Mini-Circuits®

APPLICATION NOTE

REPLACEMENT PART REFERENCE GUIDE, DAT-3175-PN+ AN-70-025

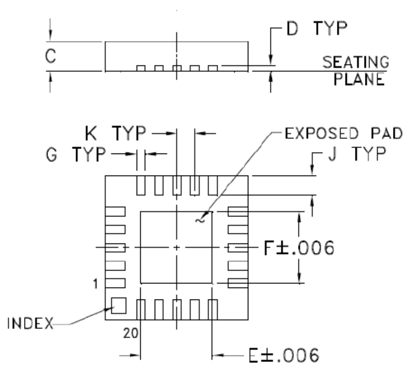
ORIGINAL PART: DAT-3175-PN+
REPLACEMENT PART: DAT-3175A-PN+

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

MECHANICAL DIMENSIONS & PCB LAND PATTERN

ORIGINAL PART: DAT-3175-PN+

Case Style: DG983-1

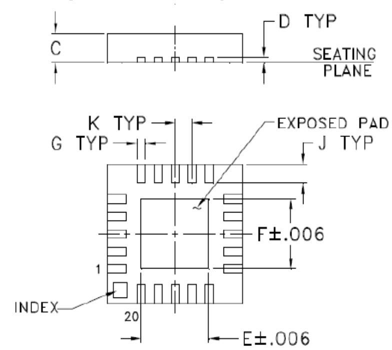


Inches (mm)

C	E	F	G
.035 (0.90)	.081 (2.06)	.081 (2.06)	.010 (0.25)

REPLACEMENT PART: DAT-3175A-PN+

Case Style: DG983-2 (minor dimensional changes as below)

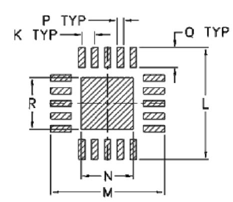


inches (mm)

C	E	F	G
.033 (0.85)	.085 (2.15)	.085 (2.15)	.009 (0.23)

Note: Dimensions not shown are same as that in DG983-1

Suggested PCB Land Pattern



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)

Marking	Marking
3175	DS75

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 part 2) and 3)

For Min/Max Specifications, see below:

Parameter		**DAT-3175-PN+ (Original Part)**		**DAT-3175A-PN+ (Replacement Part)**	
Frequency (GHz)		DC-2.0		0.001-2.5	
V_{DD}(V)		+2.7 to +3.3		+2.7 to +3.6, usable to +5.2V	
V_{SS}(V)		-2.7 to -3.3		-3.2 to -3.6	
Control input High (V)		0.7V_{DD} to V_{DD}		+1.17 to +3.6	
Control input Low (V)		0 to 0.3V_{DD}		-0.3 to +0.6(0V during power-up)	
I_{DD} (µA)		100 µA max.		80 µA max.	
I_{SS}(µA)		100 µA max.		40 µA max.	
Control Current (µA)		1 max		20 max	
Attenuation accuracy	Step (dB)	Frequency (GHz)	Spec max	Frequency (GHz)	Spec max
	1	DC-1.2	0.24	0.001-1.2	0.17
		1.2-2.0	0.25	1.2-2.0	0.18
	2	DC-1.2	0.28	0.001-1.2	0.18
		1.2-2.0	0.3	1.2-2.0	0.20
	4	DC-1.2	0.36	0.001-1.2	0.21
		1.2-2.0	0.4	1.2-2.0	0.26
	8	DC-1.2	0.52	0.001-1.2	0.27
		1.2-2.0	0.6	1.2-2.0	0.36
	16	DC-1.2	0.84	0.001-1.2	0.39
		1.2-2.0	1	1.2-2.0	0.6
Operating Temperature (°C)		-40 to 85		-40 to 105	
Storage Temperature(°C)		-55 to 100		-65 to 150	
ESD (HBM)		< 500V		1000 to <2000V	
ESD (MM)		<100V		500 to <1000V	
Max Operating Power		24dBm		From 1-30 MHz per Figure 1 (in Model Data Sheet) and +24 dBm above 30 MHz	
Absolute Maximum Rating: Vdd(V)		-0.3V Min. 4V Min.		-0.3V Min. 5.5V Min.	
Absolute Maximum Rating: Vss(V)		-4V Min, 0.3V Max		-3.8V Min -------	
Absolute Maximum Rating: Voltage on any digital input		-0.3V Min, Vdd+ 0.3V Max		-0.3V Min, 3.6V Max	
Max Input Power		+24 dBm		1-30 MHz (10-24 dBm) per Figure 2 of data Sheet >30 MHz: +30 dBm	

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) **PERFORMANCE COMPARISON[a] (TYPICAL), VDD=3V,VSS =-3.2V:**

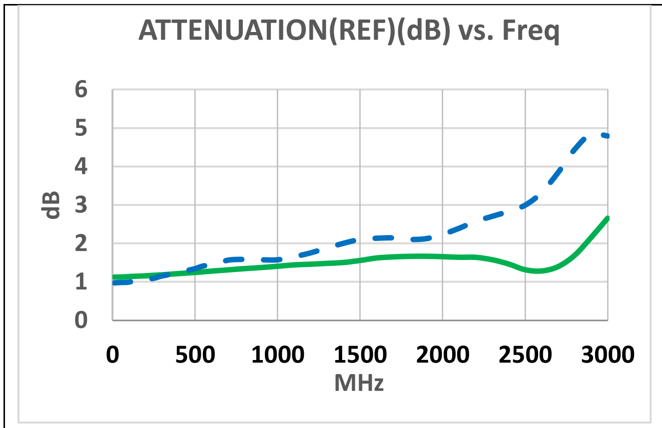
Positive Control Voltage: 3V Negative Control Voltage:-3.2V	Freq (MHz)		DAT-3175A-PN+ Data of 1 Units			DAT-3175-PN+ (REF) Data of 1 Units		
	From	To	Min.	Avg.	Max.	Min.	Avg.	Max.
ATTENUATION @ 0dB (dB)	10	1200	1.1	1.3	1.5	1.0	1.3	1.8
	1200	2000	1.5	1.6	1.7	1.8	2.1	2.2
	2000	2500	1.3	1.5	1.7	2.2	2.6	3.0
ATTENUATION @1dB (dB)	10	1200	0.99	1.01	1.02	0.94	0.96	1.01
	1200	2000	0.99	0.99	0.99	0.91	0.93	0.95
	2000	2500	0.99	1.00	1.01	0.89	0.91	0.92
ATTENUATION @2dB (dB)	10	1200	1.99	2.01	2.02	2.03	2.06	2.10
	1200	2000	1.99	1.99	1.99	1.99	2.08	2.19
	2000	2500	1.99	2.01	2.02	2.05	2.09	2.16
ATTENUATION @4dB (dB)	10	1200	3.97	3.99	4.01	3.96	4.02	4.07
	1200	2000	3.96	3.97	3.99	3.89	4.00	4.13
	2000	2500	3.99	4.05	4.13	3.91	3.97	4.09
ATTENUATION @8dB (dB)	10	1200	7.95	7.97	8.00	7.91	7.98	8.04
	1200	2000	7.92	7.96	7.99	7.80	7.90	8.01
	2000	2500	7.99	8.09	8.21	7.73	7.81	7.95
ATTENUATION @16dB (dB)	10	1200	15.91	15.94	15.97	15.69	15.95	16.10
	1200	2000	15.84	15.90	15.96	15.24	15.44	15.69
	2000	2500	15.86	15.95	16.09	14.78	15.00	15.24
INPUT RETURN LOSS @0dB (dB)	10	1200	17.3	18.0	18.6	16.8	18.5	20.3
	1200	2000	16.6	17.2	17.9	18.6	20.3	21.7
	2000	2500	17.6	20.8	30.3	13.1	16.1	18.6
INPUT RETURN LOSS @1dB (dB)	10	1200	18.4	19.3	20.2	18.6	20.7	22.8
	1200	2000	17.5	17.9	18.4	20.9	23.5	25.3
	2000	2500	17.8	21.8	34.6	15.8	19.4	22.3
INPUT RETURN LOSS @2dB (dB)	10	1200	18.7	19.9	20.8	17.0	19.3	21.7
	1200	2000	17.6	18.0	18.7	18.4	19.7	20.8
	2000	2500	18.2	22.2	34.7	13.6	16.3	18.4
INPUT RETURN LOSS @4dB (dB)	10	1200	24.2	27.5	30.9	17.7	20.7	23.8
	1200	2000	20.0	22.2	24.2	19.1	20.3	21.4
	2000	2500	18.5	19.9	21.2	14.4	17.2	19.2
INPUT RETURN LOSS @8dB (dB)	10	1200	25.2	30.2	35.9	19.5	23.2	27.5
	1200	2000	20.7	22.9	25.2	20.7	22.6	24.0
	2000	2500	19.4	20.2	21.0	16.5	19.7	21.9
INPUT RETURN LOSS @16dB (dB)	10	1200	28.4	37.8	59.2	23.9	30.7	43.5
	1200	2000	20.2	24.2	28.4	25.3	32.4	39.5
	2000	2500	17.8	19.2	20.2	20.2	26.4	32.0
OUTPUT RETURN LOSS @0dB (dB)	10	1200	17.1	18.1	18.7	16.6	18.1	20.3
	1200	2000	16.5	17.0	17.9	18.2	21.3	24.6
	2000	2500	17.9	20.5	27.9	13.9	18.6	23.9
OUTPUT RETURN LOSS @1dB (dB)	10	1200	18.0	19.2	20.0	16.8	18.5	20.8
	1200	2000	16.9	17.5	18.2	18.1	21.3	25.0
	2000	2500	18.2	21.2	29.6	14.1	18.8	24.1
OUTPUT RETURN LOSS @2dB (dB)	10	1200	18.6	20.0	20.9	20.2	22.7	26.5
	1200	2000	17.1	17.8	18.6	21.9	28.0	41.2
	2000	2500	18.4	21.3	28.2	17.4	23.2	32.1
OUTPUT RETURN LOSS @4dB (dB)	10	1200	18.6	20.6	21.8	22.4	26.0	32.5
	1200	2000	16.9	17.8	19.3	23.6	26.2	29.1
	2000	2500	19.3	23.8	28.6	18.9	22.7	27.5
OUTPUT RETURN LOSS @8dB (dB)	10	1200	24.7	30.1	35.7	22.8	27.4	35.5
	1200	2000	21.2	22.4	24.7	23.2	25.6	28.1
	2000	2500	18.5	20.7	22.2	18.9	22.4	26.8
OUTPUT RETURN LOSS @16dB (dB)	10	1200	28.2	38.4	56.6	20.4	24.2	29.3
	1200	2000	22.0	24.1	28.2	20.6	26.7	37.8
	2000	2500	16.8	19.6	22.0	17.7	23.9	34.0
INPUT RETURN LOSS (ALL STATES) (dB)	10	1200	17.3	18.0	18.6	16.8	18.5	20.3
	1200	2000	16.6	17.2	17.9	18.4	19.7	20.8
	2000	2500	16.9	18.3	19.6	13.1	16.1	18.4
OUTPUT RETURN LOSS (ALL STATES) (dB)	10	1200	17.1	18.1	18.7	16.6	18.1	20.3
	1200	2000	16.5	17.0	17.9	18.1	21.3	24.6
	2000	2500	16.0	18.7	21.5	13.9	18.6	19.2

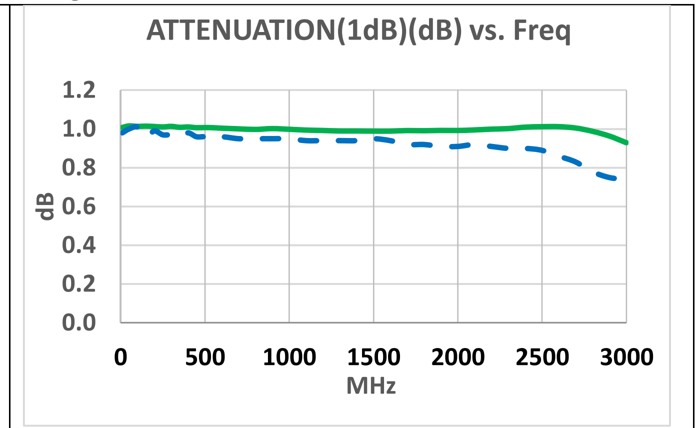
Notes:
a. Suitability for model replacement within a particular system must be determined by and is solely the responsibility of the customer based on, among other things, electrical performance criteria, stimulus conditions, application, compatibility with other components and environmental conditions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

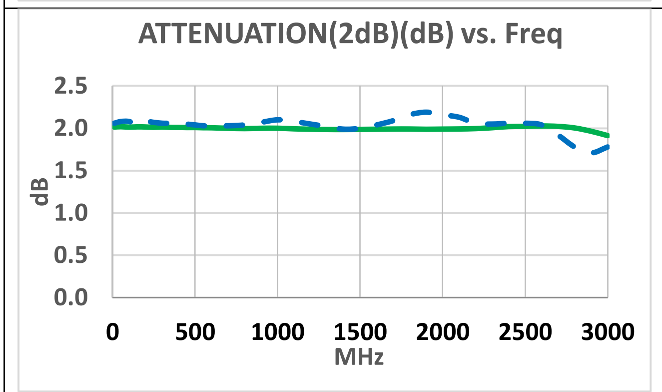
3) PERFORMANCE COMPARISON CURVES[a] (TYPICAL),VDD=3V,VSS =-3.2V:

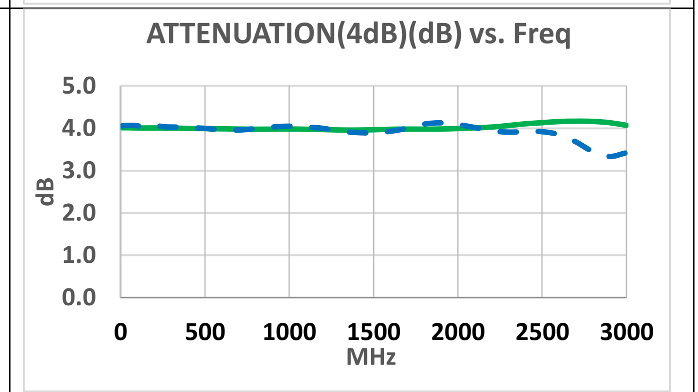
Data of Replacement Part

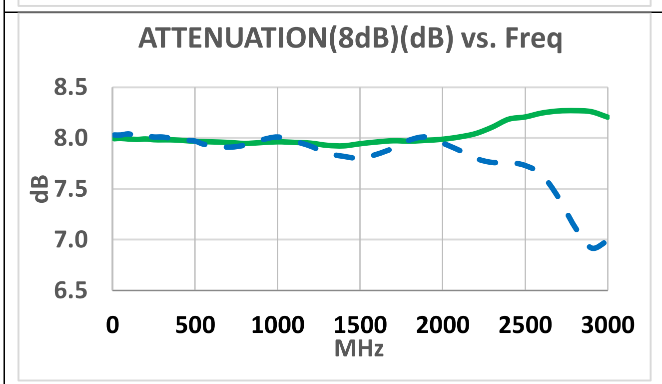
Data of Original Part

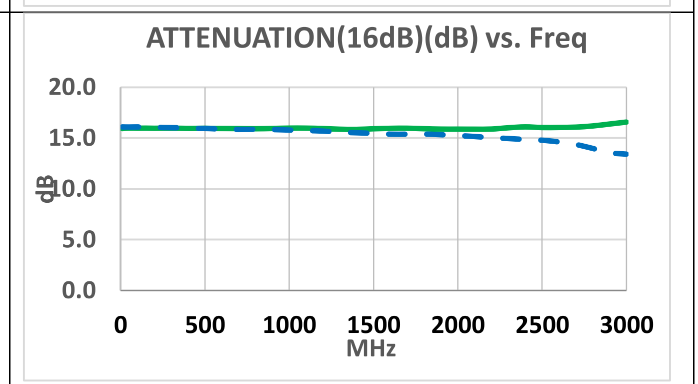


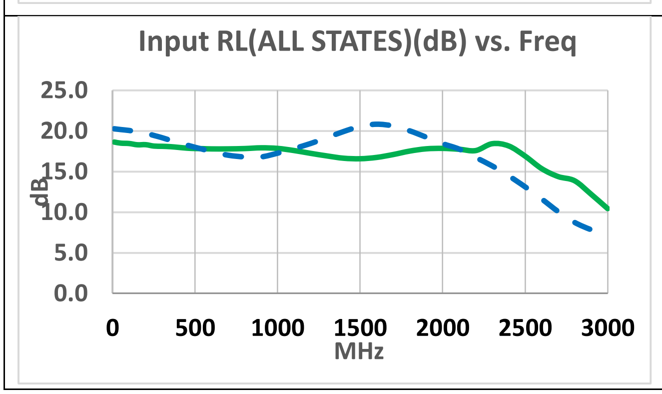


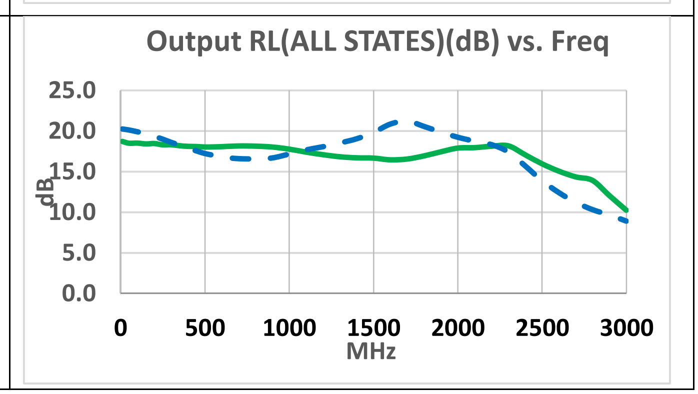












Notes:
a. Suitability for model replacement within a particular system must be determined by and is solely the responsibility of the customer based on, among other things, electrical performance criteria, stimulus conditions, application, compatibility with other components and environmental conditions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

IMPORTANT NOTICE

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.