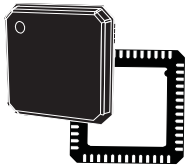



## AM/FM/HD-Radio™ submicron technology automotive receiver


**VFQFPN52 (8 x 8 x 1.0 mm)**

### Features

- AEC-Q100 qualified 
- AM/FM reception with digital IF processing
- Fully automotive grade CMOS design
- AM/FM Band
- Low-IF, DSP-based architecture
- Very high dynamic range built-in IF-ADC
- Minimum external component count
- Very small footprint package
- Multipath noise mitigation processing
- Compatible with HD-Radio™
- Digital Audio Output
- Fully RoHS-compliant

### Description

The **TDA7708S** is a single chip fully-CMOS AM/FM tuner aimed at receivers for terrestrial radio broadcasting.

The TDA7708S combines state-of-art performance with minimum external component count, making it therefore ideal for integration into car radios and other radio devices with challenging performance, quality, reliability and, last but not least, cost requirements.

Such a low external component count is made possible by cutting-edge circuit and implementation techniques that overcome the major challenges affecting both very-low and zero IF receivers.

The TDA7708S features multiple front-end low-noise amplifiers (LNAs) to cover AM LW/MW/SW bands, and the entire FM band, with advanced automatic gain control (AGC) amplifier and mixer stages.

After on-chip IF filtering, the TDA7708S digitizes the signal with a very high dynamic range ADC; it processes the complex phase-quadrature baseband signal allowing applications like multipath noise mitigation, and integrated RDS decoding.

The TDA7708S furthermore integrates the HD-Radio™ channel filtering.

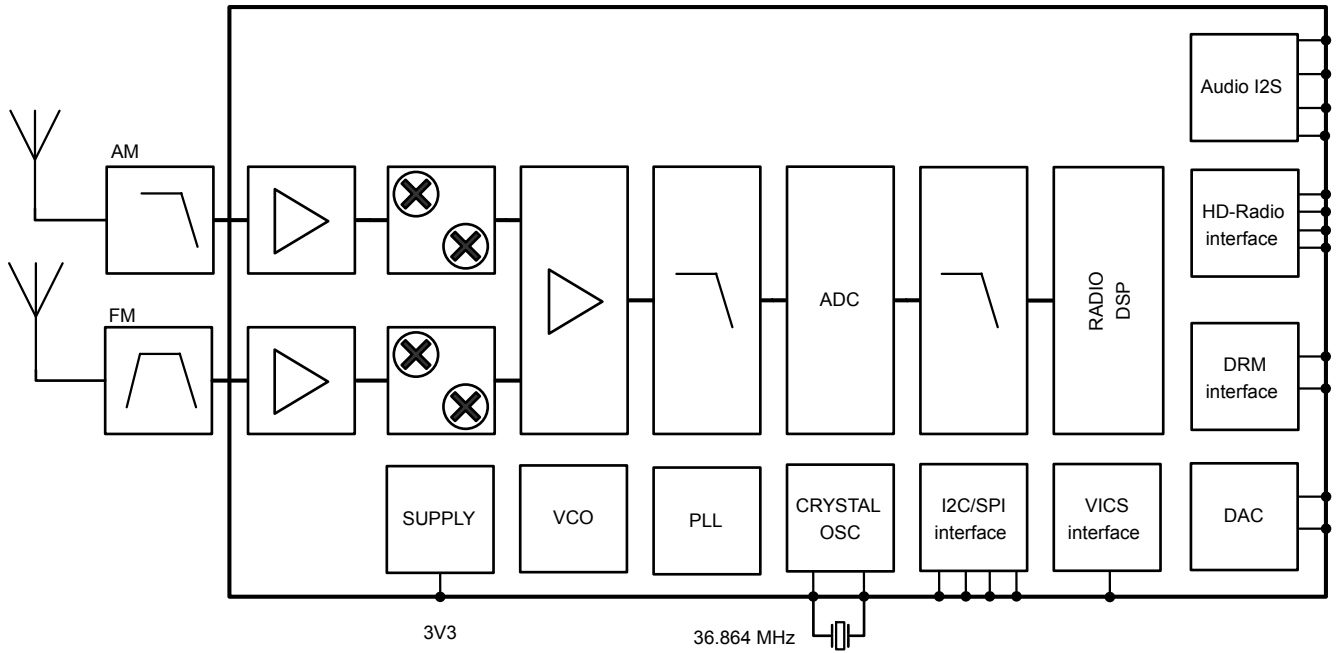
Besides providing optimal AM/FM quality reception, the TDA7708S makes it the ideal solution to realize a complete HD-Radio™ receiver solution (in combination with the external STA680D HD-Radio™ decoder), with a low bill of material, high performance and real automotive grade quality and reliability.

The TDA7708SCB requires a very 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		
TDA7708S		
Device summary		
Order code	Package	Packing
TDA7708S	VFQFPN52 (8 x 8 x 1.0 mm)	Tray
TDA7708SCB		
TDA7708STR		Tape & Reel
TDA7708SCBTR		

# 1 Block diagram

Figure 1. Block diagram



## 2 Electrical specification

### 2.1 Absolute maximum ratings

**Table 1. Absolute maximum ratings**

Symbol	Parameter	Test condition	Min	Typ	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>	ESD absolute minimum withstand voltage	Human Body model	> ±2000  <sup>(1)</sup>			V
		Charged device model	> ±500  <sup>(2)</sup>			
		Charged device model, corner pins	> ±750			
-	Max. input current at any pin (latch-up characteristic)	I <sub>INMAX</sub>	±100			mA

1. |±1000| on AM\_IN pin

2. |±400| on AM\_IN pin

### 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	Multilayer 2s2p as per JEDEC JESD51-7	40	°C/W

### 2.3 General key parameters

**Table 3. General key parameters**

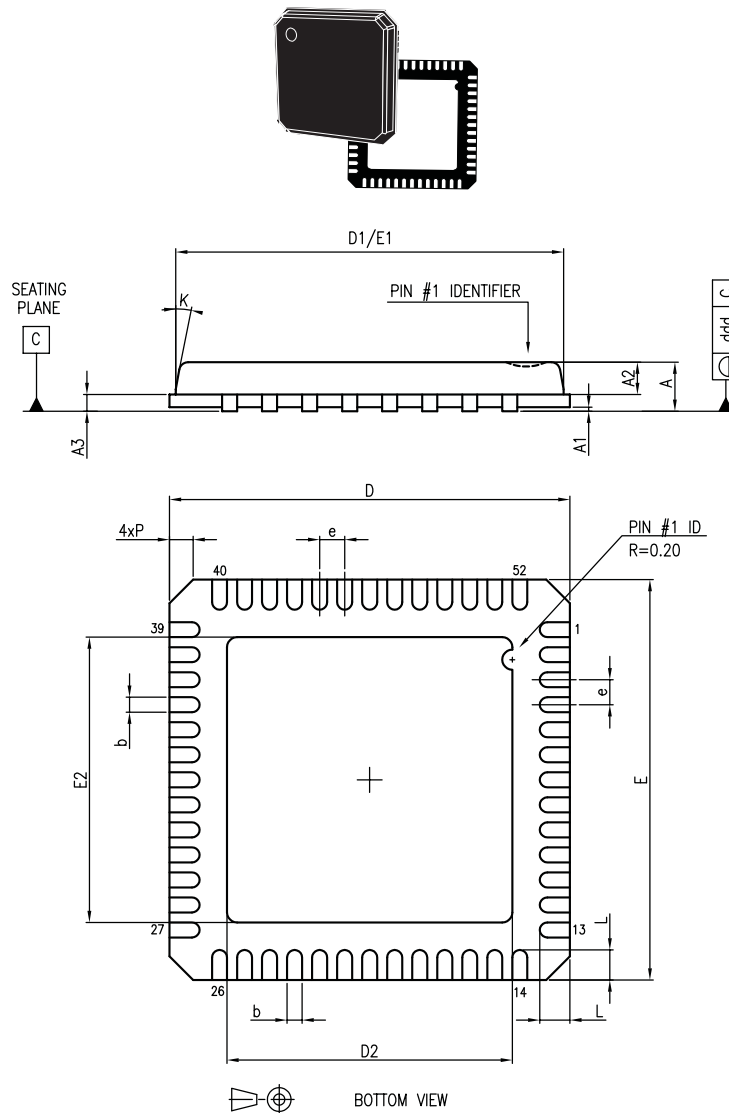
Symbol	Parameter	Test condition	Min	Typ	Max	Units
V <sub>CC</sub>	3.3 V supply voltage	-	3.15	3.3	3.45	V
I <sub>CC</sub>	Supply current	FM @108 MHz, active interfaces (10 pF load)	-	-	350	mA
T <sub>amb</sub>	Ambient temperature range	-	-40	-	85	°C
T <sub>j_oper</sub>	Operative junction temp	-	-	-	125	°C
P <sub>diss</sub>	Dissipated power	R <sub>ext</sub> = 12 Ohm	-	-	1	W

### 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](http://www.st.com). ECOPACK is an ST trademark.

#### 3.1 VFQFPN-52 (8x8x1.0 mm) package information

Figure 2. VFQFPN-52 (8x8x1.0 mm) package outline



7740640\_D\_90

GAPG0104160722PS

Table 4. VFQFPN-52 (8x8x1.0 mm) package mechanical data

Ref.	Dimensions in mm		
	Min.	Typ.	Max.
A	0.8	0.9	1

Ref.	Dimensions in mm		
	Min.	Typ.	Max.
A1	-	0.02	0.05
A2	-	0.65	1
A3	-	0.2	-
b	0.18	0.25	0.3
D	7.85	8	8.15
D1	-	7.75	-
D2	6.4	6.5	6.6
D3	-	5.9	-
E	7.85	8	8.15
E1	-	7.75	-
E2	6.4	6.5	6.6
E3	-	5.9	-
e	-	0.5	-
L	0.35	0.55	0.75
P	-	-	0.6
K	12° Max.		
ddd	-	-	0.08

## Revision history

**Table 5. Document revision history**

Date	Revision	Changes
29-Nov-2016	1	Initial release.
25-Jan-2018	2	Updated <a href="#">Section Description</a> and Device summary table on cover page.
25-Nov-2019	3	Updated <a href="#">Figure 1. Block diagram</a> .

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