



# A family for all your analog radio reception needs

NXP low-IF analog car radio tuner family TEF66xx



## Alignment free easy application analog car radio tuners

Recent generations of NXP's one-chip low-IF tuners continue to expand the frontiers of front-end excellence. At the same time, increasing component integration reduces design complexity and cuts board space requirements.

Our TEF66xx ICs represents a real breakthrough innovation for the analog car radio market. They are the market's first alignment-free, low-IF tuners that can be designed directly onto the main board without in-depth RF know-how. This enables OEM and aftersales manufacturers to benefit from the technology while still reaching the high performance requirements for car radio applications.

With the increasing number of features in the car radio head unit, space also becomes an ever more critical issue. Helping you fit more into less, TEF66xx tuner ICs make traditional analog AM/FM tuner modules obsolete. In addition to having the tuner included on the main board, these ICs incorporate all critical RF components and therefore eliminating the need for those components. Fully pin compatible, the TEF66xx product family offers a range of different feature sets to suit your feature / pricing area.



## Meet the family

NXP's TEF66xx family has been developed with our strategic partner, Catena Radio Design, together with a number of key customers. This ensures the family offers a choice of features and performance to meet a variety of price points.

### Key features

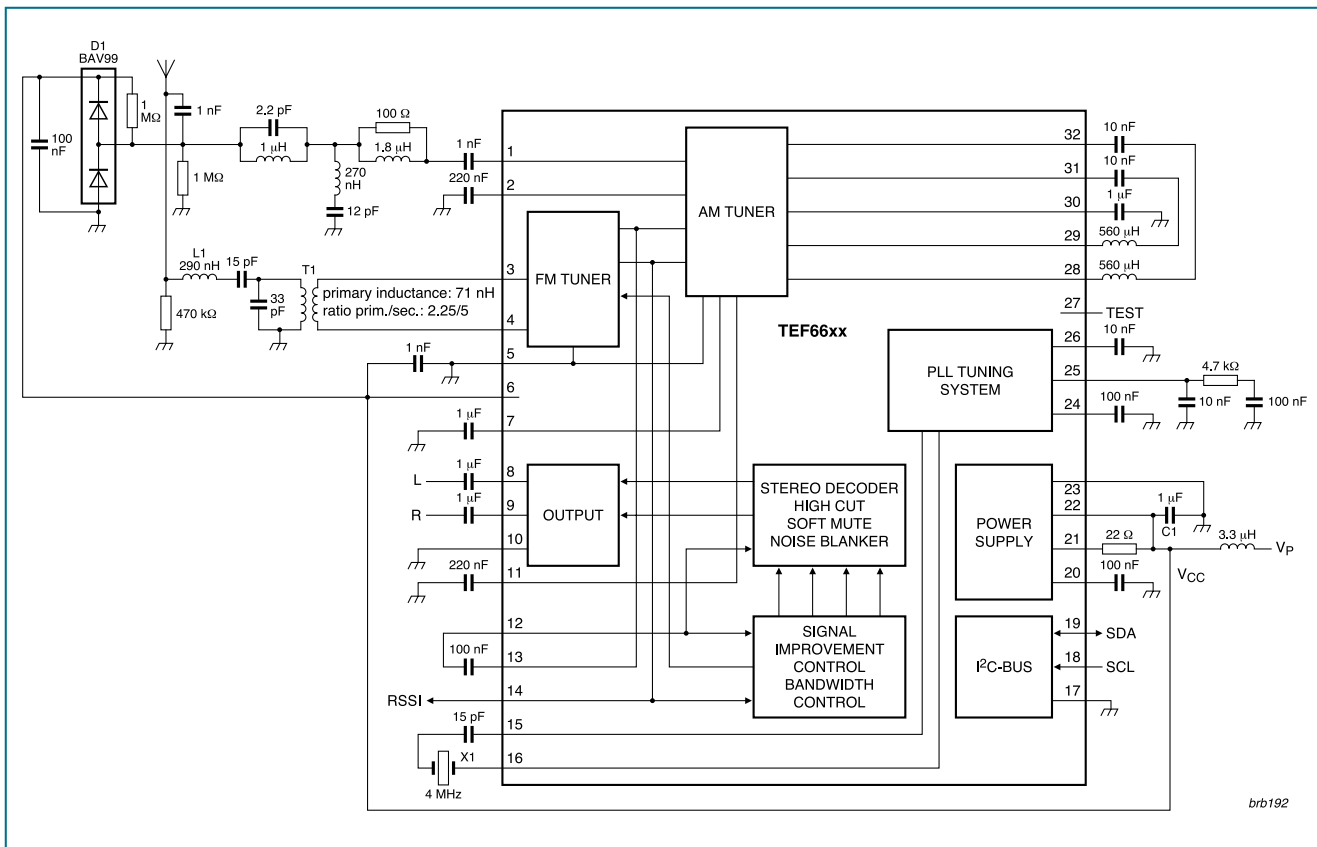
- AM / FM tuner with low IF conversion
- PLL synthesizer with integrated VCO
- Integrated AM LNA with AGC and RF selectivity
- Stereo decoder with output for interfacing with external analog or digital audio processor
- Advanced weak signal processing (soft mute, stereo blend, high cut control)
- AM / FM noise blanker (TEF6601 – FM noise blanker only)
- Signal quality detection (level, wide band AM, ultra sonic noise)
- I<sup>2</sup>C bus control
- RDS demodulator and / or decoder (TEF661x only)
- Single 8.5 V supply
- SO32 package
- Qualified in accordance with AEC-Q100
- Very low external component count
- Integrated FM LNA with AGC
- Allows for fast software development because of integrated radio knowledge and easy interface
- Very good AM / FM strong signal behavior

## TEF66xx Family Overview

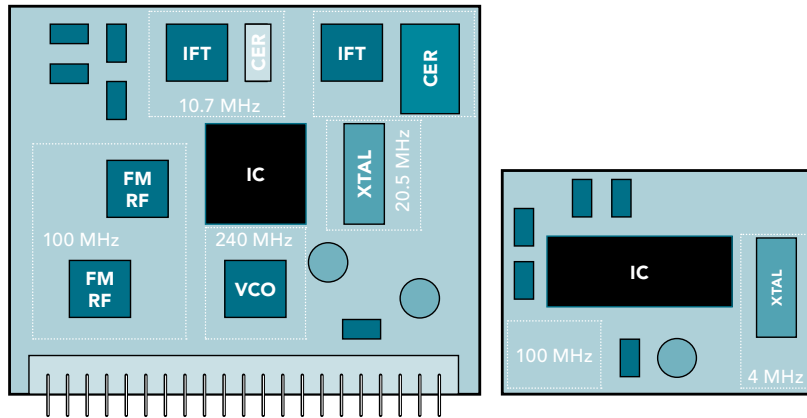
		TEF6601	TEF6606	TEF6613	TEF6614	TEF6616
System	Supply	8.5V	8.5V	8.5V	8.5V	8.5V
	Output	L/R, MPX	L/R, MPX	MPX, RDS	L/R, MPX, RDS	L/R, MPX, RDS
	IF filter	X	PACS	PACS	PACS	PACS
RD(B)S	Demodulator / Decoder	X / X	X / X	O / O	O / X	O / O
FM	Japan / EU / US bands	O	O	O	O	O
	OIRT	X	O	O	O	O
	Stereo Decoder	O	O	X	O	O
	Noise Blanker	O	O	X	O	O
	Weak Signal Processing	O	O	X	O	O
AM	LW	O	O	X	O	O
	MW	O	O	X	O	O
	SW	X	O	X	O	O
	Noise Blanker	X	O	X	O	O
	Weak Signal Processing	O	O	X	O	O
General	Package	SO32	SO32	SO32	SO32	SO32
	AEC-Q100	O	O	O	O	O
	Sampling	Final samples	Final samples	Final samples	Final samples	Final samples
	Mass Production Start	Q1 2009	Q1 2009	Q2 2009	Q2 2009	Q2 2009

O: has this feature    X: does not have this feature

## TEF66xx block and application diagram



## TEF66xx provides significant space savings



Conventional state-of-the-art tuner module: 48 x 40 mm

TEF66xx PCB area

## The benefits of NXP's proven low-IF architecture

Whereas existing solutions require double IF conversion, our TEF66xx devices eliminate both 10.7 MHz and 450 kHz IF transformer coils and ceramics, as well as the expensive external components for LNA and AGC in the AM and FM front-ends. Additionally the fully integrated VCO saves the external LC tank components.

Due to the low IF architecture, there are no critical high frequency PCB layouts and alignments needed anymore. Therefore, even set makers with limited RF know-how or resources can apply the TEF66xx to the main PCB board, saving significant costs by making a tuner module design obsolete. Manufacturing is also made easier by enabling full SMD applications. Single layer PCB design is supported as well.



### Easy to design on the main PCB

- Small application PCB area
- No critical external RF components due to highest integration
  - only 34 (all passive SMD) components required
  - complete channel selectivity / VCO integrated
- Limited resources and RF know-how needed
- Supports single layer PCB design

### Easy to manufacture

- Full SMD application possible (no hand mounting)
- Less handling due to small number of external components
- No mechanical / software alignments needed
- Higher production throughput



[www.nxp.com](http://www.nxp.com)

© 2009 NXP B.V.

All rights reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent- or other industrial or intellectual property rights.

Date of release: February 2009

Document order number: 9397 750 16699

Printed in the Netherlands

