



## Features

- RoHS compliant\* and halogen free\*\*
- Surface mount SMC package
- Standoff voltage: 5 to 170 volts
- Peak Pulse Power: 5000 watts
- AEC-Q101 compliant\*\*\*
- UL Recognized

## Applications

- Protection of power buses
- Protection of I/O interfaces
- Overvoltage transient protection
- Telecom, computer, industrial and consumer electronics applications

# 5.0SMDJ-Q Transient Voltage Suppressor Diode Series

### General Information

Bourns offers Transient Voltage Suppressor Diodes for surge and ESD protection applications, in compact chip package DO-214AB (SMC) size format. The Transient Voltage Suppressor series offers a choice of Working Peak Reverse Voltage from 5 V up to 170 V and Breakdown Voltage up to 189 V. Typical fast response times are less than 1.0 ps from 0 V to Breakdown Voltage.

Bourns® Chip Diodes conform to JEDEC standards, are easy to handle with standard pick and place equipment and the flat configuration minimizes roll away.

### Agency Recognition

| Description |                                      |
|-------------|--------------------------------------|
| UL          | File Number: <a href="#">E153537</a> |

### Electrical Characteristics (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted)

| Parameter  | Symbol             | Value       | Unit  |
|--|--------------------|-------------|-------|
| Minimum Peak Pulse Power Dissipation (T <sub>p</sub> = 1 ms) (Note 1,2)  | P <sub>PK</sub>    | 5000        | Watts |
| Peak Forward Surge Current<br>8.3 ms Single Half Sine Wave Superimposed on Rated Load<br>(JEDEC Method) (Note 3,4) | I <sub>FSM</sub>   | 300         | Amps  |
| Steady State Power Dissipation @ TL = 50 °C  | P <sub>M(AV)</sub> | 6.5         | Watts |
| Maximum Instantaneous Forward Voltage @ I <sub>PP</sub> = 100 A<br>(For Unidirectional Units Only)                 | V <sub>F</sub>     | 5           | Volts |
| Operating Temperature Range  | T <sub>J</sub>     | -55 to +150 | °C    |
| Storage Temperature Range  | T <sub>STG</sub>   | -55 to +150 | °C    |

1. Non-repetitive current pulse, per Pulse Waveform graph and derated above T<sub>A</sub> = 25 °C per Pulse Derating Curve.
2. Thermal Resistance Junction to Lead.
3. 8.3 ms Single Sine Wave duty cycle = 4 pulses maximum per minute (unidirectional units only).
4. Mounted on 8.0 mm x 8.0 mm copper pad area to each terminal.

# BOURNS®

#### Asia-Pacific:

Tel: +886-2 2562-4117 • Email: [asiacus@bourns.com](mailto:asiacus@bourns.com)

#### Europe:

Tel: +36 88 885 877 • Email: [eurocus@bourns.com](mailto:eurocus@bourns.com)

#### The Americas:

Tel: +1-951 781-5500 • Email: [americus@bourns.com](mailto:americus@bourns.com)

[www.bourns.com](http://www.bourns.com)

### How to Order

|                                    |  |
|------------------------------------|--|
|                                    | <b>5.0SMDJ 12 CA - Q</b>   |
| Package _____                      | 5.0SMDJ = SMC/DO-214AB   |
| Working Peak Reverse Voltage _____ | 12 = 12 V <sub>RWM</sub> (Volts)   |
| Suffix _____                       | A = 5 % Tolerance Unidirectional Device<br>CA = 5 % Tolerance Bidirectional Device                                       |
| AEC-Q101 Compliant Suffix _____    | Q = AEC-Q101 Compliant, 3000 pcs. per 13-inch Reel<br>QH = AEC-Q101 Compliant, 500 pcs. per 7-inch Reel, 3 Reels per Box |



**WARNING Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)**

\* RoHS Directive 2015/863, Mar 31, 2015 and Annex.

\*\* Bourns considers a product to be "halogen free" if (a) the Bromine (Br) content is 900 ppm or less; (b) the Chlorine (Cl) content is 900 ppm or less; and (c) the total Bromine (Br) and Chlorine (Cl) content is 1500 ppm or less.

\*\*\* Q suffix for automotive and other applications requiring appropriate AEC-Q101 compliance for electronic limiters.

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# 5.0SMDJ-Q Transient Voltage Suppressor Diode Series

## Electrical Characteristics (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted)

| Unidirectional Device |              | Bidirectional Device |              | Breakdown Voltage V <sub>BR</sub> (Volts) |        |                       | Reverse Standoff Voltage | Maximum Reverse Leakage @ V <sub>RWM</sub> | Maximum Clamping Voltage @ I <sub>PP</sub> | Peak Pulse Current  |
|-----------------------|--------------|----------------------|--------------|---|--------|-----------------------|--------------------------|--|--|---------------------|
| Part Number           | Part Marking | Part Number          | Part Marking | Min.                                      | Max.   | @ I <sub>T</sub> (mA) | V <sub>RWM</sub> (V)     | I <sub>R</sub> (μA)                        | V <sub>C</sub> (V)                         | I <sub>PP</sub> (A) |
| 5.0SMDJ5.0A-Q         | 5RDEQ        | 5.0SMDJ5.0CA-Q       | 5DDEQ        | 6.40                                      | 7.00   | 10                    | 5.0                      | 1050                                       | 9.2  | 543.6               |
| 5.0SMDJ6.0A-Q         | 5RDGQ        | 5.0SMDJ6.0CA-Q       | 5DDGQ        | 6.67                                      | 7.37   | 10                    | 6.0                      | 1050                                       | 10.3                                       | 485.5               |
| 5.0SMDJ6.5A-Q         | 5RDKQ        | 5.0SMDJ6.5CA-Q       | 5DDKQ        | 7.22                                      | 7.98   | 10                    | 6.5                      | 750  | 11.2                                       | 446.5               |
| 5.0SMDJ7.0A-Q         | 5PDMQ        | 5.0SMDJ7.0CA-Q       | 5DDMQ        | 7.78                                      | 8.60   | 10                    | 7.0                      | 300  | 12.0                                       | 416.8               |
| 5.0SMDJ7.5A-Q         | 5PDPQ        | 5.0SMDJ7.5CA-Q       | 5DDPQ        | 8.33                                      | 9.21   | 1                     | 7.5                      | 150  | 12.9                                       | 387.7               |
| 5.0SMDJ8.0A-Q         | 5PDRQ        | 5.0SMDJ8.0CA-Q       | 5DDRQ        | 8.89                                      | 9.83   | 1                     | 8.0                      | 70   | 13.6                                       | 367.7               |
| 5.0SMDJ8.5A-Q         | 5PDTQ        | 5.0SMDJ8.5CA-Q       | 5DDTQ        | 9.44                                      | 10.40  | 1                     | 8.5                      | 30   | 14.4                                       | 347.3               |
| 5.0SMDJ9.0A-Q         | 5PDVQ        | 5.0SMDJ9.0CA-Q       | 5DDVQ        | 10.00                                     | 11.10  | 1                     | 9.0                      | 12   | 15.4                                       | 324.8               |
| 5.0SMDJ10A-Q          | 5PDXQ        | 5.0SMDJ10CA-Q        | 5DDXQ        | 11.10                                     | 12.30  | 1                     | 10.0                     | 6  | 17.0                                       | 294.2               |
| 5.0SMDJ11A-Q          | 5PDZQ        | 5.0SMDJ11CA-Q        | 5DDZQ        | 12.20                                     | 13.50  | 1                     | 11.0                     | 2  | 18.2                                       | 274.8               |
| 5.0SMDJ12A-Q          | 5PEPQ        | 5.0SMDJ12CA-Q        | 5BEPQ        | 13.30                                     | 14.70  | 1                     | 12.0                     | 2  | 19.9                                       | 252.0               |
| 5.0SMDJ13A-Q          | 5PEQQ        | 5.0SMDJ13CA-Q        | 5BEQQ        | 14.40                                     | 15.90  | 1                     | 13.0                     | 2  | 21.5                                       | 233.0               |
| 5.0SMDJ14A-Q          | 5PERQ        | 5.0SMDJ14CA-Q        | 5BERQ        | 15.60                                     | 17.20  | 1                     | 14.0                     | 2  | 23.2                                       | 216.0               |
| 5.0SMDJ15A-Q          | 5PESQ        | 5.0SMDJ15CA-Q        | 5BESQ        | 16.70                                     | 18.50  | 1                     | 15.0                     | 2  | 24.4                                       | 205.0               |
| 5.0SMDJ16A-Q          | 5PETQ        | 5.0SMDJ16CA-Q        | 5BETQ        | 17.80                                     | 19.70  | 1                     | 16.0                     | 2  | 26.0                                       | 193.0               |
| 5.0SMDJ17A-Q          | 5PEUQ        | 5.0SMDJ17CA-Q        | 5BEUQ        | 18.90                                     | 20.90  | 1                     | 17.0                     | 2  | 27.6                                       | 181.0               |
| 5.0SMDJ18A-Q          | 5PEVQ        | 5.0SMDJ18CA-Q        | 5BEVQ        | 20.00                                     | 22.10  | 1                     | 18.0                     | 2  | 29.2                                       | 172.0               |
| 5.0SMDJ20A-Q          | 5PEWQ        | 5.0SMDJ20CA-Q        | 5BEWQ        | 22.20                                     | 24.50  | 1                     | 20.0                     | 2  | 32.4                                       | 155.0               |
| 5.0SMDJ22A-Q          | 5PEXQ        | 5.0SMDJ22CA-Q        | 5BEXQ        | 24.40                                     | 26.90  | 1                     | 22.0                     | 2  | 35.5                                       | 141.0               |
| 5.0SMDJ24A-Q          | 5PEZQ        | 5.0SMDJ24CA-Q        | 5BEZQ        | 26.70                                     | 29.50  | 1                     | 24.0                     | 2  | 38.9                                       | 129.0               |
| 5.0SMDJ26A-Q          | 5PFEQ        | 5.0SMDJ26CA-Q        | 5BFEQ        | 28.90                                     | 31.90  | 1                     | 26.0                     | 2  | 42.1                                       | 119.0               |
| 5.0SMDJ28A-Q          | 5PFGQ        | 5.0SMDJ28CA-Q        | 5BFGQ        | 31.10                                     | 34.40  | 1                     | 28.0                     | 2  | 45.4                                       | 110.0               |
| 5.0SMDJ30A-Q          | 5PFKQ        | 5.0SMDJ30CA-Q        | 5BFKQ        | 33.30                                     | 36.80  | 1                     | 30.0                     | 2  | 48.4                                       | 103.0               |
| 5.0SMDJ33A-Q          | 5PFMQ        | 5.0SMDJ33CA-Q        | 5BFMQ        | 36.70                                     | 40.60  | 1                     | 33.0                     | 2  | 53.3                                       | 93.9                |
| 5.0SMDJ36A-Q          | 5PFPQ        | 5.0SMDJ36CA-Q        | 5BFPQ        | 40.00                                     | 44.20  | 1                     | 36.0                     | 2  | 58.1                                       | 86.1                |
| 5.0SMDJ40A-Q          | 5PFRQ        | 5.0SMDJ40CA-Q        | 5BFRQ        | 44.40                                     | 49.10  | 1                     | 40.0                     | 2  | 64.5                                       | 77.6                |
| 5.0SMDJ43A-Q          | 5PFTQ        | 5.0SMDJ43CA-Q        | 5BFTQ        | 47.80                                     | 52.80  | 1                     | 43.0                     | 2  | 69.4                                       | 72.1                |
| 5.0SMDJ45A-Q          | 5PFVQ        | 5.0SMDJ45CA-Q        | 5BFVQ        | 50.00                                     | 55.30  | 1                     | 45.0                     | 2  | 72.7                                       | 68.8                |
| 5.0SMDJ48A-Q          | 5PFXQ        | 5.0SMDJ48CA-Q        | 5BFXQ        | 53.30                                     | 58.90  | 1                     | 48.0                     | 2  | 77.4                                       | 64.7                |
| 5.0SMDJ51A-Q          | 5PFZQ        | 5.0SMDJ51CA-Q        | 5BFZQ        | 56.70                                     | 62.70  | 1                     | 51.0                     | 2  | 82.4                                       | 60.7                |
| 5.0SMDJ54A-Q          | 5RGEQ        | 5.0SMDJ54CA-Q        | 5BGEQ        | 60.00                                     | 66.30  | 1                     | 54.0                     | 2  | 87.1                                       | 57.5                |
| 5.0SMDJ58A-Q          | 5PGGQ        | 5.0SMDJ58CA-Q        | 5BGGQ        | 64.40                                     | 71.20  | 1                     | 58.0                     | 2  | 93.6                                       | 53.5                |
| 5.0SMDJ60A-Q          | 5PGKQ        | 5.0SMDJ60CA-Q        | 5BGKQ        | 66.70                                     | 73.70  | 1                     | 60.0                     | 2  | 96.8                                       | 51.7                |
| 5.0SMDJ64A-Q          | 5PGMQ        | 5.0SMDJ64CA-Q        | 5BGMQ        | 71.10                                     | 78.60  | 1                     | 64.0                     | 2  | 103.0                                      | 48.6                |
| 5.0SMDJ70A-Q          | 5PGPQ        | 5.0SMDJ70CA-Q        | 5BGPQ        | 77.80                                     | 86.00  | 1                     | 70.0                     | 2  | 113.0                                      | 44.3                |
| 5.0SMDJ75A-Q          | 5PGRQ        | 5.0SMDJ75CA-Q        | 5BGRQ        | 83.30                                     | 92.10  | 1                     | 75.0                     | 2  | 121.0                                      | 41.4                |
| 5.0SMDJ78A-Q          | 5PGTQ        | 5.0SMDJ78CA-Q        | 5BGTQ        | 86.70                                     | 95.80  | 1                     | 78.0                     | 2  | 126.0                                      | 39.7                |
| 5.0SMDJ85A-Q          | 5PGVQ        | 5.0SMDJ85CA-Q        | 5BGVQ        | 94.40                                     | 104.00 | 1                     | 85.0                     | 2  | 137.0                                      | 36.5                |

Continued on next page

Note:

- 'Q' suffix denotes AEC-Q101 compliance.

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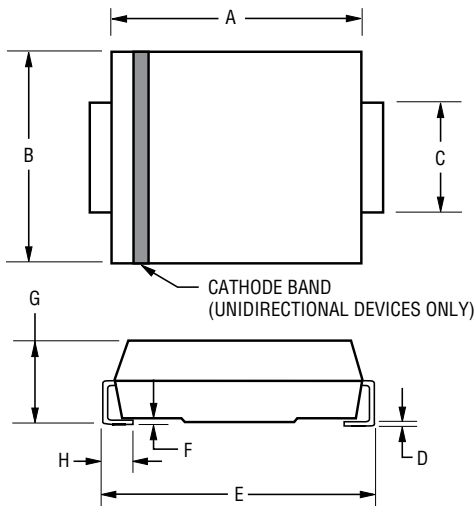
# 5.0SMDJ-Q Transient Voltage Suppressor Diode Series



## Electrical Characteristics (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted) - Continued

| Unidirectional Device |                 | Bidirectional Device |                 | Breakdown Voltage<br>V <sub>BR</sub> (Volts) |        |                          | Reverse<br>Standoff<br>Voltage | Maximum<br>Reverse<br>Leakage<br>@ V <sub>RWM</sub> | Maximum<br>Clamping<br>Voltage<br>@ I <sub>PP</sub> | Peak<br>Pulse<br>Current |
|-----------------------|-----------------|----------------------|-----------------|--|--------|--------------------------|--------------------------------|---|---|--------------------------|
| Part<br>Number        | Part<br>Marking | Part<br>Number       | Part<br>Marking | Min.   | Max.   | @ I <sub>T</sub><br>(mA) | V <sub>RWM</sub> (V)           | I <sub>R</sub> (μA)                                 | V <sub>C</sub> (V)                                  | I <sub>PP</sub> (A)      |
| 5.0SMDJ90A-Q          | 5PGXQ           |                      |                 | 100.00                                       | 111.00 | 1                        | 90.0                           | 2   | 146.0   | 34.3                     |
| 5.0SMDJ100A-Q         | 5PGZQ           |                      |                 | 111.00                                       | 123.00 | 1                        | 100.0                          | 2   | 162.0   | 30.9                     |
| 5.0SMDJ110A-Q         | 5PHEQ           |                      |                 | 122.00                                       | 135.00 | 1                        | 110.0                          | 2   | 177.0   | 28.3                     |
| 5.0SMDJ120A-Q         | 5PHGQ           |                      |                 | 133.00                                       | 147.00 | 1                        | 120.0                          | 2   | 193.0   | 26.0                     |
| 5.0SMDJ130A-Q         | 5PHKQ           |                      |                 | 144.00                                       | 159.00 | 1                        | 130.0                          | 2   | 209.0   | 24.0                     |
| 5.0SMDJ150A-Q         | 5PHMQ           |                      |                 | 167.00                                       | 185.00 | 1                        | 150.0                          | 2   | 243.0   | 20.6                     |
| 5.0SMDJ160A-Q         | 5PHPQ           |                      |                 | 178.00                                       | 197.00 | 1                        | 160.0                          | 2   | 259.0   | 19.3                     |
| 5.0SMDJ170A-Q         | 5PHRQ           |                      |                 | 189.00                                       | 209.00 | 1                        | 170.0                          | 2   | 275.0   | 18.2                     |

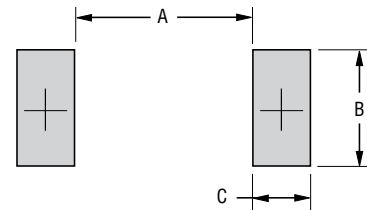
### Product Dimensions



| Dimension | SMC (DO-214AB)                        |
|-----------|---------------------------------------|
| A         | $\frac{6.60 - 7.11}{(0.260 - 0.280)}$ |
| B         | $\frac{5.59 - 6.22}{(0.220 - 0.245)}$ |
| C         | $\frac{2.90 - 3.20}{(0.114 - 0.126)}$ |
| D         | $\frac{0.15 - 0.31}{(0.006 - 0.012)}$ |
| E         | $\frac{7.75 - 8.13}{(0.305 - 0.320)}$ |
| F         | $\frac{0.20}{(0.008)}$ MAX.           |
| G         | $\frac{2.01 - 2.62}{(0.080 - 0.103)}$ |
| H         | $\frac{0.76 - 1.52}{(0.030 - 0.060)}$ |

DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

### Recommended Footprint



| Dimension | SMC (DO-214AB)         |
|-----------|------------------------|
| A (Max.)  | $\frac{4.69}{(0.185)}$ |
| B (Min.)  | $\frac{3.07}{(0.121)}$ |
| C (Min.)  | $\frac{1.53}{(0.060)}$ |

DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

### Physical Specifications

Encapsulation.....Molded plastic per UL Class 94V-0  
 Polarity..... Cathode band indicates unidirectional device  
 No cathode band indicates bidirectional device

### Environmental Specifications

Moisture Sensitivity Level..... 1  
 ESD Classification (HBM)..... 3B

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# 5.0SMDJ-Q Transient Voltage Suppressor Diode Series



## Rating & Characteristic Curves

### Pulse Derating Curve



### Maximum Non-Repetitive Surge Current



### Pulse Waveform



### Typical Junction Capacitance



### Pulse Rating Curve



### Steady State Power Derating Curve



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# 5.0SMDJ-Q Transient Voltage Suppressor Diode Series

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## Packaging Information

The product will be dispensed in tape and reel format (see diagram below).



Devices are packed in accordance with EIA standard EIA-481-D and specifications shown here.

| Item                   | Symbol         | SMC (DO-214AB)                                     |                        |
|------------------------|----------------|--|------------------------|
|                        |                | 7-Inch Reel  | 13-Inch Reel           |
| Carrier Width          | A              | $6.0 \pm 0.20$<br>(0.236 ± 0.079)                  |                        |
| Carrier Length         | B              | $8.3 \pm 0.20$<br>(0.327 ± 0.008)                  |                        |
| Carrier Depth          | C              | $2.5 \pm 0.20$<br>(0.098 ± 0.008)                  |                        |
| Sprocket Hole          | d              | $1.50 \pm 0.10$<br>(0.059 ± 0.004)                 |                        |
| Reel Outside Diameter  | D              | $\frac{178}{(7.008)}$                              | $\frac{330}{(12.992)}$ |
| Reel Inner Diameter    | D <sub>1</sub> | $\frac{50.0}{(1.969)}$ MIN.                        |                        |
| Feed Hole Diameter     | D <sub>2</sub> | $\frac{13.0 + 0.50/-0.20}{(0.512 + 0.020/-0.008)}$ |                        |
| Sprocket Hole Position | E              | $\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$          |                        |
| Punch Hole Position    | F              | $\frac{7.50 \pm 0.10}{(0.295 \pm 0.004)}$          |                        |
| Punch Hole Pitch       | P              | $\frac{8.00 \pm 0.10}{(0.315 \pm 0.004)}$          |                        |
| Sprocket Hole Pitch    | P <sub>0</sub> | $\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$          |                        |
| Embossment Center      | P <sub>1</sub> | $\frac{2.00 \pm 0.10}{(0.079 \pm 0.004)}$          |                        |
| Overall Tape Thickness | T              | $0.30 \pm 0.10$<br>(0.012 ± 0.004)                 |                        |
| Tape Width             | W              | $\frac{16.00 \pm 0.30}{(0.630 \pm 0.012)}$         |                        |
| Reel Width             | W <sub>1</sub> | $\frac{22.4}{(0.882)}$ MAX.                        |                        |
| Quantity per Reel      | --             | 500  | 3,000                  |

REV. 09/19

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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