

**REPLACEMENT PART REFERENCE GUIDE, DAT-31-PN+:**

**AN-70-014**

ORIGINAL PART:

DAT-31-PN+

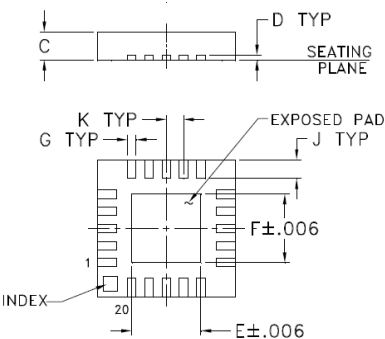
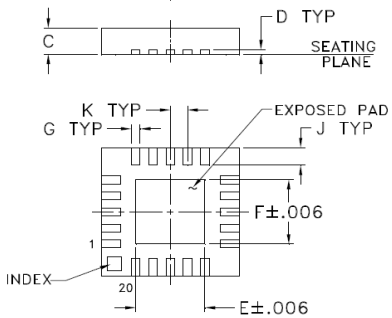
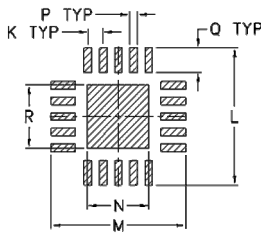
REPLACEMENT PART:

DAT-31A-PN+



*Replacement Part has been judged by Mini-Circuits Engineering as a suitable replacement to Original Part<sub>a</sub>*

**MECHANICAL DIMENSIONS & PCB LAND PATTERN**

ORIGINAL PART: DAT-31-PN+	REPLACEMENT PART: DAT-31A-PN+																
<p>Case Style: DG983-1</p>  <p>Inches (mm)</p> <table border="1"> <thead> <tr> <th>C</th> <th>E</th> <th>F</th> <th>G</th> </tr> </thead> <tbody> <tr> <td>.035 (0.90)</td> <td>.081 (2.06)</td> <td>.081 (2.06)</td> <td>.010 (0.25)</td> </tr> </tbody> </table>	C	E	F	G	.035 (0.90)	.081 (2.06)	.081 (2.06)	.010 (0.25)	<p>Case Style: DG983-2 (minor dimensional changes as below)</p>  <p>inches (mm)</p> <table border="1"> <thead> <tr> <th>C</th> <th>E</th> <th>F</th> <th>G</th> </tr> </thead> <tbody> <tr> <td>.033 (0.85)</td> <td>.085 (2.15)</td> <td>.085 (2.15)</td> <td>.009 (0.23)</td> </tr> </tbody> </table> <p>Note: Dimensions not shown are same as that in DG983-1</p>	C	E	F	G	.033 (0.85)	.085 (2.15)	.085 (2.15)	.009 (0.23)
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<p><b>Suggested PCB Land Pattern</b></p>  <table border="1"> <thead> <tr> <th>K</th> <th>L</th> <th>M</th> <th>N</th> <th>P</th> <th>Q</th> <th>R</th> </tr> </thead> <tbody> <tr> <td>.020 (0.50)</td> <td>.177 (4.50)</td> <td>.177 (4.50)</td> <td>.081 (2.06)</td> <td>.010 (0.25)</td> <td>.032 (0.81)</td> <td>.081 (2.06)</td> </tr> </tbody> </table>		K	L	M	N	P	Q	R	.020 (0.50)	.177 (4.50)	.177 (4.50)	.081 (2.06)	.010 (0.25)	.032 (0.81)	.081 (2.06)		
K	L	M	N	P	Q	R											
.020 (0.50)	.177 (4.50)	.177 (4.50)	.081 (2.06)	.010 (0.25)	.032 (0.81)	.081 (2.06)											

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:

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

Parameter		DAT-31-PN+ (Original Part)	DAT-31A-PN+ (Replacement Part)
Frequency (GHz)		DC-2.4	DC-4
VDD(V)		+2.7 to +3.3	+2.3 to +3.6, usable to +5.2V
Vss(V)		-3.3 min to -2.7 max	-3.6 min to -3.2 max
Control input High (V)		0.7VDD to VDD	+1.17 to +3.6
Control input Low (V)		0 to 0.3VDD	-0.3 to +0.6
IDD (μA)		100 μA max. During turn-on and transition between attenuation states, device may draw up to 2mA.	100 μA max.
Iss (μA)		100 max	40 max
Control Current (μA)		1 max	1 max, except 30μA typ for C16, PUP1 and 2μA typ. for LE at +3.6V
Attenuation accuracy	<u>Step</u> (dB)	<u>Freq</u> (GHz)	<u>Spec max</u>
	8	1-2.4	0.25
		2.4-4	Not Specified
	16	1-2.4	0.3
2.4-4		Not Specified	
VSWR (:1) (1-2.4 GHz)		1.5 max	1.6 Max
Power-UP: PUP1,PUP2=1 & LE=0		31dB	31.5dB
Operating Temperature (°C)		-40 to 85	-40 to 105
Storage Temperature(°C)		-55 to 100	-65 to 150
ESD (HBM)		Pass 500V	Pass 1500V
Max Operating Power		Not Specified	From 10 kHz to 50 MHz per Figure 1 (in Model Data Sheet) and +24 dBm above 50 MHz
Absolute Max input Power (dBm)		+24	+30

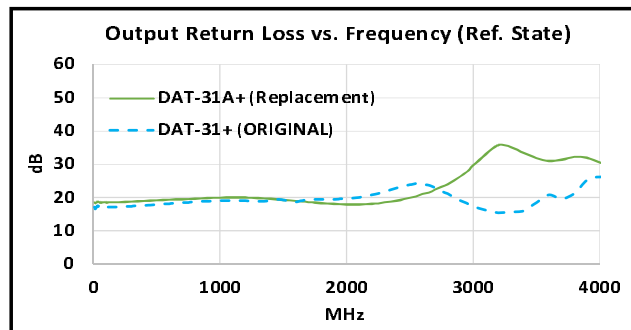
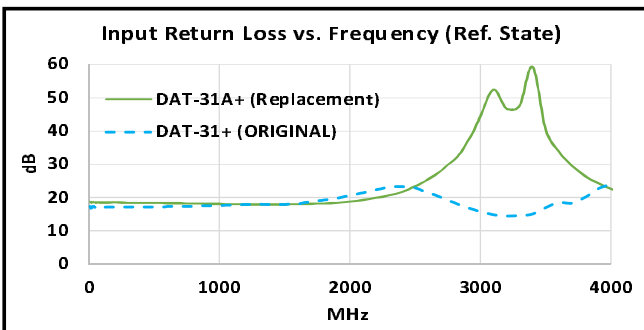
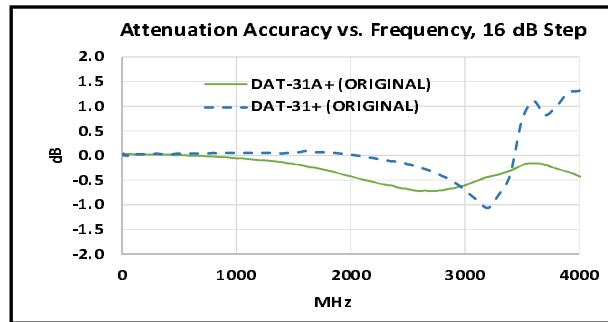
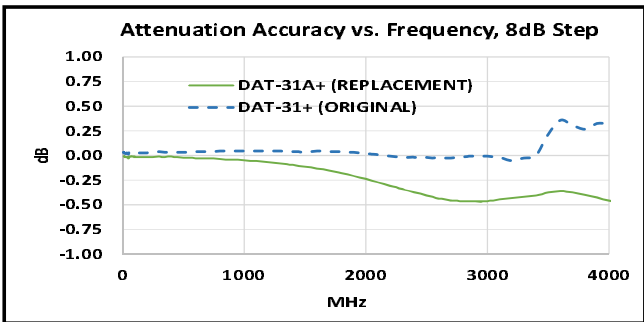
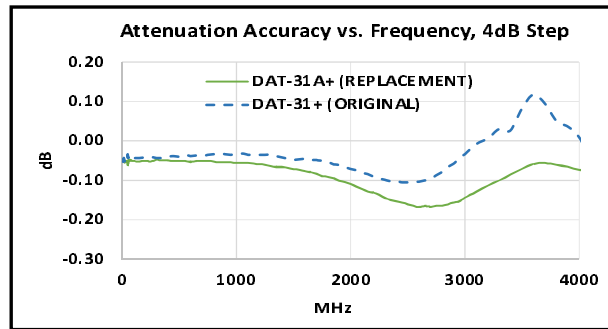
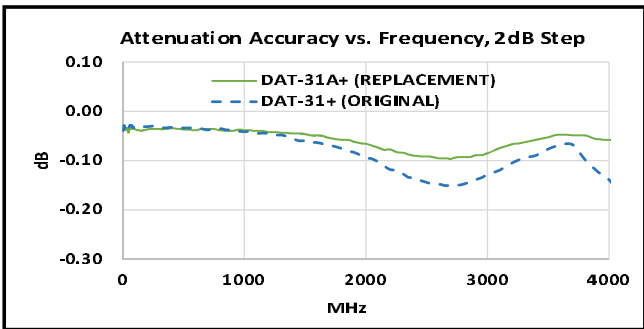
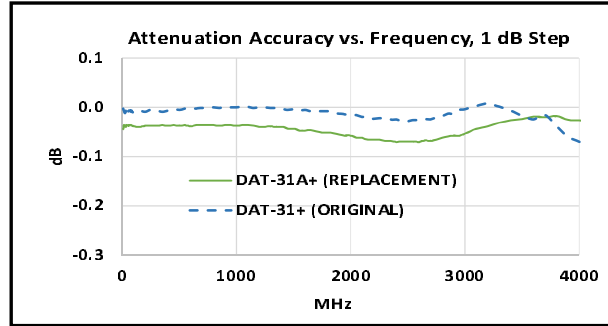
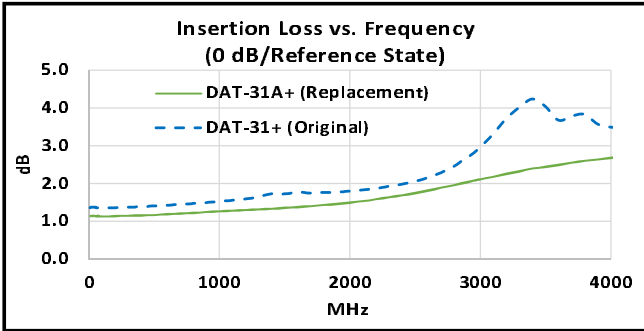
Notes:  
a. Suitability for model replacement within a particular system must be determined by and is solely the responsibility of the customer based on, among other things, electrical performance criteria, stimulus conditions, application, compatibility with other components and environmental conditions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

## 2) Typical Performance Comparison<sup>a</sup>

Parameter	Frequency (GHz)	DAT-31-PN+ (Original Part)	DAT-31A-PN+ (Replacement Part)
		Average	Average
I.Loss(dB)	0.01 to 1	1.39	1.20
	1 to 2.4	1.75	1.46
	2.4 to 4	2.97	2.16
Step Accuracy 1.0 dB Step (dB)	0.01 to 1	0.00	0.03
	1 to 2.4	0.01	0.04
	2.4 to 4	0.02	0.04
Step Accuracy 2.0 dB Step (dB)	0.01 to 1	0.03	0.03
	1 to 2.4	0.08	0.05
	2.4 to 4	0.12	0.07
Step Accuracy 4.0 dB Step (dB)	0.01 to 1	0.04	0.03
	1 to 2.4	0.06	0.07
	2.4 to 4	0.02	0.10
Step Accuracy 8.0 dB Step (dB)	0.01 to 1	0.04	0.02
	1 to 2.4	0.04	0.13
	2.4 to 4	0.07	0.37
Step Accuracy 16 dB Step (dB)	0.01 to 1	0.03	0.06
	1 to 2.4	0.03	0.23
	2.4 to 4	0.06	0.43
Input R.Loss (dB)	0.01 to 1	17.3	18.2
	1 to 2.4	19.6	18.5
	2.2 to 4	18.2	18.2
Output R.Loss (dB)	0.01 to 1	17.7	18.7
	1 to 2.4	19.7	18.7
	2.2 to 4	20.7	17.8

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.

### 3) PERFORMANCE COMPARISON CURVES (TYPICAL)<sup>a</sup>:



Note: DAT-31+ is same as DAT-31-PN+ and  
DAT-31A+ is same as DAT-31A-PN+

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.