Overview

Abilis programmable RF modulators, offered in an industry-standard 16-pin SOIC RoHS/Lead(Pb)-free package, are designed for use in Set-Top Boxes and similar applications. They use a high speed I2C interface to support PAL, SECAM or NTSC standards. They are the latest generation of the legacy MC44BS37x family of devices from Freescale Semiconductor.

These RF modulators are now available in a new product family: AS44CE37x. This AS44CE37x latest version is 100% hardware (pin to pin) and software compatible with the previous version of product family (AS44CC37x). The full compatibility insures no requirements for customer layout or PCB change to AS44CC37x designs.

AS44CE37x offers additional features and better optimized performance, such as supporting 4 MHz and 16 MHz external crystals, external clock signal, less noise susceptibility, and better sound PLL robustness.

Applications

- Set-Top Box, IPTV box
- VCR, DVD players
- Game consoles

Benefits

- **New generation** of industry leading product family, based on cost effective **CMOS process.**
- Extremely **low BoM** :
  - Reduced board space
  - Simplified PCB layout and manufacturing
  - Simplified sourcing
- Shorter **time to market** :
  - Functional equivalent to industry standard devices
  - Backward software compatibility with legacy products

- Evaluation board and reference design available
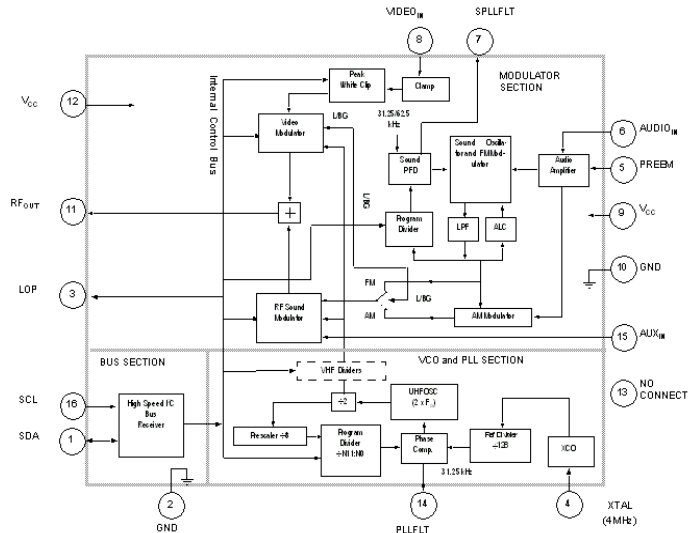
Fig 1 : AS44CE373 Functional Block Diagram

Features

- Multi Standard support : NTSC, PAL, SECAM (B/G, I, D.K, L, M/N)
- UHF operation (460 – 880 MHz)
- On chip tank circuits – no external varicaps, inductors or tuned components required.
- Program control via 800 kHz I^{2}C bus .
- Programmable sound reference frequency (31.25 or 62.5 kHz)
- Direct sound modulator input (FM or AM)
- Auxiliary input bypassing AM/FM modulators for NICAM or BTSC applications
- Video modulation depth (96% typical in system L, 83% typical in the other standards).
- Programmable peak white clip.
- On-chip video test pattern generator with sound test signal (1 kHz).
- Low power stand-by mode.
- Output inhibit during PLL lock-up at power on.
- Logical output port controlled by I2C.

Audio/Video RF Modulators
AS44CE37x

Parameter	typical	unit
Temperature range	0-70	ºC
Power supply	3.3	V
Supply current	85	mA
Power consumption	280	mW
RF output level	89	dBµV
UHF oscillator frequency	460-880	MHz
Sound subcarrier harmonics	−63	dBc
In band spurious (Fo @ 0-5 MHz)	−65	dBc
Video response (to 5 MHz)	0.1	dB
Video input level	1.0	Vcvbs
White peak clip	94	%
Video S/N	55	dB
Differential phase	+/− 5	Deg
Differential gain	+/− 5	%
Luma/sync ratio	7.0/3.0	-
PAL video modulation depth	83	%
SECAM video modulation depth	96	%
Picture-to-sound ratio	12 or 16	dB
Audio input resistance	71	kΩ
Audio frequency response	−2.5/+2.0	dB
Audio distortion FM (THD only)	0.5	%
Audio distortion AM (THD only)	1.5	%
Audio S/N with sync buzz FM	54	dB
Audio S/N with sync buzz AM	50	dB
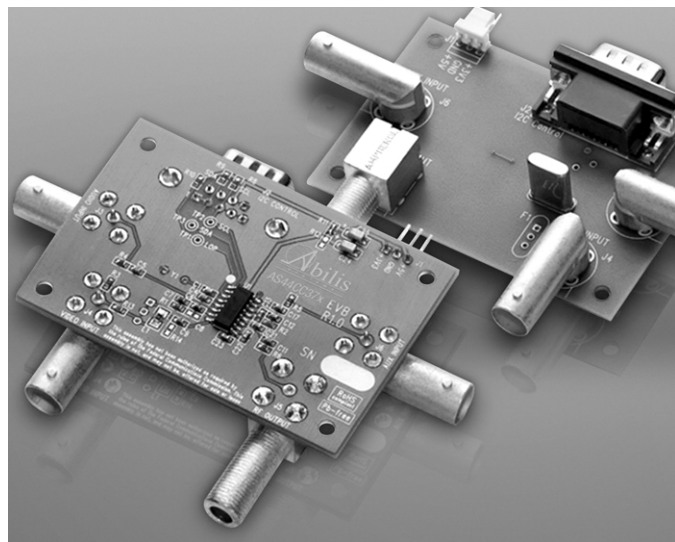
Fig 2: Evaluation Board

Quick selection guide

P/N	NTSC	PAL	SECAM	Frequency Range	Default Frequency	I2C write address
AS44CE373CAEF, R2	✓	✓	✓	UHF	591.25	0xCA
AS44CE373CASEF, R2	✓	✓	✓	UHF	591.25	0xCE
AS44CE374CAEF, R2	✓	✓	no	UHF	591.25	0xCA
AS44CE374T1AEF, R2	✓	✓	no	UHF	871.25	0xCA
AS44CE375AVEF, R2	✓	no	no	US ch 3/4	-	N/A
AS44CE377CAEF, R2	✓	no	no	US ch 3/4	-	0xCA