

REPLACEMENT PART REFERENCE GUIDE, MNA-4+

AN-60-082

ORIGINAL PART:

MNA-4+

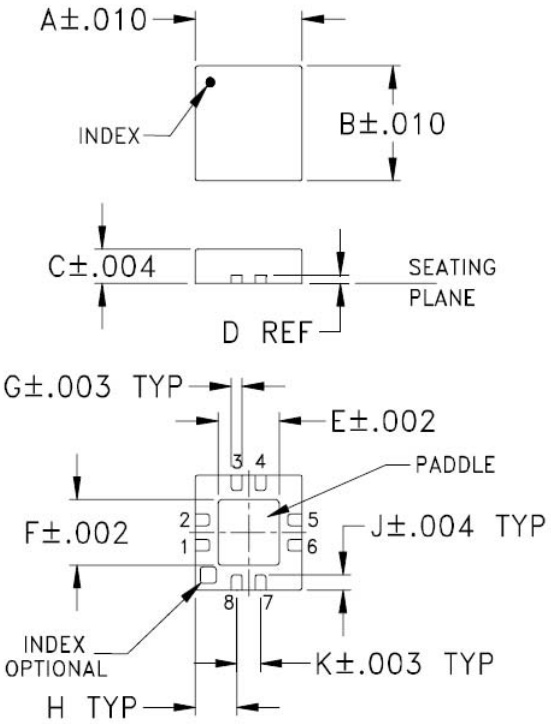
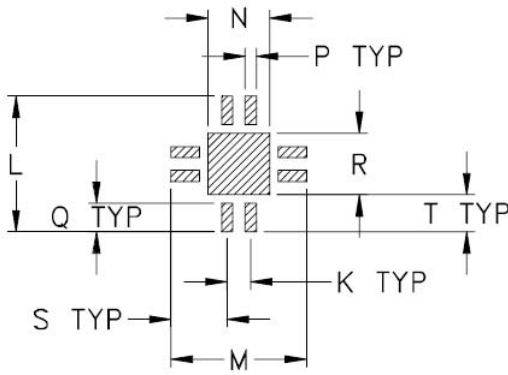
REPLACEMENT PART:

MNA-4A+



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

MECHANICAL DIMENSIONS & PCB LAND PATTERN

ORIGINAL PART: MNA-4+	REPLACEMENT PART: MNA-4A+
Case Style DQ849 (No Change)	
<div style="display: flex; justify-content: space-around;"> <div style="width: 45%;">  <p> $A \pm .010$ INDEX $B \pm .010$ $C \pm .004$ D REF SEATING PLANE $G \pm .003$ TYP $E \pm .002$ PADDLE $F \pm .002$ INDEX OPTIONAL H TYP $J \pm .004$ TYP $K \pm .003$ TYP </p> </div> <div style="width: 45%;"> <p style="text-align: center;"><u>PCB Land Pattern</u></p>  <p style="text-align: center;">Suggested Layout, Tolerance to be within $\pm .002$</p> </div> </div>	
<p>Marking</p> <p>MNA4</p>	<p>Marking</p> <p>MN4A</p>

Notes:
a. Suitability for model replacement within a particular system must be determined by and is solely the responsibility of the customer based on, among other things, electrical performance criteria, stimulus conditions, application, compatibility with other components and environmental conditions and stresses.

CONCLUSION:

1) FORM-FIT-FUNCTIONAL COMPATIBLE_a:

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

Typical performance comparison: See paragraphs 2 to 5

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

Parameter	Original Part (MNA-4+)	Replacement Part (MNA-4A+)
Gain-Min at 2 GHz (dB) & Vs=5V	14	16
Thermal resistance (°C/W)	78	50
Input Power (5 minutes max)	23	24
Maximum DC Voltage on pins 2 & 5 (V)	10	1

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2) PERFORMANCE COMPARISON^a (TYPICAL), DC Voltage=5V:

Parameter	Freq.	MNA-4+ (Original Part) Qty-1	MNA-4A+ (Replacement Part) 5 units on TB Qty-5		
			Min	Average	Max
Gain (dB)	500	13.7	16.0	16.0	16.1
	750	15.8	17.3	17.4	17.4
	1000	16.2	17.8	17.8	17.9
	1500	16.4	18.1	18.1	18.2
	2000	15.9	17.8	18.0	18.1
	2500	14.1	17.0	17.2	17.3
Input R.Loss (dB)	500	4.4	5.2	5.3	5.4
	750	10.4	10.1	10.2	10.4
	1000	15.4	14.6	14.8	15.0
	1500	14.0	24.0	25.2	25.8
	2000	15.6	31.1	33.5	35.5
	2500	23.0	29.8	32.7	36.6
Output R.Loss (dB)	500	4.9	12.9	13.1	13.4
	750	9.8	22.0	22.6	23.1
	1000	14.7	25.9	27.3	29.7
	1500	18.9	18.8	19.8	20.4
	2000	14.8	15.6	16.5	17.1
	2500	13.1	15.0	15.7	16.3
P1dB (dBm)	500	18.3	18.7	18.7	18.9
	750	19.3	18.8	18.9	19.0
	1000	18.7	18.6	18.7	18.8
	1500	17.7	18.1	18.2	18.3
	2000	16.9	17.2	17.3	17.4
	2500	16.8	16.8	16.9	17.1
Output IP3 Min of USB & LSB (dBm)	500	30.3	30.9	31.1	31.1
	750	31.3	31.3	31.4	31.6
	1000	30.1	30.8	30.9	31.1
	1500	29.7	29.7	29.9	30.0
	2000	28.9	28.5	28.7	28.8
	2500	29.4	27.9	28.2	28.3
NF (dB)	500	4.7	4.7	4.8	4.9
	750	4.8	4.4	4.6	4.7
	1000	4.7	4.2	4.4	4.4
	1500	5.0	4.3	4.4	4.5
	2000	5.0	4.3	4.4	4.5
	2500	5.2	4.3	4.4	4.5
Directivity (dB)	500	26.0	31.8	32.1	32.4
	750	21.1	30.8	31.4	31.8
	1000	19.3	26.2	26.8	27.1
	1500	17.1	21.5	22.1	22.4
	2000	16.5	19.4	19.9	20.2
	2500	18.4	19.0	19.5	19.7
DC Current (mA)	DC	77	74	75	76

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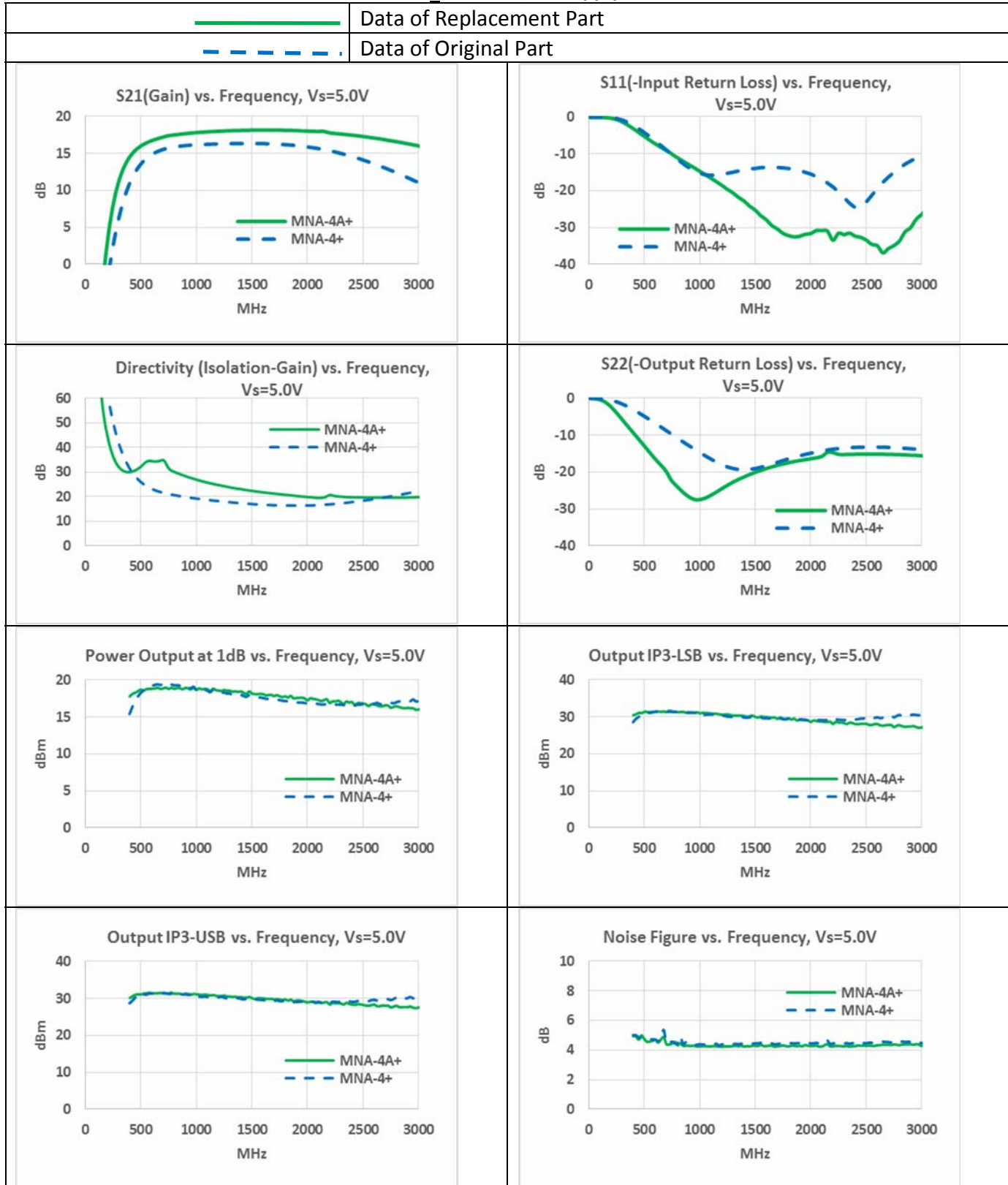
3) PERFORMANCE COMPARISON_a (TYPICAL), DC Voltage=2.8V:

Parameter	Freq.	MNA-4+ (Original Part) Qty-1	MNA-4A+ (Replacement Part) 5 units on TB Qty-5		
		Min	Average	Max	
Gain (dB)	500	12.3	14.2	14.3	14.3
	750	14.2	15.1	15.2	15.3
	1000	14.4	15.4	15.4	15.5
	1500	14.6	15.4	15.4	15.6
	2000	14.4	14.9	15.0	15.2
	2500	12.7	14.2	14.3	14.4
Input R.Loss (dB)	500	4.4	5.5	5.6	5.7
	750	10.4	10.3	10.4	10.6
	1000	15.2	14.5	14.6	14.7
	1500	14.1	22.2	22.6	23.4
	2000	15.3	26.9	30.6	33.8
	2500	18.6	30.4	33.3	35.9
	3500	5.3	15.4	16.3	17.0
	4500	2.9	8.0	8.5	9.1
Output R.Loss (dB)	500	4.6	12.1	12.4	12.6
	750	8.4	13.3	13.6	13.8
	1000	11.0	12.7	12.9	13.0
	1500	12.8	11.7	11.9	12.0
	2000	11.1	11.2	11.4	11.6
	2500	9.2	11.3	11.6	11.7
	3500	8.8	12.6	13.1	14.0
	4500	7.5	11.8	12.3	12.6
P1dB (dBm)	500	13.2	10.7	11.0	11.3
	750	14.5	11.5	11.7	12.0
	1000	14.6	11.8	12.0	12.2
	1500	14.4	11.9	12.1	12.3
	2000	13.9	12.0	12.2	12.4
	2500	14.0	12.1	12.2	12.4
Output IP3 Min of USB & LSB (dBm)	500	24.7	22.8	23.1	23.4
	750	25.6	23.3	23.5	23.8
	1000	25.3	23.5	23.7	24.0
	1500	25.7	23.4	23.5	23.8
	2000	25.6	23.4	23.5	23.7
	2500	25.8	23.2	23.3	23.4
NF (dB)	500	4.8	4.9	5.0	5.0
	750	4.9	4.6	4.7	4.7
	1000	4.9	4.4	4.5	4.5
	1500	5.0	4.5	4.5	4.6
	2000	5.1	4.5	4.5	4.6
	2500	5.2	4.5	4.5	4.6
Directivity (dB)	500	28.2	35.3	35.8	36.6
	750	22.8	30.0	30.7	31.1
	1000	20.4	26.2	26.9	27.3
	1500	17.3	22.4	23.1	23.4
	2000	15.8	20.5	21.1	21.4
	2500	17.2	19.7	20.3	20.6
DC Current (mA)	DC	71.1	69.6	70.6	71.7

Notes:

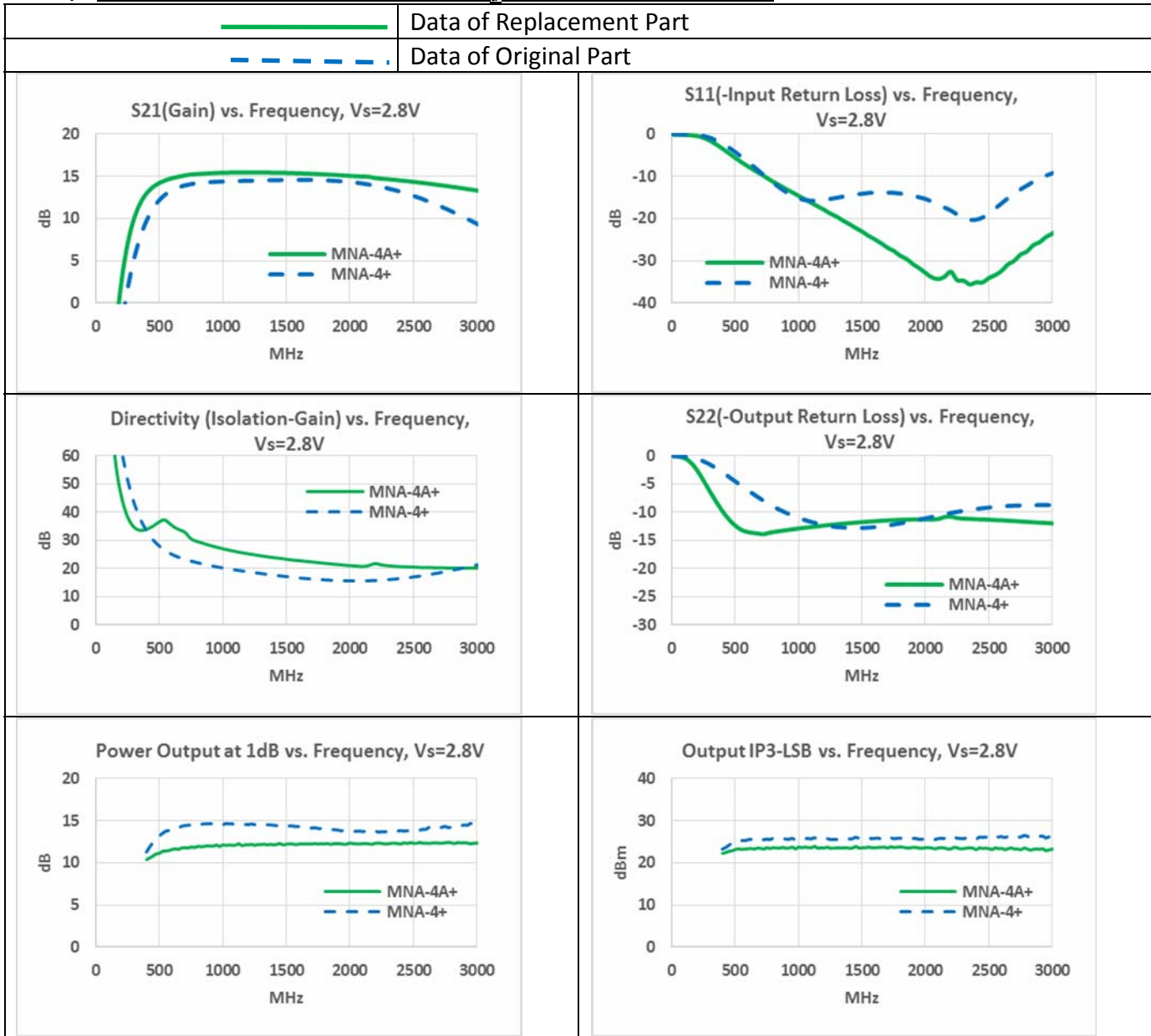
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4) PERFORMANCE COMPARISON CURVES_a (TYPICAL), DC Supply=5V:

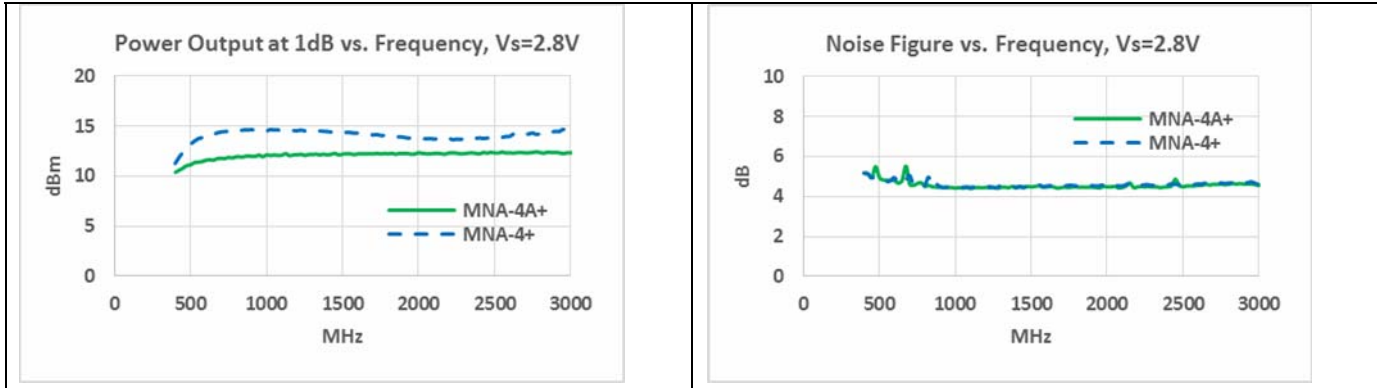


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5) PERFORMANCE COMPARISON CURVES_a (TYPICAL), DC Supply=2.8V:



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