SC14448B

1.8 V Single Chip for DECT with RFPA and QSPI

This short datasheet is an addendum to the SC14448B datasheet.

The SC14448B is member of a family of digital CMOS ICs with fully integrated radio transceivers, including RF Power Amplifier and baseband processors for DECT, DECT 6.0 and CAT-iQ handsets and base stations. The program memory and data storage reside in an external low cost, low pin count Quad SPI (QSPI) serial FLASH memory.

Key Features

- Complies with DECT ETS 300 175-2,3 & 8 and DECT 6.0
- 10.368/20.736 MHz XTAL digitally controlled oscillator with low power modes
- Processing power
  - 82.944 MHz 16-bit CompactRISC™ CR16Cplus with 16 kB instruction and data cache
- Four channel DMA controller with (non-)blocking mode
- 82.944 MHz Programmable Gen2DSP with Micro Code ROM featuring PAEC_v6
- Dedicated Instruction Processor (DIP) supporting CAT-iQ slot formats and new fast FP search instructions
- Development/Debug support
  - Serial Debug interface, Nexus Class-1 compliant
  - Performance Timer for Gen2DSP and CR16C
  - Instruction/Data/Event Trace unit
  - Gen2DSP debbuger with 2 ch MCROM patching
- Memories
  - 16 kB + 4 kB non-shared/cache RAM
  - 32 kB shared + 44 kB non-shared RAM
  - 48 kB Gen2DSP ROM
- 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
  - Charge control for 2x NiMH batteries and Li-Ion
  - Dual output voltage tripled up to 4.5 V
  - DC-DC converter buck operation
  - Three matched current sourced for white LEDs
  - Enhanced new battery detection
  - Battery voltage comparator with interrupt
- Analog and audio interfaces
  - Single 8, 16, 32 kHz 16-bit linear audio CODEC
  - Analog Front End to differential and single-ended microphones and 28 loudspeakers
  - CLASS-D amplifier 0.5 W 2.5 V (4 Ω)
  - 10-bit ADC for line interface, battery voltage, temperature sensor, headset detection
  - Opamps for caller-id, ringing, parallel set detection
- Digital interfaces
  - 82.944 MHz,1.8 V to 3.3 V Quad SPI interface form serial FLASH with erase suspend/resume support for EEPROM function
  - 4+2 purpose I/O 8 bit ports
  - Keyboard interface with debounce counter
  - Dual UART Full duplex 9600 Bd to 230.4 with DMA support
  - SPI +™ interface 20.736 MHz (Master/Slave)
  - Dual ACCESS bus 100 kHz, 400 kHz, 1.153 MHz
  - PCM + Interface M/S, 12x8 bits, 48 kHz, I2S
- Three general purpose timers and enhanced watch dog timer
- Radio transceiver
  - Integrated 1.9 GHz CMOS transceiver
  - <70 µs RF PLL lock time
  - Four digital output ports (including two for fast
  - antenna diversity switching)
  - -96 dBm receiver sensitivity
- Integrated 1.9 GHz PA for DECT and DECT 6.0
  - 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
- QFN88 package

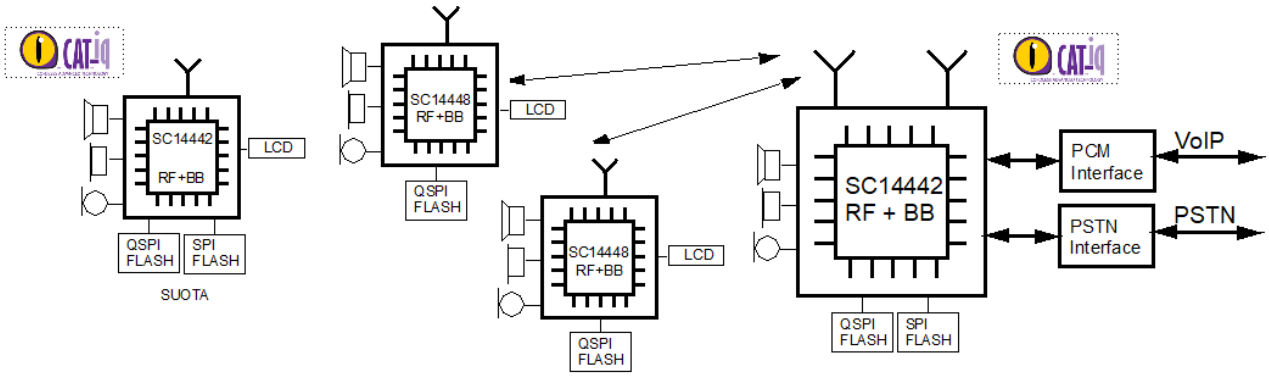

Figure 1. System diagram

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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.

All QFN packages are qualified for MSL 3.

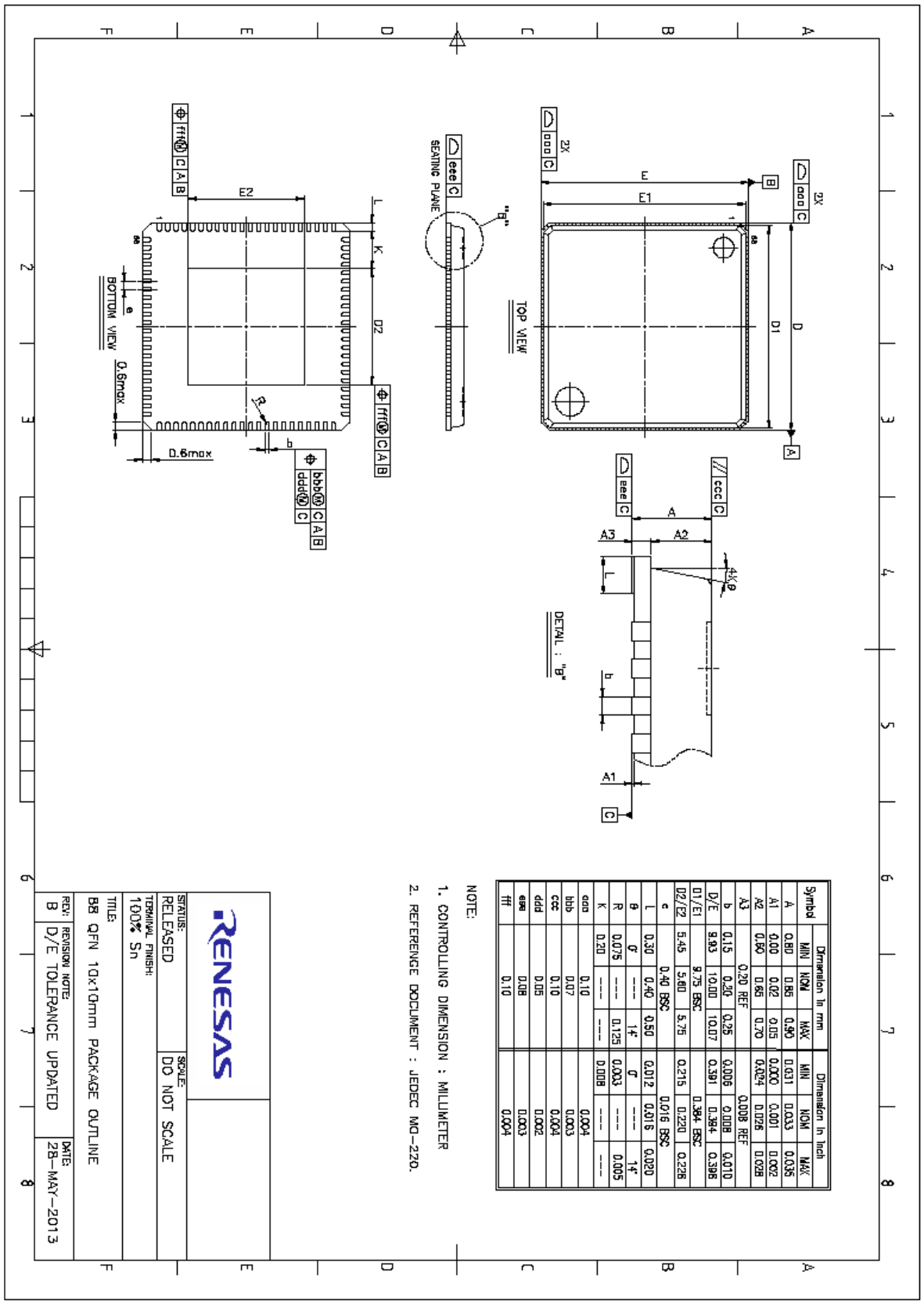
Table 1. MSL classification

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
A2	0.60	0.65	0.70	0.024	0.026	0.028
A3		0.20 REF			0.008 REF	
b	0.15	0.20	0.25	0.006	0.008	0.010
D/E	9.93	10.00	10.07	0.391	0.394	0.396
D1/E1		9.75 BSC			0.384 BSC	
D2/E2	5.45	5.60	5.75	0.215	0.220	0.226
e		0.40 BSC			0.016 BSC	
L	0.30	0.40	0.50	0.012	0.016	0.020
θ	0°	----	14°	0°	----	14°
R	0.075	----	0.125	0.003	----	0.005
K	0.20	----	----	0.008	----	----
aaa		0.10			0.004	
bbb		0.07			0.003	
ccc		0.10			0.004	
ddd		0.05			0.002	
eee		0.08			0.003	
fff		0.10			0.004	

Figure 2. QFN88 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
SC14448B96R101QNCX	QFN88 package	10 x 10	Tape and Reel	MOQ 3000

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.