## Instrumentation Test Cable

## VNAC-2R1-K+

50 $\Omega$  25 inches DC to 40 GHz Low Loss

## The Big Deal

- Ultra-wideband operation, DC to 40 GHz
- Rugged 2.92mm-female connector for direct interface with VNA
- Rugged construction, crush and torgue resistant

#### Product Overview

Mini-Circuits' VNAC-2R1-K+ is an ultra-wideband precision instrumentation cable specially designed for use with VNA equipment in test environments. The cable provides excellent VSWR and very low insertion loss over the entire frequency range. Passivated stainless steel rugged 2.92mm (F) connector interfaces directly with the ports of the VNA\*, and a rugged crush and torque resistant outer sheath protects the cable from damage in demanding lab settings.

| Feature                                                                  | Advantages                                                                                                                                                                                                                                       |
|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DC-40 GHz operation designed for use with Vector Network Analyzers (VNA) | Covers a wide range of test applications; rugged 2.92mm connector interfaces directly with VNA without the need for an adapter for improved VSWR performance.                                                                                    |
| Rugged cable-connector interface                                         | Chrome plated metal back shell maintains integrity of the cable-connector interface improving the reli-<br>ability and extending life of use.                                                                                                    |
| Extra rugged yet flexible armored cable construction.                    | 100% coverage, non-interleaved, stainless steel spiral sheath provides crush resistance and captured, opposing force steel braid provides torque resistance. PET monofilament yarn outer cover eliminates conductivity and allows easy handling. |
| 25" length                                                               | Standard VNA cable length makes VNAC-2R1-K+ a high performing, cost-effective replacement for expensive OEM cables.                                                                                                                              |

\*Compatible with 2.92mm-female connector or customer VNA equipment.

- A Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document. B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuit's website at www.minicircuits.com/MCLStore/terms.jsp





# Instrumentation Test Cable

25 Inches DC to 40 GHz Low Loss **50**Ω

#### **Maximum Ratings**

REF PLANE

-C ACROSS FLATS

CONN 1

Feet

2.08

| +18°C to +30°C |
|----------------|
| -40°C to +70°C |
| 10W            |
|                |

**Outline Drawing** 

VNA CABLE

Outline Dimensions (inch)

B C D F T Meters 0.62 0.312 0.86 0.750 Inches mm 0.63 15.75 7.92 21.84 19.05 +.50/-0 +12.7/-0

**Cable Construction** 

Dielectric: Expanded PTFE

FEP Internal Jacket Stainless Steel Spiral Armor

Center Conductor: Solid Silver Plated Copper

Outer Conductor: Multilayer Silver Plated Copper

Stainless Steel with braid for torque resistance and PET weaver for improved handling

REF PLANE

CONN 2

wt

182

grams

E ACROSS FLATS

Permanent damage may occur if any of these limits are exceeded.

#### Features

- extremely low insertion loss · extra rugged construction includes protective shield and strain relief for longer life
- stainless steel 40 GHz connector for long mating-cycle life
- · double shield cable for excellent shielding effectiveness

#### Applications

- military and defense applications
- research & development labs

## VNAC-2R1-K+



#### CASE STYLE: NE1922-2.1

Conn1 Conn2 Model 2.92 mm Male 2.92mm Rugged Female VNAC-2R1-K+

+RoHS Compliant The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

#### Electrical Specifications at 25°C

| Parameter       | Condition (GHz) | Min. | Тур. | Max. | Units |  |
|-----------------|-----------------|------|------|------|-------|--|
| Frequency Range |                 | DC   |      | 40   | GHz   |  |
| Length          |                 |      | 2.08 |      | FT    |  |
|                 | DC - 6          | —    | 0.79 | 0.97 |       |  |
| Incertion Loop  | 6-18            | —    | 1.44 | 1.60 | dD    |  |
| Insertion Loss  | 18-26.5         | —    | 1.81 | 2.03 | ub    |  |
|                 | 26.5-40         | —    | 2.25 | 2.43 |       |  |
|                 | DC - 6          | 15.5 | 27.1 | —    |       |  |
| Deturn Loop     | 6-18            | 15.5 | 22.6 | —    | -ID   |  |
| Return Loss     | 18-26.5         | 15.5 | 20.8 | —    | uв    |  |
|                 | 26 5-40         | 15.5 | 18 1 | _    |       |  |

#### **Typical Performance Data**

| Frequency<br>(MHz) | Insertion Loss<br>(dB) | Return Loss<br>(dB) |             |  |
|--------------------|------------------------|---------------------|-------------|--|
|                    |                        | 2.92 mm Male        | 2.92 mm Fem |  |
| 50                 | 0.05                   | 40.79               | 38.62       |  |
| 1000               | 0.27                   | 45.25               | 39.44       |  |
| 3500               | 0.52                   | 38.21               | 35.13       |  |
| 6000               | 0.69                   | 33.27               | 30.46       |  |
| 10000              | 0.95                   | 30.50               | 30.19       |  |
| 14000              | 1.12                   | 35.37               | 35.50       |  |
| 18000              | 1.30                   | 26.68               | 27.64       |  |
| 22000              | 1.49                   | 31.15               | 34.78       |  |
| 26500              | 1.64                   | 39.25               | 26.94       |  |
| 30000              | 1.84                   | 22.33               | 24.83       |  |
| 32000              | 1.87                   | 22.32               | 28.08       |  |
| 34000              | 1.90                   | 26.50               | 28.85       |  |
| 36000              | 1.97                   | 26.68               | 30.37       |  |
| 38000              | 2.21                   | 21.84               | 29.34       |  |
| 40000              | 2.17                   | 20.66               | 20.97       |  |



#### **Product Guarantee**

Mini-Circuits® will repair or replace your test cable at its option if the connector attachment fails within six months of shipment. This guarantee excludes cable or connector interface damage from misuse or abuse.

Notes

A Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document. B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collective), "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits, website at www.minicircuits.com/MCLStore/terms.sp



REV. A M156351 VNAC-2R1-K+ RS/CP/AM 170210 Page 2 of 2

www.minicircuits.com P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

## Flex Test, 2.92mm-Male/2.92mm-Female Ruggedized

### Instrumentation Test Cable

Typical Performance Data

| FREQUENCY | INSERTION LOSS | 2.92mm MALE        | 2.92mm FEMALE      |
|-----------|----------------|--------------------|--------------------|
|           |                | <b>RETURN LOSS</b> | Ruggedized         |
|           |                |                    | <b>RETURN LOSS</b> |
| (MHz)     | (dB)           | (dB)               | (dB)               |
| 50        | 0.05           | 40.8               | 38.6               |
| 100       | 0.08           | 40.1               | 39.3               |
| 500       | 0.19           | 49.2               | 41.4               |
| 1000      | 0.27           | 45.2               | 39.4               |
| 2000      | 0.39           | 37.1               | 37.6               |
| 3000      | 0.48           | 39.8               | 37.7               |
| 4000      | 0.55           | 38.4               | 34.9               |
| 5000      | 0.63           | 36.9               | 32.3               |
| 6000      | 0.69           | 33.3               | 30.5               |
| 7000      | 0.76           | 32.3               | 29.0               |
| 8000      | 0.81           | 30.4               | 28.1               |
| 9000      | 0.86           | 31.9               | 32.0               |
| 10000     | 0.95           | 30.5               | 30.2               |
| 11000     | 0.99           | 30.7               | 31.0               |
| 12000     | 1.03           | 30.8               | 33.0               |
| 13000     | 1.07           | 33.7               | 37.1               |
| 14000     | 1.12           | 35.4               | 35.5               |
| 15000     | 1.16           | 31.7               | 36.3               |
| 16000     | 1.18           | 30.8               | 36.9               |
| 17000     | 1.25           | 26.3               | 30.0               |
| 18000     | 1.30           | 26.7               | 27.6               |
| 19000     | 1.32           | 27.6               | 26.8               |
| 20000     | 1.32           | 25.5               | 26.8               |
| 21000     | 1.39           | 26.6               | 31.3               |
| 22000     | 1.49           | 31.1               | 34.8               |
| 23000     | 1.51           | 34.2               | 30.7               |
| 24000     | 1.54           | 28.2               | 30.6               |
| 25000     | 1.58           | 30.7               | 30.7               |
| 26000     | 1.62           | 31.2               | 27.6               |
| 27000     | 1.65           | 33.9               | 25.0               |
| 28000     | 1.74           | 26.6               | 24.4               |
| 29000     | 1.82           | 23.3               | 26.2               |
| 30000     | 1.84           | 22.3               | 24.8               |
| 31000     | 1.86           | 21.4               | 26.4               |
| 32000     | 1.87           | 22.3               | 28.1               |
| 33000     | 1.90           | 24.4               | 27.1               |
| 34000     | 1.90           | 26.5               | 28.9               |
| 35000     | 1.94           | 33.1               | 30.4               |
| 36000     | 1.97           | 26.7               | 30.4               |
| 37000     | 2.06           | 22.6               | 34.1               |
| 38000     | 2.21           | 21.8               | 29.3               |
| 39000     | 2.23           | 21.8               | 28.2               |
| 40000     | 2.17           | 20.7               | 21.0               |





P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 • Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com IF/RF MICROWAVE COMPONENTS

REV.A VNAC-2R1-K+ 5/11/2016 Page 1 of 1

## Flex Test, 2.92mm-Male/2.92mm-Female Ruggedized Instrumentation Test Cable





ISO 9001 ISO 14001 AS 9100 CERTIFIED

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 • Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

IF/RF MICROWAVE COMPONENTS

REV.A VNAC-2R1-K+ 5/11/2016 Page 1 of 1

43

# Case Style

NE1922

## **Outline Dimensions**



#### NA1922 SERIES 2.92mm MALE (CONN-1) 2.92mm RUGGED FEMALE (CONN-2)

| CASE       | А    |        | D              | C                                       | D              | Б | Б            | Т       |           | WEIGHT |
|------------|------|--------|----------------|-----------------------------------------|----------------|---|--------------|---------|-----------|--------|
| STYLE #    | FEET | METERS | D              | C                                       | D              | E | Г            | INCH    | MM        | GRAMS  |
| NE1922-2.1 | 2.08 | .63    |                | 212                                     |                |   |              | +.50/-0 | +12.7/-0  | 182.0  |
| NE1922-3   | 3.00 | .91    | .62<br>(15.75) | .312                                    | .86<br>(21.84) | - | .750 (19.05) | +.72/-0 | +18.29/-0 | 210.0  |
|            |      |        | (10170)        | (////////////////////////////////////// | (2110.)        |   | (1)100)      |         |           |        |

Unless otherwise specified dimensions are in inches (mm). Tolerances: 2Pl.  $\pm$ .03; 3Pl.  $\pm$ .015

Note:

1. VNA 26.5 and 40 GHz Coaxial Cable.



INTERNET http://www.minicircuits.com

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010 Mini-Circuits ISO 9001 & ISO 14001 Certified

## Mini-Circuits Environmental Specifications ENV79

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| Specification         | Test/Inspection Condition            | Reference/Spec                                                                    |
|-----------------------|--------------------------------------|-----------------------------------------------------------------------------------|
|                       |                                      |                                                                                   |
| Operating Temperature | +18°C to 30°C<br>Ambient Environment | Individual Model Data Sheet                                                       |
| Storage Temperature   | -40° to 70° C<br>Ambient Environment | Individual Model Data Sheet                                                       |
| Thermal Shock         | -40°C to 70°C, 100 cycles            | MIL-STD-202, Method 107, Condition A-3, except- 30 minute dwell instead of 1 hour |
|                       |                                      |                                                                                   |
|                       |                                      |                                                                                   |
|                       |                                      |                                                                                   |
|                       |                                      |                                                                                   |
|                       |                                      |                                                                                   |
|                       |                                      |                                                                                   |
|                       |                                      |                                                                                   |
|                       |                                      |                                                                                   |
|                       |                                      |                                                                                   |
|                       |                                      |                                                                                   |
|                       |                                      |                                                                                   |
|                       |                                      |                                                                                   |
|                       |                                      |                                                                                   |
|                       |                                      |                                                                                   |
|                       |                                      |                                                                                   |

ENV79 Rev: A 07/22/15 M151978 File: ENV79.pdf

This document and its contents are the property of Mini-Circuits.