

**COAXIAL SUBMINIATURE SPnT up to 40 GHz**
*Issue: Feb-3-2011*

R591 RADIALL coaxial subminiature switches have a typical operating life exceeding 25 million cycles. Excellent RF & repeatability characteristics along with a guaranteed life of 10 million cycles make these switches ideal for Automated Test Equipment (ATE) and other measurement applications. These miniature switches are also an excellent choice for Mil/Aero applications due to their small size, light weight, as well as outstanding shock and vibration handling capabilities.

**PART NUMBER SELECTION**
**R 591 . . . . .**
*Updated revision*
**RF connectors :**

3 : SMA up to 6 GHz  
 7 : SMA up to 26.5 GHz  
 8 : SMA 2.9 up to 40GHz (5)  
 E : QMA up to 6 GHz (4)

**Type :**

0 : Normally open  
 2 : Latching, global reset  
 6 : Latching, separated reset (1)

**Actuator voltage :**

2 : 12 Vdc  
 3 : 28 Vdc

**Actuator Terminal :**

0 : Solder pins  
 5 : Micro-D connector

**Options :**

0 : Without option  
 1 : Positive common  
 2 : Normally open with TTL driver (high level) (2)&(3)  
 3 : With suppression diodes  
 4 : With suppression diodes and positive common

**Number of positions :**

4 : 4 positions  
 6 : 6 positions

- (1) : Available with "solder pins" models only  
 (2) : Polarity is not relevant to application for switches with TTL driver  
 (3) : Suppression diodes are already included with TTL option



(4) : The "QLF" trademark (quick lock formula®) standard applies to QMA and QN series and guarantees the full intermateability between suppliers using this trademark. Using QLF certified connectors also guarantees the specified level of RF performances.

(5) : Connector SMA 2.9 is equivalent to "K connector®", registered trademark of Anritsu.



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## GENERAL SPECIFICATIONS

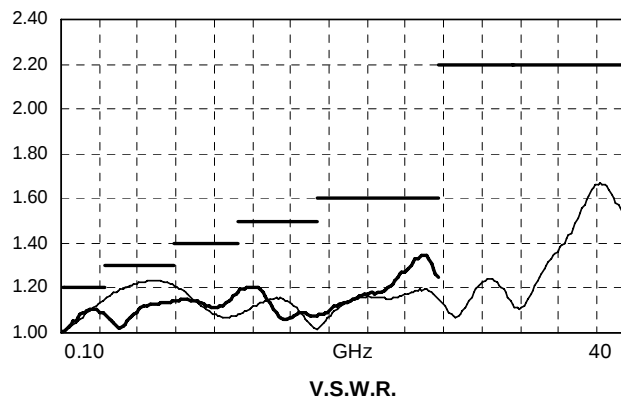
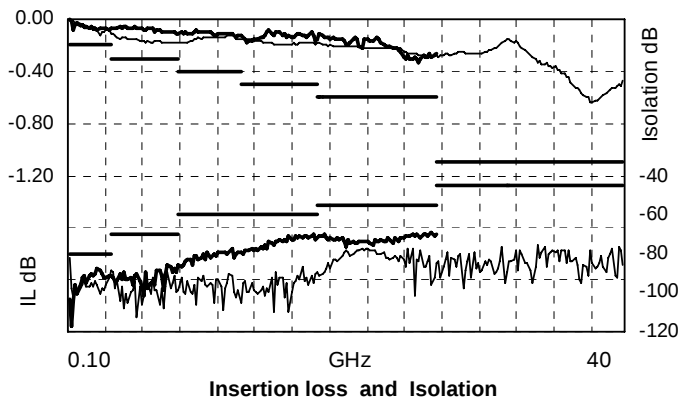
| Operating mode                                                                         |            | Normally open                                                                                                                                                                                                  |                     | Latching              |                     |
|----------------------------------------------------------------------------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------------------|---------------------|
| <b>Nominal operating voltage</b><br>(across operating temperature) Vdc                 |            | <b>12</b> (10.2 / 13)                                                                                                                                                                                          | <b>28</b> (21 / 30) | <b>12</b> (10.2 / 13) | <b>28</b> (21 / 30) |
| <b>Coil resistance (+/-10%)</b> Ohms                                                   |            | 48                                                                                                                                                                                                             | 250                 | 60                    | 285                 |
| <b>Operating current at 23°C</b> mA                                                    |            | 250                                                                                                                                                                                                            | 110                 | 200                   | 98                  |
| <b>Average power</b>                                                                   |            | See Power Rating Chart on general catalog                                                                                                                                                                      |                     |                       |                     |
| <b>TTL input</b>                                                                       | High Level | 2.2 to 5.5 Volts                                                                                                                                                                                               |                     |                       |                     |
|                                                                                        | Low Level  | 0 to 0.8 Volts                                                                                                                                                                                                 |                     |                       |                     |
| <b>Switching time (max)</b> ms                                                         |            | 10                                                                                                                                                                                                             |                     |                       |                     |
| <b>Life</b>                                                                            |            | 10 million cycles (SMA, QMA) / 2 million cycles (SMA 2.9)                                                                                                                                                      |                     |                       |                     |
| <b>Connectors</b>                                                                      |            | SMA / QMA / SMA 2.9                                                                                                                                                                                            |                     |                       |                     |
| <b>Actuator terminals</b>                                                              |            | <b>Solder Pins</b> : double row connector for wrapping, soldering (250°C max / 30 sec), or connecting to 2.54 mm pitch female connector. <b>9 pin micro-D</b> receptacle M83513/07-A according to MIL-C-85513. |                     |                       |                     |
| <b>Operating temperature range</b> °C                                                  |            | -40 to +85                                                                                                                                                                                                     |                     |                       |                     |
| <b>Storage temperature range</b> °C                                                    |            | -55 to +85                                                                                                                                                                                                     |                     |                       |                     |
| <b>Sine vibration</b><br>(According to MIL STD 202, Method 204D, Cond. D)              |            | 10-2000 Hz, 20g                                                                                                                                                                                                |                     | operating             |                     |
| <b>Random vibration</b><br>(According to MIL STD 202, Method 214A, Profile I, Cond. F) |            | 50-2000 Hz, 20.71grms                                                                                                                                                                                          |                     | operating             |                     |
| <b>Shock</b><br>(According to MIL STD 202, Method 213B, Cond. C)                       |            | 100g / 6 ms, ½ sine                                                                                                                                                                                            |                     | operating             |                     |

## RF PERFORMANCES

| Connectors | Frequency Range GHz |           | V.S.W.R.<br>(max) | Insertion Loss<br>(max) dB | Isolation<br>(min) dB | Impedance<br>Ohms |
|------------|---------------------|-----------|-------------------|----------------------------|-----------------------|-------------------|
| SMA / QMA  | DC – 6              | DC – 3    | 1.20              | 0.20                       | 80                    | 50                |
|            |                     | 3 – 6     | 1.30              | 0.30                       | 70                    |                   |
| SMA        | DC – 26.5           | DC – 3    | 1.20              | 0.20                       | 80                    | 50                |
|            |                     | 3 – 8     | 1.30              | 0.30                       | 70                    |                   |
|            |                     | 8 – 12.4  | 1.40              | 0.40                       | 60                    |                   |
|            |                     | 12.4 – 18 | 1.50              | 0.50                       | 60                    |                   |
|            |                     | 18 – 26.5 | 1.60              | 0.60                       | 55                    |                   |
| SMA2.9     | DC – 40             | DC – 3    | 1.20              | 0.20                       | 80                    | 50                |
|            |                     | 3 – 8     | 1.30              | 0.30                       | 70                    |                   |
|            |                     | 8 – 12.4  | 1.40              | 0.40                       | 60                    |                   |
|            |                     | 12.4 – 18 | 1.50              | 0.50                       | 60                    |                   |
|            |                     | 18 – 26.5 | 1.70              | 0.70                       | 55                    |                   |
|            |                     | 26.5 – 40 | 2.20              | 1.10                       | 45                    |                   |

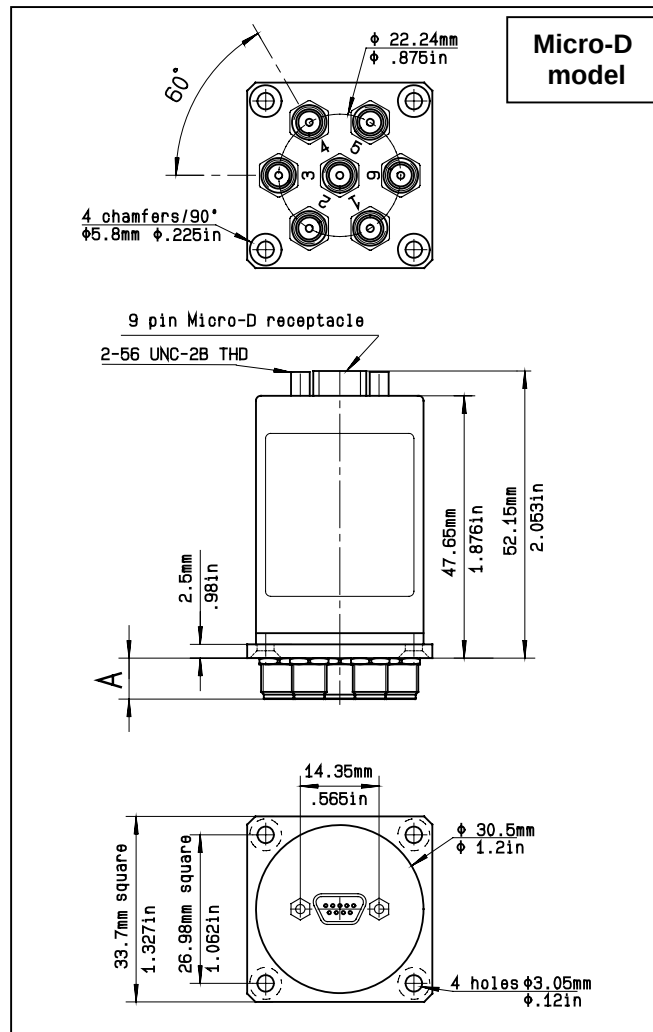
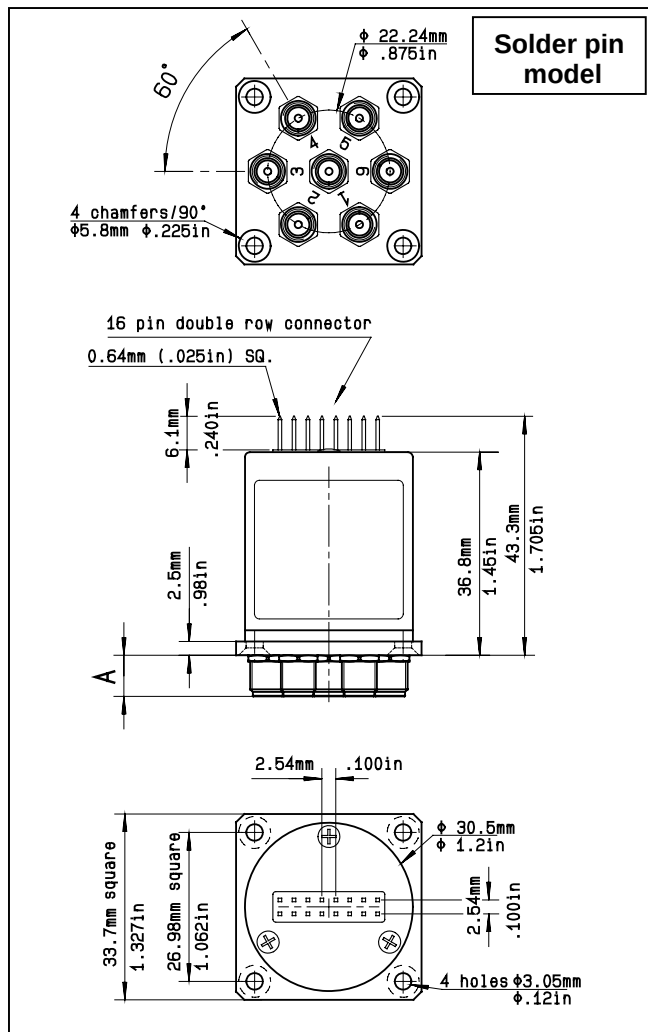
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### TYPICAL RF PERFORMANCES



### TYPICAL OUTLINE DRAWING (1)

| Connectors         | SMA        | SMA 2.9  | QMA         |
|--------------------|------------|----------|-------------|
| A max (mm/ inches) | 7.4/ 0.291 | 6.5/0.26 | 10.8/ 0.425 |



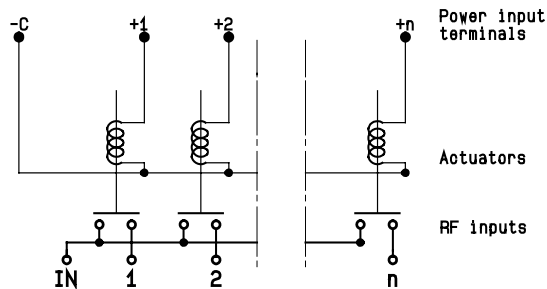
(1) : For SP4T, ways 3 and 6 not connected

all dimensions are in mm/ inches

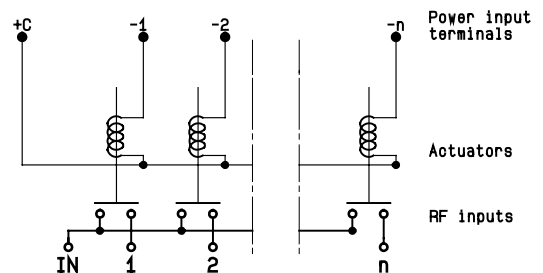
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**R591 series electrical schematics**

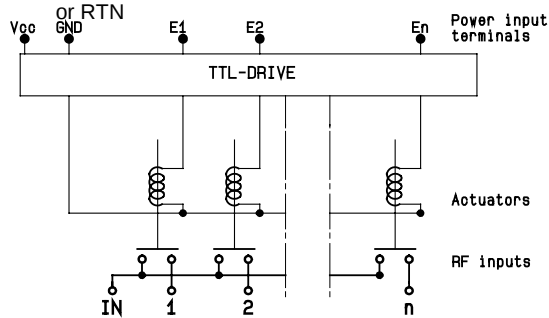
**NORMALLY OPEN WITHOUT OPTION**  
**R591 -0- -0-**



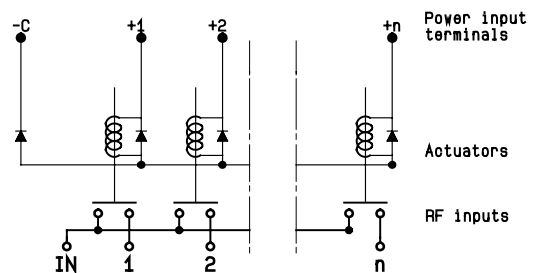
**NORMALLY OPEN WITH POSITIVE COMMON**  
**R591 -0- -1-**



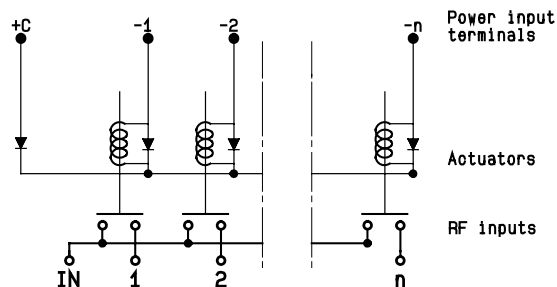
**NORMALLY OPEN WITH TTL DRIVE**  
**R591 -0- -2-**



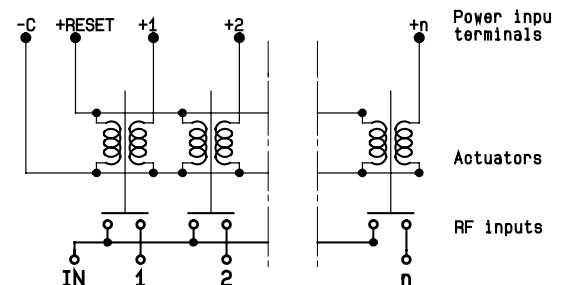
**NORMALLY OPEN WITH SUPPRESSION DIODES**  
**R591 -0- -3-**



**NORMALLY OPEN WITH POSITIVE COMMON AND SUPPRESSION DIODES**  
**R591 -0- -4-**



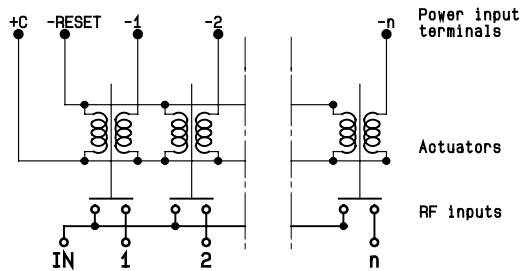
**LATCHING GLOBAL RESET WITHOUT OPTION**  
**R591 -2- -0-**



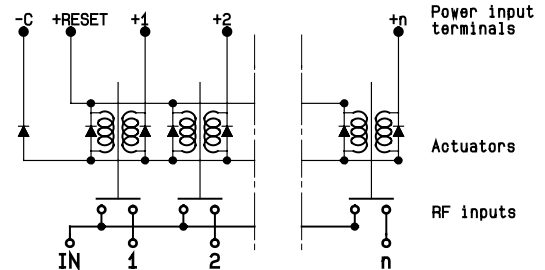
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**R591 series electrical schematics**

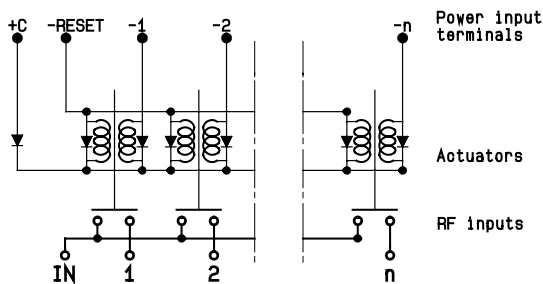
**LATCHING GLOBAL RESET WITH POSITIVE COMMON  
R591 -2- -1-**



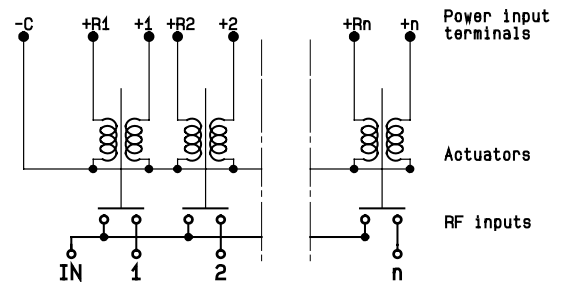
**LATCHING GLOBAL RESET WITH SUPPRESSION DIODES  
R591 -2- -3-**



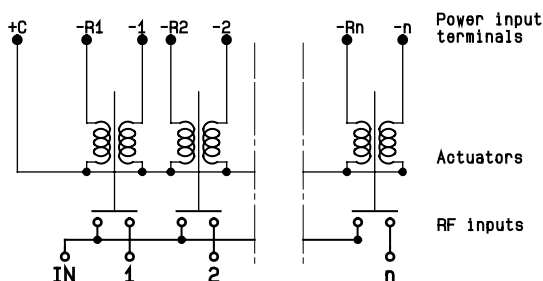
**LATCHING GLOBAL RESET WITH POSITIVE COMMON AND  
SUPPRESSION DIODES  
R591 -2- -4-**



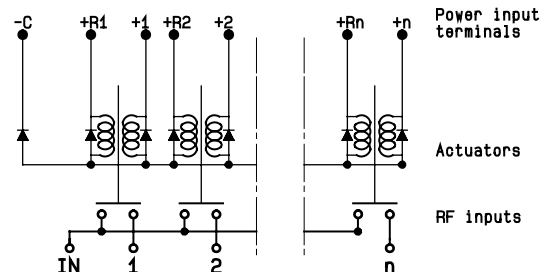
**LATCHING SEPARATED RESET WITHOUT OPTION  
R591 -6- -0-**



**LATCHING SEPARATED RESET WITH POSITIVE COMMON  
R591 -6- -1-**



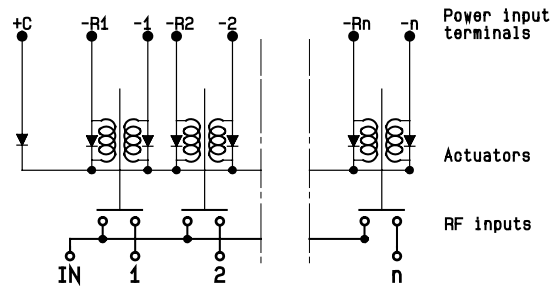
**LATCHING SEPARATED RESET WITH SUPPRESSION  
DIODES  
R591 -6- -3-**



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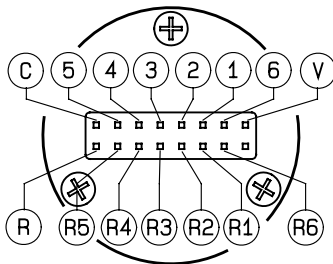
## R591 series electrical schematics

### LATCHING SEPARATED RESET WITH POSITIVE COMMON AND SUPPRESSION DIODES R591 -6- -4-

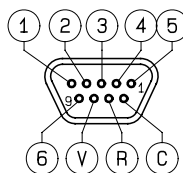


## Pin identification

Solder pins (top view)\*



9 pin Micro-D (top view )



- NC : not connected
- For SP4T, ways 3 and 6 not connected
- Pin R = reset of all paths

\* : compatible with 2.54 mm pitch double row 16 contact femelle connector

|                              |                 | PIN        |     |    |    |    |    |    |    |        |        |        |        |        |        |        |
|------------------------------|-----------------|------------|-----|----|----|----|----|----|----|--------|--------|--------|--------|--------|--------|--------|
| Type                         |                 | C          | V   | 1  | 2  | 3  | 4  | 5  | 6  | R      | R1     | R2     | R3     | R4     | R5     | R6     |
| Normally open                | negative common | -C         | NC  | +1 | +2 | +3 | +4 | +5 | +6 | NC     | NC     | NC     | NC     | NC     | NC     | NC     |
|                              | positive common | +C         | NC  | -1 | -2 | -3 | -4 | -5 | -6 | NC     | NC     | NC     | NC     | NC     | NC     | NC     |
| Latching                     | negative common | -C         | NC  | +1 | +2 | +3 | +4 | +5 | +6 | +reset | NC     | NC     | NC     | NC     | NC     | NC     |
| global reset                 | positive common | +C         | NC  | -1 | -2 | -3 | -4 | -5 | -6 | -reset | NC     | NC     | NC     | NC     | NC     | NC     |
| Latching                     | negative common | -C         | NC  | +1 | +2 | +3 | +4 | +5 | +6 | NC     | +res.1 | +res.2 | +res.3 | +res.4 | +res.5 | +res.6 |
| individual reset             | positive common | +C         | NC  | -1 | -2 | -3 | -4 | -5 | -6 | NC     | -res.1 | -res.2 | -res.3 | -res.4 | -res.5 | -res.6 |
| Normally open with TTL drive |                 | Gnd or RTN | Vcc | E1 | E2 | E3 | E4 | E5 | E6 | NC     | NC     | NC     | NC     | NC     | NC     | NC     |

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## Данный компонент на территории Российской Федерации

**Вы можете приобрести в компании MosChip.**

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

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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

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