

Disney Fairies Operational Description

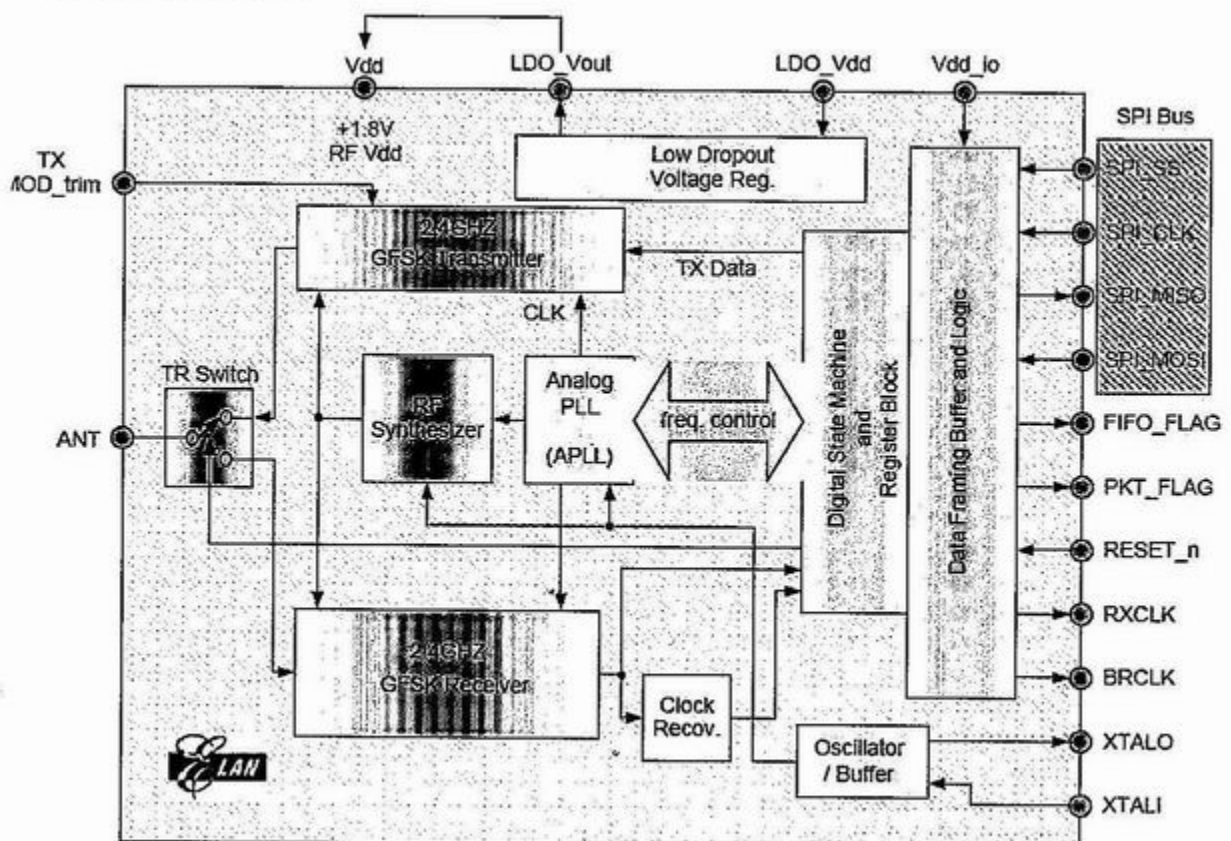
Disney Fairies is a set of TV game, consists of wireless remote controllers and a console box connecting to TV set. There is a RF transceiver module in remote controller and console. The RF band is 2405 MHz ~ 2470 MHz with 2 MHz channel spacing.

RF Transceiver

EM198810:

The EM198810 is a low-cost, fully integrated CMOS radio frequency (RF) transceiver block, combined with a 64-byte buffered framer block. In normal applications, the EM198810 is connected to a low-cost microcomputer (MCU). The on-chip framer processes and stores the RF data in the background, unloading this critical timing function from the MCU. This lowers MCU speed requirements, expedites product development time, and frees the MCU for implementing additional product features. The RF transceiver block is a self-contained, fast-hopping GFSK data modem, optimized for use in the widely available 2.4 GHz ISM band. It contains transmit, receive, VCO and PLL functions, including an on-chip channel filter and resonator, thus minimizing the need for external components. The receiver utilizes extensive digital processing for excellent overall performance, even in the presence of interference and transmitter impairments. Transmit power is digitally controlled. The low-IF receiver architecture results in sensitivity to -85 dBm or better, with impressive selectivity.

3. Block Diagram



Console

The power system regulates 6V to 3.3V stable voltages for each block. The main software program is stored in ROM. SDRAM and EEPROM is used for running software and data storage. EM198810 RF transceiver is used for wireless link.

GPAC800 is a 16-bit powerful single chip video console processor. It processes TV game software, receive data from remote controller via RF module, and manages RF channel (2405~2470MHz, 2MHz spacing).

When power on, the console broadcasts a link command periodically, waits for response and decodes data form remote controller. If there is interference, console will change to a clear channel.

RF transceiver

RF2 is 2.4GHz RF transceiver.

GPAC800

U1, a SoC designed specifically for video game and ELA products, is composed of G+core (a 16-bit CPU developed by GENERALPLUS Technology), Picture Processing Unit (PPU), Sound Processing Unit (SPU) and other primary functions. GPAC800 is able to generate graphics and sound for the television system (NTSC or PAL) and LCD. SD card and NAND-type flash are also supported for mass data storage. The operating voltage supply range is 3.0V through 3.6V and CPU speed is 27~162 MHz. Plus, it offers 47 configurable general purpose I/Os, six 16-bit timers, 32768Hz Real Time Clock, Low Voltage Detect, Low Voltage Reset, 12-bit ADC, 2 UART interfaces, SPI interface, I2C master interface and many other features that facilitate connecting with varieties of I/O devices such as TFT LCD, color STN LCD, CMOS image sensor, TV decoder, Light Pen, Touch panel...etc. The SPAC400 provides not only the latest video game technology, but also the full service and support of Generalplus mMobile.

ROM

U4 is a 64MBit read of memory. Whole software is stored in ROM.

SDRAM

U2 is a 4Mx16bit memory. The processing software is loaded to this memory

EEPROM

The U3 provides 16384 bits of serial electrically erasable and programmable read-only memory. The device is optimized for use in many automotive applications where low-power and low-voltage operation are essential.

Power system

U6 is a 3.3V voltage regulator. These regulators are powered by battery of 6V, and supply stable voltage to each block.

AV interface

Q5 is a transistor, which connects video signal to TV input.

Q4 is used for connecting audio signal to TV input.

Q1 and Q2 are used for power control of AV interface.

Remote Controller

The power system supplies each block with a stable 3.3V output. Acceleration sensor is a 3D-motion sensor, which detects force and direction of user's hand. W588D070 is a 8-bit micro-processor, which encodes keypad status and 3D-motion data. EM198810 RF transceiver is used for wireless link. The remote controller searches broadcast signal to link the console. And then transmits the encoded data to console. User enjoys the TV games with wireless remote controller.

RF transceiver

J2 is 2.4GHz RF transceiver.

W588D070

U1 (W588D070) is a single chip solution for interactive toy with DSP capability.

It receives acceleration sensor's raw data and converts them into direction, power, and acceleration data to simulate players' gesture & swing.

An additional option is: It receives image data from a CMOS sensor, then processes the data by an image processing engine, a feature recognition engine and a 8-bit CPU sequentially. These steps make the chip very powerful on color recognition, shape recognition, line recognition, gesture recognition, number recognition, and alphabet recognition. The users can use these recognition results to control many corresponding interactions.

Power system

U4 is a step-up DC-DC 3.3V voltage regulator. It is powered by battery of 3V, and supplies stable voltage to each block.

Acceleration Sensor

The U2 is a tri-axial low-g acceleration sensor IC with digital output for consumer market applications. It allows measurements of acceleration in perpendicular axes as well as absolute temperature measurement.
