

AN7243S

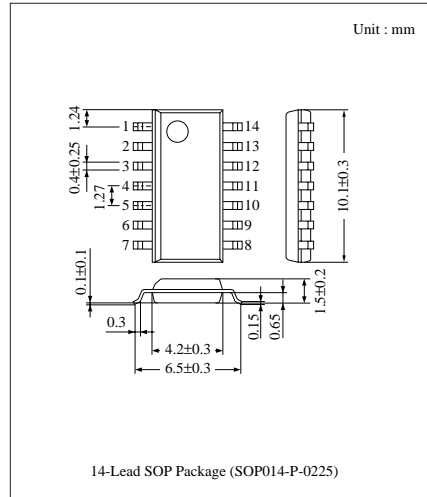
FM Front-end Circuit for Car Radio

■ Overview

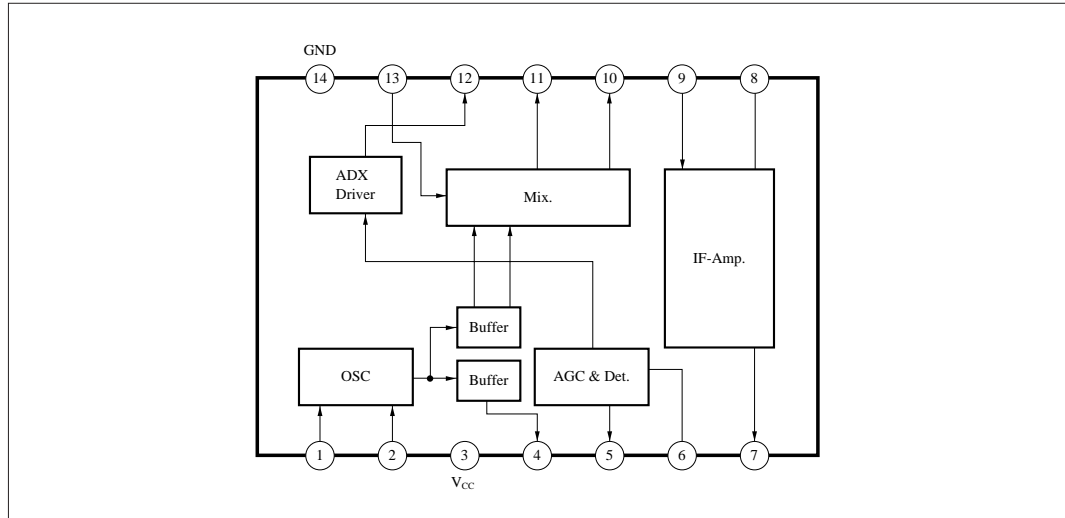
The AN7243S is an FM front-end IC designed for DTS except RF amp. of car radio. It is built-in local oscillation frequency buffer output and PIN diode (ADX) driver for antenna damping.

■ Features

- High sensitivity · High S/N ratio
- Good IM characteristics at strong input
- Timing for AGC input level is variable.
- Built-in pre-IF-Amp. having negative (positive) temperature characteristics to RF amp.



■ Block Diagram



■ Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Supply Voltage	V _{CC}	9.6	V
Supply Current	I _{CC}	50	mA
Power Dissipation	P _D	380	mW
Operating Ambient Temperature	T _{opr}	-40 ~ + 80	°C
Storage Temperature	T _{stg}	-55 ~ + 125	°C

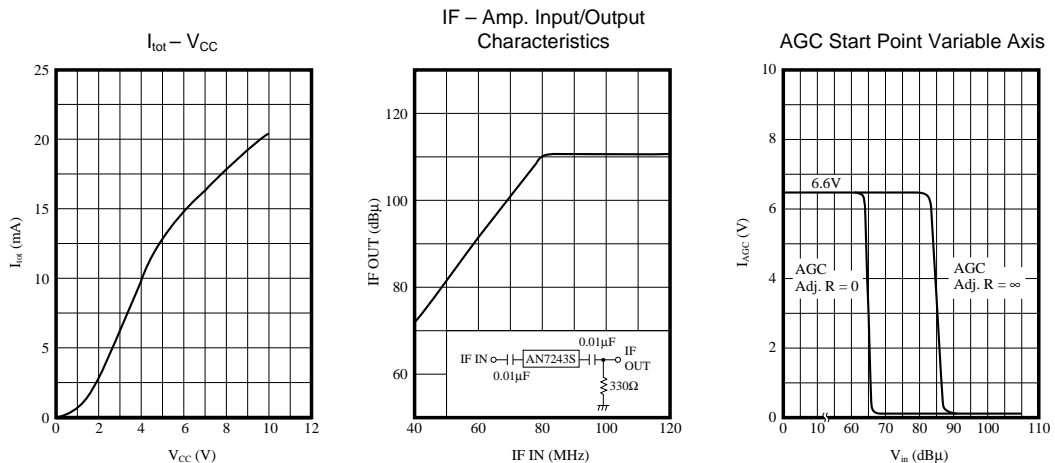
■ Recommended Operating Range (Ta=25°C)

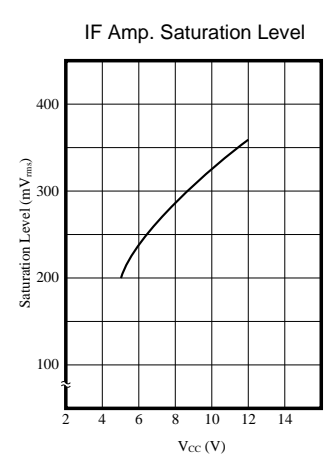
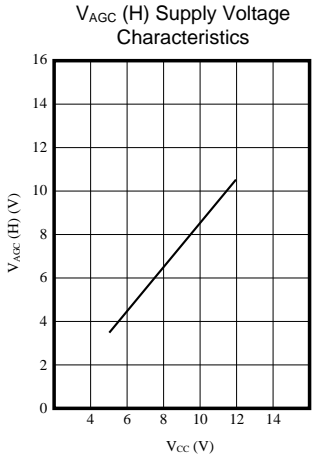
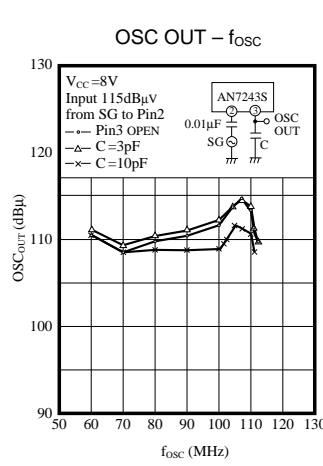
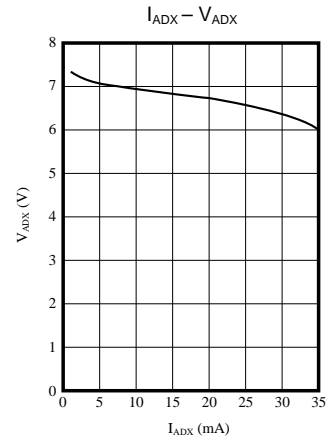
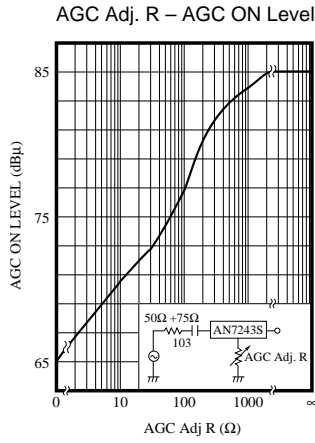
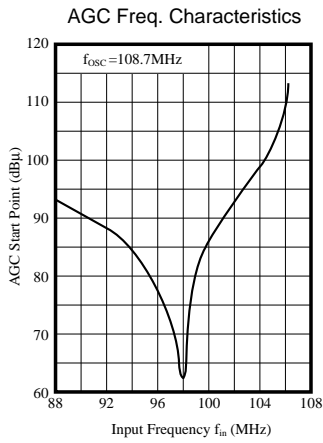
Parameter	Symbol	Range
Operating Supply Voltage Range	V _{CC}	6.5V ~ 9.6V

■ Electrical Characteristics (V_{CC} = 8V, f_{in} = 98MHz, 400Hz 30% Modulation, S₁ : Open, Ta = 25°C)

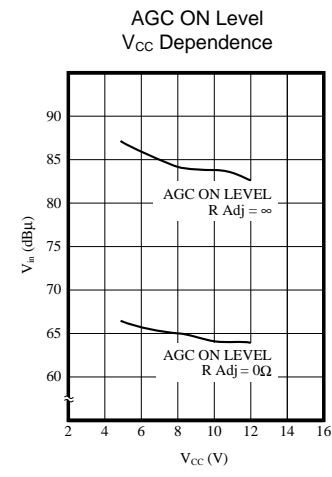
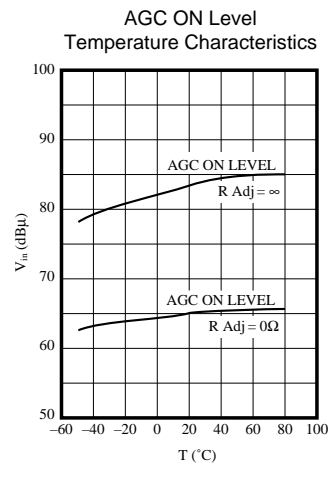
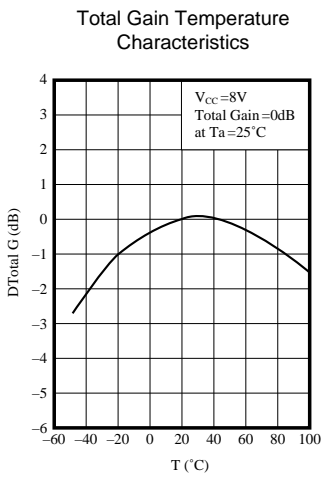
Parameter	Symbol	Condition	min.	typ.	max.	Unit
S/N Ratio	N _{OUT}	V _{in} = 17dBμ no conversion However, S = output at 400Hz 30% conversion	22	30	—	dB
Local Oscillation Output Level	V _{OSC}	f _{osc} = 108.7MHz Measured by Pin4, No signal	160	250	330	mV
IF Output Level	V _{OUT}	No modulation, V _{in} = 53dBμ	41	58	82	mV
AGC Maximum Sensitivity	S _{AGC}	Input level at V _{AGC} = 3V	60	65	70	dBμ
AGC Level (L)	V _{AGC(L)}	V _{in} = 72dBμ	—	0.02	0.5	V
AGC Level (H)	V _{AGC(H)}	V _{in} = 58dBμ	6	6.6	—	V
AGC Sensitivity Variable Range		At S ₁ ON, difference between input level at V _{AGC} = 3V and AGC maximum sensitivity	18	—	—	dB
ADX Drive Current	I _{X(max)}	V _{in} = 72dBμ	20	—	—	mA
ADX Leak Current	I _{X(leak)}	V _{in} = 63dBμ	—	—	1	μA

■ Characteristics Curve

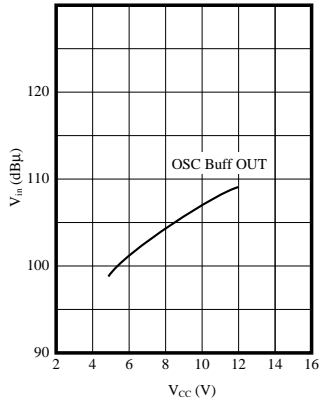




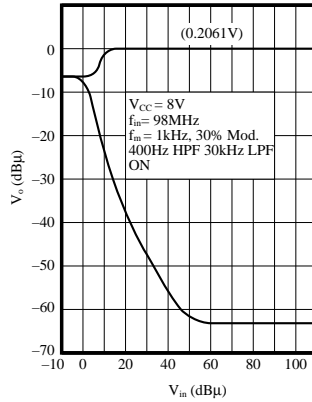
Mixer + IF Amp.



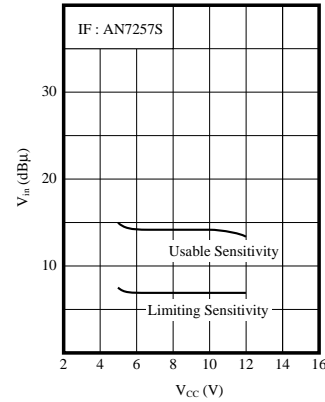
OSC Buff OUT
V_{CC} Dependence



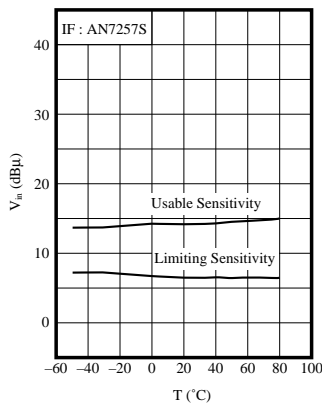
Input/Output Characteristics
Example



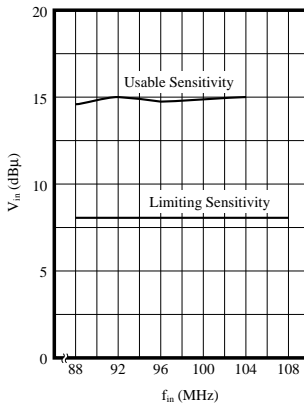
Limiting Sensitivity,
Usable Sensitivity V_{CC} Dependence



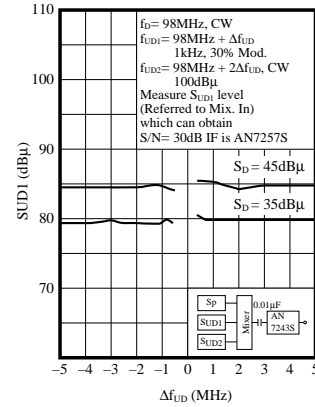
Limiting Sensitivity,
Usable Sensitivity,
Temperature Characteristics



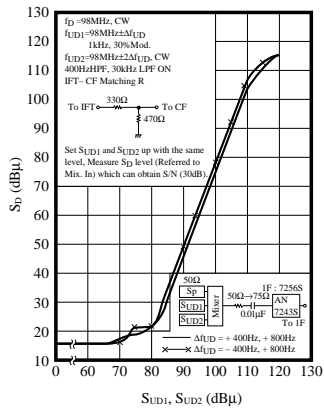
Limiting Sensitivity,
Usable Sensitivity,
Frequency Characteristics



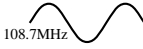
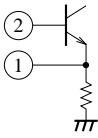
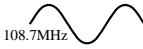
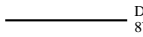

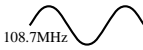
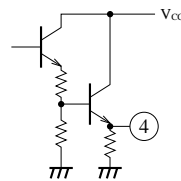
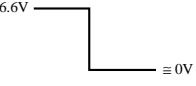
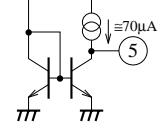
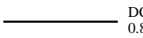
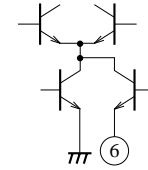
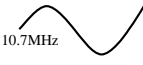
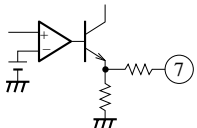
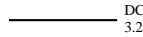
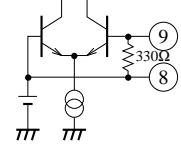
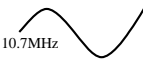
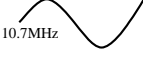
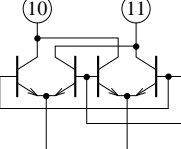
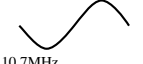
IM Characteristics (1)



IM Characteristics (2)



Pin Descriptions

Pin No.	Pin Name	Typ. Waveform	Description	Equivalent Circuit
1	Oscillation Emitter		Oscillation transistor's emitter pin	
2	Oscillation Base		Oscillation transistor's base pin	
3	V _{CC}		Main circuit V _{CC}	
4	OSC Output		Output oscillation signal to microcomputer through buffer.	
5	AGC Output		Output AGC signal according to Mix. output dimensions.	
6	AGC-Amp. Gain Adjustment		Adjust AGC-Amp. gain by external resistance. (Refer to P.275 AGC circuit.)	
7	IF Amp. Output		IF signal (10.7MHz) output pin $Z_{out} \cong 330\Omega$	
8	IF Amp. By-pass		IF amp. by-pass control	
9	IF Amp. Input		IF signal (10.7MHz) input pin	
10	Mix. Output		Convert RF signal to IF signal and output.	
11				

Note) Typical waveform frequency is the value when tuning receiving frequency to 98.0MHz.

■ Pin Descriptions (Cont.)

Pin No.	Pin Name	Typ. Waveform	Description	Equivalent Circuit
12	PIN Diode Driver Output		Drive PIN diode for input attenuate of RF-Amp. Determine drive current by Pin12 external resistance.	
13	Mix.Output		Input signal from RF Amp.	
14	GND	—	Main circuit GND	—

Note) Typical waveform frequency is the value when tuning receiving frequency 98.0 MHz.

■ Supplementary Explanation

• AGC

AGC used at the AN7243S uses mixer output (IFT primary side) signal and controls AGC output.

