SC14110A, SC14111A

Hi-Fi Codecs with USB, Analog, and Digital Audio Interfaces

This short datasheet is an addendum to the SC14110A, SC14111A datasheet.

The SC14110A, SC14111A is a family of Stereo Hi-Fi Codecs used in USB headsets for Unified Communication, Smartphones and Tablets. The variety of Analog and Digital Audio Interfaces enable many other audio products like headphones, tables phones, speakers, and microphones.
The SC14111A has a Quad SPI FLASH interface and two Gen2DSPs. The SC14110A is a ROM version with a single Gen2DSP.

Key Features

- DCXO 10.368/20.736 MHz XTAL with low power mode
- On-chip 82.944 MHz and 48 MHz PLLs
- Processing power
  - 82.944 MHz 16 bit CompactRISC™ CR16Cplus with instruction and data cache
  - Four channel DMA controller
  - Single (SC14110A), Dual (SC14111A) 82.944 MHz Gen2DSP with Micro Code RAM and ROM
  - Equal Bus cycles for ROM and QSPI access
- Development/Debug support
  - Serial Debug interface, Nexus Class-1 compliant
  - Performance Timer for Gen2DSP and CR16C
  - Instruction/Data/Event Trace unit
  - CR16C 8 channel debug unit for ROM patching
  - Gen2DSP 2 channel debug unit for MCROM patching
- Memories (SC14111A)
  - Up to 16 MB QSPI Flash (82.944 MHz)
  - 4/0.5/0.5 kB Cache/Admin/Trace RAM
  - 12 kB/12 kB Shared RAM1/2
  - 8/8 kB, 30/64 kB Micro Code RAM1/2, ROM1/2
- Memories (SC14110A)
  - 512 kbit Internal ROM (82.944 MHz)
  - 4/0.5/0.5 kB Cache/Admin/Trace RAM
  - 12 kB Shared RAM1
  - 8 kB, 30 kB Micro Code RAM1, ROM1
- Power management
  - Supports 100 mA USB low-power bus-powered operation
  - Single Supply 3.[0-9] [a-z] or 4 V to 5.5 V through VBUS
  - On-chip LDOs 3.3 V,1.8 V
  - Separated IO voltage ring for QSPI and I/O: 1.8 V to 3.45 V
- Analog and Audio Interfaces
  - Dual 20-bit HiFi audio CODEC up to 192 kHz with programmable sample rate converter with two sets of filter coefficients, optimised for audio and voice and 20 x 4 bits deep FIFOs
  - SNR(DA) > 92 dB, SNR(AD) > 87 dB
  - Stereo Analog Front End for dual single ended
  - or differential microphones and dual 16 Ω single ended (50 mW) or 32 Ω differential loudspeakers
  - Cap-less microphone supply 1.6, 2, 2.5 or 3 V
  - ADC input for analog volume control
  - Built-in headset detection and short circuit detection with output current limiter
  - On-chip temperature sensor
  - Triple LED driver with PWM support Feature
- Digital interfaces
  - USB 2.0 FS/LS Device MAC + PHY with DMA
  - 82.944 MHz Quad SPI interface (SC14111 only)
  - 17 I/O ports with Programmable Pin Assignment
  - Keyboard interface with debounce counter
  - UART with 16 bytes FIFO, 9600 Bd to 230.4 kBd
  - SPI™ Master/slave 20.736 MHz
  - I2C Interface Master transmit/receive 100 kHz, 400 z, 1.152 MHz
  - Dual Digital Audio interface with PCM, I2S, IOM and SPI™ modes, MaOctober 22, 2015 v2.3ster/Slave, 2 x 24 bits up to 192 kHz with 20 x 4 bits deep FIFOs
  - Three general purpose timers and watch dog timer
  - QFN 40 pins package

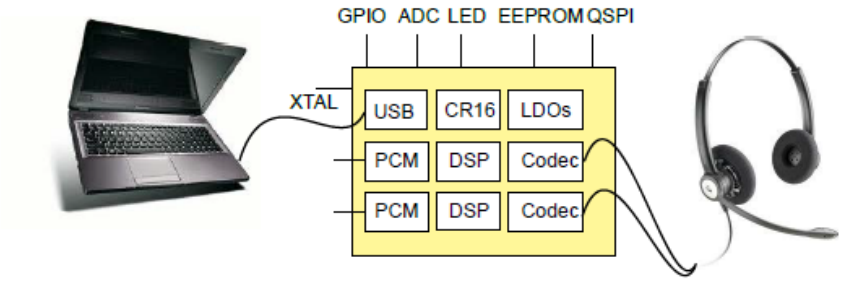

Figure 1. System diagram

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1. Moisture Sensitivity Level

The MSL is an indicator for the maximum allowable time period (floor lifetime) in which a moisture sensitive plastic device, once removed from the dry bag, can be exposed to an environment with a maximum temperature of 30 °C and a maximum relative humidity of 60% RH. before the solder reflow process.

The QFN packages are qualified for MSL 3.

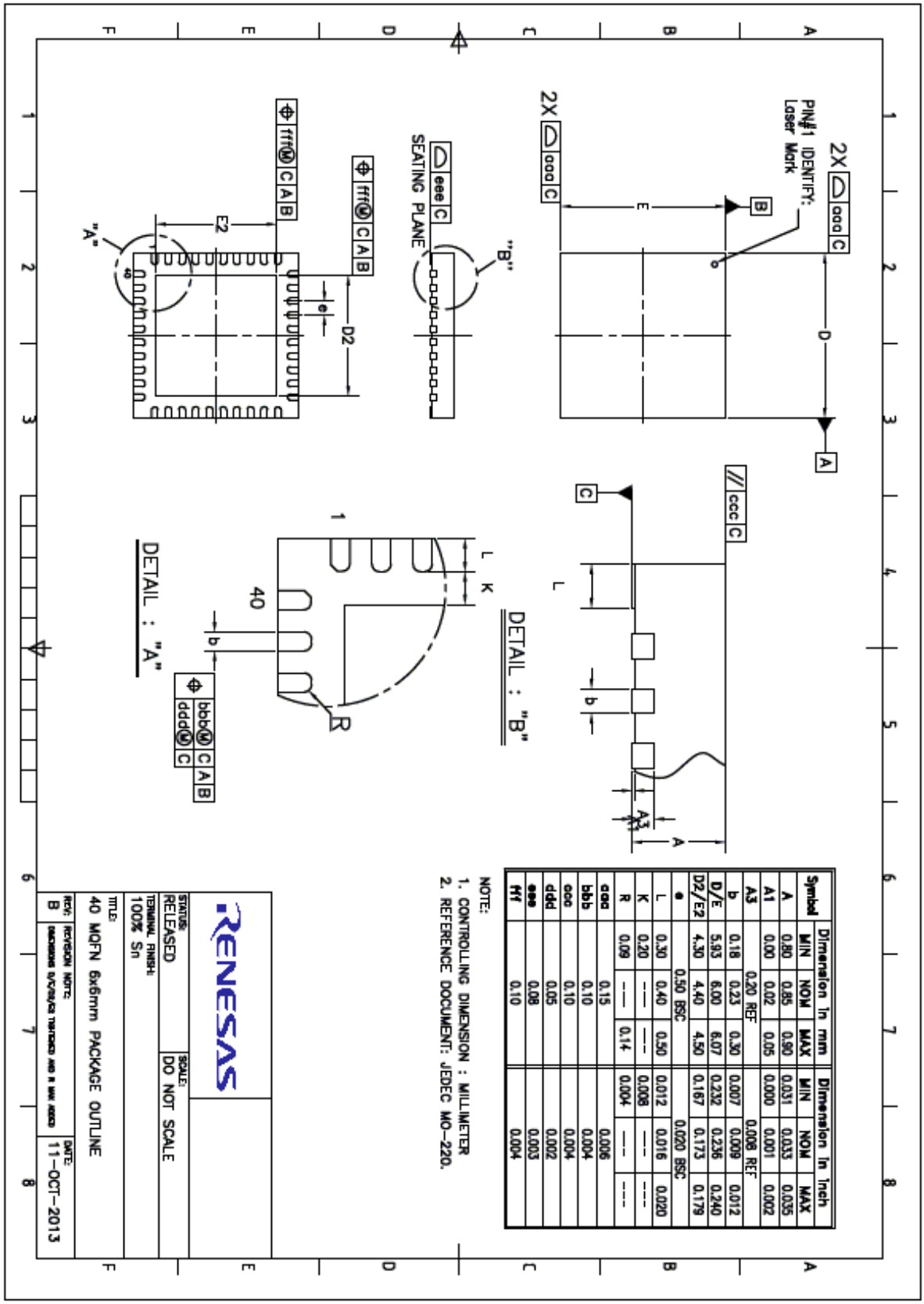
Table 1. MSL classification

MSL level	Floor lifetime
MSL 4	72 hours
MSL 3	168 hours
MSL 2A	4 weeks
MSL 2	1 year
MSL 1	Unlimited at 30 °C / 85% RH

1.1 Soldering Information

Refer to the IPC/JEDEC standard J-STD-020 for relevant soldering information. This document can be downloaded from http://www.jedec.org.

2. Package Outline Drawings



Symbol	Dimension in mm				Dimension in Inch			
	MIN	NOM	MAX		MIN	NOM	MAX	
A	0.80	0.85	0.90		0.031	0.033	0.035	
A1	0.00	0.02	0.05		0.000	0.001	0.002	
A3		0.20 REF				0.008 REF		
b	0.18	0.23	0.30		0.007	0.009	0.012	
D/E	5.93	6.00	6.07		0.232	0.236	0.240	
D2/E2	4.30	4.40	4.50		0.167	0.173	0.179	
e		0.50 BSC				0.020 BSC		
L	0.30	0.40	0.50		0.012	0.016	0.020	
K	0.20	---	---		0.008	---	---	
R	0.09	---	0.14		0.004	---	---	
aaa		0.15				0.006		
bbb		0.10				0.004		
ccc		0.10				0.004		
ddd		0.05				0.002		
eee		0.08				0.003		
fff		0.10				0.004		

Figure 2. QFN40 package outline drawing

3. Ordering Information

The ordering number consists of the part number followed by a suffix indicating the packing method. For details and availability, please consult your Renesas local sales representative.

Table 2. Ordering information

Part number	Package	Size (mm)	Shipment form	Pack quantity
SC14111A45R100QRCT	QFN40 package	6 x 6	Tray	MOQ 4900

4. Revision History

Revision	Date	Description
01.00	June 27, 2024	First release.

RoHS Compliance

Renesas Electronics' suppliers certify that its products are in compliance with the requirements of Directive 2011/65/EU of the European Parliament on the restriction of the use of certain hazardous substances in electrical and electronic equipment. RoHS certificates from our suppliers are available on request.