

## Product features

### 1. Driver circuit optimized for e-paper displays

- 42-segment output
- Selectable segment, back plane, and top plane output pin assignments
- Display drive power supply control function
- Built-in display driving waveform generator
- Built-in display data memory
- Built-in temperature sensor

### 2. Low-current real-time clock circuit that extends battery life

- 32.768 kHz (typ.) crystal oscillation circuit
- Operating current 120 nA (typ)
- Real-time clock (second, minute, hour, day, day of the week, month, and year counters)
- Day/hour/minute/second, alarm, and programmable periodic timer interrupts
- A theoretical regulation function that can be used to compensate temperature-induced drift of the oscillation frequency

## Product specifications

Product number	S1C17F63
CPU core	16-bit RISC processor
Flash memory	32 Kbytes
EEPROM	256 bytes
RAM	2 Kbytes
EPD controller/driver	Segment output: 42 Top plane output: 1 Back plane output: 1 Output voltage 48 values Built-in display drive power supply circuit
Real-time clock	Second, minute, hour, day, day of the week, month, and year counters Automatic leap year compensation Day/hour/minute/second, alarm, and programmable periodic timer interrupts
Serial interfaces	UART: 1 channel    SPI: 2 channels    I <sup>2</sup> C: 1 channel Smart card interface: 1 channel
A/D converter	12-bit successive-approximation ADC External signal inputs: 7 max. Internal signal inputs: 1    Connect temperature sensor output
Temperature sensor / reference voltage generator circuit	Sensor output can be read by the A/D converter The A/D converter reference voltage is selectable (2.0 V, 2.5 V, VDD or external source)
Supply voltage detector	32 levels (1.2 V to 5.0 V)
Timers	16-bit timer: 4 channels    16-bit PWM timer: 2 channels Watchdog timer
I/O ports	Max. 17 bits

	Universal port multiplexer: 14 bits
Operating voltage	1.8 V to 5.5 V
Current consumption	Real-time clock mode: 120 nA (typical) RUN: 5 $\mu$ A@32 kHz (typ.) RUN: 120 $\mu$ A/MHz (typ.)
Package	Gold bump chip [bump pitch: 85 $\mu$ m (min.)] Aluminum pad chip [pad pitch: 85 $\mu$ m (min.)] QFP15-100 (pin pitch: 0.5 mm)