700 to 800 MHz InGaP HBT 5W Linear Power Amplifier

August 2007 - Rev 30-Aug-07

CHV2707-QJ
RoHS

Features

- Internal Pre-matching
- Single Supply Operation, 12V
- Power Gain 14 dB
- ESD Protection On Board
- Current Control for Multiple Applications
- 2.5% EVM @ 30 dBm Avg Power, 802.16 OFDM Signal Format, PAR = 9 dB
- Low Thermal Resistance
- Ideal for WiMAX Applications
- RoHS Compliant 6x6 mm QFN Package



General Description

The CHV2707 internally pre-matched power HBT device provides 14 dB of gain, 2.5% EVM at 30 dBm output power for 802.16 OFDM signal with a peak to average power ratio of 9 dB. The device operates off a single supply voltage up to 12V and includes internal bias circuitry to enable exact setting of the quiescent current using an external Vcontrol. This Vcontrol is non-unique voltage setting and the same value can be used for each part depending on the required Icq. The device is ideal for high linearity, high data rate applications such as WiMAX. Internal pre-matching facilitates a simplified external matching approach and the highest in-band gain potential of the device. The device operates with unique matching at each of the popular WiMAX bands with the inherent repeatability of an InGaP HBT process.

Absolute Maximum Ratings

Voltage Supply (Vcc)	4.5 (min) to 12V (max)
Current (Icc)	2000 mA
Dissipated Power (Pdiss)	18W
Input Power (Pin)	18 dBm
Storage Temperature (Tstg)	-60 to +150 °C
Channel Temperature (Tch)	175 °C
Thermal Resistance (Rth)	5 °C/W
Operating Backside Temperature (Tb)	-40 °C to (see note 1)

Operation outside any of these limits can cause permanent damage.
(1) Caclulate maximum operating temperature Tmax using the following formula: Tmax=175-(Pdiss [W] x 5) [C].

Electrical Characteristics (Ambient Temperature T = 25 °C, Vcc = 12V)[1]

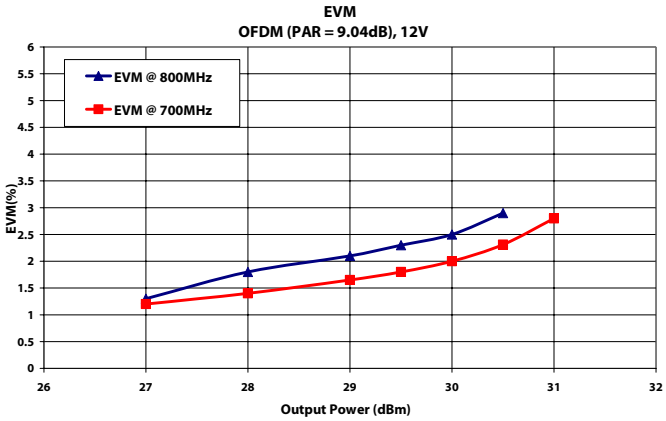
Parameter	Units	Min.	Typ.	Max.
Operating Frequency (f)	MHz	700	750	800
Quiescent Current (Icq)[2]	mA	-	730	760
Power Gain @ Pout = 29 dBm (Gps)	dB	-	14	-
Current @ 29 dBm (Icc)	mA	-	770	800
Output Power @ EVM = 2.5% (Pout)[3]	dBm	29	-	-
Adjacent Channel Power Ratio @ Pout = 30 dBm (ACPR)[4]	dBc	-	-45	-
Input Reflection Coefficient (S11)	dB		-9	
Noise Figure (NF)	dB		5	

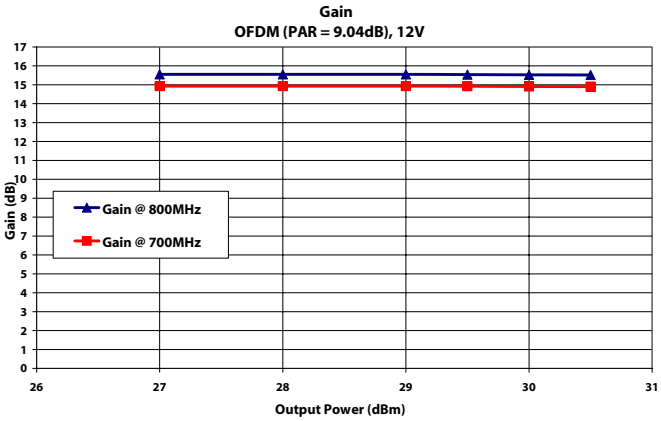
1. Data measured in a Mimix matched connectorized fixture.
2. Quiescent current depends on Vcc and measured @ Pout = 30 dBm
3. Using an 802.1 6d OFDM signal format with PAR=9 dB
4. Using 3 GPP WCDMA signal, PAR = 9.17 dB

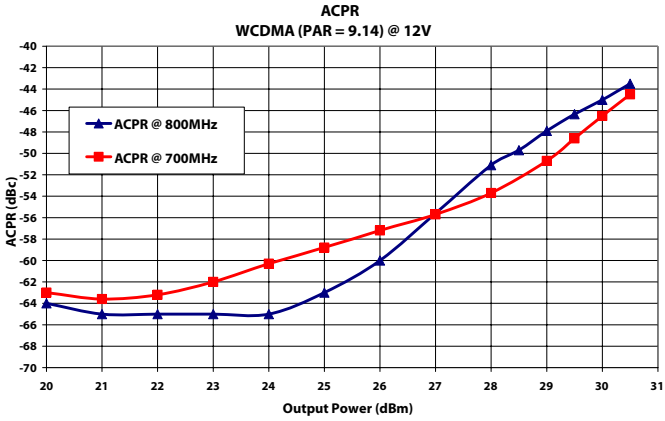
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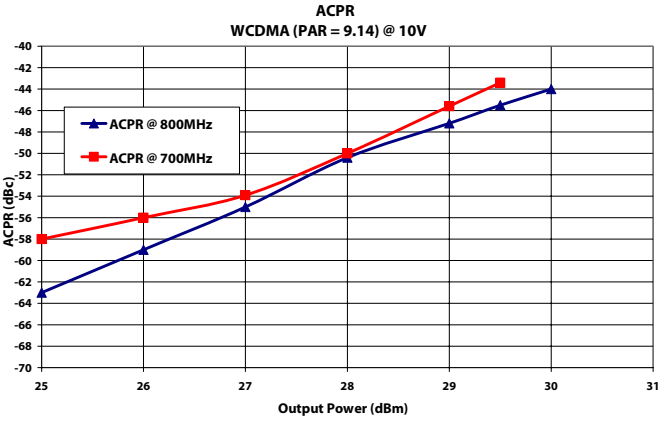
Typical Performance: (802.16 OFDM signal, PAR = 9 dB, Vcontrol = 7V)

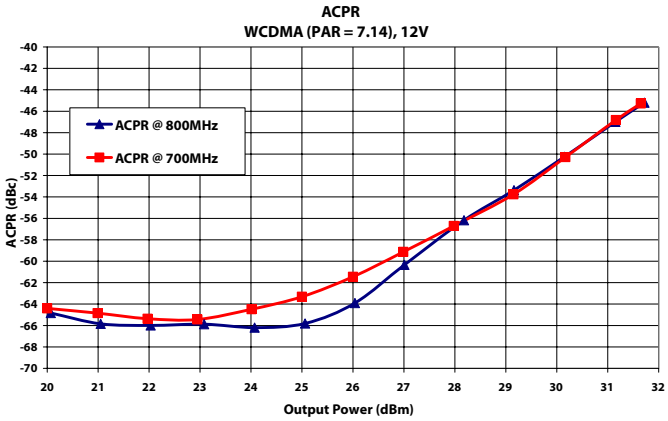
Measured in a Mimix evaluation board

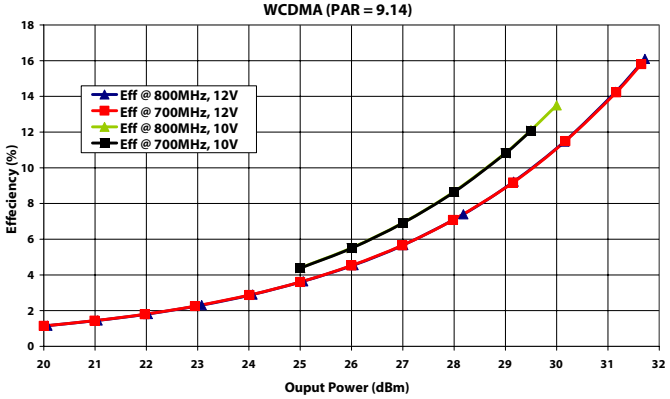








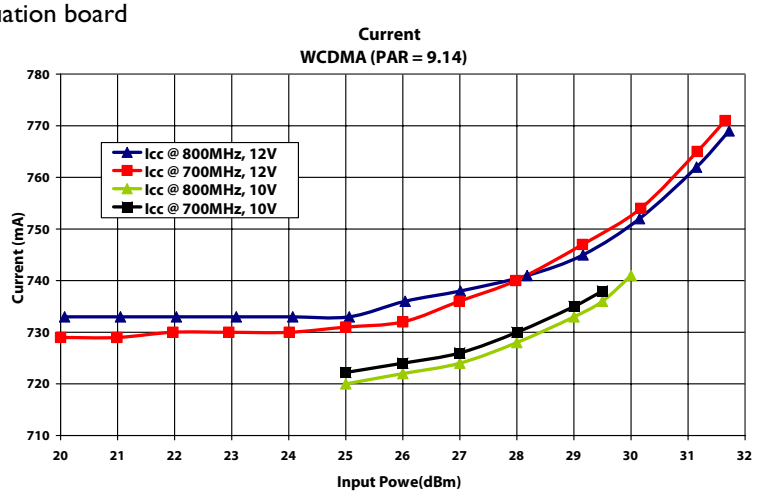


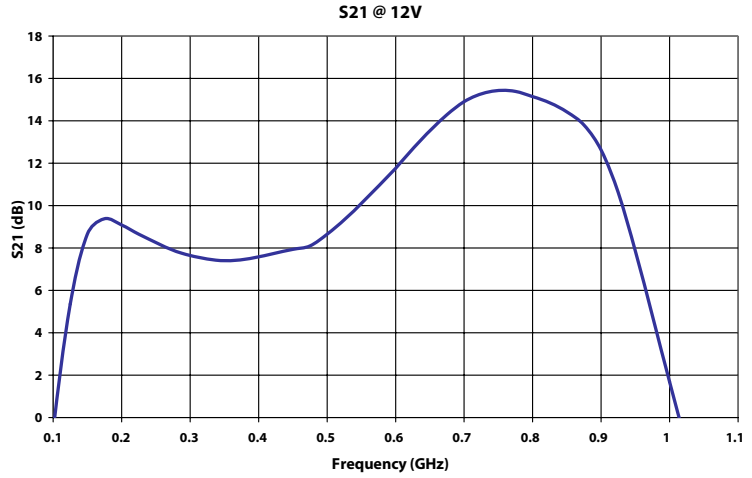


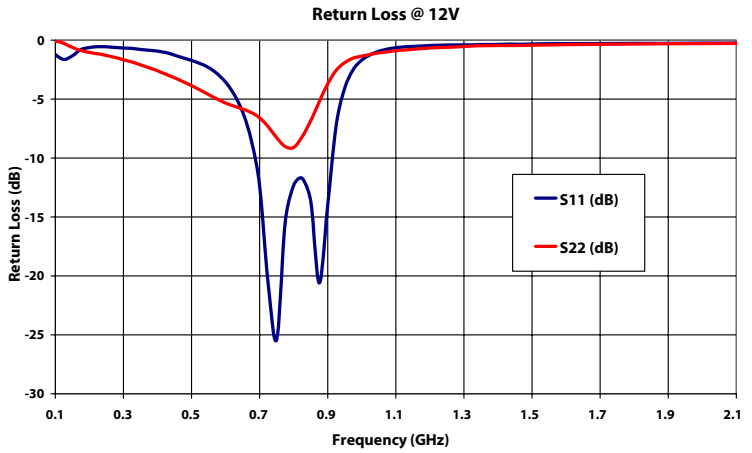
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Typical Performance: (802.16 OFDM signal, PAR = 9 dB, Vcontrol = 7V)

Measured in a Mimix evaluation board

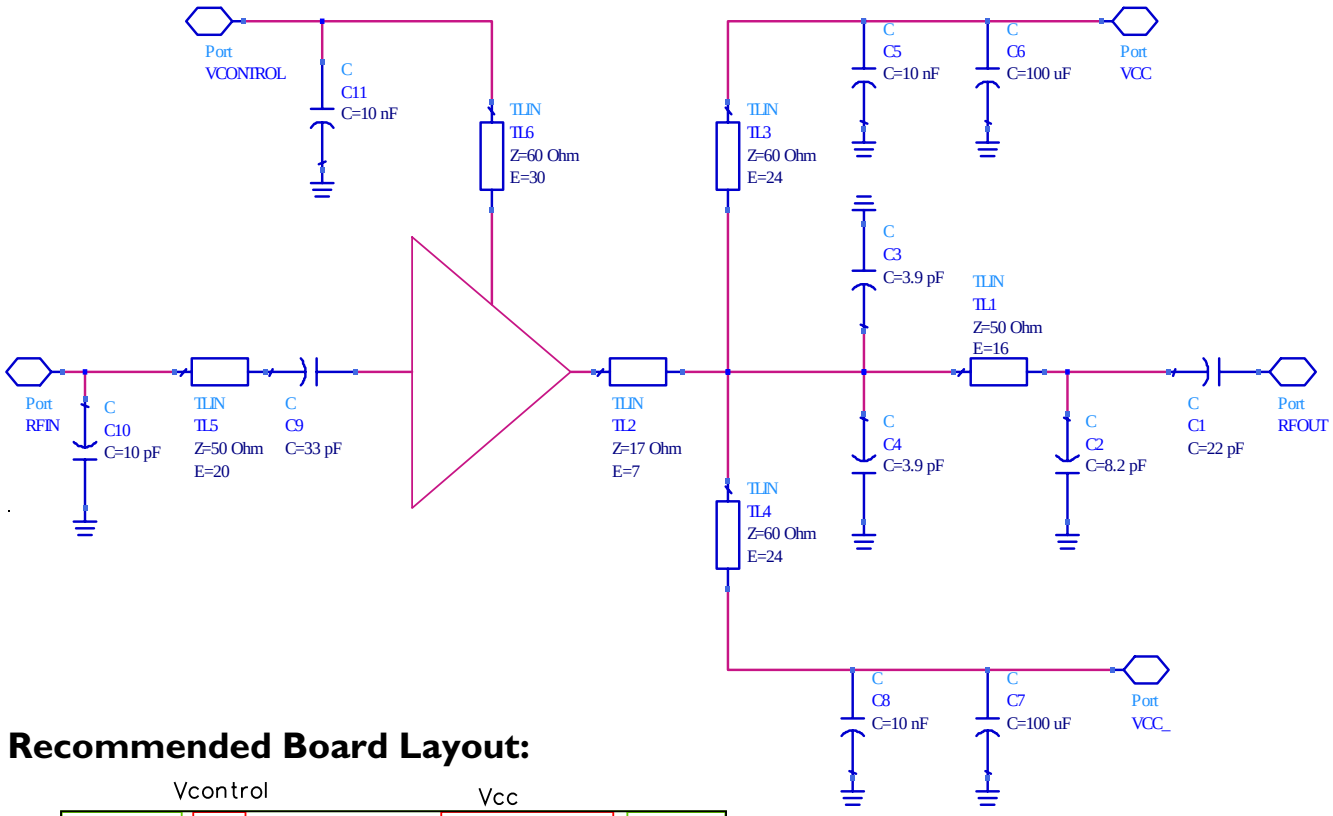




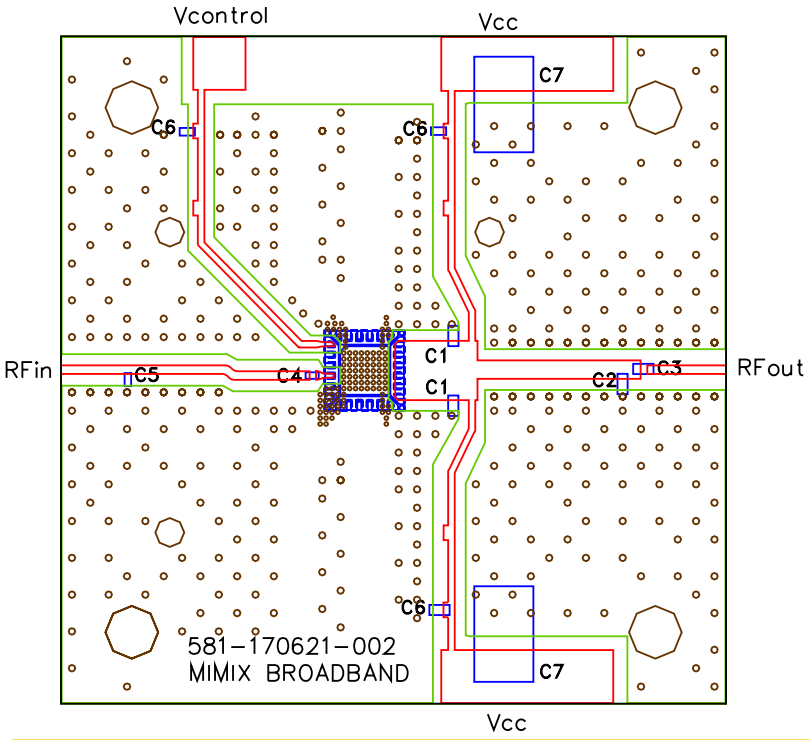


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Recommended Board Schematic:



Recommended Board Layout:

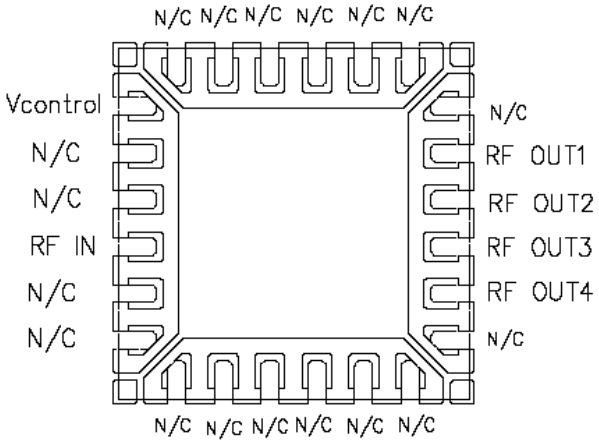


12 mil RO4003

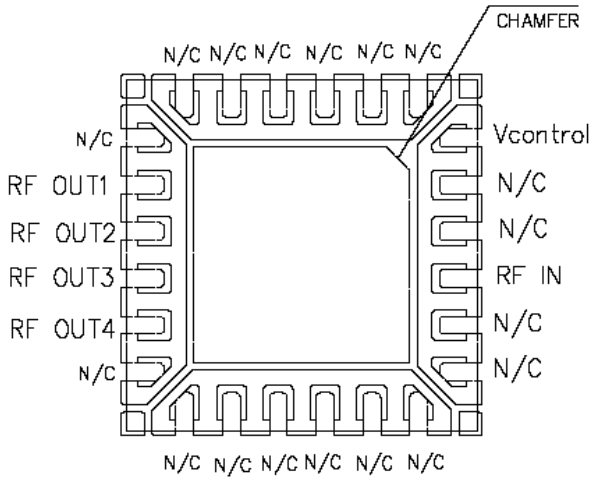
IDENT.	DESCRIPTION
C1	Murata 0603 ERB 3.9 pF
C2	Murata 0603 ERB 8.2 pF
C3	Murata 0603 ERB 22 pF
C4	Murata 0402 33 pF
C5	Murata 0402 8.2 pF
C6	10uF
C7	100uF

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Pin Assignment

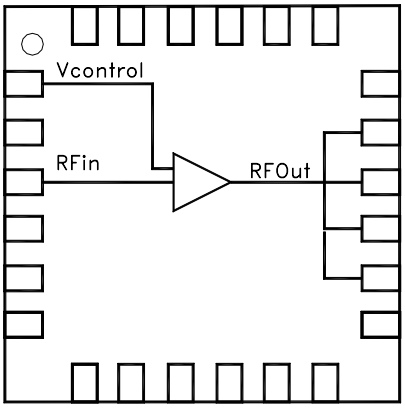


FRONT SIDE

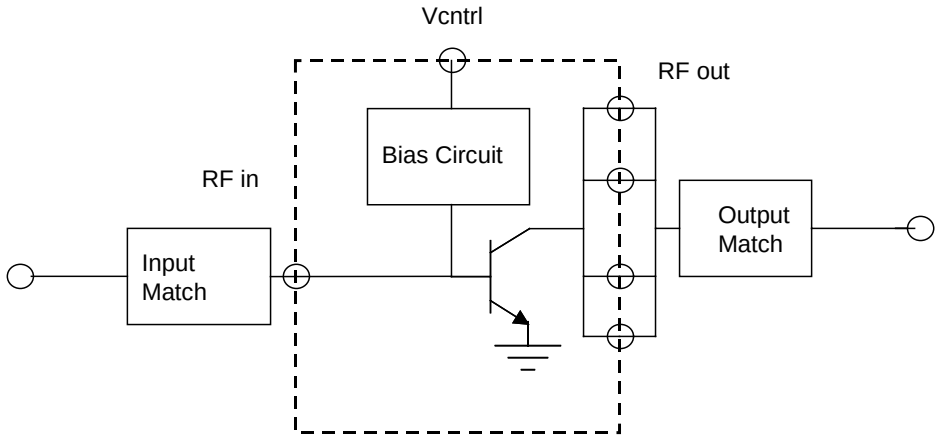


BACK SIDE

Functional Block Diagram



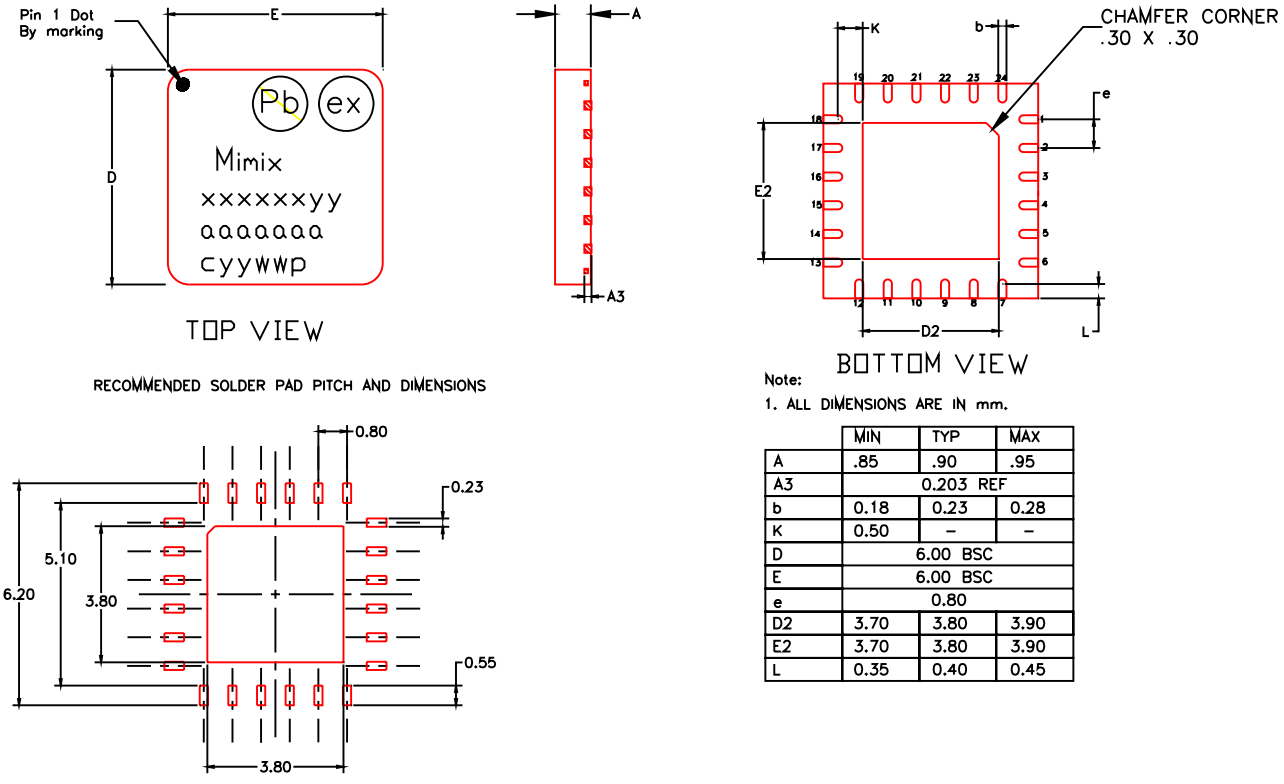
Pin #	Description
1	Vcontrol
4	RF IN
14	RF OUT 4
15	RF OUT 3
16	RF OUT 2
17	RF OUT 1
2, 3, 5, 6, 7, 8, 9, 10, 11, 12 13, 18, 19, 20, 21, 22, 23, 24	N/C



* Backside of Package is emitter gnded

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Physical Dimensions



Note:
1. ALL DIMENSIONS ARE IN mm.

	MIN	TYP	MAX
A	.85	.90	.95
A3		0.203 REF	
b	0.18	0.23	0.28
K	0.50	–	–
D		6.00 BSC	
E		6.00 BSC	
e		0.80	
D2	3.70	3.80	3.90
E2	3.70	3.80	3.90
L	0.35	0.40	0.45

Handling and Assembly Information

Mimix Lead-Free RoHS Compliant Program - Mimix has an active program in place to meet customer and governmental requirements for eliminating lead (Pb) and other environmentally hazardous materials from our products. All Mimix RoHS compliant components are form, fit and functional replacements for their non-RoHS equivalents. Lead plating of our RoHS compliant parts is 100% matte tin (Sn) over copper alloy and is backwards compatible with current standard SnPb low-temperature reflow processes as well as higher temperature (260°C reflow) "Pb Free" processes.

For those customers not making the change at this time, Mimix will maintain production of current configurations. For questions and comments e-mail: ourearth@mimixbroadband.com.

Ordering Information

Part Number for Ordering	Package
CHV2707-QJ-0G00	Matte Tin plated RoHs compliant 6X6 QFN surface mount package in bulk
CHV2707-QJ-0G0T	Matte Tin Plated RoHs compliant 6X6 QFN surface mount package in tape and reel
PB-CHV2707-0000	Evaluation Board with SMA connectors.

We also offer the plastic package with SnPb (Tin Lead) or NiPdAu. Please contact your regional sales manager for more information regarding different plating types.

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