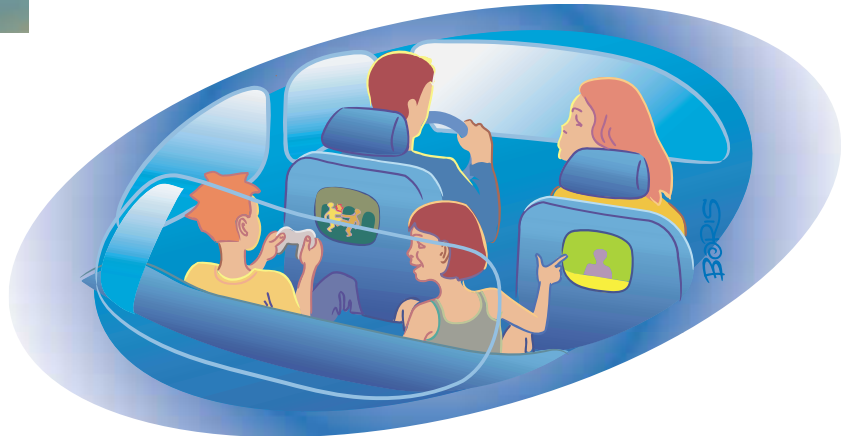




DIB3000-MC

Mobile DVB-T COFDM
demodulator
(0.18 μm CMOS technology)

Advanced
Signal Processing
on Silicon



MOBILE...

Enhanced signal processing for mobile application :

- ◆ High input dynamic range (70dB on evaluation board)
- ◆ Dynamic FFT positioning and fast channel estimation
- ◆ High Doppler effect correction
- ◆ Diversity capability with easy chip connection
- ◆ Enhanced Co-Channel Interference compensation
- ◆ Efficient surrounding noise compensation
- ◆ High performance with echoes outside the Guard Interval (improve SFN coverage)
- ◆ High Monitoring capabilities (Received Signal level, C/N, Channel Profile, BER, MER, TPS change tracking, Power and Noise for every COFDM carrier)

...CAR-TV application

- ◆ High performance in Single mode thanks to specific mobile signal processing blocks
- ◆ Large improvement in Diversity2 mode compared with Single mode :
 - C/N : up to +7dB
 - Doppler frequency : up to x2

City	DVB-T mode	Receiver mode	Typical values for TU6 mode			
			(C/N)min	FDoppler max	@ 498MHz (channel 24)	@ 826MHz (channel 65)
Berlin	8k 16QAM 2/3 1/8	SINGLE	21 dB	90 Hz	180 km/h	120 km/h
		DIVERSITY2	14 dB	130 Hz	280 km/h	170 km/h
Paris	8k 64QAM 2/3 1/32	DIVERSITY2	19 dB	120 Hz	240 km/h	150 km/h

- ◆ Scalable Power consumption : from 0.5 W to 0.8 W (for 8MHz channel bandwidth)
- ◆ DEV3000-D Reference design available for fast integration

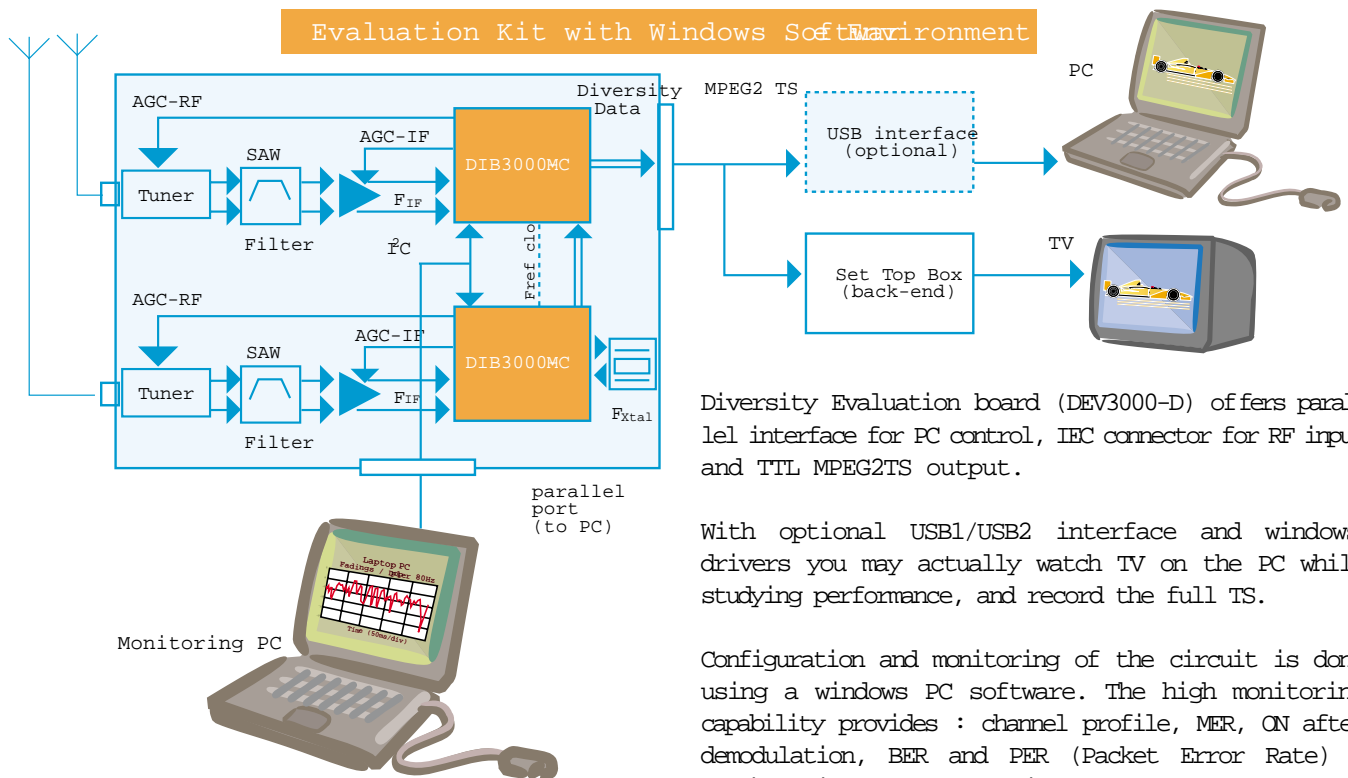
The DiBcom DIB3000-MC 2k/8k COFDM demodulator Integrated Circuit (IC) uses the most recent state of the art in Signal Processing to offer high performance for mobile, portable and fixed reception of Digital Terrestrial Television signals compliant with EN 300744/DVB-T, NORDIG II and MBRAI/EICTA standards.

The DIB3000-MC is designed in advanced 0.18 μm CMOS technology.

- ◆ The DIB3000-MC offers an enhanced acquisition process based on :
 - Synchronization and extraction of TPS parameters even with a $C/N(\text{dB}) = 0 \text{ dB}$ (usage for antenna positioning)
 - Recovery up to $\pm 350 \text{ kHz}$ frequency offset (in 8k mode) which contributes to reduce the scanning time.
- ◆ A digital filter with high rejection capability is added to cope with adjacent channels. Combined with digital interpolation, the circuit is capable of demodulating 8, 7 or 6 MHz channels while keeping the same 8 MHz analog front-end.
- ◆ The Co-Channel Interference is compensated thanks to an enhanced algorithm, which performs far better than the required value in NORDIG specification.
- ◆ The surrounding noise degradation effect is efficiently treated by a dedicated algorithm.

Specific functionalities are implemented to give optimized performance in portable and mobile environments :

- ◆ Dual IF/RF AGC control offers very high dynamic range digital control (70 dB on evaluation board). In addition the gain slopes of IF and RF amplifiers are digitally compensated to ensure an AGC loop linear behavior (usage for portability and mobility).
- ◆ Dynamic FFT window positioning gives the circuit the ability to track any change in the channel profile (with post or pre echoes) on a symbol per symbol basis.
- ◆ Accurate channel estimation for high Doppler frequency shift (up to 90 Hz for 8K, 16QAM modes in single mode; i.e 180 km/h at RF 498 MHz).
- ◆ FFT leakage suppression capability makes the DIB3000-MC able to compensate for the Inter Carrier Interference due to mobile environment.
- ◆ Diversity combining is offered on the DIB3000-MC. The connection of the different circuits is made very simple : you only have to cascade N chips to operate in Diversity N mode ! (up to 120 Hz for 8K, 64QAM 2/3 modes in diversity2 ; i.e 240 km/h at RF 498 MHz).



Diversity Evaluation board (DEV3000-D) offers parallel interface for PC control, IEC connector for RF input and TTL MPEG2TS output.

With optional USB1/USB2 interface and windows drivers you may actually watch TV on the PC while studying performance, and record the full TS.

Configuration and monitoring of the circuit is done using a windows PC software. The high monitoring capability provides : channel profile, MER, ON after demodulation, BER and PER (Packet Error Rate) ; received field strength vs time,...