# AM/FM/HD-Radio™/DAB automotive digital output tuner
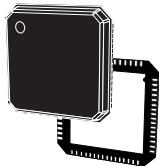
VFQFPN64 (9 x 9 x 1.0 mm)

Features

- AEC-Q100 qualified
- Full automotive grade RFCMOS design
- Quad-band:
  – AM/FM Band
  – Band-III
  – Band-L
- Software configurable digital base-band interface (I2S or JESD204B)
- Compatible with digital radio standards: DAB, DRM, and HD-Radio™
- Software programmable
- Very high dynamic range built-in ΣΔ ADC
- Very low external component count (no pin diodes, transformers or varicap)
- RoHS compliant small footprint package

Description

The STA709 is a single chip, full CMOS, quad-band, front-end tuner specifically tailored to Software-Defined-Radio (SDR) systems.

When paired with an application processor, STA709 enables the implementation of a SDR solution to receive analog (AM/FM/WX) and digital terrestrial broadcasting standards (e.g. HD-Radio™/DAB/DRM).

The STA709 features front-end low-noise amplifiers (LNAs) covering AM band (LW/MW/SW), FM and WX bands, DAB band-III and band-L.

After on-chip IF filtering, the STA709 digitizes the signal with a high dynamic range ΣΔ ADC ahead of the complex phase-quadrature base-band signal down conversion to provide a stable digital base-band output to the companion application processor.

The digital base-band signal is transmitted to the application processor via a flexible and configurable serial digital interface operating either as single-ended I2S, LVDS I2S or JESD204B.

The STA709 offers automotive grade and state-of-art RF performances with minimum external component count.

Product status link
STA709

Device summary		
Order code	Package	Packing
STA709	VFQFPN64 (9 x 9 x 1 mm)	Tray
STA709TR		Tape & Reel

DB3139 - Rev 2 - November 2019
For further information contact your local STMicroelectronics sales office.

www.st.com

1   Block diagram

Figure 1. Block diagram
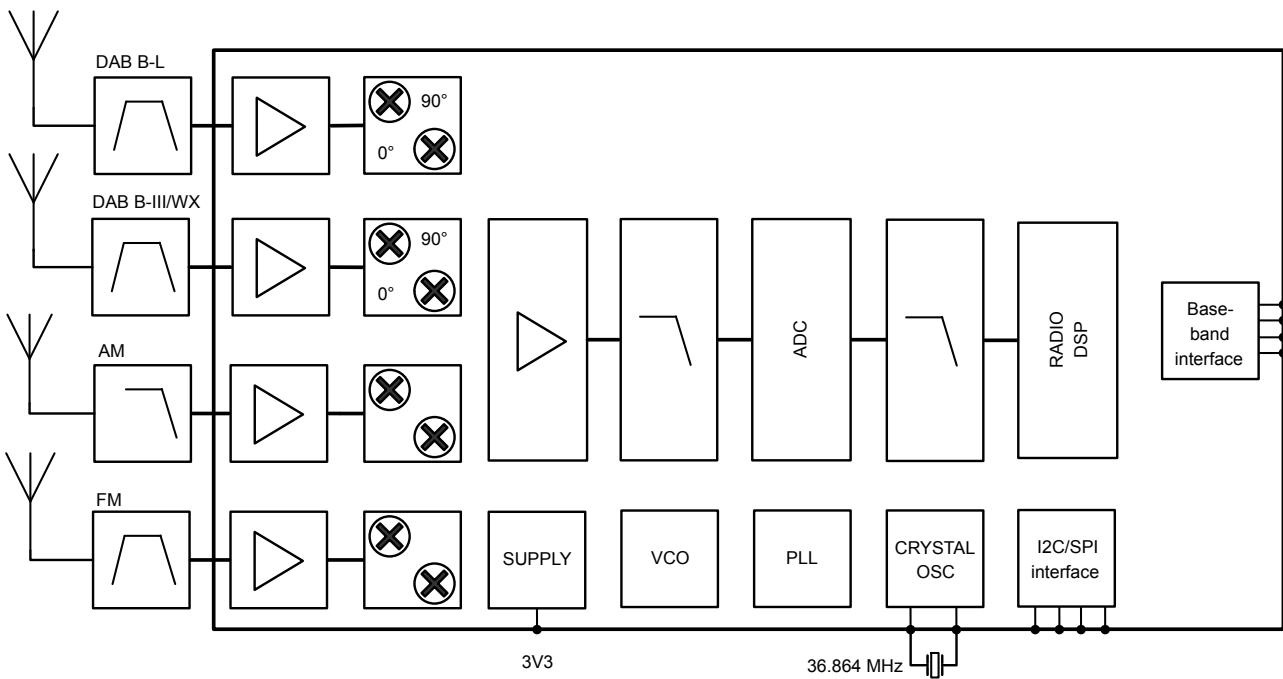
2 Electrical specification

2.1 Absolute maximum ratings

Table 1. Absolute maximum ratings

Symbol	Parameter	Test condition	Min	Typ	Max	Units
V_{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 current at any pin (latch-up characteristic)	I_{INMAX}	±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
$R_{th\ j-amb}$	Thermal resistance junction-to-ambient	Multilayer 2s2p as per JEDEC JESD51-7	27	°C/W

## 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	FM @108 MHz, active interfaces (10 pF load)	-	-	309	mA
T_{amb}	Ambient temperature range	-	-40	-	85	°C
T_{j_oper}	Operative junction temp	-	-	-	125	°C
P_{diss}	Dissipated power	R_{ext} = 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. ECOPACK is an ST trademark.

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

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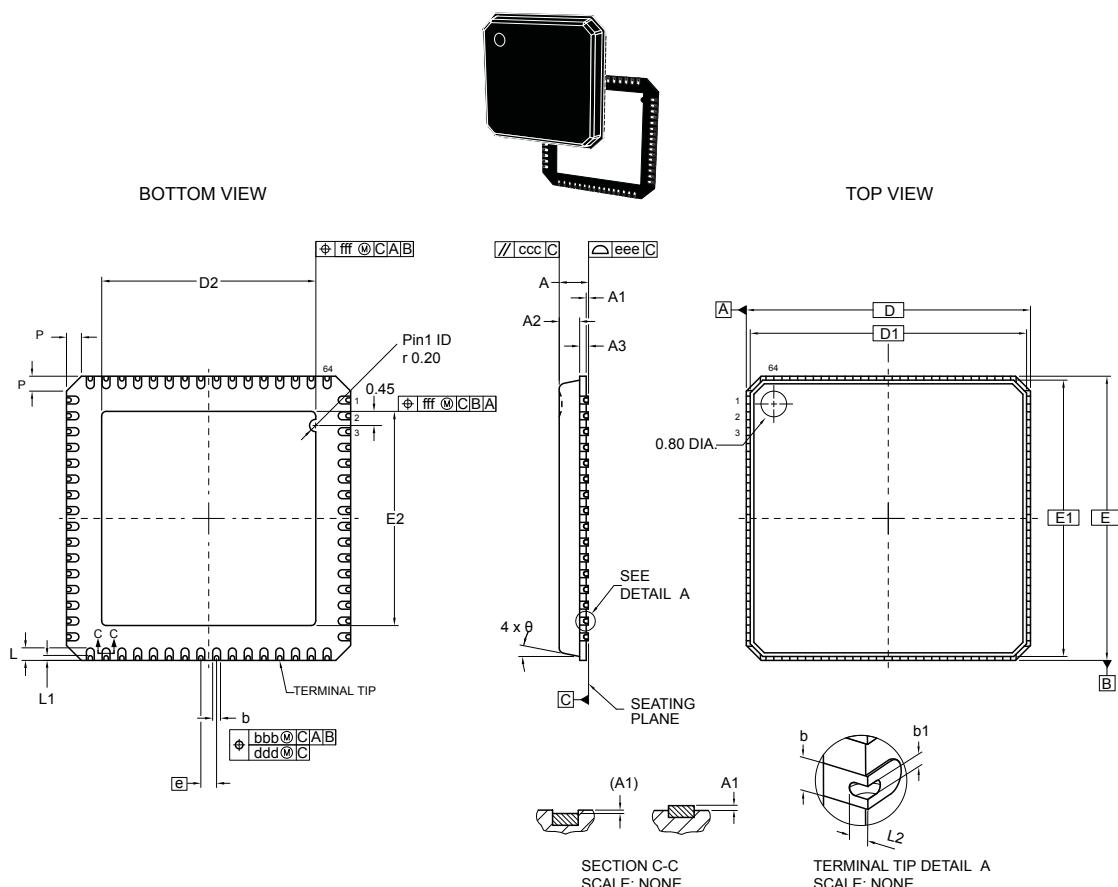
8511068_B_A0ZG

GAPGPS03460

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

Ref.	Dimensions in mm		
	Min.	Typ.	Max.
Θ	-	-	14
A	-	-	1.0
A1	0.00	-	0.05
A2	0.55	-	0.80
A3	0.20 REF		
b[1]	0.18	0.25	0.30

Ref.	Dimensions in mm		
	Min.	Typ.	Max.
b1	-	0.15	-
D	9.00 BSC		
D1[2]	8.75 BSC		
D2	-	6.70	-
e	0.50 BSC		
E	9.00 BSC		
E1[2]	8.75 BSC		
E2	-	6.70	-
L	0.30	-	0.50
L1	0.15 REF		
L2	-	0.10	-
P	-	-	0.60
Tolerance of form and position			
aaa	0.15		
bbb	0.10		
ccc	0.10		
ddd	0.05		
eee	0.08		
fff	0.10		

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

2. 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	Revision	Changes
29-Nov-2016	1	Initial release.
25-Nov-2019	2	Updated Figure 1. Block diagram.