

REPLACEMENT PART REFERENCE GUIDE, MNA-3+

AN-60-092

ORIGINAL PART:

MNA-3+

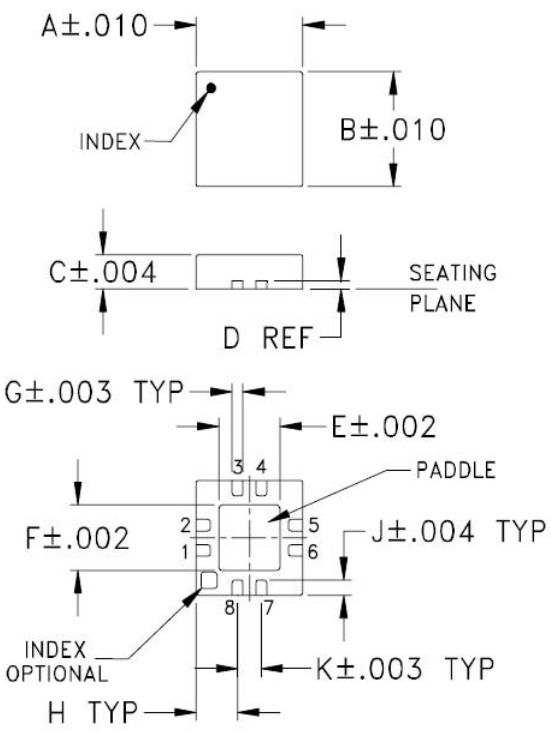
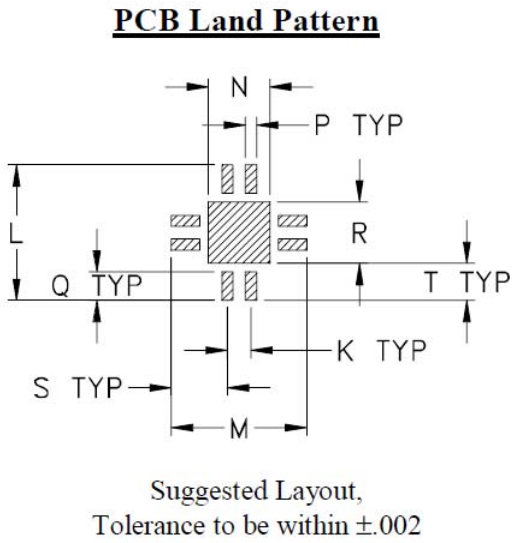
REPLACEMENT PART:

MNA-3A+



Replacement Part has been judged by Mini-Circuits Engineering as a suitable replacement to Original Part.

MECHANICAL DIMENSIONS & PCB LAND PATTERN

ORIGINAL PART: MNA-3+	REPLACEMENT PART: MNA-3A+
<p>Case Style DQ849 (No Change)</p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="159 751 706 1480">  </div> <div data-bbox="787 751 1299 1291"> <p>PCB Land Pattern</p>  <p>Suggested Layout, Tolerance to be within ±.002</p> </div> </div>	
<p>Marking</p> <p>MNA3</p>	<p>Marking</p> <p>MN3A</p>

CONCLUSION:1) **FORM-FIT-FUNCTIONAL COMPATIBLE_a:**

Replacement part is Form, Fit compatible. Following is a summary of changes/improvements:

Typical performance: See paragraphs 2 and 3

Min/Max Specifications, Thermal Resistance and Max Tj- see below:

Parameter	Original Part (MNA-3+)	Replacement Part (MNA-3A+)
Gain at 2 GHz	15	16.5
DC Current at Vs=5V (max)	40	43
Thermal Resistance	78	70
DC Voltage on pins 2 &5	10	1
Power Dissipation	500mW	650mW

2) PERFORMANCE COMPARISON_a (TYPICAL), DC Voltage=5V:

5V	Frequency (MHz)		MNA-3A+ Data of 9 Units on TB-186-3A+			MNA-3+ Data of 1 Unit on TB-186+		
	From	To	Min.	Avg.	Max.	Min.	Avg.	Max.
GAIN (dB)	500	500	12.9	13.2	14.5	13.0	13.0	13.0
	750	750	15.5	15.8	16.5	14.8	14.8	14.8
	1000	1000	16.4	16.6	17.0	15.2	15.2	15.2
	1500	1500	16.8	17.0	17.2	15.4	15.4	15.4
	2000	2000	16.5	16.7	16.8	15.0	15.0	15.0
	2500	2500	15.5	15.6	15.7	12.8	12.8	12.8
DIRECTIVITY (dB)	500	500	25.4	25.9	26.3	20.1	20.1	20.1
	750	750	19.3	20.0	20.4	17.2	17.2	17.2
	1000	1000	17.3	17.7	18.0	16.4	16.4	16.4
	1500	1500	16.3	16.5	16.6	15.5	15.5	15.5
	2000	2000	16.8	16.9	17.0	16.0	16.0	16.0
	2500	2500	18.7	18.9	19.2	20.4	20.4	20.4
INPUT RETURN LOSS (dB)	500	500	4.4	6.0	6.4	3.3	3.3	3.3
	750	750	14.1	15.1	15.5	8.3	8.3	8.3
	1000	1000	24.4	28.1	33.1	11.0	11.0	11.0
	1500	1500	16.7	17.2	17.8	11.8	11.8	11.8
	2000	2000	19.4	19.9	21.0	20.0	20.0	20.0
	2500	2500	14.2	15.2	15.8	13.0	13.0	13.0
OUTPUT RETURN LOSS (dB)	500	500	15.0	15.4	15.8	9.9	9.9	9.9
	750	750	22.3	23.0	24.1	13.8	13.8	13.8
	1000	1000	30.7	32.0	33.2	17.8	17.8	17.8
	1500	1500	25.1	26.9	28.5	18.3	18.3	18.3
	2000	2000	20.2	21.0	21.7	13.6	13.6	13.6
	2500	2500	18.5	19.2	19.8	13.3	13.3	13.3
OUTPUT POWER AT 1dB COMPRESSION (dBm)	500	500	11.6	11.8	12.6	10.7	10.7	10.7
	750	750	11.6	11.8	12.1	10.9	10.9	10.9
	1000	1000	11.0	11.2	11.5	10.4	10.4	10.4
	1500	1500	10.3	10.5	10.8	9.8	9.8	9.8
	2000	2000	9.5	9.7	10.0	9.3	9.3	9.3
	2500	2500	9.5	9.7	10.0	10.1	10.1	10.1
OIP3 (dBm)	500	500	23.3	23.6	24.5	22.5	22.5	22.5
	750	750	24.1	24.4	25.0	23.1	23.1	23.1
	1000	1000	22.9	23.2	23.5	22.3	22.3	22.3
	1500	1500	22.0	22.3	22.6	21.5	21.5	21.5
	2000	2000	21.0	21.2	21.5	20.8	20.8	20.8
	2500	2500	21.0	21.2	21.5	22.1	22.1	22.1
NOISE FIGURE (dB)	500	500	4.1	4.3	4.5	4.8	4.8	4.8
	750	750	3.8	4.0	4.1	4.6	4.6	4.6
	1000	1000	3.8	3.8	3.9	4.7	4.7	4.7
	1500	1500	3.8	3.9	3.9	4.9	4.9	4.9
	2000	2000	3.9	3.9	4.0	5.1	5.1	5.1
	2500	2500	4.0	4.0	4.1	5.4	5.4	5.4
CURRENT (mA)	DC	DC	33.8	34.3	35.3	31.0	31.0	31.0

3) PERFORMANCE COMPARISON_a (TYPICAL), DC Voltage=2.8V:

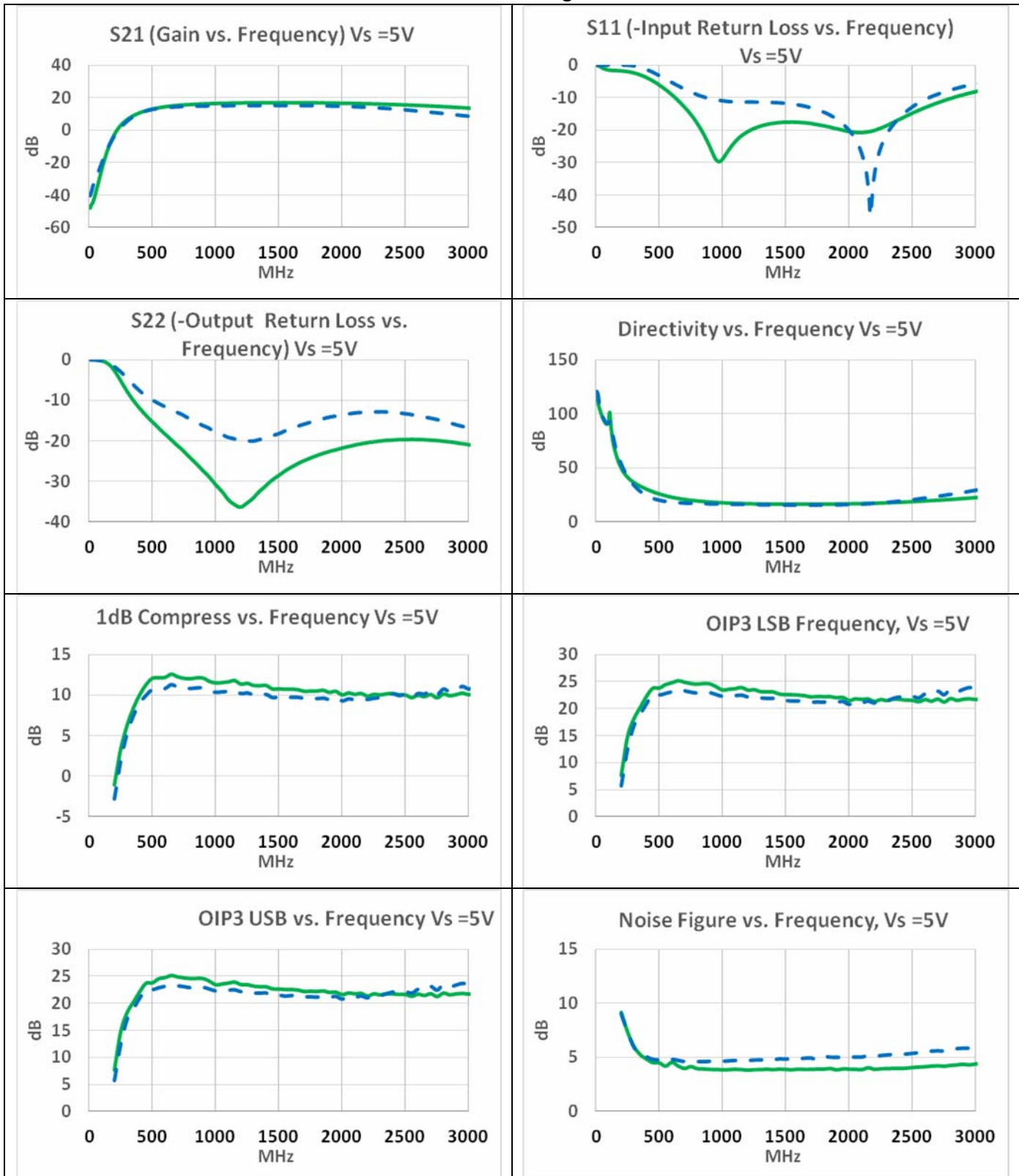
2.8V	Frequency (MHz)		MNA-3A+ Data of 9 Units on TB-186-3A+			MNA-3+ Data of 1 Unit on TB-186+		
	From	To	Min.	Avg.	Max.	Min.	Avg.	Max.
GAIN (dB)	500	500	12.0	12.4	13.8	12.3	12.3	12.3
	750	750	14.4	14.7	15.5	13.9	13.9	13.9
	1000	1000	15.2	15.4	16.0	14.2	14.2	14.2
	1500	1500	15.5	15.7	16.0	14.4	14.4	14.4
	2000	2000	15.2	15.3	15.5	14.1	14.1	14.1
	2500	2500	14.2	14.3	14.6	11.7	11.7	11.7
DIRECTIVITY (dB)	500	500	25.9	26.6	27.1	21.0	21.0	21.0
	750	750	20.0	20.8	21.2	18.0	18.0	18.0
	1000	1000	18.0	18.5	18.8	17.0	17.0	17.0
	1500	1500	16.7	16.9	17.1	15.3	15.3	15.3
	2000	2000	16.7	16.8	16.9	15.0	15.0	15.0
	2500	2500	17.7	17.9	18.1	19.0	19.0	19.0
INPUT RETURN LOSS (dB)	500	500	4.7	6.1	6.5	3.3	3.3	3.3
	750	750	14.2	14.6	14.8	8.3	8.3	8.3
	1000	1000	21.5	23.6	26.8	11.0	11.0	11.0
	1500	1500	17.0	17.6	18.3	11.7	11.7	11.7
	2000	2000	18.6	19.3	20.3	19.9	19.9	19.9
	2500	2500	13.8	14.9	15.6	12.0	12.0	12.0
OUTPUT RETURN LOSS(dB)	500	500	13.9	14.3	14.9	10.3	10.3	10.3
	750	750	18.8	19.4	20.8	15.2	15.2	15.2
	1000	1000	22.4	23.2	25.2	22.5	22.5	22.5
	1500	1500	22.9	23.4	23.9	18.2	18.2	18.2
	2000	2000	18.0	18.4	18.9	11.2	11.2	11.2
	2500	2500	15.0	15.5	16.1	9.5	9.5	9.5
OUTPUT POWER AT 1dB COMPRESSION (dBm)	500	500	10.0	10.2	10.9	9.1	9.1	9.1
	750	750	10.4	10.6	10.9	9.3	9.3	9.3
	1000	1000	10.0	10.2	10.3	8.7	8.7	8.7
	1500	1500	9.3	9.5	9.7	8.0	8.0	8.0
	2000	2000	8.6	8.8	9.0	7.4	7.4	7.4
	2500	2500	8.4	8.6	8.8	8.3	8.3	8.3
OIP3 (dBm)	500	500	21.0	21.3	22.3	20.7	20.7	20.7
	750	750	21.7	22.0	22.5	21.1	21.1	21.1
	1000	1000	21.0	21.2	21.6	20.4	20.4	20.4
	1500	1500	20.2	20.4	20.7	19.6	19.6	19.6
	2000	2000	19.4	19.6	19.9	18.9	18.9	18.9
	2500	2500	19.2	19.4	19.7	20.2	20.2	20.2
NOISE FIGURE (dB)	500	500	4.2	4.4	4.5	4.9	4.9	4.9
	750	750	4.0	4.1	4.2	4.8	4.8	4.8
	1000	1000	3.9	4.0	4.0	4.8	4.8	4.8
	1500	1500	4.0	4.0	4.0	5.0	5.0	5.0
	2000	2000	4.0	4.0	4.1	5.1	5.1	5.1
	2500	2500	4.1	4.2	4.2	5.5	5.5	5.5
CURRENT (mA)	DC	DC	31.9	32.6	33.4	28.4	28.4	28.4

4) PERFORMANCE COMPARISON CURVES_a (TYPICAL), DC Supply=5V:



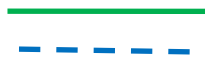
Data of Replacement Part

Data of Original Part



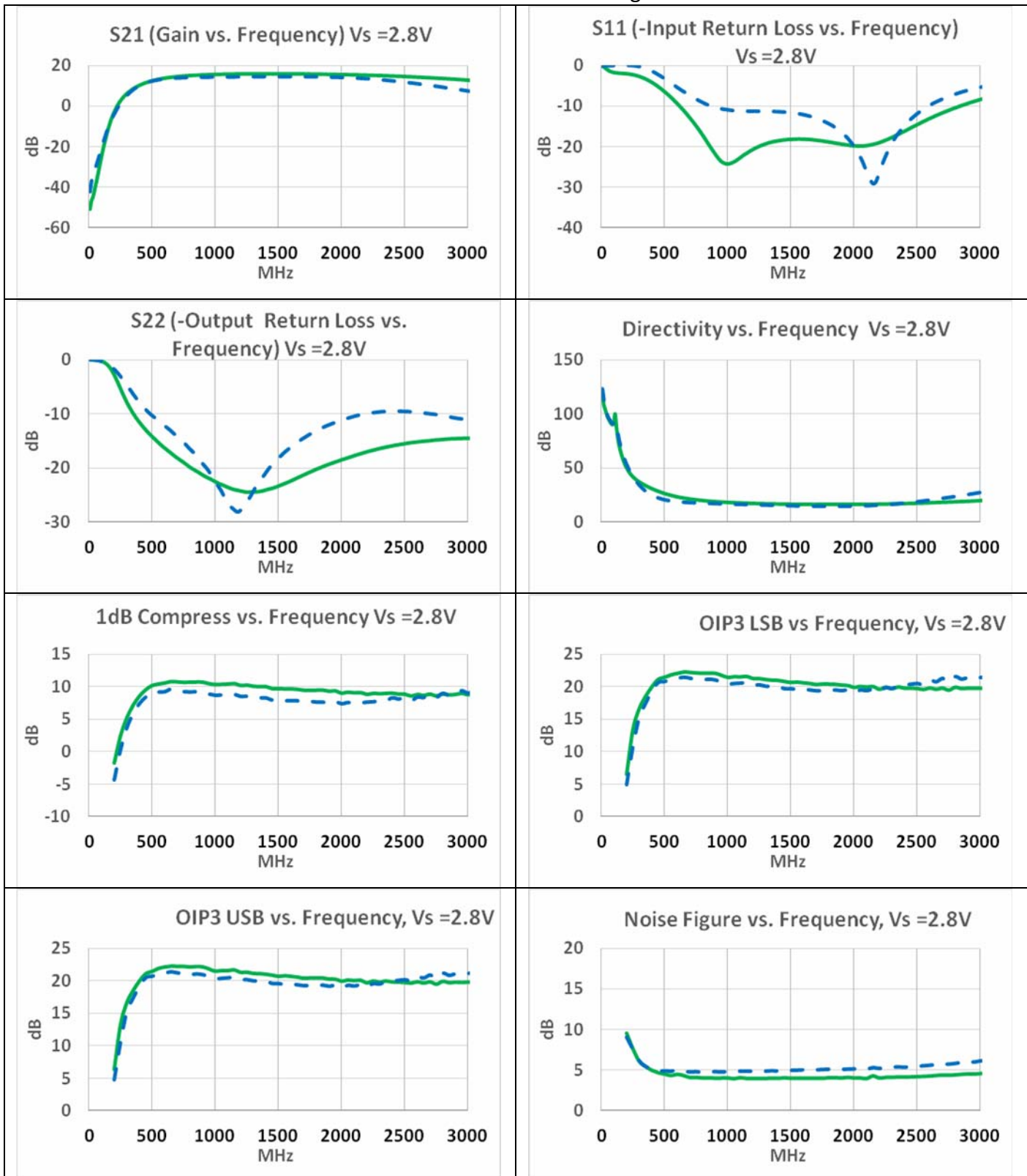
5) PERFORMANCE COMPARISON CURVES_a (TYPICAL),DC

Supply=2.8V:



Data of Replacement Part

Data of Original Part



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