Panasonic

AN7289NSC

## FM-FE+AM IC for car radio

■ Overview

The AN7289NSC is an IC having FM-FE+AM functions for car radio. A tuner block of car radio can be constructed by combination of this IC and the AN7293NSC / NFBQ.

■ Features

- A less number of electrolytic capacitors is required (3 capacitors reduction compared with our conventional IC)
- AM: Practical sensitivity is improved by 2 dB by ATC
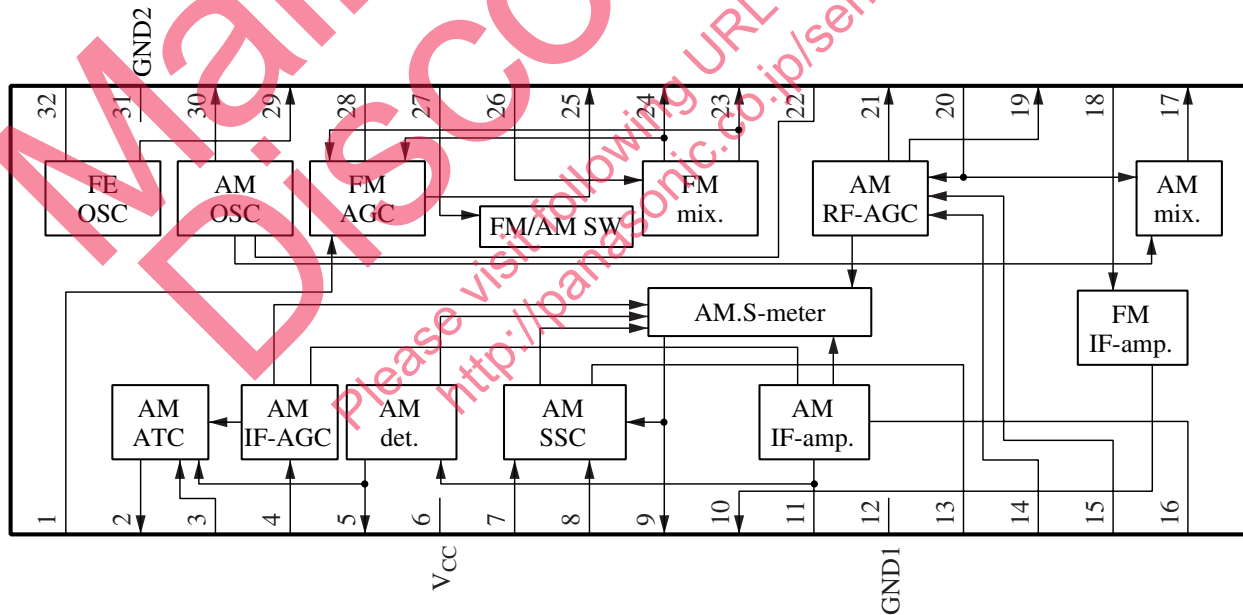- AM: Strong input characteristics is improved by 2-loop AGC function

■ Applications

- Car radios

Unit: mm

17.81±0.3

7.2±0.3 9.3±0.3 0.3 0.15 2.0±0.2

1.23 0.35±0.1 1.0 0.1±0.1 0.9

Seating plane
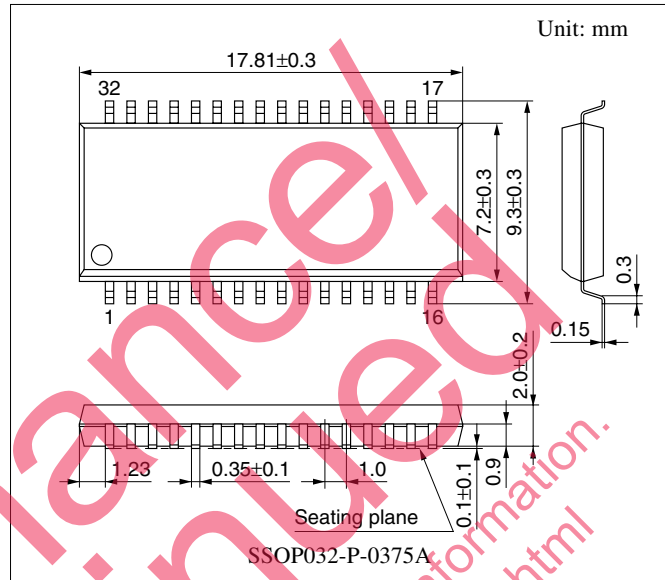
SSOP032-P-0375A

Note) The package of this product will be changed to lead-free type (SSOP032-P-0375C). See the new package dimensions section later of this datasheet.

■ Block Diagram

GND2

FE OSC | AM OSC | FM AGC | FM/AM SW | FM mix. | AM RF-AGC | AM mix.

AM.S-meter | FM IF-amp.

AM ATC | AM IF-AGC | AM det. | AM SSC | AM IF-amp.

V_CC   GND1

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■ Pin Description

Pin No.	Description	Pin No.	Description
1	FM-keyed-AGC input	18	FM-IF input
2	AM-AF output / LO setting	19	AM-RF gain control
3	AM-ATC input	20	AM-mix. input
4	AM-IF level detection	21	FM-PIN-diode driver
5	AM detection output	22	AM-OSC coil pin
6	V_{CC1}	23	FM-mix. output (2)
7	AM-IF counter output / DX / LO SW	24	FM-mix. output (1)
8	AM-SD output	25	FM-PIN-diode driver
9	AM-signal meter output	26	FM-mix. input
10	FM-IF output	27	V_{CC2} / FM / AM SW
11	AM-IF output	28	FM-AGC output
12	GND1	29	FM-OSC buffer output
13	SSC	30	AM-OSC buffer output / FE-AGC sensitivity setting
14	AM-RF level detection		
15	AM-WAGC detection / DX setting	31	GND2
16	AM-IF input	32	FM-OSC coil pin
17	AM-mix. output		

■ Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply voltage	V_{CC}	9.1	V
Supply current	I_{CC}	56	mA
Power dissipation [2]	P_D	380.2	mW
Operating ambient temperature [1]	T_{opr}	−35 to +80	°C
Storage temperature [1]	T_{stg}	−55 to +125	°C

Note) ∗1: Except for the power dissipation, operating ambient temperature, and storage temperature, all ratings are for T_a = 25°C.
 ∗2: T_a = 80°C

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{CC}	7.2 to 9.0	V

■ Electrical Characteristics at $T_a = 25°C$

1. AM mode $V_{CC} = 8.0$ V, $f_{IN} = 1$ MHz

AM tuning condition: OSC output frequency = 1 450 kHz ±500 Hz

| Parameter	Symbol	Conditions	Min	Typ	Max	Unit
AM consumption current	amI_{t1}	Without input	28	36	44	mA
AM-AF output	amV_O	AM-AF output at $V_{IN2} = 74$ dBμ, 400 Hz 30%	100	125	155	mA
AM signal-to-noise ratio	amSN	AM-AF output S/N at $V_{IN2} = 74$ dBμ, 400 Hz 30%	48	52	58	dB
AM-AGC width	amW	AM-AF output when input changes −10 dB at $V_{IN2} = 74$ dBμ, 400 Hz 30%	55	59	63	dB
AM-ATC operation	amATC	(Output ratio [dB] of 400 Hz and 3 kHz when $V_{IN2} = 18$ dBμ) − (Output ratio [dB] of 400 Hz and 3 kHz when $V_{IN2} = 74$ dBμ) 80% Mod., AM-AF Out output	3.5	6.5	9.5	dB
AM-distortion 1	amT_1	$V_{IN2} = 74$ dBμ 400 Hz 80% AM-AF output distortion	0.01	0.5	1.5	%
AM-distortion 2	amT_2	$V_{IN2} = 130$ dBμ 400 Hz 80% AM-AF output distortion	0.01	0.5	1.5	%
AM wide band AGC on input	amV_W	$f_{IN2} = 1.4$ MHz Input when pin 15 voltage becomes below 3 V	97	103	109	dBμ
AM local oscillation buffer output	amV_{OS}	Without input	160	210	260	mV
AM-IF count output 1	$amIF_1$	$V_{IN2} = 40$ dBμ	150	210	270	mV
AM-IF count output 2	$amIF_2$	Without input	—	—	10	mV
AM-SD output 1	$amSD_1$	$V_{IN2} = 40$ dBμ	4.5	4.9	5.1	V
AM-SD output 2	$amSD_2$	Without input	0.0	0.2	0.5	V
AM signal meter output 1	amV_{S1}	Without input, pin 9 voltage	1	50	200	mV
AM signal meter output 2	amV_{S2}	Pin 9 voltage at $V_{IN2} = 30$ dBμ	0.7	0.95	1.2	V
AM signal meter output 3	amV_{S3}	Pin 9 voltage at $V_{IN2} = 130$ dBμ	4.1	4.8	5.1	V
AM search sensitivity DX	amDX	AM-IF count output is 120 mV or over V_{IN2} when f becomes 450 kHz ±2 kHz	24	30	36	dBμ
AM search sensitivity LO	amLO	AM-IF count output is 120 mV or over V_{IN2} when f becomes 450 kHz ±2 kHz	44	50	56	dBμ

■ Electrical Characteristics at T_a = 25°C (continued)

2. FM mode V_{CC} = 8.0 V, f_{IN1} = 98 MHz

FM tuning condition: OSC output frequency = 108.7 MHz ±10 kHz

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
FM local oscillation buffer output	fmV_{OS}	f_{OSC} = 108.7 MHz without input	140	200	260	mV
FM-IF output level	fmIF	V_{IN1} = 71 dBμ	50	95	140	mV
FM-AGC sensitivity	fmAGC	V_{IN1} level when V_{28} becomes 3 V	59	63	67	dBμ
FM-AGC voltage (high)	fmV_{aH}	V_{IN1} = 70 dBμ V_{28}	6.0	6.4	6.8	V
FM-AGC voltage (low)	fmV_{aL}	V_{IN1} = 82 dBμ V_{28}	—	0.05	0.5	V
FM consumption current	fmI_t	Without input	26	35	44	mA

■ Application Circuit Example

SDC00005BEB
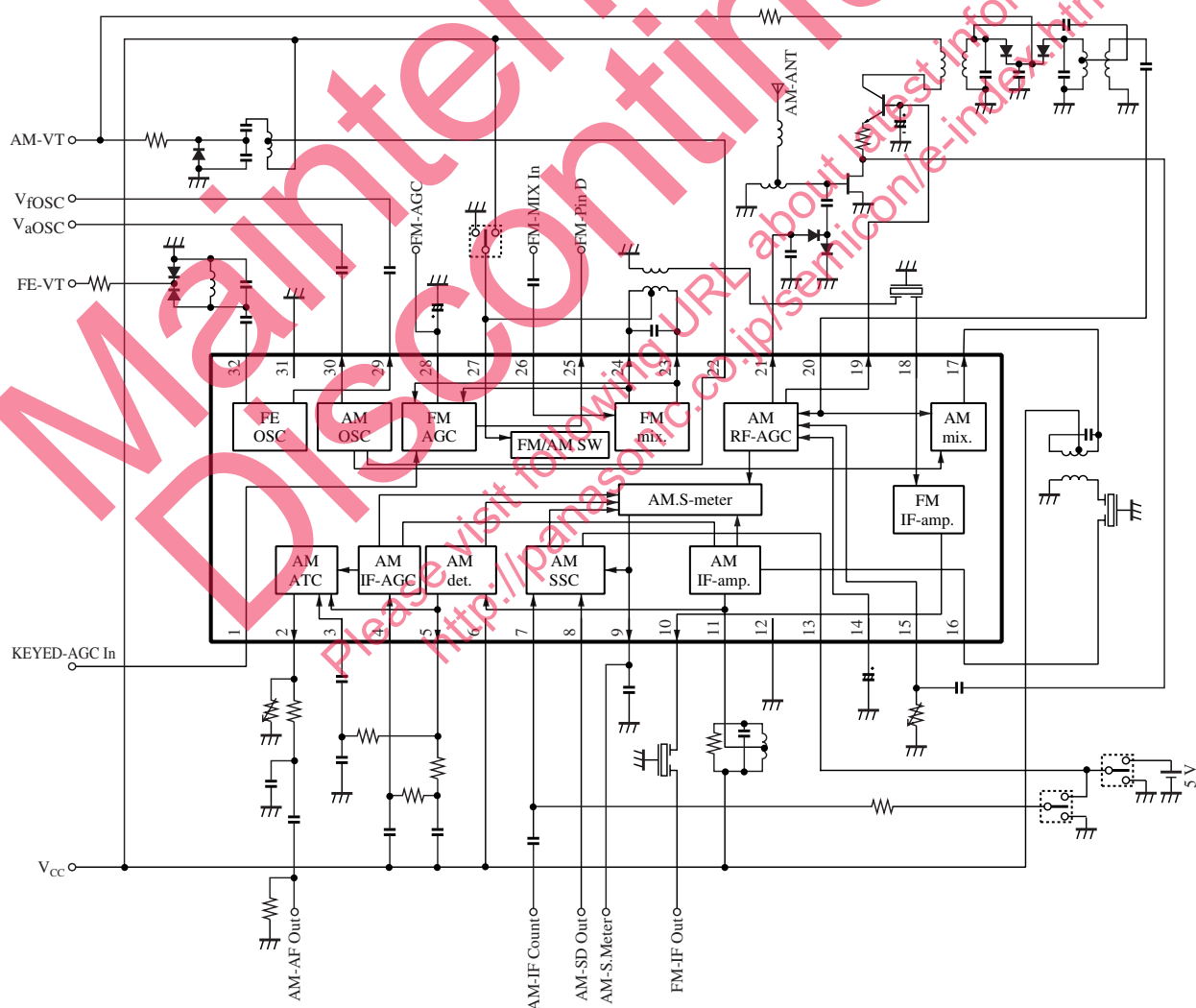
■ New Package Dimensions (Unit: mm)

• SSOP032-P-0375C (Lead-free package)
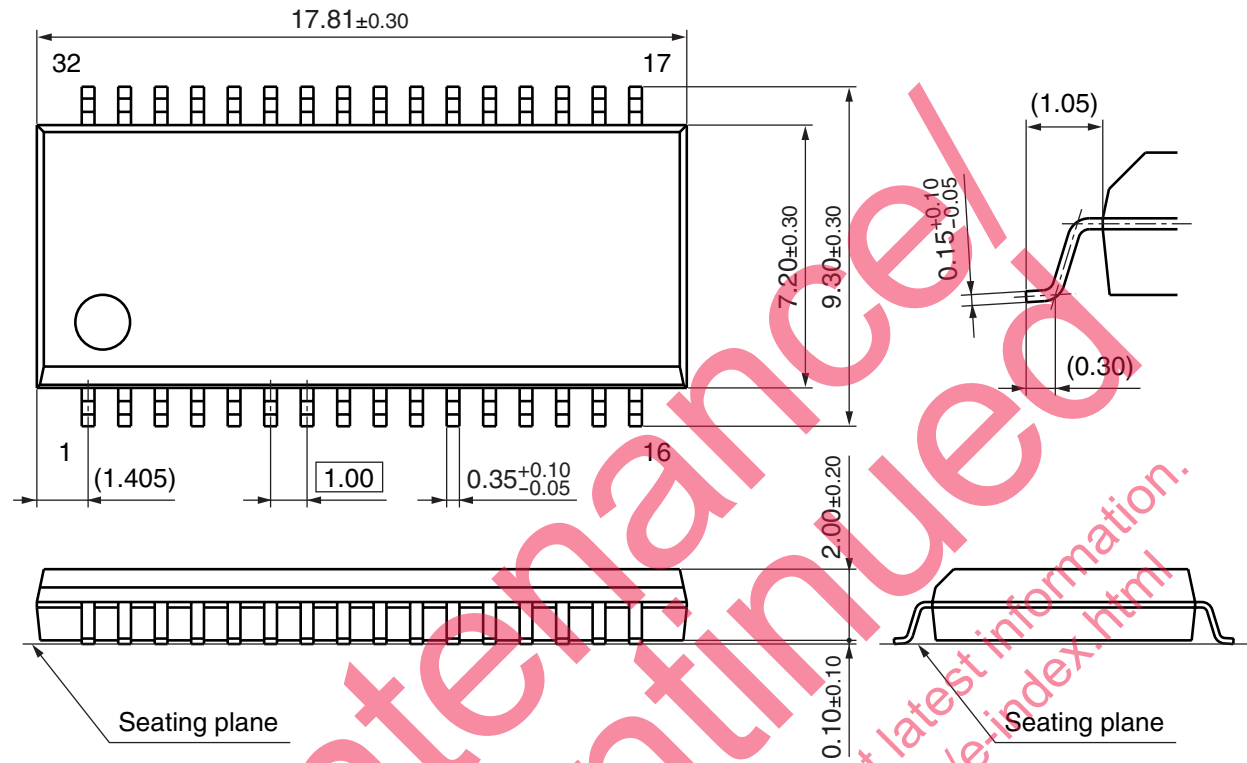
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