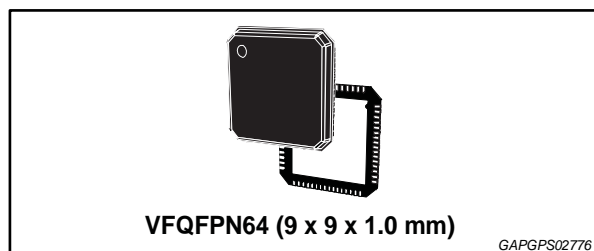


## AM/FM/HD-Radio™/DAB automotive digital output tuner

Data brief



### Features

- AEC-Q100 qualified
- Full automotive grade RFCMOS design
- Fully automotive grade CMOS 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  $\Sigma\Delta$  ADC
- Very low external component count (no pin diodes, transformers or varicap)
- RoHS compliant small footprint package



### Description

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).

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  $\Sigma\Delta$  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.

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

**Table 1: Device summary**

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

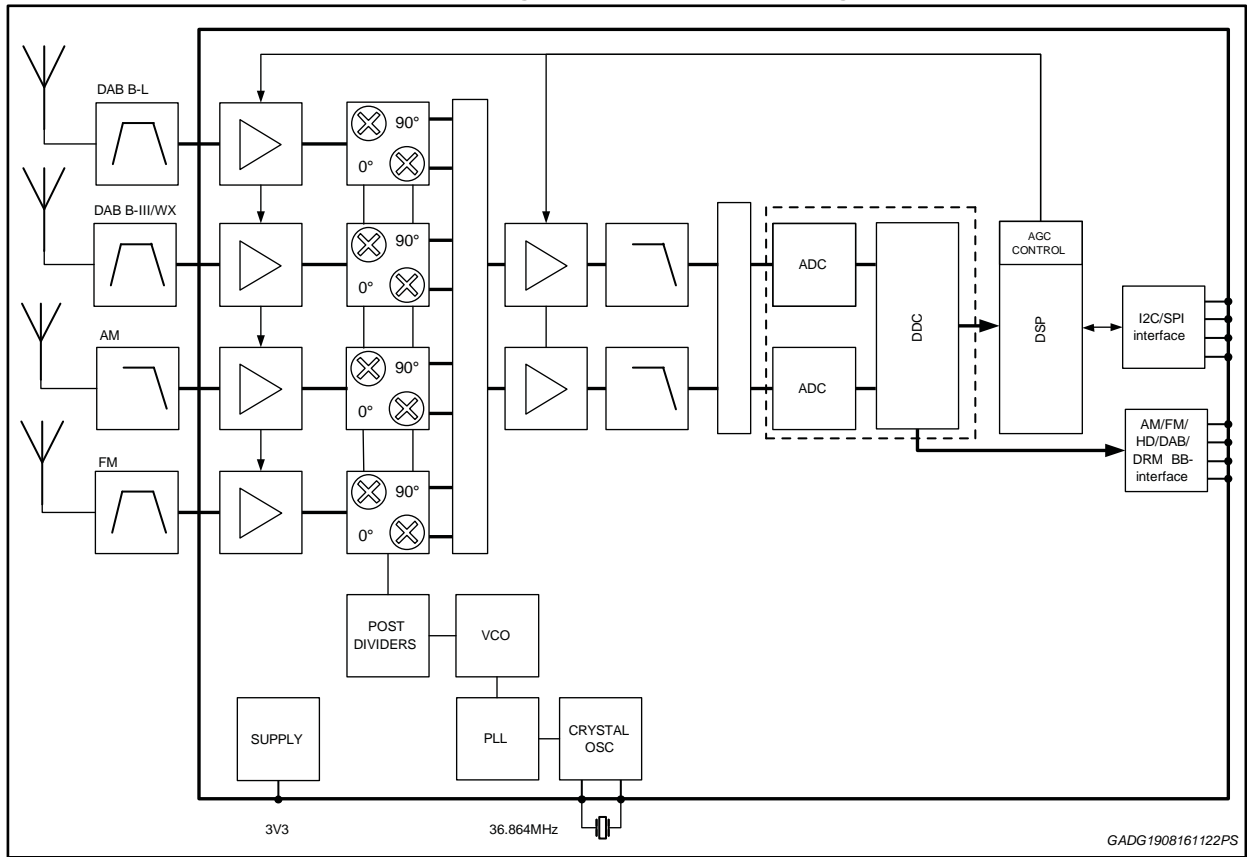
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# 1 Block diagram

Figure 1: Functional block diagram



## 2 Electrical specification

### 2.1 Absolute maximum ratings

Table 2: 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			V
		Charged device model	> ±500			
		Charged device model, corner pins	> ±750			
-	Max. input at any pin (latch-up characteristic)	I <sub>INMAX</sub>	±100			mA

### 2.2 Thermal data

Table 3: 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	27	°C/W

### 2.3 General key parameters

Table 4: 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)	-	-	340	mA
T <sub>amb</sub>	Ambient Temperature Range	-	-40	-	85	°C
T <sub>j_oper</sub>	Operative Junction Temp	-	-	-	125	°C

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

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

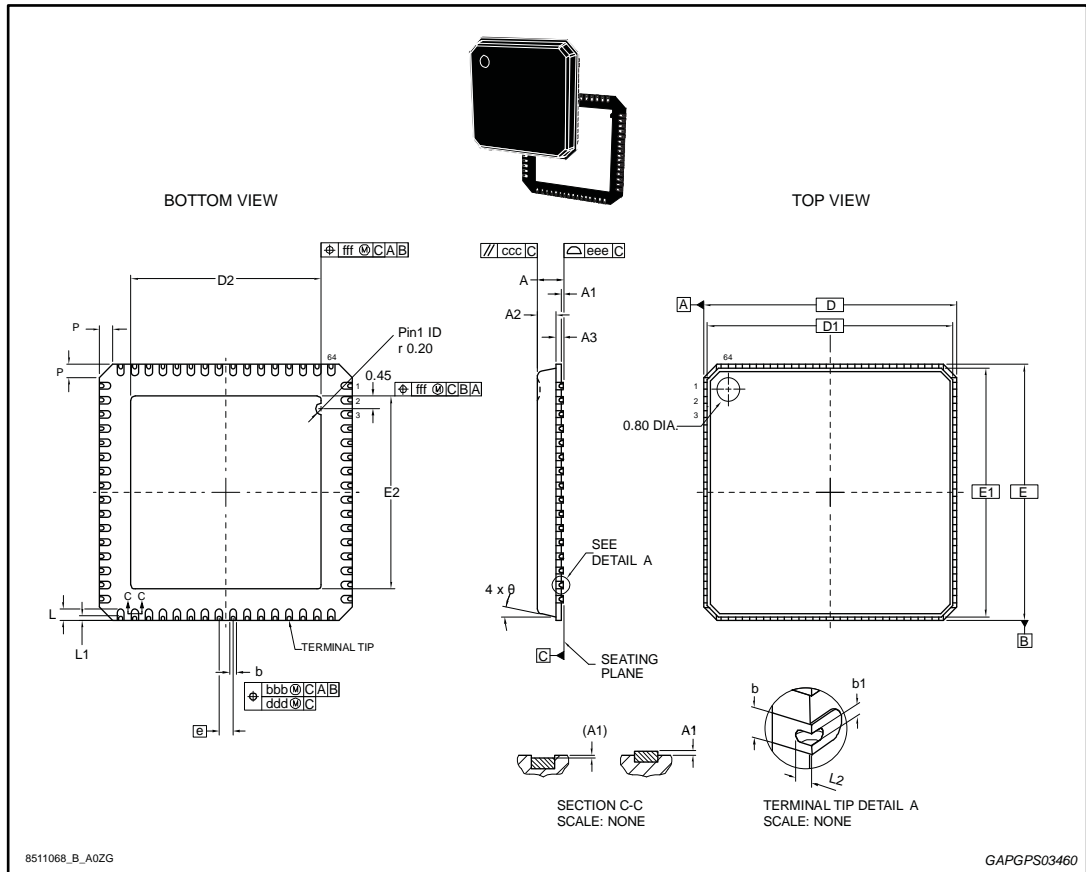


Table 5: VFQFPN-64 (9x9x1.0 mm) package mechanical data

Ref	Dimensions					
	Millimeters			Inches <sup>(1)</sup>		
	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
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	-

Ref	Dimensions					
	Millimeters			Inches <sup>(1)</sup>		
	Min.	Typ.	Max.	Min.	Typ.	Max.
D	9.00 BSC			0.3543 BSC		
D1 <sup>(3)</sup>	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 <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	-
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		

**Notes:**

<sup>(1)</sup>Values in mm are converted into inches and rounded to 4 decimal digits.

<sup>(2)</sup>Maximum allowable burrs is 0.076 mm in all directions.

<sup>(3)</sup>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.



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.

## 4 Revision history

**Table 6: Document revision history**

Date	Revision	Changes
29-Nov-2016	1	Initial release.

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