

ICs for FM/AM Tuner

Panasonic

AN7280S

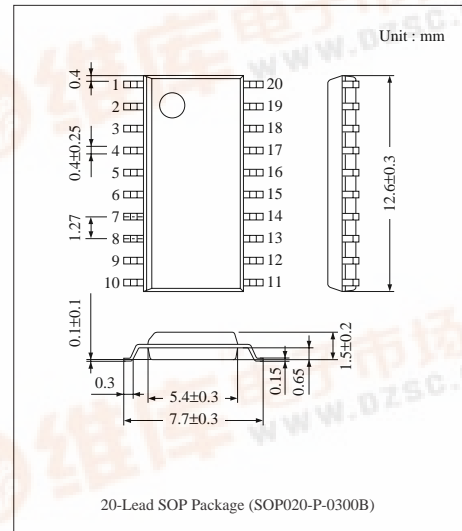
FM Front-end IC for Car Radio

Overview

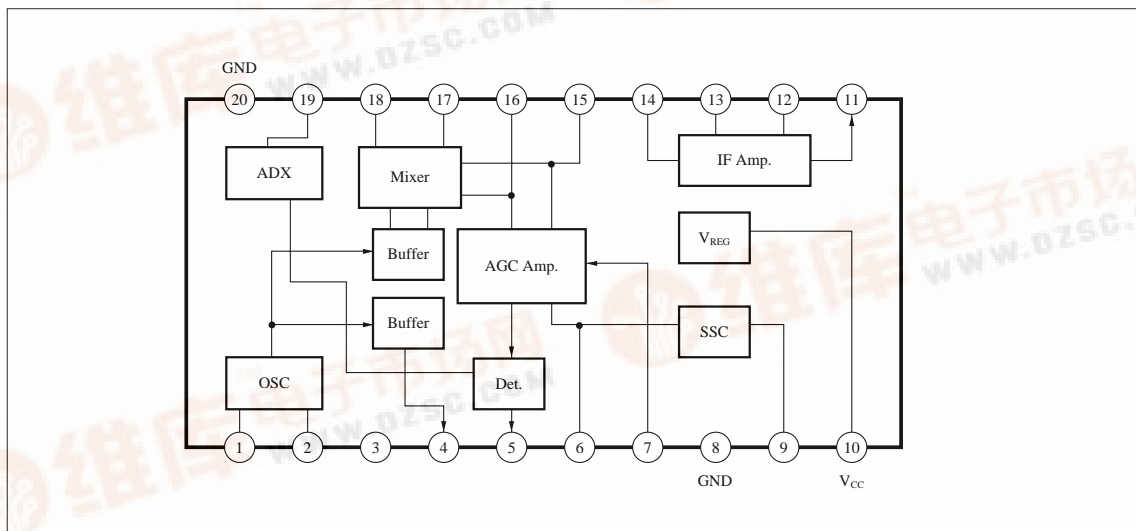
The AN7280S is an FM front-end IC designed for DTS except RF amp. of car radio. It features built-in local oscillation frequency buffer output, PIN diode driver for antenna damping and SSC (search stop control).

Features

- High sensitivity, high S/N ratio
- Good IM characteristics at strong input
- Available for two loop AGC (keyed AGC)
- Pre IF amp. gain variable
- PIN diode driver (ADX) built-in



Block Diagram



■ Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Supply Voltage	V _{CC}	9.2	V
Supply Current	I _{CC}	50	mA
Power Dissipation	P _D	460	mW
Operating Ambient Temperature	T _{opr}	-40 ~ + 85	°C
Storage Temperature	T _{stg}	-55 ~ + 150	°C

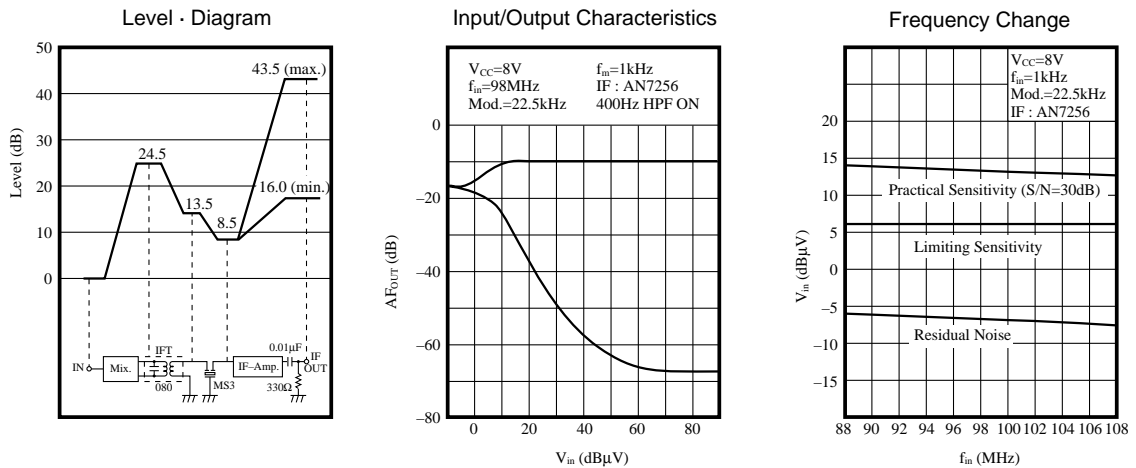
■ Recommended Operating Range (Ta=25°C)

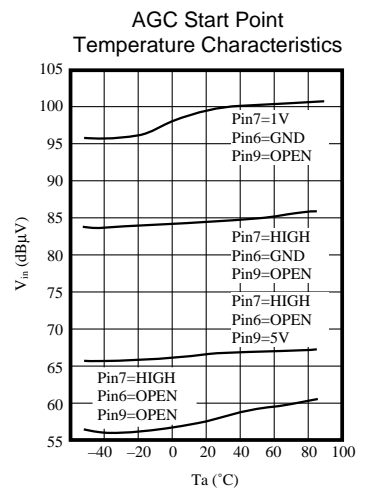
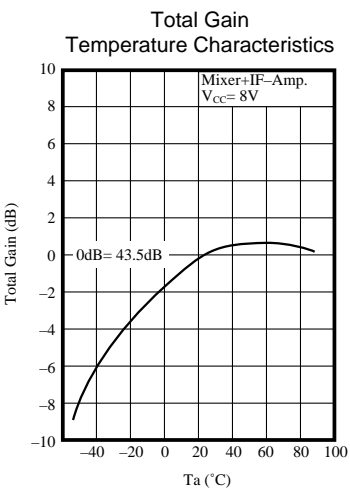
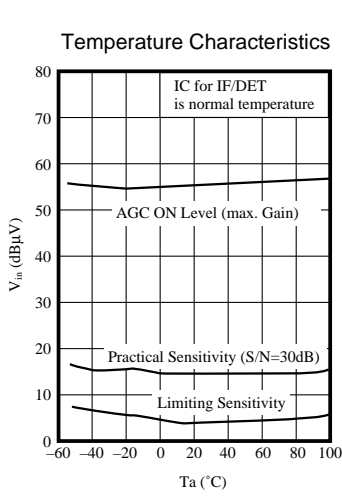
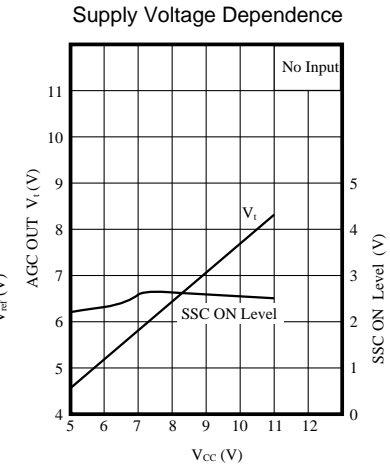
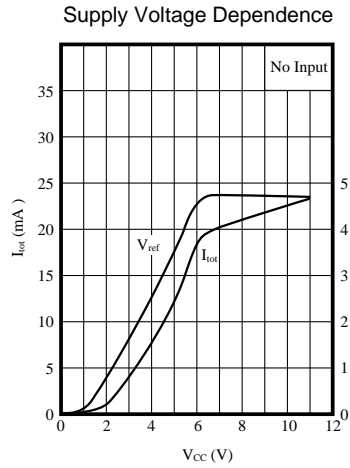
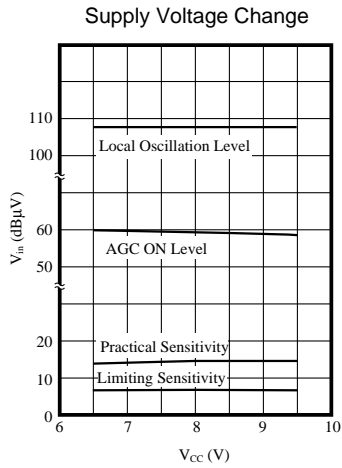
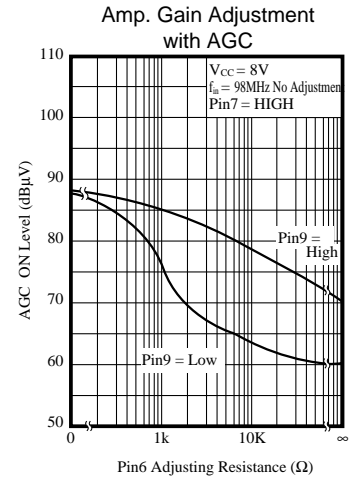
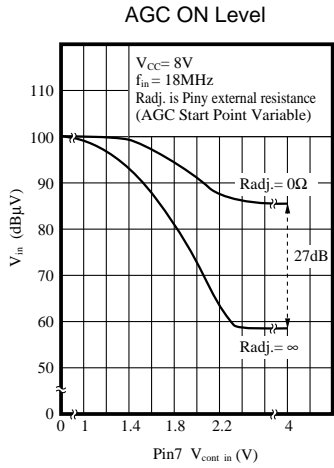
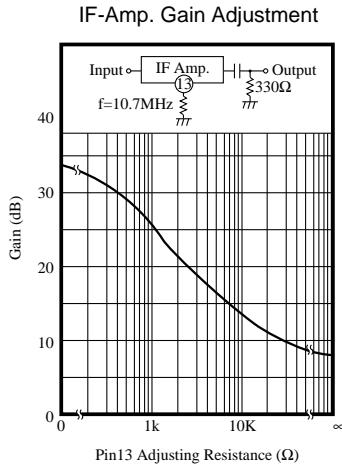
Parameter	Symbol	Range
Operating Supply Voltage Range	V _{CC}	6.8V ~ 9.2V

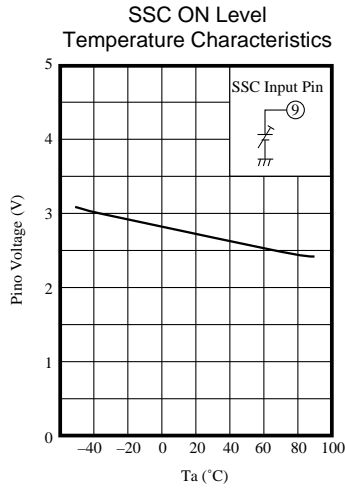
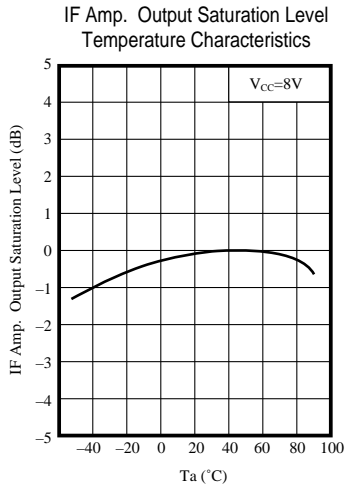
■ Electrical Characteristics (Ta=25°C)

Parameter	Symbol	Condition	min.	typ.	max.	Unit
S/N Ratio	N _{OUT}	V _{CC} = 8V, V _{in} =17dBμ No modulation However, S= output at 400Hz, 30% modulation	22	30	—	dB
Local Oscillation Level	V _{OSC}	V _{CC} = 8V, f _{osc} = 108.7MHz Measured by Pin4, No signal input	219	384	435	mV
IF Output Level	V _{OUT}	V _{CC} = 8V, V _{in} = 51dBμ	41	58	82	mV
AGC Level (L)	V _{AGC(L)}	V _{CC} = 8V, V _{in} = 67dBμ	—	0.05	0.5	V
AGC Level (H)	V _{AGC(H)}	V _{CC} = 8V, V _{in} = 53dBμ	6	6.5	—	V

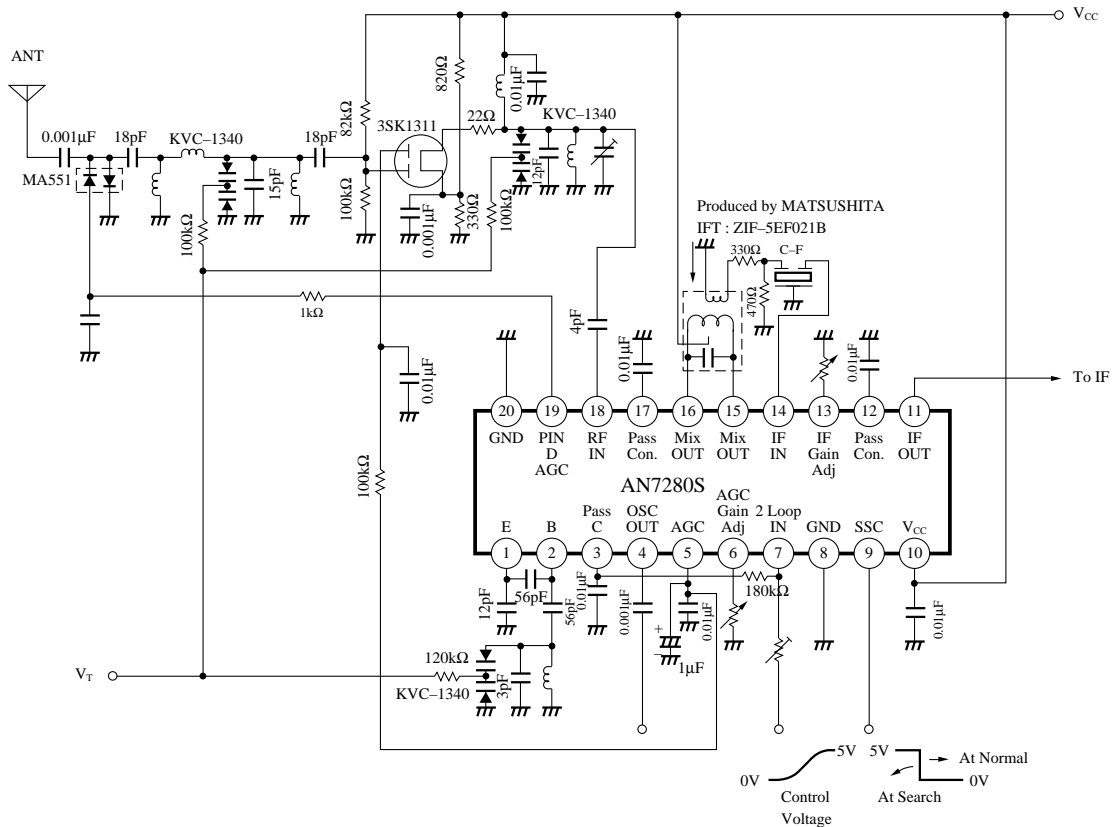
■ Characteristics Curve







■ Application Circuit



■ Pin Descriptions

Pin No.	Pin Name	Description	Equivalent Circuit
1	OSC Emitter	Local oscillation transistor emitter pin	
2	OSC Base	Local oscillation transistor base pin	
3	OSC By-pass	V _{ref} by-pass pin for mixer, OSC buffer, OSC section	
4	OSC Buffer Output	Pin for output OSC signal to pre-scaler	
5	Level Detection Output	AGC signal output pin for RF-Amp. secondary gate	
6	AGC- Amp. Gain Adjustment	Pin for adjusting AGC Amp. gain by external resistance	
7	Control Signal Input	Pin for adjusting AGC-Amp. gain through input of control signal from IF section	
8	GND	_____	_____
9	SSC Input	Pin for adjusting AGC-Amp. gain through input of control signal from microcomputer	
10	V _{CC}	_____	_____

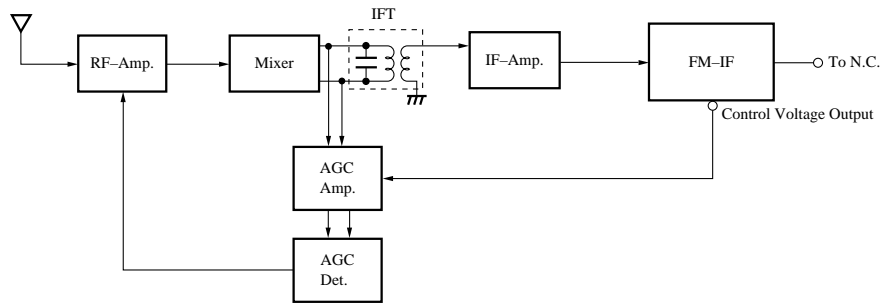
■ Pin Descriptions (Cont.)

Pin No.	Pin Name	Description	Equivalent Circuit
11	IF-Amp.	IF-Amp. output pin	
12	IF-Amp. By-pass	IF-Amp. by-pass pin	
14	IF-Amp. Input	IF-Amp. input pin	
13	IF-Amp. Gain Adjustment	Pin for adjusting IF-Amp. gain by external resistance	
15	Mix. Output	Mixer output pin	
16			
17	Mix. By-pass	Mixer by-pass pin	
18	Mix. Input	Mixer input pin	
19	ADX Output	PIN diode driver output pin Determine maximum current to PIN diode by Pin19 external resistance value.	
20	GND	Oscillator GND	

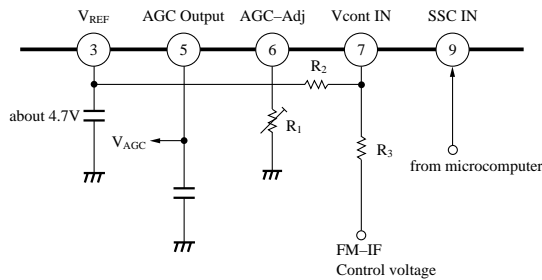
■ Operational Description

• Loop AGC

The AN7280S uses 2Loop AGC for AGC circuit. 2Loop AGC controls AGC output by using mixer output (IFT first side) signal and FM-IF control voltage (level meter output), which is a very favorable system for disturbance characteristics, etc.



- AGC start point (Mixer input level at $V_{AGC} < 3V$) changes in proportion to Pin6 external resistance (following R_1), Pin 7 applied voltage (Determine IF control voltage by R_2, R_3 resistance division) SSC ON/OFF
- Variable width at R_1 28dB (however, $V_7 \geq 3V, V_9 = 0V$)
- Variable width at R_2 40dB (however, $R_1 = \infty, V_9 = 0V$)
- Variable width at R_3 10dB (however, $R_1 = \infty, V_7 \geq 3V$)



• SSC

Change AGC start point by microcomputer control signal at seek/reception time.

Use at SSC ON $V_9 > 3.5V$

Use at SSC OFF $V_9 < 1.5V$

* SSC is designed as precondition for switching operation at microcomputer control signal.