




BOURNS®

Features

- Compliant with AEC-Q200 Rev-C- Stress Test Qualification for Passive Components in Automotive Applications
- Surface Mount Devices
- Fully compatible with current industry standards
- Packaged per EIA 481-2 standard
- RoHS compliant* and halogen free**
- Agency recognition:   
- Patents pending

MF-SM Series - PTC Resettable Fuses

Electrical Characteristics

| Model | V max. Volts | I max Amps | I _{hold} | I _{trip} | Resistance | | Max. Time To Trip | | Tripped Power Dissipation |
|--------------|--------------|------------|-------------------|-------------------|---------------|---------|-------------------|------------------|---------------------------|
| | | | Amperes at 23 °C | | Ohms at 23 °C | | Amperes at 23 °C | Seconds at 23 °C | Watts at 23 °C |
| | | | Hold | Trip | R Min. | R1 Max. | Max. | Typ. | |
| MF-SM030 | 60 | 40 | 0.30 | 0.60 | 0.90 | 4.80 | 1.5 | 3.0 | 1.7 |
| MF-SM050 | 60 | 40 | 0.50 | 1.00 | 0.35 | 1.40 | 2.5 | 4.0 | 1.7 |
| MF-SM075 | 30 | 80 | 0.75 | 1.50 | 0.23 | 1.00 | 8.0 | 0.3 | 1.7 |
| MF-SM075/60* | 60 | 10 | 0.75 | 1.50 | 0.23 | 1.00 | 8.0 | 0.3 | 1.7 |
| MF-SM100 | 30 | 80 | 1.10 | 2.20 | 0.12 | 0.48 | 8.0 | 0.5 | 1.7 |
| MF-SM100/33 | 33 | 40 | 1.10 | 2.20 | 0.12 | 0.41 | 8.0 | 0.5 | 1.7 |
| MF-SM125 | 15 | 100 | 1.25 | 2.50 | 0.07 | 0.25 | 8.0 | 2.0 | 1.7 |
| MF-SM150 | 15 | 100 | 1.50 | 3.00 | 0.06 | 0.25 | 8.0 | 5.0 | 1.9 |
| MF-SM150/33 | 33 | 40 | 1.50 | 3.00 | 0.06 | 0.23 | 8.0 | 5.0 | 1.9 |
| MF-SM185/33 | 33 | 40 | 1.80 | 3.60 | 0.04 | 0.15 | 8.0 | 5.0 | 1.9 |
| MF-SM200 | 15 | 100 | 2.00 | 4.00 | 0.045 | 0.125 | 8.0 | 12.0 | 1.9 |
| MF-SM250 | 15 | 100 | 2.50 | 5.00 | 0.024 | 0.085 | 8.0 | 25.0 | 1.9 |
| MF-SM260 | 6 | 100 | 2.60 | 5.20 | 0.025 | 0.075 | 8.0 | 20.0 | 1.7 |
| MF-SM300** | 6 | 100 | 3.00 | 6.00 | 0.015 | 0.048 | 8.0 | 35.0 | 1.5 |

*CSA recognition pending. **UL approved, CSA & TUV approval pending.

Environmental Characteristics

| | |
|---|--|
| Operating Temperature..... | -40 °C to +85 °C |
| Maximum Device Surface Temperature in Tripped State | 125 °C |
| Passive Aging | +85 °C, 1000 hours ±5 % typical resistance change |
| Humidity Aging | +85 °C, 85 % R.H. 7 days ±5 % typical resistance change |
| Thermal Shock | MIL-STD-202F, Method 107G, ±10 % typical resistance change +125 °C to -55 °C, 10 cycles |
| Vibration | MIL-STD-883C, Method 2007.1, Condition A No change |

Test Procedures And Requirements For Model MF-SM Series

| Test | Test Conditions | Accept/Reject Criteria |
|----------------------|---|--|
| Visual/Mech..... | Verify dimensions and materials..... | Per MF physical description |
| Resistance..... | In still air @ 23 °C..... | R _{min} ≤ R ≤ R _{1max} |
| Time to Trip..... | At specified current, V _{max} , 23 °C | T ≤ max. time to trip (seconds) |
| Hold Current..... | 30 min. at I _{hold} | No trip |
| Trip Cycle Life..... | V _{max} , I _{max} , 100 cycles..... | No arcing or burning |
| Trip Endurance | V _{max} , 48 hours | No arcing or burning |
| Solderability..... | MIL-STD-202F, Method 208F..... | 95 % min. coverage |

UL File Number E174545 <http://www.ul.com/> Follow link to Certifications, then UL File No., enter E174545
 CSA File Number..... CA110338 <http://directories.csa-international.org/> Under "Certification Record" and "File Number" enter 110338-0-000
 TÜV Certificate Number .. R 02057213 <http://www.tuvdotcom.com/> Follow link to "other certificates", enter File No. 2057213

Thermal Derating Chart - I_{hold} (Amps)

| Model | Ambient Operating Temperature | | | | | | | | | |
|-------------|-------------------------------|--------|------|-------|-------|-------|-------|-------|-------|--|
| | -40 °C | -20 °C | 0 °C | 23 °C | 40 °C | 50 °C | 60 °C | 70 °C | 85 °C | |
| MF-SM030 | 0.45 | 0.40 | 0.35 | 0.30 | 0.25 | 0.23 | 0.20 | 0.17 | 0.14 | |
| MF-SM050 | 0.76 | 0.67 | 0.59 | 0.50 | 0.42 | 0.38 | 0.33 | 0.29 | 0.23 | |
| MF-SM075 | 1.11 | 0.99 | 0.84 | 0.75 | 0.63 | 0.57 | 0.49 | 0.45 | 0.36 | |
| MF-SM075/60 | 1.11 | 0.99 | 0.84 | 0.75 | 0.63 | 0.57 | 0.49 | 0.45 | 0.36 | |
| MF-SM100 | 1.66 | 1.47 | 1.29 | 1.10 | 0.91 | 0.83 | 0.73 | 0.64 | 0.50 | |
| MF-SM100/33 | 1.66 | 1.47 | 1.29 | 1.10 | 0.91 | 0.83 | 0.73 | 0.64 | 0.50 | |
| MF-SM125 | 1.89 | 1.68 | 1.46 | 1.25 | 1.04 | 0.94 | 0.83 | 0.73 | 0.56 | |
| MF-SM150 | 2.27 | 2.01 | 1.76 | 1.50 | 1.25 | 1.13 | 0.99 | 0.87 | 0.68 | |
| MF-SM150/33 | 2.27 | 2.01 | 1.76 | 1.50 | 1.25 | 1.13 | 0.99 | 0.87 | 0.68 | |
| MF-SM185/33 | 2.56 | 2.32 | 2.08 | 1.85 | 1.60 | 1.44 | 1.28 | 1.12 | 0.88 | |
| MF-SM200 | 3.02 | 2.68 | 2.34 | 2.00 | 1.66 | 1.50 | 1.32 | 1.16 | 0.90 | |
| MF-SM250 | 3.78 | 3.35 | 2.93 | 2.50 | 2.08 | 1.88 | 1.65 | 1.45 | 1.13 | |
| MF-SM260 | 3.64 | 3.25 | 2.91 | 2.60 | 2.26 | 2.08 | 1.95 | 1.74 | 1.48 | |
| MF-SM300 | 4.13 | 3.75 | 3.30 | 2.87 | 2.62 | 2.43 | 2.25 | 2.00 | 1.78 | |

I_{trip} is approximately two times I_{hold}.

*RoHS Directive 2002/95/EC Jan 27, 2003 including Annex.

**To be considered halogen free, each homogenous material can have a maximum concentration of 900 ppm of either bromine or chlorine.

Specifications are subject to change without notice.

Customers should verify actual device performance in their specific applications.

Applications

Almost anywhere there is a low voltage power supply and a load to be protected, including:

- Computers & peripherals
- General electronics
- Automotive applications

MF-SM Series - PTC Resettable Fuses

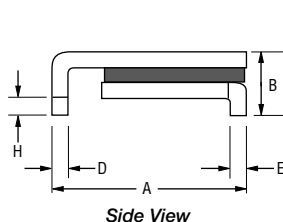
BOURNS®

Product Dimensions

| Model | A | | B | C | D | | E | | F | | G | | H |
|-------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | Min. | Max. | Max. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. |
| MF-SM030 | 6.73 (0.265) | 7.98 (0.314) | 3.18 (0.125) | 5.44 (0.214) | 0.56 (0.022) | 0.71 (0.028) | 0.56 (0.022) | 0.71 (0.028) | 2.16 (0.085) | 2.41 (0.095) | 0.66 (0.026) | 1.37 (0.054) | 0.43 (0.017) |
| MF-SM050 | 6.73 (0.265) | 7.98 (0.314) | 3.18 (0.125) | 5.44 (0.214) | 0.56 (0.022) | 0.71 (0.028) | 0.56 (0.022) | 0.71 (0.028) | 2.16 (0.085) | 2.41 (0.095) | 0.66 (0.026) | 1.37 (0.054) | 0.43 (0.017) |
| MF-SM075 | 6.73 (0.265) | 7.98 (0.314) | 3.18 (0.125) | 5.44 (0.214) | 0.56 (0.022) | 0.71 (0.028) | 0.56 (0.022) | 0.71 (0.028) | 2.16 (0.085) | 2.41 (0.095) | 0.66 (0.026) | 1.37 (0.054) | 0.43 (0.017) |
| MF-SM075/60 | 6.73 (0.265) | 7.98 (0.314) | 3.18 (0.125) | 5.44 (0.214) | 0.56 (0.022) | 0.71 (0.028) | 0.56 (0.022) | 0.71 (0.028) | 2.16 (0.085) | 2.41 (0.095) | 0.66 (0.026) | 1.37 (0.054) | 0.43 (0.017) |
| MF-SM100 | 6.73 (0.265) | 7.98 (0.314) | 3.0 (0.118) | 5.44 (0.214) | 0.56 (0.022) | 0.71 (0.028) | 0.56 (0.022) | 0.71 (0.028) | 2.16 (0.085) | 2.41 (0.095) | 0.66 (0.026) | 1.37 (0.054) | 0.43 (0.017) |
| MF-SM100/33 | 6.73 (0.265) | 7.98 (0.314) | 3.0 (0.118) | 5.44 (0.214) | 0.56 (0.022) | 0.71 (0.028) | 0.56 (0.022) | 0.71 (0.028) | 2.16 (0.085) | 2.41 (0.095) | 0.66 (0.026) | 1.37 (0.054) | 0.43 (0.017) |
| MF-SM125 | 6.73 (0.265) | 7.98 (0.314) | 3.0 (0.118) | 5.44 (0.214) | 0.56 (0.022) | 0.71 (0.028) | 0.56 (0.022) | 0.71 (0.028) | 2.16 (0.085) | 2.41 (0.095) | 0.66 (0.026) | 1.37 (0.054) | 0.43 (0.017) |
| MF-SM150 | 8.00 (0.315) | 9.50 (0.374) | 3.0 (0.118) | 6.71 (0.264) | 0.56 (0.022) | 0.71 (0.028) | 0.56 (0.022) | 0.71 (0.028) | 3.68 (0.145) | 3.94 (0.155) | 0.66 (0.026) | 1.37 (0.054) | 0.43 (0.017) |
| MF-SM150/33 | 8.00 (0.315) | 9.50 (0.374) | 3.0 (0.118) | 6.71 (0.264) | 0.56 (0.022) | 0.71 (0.028) | 0.56 (0.022) | 0.71 (0.028) | 3.68 (0.145) | 3.94 (0.155) | 0.66 (0.026) | 1.37 (0.054) | 0.43 (0.017) |
| MF-SM185/33 | 8.00 (0.315) | 9.50 (0.374) | 3.0 (0.118) | 6.71 (0.264) | 0.56 (0.022) | 0.71 (0.028) | 0.56 (0.022) | 0.71 (0.028) | 3.68 (0.145) | 3.94 (0.155) | 0.66 (0.026) | 1.37 (0.054) | 0.43 (0.017) |
| MF-SM200 | 8.00 (0.315) | 9.50 (0.374) | 3.0 (0.118) | 6.71 (0.264) | 0.56 (0.022) | 0.71 (0.028) | 0.56 (0.022) | 0.71 (0.028) | 3.68 (0.145) | 3.94 (0.155) | 0.66 (0.026) | 1.37 (0.054) | 0.43 (0.017) |
| MF-SM250 | 8.00 (0.315) | 9.50 (0.374) | 3.0 (0.118) | 6.71 (0.264) | 0.56 (0.022) | 0.71 (0.028) | 0.56 (0.022) | 0.71 (0.028) | 3.68 (0.145) | 3.94 (0.155) | 0.66 (0.026) | 1.37 (0.054) | 0.43 (0.017) |
| MF-SM260 | 6.73 (0.265) | 7.98 (0.314) | 3.0 (0.118) | 5.44 (0.214) | 0.56 (0.022) | 0.71 (0.028) | 0.56 (0.022) | 0.71 (0.028) | 2.16 (0.085) | 2.41 (0.095) | 0.66 (0.026) | 1.37 (0.054) | 0.43 (0.017) |
| MF-SM300 | 6.73 (0.265) | 7.98 (0.314) | 3.0 (0.118) | 5.44 (0.214) | 0.56 (0.022) | 0.71 (0.028) | 0.56 (0.022) | 0.71 (0.028) | 2.16 (0.085) | 2.41 (0.095) | 0.66 (0.026) | 1.37 (0.054) | 0.43 (0.017) |

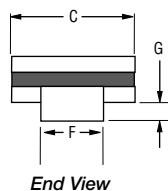
Packaging:

TAPE & REEL: MF-SM030, 050, 075, 075/60, 100, 100/33, 125, 260, 300 = 2000 pcs. per reel;
MF-SM150, 150/33, 185/33, 200, 250 = 1500 pcs. per reel.

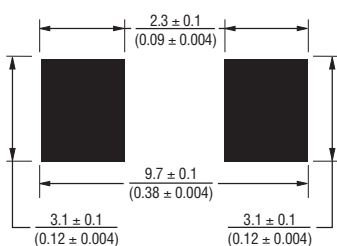


DIMENSIONS: MM (INCHES)

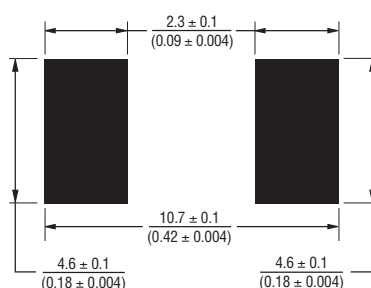
Terminal material:
Tin-plated brass



Recommended Pad Layout
MF-SM030, 050, 075, 075/60, 100, 100/33, 125, 260, 300



Recommended Pad Layout
MF-SM150, 150/33, 185/33, 200, 250



How to Order

MF - SM 100/33 - 2 - 99

Multifuse® Product Designator _____
Series _____
SM = Surface Mount Component
Hold Current, I_{hold}/V_{max}^*
030 - 300 (0.3 - 3.0 Amps)
Packaging Options
- 2 = Tape and Reel**
Part Number Suffix Option _____

- 99 = As of date code April 1, 2005 all MF-SM models are RoHS compliant. The suffix "-99" can be used if a new part number is required to reference the RoHS compliance.

Examples:
MF-SM030-2 Tape and reel packaging
MF-SM030-2-99..... Tape and reel packaging with part number suffix option
MF-SM150-2 Tape and reel packaging
MF-SM150/33-2-99 .. Tape and reel packaging with part number suffix option

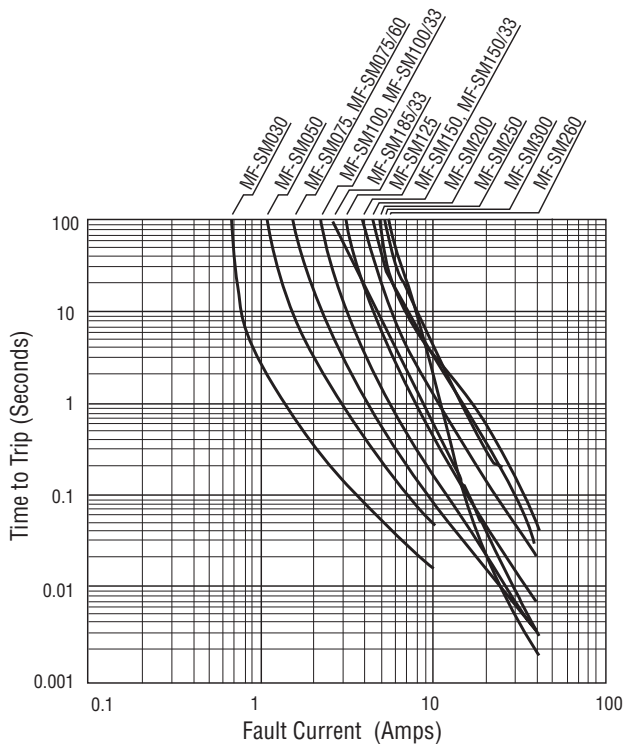
* V_{max} entry applies only to models MF-SM075/60, MF-SM100/33, MF-SM150/33 & MF-SM185/33.
** Packaged per EIA-481-2

Specifications are subject to change without notice.
Customers should verify actual device performance in their specific applications.

MF-SM Series - PTC Resettable Fuses

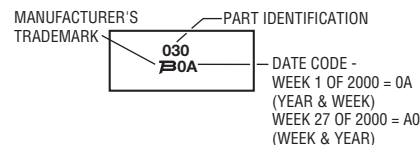


Typical Time to Trip at 23 °C

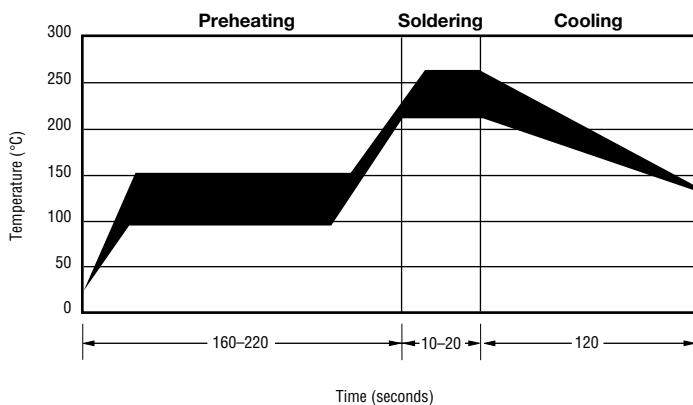


Typical Part Marking

Represents total content. Layout may vary.



Solder Reflow Recommendations



Solder reflow

- Recommended reflow methods: IR, vapor phase oven, hot air oven.
- Devices are not designed to be wave soldered to the bottom side of the board.
- Gluing the devices is not recommended.
- Recommended maximum paste thickness is 0.25 mm (.010 inch).
- Devices can be cleaned using standard industry methods and solvents.

Note:

- If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

Rework

- A device should not be reworked.

Storage Recommendations

The recommended long term storage conditions for Multifuse® Polymer PTC devices are 40 °C maximum and 70 % RH maximum. All devices should remain in the original sealed packaging prior to use. Devices may not conform with data sheet specifications if these storage recommendations are exceeded. Devices stored in this manner have an indefinite shelf life.

MF-SM SERIES, REV. P, 11/10

Specifications are subject to change without notice.
Customers should verify actual device performance in their specific applications.

MF-SM, MF-SM/33, MF-SM/60 & MF-SM/250 Series Tape and Reel Specifications

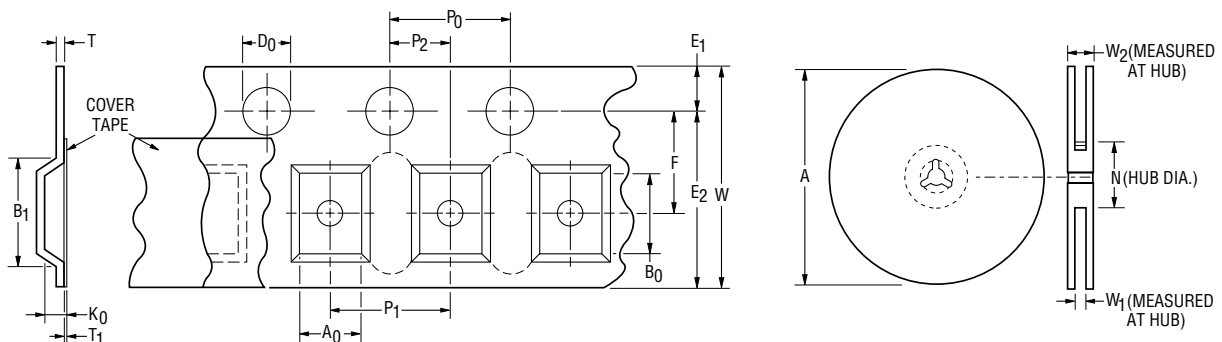


NOTE: Effective December 1, 2010 (product date code V0), the cover tape will be changed to the new 3M™ Universal Cover Tape (UCT).

| Tape Dimensions | MF-SM030, 050, 075, 100, 125, 260, 300; MF-SM075/60; MF-SM-100/33 | MF-SM150, 200, 250; MF-SM-150/33, MF-SM-185/33; MF-SM013/250 per EIA 481-2 |
|------------------------|--|--|
| | per EIA-481-2 | per EIA 481-2 |
| W | 16.0 ± 0.3 (0.630 ± 0.012) | 16.0 ± 0.3 (0.630 ± 0.012) |
| P ₀ | 4.0 ± 0.1 (0.157 ± 0.004) | 4.0 ± 0.1 (0.157 ± 0.004) |
| P ₁ | 8.0 ± 0.1 (0.315 ± 0.004) | 12.0 ± 0.1 (0.472 ± 0.004) |
| P ₂ | 2.0 ± 0.1 (0.079 ± 0.004) | 2.0 ± 0.1 (0.079 ± 0.004) |
| A ₀ | 5.7 ± 0.1 (0.224 ± 0.004) | 6.9 ± 0.1 (0.272 ± 0.004) |
| B ₀ | 8.1 ± 0.1 (0.319 ± 0.004) | 9.6 ± 0.1 (0.378 ± 0.004) |
| B ₁ max. | 12.1 (0.476) | 12.1 (0.476) |
| D ₀ | $1.5 + 0.1/-0.0$ (0.059 + 0.004/-0) | $1.5 + 0.1/-0.0$ (0.059 + 0.004/-0) |
| F | 7.5 ± 0.1 (0.295 ± 0.004) | 7.5 ± 0.1 (0.295 ± 0.004) |
| E ₁ | 1.75 ± 0.1 (0.069 ± 0.004) | 1.75 ± 0.1 (0.069 ± 0.004) |
| E ₂ min. | 14.25 (0.561) | 14.25 (0.561) |
| T max. | 0.6 (0.024) | 0.6 (0.024) |
| T ₁ max. | 0.1 (0.004) | 0.1 (0.004) |
| K ₀ | 3.4 ± 0.1 (0.134 ± 0.004) | $3.4 \pm 0.1^*$ (0.134 ± 0.004)* |
| Leader min. | 390 (15.35) | 390 (15.35) |
| Trailer min. | 160 (6.30) | 160 (6.30) |
| Reel Dimensions | | |
| A max. | 360 (14.17) | 360 (14.17) |
| N min. | 50 (1.97) | 50 (1.97) |
| W ₁ | $16.4 + 2.0/-0.0$ (0.646 + 0.079/-0) | $16.4 + 2.0/-0.0$ (0.646 + 0.079/-0) |
| W ₂ max. | 22.4 (0.882) | 22.4 (0.882) |

* Model MF-SM013/250 = $\frac{3.8 \pm 0.1}{(0.150 \pm 0.004)}$

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



Specifications are subject to change without notice.
Customers should verify actual device performance in their specific applications.

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