

Si52147 EVALUATION BOARD USER'S GUIDE

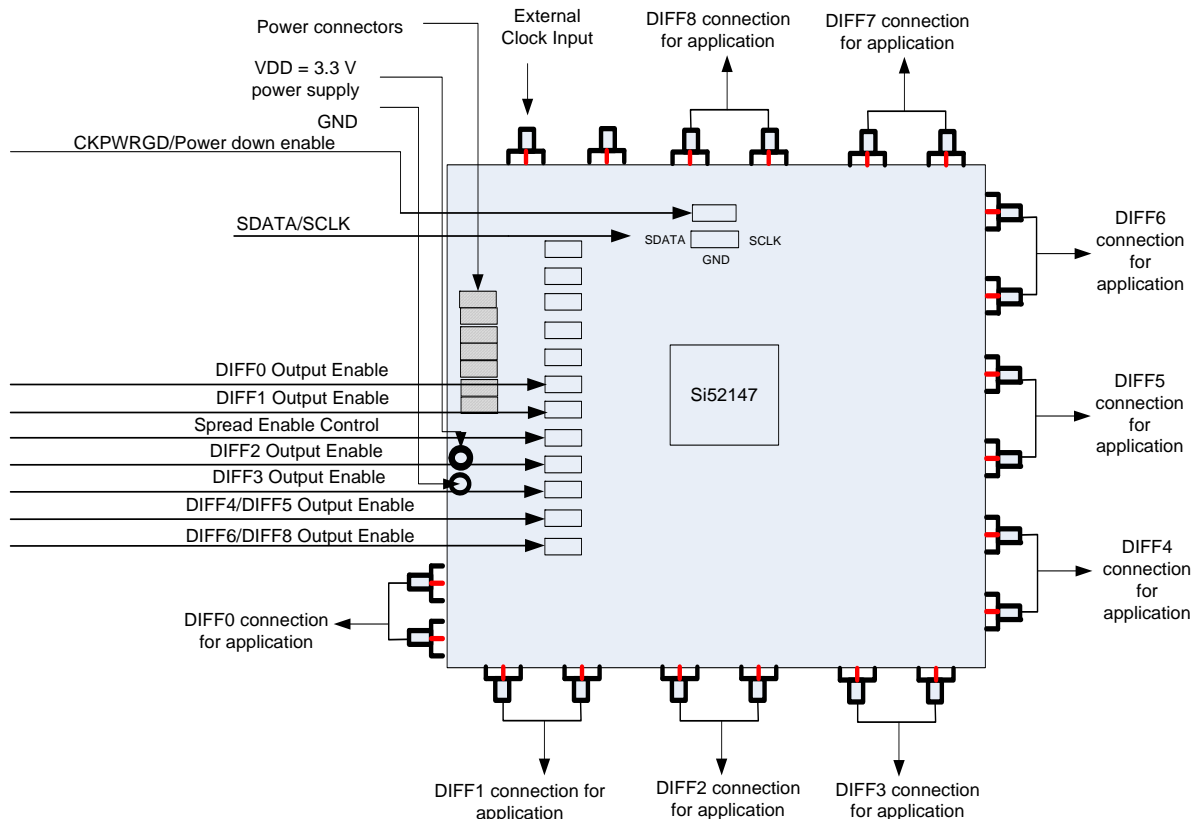
Description

The Si52147 is a nine port PCIe clock generator compliant to the PCIe Gen1, Gen2 and Gen3 standards. The Si52147 is a 48-pin QFN device that operates on a 3.3 V power supply and can be controlled using SMBus signals along with hardware control input pins. The differential outputs support spread spectrum and can be controlled through SSON input pin. The Si52147 needs a crystal or clock input of 25 MHz. The connections are described in this document.

EVB Features

This document is intended to be used in conjunction with the Si52147 device and data sheet for the following tests:

- PCIe Gen1, Gen2, Gen3 compliancy
- Power consumption test
- Jitter performance
- Testing out I²C code for signal tuning
- In-system validation where SMA connectors are present



Si52147-EVB

1. Front Panel

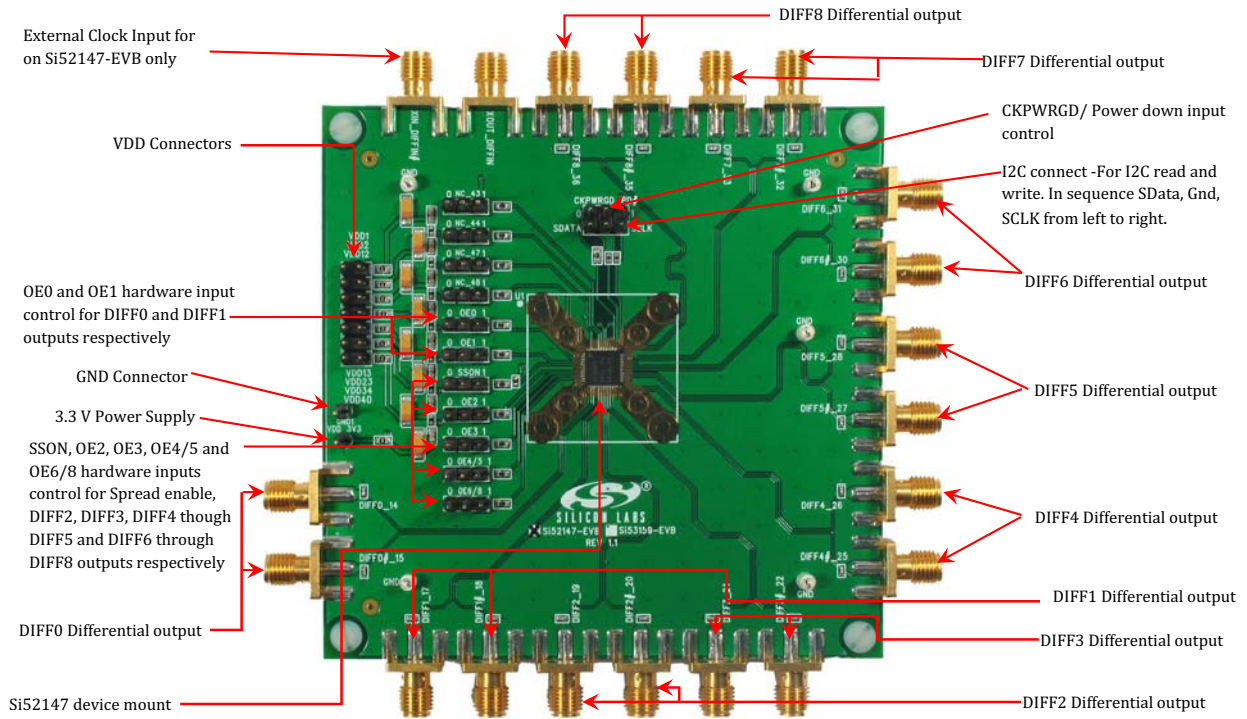


Figure 1. Evaluation Module Front Panel

Table 1. Input Jumper Settings

| Jumper Label | Type | Description |
|---------------------------------|------|--|
| OE0 | I | OE0, 3.3 V Input for Enabling DIFF0 Clock Output. 1 = DIFF0 enabled, 0 = DIFF0 disabled. |
| OE1 | I | OE1, 3.3 V Input for Enabling DIFF1 Clock Output. 1 = DIFF1 enabled, 0 = DIFF1 disabled. |
| OE2 | I | OE2, 3.3 V Input for Enabling DIFF2 Clock Output. 1 = DIFF2 enabled, 0 = DIFF2 disabled. |
| OE3 | I | OE3, 3.3 V Input for Enabling DIFF3 Clock Output. 1 = DIFF3 enabled, 0 = DIFF3 disabled. |
| OE4/5 | I | OE4/5, 3.3 V Input for Enabling DIFF4 and DIFF5 Clock Outputs. 1 = DIFF4 & DIFF5 enabled, 0 = DIFF4 & DIFF5 disabled. |
| OE6/8 | I | OE6/8, 3.3 V Input for Enabling DIFF6, DIFF7 and DIFF8 Clock Outputs. 1 = DIFF6, DIFF7 & DIFF8 enabled, 0 = DIFF6, DIFF7 & DIFF8 disabled. |
| CLKPWGD/ $\overline{\text{PD}}$ | I | 3.3 V LVTTTL Input. After CLKPWGD (active high) assertion, this pin becomes a real-time input for asserting power down (active low). |

Table 1. Input Jumper Settings (Continued)

| | | |
|-------|-----|---|
| SSON | I | SSON Input, 3.3 V-Tolerant Active Input for Spread selection on the Output. Internal 100 k Ω pulldown. 1 = -0.5% Spread enabled, 0 = Spread disabled. |
| SDATA | I/O | SMBus-Compatible SDATA. |
| SCLK | I | SMBus-Compatible SCLOCK. |

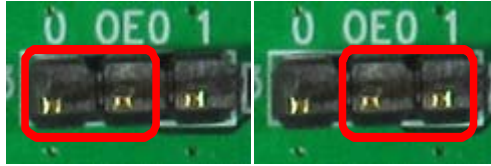
Table 2. Spread Selection

| SSON | Frequency (MHz) | Spread (%) | Note |
|------|-----------------|------------|--------------------------|
| 0 | 100.00 | OFF | Default Value for SSON=0 |
| 1 | 100.00 | -0.5 | |

Si52147-EVB

1.1. Generating DIFF Outputs from the Si52147

Upon power-on of the device, if the input pins are left floating, by default all DIFF outputs DIFF[0:8] are ON with 100 MHz and with spread spectrum disabled. The input pin headers have clear indication of jumper settings for setting logic low (0) and high (1) as shown below, the jumper placed on middle and left pin will set input OE0 to LOW; and jumper placed on middle and right pin will set input OE0 to high.



The output enable pins can be changed on the fly to observe outputs stopped cleanly. To enable the spread spectrum, the SSON input needs to change from a logic level low to high. Input functionality is explained in detail below.

1.1.1. SSON Input

Apply the appropriate logic level to SSON input to achieve clock frequency selection. When the SSON is high, -0.5% down spread is enabled on all differential outputs with a saw-tooth spread profile. When the SSON is low, spread profile is disabled.

1.1.2. OE [0:8] Input

The output enable pins can change on the fly when the device is on. Deasserting (valid low) results in corresponding DIFF output to be stopped after their next transition with final state low/low. Asserting (valid high) results in corresponding output that was stopped are to resume normal operation in a glitch-free manner.

Each of the hardware OE [0:8] pins are mapped via I²C to control bit in Control register. The hardware pin and the Register Control Bit both need to be high to enable the output. Both of these form an “AND” function to disable or enable the DIFF output. The DIFF outputs and their corresponding I²C control bits and hardware pins are listed in Table 3.

Table 3. Output Enable Control

| I ² C Control Bit | Output | Hardware Control Input |
|------------------------------|--------|------------------------|
| Byte1 [bit 4] | DIFF0 | OE0 |
| Byte1 [bit 2] | DIFF1 | OE1 |
| Byte2 [bit 1] | DIFF2 | OE2 |
| Byte2 [bit 0] | DIFF3 | OE3 |
| Byte1 [bit 7] | DIFF4 | OE4/5 |
| Byte1 [bit 6] | DIFF5 | OE4/5 |
| Byte2 [bit 5] | DIFF6 | OE6/8 |
| Byte2 [bit 4] | DIFF7 | OE6/8 |
| Byte2 [bit 3] | DIFF8 | OE6/8 |

2. Schematics

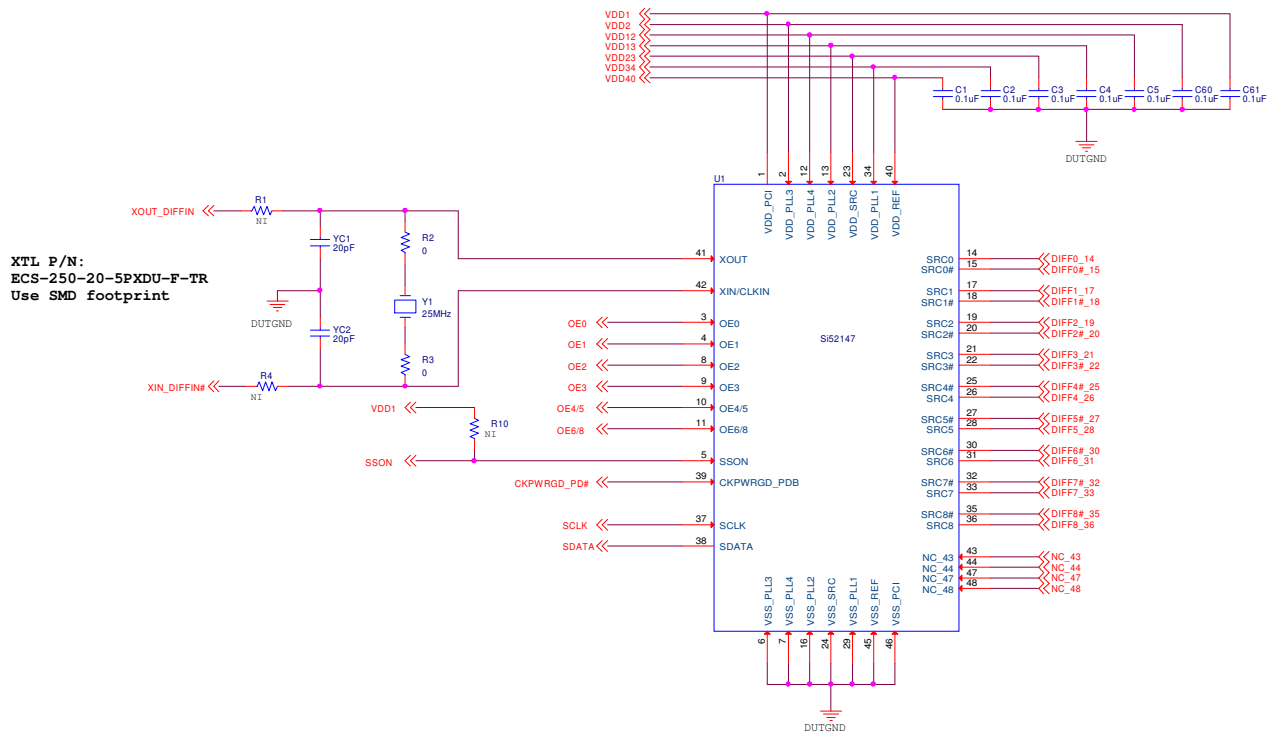


Figure 2. QFN-48 Device Connection

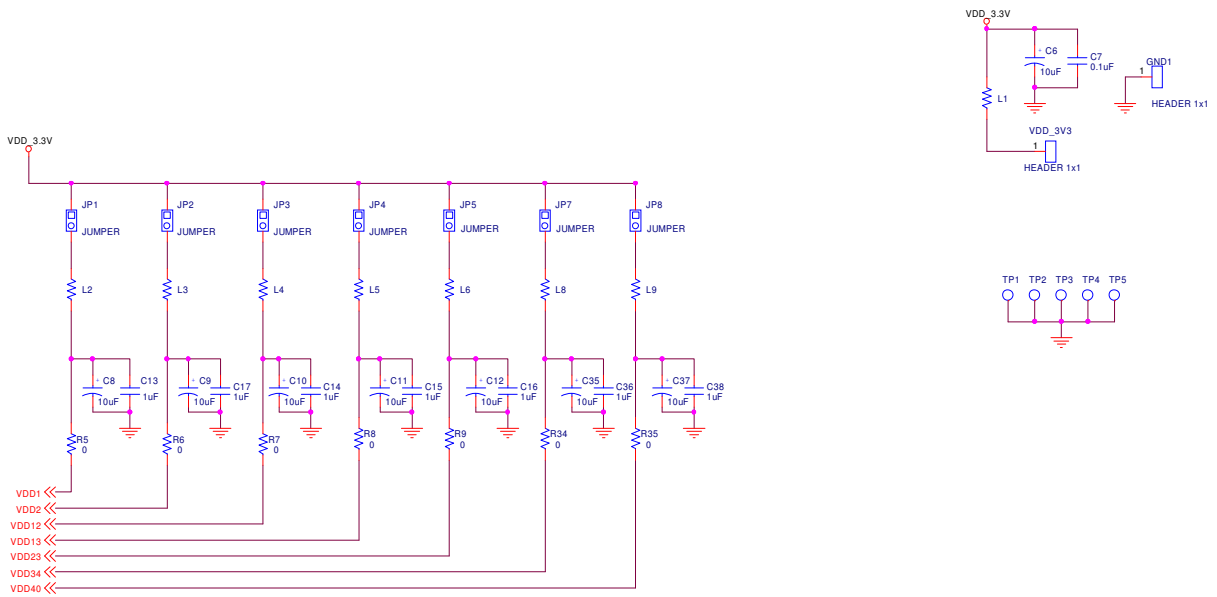


Figure 3. Device Power Supply

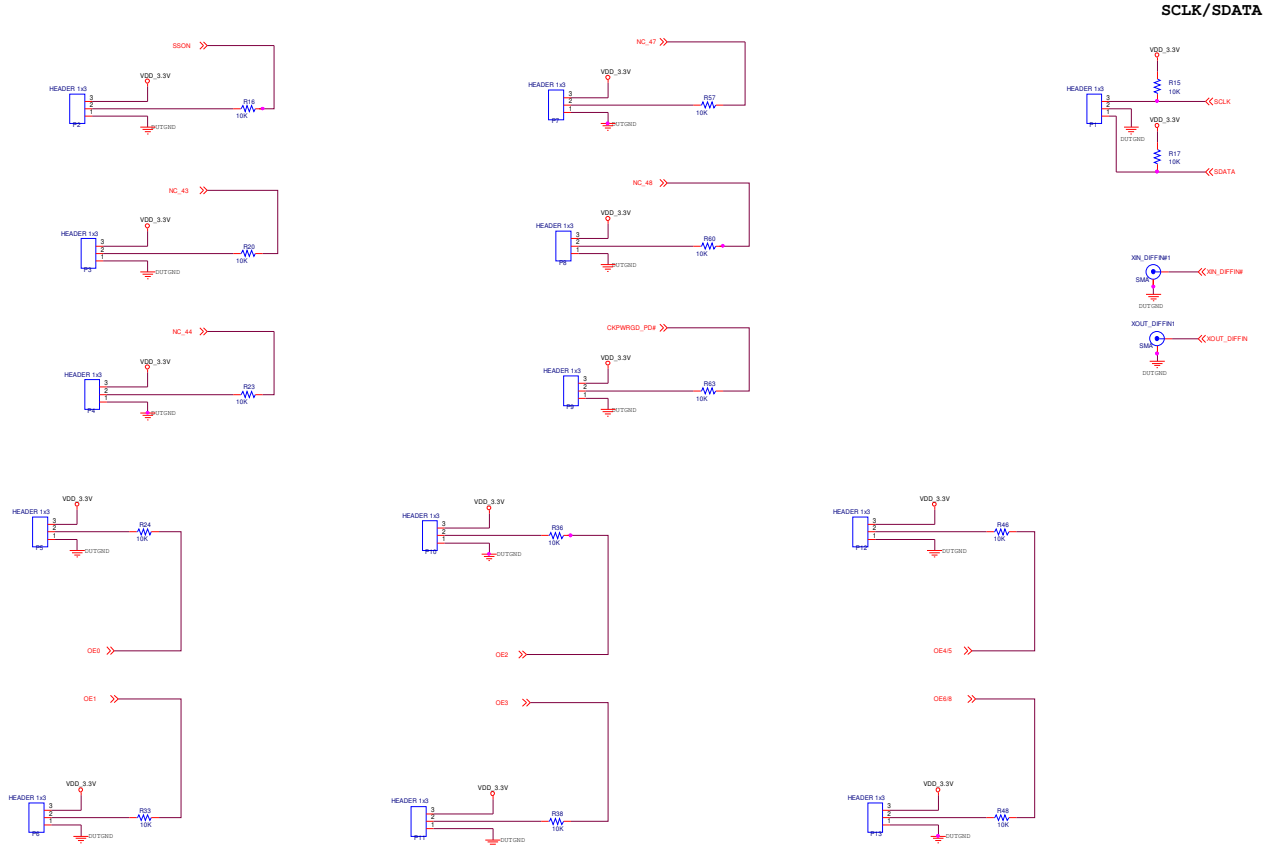


Figure 4. Clock and Control Signals

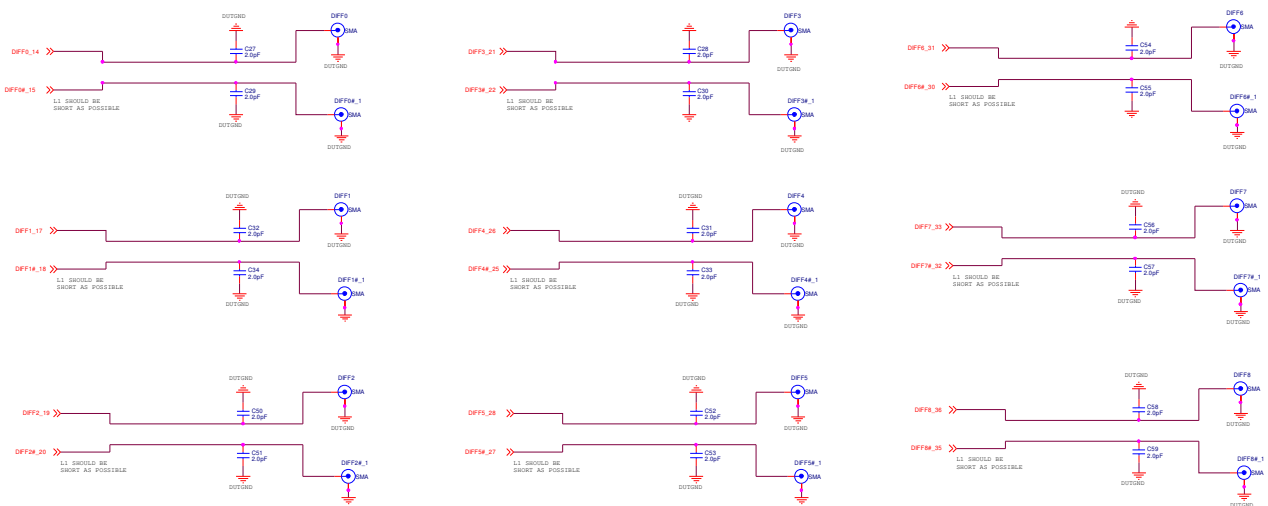


Figure 5. Differential Clock Signals

NOTES:

CONTACT INFORMATION

Silicon Laboratories Inc.
400 West Cesar Chavez
Austin, TX 78701
Tel: 1+(512) 416-8500
Fax: 1+(512) 416-9669
Toll Free: 1+(877) 444-3032

Please visit the Silicon Labs Technical Support web page:
<https://www.silabs.com/support/pages/contacttechnicalsupport.aspx>
and register to submit a technical support request.

The information in this document is believed to be accurate in all respects at the time of publication but is subject to change without notice. Silicon Laboratories assumes no responsibility for errors and omissions, and disclaims responsibility for any consequences resulting from the use of information included herein. Additionally, Silicon Laboratories assumes no responsibility for the functioning of undescribed features or parameters. Silicon Laboratories reserves the right to make changes without further notice. Silicon Laboratories makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Silicon Laboratories assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. Silicon Laboratories products are not designed, intended, or authorized for use in applications intended to support or sustain life, or for any other application in which the failure of the Silicon Laboratories product could create a situation where personal injury or death may occur. Should Buyer purchase or use Silicon Laboratories products for any such unintended or unauthorized application, Buyer shall indemnify and hold Silicon Laboratories harmless against all claims and damages.

Silicon Laboratories and Silicon Labs are trademarks of Silicon Laboratories Inc.
Other products or brandnames mentioned herein are trademarks or registered trademarks of their respective holders.

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели,
кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: ocean@oceanchips.ru

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А