WBA19-1733A

1.75- 2.05 GHz LOW NOISE BALANCE AMPLIFIER

REV C
August 2007

Key Features

- 1.75 ~ 2.05 GHz
- 0.65 dB noise figure
- 36.0 dBm output IP_3
- 17.0 dB Gain
- 18.0 dBm P_{1dB}
- 1.22:1 VSWR
- Single power supply
- >34 years MTBF
- Unconditional stable
- Full Alarm Capabilities
- RoHS compliant

Product Description

WA19-1733A integrates WanTcom proprietary low noise amplifier technology, high frequency micro electronic assembly techniques, and high reliability design to realize optimum low noise figure, wideband, high linearity, and unconditional stable performances together. With single +7.0V to +30V DC operation, the amplifier has optimal input and output matching in the specified frequency range at 50-Ohm impedance system. The amplifier has standard SMA connectorized WP-1 clear plated housing.

The amplifier is designed to meet the rugged standard of MIL-STD-202.

Applications

- Mobile Infrastructures
- Measurement
- Fixed Wireless

Ordering Information

Model No.	Feature
WA19-1733B	V_{dd} =+5.0V
WA19-1733A	V_{dd} = +7 ~ +30V

Specifications

Summary of the electrical specifications WA19-1733A at room temperature

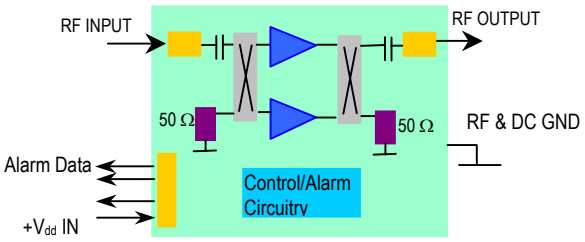
Index	Testing Item	Symbol	Test Constraints	Min	Nom	Max	Unit
1	Gain	S_{21}	1.75 – 2.05 GHz	15.5	17	17.5	dB
2	Gain Variation	ΔG	20 MHz Bandwidth		0.15	0.25	dB
3	Input Return Loss	SWR_1	1.75 – 2.05 GHz	20	22		dB
4	Output Return Loss	SWR_2	1.75 – 2.05 GHz	20	22		dB
5	Reverse Isolation	S_{12}	1.75 – 2.05 GHz	20			dB
6	Noise figure	NF	1.75 – 2.05 GHz		0.65	0.80	dB
7	Output Power 1dB compression Point	P_{1dB}	1.75 – 2.05 GHz	16	18		dBm
8	Output-Third-Order Interception point	IP_3	Two-Tone, P_{out} +0 dBm each, 1 MHz separation	34	36		dBm
9	Current Consumption	I_{dd}	V_{dd}		125		mA
10	Power Supply Voltage	V_{dd}	WA19-1733B	+4.7	+5	+5.3	V
			WA19-1733A	+7.0		+30	
11	Thermal Resistance	$R_{th,c}$	Junction to case			220	°C/W
12	Operating Temperature	T_o	Base Plate	-40		+85	°C
13	Maximum Average RF Input Power	$P_{IN, MAX}$	1.75 – 2.05 GHz			10	dBm
14	Soft Alarm TTL Output	V_s	Normal/Fail, +/- 30% I_{d1} or I_{d2}	4.70/0.0			V
	Soft Alarm Open Collector Output	V_{so}	Normal/Fail, External 10K to an external +V_{cc}	Low/High			
	Hard Alarm TTL Output	V_h	Normal/Fail, +/- 30% I_{dd}	4.70/0.0			V
	Hard Alarm Open Collector Output	V_{ho}	Normal/Fail, External 10K to an external +V_{cc}	Low/High			
	Branch 1 Alarm TTL Output	V_{a1}	Normal/Fail, +/- 30% I_{d1}	4.70/0.0			V
	Branch 2 Alarm TTL Output	V_{a2}	Normal/Fail, +/- 30% I_{d2}	4.70/0.0			V

Absolute Maximum Ratings

Parameters	Units	Ratings
DC Power Supply Voltage	V	+30V (6.0V for WA19-1733B)
Drain Current	mA	135
Total Power Dissipation	W	3.75
RF Input Power	dBm	13
Channel Temperature	°C	150
Storage Temperature	°C	-55 ~ 150
Operating Temperature	°C	-55 ~ +100
Thermal Resistance	°C/W	220

Operation of this device above any one of these parameters may cause permanent damage.

Functional Block Diagram



Specifications and information are subject to change without notice.

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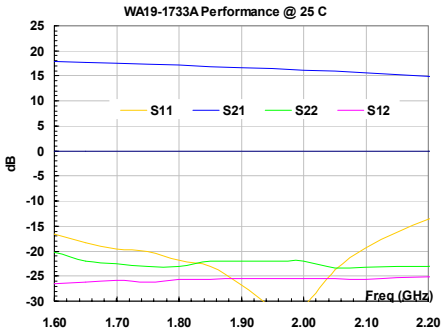
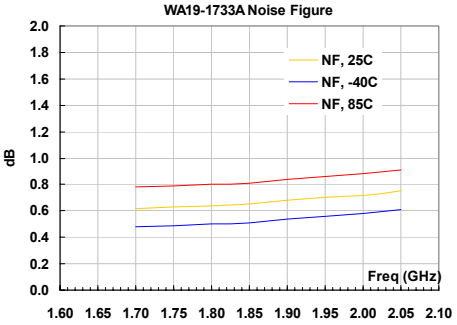
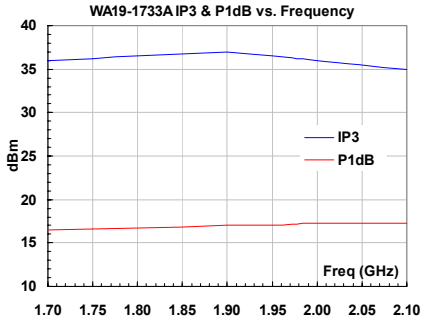
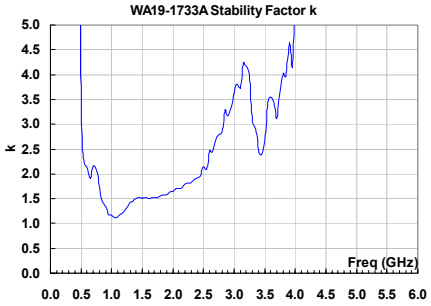
Typical Data

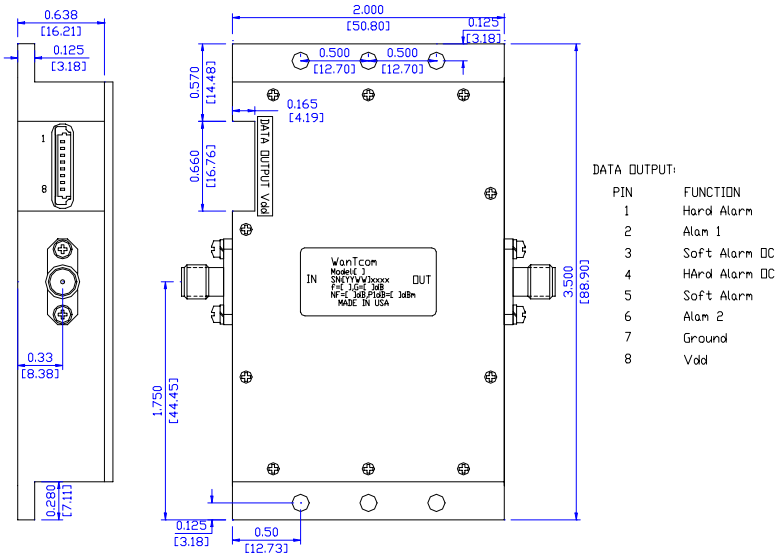








Outline, WP-1D Housing



UNITS:	INCH [mm]
BODY:	Aluminum Alloy
Finish:	Clear Plating
RF Connector:	SMA F Stainless
DATA OUTPUT/V_{dd}:	Molex, 53048-0810

Small Signal S-Parameters:

! WA19-1733A, +25C, S-parameters at V_{dd}=+7 ~ +30V, I_{dd}=125mA. Last updated 05/21/03.
GHZ s MA R 50

!Freq(GHz)	MAGS11	ANGS11	MAGS21	ANGS21	MAGS12	ANGS12	MAGS22	ANGS22
0.05	0.57	-45.3	0.05	-26.7	0.0013	-108.4	0.99	-42.3
0.1	0.46	-57.0	0.25	-49.9	0.0015	-129.2	0.99	-78.7
0.2	0.60	-72.1	0.90	-99.7	0.0020	59.1	0.98	-135.2
0.3	0.87	-115.7	1.53	-156.8	0.0020	108.5	0.96	-176.1
0.5	0.91	176.0	2.32	157.9	0.0038	98.0	0.85	132.7
0.8	0.73	115.2	4.33	64.7	0.0130	7.4	0.81	51.3
1	0.74	72.3	6.42	6.6	0.0230	-49.1	0.59	-17.0
1.2	0.57	18.3	8.20	-67.0	0.0350	-115.1	0.26	-112.6
1.5	0.22	-76.0	8.02	-167.7	0.0450	150.0	0.11	85.9
1.6	0.15	-119.8	7.81	160.8	0.0470	122.3	0.10	61.5
1.7	0.11	-171.3	7.52	128.7	0.0510	92.7	0.08	58.5
1.8	0.08	140.1	7.22	97.5	0.0520	63.8	0.07	69.5
1.9	0.05	97.3	6.84	67.1	0.0530	34.3	0.08	75.8
2	0.02	-102.8	6.39	36.9	0.0530	6.5	0.08	64.8
2.1	0.11	-143.4	5.99	7.2	0.0530	-20.5	0.07	59.9
2.5	0.44	119.1	4.26	-110.1	0.0480	-135.6	0.15	104.9
2.7	0.51	87.1	3.15	-172.0	0.0450	164.3	0.37	88.0
3	0.62	44.3	1.84	109.4	0.0300	91.2	0.74	25.5
3.6	0.82	-54.8	0.80	-10.3	0.0200	-13.8	0.89	-85.0
4	0.76	-166.5	0.80	-95.9	0.0190	-100.9	0.84	-164.5
4.6	0.63	-22.6	0.09	93.8	0.0160	-141.3	0.49	-7.0
5	0.46	-109.9	0.14	147.4	0.0150	159.7	0.38	-118.6
5.6	0.09	-82.5	0.31	13.8	0.0190	33.8	0.52	-146.2
6	0.42	-114.6	0.33	-68.9	0.0170	-95.0	0.70	165.2

Application Notes:

A. SMA Torque Wrench Selection

Always use a torque wrench with 5 ~ 6 inch-lb coupling torque setting for mating the SMA cables to the amplifier. Never use torque more than 8 inch-lb wrench for tightening the mating cable to the connector. Otherwise, the permanent damage will occur to the SMA connectors of the amplifier. 8710-1582 (5 inch-lb) is one of the ideal torque wrench choice from Agilent Technology.

B. Mounting the Amplifier

Use six pieces of #4-40 with longer than 3/8" screws for mounting the amplifier on a metal-based chase. Flat and spring washers are needed to prevent the screw loosening during the shock and vibration. Always use the appropriate torque setting of the power screwdriver to mount them.

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