

# CXA3725ER

While mainly supplying analog broadcast TV tuner ICs up to now, Sony is now adding digital broadcast tuner ICs for use in terrestrial digital broadcast reception equipment to its product line due to the rapid increase in popularity expected for this equipment.

In addition to mixer, oscillator, and PLL circuits, the CXA3725ER also integrates IF AGC, IF level detection, and RF AGC circuits on the same chip and thus can support even further miniaturization in tuners.

- Image canceling mixer adopted
- Balanced oscillator provides superb oscillator stability
- High-linearity IF AGC allows a fixed gain mode to be selected
- IF level detection and RF AGC circuits integrated on the same chip (voltage control can be applied over an I<sup>2</sup>C bus)

## ■ Easier Image Trap Filter Design

While the frequency conversion block adopts the same single conversion method used in previous terrestrial analog broadcast tuner ICs, the CXA3725ER also includes a newly-developed image canceling mixer.

Although the requirements for image rejection performance during analog broadcast reception are becoming more strict due to increases in TV screen sizes, the CXA3725ER achieves stable image rejection

performance without the addition of a trap circuit or other external components by integrating an image canceling mixer on the same chip.

This also can lead to simplification of the adjustment steps in the tuner manufacturing line.

Furthermore, the use of an external tank circuit in the VCO block makes it easier to design the tracking filter.

## ■ Integration of the IF AGC, IF Level Detection, and RF AGC Circuits

The CXA3725ER integrates on the same chip not only the IF level detection circuit required during digital reception but both the IF AGC amplifier and RF AGC circuit that used to be a separate IC in conventional designs.

The IF AGC circuit newly developed for this device includes not only a low-distortion low-noise AGC amplifier for digital reception, but also an independent fixed-gain amplifier for analog broadcast reception. (A gain of either 25, 30, 35, or 40 dB can be selected.)

The IF level detection circuit's detection level can be set over the I<sup>2</sup>C bus.

The RF AGC circuit outputs either the built-in IF level detection circuit's output signal or an external control signal, as selected by the application.

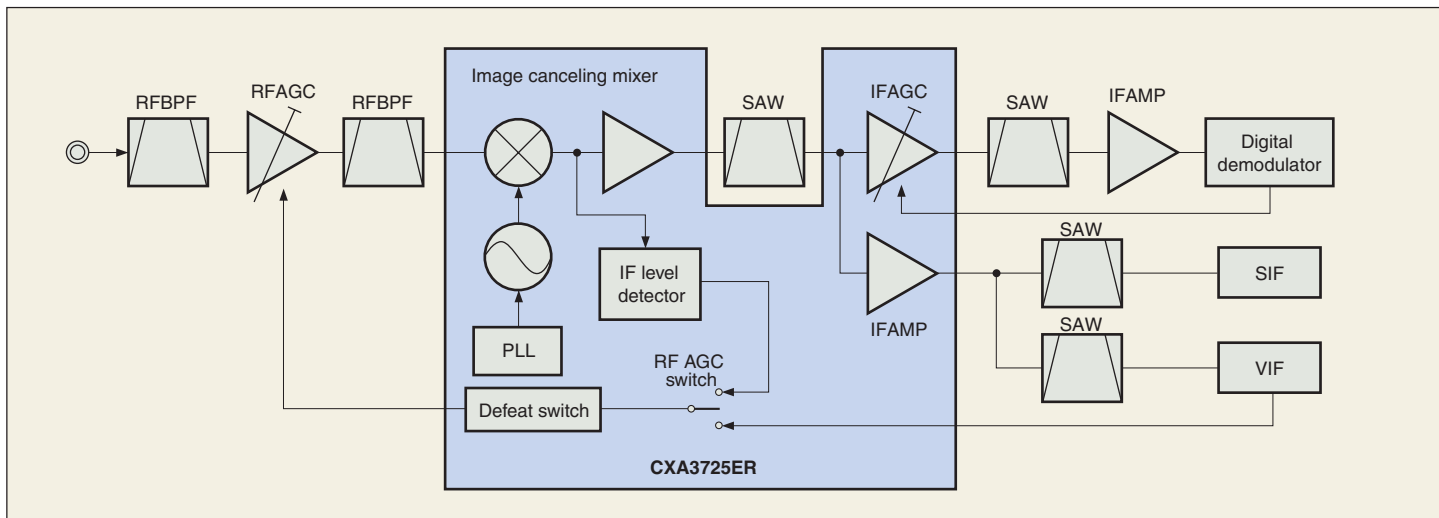
The CXA3725ER also supports applications that enable the defeat function in the output circuit and limit the RF AGC's maximum gain.

## ■ Low Power (700 mW) and the VQFN Miniature Package

In the CXA3725ER, Sony succeeded at achieving both the low power consumption of 700 mW and low-distortion/low-noise characteristics in a device that integrates image canceling mixer, oscillator, PLL, IF AGC, and IF detection functions on a single chip by taking full advantage of Sony's superlative SiGe BiCMOS process and RF circuit technologies. Furthermore, Sony adopted a 0.4 mm lead pitch 56-pin VQFN miniature package to contribute to even further end product miniaturization.

## V O I C E

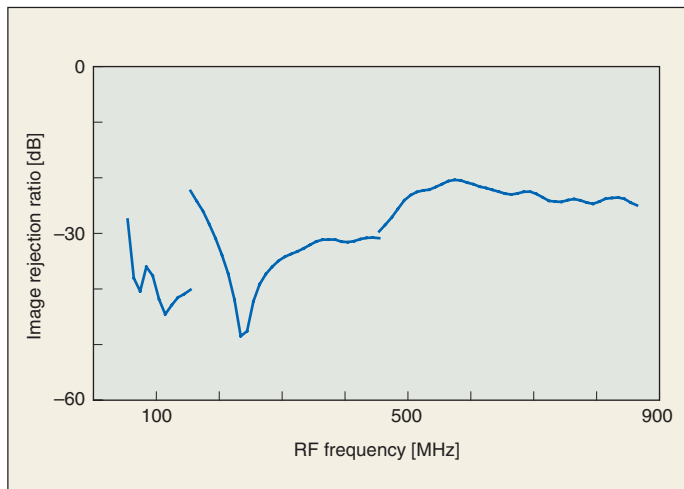
The market for equipment that supports terrestrial digital broadcasting is growing rapidly since Japan has committed to switching over completely to digital in 2011. We worked together as a tightly unified group during this development effort due to our shared hope that this device will be used in many products, from TV sets themselves to recorders, set top boxes, and other products. The image canceling mixer we adopted in this device is effective at improving its image rejection performance. I strongly urge you to try this device in your next design so that you can see how attractive its performance really is.



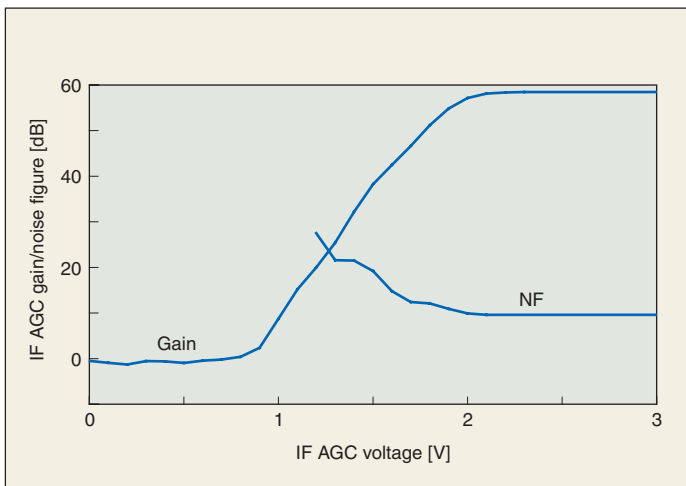
■ Figure 1 TV Tuner System Structure Example

■ Table 1 Main Characteristics

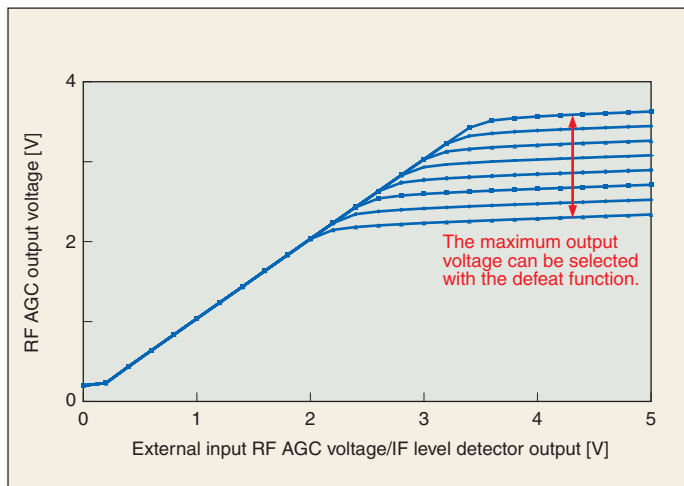
Supply voltage	5 V	
Power consumption	Approx. 700 mV	
Conversion gain	VIF	24 dB
	UHF	29 dB
IF gain	AGC mode	0 to 60 dB
	Fixed mode	25/30/35/40 dB



■ Figure 2 Image Rejection Characteristics



■ Figure 3 IF AGC Gain/Noise Figure



■ Figure 4 RF AGC Voltage Output Characteristics