750-1250 MHz LOW NOISE AMPLIFIER WEA114[1]

WEA114 LNA is a low cost, low noise figure, wideband, and high linearity amplifier. The amplifier offers typical 1.0 dB noise figure and 34 dBm output IP_3 at the frequency range from 750 MHz to 1250 MHz of Cellular, GSM, LoTACS, HiTACS, and GPS bands. WEA114 LNA is most suitable for cellular base stations, wireless data communications, tower top receiver amplifiers, cellular micro-cells, last-mile wireless communication systems, and wireless measurement applications.

WEA114 is RoHS compliant product

Key Features:

Impedance:	50 Ohm
Low Noise:	1.0 dB
Output IP_3:	34 dBm
Gain:	20.0 dB
P_{1dB}:	20.0 dBm
Single power supply:	70 mA @ +5V
Frequency Range:	750 ~ 1250 MHz
Operating Temperature:	-40 ~ +85 ºC
Return Losses:	14 dB or better
Small size:	SMA Female, 0.90" x 0.70" x 0.4" (41.9 mm x 17.8 mm x 10.2 mm)
Built-in Functions:	DC blocks at input and output, temperature compensation circuits, and auto DC biases.

Absolute Maximum Ratings[2]:

Symbol	Parameters	Units	Absolute Maximum
V_{dd}	DC Power Supply Voltage	V	6.0
I_{dd}	Drain Current	mA	90
P_{diss}	Total Power Dissipation	mW	500
$P_{In,Max}$	RF Input Power	dBm	10
T_{ch}	Channel Temperature	°C	150
T_{STG}	Storage Temperature	°C	-55 ~ 125
$T_{O,MAX}$	Maximum Operating Temperature	°C	-40 ~ +85
$R_{th,c}$	Thermal Resistance	°C/W	215

[1] Specifications are subject to change without notice.
[2] Operation of this device above any one of these parameters may cause permanent damage.

Specifications:

a) Table 1 Summary of the electrical specifications WEA114 at room temperature

Index	Testing Item	Symbol	Test Constraints	Nom (RT)	Min	Max	Unit
1	Gain	S_{21}	0.75 – 1.25 GHz	20	19	21	dB
2	Gain Variation	ΔG	0.75 – 1.25 GHz			+/-0.30	dB
3	Input Return Loss	S_{11}	0.75 – 1.25 GHz	16	14		dB
4	Output Return Loss	S_{22}	0.75 – 1.25 GHz	16	14		dB
5	Reverse Isolation	S_{12}	0.75 – 1.25 GHz	20	18		dB
6	Noise figure	NF	0.75 – 1.25 GHz	1.0		1.2	dB
7	Output Power 1dB compression Point	P_{1dB}	0.75 – 1.25 GHz	20	19		dBm
8	Output-Third-Order Interception point	IP_3	Two-Tone, P_{out} +10 dBm each, 1 MHz separation	34	32		dBm
9	Current Consumption	I_{dd}	V_{dd}= +5 V	70	65	80	mA
10	Power Supply Voltage	V_{dd}		+5	+4.5	+5.5	V
11	Thermal Resistance	$R_{th,c}$	Junction to case			215	^{o}C/W
12	Operating Temperature	T_o			-40	+85	^{o}C
13	Maximum Average RF Input Power	$P_{IN, MAX}$	DC – 6.0 GHz			10	dBm

b) Passband Frequency Response

As shown in **Figure 1**, the typical gain of the WEA114 is 20.0 dB across 0.75 to 1.25 GHz. The typical input and output return losses are 16 dB across the frequency of 0.75 to 1.25 GHz.

Figure 2 shows the measured P_{1dB} and IP_3 of the WEA114. The typical P_{1dB} and IP_3 are 20 dBm and 34 dBm in the frequency range of 0.75 to 1.30 GHz, respectively.

Figure 3 illustrates the measured noise figure performance. The noise figure is 1.0 dB across the frequency range of 0.75 to 1.30 GHz. At 85 ^{0}C, WEA114 is expected having 0.20 dB noise increases. At –40 ^{0}C, WEA114 offers approximately 0.20 dB less noise figure than that at room temperature.

Figure 4 is the plot of the stability factor *k* of WEA114. The amplifier is conditional stable due to *k* is less than 1 in some frequency ranges.

Figure 5 demonstrates the small signal performance of WEA114 at the extended frequency range.

Figure 6 shows the mechanical outline of WEA114. It is a WanTcom's standard WP-10E housing. Both RF input and output ports are equipped with stainless SMA female connectors and the DC port connector is an EMI filtered feed thru pin.

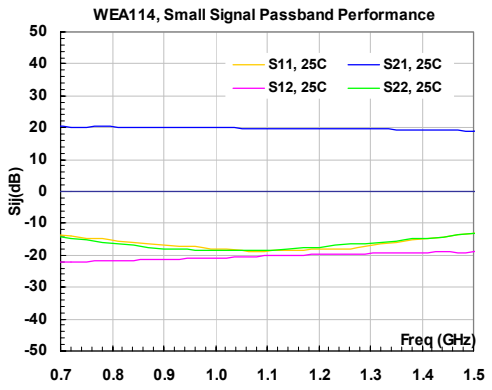

FIG. 1 Typical small signal performance.

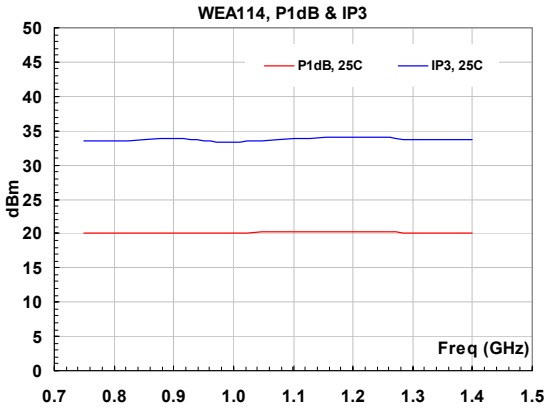

FIG. 2 Typical P_{1dB} and IP_3 at room temperature.

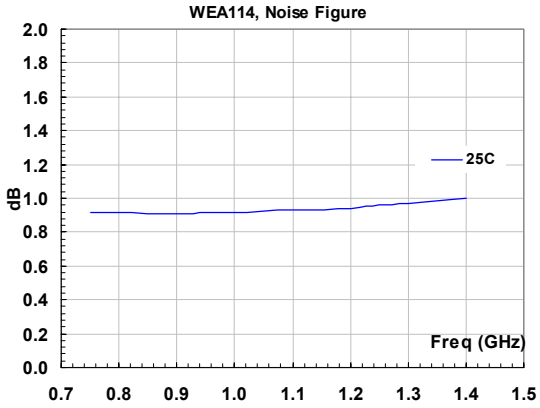

FIG. 3 Noise figure performance

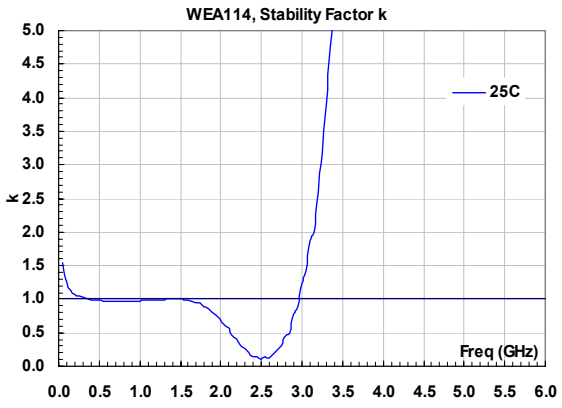

FIG. 4 Stability factor *k* of WEA114

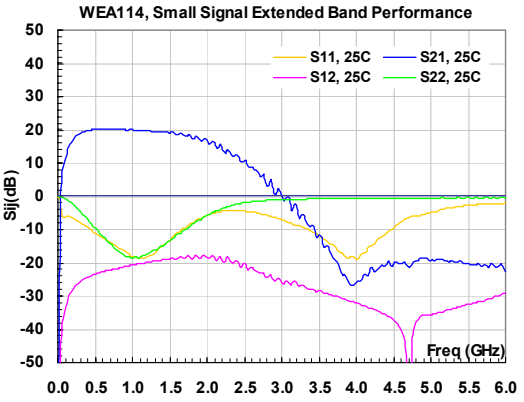

FIG. 5 Performance at the extended frequency band

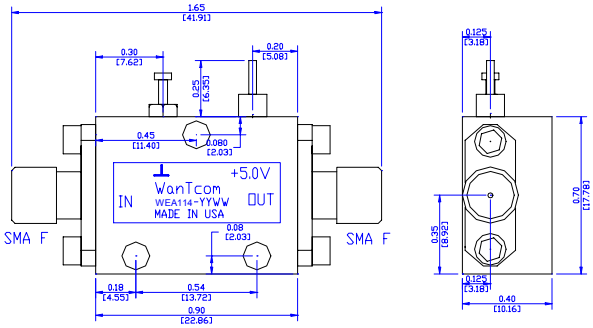

FIG. 6 WEA114 outline

WEA114 Mechanical Outline, WP-10E:

Fig. 6 shows the detail outline of WEA114. It is the WanTcom's standard LNA outline, WP-10E.

Ordering Information

Model Number	WEA114

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