StabilityBench™ Microwave/RF Cable Assemblies

DATA SHEET / 2Z-007

Stability bench™ Maury Microwave

MODELS:
SB-N // Type N color-coded StabilityBench™ cables
SB-SMA // SMA color-coded StabilityBench™ cables

Maury Microwave

// FEBRUARY 2021

StabilityBench™ Microwave/RF Cable Assemblies

SERIES SB-N AND SB-SMA

Features and Benefits

- Excellent value
- Low insertion loss
- Reliable and repeatable measurements
- Amplitude and phase stable with flexure
- High mating-cycle durability

Typical Applications

- RF and microwave instruments
- Bench-top testing
- Probe station integrations
- RF production testing
- Component/module testing
- ATE systems

Description

Maury Microwave's StabilityBench™ series sets the standard for high-end all-purpose test and measurement cable assemblies. Designed for general testing applications, StabilityBench™ offers excellent value with its low cost, low insertion loss, excellent return loss, flexibility, and amplitude and phase stability. StabilityBench™ is the ideal interconnection for reliable and repeatable measurements when mated with test instruments including bench-top testing, on-wafer characterization and ATE systems.

StabilityBench™ cable assemblies are now part of the ColorConnect™ family! Following the proposed IEEE high-frequency connector/adapter color convention, StabilityBench™ cable assemblies are the first commercially available assemblies to offer clear indications of compatibility and intermatability. ColorConnect™ makes it a simple matter to avoid and eliminate damaged equipment, degraded equipment reliability, degraded performance and lengthy maintenance times due to improper mating (and attempted mating) of incompatible interconnects.

Cable Assembly Specifications

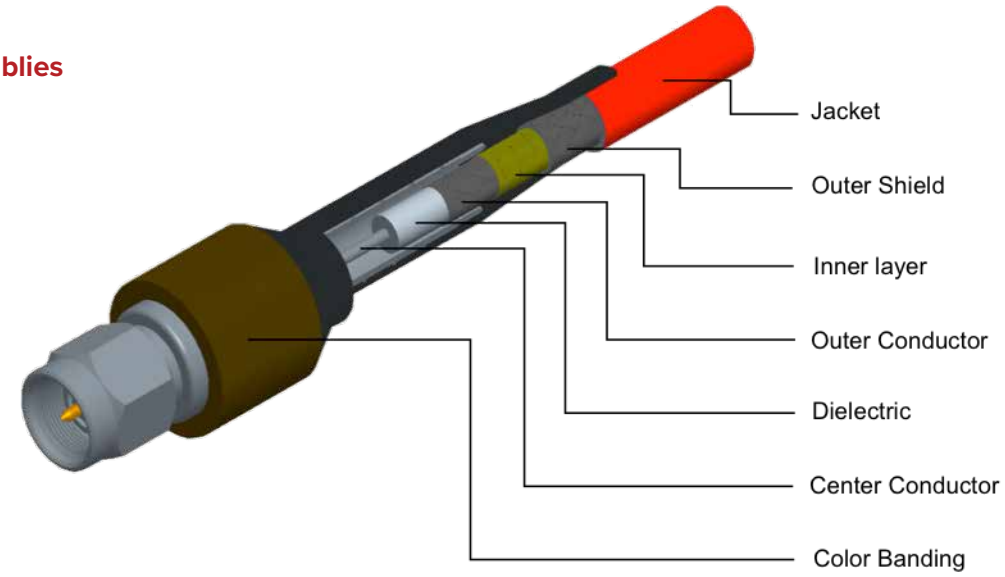
Electrical Properties

StabilityBench™ Cable Type	Type N	SMA
Maximum Freq.	18 GHz	26.5 GHz
VSWR (typical)	1.25	
Typical IL (cable only)	0.68 dB/ft	0.88 dB/ft
Impedance (nominal)	50 ohm	
Phase Stability vs Flexure (typical)	±3°	±4°
Amplitude Stability vs Flexure (typical)	±0.05 dB	
Velocity of Propagation	70%	
Shielding Effectiveness	100 dB	
Time Delay (nominal)	1.45 ns/ft (4.76 ns/m)	

Mechanical/Environmental Properties

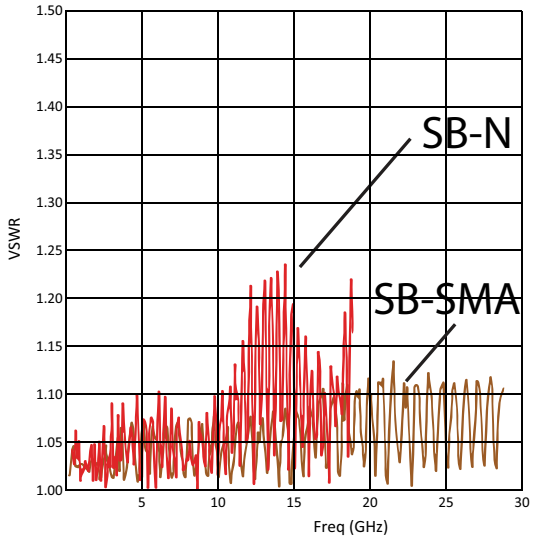
StabilityBench™ Cable Type	Type N	SMA
Center Conductor Material	Silver Plated Copper Clad Steel	
Maximum Outer Diameter (Connector)	0.87 in (22.1 mm)	0.50 in (12.8 mm)
Maximum Outer Diameter (Cable)	0.193 in (4.9 mm)	0.193 in (4.9 mm)
Nominal Weight	0.69 oz/ft (64 g/m)	
Min. Static Bend Radius/ Min. Dynamic Bend Radius	2.0 in (50.8 mm)	
Min. Dynamic Bend Radius	2.0 in (50.8 mm)	
Flex Life Cycles	>10,000	
Crush Resistance	>134 lbf/in (23 kgf/cm)	
Operating Temperature Range	-67°+157 °F (-55°+105°C)	
RoHS/REACH	Yes	

Anatomy of StabilityBench™ Microwave/RF Cable Assemblies

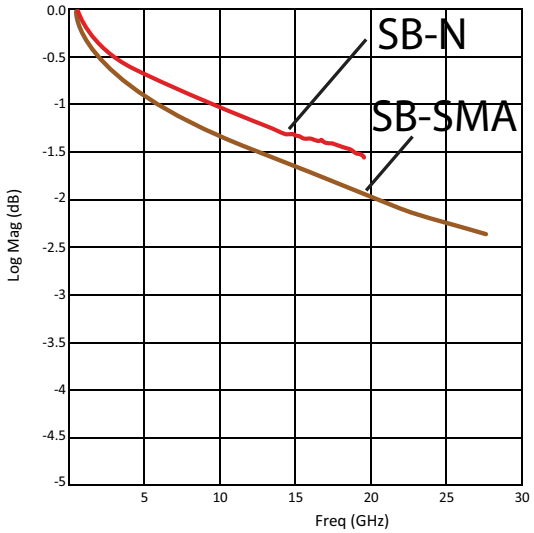


Maury StabilityBench™ Cable Assembly Typical Performance

Maury StabilityBench™ 36" Cable Assembly Typical VSWR



Maury StabilityBench™ 36" Cable Assembly Typical Insertion Loss

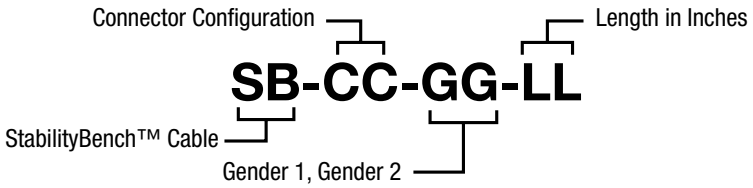


CC	GG	LL (Standard Lengths)
N (Type N)* SMA	MM (Male To Male) MF (Male to Female) FF (Female To Female)	24 36 48 60 72

** Type N available in male only.*

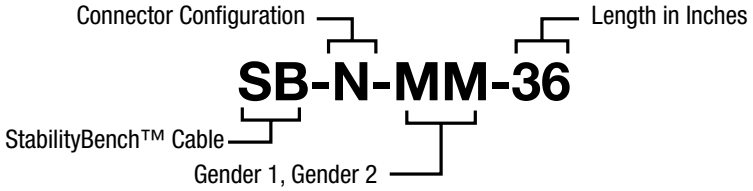
Ordering Instructions for StabilityBench™ Cable Assemblies

Standard StabilityBench™ Cable Assemblies



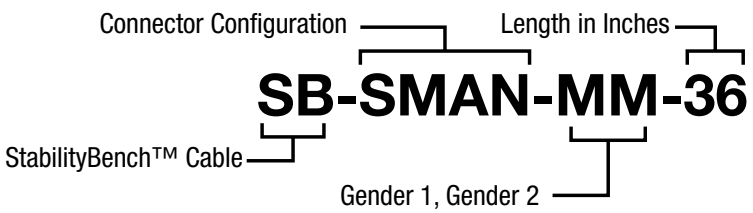
EXAMPLE:

The following is a StabilityBench™ cable assembly with Type N male connectors on both ends, and 36 inches overall length.



EXAMPLE:

The following is a StabilityBench™ cable assembly with SMA male connecter on one end and Type N connector on the other end, and 36 inches overall length.



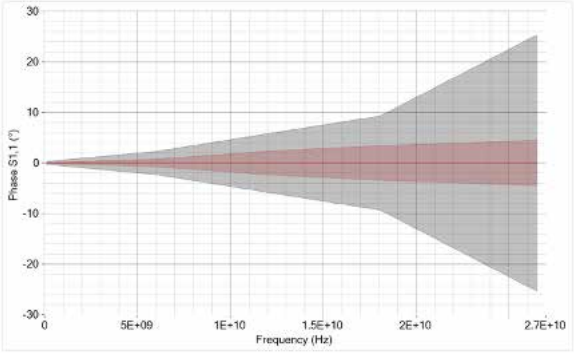
S-parameter measurements with uncertainty

A cable's *phase stability with flexure* specification is a metric used to communicate the impact of cable movement on a DUT measurement. It implies that lower specifications lessen the impact on the measurement (i.e. a cable with a 2° phase stability with flexure specification will have a lesser impact on a measurement than a cable with a 5° phase stability). However, the methods used to determine this specification may not be consistent across manufacturers, and likely do not represent the actual cable movement range of a user.

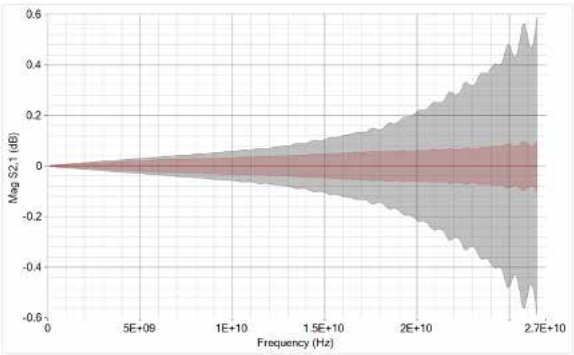
A better metric to understand a cable's impact on a DUT measurement is "uncertainty contribution". The cable's impact on measurement uncertainty can be calculated by moving the cable through a user's actual range of motion and recording the S-parameters across the movement. This technique has been thoroughly documented by the European Association of National Metrology Institutes (EURAMET)* and has been made commercially available in Maury's Insight™** calibration and measurement software platform.

The plots on the right show typical S-parameter measurements with uncertainty boundaries on different types of DUTs. The boundaries shown only consider the cable's direct contribution on measurement uncertainty.

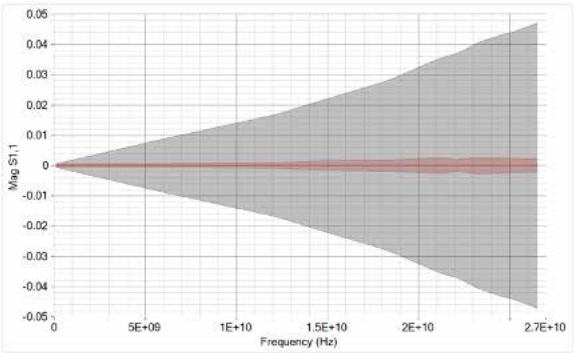
** https://www.maurymw.com/pdf/I-CAL-GUI-012.pdf*
*** https://www.maurymw.com/Precision/Insight_Software.php*



S11_phase measured on a short circuit termination SB-SMA-MM-36 shown in red; leading global competitor shown in grey



S21_mag measured on a short circuit termination SB-SMA-MM-36 shown in red; leading global competitor shown in grey



S11_mag measured on a short circuit termination SB-SMA-MM-36 shown in red; leading global competitor shown in grey

Max Insertion Loss/Attenuation

(1:1 VSWR, 25 C, Sea Level, Cable Only)

Freq (GHz)	SB-SMA (dB/100 ft)	SB-N (dB/100 ft)
1	12.2	12.2
2	18.00	18.00
4	26.80	26.80
6	34.10	34.10
8	40.70	40.70
12	52.50	52.50
18	68.30	68.30
26.5	88.40	N/A

Average Power Handling

(1:1 VSWR, 25 C, Sea Level, Cable Only)

Freq (GHz)	SB-SMA Watts (Max)	SB-N Watts (Max)
1	522	522
2	355	355
4	238	238
6	187	187
8	156	156
12	121	121
18	93	93
26.5	72	N/A

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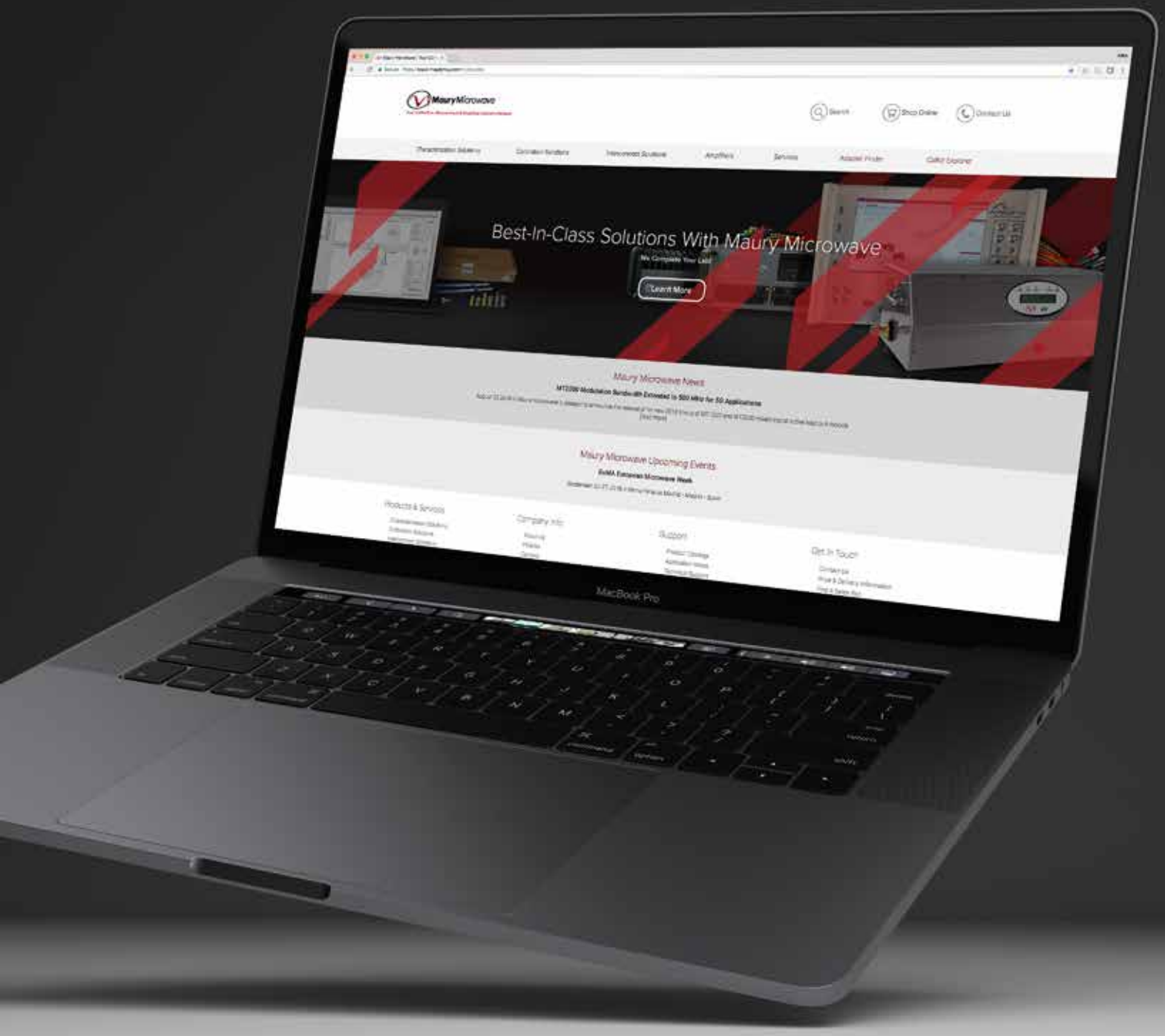

www.maurymw.com

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