

PEN SCANNER/READER (OCR): OVERVIEW

Utilizing a small pen form factor, this design operates as a hand-held scanner with optical character recognition (OCR). The pen not only captures and stores the characters available for download, but it can also read the words to you via a small built-in speaker. The heart of this design is the RL78/G14, an industry-leading lowest power MCU. The MCU interfaces to the image sensor and a micro-SD card as well as controls the volume of the speaker via a digitally controlled potentiometer. Additionally, the pen is powered off a rechargeable battery, which is charged via the ISL9205 battery charger.

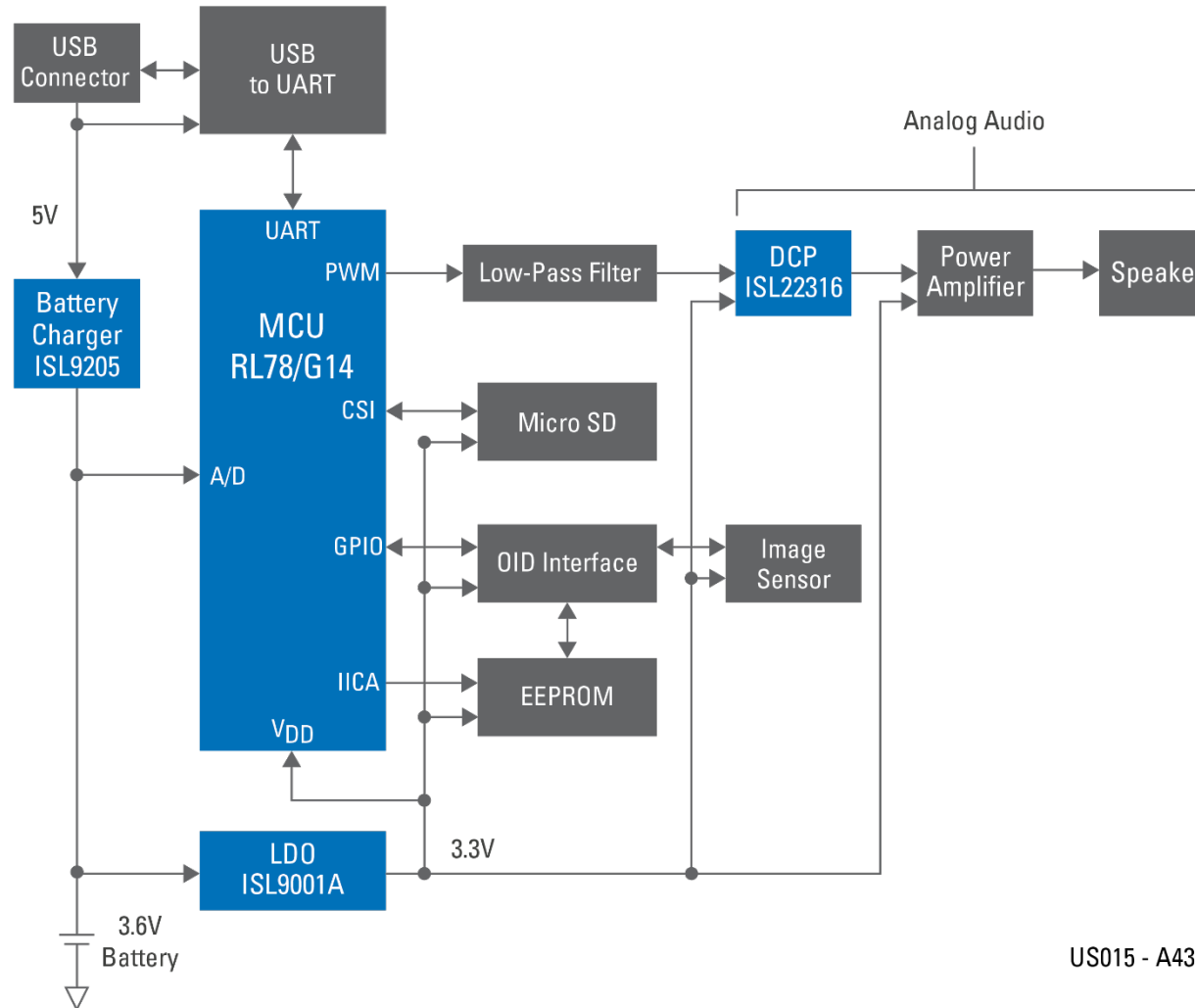
Key Features:

- Scans with OCR and captures data on micro SD card
- Reads captured sentences back via a built-in speaker
- Operates on very low current and enables long battery life
- Small form factor with rechargeable battery via the USB interface

WC#: US015-A43

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PEN SCANNER/READER (OCR): BLOCK DIAGRAM



US015 - A43

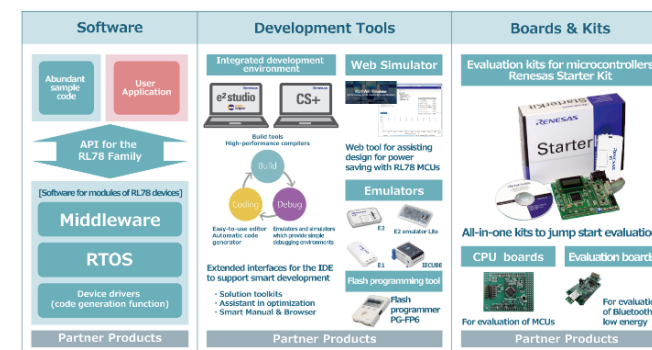
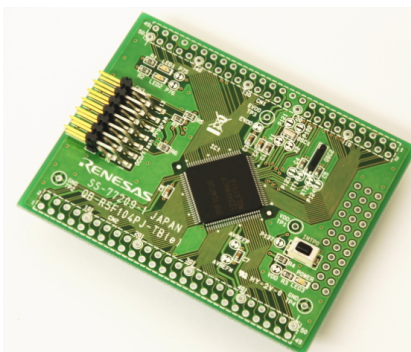
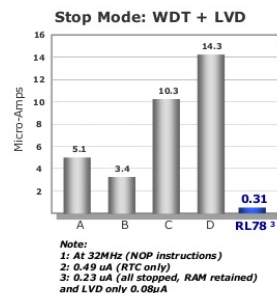
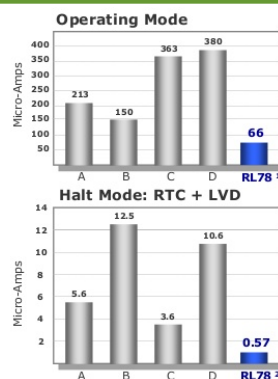
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RL78/G14: HIGH FUNCTION GENERAL PURPOSE MCU

Low power MCU series within the RL78 Family

Features	Benefits	Applications
<ul style="list-style-type: none"> • True Low Power 16bit 32MHz uC • Broad Scalability w/ pin/FLASH/RAM options • High Performance w/ 1.6V to 5.5V operation • High Integration including oscillators, power-on-reset, low voltage detection, watchdog, real time clocks and analog functions • Comprehensive Tools and Support <ul style="list-style-type: none"> – Advanced Tools, 3rd Party, Online resources and training 	<ul style="list-style-type: none"> • RL78 provide many options in-order to scale power based on application requirements by using combination of the clock selection and advanced power modes. • RL78 offer scalability via > 600 devices with wide pin count, packages, I/O peripheral mapping and large memory options • Integration options allow for many of the functions necessary to make the solution smaller, more reliable and lower cost 	<ul style="list-style-type: none"> • HVAC Systems • Climate control systems • Smart Thermostats • Bathroom fans • Kitchen exhaust hoods • Smart outlets & receptacles • Home appliance • Weather stations • Industrial automation

Typical application and key performances



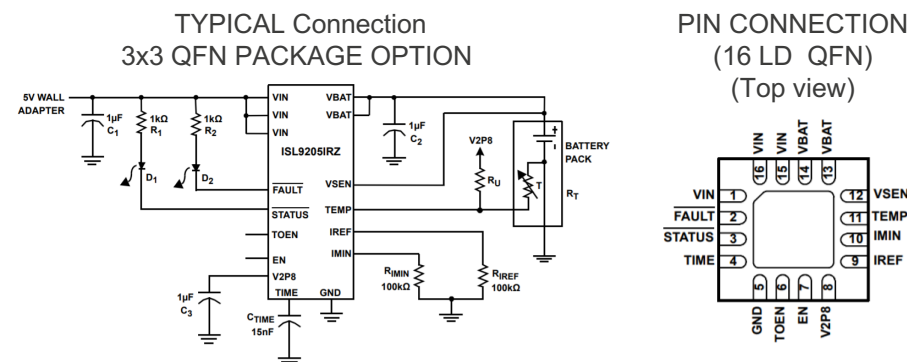
ISL9205: SINGLE-CELL BATTERY CHARGER

Integrated single-cell Li-ion or Li-polymer charger

Features	Benefits	Applications
<ul style="list-style-type: none"> Complete charger for single-cell Li-ion/polymer batteries Input voltage as low as 2.5V Integrated pass element and current sensor 25mV voltage accuracy over-temperature and input voltage range Programmable charge current Power presence and charge indications Less than 3μA leakage current off the battery when no input power attached or charger disabled 	<ul style="list-style-type: none"> Low component count and cost The ISL9205 includes an external temperature monitoring function, and over-temp protection The ISL9205 also includes a timer to set the time reference for various charge time limits. The timer is programmable with an external capacitor. Two logic inputs and two open-drain logic outputs are available for controlling the charger and indicating the charger status. 	<ul style="list-style-type: none"> Mobile phones Bluetooth devices PDA's MP3 players Stand-alone cradle or travel chargers Other handheld devices

Typical application and key performances

The ISL9205 is integrated single-cell Li-ion or Li-polymer chargers capable of operating at an input voltage as low as 2.5V. The low operating voltage allows the charger to work with a variety of AC adapters.



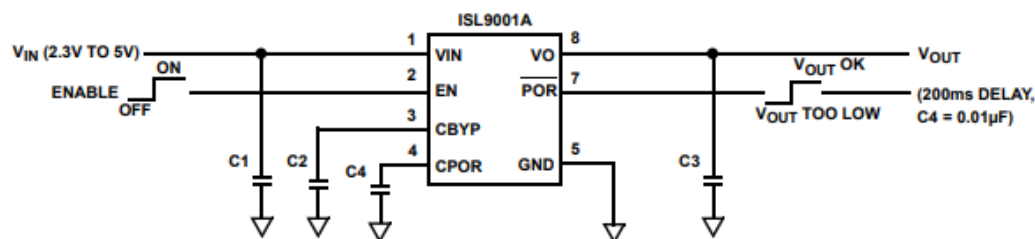
ISL9001A: HIGH ACCURACY HIGH PSRR LDO IN TINY PACKAGE

Low dropout regulator with low Iq and high PSRR

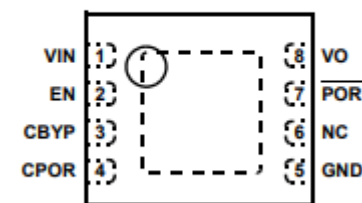
Features	Benefits	Applications
<ul style="list-style-type: none"> Excellent transient response to large current steps Excellent load regulation: <0.1% voltage change across full range of load current High PSRR: 90dB @ 1kHz Extremely low quiescent current: 25µA Low dropout voltage: typically 200mV @ 300mA Low output noise: typically 30µVRMS @ 100µA (1.5V) 	<ul style="list-style-type: none"> When coupled with a no load quiescent current of 25µA (typical), and 0.1µA shutdown current, the ISL9001A is an ideal choice for low power consumption application. 	<ul style="list-style-type: none"> PDA's, cell phones and smart phones Portable instruments, MP3 players Handheld devices, including medical handhelds

Typical application and key performances

Typical application circuit



ISL9001A
(8 LD DFN)
TOP VIEW

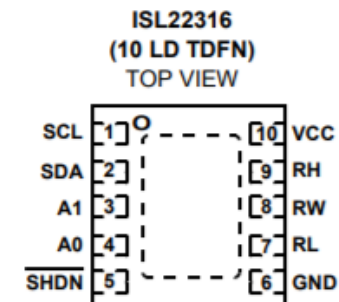
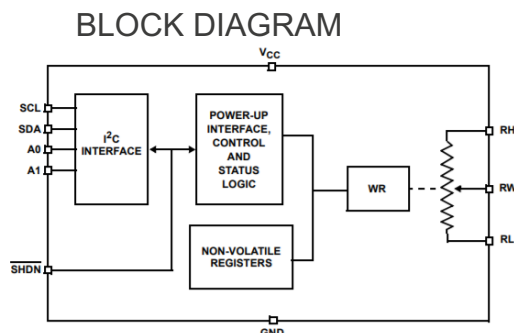


ISL22316: DIGITALLY CONTROLLED POTENTIOMETER (DCP)

Low Noise, Low Power DCP with Non-Volatile Memory

Features	Benefits	Applications
<ul style="list-style-type: none"> 128 resistor taps I2C serial interface - Two address pins, up to four devices/bus Non-volatile storage of wiper position Power supply: 2.7V to 5.5V Shutdown current 5μA max High reliability <ul style="list-style-type: none"> Endurance: 1,000,000 data changes per bit per register Register data retention: 50 years @ $T \leq +55^{\circ}\text{C}$ 	<ul style="list-style-type: none"> The I2C interface provides easy control of the registers and wiper position for variable resistance or voltage divider. Non-volatile memory recalls the last stored wiper position after a power cycle. 	<ul style="list-style-type: none"> Parameter adjustment Signal conditioning Gain control DC Margining

Typical application and key performances



PEN SCANNER/READER (OCR)

- **System benefits**

- Small form factor with industry-leading lowest power MCU
- Rechargeable battery with extended long battery life
- Smart functionalities include scanning with OCR and reading captured sentences

Device Category	P/N	Key Features
MCU	RL78/G14	RL78 Core, 30pin, 16 to 128Kb Flash, Low power MCU.
Power	ISL9001A	LDO with low Iq (25uA) and high PSRR (90dB @ 1kHz), able to source 300mA current.
Power	ISL9205	Single-cell Li-ion/polymer batterie charger with programmable charge current; 25mV voltage accuracy over line and temp change; Input voltage can be as low as 2.5V.
Analog	ISL22316	Digitally controlled potentiometer with I2C bus, shutdown current 5μA max, 128 resistor taps.