

# endrich news

www.endrich.com

## OUR PRODUCT OF THE MONTH:

E-PAPERS THAT ARE OPTIMALLY READABLE IN SUNLIGHT



## FEATURES

- High contrast
- Max. viewing angle up to 180 °C
- Fast screen change under 160 msec
- Bi-stable technology with high energy efficiencies
- Types: ICON, graphic
- Available in monochrome and color (up to 4.096 colors)

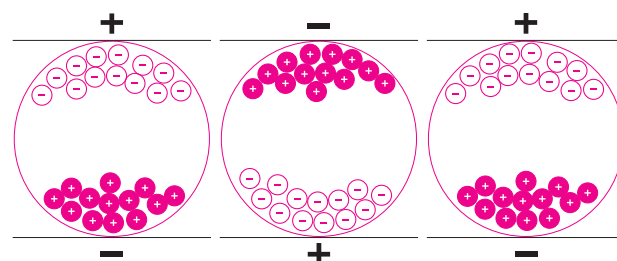


## THE SUN WORSHIPPERS E-PAPERS THAT ARE OPTIMALLY READABLE IN SUNLIGHT

HAVE A  
LOOK

Thanks to the extremely thin, flexible and high-resolution E-Paper, the display is optimally readable even in strong sunlight and thus offers decisive advantages.

The display readability is guaranteed by the reflective display with low scattered reflections without flicker, without dazzle and a maximum reading angle of up to 180°. Therefore, the display can be used despite strong sunlight and bright ambient light. By reflecting the ambient light, no constant backlighting of the display is required. The abdication of the backlight is reflected by the low power consumption of E-Paper displays. The sun worshippers are very reliable and can be utilized for more than 5 years under regular use. The display can be initialized more than 1 million times. Due to the bi-stable technology, the display retains its once entered charge pattern without further energy input. The fluid consists of both black positively charged particles and white negatively charged particles. By applying a single voltage, the particles align themselves and the display image is shown. This state is maintained until it is changed by a new voltage supply. As a result, the display image will remain static. Furthermore, the E-Paper is characterized by a fast image change of less than 160 ms. The sun worshippers are available both as segment display and full graphic display and additionally as monochrome and in color. The E-Papers are available in the standard sizes 1.54" to 8".



### APPLICATIONS

- ESL
- E-reader
- Smart home
- Smart wear
- IoT
- Advertising
- Public traffic information

### FEATURES

- High contrast
- Max. viewing angle up to 180 °C
- Fast screen change under 160 msec
- Bi-stable technology with high energy efficiencies
- Types: ICON, graphic
- Available in monochrome and color (up to 4.096 colors)

## 0.05µV / °C MAX, ZERO-DRIFT, SINGLE SUPPLY, RAIL-TO-RAIL OUTPUT CMOS OPERATIONAL AMPLIFIER

The NJU7098AF1-C is a low offset voltage and zero-drift operational amplifier. With an maximum input offset voltage of 15 µV and offset drift of 0.05 µV / °C, the NJU7098AF1-C is suitable for applications in which error sources cannot be tolerated.

The NJU7098AF1-C operates from 3V to 10V with single supply. Rail-to-rail output swing, input common mode voltage within negative rail and 30 mA high output current capability provided by the NJU7098AF1-C make low-side sensing or precision output buffer easy. The almost zero DC offset and offset drift are supported with a power supply rejection ratio

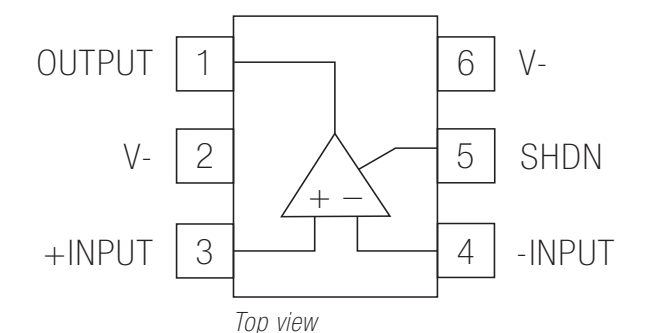
and common mode rejection ratio at 130dB. Furthermore, typical open-loop voltage gain is 140 dB. The NJU7098AF1-C includes a shutdown mode. Under logic control, the amplifiers can be switched from normal operation to shutdown current that is 15 µA max and the output placed in a high- impedance state.

### FEATURES (V+ = 5V, TYPICAL VALUE)

- Low offset voltage: max. 15 µV
- Zero-drift: max. 0.05 µV / °C
- Supply voltage range: 3V to 10V
- Rail-to-Rail output: RL = 10 kohm (20 mV from rail)
- Output current: VO = 4.5 V at V+ = 5 V (30 mA)
- DC precision: open-loop voltage gain 140 dB  
CMR, SVR 130 dB
- Supply current: 0.6 mA
- Shutdown
- RF-noise immunity
- Ground sense
- Overload recovery time: 0.45 ms
- Package: SOT-23-6-1

### APPLICATIONS

- Thermocouple amplifiers
- Electronic scales
- Strain gauge amplifiers
- Medical instrumentation
- Precision current sensing
- High resolution data acquisition
- Low-side current sensing
- Handheld test equipment



PRODUCT NAME	PACKAGE	RoHS	HALOGEN-FREE	TERMINAL FINISH	MARKETING	WEIGHT	MOQ
NJU7098AF1-C	SOT-23-6-1	yes	yes	Sn2Bi	E4	15 mg	3000 pcs

## AUR°EL LONG RANGE & LOW POWER 2.4 GHZ MULTICHANNEL TRANSCEIVER

HAVE A LOOK

AUR°EL has more than fifty years of expertise in the design, industrialization and production of wireless radio solutions. A full line of standard RF solution on free-license frequencies in 433MHz, 868MHz and 2.4GHz compliant with the European

Normative and FCC regulations (for US market) is available. A new standard product catalogue has been released March 2020. Out of the new products two new 2.4 GHz transceiver platforms are released.

### Low power 2.4 GHz multichannel transceiver RTX-24EM-AI/V

Long range transceiver RTX-24EM-AI/V is a high sensitivity, low-power consumption transceiver with proprietary protocol operating in the 2.4GHz ISM band and it is ideal for battery operated wireless applications.

It embeds the EM Microelectronic EM9209 single chip transceiver and it is pin to pin compatible with AUR°EL XTR CYP 2.4, XTR VF 2.4 LP and XTR VF 2.4 HP models. The transceiver is available with different options.

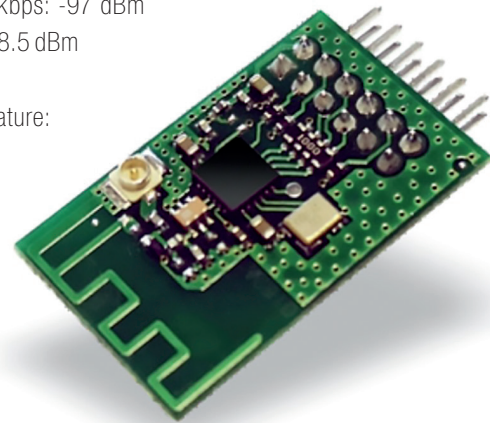
Suitable evaluation kits and user's manuals are available. Further details at <https://www.aurelwireless.com/transceivers/>

#### APPLICATIONS

- Security alarm systems
- Wireless sensors
- Heating system control
- Tubular motor control
- Home automation

#### FEATURES RTX-24EM-AI/V

- Power supply: 1.9 to 3.6 VDC
- Frequency: 2.4 to 2.484 GHz
- Supply current (Rx mode): 8 mA
- Supply current (Tx mode @8.5dBm): 36 mA
- Supply current (Tx mode @0dBm): 11 mA
- Supply current (power down mode): 1 µA
- Modulation: FSK
- RX sensitivity 1.5 kbps: -115 dBm
- RX sensitivity 72 kbps: -97 dBm
- ERP RF Power: +8.5 dBm
- RF channels: 20
- Operating temperature: -40 °C to +85 °C



AUR°EL	PRODUCT NAME	DESCRIPTION
650201476G	RTX-24EM-AI/V	Integrated PIFA antenna, vertical mounting
650201477G	RTX-24EM-AE/V	UFL connector for external antenna, vertical mounting
650201478G	RTX-24EM-AI/H	Integrated PIFA antenna, horizontal mounting
650201479G	RTX-24EM-AE/H	UFL connector for external antenna, horizontal mounting

## AUR°EL LONG RANGE & LOW POWER 2.4 GHZ MULTICHANNEL TRANSCEIVER

### Long range 2.4 GHz multichannel transceiver RTX-24EM-HP-AI/V

The RTX-24EM-HP is a 1.5kbps to 72 kbps low-power, low-voltage 2.4GHz ISM band RF transceiver module ideal for battery operated wireless applications such as wireless sensors and control.

The RTX-24EM-HP modules embed the microelectronic EM9209 Radio SOC device.

Furthermore it embeds a Power Amplifier (PA) and a Low Noise Amplifier (LNA) that allow to increase the RF output power and the sensitivity compared to the AUR°EL RTX-24EM modules. The transceiver is available with different options.

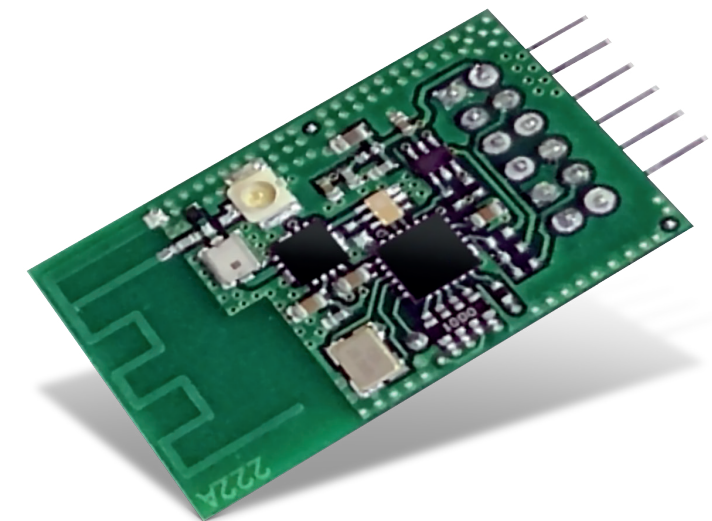
Suitable evaluation kits and user's manuals are available. Further details at <https://www.aurelwireless.com/transceivers/>

#### APPLICATIONS

- Street lighting
- Thermostat control
- Industrial machine control
- Agriculture irrigation systems

#### FEATURES RTX-24EM-HP-AI/V

- Power supply: 2.0 to 3.6 VDC (Typ 3)
- Frequency: 2.4 to 2.484 GHz
- Supply current (Rx mode): 16 mA
- Supply current (Tx mode @8.5dBm): 100 mA
- Supply current (Tx mode @0dBm): 40 mA
- Supply current (power down mode): 2 µA
- Modulation: FSK
- RX sensitivity 1.5 kbps: -119 dBm
- RX sensitivity 72 kbps: -101 dBm
- ERP RF Power: +18 dBm
- RF channels: 20
- Operating temperature: -40 °C to +85 °C



AUR°EL	PRODUCT NAME	DESCRIPTION
650201515G	RTX-24EM-HP-AI/V	Integrated PIFA antenna, horizontal mounting
650201516G	RTX-24EM-HP-AE/V	Integrated PIFA antenna, vertical mounting
650201517G	RTX-24EM-HP-AI/H	UFL connector for external antenna, horizontal mounting
650201518G	RTX-24EM-HP-AE/H	UFL connector for external antenna, vertical mounting

## MP6540H, MP6540HA – 50V, 5A, THREE-PHASE POWER STAGE BRUSHLESS DC MOTOR DRIVERS

The MP6540H and MP6540HA are three-phase brushless DC motor drivers. These devices integrate three half-bridges consisting of six N-channel power MOSFETs, pre-drivers, gate drive power supplies, and current-sense amplifiers.

The MP6540H can deliver up to 6A of peak current and 5A of continuous output current, based on thermal and PCB conditions. The MP6540H uses an internal charge pump to generate the gate drive supply voltage for the high-side

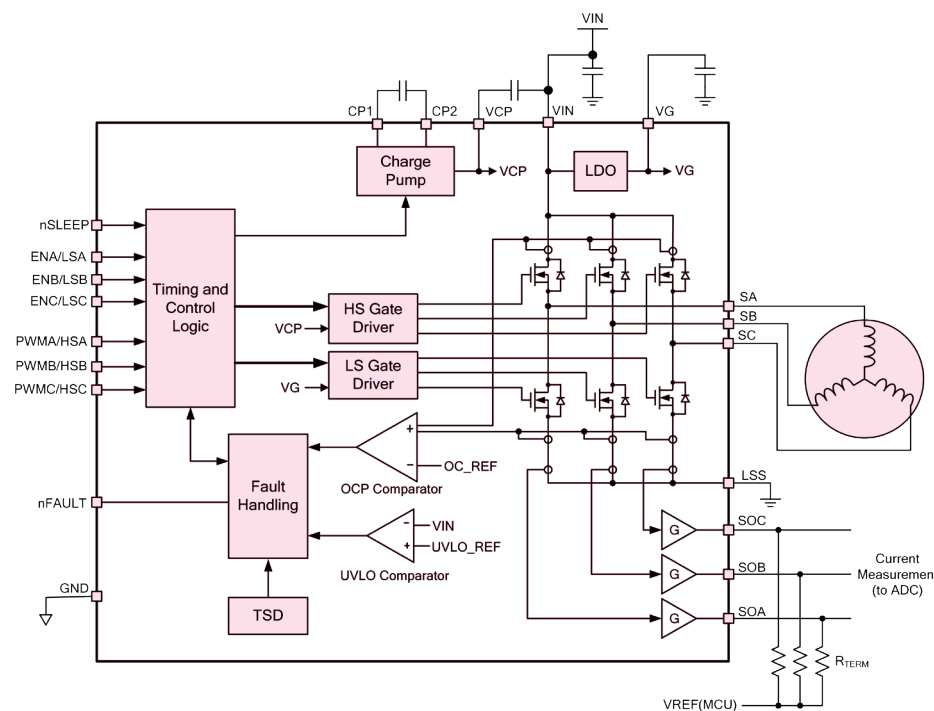
MOSFETs, and a trickle charge circuit that maintains sufficient gate drive voltage to operate at 100% duty cycle. Internal safety features include thermal shutdown, under-voltage lockout (UVLO), and over-current protection (OCP).

### FEATURES

- 5.5V to 50V operating supply voltage
- Three integrated half-bridge drivers
- Maximum 5A output current, 6A peak current
- MOSFET on resistance: HS + LS 45 mΩ
- MP6540H: PWM and enable inputs  
MP6540HA: HS and LS inputs
- Internal charge pump supports 100% duty cycle operation
- Automatic synchronous rectification
- UVLO and thermal shutdown protection
- Over-current protection (OCP)
- Integrated bidirectional current-sense amplifiers
- Available in a QFN-26 (5 x 5 mm) package

### APPLICATIONS

- Brushless DC motors
- electronic scales
- Permanent synchronous magnet motors
- medical instrumentation



## A SMALL PART FROM SITIME RUNS A BIG PART OF YOUR WORLD

HAVE A LOOK

The IoT revolution means that everything from refrigerators to vending machines, medical systems to tractors, will rely on semiconductors to operate and connect. Our cutting-edge timing technology empowers us to be at the center of this incredible future.

If timing fails ...

- Your portable medical device may not send information to your doctor
- The street lights will not turn on as soon as it gets dark
- You won't be able to control your home's security system, lights, garage door, or anything that runs on your smartphone

Experts estimate that IoT will consist of about 18 billion "things" by 2022, and we plan to be the heartbeat of those things.

Innovation in the rapidly growing wearable and IoT segments is fueled by advancements in underlying technologies. New MEMS timing technology is one of the key supporting technologies enabling the trends toward smaller size, lower power and increased robustness.

A small form factor MEMS-based 32 kHz XO/TCXO offers an alternative to the 180 to 200 ppm quartz crystal-based clock sources used in past designs.

MEMS timing reduces footprint through:

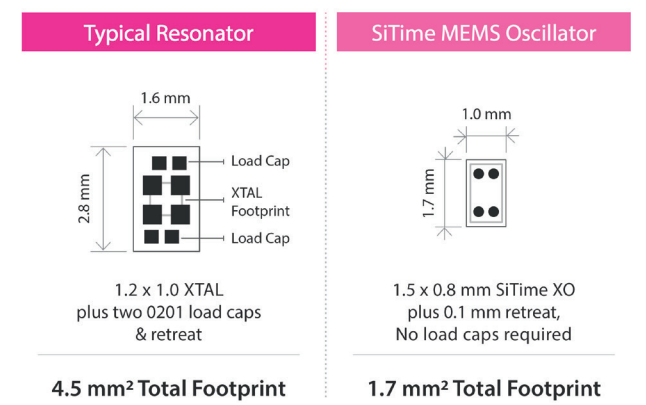
- Smaller, unique packages
- Higher integration that reduces component count
- Board layout flexibility

MEMS timing reduces power consumption through:

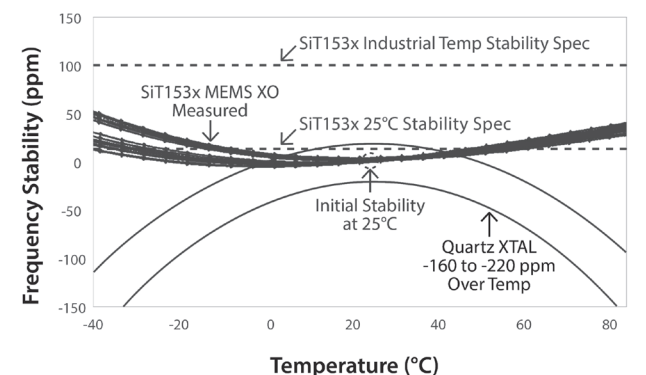
- Lower core current draw
- Higher frequency stability that enables longer sleep states
- Programmable frequency
- Programmable output swing voltage

MEMS timing increases robustness through:

- Greater resistance to shock and vibration error



Smallest size, lower BOM



Best 32 kHz stability

As the IoT continues to expand with increasingly smaller, battery-powered devices, SiTime's ultra-small, low power, low frequency MEMS-based oscillators provide the optimal timing solution and enable new products that were not previously possible with bulky, less accurate quartz products.



# A SMALL PART FROM SITIME RUNS A BIG PART OF YOUR WORLD

PART NO.	OUTPUT FREQUENCY	FREQUENCY STABILITY	SUPPLY VOLTAGE	SUPPLY CURRENT (TYPICAL)	PACKAGES	OUTPUT LOGIC	FEATURES
<b>µPOWER 32 kHz OSCILLATORS</b>   Replace quartz XTAL/XO   Smallest size   Drive two or more loads   Higher accuracy   Better reliability							
SIT1532	32.768 kHz	75 ppm, 100 ppm, 250 ppm over temp. (10 ppm, 20 ppm room temp.)	1.2 V to 3.63 V	0.90 µA	1508 mm	NanoDrive, LVCMOS	Smallest XO, Field Programmable
SIT1533					2012 mm		
SIT1572		±50 ppm	1.62 V to 3.63 V	4.5 µA	1508 mm	LVCMOS	
SIT1573		±100 ppm					
SIT1630	32.768 kHz, 16.384 kHz	75 ppm, 100 ppm, 150 ppm over temp. (20 ppm room temp.)	1.5 V to 3.63 V	1.0 µA	2012 mm, SOT23-5		-40 °C to +105 °C, Field Programmable
<b>µPOWER 32 kHz TCXOs</b>   Replace quartz XTAL/TCXO   Smallest size   Drive two or more loads   Higher accuracy   Better reliability							
SIT1552 TCXO	32.768 kHz	±10 ppm, ±13 ppm, ±22 ppm, all-inclusive	1.5 V to 3.63 V	0.99 µA	1508 mm	NanoDrive, LVCMOS	Smallest TCXO, Field Programmable
SIT1566 SUPER-TCXO		±3 ppm, ±5 ppm, all-inclusive	1.62 V to 3.63 V	4.5 µA			
SIT1568 Super-TCXO		±5 ppm all-inclusive (after overmold / underfill)	1.8 V				
SIT1580 TCXO							
<b>LOW POWER OSCILLATORS</b>   Smallest size   Lower power   Drive two or more loads   Higher accuracy   Programmable for design flexibility							
SIT1534	1 Hz to 32.768 kHz	75 ppm, 100 ppm, 250 ppm over temp. (20 ppm room temp.)	1.2 V to 3.63 V	0.90 µA	1508 mm, 2012 mm	NanoDrive, LVCMOS	Smallest XO, Field Programmable
SIT1569	1 Hz to 462.5 kHz	±50 ppm	1.62 V to 3.63 V	3.3 µA (100 kHz)	1508 mm		
SIT1579	1 Hz to 2.5 MHz		1.62 V to 3.63 V	8.0 µA (100 kHz)		Smallest XO, 2.5 ns RMS phase jitter, Field Programmable	
SIT8021	1 MHz to 26 MHz		±50 ppm, ±100 ppm	1.8 V, 2.5 V to 3.3 V			60 µA to 280 µA (0.7 µA stby)
<b>LOW POWER TCXOs</b>   Smallest size   Lower power   Drive two or more loads   Higher accuracy   Programmable for design flexibility							
SIT1576 Super-TCXO	1 Hz to 2.5 MHz	±5 ppm, ±20 ppm, all inclusive	1.62 V to 3.63 V	8.0 µA (100 kHz)	1508 mm	LVCMOS	Smallest XO, 2.5 ns RMS phase jitter, Field Programmable
SIT1581TCXO	1 Hz to 2.5 MHz	±50 ppm		6.0 µA (100 kHz)			

## HEADQUARTERS

Endrich Bauelemente Vertriebs GmbH  
P.O.Box 1251 · 72192 Nagold, Germany  
T +49 (0) 7452 6007-0  
F +49 (0) 7452 6007-70  
E [endrich@endrich.com](mailto:endrich@endrich.com)  
[www.endrich.com](http://www.endrich.com)

## SALES OFFICES IN EUROPE

**France**  
Paris:  
T +33/186653215  
[france@endrich.com](mailto:france@endrich.com)

**Lyon:**  
T +33/186653215  
[france2@endrich.com](mailto:france2@endrich.com)

**Spain**  
Barcelona:  
T +34/93 217 31 44  
[spain@endrich.com](mailto:spain@endrich.com)

**Bulgaria**  
Sofia:  
[bulgaria@endrich.com](mailto:bulgaria@endrich.com)

**Austria & Slovenia**  
Brunn am Gebirge:  
T +43/1 665 25 25  
[austria@endrich.com](mailto:austria@endrich.com)

**Romania**  
Timisoara:  
[romania@endrich.com](mailto:romania@endrich.com)

**Hungary**  
Budapest:  
T +361/2 97 41 91  
[hungary@endrich.com](mailto:hungary@endrich.com)

**Switzerland – Novitronic**  
Zurich:  
T +41/44 306 91 91  
[info@novitronic.ch](mailto:info@novitronic.ch)