

S1A00114B Power Management IC(PMIC)

■ DESCRIPTIONS

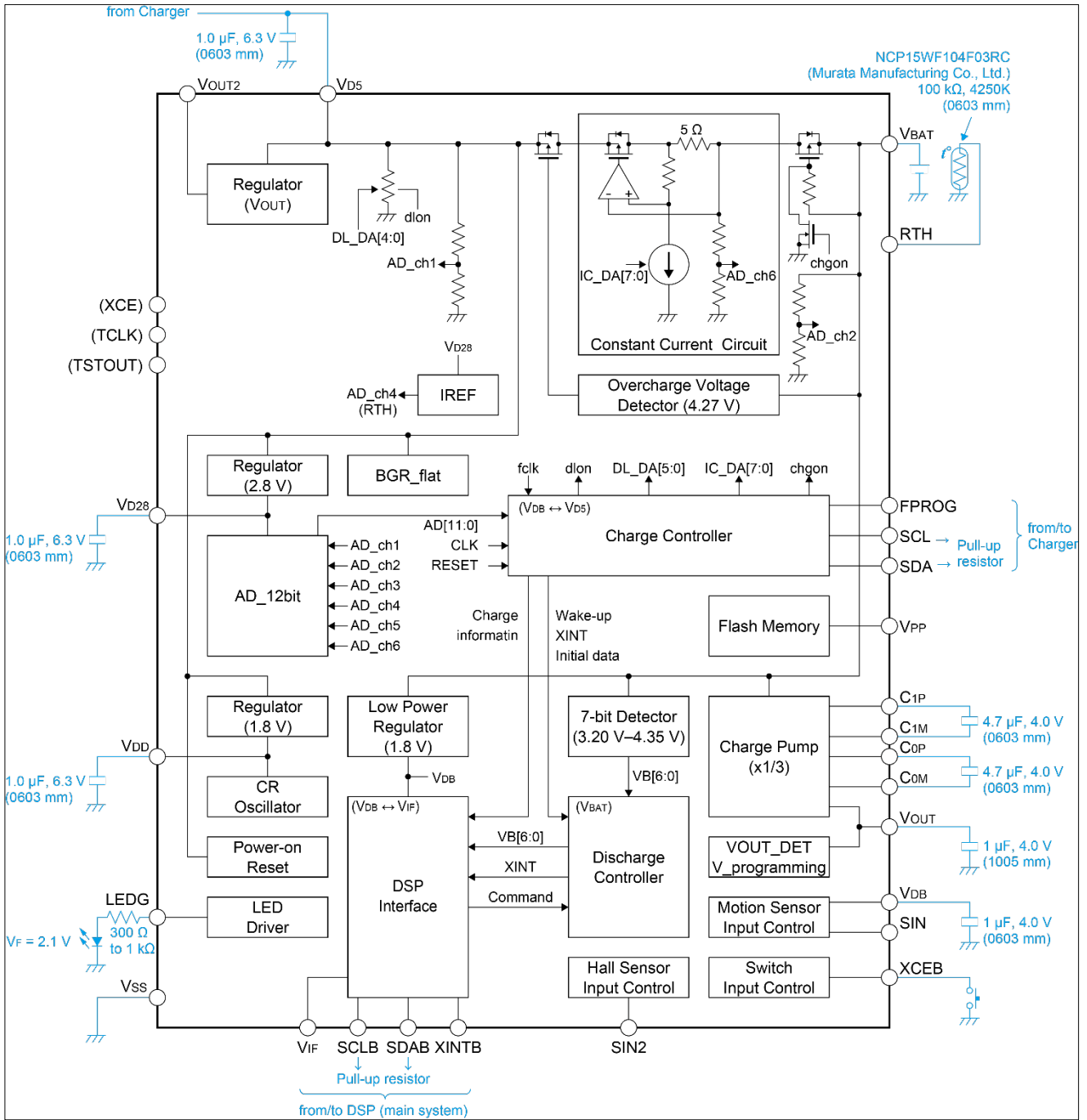
The S1A00114B is a PMIC (Power Management IC) that features lithium-ion battery charging control, power management, and communication functions with a charger and a DSP. It allows various parameters required for CC-CV (Constant Current-Constant Voltage) charging control to be programmed into the embedded flash memory, and it also supports overcharge and overdischarge protection.

■ FEATURES

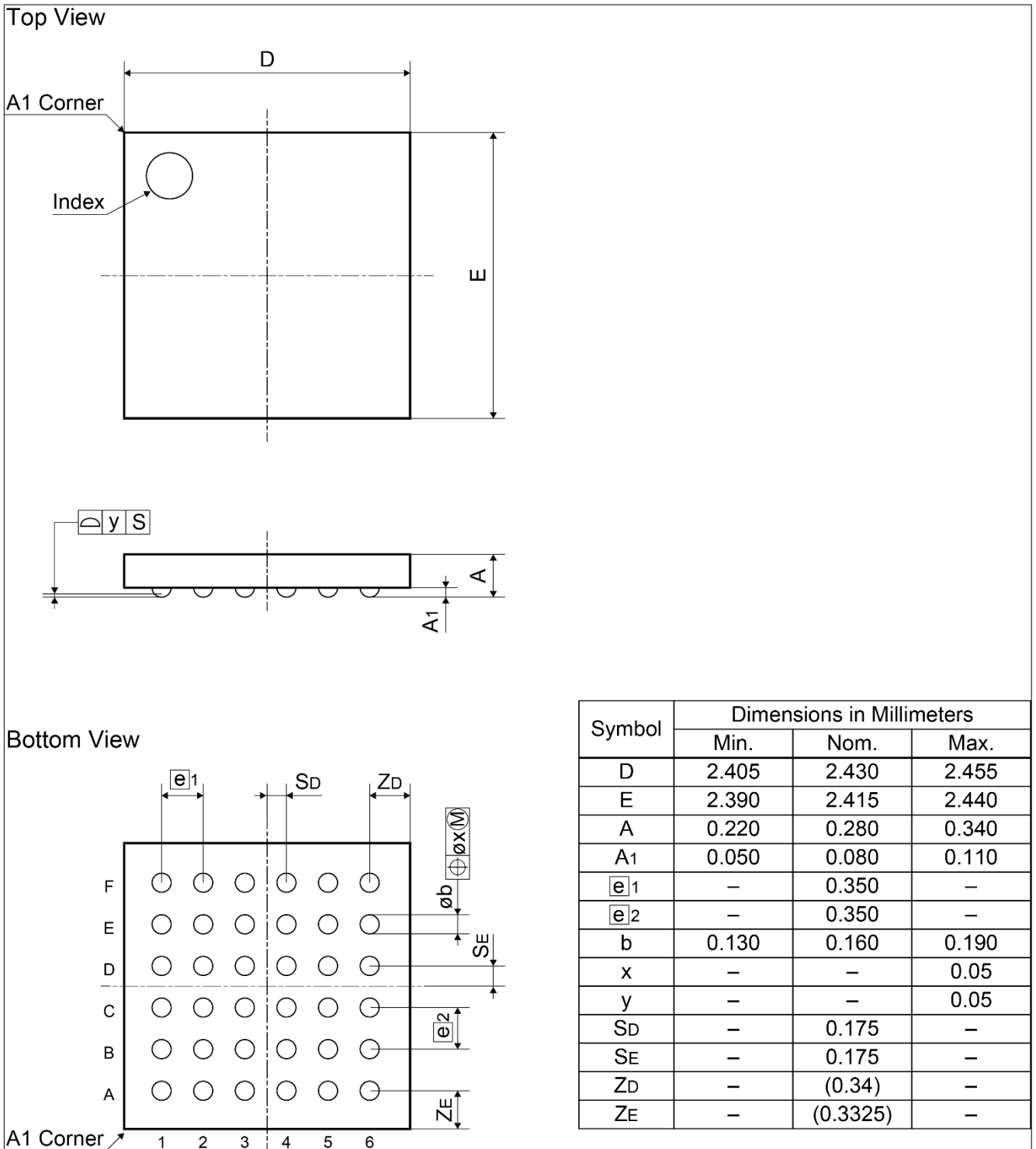
- **Lithium-ion battery charging control functions**
 - ✓ CC-CV charge method for lithium-ion battery
 - ✓ Configurable constant current through built-in flash memory
 - ✓ Overcharge voltage detection (detectable at 4.27 V/4.37 V/4.42 V for 100 ms)
 - ✓ Overcharge current detection, threshold can be set in the built-in flash memory
 - ✓ Optional function for DSP to control charging current
- **Power management functions**
 - ✓ $\times 1/3$ charge pump with 90% efficiency ($I_{out} = 2 \text{ mA}$, $f = 60.1 \text{ kHz}$)
 - ✓ Over-discharge detection (detectable at 3.2 V for 200 ms every 12-second intervals)
 - ✓ $V_{OUT-GND}$ short-circuit detection (detectable at $1/3 \times V_{BAT} \times 0.7216$ for 25 ms)
 - ✓ $V_{_}$ programming connection detection (detectable at $1/3 \times V_{BAT} \times 1.0254$ for 3 ms)
- **Communication with the charger (cradle)**
 - ✓ Communication load is configurable through the built-in flash memory
 - ✓ Communication contents include:
 - Battery charging conditions (voltage, current, temperature, cycle time)
 - V_{D5} voltage
 - Charging status
 - IC number (12-bit), ID code (15-bit, Epson's control code: 4-bit + User-specific code: 11-bit)
 - DSP communication data: Arbitrary data can be sent from the DSP to the charger (cradle)
- **DSP communication functions**
 - ✓ Battery voltage monitor (7-bit detection), power control command, charging information
 - ✓ Advanced battery capacity calculation function via battery charge calculation feature
 - ✓ I²C interface (0.9 V to V_{BAT} , Max. 100 kHz)
- **Power control for DSP (main system)**
 - ✓ External control via a switch (using push-button), motion sensor, and hall sensor
 - ✓ DSP command control, Power-off command, Shutdown command, etc.
 - ✓ Built-in V_{OUT} regulator to turn the DSP on during charging
- **Built-in CR oscillator circuit**
 - ✓ Oscillation frequency: 10 MHz
- **Operating current**
 - ✓ During charge: Max. 3 mA
 - ✓ DCDC ON:
 - Max. 70 μA (60.1 kHz)
 - Max. 80 μA (70.5 kHz)
 - Max. 90 μA (81 kHz)
 - Max. 104 μA (92.3 kHz)
 - ✓ DCDC OFF: Max. 0.4 μA ($T_a = 25^\circ\text{C}$)
 - ✓ Shutdown: Max. 0.06 μA ($T_a = 25^\circ\text{C}$)
- **Shipment package**
 - ✓ WCSP package (2.43 mm \times 2.42 mm)

S1A00114B

■ BLOCK DIAGRAM



■ PACKAGE OUTLINE



S1A00114B

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Seiko Epson Corporation

Sales & Marketing Division

MD Sales & Marketing Department

JR Shinjuku Miraina Tower, 4-1-6 Shinjuku,
Shinjuku-ku, Tokyo 160-8801, Japan

Epson semiconductor website

global.epson.com/products_and_drivers/semicon/

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