NXP DSP-based single-chip radio tuner ICs TEF668x

Premium car radio tuner with state-of-the-art signal processing

These next-generation tuners offer outstanding performance levels with the broad range of features and state-of-the-art algorithms, especially for multipath environments. When combined with a coprocessor, it offers additional support for HD Radio and DRM.

KEY FEATURES

- Alignment-free digital receiver with tuner and software-defined radio processing
- Full worldwide band coverage of AM (LW, MW, SW) and FM (65 to 108 MHz)
- Advanced RDS and RBDS demodulation and decoding
- State-of-the-art FM Improved Multipath Suppression
- FM Channel Equalization
- Soft Mute on Modulation
- Stereo High Blend
- FM LNA with AGC
- AM and FM noise blanking, signal quality detection, and weak signal processing
- Digital IF signal processing including decimation, shift to baseband, AGC control, I/Q correction, variable IF bandwidth filtering (PACS), and demodulation
- FM stereo decoding
- TEF6688 baseband I²S output supporting HD Radio and DRM with digital radio coprocessor (SAF356x or SAF360x)
- Blending function for HD Radio reception (TEF6688)
- MPX output supporting DARC demodulator
- One I²S input, one I²S output
- Two mono audio DACs
- Single 3.3 V supply voltage
- Configurable GPIO pins for RDS, Quality Status Interrupt, and generic I²C-controlled I/O
- Qualified in accordance with AEC-Q100

APPLICATIONS

- Premium automotive applications that support analog AM/FM, HD Radio, and DRM reception
- Aftermarket platforms for high-end car radios
- High-end consumer audio systems

General Description

The NXP TEF6686 and TEF6688 are single-chip radio ICs that include an AM/FM radio tuner and software-defined radio signal processing. These low-IF, high-performance ICs extend NXP's broad, industry-proven portfolio for single-tuner car radios, and offer outstanding radio performance. The wide range of features and state-of-the-art software algorithms let designers optimize system costs in high-end premium applications.

Both devices are available in HVQFN packages that save PCB space and support dual- and multi-layer PCBs. The radio receiver includes an AM/FM front-end, a tuning synthesizer, channel filtering, FM channel equalization, FM multipath improvement, demodulation, FM stereo decoding, weak-signal processing, noise blanking, and RDS, and has an interface to a DARC demodulator/decoder.

Both devices provide stereo audio in digital format on an I²S output and an audio DAC output. When used with the NXP radio coprocessor SAF356x or SAF360x, the TEF6688 supports the digital radio standards HD Radio and Digital Radio Mondiale (DRM).

Selection guide

Features	TEF6686	TEF6688
Digital-to-analog converters (DACs)	2	2
Audio I²S output (can be disabled or enabled)	√	√
Radio Bands		
▸ AM: LW-MW	√	
▸ AM: SW	√	
▸ FM	√	
HD Radio and DRM support	-	√
Standard radio features		
▸ RDS demodulator and decoder	√	
▸ FM PACS	√	
▸ Softmute	√	
▸ HighCut	√	
▸ Stereo blend	√	
Advanced radio features		
▸ AM & FM IF noise blanking	√	
▸ Dynamic LowCut	√	
High-end radio features		
▸ iMS (improved Multipath Suppression)	√	
▸ CEQ (Channel Equalization)	√	
▸ Soft mute on modulation	√	
▸ Stereo high blend	√	
Package	HVQFN32	

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