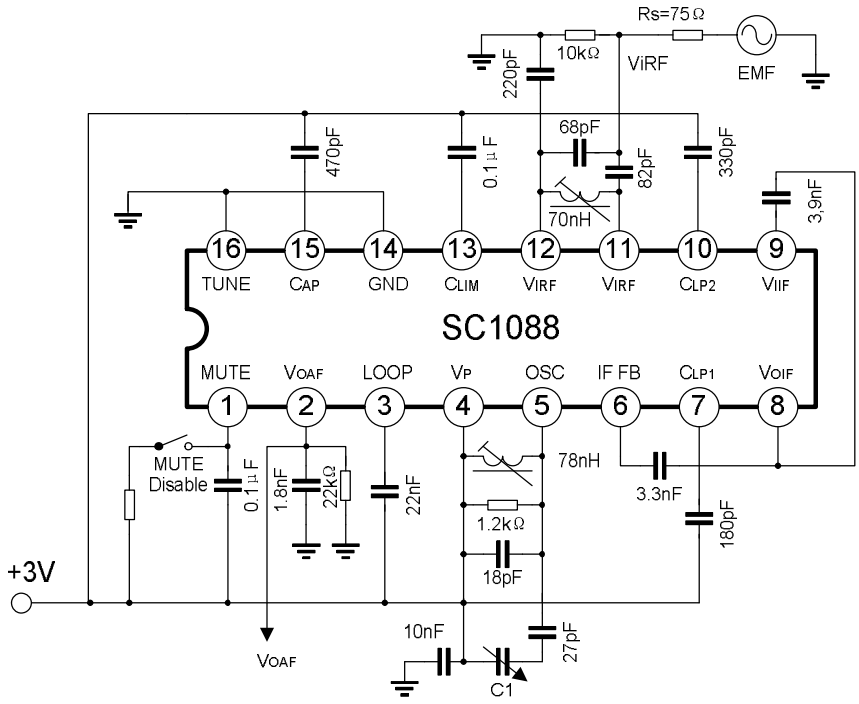


Fig. 2 Test circuit and application for mechanical tuning

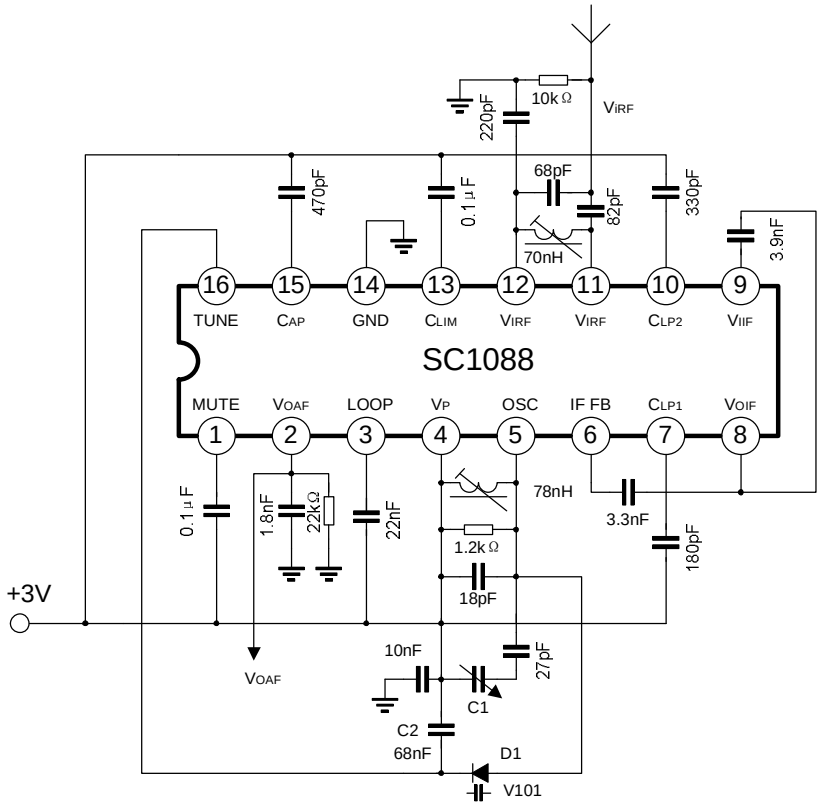


Fig. 3 Application circuit with AFC for mechanical tuning

TEST AND APPLICATION CIRCUIT (Continued)

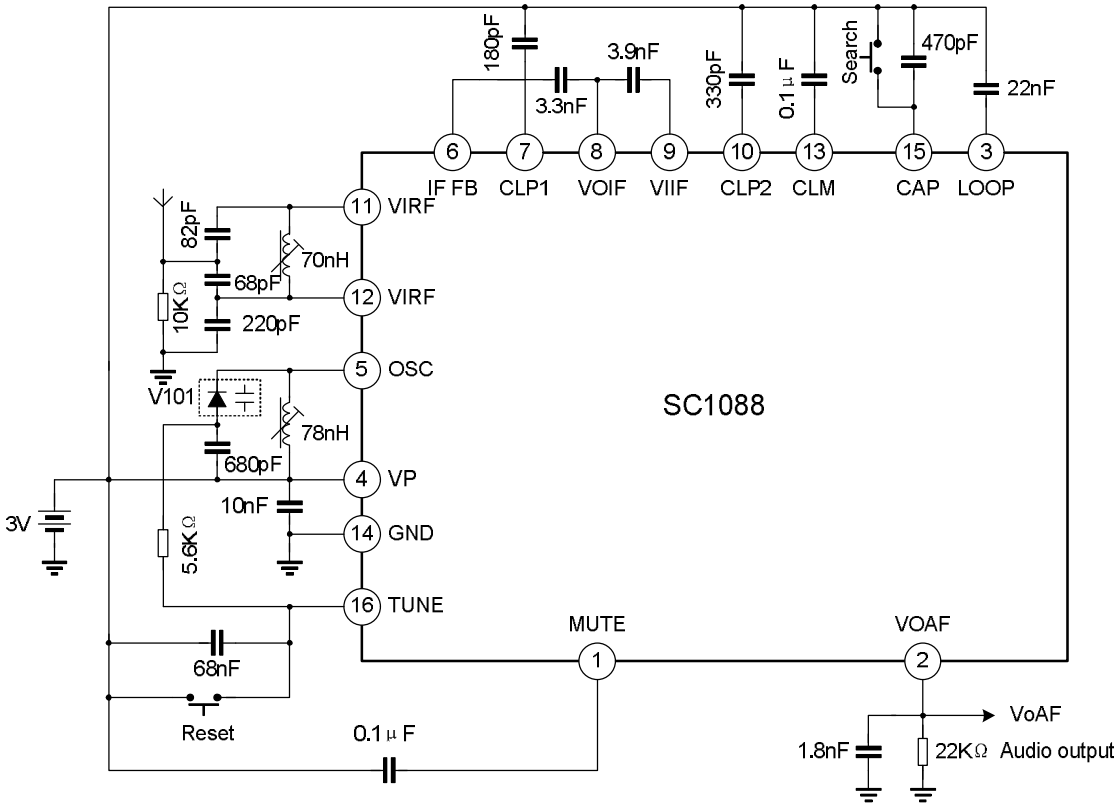


Fig.4 audio search tuning FM application circuit

TEST AND APPLICATION CIRCUIT (Continued)

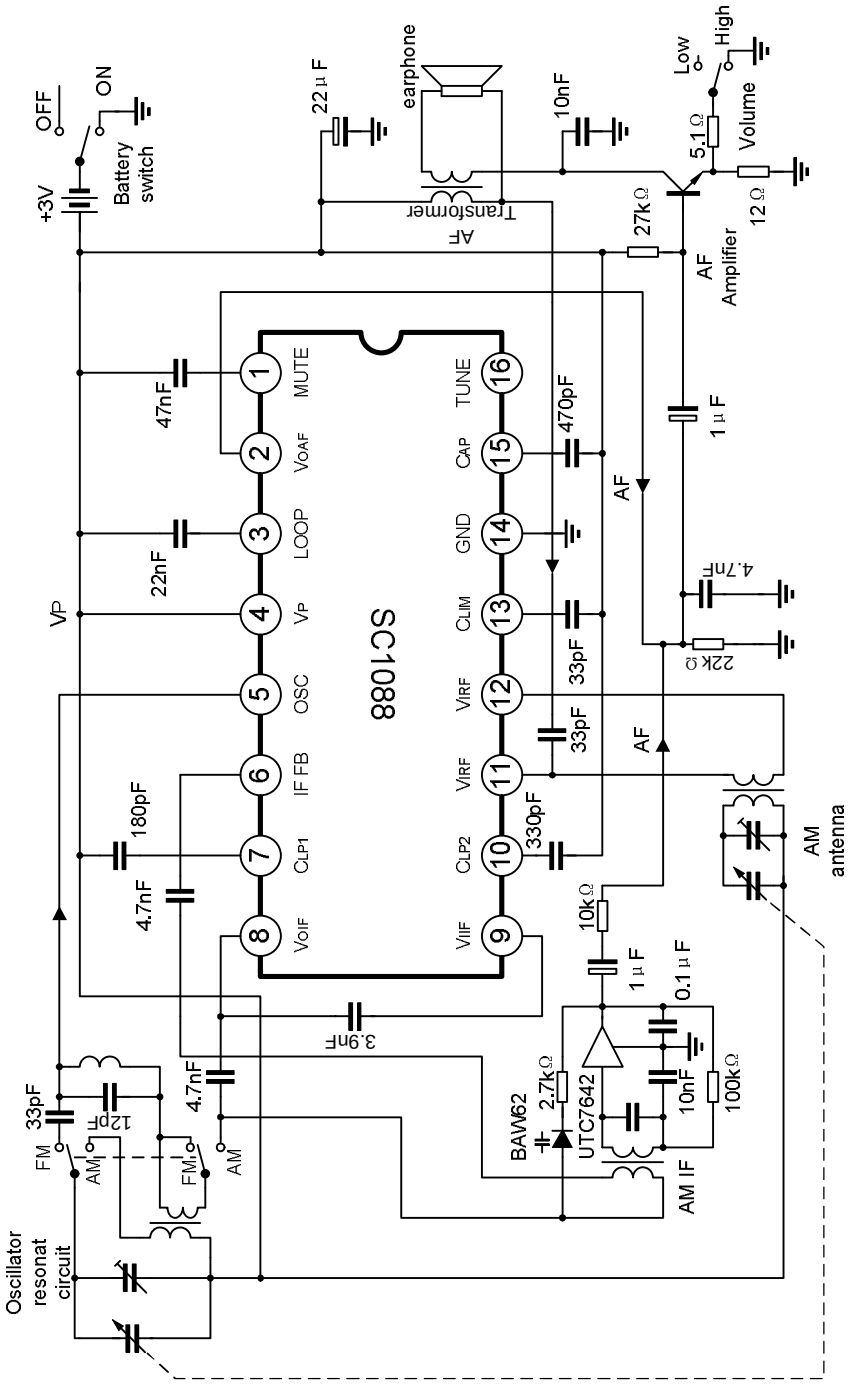
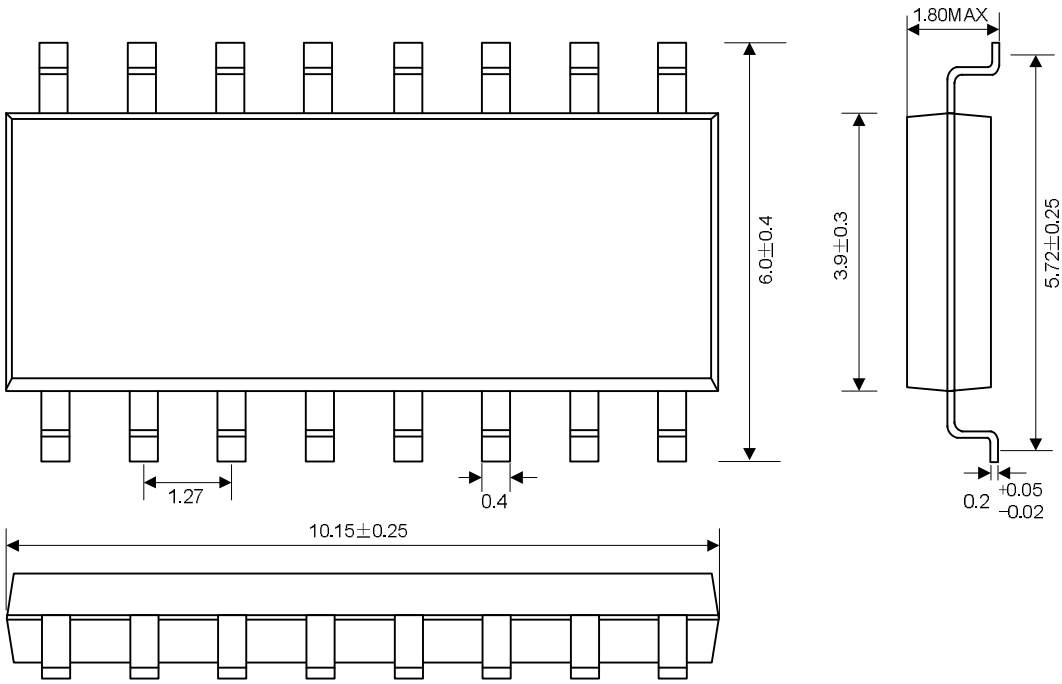


Fig.5 AM application circuit

PACKAGE OUTLINE

SOP-16-225-1.27 UNIT: mm



HANDLING MOS DEVICES:

Electrostatic charges can exist in many things. All of our MOS devices are internally protected against electrostatic discharge but they can be damaged if the following precautions are not taken:

- Persons at a work bench should be earthed via a wrist strap.
- Equipment cases should be earthed.
- All tools used during assembly, including soldering tools and solder baths, must be earthed.
- MOS devices should be packed for dispatch in antistatic/conductive containers.