

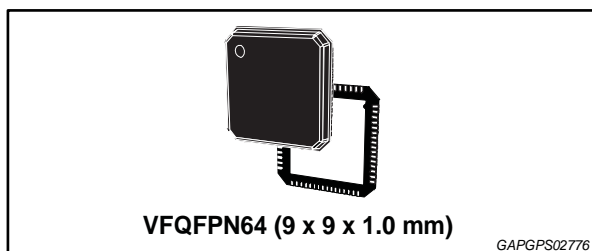
ST(意法) TDA7702 **PDF**

深圳创唯电子有限公司

<http://www.st-ic.com>

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

Data brief



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
- RDS demodulation with group and block synchronization
- Compatible with HD-Radio™ and DRM
- Digital Audio Output
- Fully RoHS-compliant

Description

The TDA7708 is a single chip fully-CMOS AM/FM tuner aimed at receivers for terrestrial radio broadcasting.

The TDA7708 is a complete integrated and optimized RF tuner for AM/FM reception. It allows the implementation of AM/FM solution (and also HD-Radio™ with external STMicroelectronics's STA680 co-processor) for automotive grade receivers and other applications.

The TDA7708 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 TDA7708 features multiple front-end low-noise amplifiers (LNAs) to cover AM LW/MW/SW bands, and the entire FM band, with advanced DSP-controlled automatic gain control (AGC) amplifier and mixer stages.

After on-chip IF filtering, the TDA7708 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 TDA7708 furthermore integrates the HD-Radio™ channel filtering.

Besides providing optimal AM/FM quality reception, the TDA7708 makes it the ideal solution to realize a complete HD-Radio™ receiver solution (in combination with the external STA680 HD-Radio™ decoder) or a DRM receiver (paired to the STA660DRM), with a low bill of material, high performance and real automotive grade quality and reliability.

The TDA7708CB 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.

Table 1: Device summary

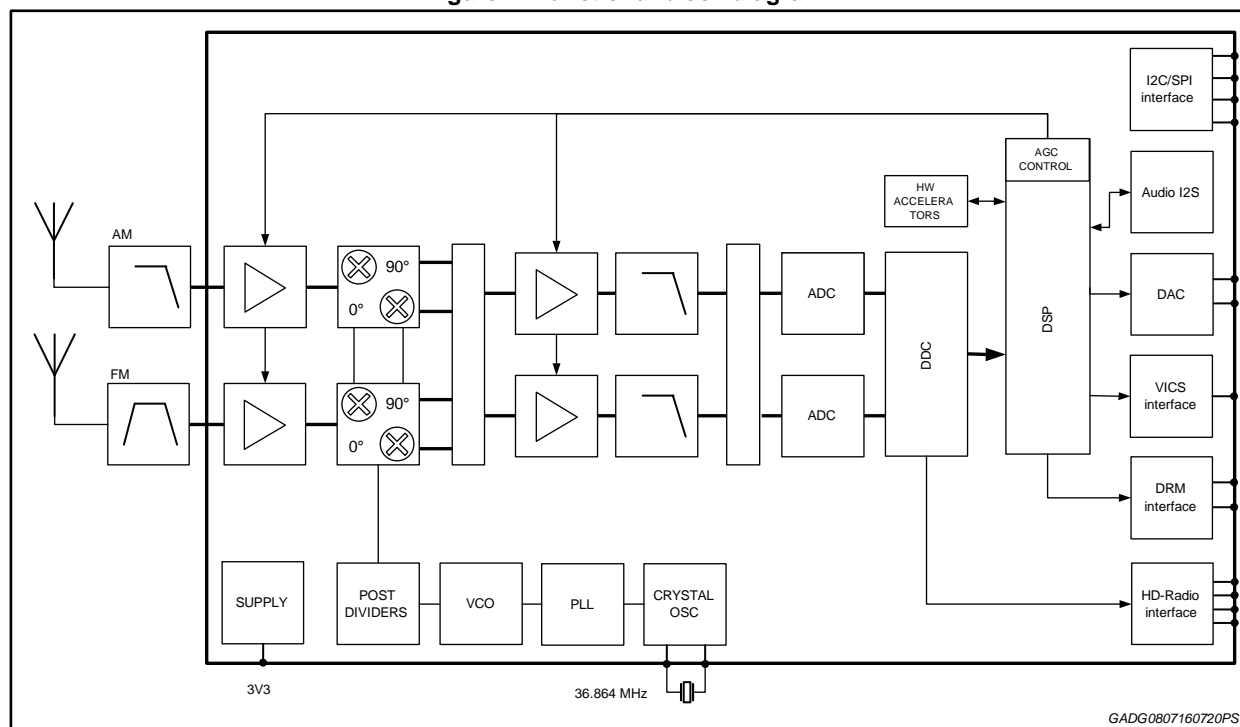
Order code	Package	Packing
TDA7708	VFQFPN64	Tray
TDA7708TR	(9 x 9 x 1 mm)	Tape & Reel
TDA7708CB	VFQFPN64	Tray
TDA7708CBTR	(9 x 9 x 1 mm)	Tape & Reel

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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 _{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

Notes:
⁽¹⁾|±1000| on pin 14

⁽²⁾|±400| on pin 14

2.2 Thermal data

Table 3: 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 4: 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)	-	-	350	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

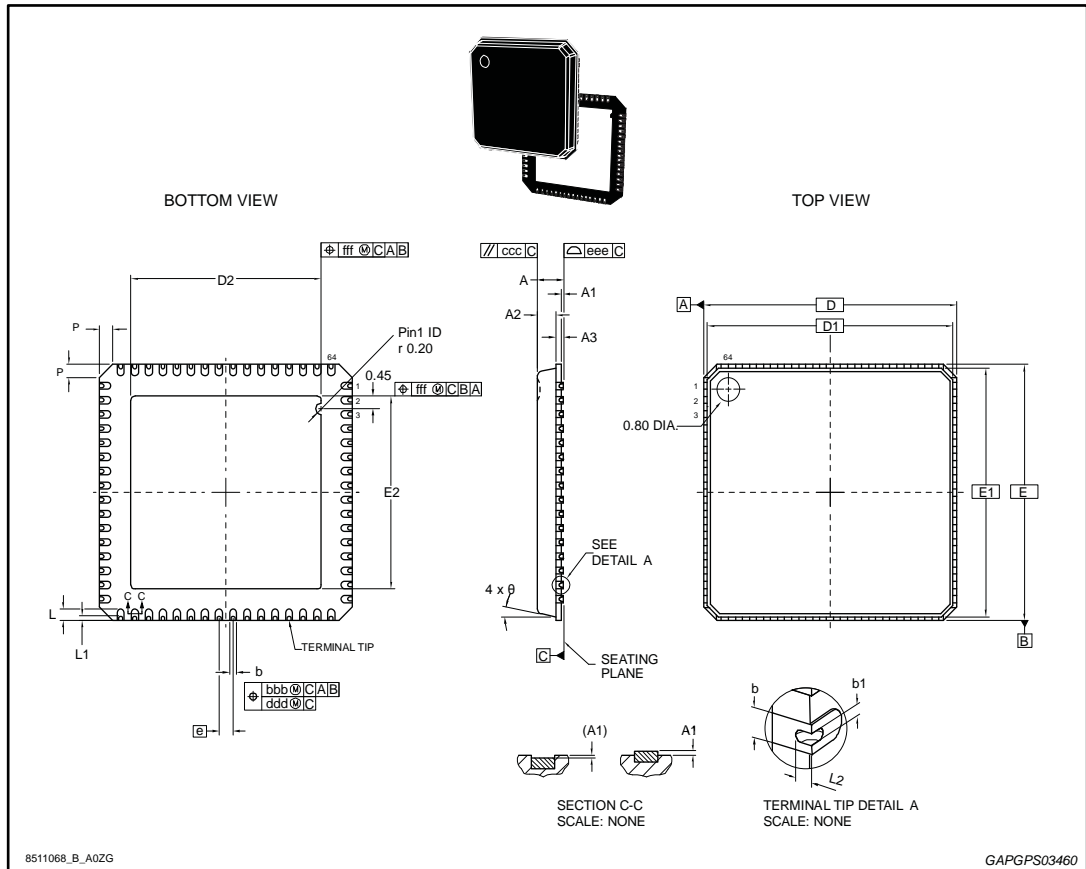


Table 5: VFQFPN-64 (9x9x1.0 mm) package mechanical data

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
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	-

Ref	Dimensions					
	Millimeters			Inches ⁽¹⁾		
	Min.	Typ.	Max.	Min.	Typ.	Max.
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		

Notes:

⁽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.



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
16-Dec-2014	1	Initial release.
29-Nov-2016	2	Fully revised.
15-May-2017	3	Added 'RDS demodulation' on Section "Features"
25-Jan-2018	4	Updated Section "Description" and Table 1: "Device summary" on cover page.

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