

# **TDA7707**

### AM/FM/HD-Radio™/DAB submicron technology automotive receiver



#### VFQFPN64 (9 x 9 x 1.0 mm)

### **Features**

- AEC-Q100 qualified
- Dual AM/FM reception with digital IF processing
- Digital radio support for dual-channel HD-Radio™ and DAB/DRM reception through external coprocessor
- Integrated phase antenna diversity processing
- Fully integrated dual VCO for world tuning
- High performance PLLs for fast RDS system
- Integrated IF-filters with high selectivity, dynamic range and adaptive bandwidth control
- Drift-free and alignment-free digital IF-signal processing with high performance and flexibility
- Integrated RF switch matrix in FM
- RDS demodulation with group and block synchronization
- Filtered MPX for VICS applications
- High performance stereo decoder with noise-blanker
- Analog DAC stereo output and I<sup>2</sup>S digital output
- I<sup>2</sup>S, JESD204B, LVDS, high-speed digital I/Q base-band interface
- I<sup>2</sup>C/SPI bus-controlled
- Single 3.3 V external supply

### **Description**

The TDA7707 is a single chip fully-CMOS quad-band, dual-channel tuner aimed at receivers for analog and digital terrestrial radio broadcasting.

When paired to STMicroelectronics's STA680 or STA660 digital decoder ICs, the TDA7707 constitutes a complete optimized RF and baseband AM/FM/HD/DAB/DRM solution for automotive grade receivers and other applications.

The TDA7707 combines state-of-art performance with minimum external component count, making it therefore ideal for integration into car radios and other AM/FM/HD/DAB/DRM devices with challenging performance, quality, reliability and, last but not least, cost requirements.

Combining TDA7707 with either STA680 or STA660 results in a complete, multistandard receiver solution, with low bill of material, high performance and real automotive grade quality and reliability.

Two device versions are available, differing only by the ROM content: the TDA7707EB requires a small FW code to be downloaded for booting the IC, thus making it especially suited to systems whose microcontroller has limited code storage capability.

Product status link							
TDA7707							
Prod	Product summary						
Order code	Package	Packing					
TDA7707		Tray					
TDA7707EB	VFQFPN64	Пау					
TDA7707TR	(9 x 9 x 1 mm)	Tape &					
TDA7707EBTR		Reel					



# 1 Block diagram and pins description

### 1.1 Block diagram

### Figure 1. Functional block diagram



GADG2709170932PS

# 2 Electrical specification

### 2.1 Absolute maximum ratings

#### Table 1. Absolute maximum ratings

Symbol	Parameter	Parameter Test condition		Тур	Max	Units	
V <sub>CC</sub>	Abs. supply voltage	-	-0.5	-	3.6	V	
T <sub>stg</sub>	Storage temperature	-	-55 - 150		°C		
V <sub>ESD</sub>		Human Body model	> ±2000  <sup>(1)</sup>		)  <sup>(1)</sup>		
	ESD absolute minimum withstand voltage	Charged device model	> ±500  <sup>(2)</sup>		(2)	V	
		Charged device model, corner pins	> ±750		)		
-	Max. input at any pin (latch-up characteristic)	I <sub>INMAX</sub>	±100		mA		

1. |±1000| on pin 14

2. |±400| on pin 14

### 2.2 Thermal data

#### Table 2. Thermal data

Symbol	Parameter Test Condition		Value	Units
R <sub>th j-amb</sub> Thermal Resistance junction-to-ambient	Thermal Desistance junction to embient	Multilayer 2s2p as per JEDEC JESD51-7	27	°C/W
	Thermally optimized multilayer 2s2p board	22	07.00	

### 2.3 General key parameters

### Table 3. General key parameters

Symbol	Parameter	Test Condition	Min	Тур	Max	Units
V <sub>CC</sub>	3.3 V supply voltage		3.15	3.3	3.45	V
I <sub>CC</sub> Supply current	Two active RF channels, V <sub>CC</sub> = 3.45 V	-	-	519		
	Two active RF channels, JESD204b interface activated (10 pF load), V_{CC} = 3.45 V	-	-	600	mA	
T <sub>amb</sub>	Ambient Temperature Range	-	-40	-	85	°C
T <sub>j_oper</sub>	Operative Junction Temp	-	-	-	125	°C
P <sub>diss</sub> Dissipated power	Two active RF channels, R <sub>ext</sub> = 9 Ohm, I2S baseband interface activated	-	-	1.5	W	
	Dissipated power	Two active RF channels, $R_{ext}$ = 7.5 Ohm, JESD204b interface activated	-	-	1.7	VV

#### **Package information** 3

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

#### VFQFPN-64 (9x9x1.0mm) package information 3.1

Figure 2. VFQFPN-64 (9x9x1.0 mm) package outline



8511068\_B\_A0ZG

#### Table 4. VFQFPN-64 (9x9x1.0 mm) package mechanical data

				Dimensions				
Ref	Millimeters			Inches <sup>(1)</sup>				
	Min.	Тур.	Max.	Min.	Тур.	Max.		
Θ	-	-	14	-	-	0.5511		
А	-	-	1.0	-	-	0.0394		
A1	0.00	-	0.05	0.0000	-	0.0020		
A2	0.55	-	0.80	0.0217	-	0.0314		

	Dimensions						
Ref	Millimeters		Inches <sup>(1)</sup>				
	Min.	Тур.	Max.	Min.	Тур.	Max.	
A3		0.20 REF			0.0079 REF		
b <sup>(2)</sup>	0.18	0.25	0.30	0.0070	0.0098	0.0118	
b1	-	0.15	-	-	0.0059	-	
D		9.00 BSC			0.3543 BSC		
D1 <sup>(3)</sup>	8.75 BSC			0.3444 BSC			
D2	-	6.70	-	-	0.2638	-	
е	0.50 BSC				0.0197 BSC		
E	9.00 BSC			0.3543 BSC			
E1 <sup>(3)</sup>	8.75 BSC		0.3444 BSC				
E2	-	6.70	-	- 0.2638		-	
L	0.30	-	0.50	0.0118	-	0.0197	
L1		0.15 REF		0.0059 REF			
L2	-	0.10	-	-	0.0039	-	
Р	-	-	0.60	-	-	0.0236	
			Tolerance of for	m and position			
aaa		0.15			0.0059		
bbb		0.10		0.0039			
CCC	0.10		0.0039				
ddd	0.05			0.0019			
eee		0.08			0.0031		
fff		0.10			0.0039		

1. Values in mm are converted into inches and rounded to 4 decimal digits.

2. Maximum allowable burr is 0.076 mm in all directions.

3. D1 and E1 are Maximum plastic body size dimensions including mold mismatch. Dimensions D1 and E1 do not include mold flash or protrusions. Allowable mold flash or protrusions is "0.25 mm (0.0098 inch)" per side.

Note:

The package is compliant to IPC/JEDEC J-STD-020D June 2007 standard Moisture/Reflow Sensitivity Classification for Nonhermetic Solid State Surface Mount Devices, MSL Level 3.

## **Revision history**

### Table 5. Document revision history

Date	Version	Changes
16-Dec-2014	1	Initial release.
04-Jun-2018	2	Fully revised.



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