The newly-developed Sony CXD2830R is a cable and terrestrial TV digital broadcast demodulator IC for the digital TV standards used in China. In particular, this product supports the GB 20600-2006 (DTMB) standard for terrestrial digital broadcasts and the ETSI EN 300 429 (DVB-C) standard for digital cable broadcasts.

- Implements both the GB 20600-2006 (DTMB) and the ETSI EN 300 429 (DVB-C) standards in a single chip
- For DTMB, the CXD2830R can implement high-speed scan sequences by automatic C1/C3780 discrimination
- Conforms to Chinese national standards (MII specifications)
- Demodulating algorithms that are highly resistant to multipath interference
- Multiple means for controlling TS output
- Package and pin compatibility with the CXD2826R and CXD2829R
- Implements both GB 20600-2006 (DTMB) and ETSI EN 300 429 (DVB-C) in a Single Chip

The CXD2830R can demodulate digital TV signals for both the Chinese terrestrial digital broadcast standard (GB 20600-2006 (DTMB)) and the ETSI EN 300 429 (DVB-C) cable digital broadcasting standard used for cable TV in China. For DTMB demodulation, the CXD2830R uses and develops further the algorithms for demodulator ICs that Sony had developed to date, and it achieves the industry's highest level of performance. For DVB-C, the CXD2830R provides the same superb reception performance as the existing Sony CXD2817R and CXD2820R devices. Figure 1 shows the block diagram for the CXD2830R.

- For DTMB, High-Speed Scan Sequences can be implemented by Automatic C1/C3780 Discrimination
- DTMB has two main modes, C1 and C3780, and the CXD2830R can automatically discriminate and receive both of these. Since no settings need to be changed, the CXD2830R can implement high-speed channel scanning.

- Multiple Means for Controlling TS Output
- While it goes without saying that the CXD2830R provides switching between serial TS and parallel TS, it also supports a wide variety of control types, including output rate control and waveform inversion. Since the CXD2830R provides flexible settings to match the TS output destination specifications, it provides a high degree of flexibility for end-product design.

- Package and Pin Compatibility with the CXD2826R and CXD2829R
- The CXD2830R is provided in a 12 × 12 mm 80-pin LQFP package. Since this device shares the same package and pin arrangement as the CXD2826R (ISDB-T/ISDB-S demodulator IC) and the CXD2829R (DVBT-T2/DVB-T/SVB-C demodulator IC), it can significantly reduce the effort required in printed circuit board design. (See figure 5.) The CXD2830R also provides a high level of software compatibility with not only the CXD2826R and CXD2829R, but other Sony demodulator ICs as well, and this can reduce the software development effort required.

- Conforms to Chinese National Standards (MII Specifications)
- The CXD2830R meets all of the Chinese national standards (MII specifications). Not only does it support the seven modes stipulated by the Chinese national standards, it also exhibits superlative reception performance even for the parameters used in Hong Kong.

- Demodulating Algorithms that are Highly Resistant to Multipath Interference
- Since reflections are present during reception of terrestrial broadcasts, demodulator ICs must be able to deal with multipath. Furthermore, operation of the so-called single-frequency network (SFN) service has now begun, and this service makes it possible to expand the reception area without reducing frequency band efficiency by using the receiver's multipath resistance functions to allow broadcast of the same programming on the same frequency from multiple towers. As a result, even more powerful multipath handling functions will be required. Figure 2 gives an overview of the multipath environments due to both reflected signals and to the SFN service. The CXD2830R boasts the industry's highest level of channel equalization performance and has a powerful ability to handle various multipath environments, including long delay, proximate delay, and multiwavelength environments. Figure 3 shows the CXD2830R's multipath resistance abilities. Furthermore, during the reception of terrestrial digital broadcasts, changes in the local environment can cause dynamic fluctuations in the multipath environment itself. The CXD2830R uses high-performance adaptive filter algorithms to follow these dynamic variations so that it exhibits optimal performance at all times. (See figure 4.)

- VOICE
- The CXD2830R adopts and further develops the algorithms used by demodulator ICs that Sony had already developed. This allowed us to succeed in developing a product that supported the Chinese terrestrial digital broadcasting standards in an extremely short time. Also, to handle the signal quality characteristics of the Chinese reception environment, where indoor antennas are common, we made field tests during development to assure adequate reception performance.
Figure 1  Block Diagram

Figure 2(a)  Multipath Due to Reflections from Mountains and Buildings

Figure 2(b)  SFN (Single Frequency Network)

Figure 3  Multipath Performance (Mode 4)

Figure 4  Dynamic Multipath Performance (Mode 2)

Figure 5  Pin and Package Compatibility

Arrival time of the delayed wave relative to the main waveform (the signal with the highest power) [μs]

Delay time required to be handled by the Chinese national standard

Delay time required to be handled by the Chinese national standard

Path delay [μs]

D/U [dB]

Signal arrival time

Signal power

Signal arrival time range that the receiver can handle

Arrival time of the delayed wave relative to the main waveform (the signal with the highest power) [μs]

Fluctuation speed required to be handled by the Chinese national standard

The wider the range, the higher the performance

Fluctuation speed required to be handled by the Chinese national standard

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Different products can be implemented by installing different chips on the same printed circuit board due to pin and package compatibility.