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Product Inquiries  
Kazuhiko Sato  
High Frequency & Optical Semiconductor  
Overseas Marketing Dept.  
Tel: +81-72-780-3835  
Sato.Kazuhiko@aj.MitsubishiElectric.co.jp  
<http://www.mitsubishichips.com/>

*Media Contact*  
Travis Woodward  
Public Relations Department  
Mitsubishi Electric Corporation  
Tel: +81-3-3218-3380  
Travis.Woodward@eb.MitsubishiElectric.co.jp  
<http://global.mitsubishielectric.com/news/>

## **MITSUBISHI ELECTRIC ANNOUNCES SALE OF SWITCHABLE POWER AMPLIFIER MODULE FOR WCDMA APPLICATIONS**

**Tokyo, October 11, 2006** – Mitsubishi Electric Corporation (President and CEO: Setsuhiro Shimomura) announced today it has developed an InGaP HBT<sup>1</sup> switchable power amplifier for WCDMA<sup>2</sup> used in mobile handset terminals. The amplifier module shows improved efficiency at low to mid power output, and also eliminates the need for external peripheral components, reducing the size of mobile handsets. Sample shipments will begin in February of 2007.

<sup>1</sup>Indium Gallium Phosphide Hetero-junction Bipolar Transistor: a high frequency device with excellent high operation efficiency used in mobile handset terminals, etc.

<sup>2</sup>Wide-band Code Division Multiple Access: a broadband and code division multiple access type of mobile digital communications

### ***Sales summary***

| Model   | Specification summary  | Dimensions  | Production          | Sample price | Initial sale |
|---------|--|-------------|---------------------|--------------|--------------|
| BA01254 | f=1920~1980MHz (Band1)<br>output=27.0dBm,<br>PAE=40/24/7% at Po=27/16/8<br>dBm(typ.)<br>ACLR±5MHz=-41dBc(typ.)<br>Quiescent current=12mA(typ.) | 4x4x1.2(mm) | 1 million<br>/month | \$10         | Feb. 2007    |

### ***Aim of Sale***

With the increasing high function and multi-band/mode operations in cellular handsets in recent years, developers have been trying to reduce the size and increasing number of necessary components to keep terminals small. To secure talk time, typical WCDMA power amplifiers need an external DC/DC converter to lower operating voltage and improve efficiency at low and mid range output when operation repetitions are frequent. We have developed a power amplifier module that does not need an external DC/DC converter by using 2 chain amplifiers that can switch to respond to different outputs, guaranteeing efficiency during

low and medium output. This improves efficiency, and secures talk time while also reducing size of mobile handset terminals.

### ***Product Characteristics***

#### ***1) Increased talking time***

We created a module with amplifiers for large and medium to small levels of output, and employed a system that can switch between amplifiers according to output. Power added efficiency is 40% during high output (27 dBm), 24% during medium output (16 dBm), and 7% during low output (8 dBm). Medium range power added efficiency, in particular, is the highest in the industry, and does not need the typically required external DC/DC converter to improve efficiency, extending talk time.

#### ***2) Reduced peripheral components, smaller mobile handset terminals***

We developed a module with the same dimensions (4x4x1.2 mm) as our previous WCDMA module (BA01231/BA01232) by using Monolithic Microwave Integrated Circuit (MMIC) and our own mobile handset module design technology to internally mount the bias circuitry reference voltage generator and two types of power amplifiers. This keeps mobile handsets small as reference voltage generators are typically an external component.

### ***Future Developments***

In fall of 2007, we plan to continue the release of switchable power amplifier modules that respond to Band9 (1752.4-1782.6 MHz), Band2 (1850-1910 MHz), and Band5 (824-849 MHz) bandwidths.

### ***Main Specifications***

Frequency:  $f=1920 \sim 1980$  MHz

Supply voltage:  $V_{cc}=V_{bias}=3.4V$

Quiescent current: 12 mA (typ.)

Collector current:  $I_{ct}=360/45/22$  mA at  $P_o=27/16/8$ dBm (typ.)

Efficiency: PAE=40/24/7% at  $P_{out}=27/16/8$ dBm (typ.)

Gain: 26.5dB at  $P_{out}=27$ dBm (typ.)

Adjacent channel leakage power ratio (+/-5MHz): ACLR5=-41dBc (typ.)

Adjacent channel leakage power ratio (+/-5MHz): ACLR5=-52dBc (typ.)

Rx band noise power: -139dBm/Hz (typ.)

### ***About Mitsubishi Electric***

With over 80 years of experience in providing reliable, high-quality products to both corporate clients and general consumers all over the world, Mitsubishi Electric Corporation (TSE:6503) is a recognized world leader in the manufacture, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite

communications, consumer electronics, industrial technology, energy, transportation and building equipment. The company recorded consolidated group sales of 3,604 billion yen (US\$ 30.8billion\*) in the fiscal year ended March 31, 2006.

For more information visit <http://global.mitsubishielectric.com>

\*At an exchange rate of 117 yen to the US dollar, the rate given by the Tokyo Foreign Exchange Market on March 31, 2006.

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