

REPLACEMENT PART REFERENCE GUIDE, MNA-7+

AN-60-085

ORIGINAL PART:

MNA-7+

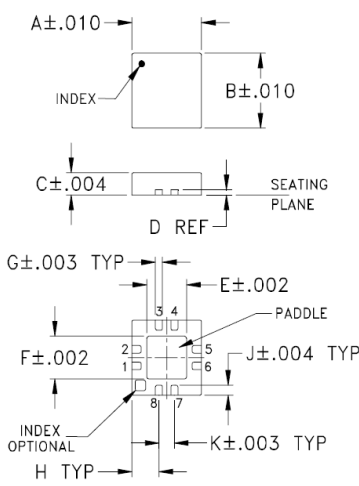
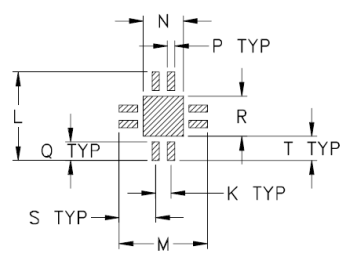
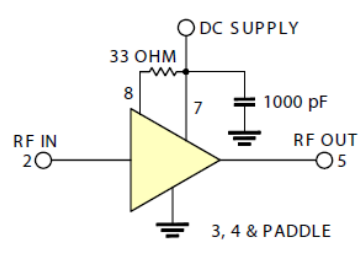
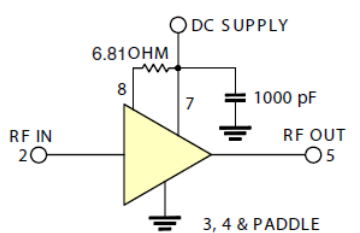
REPLACEMENT PART:

MNA-7A+



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

MECHANICAL DIMENSIONS, PCB LAND PATTERN & APPLICATION CIRCUIT

ORIGINAL PART: MNA-7+	REPLACEMENT PART: MNA-7A+
Case Style DQ849	
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  </div> <div style="text-align: center;"> <p>PCB Land Pattern</p>  <p>Suggested Layout, Tolerance to be within ±.002</p> </div> </div>	
<p>Marking</p> <p>MNA7</p>	<p>Marking</p> <p>MN7A</p>
<p>Application Circuit</p> 	<p>Application Circuit</p> <p>Resistor from Pad 8 to 7 is changed to 6.81Ω from 33Ω</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 Table is a summary of changes/improvements:

Typical performance comparison: See paragraphs 2 to 5

Parameter	Original Part (MNA-7+)	Replacement Part (MNA-7A+)
Frequency range	1.5 to 5.9 GHz	1.5 to 6 GHz
Gain-Min at 2 GHz (dB) & Vs=5V	16.3	15 dB
Thermal resistance (°C/W)	78	60
Input Power (5 minutes max)	19dBm	+26 dBm over 1.5 to 3.7 GHz +20 dBm over 3.7 to 6.0 GHz
Maximum DC Voltage on pins 2 & 5 (V)	10	1 (Due to ESD protective diodes at input/output)

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

Parameter	Freq. MHz	MNA-7+ Original Part Data of 1 Unit on Test Board	MNA-7A+ Replacement Part 10 units on TB on Test Board		
			Min	Average	Max
Gain (dB)	1500	15.7	17.5	17.9	18.2
	2000	16.1	17.7	18.1	18.5
	3500	16.0	17.7	18.5	19.0
	5000	17.1	18.0	19.0	19.6
	5900	12.9	12.6	13.9	14.7
	6000	12.2	11.7	13.0	13.8
Input Return Loss (dB)	1500	4.2	7.5	7.6	7.7
	2000	7.0	11.0	11.4	12.2
	3500	9.1	17.4	18.7	20.4
	5000	9.8	15.5	16.4	17.3
	5900	12.0	11.2	11.7	12.1
	6000	12.2	11.1	11.6	12.0
Output Return Loss (dB)	1500	16.7	18.7	30.3	40.4
	2000	15.3	21.6	28.8	34.4
	3500	18.2	21.3	23.8	25.5
	5000	41.8	15.8	21.9	24.3
	5900	18.2	14.3	16.1	18.5
	6000	18.0	13.5	14.9	17.0
Output Power at 1dB Compression (dBm)	1500	16.5	16.4	17.4	17.8
	2000	16.2	16.0	17.1	17.5
	3500	14.9	14.1	14.8	15.4
	5000	14.2	15.3	16.1	16.7
	5900	16.1	14.4	15.6	16.4
	6000	15.9	13.0	14.4	15.2
Output IP3 (dBm)	1500	28.1	27.5	28.8	29.4
	2000	28.0	27.3	28.5	29.2
	3500	26.1	24.6	25.8	26.5
	5000	25.2	26.2	27.4	28.2
	5900	27.8	26.5	27.0	28.0
NF (dB)	1500	8.4	6.5	6.7	6.9
	2000	7.1	5.4	5.6	5.7
	3500	5.8	4.2	4.2	4.3
	5000	5.0	3.6	3.7	3.7
	5900	5.1	4.1	4.4	4.5
	6000	5.2	4.3	4.5	4.7
Directivity (Isolation- Gain) (dB)	1500	40.0	32.4	34.2	38.2
	2000	28.7	27.2	28.4	32.5
	3500	20.6	20.6	21.4	23.8
	5000	16.7	19.4	20.1	22.3
	5900	21.1	23.5	25.2	34.5
	6000	21.8	24.5	26.4	36.9
DC Current (mA)	I(mA)	76.1	77.0	81.6	84.8

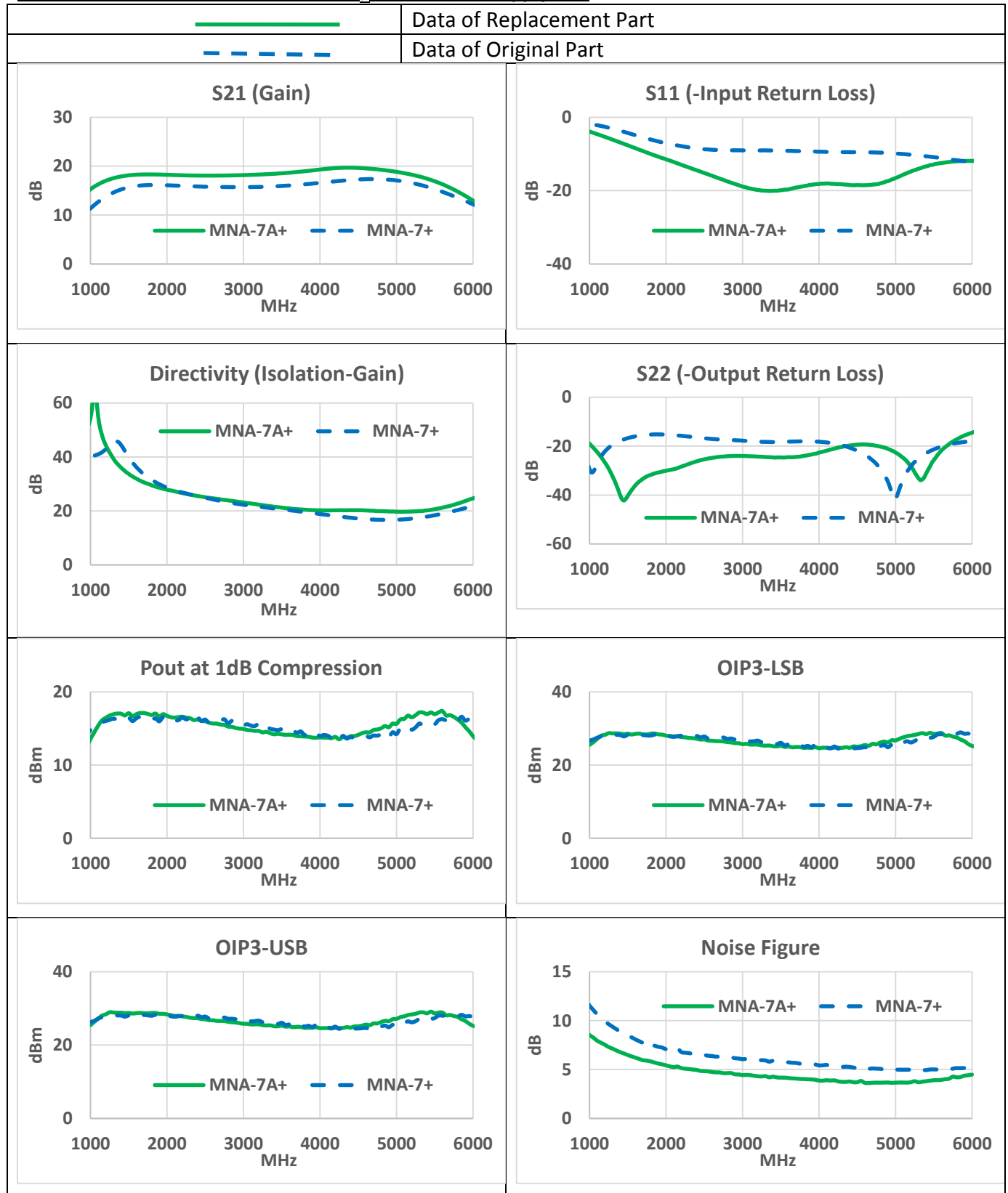
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3) PERFORMANCE COMPARISON_a (TYPICAL), DC Voltage=2.8V:

Parameter	Freq. MHz	MNA-7+ Original Part Data of 1 Unit on Test Board	MNA-7A+ Replacement Part 10 units on TB on Test Board		
			Min	Average	Max
Gain (dB)	1500	12.1	15.0	15.2	15.5
	2000	12.9	15.6	15.7	15.9
	3500	13.1	15.7	15.9	16.4
	5000	15.3	16.7	17.2	17.7
	5900	10.4	9.2	10.0	10.6
	6000	9.5	8.1	8.9	9.4
Input Return Loss (dB)	1500	4.1	7.5	7.6	7.7
	2000	6.4	10.5	10.7	11.3
	3500	8.9	15.9	16.9	18.1
	5000	9.2	15.5	16.5	18.0
	5900	10.5	10.1	10.6	10.9
	6000	10.7	10.2	10.6	10.9
Output Return Loss (dB)	1500	14.7	18.7	20.2	22.0
	2000	12.1	16.6	17.6	18.7
	3500	12.3	13.7	14.6	15.6
	5000	18.3	12.2	14.2	15.3
	5900	24.9	9.9	11.2	12.2
	6000	24.4	9.5	10.7	11.6
Output Power at 1dB Compression (dBm)	1500	11.8	12.2	12.4	12.7
	2000	11.9	12.8	13.0	13.3
	3500	11.4	11.5	11.9	12.1
	5000	11.4	12.9	13.4	13.5
	5900	12.7	10.0	10.9	11.4
	6000	12.2	8.7	9.7	10.3
Output IP3 (dBm)	1500	22.6	23.4	23.7	23.8
	2000	22.8	23.9	24.3	24.4
	3500	22.3	22.1	22.6	22.9
	5000	22.4	24.1	24.5	24.8
	5900	22.9	20.7	21.7	22.4
	6000	22.3	19.1	20.3	21.1
NF (dB)	1500	9.1	7.0	7.2	7.3
	2000	7.8	6.0	6.1	6.2
	3500	6.4	4.6	4.7	4.8
	5000	5.3	3.8	3.9	4.0
	5900	5.7	4.8	5.0	5.2
	6000	5.7	5.0	5.3	5.4
Directivity (Isolation- Gain) (dB)	1500	43.3	34.5	35.1	35.9
	2000	31.2	28.7	29.2	29.8
	3500	22.0	21.6	22.6	23.3
	5000	16.8	18.5	18.9	20.0
	5900	22.0	24.3	25.9	30.0
	6000	23.0	25.4	27.1	31.6
DC Current (mA)	I(mA)	69.9	73.0	77.1	79.8

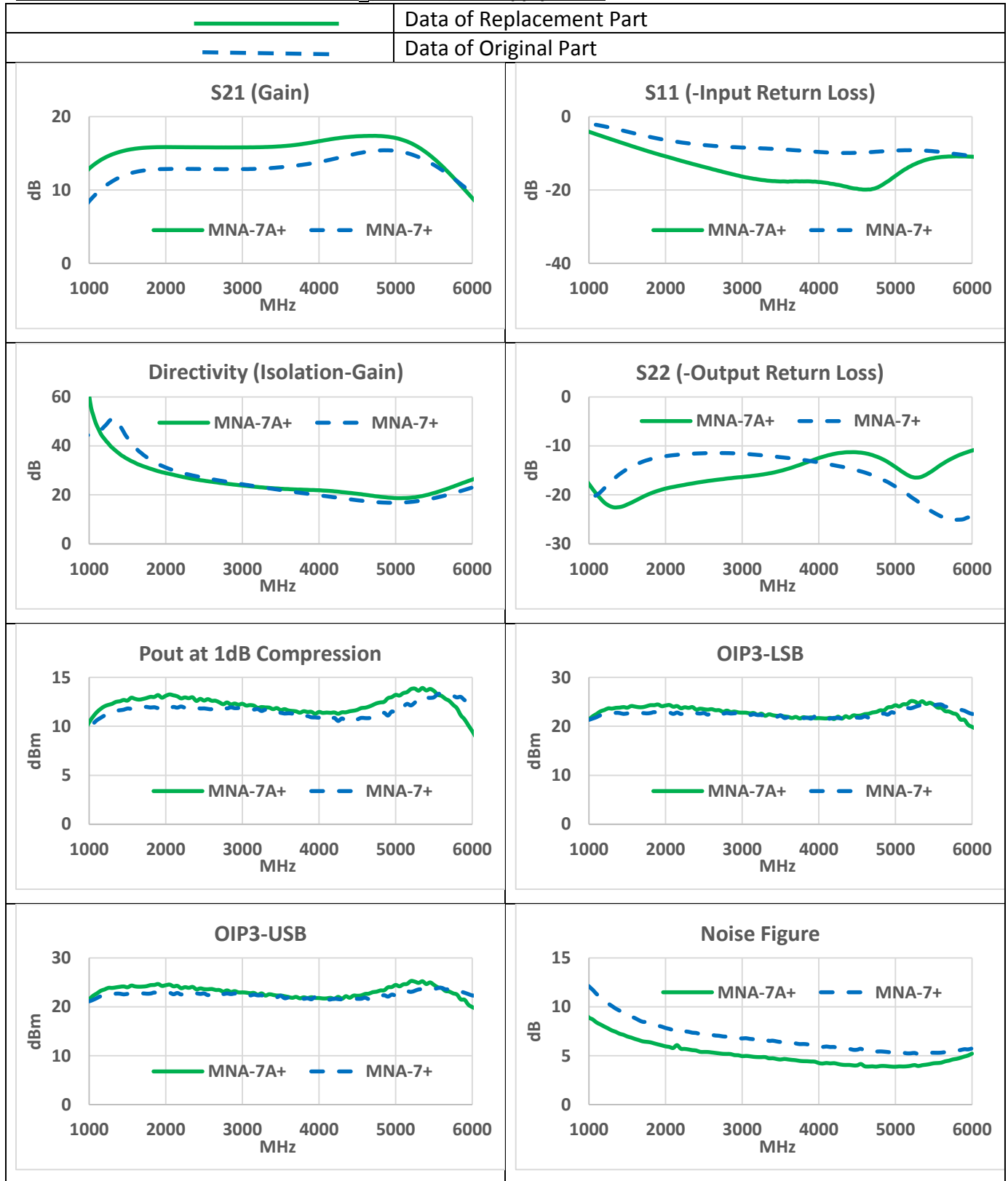
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4) PERFORMANCE COMPARISON CURVES^a (TYPICAL), DC Supply=5V:



Notes:
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5) PERFORMANCE COMPARISON CURVES^a (TYPICAL), DC Supply=2.8V:



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.