Precision Air Lines

GENERAL INFORMATION

7943S6.25

7943S1.25
2503B1

Bead-Supported

7943S1.50
8043S15

Unsupported (air dielectric)

Coaxial air lines are air-dielectric transmission lines with highly accurate dimensions that can be used as fundamental impedance standards in measurement and calibration applications, and may also be used to establish reference positions for measurements.

Maury offers air lines with bead supported and/or beadless connectors in a variety of popular types including, 1.85mm, 2.4mm, 2.92mm (K), 3.5mm, 7mm and type N.

Bead supported air lines offer greater convenience and easier connections (the center conductor is automatically aligned by the dielectric bead for easy connection); beadless air lines offer better impedance and electrical length accuracies, as well as lower VSWR (the center conductor floats free in the air line body, and the male connector nut is retractable to facilitate insertion of the center conductor contact before the thread- on connection tightened.

The photos at the right (above) show end views of two type N air lines. On the left is a model 2503A (representing Maury's bead supported design) and on the right is a model 2553T15 (representing Maury's beadless design). The low-loss dielectric bead in the 2503A keeps the center conductor precisely centered in the body of the air line. The photo on the right shows how the unsupported center conductor of the 2553T15 has shifted to the left, and floats freely in the air line body until it is connected at both ends. The beadless design is a true "air" line in that it does not include any discontinuities caused by having the center conductor supported by dielectric beads. Beadless air lines are often used as "sample holders" where samples of various materials can be inserted in the air line and measured to determine the material's dielectric properties.

Specifications given for the air line models in this section include the odd 1/4-λ frequency rating. This rating indicates the frequencies at which the electrical length is an odd multiple of a 1/4 wavelength where n = zero or an integer.

Precision Air Lines Available Models

Model	Connector Type	Frequency Range (GHz)	Electrical Length (cm)	Electrical Length Accuracy	Maximum VSWR	Odd 1/4 Wavelength Frequency (GHz)
7843S0.96	1.85mm	DC — 67.0	0.960	±0.0025	< 1.008	(2n + 1) 7.8
7843S1.15			1.150			(2n + 1) 6.5
7843S3.00			3.000			(2n + 1) 2.5
7943S1.25	2.4mm	DC — 50.0	1.250	±0.0025	< 1.008	(2n + 1) 6.0
7943S1.50			1.500			(2n + 1) 5.0
7943S6.25			6.250			(2n + 1) 1.2
7942C	2.4mm*		4.110	±0.02		(2n + 1) 1.8
8774S15	2.92mm	DC — 40.0	14.990	±0.0025	< 1.008	(2n + 1) 0.50
8774S6			6.000			(2n + 1) 1.25
8774S5.25			5.250			(2n + 1) 1.43
8774S5			4.997			(2n + 1) 1.50
8776C	2.92mm*		14.990	±0.02		(2n + 1) 0.5
8043S15	3.5mm	DC — 26.5	14.990	±0.0025	< 1.008	(2n + 1) 0.50
8043S6			6.000			(2n + 1) 1.25
8043S5.3			5.298			(2n + 1) 1.41
8043S5			4.997			(2n + 1) 1.50
8042C1	3.5mm*		14.990	±0.02	DC — 18.0 ≤ 1.04	(2n + 1) 0.50
8042D1			9.993		18.0 — 26.5 ≤ 1.055	(2n + 1) 0.75
2653S15	7mm	DC — 18.0	14.983	±0.005	<1.005	(2n + 1) 0.50
2653S3.12			3.120			(2n + 1) 1.50
2653L			0.693			(2n + 1) 10.81
2603A	7mm*		29.979	±0.015	DC — 4.0 ≤ 1.02 4.0 — 9.0 ≤ 1.03 9.0 — 18.0 ≤ 1.06	(2n + 1) 0.25
2603B			19.986			(2n + 1) 0.375
2603F1			5.996			(2n + 1) 1.25
2553T15	Type N		14.983	±0.01	<1.004 + 0.001f(GHz)	(2n + 1) 0.50
2553T3.82			3.816			(2n + 1) 1.96
2553T3.12			3.123			(2n + 1) 2.40
2503A1	Type N*		29.979	±0.02	DC — 3.0 ≤ 1.03 3.0 — 10.0 ≤ 1.05 10.0 — 18.0 ≤ 1.09	(2n + 1) 0.83
2503B1			19.986			(2n + 1) 0.84
2503H			6.604			(2n + 1) 1.14

** Indicates Bead Supported Airlines*