SC14446A, SC14447A

1.8 V Single Chip for ZBS DECT with RFPA, QSPI, EBI, GPU

This short datasheet is an addendum to the SC14446A, SC14447A datasheet.

The SC14446A, SC14447A are a family of digital CMOS ICs with fully integrated radio transceivers including RF Power Amplifier and baseband processors for Zero Blind Slot (ZBS) DECT & DECT 6.0 CATiQ, Japanese and Korean DECT handsets and base stations supporting extended temperature range.

Key Features

- Complies with DECT ETS 300 175-2,3 & 8 and DECT 6.0 and Korean DECT (1.7 GHz)
- DCXO for 10.368 MHz/20.736 MHz, 12 MHz (USB only) XTAL with low power mode
- Processing power
  - 82.944 MHz 16 bit CompactRISC™ CR16Cplus with up to 16 kB instruction and data cache
  - Four-channel DMA controller
  - Dual *) 82.944 MHz Programmable Gen2DSP with Micro Code ROM and Micro Code RAM
  - 82.944 MHz enhanced Graphics Processing Unit
  - DiP Processor supporting CAQ-iq with fast FP search instructions
  - MMU for Extended address range up to 128 MB
- Development/Debug support
  - Serial Debug interface, Nexus Class-1 compliant
  - Performance Timer for Gen2DSP and CR16C
  - Instruction/Data/Event Trace unit
  - Gen2DSP debugger with 2 ch MCROM patching
- Memories
  - 16/2/2 kB Cache/Admin/Trace RAM
  - 24/32 kB, 24/32 kB Shared RAM1/2, ROM1/2
  - 2/16 kB, 96/96 kB MCRAM1/2, oMCROM1/2
- Power management
  - 1.9 V to 3.45 V operating range
  - 1.8 V operating voltage with 1.8 V to 3.45 V I/O
  - USB Charge control for 2x NiMH and Li-Ion (*)
  - Dual DCDC converter (boost/buck, boost)
  - Ultra-low power mode (ULP) module to support DECT ULE standard and ULS phones
  - Battery voltage comparator with interrupt
- Analog and Audio Interfaces
  - Full dual 8, 16, 32 kHz 16-bit audio CODEC
  - Analog Front End to differential and single ended microphones and 28 Ω
  - CLASS-D amplifier Stereo (2x 8 Ω)/Mono (4 Ω) up to 32 kHz/48 kHz
  - 10 bit ADC for line interface, battery voltage, temperature sensor, headset detection, 4 wire resistive touch screen
  - Opamps for caller-id, ringing, par. set detection
- Digital interfaces
  - 82.944 MHz External Bus Interface to mDDR or Static Memory and PSRAM
  - 41.472 MHz 16 bits wide I/O LCD/Camera bus
  - USB 2.0 FS/LS MAC + PHY with DMA support and USB Battery Charging Specification V1.2
  - 82.944 MHz 1.8 V to 3.3 V Quad SPI interface for serial FLASH with erase suspend/resume support for EEPROM function and CAT-iQ SUOTA
  - General purpose I/O 8 bit ports
  - Keyboard interface with debounce counter
  - Dual UART Full duplex 9600 Bd to 230.4 kBd
  - Dual SPI+™ interface 20.736 MHz (incl. 9 bits)
  - Dual ACCESS bus 100 kHz, 400 kHz, 1.152 MHz
  - PCM+ Interface, M/S, 12x 8 bits, 48 kHz, I2S
- Three general purpose timers. enhanced watch dog
- Radio transceiver
  - Integrated 1.9 GHz/1.7 GHz CMOS transceiver
  - RF PLL lock time: 17 µs typ.
  - Four digital output ports (including two for fast antenna diversity switching)
  - -96 dBm receiver sensitivity
- Integrated 1.9 GHz PA for DECT and Korean DECT
  - High Power Mode EU (HPM): 25.5 dBm
  - High Power Mode USA (HPM): 23.5 dBm
  - Low Power Mode (LPM): 12 dBm
  - "Green" Mode (GPM): 4 dBm

  - Low Radiation Mode (LRM): -35 dBm
  - Output power ramp and flatness control
- LGA206 and VFBGA113 packages
- Extended temperature range -40 °C to +85 °C

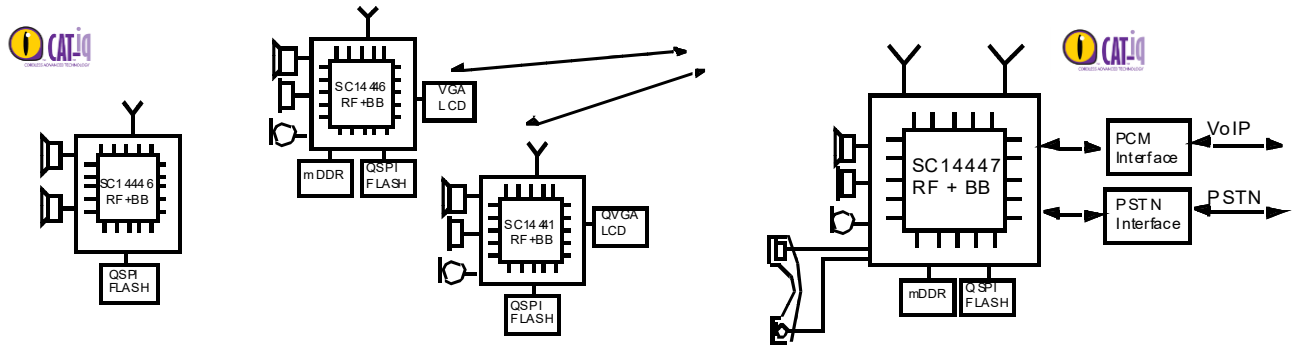

Figure 1. System diagram

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1. Moisture Sensitivity Level

The Moisture Sensitivity Level (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 LGA packages are qualified for MSL 4.

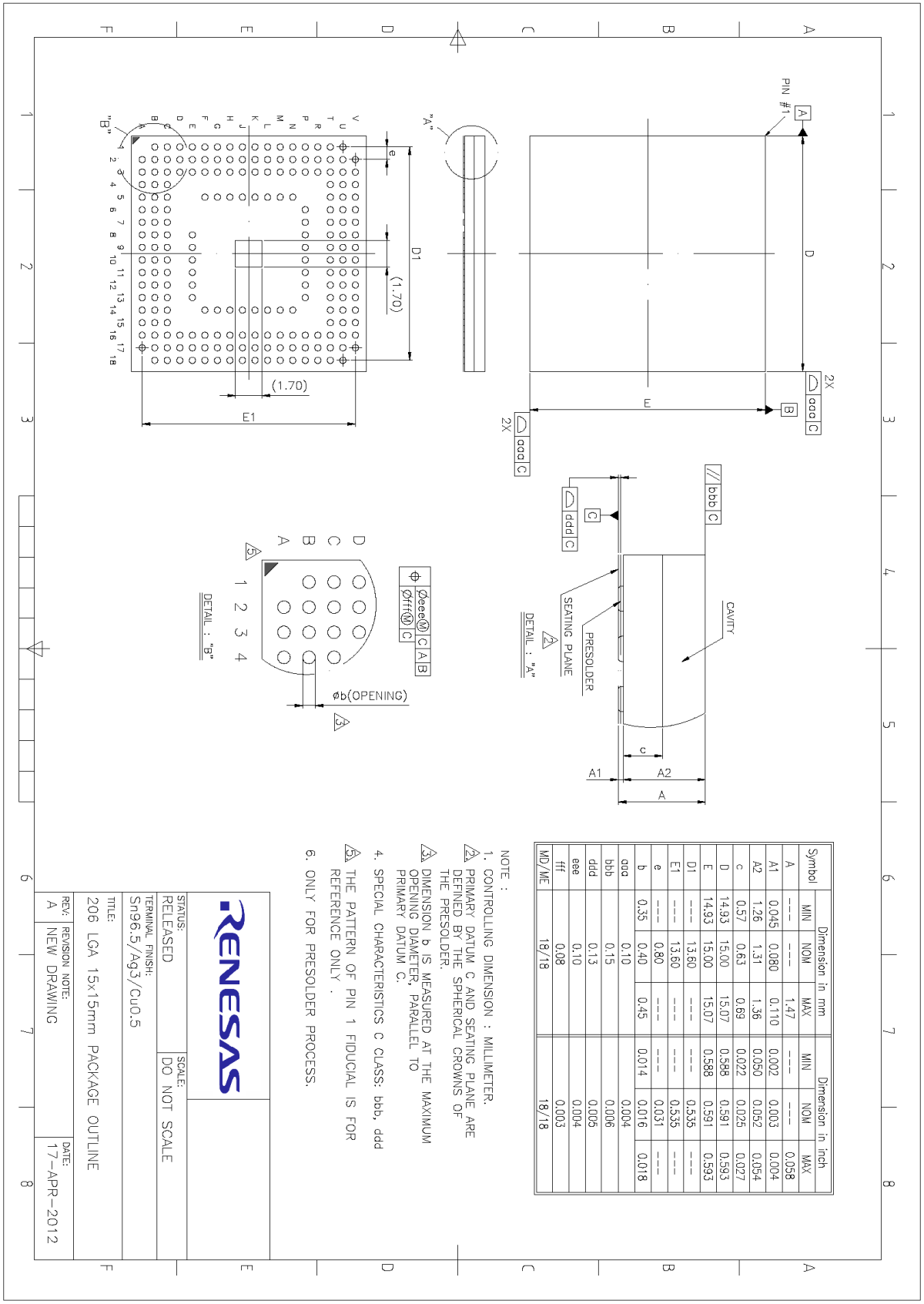
Table 1. MSL classification

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.

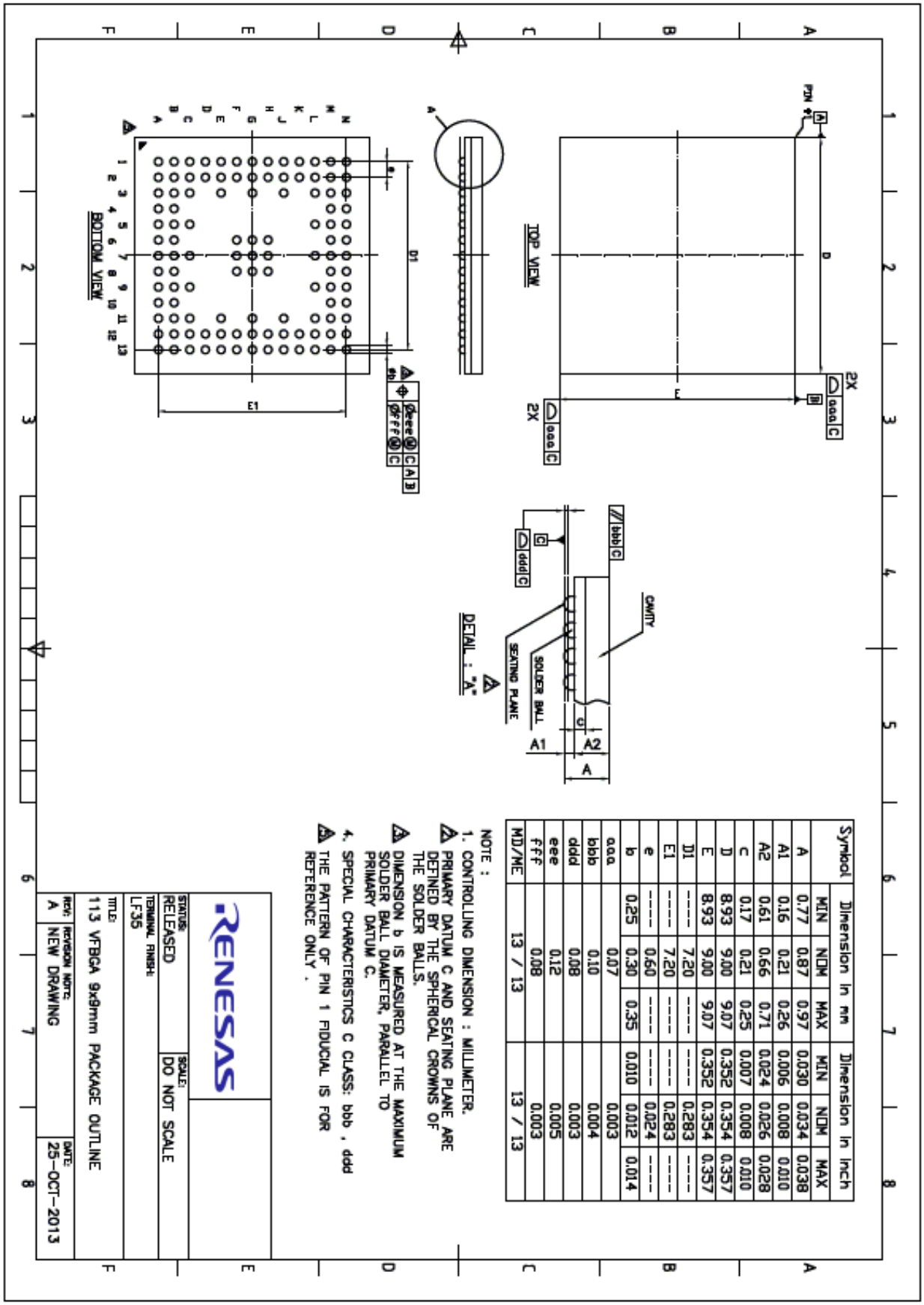
2. Package Outline Drawings



Symbol	Dimension in mm			Dimension in inch		
	MIN	NOM	MAX	MIN	NOM	MAX
A	---	---	1.47	---	---	0.058
A1	0.045	0.080	0.110	0.002	0.003	0.004
A2	1.26	1.31	1.36	0.050	0.052	0.054
c	0.57	0.63	0.69	0.022	0.025	0.027
D	14.93	15.00	15.07	0.588	0.591	0.593
E	14.93	15.00	15.07	0.588	0.591	0.593
D1	---	13.60	---	---	0.535	---
E1	---	13.60	---	---	0.535	---
e	---	0.80	---	---	0.031	---
b	0.35	0.40	0.45	0.014	0.016	0.018
aaa		0.10			0.004	
bbb		0.15			0.006	
ddd		0.13			0.005	
eee		0.10			0.004	
fff		0.08			0.003	
MD/ME		18/18			18/18	

NOTE :
1. CONTROLLING DIMENSION : MILLIMETER.
2. PRIMARY DATUM C AND SEATING PLANE ARE DEFINED BY THE SPHERICAL CROWNS OF THE PRESOLDER.
3. DIMENSION b IS MEASURED AT THE MAXIMUM OPENING DIAMETER, PARALLEL TO PRIMARY DATUM C.
4. SPECIAL CHARACTERISTICS C CLASS: bbb, ddd
5. THE PATTERN OF PIN 1 FIDUCIAL IS FOR REFERENCE ONLY .
6. ONLY FOR PRESOLDER PROCESS.

Figure 2. LGA206 package outline drawing



Symbol	Dimension in mm			Dimension in Inch		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.77	0.87	0.97	0.030	0.034	0.038
A1	0.16	0.21	0.26	0.006	0.008	0.010
A2	0.61	0.66	0.71	0.024	0.026	0.028
c	0.17	0.21	0.25	0.007	0.008	0.010
D	8.93	9.00	9.07	0.352	0.354	0.357
E	8.93	9.00	9.07	0.352	0.354	0.357
D1	-----	7.20	-----	-----	0.283	-----
E1	-----	7.20	-----	-----	0.283	-----
e	-----	0.60	-----	-----	0.024	-----
b	0.25	0.30	0.35	0.010	0.012	0.014
aaa		0.07			0.003	
bbb		0.10			0.004	
ddd		0.08			0.003	
eee		0.12			0.005	
fff		0.08			0.003	
MD/ME	13 / 13			13 / 13		

Figure 3. VFBGA113 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
SC14446A76R101LVPT	LGA206 package	15 x 15	Tray	MOQ 1260
SC14446A76R101USCT	VFBGA113 package	9 x 9	Tray	MOQ 2600
SC14447A76R101LVPT	LGA206 package	15 x 15	Tray	MOQ 1260

4. Revision History

Revision	Date	Description
01.00	June 26, 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.