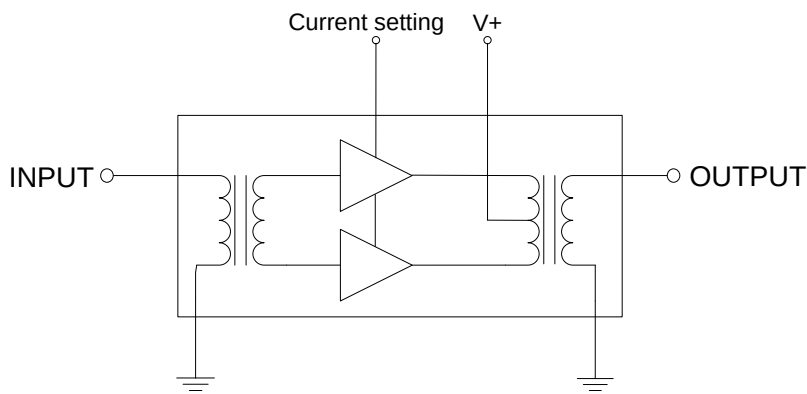


# QPA3240

GaAs/GaN Power Doubler Hybrid  
45MHz to 1218MHz

The QPA3240 is a Hybrid Power Doubler amplifier module. The part employs GaAs pHEMT die and GaN HEMT die, has extremely high output capability, and is operated from 45MHz to 1218MHz. It provides excellent linearity and superior return loss performance with low noise and optimal reliability. DC current of the device can be externally adjusted for optimum distortion performance versus power consumption over a wide range of output level.



Functional Block Diagram



Package: SOT-115J

## Features

- Excellent Linearity
- Superior Return Loss Performance
- Optimal Reliability
- Low Noise
- Unconditionally Stable Under All Terminations
- 24.5dB Min. Gain at 1218MHz
- 480mA Max.
- Extra Pin For Current Adjustment

## Applications

- 45MHz to 1218MHz CATV Amplifier Systems
- DOCSIS 3.1 Compliant

## Ordering Information

QPA3240                      Box with 50 pieces

# QPA3240

## Absolute Maximum Ratings

| Parameter                           | Rating      | Unit |
|-------------------------------------|-------------|------|
| RF Input Voltage (single tone)      | 75          | dBmV |
| DC Supply Over-Voltage (5 minutes)  | 30          | V    |
| Storage Temperature                 | -40 to +100 | °C   |
| Operating Mounting Base Temperature | -30 to +100 | °C   |



**Caution!** ESD sensitive device.



RFMD Green: RoHS status based on EU Directive 2011/65/EU (at time of this document revision), halogen free per EN 14582 : 2007, < 1000ppm each of antimony trioxide in polymeric materials and red phosphorus as a flame retardant, and <2% antimony in solder.

Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability. Specified typical performance or functional operation of the device under Absolute Maximum Rating conditions is not implied.

## Electrical Specifications

| Parameter                                                                                                        | Specification |       |       | Unit | Condition              |
|------------------------------------------------------------------------------------------------------------------|---------------|-------|-------|------|------------------------|
|                                                                                                                  | Min           | Typ   | Max   |      |                        |
| General Performance. Test conditions unless otherwise noted: V+ = 24V; TMB = 30°C; ZS = ZL = 75Ω, IDC set >370mA |               |       |       |      |                        |
| Operating Frequency Range                                                                                        | 45            |       | 1218  | MHz  |                        |
| Power Gain                                                                                                       | 23.3          | 23.8  | 24.3  | dB   | f = 45MHz              |
|                                                                                                                  | 24.5          | 24.8  | 26.0  | dB   | f = 1218MHz            |
| Slope[1]                                                                                                         | 0.5           | 1.0   | 2.0   | dB   | f = 45MHz to 1218MHz   |
| Flatness of Frequency Response                                                                                   |               |       | 0.8   | dB   | f = 45MHz to 1218MHz   |
| Input Return Loss                                                                                                | 20            |       |       | dB   | f = 45MHz to 320MHz    |
|                                                                                                                  | 19            |       |       | dB   | f = 320MHz to 640MHz   |
|                                                                                                                  | 18            |       |       | dB   | f = 640MHz to 870MHz   |
|                                                                                                                  | 18            |       |       | dB   | f = 870MHz to 1000MHz  |
|                                                                                                                  | 17            |       |       | dB   | f = 1000MHz to 1218MHz |
| Output Return Loss                                                                                               | 20            |       |       | dB   | f = 45MHz to 320MHz    |
|                                                                                                                  | 19            |       |       | dB   | f = 320MHz to 640MHz   |
|                                                                                                                  | 18            |       |       | dB   | f = 640MHz to 870MHz   |
|                                                                                                                  | 18            |       |       | dB   | f = 870MHz to 1000MHz  |
|                                                                                                                  | 17            |       |       | dB   | f = 1000MHz to 1218MHz |
| Noise Figure                                                                                                     |               | 3.0   | 4.0   | dB   | f = 50MHz to 1218MHz   |
| Total Current Consumption (DC)                                                                                   |               | 470.0 | 480.0 | mA   |                        |

## QPA3240

| Parameter                                                                                              | Specification |     |     | Unit | Condition                                                                                                         |
|--------------------------------------------------------------------------------------------------------|---------------|-----|-----|------|-------------------------------------------------------------------------------------------------------------------|
|                                                                                                        | Min           | Typ | Max |      |                                                                                                                   |
| Distortion Data 40MHz to 550MHz. Test conditions: V+ = 24V; TMB = 30°C; ZS = ZL = 75Ω, IDC=IDC typical |               |     |     |      |                                                                                                                   |
| CTB                                                                                                    |               | -73 | -68 | dBc  | VO = 62 dBmV at 1000MHz, 18dB extrapolated tilt, 79 analog channels plus 75 digital channels (-6dB offset)[2][5]  |
| XMOD                                                                                                   |               | -68 | -63 | dBc  |                                                                                                                   |
| CSO                                                                                                    |               | -76 | -70 | dBc  |                                                                                                                   |
| CIN                                                                                                    | 55            | 57  |     | dB   |                                                                                                                   |
| Distortion Data 40MHz to 550MHz. Test conditions: V+ = 24V; TMB = 30°C; ZS = ZL = 75Ω, IDC=IDC typical |               |     |     |      |                                                                                                                   |
| CTB                                                                                                    |               | -80 |     | dBc  | VO = 62 dBmV at 1218MHz, 22dB extrapolated tilt, 79 analog channels plus 111 digital channels (-6dB offset)[3][5] |
| XMOD                                                                                                   |               | -77 |     | dBc  |                                                                                                                   |
| CSO                                                                                                    |               | -80 |     | dBc  |                                                                                                                   |
| CIN                                                                                                    |               | 58  |     | dB   |                                                                                                                   |
| Distortion Data 40MHz to 550MHz. Test conditions: V+ = 24V; TMB = 30°C; ZS = ZL = 75Ω, IDC=400mA       |               |     |     |      |                                                                                                                   |
| CTB                                                                                                    |               | -72 |     | dBc  | VO = 62 dBmV at 1218MHz, 22dB extrapolated tilt, 79 analog channels plus 111 digital channels (-6dB offset)[3][6] |
| XMOD                                                                                                   |               | -67 |     | dBc  |                                                                                                                   |
| CSO                                                                                                    |               | -70 |     | dBc  |                                                                                                                   |
| CIN                                                                                                    |               | 50  |     | dB   |                                                                                                                   |

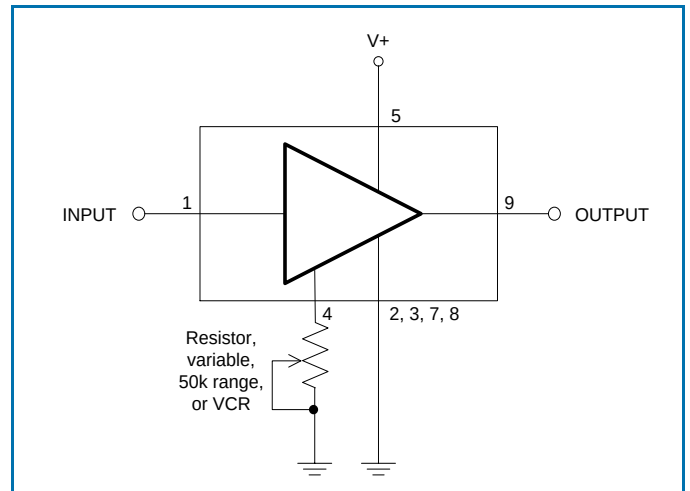
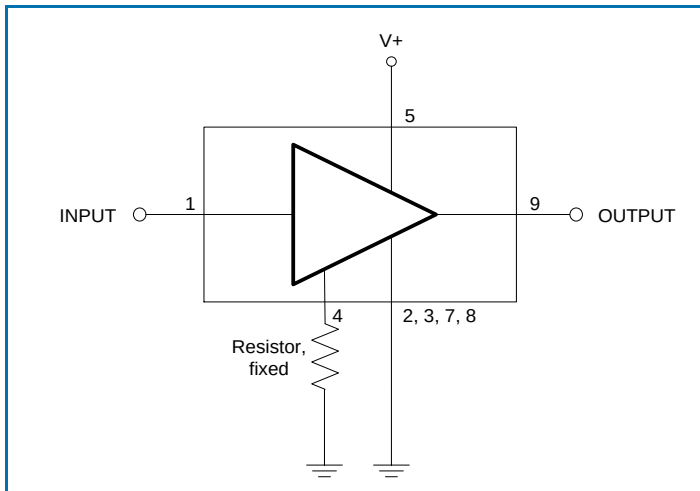
1. The slope is defined as the difference between the gain at the start frequency and the gain at the stop frequency.
2. 79 analog channels, NTSC frequency raster: 55.25MHz to 547.25MHz, +44dBmV to +53.4dBmV tilted output level, plus 75 digital channels, -6dB offset relative to the equivalent analog carrier.
3. 79 analog channels, NTSC frequency raster: 55.25MHz to 547.25MHz, +40dBmV to +49.4dBmV tilted output level, plus 111 digital channels, -6dB offset relative to the equivalent analog carrier.
4. Composite Triple Beat (CTB) - The CTB parameter is defined by the NCTA. Composite Second Order (CSO) - The CSO parameter (both sum and difference products) is defined by the NCTA. Cross Modulation (XMOD) - Cross modulation (XMOD) is measured at baseband (selective voltmeter method), referenced to 100% modulation of the carrier being tested. Carrier to Intermodulation Noise (CIN) - The CIN parameter is defined by ANSI/SCTE 17 (Test Procedure for carrier to noise).
5. Test condition: Pin 4 not connected
6. Test condition: Pin 4 connected to GND via 3.9k resistor

## QPA3240

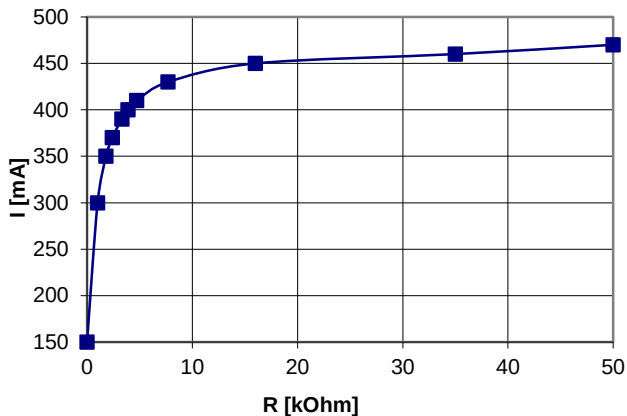
### Current Adjustment Using Hybrid Pin 4

The QPA3240 can be operated over a wide range of current to provide maximum required performance with minimum current consumption. A single external resistor connected between pin 4 and GND allows variation of current between 470mA and 150mA (typ.). Within the recommended range of current between 470mA and 370mA gain (S21) change is less than 0.2dB and noise figure change is less than 0.1dB. If pin 4 is not connected the device operates at maximum current, see table below.

Examples of connecting pin 4:



QPA3240 Current vs. external resistor



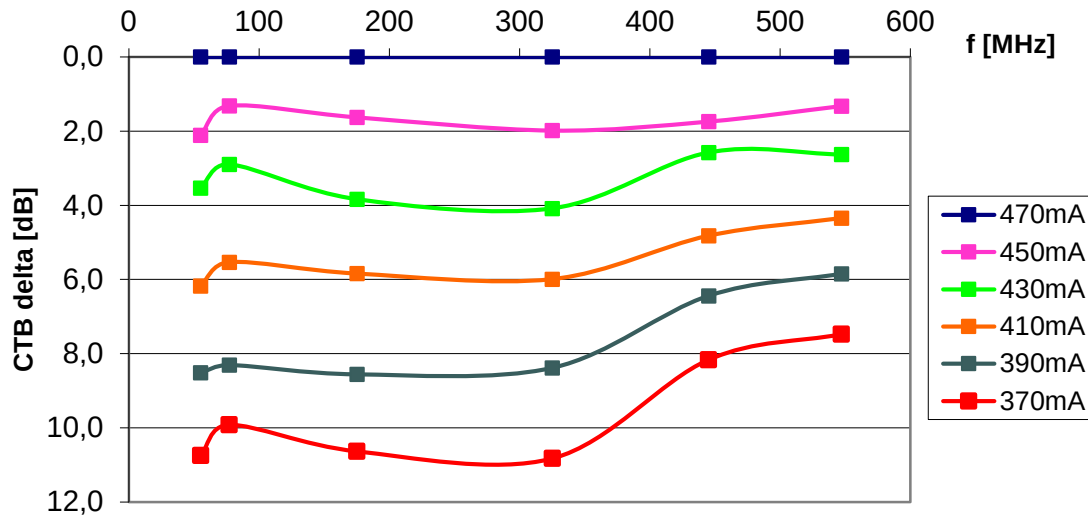
| Device current [mA], typical                                    | External resistor [ $\Omega$ ] |
|-----------------------------------------------------------------|--------------------------------|
| 470                                                             | >50k (open)                    |
| 450                                                             | 16k                            |
| 430                                                             | 7k5                            |
| 400                                                             | 3k9                            |
| 370                                                             | 2k4                            |
| 340                                                             | 1k5                            |
| 150                                                             | 0 (short)                      |
| $V_+ = 24V$ ; $T_{MB} = 30^\circ C$ ;<br>$Z_S = Z_L = 75\Omega$ |                                |

# QPA3240

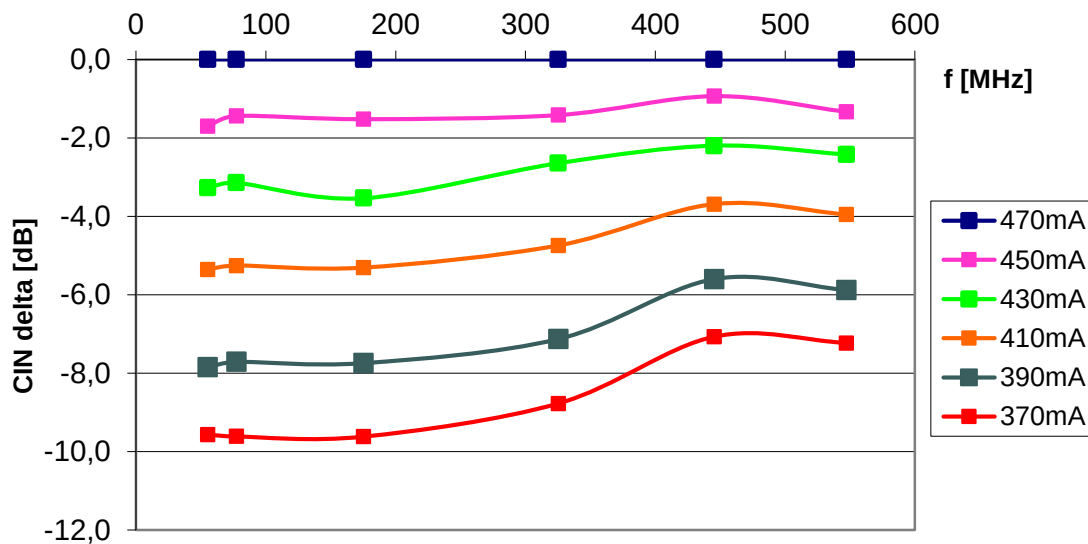
## Change of Distortion Performance Over Current

Test Condition:  $V_{+}=24V$ ,  $T_{MB} = 30^{\circ}C$ ;  $Z_S = Z_L = 75\Omega$ ,  $V_O = 62.0dBmV$  at 1000MHz, 18dB extrapolated tilt, 79 analog channels plus 75 digital channels (-6dB offset)

CTB change over device current, typical values



CIN change over device current, typical values

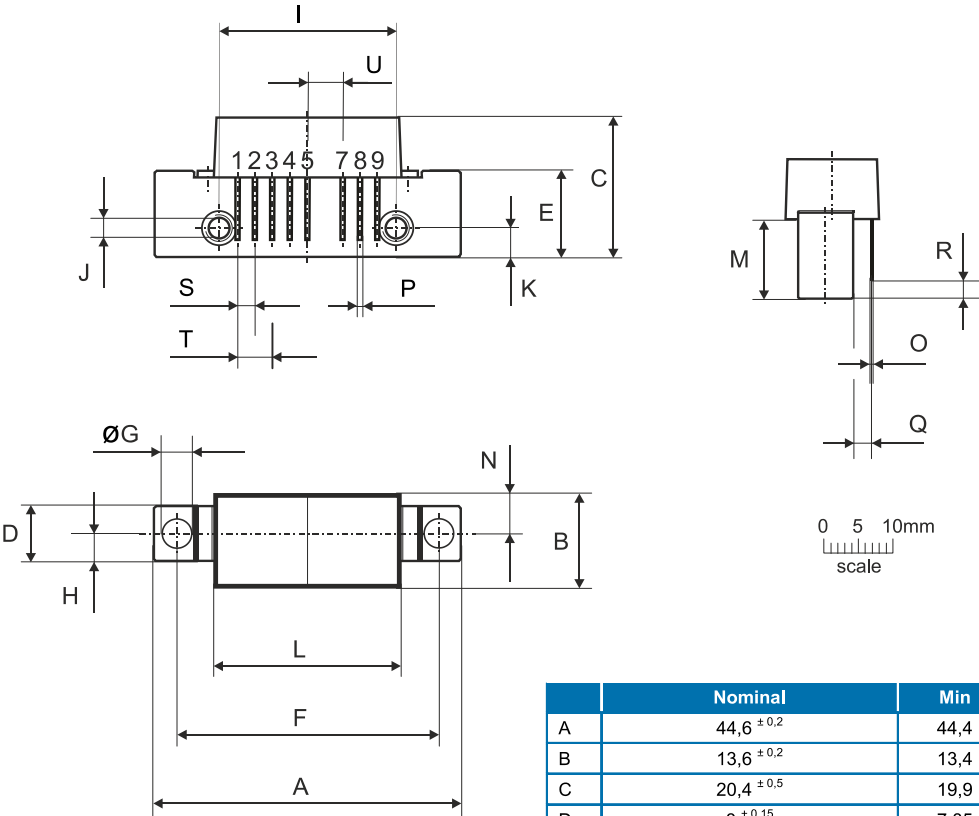


# QPA3240

## Package Drawing (Dimensions in millimeters)



RFMD + TriQuint = Qorvo



### Notes:

European Projection

### Pinning:

| Pin | Name            |
|-----|-----------------|
| 1   | Input           |
| 2-3 | GND             |
| 4   | CURRENT SETTING |
| 5   | V+              |
| 6   |                 |
| 7-8 | GND             |
| 9   | Output          |

|   | Nominal                 | Min   | Max   |
|---|-------------------------|-------|-------|
| A | 44,6 ± 0,2              | 44,4  | 44,8  |
| B | 13,6 ± 0,2              | 13,4  | 13,8  |
| C | 20,4 ± 0,5              | 19,9  | 20,9  |
| D | 8 ± 0,15                | 7,85  | 8,15  |
| E | 12,6 ± 0,15             | 12,45 | 12,75 |
| F | 38,1 ± 0,2              | 37,9  | 38,3  |
| G | 4 <sup>+0,2/-0,05</sup> | 3,95  | 4,2   |
| H | 4 ± 0,2                 | 3,8   | 4,2   |
| I | 25,4 ± 0,2              | 25,2  | 25,6  |
| J | UNC 6-32                | -     | -     |
| K | 4,2 ± 0,2               | 4,0   | 4,4   |
| L | 27,2 ± 0,2              | 27,0  | 27,4  |
| M | 11,6 ± 0,5              | 11,1  | 12,1  |
| N | 5,8 ± 0,4               | 5,4   | 6,2   |
| O | 0,25 ± 0,02             | 0,23  | 0,27  |
| P | 0,45 ± 0,03             | 0,42  | 0,48  |
| Q | 2,54 ± 0,3              | 2,24  | 2,84  |
| R | 2,54 ± 0,5              | 2,04  | 3,04  |
| S | 2,54 ± 0,25             | 2,29  | 2,79  |
| T | 5,08 ± 0,25             | 4,83  | 5,33  |
| U | 5,08 ± 0,25             | 4,83  | 5,33  |

QPA3240



## Contact Information

For the latest specifications, additional product information, worldwide sales and distribution locations:

**Web:** [www.rfmd.com](http://www.rfmd.com)

**Tel:** 1-844-890-8163

**Email:** [customer.support@qorvo.com](mailto:customer.support@qorvo.com)

For information about the merger of RFMD and TriQuint as Qorvo:

**Web:** [www.qorvo.com](http://www.qorvo.com)

## Important Notice

The information contained herein is believed to be reliable. RFMD makes no warranties regarding the information contained herein. RFMD assumes no responsibility or liability whatsoever for any of the information contained herein. RFMD assumes no responsibility or liability whatsoever for the use of the information contained herein. The information contained herein is provided "AS IS, WHERE IS" and with all faults, and the entire risk associated with such information is entirely with the user. All information contained herein is subject to change without notice. Customers should obtain and verify the latest relevant information before placing orders for RFMD products. The information contained herein or any use of such information does not grant, explicitly or implicitly, to any party any patent rights, licenses, or any other intellectual property rights, whether with regard to such information itself or anything described by such information.

RFMD products are not warranted or authorized for use as critical components in medical, life-saving, or life-sustaining applications, or other applications where a failure would reasonably be expected to cause severe personal injury or death.

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](mailto:ocean@oceanchips.ru)

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

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