Mini-Circuits®

APPLICATION NOTE

REPLACEMENT PART REFERENCE GUIDE, DVGA2-33PP+ AN-60-094

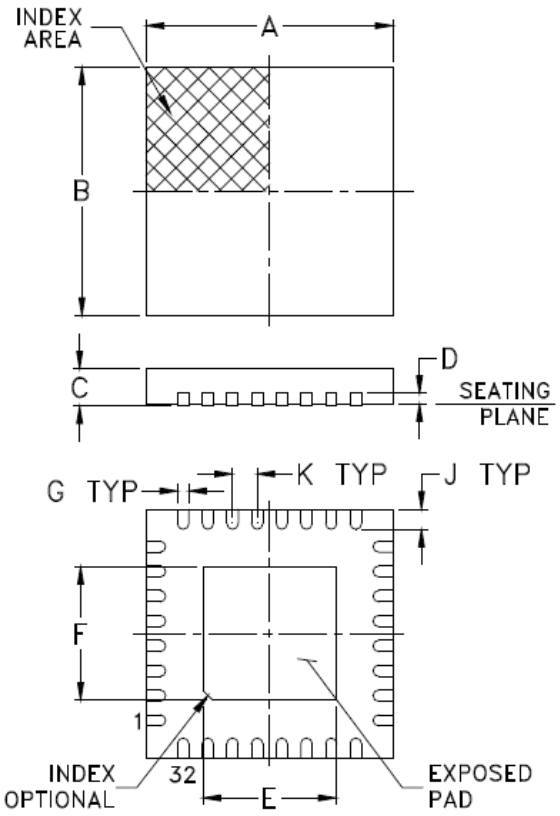
ORIGINAL PART: DVGA2-33PP+
REPLACEMENT PART: DVGA2-33APP+

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

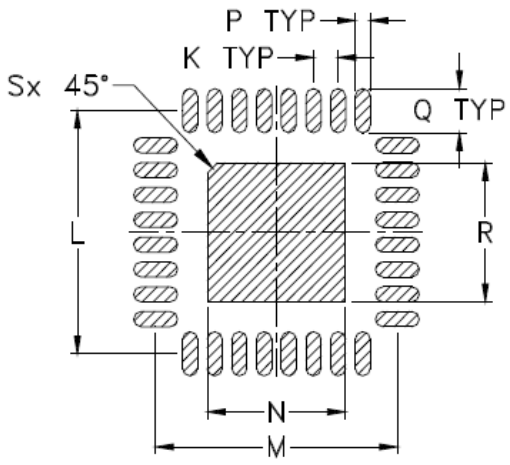
MECHANICAL DIMENSIONS & PCB LAND PATTERN

ORIGINAL PART: DVGA2-33PP+	REPLACEMENT PART: DVGA2-33APP+

Case Style DG1677 (No Change)



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

Marking	Marking
DVGA2	DVGA2A

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 seen below,

Parameter	Original Part (DVGA2-33PP+)	Replacement Part (DVGA2-33APP+)
Control Input High Voltage	0.7VD1 min	1.17V min, 3.6V max
Control Input Low Voltage	0.3VD1 max	-0.3V min & 0.6V max
Supply Current, ID1	100µA max (During turn-on and transition between attenuation states ID1 may increase up to 2mA)	200µA max
Accuracy @ 8 dB Attenuation Setting 1-3 GHz	0.7dB max	1.1 dB max
Accuracy @ 16 dB Attenuation Setting 1-3 GHz	1.1dB max	1.4dB max
Control Current	1 µA max	1 µA max except, 30µA typ. for C0.5, C16 and 2µA typ. for LE
Pin Number 8	VD1	No Connection (Will not affect existing PCB layout)
LE pull-up resistor	100kΩ	2MΩ

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2) **PERFORMANCE COMPARISON[a], V_{D1}=3V, V_{D2}=5V**:

DVGA2-33APP+	Freq (MHz) From	To	YH0336 DVGA2-33APP+ 1 Units in TB-674A+ @25degC Min.	Avg.	Max.	DVGA2-33PP+ 10 Units in TB-674+ @25degC Min.	Avg.	Max.
GAIN (dB)	50	50	20.6	20.6	20.6	20.2	20.3	20.3
	500	500	19.8	19.8	19.8	19.4	19.4	19.5
	1000	1000	19.4	19.4	19.4	19.0	19.1	19.2
	2000	2000	17.9	17.9	17.9	17.7	17.8	17.9
	3000	3000	15.7	15.7	15.7	15.4	15.5	15.6
0.5dB Step Attenuation	50	1000	0.51	0.52	0.52	0.49	0.52	0.53
	1000	3000	0.52	0.55	0.63	0.49	0.54	0.69
1dB Step Attenuation	50	1000	1.01	1.01	1.02	0.97	1.00	1.02
	1000	3000	1.01	1.06	1.22	0.97	1.05	1.21
2dB Step Attenuation	50	1000	1.98	2.00	2.02	1.97	2.00	2.04
	1000	3000	2.01	2.10	2.41	2.01	2.17	2.48
4dB Step Attenuation	50	1000	3.97	3.98	4.01	3.93	3.98	4.03
	1000	3000	3.98	4.11	4.58	3.96	4.17	4.55
8dB Step Attenuation	50	1000	7.95	7.96	8.01	7.85	7.89	7.94
	1000	3000	7.96	8.18	8.97	7.81	8.07	8.52
16dB Step Attenuation	50	1000	15.87	15.92	15.99	15.65	15.79	15.91
	1000	3000	15.87	16.18	17.21	15.57	15.86	16.42
INPUT RETURN LOSS (dB)	50	50	13.2	13.2	13.2	13.0	13.4	13.6
	500	500	17.6	17.6	17.6	17.3	17.7	18.1
	1000	1000	13.6	13.6	13.6	13.6	13.8	14.2
	2000	2000	10.8	10.8	10.8	13.3	13.6	14.1
	3000	3000	10.8	10.8	10.8	12.4	12.8	13.1
OUTPUT RETURN LOSS (dB)	50	50	17.1	17.1	17.1	18.0	19.3	20.0
	500	500	19.3	19.3	19.3	18.5	19.5	20.2
	1000	1000	15.8	15.8	15.8	16.1	16.9	17.5
	2000	2000	11.2	11.2	11.2	11.0	11.4	12.0
	3000	3000	6.5	6.5	6.5	6.7	7.0	7.3
P1dB (dBm)	50	50	16.5	16.5	16.5	17.1	17.2	17.3
	500	500	16.8	16.8	16.8	17.2	17.3	17.4
	1000	1000	16.8	16.8	16.8	16.7	16.8	16.9
	2000	2000	18.1	18.1	18.1	18.1	18.3	18.3
	3000	3000	16.2	16.2	16.2	16.6	16.8	16.9
OIP3 (dBm)	50	50	31.9	31.9	31.9	33.2	34.0	34.8
	500	500	31.5	31.5	31.5	32.7	32.9	33.2
	1000	1000	30.7	30.7	30.7	30.8	31.0	31.1
	2000	2000	31.5	31.5	31.5	31.2	31.5	31.8
	3000	3000	29.1	29.1	29.1	29.4	29.7	29.9
NF (dB)	50	50	4.7	4.7	4.7	4.8	4.9	4.9
	500	500	4.7	4.7	4.7	4.8	4.9	5.0
	1000	1000	4.9	4.9	4.9	4.9	4.9	5.0
	2000	2000	5.3	5.3	5.3	5.0	5.1	5.1
	3000	3000	5.2	5.2	5.2	5.3	5.4	5.6

Notes:
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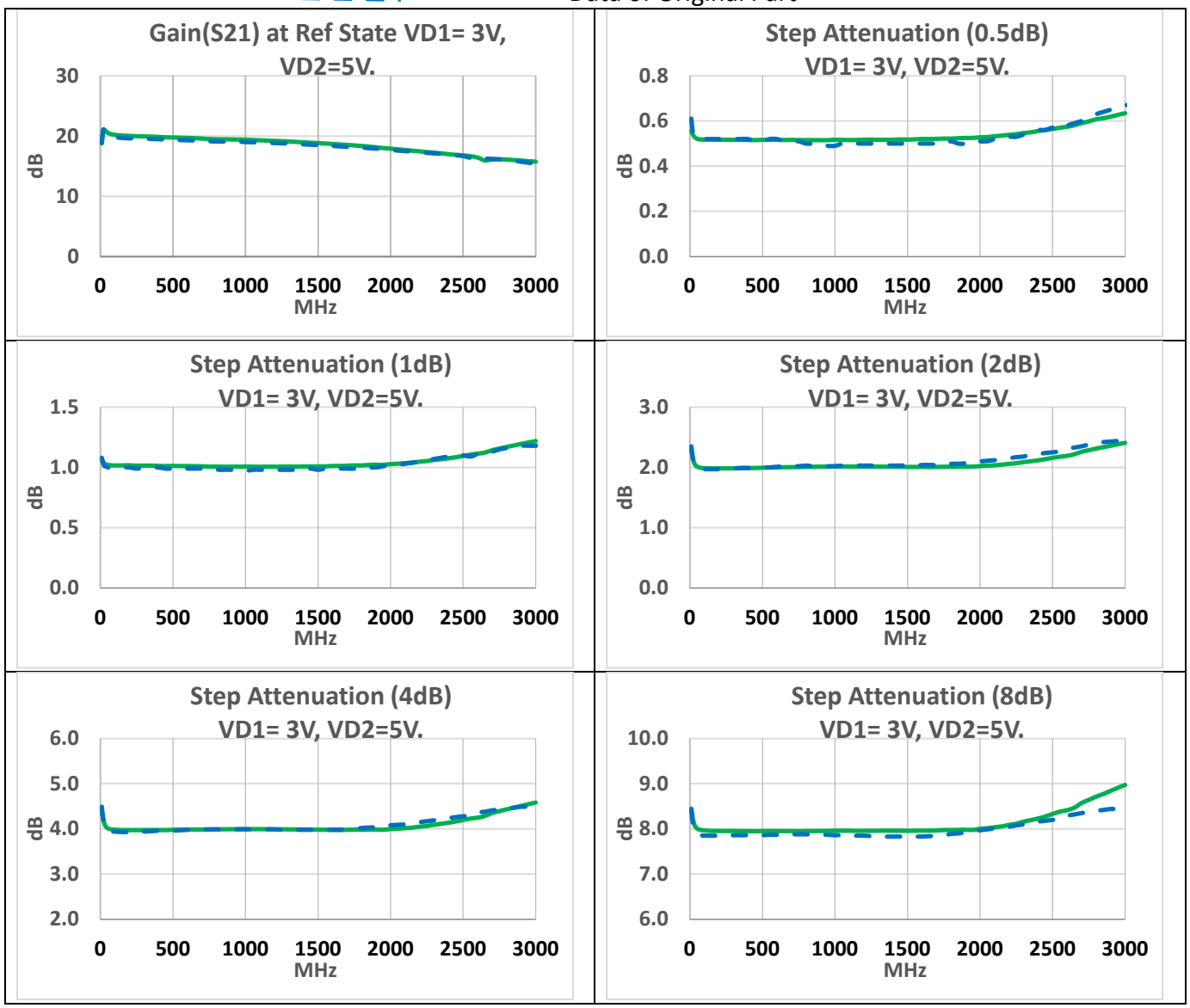
3) PERFORMANCE COMPARISON CURVES[a] V_{D1}=3V, V_{D2}=5V:

Data of Replacement Part

Data of Original Part



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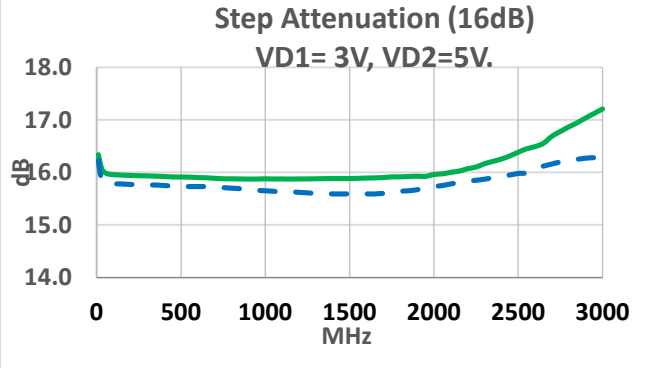

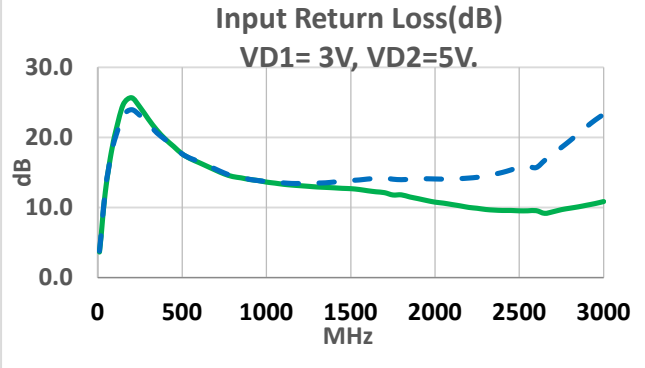

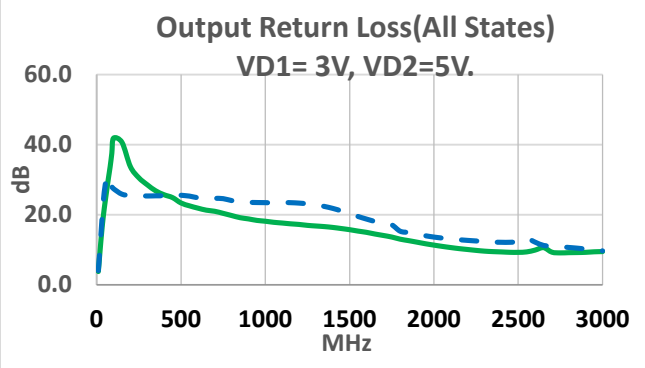

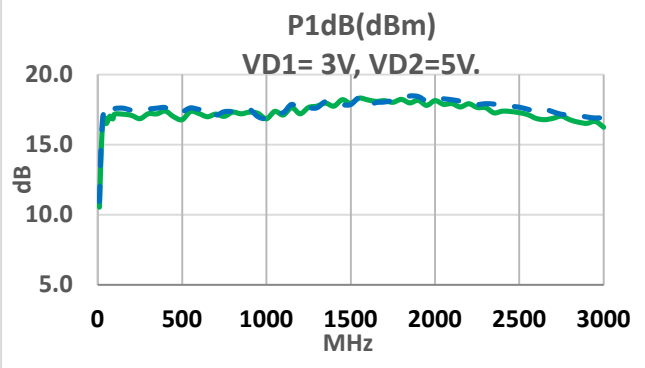

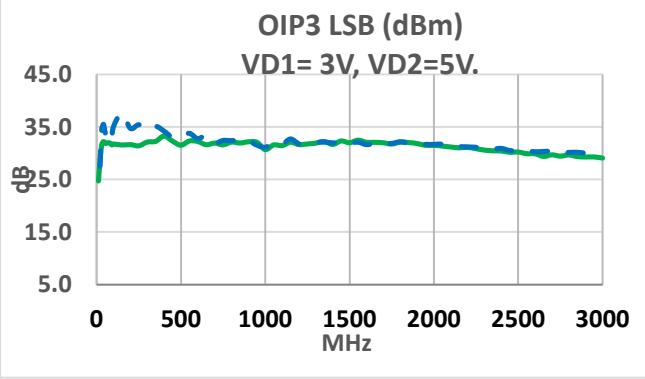

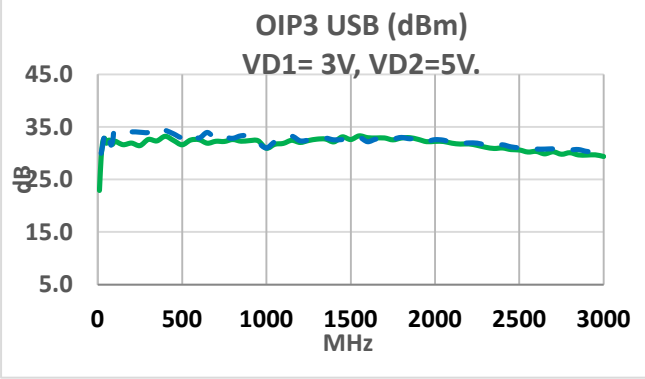

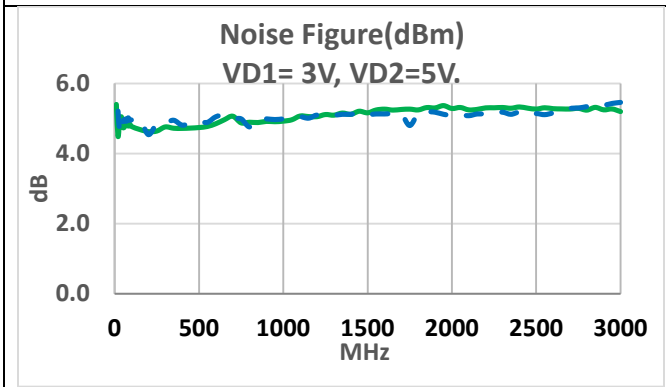

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