

# Surface Mount Dual Matched MMIC Amplifiers

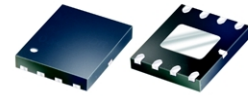
**NEW!**

**MERA-556**

**50Ω High Dynamic Range DC to 2.2 GHz**

## Features

- Two matched amplifiers in one package
- InGaP HBT IF and RF amplifier
- frequency range, DC to 2.2 GHz, usable to 4 GHz
- high gain, 20.5 dB typ. at 100 MHz
- up to +18 dBm typ. output power at 100 MHz
- high IP3, +35 dBm at 100 MHz
- low noise figure, 3.5 dB typ.
- low thermal resistance
- transient protected
- patent pending
- useable as balanced and push pull amplifier



CASE STYLE: DL1020  
PRICE: \$ 3.40 ea. QTY (25)

## Applications

- cellular
- catv
- VHF & UHF communication receivers & transmitters

## Electrical Specifications @ 25°C

Freq.* (GHz)	Gain, dB Typical A1, A2		Maximum Power (dBm)					Dynamic Range			VSWR (:1) Typ.		Maximum Rating**		DC Operating Power Pin 5, Pin 8			Thermal Resistance θ <sub>jc</sub> , typ. °C/W	matching <sup>1</sup>			
																			Amplitude Unbalance between 2 amps (dB)		Phase Unbalance between 2 amps (deg.)	
																			DC-2.2 GHz	2.2-4 GHz	DC-2.2 GHz	2.2-4 GHz
f <sub>L</sub> -f <sub>U</sub>	over frequency, GHz	Min. @ 2GHz	Output (1 dB Comp.) Typ. 0.1 GHz 1.0 GHz 2.0 GHz	Min. @ 1 GHz	Input (no dmg.)	NF (dB) Typ.	0.1 GHz	0.5 GHz	1.0 GHz	In	Out	I mA	P mW	Current (mA)	Volt Typ	Min	Max	DC-2.2 GHz Typ. Max.	2.2-4 GHz Typ. Max.	DC-2.2 GHz Typ.	2.2-4 GHz Typ.	
DC-2.2	20.5 20.2 19 16.7 13 16	18	17.6 16.6 16.5	13	3.5	35	35.5	34	1.2	1.4	120	650	65	4.9	4.2	5.5	133	0.1 0.3 0.1 —	0.6	1.5		

\* Guaranteed specification DC-2.2GHz. Low frequency cutoff determined by external coupling capacitors.

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

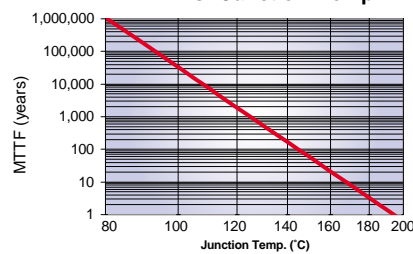
These ratings are not intended for continuous normal operation. Reliability predictions and normal operating conditions are applicable at current specified.

1. For test method, see application note AN-60-032

## Pin Connections

PORT	
RF IN 1	1
RF OUT 1	8
RF IN 2	4
RF OUT 2	5
DC 1	8
DC 2	5
GROUND	2,3,6,7 and paddle

## MTTF vs. Junction Temp.



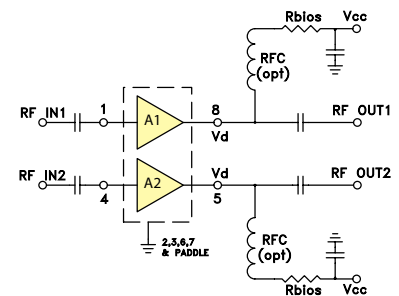
## Maximum Ratings<sup>2</sup>

Operating Case Temperature -45°C to 85°C

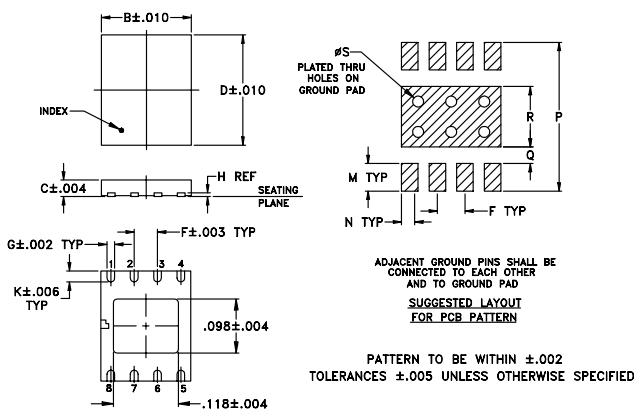
Storage Temperature -55°C to 100°C

2. See application note AN-60-032 for adequate heat sinking of paddle.

## typical biasing configuration



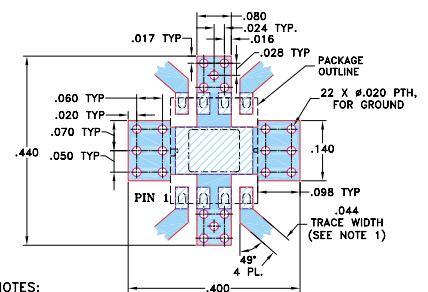
## Outline Drawing



## Outline Dimensions (inch)

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	wt.
—	.193	.035	.236	—	.050	.017	.008	—	.024	—	.050	.030	.270	.030	.110	.020	grams
—	4.90	0.90	6.00	—	1.27	0.43	0.20	—	0.60	—	1.27	0.76	6.86	0.76	2.79	0.51	.08

## Demo Board MCL P/N: TB-293 Suggested PCB Layout (PL-164)



NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350 WITH DIELECTRIC THICKNESS .020 ± .0015. COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

■ DENOTES PCB COPPER LAYOUT

■ DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

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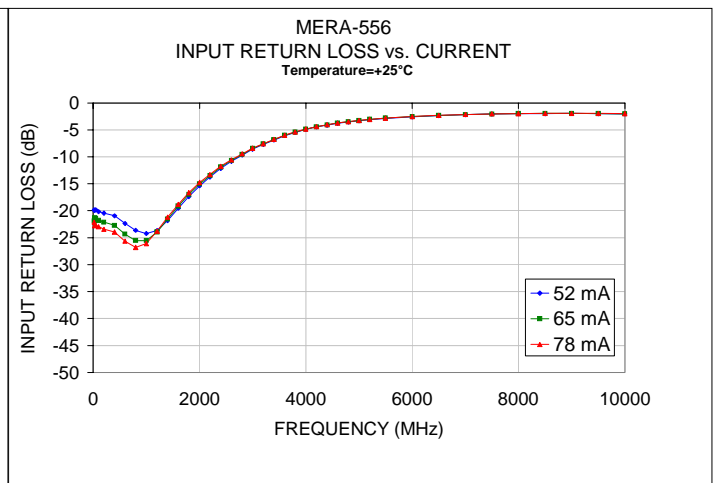
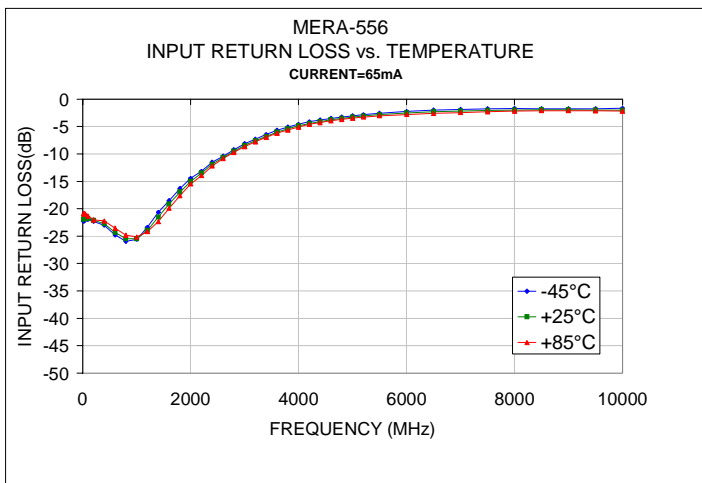
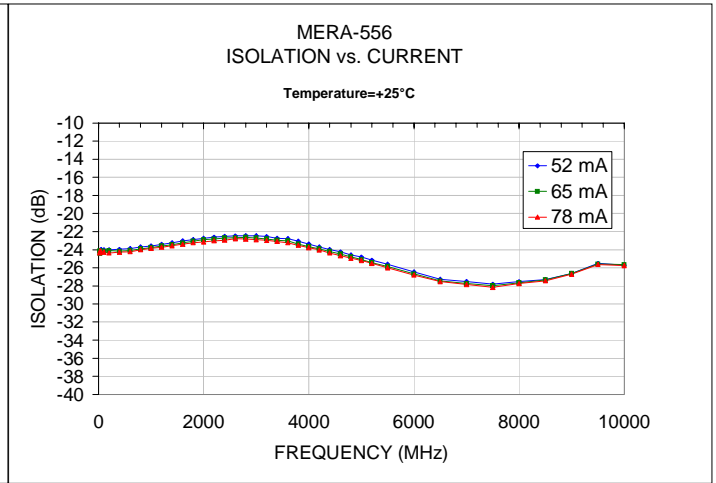
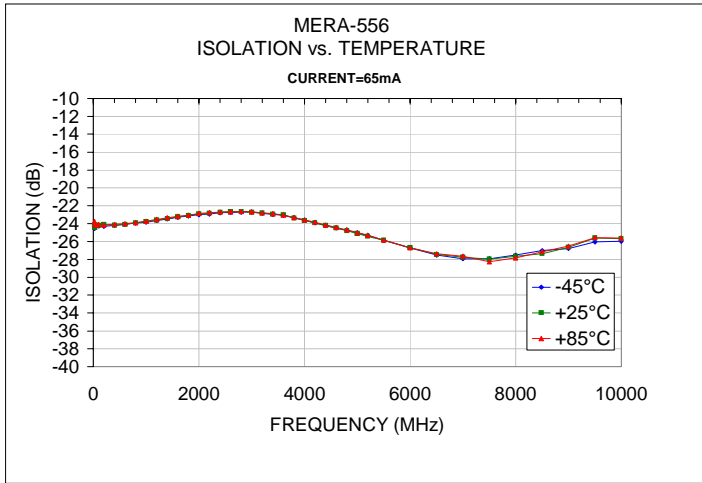
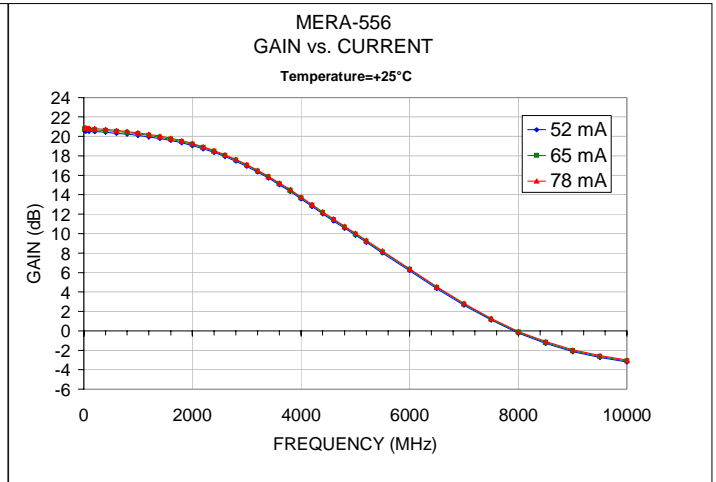
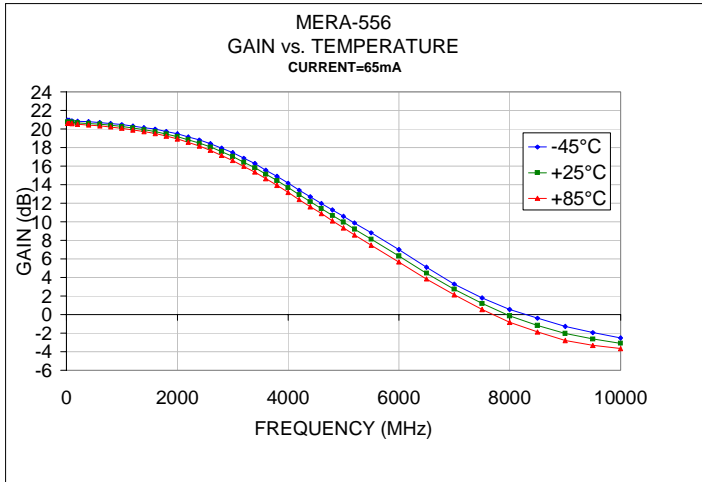
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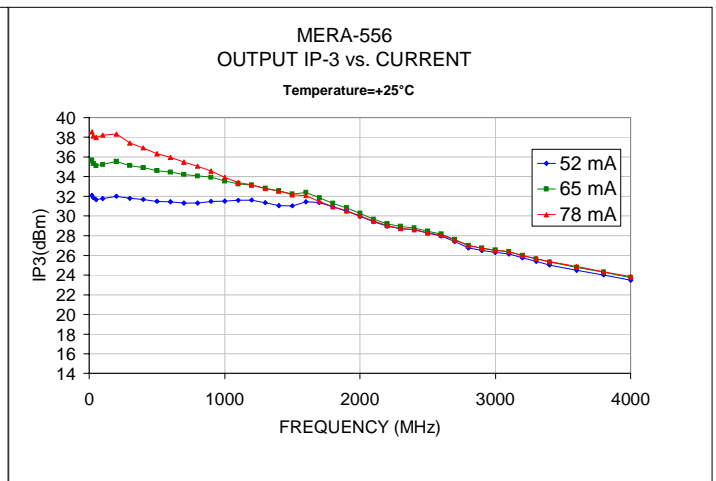
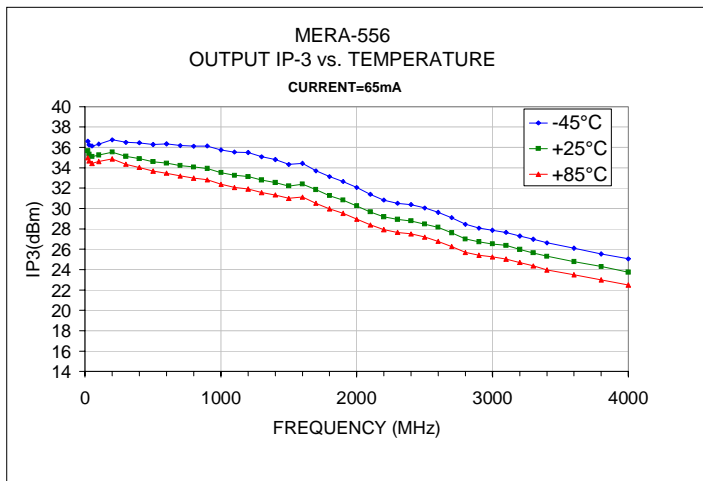
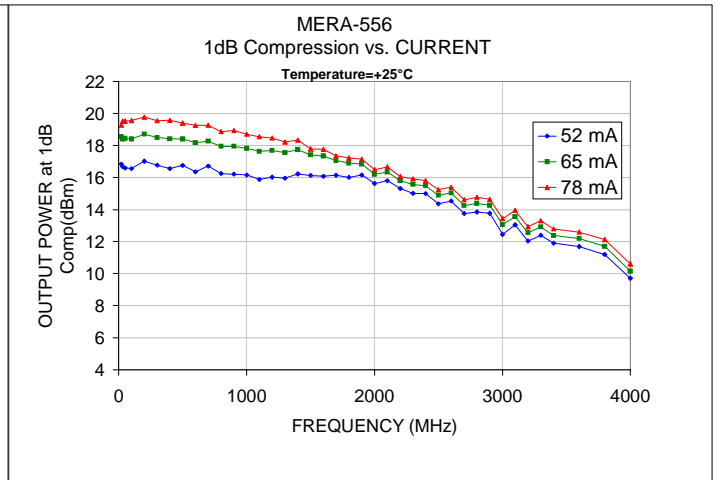
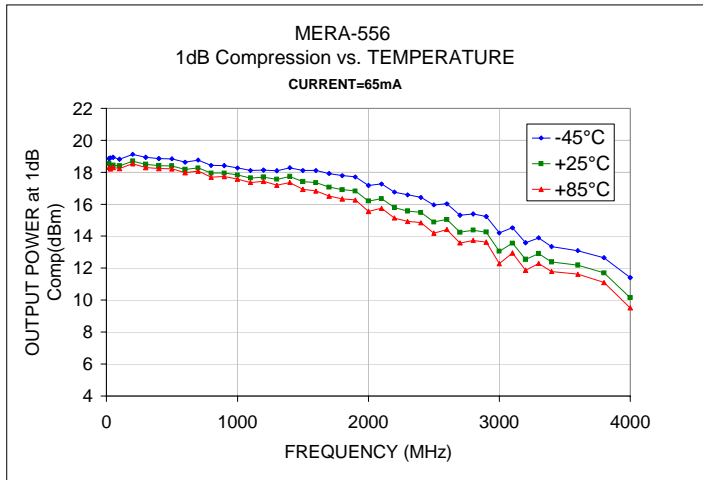
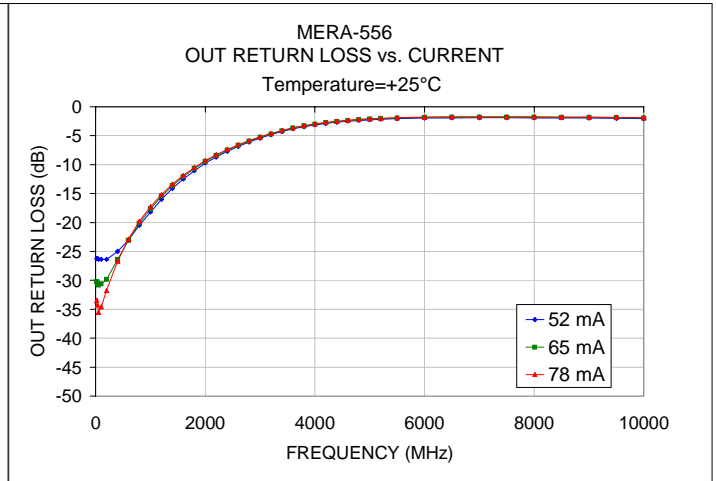
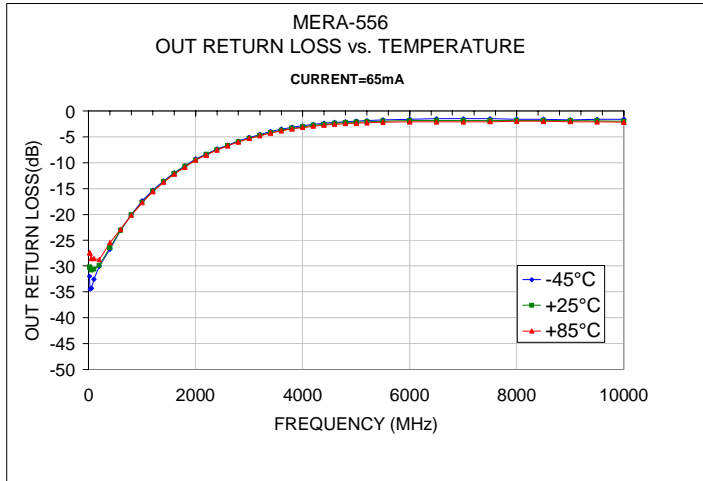
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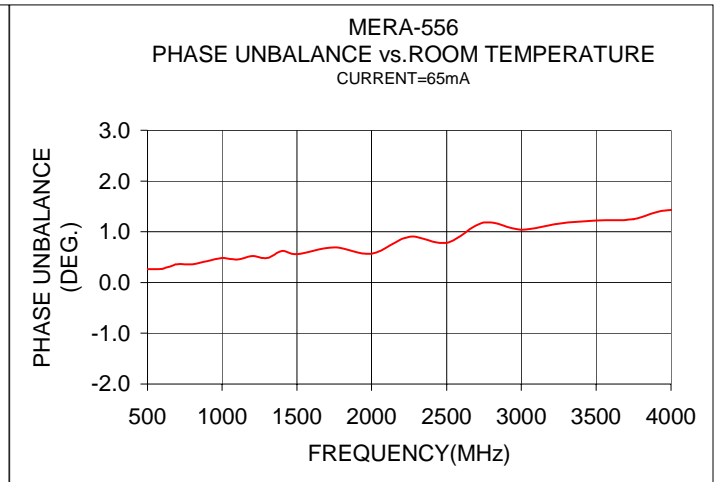
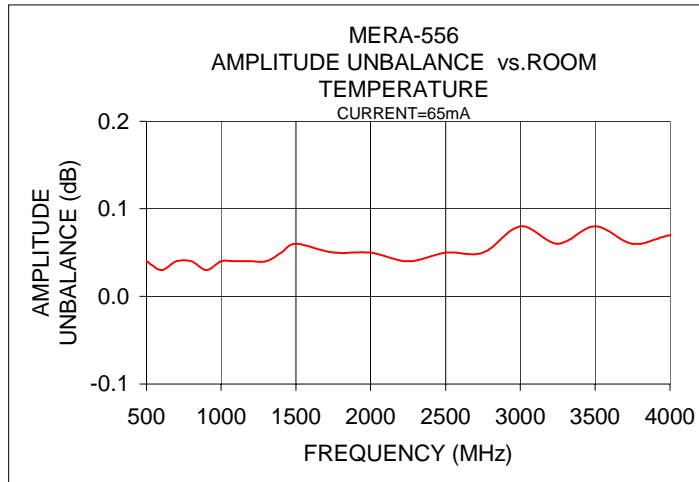
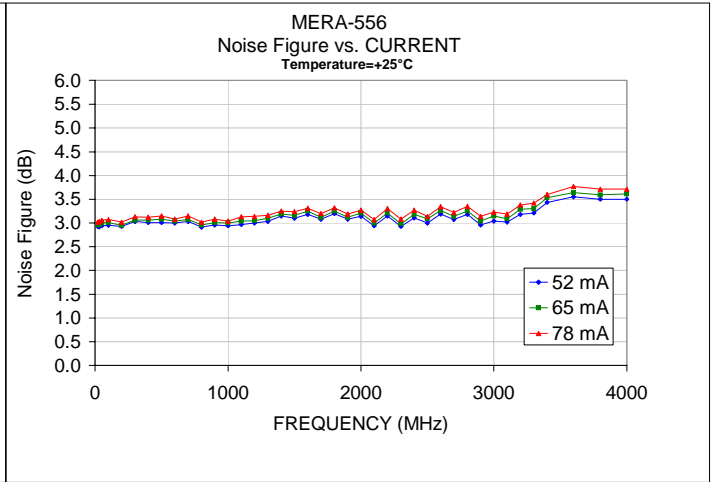
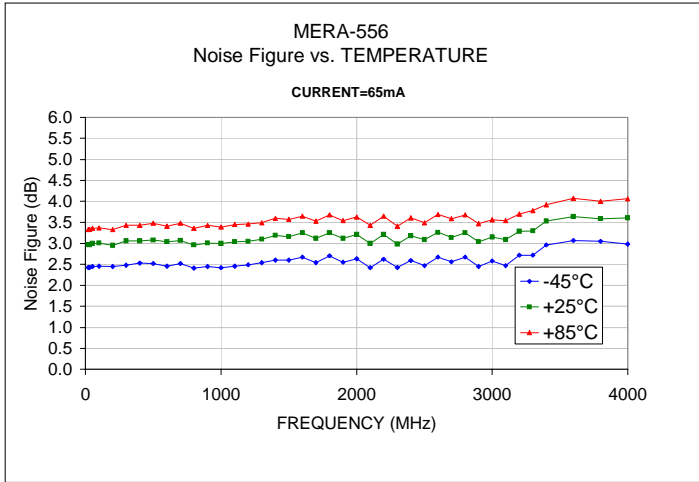
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REV. OR  
M94145  
MERA-556  
ED-11699/6  
WZ/TD/CP  
041103







Freq.	S11 (Input Return Loss)			S21 (Power Gain)			S12 (Isolation Out-in)			S22 (Output Return Loss)			K
	MHz	dB	Mag	ngle(deg)	dB	Mag	Angle	dB	Mag	Angle	dB	Mag	
20.00	-21.39	0.09	-4.19	20.46	10.54	176.43	-23.82	0.06	-1.66	-27.37	0.04	6.78	1.07
30.00	-21.19	0.09	-2.55	20.47	10.56	175.50	-23.88	0.06	-3.83	-28.73	0.04	3.82	1.07
50.00	-21.14	0.09	-6.93	20.48	10.57	173.09	-23.83	0.06	-4.64	-27.94	0.04	-12.32	1.07
100.00	-21.32	0.09	-15.93	20.46	10.54	166.72	-23.94	0.06	-9.24	-28.48	0.04	-28.04	1.08
200.00	-21.54	0.08	-32.27	20.42	10.50	153.77	-23.92	0.06	-18.16	-28.02	0.04	-56.77	1.08
400.00	-21.96	0.08	-63.17	20.36	10.42	128.21	-23.84	0.06	-35.87	-25.40	0.05	-109.59	1.07
600.00	-23.16	0.07	-98.98	20.24	10.28	102.60	-23.77	0.06	-53.89	-23.08	0.07	-155.46	1.07
800.00	-24.14	0.06	-139.41	20.13	10.15	76.98	-23.62	0.07	-71.95	-20.35	0.10	166.19	1.07
1000.00	-24.56	0.06	174.27	20.02	10.02	51.39	-23.41	0.07	-90.60	-17.87	0.13	133.62	1.06
1200.00	-23.21	0.07	127.98	19.87	9.85	25.75	-23.27	0.07	-109.22	-15.72	0.16	103.63	1.05
1400.00	-21.05	0.09	88.55	19.71	9.67	0.03	-23.12	0.07	-128.28	-13.83	0.20	75.87	1.03
1600.00	-19.08	0.11	55.28	19.51	9.45	-25.63	-22.92	0.07	-147.35	-12.27	0.24	49.16	1.02
1800.00	-16.83	0.14	24.50	19.28	9.20	-51.43	-22.75	0.07	-167.19	-10.89	0.29	22.95	1.01
2000.00	-15.08	0.18	-4.31	19.00	8.91	-77.24	-22.56	0.07	173.12	-9.78	0.32	-3.06	1.00
2200.00	-13.44	0.21	-30.81	18.69	8.60	-103.03	-22.42	0.08	152.77	-8.75	0.37	-29.28	0.99
2400.00	-11.80	0.26	-57.24	18.32	8.24	-128.96	-22.32	0.08	131.97	-7.75	0.41	-55.51	0.98
2600.00	-10.39	0.30	-83.13	17.90	7.85	-154.81	-22.34	0.08	110.95	-6.82	0.46	-81.65	0.97
2800.00	-9.07	0.35	-108.64	17.42	7.43	179.11	-22.33	0.08	89.90	-6.00	0.50	-108.01	0.96
3000.00	-7.90	0.40	-133.57	16.84	6.95	153.22	-22.39	0.08	68.66	-5.28	0.54	-134.00	0.96
3200.00	-6.87	0.45	-158.01	16.20	6.46	127.58	-22.57	0.07	47.47	-4.59	0.59	-159.46	0.96
3400.00	-5.98	0.50	178.29	15.47	5.94	102.41	-22.85	0.07	26.22	-3.97	0.63	175.77	0.96
3600.00	-5.22	0.55	155.16	14.70	5.43	77.61	-23.09	0.07	4.90	-3.41	0.68	152.12	0.95
3800.00	-4.54	0.59	132.42	13.89	4.95	53.17	-23.48	0.07	-15.61	-2.96	0.71	128.94	0.95
4000.00	-4.04	0.63	110.41	13.00	4.47	29.29	-23.97	0.06	-36.35	-2.60	0.74	106.83	0.96
4200.00	-3.62	0.66	88.99	12.11	4.03	6.03	-24.49	0.06	-55.64	-2.33	0.76	85.71	0.97
4400.00	-3.28	0.69	68.19	11.22	3.64	-16.65	-24.95	0.06	-75.19	-2.10	0.79	65.33	0.97
4600.00	-3.03	0.71	47.93	10.34	3.29	-38.87	-25.50	0.05	-93.69	-1.96	0.80	45.76	1.00
4800.00	-2.83	0.72	28.10	9.45	2.97	-60.46	-25.99	0.05	-111.79	-1.83	0.81	26.91	1.02
5000.00	-2.68	0.73	8.64	8.62	2.70	-81.52	-26.49	0.05	-129.50	-1.74	0.82	8.49	1.06
5200.00	-2.54	0.75	-10.46	7.82	2.46	-102.56	-26.91	0.05	-146.60	-1.67	0.83	-9.57	1.10
5500.00	-2.39	0.76	-38.48	6.69	2.16	-133.54	-27.43	0.04	-171.94	-1.66	0.83	-36.36	1.18
6000.00	-2.26	0.77	-84.27	4.87	1.75	175.77	-27.81	0.04	146.49	-1.70	0.82	-80.16	1.34
6500.00	-2.14	0.78	-128.60	3.15	1.44	126.12	-28.08	0.04	100.53	-1.77	0.82	-123.84	1.49
7000.00	-2.06	0.79	-171.59	1.42	1.18	77.03	-28.28	0.04	55.77	-1.92	0.80	-166.81	1.74
7500.00	-1.88	0.81	147.32	-0.17	0.98	30.09	-28.78	0.04	9.98	-1.97	0.80	150.90	1.94
8000.00	-1.76	0.82	107.39	-1.48	0.84	-14.00	-30.47	0.03	-32.81	-2.08	0.79	112.00	2.56
8500.00	-1.75	0.82	68.76	-2.35	0.76	-59.07	-30.29	0.03	-72.18	-1.83	0.81	71.67	2.44
9000.00	-1.77	0.82	30.06	-3.02	0.71	-103.47	-30.11	0.03	-112.54	-1.87	0.81	32.26	2.57
9500.00	-1.91	0.80	-9.46	-3.52	0.67	-148.40	-30.50	0.03	-158.55	-2.01	0.79	-7.03	3.10
10000.00	-2.16	0.78	-49.27	-3.80	0.65	166.53	-30.87	0.03	168.72	-2.18	0.78	-46.19	4.00