AN7208SA

TV/FM front-end IC for 1.5 V headphone stereo

■ Overview

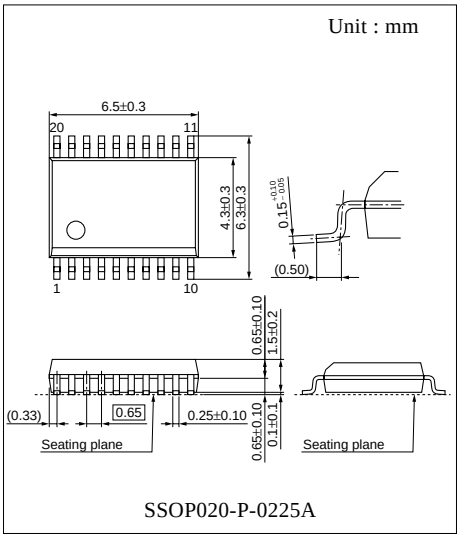
The AN7208SA is a TV/ FM front-end IC developed for use in the headphone stereo. It incorporates two systems of FM and VHF band front-end. A pre-amp. between IF amp. is not necessary by combination with the AN7233SH.

■ Features

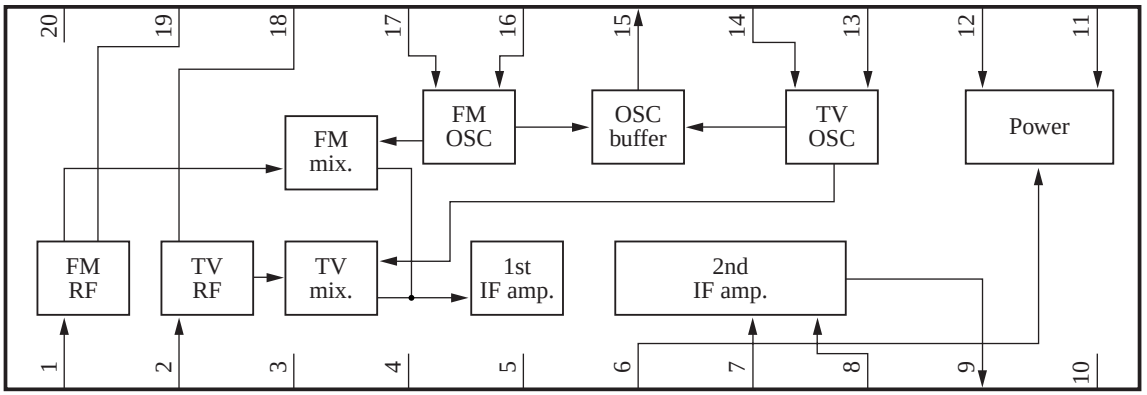
- Built-in two system of FM and VHF band front-end
- Pre-amp. between IF amp. is not necessary (combination with the AN7233SH)
- Built-in standby /IF gain control/local oscillator buffer circuits

■ Applications

- 1.5 V headphone stereo (V_{CC} 1.0 V to 2.0 V)



■ Block Diagram



■ Pin Descriptions

Pin No.	Description	Pin No.	Description
1	FM RF input	11	V_{CC2}
2	TV RF input	12	STDBY
3	GND 1	13	TV OSC 1
4	N.C.	14	TV OSC 2
5	IF out 1	15	OSC buff.
6	Mode SW	16	FM OSC 1
7	IF in	17	FM OSC 2
8	IF gain control	18	TV RF
9	IF out 2	19	FM RF
10	GND 2	20	V_{CC1}

■ Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply voltage	V_{CC}	2.5	V
Supply current	I_{CC}	12	mA
Power dissipation	P_D	30	mW
Operating ambient temperature *1	T_{opr}	–20 to +75	°C
Storage temperature *1	T_{stg}	–55 to +125	°C

Note) ∗1 : All items are at T_a = 25°C, except for the operating ambient temperature and storage temperature.

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	1.0 to 2.0	V

■ Electrical Characteristics at V_{CC} = 1.2 V, T_a = 25°C

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
TV f_{IN} = 221.75 MHz						
Conversion gain *1	$G_{CONV(TV)}$	f_{OUT} = 10.6 MHz	30	38	46	dB
Oscillation voltage	$V_{OSC(TV)}$	V_{CC} = 0.95 V	15	27	—	mV[rms]
S/N *2	$S/N_{(TV)}$	Input level = 60 dBμ 1 kHz 30% Mod.	41	44	—	dB
Quiescent current	$I_{TOT(TV)}$	—	—	8.8	12	mA
Oscillation buffer output	$V_{BUF(TV)}$	V_{CC} = 0.95 V	39	62	—	mV[rms]

Note) Tuning is taken the peak point at 10.6 MHz output level (V_{IN} = 30 dBμ, non-modulation)

∗1 : Conversion gain = 20 Log(ΔV (μV) ÷ 31.6)

ΔV is the output difference at V_{IN} = 30 dBμ and at V_{IN} = 36 dBμ

∗2 : Measurement is done at the detection output of the AN7233

Measure the ratio of output at f_{DIV} = 22.5 kHz to that at f_{DIV} = 0 Hz (modulation freq. 1 kHz)

■ Electrical Characteristics at V_{CC} = 1.2 V, T_a = 25°C (continued)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
TV f_{IN} = 221.75 MHz (continued)						
Burst noise *3	$V_{NO(TV)}$	Input level = 60 dBμ Non-modulation	−1.8	—	1.8	mV[p-0]
FM f_{IN} = 107.88 MHz						
Conversion gain *1	$G_{CONV(FM)}$	f_{OUT} = 10.6 MHz	30	38	46	dB
Oscillation voltage	$V_{OSC(FM)}$	V_{CC} = 0.95 V	40	63	—	mV[rms]
S/N *2	$S/N_{(FM)}$	Input level = 60 dBμ 1 kHz 30% mod.	48	51	—	dB
Quiescent current	$I_{TOT(FM)}$	—	—	7.7	10	mA
Oscillation buffer output	$V_{BUF(FM)}$	V_{CC} = 0.95 V	66	132	—	mV[rms]
Burst noise *3	$V_{NO(FM)}$	Input level = 60 dBμ Non-modulation	−1.8	—	1.8	mV[p-0]

Note) Tuning is taken the peak point at 10.6 MHz output level (V_{IN} = 30 dBμ, non-modulation)

∗1 : Conversion gain = 20 Log(ΔV (μV) ÷ 31.6)

ΔV is the output difference at V_{IN} = 30 dBμ and at V_{IN} = 36 dBμ

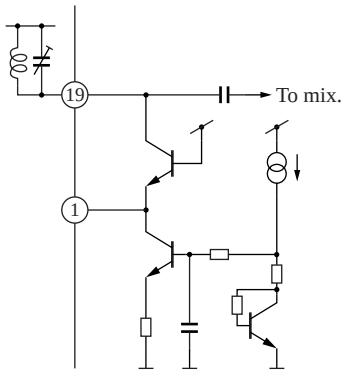
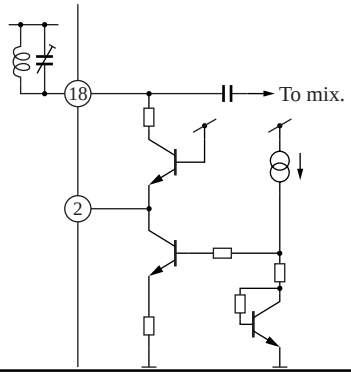
∗2 : Measurement is done at the detection output of the AN7233

Measure the ratio of output at f_{DIV} = 22.5 kHz to that at f_{DIV} = 0 Hz (modulation freq. 1 kHz)

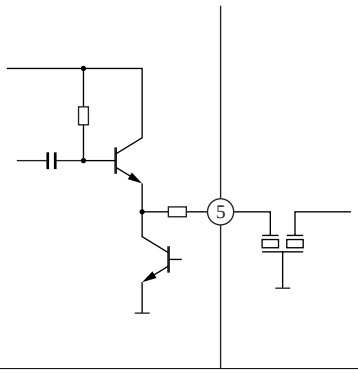
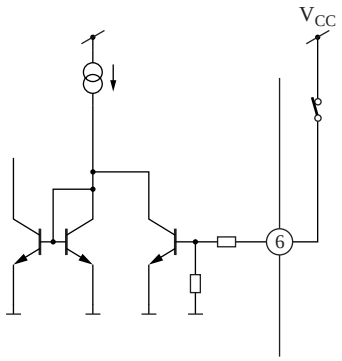
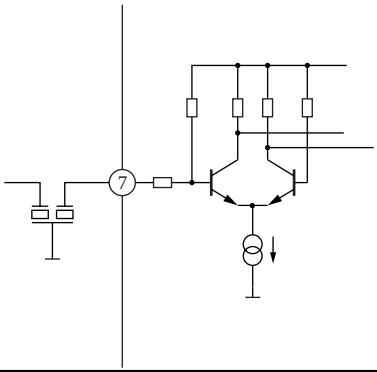
∗3 : Measurement is done at the detection output of the AN7233

Measures a peak voltage of the measurement time = within 500 ms (OK to 10 times)

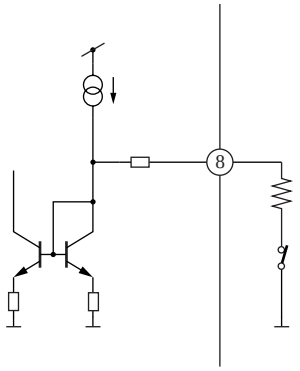
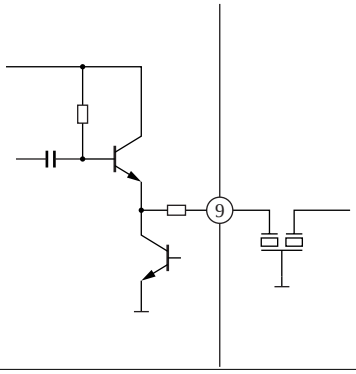
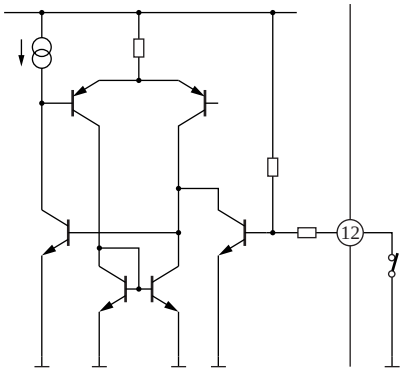
■ Terminal Equivalent Circuits

Pin No.	Equivalent circuit	Description	Input resistance or pin voltage
1		FM RF input RF signal input in FM band (Common base type)	Approx. V_{CC} − 0.7 V
2		TV RF input RF signal input in TV band (Common base type)	Approx. V_{CC} − 0.7 V

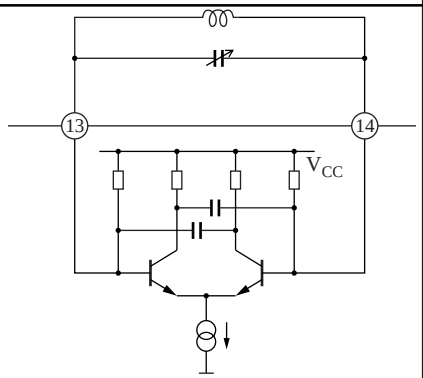
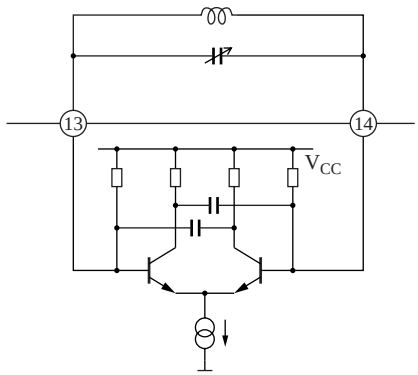
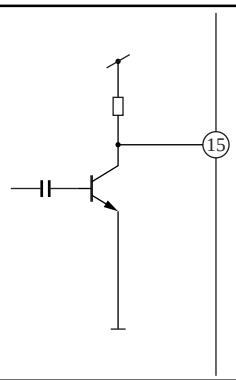
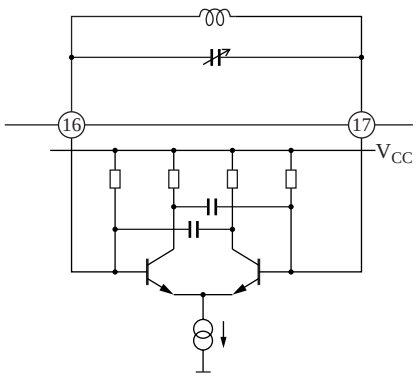
■ Terminal Equivalent Circuits (continued)

Pin No.	Equivalent circuit	Description	Input resistance or pin voltage
3	—	GND 1 GND pin (RF, mix. block)	—
4	—	N.C.	—
5		IF out 1 Outputs IF signal of TV/FM	Approx. 330 Ω Approx. V_{CC} − 0.7 V
6		Mode SW Switch of band switching V_{CC} : TV mode Open/GND : FM mode	—
7		IF in IF amp. block input	Approx. 5 kΩ

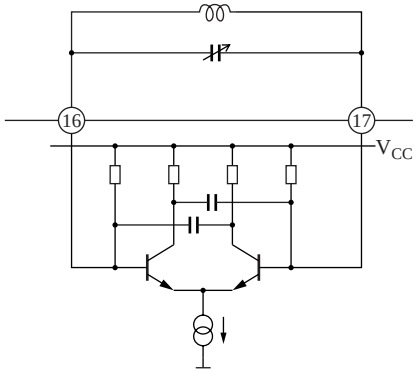
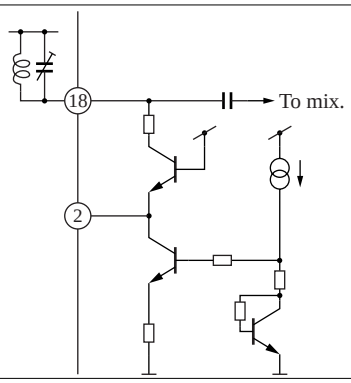
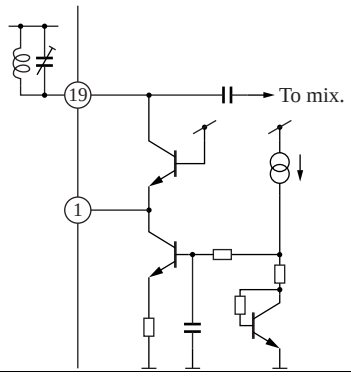
■ Terminal Equivalent Circuits (continued)

Pin No.	Equivalent circuit	Description	Input resistance or pin voltage
8		IF gain control IF amp. block gain can be decreased by inserting a resistance to GND.	Approx. 700 Ω Approx. 0.7 V
9		IF out 2 IF amp. block output	Approx. 330 Ω Approx. V_{CC} − 0.7 V
10	—	GND GND pin (IF, OSC block)	—
11	—	V_{CC2} Power supply pin (IF, OSC block)	—
12		STDBY Standby switch V_{CC} /open : IC off GND : IC operates	—

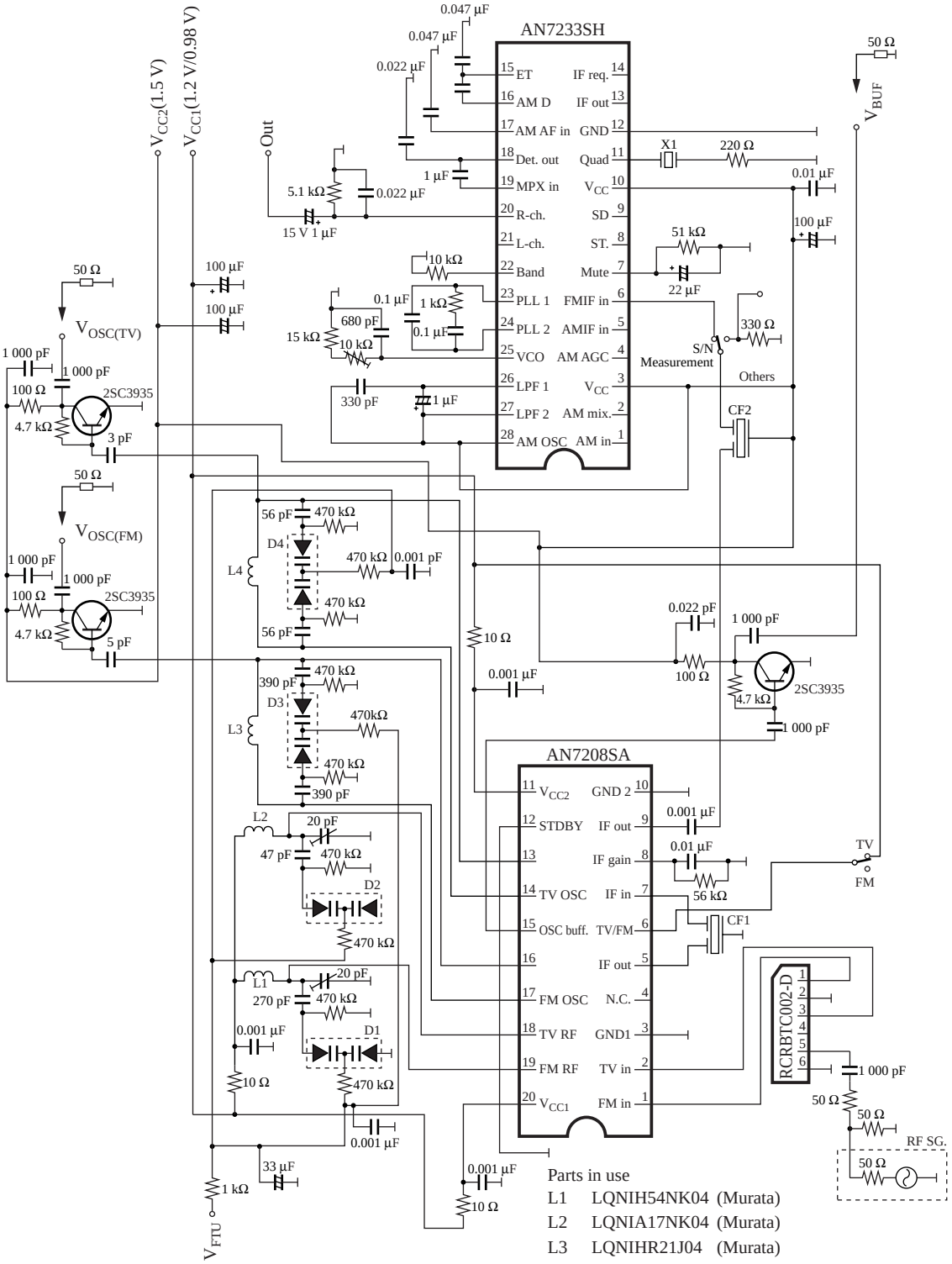
■ Terminal Equivalent Circuits (continued)

Pin No.	Equivalent circuit	Description	Input resistance or pin voltage
13		TV OSC 1 Connects a local oscillator coil of TV band	Approx. 10 kΩ Approx. V_{CC}
14		TV OSC 2 Connects a local oscillator coil of TV band	Approx. 10 kΩ Approx. V_{CC}
15		OSC buff. Oscillator buffer output pin	Approx. 150 Ω Approx. V_{CC} − 0.2 V
16		FM OSC 1 Connects a local oscillator coil of FM band	Approx. 10 kΩ Approx. V_{CC}

■ Terminal Equivalent Circuits (continued)

Pin No.	Equivalent circuit	Description	Input resistance or pin voltage
17		FM OSC 2 Connects a local oscillator coil of FM band	Approx. 10 kΩ Approx. V_{CC}
18		TV RF Connects an RF tuning coil of TV band	—
19		FM RF Connects an RF tuning coil of FM band	—
20	—	V_{CC1} Power supply pin (RF, mix.block)	—

■ Application Circuit Example



Parts in use

L1	LQNIH54NK04	(Murata)
L2	LQNIA17NK04	(Murata)
L3	LQNIHR21J04	(Murata)
L4	LQNIA33NK04	(Murata)
Vari-cap.	RVDSVC203ATX	(Sanyo)
CF1, CF2	RLFGFCWN04AL	(Murata)
X1	RLFDGC01AL	(Murata)

littlediode
COMPONENTS FOR ALL

Littlediode supplies new, hard to find or obsolete electronic components and semiconductors all over the world.

With over two million different components listed you are sure to find the part you need.

Feel free to visit us today at our online store:

LittleDiode.com

Looking forward to providing you with the best possible service.