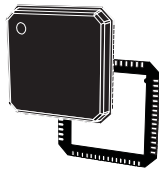



## AM/FM/HD-Radio™/DAB submicron technology automotive receiver


**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<sup>2</sup>S digital output
- I<sup>2</sup>S, JESD204B, LVDS, high-speed digital I/Q base-band interface
- I<sup>2</sup>C/SPI bus-controlled
- Single 3.3 V external supply

#### Product status link

[TDA7707](#)

#### Product summary

| Order code  | Package                    | Packing     |
|-------------|----------------------------|-------------|
| TDA7707     | VFQFPN64<br>(9 x 9 x 1 mm) | Tray        |
| TDA7707EB   |                            | Tape & Reel |
| TDA7707TR   |                            |             |
| 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.

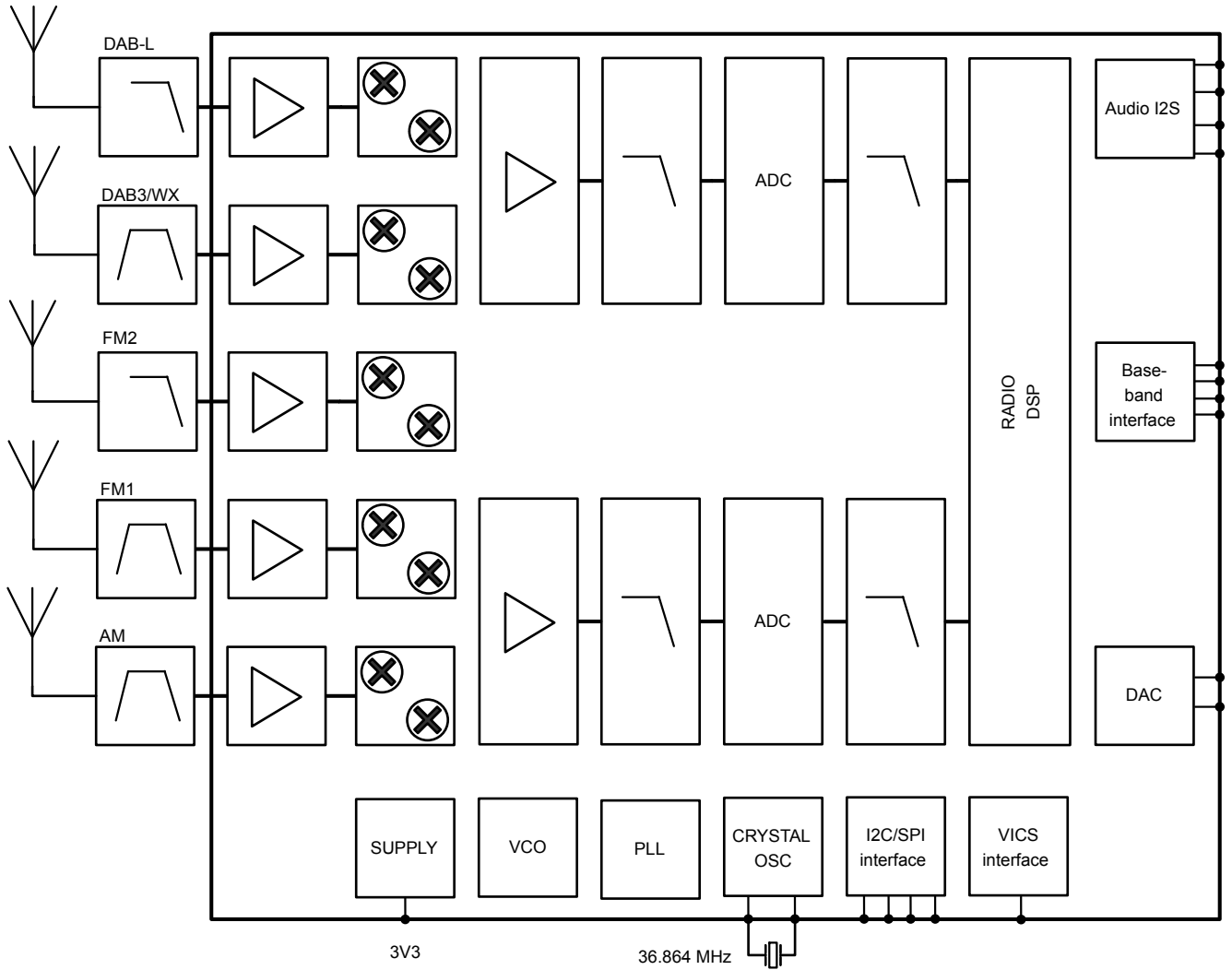
The TDA7707 combines state-of-art performance with minimum external component count, making it therefore ideal for integration into car radios and other AM/FM/HD/DAB/DRM devices with challenging performance, quality, reliability and, last but not least, cost requirements.

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.

# 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     | 27    | °C / W |
|                       |  | Thermally optimized multilayer 2s2p board | 22    |        |

### 2.3 General key parameters

**Table 3. General key parameters**

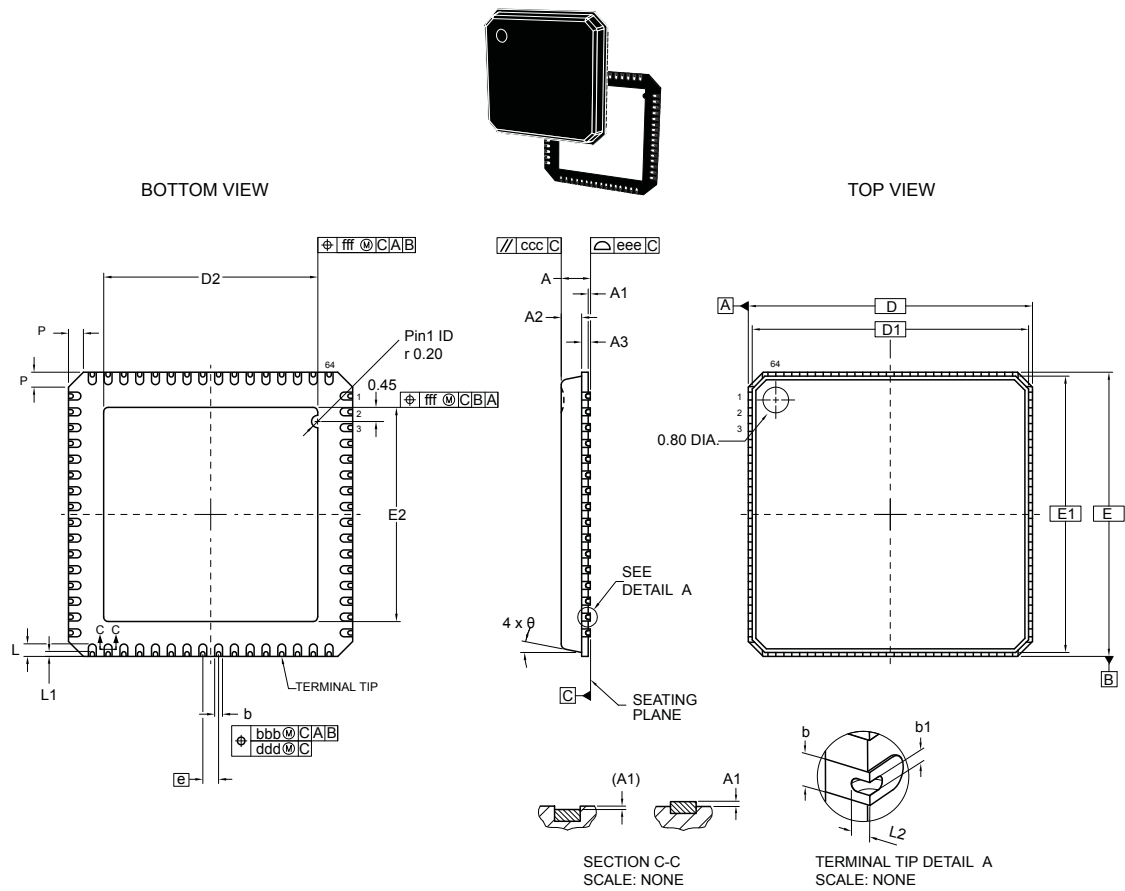
| Symbol              | Parameter                 | Test Condition  | Min  | Typ | Max  | Units |
|---------------------|---------------------------|---|------|-----|------|-------|
| V <sub>CC</sub>     | 3.3 V supply voltage      |   | 3.15 | 3.3 | 3.45 | V     |
| I <sub>CC</sub>     | Supply current            | Two active RF channels, V <sub>CC</sub> = 3.45 V  | -    | -   | 519  | mA    |
|                     |                           | Two active RF channels, JESD204b interface activated (10 pF load), V <sub>CC</sub> = 3.45 V | -    | -   | 600  |       |
| 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          | Two active RF channels, R <sub>ext</sub> = 9 Ohm, I2S baseband interface activated          | -    | -   | 1.5  | W     |
|                     |                           | Two active RF channels, R <sub>ext</sub> = 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](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



8511068\_B\_A02G

GAPGPS03460

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

| Ref.             | Dimensions in mm |      |      |
|------------------|------------------|------|------|
|                  | Min.             | Typ. | Max. |
| Ø                | -                | -    | 14   |
| A                | -                | -    | 1.0  |
| A1               | 0.00             | -    | 0.05 |
| A2               | 0.55             | -    | 0.80 |
| A3               | 0.20 REF         |      |      |
| b <sup>(1)</sup> | 0.18             | 0.25 | 0.30 |

| Ref.                                  | Dimensions in mm |      |      |
|---------------------------------------|------------------|------|------|
|                                       | Min.             | Typ. | Max. |
| b1                                    | -                | 0.15 | -    |
| D                                     | 9.00 BSC         |      |      |
| D1 <sup>(2)</sup>                     | 8.75 BSC         |      |      |
| D2                                    | -                | 6.70 | -    |
| e                                     | 0.50 BSC         |      |      |
| E                                     | 9.00 BSC         |      |      |
| E1 <sup>(2)</sup>                     | 8.75 BSC         |      |      |
| E2                                    | -                | 6.70 | -    |
| L                                     | 0.30             | -    | 0.50 |
| L1                                    | 0.15 REF         |      |      |
| L2                                    | -                | 0.10 | -    |
| P                                     | -                | -    | 0.60 |
| <b>Tolerance of form and position</b> |                  |      |      |
| 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        | Version | Changes  |
|-------------|---------|--|
| 16-Dec-2014 | 1       | Initial release.                                 |
| 04-Jun-2018 | 2       | Fully revised.                                   |
| 25-Nov-2019 | 3       | Updated <a href="#">Figure 1. Block diagram.</a> |

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