

AN7261FBQ

FM multiplex reception IC

■ Overview

The AN7261FBQ is an FM-multiplex reception IC including a front-end and an IF block for FM tuner. Since the receiving circuit of FM multiplex signal is integrated on a single chip, it is most suitable for saving the space of sets.

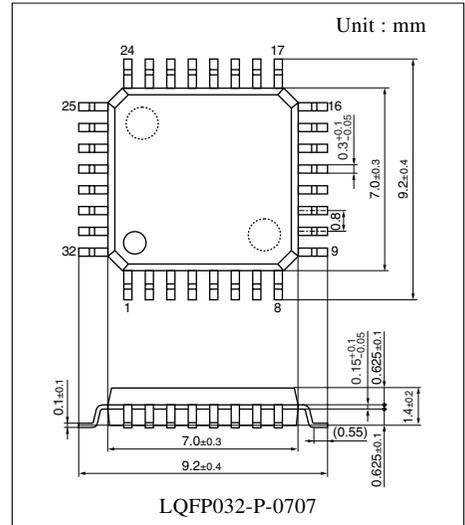
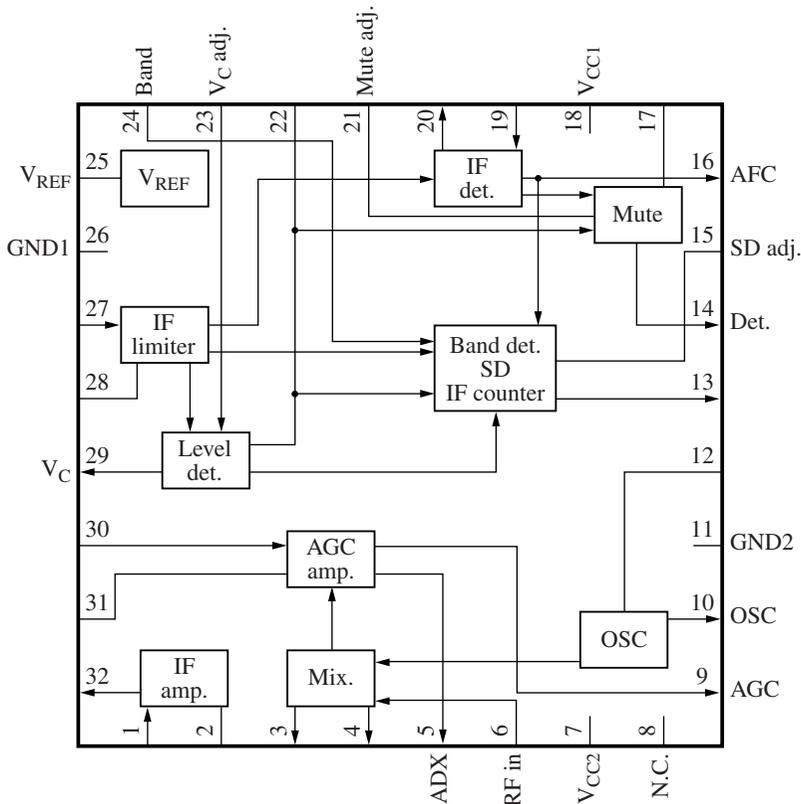
■ Features

- A single chip IC for an FM-multiplex tuner block, which was conventionally composed of two ICs.
- Fewer external components
- Can be used for 15 MHz IF

■ Applications

- VICS, RDS

■ Block Diagram



Note) The package of this product will be changed to lead-free type (LQFP032-P-0707B). See the new package dimensions section later of this datasheet.

■ Pin Descriptions

Pin No.	Description	Pin No.	Description
1	1st IF input	17	Higher frequency correction adjustment
2	GND for 1st IF input	18	V _{CC1}
3	Mixer output 1	19	FM detection
4	Mixer output 2	20	2nd IF output
5	PIN diode driver	21	Mute adjustment
6	Mix. Input	22	Mute voltage output
7	V _{CC2}	23	Control voltage adjustment
8	N.C.	24	Band mute SW/band signal output
9	AGC output	25	V _{REF}
10	OSC buffer output	26	GND1
11	GND2	27	2nd IF input
12	OSC	28	GND for 2nd IF input
13	SD/IF counter output	29	Control voltage output
14	Detection output	30	Keyed-AGC input
15	SD sensitivity adjustment	31	AGC sensitivity adjustment
16	AFC voltage output	32	1st IF output

■ Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply voltage	V _{CC}	9.1	V
Supply current	I _{CC}	66	mA
Power dissipation *2	P _D	343.6	mW
Operating ambient temperature *1	T _{opr}	-30 to +80	°C
Storage temperature *1	T _{stg}	-55 to +150	°C

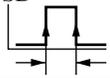
Note) *1: T_a = 25°C except power dissipation, operating ambient temperature and storage temperature.

*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 $V_{CC} = 8\text{ V}$, $f_{IN1} = 98\text{ MHz}$, $f_{IN2} = 15\text{ MHz}$, $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Control voltage 1	V_{C1}	No signal input, DC voltage of pin 29	0.0	0.05	0.8	V
Control voltage 2	V_{C2}	$V_{IN2} = 60\text{ dB}\mu$, DC voltage of pin 29	0.7	1.25	1.8	V
Control voltage 3	V_{C3}	$V_{IN2} = 80\text{ dB}\mu$, DC voltage of pin 29	1.8	2.4	3.0	V
Control voltage 4	V_{C4}	$V_{IN2} = 100\text{ dB}\mu$, DC voltage of pin 29	3.0	3.7	4.4	V
Control voltage 5	V_{C5}	$V_{C5} = V_{C3} - V_{C2}$	1.0	1.2	1.4	V
Control voltage 6	V_{C6}	$V_{C6} = V_{C4} - V_{C3}$	1.05	1.25	1.45	V
Detection output level 1	V_{O1}	$V_{IN2} = 80\text{ dB}\mu/1\text{ kHz}$, 30%FM, AC voltage of pin 14	70	90	110	mV[rms]
Detection output level 2	V_{O2}	$V_{IN2} = 80\text{ dB}\mu/76\text{ kHz}$, 10%FM, AC voltage of pin 14	37	47	57	mV[rms]
Counter output level	V_{IFC}	$V_{IN2} = 100\text{ dB}\mu$, $V_{15} = 2\text{ V}$, IFC output level	150	180	210	mV[rms]
SD sensitivity	SD_S	V_{IN2} when $V_{15} = 2\text{ V}$, $SD > 4\text{ V}$	61	71	81	$\text{dB}\mu$
SD bandwidth	SD_W	Bandwidth when $SD > 4\text{ V}$, $V_{IN2} = 100\text{ dB}\mu$ 	90	115	140	kHz
Limiting sensitivity	V_{LIM}	V_{IN2} level, 30 kHz LPF on, and 1 kHz 30% FM when pin 14 AC voltage drops by 3 dB	40	48	54	$\text{dB}\mu$
Local oscillation buffer output	V_{OS}	$f_{OSC} = 113\text{ MHz}$, without input	110	160	210	mV[rms]
IF output level	V_{IF}	$V_{IN1} = 80\text{ dB}\mu$, IF out level	60	110	170	mV[rms]
AGC sensitivity	S_{AGC}	V_{IN1} level when $V_9 = 3\text{ V}$	68	72	76	$\text{dB}\mu$
High-level AGC voltage	V_{AH}	$V_{IN1} = 66\text{ dB}\mu$, V_9	5.9	6.3	6.7	V
Low-level AGC voltage	V_{AL}	$V_{IN1} = 78\text{ dB}\mu$, V_9	—	0.05	0.5	V
Supply current	I_{TOT}	Without input	41	52	65	mA

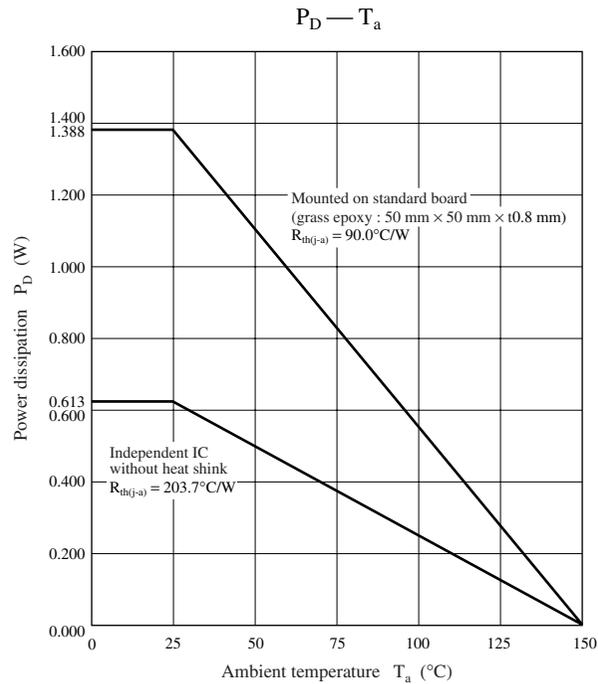
Note) FM tuning condition: Adjust the V_T of application voltage so that OSC buffer output frequency becomes $113\text{ MHz} \pm 10\text{ kHz}$.

■ Usage Notes

1. Use less than $10\text{ k}\Omega$ of external resistor of pin 31
2. Use this IC not to exceed allowable power dissipation value referring to the "■ Technical Information".

■ Technical Information

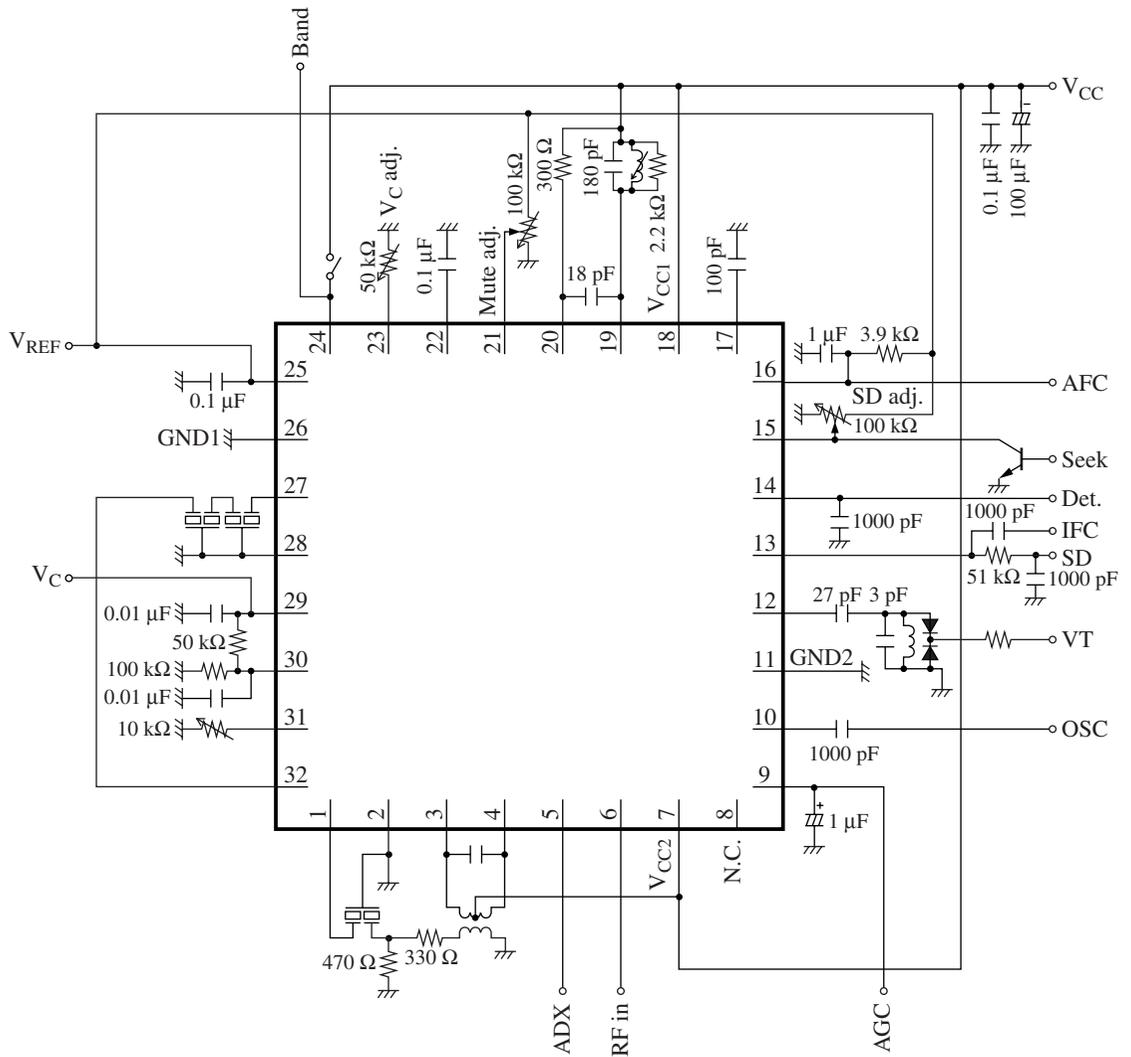
1. P_D — T_a curves of LQFP032-P-0707



2. Specification for special parts

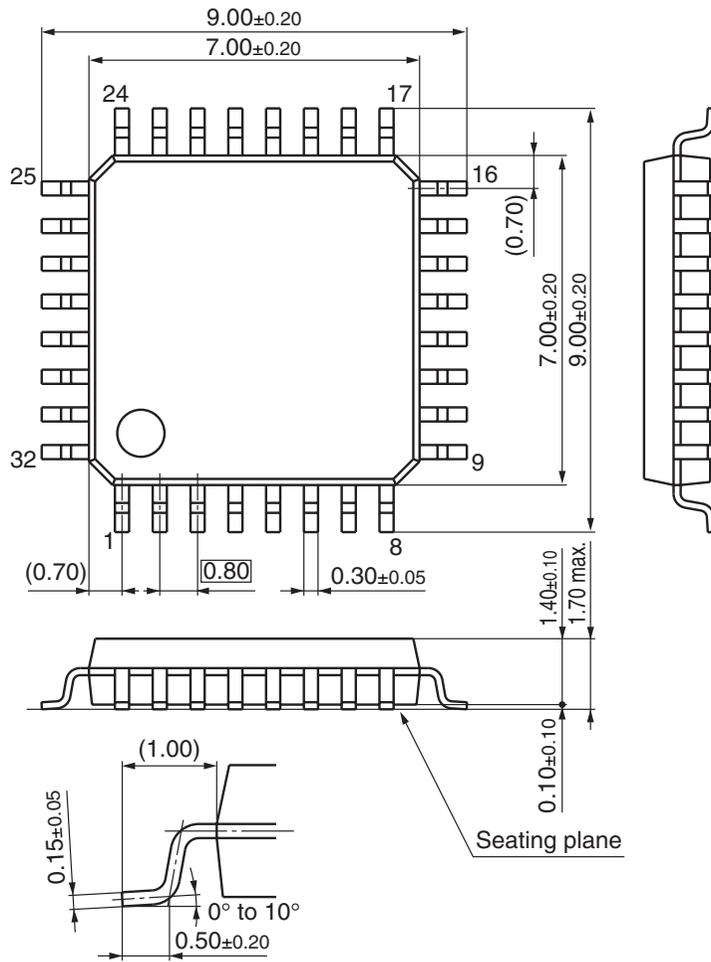
Part	Maker	Maker part number	Connection	Specification			
				Pin No.	Turns	LC value	Q at no load
IF coil	Sumida	4162-T006		4-6	10T	12 pF±10%	50 or more (15 MHz)
				1-2	11T		
				2-3	11T		
Detection coil	Matsushita electronics parts	SQF5EB033A		1-3	11T	0.59 μH ±5.0%	41±20% (15 MHz)

■ Application Circuit Example



■ New Package Dimensions (Unit: mm)

- LQFP032-P-0707B (Lead-free package)



Request for your special attention and precautions in using the technical information and semiconductors described in this material

- (1) An export permit needs to be obtained from the competent authorities of the Japanese Government if any of the products or technologies described in this material and controlled under the "Foreign Exchange and Foreign Trade Law" is to be exported or taken out of Japan.
- (2) The technical information described in this material is limited to showing representative characteristics and applied circuit examples of the products. It does not constitute the warranting of industrial property, the granting of relative rights, or the granting of any license.
- (3) The products described in this material are intended to be used for standard applications or general electronic equipment (such as office equipment, communications equipment, measuring instruments and household appliances).
Consult our sales staff in advance for information on the following applications:
 - Special applications (such as for airplanes, aerospace, automobiles, traffic control equipment, combustion equipment, life support systems and safety devices) in which exceptional quality and reliability are required, or if the failure or malfunction of the products may directly jeopardize life or harm the human body.
 - Any applications other than the standard applications intended.
- (4) The products and product specifications described in this material are subject to change without notice for reasons of modification and/or improvement. At the final stage of your design, purchasing, or use of the products, therefore, ask for the most up-to-date Product Standards in advance to make sure that the latest specifications satisfy your requirements.
- (5) When designing your equipment, comply with the guaranteed values, in particular those of maximum rating, the range of operating power supply voltage and heat radiation characteristics. Otherwise, we will not be liable for any defect which may arise later in your equipment.
Even when the products are used within the guaranteed values, redundant design is recommended, so that such equipment may not violate relevant laws or regulations because of the function of our products.
- (6) When using products for which dry packing is required, observe the conditions (including shelf life and after-unpacking standby time) agreed upon when specification sheets are individually exchanged.
- (7) No part of this material may be reprinted or reproduced by any means without written permission from our company.

Please read the following notes before using the datasheets

- A. These materials are intended as a reference to assist customers with the selection of Panasonic semiconductor products best suited to their applications.
Due to modification or other reasons, any information contained in this material, such as available product types, technical data, and so on, is subject to change without notice.
Customers are advised to contact our semiconductor sales office and obtain the latest information before starting precise technical research and/or purchasing activities.
- B. Panasonic is endeavoring to continually improve the quality and reliability of these materials but there is always the possibility that further rectifications will be required in the future. Therefore, Panasonic will not assume any liability for any damages arising from any errors etc. that may appear in this material.
- C. These materials are solely intended for a customer's individual use.
Therefore, without the prior written approval of Panasonic, any other use such as reproducing, selling, or distributing this material to a third party, via the Internet or in any other way, is prohibited.