

endrich news

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Happy New Year!

Dear readers,

For the start of the New Year I have found a little story which I find very nice:

The black dot: .

One day, a professor walked into class and suggested a pop quiz. He proceeded to hand out the test papers, face down as usual. He then asked his students to turn over the paper and to begin.

To everyone's surprise there were no questions – only a black dot in the middle of the page. The professor proceeded to explain the following: "I would ask you to please write down what you see." The students were confused but started writing. At the end of class, the professor collected the papers and began to read the answers out loud. Without exception, all students had described the black dot – its position in the middle of the page, proportions, relation to the paper etc.

The professor smiled and said:

"I wanted to give you an assignment to think about.

Nobody wrote anything about the white part of the paper.

Everybody concentrated on the black dot – and the same thing happens in our life. We are given a white piece of paper to use and to enjoy. But we only concentrate on the black dots.

Our life is a gift that we should care for with love and diligence. There is truly always a reason to celebrate – nature renews itself every day, our friends, our family, work which provides for our existence, the wonders we see every day ...

But we only concentrate on the dark spots – health issues, lack of money, a complicated relationship to a family member, the disappointment in a friend, expectations etc.

The dark spots are small in comparison to everything that we have in life, but they are what occupies our thoughts and darken our soul.

Take note of the black spots but turn your attention more towards the entire white paper and the possibilities and happy moments in your life and share it with other people!"

On this note I wish everyone a happy and prosperous new year with lots of beautiful moments

Very best regards

W. ENDRICH

ROTARY HUMAN-MACHINE-INTERFACE APPLICATIONS

MA8XX FAMILY

Rotary knobs are used in a diversity of human to machine interface applications with examples including the program selector on a washing machine or the infotainment control in a car. These applications typically use a conventional potentiometer or mechanical rotary switch which have limited lifetime due to mechanical wear and tear or environmental degradation. The use of magnetic angle sensors to implement contactless sensing eliminates both issues to provide a long lifetime solution.

The MagAlpha MA8xx family is a new simple-to-use digital magnetic sensor range designed to replace analog potentiometers or rotary switches in such applications. The sensor detects the absolute angular position of a permanent

magnet attached to the rotating knob. Typically, a simple diametrically magnetized cylinder with a 3 to 8 mm diameter is suitable.

Different options are available, including digital angle output via SPI/SSI bus, incremental ABZ interface, or PWM output.

Programmable threshold magnetic field strength detection is built in to enable implementation of a contactless push or pull button. Detection is performed by reading the device registers or the logic state of the two output signals. In this way, a combined rotary knob with “push or pull to select” functionality can be created.

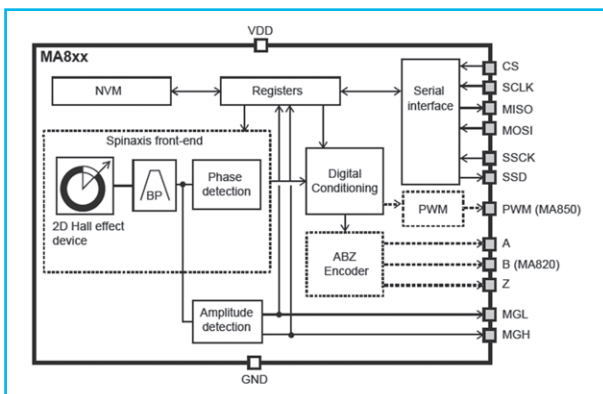
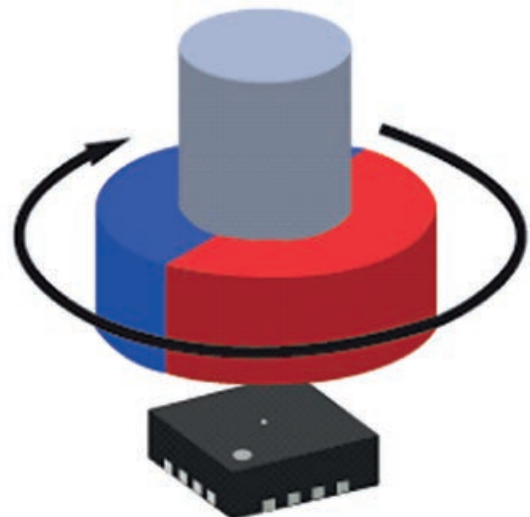


Figure 1: Block Diagram of MA8xx Family Sensor



Push Button Functionality

The MA8xx family provides contactless push or pull button functionality via programmable magnetic field strength thresholds, which can detect the distance of the magnet to the sensor. The graph in Figure 2 shows how this may be implemented with a change in magnet position of approximately 0.9 mm crossing the programmed field threshold to cause the MGH signal to change from logic 0 to logic 1.

ROTARY HUMAN-MACHINE-INTERFACE APPLICATIONS

MA8XX FAMILY

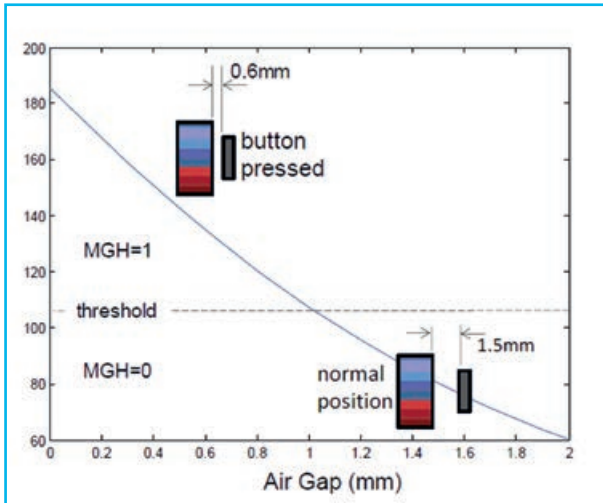


Figure 2: Example of Push Button Detection B(mT) v. Air Gap

Non-Volatile Memory

Configuration parameters are automatically stored in the MA8xx device's non-volatile memory via the SPI interface. The non-volatile memory provides storage for the reference zero angle position and the magnetic field detection thresholds. The MA8xx family operates from a 3.3 V supply and is packaged in a 3 x 3 mm QFN package. The operating temperature is -40 to +125°C.

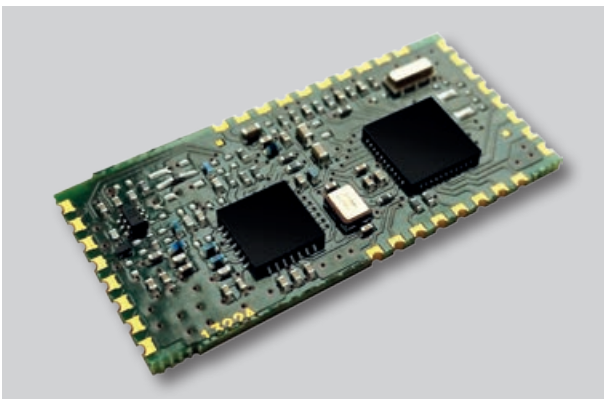
MA8xx Family Sensor Range

FEATURES BY PART		UNIT	MA800 – DIGITAL OUT	MA820 – ABZ INCREMENTAL OUT	MA850 – PWML OUT
Effective angle resolution		bit	8	8	8
Magnetic field range		mT	30 ... 150	30 ... 150	30 ... 150
Zero setting			•	•	•
SPI register configuration			•	•	•
Absolute angle on SPI		bit	8	-	-
Absolute angle on SPI		bit	8	-	-
ABZ incremental				•	
ABZ resolution		PPR		1 ... 64	
PWM output					•
PWM resolution		bit			8
Magnetic field detection			•	•	•
Push button functionality			•	•	•

LORA™ MODULES – LINE UP

Low-Power Wide-Area Network (LPWAN) or Low-Power Network (LPN) is a type of wireless telecommunication network designed to allow long range communications at a low bit rate among things (connected objects), such as sensors operated on a battery.^{[1][2]}

LoRaWAN™ is a Low Power Wide Area Network (LPWAN) specification intended for wireless battery operated Things in a regional, national or global network. LoRaWAN targets key requirements of Internet of Things such as secure bi-directional communication, mobility and localization services. Network architecture is typically laid out in a star-of-stars topology in which **gateways** is a transparent bridge relaying messages between **end-devices** and a central **network server** in the backend.



XTR-8LR100 / XTR-8LR10

Half-Duplex transceiver for long distance, (up to 12km) communication with LoRa™ modulation, able to ensure high immunity level against the interferences and a reduced energy consumption.

Working into European bandwidth 869.4 ÷ 869.65 MHz (100mW) and 868.0 ÷ 868,6 MHz (25mW) with link budget > 156 dBm.

The Transceiver Modules XTR-8LR100 and XTR-8LR10 with UART interface and an implemented data packet addressing technique allows a point-multipoint communication and 248 byte of max. payload.

Part Number	650201364G
Modulation	LoRa™
Supply	3V
Frequency	869.4 ÷ 869.6 MHz
Sensitivity	-118 to -145 dBm
RF output power	100 mW (max) / 25 mW (max)
Consumption	17 mA (RX) - 110 mA (TX)
Dimension	37 x 18 x 2.4 mm



XTR-8LR-USB

XTR-8LR-USB is a radio-modem with Usb interface, used as receiver or concentrator for data from XTR-8LR10 and XTR-8LR100 modules.

It can handle addressing data for point-to-multipoint or star networks, main radio parameters might be set up smoothly via command mode procedure, offering the user a variety of solutions and flexibility to the problems encountered in the field.

Part Number	650201428G
Modulation	LoRa™
Supply	5V by USB
Frequency	869.4 ÷ 869.6 MHz
Sensitivity	-118 to -145 dBm
RF output power	100 mW ERP
Consumption	20 mA (RX) - 135 mA (TX)
Dimension	69 x 25 x 13 mm

LORA™ MODULES – LINE UP

Communication between end-devices and gateways is spread out on different **frequency channels** and **data rates**. The selection of the data rate is a trade-off between communication range and message duration.

Due to the spread spectrum technology, communications with different data rates do not interfere with each other and create a set of „virtual“ channels increasing the capacity of the gateway.

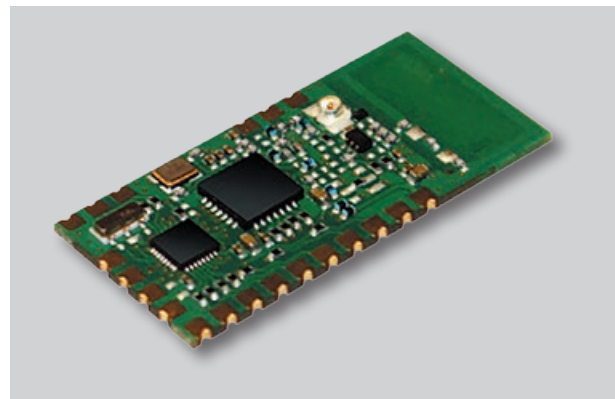


XTR-8LR-4ZN

XTR-8LR-4ZN is a keyfob with encrypted communication that combined with the XTR-8LR-DEC is used to activate remote loads. is used to activate remote loads. Two-way communication allows get acknowledgement of the status of the activated output.

Part Number	650201429G
Modulation	LoRa™
Supply	3V (CR2032 Lithium)
Frequency	868.30 MHz
Sensitivity	-122 dBm
RF output power	10 mW ERP
Consumption	35 mA
Dimension	72 x 39 x 11 mm

Compatible only with 650201431G



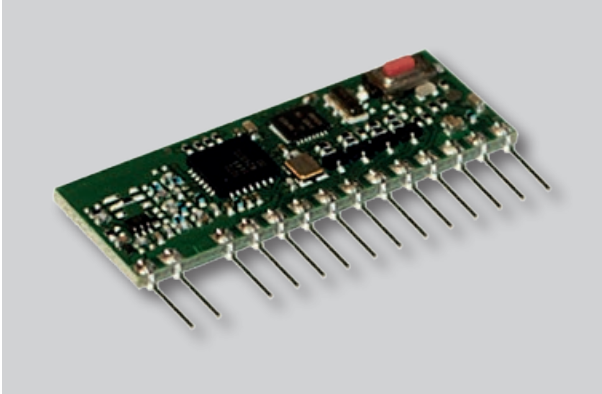
XTR-8LR-ENC

XTR-8LR-ENC is a transmitter with encrypted communication that combined with the XTR-8LR-DEC is used to activate remote loads. Two-way communication allows get acknowledgement of the status of the activated output.

Part Number	650201430G
Modulation	LoRa™
Supply	3V
Frequency	868.30 MHz
Sensitivity	-122 dBm
RF output power	20 mW ERP
Consumption	35 mA (TX) - < 1µA (PVDN)
Dimension	35.5 x 18 x 2.3 mm

Compatible only with 650201431G

LORA™ MODULES – LINE UP



XTR-8LR-DEC

XTR-8LR-DEC is a receiver with encrypted communication that combined with the XTR-8LR-ENC or with keyfob XTR-8LR-4ZN is used to activate remote loads

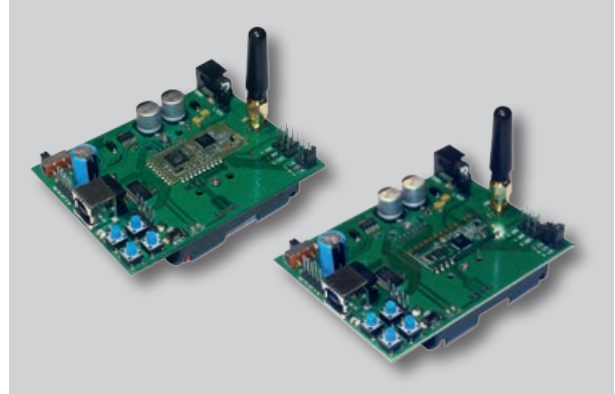
The module makes available four open-collector outputs and two lines of setting the output functioning mode, the cyclical receiver mode also allows a consumption < 1 mA, allowing use in battery powered applications. The output state will be acknowledged to its transmitter.

XTR-8LRWAN

XTR-8LRWAN is designed to support LORAWAN™ protocol stack to provide Low Power Wide Area Network with features specifically needed to support low-cost, mobile, secure bi-directional communication for Internet of Things (IoT), machine-to-machine (M2M), smart city and industrial applications. (Design Phase)

Part Number	650201431G
Modulation	LoRa™
Supply	3V
Frequency	868.30 MHz
Sensitivity	-126 dBm
RF output power	20 mW
Consumption	< 1 mA (RX IDLE) - 16 mA (RX) - 35 mA (TX)
Dimension	38.5 x 16 x 3.8 mm

Compatible only with 650201429G & 650201430G



DEMO-BOARD XTR-8LR100 & DEMO-BOARD XTR-8LR10

DEMO-BOARD XTR-8LR100 and DEMO-BOARD XTR-8LR10 is an evaluation board of the transceiver module XTR-8LR100 and module XTR-8LR10 which can easily check functionality, power consumption, commands and performance of radio link. The difference between the two demo board is on the mounted module, XTR-8LR100 that have mode of operation, Normal, Rx cycle, Tx ADC value and XTR-8LR10 that is implemented the Normal mode operation.

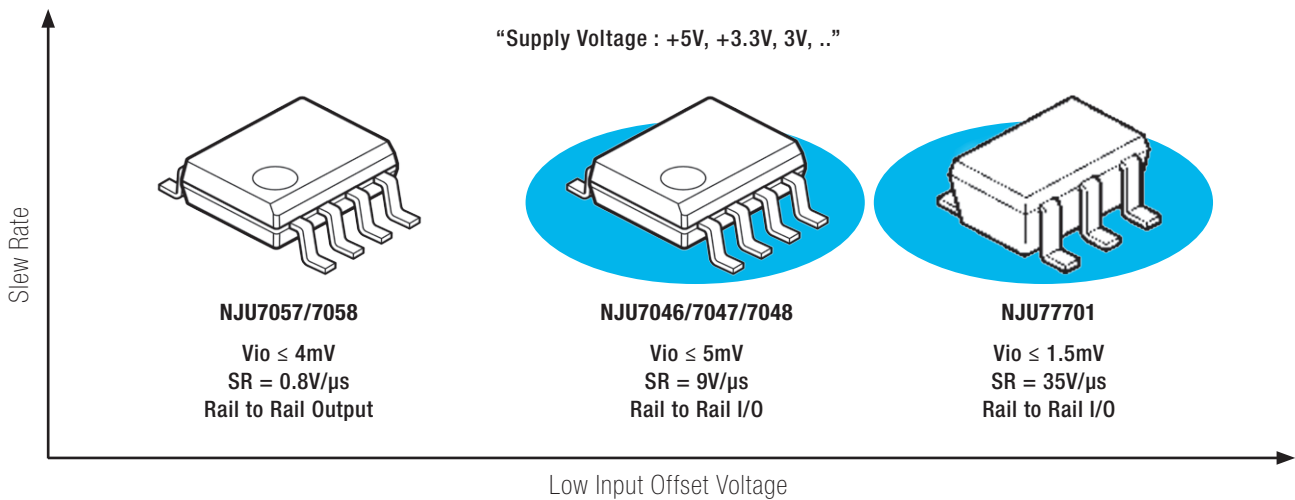
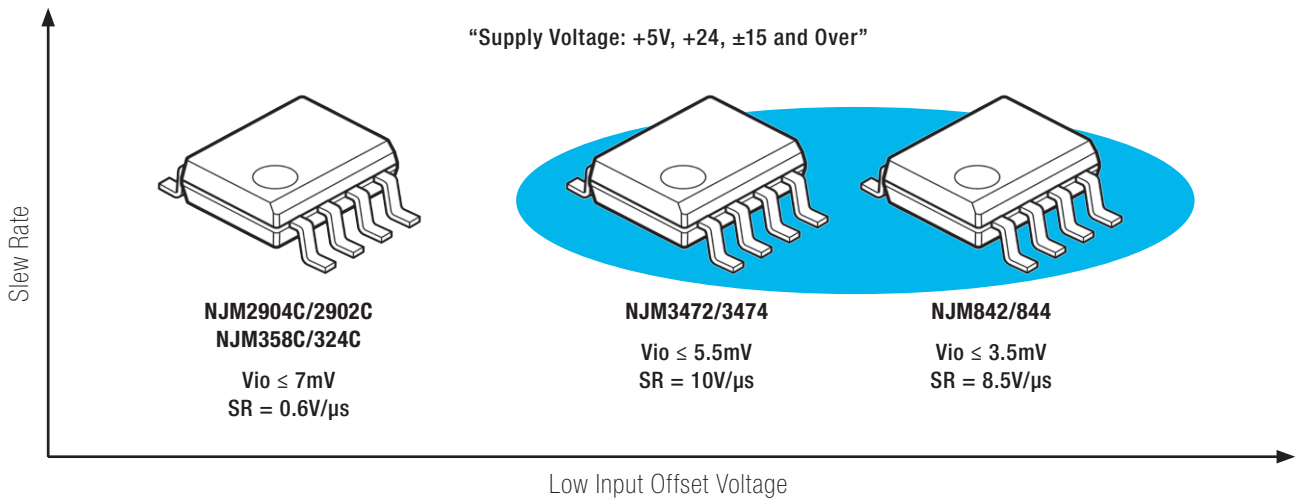
For more detail about the operation mode refer to the user manual of the used module. The device is able to work with external power supply or powered by four AA batteries, for tests in standalone.

It is included a stylus antenna operating on the 868 MHz band connected to the SMA connector, thereby using the test mode through some diagnostic led, it is possible to realize radio links. The DEMO-BOARD is equipped with a USB connector with COM port emulation realized with CI FTDI1235-C and an SMA input connector radio output for the RF connections measurement instruments.

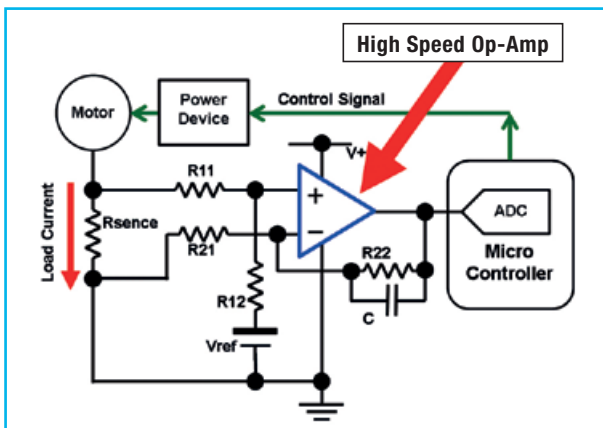
Part Number	650201415G
Modulation	LoRa™
Supply	3V
Frequency	868 ÷ 870 MHz
Sensitivity	-115 to -137 dBm
RF output power	25 mW
Consumption	17 mA (RX) - 30 mA (TX)
Dimension	33.5 x 15.4 x 2.4 mm

SINGLE SUPPLY HIGH-SPEED OP-AMP SERIES FOR HOME APPLIANCE, GENERAL PURPOSE INVERTER AND ETC.

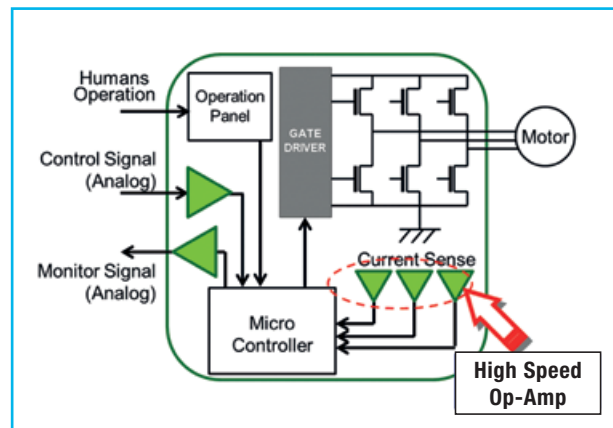
Line-up



Inverter Application



e.g.) Home Appliance



e.g.) General Purpose Inverter Unit

SINGLE SUPPLY HIGH-SPEED OP-AMP SERIES

Features / Electrical Characteristics

NJM3472, NJM3474 FEATURES

- High Slew Rate 10 V/μs typ.
- High Bandwidth 3 MHz typ.
- Input Offset Voltage 5.5 mV max..
- No Phase Reversal
- High EMI Immunity
- Operating Voltage +3 to +36 V
- Operating Temperature -40 °C to +125 °C
- Operating Current (All amplifiers)
 - NJM3472 4 mA typ.
 - NJM3474 8 mA typ.

NJM842, NJM844 FEATURES

- High Slew Rate 8.5 V/μs typ.
- High Bandwidth 3.5 MHz typ.
- Input Offset Voltage 3.5 mV max.
- No Phase Reversal
- High EMI Immunity
- Operating Voltage +3 to +36 V
- Operating Temperature -40 °C to +125 °C
- Operating Current (All amplifiers)
 - NJM842 4.3 mA typ.
 - NJM844 8.8 mA typ.

NJU7046, NJU7047, NJU7048 FEATURES

- High Slew Rate 9 V/μs typ.
- High Bandwidth 5 MHz typ.
- Input Offset Voltage 5 mV max.
- Rail-to-Rail In/Out
- High EMI Immunity
- Operating Voltage +2.7 to +5.5 V
- Operating Temperature -40 °C to +125 °C
- Operating Current (All amplifiers)
 - NJU7046 1.4 mA typ.
 - NJU7047 2.7 mA typ.
 - NJU7048 5.3 mA typ.

NJU77701 FEATURES

- High Slew Rate 35 V/μs typ.
- High Bandwidth 34 MHz typ.
- Input Offset Voltage 1.5 mV max.
- Rail-to-Rail In/Out
- High EMI Immunity
- Operating Voltage +2.4 to +5.5 V
- Operating Temperature -40 °C to +125 °C
- Operating Current (All amplifiers)
 - NJU77701 3.8 mA typ.

Pin Configuration / Package Information

Pin Function	(Top View)		(Top View)				(Top View)											
	OUTPUT	V*	A OUTPUT	A -INPUT	A +INPUT	V*	B -INPUT	B OUTPUT	C -INPUT	C +INPUT	C OUTPUT	D -INPUT	D +INPUT	D OUTPUT	V*	B OUTPUT	B -INPUT	B +INPUT
Package	SC-88A / (SC-70)	SOT-23-5	SOP8	MSOP8 / (VSP8)	SOP14	SSOP14												
NJM347x	---	---	NJM3472G	NJM3472R	NJM3474G	NJM3474V												
NJM84x	---	---	NJM842G	NJM842R	NJM844G	NJM844V												
NJU704x	NJU7046F3	NJU7046F	NJU7047E	NJU7047RB1	NJU7048G	NJU7048V												
NJM7770x	---	NJU77701F	---	---	---	---												

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