

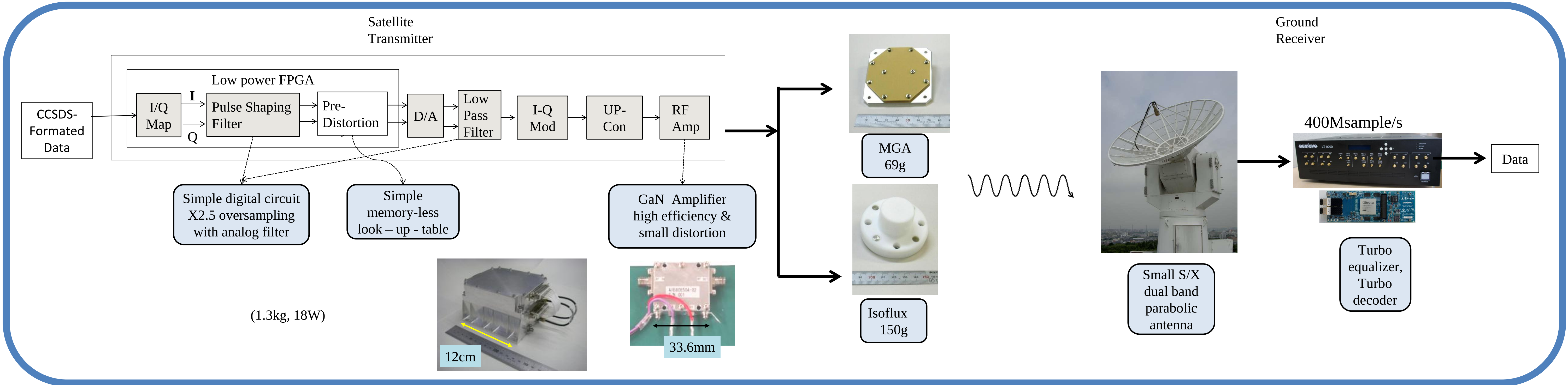
50kg級小型衛星に適合した数百Mbps高速ダウンリンク通信系と3.8m地上局

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(1) JAXA (2) 東京大学 (3) アイ電子株式会社 (4) 株式会社アドニクス (5) 東陽テクニカ



New Challenge to Limitation of Small Satellite (Power & mass)

- To enhance sensor capability (especially SAR)
- To increase data down link speed ⇒ 320 Mbps Down Link for 50kg Satellite Demonstration at Hodoyoshi#4 in 2014

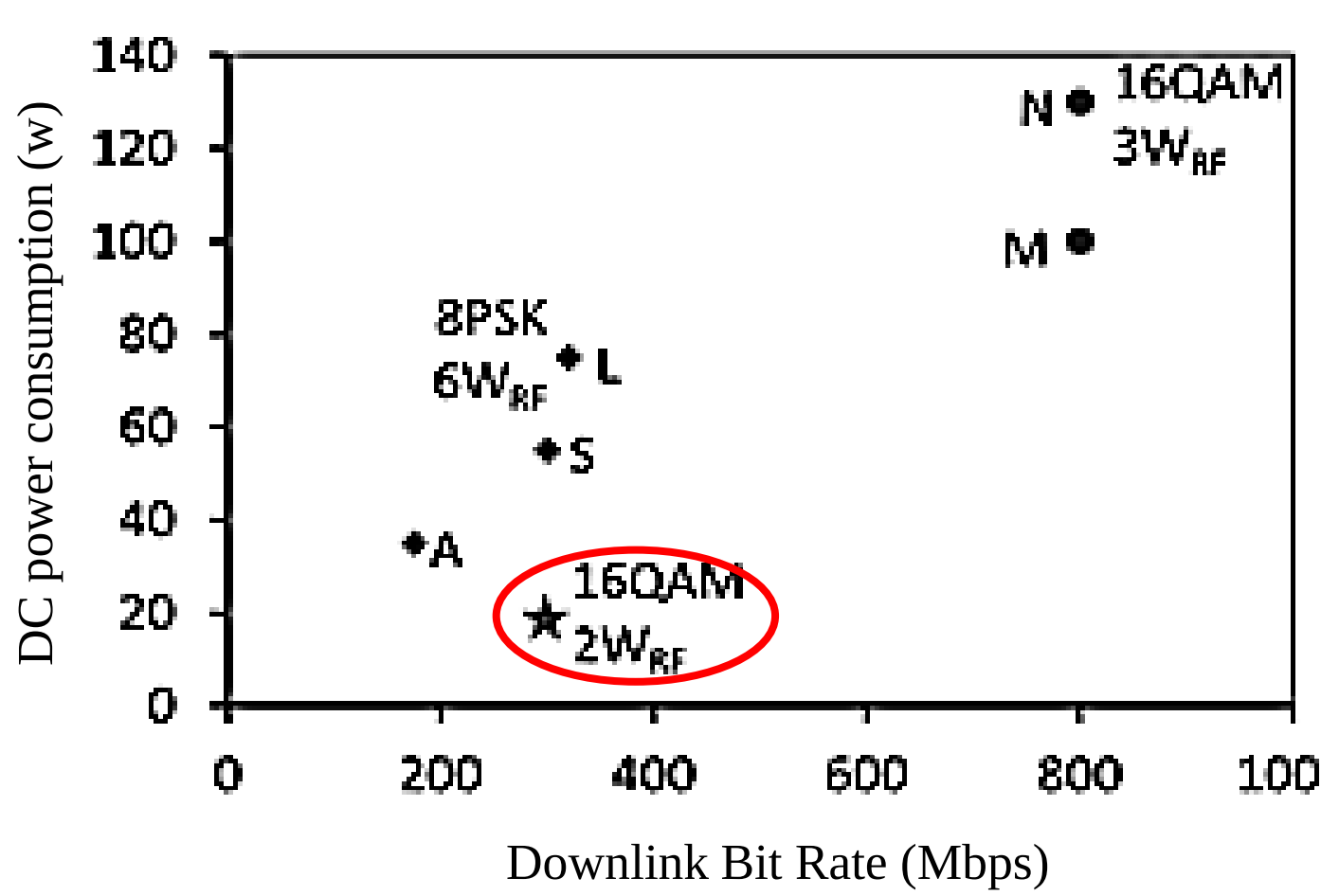
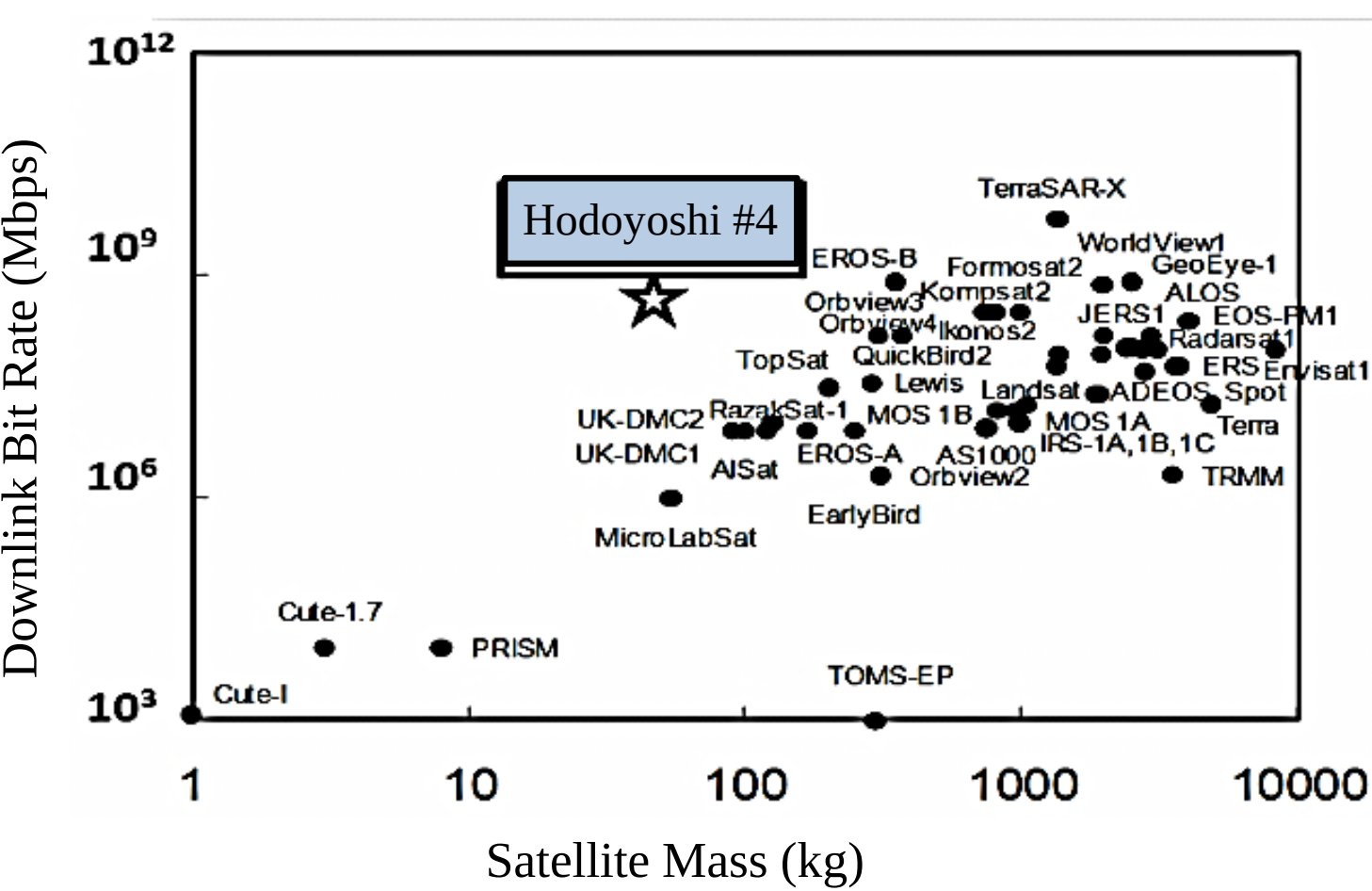


High Speed Downlink System

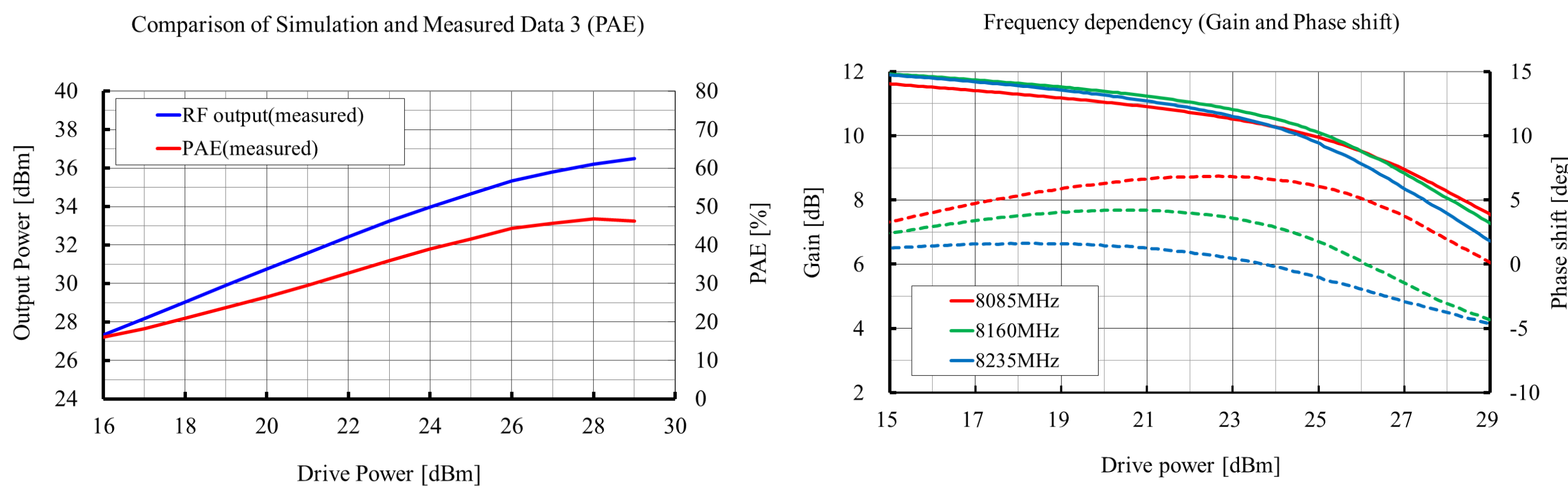
Down Link Over 300 Mbps for 50kg Satellite
Demonstration at Hodoyoshi#4 in 2014

Hodoyoshi #4 project

Center frequency	8.16 GHz (X-band)
Band width	150 MHz
Modulation scheme	QPSK, 16QAM
Data rate	> 300Mbps
Avg. RF power	33 dBm (2W)



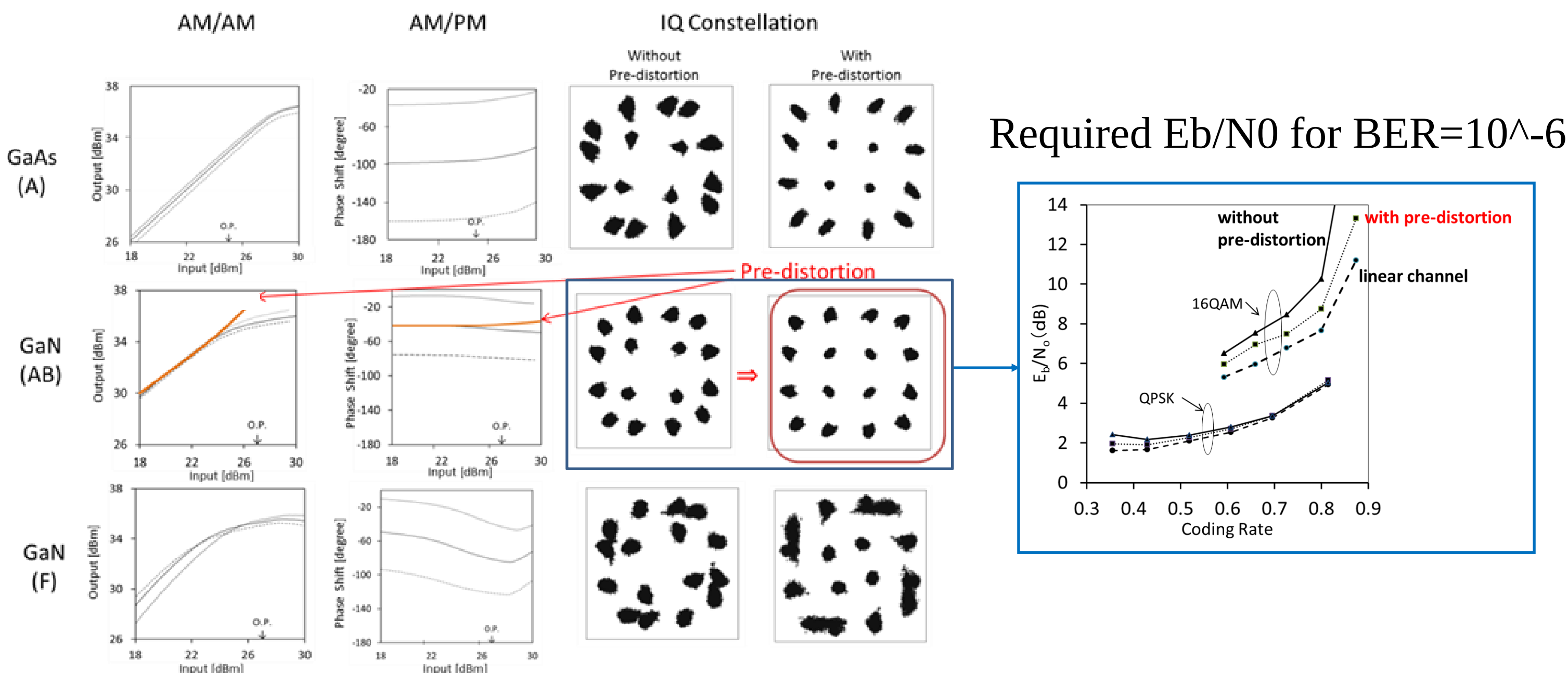
High Efficiency and Low Distortion GaN Power Amplifier



GaN class AB amplifier

- High Efficiency: PAE Max49%, 37% @ 5dB OBO
- Low Distortion: Phase shift < 7°
- Great tolerance to total dose

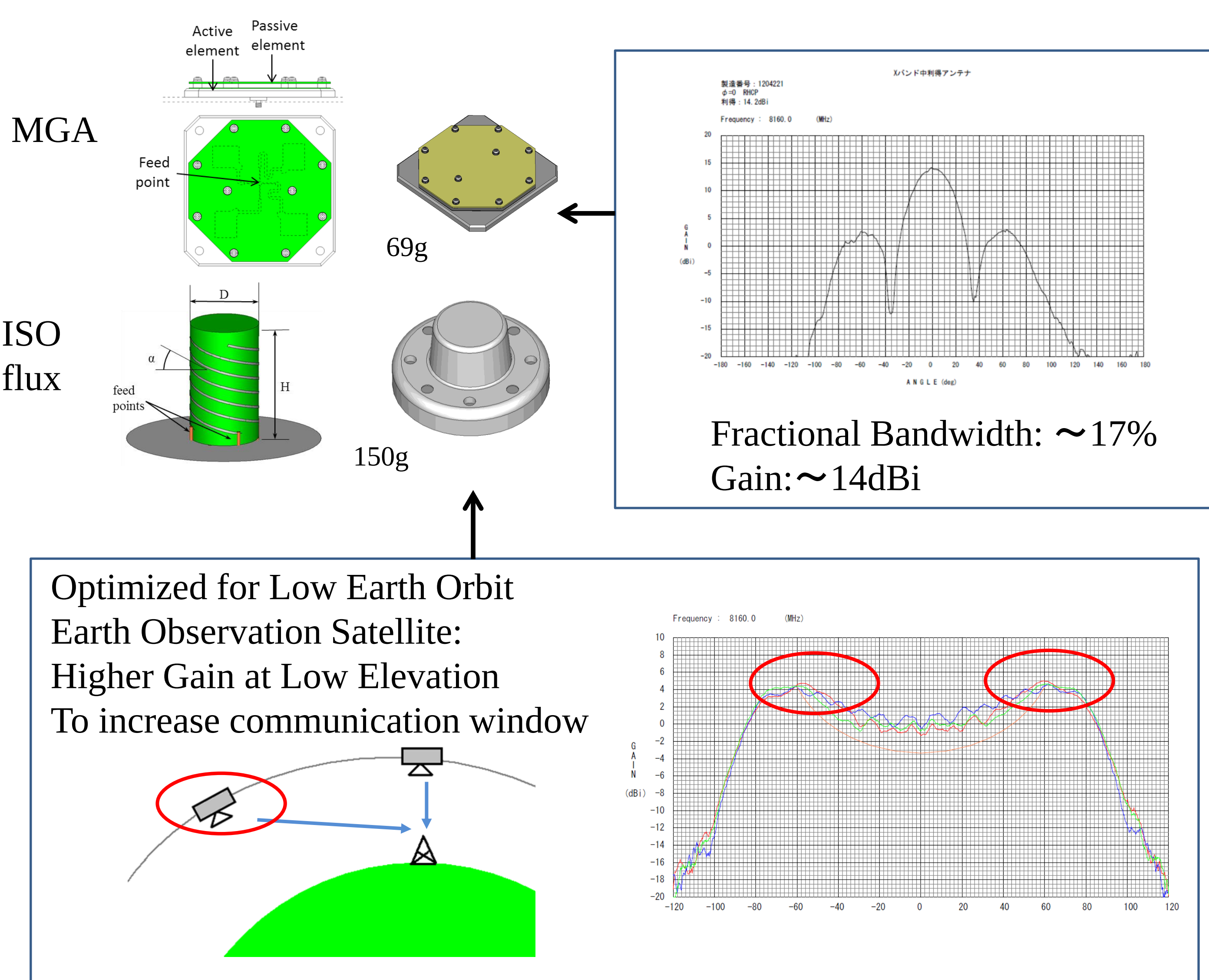
16QAM Simulation and Digital Predistortion



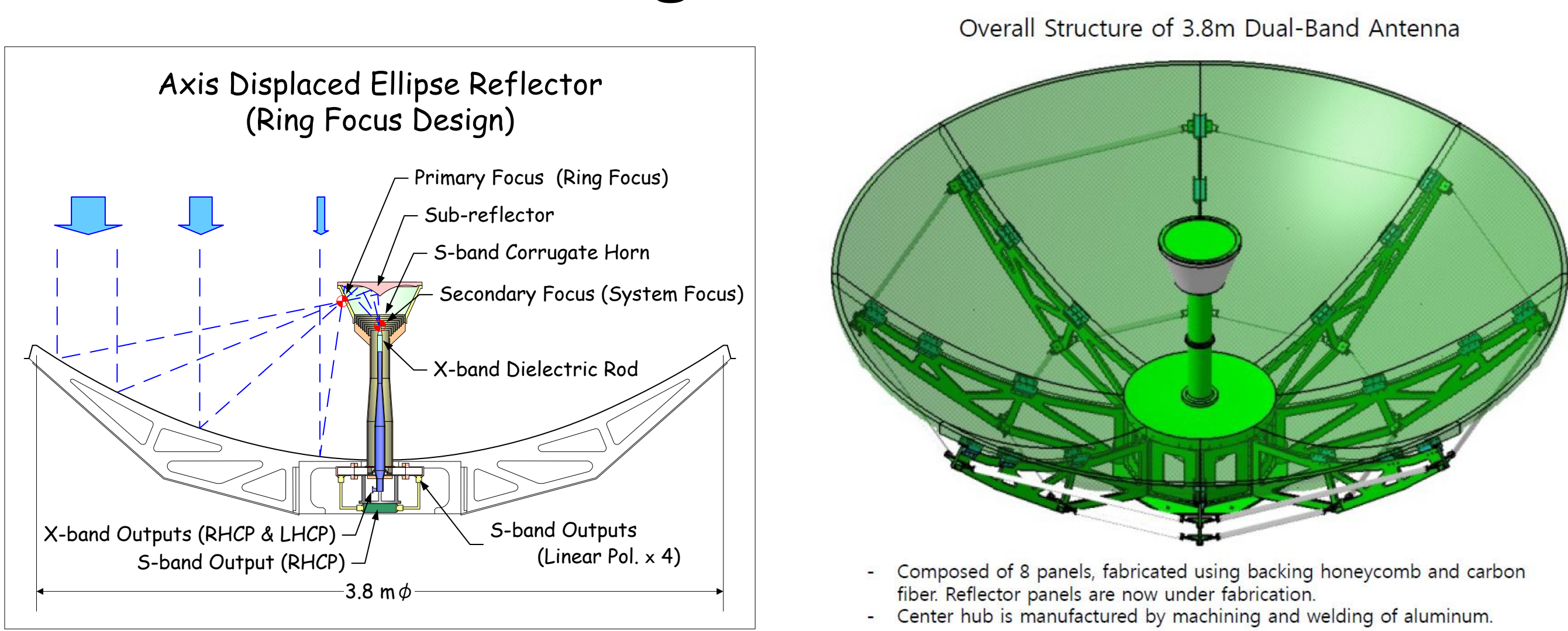
Comparison

Linearity: GaN(AB) > GaAs(AB) > GaN(F)
Efficiency: GaN(F) > GaN(AB) >> GaAs(AB)

MGA and ISO flux Antenna

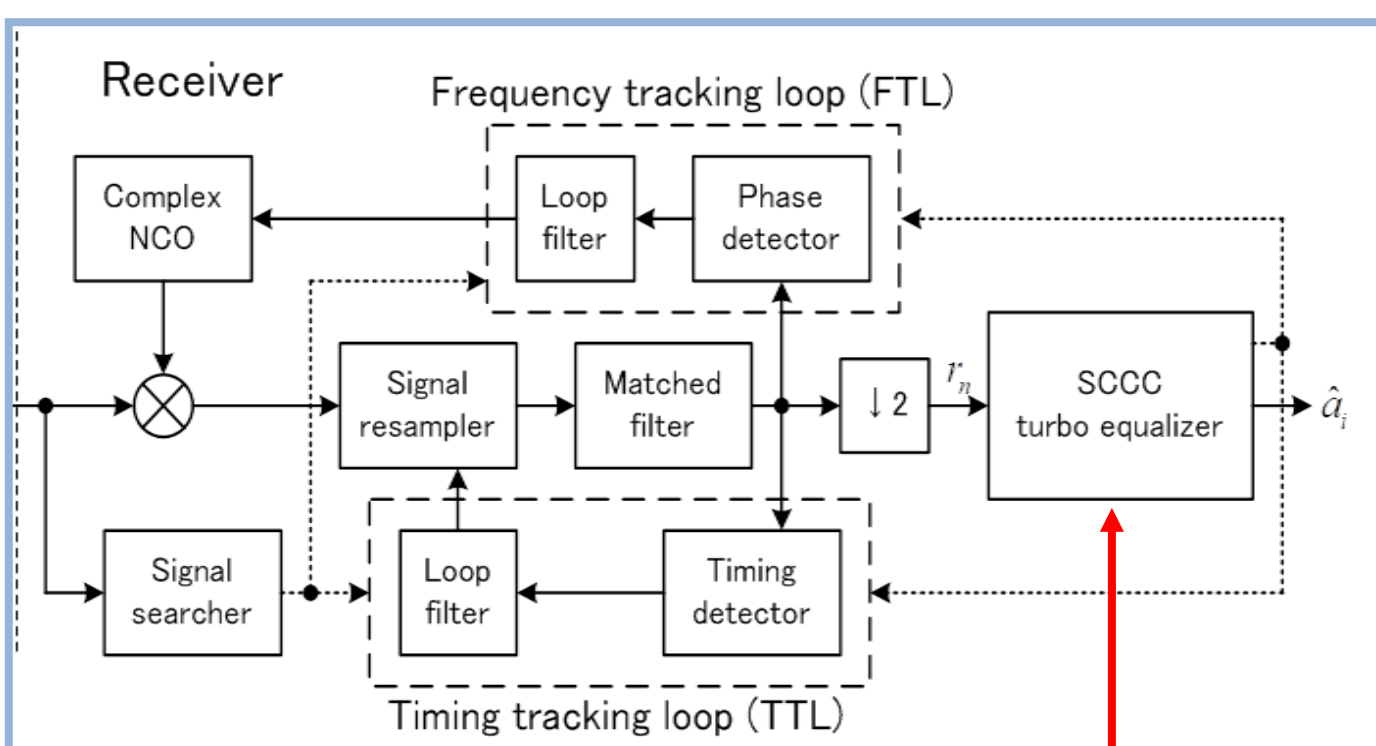


3.8m S/X Dual Band Antenna will be at Sagamihara in March 2013.

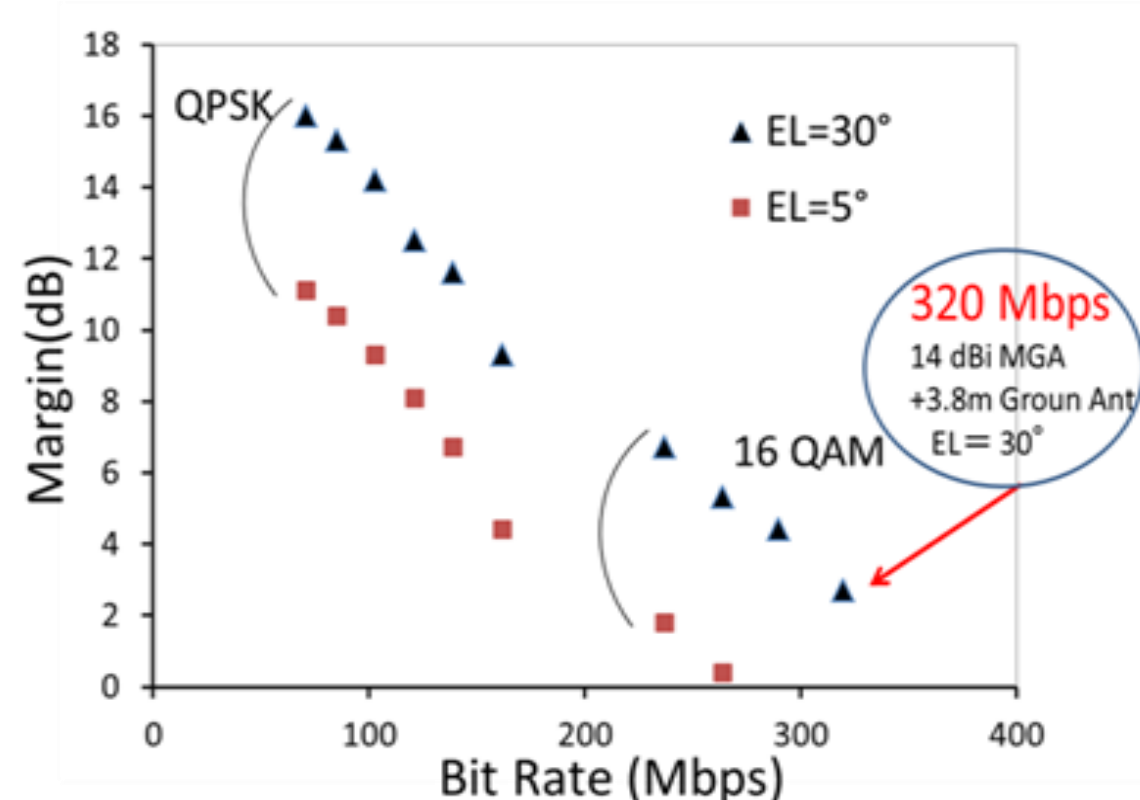


Receiver with SCCC Turbo EQ and Link Calculation

SCCC(Serial Concatenated Convolutional Code) Turbo equalizer, Turbo decoder



Link Margin for BER=10^-6 Using MGA



Downlink Over 300Mbps for small satellite will be available soon