

Following the production of HPA using 5 GHz band and 10 GHz band MMIC, we obtained EMM5832VU last year and made board and aluminum case, so we made a prototype using New Year holidays.

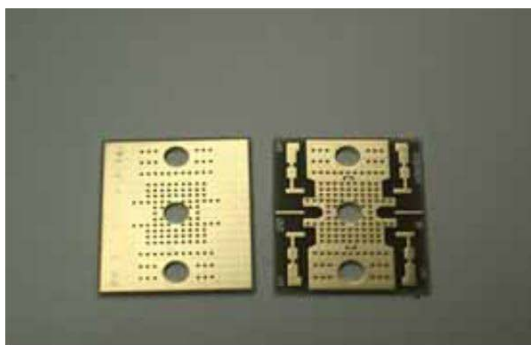
This time the MMIC package is a type that is soldered onto the board instead of the screw stop. Since the consumption current flows around 1A, measures were taken to dissipate heat by using a flat copper plate (3.0 tons), a thin (0.03 mm) copper plate between the board and case, and a silicone for heat radiation (made by Sunhayato Co., Ltd.). Because the heat at the top of the device package appears considerably, measures against heat dissipation such as FAN were also performed to prevent the output level from decreasing.



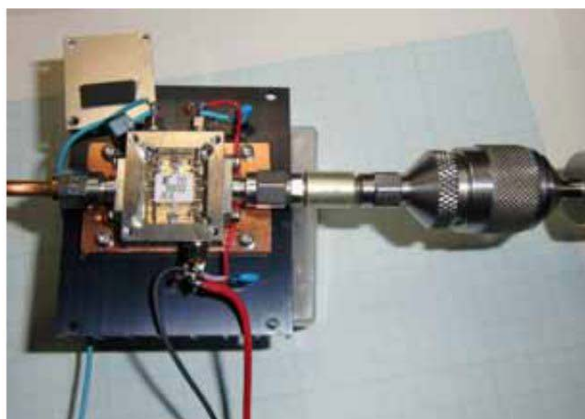
Since this time the board does not come with ceramic board etc, finish of through hole is finished beautifully Used 0.6 t on both sides of glass epo,

The through hole size 0.25 and so on small opening measures, measures against heat, the input / output line on the board was shortened and it was taken measures against loss as SMA connector pin direct device connection. The device soldered from the center hole on the back of the board and the ground plane protruded slightly above and below the device, so it was fixed by soldering at two places. The parts to be used on the board are three chip capacitors 1000 p and 0.1 μ F for VDD and VGG round respectively. I did not do any adjustment and connected VDD to VGG, checking the VDD current only while confirming the power meter. (The VGG voltage is around -0.2 V to -0.1 V, the VDD is +6.0 to +7.0 V and the consumption current is around 1 A) When the lid of the aluminum case is turned on, the power level drops by several dB and the radio wave absorbing rubber (hand-held standard unknown item) I pasted a small 5 × 9 mm size, I got the output + 30 dBm. (VDD: + 7.0 V)

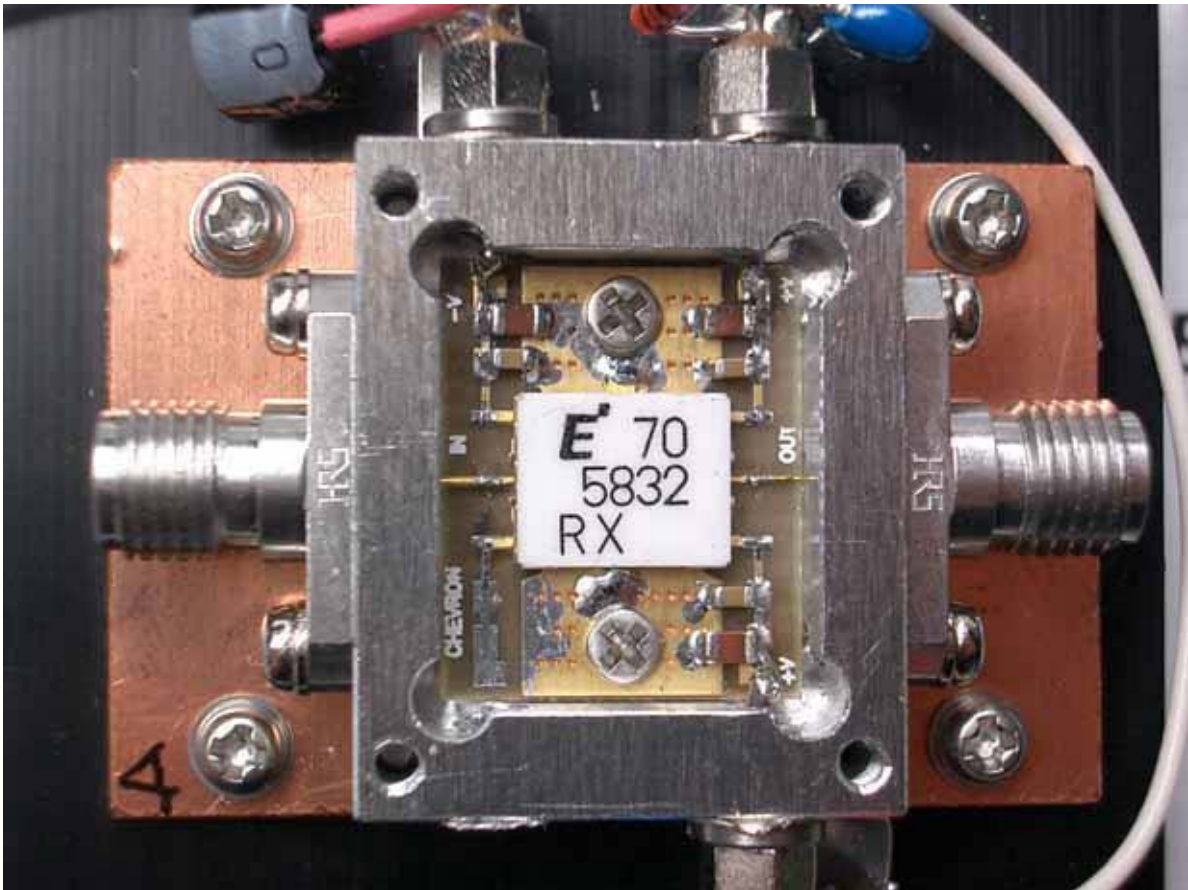
Thank you very much for taking care of parts, board production at JA3BMH station, JA3AMZ station.



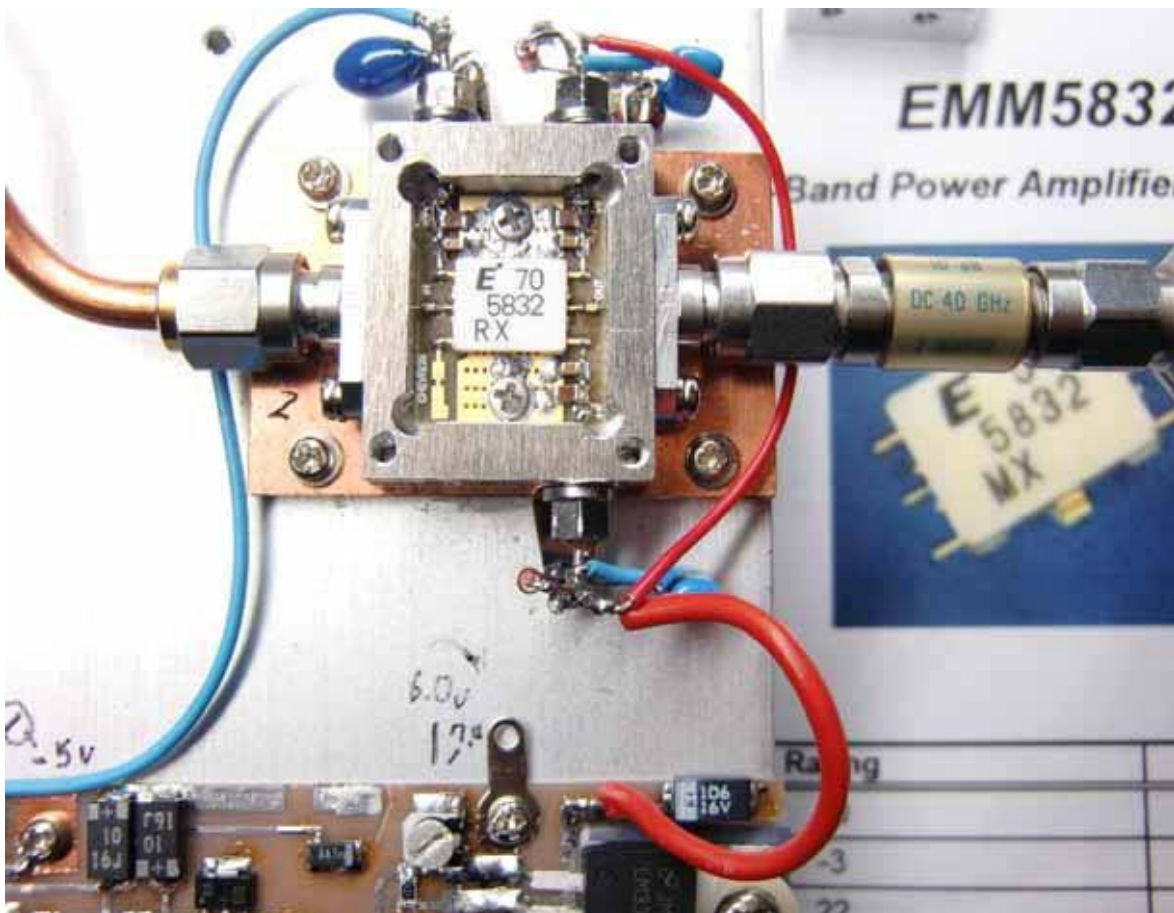
Substrate size: 17 × 14 mm size



No coupling capacitor on input / output 50 Ω line



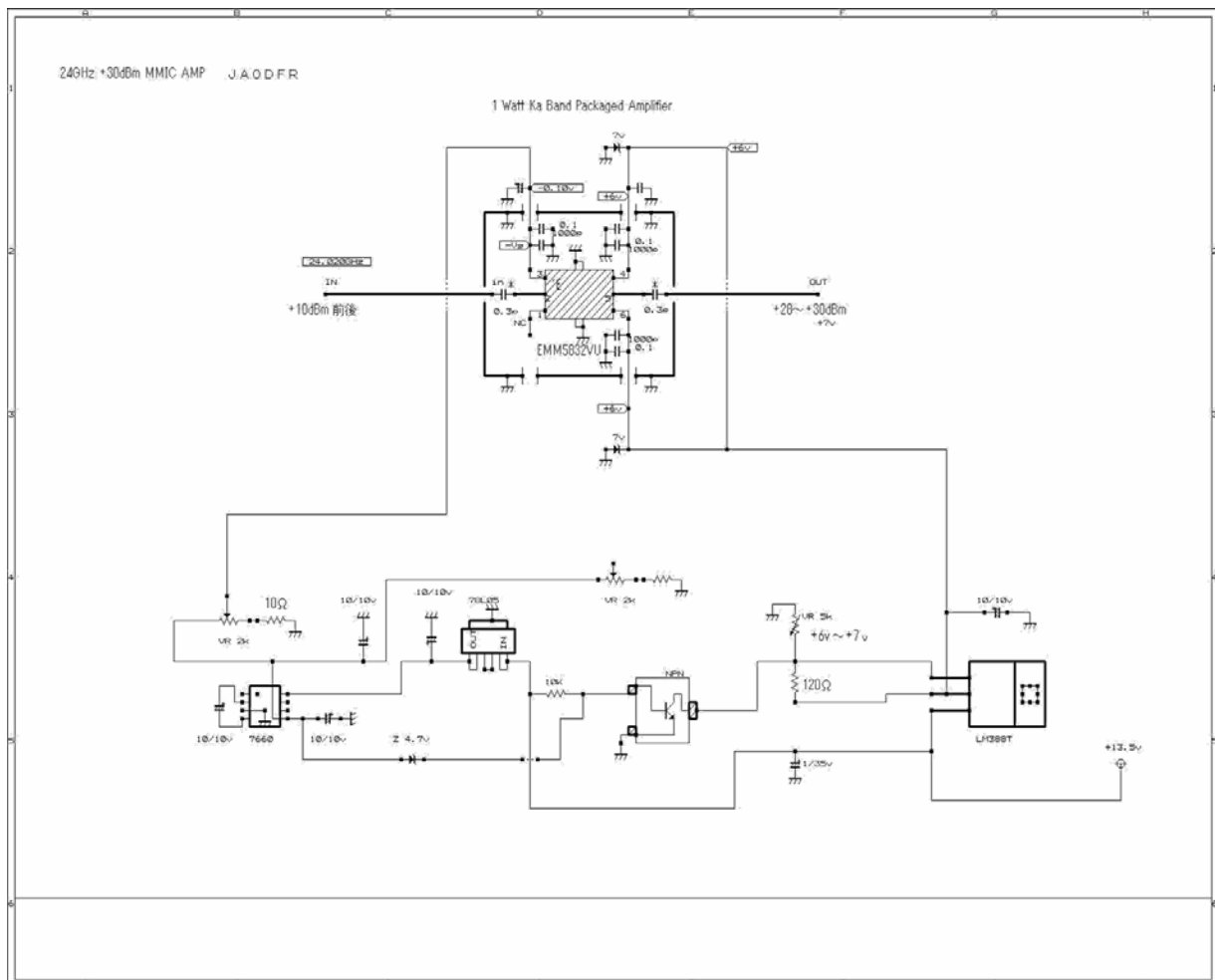
Input / output 50 Ω line with coupling capacitor 0.3 pF (1005 size) included



Spurious characteristic 2 GHz to 24 GHz band (with fixed ATT 30 dB)



circuit diagram



Production of 24GHz power amplifier (Eudyna EMM5832VU)

This time, I tried to fabricate a 24GHz band power amplifier was desire.

Device used was "EMM5832VU" in MMIC of Eudyna, since arrived, I tried to immediately experiment.

This module also power MMIC, can be used in a wide band up to 21.2GHz ~ 26.5GHz.

Specs are as follows.

EMM5832VU

VDD:

6V IDset: 800MA

POWER:

31DBm TYP (P1dB)

FREQ: 21.2GHz ~ 26.5GHz GAIN: 19DB TYP



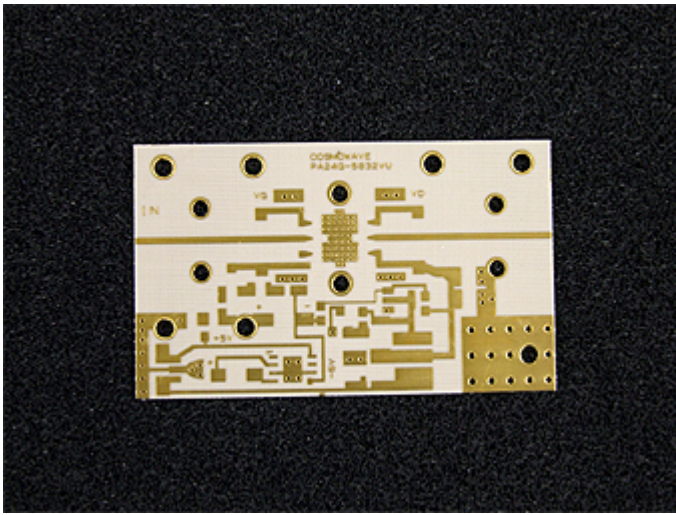
this MMIC is also input and output are matched, we become a very easy-to-use device.

The drain voltage is 6V, the gate bias voltage can be up to -3V, you must adjust the voltage so that the ID to 800mA.

GAIN is also about 20dB. , Output is equal to or greater than 31dBm.

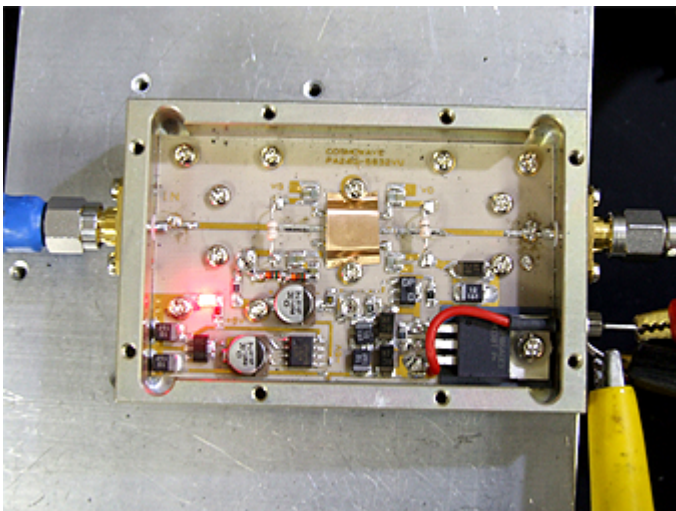
While also looking at the data sheet of the manufacturer this time, we saw that you experiment with appropriately create a board while every time.

Board has made Teflon board of 0.4mm thickness (R-4737) will be used in 24GHz so, the pattern we have a gold-plated.



In the experiment in the same way as last time, built-in the circuit in aluminum milling case, it has earned a VDD voltage regulator (LM338T) inside. VGG voltage is getting -5V using the LM2662. Also put a protection circuit to circuit this time. When the gate bias voltage does not turn on, the drain voltage will drop to about 1V.

The input and output connectors, uses the SMAJ terminal. Power supply terminal is 1000pF of the through-Con.



Very easy to oscillation and try to actually manufactured, the adjustment is very difficult. (Pattern is bad or ... of the board)
to the device there to the cover with copper plate. This is for preventing oscillation.
Power measurement has to measure the power by entering the 24.2MHz from SG in the CW mode.
Power meter was measured in HP437B + HP8485A (for 26.5GHz) + 20dBATT (for 26.5GHz).



Frequency: 24.02GHz
 Input: 10mW
 Voltage: 13.8V
 (VDD 4.5V) VGG: -0.5V (IDset1.2A)
 Output: 250mW or more (peak)

, but is the place you want to say that almost no adjustment, the adjustment is very in difficult, drain voltage, gate voltage, was a repetition of the adjustment of the stub.
 We obtained a 250mW in somehow 10mW input. Gain was about 14dB.
 This is where you need is still adjusting. But could not input of more than 10mW in relation to SG, the maximum output is I think a little bit more out.
 The current value was about 0.7A.
 When this MMIC also warmed to come, because of course the power is coming down, it must have sufficient heat dissipation.
 Also to be a 24GHz adjustment is a very subtle, the position of the stub, the drain voltage, and does not adjust to alternately gate voltage, will be immediately oscillation.
 Sometimes come out 0.5W about power and oscillation, was careful attention must be paid to adjustment.
 Review the little circuit, you want to give a gain of more than 16dB.