

# Voltage Variable Attenuator

HVA-73+

## Typical Performance Data

V CTRL (V)	ATTENUATION (dB) @ 6260 MHz
0.00	1.78
0.20	1.91
0.40	2.12
0.60	4.61
0.80	8.86
0.90	11.51
1.00	14.68
1.10	20.25
1.20	24.51
1.25	27.95
1.30	29.38
1.40	24.18
1.50	20.08
1.60	17.41
1.80	14.15
2.00	12.16
2.20	10.78
2.50	9.35
3.00	7.85
4.00	6.27
5.00	5.41
6.00	4.88

V CTRL (V)	INPUT IP3 vs. V CTRL (dB)		
	IP3 @ 5500MHz	IP3 @ 6250MHz	IP3 @ 7000MHz
0.00	46.58	46.59	54.93
0.20	47.59	46.62	49.86
0.40	36.02	36.84	36.99
0.60	35.57	36.03	36.18
0.80	40.07	41.15	42.20
0.90	37.08	38.02	38.73
1.00	34.67	35.39	36.16
1.10	32.30	32.92	33.98
1.20	29.67	29.55	31.71
1.25	29.20	27.71	30.53
1.30	30.32	28.62	31.10
1.40	32.81	32.28	33.67
1.50	34.38	34.61	35.84
1.60	35.99	35.93	37.18

ATTENUATION VS. INPUT POWER @ 6000 MHz										
Input Power (dBm)	@V Ctrl 0V	@V Ctrl 0.4V	@V Ctrl 0.6V	@V Ctrl 0.8V	@V Ctrl 0.9V	@V Ctrl 1.2V	@V Ctrl 1.25V	@V Ctrl 1.3V	@V Ctrl 1.4V	@V Ctrl 1.5V
0.0	1.55	1.85	4.64	9.42	12.13	28.28	30.11	27.20	21.04	17.96
5.0	1.52	1.83	4.62	9.38	12.11	28.22	30.10	27.19	21.07	17.95
10.0	1.51	1.84	4.63	9.38	12.11	28.15	30.14	27.27	21.15	17.98
15.0	1.69	2.26	5.04	9.60	12.38	27.71	30.83	27.87	22.15	18.60



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IF/RF MICROWAVE COMPONENTS

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## Typical Performance Data

Frequency (MHz)	ATTENUATION vs. FREQUENCY OVER V CTRL (dB)										
	@V Ctrl 0V	@V Ctrl 0.2V	@V Ctrl 0.4V	@V Ctrl 0.6V	@V Ctrl 0.8V	@V Ctrl 0.9V	@V Ctrl 1.0V	@V Ctrl 1.1V	@V Ctrl 1.2V	@V Ctrl 1.25V	@V Ctrl 1.3V
5500	1.53	1.60	1.89	4.42	8.76	11.47	14.71	20.26	23.81	25.53	25.06
5540	1.53	1.60	1.90	4.43	8.77	11.48	14.72	20.32	23.98	25.83	25.38
5580	1.54	1.61	1.91	4.43	8.77	11.48	14.73	20.35	24.13	26.12	25.70
5620	1.55	1.61	1.92	4.44	8.79	11.49	14.75	20.37	24.29	26.40	26.02
5660	1.55	1.62	1.92	4.45	8.79	11.50	14.75	20.39	24.40	26.66	26.33
5700	1.56	1.63	1.93	4.46	8.79	11.50	14.75	20.42	24.48	26.90	26.64
5740	1.57	1.64	1.94	4.47	8.80	11.50	14.75	20.43	24.60	27.18	26.99
5780	1.58	1.66	1.95	4.48	8.80	11.50	14.75	20.45	24.68	27.42	27.30
5820	1.60	1.67	1.97	4.49	8.81	11.50	14.75	20.45	24.76	27.62	27.60
5860	1.61	1.68	1.98	4.50	8.83	11.50	14.75	20.47	24.83	27.81	27.90
5900	1.62	1.71	1.99	4.50	8.82	11.49	14.74	20.46	24.84	27.94	28.15
5940	1.64	1.72	2.00	4.52	8.83	11.49	14.74	20.46	24.86	28.07	28.42
5980	1.65	1.75	2.01	4.53	8.83	11.50	14.74	20.44	24.86	28.18	28.67
6020	1.67	1.77	2.03	4.54	8.83	11.50	14.74	20.41	24.87	28.30	28.93
6060	1.69	1.79	2.05	4.56	8.84	11.51	14.74	20.42	24.90	28.37	29.12
6100	1.71	1.82	2.06	4.57	8.85	11.51	14.74	20.39	24.87	28.38	29.27
6140	1.73	1.84	2.08	4.58	8.86	11.51	14.74	20.34	24.83	28.32	29.29
6180	1.75	1.87	2.10	4.60	8.86	11.51	14.72	20.32	24.73	28.21	29.32
6220	1.76	1.90	2.11	4.60	8.86	11.51	14.70	20.31	24.61	28.10	29.36
6260	1.78	1.91	2.12	4.61	8.86	11.51	14.68	20.25	24.51	27.95	29.38
6280	1.79	1.92	2.13	4.62	8.87	11.51	14.68	20.23	24.50	27.95	29.43
6320	1.80	1.95	2.15	4.63	8.88	11.52	14.69	20.18	24.41	27.82	29.38
6360	1.82	1.99	2.16	4.64	8.88	11.51	14.66	20.17	24.28	27.63	29.33
6400	1.84	2.04	2.18	4.67	8.90	11.54	14.66	20.15	24.21	27.55	29.35
6440	1.86	2.07	2.20	4.68	8.91	11.55	14.67	20.11	24.16	27.45	29.25
6480	1.87	2.10	2.22	4.70	8.93	11.57	14.67	20.08	24.06	27.28	29.10
6520	1.90	2.11	2.24	4.72	8.95	11.59	14.67	20.07	23.97	27.15	28.97
6560	1.92	2.11	2.27	4.74	8.97	11.61	14.68	20.03	23.92	27.04	28.88
6600	1.93	2.10	2.29	4.77	9.00	11.63	14.70	20.04	23.86	26.94	28.76
6640	1.95	2.10	2.30	4.78	9.02	11.65	14.71	20.04	23.80	26.80	28.58
6680	1.95	2.11	2.31	4.79	9.03	11.67	14.72	20.00	23.74	26.66	28.36
6720	1.94	2.13	2.31	4.79	9.04	11.69	14.74	20.01	23.66	26.50	28.10
6760	1.94	2.16	2.31	4.80	9.05	11.70	14.77	20.09	23.62	26.39	27.89
6800	1.93	2.16	2.31	4.81	9.06	11.71	14.76	20.16	23.50	26.17	27.57
6840	1.93	2.18	2.32	4.82	9.10	11.73	14.80	20.19	23.41	25.99	27.30
6880	1.94	2.18	2.33	4.84	9.13	11.78	14.83	20.19	23.35	25.80	26.97
6920	1.94	2.18	2.34	4.86	9.16	11.82	14.84	20.26	23.23	25.58	26.68
6960	1.96	2.19	2.36	4.88	9.21	11.86	14.89	20.28	23.16	25.42	26.42
7000	1.98	2.20	2.38	4.92	9.25	11.90	14.93	20.26	23.12	25.26	26.17



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IF/RF MICROWAVE COMPONENTS

## Typical Performance Data

Frequency (MHz)	INPUT RETURN LOSS vs. FREQUENCY OVER V CTRL (dB)										
	@V Ctrl 0V	@V Ctrl 0.2V	@V Ctrl 0.4V	@V Ctrl 0.6V	@V Ctrl 0.8V	@V Ctrl 0.9V	@V Ctrl 1.0V	@V Ctrl 1.1V	@V Ctrl 1.2V	@V Ctrl 1.25V	@V Ctrl 1.3V
5500	19.55	19.56	19.82	30.28	25.91	21.33	21.38	21.45	21.62	21.57	21.61
5540	20.18	20.18	20.44	32.70	25.43	21.06	20.96	20.91	20.93	20.89	20.90
5580	20.51	20.52	20.82	34.98	27.33	21.83	21.71	21.64	21.76	21.58	21.58
5620	20.42	20.41	20.68	34.20	26.35	20.95	20.86	20.80	21.39	20.76	20.77
5660	21.64	21.65	21.95	45.03	26.63	21.33	21.08	20.87	21.00	20.65	20.61
5700	21.40	21.43	21.75	38.02	28.66	21.74	21.52	21.35	22.02	21.16	21.13
5740	22.02	22.08	22.28	45.72	26.71	20.71	20.41	20.19	21.10	19.96	19.92
5780	23.58	23.66	23.97	39.43	27.71	21.62	21.13	20.75	21.18	20.34	20.23
5820	23.05	23.12	23.37	40.94	28.72	21.43	21.03	20.73	21.84	20.38	20.30
5860	25.01	25.05	25.21	37.92	26.24	20.69	20.16	19.76	20.48	19.30	19.18
5900	26.49	26.54	27.06	32.20	27.88	22.06	21.34	20.78	21.07	20.13	19.94
5940	25.74	25.74	26.06	35.62	28.43	21.45	20.88	20.41	21.43	19.85	19.69
5980	29.08	29.15	29.38	30.86	26.41	21.06	20.35	19.77	20.36	19.07	18.88
6020	29.49	29.62	30.44	29.86	28.12	22.19	21.34	20.65	21.16	19.81	19.57
6060	30.66	30.76	30.92	30.76	26.97	21.18	20.42	19.79	20.63	19.02	18.79
6100	37.90	38.23	39.22	27.90	25.85	21.51	20.55	19.78	20.06	18.84	18.55
6140	35.29	35.73	38.49	29.55	27.49	22.45	21.41	20.55	20.89	19.50	19.18
6180	46.32	45.01	42.21	28.06	25.79	21.51	20.49	19.67	20.00	18.66	18.35
6220	37.56	38.97	42.58	31.10	25.60	22.44	21.14	20.15	20.03	18.94	18.59
6260	40.81	42.31	50.44	30.63	26.63	22.57	21.28	20.28	20.43	19.07	18.70
6280	40.85	43.16	40.07	29.16	25.53	21.91	20.67	19.71	19.84	18.53	18.18
6320	32.28	32.94	32.82	30.27	24.35	22.23	20.81	19.74	19.33	18.42	18.03
6360	33.51	34.16	35.20	33.11	25.84	23.28	21.69	20.49	20.07	19.04	18.61
6400	31.37	32.02	31.53	29.53	24.20	22.09	20.66	19.54	19.06	18.17	17.76
6440	28.69	29.04	29.36	31.04	25.10	23.10	21.46	20.18	19.09	18.61	18.16
6480	31.00	31.33	31.88	33.20	25.87	23.72	21.96	20.57	19.55	18.91	18.44
6520	28.29	28.58	28.68	29.20	24.23	22.43	20.87	19.60	18.50	18.04	17.60
6560	27.22	27.43	28.25	32.13	25.82	23.81	22.04	20.56	19.32	18.79	18.30
6600	29.15	29.57	30.28	32.95	26.01	23.83	22.03	20.53	19.27	18.73	18.23
6640	26.71	26.96	27.55	30.43	24.47	22.74	21.19	19.80	18.64	18.12	17.67
6680	26.68	26.79	27.76	33.35	25.98	24.22	22.42	20.82	19.53	18.95	18.46
6720	27.81	28.00	28.83	33.87	25.25	23.48	21.70	20.17	18.94	18.38	17.90
6760	25.09	25.09	25.79	28.59	23.90	22.58	21.13	19.79	18.67	18.15	17.70
6800	24.96	24.70	25.80	28.59	25.21	23.89	22.21	20.70	19.46	18.89	18.40
6840	24.77	24.51	25.54	27.66	23.85	22.60	21.06	19.69	18.56	18.04	17.59
6880	21.90	21.61	22.43	23.71	22.74	22.05	20.88	19.73	18.71	18.23	17.79
6920	21.58	21.23	22.10	23.42	23.61	22.94	21.66	20.39	19.26	18.75	18.27
6960	20.41	20.10	20.85	21.85	21.94	21.37	20.39	19.35	18.40	17.96	17.54
7000	18.30	18.05	18.65	19.73	21.29	21.26	20.71	19.91	19.08	18.66	18.27



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IFIRF MICROWAVE COMPONENTS

## Typical Performance Data

Frequency (MHz)	OUTPUT RETURN LOSS vs. FREQUENCY OVER V CTRL (dB)										
	@V Ctrl 0V	@V Ctrl 0.2V	@V Ctrl 0.4V	@V Ctrl 0.6V	@V Ctrl 0.8V	@V Ctrl 0.9V	@V Ctrl 1.0V	@V Ctrl 1.1V	@V Ctrl 1.2V	@V Ctrl 1.25V	@V Ctrl 1.3V
5500	20.13	20.09	20.51	22.03	21.77	21.29	20.85	20.49	20.20	20.07	19.97
5540	20.40	20.37	20.78	22.20	21.78	21.28	20.82	20.45	20.16	20.03	19.92
5580	20.74	20.72	21.09	22.24	21.60	21.07	20.58	20.19	19.87	19.74	19.62
5620	20.95	20.93	21.37	22.81	22.05	21.38	20.81	20.36	20.00	19.85	19.70
5660	21.52	21.50	21.90	23.00	21.95	21.26	20.68	20.23	19.86	19.71	19.56
5700	21.85	21.85	22.23	23.18	21.89	21.12	20.49	20.00	19.62	19.45	19.29
5740	22.36	22.39	22.86	24.08	22.42	21.47	20.77	20.21	19.76	19.57	19.39
5780	23.22	23.29	23.71	24.38	22.36	21.38	20.67	20.10	19.64	19.44	19.26
5820	23.55	23.63	24.10	24.94	22.58	21.48	20.68	20.06	19.54	19.33	19.11
5860	24.44	24.55	25.10	26.10	23.09	21.81	20.94	20.25	19.69	19.45	19.22
5900	25.74	25.85	26.32	26.32	22.97	21.70	20.81	20.11	19.54	19.29	19.05
5940	25.83	25.92	26.61	27.22	23.40	22.00	20.98	20.21	19.57	19.31	19.05
5980	26.99	27.13	27.98	28.18	23.65	22.18	21.10	20.29	19.63	19.34	19.07
6020	28.37	28.47	29.41	28.47	23.60	22.13	21.00	20.15	19.46	19.17	18.87
6060	28.33	28.37	29.82	30.65	24.43	22.72	21.44	20.48	19.69	19.37	19.04
6100	30.11	30.09	31.98	31.29	24.58	22.83	21.53	20.54	19.74	19.40	19.06
6140	31.38	31.39	33.87	31.90	24.67	22.86	21.49	20.46	19.62	19.27	18.91
6180	30.76	30.76	33.73	34.44	25.42	23.39	21.89	20.78	19.86	19.48	19.10
6220	33.74	33.76	37.90	33.09	25.17	23.21	21.78	20.68	19.76	19.37	18.99
6260	33.23	33.32	37.69	34.20	25.39	23.29	21.77	20.61	19.65	19.24	18.84
6280	31.88	31.92	35.79	35.90	25.92	23.67	22.06	20.83	19.83	19.39	18.98
6320	33.43	33.21	38.08	35.58	26.33	24.09	22.46	21.18	20.12	19.66	19.22
6360	33.96	33.96	38.76	35.82	26.49	24.10	22.45	21.13	20.02	19.55	19.09
6400	31.44	31.48	34.78	38.63	27.60	24.87	23.06	21.60	20.39	19.87	19.39
6440	34.68	34.73	39.28	38.09	28.07	25.31	23.49	21.95	20.68	20.13	19.61
6480	34.44	34.61	37.79	40.66	28.73	25.63	23.69	22.05	20.71	20.13	19.61
6520	33.21	33.44	36.19	44.44	30.27	26.69	24.53	22.69	21.22	20.58	20.02
6560	37.29	38.11	41.28	47.41	31.33	27.39	25.08	23.10	21.53	20.85	20.25
6600	35.12	35.98	37.47	53.88	32.81	28.35	25.59	23.41	21.73	21.01	20.39
6640	37.13	38.18	38.75	46.55	35.46	30.18	26.72	24.23	22.36	21.56	20.89
6680	40.18	41.77	37.83	41.53	37.51	31.16	27.25	24.56	22.59	21.73	21.04
6720	38.32	39.37	36.26	38.27	39.39	32.26	27.83	24.92	22.84	21.93	21.23
6760	35.33	35.78	32.80	34.48	44.71	34.85	29.24	25.88	23.55	22.55	21.78
6800	30.82	31.12	29.44	31.59	44.01	36.62	29.94	26.26	23.78	22.74	21.94
6840	29.08	29.42	27.96	29.81	38.11	38.19	31.10	27.04	24.35	23.23	22.37
6880	25.44	25.66	24.90	27.31	35.17	40.66	33.25	28.32	25.21	23.98	23.02
6920	23.67	23.76	23.40	25.77	32.91	38.63	34.02	28.81	25.52	24.24	23.24
6960	21.96	22.10	21.78	24.17	30.09	34.76	34.99	30.06	26.45	25.08	23.94
7000	19.68	19.70	19.69	22.23	28.03	32.53	36.68	31.95	27.62	26.08	24.74



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## Typical Performance Data

Frequency (MHz)	PHASE SHIFT VS. FREQUENCY OVER V CTRL (Deg.)						
	@V Ctrl 0.2V	@V Ctrl 0.4V	@V Ctrl 0.6V	@V Ctrl 0.8V	@V Ctrl 0.9V	@V Ctrl 1.0V	@V Ctrl 1.1V
	5500.0	-0.07	0.02	0.46	2.43	5.28	10.08
5540.0	-0.07	0.02	0.50	2.40	5.11	9.71	19.50
5580.0	-0.08	0.00	0.52	2.36	4.94	9.35	18.80
5620.0	-0.08	0.03	0.52	2.30	4.74	9.00	18.15
5660.0	-0.07	0.05	0.55	2.31	4.62	8.75	17.56
5700.0	-0.06	0.04	0.55	2.24	4.46	8.42	16.89
5740.0	-0.05	0.05	0.55	2.20	4.32	8.07	16.21
5780.0	-0.05	0.05	0.58	2.17	4.24	7.84	15.67
5820.0	-0.06	0.04	0.55	2.10	4.09	7.55	15.13
5860.0	-0.07	0.06	0.56	2.08	3.98	7.33	14.66
5900.0	-0.07	0.07	0.59	2.09	3.94	7.18	14.28
5940.0	-0.08	0.07	0.59	2.03	3.78	6.94	13.83
5980.0	-0.08	0.07	0.62	2.03	3.72	6.80	13.48
6020.0	-0.06	0.06	0.60	2.03	3.63	6.63	13.10
6060.0	-0.05	0.08	0.62	2.00	3.61	6.57	12.94
6100.0	-0.05	0.09	0.67	2.02	3.60	6.54	12.81
6140.0	-0.04	0.10	0.68	2.04	3.54	6.54	12.82
6180.0	-0.03	0.10	0.72	2.05	3.54	6.54	12.78
6220.0	-0.01	0.13	0.75	2.10	3.56	6.55	12.72
6260.0	0.02	0.12	0.78	2.13	3.59	6.55	12.70
6280.0	0.02	0.12	0.77	2.11	3.55	6.49	12.60
6320.0	0.05	0.11	0.77	2.16	3.64	6.60	12.73
6360.0	0.09	0.11	0.74	2.14	3.66	6.70	12.83
6400.0	0.13	0.09	0.72	2.15	3.69	6.72	12.78
6440.0	0.16	0.08	0.70	2.15	3.75	6.86	12.97
6480.0	0.20	0.07	0.67	2.15	3.86	7.02	13.19
6520.0	0.23	0.08	0.67	2.21	4.03	7.19	13.41
6560.0	0.24	0.07	0.65	2.22	4.10	7.30	13.59
6600.0	0.31	0.05	0.67	2.28	4.26	7.45	13.83
6640.0	0.32	0.09	0.64	2.32	4.41	7.68	14.21
6680.0	0.36	0.10	0.63	2.39	4.54	7.87	14.56
6720.0	0.38	0.07	0.59	2.41	4.75	8.19	15.10
6760.0	0.38	0.05	0.60	2.50	5.07	8.59	15.68
6800.0	0.41	0.07	0.65	2.69	5.30	9.03	16.41
6840.0	0.43	0.09	0.75	2.97	5.53	9.46	17.09
6880.0	0.46	0.09	0.88	3.29	5.85	10.05	17.99
6920.0	0.45	0.11	1.03	3.60	6.29	10.64	18.87
6960.0	0.44	0.12	1.20	3.93	6.80	11.29	19.77
7000.0	0.44	0.13	1.38	4.23	7.29	11.97	20.73



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