

REPLACEMENT PART REFERENCE GUIDE,

VNA-28A+

AN-60-089

ORIGINAL PART:

VNA-28A+

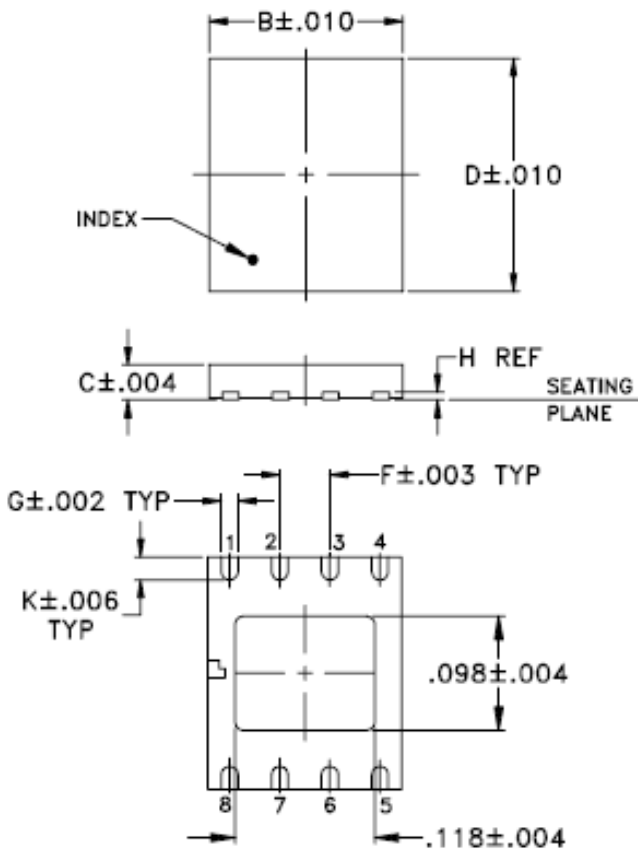
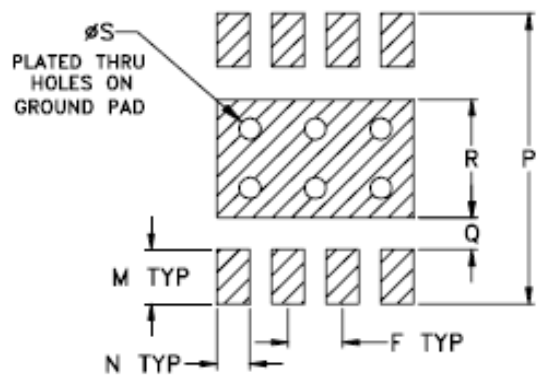
REPLACEMENT PART:

VNA-28B+



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

MECHANICAL DIMENSIONS & PCB LAND PATTERN

ORIGINAL PART: VNA-28A+	REPLACEMENT PART: VNA-28B+
<p>Case Style DL1020 (No Change)</p> <div style="display: flex; justify-content: space-around;"> <div style="width: 45%;">  <p>Diagram showing mechanical dimensions for VNA-28A+:</p> <ul style="list-style-type: none"> Width: $B \pm .010$ Height: $D \pm .010$ INDEX (arrow pointing to a mark) Seating Plane (indicated by a horizontal line) Dimension $C \pm .004$ Dimension H REF Dimensions 1, 2, 3, 4, 5, 6, 7, 8 Dimension $G \pm .002$ TYP Dimension $F \pm .003$ TYP Dimension $K \pm .006$ TYP Dimension $.098 \pm .004$ Dimension $.118 \pm .004$ </div> <div style="width: 45%;"> <p>PCB Land Pattern</p>  <p>Diagram showing PCB Land Pattern dimensions:</p> <ul style="list-style-type: none"> Plated Thru Holes on Ground Pad (indicated by circles) Dimension ϕS Dimensions M TYP, N TYP, F TYP, Q, R, P <p>Suggested Layout, Tolerance to be within $\pm .002$</p> </div> </div>	
<p>Marking</p> <p>VNA-28A</p>	<p>Marking</p> <p>VNA-28B</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: See paragraphs 2 and 3

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

Parameter	Original Part (VNA-28A+)	Replacement Part (VNA-28B+)
Gain at 2 GHz	18.6dB min	19.5 dB min
Thermal Resistance	78°C/W	64°C/W
DC Voltage on pins 3 &6	10V max	1V max
Power Dissipation	500 mW max	700 mW max

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

Parameter	Freq. (MHz)	VNA-28A+ (Original Part) 1 Unit on TB			VNA-28B+ (Replacement Part) 5 units on TB		
		Min	Avg.	Max	Min	Avg.	Max
Gain (dB)	500	17.2	17.2	17.2	21.2	21.3	21.5
	750	20.7	20.7	20.7	23.2	23.3	23.5
	1000	22.0	22.0	22.0	23.5	23.6	23.8
	1500	22.8	22.8	22.8	23.0	23.1	23.2
	2000	22.0	22.0	22.0	21.7	21.8	21.9
	2500	19.0	19.0	19.0	19.9	19.9	20.0
Input R.Loss (dB)	500	7.3	7.3	7.3	5.0	5.0	5.1
	750	13.0	13.0	13.0	10.0	10.1	10.2
	1000	15.2	15.2	15.2	14.9	15.1	15.1
	1500	12.7	12.7	12.7	17.3	17.8	18.8
	2000	20.1	20.1	20.1	16.1	16.5	17.8
	2500	10.1	10.1	10.1	13.9	14.3	15.4
Output R.Loss (dB)	500	8.0	8.0	8.0	12.0	12.0	12.1
	750	13.2	13.2	13.2	13.9	14.1	14.3
	1000	14.6	14.6	14.6	11.7	11.9	12.0
	1500	13.1	13.1	13.1	10.6	10.9	11.0
	2000	11.8	11.8	11.8	11.2	11.5	11.6
	2500	11.4	11.4	11.4	13.3	13.6	13.9
P1dB (dBm)	500	13.2	13.2	13.2	13.3	13.5	13.8
	750	13.9	13.9	13.9	12.9	13.1	13.4
	1000	12.7	12.7	12.7	11.9	12.1	12.4
	1500	11.2	11.2	11.2	11.4	11.6	11.9
	2000	11.0	11.0	11.0	10.9	11.2	11.4
	2500	11.5	11.5	11.5	10.5	10.8	11.1
Output IP3, Min of USB & LSB (dBm)	500	24.4	24.4	24.4	24.3	24.6	24.9
	750	25.2	25.2	25.2	24.6	25.0	25.3
	1000	23.6	23.6	23.6	23.4	23.6	23.9
	1500	22.7	22.7	22.7	22.7	22.9	23.2
	2000	22.2	22.2	22.2	21.8	22.1	22.5
	2500	22.9	22.9	22.9	21.2	21.5	21.8
NF (dB)	500	3.7	3.7	3.7	3.1	3.2	3.2
	750	3.6	3.6	3.6	2.8	2.9	3.0
	1000	3.6	3.6	3.6	2.9	2.9	3.0
	1500	3.7	3.7	3.7	2.9	2.9	2.9
	2000	3.9	3.9	3.9	2.9	3.0	3.0
	2500	4.3	4.3	4.3	3.1	3.1	3.1
Directivity (dB)	500	18.6	18.6	18.6	17.1	17.2	17.3
	750	16.2	16.2	16.2	20.0	20.3	20.4
	1000	15.6	15.6	15.6	23.3	23.5	23.6
	1500	15.4	15.4	15.4	20.7	21.0	21.4
	2000	18.0	18.0	18.0	18.7	19.0	19.4
	2500	26.5	26.5	26.5	17.5	17.6	17.9
DC Current (mA)	DC	36.8	37	37	33.2	34	35

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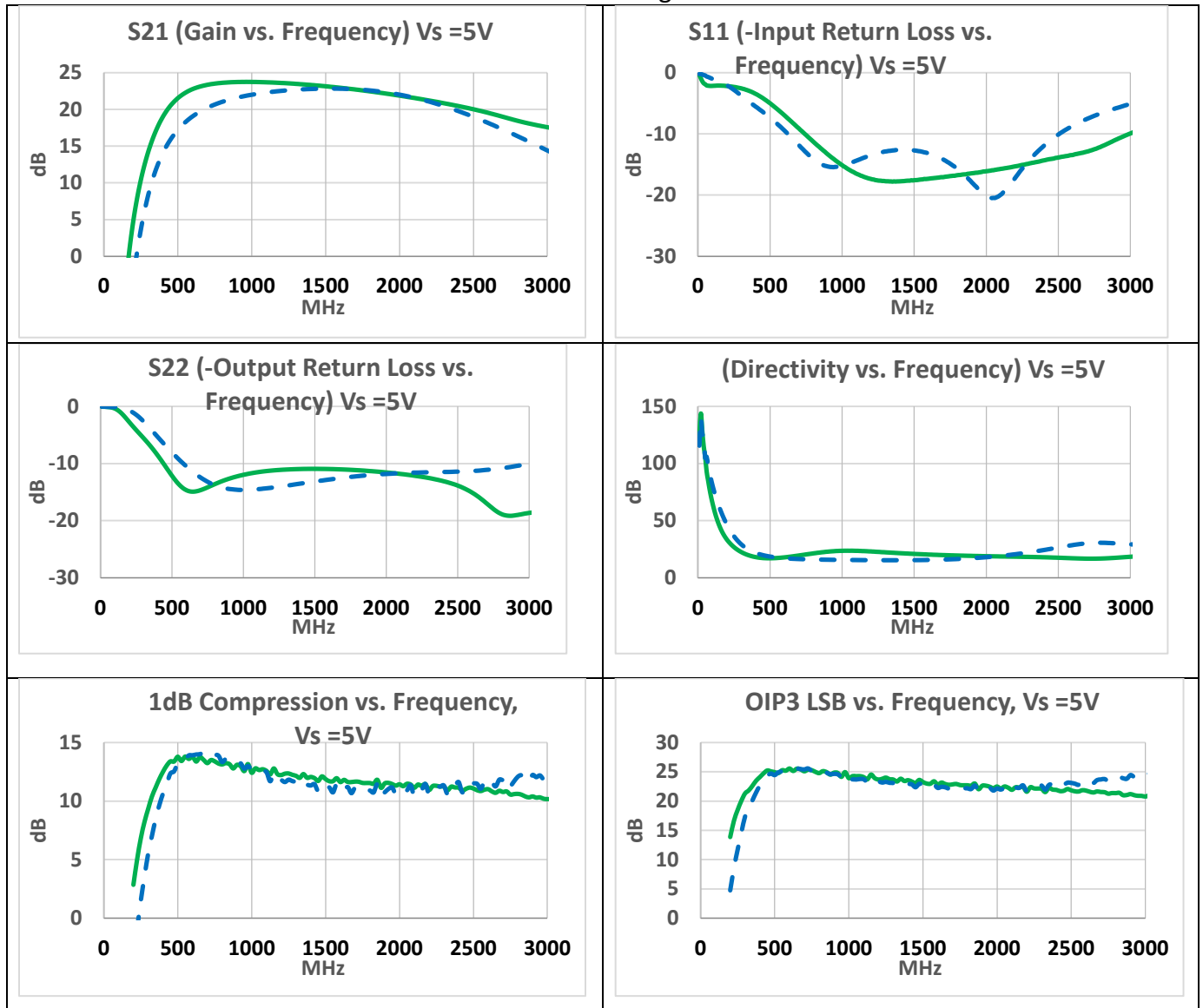
3) PERFORMANCE COMPARISON_a (TYPICAL), DC Voltage=2.8V:

Parameter	Freq. (MHz)	VNA-28A+ Ref (Original Part) Qty-1 on TB			VNA-28B+ (Replacement Part) 5 units on TB Qty-5		
		Min	Avg.	Max	Min	Avg.	Max
Gain (dB)	500	16.4	16.4	16.4	20.2	20.3	20.5
	750	19.6	19.6	19.6	21.9	22.0	22.1
	1000	20.8	20.8	20.8	22.0	22.1	22.2
	1500	21.5	21.5	21.5	21.1	21.2	21.3
	2000	20.8	20.8	20.8	19.7	19.8	19.8
	2500	18.1	18.1	18.1	17.9	17.9	17.9
Input R.Loss (dB)	500	7.2	7.2	7.2	5.2	5.3	5.3
	750	12.7	12.7	12.7	10.7	10.8	10.9
	1000	14.8	14.8	14.8	16.1	16.3	16.4
	1500	13.0	13.0	13.0	19.4	20.1	21.2
	2000	21.1	21.1	21.1	17.0	17.6	19.0
	2500	10.2	10.2	10.2	14.0	14.4	15.4
Output R.Loss (dB)	500	7.8	7.8	7.8	12.5	12.6	12.7
	750	11.4	11.4	11.4	21.0	21.6	22.3
	1000	12.0	12.0	12.0	17.9	18.5	19.0
	1500	10.9	10.9	10.9	16.3	16.9	17.2
	2000	9.2	9.2	9.2	17.3	17.9	18.3
	2500	8.1	8.1	8.1	20.8	21.7	22.8
P1dB (dBm)	500	10.7	10.7	10.7	11.4	11.4	11.5
	750	11.2	11.2	11.2	11.4	11.5	11.6
	1000	10.2	10.2	10.2	10.8	10.9	11.1
	1500	9.0	9.0	9.0	10.2	10.4	10.5
	2000	8.6	8.6	8.6	9.7	9.8	10.0
	2500	9.3	9.3	9.3	9.1	9.3	9.5
Output IP3, Min of USB & LSB (dBm)	500	22.4	22.4	22.4	22.2	22.3	22.6
	750	22.9	22.9	22.9	22.3	22.5	22.6
	1000	21.6	21.6	21.6	21.5	21.6	21.7
	1500	20.9	20.9	20.9	20.8	20.9	21.1
	2000	20.5	20.5	20.5	20.1	20.3	20.4
	2500	21.0	21.0	21.0	19.3	19.6	19.8
NF (dB)	500	3.8	3.8	3.8	3.2	3.3	3.3
	750	3.6	3.6	3.6	2.9	3.0	3.1
	1000	3.6	3.6	3.6	3.0	3.0	3.0
	1500	3.7	3.7	3.7	3.0	3.0	3.1
	2000	3.9	3.9	3.9	3.0	3.1	3.1
	2500	4.4	4.4	4.4	3.2	3.3	3.3
Directivity (dB)	500	19.9	19.9	19.9	19.5	19.7	19.8
	750	17.5	17.5	17.5	23.0	23.3	23.4
	1000	16.6	16.6	16.6	22.9	23.0	23.2
	1500	15.3	15.3	15.3	18.9	19.1	19.4
	2000	16.2	16.2	16.2	17.4	17.6	17.9
	2500	21.6	21.6	21.6	16.5	16.7	16.9
DC Current (mA)	DC	34.0	34	34	31.6	32	33

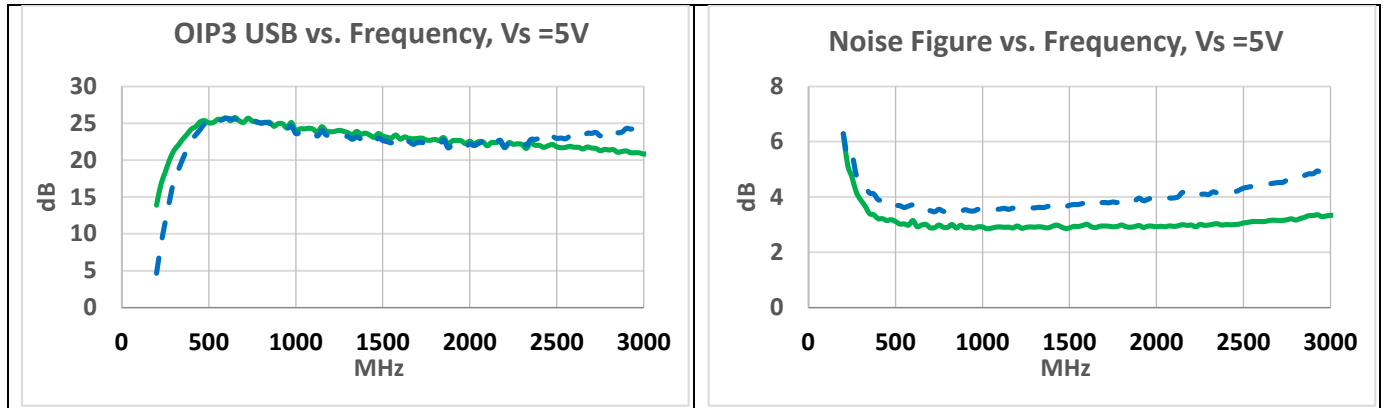
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4) PERFORMANCE COMPARISON CURVES_a (TYPICAL), DC Supply=5V:

— Data of Replacement Part
- - - Data of Original Part



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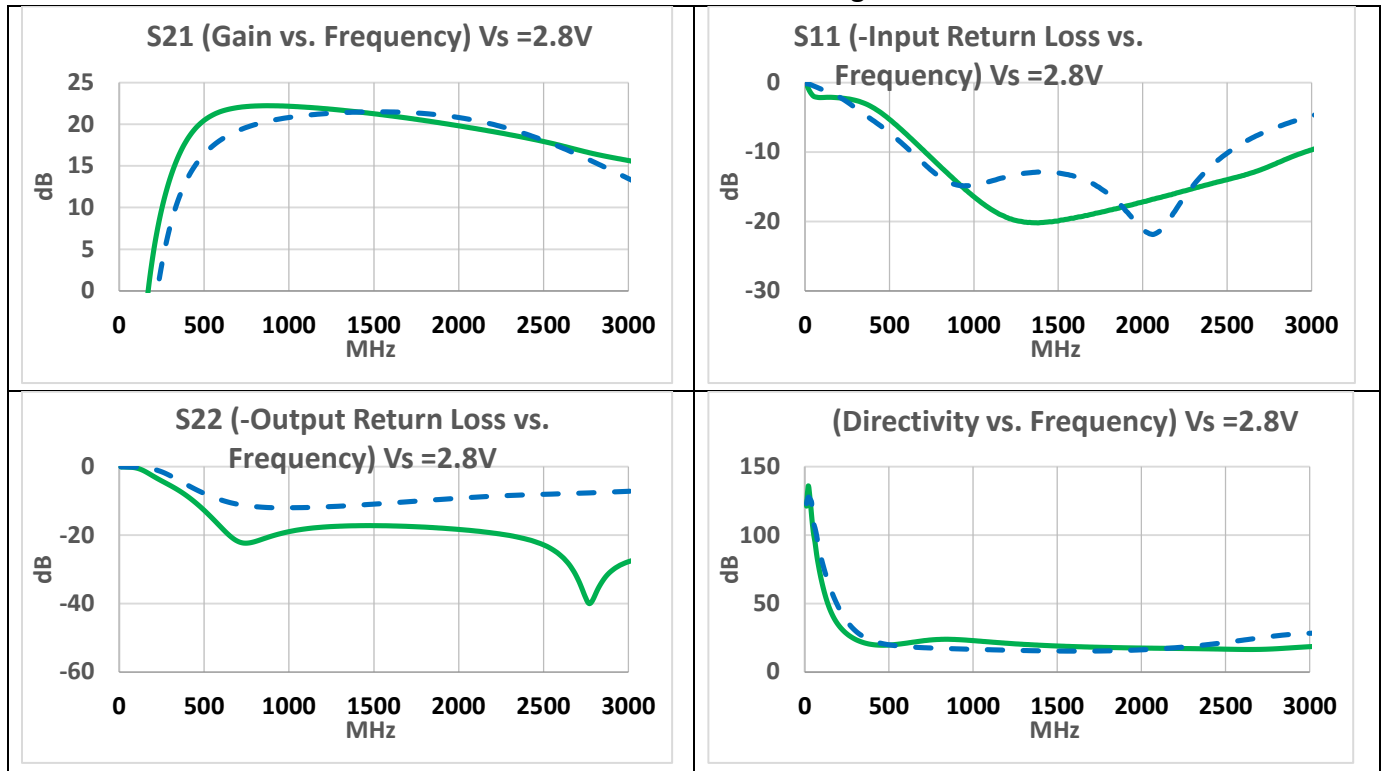


5) PERFORMANCE COMPARISON CURVES_a (TYPICAL), DC Supply=2.8V:

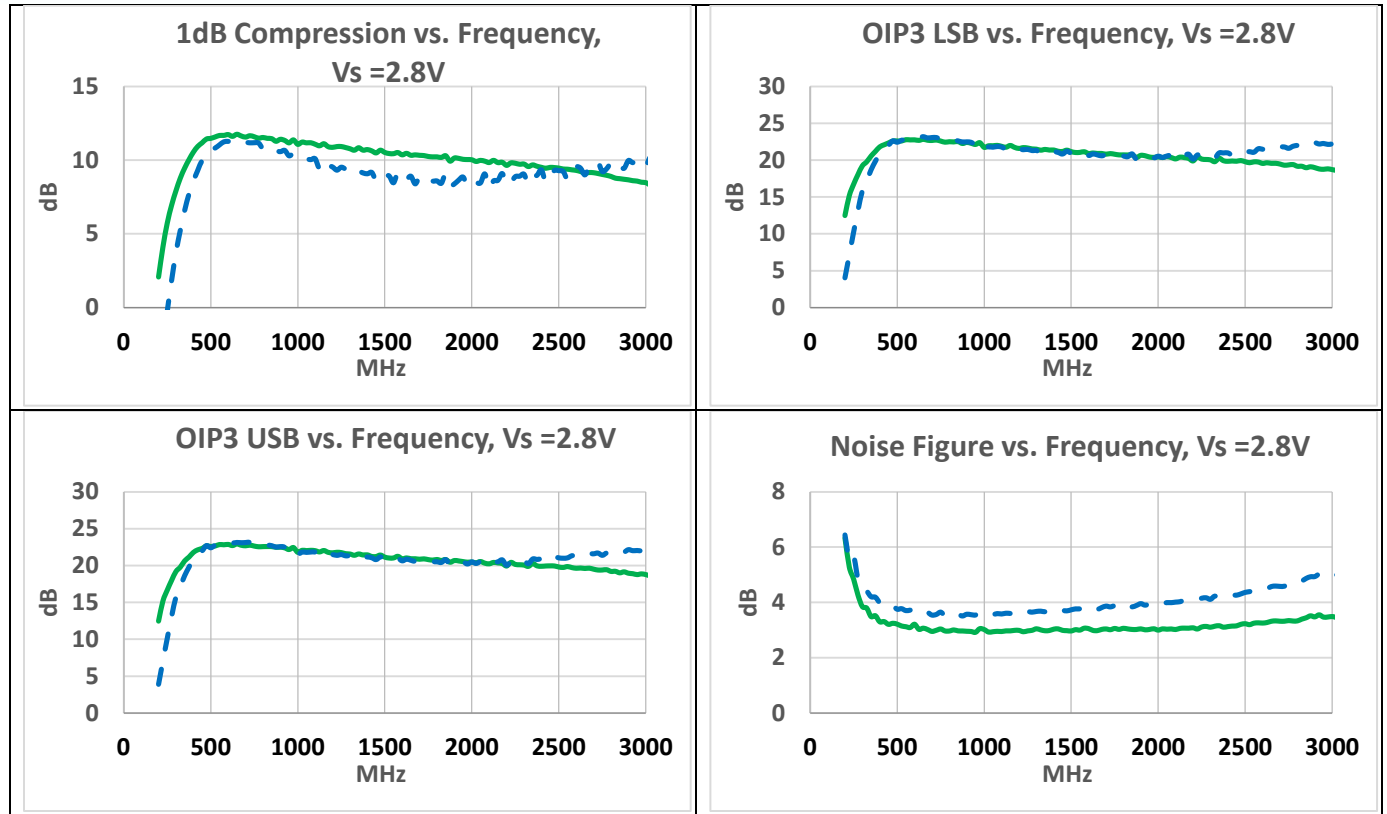
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Data of Replacement Part

Data of Original Part



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