APPLICATION NOTE

REPLACEMENT PART REFERENCE GUIDE, MNA-2+

AN-60-083

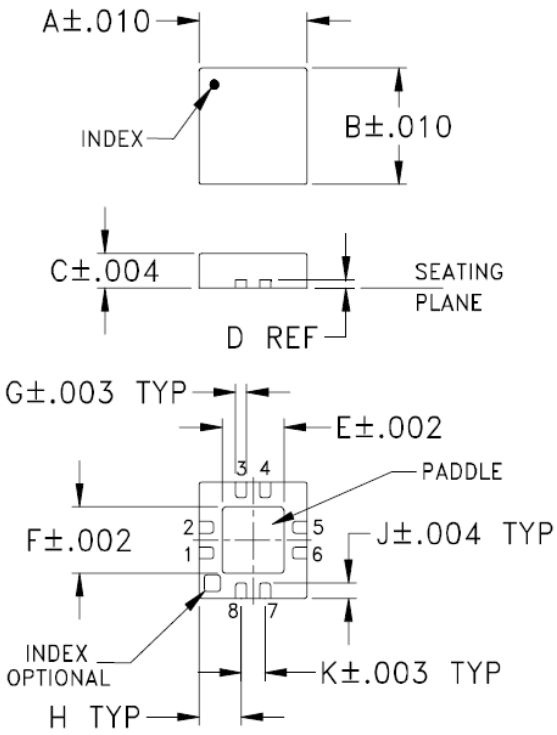
ORIGINAL PART: MNA-2+
REPLACEMENT PART: MNA-2A+

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

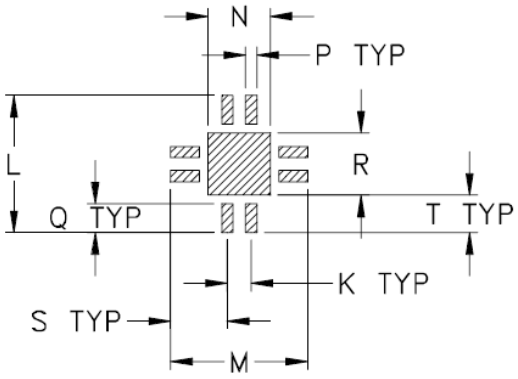
MECHANICAL DIMENSIONS & PCB LAND PATTERN

ORIGINAL PART: MNA-2+	REPLACEMENT PART: MNA-2A+

Case Style DQ849 (No Change)



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

Marking	Marking
MNA2	MN2A

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: See paragraphs 2 and 3

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

Parameter	Original Part (MNA-2+)	Replacement Part (MNA-2A+)
Gain at 2 GHz	10.3dB min	13.5 dB min
DC Current at Vs=5V (max)	95 mA max.	104 mA max
Thermal Resistance	78°C/W	54°C/W
DC Voltage on pins 2 &5	10V max	1V max
Power Dissipation	500 mW max	800 mW max

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2) **PERFORMANCE COMPARISON[a] (TYPICAL), DC Voltage=5V**:

Parameter	Freq. MHz	Original Part Data of 1 Unit	Replacement Part Data of 5 units		
			Min	Average	Max
Gain (dB)	500	9.5	14.1	14.3	14.4
	750	11.4	14.8	14.9	15.1
	1000	12.0	15.0	15.2	15.3
	1500	12.3	15.2	15.3	15.4
	2000	12.0	15.0	15.2	15.3
	2500	11.4	14.7	14.8	14.9
Input Return Loss (dB)	500	9.6	8	8	8
	750	12.3	13	13	14
	1000	14.4	16	17	18
	1500	18.9	20	21	22
	2000	27.3	19	19	21
	2500	26.0	17	17	19
Output Return Loss (dB)	500	9.2	14	14	15
	750	21.1	21	22	23
	1000	25.5	21	23	24
	1500	14.4	18	19	22
	2000	11.5	15	16	18
	2500	10.7	14	15	15
Output Power at 1dB Compression (dBm)	500	18.6	19.2	19.4	19.5
	750	18.5	19.3	19.6	19.7
	1000	18.1	19.1	19.4	19.6
	1500	17.3	18.6	19.1	19.3
	2000	16.5	17.9	18.4	18.8
	2500	16.4	17.5	18.1	18.4
Output IP3 (dBm)	500	30.4	32	32	32
	750	30.8	32	32	32
	1000	29.9	31	32	32
	1500	29.2	31	31	31
	2000	28.3	29	30	30
	2500	27.3	29	30	30
NF (dB)	500	5.7	5.6	5.6	5.6
	750	5.5	5.3	5.4	5.5
	1000	5.4	5.3	5.3	5.3
	1500	5.5	5.3	5.3	5.4
	2000	5.5	5.3	5.3	5.3
	2500	5.5	5.3	5.4	5.4
Directivity (Isolation- Gain) (dB)	500	30	33	33	33
	750	26	33	33	34
	1000	23	29	29	29
	1500	20	24	25	25
	2000	19	22	22	23
	2500	18	21	21	21
DC Current (mA)		83	78	84	88

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3) **PERFORMANCE COMPARISON[a] (TYPICAL), DC Voltage=2.8V**:

Parameter	Freq. MHz	Original Part Data of 1 Unit	Replacement Part Data of 5 units		
			Min	Average	Max
Gain (dB)	500	8.0	12.4	12.6	12.9
	750	9.8	12.9	13.1	13.4
	1000	10.3	13.0	13.2	13.5
	1500	10.4	13.0	13.1	13.4
	2000	9.9	12.6	12.9	13.1
	2500	9.2	12.3	12.4	12.6
Input Return Loss (dB)	500	9.7	8	8	9
	750	12.5	13	13	14
	1000	14.7	17	18	18
	1500	18.5	23	24	28
	2000	21.8	22	24	26
	2500	22.0	19	20	22
Output Return Loss (dB)	500	8.3	13	13	14
	750	15.8	17	18	20
	1000	19.8	18	19	22
	1500	14.9	17	18	20
	2000	12.0	18	18	18
	2500	11.2	17	18	19
Output Power at 1dB Compression (dBm)	500	11.8	10.3	10.7	11.6
	750	13.0	11.1	11.5	12.3
	1000	13.3	11.4	11.8	12.4
	1500	13.3	11.5	11.9	12.5
	2000	13.1	11.8	12.2	12.7
	2500	12.9	11.8	12.1	12.5
Output IP3 (dBm)	500	23.2	22	23	24
	750	24.2	23	24	24
	1000	24.2	23	24	24
	1500	23.8	23	24	24
	2000	23.4	23	24	24
	2500	23.3	23	24	24
NF (dB)	500	5.8	5.7	5.7	5.8
	750	5.8	5.4	5.5	5.6
	1000	5.6	5.4	5.4	5.4
	1500	5.7	5.4	5.5	5.5
	2000	5.7	5.4	5.5	5.5
	2500	5.8	5.5	5.5	5.6
Directivity (Isolation- Gain) (dB)	500	32	36	37	37
	750	27	32	33	33
	1000	24	28	29	29
	1500	21	24	25	25
	2000	20	22	23	23
	2500	19	21	21	22
DC Current (mA)		76	73	79	82

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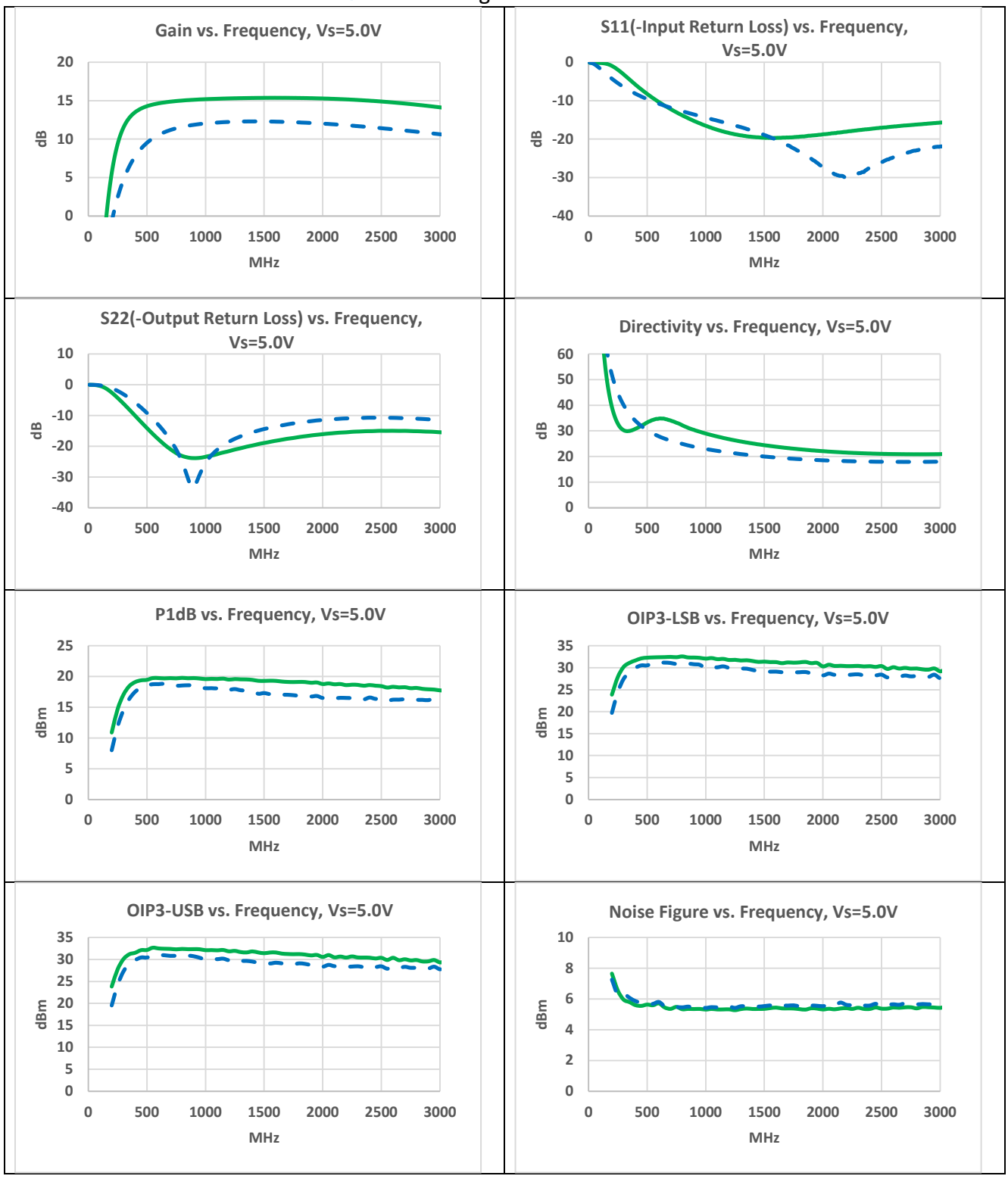
4) PERFORMANCE COMPARISON CURVES[a] (TYPICAL), DC Supply=5V:

Data of Replacement Part

Data of Original Part



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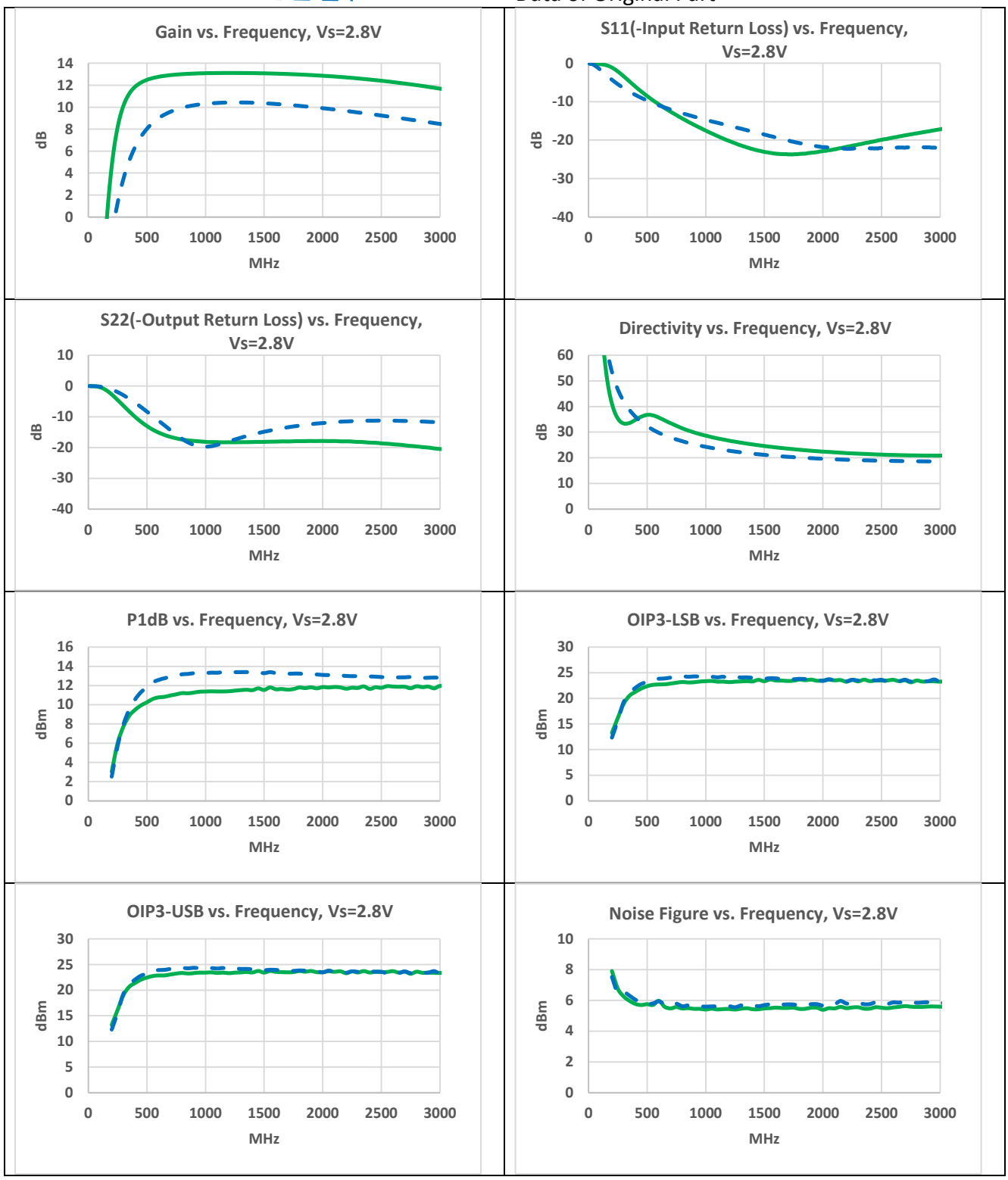
5) PERFORMANCE COMPARISON CURVES[a] (TYPICAL),DC Supply=2.8V:

Data of Replacement Part

Data of Original Part



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