

## SC14441A/B/C, SC14442A

1.8 Single Chips for DECT with RFPA and QSPI

This short datasheet is an addendum to the SC14441A/B/C, SC14442A datasheet.

The SC14441A/B/C, SC14442A are a family of digital CMOS ICs with fully integrated radio transceivers including RF Power Amplifier and baseband processors for DECT and DECT 6.0 CAT-iQ handsets and base stations. The program memory and data storage resided in a low cost, low pin count Quad SPI (QSPI) Serial Flash. The dual row LGA approach provides a backward compatible pinning to the SC14481 devices.

### Key Features

- Complies with DECT ETS 300 175-2,3 & 8 and DECT 6.0
- 10.368/20.736 MHz XTAL digital controlled oscillator
- Processing power
  - 82.944 MHz 16 bit CompactRISCTM CR16Cplus with 16 kB instruction and data cache
  - Four channel DMA controller with (non-)blocking mode
  - 82.944 MHz programmable Gen2DSP with MicroCode ROM and 2 kB MicroCode RAM
  - Dedicated Instruction Processor (DIP) supporting CAT-iQ slot formats (1.25 kB DIP RAM)
- 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 kB + 4 kB non-shared/cache RAM
  - 32 kB shared RAM (0/1 wait cycles)
  - 48/2 kB Gen2DSP ROM/RAM
- 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 tripler
  - DC-DC converter with boost, buck, boost-buck operation
- Three matched current sources for white LEDs
- Ultra-low power mode (ULP) 32 kHz time base and low power CR16 Mode in off mode
- Enhanced new battery detection
- Battery voltage comparator with interrupt
- Analog and Audio Interfaces
  - Dual 8, 16, 32 kHz 16-bit linear audio CODEC
  - Analog Front End to differential and single ended microphones and 28 Ω loudspeaker
  - 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 for serial FLASH with erase suspend/resume support for EEPROM function and CAT-iQ SUOTA
  - 4+2 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 (Master/Slave)
  - Dual ACCESS bus 100 kHz, 400 kHz, 1.152 MHz
  - 6 channel PCM+ Interface M/S (I2S compatible)
- Three general purpose timers and watch dog timer
- Radio transceiver
  - Integrated 1.9 GHz/1.7 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
  - 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
- LGA96, LGA132 and QFN88 packages

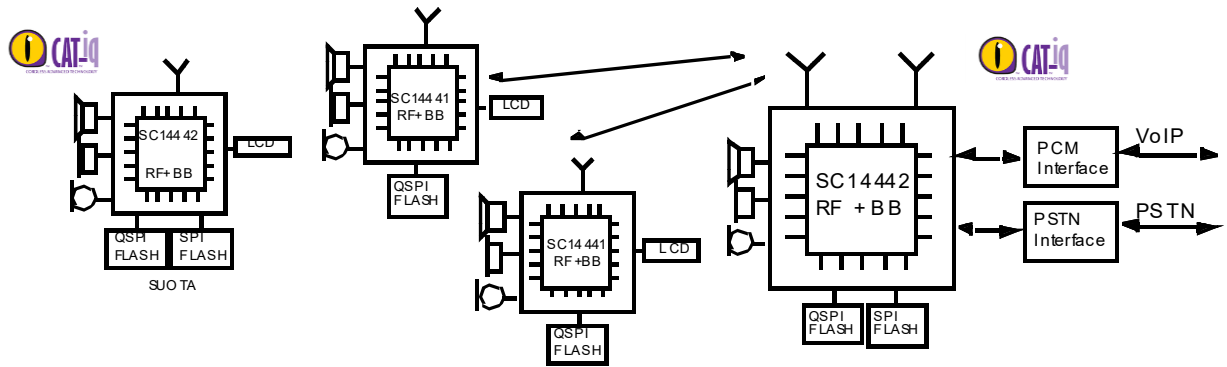


Figure 1. System diagram

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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 3.

The QFN packages have 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

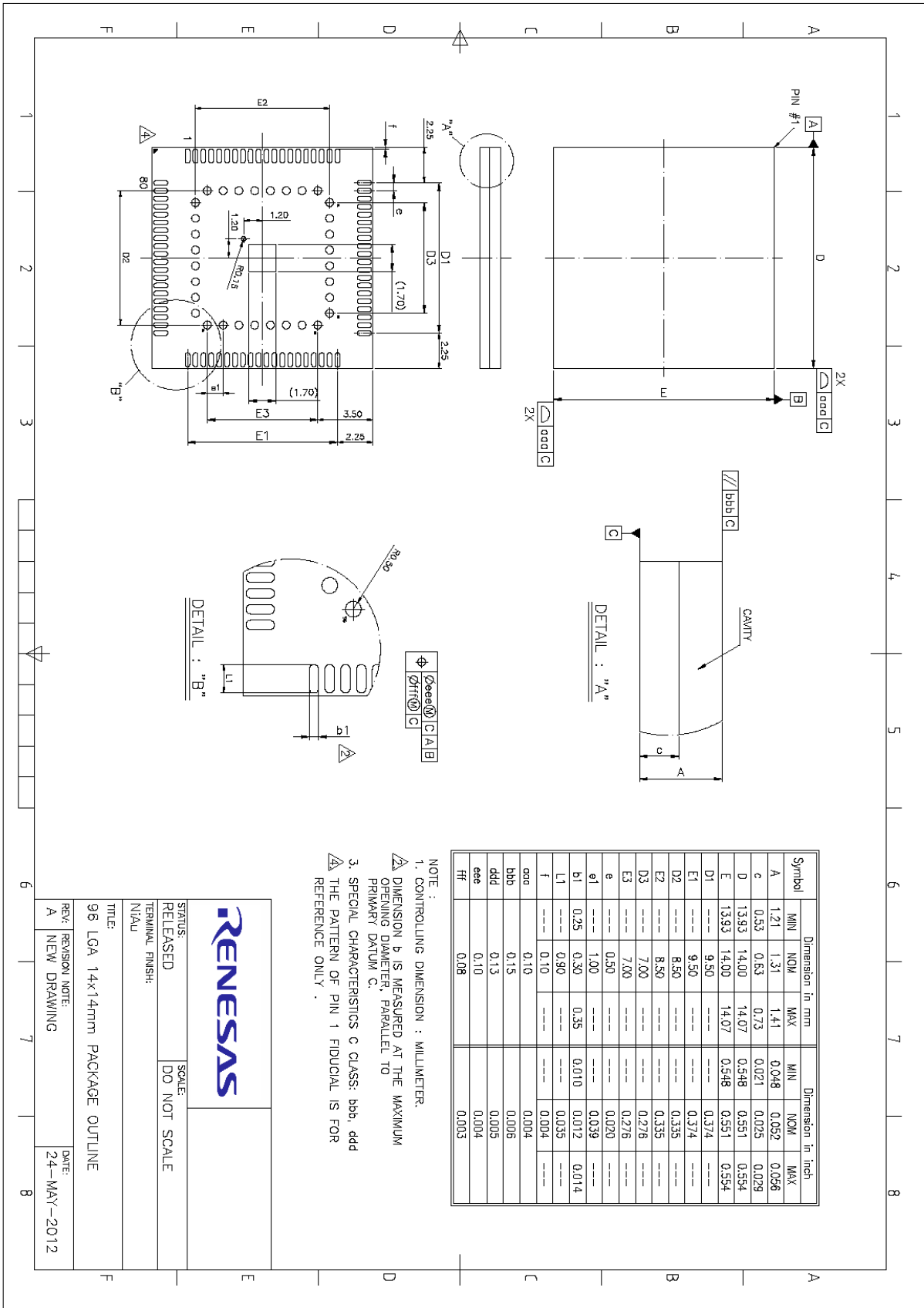


Figure 2. LGA96 package outline drawing (non-presoldered)

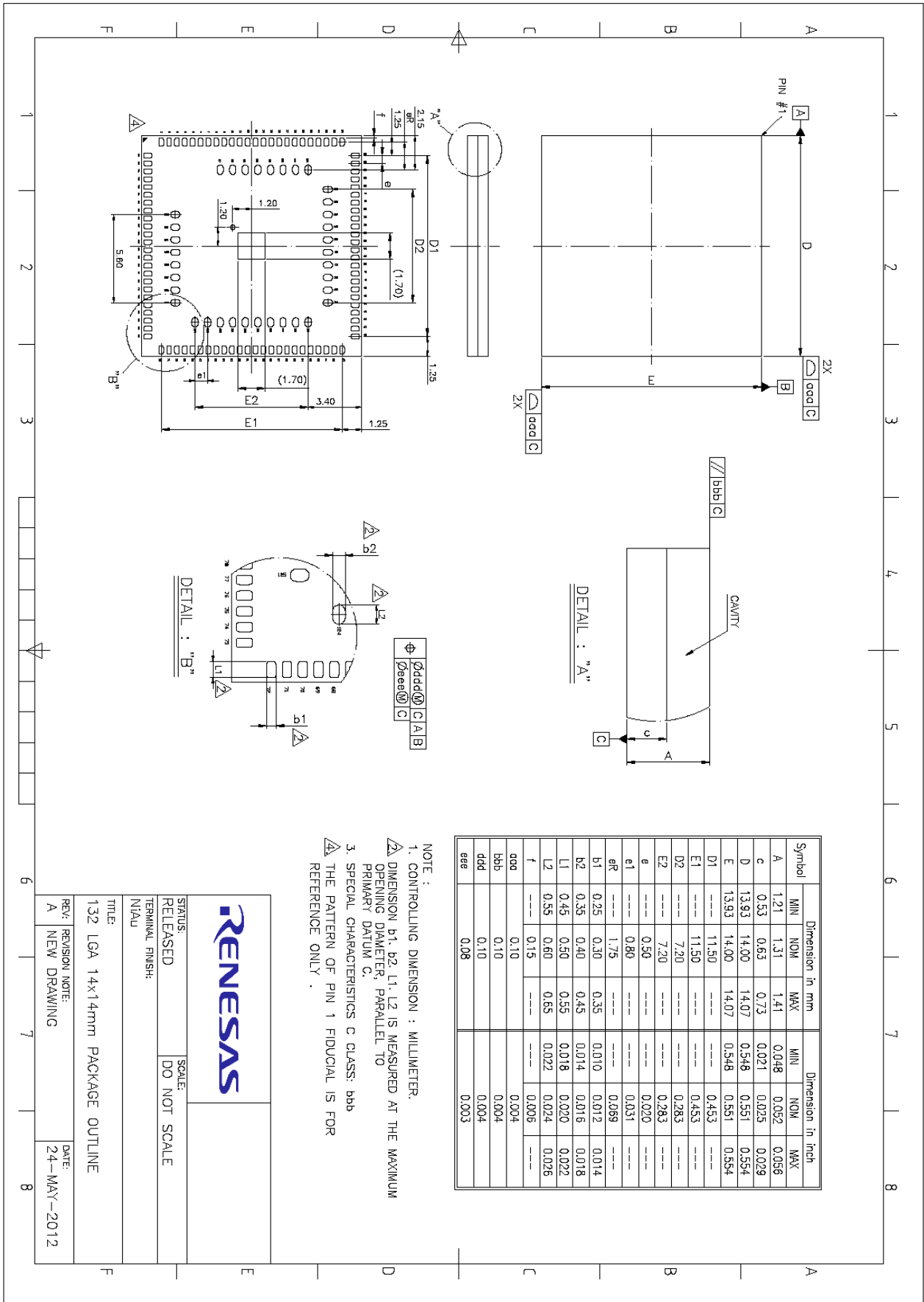


Figure 3. LGA132 package outline drawing (non-presoldered)

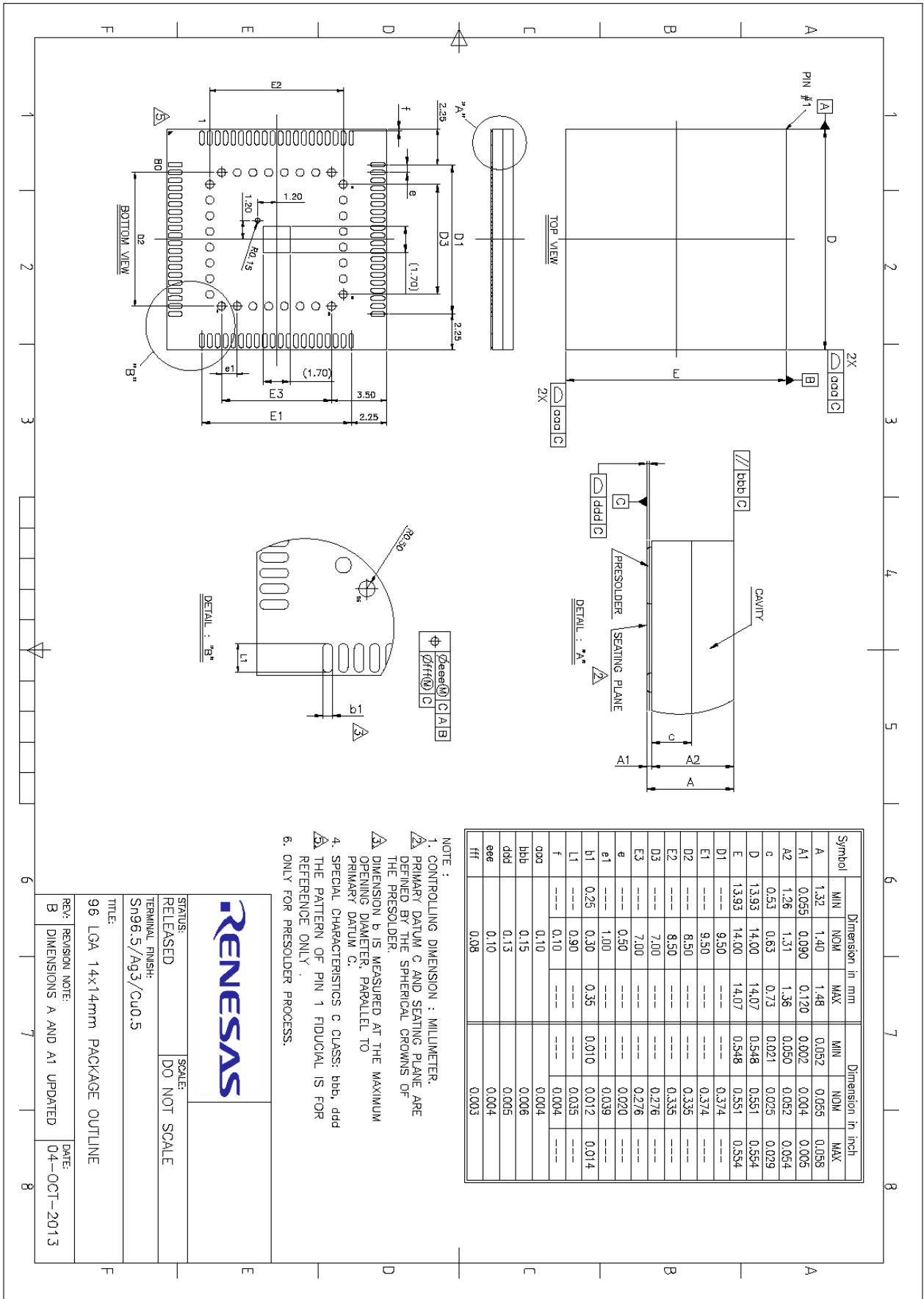


Figure 4. LGA96 package outline drawing (presoldered)

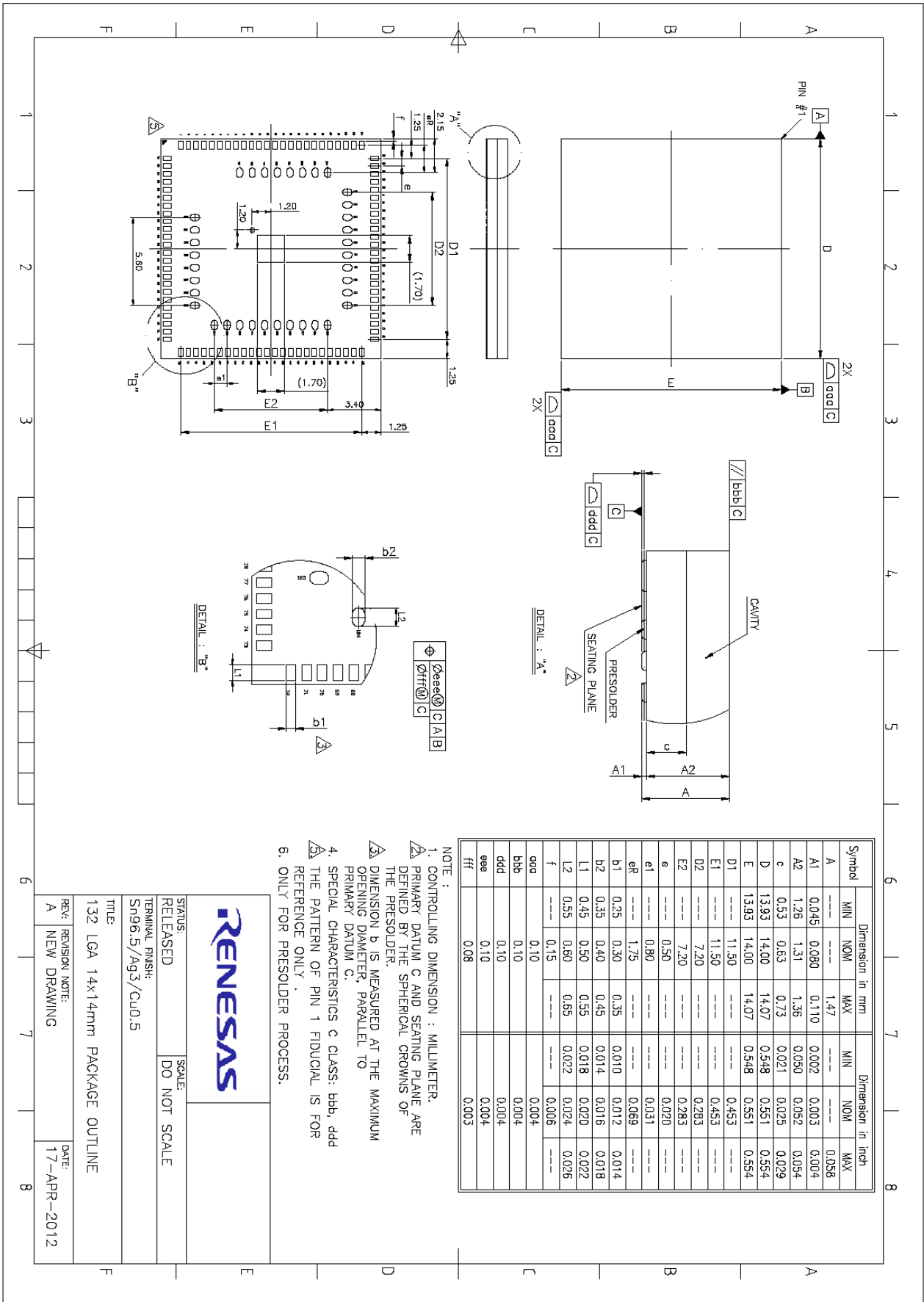


Figure 5. LGA132 package outline drawing (presoldered)



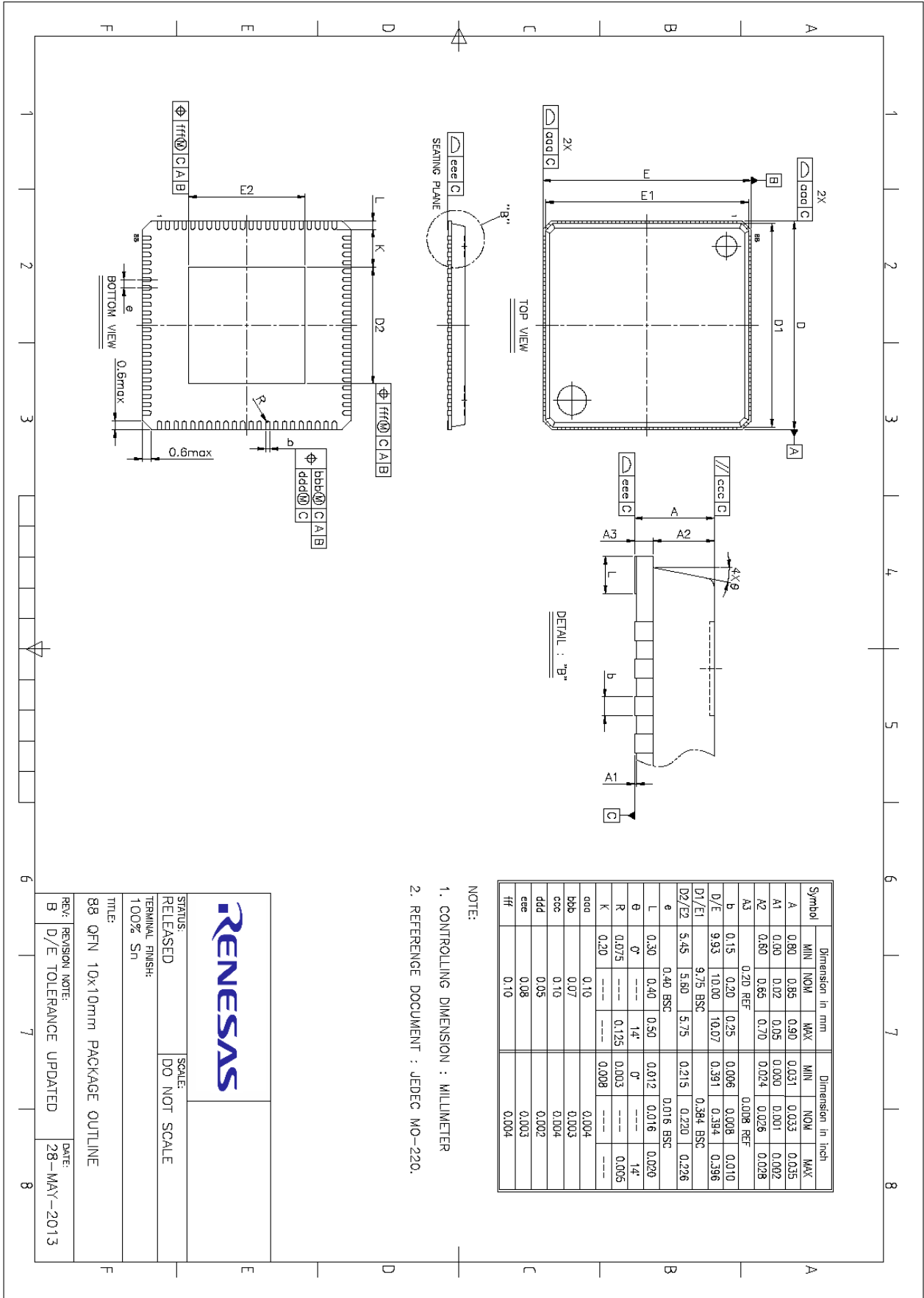


Figure 6. QFN88 (5.6 x 5.6 mm Epad) package outline drawing

### 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 |
|--------------------|---------------|-----------|---------------|---------------|
| SC14441C52R101QNCT | QFN88 package | 10 x 10   | Tray          | MOQ 1680      |
| SC14441B52RLT      | LGA96 package | 14 x 14   | Tray          | MOQ 1190      |

## 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.