

|                        |             |  |   |  |  |  |  |  |
|------------------------|-------------|--|---|--|--|--|--|--|
| SPECIFICATION<br>SHEET | PREPARED BY |  | R |  |  |  |  |  |
|                        | CHECKED BY  |  | E |  |  |  |  |  |
|                        | APPROVED BY |  | V |  |  |  |  |  |
|                        | DATE        |  |   |  |  |  |  |  |

Hybrid Integrated Circuit Amplifier for W-CDMA

1. Type No. BA01232E - 01
2. Structure Hybrid Integrated Circuit
3. Function 1920~1980MHz Power Amplification
4. Quality Grade General grade
5. Outline G475584(GH-39)

6. Absolute Maximum Ratings (Tc=25°C)

| PARAMETER             | SYMBOL | CONDITION                       | VALUE       | UNIT        |
|-----------------------|--------|---------------------------------|-------------|-------------|
| Supply Voltage        | Vc1    | Po≤562mW(27.5dBm),<br>Vref=2.9V | 6.0         | V           |
|                       | Vc2    |                                 |             |             |
|                       | Vcb    |                                 |             |             |
|                       | Vref   | Vc1=Vc2=3.5V,Vcb=2.9V           | 3.5         | V           |
| Input Power           | Pin    |                                 | 5.01<br>(7) | mW<br>(dBm) |
| Operation Temperature | Tc(op) |                                 | -20 ~ +85   | °C          |
| Storage Temperature   | Tstg   |                                 | -30 ~ +95   | °C          |

Note : Each maximum rating is guaranteed independently.  
Please take care that BA01232E is operated under these conditions at the worst case on your terminal.

Mitsubishi Electric Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage. Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i)placement of substitutive, auxiliary, circuits, (ii)use of non-flammable material or (iii)prevention against any malfunction or mishap..

|               |                      |             |
|---------------|----------------------|-------------|
| SPECIFICATION | GNOK - BA01232E - 01 | PAGE<br>1/4 |
|---------------|----------------------|-------------|

7. Electrical Characteristics (Ta=25°C unless otherwise noted, ZG=ZL=50ohm)

| PARAMETER                                    | SYMBOL   | Note | CONDITIONS                                                                                                                                      | VALUE                                   |                           |                           | UNIT              |
|----------------------------------------------|----------|------|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|---------------------------|---------------------------|-------------------|
|                                              |          |      |                                                                                                                                                 | MIN                                     | TYP                       | MAX                       |                   |
| Frequency Range                              | freq     | -    | -                                                                                                                                               | 1920                                    | -                         | 1980                      | MHz               |
| Idle Current on                              | Icqt_on  | 1    | Pin : OFF, Vc1=Vc2=3.5V<br>Vcb=Vref=2.9V                                                                                                        | -                                       | 35                        | 55                        | mA                |
| Idle Current off                             | Icqt_off | 1    | Pin : OFF, Vc1=Vc2=3.5V<br>Vcb=2.9V, Vref=0V                                                                                                    | -                                       | -                         | 10                        | μA                |
| Output Power                                 | Pout     | -    | Vc1=Vc2=3.5V, Vcb=Vref=2.9V<br>ZG=ZL=50Ω,                                                                                                       | 562<br>[27.5]                           | -                         | -                         | mW<br>[dBm]       |
| Gain                                         | Gp       | -    | Vc1=Vc2=3.5V, Vcb=Vref=2.9V<br>Po=562mW[27.5dBm] (Pin : control)<br>ZG=ZL=50Ω,<br><br>ACLR : Offset ±5,10MHz<br>Bandwidth=3.84MHz               | 24.5                                    | 26.5                      | 28.5                      | dB                |
| Total Current                                | Ict      | 1    |                                                                                                                                                 | -                                       | 342                       | 374                       | mA                |
| Total Efficiency                             | PAE      | 5    |                                                                                                                                                 | [42.4]                                  | [46.3]                    | -                         | [%]               |
| Vcb Current                                  | Icb      | -    |                                                                                                                                                 | -                                       | 4.0                       | 6.0                       | mA                |
| Vref Current                                 | Iref     | -    |                                                                                                                                                 | -                                       | 1.0                       | 2.0                       | mA                |
| Adjacent Channel Leakage Power Ratio(±5MHz)  | ACLR-5   | -    |                                                                                                                                                 | -                                       | -41                       | -38                       | dBc               |
| Adjacent Channel Leakage Power Ratio(±10MHz) | ACLR-10  | -    |                                                                                                                                                 |                                         | -52                       | -48                       | dBc               |
| Input VSWR                                   | ρin      | 2    |                                                                                                                                                 | -                                       | -                         | 3                         | -                 |
| 2nd Harmonics                                | 2fo      | 2    | -                                                                                                                                               | -40                                     | -33                       | dBc                       |                   |
| 3rd Harmonics                                | 3fo      | 2    |                                                                                                                                                 | -45                                     | -40                       | dBc                       |                   |
| Rx Band Noise Power                          | -        | 3,6  | Rx:2110 – 2170MHz<br>Vc1=Vc2=3.5V, Vcb=Vref=2.9V<br>Po=562mW[27.5dBm] (Pin : control)<br>ZG=ZL=50Ω, RES BW=1MHz<br>Noise Marker, Averaging Mode | -                                       | 10.0<br>x10e-15<br>[-140] | 31.6<br>x10e-15<br>[-135] | mW/Hz<br>[dBm/Hz] |
| Stability                                    | -        | 3    | Vc1=Vc2=4.2V, Vcb=Vref=2.9V<br>ZG= 50Ω<br>Pin=1.26mW (1dBm)<br>Load VSWR=3:1, All Phase                                                         | Parasitic oscillation level<br>≤ -70dBc |                           |                           | -                 |
| Damage with Standing                         | -        | 3,4  | Vc1=Vc2=4.2V, Vcb=Vref=2.9V<br>ZG= 50Ω, Pin=1.26mW (1dBm)<br>Load VSWR=10:1, All Phase<br>Time=10sec.                                           | No damage                               |                           |                           | -                 |
| Operating Condition Recommendation           |          |      |                                                                                                                                                 |                                         |                           |                           |                   |
| Supply Voltage                               | Vc1,Vc2, |      |                                                                                                                                                 | [1.0]                                   | 3.5                       | 4.2                       | V                 |
|                                              | Vcb      |      |                                                                                                                                                 | 2.5                                     | 2.90                      | 4.2                       | V                 |
|                                              | Vref     |      |                                                                                                                                                 | 2.85                                    | 2.90                      | 2.95                      | V                 |

Note1. Icqt=Icq1+Icq2, Ict=Ic1+Ic2

Note2. Design assurance. For confirmation, sampling test (10pcs/lot) is done in the first 10 lots.

Note3. Design assurance. For confirmation, sampling test (3pcs/lot) is done in the first 5 lots.

Note4. No modulation, unless otherwise noted W-CDMA HPSK modulation (Chip rate=3.84Mcps)

Note5. We calculate the Total Efficiency(PAE) from Input Power value, Output Power value and Total Current value.

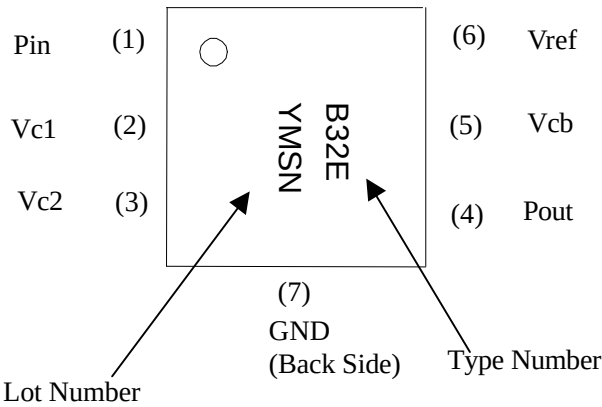
The PAE is reference value, as we specify each parameter at each condition.

Note6. Settings of the Spectrum Analyzer: RBW=VBW=1MHz, SWP=20ms, Detector Mode=Sample, Average, Sweep Times=20times.

Note7. In this table, we use the symbol [ ] that is the reference value.

|               |                      |             |
|---------------|----------------------|-------------|
| SPECIFICATION | GNOK - BA01232E - 01 | PAGE<br>2/4 |
|---------------|----------------------|-------------|

8. Pin Configuration and Marking



[Note]  
Marked by laser process or ink printing.

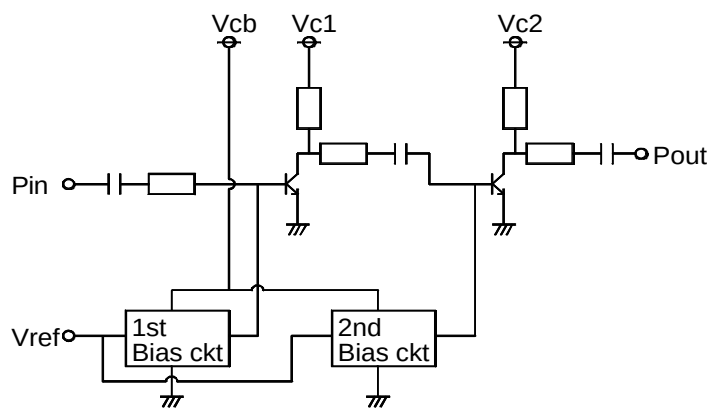
[ Lot number ]

| Symbol | Content       | Description                                                                                                                                                                              |
|--------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Y      | Year          | This single figure shows the year when the assembly of the lot is started. The period of the year is from April to March.<br>(e.g.) 3 -- The lot was assembled in Apr./2003 to Mar./2004 |
| M      | Month         | This single figure shows the month when the assembly of the lot is started.<br>Apr.=1, May=2, ..... Nov.=8, Dec.=9, Jan.=X, Feb.=Y, Mar.=Z                                               |
| SN     | Serial Number | This combination of double alphabets(except I,O) shows the order when the assembly of the lot is started in the month.<br>AA→AB→.....→AY→AZ→BA→BB→.....                                  |

9. Pin Description

| Pin No. | Pin name | Function                                   |
|---------|----------|--------------------------------------------|
| 1       | Pin      | RF input                                   |
| 2       | Vc1      | Supply voltage of 1st stage HBT            |
| 3       | Vc2      | Supply voltage of 2nd stage HBT            |
| 4       | Pout     | RF output                                  |
| 5       | Vcb      | Bias circuit supply voltage of 1st and 2nd |
| 6       | Vref     | Reference bias to set idle current         |
| 7       | GND      |                                            |

10. Block Diagram



Note: DC cut capacitors of Pin/Pout are enclosed in the module.

11. Package Outline

