

## TEF6657HN

DSP-based radio tuner one-chip

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The TEF6657 and TEF6659 are single-chip radio ICs including an AM/FM radio tuner and software-defined radio signal processing. These devices are the successors to the industry-proven TEF661X product range, with improved performance and feature set at lower system cost.

Both devices are available in HVQFN packages occupying only smallest PCB real estate and are suitable for multi-layer PCBs.

The radio receiver includes the FM/AM front-ends, tuning synthesizer, channel filtering, FM multipath improvement, demodulation, FM stereo decoding, weak signal processing, noise blanking, RDS and DARC support.

Stereo audio is provided in digital format on the I<sup>2</sup>S outputs and on the audio DAC outputs.

The TEF6659 supports the HD Radio and Digital Radio Mondiale (DRM) digital radio standards when used with NXP Semiconductors' digital radio coprocessors such as SAF356X and SAF360X.

### Features and benefits

- Alignment free digital receiver including tuner and software-defined radio processing
- Command based high-level user interface combining high control flexibility with ease of control
- FM receiver with a tuning range of 0.5 MHz to 108 MHz covering Eastern Europe (OIRT), Japan, Europe and US bands
- AM receiver covering LW, MW and full SW
- Fully integrated tuning system with low phase noise and fast tuning
- FM LNA with AGC
- FM mixer for frequency conversion to a low IF complex signal
- AM LNA with AGC, matching active and passive antenna applications
- AM mixer for frequency conversion to a low IF complex signal (AM SW)
- High dynamic range IF ADC
- Digital IF signal processing including decimation, shift to baseband, AGC control, IQ correction, variable IF bandwidth filtering (PACS) and demodulation
- FM stereo decoding
- Baseband I<sup>2</sup>S output supporting HD Radio and DRM1 with external digital radio coprocessor (TEF6659)
- Blending function for HD Radio reception (TEF6659)
- AM & FM noise blanking, Signal quality detection and weak signal processing
- Advanced RDS and RBDS demodulation and decoding
- MPX output supporting DARC demodulator
- One I<sup>2</sup>S input and one I<sup>2</sup>S output
- Two mono audio DACs
- Single 3.3 V supply voltage
- Fast mode I<sup>2</sup>C-bus (400 kHz)
- Configurable GPIO pins for RDS, Quality Status Interrupt and generic I<sup>2</sup>C-bus controlled I/O
- Qualified in accordance with AEC-Q100

### Applications

The TEF665X is a single tuner AM/FM receiver for automotive applications and supports analog AM/FM and HD/DRM reception (HD/DRM is supported in TEF6659 only).

Additionally, due to a common technology platform, the TEF665X can be combined with TEF701X, SAF775X and SAF360X for optimal system application through common crystal oscillator sharing.

► **Series** TEF665X  
DSP-based radio tuner one-chip

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[General product disclaimer](#)  
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### Package

Type number	Package	Outline version	Reflow-Wave soldering	Packing	Product status	Marking	Orderable part number, (Ordering code (12NC))
TEF6657HN/V102	 HVQFN32 (SOT617-3)	<a href="#">↓ sot617-3_po</a>	<a href="#">↓ sot617-3_fr</a>	Tray, Bakeable, Multiple in Drypack	<b>Active</b>	Standard Marking	TEF6657HN/V102K (9353 026 13557)
				<a href="#">↓ Reel 13" Q1/T1 in Drypack</a>	<b>Active</b>	Standard Marking	TEF6657HN/V102Y (9353 026 13518)

### Quality, reliability & chemical content

Type number	Orderable part number	Chemical content	RoHS / RHF	Leadfree conversion date	MSL	MSL LF
TEF6657HN/V102	TEF6657HN/V102K	TEF6657HN/V102		Always Pb-free	3	3
TEF6657HN/V102	TEF6657HN/V102Y	TEF6657HN/V102		Always Pb-free	3	3

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### Documentation for this product

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File name	Title	Type	Format	Date
<a href="#">TEF665X_SDS</a>	DSP-based radio tuner one-chip	★ Short data sheet	pdf	2014-01-29
<a href="#">75017469</a>	NXP DSP-based single-chip radio tuner ICs TEF665x	★ Leaflet	pdf	2013-09-17
<a href="#">SOT617-3_518</a>	HVQFN32; Reel pack; SMD, 13" Q1/T1 Standard product orientation Orderable part number ending ,518 or Y Ordering code (12NC) ending 518	★ Packing	pdf	2015-04-01
<a href="#">sot617-3_fr</a>	Footprint for reflow soldering SOT617-3	★ Reflow soldering	pdf	2009-10-08
<a href="#">sot617-3_po</a>	plastic thermal enhanced very thin quad flat package; no leads; 32 terminals; body 5 x 5 x 0.85 mm	★ Outline drawing	pdf	2002-10-21

### Ordering & availability

Type number	Ordering code (12NC)	Orderable part number	Region	Distributor	In stock	Order quantity	Inventory date	Buy online	Samples
TEF6657HN/V102	9353 026 13557	TEF6657HN/V102K							<a href="#">Order samples</a>
TEF6657HN/V102	9353 026 13518	TEF6657HN/V102Y							<a href="#">Order samples</a>

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