USB / Ethernet

Programmable Attenuator RC4DAT-8G-120H

50Ω 0 – 120 dB, 0.05 dB step 200 to 8000 MHz

The Big Deal

- Four independently programmable channels
- Wide attenuation range, 120 dB
- Supports U-NII bands 5-8 (5.925 to 7.125 GHz)
- Fine attenuation resolution, 0.05 dB
- Daisy-chain control of up to 25 attenuators

Download

Software Package

Case Style: QE2671

Applications

- Wi-Fi 6E MIMO development
- LTE / 5G / IoT / Bluetooth / Zigbee
- Cellular handover testing
- C-band radar / satcom testing
- Automated signal sweeping / fading

Included Accessories

Model No.	Description	Qty.
MUSB-CBL-3+	3.0 ft. USB cable	1

Refer to user guide for compliance information

CE FC UK CA

Product Overview

Mini-Circuits' RC4DAT-8G-120H is a 4-channel programmable attenuator suitable for a wide range of signal level control applications from 200 MHz to 8 GHz. Each independently controlled channel provides 0 to 120 dB attenuation in 0.05 dB steps. Its unique design maintains linear attenuation change per dB, even at the highest attenuation settings.

The attenuator can be controlled via USB or Ethernet (supporting SSH, HTTP & Telnet protocols). Full software support is provided, including our user-friendly GUI application for Windows and a full API with programming instructions for Windows and Linux environments (both 32-bit and 64-bit systems). To downloaded the software visit our website at **http://www.minicircuits.com/softwaredownload/patt.html**.

The daisy-chain control interface with Mini-Circuit's novel dynamic addressing feature simplifies control systems, allowing multiple attenuators to be connected into a Master / Slave chain. Simply connect, then power on and the whole chain of up to 25 RC4DAT-8G-120H attenuators (with up to 100 channels) can be independently controlled through a single USB or Ethernet connection, with a single software interface.

Key Features

Feature	Advantages
USB & Ethernet control	USB HID and Ethernet (HTTP / Telnet / SSH) interfaces provide easy compatibility with a wide range of software setups and programming environments. The device draws all power requirements through the USB port.
Programmable attenuation sweep and Hop sequences	The RC4DAT-8G-120H can be programmed with a timed sequence of attenuation settings, to run without any additional external control.
120 dB attenuation range.	The RC4DAT-8G-120H provides high-accuracy attenuation up to 120 dB in 0.05 dB steps, allowing the user precise level control over a broad attenuation and frequency range.
High linearity	Typical input IP3 of +51 dBm up to 8000 MHz.

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Rev. D
ECO-030139
EDR-11699/2
RC4DAT-8G-120H
MCIL
260621

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Electrical Specifications [1,2] at +25°C

Parameter	Frequency range	Conditions	Min.	Typ.	Max.	Units
Attenuation range	200 - 8000 MHz	0.05 dB step	0	–	105	dB
		0.10 dB step	105		120	
Attenuation accuracy [2]	200 - 8000 MHz	@ 0.05 - 30 dB	–	±0.50	±(0.8+4.0% of nominal value)	dB
		@ 30.05 - 60 dB	–	±1.20	±(1.4+2.0% of nominal value)	
		@ 60.05 - 90 dB	–	±2.10	±(0.2+4.0% of nominal value)	
		@ 90.05 - 110 dB	–	±3.20	±(-3.4+8.0% of nominal value)	
		@ 110.10 - 120 dB	–	±4.30	±7.0	
Insertion Loss	200 - 2000 MHz	@ 0 dB	–	5.7	7.0	dB
	2000 - 4000 MHz		–	7.2	9.0	
	4000 - 6000 MHz		–	9.5	11.5	
	6000 - 7200 MHz		–	12	14	
	7200 - 8000 MHz		–	13	14.5	
Isolation In-Out	200 - 8000 MHz	Note 3	–	130	–	dB
Isolation (between channels)	200 - 6000 MHz	@ 0 - 120 dB	127	140	–	dB
	6000 - 7200 MHz		125	137	–	
	7200 - 8000 MHz		115	130	–	
Input operating power [4] (RF In and RF Out ports)	200 - 8000 MHz	@ 0 - 120 dB	–	–	+23	dBm
Input IP3 [5]	200 - 8000 MHz	@ 0 dB setting (P_{IN}=+5 dBm)	–	+50	–	dBm
VSWR	200 - 8000 MHz	@ 0 - 15 dB	–	1.35	–	:1
		@ 15.05 - 120 dB	–	1.20	–	
Min Dwell Time [3,6]	200 - 8000 MHz	High speed mode	–	600	–	µSec
Channel Synchronization	200 - 8000 MHz	Note 7	–	400	–	µSec
Attenuation Transition Time [8]	200 - 8000 MHz	to ±0.25 dB of final value	–	1	–	µSec
Supply Voltage	–	via USB port	4.75	5	5.25	V
USB current draw (single unit)	Ethernet Enabled	–	–	250	350	mA
	Ethernet Disabled			230	280	
DC current pass through	–	–	–	–	1000	
Ethernet Communication	Protocol	TCP / IP, HTTP, Telnet, SSH, DHCP, UDP (limited)				
	Max Data Rate	100 Mbps (100 Base-T Full Duplex)				
USB Communication	Protocol	HID (Human Interface Device) - High Speed				
	Min Communication Time [9]	400 µSec Typ (full transmit/receive cycle)				

[1] Attenuator RF ports are interchangeable, and support simultaneous, bidirectional signal transmission, however the specifications are guaranteed for the RF in and RF out as noted on the label. There may be minor changes in performance when injecting signals to the RF Out port.
[2] Max setting accuracy defined as ±[absolute error+% of attenuation setting]. For example, when setting the attenuator to 108 dB attenuation the maximum error at 7500 MHz will be: ±(-5+0.09x108)= ±(-5+9.72)= ± 4.72 dB
[3] Isolation is defined as max attenuation plus insertion loss; this is the path loss through the attenuator when initially powered up. After a brief delay (~0.5 Sec typically) the attenuator will revert to a user defined "power-up" state (either max attenuation or a pre-set value).
[4] Total operating input power from both RF In and RF Out out ports. Compression level not noted as it exceeds max safe operating power level.
[5] IP3 tested with 1 MHz span between signals.
[6] Minimum Dwell Time is the time the RC4DAT will take to respond to a command to change attenuation states of a single channel without communication delays.
[7] Channel Synchronization is the delay between the first and last attenuator transitions beginning, in response to a command to set all channels.
[8] Attenuation Transition Time is specified as the time between starting to change the attenuation state and settling on the requested attenuation state.
[9] USB min communication time is based on the polling interval of the USB HID protocol (125 µSec polling interval, 64 bytes per packet), medium CPU load and no other high speed USB devices using the USB bus.

Absolute Maximum Ratings

Operating Temperature	0°C to 50°C
Storage Temperature	-20°C to 85°C
V_{USB} Max.	6 V
DC voltage at RF port	25 V
Total RF power for RF In & RF Out	+26 dBm

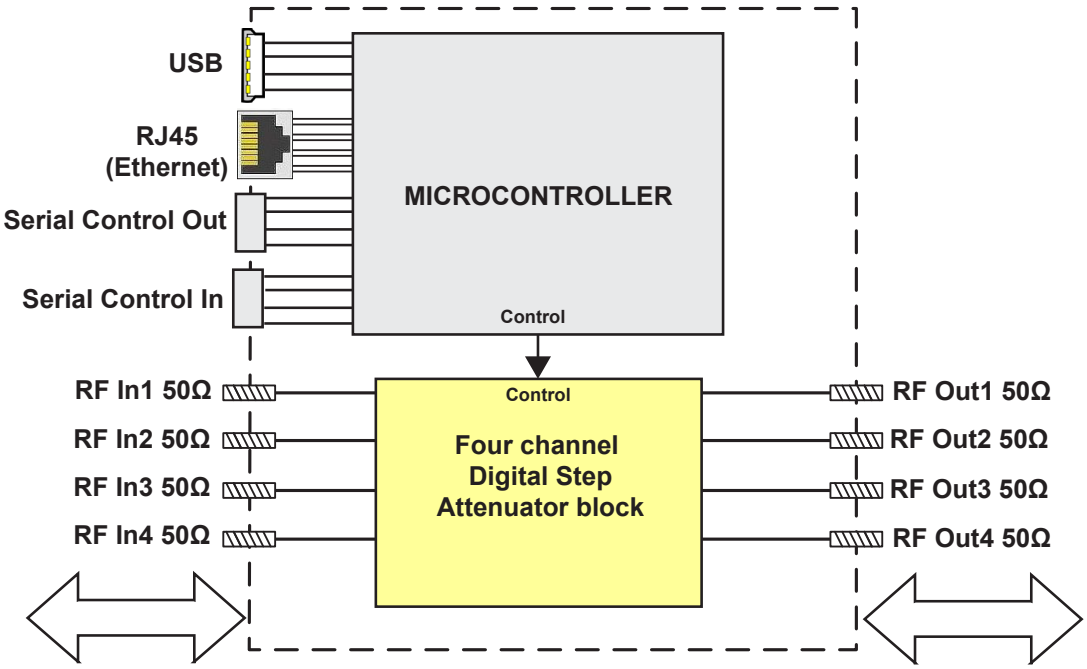
Permanent damage may occur if any of these limits are exceeded. Operating in the range between operating power limits and absolute maximum ratings for extended periods of time may result in reduced life and reliability.

Connections

RF In 1,2,3,4	(SMA female)
RF Out 1,2,3,4	(SMA female)
USB	(USB type Mini-B female)
Network (Ethernet/LAN)	(RJ45 socket)
Serial Control Out	(10 Pin Digital Snap Fit female) [11]
Serial Control In	(10 Pin Digital Snap Fit female) [11]

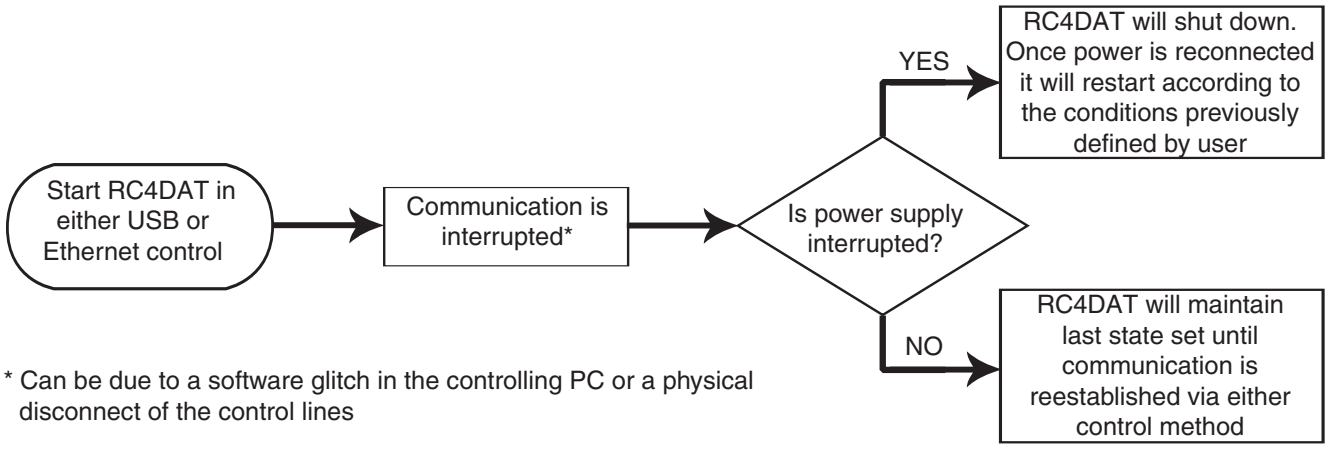
[11] Mating connector is Hirose ST40X-10S-CV(30)

Block Diagram



Simultaneous, bidirectional RF signal transmission with symmetrical performance

RC4DAT response to communication interrupt

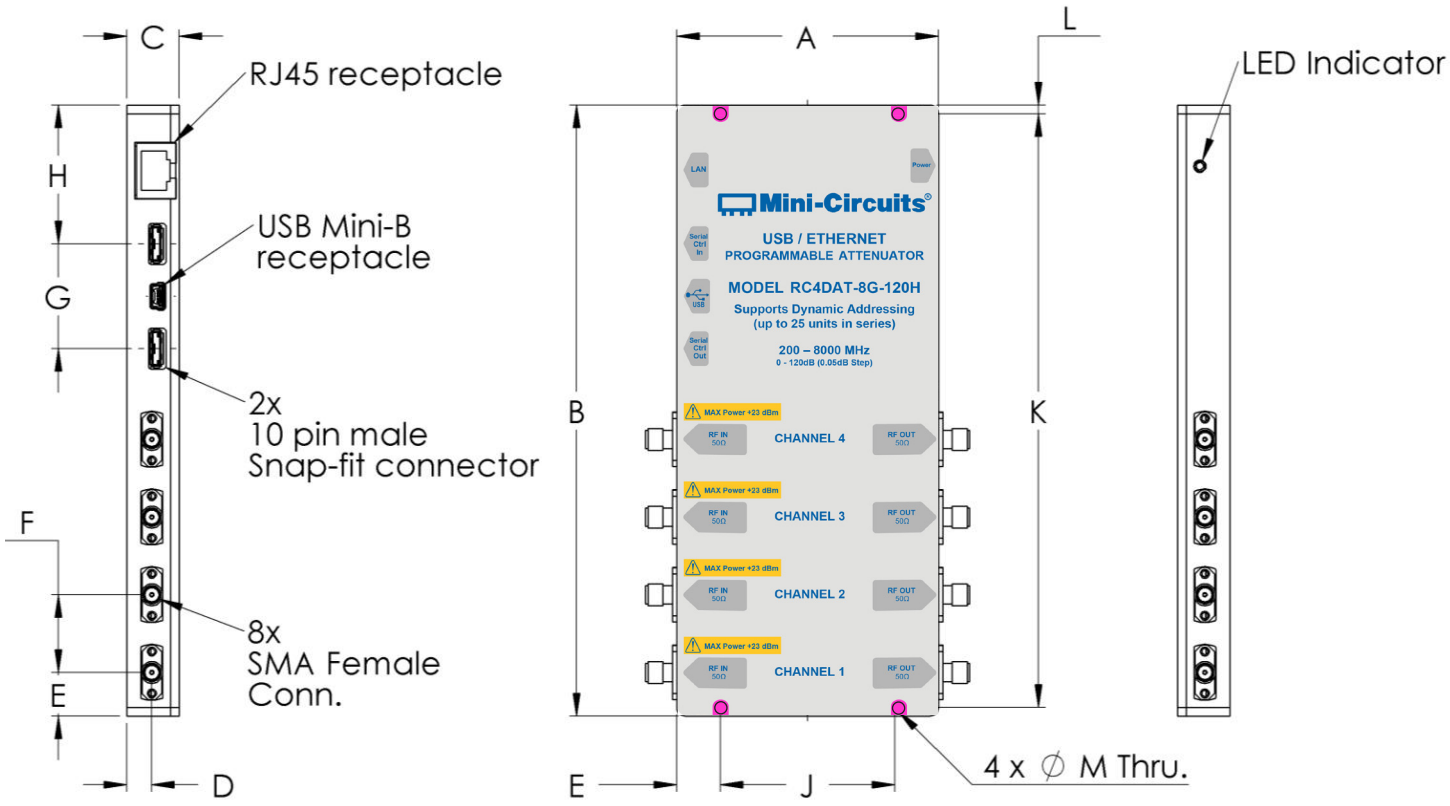


* Can be due to a software glitch in the controlling PC or a physical disconnect of the control lines

Outline Drawing (QE2671)

Connections

RF In 1,2,3,4	(SMA female)
RF Out 1,2,3,4	(SMA female)
USB	(USB type Mini-B female)
Network (Ethernet/LAN)	(RJ45 socket)
Serial Control Out	(10 Pin Digital Snap Fit female)
Serial Control In	(10 Pin Digital Snap Fit female)



Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H	J	K	L	M	WT. GRAMS
3.00	**7.00**	**0.60**	**0.287**	**0.50**	**0.890**	**1.20**	**1.59**	**2.00**	**6.800**	**0.10**	**0.125**	500
76.2	177.8	15.24	7.29	12.7	22.61	30.5	40.4	50.80	172.72	2.54	3.18	

Typical Performance Data @ +25°C

FREQ. (MHz)	I. Loss (dB)	Attenuation relative to I. Loss (dB) @ Attenuation setting (dB)									
		1	5	10	20	40	60	80	100	110	120
200	4.20	1.05	5.16	10.15	20.43	40.84	60.94	81.33	101.33	110.24	118.94
400	4.48	1.03	5.06	10.03	20.34	40.55	60.66	80.61	99.90	108.77	117.58
600	4.82	1.00	4.95	9.89	20.20	40.31	60.46	80.31	99.69	108.65	117.56
800	5.12	0.97	4.86	9.80	20.10	40.18	60.36	80.33	99.96	109.10	118.19
1000	5.33	0.97	4.84	9.81	20.09	40.17	60.39	80.46	100.29	109.56	118.78
1200	5.48	0.98	4.88	9.89	20.15	40.25	60.48	80.64	100.59	109.95	119.09
1400	5.69	0.99	4.93	9.98	20.23	40.35	60.62	80.84	100.89	110.30	119.45
1600	5.89	1.00	4.96	10.01	20.25	40.39	60.68	80.95	101.01	110.47	119.72
1800	5.98	0.99	4.95	10.00	20.22	40.38	60.69	80.93	101.12	110.64	120.14
2000	6.13	0.98	4.94	9.99	20.18	40.36	60.69	81.00	101.27	110.70	120.55
2400	6.45	0.99	4.99	10.08	20.22	40.46	60.84	81.19	101.52	111.10	120.67
2800	6.70	1.02	5.09	10.22	20.37	40.67	61.02	81.56	101.96	111.64	121.52
3200	7.00	1.03	5.13	10.22	20.44	40.82	61.18	81.76	102.24	112.20	121.97
3600	7.41	1.03	5.12	10.13	20.45	40.90	61.25	81.88	102.61	112.63	122.47
4000	7.78	1.04	5.18	10.13	20.51	41.05	61.32	82.14	102.97	113.15	123.41
4400	8.16	1.04	5.26	10.17	20.60	41.20	61.42	82.21	103.17	113.54	123.56
4800	8.67	1.01	5.25	10.11	20.58	41.21	61.37	82.34	103.32	113.82	124.13
5000	8.95	1.00	5.22	10.06	20.58	41.20	61.29	82.20	103.34	113.58	123.89
5400	9.34	1.00	5.25	10.10	20.72	41.33	61.43	82.42	103.48	114.25	124.17
5600	9.52	1.02	5.28	10.15	20.83	41.42	61.46	82.55	103.57	114.00	124.90
6000	10.01	1.02	5.28	10.20	20.91	41.45	61.64	82.66	103.60	114.08	124.42
6200	10.39	1.01	5.24	10.19	20.83	41.34	61.56	82.55	103.30	114.11	124.59
6400	10.87	0.99	5.17	10.15	20.67	41.13	61.39	82.43	103.10	113.63	123.85
6500	11.13	0.97	5.13	10.12	20.58	40.99	61.29	82.24	102.86	113.52	124.16
6700	11.67	0.95	5.06	10.07	20.38	40.70	61.02	81.89	102.35	113.24	123.55
6800	11.92	0.95	5.04	10.07	20.30	40.57	60.93	81.74	102.21	112.80	123.27
7000	12.35	0.96	5.06	10.11	20.22	40.37	60.75	81.57	101.85	112.57	123.76
7100	12.50	0.97	5.09	10.16	20.24	40.32	60.68	81.42	101.62	112.32	123.05
7300	12.71	1.01	5.20	10.30	20.34	40.27	60.67	81.27	101.39	112.06	121.95
7400	12.80	1.03	5.25	10.37	20.42	40.26	60.57	81.22	101.27	111.86	122.53
7600	12.96	1.05	5.31	10.44	20.53	40.21	60.50	80.86	100.85	111.22	121.58
7700	13.07	1.05	5.31	10.44	20.56	40.15	60.42	80.59	100.57	111.04	121.64
7900	13.31	1.04	5.26	10.38	20.56	39.95	60.12	80.10	99.98	110.39	119.93
8000	13.44	1.03	5.23	10.33	20.54	39.83	59.94	79.84	99.61	109.88	119.37

FREQ. (MHz)	I. Loss (dB)	Attenuation relative to I. Loss Fine resolution (0.05 dB) @ Attenuation setting (dB)														
		7.40	7.45	7.50	7.55	7.60	67.40	67.45	67.50	67.55	67.60	100.40	100.45	100.50	100.55	100.60
200	4.20	7.52	7.59	7.63	7.68	7.70	68.55	68.60	68.66	68.71	68.75	99.06	99.13	99.21	99.23	99.27
400	4.48	7.41	7.45	7.55	7.58	7.64	67.85	67.89	67.96	68.01	68.05	97.66	97.72	97.79	97.82	97.89
600	4.82	7.33	7.31	7.41	7.48	7.50	67.62	67.67	67.73	67.78	67.83	97.72	97.76	97.84	97.88	97.92
800	5.12	7.22	7.25	7.33	7.35	7.42	67.66	67.70	67.75	67.80	67.85	98.22	98.31	98.35	98.43	98.44
1000	5.33	7.25	7.28	7.33	7.37	7.42	67.83	67.88	67.92	67.98	68.03	98.78	98.83	98.89	98.98	98.97
1200	5.48	7.28	7.36	7.40	7.43	7.51	67.97	68.02	68.06	68.11	68.16	99.18	99.17	99.26	99.31	99.35
1400	5.69	7.39	7.45	7.48	7.56	7.62	68.20	68.25	68.28	68.33	68.39	99.58	99.62	99.61	99.71	99.75
1600	5.89	7.42	7.44	7.45	7.58	7.62	68.27	68.32	68.35	68.40	68.46	99.78	99.85	99.88	99.87	100.03
1800	5.98	7.44	7.47	7.50	7.54	7.54	68.23	68.28	68.31	68.36	68.42	99.96	99.97	99.99	100.10	100.08
2000	6.13	7.38	7.46	7.48	7.55	7.52	68.24	68.29	68.32	68.37	68.43	100.15	100.14	100.14	100.23	100.31
2400	6.45	7.50	7.55	7.55	7.62	7.66	68.36	68.41	68.43	68.48	68.54	100.47	100.56	100.46	100.57	100.66
2800	6.70	7.58	7.64	7.62	7.69	7.75	68.65	68.71	68.72	68.78	68.83	101.03	101.05	101.15	101.19	101.23
3200	7.00	7.52	7.57	7.60	7.69	7.73	68.73	68.78	68.78	68.84	68.91	101.61	101.69	101.73	101.74	101.85
3600	7.41	7.33	7.41	7.46	7.50	7.60	68.76	68.82	68.81	68.88	68.94	102.00	102.13	102.11	102.19	102.25
4000	7.78	7.32	7.38	7.40	7.49	7.49	68.83	68.89	68.87	68.94	69.01	102.48	102.51	102.47	102.58	102.61
4400	8.16	7.34	7.46	7.47	7.49	7.56	68.87	68.94	68.91	68.98	69.05	102.80	102.83	102.78	102.91	102.97
4800	8.67	7.33	7.44	7.37	7.47	7.52	68.77	68.84	68.81	68.88	68.95	103.06	103.04	103.01	103.05	103.18
5000	8.95	7.30	7.33	7.31	7.31	7.45	68.72	68.79	68.75	68.82	68.90	103.04	103.12	103.00	103.04	103.22
5400	9.34	7.32	7.33	7.35	7.39	7.45	68.72	68.79	68.74	68.82	68.90	103.16	103.16	103.17	103.33	103.28
5600	9.52	7.33	7.47	7.36	7.43	7.46	68.83	68.91	68.86	68.94	69.02	103.51	103.44	103.24	103.36	103.59
6000	10.01	7.44	7.50	7.41	7.49	7.51	68.93	69.00	68.97	69.04	69.12	103.37	103.58	103.37	103.60	103.74
6200	10.39	7.46	7.60	7.38	7.52	7.60	68.87	68.94	68.91	68.99	69.07	103.48	103.55	103.55	103.39	103.58
6400	10.87	7.47	7.51	7.42	7.50	7.63	68.64	68.72	68.71	68.78	68.85	103.23	103.28	103.39	103.22	103.28
6500	11.13	7.55	7.51	7.50	7.55	7.68	68.47	68.54	68.54	68.61	68.68	102.92	103.03	102.96	103.12	103.20
6700	11.67	7.44	7.50	7.44	7.50	7.57	68.10	68.16	68.17	68.24	68.31	102.39	102.54	102.67	102.63	102.66
6800	11.92	7.43	7.47	7.39	7.42	7.49	67.97	68.04	68.05	68.12	68.19	102.35	102.46	102.45	102.41	102.49
7000	12.35	7.51	7.47	7.41	7.53	7.56	67.78	67.84	67.87	67.94	68.01	102.04	102.02	101.96	102.20	102.28
7100	12.50	7.54	7.61	7.47	7.74	7.67	67.71	67.77	67.81	67.87	67.93	101.91	101.88	101.89	102.07	102.00
7300	12.71	7.62	7.73	7.63	7.77	7.82	67.64	67.70	67.75	67.81	67.87	101.56	101.51	101.65	101.70	101.94
7400	12.80	7.75	7.69	7.68	7.73	7.78	67.64	67.69	67.74	67.80	67.87	101.56	101.64	101.52	101.53	101.75
7600	12.96	7.80	7.92	7.66	7.80	7.83	67.48	67.53	67.60	67.65	67.72	101.02	101.08	101.00	101.11	101.21
7700	13.07	7.72	7.84	7.51	7.82	7.75	67.31	67.37	67.43	67.49	67.55	100.63	100.80	100.82	100.83	100.81
7900	13.31	7.60	7.75	7.57	7.71	7.81	66.92	66.98	67.04	67.10	67.16	100.04	100.17	100.15	100.20	100.11
8000	13.44	7.53	7.65	7.51	7.62	7.69	66.75	66.81	66.87	66.93	67.00	99.65	99.84	99.86	99.77	99.76

Typical Performance Data @ 0°C

FREQ. (MHz)	I. Loss (dB)	Attenuation relative to I. Loss (dB) @ Attenuation setting (dB)									
		1	5	10	20	40	60	80	100	110	120
200	4.17	1.05	5.19	10.15	20.48	40.90	61.01	81.42	101.39	110.31	119.25
400	4.43	1.03	5.10	10.04	20.40	40.62	60.75	80.69	100.04	108.90	117.72
600	4.76	0.99	4.97	9.89	20.26	40.38	60.52	80.45	99.88	108.87	117.73
800	5.05	0.97	4.88	9.81	20.15	40.25	60.45	80.47	100.15	109.35	118.29
1000	5.26	0.96	4.85	9.81	20.13	40.23	60.47	80.58	100.49	109.68	118.87
1200	5.39	0.97	4.88	9.89	20.18	40.30	60.58	80.75	100.75	110.10	119.43
1400	5.60	0.99	4.93	9.97	20.26	40.39	60.70	80.96	101.00	110.44	119.65
1600	5.81	0.99	4.95	10.00	20.28	40.43	60.77	81.02	101.13	110.72	119.87
1800	5.89	0.99	4.95	9.99	20.26	40.41	60.77	81.06	101.24	110.74	120.09
2000	6.04	0.98	4.94	9.98	20.23	40.40	60.81	81.09	101.30	110.88	120.32
2400	6.35	0.99	5.00	10.07	20.28	40.50	60.88	81.27	101.61	111.30	120.64
2800	6.62	1.02	5.12	10.21	20.43	40.72	61.11	81.60	101.98	111.78	121.46
3200	6.90	1.04	5.16	10.23	20.50	40.88	61.26	81.85	102.43	112.39	122.13
3600	7.30	1.04	5.15	10.15	20.51	40.97	61.36	82.01	102.66	112.88	122.47
4000	7.66	1.05	5.20	10.14	20.57	41.12	61.45	82.21	103.03	113.14	123.36
4400	8.03	1.05	5.29	10.19	20.67	41.26	61.51	82.38	103.33	113.67	123.80
4800	8.53	1.02	5.28	10.12	20.66	41.26	61.42	82.27	103.31	113.81	124.57
5000	8.80	1.00	5.26	10.08	20.66	41.24	61.37	82.31	103.36	113.77	124.61
5400	9.19	1.00	5.30	10.11	20.81	41.34	61.51	82.39	103.49	113.96	124.63
5600	9.37	1.01	5.32	10.16	20.91	41.41	61.60	82.62	103.56	114.37	125.45
6000	9.84	1.03	5.33	10.24	21.00	41.43	61.65	82.71	103.51	114.37	125.10
6200	10.20	1.01	5.29	10.23	20.93	41.32	61.63	82.67	103.48	114.09	125.39
6400	10.67	0.99	5.22	10.19	20.77	41.10	61.46	82.46	103.06	113.92	124.48
6500	10.94	0.98	5.18	10.16	20.67	40.95	61.34	82.28	103.00	113.65	123.76
6700	11.48	0.95	5.10	10.11	20.45	40.64	61.03	81.98	102.43	113.19	124.08
6800	11.74	0.95	5.08	10.09	20.36	40.49	60.92	81.80	102.24	112.96	123.30
7000	12.17	0.95	5.09	10.13	20.26	40.27	60.75	81.42	101.79	112.54	122.50
7100	12.32	0.96	5.12	10.18	20.27	40.21	60.65	81.37	101.72	112.34	123.07
7300	12.53	1.00	5.22	10.32	20.38	40.16	60.65	81.17	101.44	111.88	122.75
7400	12.60	1.02	5.28	10.39	20.45	40.15	60.60	81.11	101.29	111.76	122.32
7600	12.75	1.04	5.34	10.47	20.57	40.10	60.49	80.79	100.88	111.35	122.65
7700	12.85	1.05	5.34	10.47	20.60	40.04	60.41	80.59	100.56	111.22	121.03
7900	13.09	1.04	5.29	10.39	20.59	39.83	60.10	80.16	100.13	110.39	120.53
8000	13.22	1.03	5.25	10.34	20.57	39.71	59.94	79.84	99.80	109.92	119.77

FREQ. (MHz)	I. Loss (dB)	Attenuation relative to I. Loss Fine resolution (0.05 dB) @ Attenuation setting (dB)														
		7.40	7.45	7.50	7.55	7.60	67.40	67.45	67.50	67.55	67.60	100.40	100.45	100.50	100.55	100.60
200	4.17	7.55	7.60	7.64	7.69	7.75	68.67	68.72	68.77	68.82	68.87	99.23	99.27	99.36	99.40	99.42
400	4.43	7.45	7.50	7.54	7.59	7.65	67.99	68.03	68.09	68.14	68.19	97.82	97.86	97.95	97.98	98.01
600	4.76	7.33	7.38	7.41	7.47	7.53	67.76	67.81	67.86	67.91	67.96	97.89	97.93	97.97	98.05	98.06
800	5.05	7.26	7.31	7.34	7.40	7.45	67.78	67.83	67.87	67.93	67.98	98.39	98.49	98.52	98.55	98.61
1000	5.26	7.27	7.32	7.35	7.41	7.47	67.95	68.00	68.03	68.09	68.14	98.94	98.96	99.04	99.11	99.15
1200	5.39	7.34	7.38	7.42	7.48	7.53	68.09	68.14	68.17	68.23	68.28	99.34	99.38	99.41	99.46	99.51
1400	5.60	7.41	7.46	7.49	7.54	7.60	68.32	68.37	68.39	68.45	68.51	99.71	99.78	99.81	99.87	99.95
1600	5.81	7.43	7.48	7.50	7.56	7.62	68.40	68.45	68.47	68.52	68.58	99.92	100.03	100.02	100.14	100.09
1800	5.89	7.41	7.47	7.48	7.54	7.60	68.36	68.41	68.43	68.49	68.54	100.09	100.13	100.15	100.20	100.29
2000	6.04	7.41	7.46	7.46	7.52	7.58	68.38	68.43	68.44	68.50	68.56	100.24	100.32	100.31	100.38	100.42
2400	6.35	7.49	7.55	7.53	7.60	7.66	68.49	68.55	68.55	68.61	68.67	100.64	100.77	100.76	100.82	100.82
2800	6.62	7.62	7.67	7.66	7.73	7.79	68.79	68.85	68.84	68.90	68.97	101.21	101.25	101.24	101.25	101.37
3200	6.90	7.57	7.62	7.63	7.69	7.75	68.88	68.94	68.93	68.99	69.06	101.78	101.86	101.87	101.94	101.99
3600	7.30	7.44	7.50	7.51	7.57	7.63	68.94	69.00	68.97	69.04	69.11	102.32	102.41	102.30	102.37	102.48
4000	7.66	7.41	7.47	7.47	7.54	7.60	68.99	69.06	69.02	69.09	69.17	102.64	102.71	102.67	102.76	102.82
4400	8.03	7.46	7.52	7.50	7.57	7.64	69.04	69.11	69.06	69.14	69.21	103.06	103.07	103.05	103.14	103.23
4800	8.53	7.40	7.47	7.42	7.50	7.58	68.94	69.02	68.96	69.04	69.12	103.42	103.39	103.22	103.36	103.42
5000	8.80	7.35	7.42	7.36	7.44	7.52	68.89	68.96	68.90	68.99	69.07	103.32	103.42	103.28	103.34	103.48
5400	9.19	7.34	7.42	7.34	7.42	7.50	68.89	68.97	68.90	68.99	69.07	103.48	103.48	103.34	103.44	103.46
5600	9.37	7.39	7.47	7.37	7.46	7.54	68.99	69.07	69.00	69.09	69.17	103.53	103.69	103.49	103.59	103.70
6000	9.84	7.49	7.58	7.45	7.54	7.63	69.11	69.18	69.13	69.21	69.30	103.87	103.85	103.81	104.04	103.89
6200	10.20	7.52	7.61	7.47	7.56	7.65	69.07	69.15	69.10	69.19	69.27	103.74	103.83	103.82	103.85	103.85
6400	10.67	7.52	7.61	7.47	7.56	7.65	68.87	68.95	68.92	69.00	69.08	103.47	103.78	103.52	103.58	103.59
6500	10.94	7.51	7.60	7.46	7.55	7.64	68.71	68.78	68.76	68.83	68.91	103.28	103.42	103.40	103.37	103.54
6700	11.48	7.49	7.57	7.44	7.52	7.61	68.33	68.40	68.39	68.47	68.54	102.81	103.00	102.96	103.04	103.04
6800	11.74	7.48	7.56	7.43	7.52	7.60	68.18	68.24	68.24	68.32	68.39	102.70	102.79	102.83	102.92	102.94
7000	12.17	7.52	7.59	7.48	7.56	7.63	67.98	68.04	68.05	68.12	68.19	102.51	102.29	102.27	102.32	102.43
7100	12.32	7.56	7.63	7.52	7.60	7.67	67.89	67.95	67.97	68.04	68.11	102.33	102.32	102.18	102.23	102.25
7300	12.53	7.68	7.74	7.65	7.72	7.79	67.83	67.89	67.92	67.99	68.05	101.91	101.75	101.91	102.06	102.11
7400	12.60	7.73	7.79	7.70	7.77	7.83	67.84	67.90	67.93	68.00	68.06	101.69	101.67	101.77	101.78	101.92
7600	12.75	7.77	7.83	7.74	7.81	7.88	67.68	67.74	67.79	67.85	67.91	101.45	101.30	101.36	101.48	101.50
7700	12.85	7.76	7.82	7.73	7.80	7.86	67.51	67.57	67.62	67.68	67.75	101.17	101.14	101.11	101.11	101.28
7900	13.09	7.68	7.74	7.65	7.72	7.79	67.13	67.19	67.24	67.30	67.37	100.30	100.52	100.31	100.52	100.54
8000	13.22	7.63	7.69	7.60	7.67	7.73	66.97	67.03	67.08	67.15	67.21	100.07	100.20	100.10	100.21	100.27

Typical Performance Data @ +50°C

FREQ. (MHz)	I. Loss (dB)	Attenuation relative to I. Loss (dB) @ Attenuation setting (dB)									
		1	5	10	20	40	60	80	100	110	120
200	4.28	1.03	5.11	10.12	20.34	40.72	60.80	81.09	100.96	109.86	118.75
400	4.59	1.01	5.01	9.98	20.24	40.41	60.48	80.35	99.60	108.44	117.28
600	4.94	0.98	4.90	9.84	20.11	40.17	60.24	80.07	99.36	108.35	117.05
800	5.24	0.96	4.82	9.76	20.02	40.05	60.15	80.11	99.66	108.87	117.86
1000	5.47	0.96	4.82	9.78	20.02	40.06	60.21	80.21	99.96	109.14	118.21
1200	5.62	0.97	4.87	9.87	20.09	40.15	60.29	80.39	100.31	109.57	118.73
1400	5.84	0.99	4.92	9.96	20.16	40.25	60.45	80.61	100.57	109.95	119.20
1600	6.02	0.99	4.95	9.99	20.18	40.29	60.53	80.67	100.73	110.01	119.35
1800	6.12	0.98	4.93	9.99	20.15	40.29	60.52	80.73	100.81	110.27	119.60
2000	6.29	0.97	4.92	9.98	20.10	40.27	60.53	80.77	100.89	110.44	119.77
2400	6.60	0.98	4.95	10.06	20.14	40.37	60.68	81.00	101.25	110.69	120.47
2800	6.85	1.01	5.05	10.19	20.28	40.57	60.88	81.35	101.59	111.29	120.73
3200	7.16	1.02	5.09	10.18	20.35	40.70	61.00	81.47	101.91	111.79	121.49
3600	7.59	1.02	5.09	10.09	20.36	40.78	61.08	81.65	102.28	112.25	122.41
4000	7.97	1.03	5.15	10.09	20.43	40.93	61.18	81.83	102.59	112.68	122.87
4400	8.35	1.03	5.24	10.14	20.51	41.10	61.24	82.03	102.90	113.07	123.60
4800	8.90	0.99	5.21	10.07	20.48	41.12	61.22	82.13	103.09	113.23	123.80
5000	9.17	0.98	5.18	10.02	20.47	41.12	61.18	82.12	103.14	113.26	123.80
5400	9.58	0.99	5.21	10.05	20.62	41.28	61.30	82.24	103.29	113.71	124.77
5600	9.76	1.01	5.24	10.10	20.72	41.38	61.43	82.41	103.40	113.77	125.00
6000	10.26	1.01	5.24	10.16	20.80	41.43	61.54	82.62	103.42	113.93	124.66
6200	10.65	1.00	5.19	10.15	20.72	41.33	61.52	82.58	103.30	113.78	124.60
6400	11.14	0.98	5.12	10.10	20.57	41.13	61.36	82.32	102.94	113.28	124.28
6500	11.41	0.96	5.08	10.07	20.47	41.00	61.22	82.19	102.68	113.24	124.29
6700	11.95	0.94	5.01	10.03	20.27	40.73	61.01	81.89	102.40	112.90	123.97
6800	12.20	0.94	5.00	10.02	20.20	40.60	60.89	81.61	101.99	112.72	124.02
7000	12.61	0.95	5.03	10.07	20.15	40.44	60.68	81.40	101.66	112.20	122.82
7100	12.75	0.97	5.06	10.13	20.17	40.40	60.65	81.33	101.53	112.19	122.69
7300	12.96	1.01	5.17	10.27	20.30	40.37	60.66	81.29	101.40	111.80	122.96
7400	13.05	1.02	5.22	10.33	20.37	40.36	60.58	81.21	101.26	111.33	122.33
7600	13.23	1.04	5.27	10.39	20.48	40.30	60.52	80.92	100.92	111.24	121.26
7700	13.34	1.05	5.27	10.39	20.51	40.24	60.41	80.76	100.75	110.94	120.98
7900	13.58	1.03	5.22	10.33	20.51	40.05	60.10	80.12	99.85	110.15	119.76
8000	13.71	1.02	5.20	10.29	20.50	39.93	59.93	79.93	99.62	109.74	119.01

FREQ. (MHz)	I. Loss (dB)	Attenuation relative to I. Loss Fine resolution (0.05 dB) @ Attenuation setting (dB)														
		7.40	7.45	7.50	7.55	7.60	67.40	67.45	67.50	67.55	67.60	100.40	100.45	100.50	100.55	100.60
200	4.28	7.53	7.58	7.63	7.68	7.73	68.35	68.39	68.46	68.51	68.55	98.81	98.84	98.93	98.98	98.98
400	4.59	7.40	7.44	7.50	7.55	7.60	67.62	67.67	67.74	67.78	67.82	97.36	97.40	97.51	97.54	97.60
600	4.94	7.27	7.31	7.37	7.42	7.47	67.41	67.45	67.51	67.56	67.61	97.41	97.47	97.55	97.59	97.61
800	5.24	7.20	7.24	7.31	7.36	7.40	67.44	67.48	67.54	67.59	67.64	97.93	97.98	98.05	98.08	98.16
1000	5.47	7.21	7.26	7.32	7.37	7.42	67.61	67.65	67.71	67.76	67.81	98.45	98.49	98.56	98.60	98.70
1200	5.62	7.29	7.33	7.39	7.44	7.49	67.76	67.80	67.85	67.90	67.95	98.84	98.85	98.95	98.96	99.05
1400	5.84	7.36	7.41	7.47	7.52	7.56	67.99	68.04	68.08	68.13	68.18	99.25	99.32	99.37	99.40	99.43
1600	6.02	7.39	7.43	7.48	7.53	7.58	68.06	68.11	68.15	68.20	68.25	99.48	99.56	99.54	99.60	99.66
1800	6.12	7.38	7.42	7.46	7.52	7.57	68.03	68.07	68.11	68.16	68.21	99.63	99.67	99.77	99.75	99.81
2000	6.29	7.37	7.42	7.45	7.50	7.55	68.03	68.07	68.11	68.16	68.21	99.81	99.84	99.84	99.92	99.97
2400	6.60	7.47	7.52	7.53	7.59	7.64	68.16	68.20	68.24	68.29	68.34	100.21	100.22	100.27	100.31	100.35
2800	6.85	7.59	7.64	7.66	7.71	7.77	68.45	68.50	68.53	68.58	68.63	100.78	100.82	100.85	100.87	100.92
3200	7.16	7.51	7.56	7.60	7.65	7.70	68.50	68.55	68.56	68.62	68.68	101.34	101.36	101.44	101.44	101.50
3600	7.59	7.36	7.41	7.45	7.51	7.56	68.52	68.57	68.58	68.63	68.69	101.67	101.75	101.81	101.82	101.86
4000	7.97	7.33	7.38	7.41	7.47	7.52	68.58	68.64	68.64	68.70	68.76	102.10	102.10	102.12	102.25	102.23
4400	8.35	7.38	7.44	7.45	7.51	7.58	68.63	68.69	68.68	68.74	68.80	102.39	102.50	102.46	102.60	102.63
4800	8.90	7.33	7.39	7.38	7.45	7.51	68.50	68.57	68.55	68.62	68.68	102.58	102.66	102.76	102.68	102.71
5000	9.17	7.28	7.34	7.33	7.39	7.46	68.45	68.51	68.49	68.56	68.63	102.60	102.69	102.67	102.70	102.83
5400	9.58	7.31	7.37	7.34	7.41	7.47	68.46	68.52	68.50	68.57	68.64	102.86	102.89	102.75	102.90	102.92
5600	9.76	7.36	7.43	7.38	7.45	7.53	68.57	68.64	68.62	68.69	68.76	103.06	103.03	103.00	103.03	103.12
6000	10.26	7.44	7.52	7.44	7.52	7.59	68.67	68.74	68.72	68.79	68.87	103.13	103.23	103.12	103.13	103.13
6200	10.65	7.46	7.53	7.44	7.52	7.60	68.59	68.65	68.65	68.72	68.79	103.06	102.96	103.02	103.04	103.12
6400	11.14	7.45	7.52	7.43	7.51	7.59	68.36	68.42	68.43	68.50	68.57	102.72	102.78	102.79	102.77	102.77
6500	11.41	7.44	7.51	7.43	7.50	7.58	68.19	68.25	68.26	68.33	68.40	102.69	102.80	102.60	102.59	102.68
6700	11.95	7.44	7.50	7.43	7.50	7.57	67.82	67.88	67.90	67.97	68.04	102.12	102.18	102.12	102.25	102.23
6800	12.20	7.45	7.51	7.44	7.51	7.58	67.69	67.75	67.78	67.85	67.91	101.85	102.13	102.07	102.03	101.99
7000	12.61	7.51	7.57	7.51	7.58	7.64	67.53	67.59	67.62	67.69	67.75	101.50	101.70	101.70	101.67	101.70
7100	12.75	7.56	7.62	7.57	7.63	7.69	67.47	67.52	67.56	67.63	67.69	101.36	101.46	101.46	101.56	101.49
7300	12.96	7.67	7.72	7.67	7.73	7.79	67.38	67.43	67.49	67.55	67.61	101.27	101.12	101.19	101.23	101.34
7400	13.05	7.70	7.76	7.71	7.77	7.83	67.37	67.43	67.49	67.55	67.61	101.11	100.97	101.10	100.97	101.20
7600	13.23	7.73	7.78	7.73	7.79	7.85	67.24	67.29	67.36	67.42	67.48	100.63	100.70	100.63	100.60	100.69
7700	13.34	7.71	7.76	7.71	7.77	7.83	67.09	67.14	67.21	67.27	67.33	100.31	100.37	100.41	100.47	100.45
7900	13.58	7.63	7.68	7.63	7.69	7.74	66.69	66.74	66.82	66.88	66.94	99.58	99.79	99.72	99.69	99.81
8000	13.71	7.58	7.63	7.58	7.64	7.70	66.52	66.58	66.66	66.71	66.77	99.25	99.42	99.38	99.44	99.43

Typical Performance Data (Continued)*

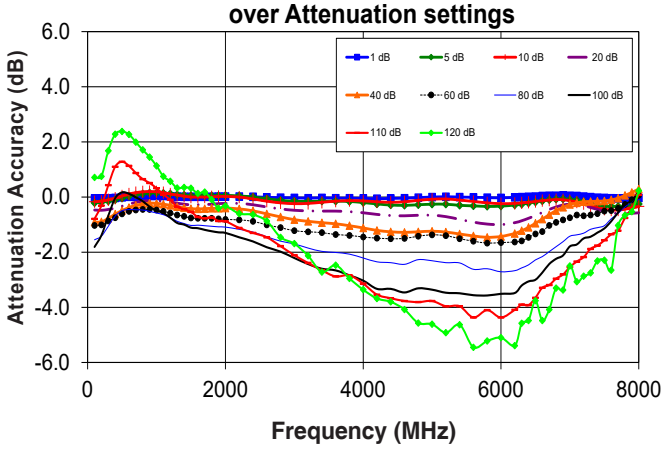
*at +25°C unless noted otherwise

FREQ. (MHz)	VSWR In (:1) @ Attenuation setting (dB)											VSWR Out (:1) @ Attenuation setting (dB)										
	0	1	5	10	20	40	60	80	100	110	120	0	1	5	10	20	40	60	80	100	110	120
200	1.68	1.57	1.44	1.17	1.37	1.11	1.04	1.05	1.10	1.10	1.05	1.70	1.62	1.37	1.28	1.12	1.24	1.09	1.09	1.09	1.07	1.07
400	1.43	1.37	1.35	1.12	1.35	1.10	1.01	1.03	1.09	1.09	1.02	1.45	1.41	1.27	1.23	1.08	1.24	1.07	1.08	1.08	1.04	1.04
600	1.21	1.21	1.29	1.10	1.33	1.10	1.03	1.04	1.09	1.09	1.03	1.20	1.19	1.20	1.20	1.07	1.24	1.07	1.08	1.08	1.03	1.03
800	1.15	1.19	1.27	1.08	1.32	1.10	1.05	1.05	1.09	1.09	1.05	1.04	1.06	1.20	1.21	1.07	1.24	1.06	1.08	1.08	1.03	1.03
1000	1.27	1.29	1.30	1.07	1.31	1.10	1.07	1.05	1.09	1.09	1.07	1.20	1.19	1.26	1.25	1.08	1.24	1.06	1.08	1.08	1.03	1.03
1200	1.38	1.38	1.33	1.07	1.30	1.09	1.08	1.06	1.08	1.08	1.08	1.36	1.33	1.33	1.30	1.08	1.24	1.06	1.08	1.08	1.03	1.03
1400	1.40	1.40	1.33	1.07	1.29	1.09	1.08	1.07	1.08	1.08	1.09	1.43	1.40	1.38	1.34	1.10	1.24	1.07	1.09	1.09	1.03	1.03
1600	1.34	1.35	1.30	1.06	1.27	1.08	1.08	1.07	1.07	1.07	1.09	1.43	1.41	1.39	1.36	1.11	1.25	1.08	1.09	1.09	1.04	1.04
1800	1.23	1.25	1.25	1.04	1.25	1.07	1.09	1.06	1.06	1.06	1.09	1.41	1.42	1.41	1.37	1.12	1.25	1.08	1.09	1.09	1.04	1.04
2000	1.13	1.16	1.20	1.03	1.23	1.05	1.09	1.07	1.05	1.05	1.10	1.46	1.47	1.44	1.38	1.13	1.25	1.08	1.10	1.10	1.04	1.04
2400	1.16	1.16	1.19	1.01	1.20	1.03	1.09	1.06	1.03	1.03	1.10	1.68	1.66	1.53	1.43	1.14	1.25	1.09	1.10	1.10	1.05	1.05
2800	1.30	1.26	1.23	1.02	1.20	1.03	1.08	1.05	1.03	1.02	1.08	1.64	1.61	1.50	1.43	1.14	1.25	1.10	1.11	1.11	1.06	1.06
3200	1.35	1.30	1.26	1.06	1.21	1.05	1.06	1.03	1.04	1.04	1.06	1.29	1.30	1.34	1.34	1.12	1.25	1.10	1.12	1.12	1.07	1.07
3600	1.33	1.30	1.26	1.09	1.21	1.07	1.03	1.02	1.07	1.07	1.03	1.07	1.08	1.17	1.26	1.09	1.24	1.10	1.13	1.13	1.08	1.08
4000	1.30	1.28	1.26	1.06	1.22	1.09	1.04	1.04	1.09	1.09	1.04	1.17	1.15	1.08	1.23	1.06	1.22	1.11	1.13	1.13	1.08	1.08
4400	1.09	1.12	1.18	1.04	1.21	1.11	1.08	1.10	1.10	1.10	1.09	1.13	1.14	1.11	1.18	1.07	1.21	1.11	1.14	1.14	1.09	1.09
4800	1.20	1.17	1.16	1.12	1.20	1.13	1.14	1.15	1.13	1.13	1.14	1.17	1.18	1.24	1.19	1.12	1.22	1.11	1.14	1.14	1.10	1.10
5000	1.32	1.26	1.17	1.15	1.18	1.14	1.17	1.19	1.14	1.14	1.18	1.25	1.24	1.29	1.21	1.14	1.23	1.12	1.15	1.15	1.11	1.11
5400	1.30	1.23	1.12	1.18	1.16	1.17	1.26	1.28	1.19	1.19	1.26	1.28	1.27	1.31	1.22	1.14	1.23	1.13	1.17	1.17	1.13	1.13
5600	1.17	1.11	1.05	1.20	1.16	1.20	1.30	1.32	1.22	1.22	1.30	1.24	1.24	1.27	1.19	1.13	1.23	1.14	1.18	1.18	1.14	1.14
6000	1.18	1.17	1.17	1.28	1.17	1.25	1.37	1.39	1.27	1.27	1.38	1.16	1.15	1.16	1.08	1.08	1.21	1.16	1.21	1.21	1.18	1.18
6200	1.35	1.33	1.29	1.37	1.21	1.30	1.41	1.43	1.31	1.31	1.42	1.15	1.14	1.15	1.06	1.10	1.19	1.18	1.23	1.23	1.20	1.20
6400	1.54	1.49	1.40	1.46	1.25	1.35	1.46	1.48	1.36	1.35	1.47	1.24	1.23	1.24	1.11	1.15	1.17	1.19	1.25	1.25	1.22	1.22
6500	1.62	1.57	1.45	1.51	1.27	1.37	1.48	1.49	1.38	1.37	1.49	1.31	1.30	1.31	1.16	1.18	1.17	1.20	1.26	1.26	1.24	1.24
6700	1.76	1.69	1.53	1.59	1.31	1.41	1.51	1.53	1.41	1.41	1.52	1.50	1.48	1.47	1.27	1.26	1.16	1.22	1.28	1.28	1.26	1.26
6800	1.80	1.72	1.56	1.62	1.33	1.44	1.53	1.54	1.43	1.43	1.54	1.59	1.57	1.55	1.32	1.30	1.15	1.23	1.28	1.29	1.27	1.27
7000	1.77	1.70	1.57	1.65	1.36	1.48	1.57	1.57	1.47	1.47	1.58	1.72	1.70	1.68	1.41	1.37	1.15	1.25	1.30	1.30	1.29	1.29
7100	1.71	1.65	1.56	1.65	1.37	1.50	1.59	1.58	1.49	1.49	1.59	1.76	1.74	1.72	1.44	1.40	1.15	1.26	1.31	1.31	1.31	1.31
7300	1.50	1.48	1.49	1.62	1.39	1.53	1.62	1.60	1.52	1.53	1.62	1.77	1.77	1.76	1.48	1.44	1.14	1.27	1.32	1.32	1.33	1.33
7400	1.39	1.39	1.45	1.60	1.40	1.54	1.63	1.61	1.54	1.54	1.63	1.76	1.76	1.75	1.48	1.44	1.14	1.28	1.32	1.32	1.33	1.33
7600	1.23	1.28	1.40	1.56	1.41	1.56	1.64	1.61	1.57	1.57	1.64	1.68	1.69	1.68	1.45	1.43	1.12	1.29	1.32	1.32	1.35	1.35
7700	1.25	1.29	1.40	1.54	1.42	1.57	1.64	1.61	1.58	1.58	1.65	1.64	1.64	1.63	1.42	1.41	1.11	1.29	1.32	1.32	1.36	1.36
7900	1.42	1.42	1.44	1.55	1.46	1.58	1.64	1.59	1.59	1.59	1.65	1.52	1.52	1.50	1.33	1.36	1.09	1.30	1.31	1.31	1.36	1.36
8000	1.52	1.50	1.47	1.56	1.47	1.58	1.64	1.58	1.60	1.60	1.65	1.45	1.45	1.42	1.28	1.33	1.08	1.30	1.30	1.30	1.36	1.36

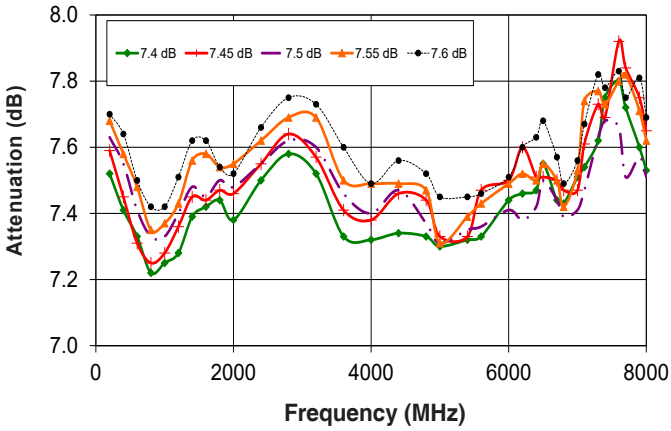
Typical Performance Curves *

*at +25°C unless noted otherwise

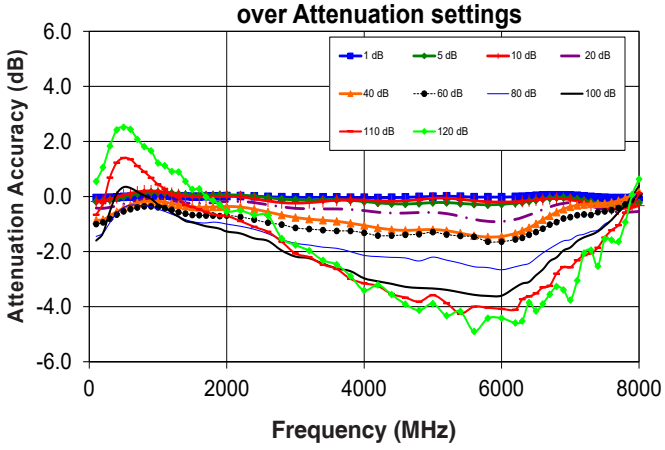
Attenuation Accuracy @0°C vs. Frequency over Attenuation settings



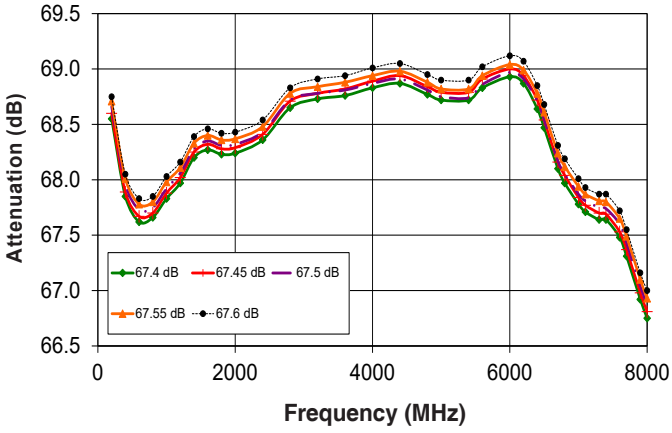
Attenuation relative to I.Loss Fine resolution around Atten. 7.5 dB



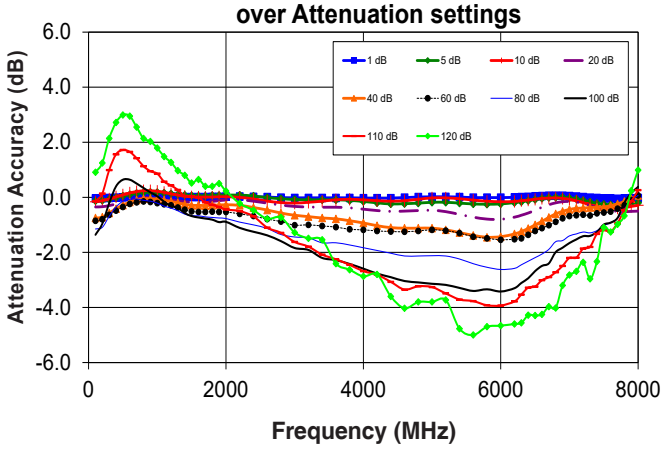
Attenuation Accuracy @25°C vs. Frequency over Attenuation settings



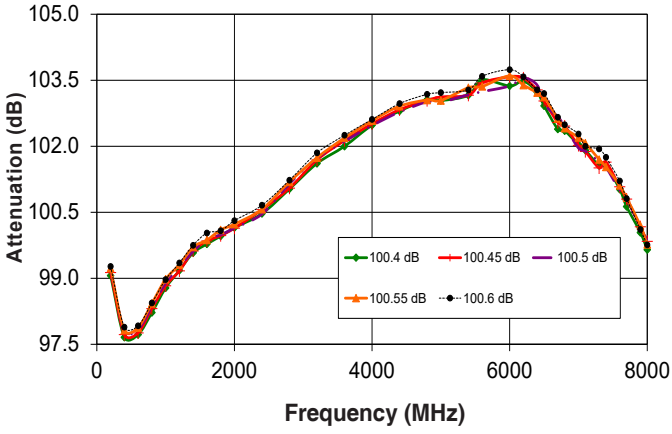
Attenuation relative to I.Loss Fine resolution around Atten. 67.5 dB



Attenuation Accuracy @50°C vs. Frequency over Attenuation settings



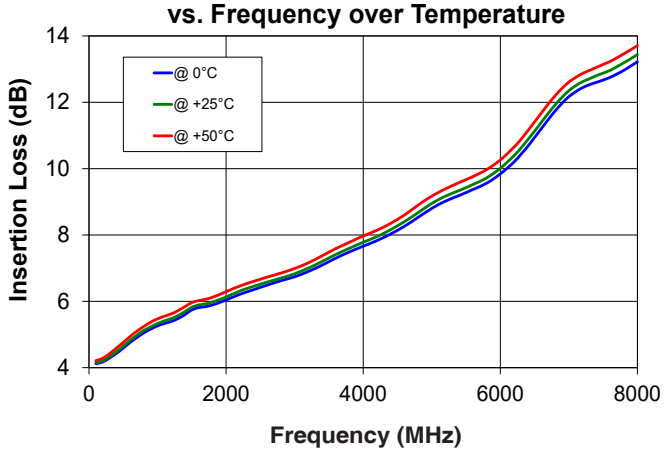
Attenuation relative to I.Loss Fine resolution around Atten. 100.5 dB



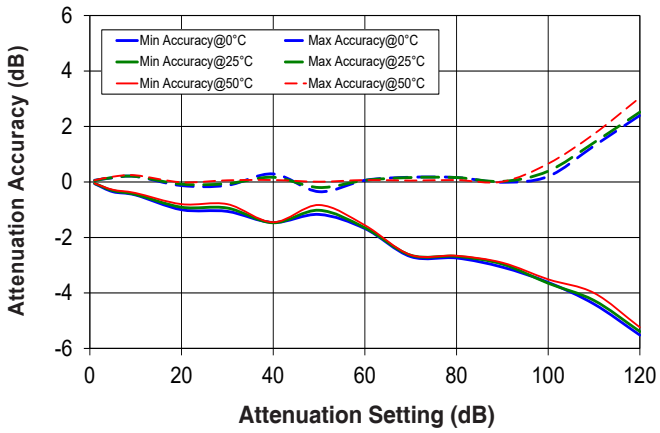
Typical Performance Curves (Continued) *

*at +25°C unless noted otherwise

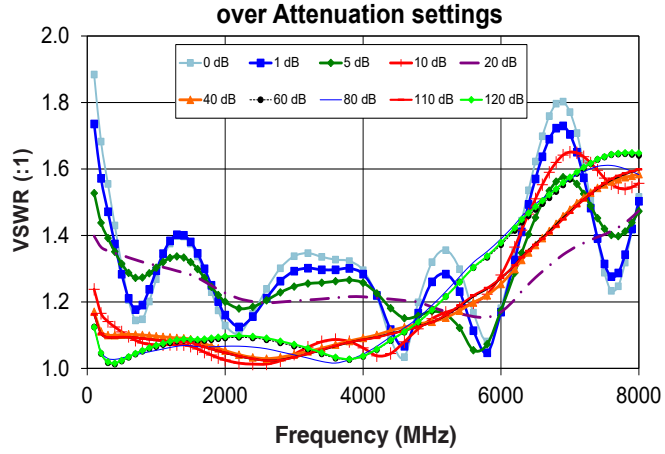
Insertion Loss vs. Frequency over Temperature



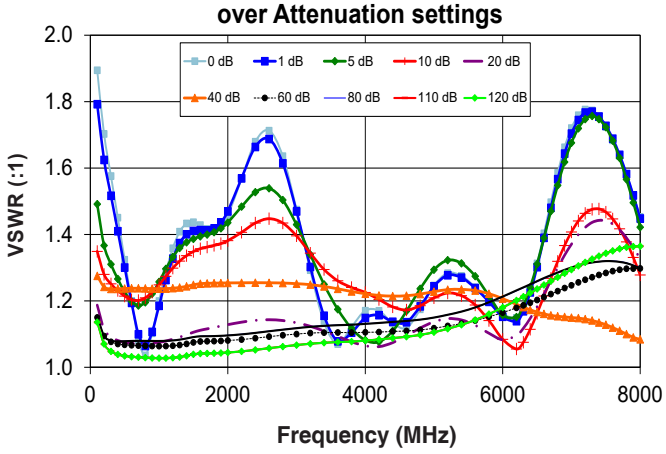
Typical Attenuation Accuracy @200-8000MHz vs. Attenuation settings over Temprature



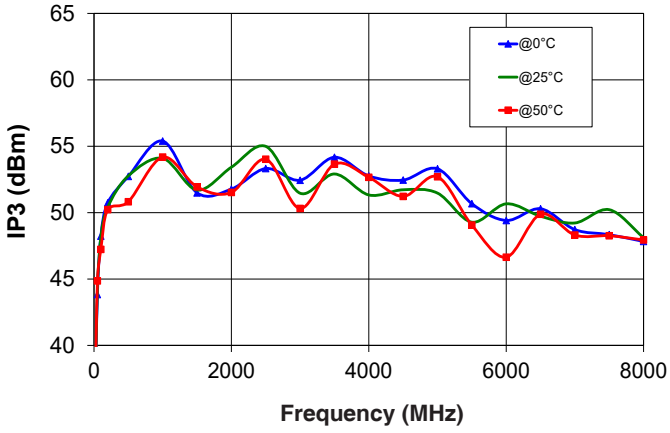
Input VSWR vs. Frequency over Attenuation settings



Output VSWR vs. Frequency over Attenuation settings



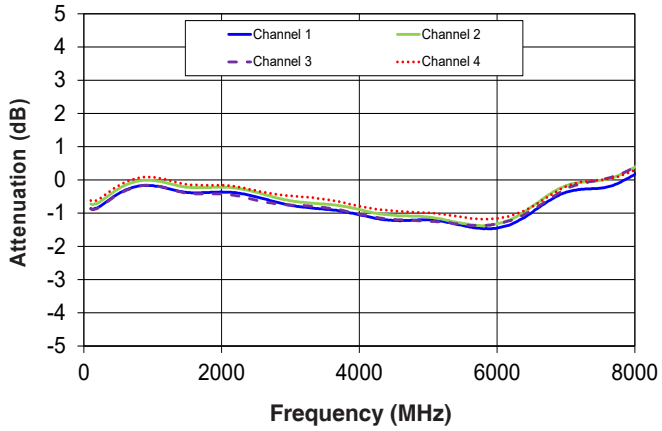
IP3 @ 0dB Attenuation vs. Frequency



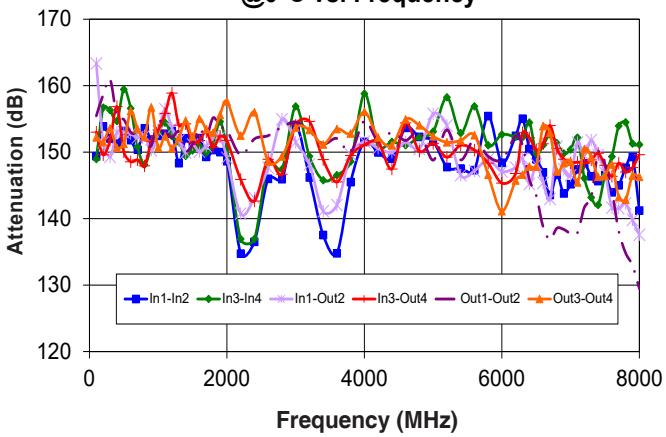
Typical Performance Curves (Continued) *

*at +25°C unless noted otherwise

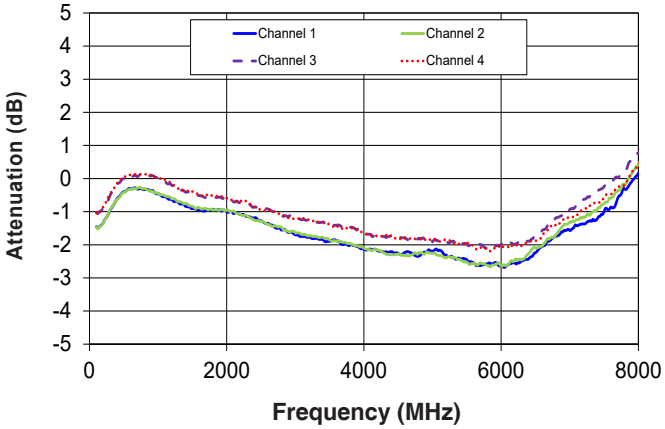
Attenuation Accuracy @ 40dB setting vs. Frequency at all channels



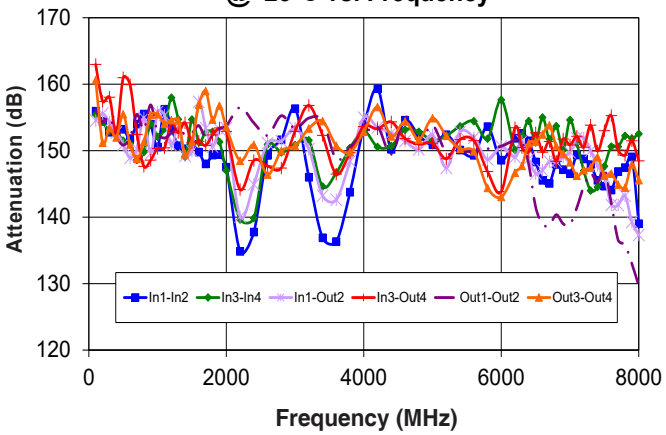
Isolation between channels @0°C vs. Frequency



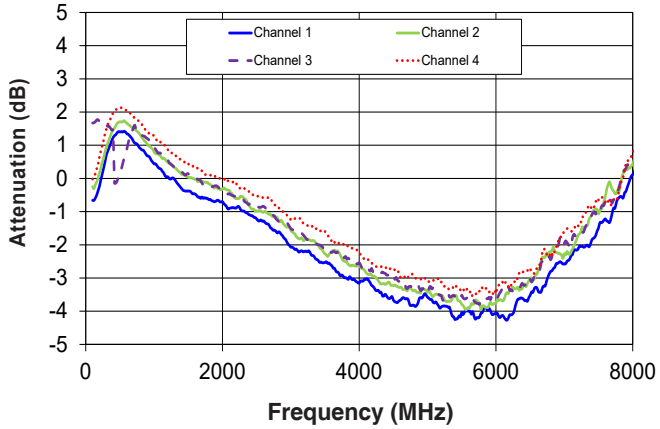
Attenuation Accuracy @ 80dB setting vs. Frequency at all channels



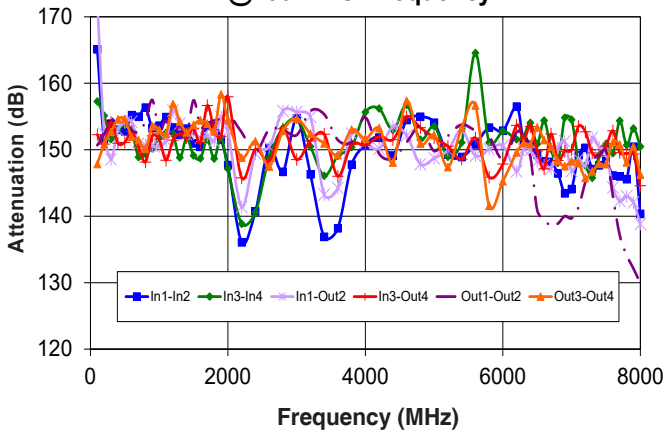
Isolation between channels @+25°C vs. Frequency



Attenuation Accuracy @ 110dB setting vs. Frequency at all channels

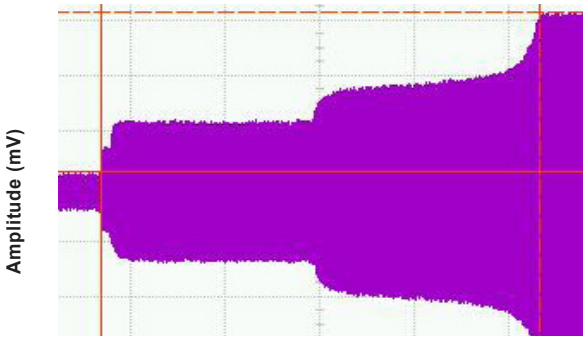


Isolation between channels @+50°C vs. Frequency



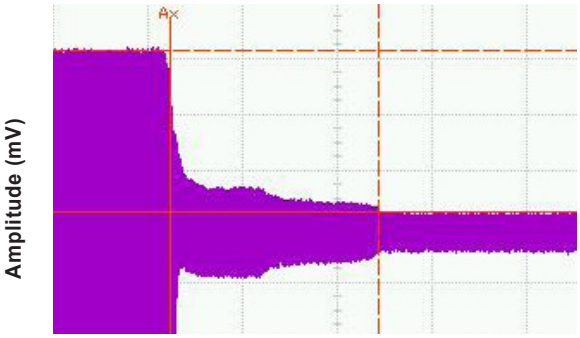
Typical Transition times @ +25°C

Transition 20 dB to 0 dB, tested using Osciloscope



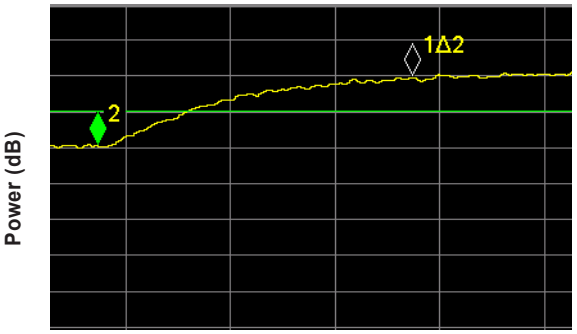
Rise time at transition 20 to 0 dB:
Δt: 927.3 ns ; ΔV: 144.8 mV
Scale 200 ns/dev ; 50 mV/dev

Transition 0 dB to 20 dB, tested using Osciloscope



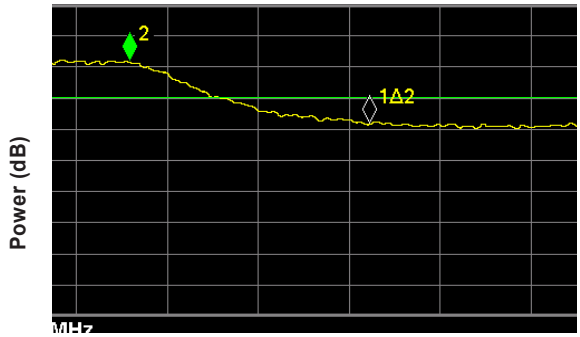
Fall time at transition 0 to 20 dB:
Δt: 440.4 ns ; ΔV: 144.8 mV
Scale 200 ns/dev ; 50 mV/dev

Transition 20.2 dB to 20 dB, tested using Spectrum Analyzer



Fall time at transition 20.2 to 20 dB:
Δt: 6.02 µs ; ΔP: 0.19 dB
Scale 2 µs/dev ; 0.1 dB/dev

Transition 20 dB to 20.2 dB, tested using Spectrum Analyzer

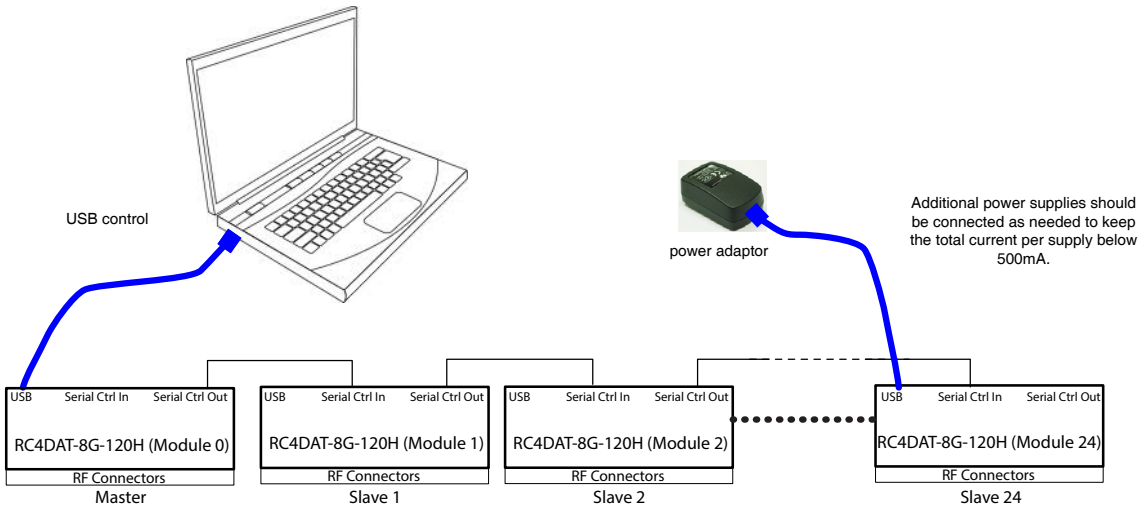


Fall time at transition 20 to 20.2 dB:
Δt: 5.28 µs ; ΔP: 0.20 dB
Scale 2 µs/dev ; 0.1 dB/dev

Note: All transition time tests performed with input signal of 501 MHz, 0 dBm.

Connecting multiple modules (Daisy-Chain)

The RC4DAT-8G-120H is designed to connect up to 25 modules in series (Daisy-chain) using dynamic addressing, meaning there is no need to specifically set the address of the modules, the addresses will be set automatically as part of establishing the communications with the PC. The module connected to the PC USB port or LAN connection will be assigned address 0 (Master), the first module connected to it will get address 1(slave) and subsequent modules incrementing up to address 24 (slave).



Connections between modules will be made using the serial in/out ports with the module connected to the PC as a master and all others as slave modules. All control will be through the master module (address zero) which is the only one communicating with the PC (via USB or Ethernet). Serial control out port of each module should be connected to the serial control in port of the next module. Power can be supplied from the PC via the master module or from additional power supplies connected to the USB ports of slave units.

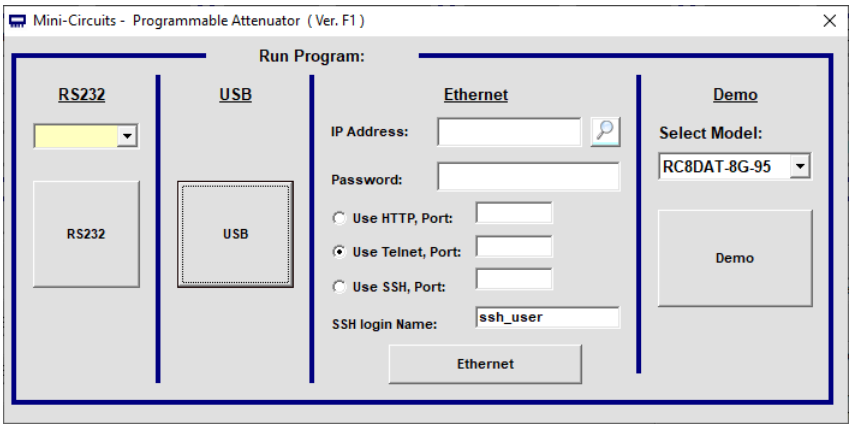
Note that with Ethernet enabled each unit will draw up to 350 mA so to connect three units in series you will need to supply 1050mA, thus it is recommended to turn off the Ethernet circuitry in the slave units to reduce the power requirements. The max current pass through a single unit should be limited to 1000 mA so additional power supplies should be used as needed. Connecting an additional power supply will automatically cut off power draw from the serial control in port for the module connected.

The serial master/slave bus allows connecting modules of different types to the same daisy-chain as long as all modules support Mini-Circuits' dynamic addressing setup. To add a new module to the set up simply connect the module to the setup and refresh the address listing, no need to reset any of the existing modules or assign addresses manually.

Note: Using longer control cables between modules may reduce the max number of units connected in daisy-chain.

Controlling multiple modules in GUI program

Connect the attenuator you wish to use as master to either USB or LAN and connect additional units to the master using the serial control in/out ports and CBL-1.5FT-MMD+ or equivalent control cables, then start the GUI and select the control method you wish to use (USB, HTTP, Telnet, or SSH. RS232 is not available in this model.)



RC4DAT GUI initial (control selection) screen

Once you've selected the control method the main attenuation control screen will appear, allowing you to set a fixed attenuation, an arbitrary sequence of attenuation steps, or a sweep(ramp) of attenuation for each attenuator, or for a number of attenuators at once.

RC4DAT GUI main screen (USB control) with 10 units connected in series

Software & Documentation Download:

- Mini-Circuits' full software and support package including user guide, Windows GUI, DLL files, programming manual and examples can be downloaded free of charge from http://www.minicircuits.com/softwaredownload/patt.html
- Please contact testsolutions@minicircuits.com for support

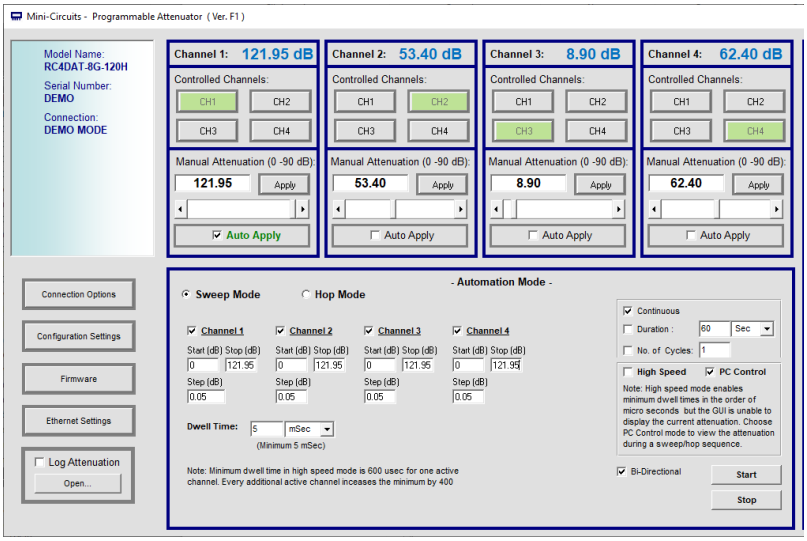
Minimum System Requirements

Parameter	Requirements	
Interface	USB HID or HTTP Get/Post or Telnet protocols	
System requirements	GUI:	Windows 7 or later
	USB API (ActiveX & .Net)	Windows 7 or later and programming environment with ActiveX or .NET support
	USB direct programming support	Linux, Windows 7 or later
	HTTP or Telnet	Any computer with a network port and Ethernet-TCP/IP (HTTP or Telnet protocols) support
Hardware	Intel i3 (or equivalent) or later	

Graphical User Interface (GUI) for Windows

Key Features:

- Manual attenuation setting
- Sweep and Hop attenuation sequences directed from the PC, or entire sequence loaded into RC4DAT.
- Attenuator address configuration and Firmware upgrade
- Attenuation at power up may be set to selected attenuation level or last attenuation state recorded.
- Controlling up to 25 units in 'daisy-chain' configuration.
- USB, HTTP or Telnet control of RC4DAT
- Setting Ethernet configuration



Application Programming Interface (API)

Programming manual: https://www.minicircuits.com/softwaredownload/Prog_Manual-6-Programmable_Attenuator.pdf

Windows Support:

- API DLL files exposing the full switch functionality
  - ActiveX COM DLL file for creation of 32-bit programs
  - .Net library DLL file for creation of 32 / 64-bit programs
- Supported by most common programming environments (refer to application note AN-49-001 for summary of tested environments)

Linux Support:

- Full attenuator control in a Linux environment is achieved by way of USB interrupt commands.

Ordering Information

Model	Description
RC4DAT-8G-120H	USB/Ethernet four channel Programmable Attenuator

Included Accessories	Part No.	Description
	MUSB-CBL-3+	3.0 ft (0.9 m) USB Cable: USB type A(Male) to USB type Mini-B(Male)

Optional Accessories	Description
USB-AC/DC-5	AC/DC 5V_{DC} Power Adapter with US, EU, IL, UK, AUS, and China power plugs [10,11]
MUSB-CBL-3+ (spare)	3.0 ft (0.9 m) USB Cable: USB type A(Male) to USB type Mini-B(Male)
MUSB-CBL-7+	6.6 ft (2.0 m) USB Cable: USB type A(Male) to USB type Mini-B(Male)
CBL-RJ45-MM-5+	5 ft (1.5 m) Ethernet cable: RJ45(Male) to RJ45(Male) Cat 5E cable
CBL-1.5FT-MMD+	1.5 ft (0.5 m) Digital Snap Fit(male-male) cable assembly(daisy chain)
CBL-5FT-MMD+	5 ft (1.5 m) Digital Snap Fit(male-male) cable assembly(daisy chain)
BKT-355-02+	Bracket kit including 3.75 × 5.17" bracket, mounting screws and washers

[10] The USB-AC/DC-5 may be used to provide the 5V_{DC} power input via USB port if operating the RC4DAT with Ethernet control. Not required if using USB control.

[11] Power plugs for other countries are also available, Plugs for other countries are also available, if you need a power plug for a country not listed please contact testsolutions@minicircuits.com

Additional 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-Circuits' applicable established test performance criteria and measurement instructions.

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