

Component

SPECIAL EDITION

by **ÖZDİSAN**

JOURNAL OF ELECTRICITY ELECTRONICS AND AUTOMATION

YOUR COMPLIMENTARY COPY

**ELECTRONIC COMPONENTS
SUPPLY IS SUFFERING
FROM ALLOCATION**

**THE IRREPLACEABLE
COMPONENT OF
TECHNOLOGY
CAPACITIVE
TOUCH PANELS**

**LIGHT RECIPE
IS THE KEY OF
HORTICULTURAL
LIGHTING**

**A EPOCH OF
HARDWARE
AUDIO IC**

**THE PIONEER OF
DIGITAL IN THE
INDUSTRY
OZDISAN.COM**

**HDI LEAVES
CLASSIC
PCB'S BACK**

MUSTAFA YURTTAŞ

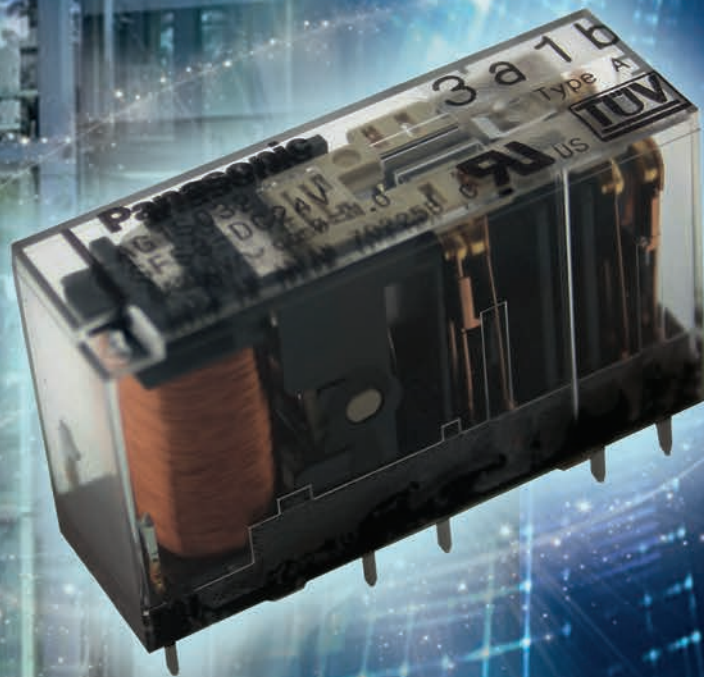
"WE ARE AMONG GLOBAL PLAYERS"





 /ozdisanelektronik

Safety Lifts with Panasonic Relays...



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|

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SFS relays stand out with high reliable and elegant design. SFS relays bring confidence to designers with fast response time and strenghtened contact structure.

Panasonic

Component

Dear All Electronic World of Sector Representatives,

Özdisan Elektronik, an affiliated company of DMY Group that is a significant player of today's electronic world, has taken its place among global market with 39 years of experience and knowledge. Our company is taking confident steps to enter new markets and in line with our strategy, we are attending Electronica as exhibitor since 2012. Our philosophy is producing solution and trading by establishing empathy and standing next to customer under the principle of honesty.

Today, Özdisan presents at global market with worldwide known brands. With our high volume dynamic stock consisting more than 100.000 kinds of product, we're a global player racing against time to ship out orders within 24 hours to anywhere in the world.

Beside representation and distributorship of global brands, Özdisan provides unusual services such as aluminium heatsink production, PCBA, PCB and TFT screen production and solutions from its own structure. Özdisan is coming into forefront day by day with its differences and solutions.

I would like to express my gratitude to all representatives of the Electronic World.

Best Regards
MUSTAFA YURTTAŞ



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ÖZDİSAN NEWS

EUROPE BEST SALES DISTRIBUTOR AWARDS WINNER IS ÖZDİSAN ELEKTRONİK

Özdisan Elektronik, which is the leader electronic component distributor in Turkey, has been rewarded with "Top Sales Prize" by Fuji Electric four times in a row among European Distributors. Özdisan has been offering Fuji Electric's high technology products to Turkish market for many years with the services of local technical support and high volume stock.

Fuji Electric is one of the largest company in Japan, employs more than 25.000 people and operates in 5 different sectors. Their products are used around the world in a variety of different markets, industries, and applications since 1923.

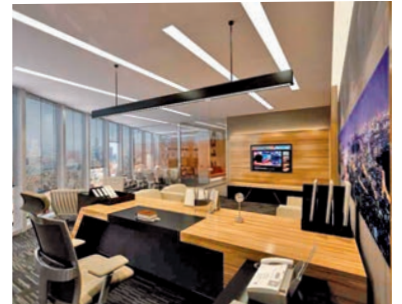


ÖZDİSAN ELEKTRONİK CONTINUES TO SERVE IN ITS NEW BUILDING IN ANKARA

Özdisan has moved its Ankara branch office from Ulus to Maxivedik business center at Yenimahalle.

At their new office in this modern and high-tech building, Özdisan Ankara will continue to provide the best service to their clients with the help of product showrooms and e-platform panels.

Özdisan has reached to 245 employees and supports all needs of customers as component, PCB and PCBA solutions and plans to carry its leadership in electronic component supplying in Turkish distribution in local.



NUVOTON'S OFFICIAL DISTRIBUTOR IS ÖZDİSAN

Özdisan Elektronik made a very big move in the second quarter of 2018 by signing an official distributorship agreement with Nuvoton, which is listed among world's top companies on microprocessor and microcontrollers field. In this way, Özdisan has added Nuvoton's MCUs, MPUs, audio/voice ICs, etc. to its continuously expanding product portfolio and aims to corner MCU/MPU market.

Who is Nuvoton?

Nuvoton Technology is a Taiwanese company, was founded to bring customers new solutions inspired by innovation. After withdrawing from partnership with Winbond in 2008, Nuvoton has headed towards digital/analog/mixed signal semiconductors business and public since September 2010, on the Taiwan Stock Exchange (TSE).

nuvoTon

ÖZDİSAN ELEKTRONİK IS PREPARING TO GET ISO 27001 INFORMATION SECURITY MANAGEMENT SYSTEM CERTIFICATE



Özdisan Elektronik is preparing to get ISO 27001 Information Security Management System Certificate. Institutions and organizations need to obtain an ISO 27001 Information Security Management System Certificate in order to document the information security management systems they have established to ensure the confidentiality, integrity and accessibility of their information. In this direction, Özdisan Elektronik arranged their systems made the necessary investments. Employees got training about the certification and completed the necessary steps.

Özdisan will have ISO 27001 Information Security Management System Certificate after the audit of accredited institutions.



COMPONENT MAGAZINE IS AT TURKCELL DERGİLİK



Component magazine, which was prepared by Özdisan Elektronik and address to the sectors of electric, electronic and automation, is now at Turkcell Dergilik.

You can easily access the new and old issued prints of Component magazine by using the application, which offers a comfortable reading experience with user-friendly interface. Component magazine, notify the latest informations on electric, electronic and automation sectors. You can also read interviews with expert people in their field which also offers you enjoyable time with knowledge. Articles are written by Özdisan expert team and also shows you the looking way of the company for new horizons in electronics.

NEW INVESTMENT TO THE ALUMINIUM HEATSINK DEPARTMENT

Özdisan Elektronik increased the capacity in heatsink department with new investments. After the investment, Özdisan became highest capacity heatsink supplier in Turkish Electronic market.

Özdisan has;

- 3 pieces ARES SEIKI double table and 3-Axis machining ability
- 1 piece ARES SEIKI double table, double divisor with 4 axis machining capability
- 1 piece QUASER MV 204 C, with 1400x700 table dimensions and 3 axis
- 1 piece TOPPER MV 510 C, 3 axis
- 2 piece full automatic, 1 piece manual slicer
- 1 piece ultrasonic washing station with INTERSONIK brand

With an average production of 25 tons per month, the Özdisan Elektronik cooler department will continue to develop and grow to meet the needs of the industry.



ÖZDİSAN NEWS



ÖZDİSAN ELEKTRONİK IS 38 YEARS OLD

Özdisan Elektronik celebrated its 38th birthday at Ataşehir Silence Hotel. The event that the group companies employees gathered by Davut & Mustafa Yurttaş brothers and their precious wives Deniz & Beste Yurttaş.

In the evening, which was introduced and compered by Hakan Bilgin, hosts have experienced pleasant moments with Doğanay and İstanbul Orchestra's

performance. Later in the night, Hakan Bilgin, invited Mrs Şadiye Yurttaş to share her feelings and memories about her sons Davut and Mustafa Yurttaş.

The last speeches were made by Mustafa Yurttaş and Davut Yurttaş. Davut Yurttaş expressed his happiness of celebrating 38th anniversary of the company by telling the stages they passed through. Mustafa Yurttaş expressed his gratitude to all the employees who participated in the evening and the importance

of being a family and the role of the company in coming today.

After the speeches, Mehmet Celal Şahin, general director of Savior, Özdisan deputy general managers Fatih Duran and Okan Abdi, and all employees were invited to family photo.

All employees enjoyed all the night and promised to be more succesful in next year.



ÖZDİSAN ELEKTRONİK IS EXPANDING IT'S ELECTRONIC DISTRIBUTION NETWORK

As being Turkey's the largest electronic component supplier and market leader for many years, Özdisan Elektronik is continuously expanding its broad line card with new suppliers while continuing to provide best-in-class service. Serving as the official distributor of the world's leading manufacturers, the company supplies components at the most affordable prices to local producers.

CREE

CREE ranks 1st in world in High Power LEDs with 40% market share and 2nd in COB LEDs with 15% market share. Wide range of CREE products are available in Özdisan local stocks since the official distribution agreement signed in 2016 and served together with Özdisan's expanding product portfolio for the lighting market.



COREMASTER

Coremaster is Taiwan based company produces



many different types of electronics components, such as power inductors, EMI ferrite core, chip inductors, ferrite inductors, ferrite chip bead, EMI core and RF chokes in their 5600sqm plants located in JiangXi and Guangdong. All of the products are certificated with RoHS and submitted for test, verify and complete SGS reports. Özdisan Elektronik and Coremaster has signed a distributorship agreement at the beginning of 2017.



GOSUNCNWEILINK

GOSUNCNWeilink is a group of companies that develops and manufactures wireless communication modules that communicate over the simcards of state-owned ZTE group, which is amongst the largest RF developer companies in China. As well as 2G that is regarded as old technology, company's product range includes 3G, 4.5G, and latest technology LTE-NB IoT. GOSUNCNWeilink has more than 12 years experience in research and development of modules communicating via simcard. Fully aware of the technology advancement in the direction of wireless communication, Özdisan Elektronik has signed a distributorship agreement with GOSUNCNWeilink Company. As a result, Özdisan Elektronik started to deliver both GOSUNCNWeilink products and after sales technical support services.



LIFUD

Founded in 2007, LIFUD is one of the largest LED Driver manufacturers in China. The 7W-80W LED drivers that company produces have UL, FCC, ROHS, CE, ENEC, CB, TUV, PSE, RCM and CQC certifications. Özdisan Elektronik signed a distributorship agreement with Lifud in early 2007.

SAMYOUNG

Established in 1968, South Korea-based Samyoung has a production capacity of 538 million aluminium electrolytic capacitors and aluminium polymer capacitors per month with 1650 employees and 2 factories. Samyoung is supplier of Arçelik, LG, Samsung, Cisco, Thyssen Krupp, Hyundai and many other giant manufacturers.



UTC

Taiwan based Unisonic (UTC), founded in 1990,



is one of Asia's leading integrated circuit producers and produces ICs, Diodes and transistors for the electronic card manufacturers in the TV, satellite receiver, lighting, white goods and electronic meter industries. In recent years, the company is taking firm steps forward to becoming one of the leading companies in the industry in the production of Power Management, Amplifier, Comparator, Analog Switch, Hall IC, Special Application IC, Login IC, Transistor, Mosfet, Triac, SCR and Diode. UTC signed the distributorship agreement with Özdisan Elektronik in the second half of 2017.

ÖZDİSAN NEWS

AWARD FROM ÜMRANIYE MUNICIPALITY TO ÖZDİSAN

Municipality of Ümraniye arranged a ceremony to award the companies which support "Recycling for Fidelity of Nature" in Municipality of Ümraniye Culture and Art Center on 16th of March 2018.

Minister of Education Dr. İsmet Yılmaz and Mayor of Ümraniye Hasan Can congratulated and awarded the companies that gives their support to packing, battery, oil and paper waste prevention.

Özdisan Elektronik has been awarded with a plaque as one of 63 eco-friendly companies that dispose wastes to municipality and had a great role in saving 152 thousands of trees by recycling.

Import & logistics Manager Sena Yılmaz, purchasing & e-commerce department manager Alper Ertorun and Aliye Toker joined to the ceremony on behalf of Özdisan Elektronik.



SHENZHEN DMY IS CREATING A SAFE ENVIRONMENT FOR CORPORATE GROUPS

Shenzhen DMY Consulting Trading Limited was found in 2015 in regards to the growing trade relations of DMY companies with Chinese and Eastern markets. Chinese DMY presence was first seen when partnered with Chinese TFT producer SAT and entered a new phase when Tamer Kaplan was appointed as the official representative to China. Founded in the city of Dongguan where their partner is located, a year later it was moved to Shenzhen, which is in the position of the centre of electronic components, with Özdisan concentrating on coordination of Chinese and Hong Kong purchases. According to local law the company changed its name to Shenzhen DMY Consulting Trading.

As a result of the government policies, the difficulties that Turkish citizens are having on visa and travelling, in a short span of time the presence of Shenzhen DMY has become more important. Aiming to create a safer environment for corporate groups in harsh market conditions, with a team of seven, Shenzhen DMY intends to offer other companies its expertise and potential it has developed over a long period.

Focused on improving by creating a safe working environment for both Chinese and local suppliers and buyers outside of China, Shenzhen DMY is also interested in trade movement towards China. However, considering



the tough climate, they are trying to keep focus and aim to grow gradually.

Logistically allocating their Hong Kong branch, Proxima Electronic, Shenzhen DMY is keeping utmost care on client and supplier satisfaction, environmental mindfulness and their employee satisfaction along with service and product quality.

ÖZDİSAN & PANASONIC COOPERATION IS OVER 20 YEARS

Özdisan has been distributor of Panasonic for electromechanical components in Turkey more than 20 years.

Özdisan and Panasonic visit customer together and help customers for the new projects. The most important support is to keep stock and provide technical solutions.



ÖZDİSAN PARTICIPATED EXHIBITION IN MOROCCO



Özdisan had an succesful exhibition in ELEX ECPO in Casablanca.

Many visitors had the chance of seeing new products, leds, pcba solutions,as well as the heatsinks.



Özdisan will participate to ELECTRONICA 2018 in HALL C4.410. Özdisan increased the booth space to 100 sqm and have many new products and solutions to offer worldwide customers.



Özdisan signed distributorship agreement with Isabellenhuette.

Isabellenhuette is one of the world's leading manufacturers of electrical resistance and thermoelectric alloys for temperature measurement. Leading power electronic component supplier Özdisan in Turkey, will help its customers to meet these high reliable power resistors.

SHOWROOM



2.7 INCH WEF012864Q (W/FRAME)

OLED screens have many advantages comparing to standard LCD and VFD technology. OLED does not need a backlight due to it reflects the light itself and has viewing angle up to 175 degrees. They have very short responsive time and high contrast rate at high brightness. OLED screens have a sunlight readable feature and low power consumption. This WEF012864Q display has built-in SSD1309ZC controller IC and it communicates via 6800/8080 8-bit parallel, I2C and 4-wire serial interface. WEF012864Q model is a COG OLED; it can be used as an alternative of TAB type WEX012864L that had EOL in 2016.

PANASONIC PA-N SERIES RELAY

Panasonic, a worldwide leader in Relay Products, has modified the internal structure of the PA-N Series Relay to improve its breakdown voltage from 2,000 V to 3,000 V to make it compatible with the new PLC safety standard IEC61010.

It is essential that industrial equipment utilized in factories needs to be secure, reliable, and perform strongly during the time of use. The PA-N Series achieves a high breakdown voltage of 3,000 V, as well as showing excellent shock resistance and low power consumption. They are suitable to switch maximum of 5A at 250Vac and 30Vdc and help PLC (Programmable Logic Controller) manufacturers in the development of new products that are compatible with the new standards.



LIFUD LF-GIFXXXYA SERIES

Lifud has expanded its new generation flicker-free, LF-GIFxxxYA series LED drivers family with 50W and 60W output power options. LF-GIFxxxYA series offers a flicker coefficient of less than 0.5% and can achieve up to 91% efficiency with its patented design. It has ENEC, CE, CB, TUV, RCM, SAA and CCC certificates and continues to making use of press-button shell design to save user's installation time and cut down labour cost. With stand-by power less than 0.3 W, this series meets the ERP standards when being assembled with the LED lighting fixtures. The LF-GIFxxxYA series is offered with 5 years warranty as in many products of Lifud and with its compact design, it offers the perfect flicker-free drive solution for LED panels, recessed ceilings, ray spot and similar applications.



EXCELITAS LOW POWER MOTION SENSOR PYD1698

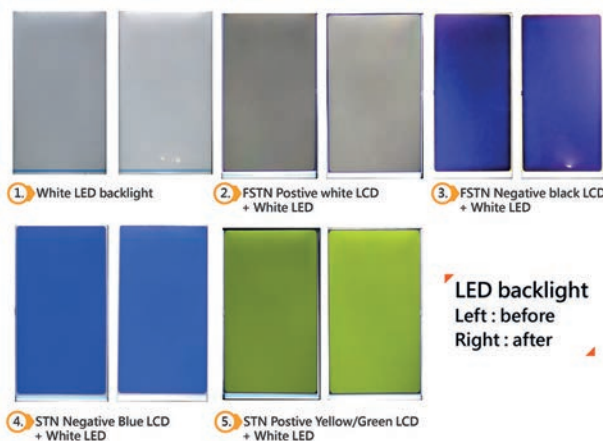
PYD1698 Low Power Pyro sensor has created for consume deeply low power applications. The most important feature, which PYD1698 has, is it can work Wakeup interrupt mode. With this feature, unlike the traditional ways PYD1698 don't need regular control via MCU. When PYD1698 settled one time, it will only wakeup when it catch movement which you already set. There is internal register, which you can set different parameters into the pyro sensor one time. The other important feature is pyro threshold parameter. Traditional pyro sensors give us standard value. We need to process this value into our MCU code. In this way we can set distance of the sensor. But, in PYD1698 when you set internal register threshold value one time. It will only give interrupt when movement match with threshold value. In this way you can decide sensor distance easily. PYD1698 has internal temperature sensor, which can sense ambience temperature.

This value can use for optimizations. Voltage range is between 2.5V and 3.6V. Current consumption is 3uA when power supply is 3V. Özdisan Elektronik has internal R&D support team, this team helps customer's R&D using this kind of products. For this purpose Özdisan Elektronik R&D support team has created little development kit, which include PYD1698. In this way customers can test and implement in their systems.

This development kit has 1pcs PYD1698, 3pcs 3528 LED, 1pcs lens for PYD1698, 1pcs Elan Mcu, 1pcs CR2032 battery. In this development kit when there is no movement in the field power consumption is 4.8uA. When it calculated with CR2032, which have 220mAh it, will work approximately 5 years. Özdisan Elektronik R&D support team can share technical documents, PCB schematic and C codes with customers. For further information please contact ts@ozdisan.com



BACKLIGHT LED BRIGHTNESS IS INCREASED IN WINSTAR LCD MODULES



Winstar company which is one of the leading companies in the sector with its long years of experience in the production and development of high quality industrial LCD displays such as OLED, STN, LCM/STN/TN, COG LCD, VATN-LCD, TFT is increased backlight LED brightness in LCD modules.

With this upgrade, brightness of LCD modules will increase approximately %10 - %40. Especially, there will be more noticeable difference in LCD negative mode products. For current users, there will be no need to change any hardware or software in their current design.

SHOWROOM

LES - LESR - LKSR - LPSR - LXS - LXSR

- Single power supply 0V, +5V
- Isolation test voltage:
4.3KVRMS / 50 Hz / 1min
- Close loop hall effect, ASIC patented technology
- Working temperature range:
-40°C to +85°C and +105°C
- Voltage output
- Fast response time <0.4us
- LXSR & LESR & LKSR & LPSR:
extra referenced pin output
- LPSR & LKSR: For high isolation, 4 pin
primer architecture it support more yield and clearance distance (9.9 mm)
- LPSR: Over-Current protection output feature
- LXS & LXSR: Primary integrated conductive and diaphragm



SECURE TOUCH WITH PANASONIC SWITCHES

Panasonic high quality switches can be used in many sensitive applications. These switches can support different options like dimensions, shapes, terminal and pushing force.

Light touch series give best options for selection in applications. Some of the key specifications are low contact resistance, low-level noise, high contact reliability and sharp touch sensing.

Özdisan supports their customer demands in light touch switch with, Panasonic brand and stock availability.



NO MATTER HOW YOUR COFFEE IS, WINSTAR TFT IS READY FOR YOUR CHOICE

Model No: WF18FTLAADNNO

- **Display Format:** 128 x 160
- **Size:** 1.77"
- **Viewing angle:** 6H
- **Communication:** MCU
- **Controller IC:** ST7735S
- **Control Board:** No
- **Brightness (cd/m²):** 500
- **Frame Through Hole:** No
- **Touch Screen:** Without touch screen



GAOSONG DGC-13 ELECTRIC VEHICLE CHARGING PLUG

- Compatible with GB / T 20234-2015 Standard
- Easy to handle
- Temperature monitoring
- Safe charging
- Anti-Touch
- High Reliability

SATOZ 2.4" TFT

SATOZ is offering new 2.4" TFT solution for small size industrial applications.

Product features

- 320x240 resolution
- 400 cd/m² Luminance
- RTP and CTP touch option
- Connection with 0.5 mm pitch FPC connector
- Included ST7789V driver IC
- 8 bit parallel data interface
- Internal RAM and TFT driver hardware



TFT SOLUTIONS FOR WHITE GOODS

Winstar is one of the leading manufacturer in the LCD/TFT sector. Winstar has long years of experience in the production and development of high quality industrial LCD displays.

Now bar type TFT solutions are available for White goods application. Designers can choose TFT alternatives with the range of 3.9", 5.2" and 12.3".

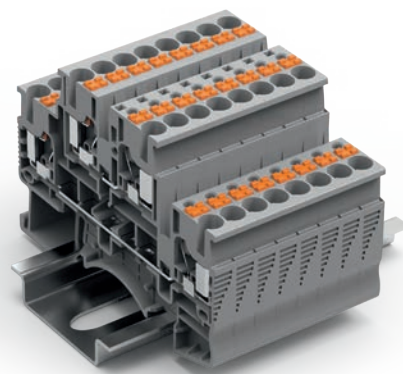
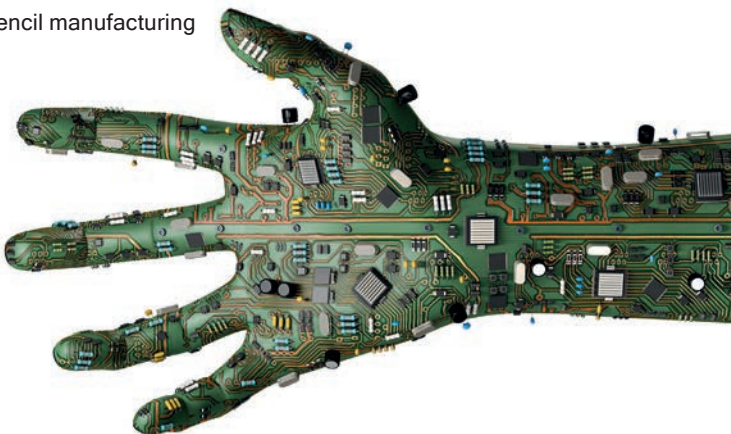
SHOWROOM

OWNLON

High quality, competitive prices, reliable manufacturer

Specifications:

- Production up to 22 layers
- %100 e-test control
- Automotive certification (TS-16949)
- Leadless / ROHS production
- 23 years over experiences
- Focusing FR4 & metal core PCB production
- Expert support
- Stencil manufacturing



GAOSONG

Part Number: Dskk2.5

- Push-in structure, easy to connect
- Two in two out, double layer structure
- Wire range up to 2.5mm²
- High current and voltage level option available.

GOSUNCNWELINK MG2609

GosuncnWelink the New Generation GSM/GPRS (2G) Module

GosuncnWelink has combined high performance with competitive price with its 2G module.

- 77-pin, LCC package
- Connection type: GSM/GPRS
- Dimension: 17.6 mm x 15.7 mm x 2.3 mm
- Frequency Band: GSN850 / 900 / 1800 / 1900 MHz (Quad-Band)
- Internal GNSS (GPS / GLONASS / Galileo): Optionally
- Embedded TCP / UDP / PPP / HTTPS / SSL Protocols
- Easy design with AT commands
- M2M applications
- Industrial working temperature (-40°C ~ +85°C)
- Support analog output





GOSUNCN WELINK ME3616

New NB-IoT Module of GosuncnWelink

GosuncnWelink the introduction of the new NBA-IOT module will cover a large part in the Turkey market at an affordable price.

- LCC Package
- Uplink 66 Kbps / Downlink 34 Kbps
- Dimensions: 16 mm x 18 mm x 2.3 mm
- Frequency Band: NB-IoT, B1, B3, B5, B8, B20, B28

- Internal GNSS (GPS / GLONASS / Galileo): Optionally
- Embedded TCP/UDP, HTTP, PPP, CoAP, OMA, LWM2M, MQTT Protocols
- Easy design with AT commands
- M2M applications
- Industrial working temperature (-40°C ~ +85°C)
- Support E-SIM technology, optionally.

NUVOTON

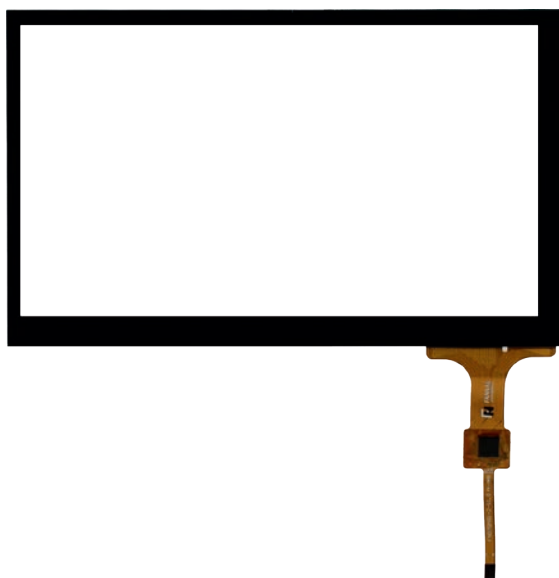
Nuvoton 8051 Family;

Nuvoton Company has started MCU production with 8051 family. Unlike traditional 8051 design, Nuvoton implement different feature into their 8051 design. By this way Nuvoton is one step ahead of its competitors. Nuvoton has cost effective 8-bit 8051 based microcontrollers with rich peripherals and flash sizes.

N76E003 MCU's main features are:

- 2.50V to 5.50V voltage range
- 18 Kb flash memory
- Up to 4 Kb EEPROM shared with flash
- 8 channel 12 bit 400 khz ADC
- 6 channel 16 bit PWM
- 2 channel UART
- Low power consumption <5uA

N76E003 is used many different applications such as; Access control systems, Thermostat, Bluetooth applications, Electricity meter, Data loggers, Battery chargers.



FANNAL FN070A01-V1.0 OFFERS HIGH ACCURACY

Fannal is a 10 years experienced manufacturer on capacitive touch products. Fannal FN070A01-V1.0 product offers high accuracy and reliability.

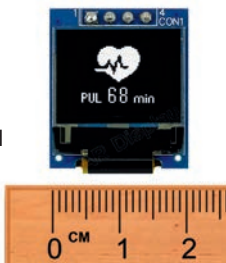
Product Specification:

- Compatible with 40 pin and 50 pin 7" TFTs
- G+G structure, 0.7mm cover glass
- 5 finger multi touch feature.
- High accuracy with internal CYTMA568 IC
- I2C interface
- %87 light transmittance
- Working temperature -20C +70C
- Working voltage 2.8V-3.3V

SHOWROOM

WINSTAR OLED DISPLAYS

0.66 " WEA006448A OLED module is used in industrial devices, smart home applications, portable devices, medical devices and measurement applications.



Part Number:

WEA006448A: Dimensions

Dot Matrix: 64 x 48 Dots

Module Dimensions: 19.9 x 23.1 x 2.4 mm

Active Area: 13.42 x 10.06 mm

Pixel Size: 0.185 x 0.185 mm

Pixel Range: 0.210 x 0.210 mm

Display Mode: Passive Matrix

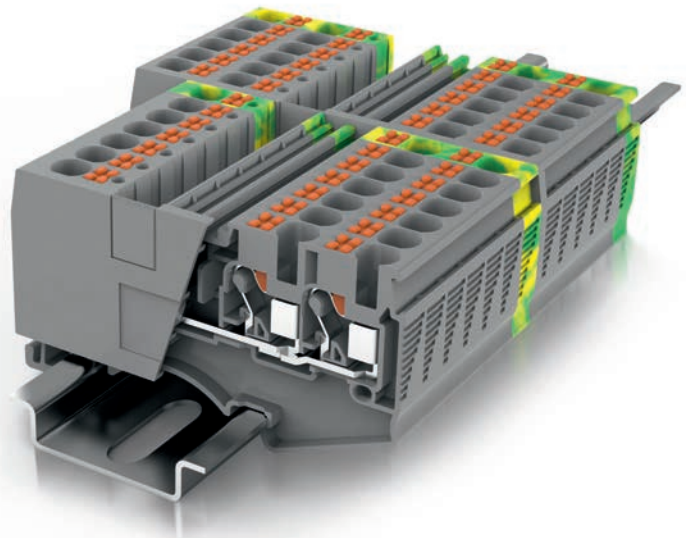
Color Options: White

Drive Duty: 1/48 Duty

IC: SSD1306BZ

Interface: I2C

Size: 0.66 inch



GAOSONG DS4-QU/TW/DS4-QU/TW-PE

- Push in spring technology, two input and one output.
- Compact design and front entry make it possible for wiring in enclosed space.
- Protecting earth function is available.



PANASONIC ALZ-N

- Panasonic EN60335 - 1 GWT suitable small dimension power relay
- 12.5(W) x 28.8(L) x 15.7(H) mm
- 16 Amps Slim relay

Usage Areas;

- Electrical household appliances (Refrigerator, Washing machine, Dishwasher, Vacuum cleaner, Kitchen robot, Coffee machine)
- Industrial applications (UPS, Power Analysers, Multimeter)

7TH GENERATION MODULE DUAL XT AND PREMIUM DUAL XT

Dual XT series main features;

- 7G IGBT & FWD
- New internal layout
- Higher reliability
- Improved silicone gel
- Solder or Mini press-fit pins
- More power, lower losses

Premium Dual XT series main features;

- 7G IGBT & FWD
- Advanced bond wire design
- High thermal conductive ceramic substrate
- Package material with CTI > 600
- Viso = 4kV
- Improved silicone gel
- Solder or mini press-fit pins
- High power density



OLED MODULES, PASSIVE MATRIX OLED, OLED DISPLAY PANEL, OLED DOT MATRIX DISPLAY

Winstar provides a wide range of standard passive matrix OLED (PMOLED) / OLED dot matrix display and custom design Character OLED modules, Graphic OLED displays and OLED display panels. Mechanical structure includes Chip on Board (COB), Chip on Glass (COG), and TAB (Tape Automated Bonded) types. Customers can upgrade applications from STN LCD to OLED displays easily.

Winstar OLED modules are featured with all the important advantages:

- Faster response time
"At +25 °C 10 μsec."
- Unlimited viewing angle
"Up to 175 degree"
- Thin - No need of backlight, self emitting
- High Brightness
- High contrast ratio "Up to 2000:1"
- Wide pperation temperature
"-40 °C~ 80 °C"
- Lower power consumption

Winstar Passive Matrix OLED Modules are perfect for wearable devices, hardware wallet, E-cigarette, white goods, smart home applications, IoT System, medical system, industrial instrument, DJ mixer, car equipment, car dashboard, car audio, car clock, car door display system, water ionizer, sewing machine, meter, ammeter, instrument tuner, external

hard disk, printers...etc. The OLED standard colors are white, yellow, but options are available in green, blue or sky-blue (some colours or models might have MOQ).

We provide many solutions such as I2C OLED display, SPI OLED display, SSD1306 OLED display, micro OLED, mini OLED display and OLED touch display.



WE ARE AMONG GLOBAL PLAYERS

Özdisan Elektronik was laid the foundation by 2 brothers in 1980, had produced redresser, regulator and uninterruptible power supply during first times. Afterwards, the company has started import and export activities for electronic components. Now, Özdisan is in the leading position of component distribution in Turkey. Mustafa Yurttaş, the general manager of Özdisan, carried out evaluations of the sector by telling the new aims and investments and growing process.

Could you please mention about yourself?

I was born in Samsun in 1960. We have moved to İstanbul in 1966 as a result of my father's occupation and he realised the future in the city. That is why I continued my education life in İstanbul. During summer vacation I was working with my father. I started to have an idea and experience about business life. On the other hand, I was playing in İstanbul Sports Club as I had passion and talent for football. I found myself in business life at the age of twenty with the encouragement of my father while I was having my language education. Myself, my brother Davut Yurttaş and one of my friend who is a German engineer started a new business life with a new company investment.

How Özdisan Elektronik was founded?

We have established Özdisan Elektronik in 1980 with the idea of a company that supplies sector requirements. We



ÖZDİSAN ELEKTRONİK
GENERAL MANAGER
MUSTAFA YURTTAŞ

started activity on basement of Old French School (Freres Saint Pierre) in Galata İstanbul. By analysing the needs of sector, we have achieved significant growth in a short period of time. With the growth of commercial activities we moved the center of company to current place in Dudullu.

We divided company into two sections in terms of production and commercial activities. Inform Elektronik undertook production side and became a leader in uninterruptible power supply manufacturing.

Özdisan Elektronik took the responsibility of commercial side. Currently, Özdisan supplies; semiconductors, active, passive and electromechanical components, PCB, PCBA as well as Aluminium heatsink. Many type of heatsink is produced in its own facilities.

With all these activities, Özdisan keeps its leader position in electronic component supply sector.

In 2010 Inform was acquired by Legrand and group has started to invest in many different sectors and companies.

Could you please inform about your group structure in Turkey?

Özdisan operates under the DMY Group, which consists of 32 companies. 11 of these companies are in solar energy industry.

DMY Group operates in different kinds of industries such as electricity, electronics, energy, automation, marine, medicine and tourism. With the group synergy and experienced management, 6 of these companies started export activities. We aim to enlarge



all group companies to a significant level in local and international market.

What are the prior sectors that Özdisan focus on?

Özdisan's priority is introducing newest technologies with Turkish electronic sector. As electronics are merged with all other industries, these

new technologies are spreaded out to all sectors.

Unfortunately there is no production of semiconductors in Turkey. We have to supply these semiconductors from American, Japanese, Taiwanies, Chinese, and European companies.

We support electronic device manufacturers by supplying these components with good service and price. We focus on manufacturers, universities, R&D offices.

Can you mention about your E-Commerce investment and expectations?

As Özdisan, we try to keep up with digital age and try to make serious investments in this field. We analysed that electronic market needs this E-Commerce platform and started to work 3 years ago to have a good homepage and E-commerce platform.

We examined the existing E-Trade portals which are already in market and take the good points and developed a new platform for our customers. The new portal that we made is full of technologic informations.



In order to make better homepage and portal we keep 300000 to 400000 usd budget for web expenses.

We reached more than 165 countries in E-Trade. We have more than 100.000 products are with their data sheets in web-site. We aim to reach 500 000 electronic product in a short time.

One of the most important point is many of the components can be supplied from stock. Thanks to logistic team regarding same day shipping for many orders.

2017 we established aluminium processing and production factory in Dudullu. I think that the needs of heatsink in electronic sector will be supported by this facility. We started to supply huge amount of heatsinks for local market and will also start export soon.



Can we get information about your foreign investments?

Özdisan invested to TFT sector with have a share of a Chinese TFT manufacturer company SAT. The company renamed as SATOZ and make a big development in its field. SATOZ supplies TFT's to market from 2.8 inch to 12,1 inch. After the second factory investment, the production capacity reached 30 million pcs annually.

In 5 years the sales amount increased from 28 million \$ to 90 million \$. Many of European manufacturers started new designs with SATOZ products.

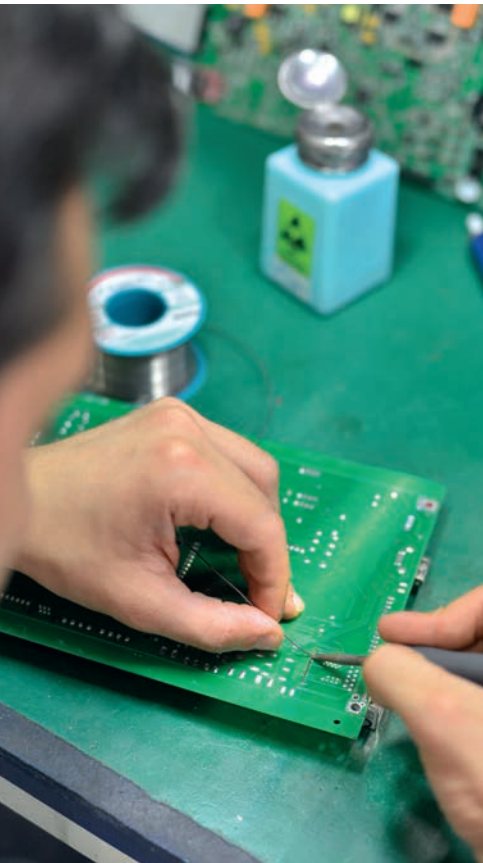
SATOZ planned to produce Capacitive Touch Panels (CTP). This product will also have a big demand in near future with the developments in smart homes. Within next years we also want to invest in UK, Spain, Greece, Portugal and Bulgaria.

Could you mention about Özdisan Elektronik with numbers? Facilities, endorsement, sales, numbers etc.

Headquarter is located in Ümraniye / Istanbul. There are 250 employees in Özdisan including branches in Ankara, İzmir, Bursa and Karaköy, which is in the European side of Istanbul. Özdisan reached over 90 million \$ turnover and aim to reach 250 million in 2023.

We invested more than 1.5 million \$ in E-trade and we expect to reach every country who needs electronic components.

We make business with many different countries. While our export is consist 2% of our annual turnover, we guess that this rate will reach to % 20 this year. Next years we aim to reach minimum 30% of sales with export sales.





**"We provide
the best affordable
price goods to
industrialists that
they can reach."**

What are your advantages compare to your competitor?

We supply good quality products as well as with price advantage. Özdisan keep stock for customers and serve from stock while competitors promise long delivery times.

Özdisan culture is to keep reliable quality and service to customers. Our customer can visit our home page to get technical information stock level and prices. This is really a good advantage for customers to find every needs in one portal.

Can you analyse electronic sector and companies? What is the main problem in this field?

Most important problem of the sector is to supply of raw materials for productions.

Although electronic industry is the most foreign dependent sector in terms of raw materials, it has an important role to support employment in Turkish industry. When we look at electronic market, we can see there are three kinds of company groups.

Big companies whose numbers can reach to 10 or 20 (like ARCELİK, VESTEL, ASELSAN etc.) are dominating market with %70. These companies become a role model with their employment and sub-industry sources in Turkey.

In industry there are many small and mid size companies with 5 to 150 employees. These companies have a share of %20-%22. They have dynamic and creative structures. Some of them have a semi professional management, and some are boss oriented.

The rest of the companies in industry are very small size and R&D companies. These companies needs more support from the government.

The most important problems of small and mid size companies are

- Owners do not leave the management of companies to professional people.
- Insufficient fund. Financial structure.
- Forget market size and compete each other just with price.
- Not to have any proper plan for investment and production.
- Lack of experienced workers and insufficient training.
- Resistance to become Professional in management.

The companies who analysed and try to find solutions can survive in industry and have a chance to become bigger. Small size and R&D companies are more lucky as they can find "Angel Investor", when they work on new designs.

Unfortunately many of them can not be successful and stay as small company in industry.

SUPPORT OF OZDISAN TO GLOBAL BRANDS

World become more digital day by day. The needs of electronic components are also increasing rapidly. Özdisan, who is the biggest component distributor in Turkey supplies many different kind of components for manufacturers not only in Turkey also for Europe and Asian market. Recent years the needs of Capacitive Touch Panels, GSM Modules, TFT's, HDI PCB, Presence Detection sensors, Low Power Microcontrollers and Batteries increases. The Deputy General Manager for Özdisan Mr Okan ABDİ, shares informations with Component By Özdisan Magazine.

How do you see the Global Electronic Market

We can see electronic in every part of human life. With the new electronic revolution industry 4.0 and IoT the needs of electronic components increases. The machines can talk each other and supply the needs by artificial intelligence.

The more digital life and smallest electronic components are indispensable of Electronics. More lighter and more efficient designs are getting more important. Software is getting popular as hardware designs.

What can you say about electronic market in Turkey?

The demand of electronic components in Turkey is increased recent years. Especially in medical, smart home, automotive sectors are dominating the market.

What is the market share of Özdisan in Turkish market?

Özdisan is the biggest distributor in Turkish market. Özdisan has more than 60 companies distribution in Turkish market. Özdisan supports more than 5 more 3 thousand customers with his various kind of electronic components.

What is the industry trends?

As i mentioned before more digital, more smaller designs are leading the market. Combination of low power is a must for the new designs.



ÖZDİSAN ELEKTRONİK
DEPUTY GENERAL MANAGER
OKAN ABDİ

Recently the image of the products is also very important. Every device needs a vision. Nowadays TFT displays and OLED s getting popular.

The owners of Özdisan made an investment in China for TFT and get %40 of a Chinese TFT manufacturer. TFT factory SATOZ which is located in Shenzhen produces 28 million pcs of TFT annually.

What makes Özdisan powerful in distribution

Özdisan is %100 Turkish owned company. Özdisan serves its customer more than 38 years in electronic field. Keep stock and sustainable product quality give customer confidence. Özdisan is not only a distributor but also a solution partner for the customers.

Özdisan have 5 field application engineers to support customers. The customers can have solution for PCB, Electronic Component and PCBA from one roof as using Özdisan support.



How do you see lighting market in Turkey?

Leds are every where. As the need of energy saving is increased the usage of leds has to increase. Lighting market in Turkey is not improving as it is in worldwide. The starting costs are still high for led designs. If the prices

go down like this the usage will keep increase. Özdisan is supplying Cree and Seoul semiconductor leds to market. Beside this we also supply various kind of lenses according to customer needs.

How do you choose a new brand and product for distribution?

Özdisan is very well know company in Turkish market. Özdisan means availability, trust and quality. When we look for a new supplier, the most important thing is quality. We choose products with high quality and keep this quality continuously.

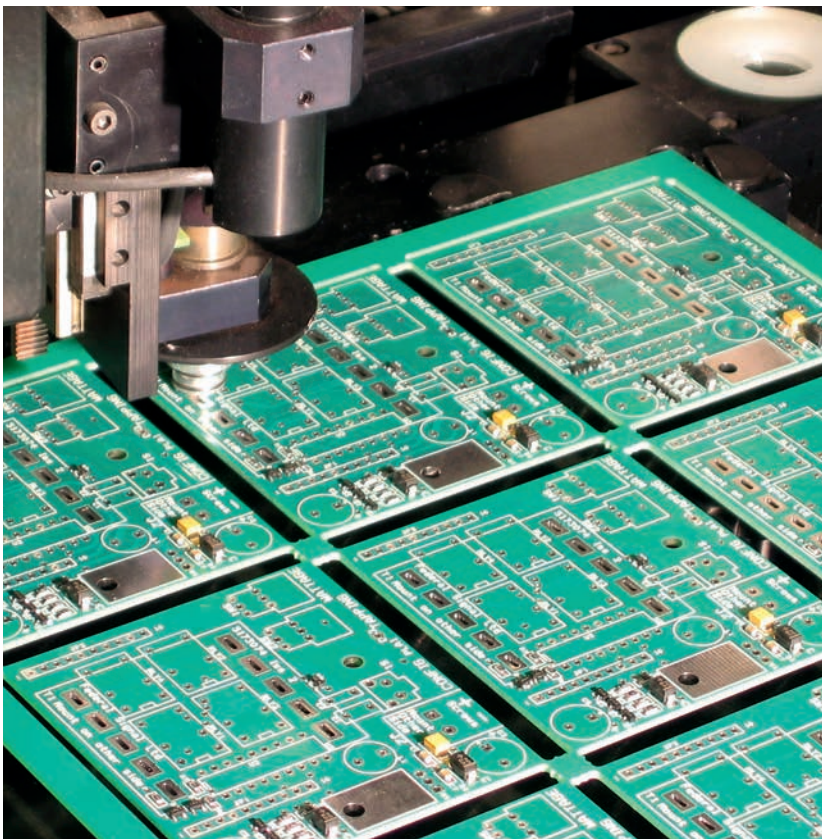
Which companies are added in distribution line recently?

We started to distribute products of NUVOTON, FANNAL, LIFUD, COREMASTER recently.

What is your vision for E-Trade?

Last 2 years Özdisan started to make E-trade. We have many customers from worldwide. Everyday we have new customers who are registered to system and check and buy components online.

We supply more than 200k components and want to reach 500 000 type of components in next 2 years. With E-trade Özdisan reaches the needs from local to global.



ELECTRONIC COMPONENTS

SUPPLY IS SUFFERING FROM ALLOCATION

Electronics industry is evolving rapidly. All products around us change the shape and become more boosted technology. Rising of electronics sector, increased the demand of all components and manufacturers can't catch up the demand growth rate. Many manufacturers have announced extended lead times and products on allocation. We had an interview with Mr. Gürkan Akçay who is the Deputy General Manager of Özdisan, about allocation problems on electronic components and his suggestions to customers how to manage component supply depends on his 23 years of experience at Özdisan.

Electronic components supply is suffering from allocation 23 years is really long time. What are advantages of working such a long time at same company?

The biggest advantage is, you totally understand the company culture and can control every process inside company. Moreover you have the chance to know every customer and supplier of the company which brings a considerable experience. By company side, I hope to convey my experience to my colleagues as best as I can.

What would you like to tell about your sales and marketing strategies?

Our main strategy is following up innovations, exhibitions and new product releases closely, to be able to serve new products to the market earlier than any competitors with better service. Electronics is an industry rapidly expands and evolves. We need to adapt ourselves to the speed of its change. To be permanent at the market, doing great sales and great marketing alone is not enough anymore. You need to give great support also by acting as a partner of customers and giving technical support at every stage of their production.

Well, during all these activities what is your priority on focus?

We have many significant customers running big projects and doing high volume business. Our relationship with our customers is beyond a supplier, like a partnership.



ÖZDİSAN ELEKTRONİK
DEPUTY GENERAL MANAGER
GÜRKAN AKÇAY

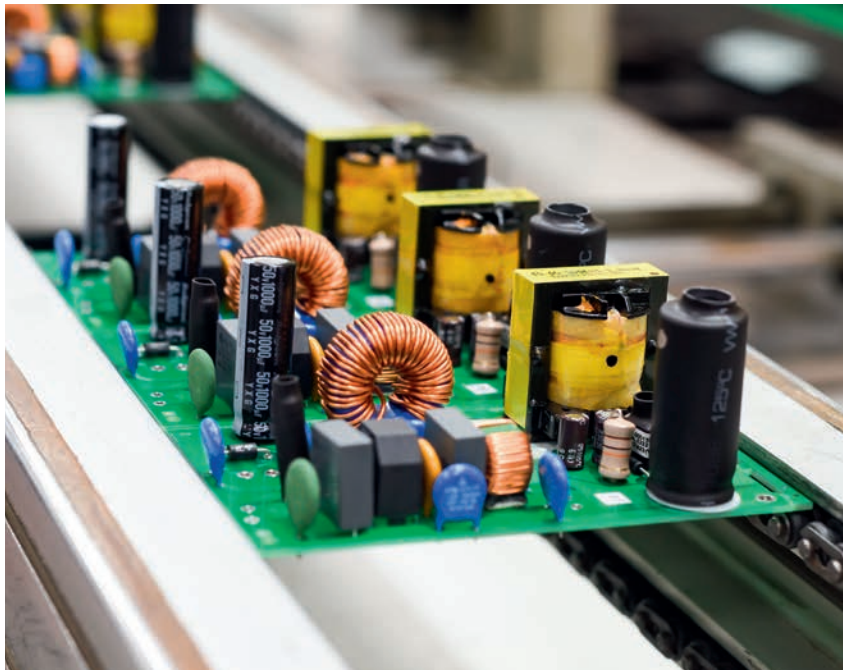
We aim to supply their all electronic components needs to save their time and labour cost which they spend when trying to collect goods from different suppliers with different lead times. We focus on bringing benefit to our customers by the best service with competitive prices.

What is the effect of Ozdisan.com on sales and marketing?

Ozdisan.com is not a component sales website only. It's a platform where new product announcements, datasheets, alternative product recommendations, online stock information, unit prices and more are presented to users. It helps R&D teams to choose not only right product by means of specification and cost, but also the one easy-to-find when the time of mass production comes. Our main purpose to create this platform was carrying Özdisan to customer's computers on their desk and offering the fastest service especially for R&D teams. According to the feedbacks from customers, we're really successful on it but it's still a developing platform. A very talented team working behind the system to be able to keep website up to date and improve by adding new features depend on customer's reviews, demands and requirements. Ozdisan.com made great job up to date, however we know we have a long way ahead and should never stop developing.

How do you see the branding concept in sales and marketing strategies?

Branding means quality, trust, continuity, fast service and reasonable price. Özdisan is a well-known brand in domestic and foreign markets. Our customers knows that if Özdisan supplies components from a manufacturer, it will be a reliable product. We also care about our employees' motivation and invest into them to maintain the best service to our customers. We encouraged our team continuously, organize trainings, sending them abroad for exhibitions, seminars or annual meetings organized by suppliers. These are some of the reasons why Özdisan is the leader electronic



"We focus on bringing benefit to our customers by the best service with competitive prices."

component distributor in Turkey. Our goal is to keep our leader position and we're really working hard for it.

Where are the most active foreign markets for Özdisan? What would you like to say about your current sales and marketing activities there?

Searching new foreign markets is a consistent progress. Regularly, we join Electronica Exhibition in Germany. We visit other important exhibition worldwide. In Greece, we've employed a field application engineer who make regular customer visits, collect customers' demands and supports them locally.

We are selling components to China, Canada, Italy, Bulgaria, Egypt, Germany, England, Singapore,

HK, Greece, Russia and many other countries. We suppose our foreign sales will increase a lot due to global supply demand imbalance.

What are your comments about direction of electronics sector? Could we have your predictions?

Electronics is a fast growing sector globally. The role of electronics in our life is increasing day by day. Accordingly, the demand is increasing rapidly. It's sure it will never stop growing. Due to high demand coming from automotive and mobile phone markets, long delivery or shortage problems may carry on till the end of 2019. Accordingly, customers has to make long-term plans in supply. Otherwise, they might face with long delivery or no delivery or bear high costs.

Which products do foreign customers show more interest and what is the reason behind?

As of 2018, there are high demand from abroad for ICs, semiconductors and passive components. The main reason behind it is the delivery problems at these components. Beside these items, we have been regularly exporting TFT panels of our group company, SATOZ, to the Europe for 3 years.



WE SUPPLY %50 OF TFT SCREEN DEMAND IN THE **INTERCOM MARKET**

Nowadays, as the technology grows rapidly, the inventions and the systems that make our life easier, enter our life. Touch screens are one of the innovations that became an irreplaceable part of our life now. Since 1970's touch-operated systems begin being used widely with their rapidly increasing popularity in the last few years. The touch screens we used to see on some devices like the ATMs are now almost standard on mobile devices like all the phones appearing on the market. Today, from the medical devices to the home appliances, touch screens are quite widespread in all areas. With the help of the touchscreens, the improvements in the microprocessor and the microcontroller systems are letting the users interact in a more visual and voluminous manner. SATOZ, being among biggest three names in the global touchscreen market, produces touchscreens for the techno-giants. So we met with SATOZ General Manager Mr. Sherong Yuan to discuss the screen market and the general situation of the market. Mr. Yuan answered us on the future of the touchscreens and the SATOZ's expectations in 2019.



Could you tell us about the history behind SATOZ? After what kind of phases SATOZ became what it is today?

SATOZ was founded in 2003. When we look at this 15 years, SATOZ started to produce CRT tubes for intercom systems in 2003. Then in 2008, our TFT colour screen production process started. In the years following this, we developed

in the camera, the PCB-A and the touch panel production.

Could you tell us about your position in the TFT screen market and the company's importance to the market?

SATOZ is one of the leaders considering TFT screen market and has a good reputation as well as the stability. Plus our company is one of the biggest in China's private sector.



SATOZ
GENERAL MANAGER
MR. SHERONG YUAN

"I believe the intercom sector has a future full of hope as a result of the unique technological improvements and the rapid changes in our lives."

What about the annual production capacity, the personnel and the production facilities of SATOZ, could you give us some information?

SATOZ has 5 SMT production lines, 6 glass cutting lines, 10 FOG (flex on glass) lines, 20 polarizer gluing lines and 30 different assembly lines. With more than 1,000 personnel we have, we are capable of producing around 2.2 million items per month.



What are the TFT production size capabilities you already have? And if you are planning on new sizes, could you share with us what will they be?

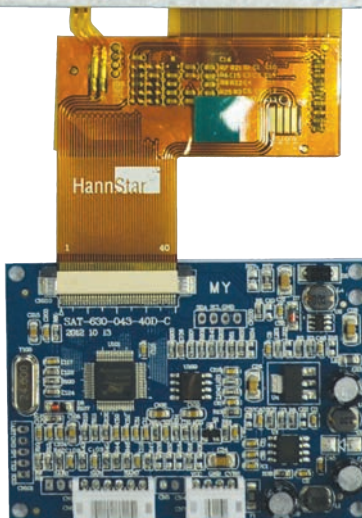
We produce TFT with the sizes of 2.4", 3.5", 4.00", 4.3", 5.00", 6.2", 6.86", 6.95", 7.00", 8.00", 9.00", 10.1". The new sizes we consider developing are 5.2", 5.5", 7.84", 9.35", 11.6", 12.2", 10.4", 13.3", 14.1" and 15.6".

Which sizes of your products are the most popular?

4.3" and 7" TFT sales are higher when we compare with the other sizes.

For which sectors SATOZ is producing TFTs and which one of these sectors has the biggest share among all?

Our products are mainly being used for the tablets, the security and the intercom systems, the vehicle navigation, consumers' electronics and all kinds of industrial applications. Among all, the intercom sector owns the biggest share. Globally, the fifty percent of the intercom demand is supplied by SATOZ.



"Our products are mainly being used for the tablets, the security and the intercom systems, the vehicle navigation, consumers' electronics and all kinds of industrial applications."



In which countries your products are being sold?

Apart from those we sell in the Chinese domestic market, our products are being sold in countries as the South America, Korea, Taiwan, Hong Kong, India, Turkey, France, Italy and Spain.

What are your thoughts about the future of the intercom market?

I believe the intercom sector has a future full of hope as a result of the unique technological improvements and rapid changes in our lives. The intercom market holds a great deal of importance in the future plans of SATOZ as well.

What are you thinking about the future of the TFT products? Will there be any new products in our lives?

In many parts of our life, we see the usage of the TFT LCD technology. As we see, the world evolves, from the main display

technology into the technologies operating with the human - machine interaction, the smart recognition and the artificial intelligence. The traditional TFT we have faces the danger of leaving its place to those more advantaged technologies of OLED, AMOLED, even the Quantum screen and the laser screen.

What about your thoughts on the active matrix OLED (AMOLED) technology? Do you think AMOLED technology will be more popular than the TN and IPS technology?

Right now the AMOLED technology is on the rise; it is likely to get involved more with devices from smart home applications to the tablets and the TVs with its usage. It will be also used for the flexible screen technology and with the super wider screens.

What would be your targets and the primary aim as a market?

In the domestic market that would be doing our best for expanding our share of the vehicle navigation and the VDR market. Also our greatest aim is to increase the imports.

What is your aim with the expanding in 2019?

The TFT technology gets a bigger share from the market day by day. For SATOZ, being one of the most important actors in the sector, the year 2018 were the year of expanding. Under this hard market circumstances, SATOZ mainly aims to stay strong and then to discover greater markets by 2019.

As an experienced businessman, how do you see the trends in trade, what would be your advice to us?

In the developing countries with their augmented capabilities, there is more and more competition between the suppliers. It is significantly important both the learning and to educate people. SATOZ will always find a way to meet the contemporary circumstances. During the upcoming period of time, the great companies are to be even greater; only way to survive is to discover and to improve continuously.

SATOZ has made a new investement for Capacitive Touch. Possible to support Capacitive Touch and Cover Glass Solutions from this year.



"As we see, the world evolves, from the main display technology into the technologies operating with the human - machine interaction, the smart recognition and the artificial intelligence."



THE IRREPLACEABLE COMPONENT OF TECHNOLOGY CAPACITIVE **TOUCH PANELS**



ÖZDİŞAN ELEKTRONİK
CHIEF OF R&D AND TECHNICAL SUPPORT DEPT.
SABRİ DAĞERİ



In this edition we will talk about Touch screens, which is inseparable component of TFT. Touch screens are an important part of our daily life, and in addition to the technological improvement in industrial applications, the need for TFT and touch screen is also increasing.

There are different kinds of touch technologies like Resistive, Capacitive, INFRARED, SAW. Resistive touch screen is first invented touch screen technology and continues to be used. INFRARED and SAW is preferred in big sizes. Capacitive touch panel (CTP) is usually preferred in small and medium sizes. For sensing of resistive touch (RTP) needs to apply some pressure with finger or any kind of material. That's why cannot put a protective glass on RTP, in other technologies don't have such a limitation. CTP can affect from high magnetic noise, they can make some false detection but RTP is more resistant to magnetic noises. Also RTP prices are lower comparing with others. Standard CTP's cannot sense with glove but with improving of CTP technology there is some CTP products that can sense with glove, even there is some products, which can work under the water.

CTPs are manufacturing separately from TFTs. After production CTP and TFT bond each other. There is two way for bonding; tape bonding (air bonding) and optical bonding. Tape bonding is a low cost application method. CTP and TFT glue each other only with double side adhesive tape on frames.

In optical bonding method CTP and TFT are glued each other with OCA, all of the layer is covered with OCA. Between two methods the most important difference is light transmission. In tape bonding

"Improvement in industrial applications, the need for TFT and touch screen is also increasing."

method there is air gap between CTP and TFT, that why light transmission is decreasing. Usually in indoor applications tape bonding is preferred and in outdoor applications optical bonding is preferred.

In some application CTP can be used without bonding.



Difference of tape bonding and optical bonding

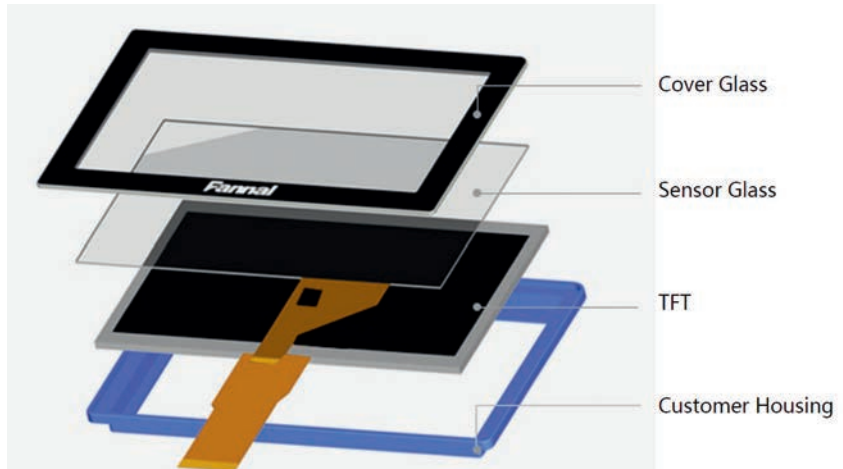


Capacitive touch on TFTs

To increase visibility under sunlight can be added some filter on CTP. The most used filter is AR (anti reflective). This filter can prevent reflection on CTP by matting the surface.

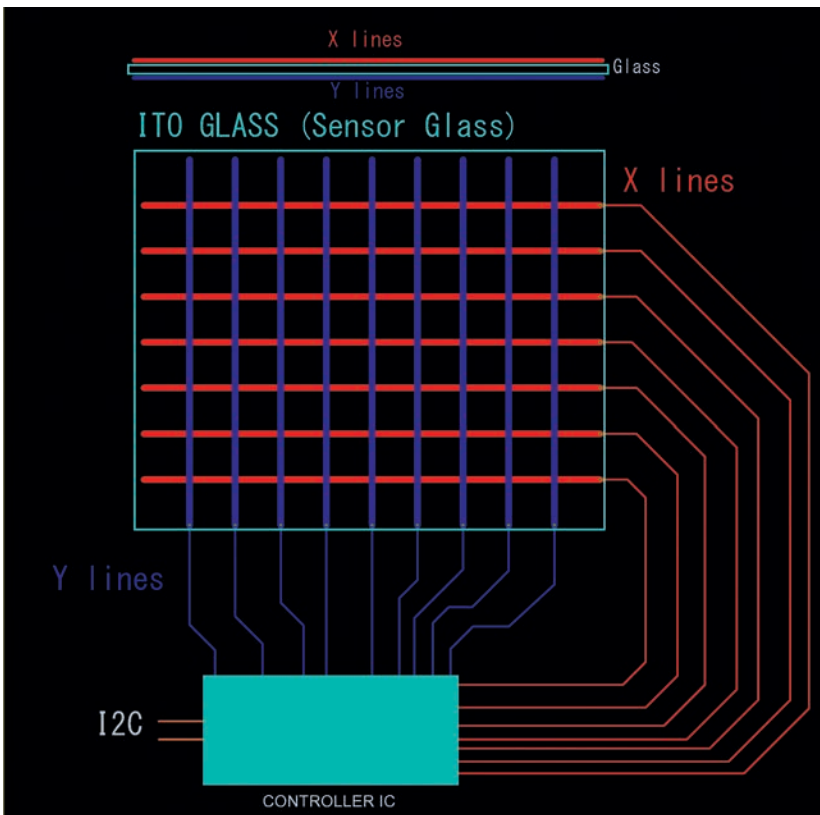
According to sensing method CTPs are divided into projected capacitive touch (PCAP) and surface capacitive touch. PCAP is being used more today. Working of CTP withstands measuring of capacitance of two conductors. When a conductor like a finger get close to two-conductor wire capacitance is changing, hereby CTP sense touch.

There is lots of different PCAP structure, we will mentioned about most used G+G and G+P structure. On one surface of glass x coordinates are drawn and on other surface of glass y coordinates are



Capacitive touch panel layers

“CTP prices are depend on technology and structure. Tempered glass or PET choice, Controller IC, being standard or custom design affects the price.”



Capacitive touch working principle

drawn. Wires are drawn with ITO material. This glass is called as ITO glass or sensor glass. Controller IC scans the capacitance on all of the wires, when a finger get close to those wires capacitance changes and controller IC detects the touch. The number of parallel wires on x and y coordinates determines the resolution of CTP. For high accuracy the number of parallel wire should be high.

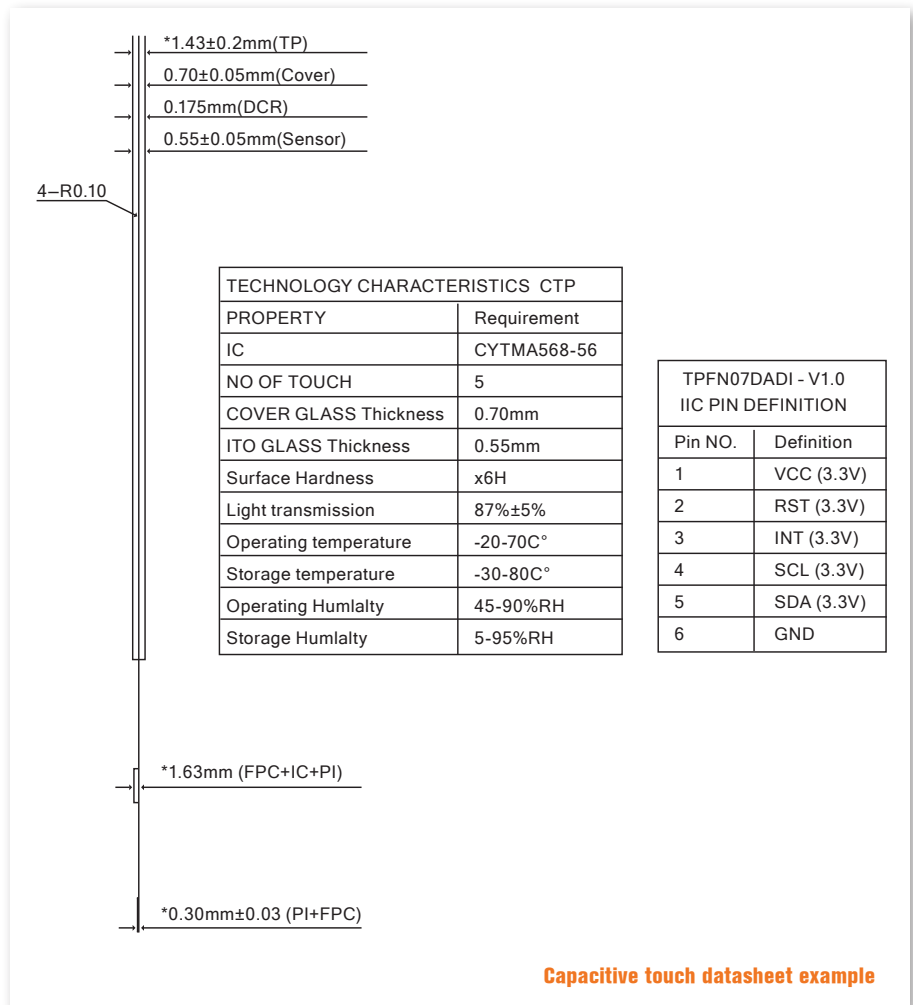
Controller IC brand and model also affect the accuracy of CTP. Controller IC is one of the main factors of CTP price. To protect ITO glass from any impact a protective layer is added. This protective layer can be tempered glass or PET. If this layer is tempered glass it is called as G+G and if it is PET it is called as G+P. G+G structure is more resistant to impacts and light transmission is higher that's why the price is higher. This glass can also be called as cover lens. This glass can be in size of customers request

and the producer can add a logo of the customer. G+P structure is less resistant to impacts and light transmission is lower. Customer can add its own glass on it. ITO glass and tempered glass or PET glues each other with OCA. The wires on ITO Glass are exported by FPC cable. Controller IC can be on FPC cable or on customers PCB.

CTP prices are depend on technology and structure. Tempered glass or PET choice, Controller IC, being standard or custom design affects the price. According to need right product should be chosen.

"Özdisan Elektronik has sign an agreement with Chinese capacitive touch manufacturer FANNAL to meet the needs of customers."

Özdisan Elektronik has sign an agreement with Chinese capacitive touch manufacturer FANNAL to meet the needs of customers. FANNAL is one of the good quality manufacturers of china and expert on capacitive touch solutions. FANNAL can provide solutions for all kinds of needs. FANNAL can make high technology solutions and also can offer low cost solutions. Özdisan offers good quality and reasonably priced products with combining SATOZ brand TFTs and FANNAL brand CTPs.



DEFINITION OF TERMS RELATED TO CTP

OCA (Optically Clear Adhesive): A kind of adhesive to glue layers of CTP. Light transmission is very high.

ITO (indium Tin Oxide): A kind of chemical which is transparent and conductive. It is mostly using in TFT and LCD products. It is using for electrical wires on glass.

ITO Glass: A glass which has drawn ITO wires on it. It is also called as sensor glass.

Tempered glass: Reinforced protective glass against impact. It is also called as cover glass or cover lens.

PET (polyester film): A kind of petrochemical glass which is thinner and weaker comparing with tempered glass.



THE PIONEER OF DIGITAL IN THE INDUSTRY **OZDISAN.COM**

www.ozdisan.com has been declared as official website of Özdisan Elektronik firstly in 1999. In order to sustain company's industrial leading at online platform ozdisan.com has been transformed into an e-commerce portal by virtue of its expert staff and accumulation of knowledge and consistently updating its software base. Today in Turkey it has been the first thing come to mind when it's said "electronic component" and takes turn to the market.

Through the technical data's which are available in it, its modules and its user-friendly interface ozdisan.com has become an important and advantageous address of Özdisan's existing customers, especially for companies which are in adaptation period with "Industry 4.0", for R&D engineers, students, and for all users in the sector.

Apart from the advantages which offers inside the website, it supplies quick delivery and high quality of customer relations management. So, it has delivered all the orders in full and on time that it received from particularly all cities of Turkey and many countries of the world.



ÖZDİSAN ELEKTRONİK
PURCHASING & E-COMMERCE MANAGER
ALPER ERTORUN

BEYOND THE BOUNDS OF COUNTRY

Ozdisan.com has succeeded to attract notice of all users around the world by means of its stock diversity, convenient prices and quick delivery options.

This platform has received visitor logins from 165 different countries because of the penetration with not only the users in electronic component sector of Turkey but also the users around the world.

This situation proves that ozdisan.com is an e-commerce website which can also easily supply the demands from global market.

BRIEFLY OZDISAN.COM

We can compile the features of ozdisan.com, which supplies an active service to its customers by enhancing user's experience.

Buy More, Pay Less: Users have a chance to win discount in the ratio of %5 and %30 according to basket total prices and previous shoppings through www.ozdisan.com.

Reliable Shopping on Internet:

All shopping's are secured by 3D secure payment and 256 Bit SSL certificate.



Alternative Paying Ways: Users can make a payment in instalments or one shot by credit card and also Money Order/EFT.

PCB Reckoning and Offer

Module: By virtue of this Module, you can get an offer, which would be calculated automatically by the system after you entered demanded data's. If you want to have more information, you can directly contact with leading expert engineers.

Aluminium Cooler Offer

Module: Users can quote the needs about aluminium cooler as online and transform the offers into an order.

Campaign Products: It is applied extra discounts for users who shops from online sales channel at some product groups. Those products can be seen under "Campaigns" tab on www.ozdisan.com.

Saving Different Shopping

Baskets: Users can create and save different order lists for different purposes and they can make it an order whenever they want.

Filtration Options: When users are on a product page, they can easily reach the demanded product by using filters on the screen.

Get Offer Now: On the part of sales team your requests are taken and replied rapidly and also when demanded products are available on the stocks it is given feedback to you by email.

Add to Favourites: Products can be added to favourites in order to look over later.

Add to Comparison Basket:

This module can be used in order to compare products more than one in the same category.

Equivalent, Similar and

Mutual Products: At some products on www.ozdisan.com this feature is available. By virtue of this, all other products, which are related to the wanted product, are easily reached.



HDI LEAVES CLASSIC PCB'S BACK



ÖZDİSAN ELEKTRONİK
PCB REPRESENTATIVE
SİNAN YÜKSEL

HDI (High Density Interconnect PCBs), can be defined as printed circuit boards having a higher line density per unit than conventional PCBs. HDI PCB's; have any or all of such structures as microvia, blind via, buried via, other microvia techniques.

PCB technology constantly evolves by changing its own technology, as smaller and faster products are constantly being demanded. HDI products have more complex, smaller vias, pads, tracks and space (Track to Track). Rather than using several PCBs in one package, the same functionality can be achieved using an HDI PCB.

Mikrovias plays a major role in the size and capabilities of HDI cards. Smaller vias can be placed much closer together to provide additional space for designer components. In addition, microvias have smaller and higher reliability than normal vias.

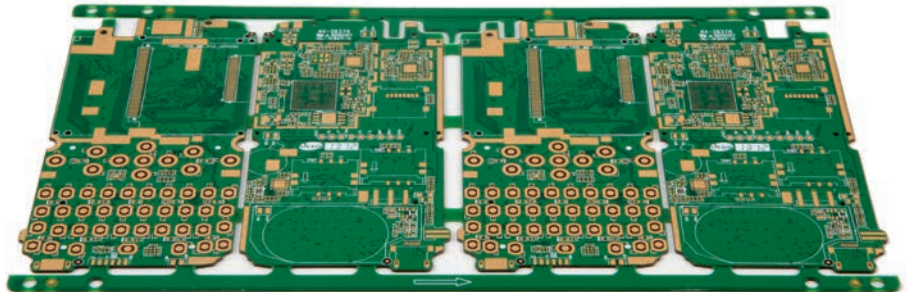
Because of smaller and more functional products are needed in the semiconductor and electronics market, HDI designs can respond to engineers' demands. Electronics can provide more efficient performances by shortening distances between

devices, road gaps and placing a large number of semiconductors. Complex HDI PCBs provide better electrical performance and lower power consumption. By reducing the distances between the contacts, it improves signal integrity due to lower power consumption. Compared to traditional PCBs, performance increases include steady voltage, lower RFI / EMI

and closer ground connectivity and distributed capacitance.

Benefits of HDI PCB

HDI PCBs are small, complex and have electrical performance. If we mention the advantages of using HDI PCBs;





Cost Advantage

When properly planned out, overall costs are reduced due to the lower number of necessary layers and smaller sizes compared to standard PCBs.



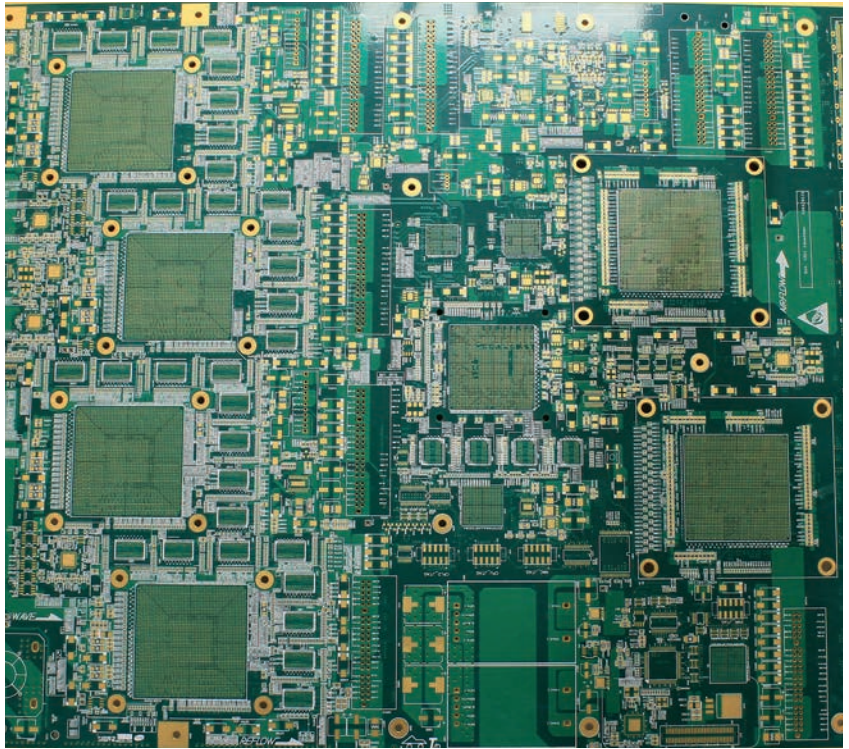
Faster Time-to-Market

Because of the easy placement of components, vias and electrical performance, it takes a shorter amount of time to go through the design and testing process for the HDIs. Design efficiencies in HDI production means faster time-to-market.

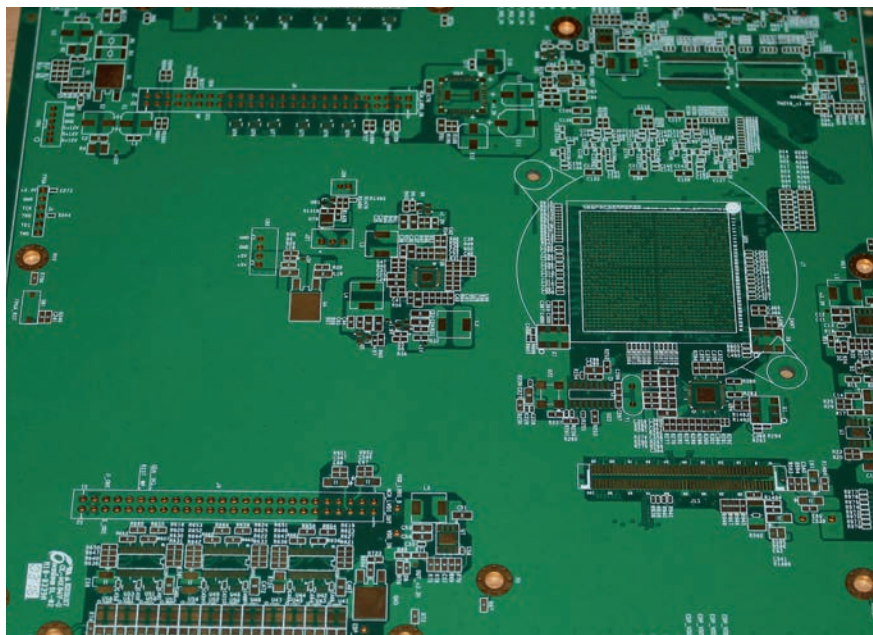


Better Reliability

Microvias have much better reliability than typical through holes due to use of better materials and a smaller aspect ratio. Since microvias are more dependable than through holes, the HDIs perform better with better materials and parts.



“Rather than using several PCBs in one project, the same functionality can be achieved using an HDI PCB.”



Difficulties of HDI PCB

Although HDIs are extremely useful when implemented in small devices, they need to be aware of the needs of the electronic product. Before designing your HDI card some information should be obtained. The design must be negotiated with the manufacturing and assembly workshop and checked to see if it is within their capabilities.

Carefully planning and browsing the design and manufacturing process is crucial to ultimately guaranteeing exactly what you need. For this reason, it is not known which components will be needed and what needs to be done is missing slows down the design process. It is also very difficult to change the design and parts afterwards. Constantly making changes in the already completed equipment is more costly than the first time properly planned design is happening.



GSM MODULES OF GOSUNCNWELINK

In our country where Industry 4.0 is becoming more important day by day, the GSM modules are expanding their place in the electronic world. GSM modules keep on top of their popularity due to the fact that they work with an external SIM card. They will also eliminate distance limits with wireless technology. Considering the advancements in technology, it is obvious that this situation will be felt both in the world and in our country.

"GSM modules keep on top of their popularity due to the fact that they work with an external SIM card. They will also eliminate distance limits with wireless technology."

Famous GSM module manufacturer ZTEWelink, which we all know closely, will continue to lead us in this market as GOSUNCNWelink with its renewed face. GOSUNCNWelink, With over 30 years of experience, it produces modules that support all GSM communication technologies and guarantees that it will produce

modules suitable for new technologies. More than 25,000,000 GOSUNCNWelink modules are actively used in the field. GOSUNCNWelink achieved a turnover of \$ 18 million in 2017, with a share of 90% in the Chinese market and 37% in the world.

Following the distributorship agreement with GOSUNCNWelink, Özdisan Elektronik provides technical support and sales services to its customers using GOSUNCNWelink module. Özdisan Elektronik R&D team provides technical support about supplying all necessary software and hardware documents, supplying and using the necessary demo-kits during the testing phase and supports the customers in the process of testing, mass production and subsequent processes of the GSM module. In addition the module users, when necessary, thanks to the difference of video GOSUNCNWelink's R&D engineers with the ability to talk to the video, the problem quickly has the privilege to solve with experts.



ÖZDİSAN ELEKTRONİK
FIELD APPLICATION ENGINEER
İSMET ÇELİK

The Modules of the GOSUNCNWELINK

All modules, including 3G, 4G and advanced technologies, are available as standard LCC or mini-PCIE packages. And they also, all modules are P2P and new technologies will be installed in P2P. In this case the customer has not to change PCB design. For his reason the customers may upgrade their PCB easily. The applications on 2G and NB-IoT modules, it is possible to reduce it to much smaller dimensions in terms of advantages.

NB-IoT

ME3612

- **Connection Type:** GSM / GPRS / NB-IoT
- NCC Package
- **Dimensions:** 30 mm x 300 mm x 2.3 mm
- **Frequency Bands:** 2G and NB-IoT
- Internal GNSS (GPS / GLONASS / Galileo); Optionally
- Internal TCP / UDP / MQTT / FTP Protocols
- NB-IoT Max Uplink 66 Kbps / Downlink 34 Kbps
- EGPRS max Uplink 85.6 Kbps / Downlink 34 Kbps
- Industrial working temperature (-40°C ~ +85°C)



LTE (4G)

ME3630

- LCC Package
- **Dimensions:** 30mm x 30mm x 2.3mm
- **Connection Type:** LTE FDD / LTE TDD / WCDMA / HSDPA/ EDGE / GPRS / GSM
- Internal GNSS (GPS / GLONASS / Galileo); Optionally
- **Frequency Bands:**
 - 4G:** B1, B3, B7, B8, B20
 - 3G:** B1, B8
 - 2G:** B3, B8
- Uplink 50 Mbps / Downlink 150 Mbps
- Double UART
- RX Diversity
- Internal TCP / UDP / FTP / PAP / CHAP PROTOCOLS
- Industrial Working temperature (-40°C ~ +85°C)



NB-IoT

ME3616

- Competitive NB-IoT module in price;
- LCC package
- Uplink 66 Kbps / Downlink 34 Kbps
- **Dimension:** 17.6 mm x 15.7 mm x 2.3 mm
- Frequency Bands: GSM850 / 900 / 1800 / 1900 MHz (Quad-band)
- Internal GNSS (GPS / GLONASS / Galileo); Optionally
- Internal TCP / UDP, PPP, FTP, HTTPS, SSL Protocols
- Industrial working temperature (-40°C ~ +85°C)
- e-SIM support; Optionally



GSM/GPRS (2G)

MG2609

High performance combined with competitive price

- LCC package
- **Connection Type:** GSM / GPRS
- **Dimensions:** 17.6 mm x 15.7 mm x 2.3 mm
- **Frequency Band:** GSM850 / 900 / 1800 / 1900 MHz (Quad-Band)
- Internal GNSS (GPS / GLONASS / Galileo); Optionally
- Internal TCP / UDP / PPP / FTP / HTTPS / SSL Protocols
- Industrial working temperature (-40°C ~ +85°C)
- Support analog sound output



"GOSUNCNWeLink achieved \$ 18 million turnover in 2017 with a share of 90% in the Chinese market and 37% in the world"

GSM/GPRS (2G)

MG2810

- Ultra tiny design
- LGA Package (79 pins)
- **Connection Type:** GSM / GPRS
- **Dimensions:** 17.4 mm x 14.4 mm x 2.05 mm
- **Frequency Band:** GSM850 / 900 / 1800 / 1900 MHz (Quad-Band)
- Internal Bluetooth
- Max Uplink 42.8 Kbps / Downlink 85.6 Kbps
- Double Uart
- Internal TCP / UDP / FTP Protocols
- Industrial working temperature (-40°C ~ +85°C)
- Support analog sound output



WCDMA/HSDPA/EDGE (3G)

MW3650

- LCC package
- **Dimensions:** 30mm x 30mm x 2.3mm
- **Connection Type:** WCDMA / HSDPA / EDGE / GPRS / GSM
- Uplink 384 Kbps / Downlink 3.6 Mbps
- Double UART
- Internal TCP / UDP / FTP PROTOCOLS
- Industrial working temperature (-40°C ~ +85°C)

ROUTER

ROUTER R800

Enjoy wireless internet and share with loved ones when you are at home or in your company with only a SIM card.

- Optional 3G or 4G compatible,
- Internal GNSS (GPS / GLONASS / Galileo); Optionally
- Easy connection with RJ-45 connector or wireless.



OBD&TELEMATIC

It provides you with the most detailed information for your vehicle or fleet to drive performance. With GOSUNCNWellink you will be able to learn the status, speed, fuel consumption, storage status, driving performance, vehicle error information, acceleration, deceleration information, sudden braking and all the information you might need. This will change the security situation for insurance companies as well as personal use, and also the pricing while insuring your vehicle.

OUR AFTER-MARKET PRODUCT

AT21



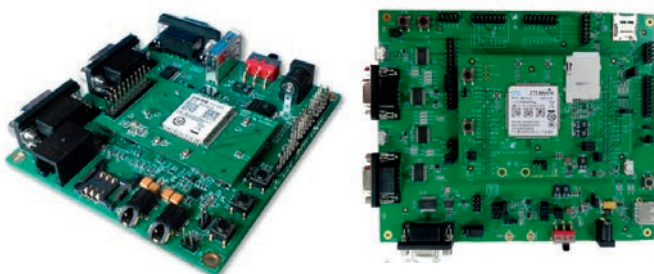
- **Sensors:** G-sensor / Gyroscope
- **SIM:** Embedded SIM Card or external one
- **Power supply:** 9V-16V
- **Battery:** 110mAh, Li-ion, 3.7V
- **Bluetooth:** BT4.1
- Support CAN
- **Upgrade:** Firmware over the Air (FOTA)
- **IP Grade:** IP 65
- **Certification:** CE, E-mark, RoHS, GCF, REACH, WEEE

AD21-22

- STA8090FG (include GNSS) chipset
- MT6261D platform
- **Frequency:** 850 / 900 / 1800 / 1900 MHz Class 10
- **GPS Sensitivity:** -162 dBm indoor
- **Start Time:**
 - Cold Start:** Less than 30 s
 - Warm Start:** Less than 30 s
 - Hot start:** Less than 1 s

OUR DEMO BOARDS

Our demo boards to try out all the functions of the modules;
G2000 and **GE2015**



REQUIRED PARAMETERS WHEN CHOOSING RIGHT PCB

If the subject is PCB base material, many alternatives come to mind. When choosing base material, you can be confused easily. In this writing, we will refer to base (Rigit) PCB. We will give some information about how to choose the materials and what give attention to.

Base material is an important part of PCB. This material will effect your design performance and application coverage limits. Today's technology and demand are causing more difficulties in our PCB design and this also causes difficulties in the development of (CCL Copper Clad Laminates) copper laminates.

Most used PCB's material classification are as follows:

1- Paper base (FR1, FR2...)

2- Glass epoxy base (FR4, FR5, FR6,CEM3...)

3- Composite base (CEM1, CEM2...)

4- Multi stack-up (PET, PE film...)

5- Special material base (Metal, Ceramic...)

Classifications of Inflammability

• Flammability of PCB material are classified on basis of UL-94V and must be selected accordingly.

• 94HB: Slow burning on a horizontal specimen; burning rate stops before < 76 mm/min (for thickness < 3 mm) or 100 mm.

• 94V-2: Burning stops within 30 seconds on a vertical specimen; drips of flaming particles are allowed.



ÖZDİŞAN ELEKTRONİK
PCB DEPARTMENT MANAGER

MİRAC BAKICI

• 94V-1: Burning stops within 30 seconds on a vertical specimen; drips of particles allowed as long as they are not inflamed.

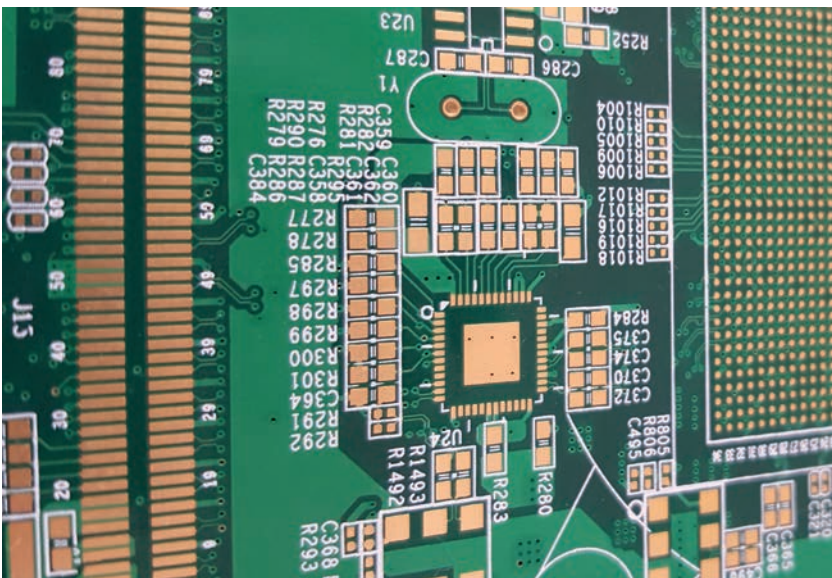
• 94V-0: Burning stops within 10 seconds on a vertical specimen; drips of particles allowed as long as they are not inflamed. Standard acceptable classification of PCB is 94V0.

Halogen-Free Material

It defines material not including fluorine, chlorine and bromine. Halogen materials produce poisonous gas while burning. Therefore, halogen - free material may be preferred.

Tg - Glass Transition Temperature

The Tg value is the temperature at which the material changes from



a reasonably stiff glass like material to a more elastic and bendable plastic like material. This value is important for both production assembly line and working environment.. Normal Tg is generally 130 °C, medium Tg is 150°C, High Tg is 170°C and above.

Td - Decomposition Temperature

This value is a measure of the degradation of the laminate. The analysis method measures the time when 5 % of the material is lost by weight, the point as which reliability is compromised and delamination may occur. High reliability PCB requires Td \geq 340°C.

Thermal Conductivity (k)

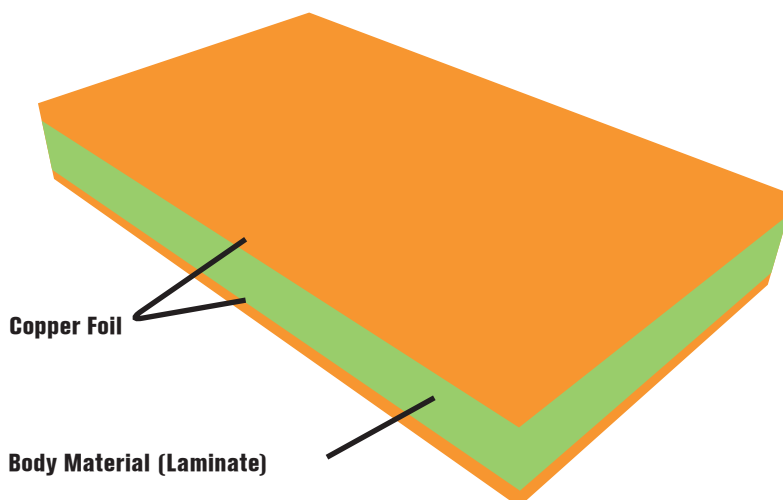
This value is the heat transfer property of the material. Low conductivity means low heat transfer, high conductivity means high heat transfer. Measurement unit is (W/m°C) expressed in watt per meter. Many PCB materials have got 0.36 ± 0.6 W/m°C value, as so the raw copper has got $k=386$ W/m°C value. Therefore, copper will move from the body of material more quickly.

The Coefficient Thermal Expansion (CTE)

The coefficient of thermal expansion is the rate of expansion of a PCB material when it heats up. CTE is expressed as parts of heated as substance temperature expands, CTE will also rise million (ppm) expanded for every °C. The CTE of a substance is usually much higher than copper, which can cause interconnection issues as a PCB is heated.

Dielectric Constant (Er)

The dielectric constant of a material is important for impedance considerations and signal integrity, which are critical factors for high frequency electrical performance. The dielectric constant varies with frequency and generally decreases as frequency increases. This value for most PCB materials is in the range of 2.5 to 4.5.



Loss factor

The loss factor of material gives a measure of power lost due to the material. The lower loss factor of material, the less power lost. The value of most PCB materials range from 0.02 for most commonly used materials to 0.001 for very low loss materials. It also varies with frequency, increasing as frequency increases.

Loss factor is usually a critical consideration for digital circuit, which work with very high frequencies above 1Ghz. It is not critical for other low frequencies digital circuits.



Surface Resistivity (pS)

This is the measure of the insulation or electrical resistance of the surface of a PCB material. The materials are required to have very high values of surface resistivity, in the order of $10^6 - 10^{10}$ Megaohms per square. It is also somewhat affected by both temperature and moisture.

Electrical Strength

Electrical strength is a PCB material's ability value to resist electrical breakdown in the PCB's Z direction. It is expressed in Volts.

Peel Strength

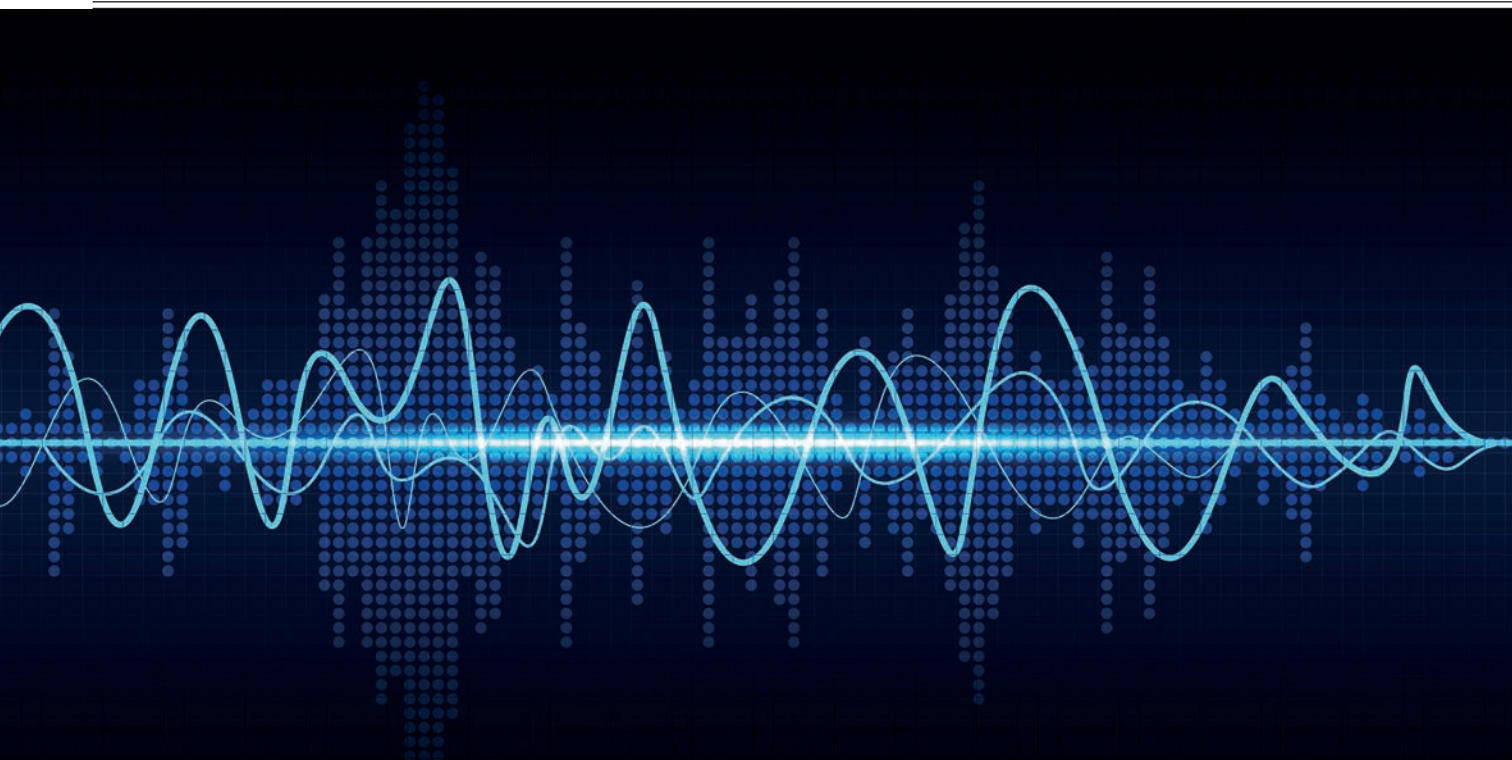
This value is a measure of the bond strength between the copper and the dielectric material of PCB.

Flexural Strength

Flexural strength is the measure of a material's capability to resist mechanical stress without fracturing. It is expressed in KPSI.

Delamination

Delamination measures how long a material will resist delamination the resin's separation from the laminate, foil, or fiberglass at a specified temperature. Delamination can be caused by thermal shock, moisture, the wrong Tg in the material, a poor lamination process.



A EPOCH OF HARDWARE VOICE / AUDIO IC

Which one of us didn't chat with Siri or which one of us didn't try Cortana? Let's forget about these, which one of us didn't ask something to Google Dublex? Almost all of us have met with these systems that can give them or similar interactive answers. We're not going to talk about the voice analysis part of this work, but we will talk about the hardware that allows voice come to our ear.

Nuvoton is one of the most important brands that Özdisan Elektronik' has recently put in its distribution brands portfolio. In the previous article, we talked about the Nuvoton's strengths on the processor side. In this article we will talk about Nuvoton brand's hardware audio IC.

Nuvoton is a company that has strengthened itself on the side of processor and audio after leaving Winbond electronics in 2008. In audio IC side, they have AECQ100 automotive certification. It is possible to see the Nuvoton brand in most of the devices that can give voice to outside. You can see Nuvoton audio products in over 1 billion products worldwide. Fortune 500 companies also use Nuvoton products for provide high quality service to their customers. Nuvoton have different audio products which can be used for for different fields such as automotive, computer, industrial and consumer electronics.

Nuvoton has strong company references in terms of voice. The most well-known of these companies are Dell, Google, Intel, Microsoft. This means we can see Nuvoton products on our computers with confidence has developed.



Nuvoton has developed a system out of classical solutions thereby mark an era in the voice field. Nuvoton has created new powerfull voice

integrated circuit by placing voice part inside the ARM Cortex architecture microcontroller.

With this voice integrated circuit solution customers can put their algorithms, which is different scenarios into the IC. Thus, as a normal microprocessor writes algorithms, customer's algorithms can be written into the voice integrated circuit, and the voice we plan to use are exported according to the algorithm we want.

Nuvoton is a company that has proven itself in voice recognition as well as playing audio files loaded into it.

Both speaker independent voice recognition and speaker depend voice recognition solutions are available in Nuvoton side. In this way, Nuvoton products can be used in the applications that both everyone can control with voice and in the applications we decide to control only the person we choose. Each product has different Flash / Ram and hardware features. Thus, the product can be selected according to the customer requirements.

Voice control systems, which are entering our lives slowly, are seem to be inevitable in the future. When I come home, I can turn the lights on and off without using a physical switch, I can tell the washing machine which program to work on and finally I can tell my coffee machine to make coffee in the specification, which I want.

The Nuvoton processors also give the elegance to the foreground in their programmers.

All of this can be with Nuvoton's voice recognition voice integrated circuit. Both IoT and smart home applications started to use this kind of products.



ISD9160 series voice IC is one of the proven IC in this field. This series has ARM Cortex M0 architecture. It can run up to 49Mhz speeds. It has 12Kb Ram with 145K / 64K flash option. It has audio pwm driver internally. Supports up to 1 Watt output power. In addition, it has many



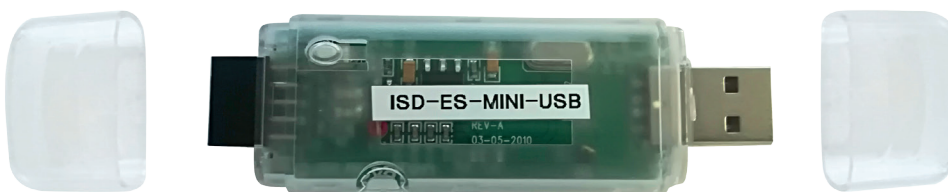
ÖZDİŞAN ELEKTRONİK
FIELD APPLICATION ENGINEER
İBRAHİM EKMEÇÇİ

additional equipment such as Uart, SPI, I2C and I2S. Voice recognition applications can be made with these serial voice integrated circuit.

The Nuvoton voice integrated circuit are also easy to use. With computer software provided by the manufacturer, the desired sounds can be loaded into the chip. After the customer's algorithms are written it can be download into the voice integrated circuit with the Nuvoton programmer.

The Nuvoton processors also give the elegance to the foreground in their programmers.

Nuvoton USB programmer allow programming in field. You just need to compile your coding and download your compiled code into the Nuvoton USB programmer. In addition, you can also put limitation for programming. In this way you will protect your code.





ENSURING PRICE STABILITY SUPPORTS THE PRODUCTION

The way to success is being steady in electronics market like every other area. When there is no stability the success is existing depending on coincidences. The price stability that is a indispensable condition for economic and social stability, are contributing sustainable economic growth and economic welfare with helping to remove uncertainty that created by high inflation. Growth potential increases in an environment

that price stability provided. Price stability is becoming an important agenda topic for the electronic productions that we dependent on the foreign countries.

To bring the electronic components that will create products in our country, providing price stability comes at the beginning of the most important criteria for the items, which will be imported.

"Growth potential increases in an environment that price stability provided."



ÖZDİSAN ELEKTRONİK
IMPORT AND LOGISTICS MANAGER
SENA YILMAZ

One of the most important points to pay attention is to keep the costs of the parts which constitute the main input cost balanced, in the productions that can be made as an outsourced product due to the excessive increase of foreign currency in our country in recent years.

Özdisan Elektronik keeps self-sacrificing working fort o reduce the costs of the producers. The company works with a system that contributes to local producers' production planning and profitability by keeping the cost of materials at a certain level.

Özdisan is taking important initiatives to ensure price stability in the import and procurement process, which is the most important member of the supply chain, which ends up with supplies to warehouses, warehouses and even to customers.

- By giving planned orders, Özdisan decrease the problems, which exists because of unexpected allocations on production of the items, to minimum level.

- Özdisan reaches the actual informations about market prices by regular price researches

- Özdisan finding a stronger bargain chance by creating a common list of materials used by customers

- Meeting with airway and logistics companies and by the annual freight agreements Özdisan keeps the ratio at a certain level for the import, transportation, customs costs that will be done.

“The company works with a system that contributes to local producers' production planning and profitability by keeping the cost of materials at a certain level.”



PCBA INVESTMENTS

GIVE LIFE TO ELECTRONICS

Electronic industry in the world has a rapidly growing and developing structure. Today, the electronics industry has evolved from being a stand-alone sector to an industrial sector that has developed other industries and increased production and productivity. In recent years, rapid development in the industry has been provided. With this, It has been understood that the development in the world can be achieved only through planned development, appropriate infrastructure and technological investments. Özdisan is a company that creates awareness in the sector with its investments in electronics.

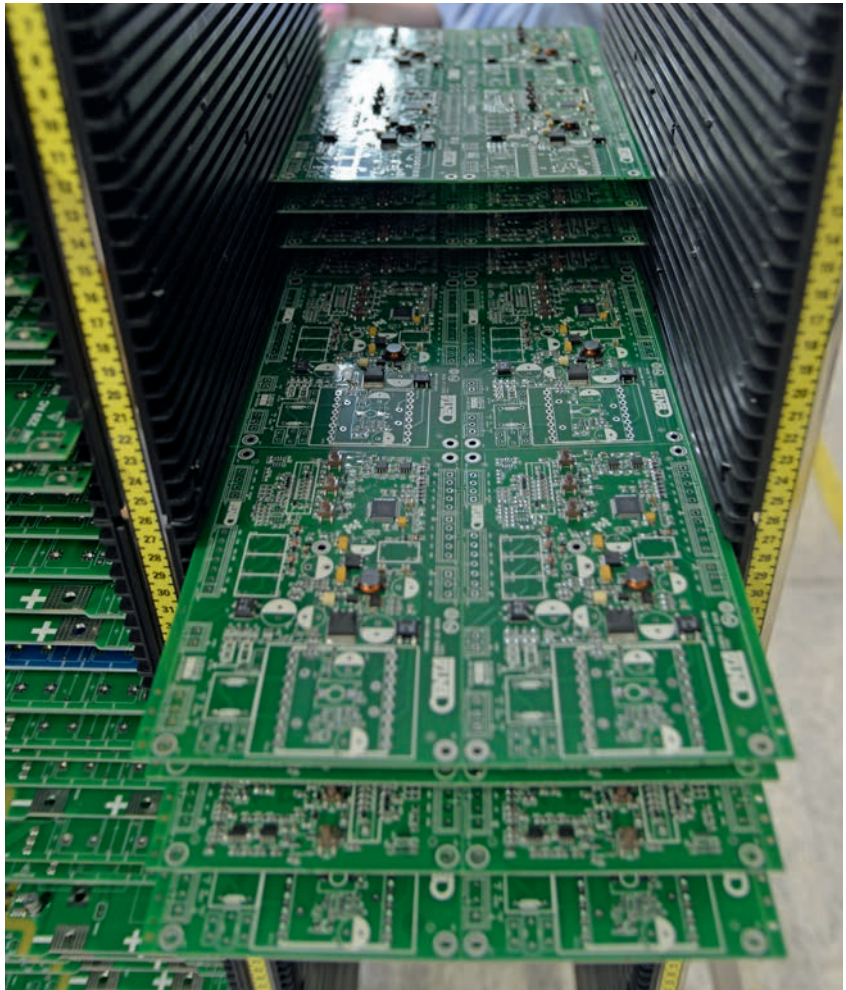
Today, rapidly developing technology causes change and development in PCBAs. It is crucial to use the right technology in PCBA production, to build a reliable supply chain and to guarantee quality continuity. Özdisan has received %40 of the market in the component supply in Turkey and has proven itself by becoming a leader in its field.

Along with this feature, it has become an ambitious position to give electronic life with the supplier role provided by the companies that make electronic card serialisations (ASSAN and EMS Electronics). PCBA is a company that is followed in the sector with its technological investments in its productions.

The entire electronic card system is a very complicated process. SMT technology is the critical stage of PCBA manufacturing. The determination of soldering determines the performance of electronic products directly. It is

challenging to foresee and plan the possibilities that may arise during the design and production phases of a new product. The firm that provides the electronic production service is essential in this process. Özdisan's PCBA is superior because we are working with our string companies, which are well-trained professionals, know the production stages and use the latest technology machines.

The primary aim of Özdisan Elektronik is to provide its customers with quality, cost-effective and timely products.



Özdisans' offer at PCBA

Design services:

You have designed your product and, of course, your engineers are good; however, it is important not to forget that the production line to be produced for design must be optimised. We know our production equipment well and offer ways for our customer to be better before the producing process.

Testing services:

You need comprehensive testing both before and during the production. Testing your product saves you from many questions that will result in high-priced results later on. Therefore, as Özdisan, we attach importance to product tests.

Supply chain management:

The only way to keep counterfeit goods out of the electronic manufacturing environment is to be strong in your supply chain management. Özdisan provides a secure supply chain network with stringent supplies and its reliable sources.

We use a wave soldering process or selective soldering equipment for THT materials. Following the demands of our customers, we can automatically coat the surfaces of PCBAs and apply ageing tests on the desired temperature profile.

Özdisan produces PCBA to telecommunication, industrial electronics, medical systems, vehicle tracking, energy and automotive sectors.

In today's conditions, to increase productivity which is one of the most critical priorities of companies; it is aimed to respond to needs such as productivity analysis of used systems, historical production records, defect tracking, periodical maintenance in diffused environments (web, office etc.). Özdisan Elektronik uses traceability software in all typesetting facilities targeting quality, traceability and standardisation.

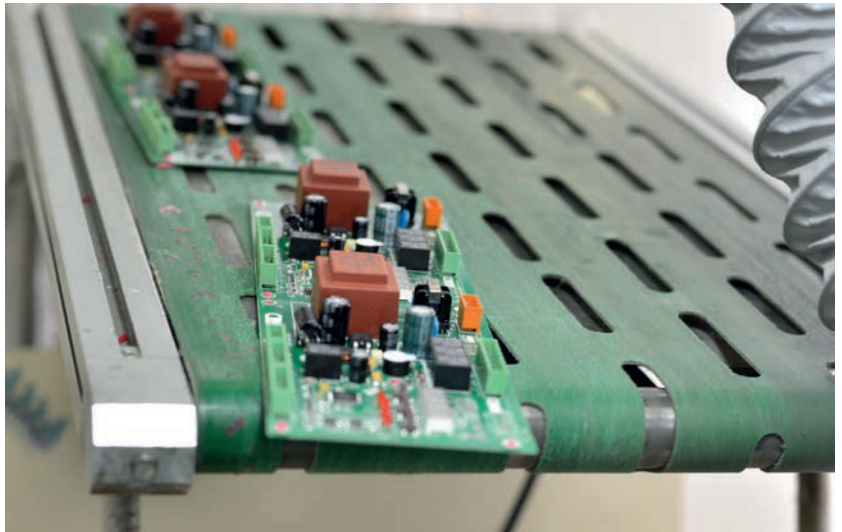
Besides, Our EMS companies attach great importance to the information



ÖZDİSAN ELEKTRONİK
PCBA DEPT. MANAGER
LEVENT OKUR

security of our customers and are about to complete the facility security certificate work. The primary aim of Özdisan Elektronik is to provide its customers with quality, cost-effective and timely products. In addition, we are also about completing our facility security certificate system, which gives great importance to the security of information of our customers.

An average of 250 different customers per year, we produce and ship 3K - 3.5K million PCBA with 1500 different PCB types. Our production companies (ASSAN and EMS Electronics) produce according to ISO 9001, 14001, 18001 and IPC 610, J-STD001 standards. In our lines, we can perform lead and lead-free productions. All our SMT lines include automatic screen printer, 3D SPI, at least 2 pick & place machines with 75,000 CPH each, Re-Flow with Nitrogen and 3D AOI devices. We have ICT, functional and boundary scan testers that control the accuracy of the product after SMT lines. Moreover, we have XRAY machine for checking defective products, and BGA rework stations to eliminate detected faults. If necessary, we can also perform "BGA Re-balling" at our station.



THE FASTEST AND EASIEST WAY FOR SOUND SOLUTION: **APLUS**

With the ever-evolving technology of the past to the present, audio IC's begins to take part in many projects. And it seems, we will use it more often after that. Let's give an example basically: The people who produce the automatic door systems prefer voice IC's instead of buzzers. At now people prefer to hear the "Door is open" sound rather than hear the "beep" sound. When we consider this situation, even in the simplest project, the prominence of voice IC's is growing. The Özdisan Elektronik, in the sector where it has been leader for 38 years, offers many qualities in the field of quality and continuity of IC's. The Özdisan Elektronik, APLUS company which is the distributor of this company has proved itself in this field, has acquired a vision of quality and continuity, is a company of Taiwan origin. To sum up the advantages of APLUS products:

OPERATIONALITY

As is known, the greatest concept in R&D projects is time. This situation is even more important for companies interested in more than one project. With the ease of use provided by APLUS products, the time lost in projects is minimized. At this point, users can spend more time on other parts of the projects.

ENDURANCE

Producer companies purchase materials in certain periods. Özdisan Elektronik provides continuity to its customers in APLUS products as well as in all products it provides. Thus, the problem does not occur in the production of the customers and they are not harmed commercially.

PRICE

APLUS brand products; compared to the equivalent products available in the market, offer great advantages in terms of price. As the number of annual usage increases, the prices are minimized.

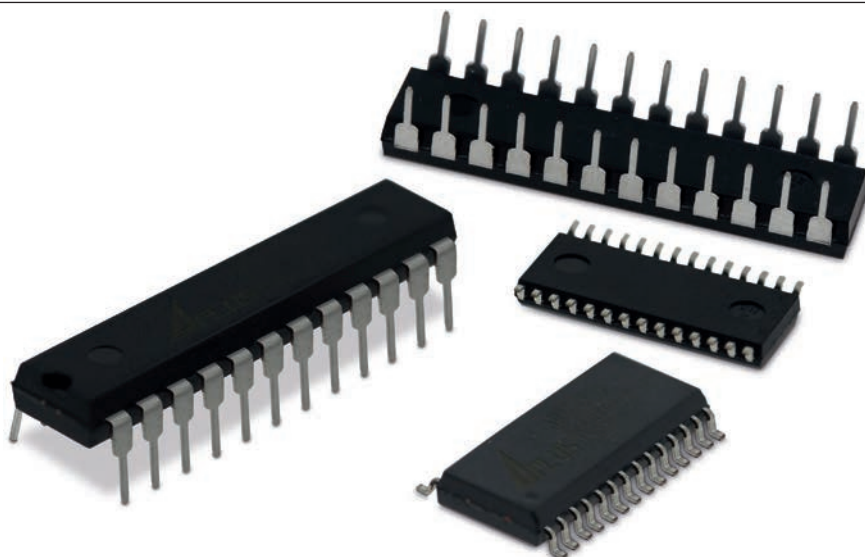


ÖZDİSAN ELEKTRONİK
FIELD APPLICATION ENGINEER
KAAN AYDIN

"With the ease of use of "APLUS" products, the time lost in the audio parts of projects is minimized. In this case, users may spend more time on other parts of their projects."

TECHNICAL SUPPORT

The R&D department of Özdisan Elektronik provides technical support to all the brands to which they are distributors. So when you start to use APLUS products, ÖZDİSAN R&D team provides hardware and software support in the audio part from the beginning to the end of the projects. To mention the technical parts that must be made when any of the APLUS products are used:



- Converting audio files to the appropriate format.
- The required software program to be installed on the computer.
- Audio files, loading of the IC to be used.

If you would like to explain these items with the product code AP89682K; AP89682K is one-time-programmable and it is new generation product. The expression '682' indicates that the total sound time that can be loaded into it will be 682 seconds in 6 KHz sampling frequency and 4-bit ADPCM data compression format. You can easily control this product by making high-low with processor output pins. You can also check with the switches instead of using the processor. There

"With the quality and easy-to-use products offered by APLUS, customers are now starting to abandon customary and hard-to-use products."

are two options for voice output: DAC and PWM. With the DAC option, you can use the voice output with an amplifier IC. In the PWM option, you can connect the audio output directly to the speaker. We recommend the DAC option to achieve much better sound quality and volume.

PCM8 or ADPCM format for data compress. For example, If you choose ADPCM data format, they are going to have much longer than PCM8 and PCM16 formats. But when you make this change you will also have a little bit less quality voice. Another thing that matters is the time period. When the sampling frequency increases, the volume of your voice decreases, but it has more quality.

Establishing the connection with the programmer by installing the required software

The software used for the AP89682K encoded product is the "aP23KWCompiler" program. You can easily download this program from APLUS's website. After downloading the program, you can connect your computer with the AP23KWC24D-coded programmer via USB cable and move on to the next step, installing your sounds.

How to install of your voice files into the IC

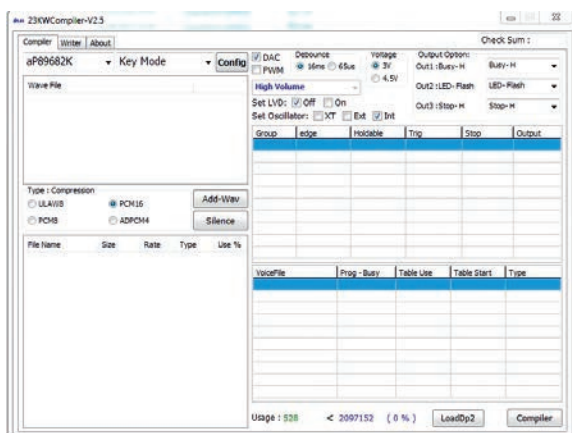
You may load voice files from the voice files AP23KWCompiler program into the voice groups you will create by selecting the product, voice compression format, control mode and voice to use. After this process a file in 'dp2' format will be created and if you upload this file into your IC, you will be ready to use your product.

After all these operations, you may easily use the product in the system you have created.

As control mode, we generally chose "key mode" for controlling with pins. And also the customer may chose "SPI mode".

Converting audio files to the appropriate format

First of all you may use the GoldWave program to edit voices. And the audio files you would like to install into AP89682K should be in 'wav' format. You may also prefer PCM16,





EXPORT GOAL GOES FOR DOUBLE

Exports play an important role in all economies, influencing the level of economic growth, employment and the balance of payments. Exports are a component of aggregate demand. Rising exports will help increase aggregate demand in the country and cause higher economic growth. Growth in exports can create employment in related industries by demand increase and also positively effect to subsidiary industries. The strength of exports has a large role in determining the current account deficit. It has a big importance for the economies who has foreign trade deficit like Turkey. When analysing an industry domestically, there are many elements to consider. But there are always additional

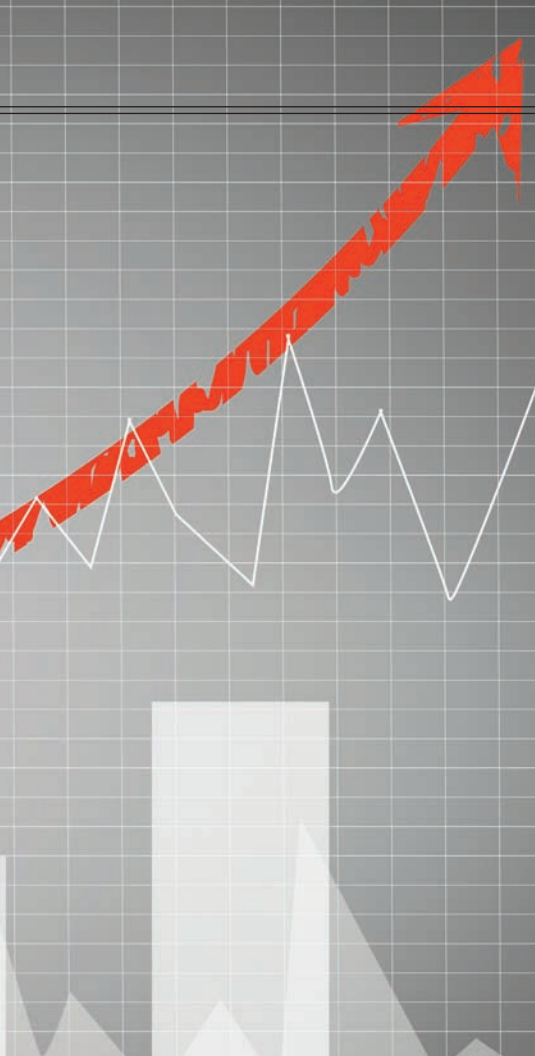
elements to consider when preparing a global industry analysis on export business such as;

- Government policies on the target markets
- Market competition is important to analyse and understand the intensity of the competition. It strongly effects the bargaining power of buyers / customers.

Özdisan puts more focus on Export business since 2016, it became a Global Player by momentum of the new organization and newly started E-commerce activities since that time.



ÖZDISAN ELEKTRONİK
EXPORT MANAGER
FİLİZ BAYCAN



The advantage of E-commerce has dissolved every remaining limitation of geography in terms of target customers and also in terms of the suppliers of Özdisan. E-commerce removes the borders and territory limits in case of distribution. We are collecting lots of demand via Özdisan B2B and B2C web site. It brings us opportunity to reach new markets, collected inquiries from more than 160 countries in one year period. Özdisan has realized export to over 60 countries at 2018 in record of 9 months.

Özdisan is Going to Exceed its 2018 Export Volume to Double

The synergy among DMY Group companies motivate Özdisan export activities by focusing on more PCB Assembly Project customers.

TFT LCD Panel & Module produced by DMY group company SATOZ is one of the important product group that Özdisan export team focus on marketing and sales activities in Europe. Target markets are Europe, Middle East, North Africa and Far East.





LIGHT RECIPE

IS THE KEY OF
HORTICULTURAL
LIGHTING



ÖZDİŞAN ELEKTRONİK
LED TECHNOLOGIES DEPARTMENT MANAGER
ÖNER GÜNEŞDOĞDU



This difference brings the need for using different units to measure light in relationship to plants and people. Since the sensitivity of the human eye to the blue and red light is relatively low, the light is usually measured with lux or lumen units. But to measure light in relation to plants, we need to use Photosynthetically Active Radiation (PAR), which is the amount of all photons in the 400 to 700 nm range and whose unit of measure is $\mu\text{mole m}^{-2} \text{s}^{-1}$.

Plants absorb the light in this spectrum, which is called as visible light, with the help of pigments such as chlorophyll on their leaves and convert it into glucose and oxygen through photosynthesis. Then, via respiration processes, cells use oxygen and glucose to synthesize energy.

Horticulture Lighting is one of the most popular and promising market of LED Lighting industry in recent years. LED-based SSL products have the potential to offer revolutionary improvement in indoor plant growing applications, but there are much more to learn about the different light needs of varying plant types and how light needs change during the growth cycle of the plant.

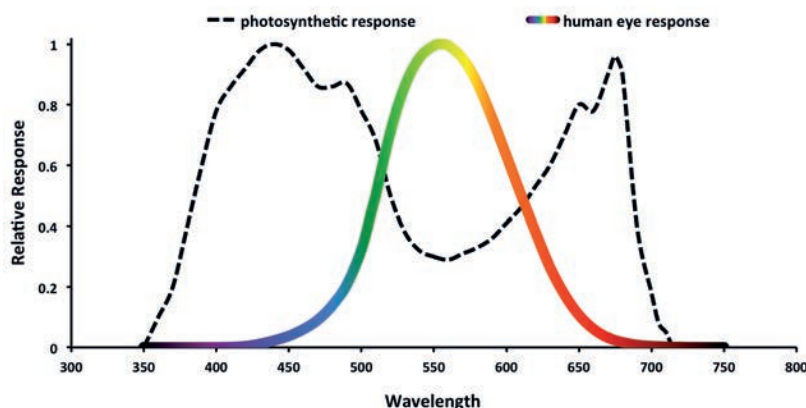
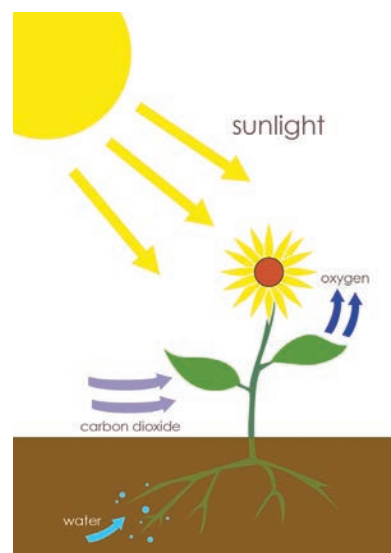
Unfortunately, there isn't much public information about the application because of intellectual properties that the lighting manufacturers want to invest and hold. In order to eliminate the lack of information to some extent, we will try to convey the information have collected about current researches, application requirements and the terms used in this specific field of LED Lighting.

Plants' expectations from light are different from humans. Therefore, human-oriented metrics such as LM/Watt efficacy or CRI may or may not give any idea about a LED luminaire will deliver good or bad results for growing vegetable or flower. Moreover, plants have circadian cycles which are different from humans and which varies widely from species to species. For this reason, many researchers across the globe have been conducting studies to

find out what is the ideal light recipes for optimal growth and yield for plants.

As most of these researches are still at their very early stages, it is difficult to say that very useful results about to show up with certain wavelengths, but many new products launch by LED manufacturers in this field indicates that the studies will be exponentially increased and more public information will be available soon.

As stated previously, the needs of plants for light and their sensitivity to the ingredients of light differ from other living things. For example, while humans are most sensitive to green light, plants respond to a much wider range of spectrum. Especially, photosynthesis is most efficient in red and blue light.



While we know the process of this cycle for many years, how the light from the sun is being evaluated by different plants with the most effective way, is an area that continues to be investigated in terms of horticultural lighting. Which plants we look for in which growth period, which time of day, in which spectrum, intensity and duration, and even from which direction the plant exposed to light will give the best response to get the desired result, are the answers we are looking for. The answers of these questions compose the light recipe for that plant and the light recipe is the key of horticultural lighting.

For the time being, public information is limited with the relationship between the color of light and the development of the plant. Generally, we can summarize it as following:

UV LIGHT:

Stimulates plant defence mechanism

BLUE LIGHT:

- Inhibits stretching
- Stimulates stoma opening
- Induces darker leaves and flowers,

- Total absence of blue or fully blue application lead to excessive stretching

GREEN LIGHT:

Counteracts effects of blue light

FAR RED:

Enhances flowering and stretching

RED/FAR RED RATIO(R/FR):

- High R/FR ratio lead rapid seedling growth
- Low R/FR increases stretching
- Low R/FR at night break promotes flowering

One point that should be noted here is that shade plants usually reacts different from sun plants.

Consequently, it is clear that we have a long way to go to determine the light recipes of plants.

Moreover, since the knowledge obtained from the applications on field is kept confidential, public information so the development is very limited. Therefore, preparing their own recipes depends on their experiences, is the only way for the lighting producers who want to work or invest on this field.



- 2.4"/3.5"/4"/4.3"/5"/7"/9"/10.1"/10.4"
- TFT LCD PANEL / IPS PANEL
- CAPACITIVE-RESISTIVE TOUCH
- COVER CLASS SOLUTIONS
- ANALOG & DIGITAL CONTROL BOARD



4.3" TFT with Capacitive touch.

Very wide application area, can be used with all industrial devices which needs touch panel.

TFT - SAT043AT40D08B2-30671T051KN

- Size 4.3", Aspect Ratio 16:9
- RGB interface
- Resolution 480x272
- Luminance 320 cd/m²
- Wide viewing angle
- Innolux glass
- Operation temperature -20 +70
- LED backlight 40mA

CTP - FN043A030-V1.0

- %100 compatible with SATOZ brand TFTs.
- 0.7mm tempered glass cover
- FT5426 controller IC
- 5 finger touch point
- Light transmission \geq %87
- Operation temperature -20 +70

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