SPECIAL EDITION 3

Component

by özdisan

JOURNAL OF ELECTRICITY ELECTRONICS AND AUTOMATION

YOUR COMPLIMENTARY COPY

CAVLI WIRELESS HUBBLE PLATFORM

ELECTRONIC COMPONENTS AND MORE

OLED LCDS THAT STAND OUT WITH THEIR LONG LIFETIME

LoRaWAN AND SENSORS

LONGSYS; MEMORY SOLUTIONS FROM A TO Z

NVIDIA JETS ON:

INTEGRATED CIRCUITS OPENING THE DOOR TO ARTIFICIAL INTELLIGENCE

POWER ELECTRONICS AND IPM MODULES

MUSTAFA YURTTAŞ

"ÖZDİSAN ELEKTRONİK, HAS BECOME THE WORLD BRAND"

ozdisan

Electronic Component Distributor & Solution Partner

www.ozdisan.com

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NORDIC®
SEMICONDUCTOR

THINGY 52 SERIES

PROTOTYPE SOLUTIONS

Thingy 52 offers a prototyping solution with multi-sensor content in its small size. It is a compact product that does not need any hardware requirements to develop software. All sensors on the device can be programmed using Bluetooth Low energy. You can monitor sensor data with Android and IOS supported mobile application.

General Features

- Supports NFC with Bluetooth LE.
- Humidity, air pressure and temperature sensors
- Easy to use interface with IOS and Android applications
- Air quality / gas sensor
- Programmable button and LED
- Color sensor
- 9-axis motion sensor
- Speaker and microphone
- Low power accelerometer
- Rechargeable Li-Po battery capacity of 1440 mAh

Component

Dear Esteemed Academicians, Sector Representatives and my Student Fellows

The war between Ukraine and Russia that started on February 20, 2022 continues with its earth-shattering affect. While we suppose we are getting through Covid-19, healthy days ahead, the deep effects of the war have led to deterioration in economic indicators in recent months. These developments are having an impact both in our country and around the world.

2023 is the 100th anniversary of the Republic of Turkey. Although we are a little far from the targets set, our proximity to Europe, the Chinese state's strict corona policy and low interest rate policies despite high increase in exchange rates, have given breath of fresh air to our country's industry. However, it also led to a decline in the purchasing power of the working class.

As a source of raw materials, we are facing serious problems with the embargo and the war process in Russia and Ukraine, especially in the automotive industry and grains. The chip crisis is already having an impact on automobile production and rising costs, as well as on inputs for many industrial products, especially iron and steel (albeit with a downward trend in recent months). Low production leads to higher prices in second-hand markets.

As Özdisan Elektronik, we have never experienced the chip crisis for our industrialists, except for a few individual products in the product groups of the companies we distribute. In the ongoing crisis, I think that our industrialists, who prefer us with the measures we have taken, feel a serious comfort as Özdisan's customers.

Our exports continue to increase day by day. We are trying to diversify with overseas markets, and we are putting everything we have into our efforts to avoid experiencing the single-market distress of the crises experienced in the past. We plan to serve the Balkans and European countries by opening our Özdisan-Selanik branch in the place where our ancestor was born.

Our cooperation with universities continues to increase. We embrace our dream of expanding industry-university cooperation on our own scale more and more every day, and we keep our doors wide open to collaborations in this field.

Finally, I think and desire that the deteriorating data in G-20 countries across the world can be improved with the measures to be taken in 2023, and that it should not be too late in this regard.

I wish peace to come to our region and the world as soon as possible and I wish you success in your work.

Peace be with you,

Özdisan Elektronik General Manager

MUSTAFA YURTTAŞ

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ÖZDİSAN NEWS

ÖZDİSAN GREECE OPENED

Özdisan Elektronik, which has a growing business volume in the Greek electronics market with component and PCB-A solutions in recent years, opens its new branch in Thessaloniki. Aiming to respond to the demands of its customers in other Balkan and European countries, especially the producers in Greece, Özdisan will make a difference with its fast delivery and local invoice opportunities.

METEKSAN VISITED ÖZDİSAN

Meteksan, which operates in high level industry, visited Özdisan Elektronik. During the visit, recent developments about supply shortage in the electronic components market were shared and the precautions to be taken against new conditions that may occur in the sector in the future were discussed. It was agreed that Özdisan and Meteksan would establish closer cooperation in both domestic and foreign demands in the future.

ÖZDİSAN WERE IN ATHENS ENERGIA.TEC FAIR

Özdisan Greece Office has joined Energia.Tec exhibition in Athens and made first launched announced at the show.

The 4th international exhibition Energia.Tec opened its doors and welcomed thousands of visitors during 21~23 October. Özdisan took place with 70 m2 booth and there were big interest to Özdisan Greece booth from the visitors.

Energia.Tec is specialized exhibition in Greece for electronics, electrical and energy industries. Energia.Tec's visitors had the opportunity to see every new product and solution, every new trend and innovation for electronic components, electrical equipment, security systems, lighting solutions, e-mobility, building automation, smart home systems, telecommunications and electronic equipments...

Energia.Tec Forum, through a wide program of workshops, businesses, organizations, university institutions, scientists and experts will be there to provide solutions and highlight the most current issues in the sector.

DFROBOT
DRIVE THE FUTURE

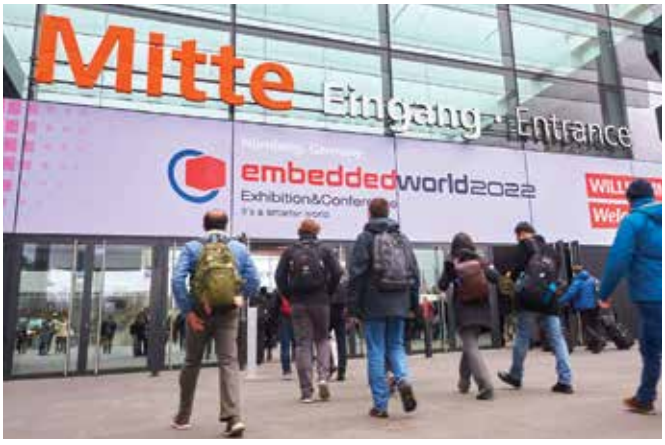
ÖZDİSAN SIGNED DISTRIBUTION AGREEMENT WITH DFROBOT

Özdisan Elektronik signed a distributorship agreement with Chinese DFRobot Company, which is among the world's leading manufacturers of maker and STEM products. DFRobot's products portfolio includes development kits, sensors and modules for products such as Arduino, LattePanda, Raspberry Pi, micro:bit. The company's products appeal to users from all walks of life and are very popular among DIY hobby electronics, industrial electronics, educators and students. The most popular products of DFRobot will be in Özdisan Elektronik's stock soon.

ÖZDİSAN ELEKTRONİK ATTENDED THE AMPER FAIR

Özdisan Elektronik participated in the 28th AMPER Fair, which was held this year in Brno, the industrial city of Czechia, on May 17-20. In the fair, 570 exhibitors from 27 countries took part with their stands; 28,000 visitors were hosted in 3 halls under the main headings of electronics, automation and lighting. Özdisan Elektronik exhibited IoT products, PCB & PCBA solutions and component products at the AMPER Fair, the largest sectoral fair of the region. Özdisan has added a new one to its developing collaborations in the developing European market share.

ÖZDİSAN ELEKTRONİK VISITED EMBEDDED WORLD 2022



Embedded World 2022 took place in Nuremberg from 21 to 23 June 2022. Manufacturers from many countries of the world presented the latest technological embedded software, integrated, sensor and IoT solutions to the fair visitors. Embedded Fair, which has not been held for the last 3 years due to pandemic conditions, exhibited new solutions that would inspire engineers and designers who yearned for technology. System and software solutions also drew attention at the fair, where IoT sensors were predominant. Özdisan visited the fair with its field application and business development teams and examined the latest technological products on site. Negotiating on new representations, the team reached an agreement on new collaborations.

SHOWROOM

NORDIC®
SEMICONDUCTOR

NORDIC NRF5340

The nRF5340 is the world's first wireless SoC with two Arm® Cortex®-M33 processors. The combination of two flexible processors, the advanced feature set and an operating temperature up to 105 °C, makes it the ideal choice for LE Audio, professional lighting, advanced wearables and other complex IoT applications.

Properties

- 128/64 MHz Arm Cortex-M33 high performance application processor with 1 MB flash and 512 KB RAM
- 64 MHz Arm Cortex-M33 programmable network processor with 256 KB Flash and 64 KB RAM
- Bluetooth 5.2 technology
- QSPI, HS-SPI, SPI, UART, TWI, I2S , PDM, PWM, QDEC and USB support
- Bluetooth LE / Bluetooth mesh / NFC / Thread / Zigbee / 802.15.4/ANT/RF 2.4GHz
- 7x7 mm aQFN™94 ultra-small size
- 48 GPIOs
- Operating temperature between -40°C and 105°C
- 1.7V to 5.5V operating voltage range

NPM1100-EK

The nPM1100 Evaluation Kit (EK) is a tool for evaluating the nPM1100 PMIC and evaluate its features for your application. The kit features switches for all selectable settings, buttons to enter and exit ship mode and connectors for batteries, USB and headers for all pins on the PMIC.

Features

- 20mA - 400mA current support
- Constant current or voltage supply
- Compatible with nrf52 and nrf53 series
- Battery temperature protection feature
- Using as external DC power supply
- Battery charging feature

NRF21540

The nRF21540 is a 'plug and play' range extender offering enhanced link robustness with an integrated power amplifier (PA) and low noise amplifier (LNA) for use in our low power short-range wireless solutions. It is a complementary device optimized to boost the link budget of the nRF52 and nRF53 Series advanced multiprotocol wireless SoCs. When combined with an nRF52 or nRF53 Series SoC, the nRF21540 RF FEM's +20 dBm TX output power and 13 dB RX gain ensure a superior link budget for between 16 and 20 dB improvement. This equates to a 6.3 to 10 times theoretical range improvement.

Features

- Key features: nRF21540 RF FEM
- Adjustable output power in small increments up to +21 dBm
- 13 dB receive gain with 2.7 dB noise figure

Supports:

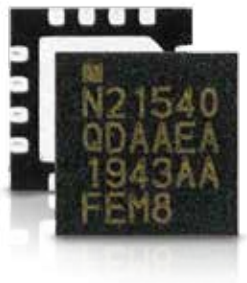
- Bluetooth® Low Energy (LE), Bluetooth® mesh
- Thread and Zigbee (802.15.4)
- Proprietary 2.4 GHz
- Two antenna ports for antenna diversity
- TX gain control via I/Os, SPI, or a combination of both
- -40 °C to 105 °C extended operating temperature range
- 1.7 V to 3.6 V input supply range
- 4 x 4 mm QFN16 package
- When combined with an nRF52 or nRF53

Series SoC:

- Between 6.3-10x range increase
- -100 dBm RX sensitivity (Bluetooth LE, 1 Mbps)

Current consumption:

- TX tuned to +20 dBm: 110 mA
- TX tuned to +10 dBm: 38 mA
- RX: 2.9 mA
- Power down mode: 45 nA



POWER PROFILER KIT II

The Power Profiler Kit II (PPK2) is a standalone unit, which can measure and optionally supply currents all the way from sub-uA and as high as 1A on all Nordic DKs, in addition to external hardware.

The PPK2 is powered via a standard 5V USB cable, which can supply up to 500mA of current. In order to supply up to 1A of current, two USB cables are required.

An ampere meter only mode, as well as a source mode (shown as AMP and source measure unit (SMU) respectively on the PCB) are supported. For the ampere meter mode, an external power supply must source VCC levels between 0.8 and 5V to the device under test (DUT). For the source mode, the PPK2 supplies VCC levels between 0.8 and 5V and the on-board regulator supplies up to 1A of current to external applications. It is possible to measure low sleep currents, the higher active currents, as well as short current peaks on all Nordic DKs, in addition to external hardware.

Properties

- 200nA to 1A current measurement range
- Resolution 100nA to 1mA depending on measuring range
- Logic analyzer support with 8 digital inputs
- 100 ksps sampling rate
- Source mode includes built-in programmable regulator with a 0.8V to 5V output range
- Supported through nRF Connect for Desktop's Power Profiler app

NORDIC® SEMICONDUCTOR

nPM1100

The nPM1100 is a dedicated power management IC (PMIC) with a highly efficient dual-mode configurable buck regulator and integrated battery charger. Its extremely compact form factor makes it ideal for advanced wearables, connected medical devices, and other size constrained applications. PCB area usage can be as low as 23 mm^2.

The highly efficient step-down buck regulator can deliver up to 150 mA of current at a selectable output voltage of 1.8, 2.1, 2.7 or 3.0 V.

Properties

- 400 mA battery charger
- Provides constant current or voltage supply
- Working in accordance with nrf52 and nrf53 series
- Typical current consumption of 800 nA while current consumption in ship mode is 460 nA
- Battery thermal protection
- 2.075 x 2.075 mm WLCSP package

nuvoTon

M031BT SERIES

The Nuvoton NuMicro M031BT series has a processor based on the 32-bit Arm Cortex M0 core. It features dual mode for Bluetooth Low Energy BLE5.0 and 2.4GHz and supports an operating voltage of 1.8V ~ 3.6V and a temperature range of -40 to 85°C. It comes with many support such as 29 I / O support, 16 channel 12-bit ADC. With the QFN48(5mm x 5mm) package, it can be easily added to very small systems.

Properties

- Flash up to 128 KB and RAM support up to 16KB
- Dual mode feature with Bluetooth5.0 and 2.4GHz support
- Wide communication option with communication unit with UART, I2C and USCI
- +8dBm Tx Power with current as low as 8mA
- Rx sensitivity at 1 Mbps is -94dBm
- Data rate 1 Mbps and 2 Mbps
- With CRC, AES-128 and AES-CCM security units
- 29 GPIOs
- Operating temperature between -40°C and 85°C
- 1.8V to 3.6V operating voltage range
- 5x5mm QFN48 ultra small size

DEGSON®

CCS2 DC EV CHARGING PLUG

Features

- Charging power up to 200kW, rated current from 65A to 200A, rated voltage 1000V
- Protection level up to IP54
- Convenient handling due to flexible design, easy to maintain
- High reliability with complete certifications (TUV, CB and CE)
- DC fast charging station

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NUVOTON M0A23 SERIES

M0A23EC1AC

Taiwanese origin microprocessor company Nuvoton, of which Özdisan Elektronik is the Nuvoton is adding new families to the sector by making new breakthroughs every day. In its latest breakthrough, the M0A23 family offers a high number of channel ADC options in a low case.

- Arm® Cortex® -M0 core
- 32-bit H/W Divider (HDIV)
- 2.4V - 5.5V operating voltage
- -40°C to +105°C operating temperature
- 32KB Flash, 4KB SRAM and 2KB ISP ROM
- Support 6-ch 48 MHz 16-bit PWM/ 5 channel PDMA
- 17 channel 12bit ADC / 1 Channel 12Bit DAC
- Support 2x Uart / 2x USCI / 1x CAN
- 128-bit Unique Customer ID
- TSSOP28

NUVOTON M258 SERIES

M258KG6AE

ARM Cortex M23 core, newly released by ARM, is designed for IoT applications. Very low power consumption is one of its biggest advantage. The top series of the M25 family is the M258 series. The Capactitive Touch and Segment LCD of the M258 support the demands of the manufacturers. Capacitive Touch feature makes it preferred in white goods and home appliances. In addition, it has very rich peripheral units with features such as RTC, USB, AES, LCD(SEG/COM).

- Arm Cortex-M23 core using Armv8-M architecture
- 1.75V - 5.5V operating voltage
- 40°C +105°C operating temperature
- 256KB Flash, 32KB SRAM and 4KB LDROM
- 24 Capactitive Touch
- Segment LCD
- USB 2.0 FS
- RTC and Vbat pins
- Internal Reference Voltage
- 12*16-bit BPWM 96Mhz / 8 channel PDMA support
- 16 channel 12bit ADC / 2 Channel 12Bit DAC
- 4x Uart / 2xI2C / 2x SPI support
- 128-bit Unique Customer ID
- AES-128, 192, 256
- LQFP128

NUVOTON NANO SERIES

NANO130KE3BN

The NuMicro® Nano130 series embedded with the ARM® Cortex®-M0 core runs up to 42 MHz with 32K / 64K / 128K bytes embedded Flash and 8K/16K bytes embedded SRAM and 4K bytes Flash loader memory for In System Programming (ISP). The Nano130 series integrates LCD Controller 4x40 & 6x38 COM/SEG, USB 2.0 FS, Real Time Counter (RTC), 12-bit SAR ADC,12-bit DAC, UART, SPI, I²C, I²S, PWM /Capture, ISO-7816-3, Watchdog Timer, Brown-out Detector, and fast wake-up via many interfaces, and supports 96-bit Unique ID and 128-bit Unique Customer ID.

- Cortex®-M0 processor- 42 MHz
- 128KB of Flash Memory / 16KB RAM
- Ultra-Low Power
- 200 uA / MHz (Normal)
- 75 uA / MHz (Idle)
- 2.5 uA (Power down, RTC on, RAM retention)
- 1 uA (Power down, RAM retention)
- Fast wake-up: less than 3.5 us
- LCD Controller (4x40 & 6x38 COM/SEG LCD)
- 8x12bit ADC (2MSPS)
- 2x 12bit DAC (400 KSPS)
- 5x Uart / 2x I2C / 3x SPI / 1x SPI Flash / 1x Quad SPI / 2x CAN
- USB 2.0 FS
- 1.8v - 3.6v Operating Voltage
- -40 +85°C Temperature Range
- LQFP128 Package

M263KIAAE

Low power and robust security are two major vitals for Internet-of-Things (IoT) applications. The NuMicro® M263KIAAE provides multi power modes for diverse operating scenarios, such as Power-down mode (PD), Fast Wake-up Power-down mode (FWPD), Low Leakage Power-down mode (LLPD), Ultra Low Leakage Power-down mode (ULLPD), Standby Power-down mode (SPD) and Deep Power-down mode (DPD).

Properties

- Flash up to 128 KB and RAM support up to 16KB
- Dual mode feature with Bluetooth5.0 and 2.4GHz support
- Wide range of communication unit with UART, I2C and USCI communication option
- +8dBm Tx Power with current as low as 8mA
- Rx sensitivity at 1 Mbps is -94dBm
- Data rate 1 Mbps and 2 Mbps
- With CRC, AES-128 and AES-CCM security units
- 29 GPIOs
- Operating temperature between -40°C and 85°C
- 1.8V to 3.6V operating voltage range
- 5x5mm QFN48 ultra small size

ML56SD1AE

NuMicro® ML56SD1AE is embedded with based on 1T 8051-based CMOS microcontroller, built-in LCD driver and capacitive touch, runs up to 24 MHz at a wide voltage range from 1.8V to 3.6V, and features 64Kbytes flash, 4Kbytes SRAM, and 4K Kbytes loader ROM for the ISP. It is also equipped with plenty of peripheral devices, such as up to 55 GPIO, Timers, Watchdog Timer, Window Watchdog Timer, UART, SPI, I2C, PWM Timer, 12-bit ADC, provides multiple packages: LQFP64.

General features

- NuMicro® ML56SD1AE, 1T 8051 based CMOS microcontroller
- Voltage range: 1.8V- 3.6V
- Temperature range: - 40°C to 105°C
- 64 Kbyte Flash
- Supports programmable internal V LCD charge pump mode
- Maximum 4 COM x 32 SEG, 6 COM x 30 SEG, 8 COM x 28 SEG
- Supports 14 touch keys + 1 reference pin
- Programmable sensitivity levels for each channel
- One-touch scanning and programmable periodic key Supports scanning
- 4-channel PDMA controller
- 14 channel 12-bit SAR ADC with 500 kSPS
- PWM output up to 12*16 bit channels or 6 complementary paired PWM output
- 2xUART / 2xSPI / 2xI²C
- 55 GPIOs

MS51BA9AE

MS51 is an embedded flash type, 8-bit high-performance 1T 8051-based microcontroller. The instruction set is fully compatible with the standard 80C51 and performance has been enhanced. With high-performance CPU cores and rich well-designed peripherals, the MS51 benefits to meet general purpose, home appliance or motor control system success.

General features

- Voltage range: 2.4V- 5.5V
- Temperature range: - 40°C to + 105°C
- Flexibility to user-developed Boot Code Configurable 4K/3K/2K/1K Byte LDROM providing
- Built-in In-App Programmable (IAP)
- 6*16-bit pulse width modulator (PWM)
- Programmable Watchdog Timer (WDT)
- 4 channel 12 bit ADC to 500 ksps up to conversion speed
- 2xUART / 1xI2C / 1xSPI
- 8 GPIOs

PHILIPS

PHILIPS XI FP_TR SERIES OUTDOOR LED DRIVERS GOT APPROVAL FROM TEDAŞ

Philips Xi FP_TR LED Drivers, produced specifically for Turkey in accordance with Tedaş Specification, became the first LED Driver to be approved for use by Tedaş.

The Xi FP_TR LED driver family meets 100% of the requirements of the current specification and provides unconditional approval to luminaire manufacturers who prefer Philips in their Tedaş Projects.

PHILIPS UPDATES CERTADRIVE LINEAR FAMILY

Philips, one of the leading brands in the LED Driver market with its innovative designs, redesigned the CertaDrive Linear family. With the new update, while the whole family gained the flicker-free feature, the dip-switches, used for current adjustment in previous design, were replaced with two different output connectors for two different output current options.

The product family, which includes different power options from 19Watt to 65Watt, will be offered to users with 200/350mA or 250/300mA dual output current options.

PHILIPS LED DRIVERS ARE IN STOCK OF ÖZDİSAN ELEKTRONİK

Signify, formerly Philips Lighting, offering various solutions including software, controls, luminaires, lighting sources and modules, is among the largest lighting companies in the world. Always the leading pioneer and supporter of LED transformation, Signify LED Drivers have taken their place in Özdisan Elektronik's stocks. Most of the newly developed products of Signify consist of products based on LED and connected lighting technologies.

XITANIUM SERIES 100W/150W/200W CURRENT ADJUSTABLE OUTDOOR LED DRIVERS

Xitanium series outdoor LED drivers with IP65 protection class have adjustable output current with potentiometer and high efficiency over 91%.

- 202-254Vac (THD<10%) input voltage
- 4KV (L/N), 6KV (L/N-GND) surge voltage protection
- High temperature, high power, short circuit protection & IP65
- Long life at high Tc temperature
- CE, CB, CCC, ENEC, RCM, TISI certificates

XI LP SERIES 40W TO 320W PROGRAMMABLE OUTDOOR LED DRIVERS

Xi LP series outdoor LED drivers have IP67 protection class. Drivers can be programmed quickly with Simpleset NFC technology, and easily configured via PC / Mobile with Multione interface.

- Programmable timed and autonomous 1-10V dimming
- Programmable constant light output
- External 1-10V dimming
- High efficiency of 91% and above
- 202-254Vac (THD<10%) input voltage
- 6KV (L/N), 10KV (L/N-GND) surge voltage protection
- High temperature, high power, short circuit, high voltage protection & IP67
- CE, CB, CCC, ENEC, RCM, TISI certificates

INDOOR LED DRIVERS CERTA SERIES 15W/21W/30W/40W

Certa series indoor led drivers provide flexibility in use in luminaires with their small dimensions.

- Constant current output
- 85% and above efficiency
- 202-254Vac (THD<20%) input voltage
- High temperature, high power, short circuit protection & IP20
- CE, CCC, ENEC, RCM, SELV, F-mark certificates

LEM

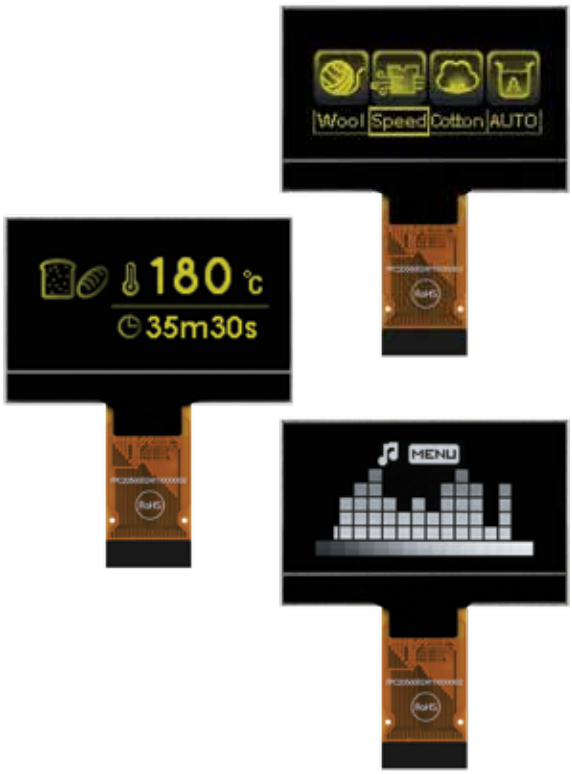
CDT SERIES

Key Features

- Fluxgate open loop current converter
- RCD Class B (CDT) and B+ (DCDT)
- Single and three phase versions
- Supply voltage 5 V
- SPI output
- Digital tripping output
- Very high accuracy, ±0.5 mA
- Very low thermal offset shift
- Fast reaction time with Tripping signal
- Reinforced galvanic isolation
- 40A RMS for primary conductor
- +/-300 mA leakage current measuring range
- Test coil
- Automotive certified, -40 to +105 °C
- Safety ISO26262 certified: ASIL B (SF version)

Features

- 4 main primary conductors compatible with three and single phase onboard chargers
- Unipolar +5 V DC Power Supply
- Primary current measuring range: ±300 mA DC
- Frequency bandwidth up to 2 kHz (CDT Version) and 100 kHz (DCDT version)
- Operating temperature range, −40 °C < T < +105 °C
- Test coil
- SPI and digital tripping output
- Compact design for PCB mounting
- IEC 62752 / UL 2231 / VDE 0664-400 (Up to 100 kHz)



WINSTAR

1.54" GRAY SCALE 128X64 COG OLED

Features

- Type: Graphic
- Structure: COG
- Size: 1.54 inches
- External Dimensions: 42.04mm x 27.22mm x 1.41mm (max.)
- Active Area: 35.05mm x 17.51mm
- Pixel Size: 0.249mm x 0.249mm
- Resolution: 128 x 64
- Control Integration: SSD1327
- Communication Interface: 6800,8080,I2C,SPI
- Operating Voltage: 3V
- Operating Temperature Range: -40°C ~ +80°C
- Color Options: White, yellow

The smarter route to Electric Vehicle metering

DCBM Series

Smart and compact, the Direct Current Billing Meter (DCBM) gives charging station providers the ability to deliver a 'gas station' like experience, using an LCD display to show real time measurements, energy, alarms and legal data.

An excellent solution for retrofit and new DC Fast charging stations from 25 to 400 kW, the DCBM uses industry standard data protocols. The result is secure, authentic billing, easy connectivity to Cloud services and a faster certification process.

www.lem.com

- **400 A - 600 A maximum current**
- **1000 V nominal voltage**
- **Class B accuracy**
- **Billing Meter in compliance with VDE-AR-E-2418-3-100**
- **Ethernet communications supporting the HTTPS/REST protocol**
- **Signed billing data sets according to the S.A.F.E OCMF**

LEM

Life Energy Motion

ENGINEER
TOOLS WITH SPIRIT

KS-14 TECHNICIAN REPAIR KIT

- Electronic hand tools set consisting of 18 pieces in a zippered bag
- Box weight: 1.3 kg Dimensions: 250 x 180 x 50 mm
- All-in-one kit for repair work

SKC-60 GAS AIR SOLDERING SET

- The portability advantage
- Equivalent to 60 watts of power
- Run time of approximately 75 minutes with 14ml gas capacity
- 208mm length, 35mm diameter

SL-71 MAGNIFIER

- Handheld LED lighted magnifier
- 10X zoom
- 30mm lens
- 177mm length

Fuji Electric

MORE POWER WITH RC-IGBT

Fuji Electric introduces a new product in a well-known package to increase the output power of IGBT modules by applying “RC-IBGT” (RC=Reverse Conducting) technology for high-power applications. The PrimePACK™3 and 3+ are suitable for high power applications in the common 1,700 and 1,200 V ratings.

The market demand for power semiconductors has been increasing for years and is requiring a miniaturization of power conversion systems, a reduction of cost and an increase in performance. Such a gain in performance is achieved by increasing the output power in a given package size, which goes hand-in-hand with elevated temperatures within the system. This results in a risk of a shorter product lifetime, due to a reduced number of power cycles at elevated temperatures.

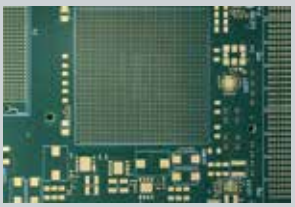
RC-IGBT Teknolojisi

The RC-IGBT technology combines patterns of IGBT and FWD regions with a suitable structure on a single chip. The portion of active area to the total chip area increases because the chip’s edge termination decreases relatively and generates more space in the module housing for bigger chips for an even higher output current. Another benefit is that the extended chip area reduces the thermal resistance between junction and case, Rth(j-c), drastically.

The bigger chip area acts like a thermal buffer zone: the generated heat in the IGBT region is transferred also to the FWD region and vice versa. Thus, the I^2t capability of the RC-IGBT is 3.8 times higher compared to the predecessor V series generation.

SOMACIS TÜRKİYE

WE PRODUCE PCBs FOR THE NEW ERA



- High Tech Rigid / Rigid-Flex / Flex
- HDI Fineline
- Special Materials
- Co-Design & Co-Engineering
- R&D - Innovative Solutions

HIGH-END PRODUCTS AND SERVICE

Advanced Manifacturing Capabilitles

Track/Insulation	25 µm	(1mil)
Laser via	40 µm	(1.6 mil)
Mechanical via	50 µm	(2 mil)
Laser via pad	150 µm	(6 mil)
Max number of layers	>50	(rigid pcbs)
Max PCB thickness	up to 8 mm	(0.315'')
HDI Sequential Build-Up	up to 7+N+7	
Min thickness flex material	25 µm	(1 mil)
Laser via aspect ratio	1:1	
Mechanical via aspect ratio	1:20	
Impedance control	+/-5%	
Mechanical depth control	+/-5 µm	(0.2 mil)

Group Certifications

ISO 9001
AS 9100
ISO 13485
ISO 14001
IATF 16949
ITAR
NADCAP

Custom Solutions For Each Market

Aerospace / Defense / Datacom & IT / Telecom / Medical / Industrial / Testing / Automotive

Advanced Materials

Halogen Free, High Speed, High Tg, Low Dk, High/Low Loss, Epoxy/BT Resin, Polyimides, PTFEs, Ceramic Reinforced, Composites, Carbon Fiber, Mixed Materials.

Surface Finishes

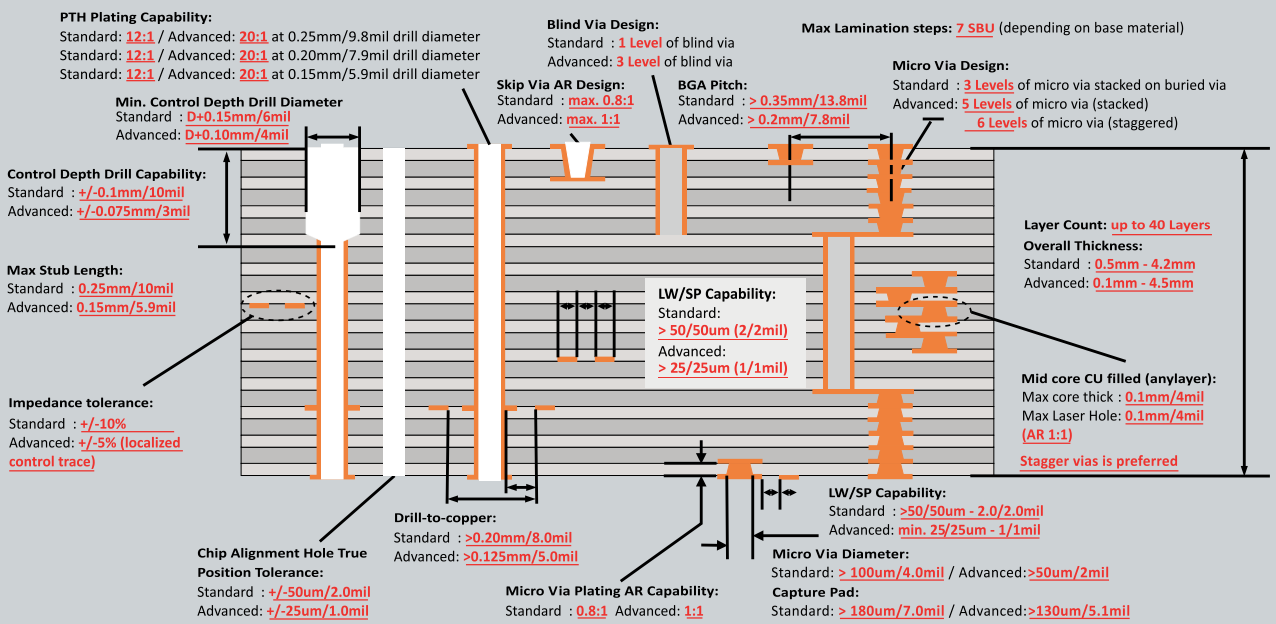
ENIG. ENEPIG, EPIG, Ni/Au Plating, HASL Lead Free, Immersion Silver/Tin, OSP, EPIG, ISIG, Mixed Finishes.

Special Technologies

Cu Coins, Cu-Filled vias, Thin-Film Resistors and Capacitors, Metal Backed and Metal Cores.

*We warmly invite you to contact us during early project stages to check the feasibility of the above advanced capabilities

CAPABILITIES OVERVIEW



** SOMACIS TECHNICAL TEAM SUPPORT IS STRONGLY RECOMMENDED FOR THE CORRECT USE OF INFORMATION HEREIN CONTAINED*

info@somacis-tr.com

DMY ELECTRONIC | INVESTMENTS SOMACIS-TR

www.somacis-tr.com

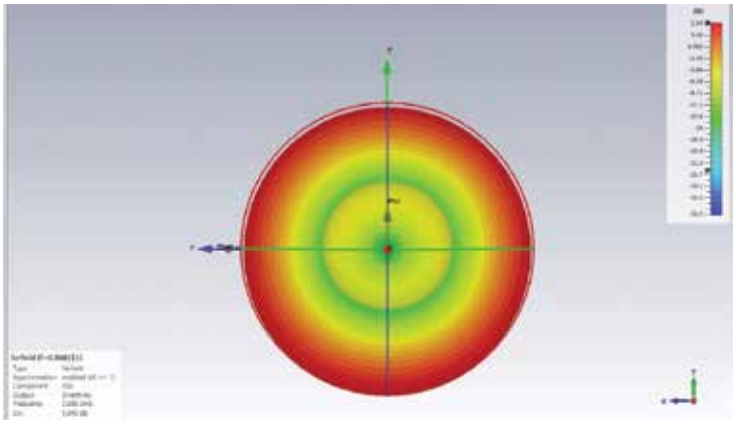
SATELCOM WIRELESS

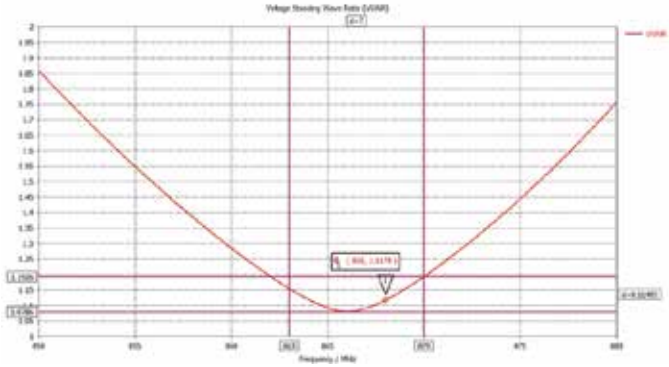
SATELCOM 5.8 DBI GAIN LORA OMNI ANTENNA (863-870 MHZ)

A low-power wide area network, or low-power network, is a type of wireless telecommunications wide area network designed to provide long-range communication between low-energy consuming objects at small size.

With the rapid spread of Internet of Things (IoT) applications around the world over the last decade, the reliable and low power consumption transfer of data over long distances has become an important need. Designed and manufactured in the 863-870MHZ range, Omni Antenna is widely used as a coverage in the ISM Band. Providing stable and excellent performance with a 360° spread pattern, the antenna is widely used in NBIT/ LORA 868- 870MHZ wireless applications, M2M / ISM Band applications, smart agriculture applications, home automation, workplace ERP applications, traffic and road information systems and wireless communication applications.

Frequence	863 - 870 MHz
Profit	5.8 dBi
VSWR	≤1.2
Beam Width-H	360°
Beam Width-V	34°
Impedance	50Ω
Connector	SMA(Female)
Dimensions	Ø20 x 650 mm
Weight	< 0.5 kg
Colour	Gri
Temperature	-40 to +55ºC
Assembly	Pipe / Wall / Box
Pipe Fitting Diameter	Φ10 - Φ60 mm





- L shape wall mounting
- VSVVR 1:1.2
- IP-67 waterproof
- Satelcom Gateway Omni Antenna, Designed in accordance with the

Euro area frequency plan (EU863-870) definitions.

Uplink:

- 868.1 - SF7BW125 to SF12BW125
- 868.3 - SF7BW125 to SF12BW125 and SF7BW250
- 868.5 - SF7BW125 to SF12BW125
- 867.1 - SF7BW125 to SF12BW125
- 867.3 - SF7BW125 to SF12BW125
- 867.5 - SF7BW125 to SF12BW125
- 867.7 - SF7BW125 to SF12BW125
- 867.9 - SF7BW125 to SF12BW125
- 868.8 - FSK

Downlink:

- Uplink channels 1-9 (RX1)
- 869.525 - SF9BW125 (RX2)

HF BAND FOLDED DIPOLE RADIO ANTENNA

The "HF Band Folded Dipole Radio Antenna" R&D project, was carried out jointly by Satelcom and Aselsan, has successfully completed. As a result of the cooperation, this type of antenna was localized and nationalized for our country. The first prototype of the antenna was tried between Ankara and TRNC, and successfully passed the tests.

SATELCOM IMU/INS/GPS

It was designed with Satelcom IMU/ INS/GPS using two navigation sensor technologies, combining a highly accurate GPS receiver and a MEMS-based inertial measurement unit (IMU) in a single housing. The seamless integration of these two navigation systems provides minimal solutions for 3D positioning, speed, direction and attitude measurement at a low cost advantage.

Main areas of use;

- Navigation Systems
- Autonomous Vehicle
- Marking and Tracking Systems
- Antenna Platform Stabilization
- Camera Feet
- Vibration Control and Stabilization

PIHER sensing systems

PST-360

The PST-360 contactless position/ angle sensor combines a through-shaft design with 360º absolute position feedback in an extremely thin package.

The angle sensor PST-360 is used for measuring angles between 30° and 360°.

Specifications

Linearity: ±1% (0.5% upon request)

- Simple & Robust Magnetic Design
- Angular Range: programmable from 15º to 360º
- Programmable Linear Transfer Characteristic (positive slopes & one negative slope can be programmed in the same transfer characteristic)
- Angular Resolution (depends on electrical angle and rotational speed)
  - Analog & PWM: up to 12 bits
  - Serial Protocol (SPI) & CAN SAE J1939: up to 14 bits
- Severalredundancy options available
- Self-Diagnostic features
- Rotational life: virtually unlimited (depending on application and mounting)
- Operating temperature: -40ºC to +125ºC (others upon request)
- Over voltage protection and reverse voltage protection
- Supply voltage: 5/12/15V ±10% (others upon request)
- Sealed for harsh envrioments.

- Custom cabling & connector configurations

Applications

Pivot point angle sensing for all applications

- Off Road/Highway Steering
- Pedal Position Sensing
- Agricultural Machinery hydraulic lift arms, scoops, articulations/joints
- Forklifts/Material Handling
- Industrial Pumps
- Robotics

DFROBOT
DRIVE THE FUTURE

GRAVITY: URM09 ULTRASONIC SENSOR (I2C)

URM09 ultrasonic sensor is a type of sensor for ranging and obstacle detection applications. It can measure up to 50Hz. It uses the I2C communication protocol. 150 cm - 300 cm - 500 cm measurement ranges.

- Supply Voltage: 3.3~5.5V DC
- Operating Current: 20mA
- Operating Temperature: -10°C~70°C
- Measurement Distance: 2cm~500cm (can be set)
- Resolution: 1cm
- Accuracy %1
- Frequence: 50Hz Max
- Dimensions: 47mm × 22mm / 1.85" × 0.87"

DC-DC BOOST CONVERTER

The product is a DC/DC Step Up inverter circuit using the LM2577. It has an input voltage between 5-32 V and the output voltage reaches up to 50 V. The small form factor and ease of use provide a good solution for all applications requiring an extra power module.

- Input Voltage: 5-32V
- Output Voltage: 50V max
- Max Input Current: 3A
- Max Power: 15W
- Efficiency: %90
- Dimensions: 32x34x20 mm (1.25x1.3x0.8")

DFRDUINO ETHERNET SHIELD V3.0 - W5100S

It is used to connect the Arduino to the internet with an RJ45 cable. Using the WizNet WS5100S chip, this shield provides communication over the SPI interface. Supports both Arduino UNO and Arduino MEGA series.

- Operating Voltage: 5V
- 16KB TX/RX Buffers
- 4 independent sockets
- Full-hardware TCP/IP protocol stacks + MAC +PHY
- Operating Temperature: -40°C ~ 85°C
- Dimensions: 70x55x30mm (2. 76x2 15x1 18")

LATTEPANDA V1 - WINDOWS 10 MINI PC 2GB / 32GB

LattePanda is a Single Board Computer (SBC). It has all the functions of a normal computer and can run all peripherals running on the PC. It supports Windows 10 operating system. In this way, Visual Studio, NodeJS, Java, etc. tools can be easily installed. Projects can be developed in languages such as C#, Javascript and Ruby. LattePanda also provides support for Arduino compatible applications and modules. In short, it is a low-cost and compact product for all projects in both PC and maker environments.

- Operating System: Windows 10 Home Edition
- Processor: Intel Cherry Trail Z8350 Quad Core Processor
- Core Frequency: 1.44GHz (1.92GHz Burst Frequency)
- RAM: 2GB DDR3L
- Storage: 32GB
- GPU: Intel HD Graphics, 12 EUs @200-500Mhz, single channel memory
- USB 3.0 x 1, USB 2.0 x 2
- Wi-Fi 802.11n 2.4G
- Bluetooth 4.0
- Integrated Arduino Co-processor: ATmega32u4 (Arduino Leonardo)
- Video output: HDMI and MIPI-DSI
- Onboard touch panel overlay connector
- Supports 100Mbps Ethernet
- Intel Processor GPIO x 6
- ATmega Processor GPIO x 20
- Gravity Interface Connectors x 6
- Voltage: 5V@2A
- Board Dimensions: 88 x 70mm / 3.46 x 2.76"
- NET Weight: 55g
- RoHS, FCC and CE Compliant

HOPERF

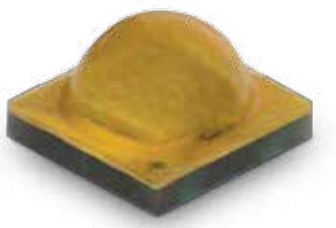
HOPERF

The RFM119CW is a high performance, highly flexible, low cost FSK/OOK transmitter for a variety of applications. As part of the HOPERF NextGenRF TM family, the RFM119CW's output power can be adjusted in 1 dB increments from 10 to +13 dBm.

RFM119CW

- Embedded EEPROM
- Frequency Range: 240 - 960 MHz
- FSK, GFSK and OOK Modulation
- Data rate:
  * 0.5 to 100 ksps (FSK/GFSK)
  * 0.5 to 30 ksps (OOK)
- Deviation: 1.0 to 200 kHz
- Output power: -10 to +13 dBm
- Operating voltage: 1.8 to 3.6 V
- Sleep Current: < 20 nA

CREE LED



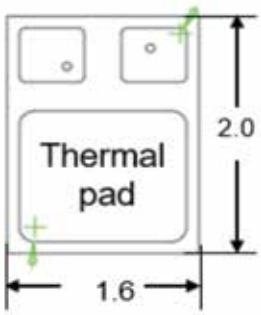
CREE-LED XPG3 IS BRIGHTER THAN EVER NOW

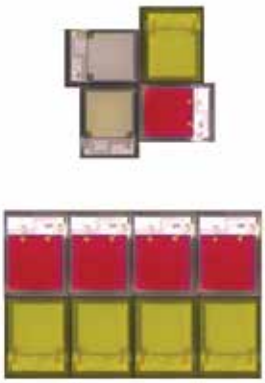
Cree LED announced the availability of ordering minimum S7 (188Lm) flux after the efficacy improvement in XPG3 S-Line version.

The XPG3 family, which already offers the highest level of sulfur resistance, efficacy and durability, has reached an unmatched performance level among outdoor lighting LEDs with its new flux option.

CREE LED INTRODUCES STATE-OF-THE-ART XLAMP® ELEMENT G LEDS WITH THE INDUSTRY'S WIDEST RANGE OF COLORS

Cree LED recently announced the launch of XLamp® Element G LEDs, a new product class for 2.0mm x 1.6mm LEDs with unmatched light output and efficiency. XLamp Element G LEDs are the latest example of Cree LED's new technological breakthroughs, delivering next-level performance in color-mixing applications.



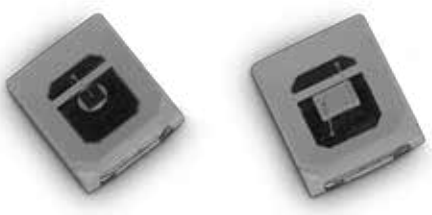


- New performance class delivering approximately 3x the light output of the XQ-E and 9x the lumen density of the XP-E2,
- Broadest range of color options available in the industry,
- No-compromise package design with minimal LED chip-to-edge spacing featuring a large, electrically isolated thermal pad and ESD protection.

CREE LED'S COLORFUL WORLD EXPANDS WITH 2835 CREE LEDS

Cree LED has introduced the new 2835-color LED family with 14 different color options.

This new family of products has been designed as a single chip to allow the best level of optical control in applications such as architecture, transportation and horticulture.



Color	WL(nm)	Vf	Max Current
Royal Blue	440-460	3V	240mA
Blue	465-480	3V	240mA
Cyan	490-510	3V	240mA
Green	520-540	3V	240mA
PC Lime	-	3V	240mA
PC Mint	-	3V	240mA
Amber	585-595	2.1V	200mA
PC Amber	-	3V	240mA
Red-Orange	610-620	2.1V	200mA
PC Red-Orange	-	3V	240mA
Red	620-630	2.1V	200mA
Photo Red	650-670	2.1V	200mA
Far Red	720-740	2.1V	250mA
PC Purple	-	2.9V	400mA

Binning condition: 140 mA, Tj = 25°C

RPX-0.5Q SERIES

RPX-0.5Q DC/DC converters are qualified to AEC-Q standards for performance and production process control used in automotive applications. It is an automotive-grade buck converter with an integrated inductor in a compact 3mm x 5mm x 1.6mm thermally-enhanced QFN package with wettable flanks. The input range is from 4 to 36VDC, allowing 5V, 12V, or 24V supply voltages to be used. The output voltage can be set with two resistors in the range from 0.8 up to 34VDC. The output current is up to 0.5A and is fully protected against continuous short-circuits, output overcurrent, or over-temperature faults.

Properties

- Input Voltage: 4-36V
- Output Voltage: 0.8-34V
- Output Current: 0.5 A
- Dimensions: 3x5x1.6 mm
- Operating Temperature: -40°C ~ +125°C

RPX-1.5Q SERIES

The RPX-1.5Q is a compact, QFN package buck converter that meets automotive standards with an integrated inductor. Washable type of RPX-1.5Q is also produced upon order. It is dependent on input/output voltages under environmental conditions, operating at 125°C and successfully passing all AEC-Q tests. It is designed with dimensions of 3 mm x 5 mm x 1.6 mm and operates in the 4-36 VDC input range. The RPX-1.5Q is fully protected against over temperature, short circuits, input low voltage and high output current.

Properties

- Input Voltage: 4-36V
- Output Voltage: 0.8-34V
- Output Current: 1.5 A
- Dimensions: 3x5x1.6 mm
- Operating Temperature: -40°C ~ +125°C

STÄUBLI

CONNECTING PLUG XVB-4 / 19

- Insulated
- 4 mm diameter
- Made of brass
- Plug structure with high insulation level, including Multilam technology with a spring system
- Available in different colors
- Can be used up to 1000 Volt voltage and 32 Amp current levels

DOLPHIN CLIP XDK-1033

- Made of versatile insulated brass
- Large toothed jaws for gripping fine wires
- Strong and hard insulation surface
- Solutions in different colors
- Can be used up to 1000 Volt voltage and 32 Amp current levels

CONNECTING PLUG KS4-11L / 1A / N

- Insulated, Ø 4 mm, made of brass
- Since it is vibration protected with Multilam technology, it can be preferred especially in test areas and service areas in the automotive sector.
- Insulated formwork structure
- Can be used up to 32 Amp current levels

PANEL-MOUNT SOCKET SLB4-F/A

- Insulated and rigid structure
- Suitable for spring connection
- Can be screwed into pre-drilled plastic panels
- Solutions in different colors
- Can be used up to 1000 Volts voltage and 24 Amperes current levels

Honeywell

NEW ABP SERIES FROM HONEYWELL

PIEZO RESISTANT SILICONE PRESSURE SENSOR

The HSC Series is fully calibrated and temperature compensated for sensor offset, sensitivity, temperature effects, and nonlinearity using an on-board Application Specific Integrated Circuit (ASIC). Calibrated output values for pressure are updated at approximately 1 kHz for analog and 2 kHz for digital.

The ABP Series are piezoresistive silicon pressure sensors offering a ratiometric analog or digital output for reading pressure over the specified full scale pressure span and temperature range.

They are calibrated and temperature compensated for sensor offset, sensitivity, temperature effects and accuracy errors (which include nonlinearity, repeatability and hysteresis) using an on-board Application Specific Integrated Circuit (ASIC). Calibrated output values for pressure are updated at approximately 1 kHz for analog and 2 kHz for digital.

ABPDANT030PG0D3

- 3V - 3.6V operating voltage
- -0.3 - 6.0 Supply voltage
- -2o•c +85°C operating temperature
- Pressure Range± 1 PSI (±6.89kPa)
- Total Error Band± 1.5
- Accuracy ±0.25
- Long-term stability ±0.25

DEGSON®

E BIKE POWER PLUG AND SOCKET EBBL/EBC/EBBM/EBBR SERIES

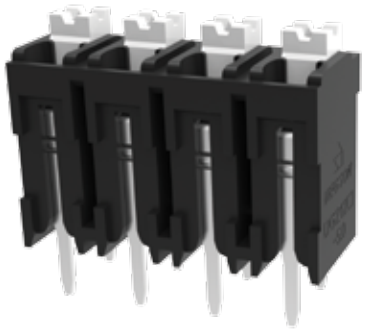
- Plug provides straight and angled options, rectangular design available (EBBR)
- Auditory and visual feedback after mating in place
- Receptacle with cover flap can effectively protect the interface
- Long mechanical life
- Ergonomically design with nice appearance

E BIKE EBS SIGNAL CONNECTOR (2~6PINS)

- Compact structure and high space utilization
- Simple interface ensures easy mating alignment
- Operate simply in the way of straight mating
- Easily recognize due to inner core's different colors
- Ergonomically design with beautiful appearance
- E bike horn, lighting, and brake system

DG212 SERIES

- Push-in connection technology, fast wiring for both cost and time saving
- Different wiring direction options such as 45, vertical and horizontal
- Multiple pitch options such as 3.5mm and 5.0mm
- Both tube and rape & reel package available
- High temperature resistance materials meetre flow soldering requirement
- Distribution I/O module, Mini servo driver, Centralized inverter



DEGSON

SERVO MOTOR CONNECTOR

OFFICIAL WEBSITE LINKEDIN YOUTUBE FACEBOOK

With the development of intelligent manufacturing and robots, various small servo motors are used as drives in the market. Connecting the drive from the console requires a connector which is small, heavy-duty, waterproof, temperature resistant, and oil resistant. Currently, such kind of these connectors have high prices and long delivery time. Degson has launched this product family to offer a cost effective alternative to the market in shorter lead time.

Features

- √ Special connector for servo motor.
- √ High waterproof class IP67.
- √ Suitable for high temperature and high frequency vibration environments.
- √ Quick and easy to assemble, selfcontained grounding function can be freely choosed.
- √ The servo motor is upgraded to replace the new connection scheme.

Large outlet Space
Easy to Assemble

The screw activity is not easyt o fall off.
Easy to install andseal good

Riveted mounting without the requiremet for extra accessories

Technical Data

Type	Number of Pins	Rated Current	Rated Voltage	Cable Range	IP Class	Ambient Temperature
DGFA-00A(H) DGFA2S-A1-00A(H) DGFA2S-B1-00A(H)	2	7A	250V	6.0- 7.0mm	IP67	- 20 ~ + 105℃
DGFA-00A(H) DGFA4S-A2-00A(H) DGFA4S-B1-00A(H)	4	7A	250V	7.0- 8.3mm	IP67	- 20 ~ + 105℃
DGFA-01A(H) DGFA9S-A1-00A(H) DGFA-02A(H) DGFA9S-B1-00A(H)	9	1A	10V	6.4- 7.0mm	IP67	- 20 ~ + 105℃

Application

Servo motor connectors are widely used in robotics, industrial automation, CNC equipment, textile machinery, railways, surveillance equipment, energy, communications and other equipment that require power and signal connections.

seeed studio

WIO TERMINAL

Wio Terminal is compatible with Arduino and Micropython, built with an ATSAMD51 microcontroller with wireless connectivity supported by Realtek RTL8720DN. Its CPU speed runs at 120MHz (Boost up to 200MHz). Realtek RTL8720DN chip supports both Bluetooth and Wi-Fi providing the backbone for IoT projects. The Wio Terminal is Highly Integrated with a 2.4" LCD Screen, there is an onboard IMU(LIS3DHTR), microphone, buzzer, microSD card slot, light sensor, and infrared emitter (IR 940nm).

Features

- Powerful MCU: Microchip ATSAMD51P19 with ARM Cortex-M4F core running at 120MHz
- Reliable Wireless Connectivity: Equipped with Realtek RTL8720DN, dual-band 2.4Ghz / 5Ghz Wi-Fi
- Complete system equipped with Screen + Development Board + Input/Output Interface + Enclosure
- Highly Integrated Design: 2.4" LCD Screen, MCU, IMU, WIFI, BT, and more practical add-ons housed in a compact enclosure with built-in magnets & mounting holes allows you to easily set up your IoT project
- Raspberry Pi 40-pin Compatible GPIO enables installation as a peripheral to the Raspberry Pi

- External onboard multi-functional Grove ports: Compatible with over 300 Plug&Play Grove modules to explore with IoT.

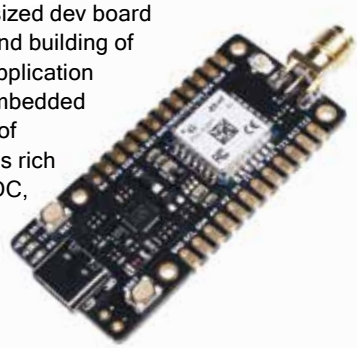
GROVE - THERMAL IMAGING CAMERA / IR ARRAY MLX90640 110 DEGREE

The IR thermal camera carries a 32x24 array of thermal sensors (MLX90640), it can detect the temperature of objects from feet away with the accuracy of ±1.5°C. In order to obtain the thermal image easily, the I2C protocol is used to get the low-resolution image from the camera. The FOV(Field of View) of this camera is 110°x75°, and the temperature measurement range is -40°C~300°C.

Features

- IR Thermal Sensor Array 32X24(MLX90640)
- 110°x75° FOV(field of view)
- Temperature measurement range:- 40°C~300°C
- I2C Grove interfce

WIO-E5 MINI (STM32WLE5JC) DEV BOARD



Wio-E5 mini is a compacted-sized dev board suitable for the rapid testing and building of small-size LoRa device and application prototyping. Wio-E5 mini is embedded with and leads out full GPIOs of Wio-E5 STM32WLE5JC. It has rich interfaces including UART, ADC, SPI, IIC,etc. Supporting Long Range protocol and global frequency, Wio-E5 mini is able to achieve a transmission range of up to 10 km in open area and ultra-low power consumption.

Features

- Full GPIOs led out from the Wio-E5 STM32WLE5JC
- Global Long Range frequency plan supported
- Long-distance transmission range to 10km (ideal value in open area)
- Mini and compact size, suitable for rapid testing and building small size prototype
- Convenient RESET and BOOT buttons on board

reServer J2032

reServer is a powerful edge server powered by Jetson Xavier NX 16 GB, delivering high AI performance. It provides a high-speed 2.5 Gigabit Ethernet port and supports hybrid connectivity including 5G, LoRa, BLE and WIFI. With a pre-installed Triton server, reServer is ready for fast and scalable AI projects in production and concurrent model execution.

Properties

- Compact design for a server with an overall size of 132 mm* 124 mm*233 mm
- Powered by Nvidia Jetson Xavier NX 16GB.
- 6-core NVIDIA Carmel ARM®v8.2 64-bit CPU 6MB L2 + 4MB L3 Supports hybrid connectivity including 5G, LoRa, BLE and WiFi.
- 2.rich peripherals including 5G&1G Gigabit Ethernet ports, USB 3.0 Type-A ports, HDMI port and DP port
- Silent cooling fan with a large heat sink for excellent heat dissipation
- Easy to install, upgrade and maintain with ease of access.
- Pre-installed 256 GB (2.5-inch SATA) SSD
- Pre-installed Jetpack system
- Pre-installed Triton Server

NVIDIA JETSON AGXXAVIER DEVELOPMENT KIT

With the NVIDIA Jetson AGX Xavier developer kit, you can easily build and deploy end-to-end AI robotics applications for manufacturing, delivery, retail, agriculture, and more. Supported by the NVIDIA JetPack and DeepStream SDKs, as well as the CUDA®, cuDNN, and TensorRT software libraries, the kit provides all the tools you need to get started right away. Powered by the new NVIDIA Xavier processor, it now has 20x more performance and 10x more energy efficiency than its predecessor, NVIDIA Jetson TX2.

Properties

- GPU: 512-core Volta GPU with Tensor Cores
- CPU: 8-core ARM v8.2 64-bit CPU, 8MB L2 + 4MB L3
- Memory: 32GB 256-Bit LPDDR4x | 137GB/S
- Storage: 32GB eMMC 5.1
- Encoder/Decoder: (2x) 4Kp60 | HEVC/(2x) 4Kp60 112-Bit support
- PCIe X16 (x8 PCIe Gen4/x8 SLVS-EC)
- RJ45 (Gigabit Ethernet)
- Camera connector (16x CSI-2 Lanes)
- M.2 Key M (NVMe)
- M.2 Key E(PCIe x1 + USB 2.0 + UART (for VVI-FI/LTE) / I2S / PCM)
- HDMI Type A(HDMI2.0)

SLAMTEC MAPPER M2M2

Slamtec Mapper M2M2 is an industrial-grade LiDAR. Different from the normal LiDAR, M2M2 has the ability to work in some severe surroundings. SLAMTEC Mapper uses high-performance SLAM map optimization engine and SharpEdge™ fine-mapping technology, which can actively detect and correct closed-loop, and achieve 100,000 square meters high-precision map and pose. SLAMTEC Mapper can work without additional sensors or data input. Because of the built-in 9-DOF inertial navigation system, SLAMTEC Mapper in the hand-held mapping mode can work normally in a fluctuating environment with inclination, to ensure the best map data quality.

Features

- Large Scenarios and High-quality Mapping
- Industry grade LiDAR, detecting range is 40mt
- Plug and play, without any external dependence
- Can be used as a mapper as well as a laser range scanner
- Connected with WiFi or Ethernet, easy communication
- Fully Compatible with ROS, Easy Data Analysis
- Strong stability: work well in fast speed and in the tilting scenarios

ÖZDİSAN ELEKTRONİK, HAS BECOME THE WORLD BRAND

Unpredictable situations such as pandemics and economic crises have started to adapt quickly to changing market conditions and have become the most important places in the strategic planning of companies and governments. Many sectors started to develop according to their own dynamics during the pandemic period. The rapid pace of technological development and the ever-increasing range of products produced have significantly contributed to the growth of the electronics sector. Products from a wide range of sub-sectors, from consumer electronics to telecommunication devices, from computers to industrial devices, from medical to defense electronics, continued to be produced. Özdisan Elektronik, one of the leading brands in Turkey's component industry, has made a significant contribution to the development of the Turkish industry during the pandemic period with the solutions and products it offers to the sector. We talked to Mustafa Yurttaş, General Manager of Özdisan Elektronik, about both Özdisan Elektronik and the electronics sector.

How did you spend 2021 as Özdisan Elektronik?

In fact, it would be more accurate to define this situation under several headings. In 2013, we asked ourselves what our goals were for the next 10 years.

In this process, I can say that we have completed 8 years in which we have realized the answers to those questions. I can list the main ones as exports, e-commerce, PCBA key turn solutions, branches and central structures.

What has the pandemic changed in your business processes?

After the pandemic was held, in mid-March 2020, our business was ceased suddenly. This situation continued until mid-June. The productions are effected and reduced rapidly. Chip and component crisis also caused limited woking hours and limited outputs.

"As Özdisan Elektronik, by taking early precautions and serious risks, we have created a shield for the Turkish industrialists against the crisis to some extent, and we have taken precautions in supply with forecasts so as not to disrupt their production."

In these hard conditions, as Özdisan Elektronik, we took early precautions and serious risks to create a shield for the Turkish customers against the crisis, and we took precautions in supply with forecasts so as not to disrupt their production. Currently, the chip crisis is ongoing and it looks like it will continue for another 1-2 years worldwide.

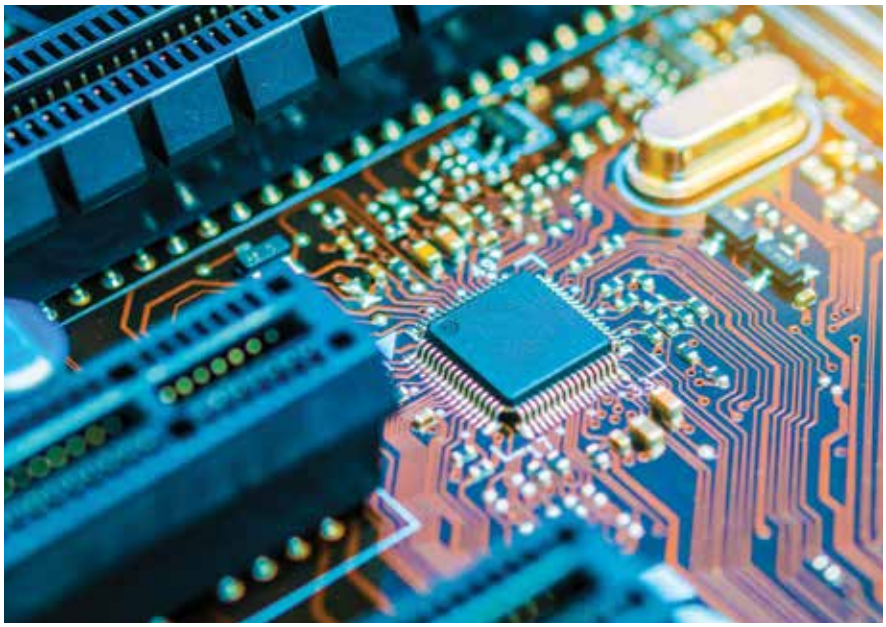
However, I can say that the crisis management habits of myself and my teammates made Özdisan Elektronik even more successful in this process.

What are your thoughts on the development of ozdisan.com?

Our website continues to serve more and more users every day since 2016. In this way, Özdisan Elektronik has become a global brand with its brand recognition. Thanks to this, our exports continue to increase rapidly every year.

ÖZDİSAN ELEKTRONİK
GENERAL MANAGER
MUSTAFA YURTTAŞ

Which markets are you most active in? What would you like to say about your sales and marketing activities abroad?
We export to more than 100 countries. Europe continues to stand out as our essential market. We are strengthening our presence in this market every year. Beside this our business with North Africa, America and Far East continues to grow.



"Recently, we have signed agreements with many famous brands such as Honeywell and Philips."

Are there any new sectors you are targeting?
The electronic industry has interaction with all other sectors. So I would like to say that we try to cover the needs of all industry without any distinction.

How do you evaluate the progress of the electronics industry?
In Digital life all industry is combined with electronis. Electronics lightened the road of other sectors with the advantage of flexibility and software power.

How do you evaluate the state of the Turkish electronic components market?

It is getting better and better every day. In the sector where global players are more intense, Özdisan Elektronik continues its way at the forefront of the market with national capital.

Could you tell us about your R&D investments?

Özdisan has customer oriented R&D and FAE. We try to support our customers in design in activities and creating alternative and cost effective solutions for customer designs.

Are there any new brands alternative and that have recently joined your distributorship network?

As Özdisan elektronik is in a leader position in the market we try to be more selective. We focus on brands that have wide portfolio and good quality. Recently we have signed agreements with many famous brands like Honeywell and Philips.

"We maintain our presence in the component market by conducting customer-oriented R&D. We provide serious support to companies engaged in R&D in this field."

What would you say about your 2022 goals?

Özdisan will continue to grow in global market and will open new offices in Europe and USA.

Your comments

Finally i would like to inform that the microcontroller crisis effected all sectors. Unfortunately some of the microcontroller companies will try to use this time as a price gouging. I really wonder that this time will go a longer period and takes years to come back to normal position.

We strongly recommend to our customers to keep close relations with Özdisan to get lowest negative effects of this ubnormal conditions. We will share all the informations which we get from market and our distribution lines to support our customers.

NVIDIA JETSON: INTEGRATED CIRCUITS OPENING THE DOOR TO ARTIFICIAL INTELLIGENCE

In line with the developing world and its needs, it is inevitable that technology will evolve as well. Artificial intelligence, which has entered our life with science fiction movies in recent years, is now rapidly becoming a part of our daily life. It is an indispensable part of industrial life as well as everyday life.

NVIDIA Jetson is one of the leading companies in the industry in terms of artificial intelligence solutions. As a solution, the integrated circuit structures of the Jetson family and its integration into autonomous systems provide great convenience.

The Jetson series, also referred to as a performance-powered computer, provides NVIDIA SDK support for fast and easy software development. It also offers (BSP) files, also referred to as sample code, and library support for deep learning, computer vision and much more. In this context, it has a user-friendly software process. Artificial intelligence and intertwined systems for all NVIDIAs work harmoniously in business processes.

ÖZDİSAN ELEKTRONİK
FIELD APPLICATION ENGINEER
ABDÜLKADİR DOĞAN

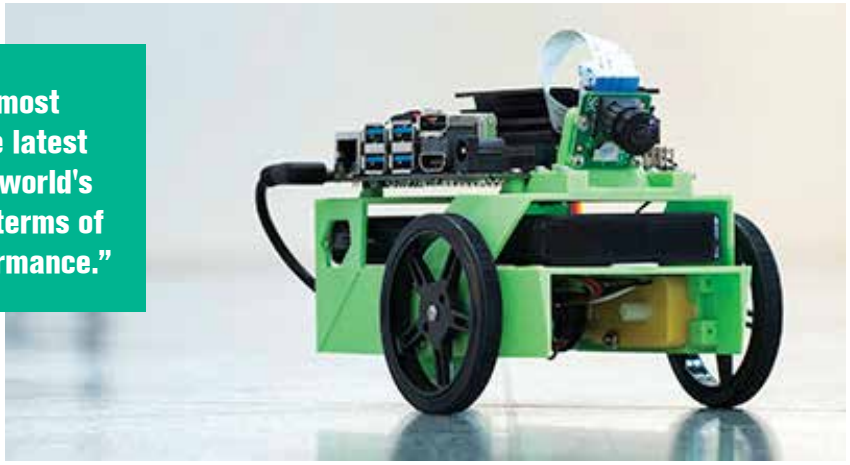
Same Ecosystem as the Jetson Family

Each jetson product can be preferred by users in all sectors due to their features.

"The AI and Interwoven systems used for all NVIDIAs work harmoniously across business processes."

To address this wide range, a variety of performance, alternative add-ons and ancillary features are available. The Jetson family offers both software and hardware solutions that are easy to use. Thanks to all these conveniences, you can reach the market for artificial intelligence and advanced technologies faster and easier.

"The Jetson AGX Orin, the most functionally complex and the latest addition to the family, is the world's most powerful AI machine in terms of power consumption and performance."



Since all Jetson products use the same software, SDK support and interface, it helps the user to master a wide range.

Artificial Intelligence in Industries

Considering today's technologies and future potential, artificial intelligence will appear in almost every sector. It will be possible to see artificial intelligence in every sector, from industrial autonomous systems to medical devices. The Jetson family enables you to integrate AI technology into your projects for your existing systems or help you develop them from scratch using Jetson platforms.

Jetson Family

The Jetson family offers solutions in advanced technology areas with its high capability. The product profile ranges from the most basic to the most comprehensive projects. It offers solutions at different performance levels to adapt to different systems and programs. For the most basic project solutions, the Jetson Nano module is a small in size AI computer with the performance and power needed to harness AI capability and receive simultaneous data from multiple high-caliber sensors. It also enables real-time execution of multiple operations in parallel.

Another member of the family for mid-range projects is the Jetson AGX Xavier. Jetson AGX Xavier's primary use case is in autonomous vehicles.

AGX Xavier, which is also available as a kit solution, is supported by the TensorRT software library and offers you all the interfaces and environments you need to get started right away. NVIDIA Xavier delivers up to 20x more performance and 10x more power efficiency than its predecessor, NVIDIA Jetson TX2.

The most functionally complex and the latest addition to the family, Jetson AGX Orin is one of the world's most powerful AI computers in terms of power consumption and performance. It has 8 times higher performance compared to the last generation. Thanks to its quick interface, you can get a lot of sensor data in real time. It offers you the solution you need for high-capability AI inference. High-speed interface access is of great importance for real-time and timing-important AI projects. You can find all the products described here and more on ozdisan.com.

ELECTRONIC COMPONENTS AND MORE

Founded in 1980,"Özdisan" has been the leading company on electronic component distribution.

“Expanding its inventory, Özdisan Elektronik effectively offers its customers a strong supply infrastructure in product groups for the industry sector.”

Özdisan Elektronik, which provides instant and on-site solutions to almost all needs in the sector with the cooperation of other companies under the DMY Group, supports the Turkish economy by providing turnkey products and solutions for both companies and end users and minimizes the demand for global suppliers.

Founded in 2015, the online portal www.özdisan.com Özdisan Elektronik, which has expanded its product portfolio by taking into account the demands from end users, has signed new distributorship

ÖZDİSAN ELEKTRONİK
E-COMMERCE AND BUSINESS
DEVELOPMENT CHIEF
TAYLAN AKER

agreements in semi-finished and finished product ranges for end users. It also continues to pursue its goal of becoming a solution partner both domestically and internationally, except for electronic components.

In this context, Özdisan Elektronik, which primarily stocks sensors, modules and computers compatible with development platforms such as Arduino and Raspberry Pi, diversifies its inventory with products such as various development kits, single board computers, programmers, sensor and module cards with distributorship agreements that appeal to both the Maker and IoT sector.

In addition to this, Özdisan Elektronik, which has expanded its inventory in products such as ESD product ranges, hand tools, electronic measuring devices, chemicals, magnifiers, soldering and soldering iron products and their consumables, which are frequently needed by the sector on the scale of end users and companies, also offers its customers a strong supply infrastructure effectively in product groups for the industrial sector.

Özdisan Elektronik, which has recently become a Solution Partner of Arçelik with its cooperation with Arçelik, has included many product groups, especially Arçelik 3D Printer and professional imaging systems, in its inventory.

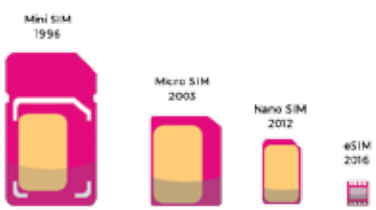
“Özdisan Elektronik, which has recently become a Solution Partner of Arçelik with its cooperation with Arçelik, has included many product groups, especially Arçelik 3D Printer and professional imaging systems, in its inventory.”

In addition, together with its sister company DMY Electrical Automation Lighting company under the roof of DMY, it brings together all product groups especially for the automation sector with sector users under the Weintek, ABB and Chint brands.

CAVLI WIRELESS HUBBLE PLATFORM

IOT devices are popular day by day, the number of devices with sim card modules that work without the need to connect to any network is increasing. However, the management of these devices is also getting importance. Especially the data and sim card management of the devices sent from the production site to field can have serious problems. In matters such as any sim card operator change or number change in the device, it is necessary to physically intervene in the device, and this situation involves the establishment of technical support teams. Our solution proposal for this situation is CAVLI WIRELESS, which has eSIM technology and offers Hubble platform support.

First of all, I would like to talk about eSIM technology. We can summarize eSIM technology as embedded in the chip without any hardware sim card. The biggest advantage of eSIM is that it can pass any sim card operator change without making any hardware changes. Another advantage is that it is protected from external factors such as oxidation by being affected by the external environment over time, since it is not an external integrated hardware. Along with eSIM technology, we need a platform to manage this technology. This is where the Cavli Hubble platform comes into play. The Cavli Hubble platform is a software solution used to enable the devices registered in the system to be accessed from anywhere with the internet, such as operator selection, data planning, dividing them into different groups, device management, obtaining information about the current status of the device.



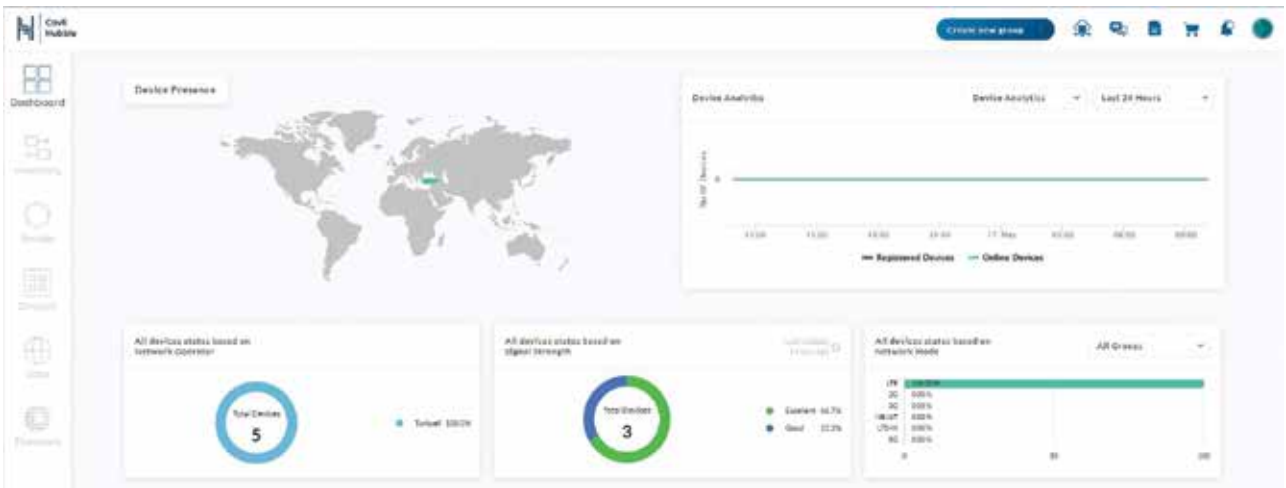
	Traditional Way	Hubble99
Connectivity enablement	Relies on multiple vendors	End-to-end solution for global deployment
IoT data billing	Manage several operator invoices	One centralized invoice
SIM management	Higher connectivity loss rate due to SIM displacement	Robust 'Connectivity Inside Silicon' with integrated eSIM
Connectivity uptime	At the risk of connectivity interruptions	Assured global connectivity
Hardware cost	Additional charges for module and connectivity platform	No separate charges. Pay only for the hubble99 subscription
FOTA capability	Manual firmware-software installation	OTA updates = smooth firmware-software installation
Warranty	No lifetime warranty	Lifetime warranty on IoT modules
Maintenance	Frequent maintenance required	Deploy & forget model
Troubleshooting	Manual troubleshooting	Remote diagnostics troubleshooting
Lead time	Longer lead time	Mass deployment in under 3 months
CAPEX requirement	Higher	Considerably lower

ÖZDİSAN ELEKTRONİK
FIELD APPLICATION ENGINEER
KADİR KARSON

As can be seen in the table above, the Hubble platform has serious advantages over traditional sim card methods and provides users with remote grouping and control of devices as the most important advantage.

CAVLI HUBBLE PLATFORM INTERFACE

As can be seen below, the Hubble platform offers us a lot of different information on its home page. First of all, it provides many different information such as whether the devices are online or not, the reception power according to the latest information sent by the devices, the distribution of registered devices over the operators, the ratio of different modules such as 2G and 4G to the total devices. In addition, it can be seen from which country the devices were connected to the last Hubble platform. To access this screen, you must first create a Hubble account. Afterwards, with the help of the demokit obtained from Özdisan Elektronik with the help of the steps I will talk about in the next stages of the article, you will be able to see the features of the device as a result of the registration of your device to the Hubble platform.



On the main page of the Cavli platform, it is possible to switch to many different tabs from the menus on the left.

There are 6 different transition options from the menu

- Dashboard ➜ Page with general information on the homepage
- Inventory ➜ General list of registered devices (IMEI numbers and Device ID are here)
- Groups ➜ Page where you can divide devices by project and departments
- Devices ➜ Page showing devices in groups
- Data ➜ Page where you can see data agreements and different packages
- Firmware ➜ Page for remote software updates

REGISTER TO HUBBLE PLATFORM

In order to register with the Hubble platform, we first need to have a development kit with eSIM technology. I will explain the subject through the C10AM development kit.

After obtaining the device, we connect the USB that says UART with the help of the USB cable that comes with it. If Silicon Labs CP210X series has not used USBUART converter before, the driver must be installed. When you see it as a com port, your device can benefit from any terminal program.

First of all, the device needs to be activated with the Hubble Platform account created before. For this;

Command	Response
AT+Hubblereg=<account_id>, <plan_id>[,<group_id>]	Registration Success
OTHER	Registration FAIL

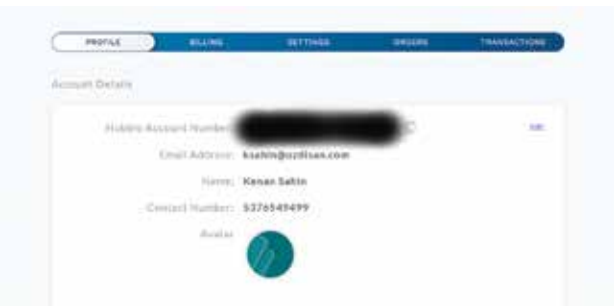
Defined value

Parameter	Explain
<account_id>	Account ID
<plan_id>	Plan ID
<group_id>	Group ID

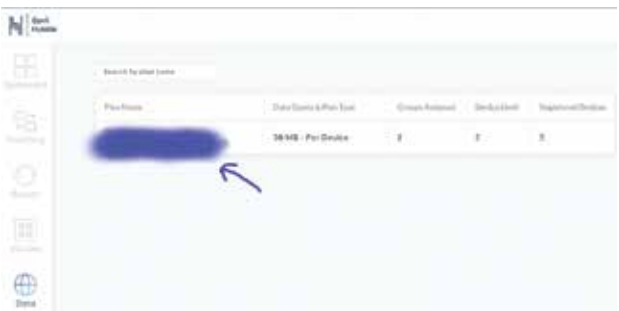
"The biggest advantage of eSIM is that it can pass any sim card operator change without making any hardware changes."

He can use his command. You can get the 3 parameters listed here from the Hubble site.

Account id ➔ From your profile information on the top left, from the "View Account" tab.



Plan id ➔ From the data tab on the left side menu



Group id ➔ From the group tab on the left side menu

When the command response is set to Registration Success, it will now be seen that this device is included in the Hubble account. What needs to be done afterwards is to send a connect command to Hubble when every module is turned on.

```
AT+CGDCONT=2,"IP","hubblethings.io"
AT+CFUN=1
AT^NETIF?
AT+CGACT=1,2
```

After these commands, information about the device can be accessed via the Hubble platform. It is the main information screen on the side. There is also a section where you can reach more detailed information.

LONGSYS;
MEMORY SOLUTIONS FROM A TO Z

LONGSYS; With the development of electronic device designs over the years, the use of processors in electronic cards has increased considerably. Most of the devices we use in our daily life use simple or complex processors. One of the most important hardware for processors is memory units. Processors keep the software necessary to run in memory units, keep the data that needs to be stored in this unit, and perform the mathematical operations in these units.

Memory products are divided two groups, volatile memory and non-volatile memory. Non-volatile memory products; It is called flash and even if the power of the device is cut off, the data inside isn't lost. Its purpose is to save data. Volatile memory products are called RAM. When the power of the device is cut off, the data is lost. Its purpose is to perform mathematical operations of the processor and to keep temporary data. In simple processors, these units are usually built-in, external memory products are used when capacity and system requirements increase. In this article, we will talk more about external memory products.

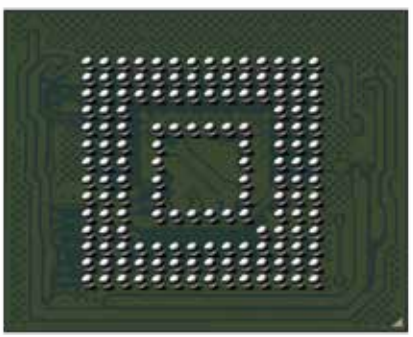
RAM products are structurally divided into two basic groups. Static RAM (SRAM) and Dynamic RAM (DRAM). SRAMs use transistors

ÖZDİSAN ELEKTRONİK
R&D AND TECHNICAL SUPPORT ENGINEER
KENAN ŞAHİN

to keep every bit of data in memory. DRAMs use very small capacitors. SRAMs are much faster than DRAMs because of its transistor structure. DRAMs are slower because of the charging time of the capacitors. The write speed is slower than the read speed because it takes more time to charge the capacitors in DRAMs than to discharge them. In SRAMs it is possible to read and write a single byte. In DRAMs it is possible to write in blocks. SRAMs take up more space because they contain more complex electronic circuits. Memory density is lower than DRAMs. DRAM of the same size can hold more data than SRAM. SRAMs consume more power than DRAM due to their transistor structure. Simple processors need less RAM. they use SRAM internally for this. SRAM is used in cache memories due to fast processing power in computers. DRAM is used in applications require high capacity. DRAMs are divided into groups.

The most common are SDRAM and DDR SDRAM. SDRAM (Synchronous Dynamic Random Access Memory) can write and read in a fixed time. In this way, it can work synchronously with the processor. For example; The processor is sending data at 100MHz. And if SDRAM's receiving rate is 100Mhz, the processor knows that SDRAM is ready to receive data the next time it sends data.

"Özdisan Elektronik has signed a distributorship agreement with Longsys. In this way, it aims to deliver a wide variety of memory products to its customers."



For this reason, it is called synchronous DRAM. The DDR SDRAM (Double Data Rate Synchronous Dynamic Random Access Memory) can receive data on both the rising and falling edge of the clock frequency. In this way, the data transfer rate is doubled. There is a performance difference between DDR2, DDR3, DDR4 products. As technology improves, data transfer speed increases. RAM products can be different physical forms. Small capacities are generally used on electronic cards in the form of chips. As the capacity increases, it is available in module form. There are many DDR SDRAM ICs on this module according to the capacity. These modules became standard in computer products and took the names of DDR2, DDR3, DDR4 modules.

Non Volatile products originally appeared as ROMs (Read Only Memory).

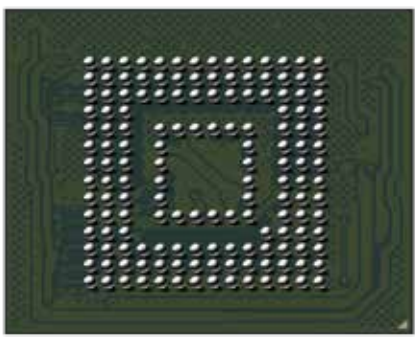
These products could only be programmed during production. EEPROM (Erasable Programmable Read Only Memory) memories were produced because this situation made software development difficult. These memories could be written electrically. but it required ultraviolet light to erase. EEPROMs are still used today. The biggest advantage

"Although there are many different types of flash today, the most used structure is NOR and NAND Flash. NOR flashes provide faster reading and safer data storage, but their capacity is limited. It can have a maximum of 2GB memory."

is that each byte of the EEPROM memory can be written and read. However, it is not widely used because its capacity is very limited and its cost is high. Although there are many different types of flash today, the most used structure is NOR and NAND Flash. NOR flashes provide faster reading and safer data storage, but their capacity is limited. It can have a maximum of 2GB memory. Above these values, NAND Flash is used. The NAND Flash structure is the basis of many computer products. NAND Flash products can be used directly with the processor. But due to the difficulties it brings in practice, it is usually used over controls. Memory products containing NAND Flash are used in many different forms depending on their physical structure and communication style. The controls in these devices provide communication between the NAND Flash and the processor. NAND Flash is used in removable PC products such as SSD hard disk, SD card, USB memory

"RAM products are structurally divided into two basic groups. Static RAM (SRAM) and Dynamic RAM (DRAM). SRAMs use transistors to keep every bit of data in memory. DRAMs use very small capacitors."

and in embedded products such as eMMC, UFS, eMCP, SPI Flash. eMMC is used as an integrated card in devices such as tablets, mobile phones, and single board computers. Its capacity is lower than SSD harddisk. eMCP Flash and RAM memories are integrated products in a single package. SPI flash products are used in systems that require low capacity. Speed is lower. It can be in NAND or NOR structure. One of the most important parameters about Flash products is the write/erase life.



After a certain cycle, flash memory cells may lose their function. Some definitions have been developed to specify the lifetime of flash memory. SLC (Single Level Cell), MLC (Multi-Level Cell), TLC (Triple-Level Cell). Lifetimes are SLC>MLC>TLC.

Özdisan Elektronik has signed a distributorship agreement with Longsys. In this way, it aims to deliver a wide variety of memory products to its customers. Founded in 1999, Longsys is one of the world's leading memory manufacturers. Longsys offers embedded storage products under the Foresee brand and consumer storage products under the Lexar brand.

OLED LCDs
THAT STAND OUT WITH THEIR LONG LIFETIME

Organic Light Emitting Diode, briefly OLED, is a technology that can be shown as an alternative to LCDs. Oleds are organic because it has a structure consisting of carbon and hydrogen. Oled lcds don't need a backlight. Each pixels of it can provide own light. In other words, lcds have to use backlight leds but oleds don't need. Due to the reasons I wrote above, the image, symbol, text etc created in OLEDs will be much brighter than normal LCDs. Contrast is not hardware adjusted in oleds. It is set in software. In the opposite way, contrast on LCDs is physically adjusted. This is a disadvantage because contrast in LCDs may deteriorate over time depending on usage conditions. Oleds don't have this trouble. Two types of oleds can be mentioned. PMOLED (passive matrix OLED) and AMOLED (active matrix OLED). PMOLEDs have simple design, limited resolution and small size. AMOLEDs have higher resolution, unlimited size, more expensive production.

Oled's power consumption is lower than lcd. Lcd's backlight always Works at maximum. Oled consumes as much power as it needs because there is no light in the pixels it does not use. The following can be said about oleds; It is light,

ÖZDİSAN ELEKTRONİK
R&D AND TECHNICAL SUPPORT ENGINEER
MERT KALINLI

"Contrast is not hardware adjusted in oleds. It is set in software. In the opposite way, contrast on LCDs is physically adjusted. This is a disadvantage because contrast in LCDs may deteriorate over time depending on usage conditions."

COB OLED example;

COG OLED example;

COF OLED example;

the minimum viewing angle is 160 degrees, the operating temperature is -40 to +70, the minimum lifetime is 50000 hours. OLED is used in automobile displays, mobile phones, medical devices, white goods, automation products and many different devices.

OLEDs are divided into two according to their graphic structure. These are character oleds and graphic oleds. As Özdisan Elektronik, we are the distributor of Winstar company. 2x8, 1x16, 2x16 and 4x20 character oleds of this company in our stocks. For example, 2x16 character oled has 2 rows and 16 columns. In each of these rows and columns, the characters in the controller IC of the OLED LCD can be written.

According to graphic structure, other oleds are called graphic oleds. Each pixel of these oleds is driven by a microcontroller. There are no pattern. Graphic oled lcds can be in various resolutions such as 128x64, 128x32, 96x64. For example, 128x64 graphic oled has 128 horizontal pixels and 64 vertical pixels.

Generally, oleds supply voltage is between 3V and 5V. It can be in colors such as red, green, blue, white, amber etc. Oleds can also be in more than one color. Some oleds have touch panel. The interface of oleds can be parallel, spi or i2c.

Oled screens are divided into 3 groups according to their physical structures; COB (chip on board), COG (chip on glass) and COF (chip on flex). In COB screens, all components and controller IC are on the pcb under the glass. For these COB oleds, the user does not need to connect external components. In COG displays, the controller IC is mounted on the glass. All required components must be connected externally by the user. In COF displays, the controller IC is on the flex cable. In addition, some components are on the flex cable.

Graphic OLED example (128x64);

Character OLED example (2x16);

LoRaWAN AND SENSORS

LoRaWAN technology and sensors developed with this technology have gained momentum and popularity in recent days. First, let's understand what LoRaWAN is and then let's focus on why we need LoRaWAN technology.

LoRaWAN, or LPWAN, as the name suggests, is a technology built on three main themes. These are;

- Low power consumption (Low Power)
- Wide coverage (Wide Area)
- A network to create communication

Let's explain these terms briefly, let's start with the network part first. The main condition for a device to become an IoT device is that it can connect to the internet.

With millions of devices expected to be connected to the internet, we need a network that can connect them all. If each IoT device manufacturer builds its own network, there will be major problems in the communication and integration of systems with each other. Since IoT device manufacturers and network providers may be different companies, this network to be established must comply with global standards.

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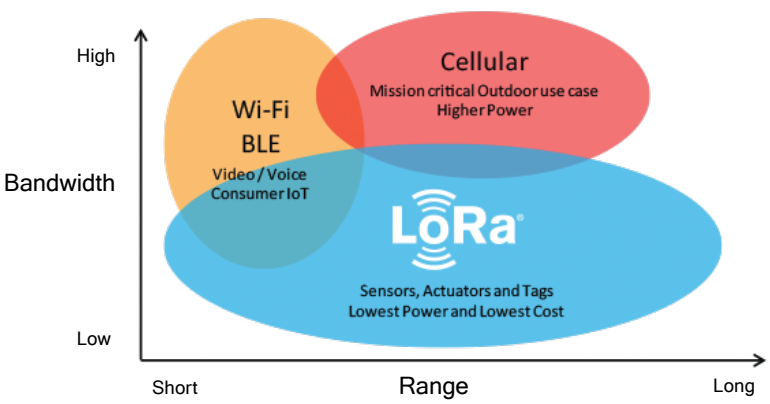
FIELD APPLICATION DEPARTMENT MANAGER
İBRAHİM EKMEKÇİ



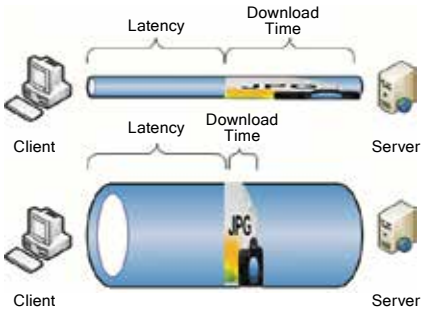
The best method is therefore to have an international standard that is accepted by all.

Another part of us will have wide coverage. If we consider a device made with a WiFi module, it can easily connect to our home WiFi network. But we all know that we can't get enough efficiency from our WiFi modem located a few rooms (walls) away. This is because the WiFi network is limited to a few meters. When we say LoRaWAN, we mean wide area networking.

So it needs to cover much larger areas, not just a few meters like WiFi. Although this wide coverage is not essential for computers, phones and tablets, it is a must for a loT device. Because we now see smart systems in every corner of our homes and in parks and gardens. Many of these smart systems are made possible by loT devices. On the other hand, when we think about it, the radios in our cars and homes can receive signals from far away places and play music to us. It is possible to listen to the radio even in the most isolated places. We can listen to our radio even when we are far away from the radio stations. This simple and long-standing radio falls squarely into the category of wide coverage mentioned above. But when we look at the radio transmitters in the stations, we see that they are both gigantic in size and the power they broadcast at is very high.

In this way, it seems that it is actually easy to reach long distances and create a wide coverage area by emitting high power.

Now we come to the third part. This part is low power consumption. If we want to run on battery and the LoT devices to run on battery without the need for a relative energy, then we see that we don't have a lot of power, and it is out of this dilemma that LoRaWAN technology was created. We want miles of coverage, but we don't have much to spend.



Miles of network coverage - Low power consumption

If we don't want to give up either feature, there is only one thing we can give up: bandwidth. The laws of physics tell us that if we need to establish a radio (wireless) connection for a certain distance, we can either increase the power we transmit or decrease the bandwidth of the channel.

Bandwidth is directly related to the capacity of the channel on which the signal will be transmitted. As bandwidth increases, channel capacity increases and larger data can be sent faster. Conversely, as bandwidth decreases, channel capacity decreases and we start to send smaller data in longer times.

As an example of existing technologies, WIFI has a high bandwidth. But it has a low range. Thus, very large data can be sent using WIFI, but not over long distances. Another example is mobile internet on our cell phones. The range of these systems can reach up to several kilometers.

But we all know that the battery life of new generation phones is not very long. This means high power consumption. Another example is Bluetooth technology. This technology can run on small batteries for a long time. That's why we see it in smartwatches and so on. But even with this technology, unfortunately, we cannot send data a few meters ahead. So all these existing technologies cannot fully meet the needs of IoT devices. As we know, these needs were to cover large areas with low power consumption.

Superpower LoRaWAN for IoT sensors

LoRaWAN has its own category. While it can cover long ranges, it does so with very, low power and bandwidth. Now we can say that LoRaWAN technology is exactly where it fits. It should be noted that it should never be compared with WIFI technology and should not be considered as an alternative to it. Its application area is sensor networks.

The sensors we are referring to here are those that are large in size and do not transmit real-time data. To give an example, we can easily see that it would not be appropriate to send

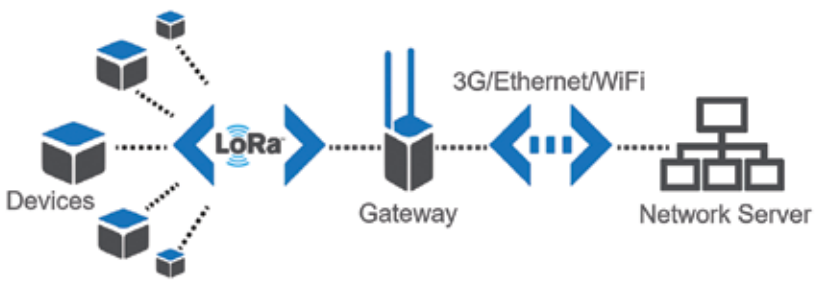
a CCTV image over a LoRaWAN network.

LoRaWAN would not be a suitable choice here as there would be both a high data throughput and a real-time data sending frequency. But when you want to measure the soil moisture data of the crops in the field, this is exactly what can be done with LoRaWAN technology. This is because soil moisture data is small in data size and does not change much within seconds. Another example is the sensors in indoor parking lots that we use very often in our daily lives. In all existing systems, we can only know whether it is full or empty when we go near it (in its field of view). When we use LoRaWAN sensors here, LoRaWAN technology will be a very suitable choice, as it will be able to run on batteries for many years, send parking lot status to far away locations, and parking lot data will not change much within seconds.

The frequencies used in LoRaWAN technology may vary from region to region. The most basic of these are as follows;

- 868MHz for Europe
- 915MHz for America
- 433MHz for Asia

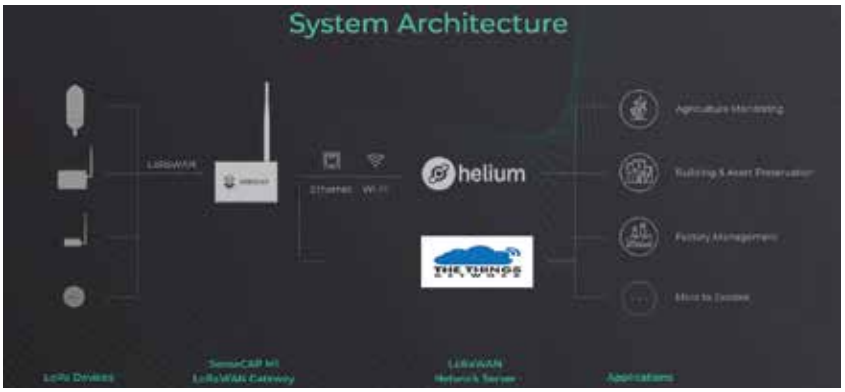
The frequencies selected for each region are in the ISM (Industrial, Scientific, Medical) band and are completely free of charge. In other words, users do not pay for a LoRaWAN communication in legal bands. Of course, there are certain restrictions on the use of this free band. In Europe, for example, the maximum broadcasting power is 25mW. A little more is practiced in the United States.



“LoRaWAN has its own category. While it can cover long ranges, it has very low power and bandwidth.”

The biggest disadvantage of LoRaWAN technology is that it requires a structure that receives the data sent by the sensors in order to communicate. This structure is called Gateway and Network. In all the examples mentioned above, gateways are needed to receive data and LoRaWAN networks are needed to collect this data in a common place. The Things Network (TTN) is the most established and oldest LoRaWAN network. Its users voluntarily include their own gateways in the system. Thus, they enable LoRaWAN communication in the region where the gateway is located. Until now, the biggest problem was the low coverage of the TTN network all over the world and the low number of gateways established on a voluntary basis. For this reason, users did not prefer the LoRaWAN network, even though it was optimal for LoT devices.

But there is one LoRaWAN-based project that has emerged in recent years.



This project is called Helium. Helium encourages the installation of LoRaWAN gateways all over the world as part of its system. This now also makes it possible to use LoRaWAN systems. For this reason, existing sensor manufacturers have now started to produce all sensors (suitable for the structure) with LoRaWAN technology. It is now possible to find versions of many alternatives available in the market as sensors such as LoRaWAN temperature & humidity sensor, LoRaWAN pressure sensor, LoRaWAN C02 sensor, LoRaWAN light sensor, LoRaWAN asset sensor, etc. that can now work with the LoRaWAN network.

The Chinese company SeeedStudio is at the top of this chain. It is a company that produces both LoRaWAN gateway and LoRaWAN sensor types. A few of the LoRaWAN gateways and LoRaWAN sensors that it has already produced and combined with its users are as follows.

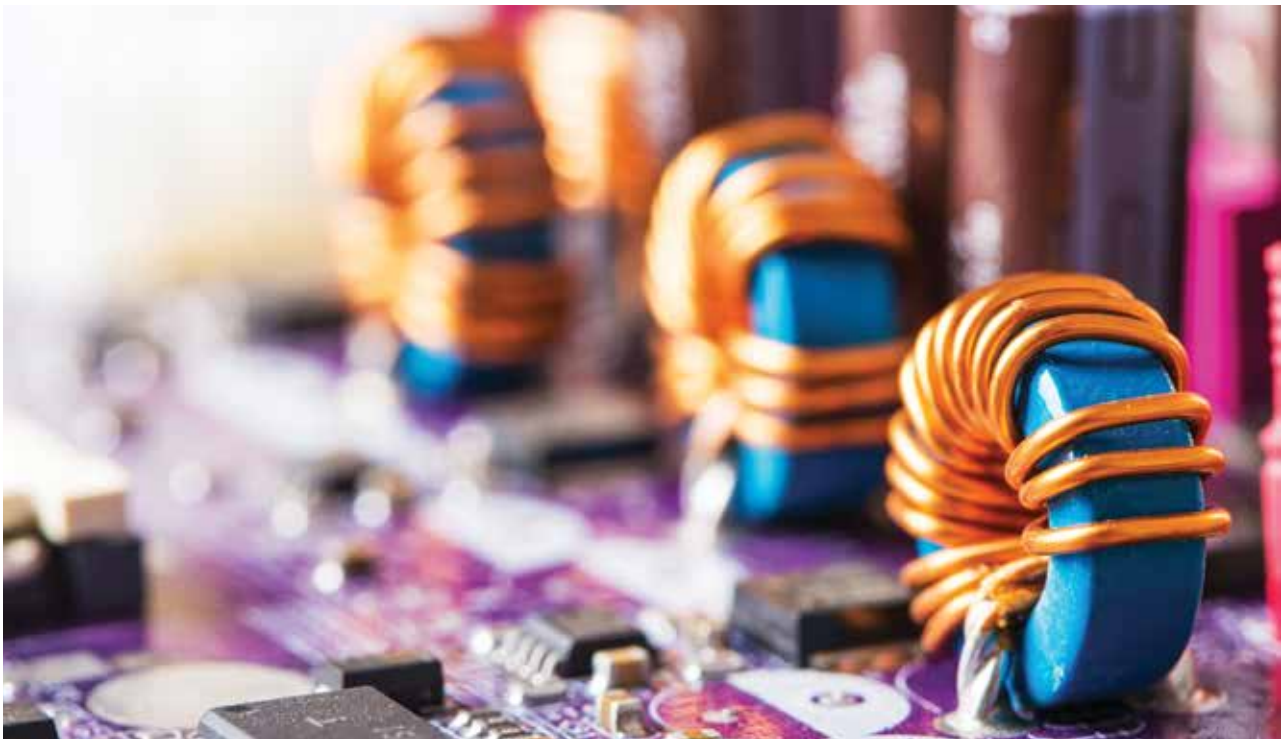
SeeedStudio LoRaWAN Temperature & Humidity Sensor

SeeedStudio LoRaWAN Air Pressure Sensor

SeeedStudio LoRaWAN Gateway

SeeedStudio LoRaWAN Temperature & Humidity Sensor

SeeedStudio LoRaWAN Air Pressure Sensor



POWER ELECTRONICS AND IPM MODULES

Power electronics is a specialty that produces control systems that manage high currents and voltages. Within this field, there are many different application areas such as motor control, uninterruptible power supply, welding machine, energy transmission. Each implementation has its own problems and challenges. Different materials have been developed to overcome these problems. In this article, we will focus more on motor control.

One of the most widely used materials in power electronics is switching elements. Switching elements are basically BJT (Bipolar Junction Transistor), FET (Field-Effect Transistor), IGBT (Insulated Gate Bipolar Transistor) and Tyristor. There are many different types of technology withinthese main headings.

One of these materials should be selected according to the intended application. BJTs have emitter, base, collector pins. The current through the emitter-collector depends on the current through the gate-emitter. FETs have drain, gate and source pins. The current flowing through the drain-source depends on the voltage between the gate and source pins. FETs can operate at higher frequencies while BJTs can operate at lower frequencies.

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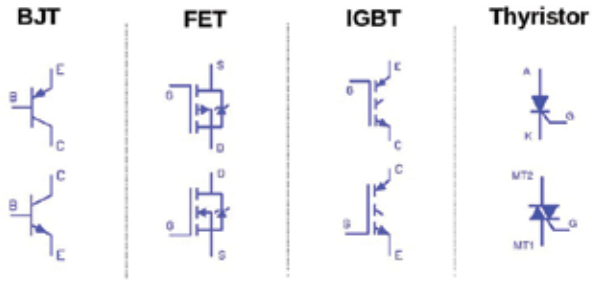
SABRİ DAĞERİ

BJTs have a higher current capacity than FETs. IGBTs are a combination of the good properties of BJTs and FETs. IGBT consists of Gate, Emitter, Collector pins. The gate pin is triggered by voltage as in FETs, while the current capacity is high as in BJTs. The operating frequency is higher than BJTs and lower than FETs. MOSFET (Metal Oxide Field Effect Transistor) is the most widely used type of FET. In addition, SiCFETs (Silicon Carbide FET), which have been developed in recent years, provide high current, voltage and frequency. Generally IGBT for high current and voltage, medium frequency (20KHz) and SiCFET for high current, voltage and high frequency. The use of MOSFETs for medium and low voltage is common. There may be ranges of values where these products intersect, and the right product selection should be made according to the characteristics and cost targets of the application. Tyristor products have Gate, Anode and Cathode pins. Unlike other products, when the Gate pin is triggered, it remains in continuous conduction, but is reset when the voltage between the Anode and Cathode pins drops to O volts. This process is called latching. Triac is a product in which two Tyristors are connected in reverse parallel to each other. Triac can operate in both poles. Triac is mostly preferred for AC voltage, since sine signals constantly change polarity, they need to be triggered at both poles. Dimmer applications are the most common applications where Triac is used. Özdisan Elektronik provides these products to its users with IXYS, FUJI and PANJIT brands.

"Although they are cost-effective, the disadvantage of induction motors is that speed control is difficult and their efficiency is lower than that of magnet motors."

Electric motors can be divided into two main groups as brush and brushless driving methods. Within these main groups there are many sub-groups. Motors need a rotating magnetic field to move. Brushed DC motors have windings in the moving part called the rotor and permanent magnets in the outer part called the stator. Electricity is applied to the windings by means of conductive parts called charcoal to create a magnetic field. With this magnetic field, a moving magnetic field is created as the winding energized by the coal changes when the motor moves.

Brushed motors are the simplest and most cost-effective motors. The disadvantage is the heating problem, high losses due to friction and short lifetime. Brushless motors can have two different structures. In induction type motors, the windings are in the Stator part and copper rods are in the Rotor part.



Device Characteristic	Power Bipolar	Power MOSFET	IGBT
Voltage Rating	High <1kV	High <1kV	Very High >1kV
Current Rating	High <500A	Low <200A	High >500A
Input Drive	Current 20-200 h_{FE}	Voltage V_{GS} 3-10V	Voltage V_{GE} 4-8V
Input Impedance	Low	High	High
Output Impedance	Low	Medium	Low
Switching Speed	Slow (uS)	Fast (nS)	Medium
Cost	Low	Medium	High

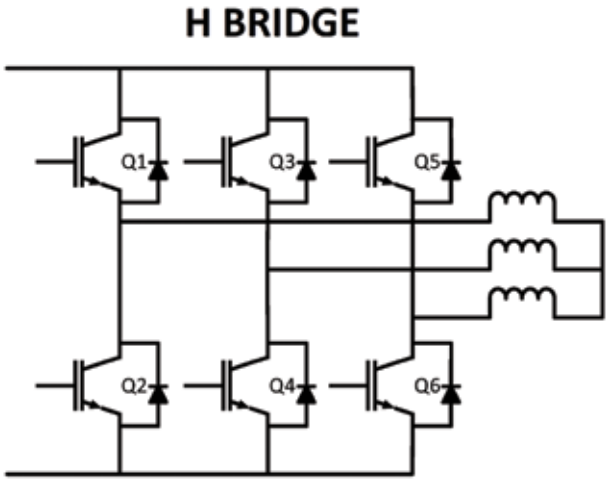
"The angle differences between the signals and the change of direction are provided by the 6-channel PWm output of a processor. Since the PWm outputs of the processor cannot be connected directly to the IGbTs, an IGbT or mOSFET driver integrated is needed."

These motors generally create a rotating magnetic field at the mains frequency by using the 3-phase city network. As a result of the short circuit current in the copper rods in the rotor part, movement is provided by creating an opposite magnetic field. In these motors, the rotational speed of the Rotor may not be synchronized with the magnetic field rotating in the Stator. Even if the rotor stops, the magnetic field in the stator will continue to rotate. This is why these motors are also referred to as asynchronous motors. Although they are cost-effective, the disadvantage of induction motors is that speed control is difficult and their efficiency is lower than magnet motors. Another type of brushless motors are permanent magnet motors.

These motors are a newer technology compared to other motors and their efficiency and lifetime are quite high as there are no rubbing parts. Today, their use has increased considerably. When it comes to BLDC (Brushless DC Motor) motors, these motors usually come to mind. BLDC motors with magnets can be driven by an electronic driver board.

In BLDC motors with Inner Rotor type, windings are located in the stator and magnets in the rotor. Outer BLDC motors have windings in the rotor and magnets in the stator. The moving part in these motors is the Stator. The motors used in electric scooters are an example of this type.

In BLDC motors, the position of the moving part where the magnets are located is detected by means of hall effect sensors and the magnetic field created in the yellows is synchronized.

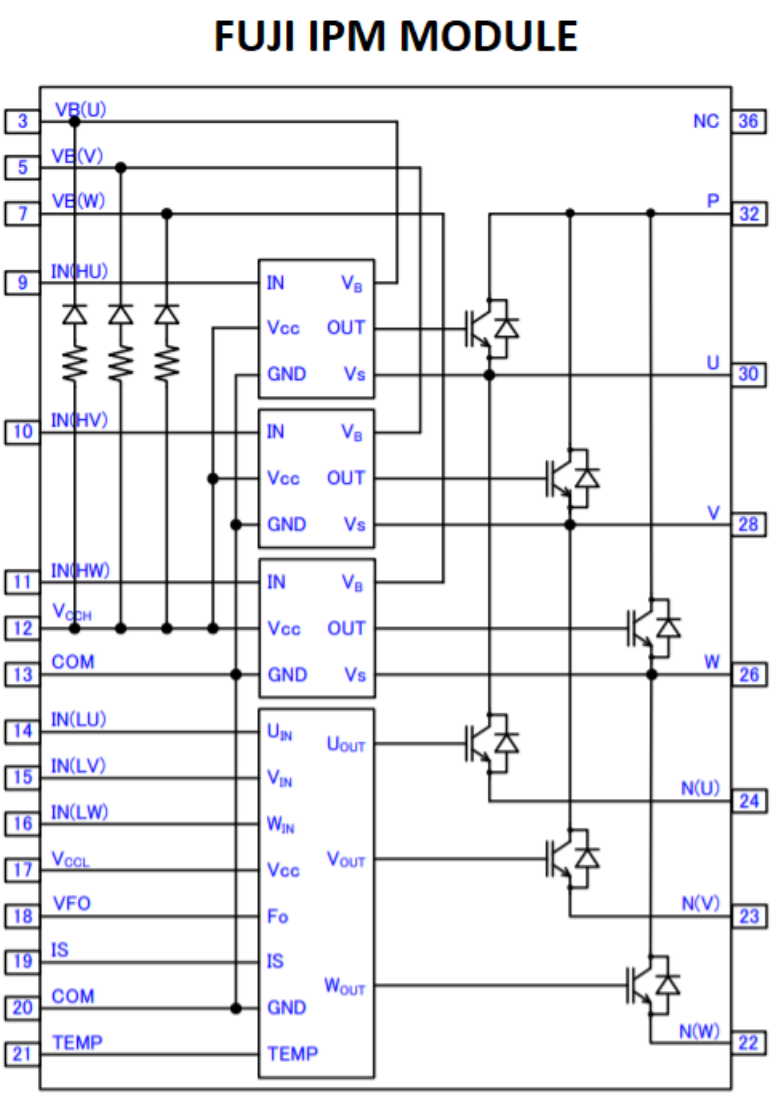


Since the PWM outputs cannot be connected directly to the IGBTs, an IGBT or MOSFET driver integrated is needed. Additional circuits are needed to measure the motor current, protect the IGBTs in case of short circuits and protect the IGBTs from overheating. The IPM modules developed by FUJI Electronics combine all these circuits and 6 IGBTs in a single package. In this way, it provides cost and size advantage by significantly reducing the number of external materials, and there is no Driver IGBT compatibility problem. IPM modules facilitate the cooling of IGBTs thanks to their heat sink mountable structure. The temperature of the IPM can be monitored with the temperature sensor output. Fault conditions can be detected with the FAULT output. By means of the current sensing input, the motor current can be limited and protected against short circuits. Özdisan Elektronik supports its customers with FUJI brand.

"The IPm modules developed by FUJI Elektronik have all these circuits and 6 IGbTs in a single package. in this way, it provides cost and size advantages by greatly reducing the number of external materials, and there is no Driver IGbT compatibility problem."

The rotating magnetic field in induction motors is provided using the sinusoidal structure of the city grid. In BLDC motors, this rotating magnetic field is obtained from a DC voltage source with the help of the H Bridge circuit. H Bridge consists of 6 MOSFETs or IGBTs. BLDC motors have 3 phase windings. these windings must be energized with an angle difference of 120 degrees. As with a sine signal, the electricity supplied to the windings must change polarity by 180 degrees.

The angle differences between the signals and the change of direction are provided by the 6-channel PWM output of a processor.



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A NEW PRODUCT FROM
NUVOTON
M471KI8AE

Nuvoton, one of the world's leading MCU manufacturers, continues to expand its product family day by day. The latest product of NUVOTON company, M471KI8AE, targets smart home appliance applications. This 32-bit MCU has DSP instruction set and FPU has Arm Cortex-M4F.It also includes a pseudo-random number generator (PRNG) to support encryption and decryption requirements of M471KI8AE smart home appliances whose target applications are smart home appliances.

GENERAL FEATURES

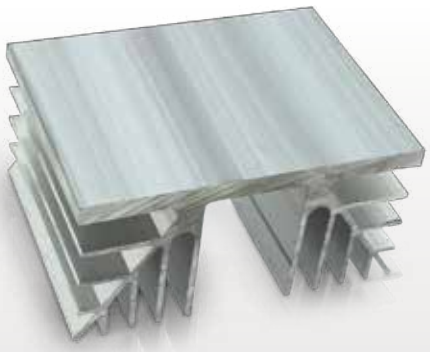
- Voltage range: 2.5V - 5.5V
- ARM Cortex-M4F up to 120 MHz
- Temperature range: -40°C to 105°C
- Up to 512 KB Flash memory with dual bank structure supporting Firmware Over-The-Air (FOTA)
- Flash memory supporting up to four regions of eXecute-Only-Memory (XOM)
- Internal PLL up to 120 MHz
- Memory Protection Unit (MPU) with eight memory zones
- 32 KB independent Data Flash with 256 Bytes page erasing unit
- Normal operation: 353 µA/MHz at 25°C/5V
- Normal Power-down: 27 µA
- Supports wake up from Normal Power Down mode: RTC, WDT, I2C, TIMER, UART, GPIO, EINT, ACMP, CiRO and BOD
- 6xUART / 2xSPI / 2xI2C / 1 x DAC / 24x ADC/RTC/ 2xI2S

The right address for your expanding aluminum cooler profile needs;

ÖZDİSAN ELEKTRONİK

Compact

Effective



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YAGEO's AC series capacitors are high quality and high reliability capacitors designed for use in automotive equipment application areas and comply with AEC-Q200 criteria.

The AC series operates without derating above 220 °C, ,
making it suitable for demanding industrial applications.
The robust chip capacitor construction has successfully passed the "MIL-STD-202G-method 210F" soldering heat resistance test, which withstands a soldering temperature of 260 °C for 10 seconds.

Features

- AEC-Q200 qualified
- MSL class: MSL 1
- AC series soldering
- Compatible with J-STD-020D
- High component and equipment reliability