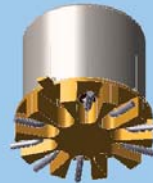


**SURFACE MOUNT  
HIGH REPEATABILITY,  
BROADBAND TO-5 RELAYS  
DPDT**



| SERIES    | RELAY TYPE                                                                                                           |
|-----------|----------------------------------------------------------------------------------------------------------------------|
| SGRF300   | Repeatable, RF relay                                                                                                 |
| SGRF300D  | Repeatable, RF relay with internal diode for coil transient suppression                                              |
| SGRF300DD | Repeatable, RF relay with internal diodes for coil transient suppression and polarity reversal protection            |
| SGRF303   | Sensitive, repeatable, RF relay                                                                                      |
| SGRF303D  | Sensitive, repeatable, RF relay with internal diode for coil transient suppression                                   |
| SGRF303DD | Sensitive, repeatable, RF relay with internal diodes for coil transient suppression and polarity reversal protection |

**DESCRIPTION**

The ultraminiature SGRF300 and SGRF303 relays are designed to provide a practical surface-mount solution with improved RF signal repeatability over the frequency range. SGRF300 and SGRF303 relays feature a unique ground shield that isolates and shields each lead to ensure excellent contact-to-contact and pole-to-pole isolation. This ground shield provides a ground interface that results in improved highfrequency performance as well as parametric repeatability. The SGRF300 and SGRF303 extend performance advantages over similar RF devices that simply offer formed leads for surface mounting. These relays are engineered for use in RF attenuator, RF switch matrices, ATE and other applications that require dependable high frequency signal fidelity and performance.

The SGRF300 and SGRF303 feature:

- High repeatability
- Broader bandwidth
- Metal enclosure for EMI shielding
- High isolation between control and signal paths
- High resistance to ESD

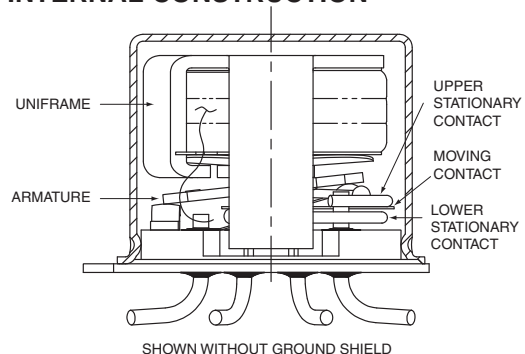
The following unique construction features and manufacturing techniques provide excellent robustness to environmental extremes and overall high reliability:

- Uniframe motor design provides high magnetic efficiency and mechanical rigidity
- Minimum mass components and welded construction provide maximum resistance to shock and vibration
- Advanced cleaning techniques provide maximum assurance of internal cleanliness
- Gold-plated precious metal alloy contacts ensure reliable switching
- Hermetically sealed

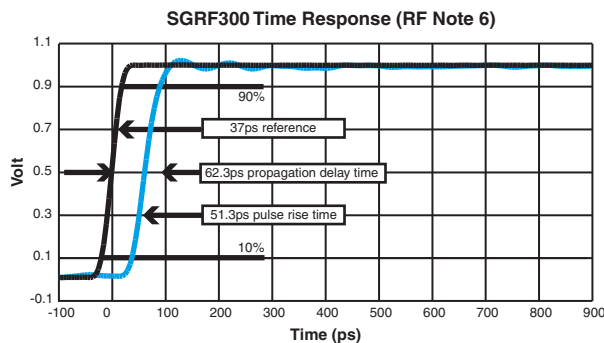
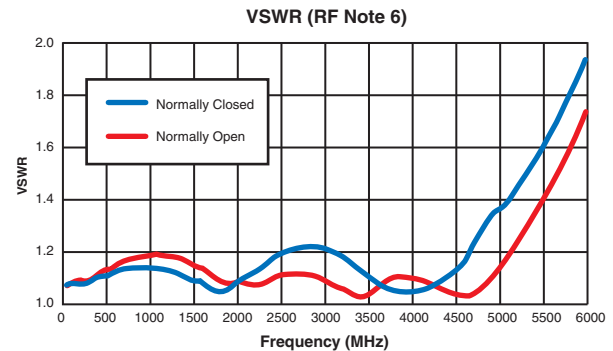
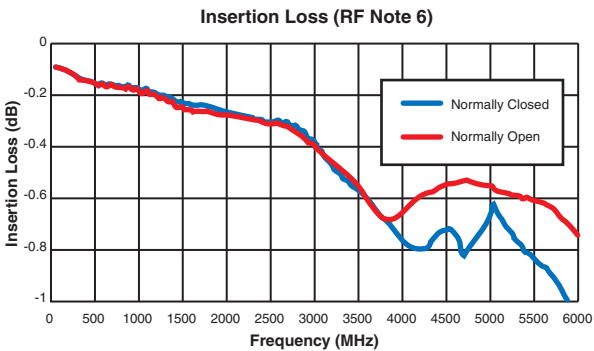
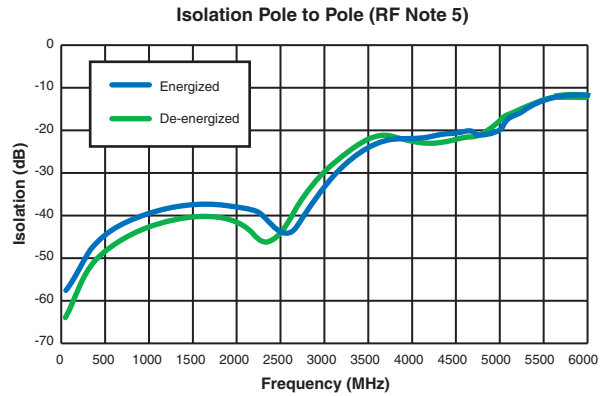
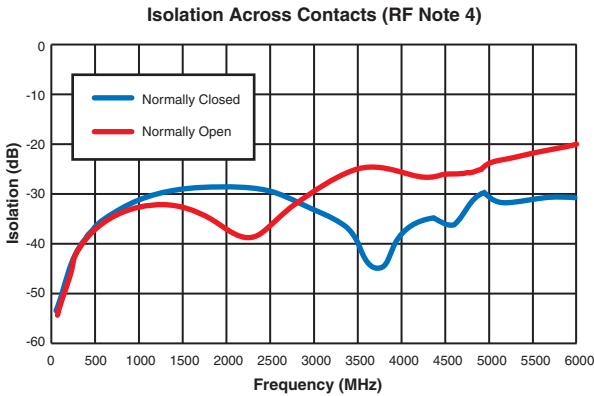
The Series SGRF300D/SGRF303D and SGRF300DD/SGRF303DD relays have internal discrete silicon diodes for coil suppression and polarity reversal protection. This hybrid package reduces required PC board floor space by reducing the number of external components needed to drive the relay.

| ENVIRONMENTAL AND PHYSICAL SPECIFICATIONS |                  |                          |
|-------------------------------------------|------------------|--------------------------|
| <b>Temperature</b><br>(Ambient)           | <b>Storage</b>   | -65°C to +125°C          |
|                                           | <b>Operating</b> | -55°C to +85°C           |
| <b>Vibration</b><br>(General Note I)      |                  | 10 g's to 500 Hz         |
| <b>Shock</b><br>(General Note I)          |                  | 30 g's,<br>6ms half sine |
| <b>Enclosure</b>                          |                  | Hermetically sealed      |
| <b>Weight</b>                             | <b>SGRF300</b>   | 0.09 oz. (2.55g) max.    |
|                                           | <b>SGRF303</b>   | 0.16 oz. (4.5g) max.     |

**INTERNAL CONSTRUCTION**



**SERIES SGRF300/SGRF303**  
**TYPICAL RF CHARACTERISTICS (See RF Notes)**

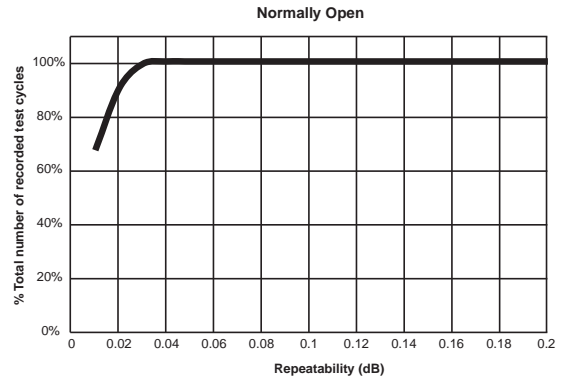
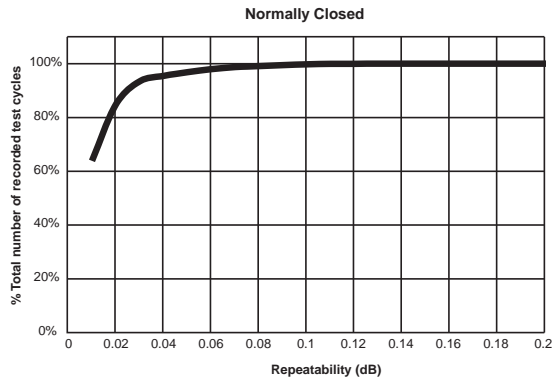


**RF NOTES**

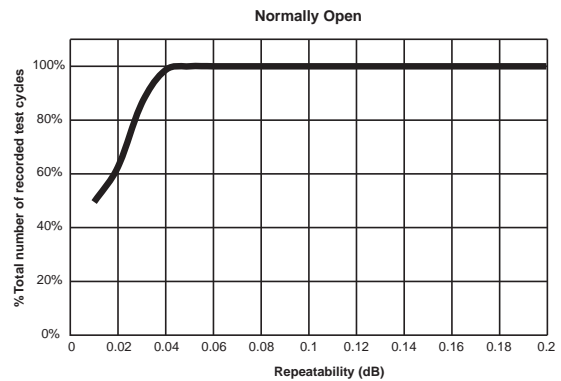
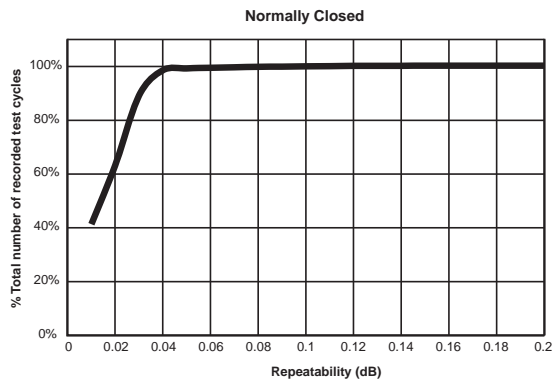
- Test conditions:
  - Fixture: .031" copper clad, reinforced PTFE, RT/duroid® 6002 with SMA connectors. (RT/duroid® is a registered trademark of Rogers Corporation.)
  - RF ground shield is soldered to PCB RF ground plane.
  - Room ambient temperature.
  - Terminals not tested were terminated with 50-ohm load.
  - Contact signal level: -10 dBm.
  - No. of test samples: 2.
- Data presented herein represents typical characteristics and is not intended for use as specification limits.
- Data is per pole, except for pole-to-pole data.
- Data is the average from readings taken on all open contacts.
- Data is the average from readings taken on poles with coil energized and de-energized.
- Data is the average from readings taken on all closed contacts.
- Test fixture effect de-embedded from frequency and time response data.

**SERIES SGRF300 AND SGRF303**  
**TYPICAL RF INSERTION LOSS REPEATABILITY CHARACTERISTICS**  
(See RF Insertion Loss Repeatability Notes)

REPEATABILITY CHARACTERISTICS SGRF300 RELAYS



REPEATABILITY CHARACTERISTICS SGRF303 RELAYS

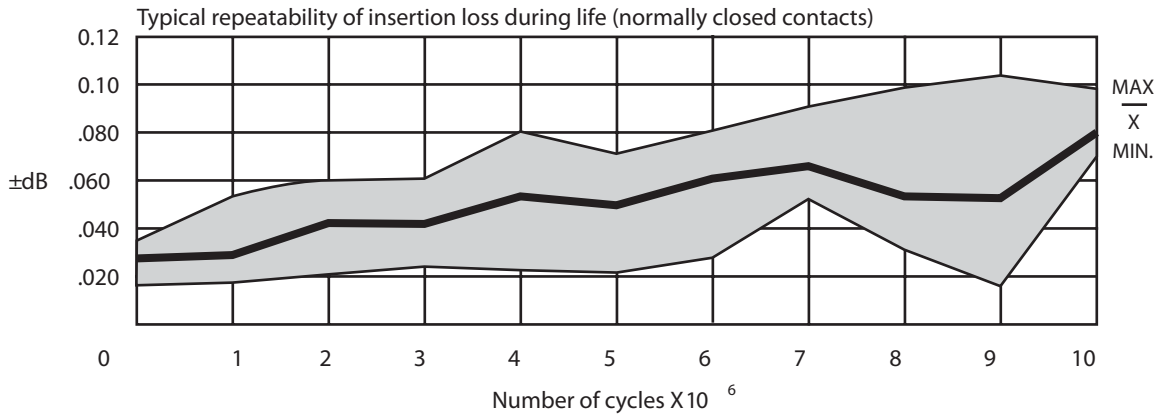
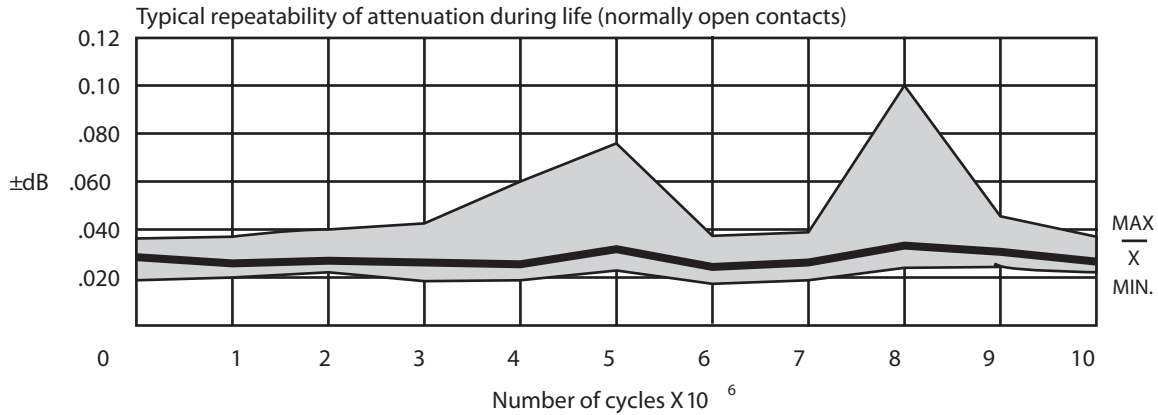


**RF INSERTION LOSS REPEATABILITY NOTES**

1. Test conditions:
  - a. Fixture: .031" copper clad, reinforced PTFE, RT/duroid® 6002 with SMA connectors. (RT/duroid® is a registered trademark of Rogers Corporation.)
  - b. Test performed at room ambient temperature.
  - c. Contact signal level: 20dBm.
2. Data presented herein represents typical characteristics and is not intended for use as specification limits.
3. Insertion loss repeatability measured over frequency range from 50MHz to 4GHz.

**SERIES SGRF300/SGRF303**  
**TYPICAL RF REPEATABILITY PERFORMANCE (See RF Notes 1,2 and 3)**

**1 Million Cycle Repeatability      ±0.1 dB from DC to 3GHz**



**RF NOTES**

1. One million cycle repeatability data is based upon 396 observations with an average repeatability ±0.033 dB and a range of ±0.093 dB.
2. Repeatability of attenuation values were obtained from tests conducted in a 20 dB attenuator network with a 0 dBm input signal.
3. Relay operates at frequencies higher than 3 GHz with reduced RF performance characteristics.
4. Curves were developed from tests performed on a 0.031" copper clad, reinforced PTFE circuit board at 20°C (ref). The unused contacts were terminated in 50 ohms; characteristic impedance of measuring equipment is 50 ohms. The relays were mounted flush to the circuit board ground plane without the relay header soldered to the ground plane.

### SERIES SGRF300/SGRF303 GENERAL ELECTRICAL SPECIFICATIONS (@25°C)

|                                      |                                                               |                                   |
|--------------------------------------|---------------------------------------------------------------|-----------------------------------|
| <b>Contact Arrangement</b>           | 2 Form C (DPDT)                                               |                                   |
| <b>Rated Duty</b>                    | Continuous                                                    |                                   |
| <b>Contact Resistance</b>            | 0.15 Ω max.                                                   |                                   |
| <b>Contact Load Rating</b>           | Resistive: 1Amp/28Vdc<br>Low level: 10 to 50 μA @ 10 to 50 mV |                                   |
| <b>Contact Life Ratings</b>          | 10,000,000 cycles (typical) at low level                      |                                   |
| <b>Coil Operating Power</b>          | SGRF300-5: 500 mW @ nominal coil                              | SGRF300-12: 370 mW @ nominal coil |
|                                      | SGRF303-5: 250 mW @ nominal coil                              | SGRF303-12: 169 mW @ nominal coil |
| <b>Operate Time</b>                  | SGRF300: 4.0 mS max.<br>SGRF303: 6.0 mS max.                  |                                   |
| <b>Release Time</b>                  | SGRF300: 3.0 mS max.                                          | SGRF300D, SGRF300DD: 4.0 mS max.  |
|                                      | SGRF303: 3.0 mS max.                                          | SGRF303D, SGRF303DD: 7.5 mS max.  |
| <b>Intercontact Capacitance</b>      | 0.4 pf typical                                                |                                   |
| <b>Insulation Resistance</b>         | 1,000 MΩ min. between mutually isolated terminals             |                                   |
| <b>Dielectric Strength</b>           | 350 Vrms (60 Hz) @ atmospheric pressure                       |                                   |
| <b>Negative Coil Transient (Vdc)</b> | SGRF300D/SGRF303D,<br>SGRF300DD/SGRF303DD                     | 1.0 max                           |
| <b>Diode P.I.V. (Vdc)</b>            | SGRF300D/SGRF303D,<br>SGRF300DD/SGRF303DD                     | 100 min.                          |

### DETAILED ELECTRICAL SPECIFICATIONS (@25°C)

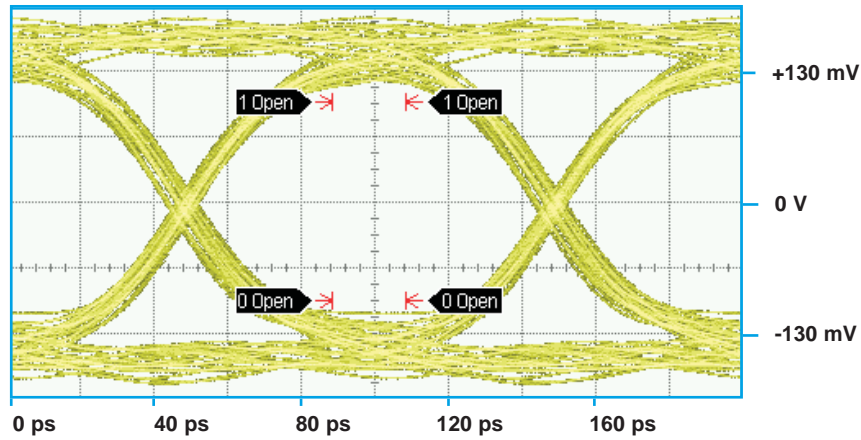
| BASE PART NUMBERS (SGRF300, SGRF300D, SGRF300DD)   |                             | SGRF300-5<br>SGRF300D-5<br>SGRF300DD-5 | SGRF300-12<br>SGRF300D-12<br>SGRF300DD-12 |
|----------------------------------------------------|-----------------------------|----------------------------------------|-------------------------------------------|
| <b>Coil Voltage, Nominal (Vdc)</b>                 |                             | 5.0                                    | 12.0                                      |
| <b>Coil Resistance (Ohms ±20%)</b>                 | SGRF300, SGRF300D           | 50                                     | 390                                       |
|                                                    | SGRF300DD (General Note II) | 39                                     | 390                                       |
| <b>Coil Current (mAdc @ 25 °C)(RF300DD Series)</b> | Min.                        | 93.2                                   | 25.6                                      |
|                                                    | Max.                        | 128.2                                  | 32.8                                      |
| <b>Pick-up Voltage (Vdc max.)</b>                  | SGRF300, SGRF300D,          | 3.6                                    | 9.0                                       |
|                                                    | SGRF300DD                   | 3.9                                    | 10.0                                      |

| BASE PART NUMBERS (SGRF303, SGRF303D, SGRF303DD)   |                             | SGRF303-5<br>SGRF303D-5<br>SGRF303DD-5 | SGRF303-12<br>SGRF303D-12<br>SGRF303DD-12 |
|----------------------------------------------------|-----------------------------|----------------------------------------|-------------------------------------------|
| <b>Coil Voltage, Nominal (Vdc)</b>                 |                             | 5.0                                    | 12.0                                      |
| <b>Coil Resistance (Ohms ±20%)</b>                 | SGRF303, SGRF303D           | 100                                    | 850                                       |
|                                                    | SGRF303DD (General Note II) | 64                                     | 850                                       |
| <b>Coil Current (mAdc @ 25 °C)(RF303DD Series)</b> | Min.                        | 56.8                                   | 11.7                                      |
|                                                    | Max.                        | 78.1                                   | 15.0                                      |
| <b>Pick-up Voltage (Vdc max.)</b>                  | SGRF303, SGRF303D,          | 3.6                                    | 9.0                                       |
|                                                    | SGRF303DD                   | 3.7                                    | 11.0                                      |



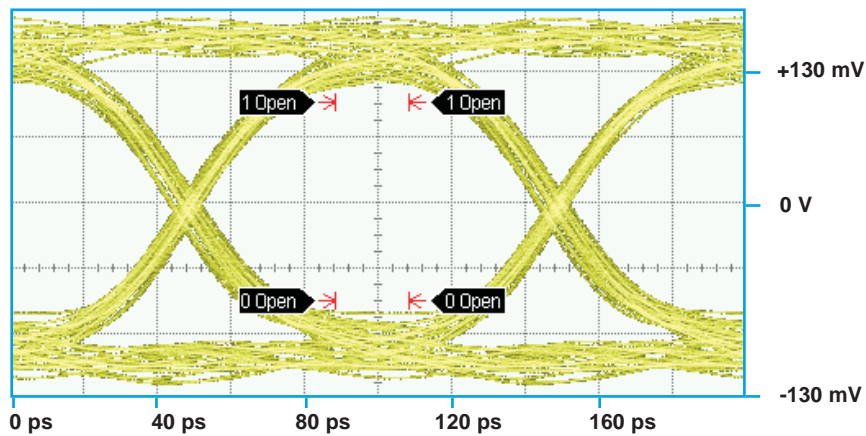
**SERIES SGRF300/SGRF303**  
**TYPICAL SIGNAL INTEGRITY CHARACTERISTICS @ 10 Gbps**

**Normally Closed (Typ.)**



| Bit Rate | Eye Height | Eye Width | Jitter <sub>P-P</sub> |
|----------|------------|-----------|-----------------------|
| 10 Gbps  | 195.3 mV   | 87.41 ps  | 9.78 ps               |

**Normally Open (Typ.)**

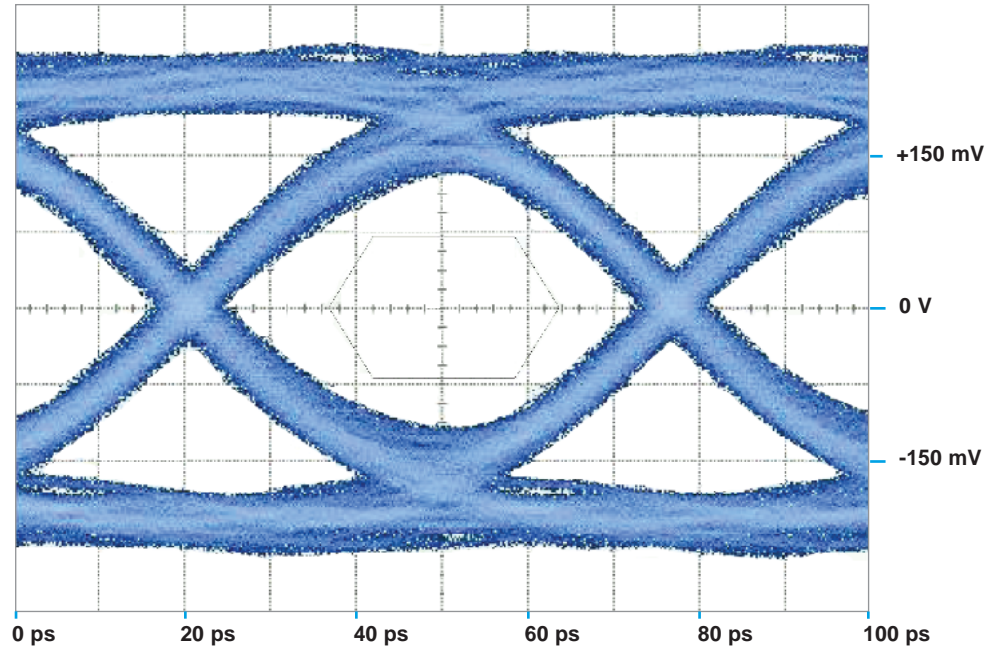


| Bit Rate | Eye Height | Eye Width | Jitter <sub>P-P</sub> |
|----------|------------|-----------|-----------------------|
| 10 Gbps  | 197.4      | 82.95 ps  | 10.67 ps              |

**PATTERN GENERATOR SETTINGS**

- 10 Gbps Random Pulse Pattern Generator
- $2^{31} - 1$  PRBS signal
- PRBS output of 300 mV<sub>P-P</sub> (nominal)
- RF PCB effect (negligible) not removed from measurement
- Data shown is typical of both poles

**SERIES SGRF300/SGRF303**  
**TYPICAL SIGNAL INTEGRITY CHARACTERISTICS @ 18 Gbps**



| Bit Rate | Eye Height | Eye Width | Jitter <sub>P-P</sub> |
|----------|------------|-----------|-----------------------|
| 18 Gbps  | 185 mV     | 46.4 ps   | 10.44 ps              |

**PATTERN GENERATOR SETTINGS**

- 18 Gbps Random Pulse Pattern Generator
- $2^{31} - 1$  PRBS signal
- PRBS output of 300 mV<sub>P-P</sub> (nominal)
- RF PCB effect (negligible) not removed from measurement
- Data shown is typical of both poles





Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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