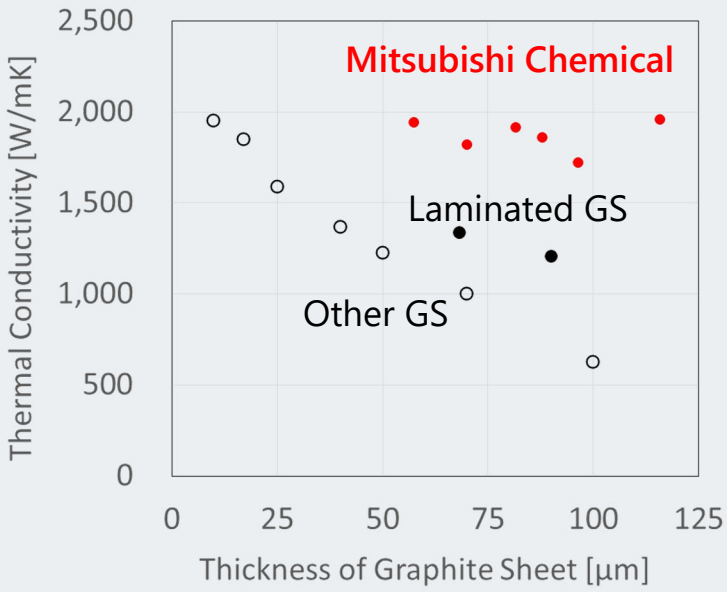
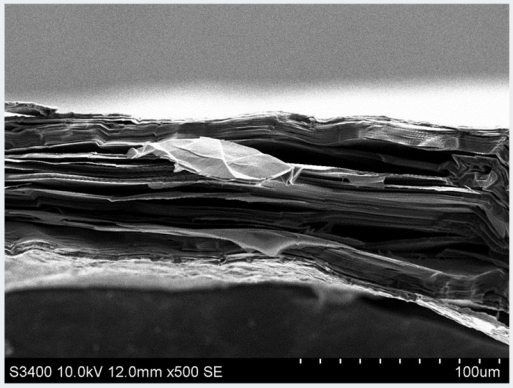
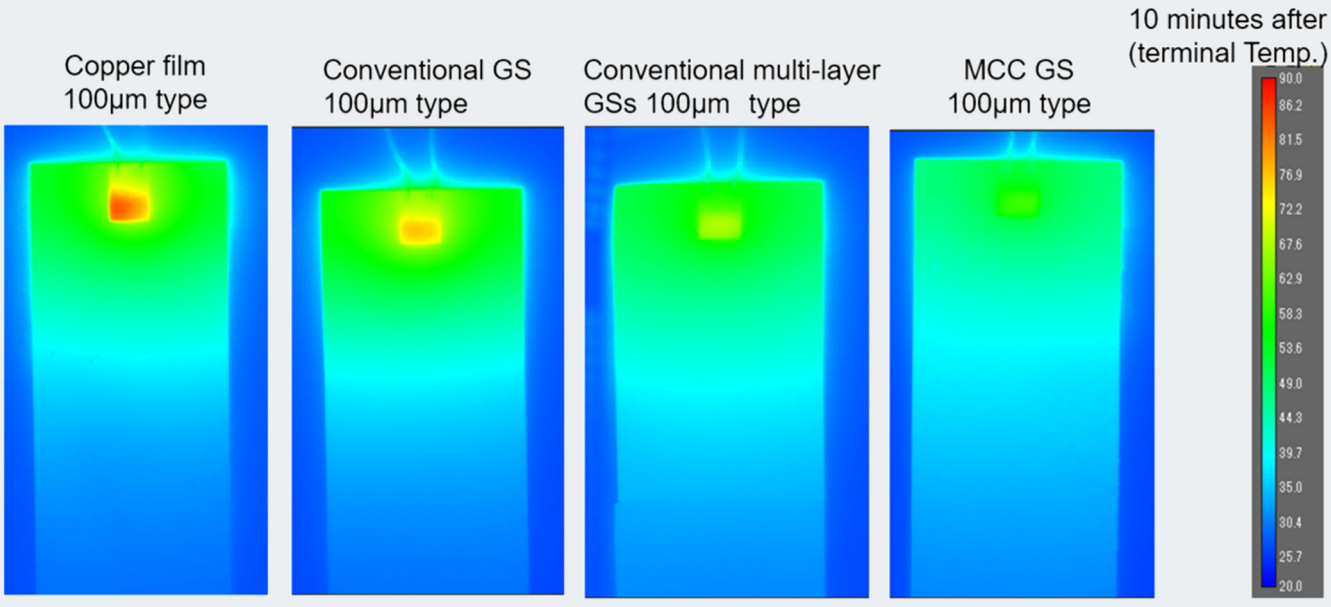
Innovative Graphite Sheet Business Development Project

Space communication antenna, Optical laser, High TC C/C

Thicker than 100μm with High Thermal Conductivity







MCG GS shows the best cooling performance

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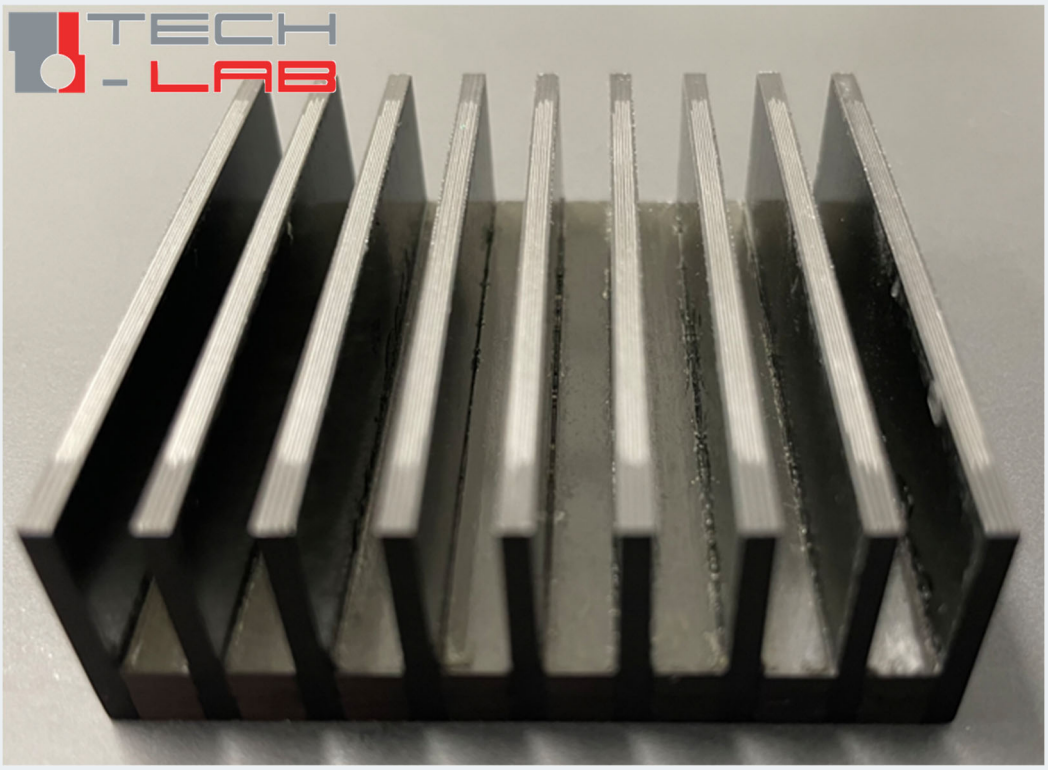
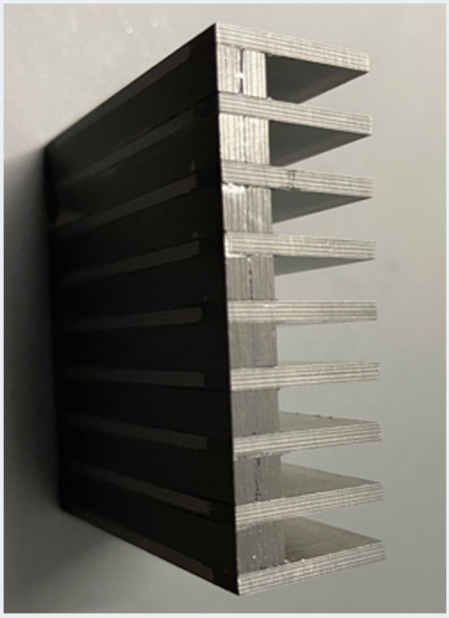
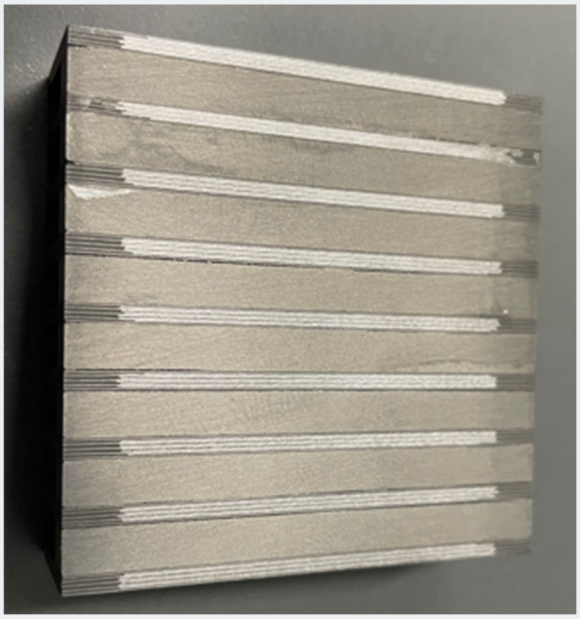
Innovative Graphite Sheet Business Development Project

GS/CFRP Heat Sink:
Space Satellites, Optoelectronic Semiconductor Lasers, Laser Nuclear Fusion

Achieved thermal conductivity of **1000 W/m·K in two directions** by alternately stacking 120 µm Graphite Sheets and 180 µm Pitch-based carbon fiber (K13916) / Cyanate resin (#290) prepreg







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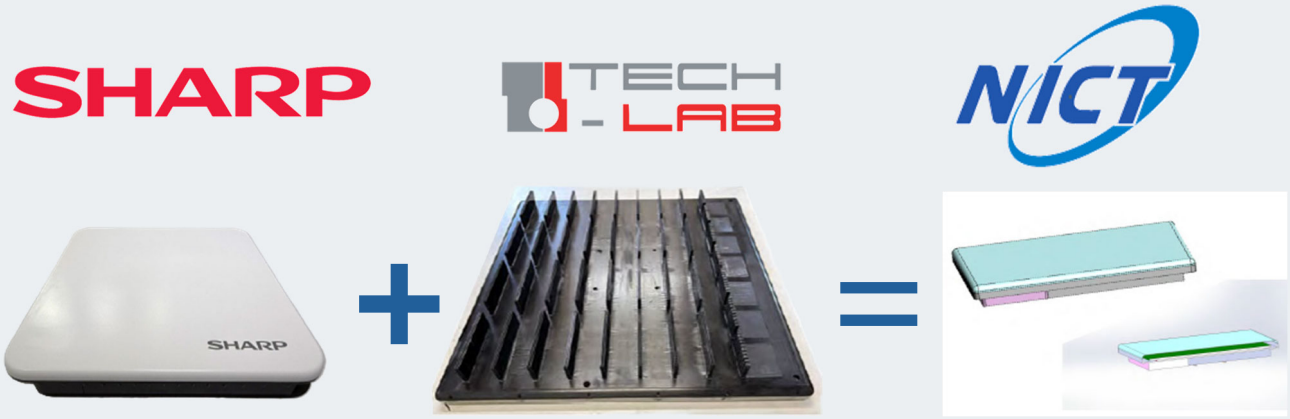
Heat Dissipation Plate for Flat Antenna for Space Communication:
NICT / Tech Labo Co., Ltd.

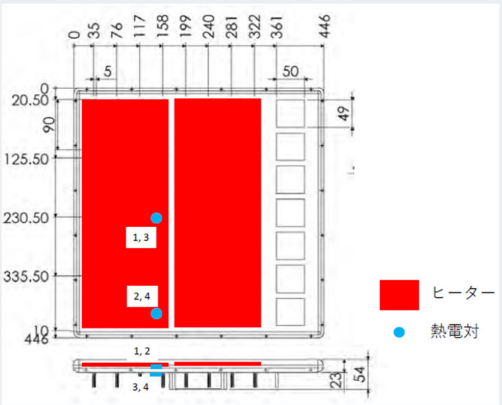
Development Activities for Flat Antennas Installable on NTN Platforms

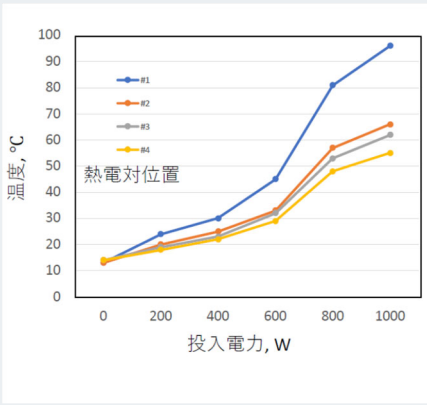
- Research and development of flat antenna systems installable on flying cars, drones, and similar platforms
- Research and development of various materials and heat dissipation structures enabling miniaturization and thinning of flat antennas according to different heat sources and terminal shapes
- Research and development of integration technologies for flat antennas on NTN platforms

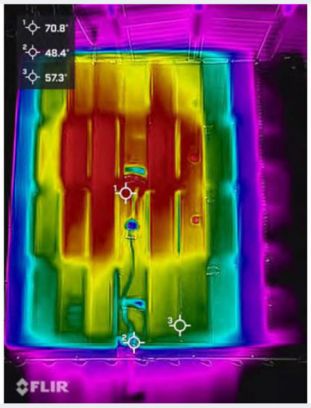


Achieving compact, slim, and lightweight antenna systems for integration into any mobile platform

Temperature Change and Thermal Imaging at 1000W Input (Air Cooling)







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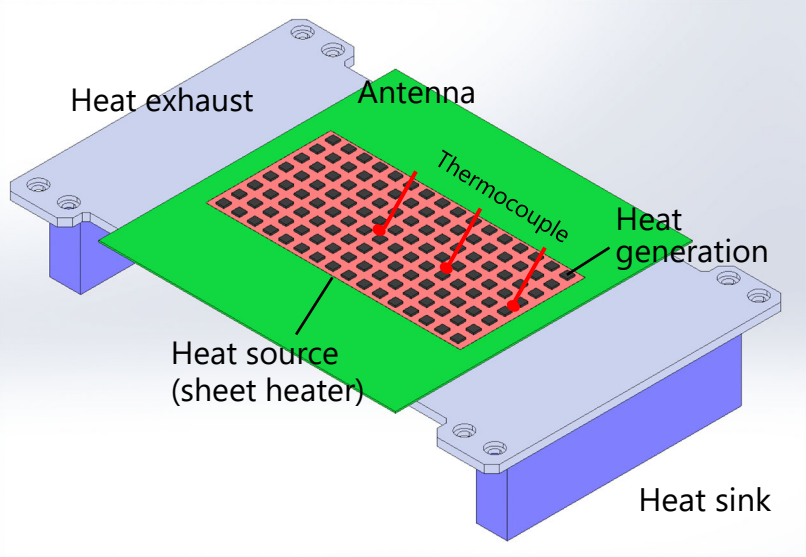
Innovative Graphite Sheet Business Development Project

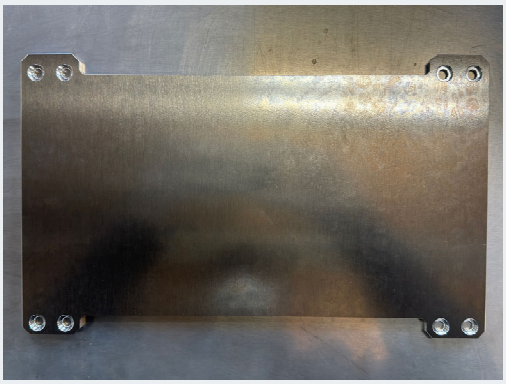
Heat exhaust plate of flat antenna for space communication:
NICT / Tech Labo Co., Ltd.

Verification of high thermal conductivity performance through heat generation/exhaust heat model experiments of flat antennas

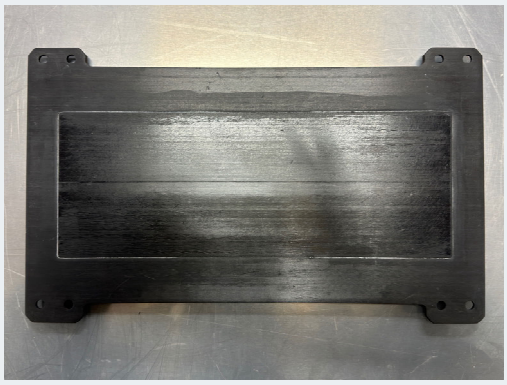


The effectiveness of suppressing heat generation in antenna elements using a heat exhaust plate that takes advantage of the high thermal conductivity of graphite sheets has been experimentally verified.

Aluminum plate



Graphite Sheet / High thermal conductivity CFRP plate



		Material of plate		
		Aluminum	**CFRP**	**GS/CFRP**
Density		2.7	1.7	1.8
Thermocouple	1	61.4 °C	57.9 °C	39.4 °C
	2	60.1 °C	55.6 °C	36.5 °C
	3	60.5 °C	48.4 °C	26.5 °C

Aluminum heat exhaust plate weighing over 20 kg can be reduced to less than 4 kg. (Thinner due to lighter material x high heat transfer performance)