Astrolab minibend HR

High performance, low profile, ruggedized

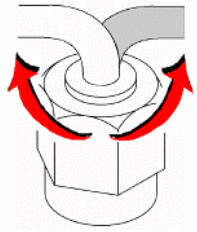
The 'ruggedized' version of the original minibend®

Product Description

minibend® HR is a highly isolated, ruggedized version of the standard minibend. minibend® HR has RF shielding greater than 110db when tested IAW MIL-PRF-39012. minibend® HR is designed for use in complex, congested environments where higher cable retention force is required. minibend® HR's pull strength is more than 70% greater than standard minibend®. minibend® HR when installed and bent at the minimum bend radius will tolerate multiple 90° rotations at the cable/connector junction. The 'R' ruggedization can be added to any minibend®connector style. All materials used in minibend® HR assmblies meet or exceed NASA TML and CVCM requirements for use in spacecraft applications.

Product Features

- Precision stainless steel SMA plug connectors (Patented - US Patent Office)
- Connector pull strength 70% stronger than standard minibend and torque resistant utilizing minibend R technology (Patented - US Patent Office)
- Eliminates need for costly right angle connectors
- Quintuple shielded for high isolation
- Frequency range up to 26.5 GHz
- 99.9% lead free



minibend® HR when installed and bent at the minimum bend radius will tolerate multiple 90° rotations at the cable/connector junction.

Note: The 'R' ruggedization can be added to any minibend connector

Environmental Limits

Temperature Range:	-60°C to +165°C
Thermal Shock:	per Mil-Std-202, Method 107, Test Condition F
Vibration:	per Mil-Std-202, Method 214, Test Condition K1 (46.3 Grams)

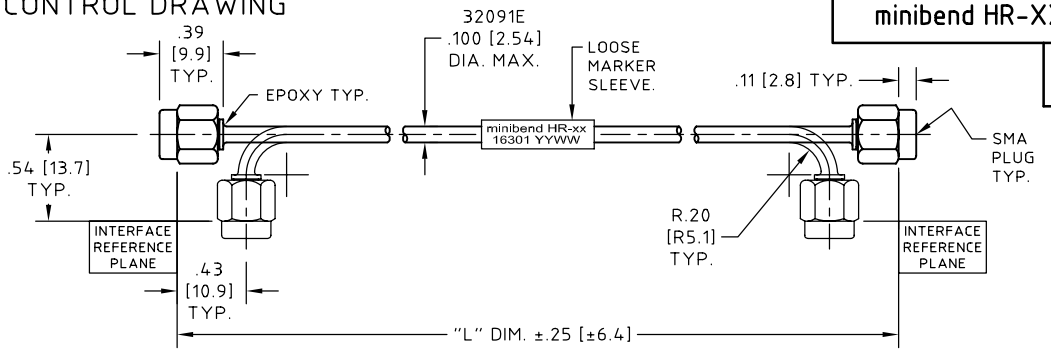
Phase Versus Flexure Reference Data

Astrolab performed phase tests on hundreds of minibend® cable assemblies. Following are two standard Astrolab tests with the corresponding data. In test one minibend®HR–6 assembly's were flexed 90° in a 0.25 inch radius directly behind the connector. In test two, minibend® HR–16 assembly's were flexed 180° with a 0.4 inch radius in the middle. Typical data is listed here:

	TEST ONE	TEST TWO
24 GHz.	1.4°	3.9°
18 GHz.	1.2°	2.9°
12.4 GHz.	0.9°	1.8°
1 GHz.	0.1°	0.2°

CONTROL DRAWING

minibend HR-XX | B



NOTES:

1. CABLE, FIVE SHIELD CONSTRUCTION, ASTROLAB 32091E
   astro-STEEL-flex I SERIES, EXCEEDS MIL-DTL-17
   MATERIALS AND FINISHES:
   CENTER CONDUCTOR, SILVER PLATED, SOLID COPPER WIRE
   DIELECTRIC, EXTRUDED PTFE.
   OUTER CONDUCTOR, SILVER PLATED FLAT COPPER WIRE BRAID.
   BARRIER LAYER, ALUMINUM/POLYIMIDE TAPE.
   SHIELD, 304 STAINLESS STEEL WIRE BRAIDS.
   OUTER JACKET, EXTRUDED BLUE FEP.

2. CONNECTOR: SMA PLUG, PERFORMANCE PER MIL-PRF-39012.
   MATERIALS AND FINISHES:
   BODY, SMA NUT AND BACK NUT
   STEEL, CORROSION RESISTANT PER ASTM A-582,
   UNS No. S30300, COND. A, NON MAGNETIC.
   GOLD PLATED .000050 IN MIN. THK.
   (1.27 MICRO METERS)
   PER ASTM B-488, CODE C, TYPE II
   OVER
   NICKEL PLATE, .000050 IN MIN. THK. PER
   SAE-AMS-QQ-N-290 OR ASTM B-689 TYPE 1.
   CENTER CONDUCTOR
   BERYLLIUM COPPER ALLOY PER ASTM B-196,
   UNS No. C17300, TEMPER TD04(H).
   GOLD PLATED .000050 IN MIN. THK.
   (1.27 MICRO METERS)
   PER ASTM B-488, CODE C, TYPE II
   OVER
   NICKEL PLATE, .000050 IN MIN. THK. PER
   SAE-AMS-QQ-N-290 OR ASTM B-689 TYPE 1.
   DIELECTRIC
   POLYTETRAFLUOROETHYLENE (PTFE) PER
   ASTM D-1710 OR ASTM D-4894,
   TYPE I, GRADE 1.
   EPOXY
   TWO-COMPONENT HIGH TEMPERATURE EPOXY SYSTEM.

3. ELECTRICAL
   IMPEDANCE 50.0 Ohms NOMINAL.
   PERFORMANCE, SEE MAXIMUM VALUES IN CHART.
   RF SHEILDING, GREATER THAN 110 dB WHEN TESTED
   IAW MIL-PRF-39012 PARAGRAPH 4.6.23.

4. TECHNICAL DATA:
   MECHANICAL PERFORMANCE
   GUARANTEED 25.0 LBS [111 N] PULL FORCE.
   OPERATING TEMPERATURE
   -55°C TO +125°C.
   OPERATIONAL LIMITS
   "minibend HR" IS A HIGHLY ISOLATED, RUGGEDIZED VERSION
   OF THE STANDARD minibend. IT IS SUITABLE FOR SEVERE,
   ENVIRONMENTS AND CONGESTED HIGH DENSITY PACKAGES.

5. MARKER MATERIAL HEAT SHRINKABLE SLEEVING PER SAE-AMS-DTL-23053.
   LOOSE ON THE CABLE BUT CAPTIVATED FROM FALLING OFF.
   MARKED IN BLACK CHARACHTERS AS SHOWN.

ASTROLAB		DIM. "L"	2.0 GHz		18.0 GHz		26.5 GHz	
PART No.	REF. No.		VSWR	I.L. dB	VSWR	I.L. dB	VSWR	I.L. dB
minibend HR-2	32091E-2-29094CR-2	2.00 (50.8)	1.20:1	0.19	1.37:1	0.53	1.45:1	0.65
minibend HR-2.5	32091E-2-29094CR-2.5	2.50 (63.5)	1.20:1	0.21	1.37:1	0.58	1.45:1	0.72
minibend HR-3	32091E-2-29094CR-3	3.00 (76.2)	1.20:1	0.23	1.37:1	0.64	1.45:1	0.80
minibend HR-3.5	32091E-2-29094CR-3.5	3.50 (88.9)	1.20:1	0.25	1.37:1	0.70	1.45:1	0.87
minibend HR-4	32091E-2-29094CR-4	4.00 (101.6)	1.20:1	0.27	1.37:1	0.76	1.45:1	0.95
minibend HR-4.5	32091E-2-29094CR-4.5	4.50 (114.3)	1.20:1	0.29	1.37:1	0.82	1.45:1	1.03
minibend HR-5	32091E-2-29094CR-5	5.00 (127.0)	1.20:1	0.31	1.37:1	0.88	1.45:1	1.10
minibend HR-5.5	32091E-2-29094CR-5.5	5.50 (139.7)	1.20:1	0.33	1.37:1	0.95	1.45:1	1.18
minibend HR-6	32091E-2-29094CR-6	6.00 (152.4)	1.20:1	0.35	1.37:1	1.01	1.45:1	1.25
minibend HR-6.5	32091E-2-29094CR-6.5	6.50 (165.1)	1.20:1	0.37	1.37:1	1.08	1.45:1	1.32
minibend HR-7	32091E-2-29094CR-7	7.00 (177.8)	1.20:1	0.38	1.37:1	1.13	1.45:1	1.39
minibend HR-7.5	32091E-2-29094CR-7.5	7.50 (190.5)	1.20:1	0.40	1.37:1	1.18	1.45:1	1.47
minibend HR-8	32091E-2-29094CR-8	8.00 (203.2)	1.20:1	0.42	1.37:1	1.25	1.45:1	1.54
minibend HR-9	32091E-2-29094CR-9	9.00 (228.6)	1.20:1	0.46	1.37:1	1.37	1.45:1	1.69
minibend HR-10	32091E-2-29094CR-10	10.00 (254.0)	1.20:1	0.50	1.37:1	1.49	1.45:1	1.84
minibend HR-11	32091E-2-29094CR-11	11.00 (279.4)	1.20:1	0.53	1.37:1	1.61	1.45:1	1.99
minibend HR-12	32091E-2-29094CR-12	12.00 (304.8)	1.20:1	0.57	1.37:1	1.73	1.45:1	2.14
minibend HR-13	32091E-2-29094CR-13	13.00 (330.2)	1.20:1	0.61	1.37:1	1.85	1.45:1	2.29
minibend HR-14	32091E-2-29094CR-14	14.00 (355.6)	1.20:1	0.65	1.37:1	1.97	1.45:1	2.44
minibend HR-15	32091E-2-29094CR-15	15.00 (381.0)	1.20:1	0.69	1.37:1	2.09	1.45:1	2.59
minibend HR-16	32091E-2-29094CR-16	16.00 (406.4)	1.20:1	0.72	1.37:1	2.22	1.45:1	2.74

REV.	DESCRIPTION	DATE	BY	APPROVED
B	ECN No. 12623	06/17/09	EF	

UNITS
INCH [mm]

UNLESS OTHERWISE SPECIFIED CONCENTRICITY .004 T.I.R. CORNERS AND FILLETS .005 MAX. RADIUS OR CHAMFER. SURFACE FINISH 63 RMS MICROINCHES OR BETTER.

FRACTIONS	± 1/16
X	± .030
XX	± .015
XXX	± .005
ANGLES	± 1°

DO NOT SCALE DRAWING

	NAME	DATE
PREP.	E. BAIZA	10/05/07
ELEC.		
MECH.	GSG	10/05/07
Q.C.		

ASTROLAB® INC.
WARREN, NJ

TITLE
CABLE ASSEMBLY,
"minibend HR-XX" TYPE, HIGH SHIELDING, SMA PLUG TO SMA PLUG.

THDS. TO BE IN ACCORD WITH U.S. DEPT. OF COMM. SCREW THD. STDS. FOR FEDERAL SERVICES 1950 SUPL. TO HANDBOOK H 28.

SCALE	CODE IDENT.	DWG NO.	REV
1:1	16301	minibend HR-XX	B