



PR-Nr. 14 – 18. January 2019

Ricoh launches two 42 V Power Management ICs with a built-in Window or Battery Voltage Detector

Osaka, Japan, 15 January 2019 – Ricoh Electronic Devices Co., Ltd. in Japan has launched the R5116 and R5117, a 500mA voltage regulator with either a window or a battery voltage detector and capable of operating in a wide input voltage range. These products were especially designed to add functional safety to automotive, industrial, and consumer applications, requiring a high level of operational reliability.

Microcontroller processors often require a precise power supply in order to operate properly. To improve the reliability of the application some additional monitoring circuits have been added to check if the power supply operates within the narrow safety margins. If the supply voltage exceeds the safety margins, the microcontroller must be reset to prevent its operation from working improperly. The R5116 and R5117 both have a 500mA voltage regulator and supervisory circuits embedded in a single package which saves valuable circuit board space and additional wiring between the components, providing the designer a cost effective solution with minimal external components.

The main differences between the R5116 and R5117 are the supervisory circuits:

- R5116: 500mA Voltage Regulator + monitors the output voltage for both over- and undervoltage
- R5117: 500mA Voltage Regulator + monitors both the input voltage and output voltage for undervoltage
- The integrated supervisory circuitry provides an active low reset signal when the regulator output falls out of regulation or when the input voltage falls below a minimum.



Press



RELEASES

As for the circuit monitoring the output voltage, it has an independent sense pin which can be connected to the regulator output or directly to the microcontroller supply voltage pin for improving the measurement accuracy.

The new CMOS-based R5116 and R5117 are robust enough to survive in harsh conditions; operating up to 42 V and even tolerates load dump surge peak voltages of 60 V with a duration of less than 200 ms. The minimum operating voltage starts at 3.5 V, which makes the products suitable to use even at severe cranking conditions. The product will be available in a version intended for the consumer, industrial and automotive application market and has customized operating temperature ranges, respectively -40 to 105°C, -50 to 125°C and -40 to 125°C. The automotive version is scheduled to become AEC-Q100 compliant soon.

All settings for the output voltage and supervisory thresholds are internally fixed by laser trimming and have a high accuracy level, making the product suitable as a power source with high reliability. The voltage regulator has an excellent transient response, a change on the input or load results in only a small signature on the output voltage and a false supervisory detection is prevented by these characteristics. The ripple rejection ratio is in the range of 70dB at 1kHz.

Another important feature is to minimize current consumption for those applications that are continuously active, thereby extending the operational lifetime of the battery. The R5116 / R5117 contribute to reducing the total current consumption with respectively Typ. 25 / 35 μ A in On-mode and 1.5 / 10 μ A in Off-mode by controlling the chip disable pin.

The outputs have an N-Channel open drain and require an external pull-up resistor to define its logic high state, each supervisory circuit has its own output and can be combined together or connected individually to the microcontroller. An external capacitor is used to specify the active reset period and power on reset time, it should be set long enough in order to reset the processor properly.

MACNICA

MACNICA GmbH, 85051 Ingolstadt

www.macnica.eu

MACNICA

MACNICA GmbH, 81249 Munich

www.macnica.eu



Press



RELEASES

The R5116 and R5117 have an array of safety features, protecting the voltage regulator and other parts of the application from possible damage and defects.

- Over-current protection, reducing the output current when overloaded.
- Short protection, an embedded fold-back short current limit circuit detects a short circuit and decreases the output current to a safe level of 105 mA, after removing the short the regulator resumes to normal operation automatically.
- Thermal protection is incorporated and will turn off the regulator when an over-temperature of 175°C is detected and will resume to normal operation again as soon a temperature of 145°C is reached.

Target applications for these products are for example devices with a direct 12 V battery connection, ECUs, Infotainment, Security System, Dashboard Systems, Remote Keyless Entry, Immobilizer, Gateway and ADAS Drive Safety Systems.

Pricing and Availability

Information about Pricing and availability info via email: sales.europe@macnica.com.

R5116 and R5117 Features:

Input Voltage Range (Maximum Rating)	3.5 to 42.0 V (50 V)
Absolute Maximum Rating	60V < 200 ms
Operating Temperature Range	
Consumer / Industrial / Automotive	-40 to +105 / -50 to +125 / -40 to +125°C
Supply Current R5116 / R5117:	Typ. 25 / 35 µA
Standby Current R5116 / R5117:	Typ. 1.5 / 10 µA

Voltage Regulator (VR)

Output Voltage Range:	3.3 to 5.0 V
Output Voltage Accuracy:	-1.25 to +0.75% (-40°C ≤ Ta ≤ 105°C)
Output Current:	500 mA
Protection Circuits:	Thermal shutdown (Detection Temperature Typ.175 °C) Output current (Typ.750 mA) Output current short-circuit (Typ.105 mA)

MACNICA

MACNICA GmbH, 85051 Ingolstadt

www.macnica.eu

MACNICA

MACNICA GmbH, 81249 Munich

www.macnica.eu



Press



RELEASES

Voltage Detector (VD) R5116

Overvoltage (OV) Detector Threshold:	3.3 to 5.5 V (in 0.01V step)
Undervoltage (UV) Detector Threshold:	2.5 to 5.0 V (in 0.01V step)
Detector Threshold Accuracy:	-1.25 to +0.75% ($-40^{\circ}\text{C} \leq T_a \leq 105^{\circ}\text{C}$)
Release hysteresis:	max 0.7%

Sense Voltage Detector (SVD) R5117

Detector Threshold:	2.5 V to 5.0 V (in 0.01V step)
Detector Threshold Accuracy:	-1.25 to +0.75% ($-40^{\circ}\text{C} \leq T_a \leq 105^{\circ}\text{C}$)
Release hysteresis:	max 0.7%

Battery Voltage Detector (BVD) R5117

Detector Threshold:	3.5 to 12.0 V (in 0.1V step)
Detector Threshold Accuracy:	-2.0 to +1.0% ($-40^{\circ}\text{C} \leq T_a \leq 105^{\circ}\text{C}$)
Release hysteresis:	max 5.0%

Package R5116S, R5117S

HSOP-8E

AEC-Q100 Compliant

To be confirmed soon

Learn More:

https://www.e-devices.ricoh.co.jp/en/products/power/vr_ldo/r5116/

https://www.e-devices.ricoh.co.jp/en/products/power/vr_ldo/r5117/

Contact:

Press

Macnica GmbH

Josef Sigl

Tel. +49-89-899143-0

Email: sales.europe@macnica.com

Sales

Macnica GmbH

Tel. +49-84188198-0

Email: sales.europe@macnica.com

About Ricoh

Ricoh Electronic Devices Co., Ltd is a leading global provider of semiconductor products, offering a comprehensive portfolio of CMOS Power Management and Real Time Clock ICs that enable engineers to design advanced applications for the consumer, industrial and automotive markets. The company's headquarter is based in Japan, as well as development, sales and manufacturing facilities. Regional sales and support offices are located in North America, Europe, and Asia.

MACNICA

MACNICA GmbH, 85051 Ingolstadt

www.macnica.eu

MACNICA

MACNICA GmbH, 81249 Munich

www.macnica.eu



Press



RELEASES

Ricoh has an extensive expertise in small package technology has a focus on developing products providing features such as low-supply current, high-accuracy, high efficiency and high-reliability. We obtained certificates for quality management (ISO9001 and ISO/TS16949) and environmental management (ISO14001).

About Macnica Europe GmbH

Macnica's European headquarter was originally established in the UK in 2006, and moved to Germany in July 2008, to increase efficacy of its service for European customers.

By its acquisition of the Munich based company Scantec Mikroelektronik in 2014 Macnica Europe formed a powerful semiconductor distribution with headquarters in Munich and Ingolstadt and numerous sales offices in Europe offering an attractive and competitive portfolio of highly sophisticated devices.

Macnica provides end to end support from design-in to production through its global service network to its customers, regardless of the final destination of the product shipment to customers' manufacturing locations.

About Macnica, Inc.

Macnica was established in 1972 as a semiconductor distribution company headquartered in Yokohama, Japan, and has over 65 sales offices worldwide in eastern Asia, Europe and the USA. Total number of employees is over 2,600 and its consolidated revenue for fiscal 2015 was approximately US\$ 4 B. Macnica is famous for having an excellent engineering team of more than 800 application support engineers, IC designers and software developers with strong focus on providing technical support for its customers including custom design services. Macnica is continuing to extend its presence globally by having successful partners in strategic areas in the electronics market.

MACNICA

MACNICA GmbH, 85051 Ingolstadt

www.macnica.eu

MACNICA

MACNICA GmbH, 81249 Munich

www.macnica.eu

