Coaxial

Slope Equalizer

ZEQ-5-292-S+

50Ω 1300 to 2900 MHz

CASE STYLE: H16

The Big Deal

- Good matching
- Minimal deviation in the attenuation slope ± 0.4 dB
- Connectorized package

Product Overview

ZEQ-5-292-S+ is a 50Ω coaxial slope Equalizer. This model offers excellent performance in the “L and S band” frequency range of 1300-2900 MHz with minimal deviation in the attenuation slope.

Key Features

Feature	Advantages
Minimal deviation in the attenuation slope, ± 0.4dB	Provide low signal distortion over the passband. Can be used in satellite system.
Good matching in the passband	Good 50Ω matching between input and output.
Connectorized package	This connectorized package is easy to interface with other devices and well suits for test setups.

Coaxial

Slope Equalizer

ZEQ-5-292-S+

50Ω 1300 to 2900 MHz

CASE STYLE: H16

Connectors	Model
SMA-M/F	ZEQ-5-292-S+

+RoHS Compliant

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

Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Input power	+20 dBm

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

Coaxial Connections

Input	SMA Male
Output	SMA Female

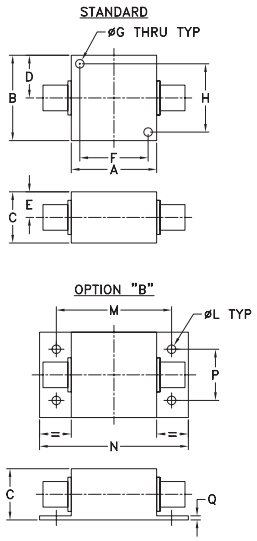
Features

- Good matching in passband
- Minimal deviation in the attenuation slope ± 0.4 dB
- Connectorized package

Applications

- Loss compensation
- Satellite L band applications

Outline Drawing

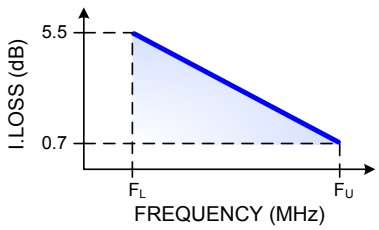


Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H
1.25	1.25	.75	.63	.38	1.000	.125	1.000
31.75	31.75	19.05	16.00	9.65	25.40	3.18	25.40

J	K	L	M	N	P	Q	wt
--	--	.125	1.688	2.18	.750	.06	grams
--	--	3.18	42.88	55.37	19.05	1.52	70.0

Typical Frequency Response



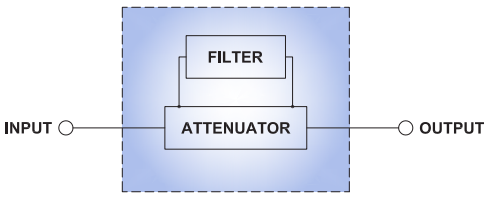
Electrical Specifications at 25°C

Parameter	Condition	Min.	Typ.	Max.	Units
Frequency Range	-	1300	-	2900	MHz
Insertion Loss	1300 MHz	4.8	-	6.2	dB
	2100 MHz	1.6	-	3.1	
	2900 MHz	0.2	-	1.5	
VSWR	1300-2900 MHz	-	1.1	1.6	:1

Typical Performance Data at 25°C

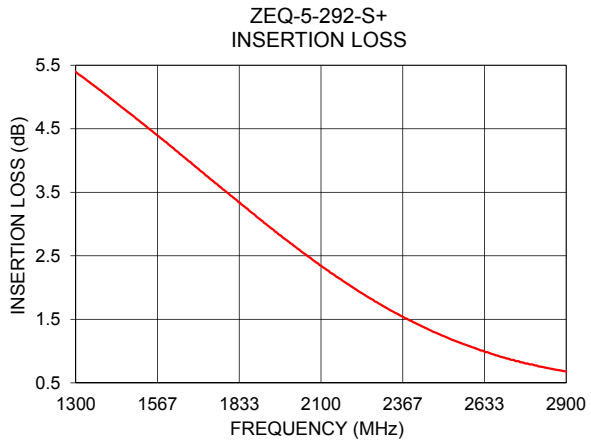
Frequency (MHz)	Insertion Loss (dB)	VSWR
1300	5.39	1.20
1400	5.03	1.20
1500	4.65	1.19
1600	4.26	1.18
1700	3.87	1.17
1800	3.47	1.15
1900	3.08	1.14
2000	2.70	1.12
2100	2.34	1.10
2200	2.02	1.08
2300	1.72	1.07
2400	1.46	1.06
2500	1.24	1.06
2700	0.89	1.07
2900	0.68	1.08

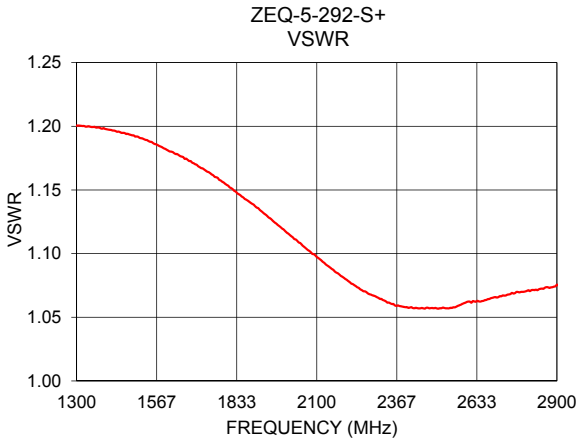
Simplified Functional Schematic



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 (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-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp





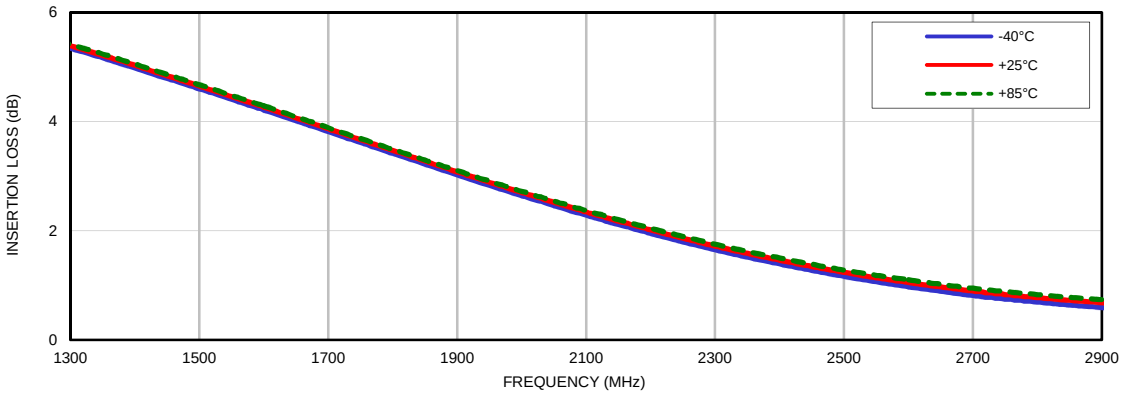
Slope Equalizer ZEQ-5-292-S+

Typical Performance Data

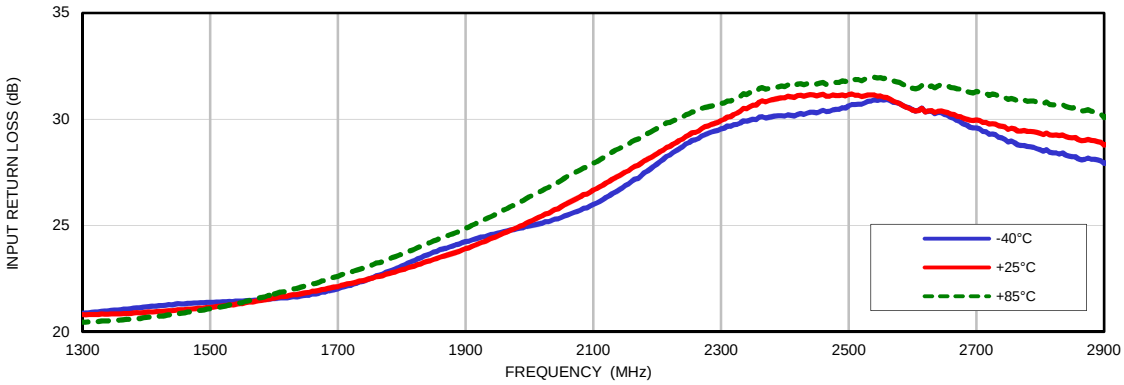
FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
1300	5.35	5.39	5.42	20.88	20.88	20.46	21.21	21.60	21.40
1325	5.26	5.30	5.32	20.94	20.94	20.49	21.28	21.68	21.45
1350	5.17	5.21	5.24	21.02	21.02	20.54	21.38	21.76	21.52
1375	5.08	5.12	5.15	21.08	21.08	20.59	21.49	21.85	21.57
1400	4.98	5.03	5.05	21.18	21.18	20.67	21.63	21.94	21.64
1425	4.88	4.93	4.95	21.24	21.24	20.74	21.80	22.06	21.73
1450	4.79	4.84	4.86	21.32	21.32	20.87	21.98	22.18	21.82
1475	4.70	4.75	4.77	21.35	21.35	20.96	22.19	22.31	21.92
1500	4.60	4.65	4.67	21.39	21.39	21.08	22.42	22.46	22.04
1525	4.50	4.56	4.58	21.42	21.42	21.23	22.64	22.61	22.18
1550	4.41	4.46	4.48	21.45	21.45	21.38	22.87	22.79	22.32
1575	4.31	4.36	4.38	21.50	21.50	21.58	23.11	22.99	22.51
1600	4.21	4.26	4.29	21.57	21.57	21.78	23.33	23.19	22.68
1625	4.11	4.16	4.19	21.63	21.63	21.97	23.53	23.41	22.88
1650	4.01	4.06	4.09	21.72	21.72	22.16	23.75	23.65	23.12
1675	3.92	3.97	3.99	21.86	21.86	22.39	23.97	23.89	23.36
1700	3.82	3.87	3.89	22.02	22.02	22.60	24.21	24.18	23.64
1725	3.72	3.76	3.79	22.26	22.26	22.86	24.42	24.43	23.90
1750	3.62	3.67	3.69	22.51	22.51	23.11	24.66	24.69	24.18
1775	3.52	3.57	3.59	22.80	22.80	23.39	24.95	24.99	24.51
1800	3.42	3.47	3.49	23.10	23.10	23.66	25.28	25.30	24.85
1825	3.32	3.38	3.40	23.44	23.44	23.96	25.66	25.64	25.22
1850	3.22	3.27	3.30	23.74	23.74	24.27	26.07	26.00	25.63
1875	3.12	3.17	3.20	23.99	23.99	24.56	26.53	26.38	26.07
1900	3.02	3.08	3.10	24.24	24.24	24.88	26.95	26.74	26.48
1925	2.92	2.98	3.00	24.46	24.46	25.22	27.34	27.08	26.91
1950	2.83	2.88	2.91	24.64	24.64	25.58	27.71	27.41	27.32
1975	2.73	2.79	2.82	24.81	24.81	25.95	28.04	27.73	27.74
2000	2.64	2.70	2.72	24.98	24.98	26.35	28.36	28.07	28.19
2025	2.55	2.61	2.63	25.18	25.18	26.73	28.72	28.47	28.71
2050	2.46	2.52	2.55	25.38	25.38	27.13	28.93	28.71	29.08
2075	2.37	2.43	2.46	25.66	25.66	27.54	29.18	28.97	29.47
2100	2.28	2.34	2.37	25.99	25.99	27.93	29.44	29.21	29.84
2125	2.20	2.26	2.29	26.40	26.40	28.36	29.50	29.25	30.00
2150	2.11	2.17	2.20	26.87	26.87	28.77	29.66	29.33	30.16
2175	2.03	2.09	2.12	27.34	27.34	29.16	29.71	29.35	30.24
2200	1.95	2.02	2.05	27.88	27.88	29.56	29.62	29.28	30.19
2225	1.87	1.93	1.97	28.42	28.42	29.92	29.46	29.18	30.06
2250	1.80	1.86	1.89	28.90	28.90	30.25	29.21	29.08	29.92
2275	1.72	1.78	1.82	29.27	29.27	30.55	28.80	28.88	29.68
2300	1.65	1.72	1.75	29.54	29.54	30.73	28.31	28.65	29.34
2325	1.58	1.65	1.68	29.76	29.76	30.99	27.84	28.45	29.03
2350	1.52	1.59	1.62	29.99	29.99	31.30	27.33	28.19	28.68
2375	1.45	1.52	1.56	30.09	30.09	31.44	26.91	27.97	28.35
2400	1.39	1.46	1.50	30.15	30.15	31.54	26.58	27.81	28.10
2425	1.33	1.40	1.44	30.26	30.26	31.67	26.30	27.64	27.83
2450	1.27	1.34	1.38	30.30	30.30	31.66	26.02	27.39	27.49
2475	1.22	1.29	1.33	30.43	30.43	31.73	25.79	27.14	27.14
2500	1.16	1.24	1.28	30.62	30.62	31.84	25.66	26.94	26.86
2525	1.11	1.18	1.23	30.77	30.77	31.88	25.60	26.74	26.60
2550	1.06	1.14	1.18	30.93	30.93	31.95	25.51	26.52	26.32
2575	1.02	1.09	1.14	30.77	30.77	31.76	25.53	26.39	26.13
2600	0.97	1.05	1.10	30.45	30.45	31.45	25.62	26.34	26.02
2650	0.89	0.97	1.02	30.23	30.23	31.58	25.64	26.08	25.67
2700	0.82	0.89	0.95	29.59	29.59	31.31	25.67	25.93	25.44
2750	0.74	0.83	0.88	28.92	28.92	30.93	25.59	25.78	25.24
2775	0.72	0.80	0.86	28.76	28.76	30.89	25.55	25.73	25.17
2800	0.69	0.77	0.83	28.57	28.57	30.77	25.56	25.72	25.15
2850	0.64	0.72	0.78	28.23	28.23	30.53	25.58	25.69	25.10
2900	0.59	0.68	0.73	27.91	27.91	30.07	25.79	25.81	25.20

Typical Performance Curves

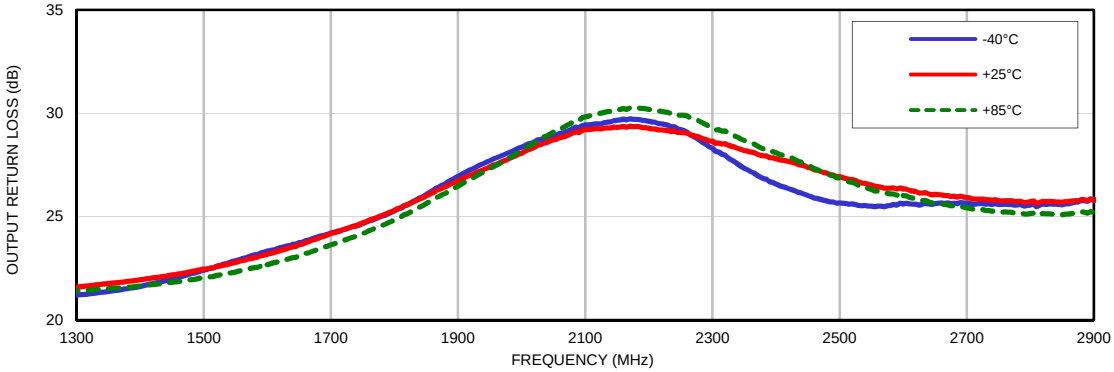
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



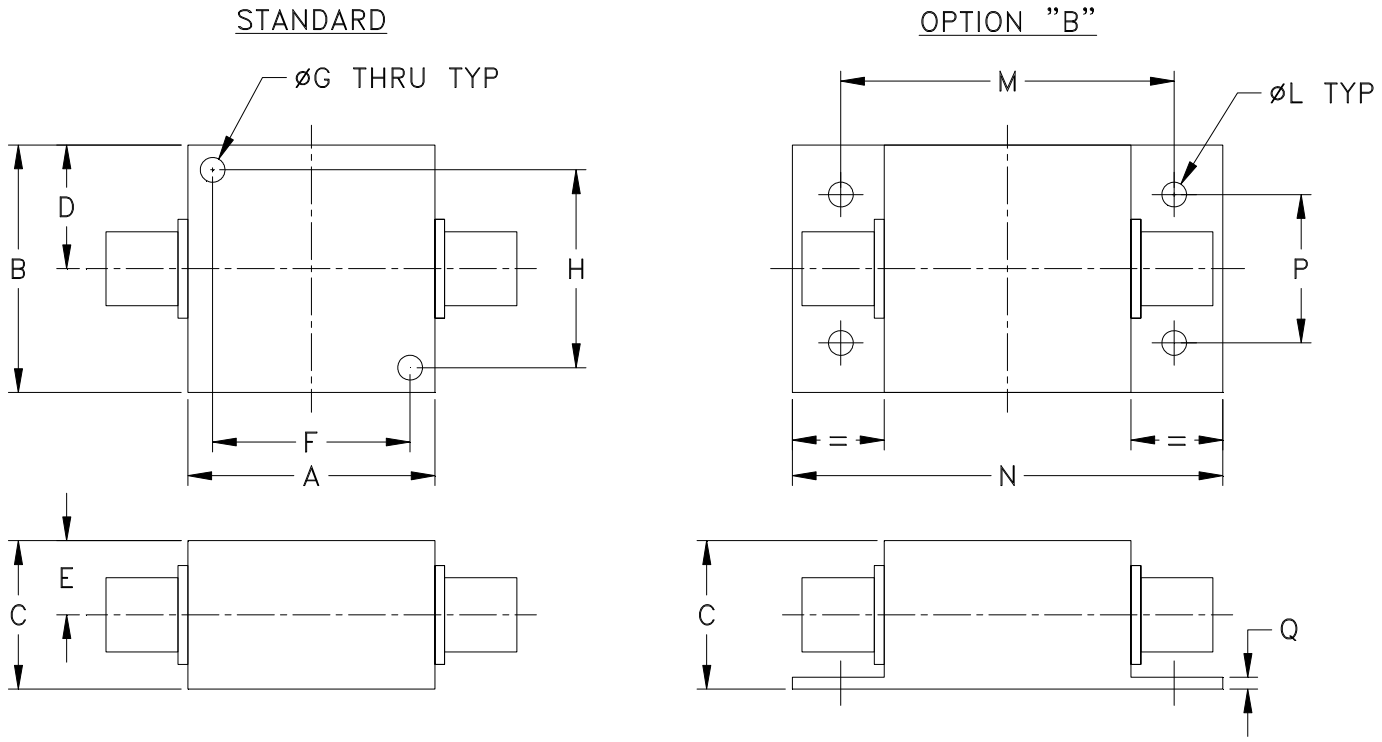
OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



Case Style H

Outline Dimensions

H16



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
H16	1.25 (31.75)	1.25 (31.75)	.750 (19.05)	.63 (16.00)	.38 (9.65)	1.000 (25.40)	.125 (3.18)	1.000 (25.40)	--	--	.125 (3.18)	1.688 (42.88)	2.18 (55.37)

CASE#	P	Q	WT.GRAMS
H16	.750 (19.05)	.06 (1.52)	70

Dimensions are in inches (mm). Tolerances: 2PL. ± .03; 3PL. ± .015

Notes:

1. Case material: Aluminum alloy.
2. Case finish:
   For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.
3. Mounting bracket available on request. Add suffix B to part number.
4. Bracket version, option B, dimension "C" changes from .75 to .94 inches when connectors are type N.
5. Refer to the individual model data sheet for the type of connectors available.

Mini-Circuits

Environmental Specifications ENV28

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	-55° to 100°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D
Humidity	90% RH, 65°C Units may require bake-out after humidity to restore full performance.	MIL-STD-202, Method 103
Thermal Shock	-65° to 125°C, 5 cycles	MIL-STD-202, Method 107, Condition B
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)	MIL-STD-202, Method 213, Condition I