

CXA3775ER

High-Performance/Low-Power Zero IF Silicon Tuner IC for Digital Satellite Broadcasts Including DVB-S2 High-Definition Broadcasts



In Japan, broadcast digital satellite TV is growing in popularity along with the increasing market penetration of terrestrial digital broadcasting.

In the near future, the planned introduction of the DVB-S2 format in the communication satellite broadcasting system will result in increasing demand for high-performance tuner ICs.

Furthermore, as the trend to even thinner TV sets progresses, there is an increasing need for even further miniaturization and lower power in the tuner block.

To respond to these market needs, Sony has announced the miniature high-performance CXA3775ER tuner IC.

- Achieves both low power (400 mW) and excellent interference rejection
- Fast PLL locking: under 10 ms
- Low phase noise: -95 dBc/Hz (100 kHz offset)
- Provides an external attenuator control output
- Miniature package: 36-pin VQFN

Low-Power/Miniature Package

The CXA3775ER is provided in a compact 4.3 × 4.3 mm package. It provides an external attenuation control output, can reduce the number of external components, and contributes to tuner miniaturization. Furthermore, its power consumption is 400 mW, which makes thermal design easy and it is appropriate for use in hybrid (terrestrial and satellite reception) tuners.

Excellent Interference Rejection

The CXA3775ER inherits Sony's proven RF tracking filter and unique AGC control functions, and achieves excellent interference rejection while minimizing power consumption. The CXA3775ER's rejection capabilities are particularly effective against interference from Japan's broadcast satellite system on the lower-

power 110° CS band. Furthermore, the CXA3775ER supports baseband filter switching between a 23 MHz filter for ISDB-S and an 18 MHz filter for narrow-band CS broadcasts.

Fast PLL Locking

Optimization of both the VCO*1 and the PLL loop has been speeded up by a newly-developed PLL calibration system. Also, since a tuning command can be issued with just 6 bytes (I²C bus address + subaddress + 4 bytes), the CXA3775ER can reduce the overall tuning time.

*1: VCO: Voltage Controlled Oscillator

Low Phase Noise

The VCO phase noise has been improved, allowing the CXA3775ER to achieve stable reception even during rain or if an analog satellite antenna is used.

When combined with the Sony CXD2810GG, the CXA3775ER can also support reception of the DVB-S2 format, which is slated for adoption in Japan.

High Ripple Rejection

The resistance to external noise, such as power supply ripple, has been improved by the adoption of a new regulator circuit. Even when there are high levels of noise from logic circuits and DC-DC converters, characteristics

degradation is minimal, so the CXA3775ER can be mounted on the same board as other circuits in end products.

Support for both Differential and Single-Ended Outputs

While the baseband output pin supports the differential input that is now the mainstream in current demodulator ICs, it can also be used as a single-ended output.

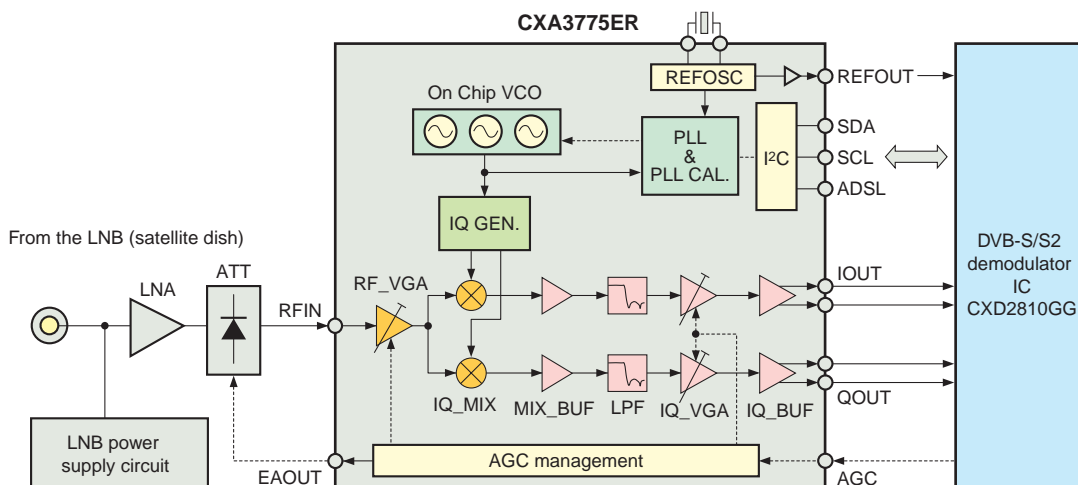
Crystal Oscillator with Low Spurious Emissions

The CXA3775ER features a new circuit in the reference signal crystal oscillator. This new circuit achieves both stable oscillation and low spurious emissions at the same time. The CXA3775ER supports crystals from 4 to 32 MHz and can also supply a reference signal to the demodulator IC.

V O I C E

In developing the CXA3775ER, we focused on ease of use. In this effort, we introduced a new system called PLL calibration. This makes PLL loop filter design far easier and achieves superb stability. For the fun of it, we tried forming the loop filter as an E-1 series (10 kΩ, 100 pF, and 1000 pF). In my personal opinion, this is truly groundbreaking.

Figure 1 Satellite Broadcast Tuner System Example



Photograph 1 Example of Mounting in a Miniature Module

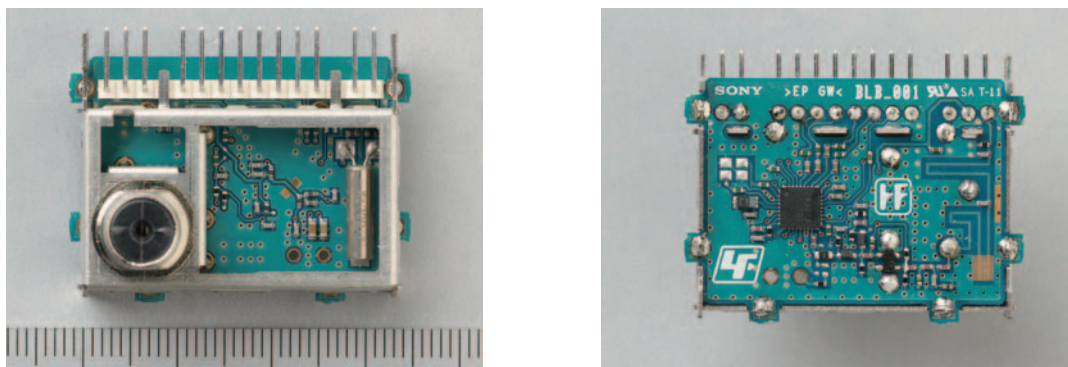


Figure 2 Baseband Output Spectrum (phase noise)

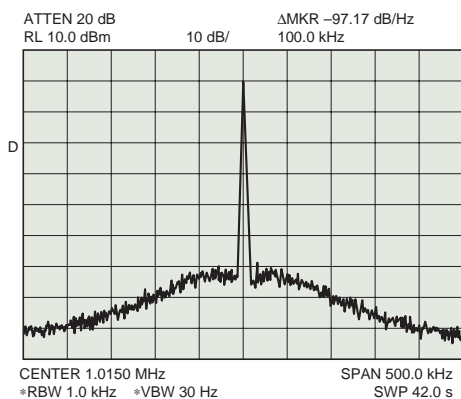


Figure 3 AGC Control Characteristics

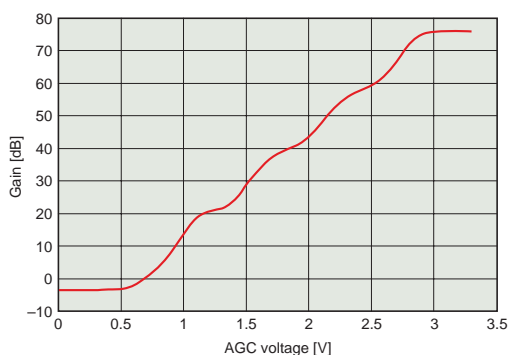


Figure 4 Baseband Pass Characteristics

