

CXD2840ER

Second Generation DTMB and DVB-C Demodulator IC for China that Combines Improvements in Functionality and Performance with Compact Size



The Chinese TV market with its vast potential is one of the most competitive markets in the world. Sony's newly developed CXD2840ER retains the user-friendly interface of the CXD2830R while substantially improving stable receiver performance in China's tough reception environment. The CXD2840ER achieved both the compact package and reduced printed circuit board and BOM costs.

- Conforms to Chinese National Standards (GB/T20683-2011, GB/T20686-2011)
- Improved multipath performance
- Improved impulsive noise tolerance
- Compact package and reduced printed circuit board and BOM costs
- Tuner IC chipset that supports all the world's broadcasting standards

Conforms to Chinese National Standards (GB/T20683-2011, GB/T20686-2011)

The CXD2840ER meets all the receiver performance stipulated by the Chinese national standards (GB/T20683-2011, GB/T20686-2011). The Chinese national standard will be formally enacted in November 2011 and Sony is one of the first companies to receive national standard certification for its demodulator IC. (See photograph 1.) Not only does it support the seven modes stipulated by the Chinese national standards, it also exhibits superlative receiver performance even for the parameters used in Hong Kong.

Improved Multipath Performance

Since reflected waves are present during reception of terrestrial broadcasts, demodulator ICs must be able to deal with multipath environment. Indoor antennas are used in China to receive terrestrial broadcasts, which makes reception more problematic.

(See figure 1.)

The newly developed CXD2840ER has even better multipath performance than the CXD2830R, the current Sony product.

One improvement is better pre-echo tolerance. (See figure 2.) The low position of antennas mean that they receive a large amount of reflected waves from adjacent buildings. Since SFN (Single Frequency Network) services have already started, not only delayed waves but preceding waves (pre-echo) may also be present. Another is the improvement in dynamic multipath performance. (See figure 3.) Since antennas are often installed near streets, reception is often affected by waves reflected off passing buses and cars creating a continuously changing reception environment.

Improvements in the adaptive filter algorithms of the CXD2840ER allow it to handle quickly changing reception environments.

Improved Impulsive Noise Tolerance

China is a vast country with widely varying environments. For example, South China lies in a subtropical region that is sometimes exposed to severe weather conditions and where violent thunder storms can cause interference in the broadcasting system.

The CXD2840ER has been provided with significantly better impulsive noise tolerance than the current CXD2830R and can withstand impulse noise that is up to 30 times longer. (See table 1.)

Compact Package and Reduced Printed Circuit Board and BOM Costs

The CXD2840ER is provided in a compact package (48-pin VQFN, 7 mm × 7 mm) and runs on 3.3 V and 1.2 V power supplies. A small mounting area simplifies the wiring with the two power supplies. When combined with a Sony silicon tuner IC (CXD2831WR), the area occupied by the tuner on the board can be minimized. This IC can select either 20.5 MHz or 41 MHz X'tal with a tolerance of up to ±100 ppm.

Tuner IC Chipset that Supports All the World's Broadcasting Standards

Sony is the only manufacturer to develop IC chipsets that support all the world's broadcasting systems.

Since the CXD2840ER shares the package and pin assignment with demodulator ICs for other markets (CXD2836ER, CXD2835ER, CXD2834ER, CXD2828ER and CXD2817ER) that were developed during the same time period, they are mutually replaceable. (See figures 4 and 5.) Also, a shared software interface will minimize man-hours spent on examination and development.

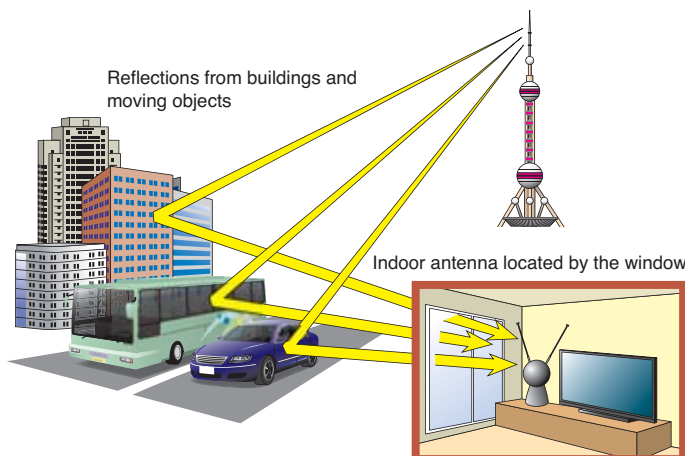
V O I C E

China has a huge number of consumers and the potential of its digital TV market is immense. The numbers of IC vendors engaged in fierce competition for market share far exceed that of any other market, but Sony is one step ahead of the competition with this product having substantially better performance and in a more compact package.

Photograph 1 Ceremony Handing Out Certificates to Manufacturers Whose Products Passed the China National Standard



Figure 1 Terrestrial Broadcast Reception in China



Antennas for receiving terrestrial digital broadcasts are generally placed indoors

Figure 2 Pre Echo Performance (Mode 4)

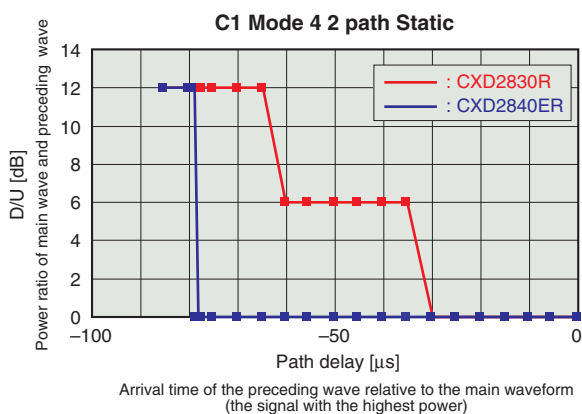


Figure 3 Dynamic Multipath Performance (Mode 4)

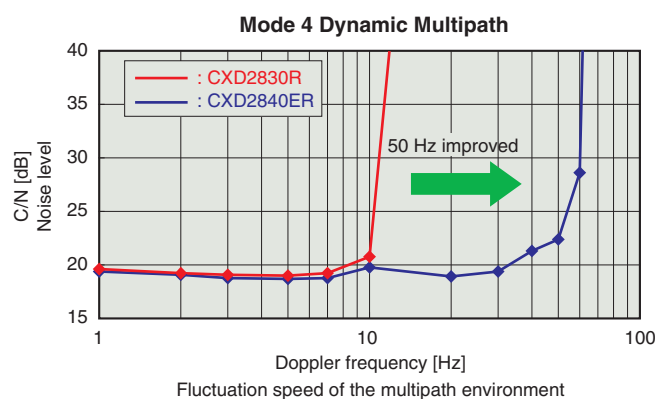
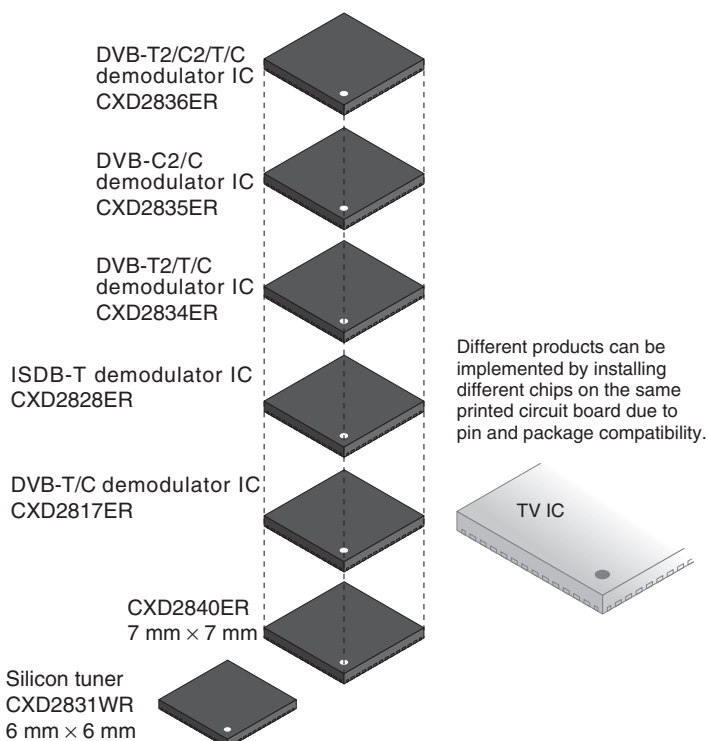


Figure 4 Pin and Package Compatibility

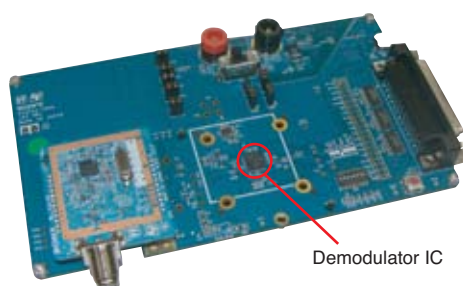


Different products can be implemented by installing different chips on the same printed circuit board due to pin and package compatibility.

Table 1 Impulsive Noise Tolerance

Mode	National standard	CXD2830R	CXD2840ER
Mode 1	100 μs	1090 μs	3225 μs
Mode 2	70 μs	200 μs	1250 μs
Mode 3	50 μs	200 μs	2050 μs
Mode 4	35 μs	130 μs	900 μs
Mode 5	25 μs	40 μs	875 μs
Mode 6	25 μs	125 μs	1750 μs
Mode 7	25 μs	80 μs	625 μs

Figure 5 Example of Mounting ICs Supporting All Broadcasting Systems on the Same Board



Sony evaluation board
A demodulator IC supporting all broadcasting systems can be mounted on a single board.