

# COMPACT POWER TWIN RELAY

## 1 POLE x 2—30A (Dual relay)

### (FOR AUTOMOTIVE APPLICATIONS)

## FBR512, 522 SERIES

#### ■ FEATURES

- Two independent relays mounted in a single package
- Miniature size  
(54% of the volume of the FBR160 relays)
- High current contact capacity  
(carrying current: 35 A/10 minutes, 25 A/1 hour)
- High resistance to vibration and shock
- Improved heat resistance and extended operating range
- Two contact gap options  
(FBR510: 0.3 mm, FBR520: 0.6 mm)
- Two types of contact materials



#### ■ ORDERING INFORMATION

FBR512 N D12 - W1 \*\*

[Example] —(a)— (b) -(c)- (d) -(e)-

(a)	Series Name	FBR512: Standard type (contact gap 0.3 mm) FBR522: Wider contact gap type (contact gap 0.6 mm)
(b)	Enclosure	N : Plastic sealed type
(c)	Nominal Voltage	D06 : 6 VDC D09 : 9 VDC D10 : 10 VDC D12 : 12 VDC
(d)	Contact Material	W1 : Silver-tin oxide indium (high power type)
(e)	Custom Designation	To be assigned custom specification

# FBR512, 522 SERIES

## ■ SPECIFICATIONS

Item		Specifications	
		W1 contact	
Contact	Arrangement	1 form C × 2 (SPDT × 2)	
	Material	Silver-tin oxide indium (high power type)	
	Voltage Drop (Resistance)	Maximum 100 mV (at 1 A 12 VDC)	
	Rating	14 VDC 25 A (locked motor load)	
	Maximum Carrying Current*1	35 A/10 minutes, 30 A/1 hour (25°C, 100% rated coil voltage)	
	Max. Inrush Current (Reference)	60 A	
	Max. Switching Current (Reference)	35 A 16 VDC	
	Min. Switching Load*2 (Reference)	1 A 6 VDC	
Coil	Operating Temperature	−40°C to + 85°C (no frost)	
	Storage Temperature	−40°C to +100°C (no frost)	
Time Value	Operate (at nominal voltage)	Maximum 10 ms	
	Release (at nominal voltage)	Maximum 5 ms	
Life	Mechanical	1 × 10 <sup>7</sup> operations minimum	
	Electrical	2 × 10 <sup>5</sup> operations minimum 14 VDC 25 A (locked motor load)	
Other	Vibration Resistance		10 to 55 Hz (double amplitude of 1.5 mm)
	Shock Resistance	Misoperation	100 m/s <sup>2</sup>
		Endurance	1,000 m/s <sup>2</sup>
	Weight		Approximately 13 g

\*1 Need to consider the head from PCB when max. current is more than 10A.

\*2 Values when switching a resistive load at normal room temperature and humidity, and in a clean environment. The minimum switching load varies with the switching frequency and operating environment.

## ■ COIL DATA CHART

### 1. FBR512 SERIES

MODEL	Nominal voltage	Coil resistance (±10%) (at 20°C)	Must operate voltage*	Thermal resistance
W1 contact				
FBR512ND06-W1	6 VDC	60 Ω	3.6 VDC (at 20°C) 4.5 VDC (at 85°C)	73°C/W
FBR512ND09-W1	9 VDC	135 Ω	5.4 VDC (at 20°C) 6.8 VDC (at 85°C)	
FBR512ND10-W1	10 VDC	180 Ω	6.3 VDC (at 20°C) 7.9 VDC (at 85°C)	
FBR512ND12-W1	12 VDC	240 Ω	7.3 VDC (at 20°C) 9.2 VDC (at 85°C)	

\* Pulse drive

# FBR512, 522 SERIES

## 2. FBR522 SERIES

MODEL	Nominal voltage	Coil resistance ( $\pm 10\%$ ) (at 20°C)	Must operate voltage*	Thermal resistance
W1 contact				
FBR522ND06-W1	6 VDC	45 $\Omega$	3.6 VDC (at 20°C) 4.5 VDC (at 85°C)	65°C/W
FBR522ND09-W1	9 VDC	100 $\Omega$	5.4 VDC (at 20°C) 6.8 VDC (at 85°C)	
FBR522ND10-W1	10 VDC	135 $\Omega$	6.3 VDC (at 20°C) 7.9 VDC (at 85°C)	
FBR522ND12-W1	12 VDC	180 $\Omega$	7.3 VDC (at 20°C) 9.2 VDC (at 85°C)	

\* Pulse drive

## ■ SUITABLE APPLICATIONS

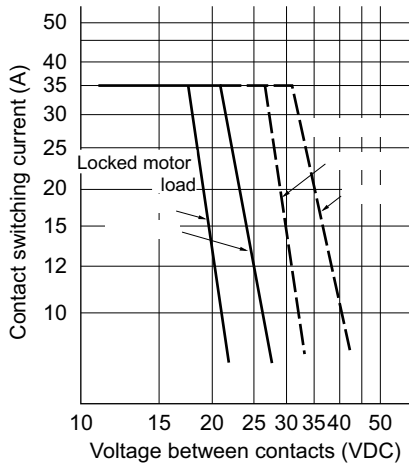
Application	Normal load current (12 VDC system)	Description	Recommended model (example)	
			For 16 V or less motor load voltage	For instantaneous 20 V or more load voltage
Power Windows	20 to 25 A (switching at motor locking)	forward and reverse motor control	FBR512N□ -W1	FBR522N□ -W1
Automatic Door Lock	18 to 25 A (switching at motor locking)	forward and reverse motor control	FBR512N□ -W1	FBR522N□ -W1
Automatic Antenna	8 to 12 A (INRUSH) break 2 A maximum (motor-free)	forward and reverse motor control	FBR512N□ -W1	
Intermittent Wipers (Front and Rear)	15 to 30 A break 2 to 8 A (motor-free)	forward only	FBR512N□ -W1	FBR522N□ -W1
Tilt-Lock Wheel	20 A (switching at motor locking)	forward and reverse motor control	FBR512N□ -W1	FBR522N□ -W1
Power Seat	20 to 30 A (switching at motor locking)	forward and reverse motor control	FBR512N□ -W1	FBR522N□ -W1
Sunroof	20 to 30 A (switching at motor locking)	forward and reverse motor control	FBR512N□ -W1	FBR522N□ -W1

• For the load condition where higher voltage would be encountered during contact break, FBR522 series with wider contact gap is recommended.

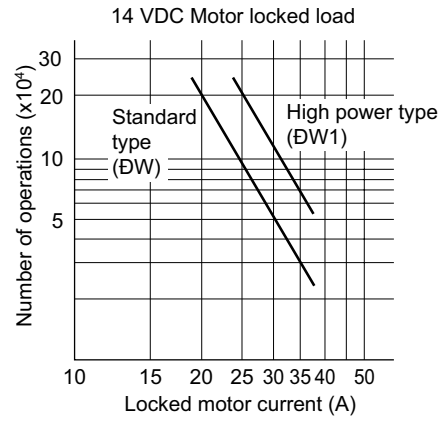
# FBR512, 522 SERIES

## ■ CHARACTERISTIC DATA

### 1. MAXIMUM BREAK CAPACITY



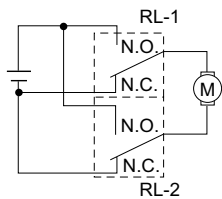
### 2. LIFE



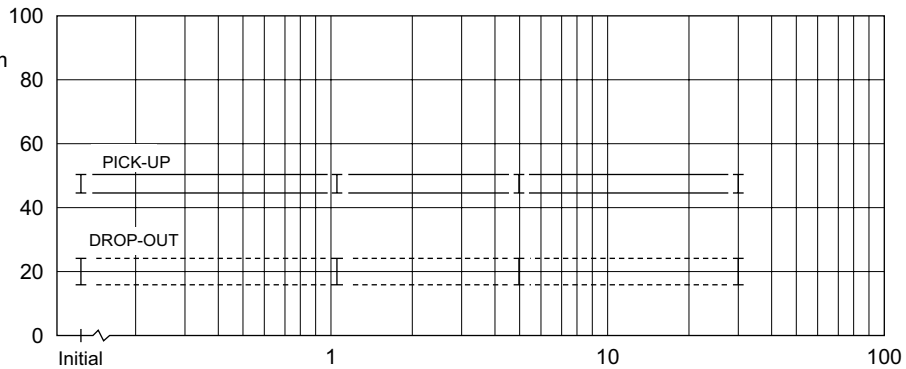
### 3. LIFE TEST (EXAMPLE)

- Test item  
14 V DC-20 A  
Motor lock  
200,000 operations minimum  
(FBR512 □-W type)

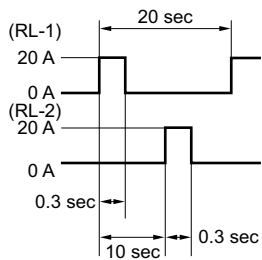
- Test circuit



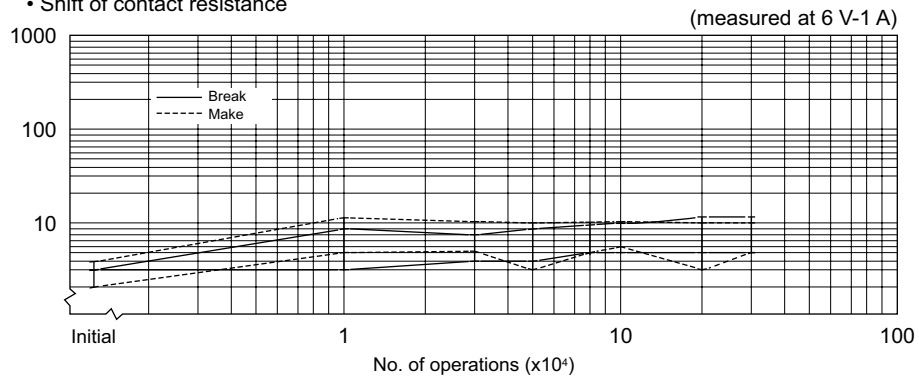
- Shift of pick-up and drop-out voltage



- Current wave form

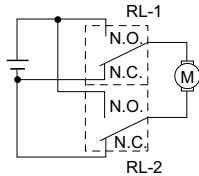


- Shift of contact resistance

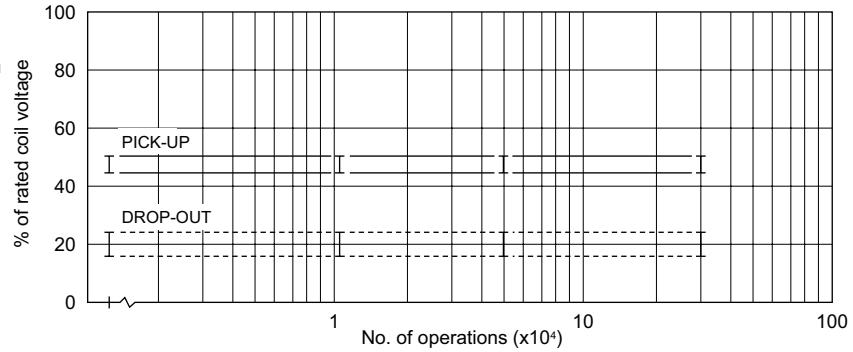


# FBR512, 522 SERIES

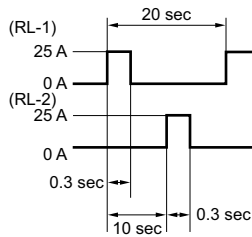
- Test item  
14 V DC-25 A  
Motor lock  
200,000 operations minimum  
(FBR512 □-W1 type)
- Test circuit



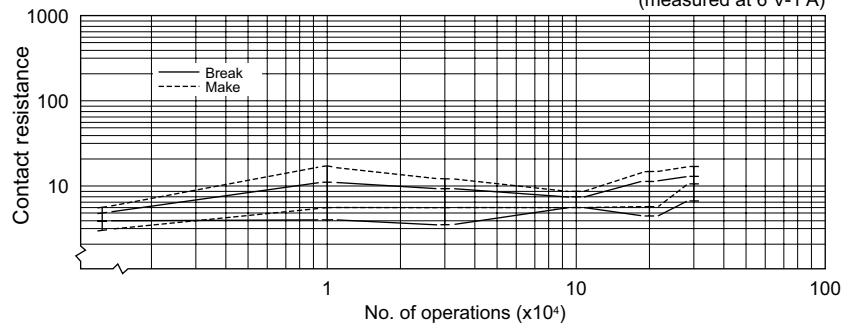
- Shift of pick-up and drop-out voltage



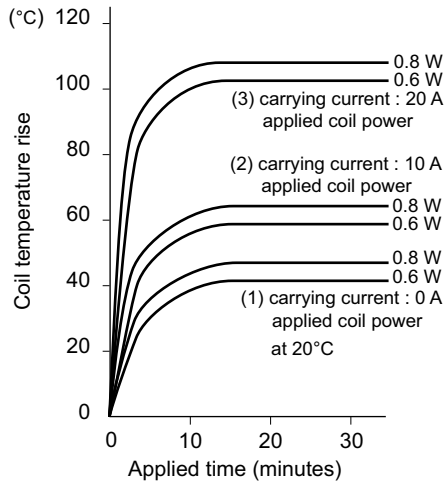
- Current wave form



- Shift of contact resistance



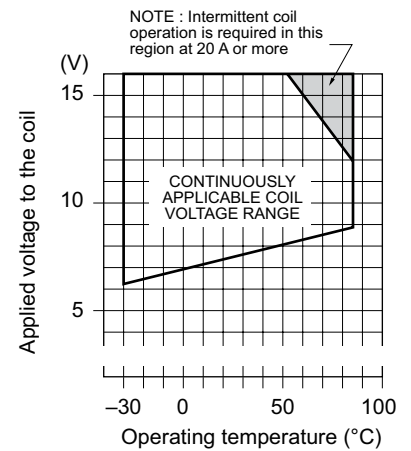
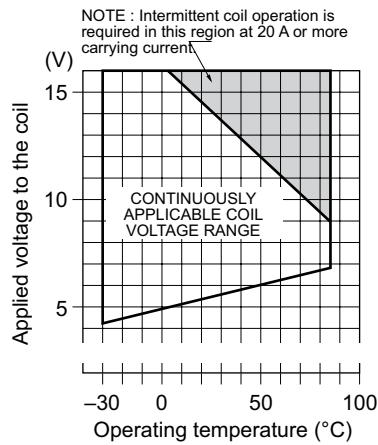
## 4. COIL TEMPERATURE RISE



## 5. OPERATING COIL VOLTAGE RANGE (EXAMPLE)

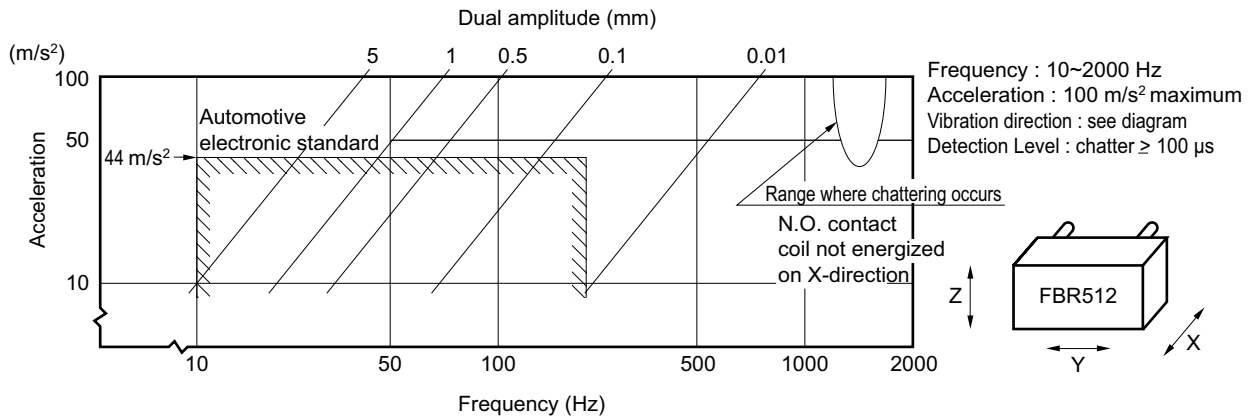
[ FBR512ND09-W ]

[ FBR512ND12-W ]

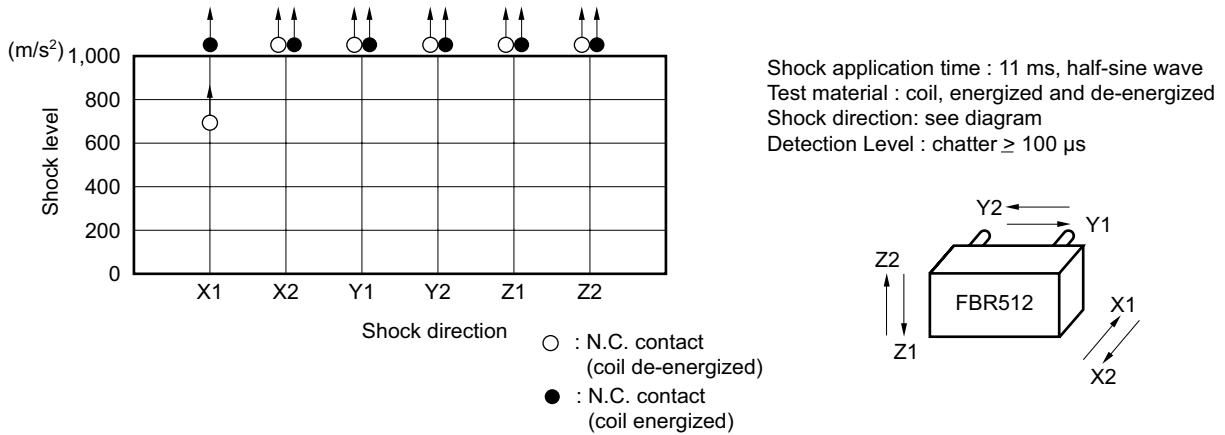


# FBR512, 522 SERIES

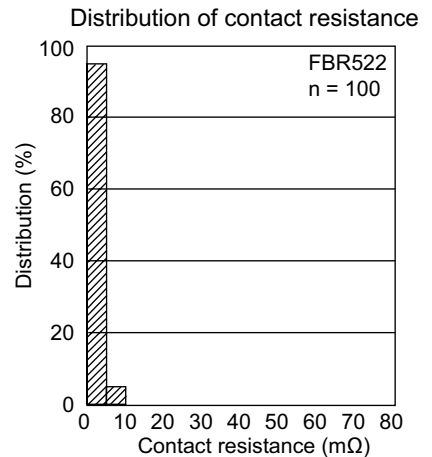
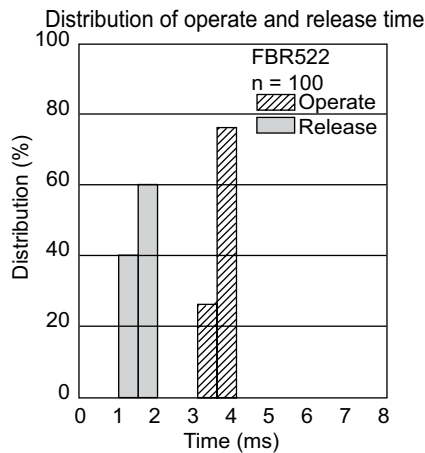
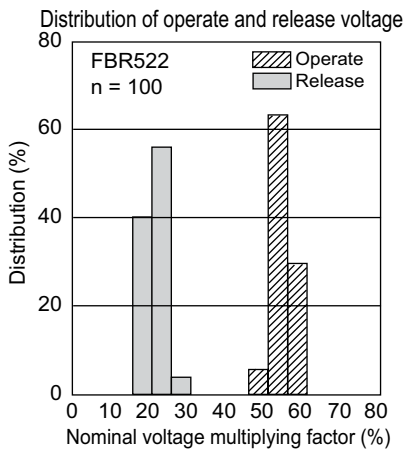
## 6. VIBRATION RESISTANCE CHARACTERISTICS



## 7. SHOCK RESISTANCE CHARACTERISTICS



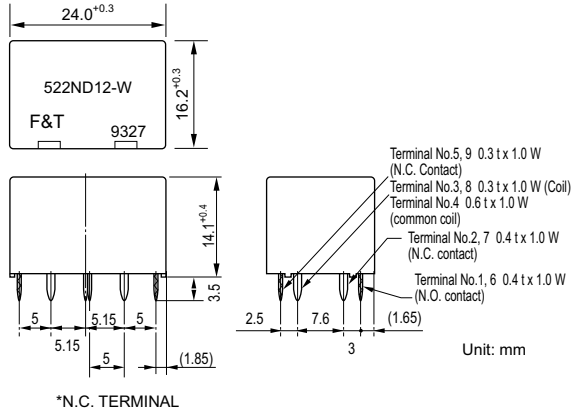
## REFERENCE DATA



# FBR512, 522 SERIES

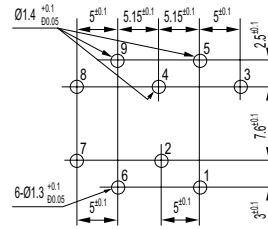
## DIMENSIONS

### Dimensions

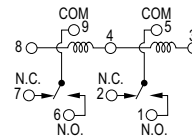


\*N.C. TERMINAL

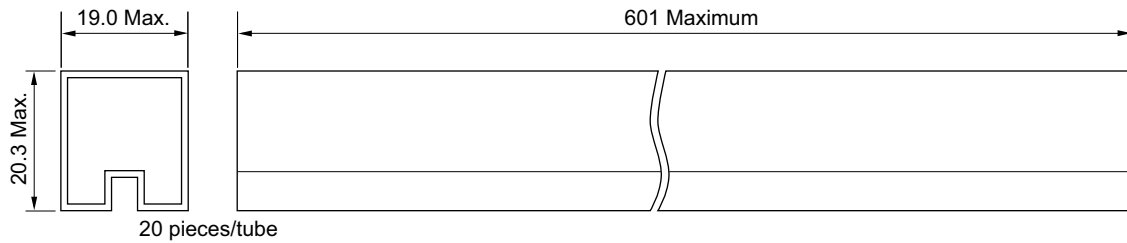
### PC board mounting hole layout (BOTTOM VIEW)



### Schematic (BOTTOM VIEW)



### Tube carrier



Unit: mm

## Fujitsu Components International Headquarter Offices

### Japan

Fujitsu Component Limited  
 Gotanda-Chuo Building  
 3-5, Higashigotanda 2-chome, Shinagawa-ku  
 Tokyo 141 8630, Japan  
 Tel: (81-3) 5449-7010  
 Fax: (81-3) 5449-2626  
 Email: [promothq@fcl.fujitsu.com](mailto:promothq@fcl.fujitsu.com)  
 Web: [www.fcl.fujitsu.com](http://www.fcl.fujitsu.com)

### North and South America

Fujitsu Components America, Inc.  
 250 E. Caribbean Drive  
 Sunnyvale, CA 94089 U.S.A.  
 Tel: (1-408) 745-4900  
 Fax: (1-408) 745-4970  
 Email: [components@us.fujitsu.com](mailto:components@us.fujitsu.com)  
 Web: <http://www.fujitsu.com/us/services/edevices/components/>

### Europe

Fujitsu Components Europe B.V.  
 Diamantlaan 25  
 2132 WV Hoofddorp  
 Netherlands  
 Tel: (31-23) 5560910  
 Fax: (31-23) 5560950  
 Email: [info@fceu.fujitsu.com](mailto:info@fceu.fujitsu.com)  
 Web: [emea.fujitsu.com/components/](http://emea.fujitsu.com/components/)

### Asia Pacific

Fujitsu Components Asia Ltd.  
 102E Pasir Panjang Road  
 #01-01 Citilink Warehouse Complex  
 Singapore 118529  
 Tel: (65) 6375-8560  
 Fax: (65) 6273-3021  
 Email: [fcalfcal.fujitsu.com](mailto:fcalfcal.fujitsu.com)  
 Web: <http://www.fujitsu.com/sg/services/micro/components/>

©2008 Fujitsu Components America, Inc. All rights reserved. All trademarks or registered trademarks are the property of their respective owners.

Fujitsu Components America or its affiliates do not warrant that the content of datasheet is error free. In a continuing effort to improve our products Fujitsu Components America, Inc. or its affiliates reserve the right to change specifications/datasheets without prior notice.  
 Rev. January 3, 2008.

## 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