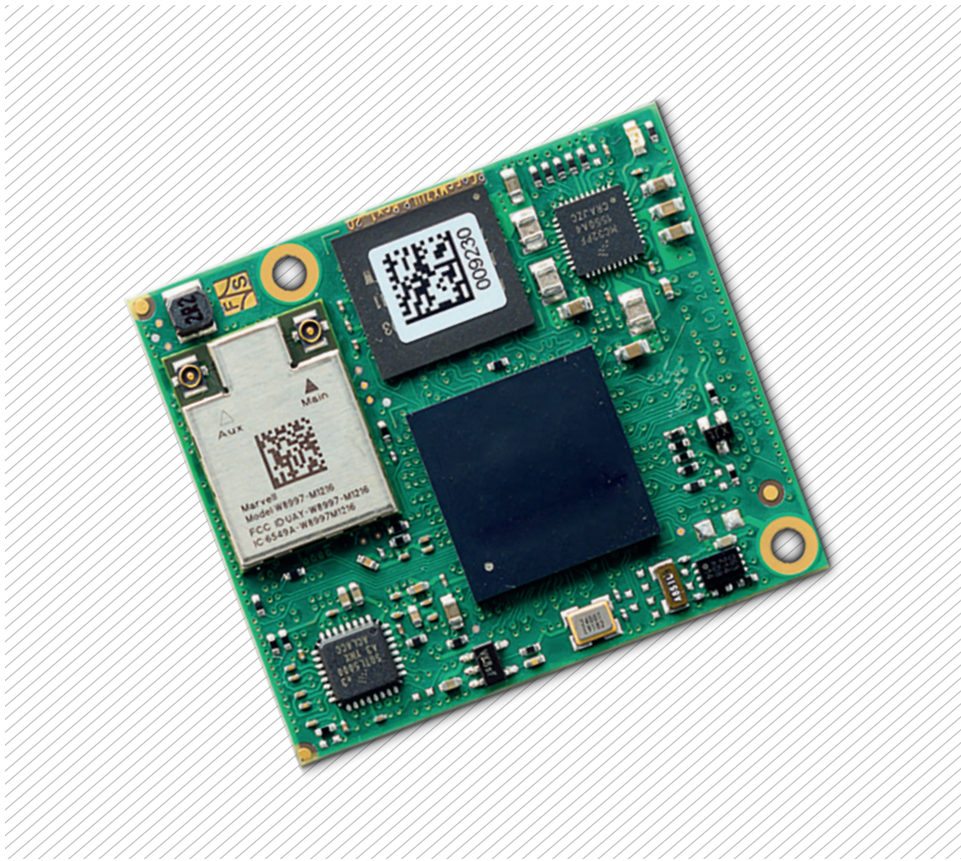


# endrich news

www.endrich.com

## OUR PRODUCT OF THE MONTH:

THE NEW ULTRA-LOW-POWER PICOCORE™MX7ULP



### FEATURES

- NXP i.MX 7ULP CPU, Ultra-Low-Power CPU
- Single Voltage 5V/ 4.2V for Battery
- WLAN 802.11 ac, BT 5.0 LE
- Linux Buildroot, Yocto
- Form Factor 35 x 40 mm
- Long-term availability until 2029



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## HIGH RELIABLE 10 – 25 W AC/DC CONVERTER OF THE LHXX-23BXXR2 SERIES

### HAVE A LOOK

MORNSUN recently launched the high reliable AC/DC power module LHxx-23BxxR2 series, covering power ratings of 10, 15 & 25 W. The LHxx-23BxxR2 series is part of the 305RAC (reliable under all conditions) family. These products have the advantages of a wide input voltage range of 85 – 305 VAC / 100-430 VDC and an operating temperature range

of -40 °C to +85 °C. Their strong load capacity, excellent EMC performance and multiple protection functions make them a reliable and cost-effective solution in various applications. The LHxx-23BxxR2 modules are pin to pin compatible with the LHE series. Chassis type (A2) and DIN-rail type (A4) packages are available.

### ADVANTAGE

#### ▪ High efficiency

Efficiency up to 87 %, less heat loss improves product life and resistance to high-temperature environments.

#### ▪ Wide input voltage range

Global universal input voltage range of 85 – 305 VAC / 100 – 430 VDC, satisfy different requirements of 110 VAC / 220 VAC // 277 VAC, running stable and reliable in case of grid fluctuations.

#### ▪ Wide operating temperature range

Operating temperature range of -40 °C to +85 °C, no derating within -25 °C to +55 °C; Running stable and reliable at outdoor low-temperature environment or enclosed high-temperature environment.

#### ▪ High reliable, high anti-interference

- High I/O isolation test voltage up to 4200 VAC, meet 5000 m altitude application

- Transient over-power acceptable, able to start-up @ 1.5 times of rated power, suitable for all kinds of inductive load equipment applications

- Class I equipment power supply with ground fault protection, suitable for applications with high requirement for EMI performance of the whole equipment, such as power equipment.

#### ▪ Good EMC performance

- Meet EMI CISPR32/EN55032 CLASS B without peripheral components, reduce interference to electronic equipment
- EFT: IEC/EN61000-4-4 ±4 KV, perf. criteria A and surge: IEC/EN61000-4-5 line to line ±2 KV / line to ground ±4 KV, perf. criteria A without peripherals circuits, can be used in applications with severe spike voltage interference
- Achieved a high requirement of pulse and surge standard with peripherals circuits.



High reliable  
10 – 25 W AC/DC  
converter

### FEATURES

- High I/O isolation test voltage up to 4200 VAC
- Efficiency up to 87 %
- Satisfy 5000 m altitude application
- Plastic case meets UL94V-0 flammability
- Meets emissions CLASS B and surge ±2 KV / ±4 KV without additional circuits
- Over-voltage category OVCIII (meet IEC62477-1) (2000 m altitude)
- IEC/UL/EN62368 approved

### APPLICATIONS

- Industrial control
- Smart home
- Intelligent building
- Intelligent agriculture
- Household appliances
- etc., especially for those designs that are space limited and require good EMI performance

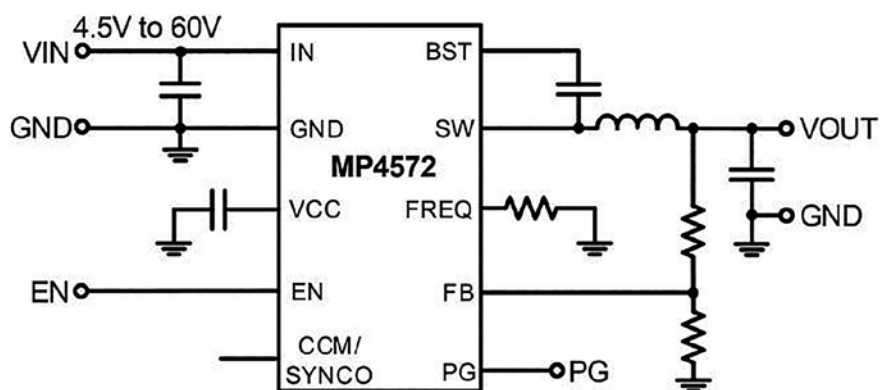
## MP4572XX HIGH-EFFICIENCY, 2A, 60V, FULLY INTEGRATED SYNCHRONOUS BUCK CONVERTER

The MP4572 is a fully integrated, fixed-frequency, synchronous step-down converter. It can achieve up to 2 A of continuous output current with peak current control for excellent transient response. The wide 4.5 V to 60 V input voltage range accommodates a variety of step-down applications in an automotive input environment. A 2  $\mu$ A shutdown mode quiescent current makes the MP4572 ideal for battery-powered applications.

The MP4572 integrates internal high-side and low-side power MOSFETs for high efficiency without an external Schottky diode. With internal compensation, the MP4572 offers a very compact solution with a minimal number of readily available standard external components. It is available in a QFN-12 (2.5 mm x 3 mm) package.

### APPLICATIONS

- Automotive Infotainment
- Automotive Lamps and LEDs
- Automotive Motor Control
- Industrial Power Systems



### FEATURES

- Wide 4.5 V to 60 V Operating Input Range
- 2 A Continuous Output Current
- High-Efficiency Synchronous Mode Control
- 250 m $\Omega$ /45 m $\Omega$  Internal Power MOSFETs
- Configurable Frequency up to 2.2 MHz
- 180° Out-of-Phase SYNCO Clock
- 40  $\mu$ A Quiescent Current
- Low Shutdown Mode Current: 2  $\mu$ A
- FB Tolerance: 1 % at Room Temp, 2 % at Full Temp
- Selectable AAM or Forced CCM Operation at Light Load
- Internal 0.45 ms Soft Start
- Remote EN Control
- Power Good (PG) Indicator
- Low-Dropout Mode
- Over-Current Protection (OCP)
- Short-Circuit Protection with Hiccup Mode
- VIN Under-Voltage Lockout (UVLO)
- Thermal Shutdown
- Available in a QFN-12

## THE NEW ULTRA-LOW-POWER PICOCORE™MX7ULP

HAVE A  
LOOK



Based on NXP's i.MX 7ULP application processor, the PicoCore™MX7ULP low power CPU module has been developed. The i.MX 7ULP processor family represents NXP's latest development in ultra-low power application processing for use cases requiring a long battery lifetime. Focused on the growing portable device market, the i.MX 7ULP features advanced implementation of the Arm® Cortex®-A7 core, Arm Cortex-M4 core, and a 3D and 2D graphics processing unit (GPU).

On the compact (35 x 40 mm) PicoCore™MX7ULP module, up to 1 GB LPDDR3 RAM, up to 64 MB QSPI / 32 GB eMMC, as well as USB OTG, I2C, SPI, and UART are available. Besides, a MIPI-DSI interface is provided as display interface. Networking is also important for portable devices. Therefore WLAN/BT5.0 LE module (pre-certified) with antenna sockets is on-board. Other interfaces for connecting peripheral devices such as GPS and camera sensors are also included.

The Hirose board-to-board connectors used in the PicoCore™ standard allow a very compact design. Due to these connectors, a board-to-board distance of 1.5mm is possible. The power supply of the PicoCore™MX7ULP is 5V or 4.2V for battery power. The power consumption in deep power down mode is about 12 mW, in run mode (LCD on, idle) about 280 mW.

The operating system is Linux (Buildroot / Yocto) and was ported to the PicoCORE™MX7ULP. Bootloader, devicetree, adapted interface drivers and all tools necessary for development are available for download. Various security functions such as Secure Boot are also in preparation. A corresponding starter kit is now available from Endrich.

### FEATURES

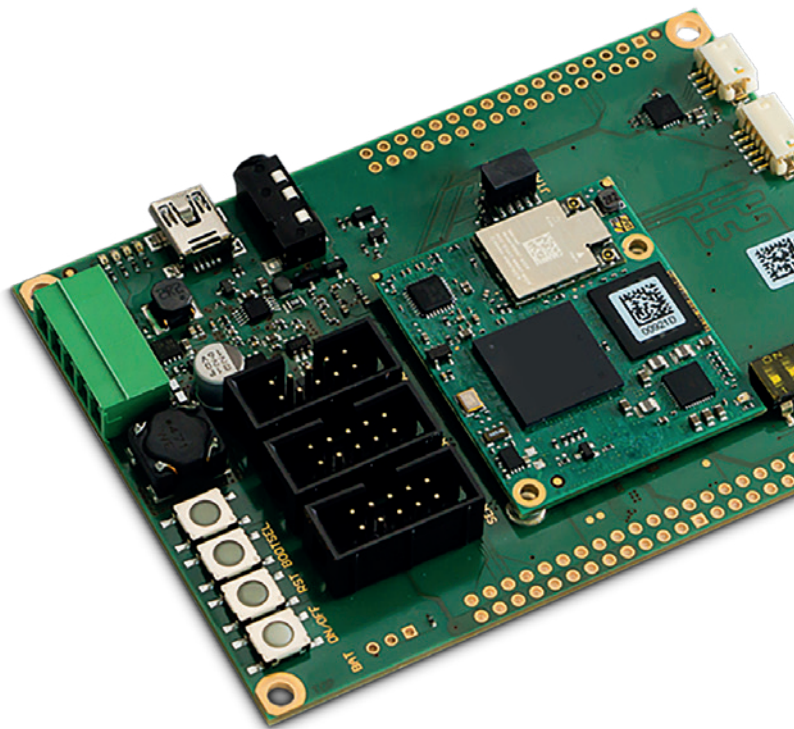
- NXP i.MX 7ULP CPU, Ultra-Low-Power CPU
- Single Voltage 5V / 4.2V for Battery
- WLAN 802.11 ac, BT 5.0 LE
- Linux Buildroot, Yocto
- FreeRTOS for Cortex-M
- Secure Boot, Encrypted Boot, Cloud Security
- Form Factor 35 x 40 mm
- Long-term availability until 2029



# THE NEW ULTRA-LOW-POWER PICOCORE™MX7ULP

PicoCore™MX7ULP	
<b>CPU</b>	
CPU	NXP i.MX 7ULP
Core	ARM Cortex-A7 + Cortex-M4
No of Cores	1 + M4
Frequency	max. 720 MHz
L2-Cache	256 KB
GPU	3D, 2D
<b>Operating System</b>	
Linux	Yocto, Buildroot (Uboot Installed)
Real Time	FreeRTOS
<b>Memory</b>	
Flash	max. 64 MB QSPI max. 32 GB eMMC
RAM	max. 1 GB LPDDR3
<b>Interfaces</b>	
SD-Card	1x External
WiFi	802.11 ac/a/b/g/n
BT	5.0 LE
USB Device	1x OTG
UART	5x
I2C	3x
SPI	1x
Audio	Line In / Out / Mic / Headphone
Touch Panel	Analog Resistive and PCAP Touch ext. via I2C
RTC	External IC

PicoCore™MX7ULP	
<b>Display</b>	
MIPI-DSI	1 x 2 Lanes
<b>Common</b>	
Supply Voltage	+5VDC / ±5 % / 4.2V Battery
Operating Temperature	0 °C to +70 °C opt. -20 °C to +85 °C
Size	35 x 40 mm (LxB)
Long Term Availability	2029



Starterkit PicoCore™MX7ULP Linux

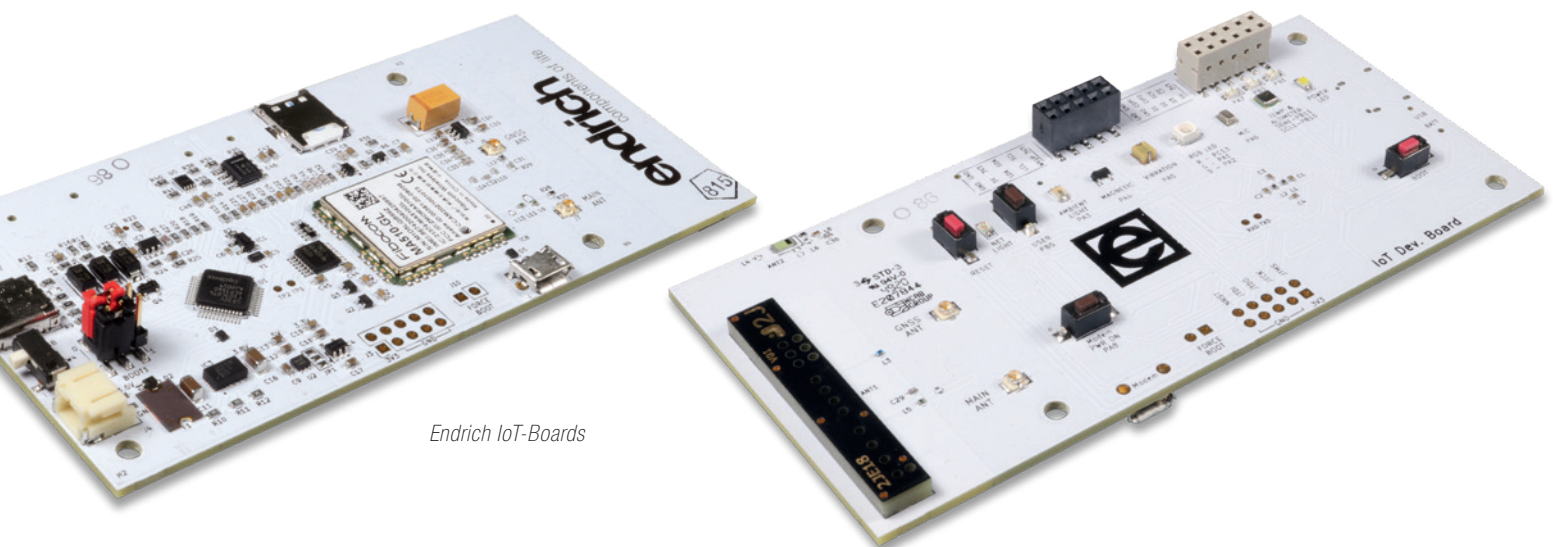
## ENDRICH IOT ECOSYSTEM – FOR SMART AND CONNECTED APPLICATIONS

HAVE A  
LOOK

One concept to cover the basics of IoT. Not a dream but a real platform developed by Endrich to contribute to a smart and connected world. The Endrich IoT platform concept combines sensors, intelligence, wireless technology and cloud connection with open source support.

The heart of the Endrich IoT concept is our self-developed base board called Endrich IoT board v52. The board is equipped with various sensors, a RISV-V architecture microcontroller, LTE-M/NB-IoT technology and multiple options to control and drive a wide range of applications. Via I<sup>2</sup>C, SPI & GPIO and UART can be used to directly communicate with the Endrich IoT board to send or receive the sensor data (from ALS-, Hall-, temperature-, air pressure-, vibration sensor or MEMS microphone). Since most applications communicate wirelessly, a LTE-M/NB-IoT modem with antenna is integrated. Thus the data can be connected to the cloud with standard protocols like MQTT/CoAP/LWM2M PPP/TCP/UDP/HTTP(S) and more.

For evaluation purposes we established our Endrich Cloud Database to easily visualize data. The UDP cloud data are shown in a messaging log as well as in a customized visualization tool. The cloud database can be used freely for testing purposes during the development with our IoT products. With external partners it is planned to extend the offer and provide different cloud databases for example MQTT based with different visualization options. Even bigger cloud systems like Azure or AWS are supported to integrate our IoT solutions into existing platforms. The best way to learn about our partners is the direct contact with our sales and the Endrich team.



*Endrich IoT-Boards*

At the current stage the website shows the basic concept of our Endrich IoT platform in combination with the Endrich Cloud Database. Also the user manual is implemented with detailed descriptions on hardware and software development as well as information on the products used on the IoT board. The

website is always in progress and to be extended with more information. More materials like photos and videos are already accessible.

**All information are available for free on our IoT Website:**  
<https://e-iot.info/>

**ENDRICH IOT ECOSYSTEM – FOR SMART AND CONNECTED APPLICATIONS**

**DATA VISUALIZATION**

**VIBRATION**

Vibration sensor VS1/2

Detecting vibration:  
Signaling of machines' running, detecting of motor start, monitoring motor run, rain, intrusion & anti vandalism detection

**ALTITUDE / AIR PRESSURE**

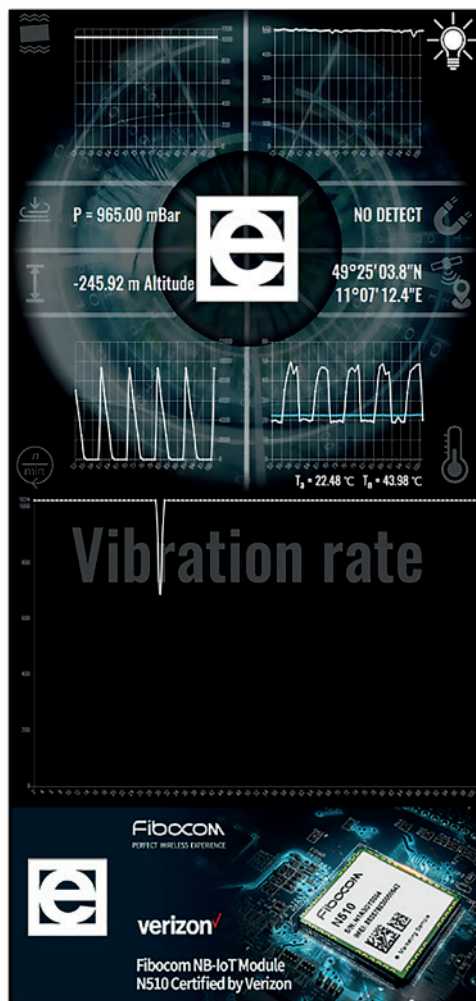
Air pressure sensor for altitude measuring

Detecting altitude by measuring air pressure

**FAN SPEED MEASUREMENT**

Tacho signal detection – measuring RPM

Measuring rotation speed with 4 wire cooling fan



**INTENSITY OF AMBIENT LIGHT**

ALS sensor detecting in the sensitivity area (spectrum) of human eye

Detecting light and dark condition, measuring visible light intensity

**GPS COORDINATES**

GNSS coordinates (localization)

Providing device's physical location – device tracking

**TEMPERATURE SENSOR**

Ambient and forced temperature measurement

Different sensors for ambient temperature and forced temperature

Customized solutions as well as universal adapter boards are possible with our R&D team located in Hungary. Adapter boards may be just a short extension for a battery pack but can also be external boards with different sensors to easily receive sensor data from sensors which are not on the Endrich IoT baseboard. A customization can be similar – just based on different designs. Especially for companies with limited time or knowledge about wireless protocols or IoT integration this

option provides a unique position for a distributor like Endrich in the market.

More information about our IoT concept and different products will be shared in the future. For direct contact or discussions how to make your product smart and connected feel free to contact Endrich at any time. All information are available for free on our IoT Website: <https://e-iot.info/>

## COMPACT "ALLROUND" LOUDSPEAKER MODELS

Acoustic component manufacturer Vansonic Electronics Corporation ("VECO") based in Taiwan introduces two ultra-compact wideband loudspeaker models, **P25CCG04-11** and **P28CCG04-11** with enhanced performance and a remarkably flat wideband frequency reproduction curve, which makes them ideal for "all purpose" use for such kind of application where the available space in device is limited and therefore designers will prefer reasonably small sizes to generate high quality sound output.



The possible use is not only limited to playing melodies, jingles and music – also human voice as well as single tones for confirmation and signalling can be well reproduced.

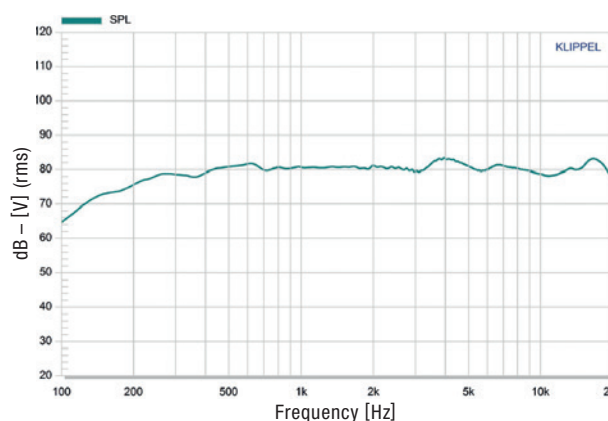
**Both speaker models are of round shape, with an outer diameter of:**

- dia. 25 mm at a height of 9.4 mm (P25CCG04-11), respectively
- dia. 28 mm at a height of 9.2 mm (P28CCG04-11)

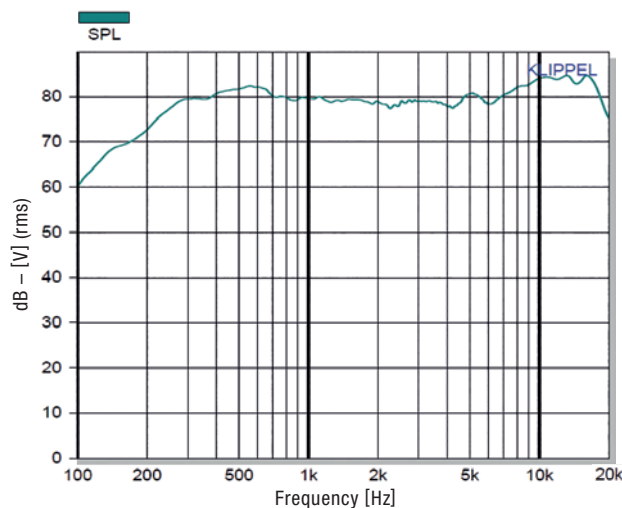
The electrical input power needed to drive these speakers in a most efficient way is 2W for P25CCG04-11 and 3W for P28CCG04-11. (For details, please consult data sheets.)

Different impedance values as well as modifications to reach certain IP rating level are subject to separate request.

### P25CCG04-11 – 1 W / 0.5 M ON BAFFLE



### P28CCG04-11 – 1 W / 0.5 M ON BAFFLE



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