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No.2506

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**Mitsubishi Electric Develops World's First GaN HEMT Amplifier
Exclusive to Satellite Applications**

Use of gallium nitride achieves high output of up to 100 W

Tokyo, February 25, 2010 – [Mitsubishi Electric Corporation](#) (TOKYO: 6503) announced today it has developed four models of gallium nitride high-electron mobility transistor (GaN HEMT) for 4.0 GHz band satellite applications, with output ranging from 2W to 100W. With these products, Mitsubishi Electric will become the first company in the world to market GaN HEMTs engineered exclusively for these particular applications. Sample shipments are scheduled to begin in March 2010.

Summary of Sale

Product	Model	Description
Internally impedance matched high output power GaN HEMT	MGFC50G3742S	f=3.7 - 4.2 GHz (one of the three separated bands) Output Power: 50 dBm (100 W), Efficiency: 60%
	MGFC46G3742S	f=3.7 - 4.2 GHz(one of the three separated bands) Output Power: 46 dBm (40 W), Efficiency: 60%
	MGFC43G3742S	f=3.7 - 4.2 GHz Output Power: 43 dBm (20 W), Efficiency: 60%
Non internally impedance matched high output power GaN HEMT	MGF2633GS	f=4.0 GHz Output Power:33 dBm (2 W), Efficiency: 50%

Aim of Sale

As more and more satellites are meeting the end of their operational lifespan, demand for new microwave communication satellites has recently been growing. While transmitter devices in these communication satellites have traditionally utilized gallium arsenide (GaAs) amplifiers, gallium nitride (GaN) HEMT amplifiers offer higher efficiency, as well as high-field electron velocity and high breakdown fields. These characteristics help make transmitter devices smaller, lighter and more durable.

Product Features

1) GaN HEMT with high output power of up to 100 W (MGFC50G3742S)

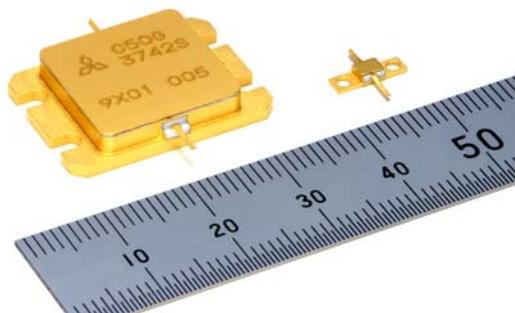
To gain 100W output with GaAs amplifiers, it is necessary to combine an additional amplifier with an output

of approximately 25 W in the final stage. Mitsubishi Electric's new GaN HEMT amplifier, the MGFC50G3742S, achieves 100 W output with a single device, while retaining the same size as 25 W GaAs amplifiers, and offering a very high efficiency (power added efficiency) of 60%.

Mitsubishi Electric has also developed GaN HEMT amplifiers with 40 W, 20 W and 2 W outputs, suitable for use in first- and mid-stage amplification. These lower output amplifiers are smaller, lighter and consume less energy.

2) **High reliability for satellite applications**

Designed for use in satellites, which are usually used for approximately 10 years, Mitsubishi Electric's GaN HEMTs can operate for as long as one million hours given a chip temperature of 175 degrees C and an operation voltage of 45V, and are fit to operate in severe conditions found in space.



Specifications

Internally impedance matched high output power amplifiers:

		MGFC50G3742S	MGFC46G3742S	MGFC43G3742S
Operating conditions	VDS ¹	40 V	40 V	40 V
	IDQ ²	2.0 A	1.0 A	0.5 A
	Rg ³	10 ohm	25 ohm	50 ohm
Frequency	f	3.7 ~ 4.2 GHz ⁴	3.7 ~ .2 GHz ⁴	3.7 ~ 4.2 GHz
Output power of 2 dB compression	P2dB (Typ.)	100 W	40 W	20 W
Linear power gain	Glp (Typ.)	13 dB	14 dB	14 dB
Power added efficiency	PAE ⁴ (Typ.)	60 %	60 %	60 %
Package Size (mm)		17.4 ×24.0 ×4.3		

- 1: Drain to source voltage
- 2: Quiescent drain current
- 3: Gate series resistance
- 4: One of the three separated bands
- 5: Power added efficiency (condition: PAE@P2dB)

Non internally impedance matched high output power amplifier:

		MGF2633GS
Operating conditions	VDS ¹	40 V
	IDQ ²	0.05A
	Rg ³	400 ohm
Frequency	F	4.0 GHz
Output power of 2 dB compression	P2dB (Typ.)	2W
Linear power gain	Glp (Typ.)	12 dB
Power added efficiency	PAE ⁵ (Typ.)	50 %
Package Size (mm)		2.5 × 8.5 × 2.0

About Mitsubishi Electric

With over 85 years of experience in providing reliable, high-quality products to both corporate clients and general consumers all over the world, [Mitsubishi Electric Corporation](http://www.mitsubishielectric.com) (TOKYO: 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 3,665.1 billion yen (US\$ 37.4 billion*) in the fiscal year ended March 31, 2009. For more information visit <http://global.mitsubishielectric.com>

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