

# Pt Temperature Sensor – PTF Family



- Conformal to standard platinum temperature sensors according DIN EN 60751
- $R_0$ : 100 and 1000  $\Omega$
- Class F 0.1 (T = AA), F 0.15 (A), F 0.3 (B) and F 0.6 (C) accuracy
- Wide temperature range
- Different outline dimensions
- Global interchangeability

## DESCRIPTION

The PTF-sensor family combines a group of resistance temperature detectors (RTD) using a Platinum resistor in thin film technology as sensing element. It consists of a structured platinum film on a ceramics substrate, passivated by glass coating. The connection wires are protected with glass on the welding area.

The characteristic curve of this Platinum RTD complies with DIN EN 60751. The usage of Platinum as resistive material guarantees high long term stability.

Due to small outline and low mass this RTD has a low time constant; therefore it is a suitable solution for fast and precise feedback control systems.

## FEATURES

Conformal to DIN EN 60751  
 Wide temperature range: -50 ... +600 °C (Ni/Au wire and Class F 0.3, Ag-Wire versions are limited to 300 °C)  
 Standard nominal resistances values:  
 $R_0$ : 100 and 1000  $\Omega$  (other on request)  
 Class F 0.1 (T = AA), F 0.15 (A), F 0.3 (B) and F 0.6 (C) accuracy  
 Low drift over lifetime  
 Fast response time because of low thermal mass  
 Different outline dimensions available to fit a wide range of space requirements  
 Global interchangeability

## APPLICATIONS

Temperature feedback control  
 White goods  
 Industrial applications  
 Automotive  
 Medical  
 Sensing element for plug-in probes

# Pt Temperature Sensor – PTF Family

## PERFORMANCE SPECS

| Parameter                                    | Symbol             | Condition  | Min.           | Typical                   | Max.                     | Unit   |
|--|--------------------|--|----------------|---------------------------|--------------------------|--------|
| Nominal Resistance at 0 °C                   | R <sub>0</sub>     | Class B  | 99.88<br>998,8 | 100.00<br>1000.0          | 100.12<br>1001,2         | Ω      |
| Tolerance at 25 °C                           | Class B            | Room temperature calibration                                 | -0.43          | 0                         | 0.43                     | °C     |
| Temperature Coefficient of Resistance        | TCR                | 0 °C, 100 °C   |                | 3850                      |                          | ppm/°C |
| Temperature Range                            |                    |  | -50            |                           | 600                      | °C     |
| Self Heating Coefficient in air, flow: 1 m/s |                    | PTFC outline<br>PTFD outline<br>PTFF outline<br>PTFM outline |                | 0.5<br>0.33<br>0.5<br>0.5 |                          | °C/mW  |
| Response Time Water Flow: 0.4 m/s            | τ <sub>W,0.9</sub> | PTFC outline<br>PTFD outline<br>PTFF outline<br>PTFM outline |                | 0.2<br>0.35<br>0.2<br>0.2 |                          | s      |
| Response Time Air Flow: 1 m/s                | τ <sub>A,0.9</sub> | PTFC outline<br>PTFD outline<br>PTFF outline<br>PTFM outline |                | 10<br>17<br>10<br>10      |                          | s      |
| Measuring Current R <sub>0</sub> : 100 Ω     |                    | PTFC outline<br>PTFD outline<br>PTFF outline<br>PTFM outline |                |                           | 1.4<br>1.7<br>1.4<br>1.4 | mA     |
| Measuring Current R <sub>0</sub> : 1000 Ω    |                    | PTFC outline<br>PTFD outline<br>PTFF outline<br>PTFM outline |                |                           | 0.4<br>0.5<br>0.4<br>0.4 | mA     |

## CALCULATION FORMULAS

The calculation formulas of Pt-RTDs are defined in DIN EN 60751 as following:

**For T ≥ 0 °C:**

$$R(T) = R(0) * (1 + a * T + b * T^2)$$

**For T < 0 °C:**

$$R(T) = R(0) * [1 + a * T + b * T^2 + c * (T - 100 °C) * T^3]$$

**Coefficients:**

$$\begin{aligned} a &= 3.9083E-03 \\ b &= -5.775E-07 \\ c &= -4.183E-12 \end{aligned}$$

**Tolerances:**

|                       |                           |                |
|-----------------------|---------------------------|----------------|
| Class F 0.1 (T = AA): | ± (0.10+0.0017* T/°C ) °C | (-30..+200 °C) |
| Class F 0.15 (A)      | ± (0.15+0.002* T/°C ) °C  | (-30..+300 °C) |
| Class F 0.3 (B):      | ± (0.30+0.005* T/°C ) °C  | (-50..+600 °C) |
| Class F 0.6 (C):      | ± (0.60+0.01* T/°C ) °C   | (-50..+600 °C) |

# Pt Temperature Sensor – PTF Family

## TYPICAL PERFORMANCE CURVES



Figure 1: Resistance characteristics



Figure 2: Tolerance chart

# Pt Temperature Sensor – PTF Family

## DIMENSIONAL DRAWING - PTFC OUTLINE



Figure 3: PTFC outline dimensions (mm)

## DIMENSIONAL DRAWING - PTFD OUTLINE

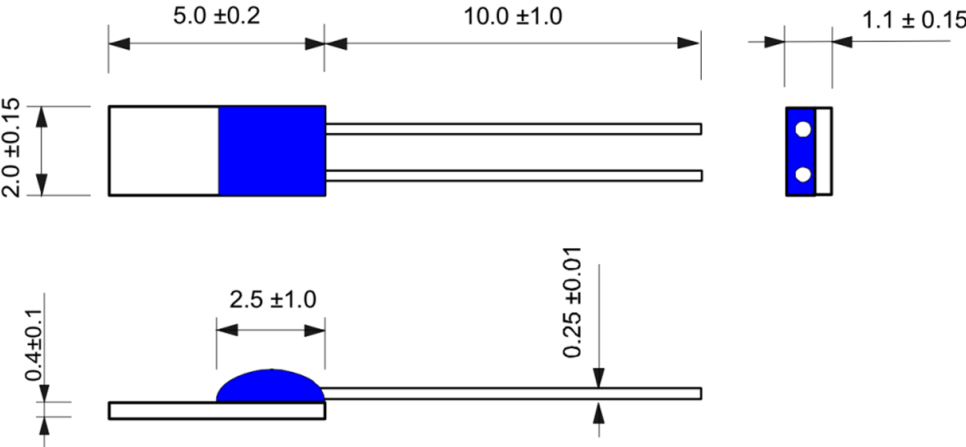


Figure 4: PTFD outline dimensions (mm)

## DIMENSIONAL DRAWING - PTFF OUTLINE

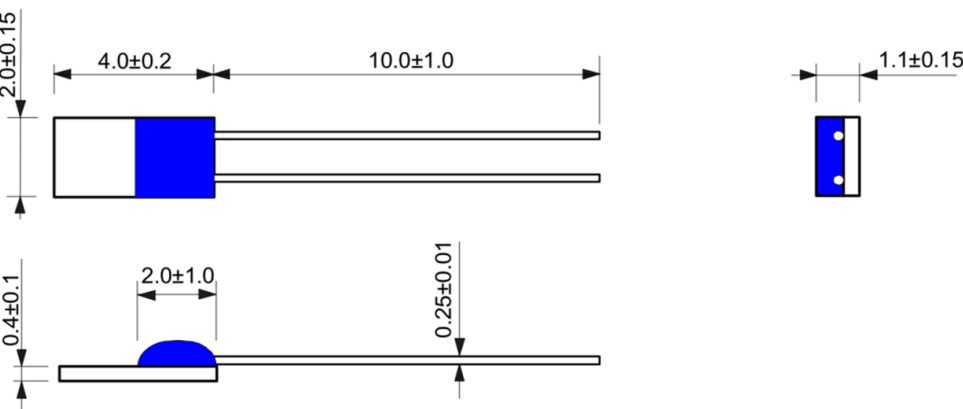


Figure 5: PTFF outline dimensions (mm)

# Pt Temperature Sensor – PTF Family

## DIMENSIONAL DRAWING - PTFM OUTLINE

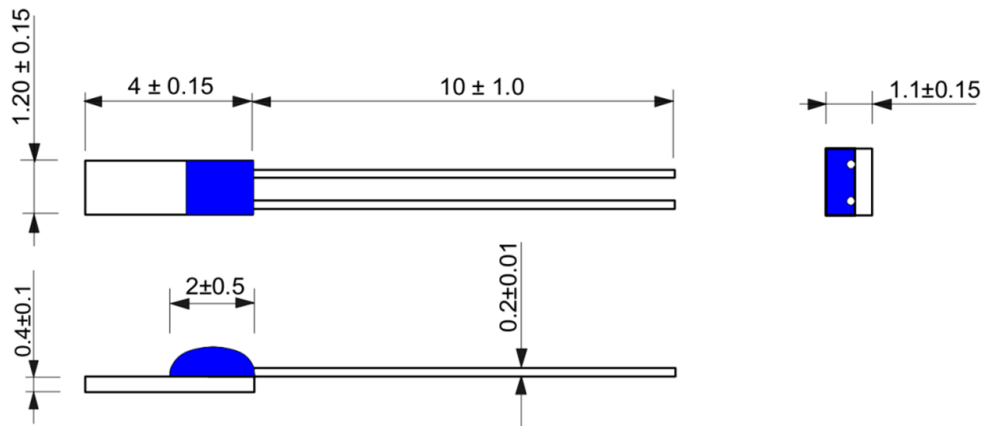


Figure 6: PTFM outline dimensions (mm)

## TYPE CONFIGURATION MATRIX

| Sensor family | Type | Outline dimensions | Nominal resistance |        | Tolerance class<br>DIN EN 60751 |   |   |   | Connection wire |            |
|---------------|------|--------------------|--------------------|--------|---------------------------------|---|---|---|-----------------|------------|
|               |      |                    | 100 Ω              | 1000 Ω |                                 |   |   |   | Ag wire         | Ni/Au wire |
| PTF           | C    | 2.0 x 2.3          | 101                | 102    | T                               | A | B | C | 1A0             | 1G0        |
| PTF           | D    | 2.0 x 5.0          | 101                | 102    | T                               | A | B | C | 1A0             | 1G0        |
| PTF           | F    | 2.0 x 4.0          | 101                | 102    | T                               | A | B | C | 1A0             | 1G0        |
| PTF           | M    | 1.2 x 4.0          | 101                | 102    | T                               | A | B | C | 1A0             | 1G0        |

# Pt Temperature Sensor – PTF Family

## ORDERING INFORMATION I

| Product Number  | Type        | Description  |
|---|-------------|--|
| <b>Platinum Thin Film Sensors PTFC-Type (2 mm x 2.3 mm)</b> |             |  |
| G-PTCO-005  | PTFC101C1G0 | 100 Ohms, 2.0 mm x 2.3 mm, F 0.6 (C), Ni/Au-wire       |
| G-PTCO-002  | PTFC101B1G0 | 100 Ohms, 2.0 mm x 2.3 mm, F 0.3 (B), Ni/Au-wire       |
| G-PTCO-011  | PTFC101A1G0 | 100 Ohms, 2.0 mm x 2.3 mm, F 0.15 (A), Ni/Au-wire      |
| G-PTCO-058  | PTFC101T1G0 | 100 Ohms, 2.0 mm x 2.3 mm, F 0.1 (T = AA), Ni/Au-wire  |
| G-PTCO-159  | PTFC101C1A0 | 100 Ohms, 2.0 mm x 2.3 mm, F 0.6 (C), Ag-wire          |
| G-PTCO-160  | PTFC101B1A0 | 100 Ohms, 2.0 mm x 2.3 mm, F 0.3 (B), Ag-wire          |
| G-PTCO-161  | PTFC101A1A0 | 100 Ohms, 2.0 mm x 2.3 mm, F 0.15 (A), Ag-wire         |
| G-PTCO-162  | PTFC101T1A0 | 100 Ohms, 2.0 mm x 2.3 mm, F 0.1 (T = AA), Ag-wire     |
| G-PTCO-046  | PTFC102C1G0 | 1000 Ohms, 2.0 mm x 2.3 mm, F 0.6 (C), Ni/Au-wire      |
| G-PTCO-006  | PTFC102B1G0 | 1000 Ohms, 2.0 mm x 2.3 mm, F 0.3 (B), Ni/Au-wire      |
| G-PTCO-029  | PTFC102A1G0 | 1000 Ohms, 2.0 mm x 2.3 mm, F 0.15 (A), Ni/Au-wire     |
| G-PTCO-154  | PTFC102T1G0 | 1000 Ohms, 2.0 mm x 2.3 mm, F 0.1 (T = AA), Ni/Au-wire |
| G-PTCO-163  | PTFC102C1A0 | 1000 Ohms, 2.0 mm x 2.3 mm, F 0.6 (C), Ag-wire         |
| G-PTCO-157  | PTFC102B1A0 | 1000 Ohms, 2.0 mm x 2.3 mm, F 0.3 (B), Ag-wire         |
| G-PTCO-164  | PTFC102A1A0 | 1000 Ohms, 2.0 mm x 2.3 mm, F 0.15 (A), Ag-wire        |
| G-PTCO-165  | PTFC102T1A0 | 1000 Ohms, 2.0 mm x 2.3 mm, F 0.1 (T = AA), Ag-wire    |
| <b>Platinum Thin Film Sensors PTFD-Type (2 mm x 5 mm)</b>   |             |  |
| G-PTCO-013  | PTFD101C1G0 | 100 Ohms, 2.0 mm x 5.0 mm, F 0.6 (C), Ni/Au-wire       |
| G-PTCO-024  | PTFD101B1G0 | 100 Ohms, 2.0 mm x 5.0 mm, F 0.3 (B), Ni/Au-wire       |
| G-PTCO-037  | PTFD101A1G0 | 100 Ohms, 2.0 mm x 5.0 mm, F 0.15 (A), Ni/Au-wire      |
| G-PTCO-155  | PTFD101T1G0 | 100 Ohms, 2.0 mm x 5.0 mm, F 0.1 (T = AA), Ni/Au-wire  |
| G-PTCO-166  | PTFD101C1A0 | 100 Ohms, 2.0 mm x 5.0 mm, F 0.6 (C), Ag-wire          |
| G-PTCO-053  | PTFD101B1A0 | 100 Ohms, 2.0 mm x 5.0 mm, F 0.3 (B), Ag-wire          |
| G-PTCO-158  | PTFD101A1A0 | 100 Ohms, 2.0 mm x 5.0 mm, F 0.15 (A), Ag-wire         |
| G-PTCO-152  | PTFD101T1A0 | 100 Ohms, 2.0 mm x 5.0 mm, F 0.1 (T = AA), Ag-wire     |
| G-PTCO-167  | PTFD102C1G0 | 1000 Ohms, 2.0 mm x 5.0 mm, F 0.6 (C), Ni/Au-wire      |
| G-PTCO-126  | PTFD102B1G0 | 1000 Ohms, 2.0 mm x 5.0 mm, F 0.3 (B), Ni/Au-wire      |
| G-PTCO-168  | PTFD102A1G0 | 1000 Ohms, 2.0 mm x 5.0 mm, F 0.15 (A), Ni/Au-wire     |
| G-PTCO-150  | PTFD102T1G0 | 1000 Ohms, 2.0 mm x 5.0 mm, F 0.1 (T = AA), Ni/Au-wire |
| G-PTCO-169  | PTFD102C1A0 | 1000 Ohms, 2.0 mm x 5.0 mm, F 0.6 (C), Ag-wire         |
| G-PTCO-035  | PTFD102B1A0 | 1000 Ohms, 2.0 mm x 5.0 mm, F 0.3 (B), Ag-wire         |
| G-PTCO-170  | PTFD102A1A0 | 1000 Ohms, 2.0 mm x 5.0 mm, F 0.15 (A), Ag-wire        |
| G-PTCO-151  | PTFD102T1A0 | 1000 Ohms, 2.0 mm x 5.0 mm, F 0.1 (T = AA), Ag-wire    |

# Pt Temperature Sensor – PTF Family

## ORDERING INFORMATION II

| Product Number  | Type        | Description  |
|---|-------------|--|
| <b>Platinum Thin Film Sensors PTFF-Type (2 mm x 4 mm)</b>   |             |  |
| G-PTCO-171  | PTFF101C1G0 | 100 Ohms, 2.0 mm x 4.0 mm, F 0.6 (C), Ni/Au-wire       |
| G-PTCO-172  | PTFF101B1G0 | 100 Ohms, 2.0 mm x 4.0 mm, F 0.3 (B), Ni/Au-wire       |
| G-PTCO-173  | PTFF101A1G0 | 100 Ohms, 2.0 mm x 4.0 mm, F 0.15 (A), Ni/Au-wire      |
| G-PTCO-174  | PTFF101T1G0 | 100 Ohms, 2.0 mm x 4.0 mm, F 0.1 (T = AA), Ni/Au-wire  |
| G-PTCO-175  | PTFF101C1A0 | 100 Ohms, 2.0 mm x 4.0 mm, F 0.6 (C), Ag-wire          |
| G-PTCO-176  | PTFF101B1A0 | 100 Ohms, 2.0 mm x 4.0 mm, F 0.3 (B), Ag-wire          |
| G-PTCO-177  | PTFF101A1A0 | 100 Ohms, 2.0 mm x 4.0 mm, F 0.15 (A), Ag-wire         |
| G-PTCO-178  | PTFF101T1A0 | 100 Ohms, 2.0 mm x 4.0 mm, F 0.1 (T = AA), Ag-wire     |
| G-PTCO-149  | PTFF102C1G0 | 1000 Ohms, 2.0 mm x 4.0 mm, F 0.6 (C), Ni/Au-wire      |
| G-PTCO-101  | PTFF102B1G0 | 1000 Ohms, 2.0 mm x 4.0 mm, F 0.3 (B), Ni/Au-wire      |
| G-PTCO-179  | PTFF102A1G0 | 1000 Ohms, 2.0 mm x 4.0 mm, F 0.15 (A), Ni/Au-wire     |
| G-PTCO-180  | PTFF102T1G0 | 1000 Ohms, 2.0 mm x 4.0 mm, F 0.1 (T = AA), Ni/Au-wire |
| G-PTCO-181  | PTFF102C1A0 | 1000 Ohms, 2.0 mm x 4.0 mm, F 0.6 (C), Ag-wire         |
| G-PTCO-182  | PTFF102B1A0 | 1000 Ohms, 2.0 mm x 4.0 mm, F 0.3 (B), Ag-wire         |
| G-PTCO-183  | PTFF102A1A0 | 1000 Ohms, 2.0 mm x 4.0 mm, F 0.15 (A), Ag-wire        |
| G-PTCO-184  | PTFF102T1A0 | 1000 Ohms, 2.0 mm x 4.0 mm, F 0.1 (T = AA), Ag-wire    |
| <b>Platinum Thin Film Sensors PTFM-Type (1.2 mm x 4 mm)</b> |             |  |
| G-PTCO-148  | PTFM101C1G0 | 100 Ohms, 1.2 mm x 4.0 mm, F 0.6 (C), Ni/Au-wire       |
| G-PTCO-032  | PTFM101B1G0 | 100 Ohms, 1.2 mm x 4.0 mm, F 0.3 (B), Ni/Au-wire       |
| G-PTCO-142  | PTFM101A1G0 | 100 Ohms, 1.2 mm x 4.0 mm, F 0.15 (A), Ni/Au-wire      |
| G-PTCO-156  | PTFM101T1G0 | 100 Ohms, 1.2 mm x 4.0 mm, F 0.1 (T = AA), Ni/Au-wire  |
| G-PTCO-185  | PTFM101C1A0 | 100 Ohms, 1.2 mm x 4.0 mm, F 0.6 (C), Ag-wire          |
| G-PTCO-186  | PTFM101B1A0 | 100 Ohms, 1.2 mm x 4.0 mm, F 0.3 (B), Ag-wire          |
| G-PTCO-187  | PTFM101A1A0 | 100 Ohms, 1.2 mm x 4.0 mm, F 0.15 (A), Ag-wire         |
| G-PTCO-188  | PTFM101T1A0 | 100 Ohms, 1.2 mm x 4.0 mm, F 0.1 (T = AA), Ag-wire     |
| G-PTCO-189  | PTFM102C1G0 | 1000 Ohms, 1.2 mm x 4.0 mm, F 0.6 (C), Ni/Au-wire      |
| G-PTCO-012  | PTFM102B1G0 | 1000 Ohms, 1.2 mm x 4.0 mm, F 0.3 (B), Ni/Au-wire      |
| G-PTCO-050  | PTFM102A1G0 | 1000 Ohms, 1.2 mm x 4.0 mm, F 0.15 (A), Ni/Au-wire     |
| G-PTCO-153  | PTFM102T1G0 | 1000 Ohms, 1.2 mm x 4.0 mm, F 0.1 (T = AA), Ni/Au-wire |
| G-PTCO-190  | PTFM102C1A0 | 1000 Ohms, 1.2 mm x 4.0 mm, F 0.6 (C), Ag-wire         |
| G-PTCO-191  | PTFM102B1A0 | 1000 Ohms, 1.2 mm x 4.0 mm, F 0.3 (B), Ag-wire         |
| G-PTCO-192  | PTFM102A1A0 | 1000 Ohms, 1.2 mm x 4.0 mm, F 0.15 (A), Ag-wire        |
| G-PTCO-193  | PTFM102T1A0 | 1000 Ohms, 1.2 mm x 4.0 mm, F 0.1 (T = AA), Ag-wire    |

# Pt Temperature Sensor – PTF Family

## TECHNICAL CONTACT INFORMATION

| NORTH AMERICA  | EUROPE  | ASIA   |
|--|---|--|
| Measurement Specialties, Inc.<br>910 Turnpike Road<br>Shrewsbury, MA 01545<br>United States<br>Phone: +1-508-842-0516<br>Fax: +1-508-842-0342<br>Email:<br><a href="mailto:temperature.sales.amer@meas-spec.com">temperature.sales.amer@meas-spec.com</a><br>Web: <a href="http://www.meas-spec.com">www.meas-spec.com</a> | MEAS Deutschland GmbH<br>Hauer 13<br>D-44227 Dortmund<br>Germany<br>Phone: +49-(0)231-9740-0<br>Fax: +49-(0)231-9740-20<br>Email: <a href="mailto:info.de@meas-spec.com">info.de@meas-spec.com</a><br>Web: <a href="http://www.meas-spec.com">www.meas-spec.com</a> | Measurement Specialties China Ltd.<br>No. 26, Langshan Road<br>High-tech Park (North)<br>Nanshan District, Shenzhen 518057<br>China<br>Phone: +86-755-33305088<br>Fax: +86-755-33305099<br>Email:<br><a href="mailto:temperature.sales.asia@meas-spec.com">temperature.sales.asia@meas-spec.com</a><br>Web: <a href="http://www.meas-spec.com">www.meas-spec.com</a> |

The information in this sheet has been carefully reviewed and is believed to be accurate; however, no responsibility is assumed for inaccuracies. Furthermore, this information does not convey to the purchaser of such devices any license under the patent rights to the manufacturer. Measurement Specialties, Inc. reserves the right to make changes without further notice to any product herein. Measurement Specialties, Inc. makes no warranty, representation or guarantee regarding the suitability of its product for any particular purpose, nor does Measurement Specialties, Inc. 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. Typical parameters can and do vary in different applications. All operating parameters must be validated for each customer application by customer's technical experts. Measurement Specialties, Inc. does not convey any license under its patent rights nor the rights of others.



## Данный компонент на территории Российской Федерации

### Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9