

REV B

0.1 – 2.0 GHz LOW NOISE AMPLIFIER WHM0110AE¹

WHM0110AE LNA is a low noise figure, wideband, and high linearity SMT packaged amplifiers. The amplifier offers typical noise figure of 0.65 dB and output IP₃ of 34 dBm at the frequency range from 0.1 GHz to 1.1 GHz and extendable to 2.0 GHz of VHF, UHF, Cellular, GSM, GPS, DCS, PCS, and 3G bands. WHM0110AE LNA is most suitable for cellular base stations, wireless data communications, tower top receiver amplifiers, last-mile wireless communication systems, and wireless measurement applications.



Key Features:

Impedance:	50 Ohm
MTBF ² :	>2,500,000 hrs (300 Years)
LGA (land grid array) package:	6-pin
Low Noise:	0.65 dB
Output IP ₃ :	34 dBm
Gain:	20.0 dB
P _{1dB} :	17.0 dBm
Single power supply:	60 mA @ +5V
Frequency Range:	$0.1 \sim 1.1$ GHz Extendable to 2.0 GHz
Operating Temperature:	-40 ~ +85 °C
Return Losses:	16 dB Typical
Small size:	0.25" x 0.25" x 0.060" (6.35 mm x 6.35 mm x 1.52 mm)
Built-in Functions:	DC blocks at input and output, temperature compensation circuits, and auto DC biases.

Specifications:

a) Table 1 Summary of the electrical specifications WHM0110AE at room temperature

Index	Testing Item	Symbol	Test Constraints	Nom (RT)	Min	Max	Unit
1	Gain	S ₂₁	0.1 – 1.1 GHz		17.5	23	dB
2	Gain Variation	ΔG	0.1 GHz Bandwidth	+/- 0.25		+/- 0.4	dB
3	Input Return Loss	S ₁₁	0.1 – 1.1 GHz	20	18		dB
4	Output Return Loss	S ₂₂	0.1 – 1.1 GHz	18	16		dB
5	Reverse Isolation	S ₁₂	0.1 – 1.1 GHz	22	20		dB
6	Noise figure	NF	0.1 – 1.1 GHz	0.65		0.80	dB
7	Output Power 1dB compression Point	P _{1dB}	0.1 – 1.1 GHz	17	16		dBm
8	Output-Third-Order Interception point	IP ₃	Two-Tone, P _{out} +0 dBm each, 1 MHz separation	34	32		dBm
10	Current Consumption	l _{dd}	V _{dd} = +5 V	60	55	70	mA
11	Power Supply Voltage	V _{dd}		+5	+4.7	+5.3	V
12	Thermal Resistance	R _{th,c}	Junction to case			215	°C/W
13	Operating Temperature	To			-40	+85	°C
14	Maximum Average RF Input Power	P _{IN, MAX}	0.1 – 2.0 GHz			10	dBm

¹ Specifications are subject to change without notice.

² MTBF: Mean Time Between Failure, Per TR-NWT-000332, ISSUE 3, SEPTEMBER, 1990, T=40 °C



b) Passband Frequency Response

As shown in **Figure 1**, the typical gain of the WHM0110AE is from 18.0 dB to 22.5 dB across 0.1 GHz to 1.1 GHz. The typical input and output return losses are 20 dB and 18 dB across the frequency of 0.1 to 1.1 GHz. The return losses and gain are usable up to 2.0 GHz. **Figure 2** shows the full band performance up to 2.0 GHz.

Figure 3 shows the measured P_{1dB} and IP_3 of the WHM0110AE. The typical P_{1dB} and IP_3 are 17 dBm and 34 dBm in the frequency range of 0.10 GHz to 2.0 GHz, respectively.

Figure 4 illustrates the measured noise figure performance at full temperature. The measured results include the test fixture loss of approximately 0.05 dB to 0.10 dB depending on the frequency. The noise figure is 0.60 dB to 0.75 dB across the frequency range of 0.1 to 1.1 GHz at room temperature. The noise figure is below 1.0 dB at 2.0 GHz. At 85 $^{\circ}$ C, WHM0110AE only has 0.35 dB noise increases. At -40 $^{\circ}$ C, WHM0110AE offers approximately 0.25 dB less noise figure than that at room temperature.

Figure 5 demonstrates the stability factor k of the amplifier. The k values are slightly below 1 in some frequency ranges of 2.7 GHz to 3.4 GHz. Figure 6 plots the input and output stability circles. As shows in Figure 6, the red circles are the input stability circles and there are some small potential unstable areas falling into the unit Smith Chart. The high inductance to open load would cause the unstable to the amplifier. The blue circles are the output stability circles and there are some small potential unstable areas falling into the unit Smith Chart. The high circles and there are some small potential unstable areas falling into the unit Smith Chart. The high capacitance to open load would cause the unstable to the amplifier.

Figure 7 is the block diagram of internal circuit of WHM0110AE. It is one stage amplifier with the DC block capacitors at the input and output RF ports. All the RF matching networks, DC bias circuitries, and temperature compensation circuits are built in.

Figure 8 demonstrates the application schematic diagram of WHM0110AE. It requires two (2) external decoupling capacitors of 0.01 uF to build a LNA with WHM0110AE. The +5V DC can be applied either at Pin 3 or Pin 5 depending on the availability of the +5.0V source location. No DC block capacitor is required for both input and output RF ports. For +5V line trace length being longer than 6 inch without a decoupling capacitor, an additional 0.01 ~ 0.1 uF de-coupling capacitor with minimum rating voltage of 10V may be needed across the +5V line to ground. The capacitor must be rated in the temperature range of -40 $^{\circ}$ C to 85 $^{\circ}$ C to ensure the entire circuit working in the specified temperature range.

Figure 9 shows the mechanical outline and recommended motherboard layout of WHM0110AE. Plenty of ground vias on the motherboard are essential for the RF grounding. The width of the 50-Ohm lines at the input and output RF ports may be different for different property of the substrate.



FIG. 1 Typical small signal performance.

FIG. 2 Small signal performance up to 2 GHz.



WHM0110AE IP3 and P1dB 50 45 40 35 dBm 30 25 20 15 10 IP3 (dBm) P1dB (dBm) 5 Freq (GHz) 0 0.0 0.2 0.4 0.6 0.8 1.0 1.6 1.8 2.0 1.2 1.4

FIG. 3 Typical P_{1dB} and IP_3 at room temperature.





GN IN

R

Vd

C12

5.0<

BOTTOM GND PLANE

z



FIG. 4 Noise figure performance at full temperature



FIG. 6 Plots of Input and output stability circles



FIG. 5 Block diagram of internal circuit.

FIG. 6 Typical application schematic for WHM0110AE

www.wantcominc.com

REV B

3

(OPTIONAL)



DISCRIPTIONS DATE REV REV DESCRIPTION A NEW RELEASE 9/5/03 GHu BASE LID <u>PIN 1 ID</u> 0.04 0.1400 WanTcom 0.04 (MODEL NO) PIN 1 2 3 4 5 6 CTR 0020 YWWW 0.002 0.0300 ID RFIN +5V NC +5V RFOUT NC GND 0.2500 0.0600 INPUT SIDE ID 0.0350 0.2500 0.0250 0.0330 1 50 DHM LINE MICROSTRIP 50 DHM LINE MICROSTRIP GND LAYER 0.0290 0.0440 пит 0.0300 UTE: 0.180 0) +5V. IN TO ETHER PIN 2 GR PIN 4 1) C1: 0LF_IOV_XSR 2) PCB MATERIAL: RD4003, H=20 MILS, 1 UZ 3) ALL VIAS MUST BE PLATED 4) VIA DRILL DIAMETER: 0.024' GR EDUVALENT 5) WIDTH OF SO-DML ILNE MAY VARY WITH OTHER MATERIAL OR THICKNESS 6) SOLDERE STENCIL THICKNESS: 1004' 7) SOLDERE STENCIL THICKNESS: 0.004' 0.0510 NOTE 0) 1) 2) 3) 4) 5) TDLERANCE UNLESS NOTED DTHERWISES DIMENSIONS ARE 90° FORMED IN INCHE/CMMI XXX +/- 0.05 XXXX+/-0.010 XXXXX+/-0.005 DRAWN GHU 9/1/03 Wantcom DESIGN GHU 9/1/03 1990 GRUD HAL HIR LAR 1990 GRUD HAL HIR LAR 1990 GRUD HAL HIR LAR 1990 AD 1 THIRD ANGLE PROJECTION Inc DESIGN GHu 9/1/03 \bigoplus \in INSPECT YWO 9/5/03 PROD PROD WHM-1 OUTLIN DESC OUTLINES FOR REFERENCE DNLY QA DDC D PACKAGE DESC 2)TEST BUARI DDC 2000131 MFG ENGR SOLDER MASK MATERIAL: LOW LOSS, EXAMPLE, PSR4000BN FROM TAIYO 7) ATERIAL: SEE THE NOTES MANAGER © COPHRIGHT YonTcon, Inc., 1999 - 2003 ALL RIGHT RESERVED 11/1/03 ELECTRONIC DRAWING: HW ENGR DONOT SCALE THE PRINT

WHM0110AE Mechanical Outline, WHM-1:

FIG. 7 WHM0110AE outline

Ordering Information

|--|

Waffle pack with the capacity of 100 pieces (10 x 10) is used for the packing. Contact factory for tape and reel packing option for higher volume requirements.



Small Signal S-Parameters:

!WHM0110AE !s-parameters at Vds=5V, Id=60 mA, including the test board. !Last updated 2/2/04.

GHZ s MA R 50

$\begin{array}{cccccccccccccccccccccccccccccccccccc$
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
$\begin{array}{cccccccccccccccccccccccccccccccccccc$
0.3 0.092 -73.3 12.629 144.1 0.0520 8.3 0.116 107.2 0.4 0.098 -103.0 12.125 127.4 0.0550 4.6 0.113 79.6 0.5 0.107 -127.0 11.517 112.4 0.0570 1.5 0.108 55.7 0.6 0.116 -149.6 10.873 98.3 0.0600 -1.6 0.107 31.5 0.7 0.120 -169.6 10.268 85.0 0.0640 -5.0 0.103 7.3 0.8 0.124 172.4 9.669 72.3 0.0680 -8.9 0.101 -15.7 0.9 0.129 154.9 9.088 60.1 0.0730 -31.1 0.100 -38.3 1 0.130 139.7 8.560 48.3 0.0770 -17.9 0.100 -61.9 1.1 0.132 124.7 8.072 36.7 0.0820 -23.0 0.104 -83.6 1.2 0.134 111.5 7.622 25.2 0.0870 -23.2 0.104 -83.6 1.2 0.134 111.5 7.622 25.2 0.0870 -28.2 0.110 -106.3 1.3 0.134 98.2 7.220 13.9 0.0920 -34.1 0.114 -126.2 1.4 0.130 88.3 6.859 3.1 0.0970 -40.1 0.129 -145.7 1.5 0.129 77.7 6.546 -7.8 0.1030 -46.4 0.141 -164.9 1.6 0.129 68.0 6.210 -19.0 0.1080 -53.1 0.154 177.1 1.7 0.133 58.0 5.868 -30.2 0.1140 -60.6 0.167 160.8 1.8 0.126 43.2 5.442 -40.9 0.1200 -68.3 0.178 147.1 1.9 0.077 28.7 5.224 -49.3 0.1270 -76.1 0.199 142.0 2 0.070 85.3 5.246 -61.7 0.1270 -89.3 0.302 128.8 2.1 0.136 65.2 4.512 -85.2 0.1280 -100.4 0.354 92.3 2.3 0.223 53.4 4.277 -96.1 0.1320 -108.7 0.393 78.3 2.4 0.273 41.8 4.030 -108.0 0.1370 -117.6 0.432 64.9 2.5 0.319 29.2 3.820 -120.2 0.1400 -126.8 0.472 51.4 2.6 0.372 16.4 3.597 -132.0 0.1300 -147.5 0.557 25.5 2.8 0.495 -11.3 2.998 -155.6 0.1370 -158.7 0.600 12.6 2.9 0.557 -26.7 2.649 -168.2 0.1330 -169.2 0.640 -1.4 3 0.611 -43.1 2.290 -177.8 0.1230 -108.7 0.393 78.3 2.4 0.273 41.8 4.030 -108.0 0.1370 -158.7 0.601 12.6 2.9 0.557 -26.7 2.649 -168.2 0.1330 -169.2 0.640 -1.4 3 0.611 -43.1 2.99 3.330 -143.2 0.1370 -158.7 0.651 -16.1 3.1 0.649 -57.9 2.177 174.6 0.1170 175.0 0.612 -23.7 3.2 0.695 -71.6 2.076 160.2 0.1190 165.8 0.692 -30.0 3.3 0.736 -68.4 1.829 145.2 0.1330 -169.2 0.640 -1.4 3 0.611 -43.1 3.299 8.155.6 0.1370 -158.7 0.651 -16.1 3.1 0.649 -57.9 2.177 174.6 0.1170 175.0 0.612 -23.7 3.2 0.695 -71.6 2.076 160.2 0.1190 165.8 0.692 -30.0 3.3 0.736 -68.5 1.829 0.170 0.960 115.9 0.874 -90.2 3.4 0.779 -101.4
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
$ 0.5 0.107 -127.0 11.517 112.4 0.0570 1.5 0.108 55.7 \\ 0.6 0.116 -149.6 10.873 98.3 0.0600 -1.6 0.107 31.5 \\ 0.7 0.120 -169.6 10.268 85.0 0.0640 -5.0 0.103 7.3 \\ 0.8 0.124 172.4 9.669 72.3 0.0680 -8.9 0.101 -15.7 \\ 0.9 0.129 154.9 9.088 60.1 0.0730 -13.1 0.100 -38.3 \\ 1 0.130 139.7 8.560 48.3 0.0770 -17.9 0.100 -61.9 \\ 1.1 0.132 124.7 8.072 36.7 0.0820 -23.0 0.104 -83.6 \\ 1.2 0.134 111.5 7.622 25.2 0.0870 -28.2 0.110 -106.3 \\ 1.3 0.134 98.2 7.220 13.9 0.0920 -34.1 0.114 -126.2 \\ 1.4 0.130 88.3 6.859 3.1 0.0970 -40.1 0.129 -145.7 \\ 1.5 0.129 77.7 6.546 -7.8 0.1030 -46.4 0.141 -164.9 \\ 1.5 0.129 68.0 6.210 -19.0 0.1080 -53.1 0.154 177.1 \\ 1.5 0.129 68.0 5.868 -30.2 0.1140 -60.6 0.167 160.8 \\ 1.8 0.126 43.2 5.442 -40.9 0.1200 -68.3 0.178 147.1 \\ 1.9 0.077 28.7 5.224 -49.3 0.1270 -76.1 0.199 142.0 \\ 2 0.070 85.3 5.246 -61.7 0.1220 -94.2 0.321 106.2 \\ 2.2 0.180 65.2 4.512 -85.2 0.1280 -100.4 0.354 92.3 \\ 2.3 0.223 53.4 4.277 -96.1 0.1320 -108.7 0.393 78.3 \\ 2.4 0.273 41.8 4.030 -108.0 0.1370 -117.6 0.432 64.9 \\ 2.5 0.319 2.92 3.820 -120.2 0.1400 -126.8 0.472 51.4 \\ 2.6 0.372 16.4 3.597 -132.0 0.1390 -136.4 0.514 38.6 \\ 2.7 0.431 2.9 3.330 -143.2 0.1370 -117.6 0.432 64.9 \\ 2.5 0.319 2.92 3.820 -120.2 0.1400 -126.8 0.472 51.4 \\ 3.6 0.49 -57.9 2.177 174.6 0.1170 175.0 0.612 -23.7 \\ 3.2 0.495 -71.6 2.90 -177.8 0.1230 -94.2 0.321 106.2 \\ 2.9 0.557 -26.7 2.649 -168.2 0.1330 -168.7 0.651 -16.1 \\ 3.1 0.649 -57.9 2.177 174.6 0.1170 175.0 0.612 -23.7 \\ 3.2 0.895 -71.6 2.90 -177.8 0.1230 -178.7 0.651 -16.1 \\ 3.1 0.649 -57.9 2.177 174.6 0.1170 175.0 0.612 -23.7 \\ 3.2 0.843 -130.6 1.062 110.3 0.0990 125.5 0.857 -79.0 \\ 3.5 0.818 -115.9 1.283 121.3 0.0990 125.5 0.857 -79.0 \\ 3.5 0.8$
$\begin{array}{cccccccccccccccccccccccccccccccccccc$
$\begin{array}{cccccccccccccccccccccccccccccccccccc$
$\begin{array}{cccccccccccccccccccccccccccccccccccc$
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
1.1 0.132 124.7 8.072 36.7 0.0820 -23.0 0.104 -83.6 1.2 0.134 111.5 7.622 25.2 0.0870 -28.2 0.110 -106.3 1.3 0.134 98.2 7.220 13.9 0.0920 -34.1 0.114 -126.2 1.4 0.130 88.3 6.859 3.1 0.0970 -40.1 0.129 -145.7 1.5 0.129 77.7 6.546 -7.8 0.1030 -46.4 0.141 -164.9 1.6 0.129 68.0 6.210 -19.0 0.1080 -53.1 0.154 177.1 1.7 0.133 58.0 5.868 -30.2 0.1140 -60.6 0.167 160.8 1.8 0.126 43.2 5.442 -40.9 0.1200 -68.3 0.178 147.1 1.9 0.077 28.7 5.224 -49.3 0.1270 -76.1 0.199 142.0 2 0.070 85.3 5.246 -61.7 0.1280 -94.2 0.321 106.2 2.2 0.180 65.2 4.512 -85.2 0.1280 -100.4 0.354 92.3 2.3 0.223 53.4 4.277 -96.1 0.1320 -108.7 0.393 78.3 2.4 0.273 41.8 4.030 -108.0 0.1370 -117.6 0.432 64.9 2.5 0.319 29.2 3.330 -143.2 0.1370
1.2 0.134 111.5 7.622 25.2 0.0870 -28.2 0.110 -106.3 1.3 0.134 98.2 7.220 13.9 0.0920 -34.1 0.114 -126.2 1.4 0.130 88.3 6.859 3.1 0.0970 -40.1 0.129 -145.7 1.5 0.129 77.7 6.546 -7.8 0.1030 -46.4 0.141 -164.9 1.6 0.129 68.0 6.210 -19.0 0.1080 -53.1 0.154 177.1 1.7 0.133 58.0 5.868 -30.2 0.1140 -60.6 0.167 160.8 1.8 0.126 43.2 5.442 -40.9 0.1200 -68.3 0.178 147.1 1.9 0.077 28.7 5.224 -49.3 0.1270 -76.1 0.199 142.0 2 0.077 85.3 5.246 -61.7 0.1270 -89.3 0.302 128.8 2.1 0.136 75.2 4.846 -74.9 0.1230 -94.2 0.321 106.2 2.2 0.180 65.2 4.512 -85.2 0.1280 -100.4 0.354 92.3 2.3 0.223 53.4 4.277 -96.1 0.1320 -108.7 0.333 78.3 2.4 0.273 41.8 4.030 -108.0 0.1370 -117.6 0.432 64.9 2.5 0.319 29.2 3.820 $-120.$
1.3 0.134 98.2 7.220 13.9 0.0920 -34.1 0.114 -126.2 1.4 0.130 88.3 6.859 3.1 0.0970 -40.1 0.129 -145.7 1.5 0.129 77.7 6.546 -7.8 0.1030 -46.4 0.141 -164.9 1.6 0.129 68.0 6.210 -19.0 0.1080 -53.1 0.154 177.1 1.7 0.133 58.0 5.868 -30.2 0.1140 -60.6 0.167 160.8 1.8 0.126 43.2 5.442 -40.9 0.1200 -68.3 0.178 147.1 1.9 0.077 28.7 5.224 -49.3 0.1270 -76.1 0.199 142.0 2 0.070 85.3 5.246 -61.7 0.1230 -94.2 0.321 106.2 2.2 0.180 65.2 4.512 -85.2 0.1280 -100.4 0.354 92.3 2.3 0.223 53.4 4.277 -96.1 0.1320 -108.7 0.393 78.3 2.4 0.273 41.8 4.030 -108.0 0.1370 -117.6 0.432 64.9 2.5 0.319 29.2 3.820 -120.2 0.1400 -126.8 0.472 51.4 2.6 0.372 16.4 3.597 -132.0 0.1370 -147.5 0.557 25.5 2.8 0.495 -11.3 2.998 -155.6 0.1370 <t< td=""></t<>
1.40.13088.36.8593.10.0970-40.10.129-145.71.50.12977.76.546-7.80.1030-46.40.141-164.91.60.12968.06.210-19.00.1080-53.10.154177.11.70.13358.05.868-30.20.1140-60.60.167160.81.80.12643.25.442-40.90.1200-68.30.178147.11.90.07728.75.224-49.30.1270-76.10.199142.020.07085.35.246-61.70.1230-94.20.321106.22.20.18065.24.512-85.20.1280-100.40.35492.32.30.22353.44.277-96.10.1320-108.70.39378.32.40.27341.84.030-108.00.1370-117.60.43264.92.50.31929.23.820-120.20.1400-126.80.47251.42.60.37216.43.597-132.00.1330-169.20.640-1.430.611-43.12.998-155.60.1370-158.70.660112.62.90.557-26.72.649-168.20.1130-178.70.651-16.13.10.649-57.92.177174.60.1170175.00.612-23.73.20.695-71
1.5 0.129 77.7 6.546 -7.8 0.1030 -46.4 0.141 -164.9 1.6 0.129 68.0 6.210 -19.0 0.1080 -53.1 0.154 177.1 1.7 0.133 58.0 5.868 -30.2 0.1140 -60.6 0.167 160.8 1.8 0.126 43.2 5.442 -40.9 0.1200 -68.3 0.178 147.1 1.9 0.077 28.7 5.224 -49.3 0.1270 -76.1 0.199 142.0 2 0.070 85.3 5.246 -61.7 0.1270 -89.3 0.302 128.8 2.1 0.136 75.2 4.846 -74.9 0.1230 -94.2 0.321 106.2 2.2 0.180 65.2 4.512 -85.2 0.1280 -94.2 0.321 106.2 2.3 0.223 53.4 4.277 -96.1 0.1320 -108.7 0.393 78.3 2.4 0.273 41.8 4.030 -108.0 0.1370 -117.6 0.432 64.9 2.5 0.319 29.2 3.820 -120.2 0.1400 -126.8 0.472 51.4 2.6 0.372 16.4 3.597 -132.0 0.1330 -168.7 0.600 12.6 2.9 0.557 -26.7 2.649 -168.2 0.1330 -169.2 0.640 -1.4 3 0.611 -43.1 2.290 -177.8 0.1230 <
1.6 0.129 68.0 6.210 -19.0 0.1080 -53.1 0.154 177.1 1.7 0.133 58.0 5.868 -30.2 0.1140 -60.6 0.167 160.8 1.8 0.126 43.2 5.442 -40.9 0.1200 -68.3 0.178 147.1 1.9 0.077 28.7 5.224 -49.3 0.1270 -76.1 0.199 142.0 2 0.070 85.3 5.246 -61.7 0.1230 -94.2 0.321 106.2 2.2 0.180 65.2 4.512 -85.2 0.1230 -94.2 0.321 106.2 2.3 0.223 53.4 4.277 -96.1 0.1320 -10.4 0.354 92.3 2.3 0.223 53.4 4.277 -96.1 0.1320 -108.7 0.393 78.3 2.4 0.273 41.8 4.030 -108.0 0.1370 -117.6 0.432 64.9 2.5 0.319 29.2 3.820 -120.2 0.1400 -126.8 0.472 51.4 2.6 0.372 16.4 3.597 -132.0 0.1390 -136.4 0.514 38.6 2.7 0.431 2.9 3.330 -143.2 0.1370 -147.5 0.557 25.5 2.8 0.495 -11.3 2.998 -155.6 0.1370 -158.7 0.600 12.6 2.9 0.557 -26.7 2.649 -168.2 0.1330
1.7 0.133 58.0 5.868 -30.2 0.1140 -60.6 0.167 160.8 1.8 0.126 43.2 5.442 -40.9 0.1200 -68.3 0.178 147.1 1.9 0.077 28.7 5.224 -49.3 0.1270 -76.1 0.199 142.0 2 0.070 85.3 5.246 -61.7 0.1270 -89.3 0.302 128.8 2.1 0.136 75.2 4.846 -74.9 0.1230 -94.2 0.321 106.2 2.2 0.180 65.2 4.512 -85.2 0.1280 -100.4 0.354 92.3 2.3 0.223 53.4 4.277 -96.1 0.1320 -108.7 0.333 78.3 2.4 0.273 41.8 4.030 -108.0 0.1370 -117.6 0.432 64.9 2.5 0.319 29.2 3.820 -120.2 0.1400 -126.8 0.472 51.4 2.6 0.372 16.4 3.597 -132.0 0.1390 -136.4 0.514 38.6 2.7 0.431 2.9 3.330 -143.2 0.1370 -178.7 0.6600 12.6 2.9 0.557 -26.7 2.649 -168.2 0.1330 -169.2 0.640 -1.4 3 0.611 -43.1 2.290 -177.8 0.1230 -178.7 0.651 -16.1 3.1 0.695 -71.6 2.076 <td< td=""></td<>
1.8 0.126 43.2 5.442 -40.9 0.1200 -68.3 0.178 147.1 1.9 0.077 28.7 5.224 -49.3 0.1270 -76.1 0.199 142.0 2 0.070 85.3 5.246 -61.7 0.1270 -89.3 0.302 128.8 2.1 0.136 75.2 4.846 -74.9 0.1230 -94.2 0.321 106.2 2.2 0.180 65.2 4.512 -85.2 0.1280 -100.4 0.354 92.3 2.3 0.223 53.4 4.277 -96.1 0.1320 -108.7 0.393 78.3 2.4 0.273 41.8 4.030 -108.0 0.1370 -117.6 0.432 64.9 2.5 0.319 29.2 3.820 -120.2 0.1400 -126.8 0.472 51.4 2.6 0.372 16.4 3.597 -132.0 0.1390 -136.4 0.514 38.6 2.7 0.431 2.9 3.330 -143.2 0.1370 -147.5 0.557 25.5 2.8 0.495 -11.3 2.998 -155.6 0.1370 -178.7 0.661 -1.4 3 0.611 -43.1 2.290 -177.8 0.1230 -178.7 0.661 -1.4 3.1 0.695 -71.6 2.076 160.2 0.1190 145.3 0.802 -55.1 3.2 0.695 -71.6 2.076 160.2 0.1180
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
$\begin{array}{cccccccccccccccccccccccccccccccccccc$
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
$\begin{array}{cccccccccccccccccccccccccccccccccccc$
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
$\begin{array}{cccccccccccccccccccccccccccccccccccc$
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
2.8 0.495 -11.3 2.998 -155.6 0.1370 -158.7 0.600 12.6 2.9 0.557 -26.7 2.649 -168.2 0.1330 -169.2 0.640 -1.4 3 0.611 -43.1 2.290 -177.8 0.1230 -178.7 0.651 -16.1 3.1 0.649 -57.9 2.177 174.6 0.1170 175.0 0.612 -23.7 3.2 0.695 -71.6 2.076 160.2 0.1180 165.8 0.692 -30.0 3.3 0.736 -86.4 1.829 145.2 0.1180 155.2 0.763 -42.6 3.4 0.779 -101.4 1.550 132.9 0.1100 145.3 0.802 -55.1 3.5 0.818 -115.9 1.283 121.3 0.1040 135.5 0.834 -67.0 3.6 0.843 -130.6 1.062 110.3 0.0990 125.5 0.857 -79.0
2.9 0.557 -26.7 2.649 -168.2 0.1330 -169.2 0.640 -1.4 3 0.611 -43.1 2.290 -177.8 0.1230 -178.7 0.651 -16.1 3.1 0.649 -57.9 2.177 174.6 0.1170 175.0 0.612 -23.7 3.2 0.695 -71.6 2.076 160.2 0.1190 165.8 0.692 -30.0 3.3 0.736 -86.4 1.829 145.2 0.1180 155.2 0.763 -42.6 3.4 0.779 -101.4 1.550 132.9 0.1100 145.3 0.802 -55.1 3.5 0.818 -115.9 1.283 121.3 0.1040 135.5 0.834 -67.0 3.6 0.843 -130.6 1.062 110.3 0.0990 125.5 0.857 -79.0 3.7 0.855 -145.0 0.875 99.7 0.0960 115.9 0.874 -90.2
3 0.611 -43.1 2.290 -177.8 0.1230 -178.7 0.651 -16.1 3.1 0.649 -57.9 2.177 174.6 0.1170 175.0 0.612 -23.7 3.2 0.695 -71.6 2.076 160.2 0.1190 165.8 0.692 -30.0 3.3 0.736 -86.4 1.829 145.2 0.1180 155.2 0.763 -42.6 3.4 0.779 -101.4 1.550 132.9 0.1100 145.3 0.802 -55.1 3.5 0.818 -115.9 1.283 121.3 0.1040 135.5 0.834 -67.0 3.6 0.843 -130.6 1.062 110.3 0.0990 125.5 0.857 -79.0 3.7 0.855 -145.0 0.875 99.7 0.0960 115.9 0.874 -90.2 3.8 0.872 -159.0 0.711 90.3 0.0910 107.0 0.887 -101.1
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
3.2 0.695 -71.6 2.076 160.2 0.1190 165.8 0.692 -30.0 3.3 0.736 -86.4 1.829 145.2 0.1180 155.2 0.763 -42.6 3.4 0.779 -101.4 1.550 132.9 0.1100 145.3 0.802 -55.1 3.5 0.818 -115.9 1.283 121.3 0.1040 135.5 0.834 -67.0 3.6 0.843 -130.6 1.062 110.3 0.0990 125.5 0.857 -79.0 3.7 0.855 -145.0 0.875 99.7 0.0960 115.9 0.874 -90.2 3.8 0.872 -159.0 0.711 90.3 0.0910 107.0 0.887 -101.1 3.9 0.884 -172.2 0.567 81.4 0.0850 97.0 0.897 -111.3
3.3 0.736 -86.4 1.829 145.2 0.1180 155.2 0.763 -42.6 3.4 0.779 -101.4 1.550 132.9 0.1100 145.3 0.802 -55.1 3.5 0.818 -115.9 1.283 121.3 0.1040 135.5 0.834 -67.0 3.6 0.843 -130.6 1.062 110.3 0.0990 125.5 0.857 -79.0 3.7 0.855 -145.0 0.875 99.7 0.0960 115.9 0.874 -90.2 3.8 0.872 -159.0 0.711 90.3 0.0910 107.0 0.887 -101.1 3.9 0.884 -172.2 0.567 81.4 0.0850 97.0 0.897 -111.3
3.4 0.779 -101.4 1.550 132.9 0.1100 145.3 0.802 -55.1 3.5 0.818 -115.9 1.283 121.3 0.1040 135.5 0.834 -67.0 3.6 0.843 -130.6 1.062 110.3 0.0990 125.5 0.857 -79.0 3.7 0.855 -145.0 0.875 99.7 0.0960 115.9 0.874 -90.2 3.8 0.872 -159.0 0.711 90.3 0.0910 107.0 0.887 -101.1 3.9 0.884 -172.2 0.567 81.4 0.0850 97.0 0.897 -111.3
3.5 0.818 -115.9 1.283 121.3 0.1040 135.5 0.834 -67.0 3.6 0.843 -130.6 1.062 110.3 0.0990 125.5 0.857 -79.0 3.7 0.855 -145.0 0.875 99.7 0.0960 115.9 0.874 -90.2 3.8 0.872 -159.0 0.711 90.3 0.0910 107.0 0.887 -101.1 3.9 0.884 -172.2 0.567 81.4 0.0850 97.0 0.897 -111.3
3.6 0.843 -130.6 1.062 110.3 0.0990 125.5 0.857 -79.0 3.7 0.855 -145.0 0.875 99.7 0.0960 115.9 0.874 -90.2 3.8 0.872 -159.0 0.711 90.3 0.0910 107.0 0.887 -101.1 3.9 0.884 -172.2 0.567 81.4 0.0850 97.0 0.897 -111.3
3.7 0.855 -145.0 0.875 99.7 0.0960 115.9 0.874 -90.2 3.8 0.872 -159.0 0.711 90.3 0.0910 107.0 0.887 -101.1 3.9 0.884 -172.2 0.567 81.4 0.0850 97.0 0.897 -111.3
3.8 0.872 -159.0 0.711 90.3 0.0910 107.0 0.887 -101.1 3.9 0.884 -172.2 0.567 81.4 0.0850 97.0 0.897 -111.3
3.9 0.884 -172.2 0.567 81.4 0.0850 97.0 0.897 -111.3
4 0.892 173.9 0.444 72.9 0.0810 85.6 0.908 -121.4
4.1 0.891 160.6 0.336 64.1 0.0790 74.4 0.917 -131.6
4.2 0.669 147.6 0.255 55.2 0.0770 55.5 0.926 -141.0
4.3 0.007 1.34.0 0.102 47.3 0.07.30 50.0 0.932 -150.8
4.5 0.866 100.2 0.072 40.4 0.0660 32.0 0.030 -100.0
4.5 0.600 109.2 0.012 40.4 0.0000 32.9 0.936 -109.4
5 0.607 47.1 0.005 150.5 0.0500 -15.2 0.940 147.0 55 0.647 16.7 0.081 108.9 0.0610 48.1 0.039 104.6
6 0.603 -64.2 0.049 60.0 0.0770 -83.0 0.929 64.4

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for RF Amplifier category:

Click to view products by Wantcom manufacturer:

Other Similar products are found below :

ADPA7006AEHZ CXE2089ZSR MGA-43828-BLKG A82-1 RF2878TR7 BGA 728L7 E6327 BGB719N7ESDE6327XTMA1 HMC1126-SX HMC342 HMC561-SX HMC598-SX HMC-ALH382-SX HMC-ALH476-SX SE2433T-R SE2622L-R SMA3101-TL-E SMA39 SMA70-1 A66-1 A66-3 A67-1 LX5535LQ LX5540LL RF2373TR7 HMC3653LP3BETR HMC395 HMC549MS8GETR HMC576-SX HMC754S8GETR HMC-ALH435-SX SMA101 SMA1031 SMA181 SMA32 SMA411 SMA531 SST12LP17E-XX8E SST12LP19E-QX6E TGA2598 WPM0510A HMC5929LS6TR HMC5879LS7TR HMC906A-SX HMC1127 HMC544A HMC1126 HMC1110-SX HMC1087F10 HMC1086 HMC1016