

## Nagoya Institute of Technology

### “Innovation Center for Multi-Business of Nitride Semiconductors”

~University, corporations and public institution carry out joint research and development under one roof~

“Innovation Center for Multi-Business of Nitride Semiconductors” is established as the base for developing practical applications of GaN based power devices with NITech’s pioneering crystal growth technique to fabricate GaN film on Si substrate.

The project is expected to realize further miniaturized and energy-saving semiconductors to promote wider usage through home appliances, next generation automobiles, etc.

Facility name : “Innovation Center for Multi-Business of Nitride Semiconductors”

Project size (total project cost) : 2.27 billion yen

Expected completion date : March 2013

Location : on NITech campus

Member institutions : NITech, 15 corporations, 1 public research institution

※The foundation of this center was adopted as “**Innovation Base Support Project**” (“**The Base between Technologies**” development project) led by the Ministry of Economy, Trade and Industry. (Announcement date : July 1, 2011)



3 story building with basement, 2,350 m<sup>2</sup>

#### **3rd floor : “Multi-Business Floor”**

Industry-academia-government partnership to achieve multiple types of business models

#### **2nd floor : “Innovation Floor”**

Characterization and combining technologies

#### **1st floor : “Creation Floor”**

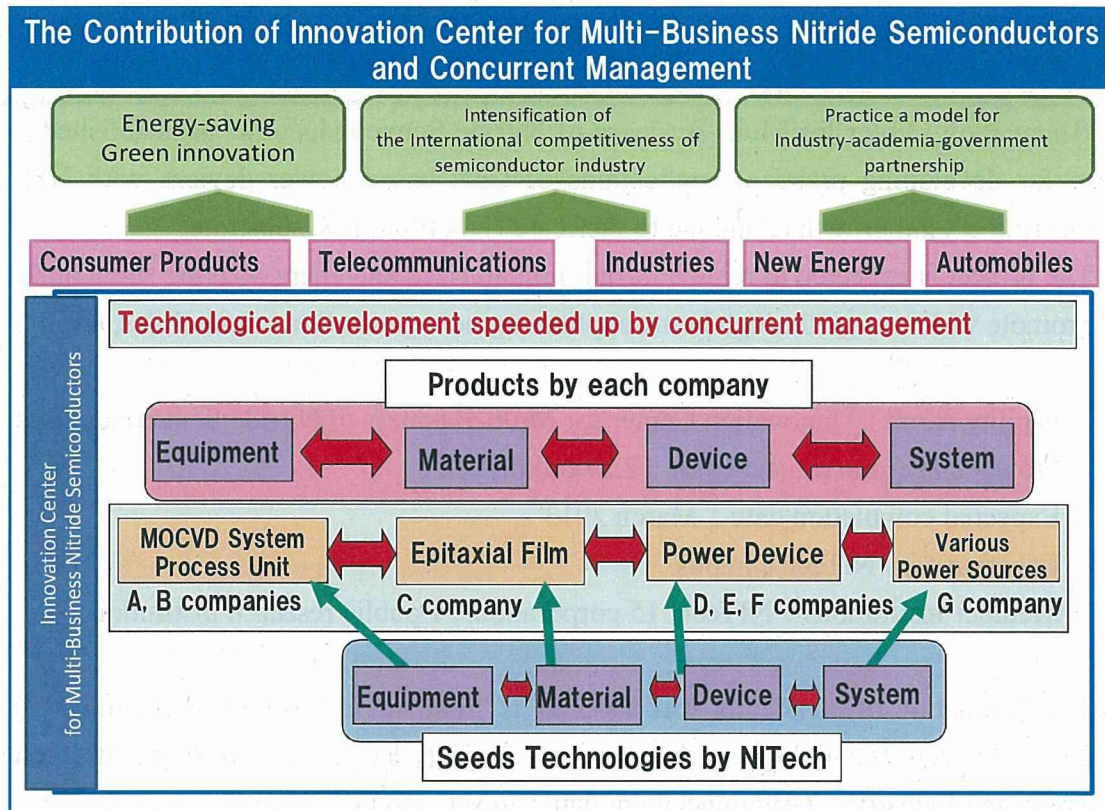
Crystal growth and device processing

**Basement** : electrical rooms, equipment rooms, etc.

### **1. Characteristics**

- The most distinctive characteristic of this center is the consistent product development process from basis, application, trial to evaluation, available because of the joint research with various related companies and NITech under one roof.
- The joint research at this center will be participated by 15 corporations dedicating to the development of equipments for crystal growth and device processing, large diameter and high quality materials, and devices for home appliances, communications, automobiles, etc.

- Distinction between the areas of cooperation and competition must be managed precisely since the development process of equipments, materials, and devices are conducted under one roof. A specialized management team will be formed at NITech for that purpose.



## **2. Research points (advantages over other techniques)**

The points of NITech's GaN/Si crystal growth technique (and its advantages over other techniques) are as follows.

- ① GaN-based power device is made by fabricating GaN (Gallium Nitride), the new material, on Si (silicon wafer), the conventional material.
- ② The practical application of GaN-based power devices will achieve miniaturization and energy-savings compared to the currently dominant silicon power devices, and consequently contribute to reduce greenhouse gas emissions.
- ③ The growth method of large diameter GaN/Si enables low-cost production owing to the utilization of equipments and technical know-how already possessed by device companies.

## **3. Fields expected to be commercialized**

- Home appliances (energy-saving, miniaturized)
- Personal computers (adapter-less)
- Next generation automobiles (energy-saving, weight-saving, miniaturized)
- Industries including power devices for motor drive
- New-Energy including smart grid