

WJ-L40

500 TO 4000 MHz TO-8 THIN FILM LIMITER MODULE

- VOLTAGE VARIABLE
LIMITING LEVEL:
-2 TO +2 dBm
- GOOD SUPPRESSION OF
EVEN ORDER HARMONICS
DUE TO BALANCED CIRCUIT
DESIGN: > 40 dB AT 10 dBm
INPUT (TYP.)



Specifications

Characteristic	Typical	Guaranteed* Min./Max.
Frequency	500-4200 MHz	500-4000 MHz
Insertion Loss $P_{IN} \leq -20$ dBm $+15 \leq \text{Bias} \leq +20$ Vdc	< 3.5 dB	4.5 dB (Max.)
Input VSWR $P_{IN} \leq -10$ dBm $+10 \leq \text{Bias} \leq +20$ Vdc	< 1.6:1	2.0:1 (Max.)
Output VSWR $P_{IN} \leq +10$ dBm $+10 \leq \text{Bias} \leq +20$ Vdc	< 1.8:1	2.2:1 (Max.)
Input Signal (Max.)		+26 dBm
Bias At +20 Vdc At +15 Vdc At +10 Vdc	8.5 mA 6.5 mA 4.0 mA	

*Measured in a 50-ohm system, guaranteed at 25°C.

Limiting and Insertion Loss Characteristics (25°C)

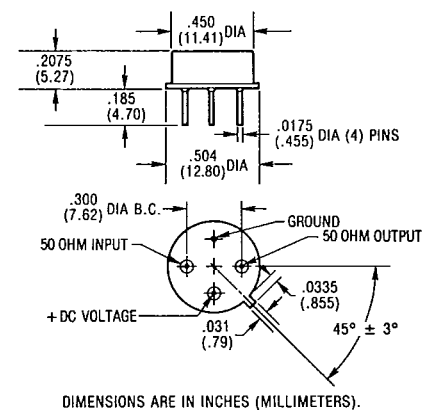
Bias Voltage	Output Level at Limiting Threshold (1 dB Comp)		Max. Output at Limiting Level (+20 dBm Input)		Insertion Loss (4000 MHz)	
	Typ.	Max.	Typ.	Max.	Typ.	Max.
+20 Volts	-2.0	-0.5	+2.4 ¹	+3.5 ¹	3.8	4.3
+15 Volts	-2.5	-1.0	+1.0 ¹	+2.0 ¹	4.0	4.5
+10 Volts	-4.2	-2.5	-0.5 ²	+0.5 ²	4.5	5.0
+5 Volts	-10.5	-8.0	-2.0 ²		6.1	6.5

Notes:

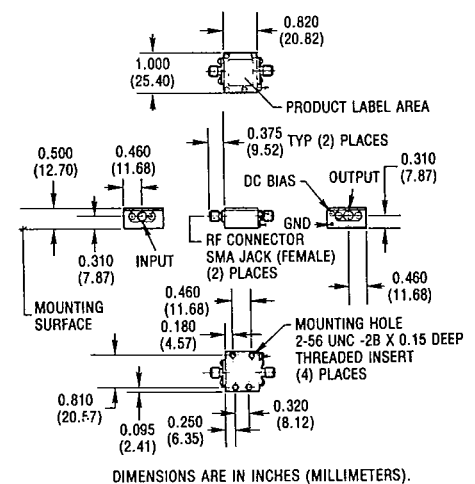
- At 3000 MHz
- At 4000 MHz

Outline Drawings

L40



CL40



*WJ-CL40 is standard WJ-L40 installed in miniature SMA connector housing and guaranteed over 0°C to 50°C temperature range.

Weight

2.27 grams (0.08 oz.)
maximum

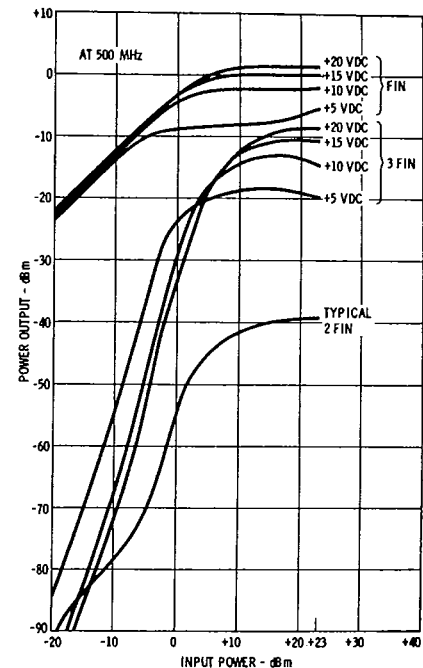
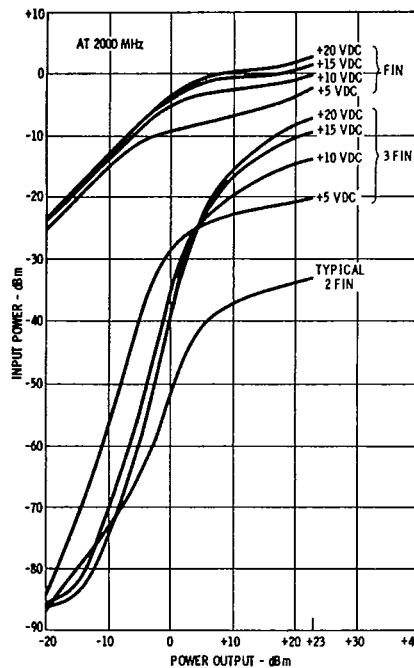
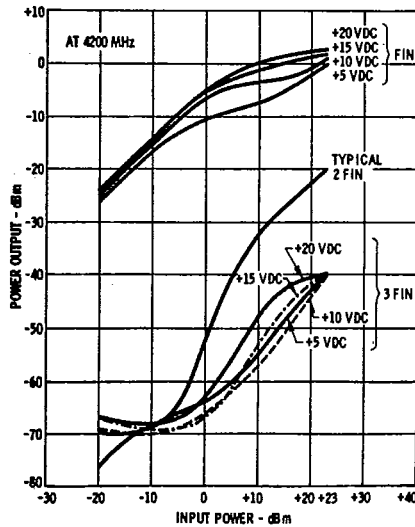
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WJ-L40

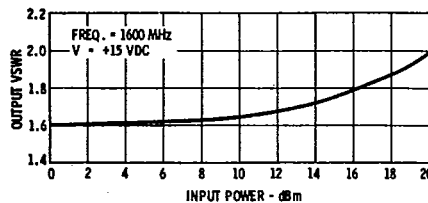
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Typical Performance at 25°C

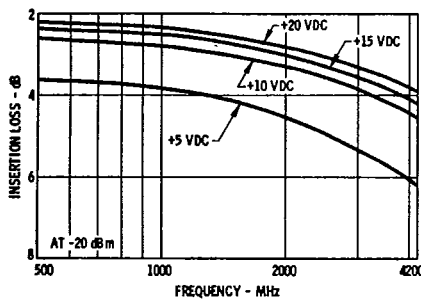
Limiting Characteristics vs. Input Level and D.C. Bias



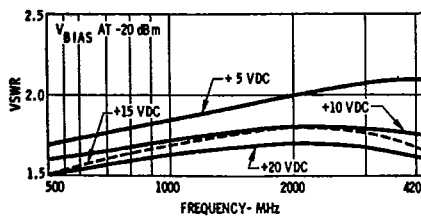
Output VSWR vs. Input Power



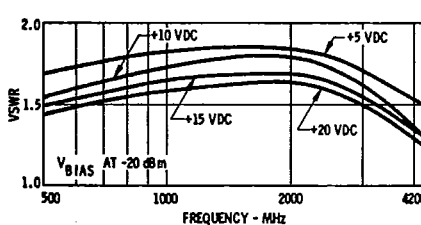
Insertion Loss vs. Frequency



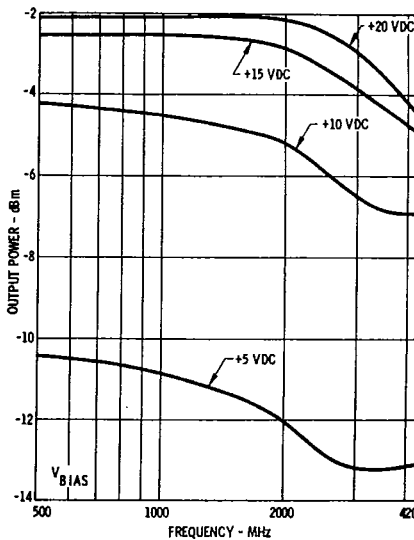
Output VSWR vs. Frequency



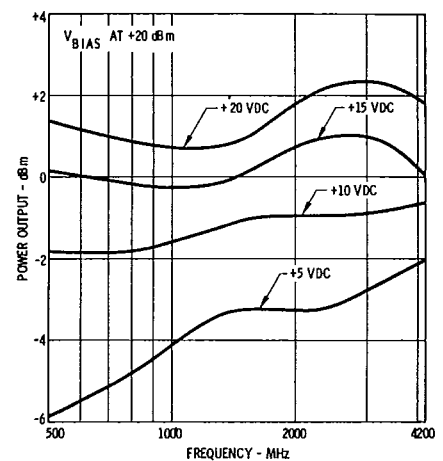
Input VSWR vs. Frequency



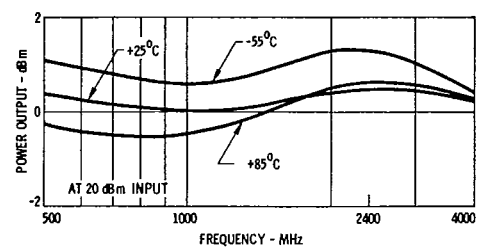
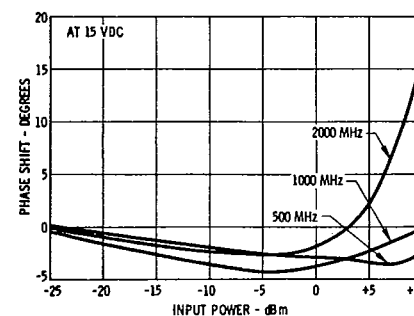
Power Output at 1 dB Compression Point



Maximum Limiting Level



Input Power vs. Phase Shift



Typical Automatic Test Data

 $V_{CC} = 15 \text{ V}$

Deviation from Linear Phase, Gain and Group Delay

S/N ? FREQ MHz	3 USUR IN	USUR OUT	LOSS dB	FREQ MHz	DEV LIN P dB	REL P dB	GRIN DEV dB	MIS GRIN dB	GROUP DELAY N-SEC
500.	1.6	1.6	2.8	500.	2.77	1.00	.62	-2.46	.12
600.	1.5	1.6	2.4	600.	1.49	4.44	.91	-2.36	.14
700.	1.5	1.6	2.4	700.	1.25	9.91	.91	-2.37	.12
800.	1.5	1.6	2.4	800.	-.99	13.39	.97	-2.31	.13
900.	1.5	1.6	2.3	900.	-1.15	18.94	.99	-2.28	.16
1000.	1.5	1.6	2.3	1000.	-.87	24.94	.86	-2.41	.15
1100.	1.5	1.6	2.4	1100.	-1.51	30.01	.73	-2.54	.13
1200.	1.5	1.6	2.4	1200.	-2.33	34.41	.74	-2.52	.16
1300.	1.5	1.6	2.5	1300.	-1.52	41.43	.58	-2.70	.18
1400.	1.6	1.6	2.5	1400.	-1.20	47.46	.47	-2.81	.16
1500.	1.6	1.7	2.7	1500.	-1.09	53.29	.42	-2.86	.17
1600.	1.6	1.7	2.8	1600.	-.82	59.77	.38	-2.89	.17
1700.	1.6	1.7	2.9	1700.	-.67	65.73	.35	-2.92	.17
1800.	1.6	1.7	2.9	1800.	-.43	71.95	.33	-2.94	.17
1900.	1.6	1.7	2.9	1900.	-.72	77.96	.39	-2.88	.16
2000.	1.6	1.7	2.9	2000.	.82	83.76	.31	-2.96	.16
2100.	1.6	1.7	2.9	2100.	.45	89.11	.23	-3.08	.14
2200.	1.6	1.7	3.0	2200.	-.32	94.06	.32	-2.96	.16
2300.	1.6	1.8	3.1	2300.	-.59	100.68	.33	-2.94	.15
2400.	1.6	1.8	3.0	2400.	-.84	104.96	.36	-3.22	.15
2500.	1.8	1.7	2.9	2500.	.29	111.80	-.13	-3.40	.18
2600.	1.8	1.7	3.2	2600.	.56	117.80	.09	-3.19	.16
2700.	1.8	1.7	3.4	2700.	.47	123.42	-.17	-3.44	.16
2800.	1.4	1.7	3.2	2800.	.43	129.09	-.13	-3.40	.16
2900.	1.4	1.6	3.4	2900.	.91	135.28	-.22	-3.50	.17
3000.	1.4	1.6	3.4	3000.	.96	141.05	-.18	-3.45	.16
3100.	1.4	1.6	3.5	3100.	1.14	146.94	-.26	-3.54	.17
3200.	1.3	1.5	3.5	3200.	1.49	153.01	-.23	-3.51	.16
3300.	1.3	1.5	3.5	3300.	1.49	158.72	-.22	-3.49	.15
3400.	1.3	1.5	3.5	3400.	1.19	164.14	-.23	-3.51	.15
3500.	1.3	1.5	3.5	3500.	1.18	169.84	-.26	-3.54	.15
3600.	1.3	1.5	3.5	3600.	.83	174.91	-.36	-3.63	.14
3700.	1.3	1.5	3.6	3700.	.53	180.14	-.44	-3.71	.14
3800.	1.3	1.5	3.7	3800.	-.47	185.33	-.39	-3.67	.14
3900.	1.3	1.5	3.7	3900.	-.96	190.54	-.57	-3.84	.15
4000.	1.3	1.5	3.8	4000.	-.73	196.44	-.72	-4.00	.15
4100.	1.3	1.6	4.0	4100.	-1.83	201.11	-.76	-4.03	.14
4200.	1.4	1.6	4.2	4200.	-2.44	206.22	-.99	-4.27	.14

Absolute Maximum Ratings

Ambient Operating

Temperature. . . . -54°C to +100°C

Storage

Temperature. . . . -62°C to +125°C

Max. DC Voltage. +25 Vdc

Max. Continuous RF

Input Power 1 Watt

Max. Short Term RF

Input Power
(1 Minute Max.) 4 Watts

Max. Peak Power

(3 μ sec Max.) 10 Watts

"S" Series Burn-in

Temperature. 125°C

Maximum

Case Temperature 125°C

FREQ MHz	111 dB	112 dB	121 dB	122 dB	131 dB	132 dB	141 dB	142 dB
500.	.22	-78.2	.75	37.1	.76	37.0	.23	-75.4
600.	.21	-84.9	.76	41.5	.76	41.3	.23	-80.7
700.	.20	-91.9	.76	47.0	.77	46.3	.23	-86.0
800.	.21	-99.1	.77	50.5	.77	50.5	.23	-91.5
900.	.21	-105.4	.77	56.0	.76	55.3	.24	-96.6
1000.	.21	-111.5	.76	62.0	.76	61.1	.24	-100.9
1100.	.21	-118.1	.75	67.1	.74	66.9	.24	-107.1
1200.	.22	-123.9	.75	71.5	.74	72.0	.24	-111.7
1300.	.22	-129.5	.73	78.5	.73	78.1	.25	-116.1
1400.	.22	-135.2	.72	84.6	.71	84.4	.25	-120.7
1500.	.22	-140.2	.72	90.4	.71	90.3	.25	-125.5
1600.	.22	-144.5	.72	96.9	.71	96.8	.26	-129.3
1700.	.22	-150.1	.71	102.8	.70	103.1	.26	-133.7
1800.	.22	-154.3	.71	109.0	.70	109.5	.26	-136.5
1900.	.22	-160.4	.72	115.1	.70	115.7	.26	-140.7
2000.	.21	-165.0	.71	120.9	.70	121.8	.26	-144.1
2100.	.23	-173.3	.70	126.2	.71	126.5	.28	-154.8
2200.	.22	-178.4	.71	131.2	.70	132.1	.27	-158.5
2300.	.21	-178.1	.71	137.8	.70	137.8	.27	-159.8
2400.	.20	-173.6	.69	142.1	.70	143.3	.26	-164.0
2500.	.19	-168.3	.68	148.9	.69	148.7	.26	-165.1
2600.	.18	-165.5	.69	154.9	.70	154.8	.25	-167.4
2700.	.17	-159.0	.67	160.5	.68	160.7	.24	-170.9
2800.	.16	-154.1	.68	166.2	.67	165.6	.24	-171.1
2900.	.15	-147.6	.67	172.4	.67	171.6	.22	-174.0
3000.	.14	-142.1	.67	178.1	.67	178.4	.21	-171.8
3100.	.13	-136.2	.67	-176.0	.66	-175.7	.20	-173.2
3200.	.12	-132.3	.67	-169.9	.67	-170.0	.21	-174.2
3300.	.12	-124.2	.67	-164.2	.67	-164.4	.20	-175.0
3400.	.11	-119.0	.67	-158.8	.66	-158.9	.20	-177.3
3500.	.11	-110.6	.67	-153.1	.66	-153.3	.20	-179.5
3600.	.11	-103.7	.66	-148.0	.66	-148.2	.21	-178.3
3700.	.11	-97.9	.65	-142.8	.65	-142.6	.21	-175.2
3800.	.12	-89.6	.66	-137.6	.65	-137.6	.21	-172.3
3900.	.12	-83.6	.64	-132.4	.64	-132.3	.22	-168.8
4000.	.13	-77.3	.63	-126.5	.63	-126.6	.22	-164.8
4100.	.14	-71.2	.63	-121.8	.61	-121.0	.22	-161.6
4200.	.15	-65.1	.61	-116.7	.61	-116.5	.23	-156.1
4300.	.17	-61.2	.62	-109.4	.62	-110.9	.24	-151.7
4400.	.18	-54.2	.60	-104.1	.60	-104.4	.24	-146.9