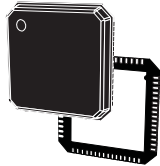## AM/FM/HD-Radio™/DAB submicron technology automotive receiver

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^{2}S digital output
- I^{2}S, JESD204B, LVDS, high-speed digital I/Q base-band interface
- I^{2}C/SPI bus-controlled
- Single 3.3 V external supply

Product status link
TDA7707

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

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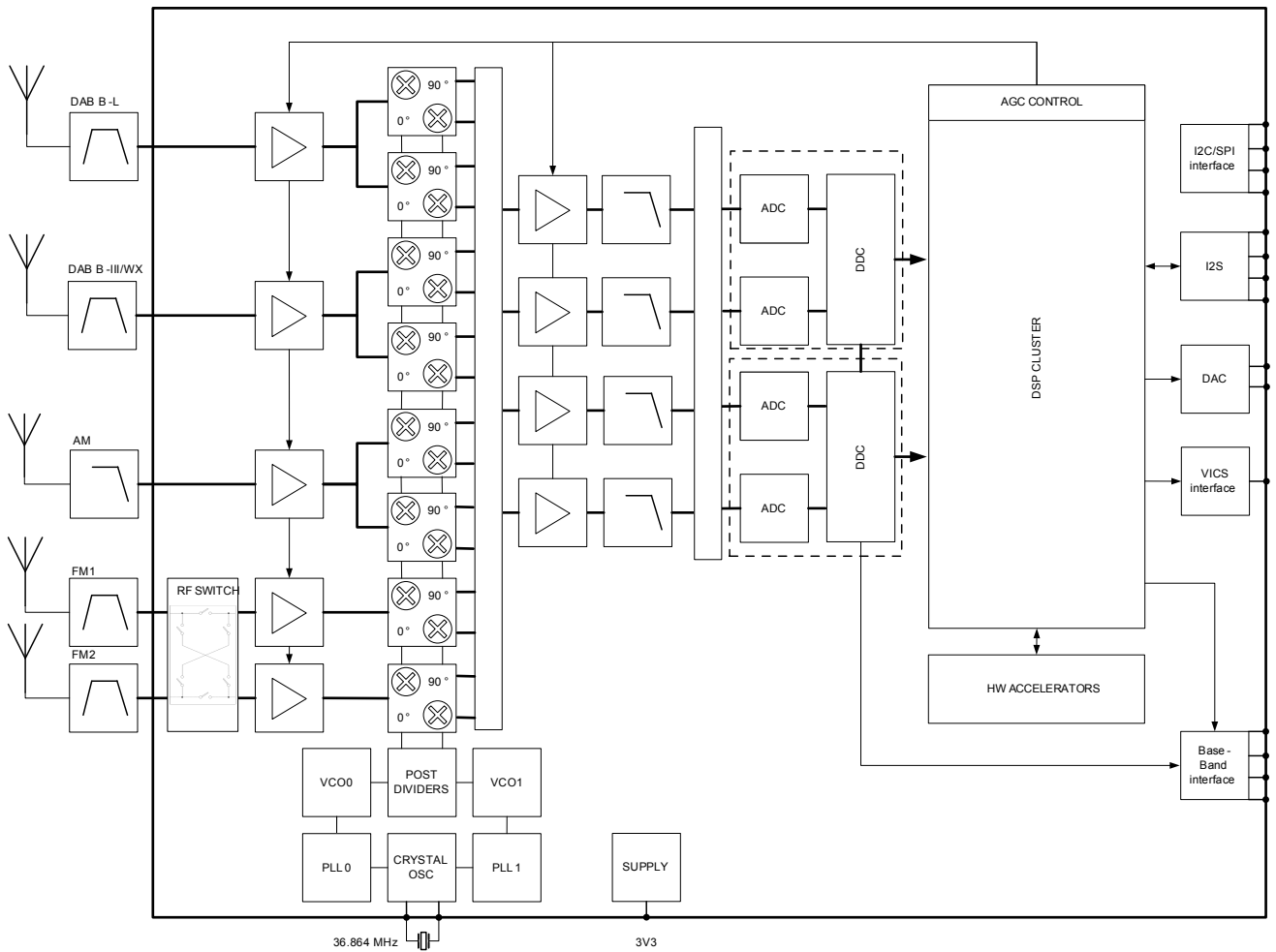
The TDA7707 combines state-of-art performance with minimum external component count, making it therefore ideal for integration into car radios and other AM/FM/HD/DAB/DRM devices with challenging performance, quality, reliability and, last but not least, cost requirements.

Combining TDA7707 with either STA680 or STA660 results in a complete, multi-standard 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.

DB2481 - Rev 2 - June 2018
For further information contact your local STMicroelectronics sales office.

www.st.com

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	Test condition	Min	Typ	Max	Units
V_{CC}	Abs. supply voltage	-	-0.5	-	3.6	V
T_{stg}	Storage temperature	-	-55	-	150	°C
V_{ESD}	ESD absolute minimum withstand voltage	Human Body model	>|±2000|[1]			V
		Charged device model	>|±500|[2]			
		Charged device model, corner pins	>|±750|			
-	Max. input at any pin (latch-up characteristic)	I_{INMAX}	±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
$R_{th\ j\text{-}amb}$	Thermal Resistance junction-to-ambient	Multilayer 2s2p as per JEDEC JESD51-7	27	°C / W
		Thermally optimized multilayer 2s2p board	22	

2.3 General key parameters

Table 3. **General key parameters**

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

3 Package information

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.

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

Figure 2. VFQFPN-64 (9x9x1.0 mm) package outline
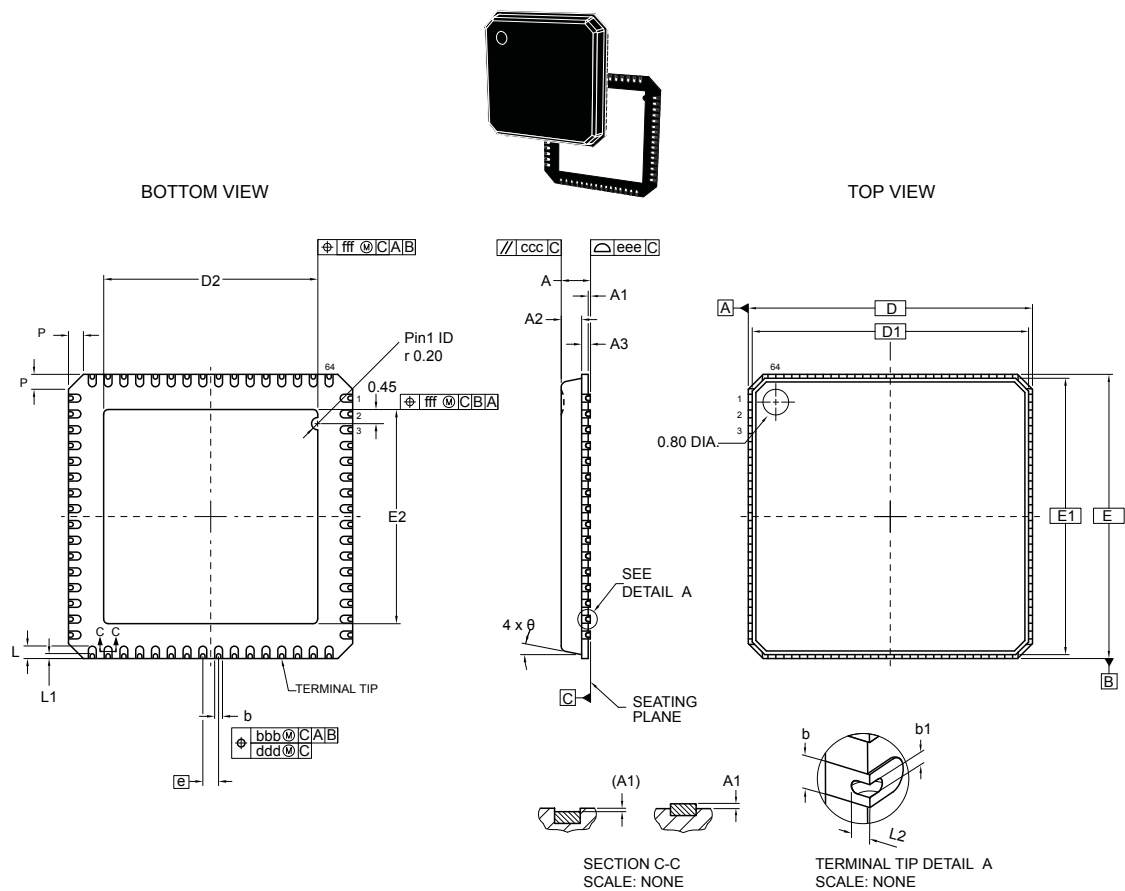
8511068_B_A0ZG   GAPGPS03460

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

Ref	Dimensions					
	Millimeters			Inches[1]		
	Min.	Typ.	Max.	Min.	Typ.	Max.
Θ	-	-	14	-	-	0.5511
A	-	-	1.0	-	-	0.0394
A1	0.00	-	0.05	0.0000	-	0.0020
A2	0.55	-	0.80	0.0217	-	0.0314

Ref	Dimensions					
	Millimeters			Inches[1]		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A3	0.20 REF			0.0079 REF		
b[2]	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[3]	8.75 BSC			0.3444 BSC		
D2	-	6.70	-	-	0.2638	-
e	0.50 BSC			0.0197 BSC		
E	9.00 BSC			0.3543 BSC		
E1[3]	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	-
P	-	-	0.60	-	-	0.0236
Tolerance of form 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.

Contents

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