

A wide-angle photograph of a wind farm. Numerous white wind turbines are scattered across a landscape covered in dense trees with vibrant autumn foliage in shades of orange, yellow, and brown. The sky is overcast with grey clouds. In the top right corner, the logos for HITACHI and ABB are displayed.

HITACHI

ABB

CUSTOMER PRESENTATION

Medium power IGBT modules

High quality 1200V LoPak IGBT modules

POWERING GOOD FOR SUSTAINABLE ENERGY

2021-04-26

HITACHI ABB POWER GRIDS

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Perpetual innovation
for more than 60 years



1954
BBC develops the first germanium diode



1979
Cahora Bassa, first HVDC with thyristors



1996
First medium voltage drives with IGCTs



2016
62Pak - Medium-power IGBT modules and BiGT StakPak



1964
First locomotive using BBC silicon diodes



1987
First BBC locomotive using GTOs



2012
Successful design and development of hybrid HVDC breaker



2018
Full automation of the IGBT back-end process

High quality and process reliability levels

- High level of quality and process reliability documented in various audits
- Quality management and quality assurance
- Enhanced testing, highest reliability and very few field returns
- Originating from high-power semiconductors, Hitachi ABB Power Grids is regarded as one of the world's leading suppliers setting standards in performance and quality
- Hitachi ABB Power Grids' unique knowledge in high-power semiconductors now expands to industry-standard medium-power IGBT modules

Expansion to medium power offering



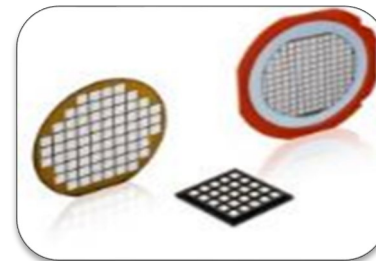
BiPolar devices



BiPolar
press-pack



IGCT with
gate unit



BiMOS devices



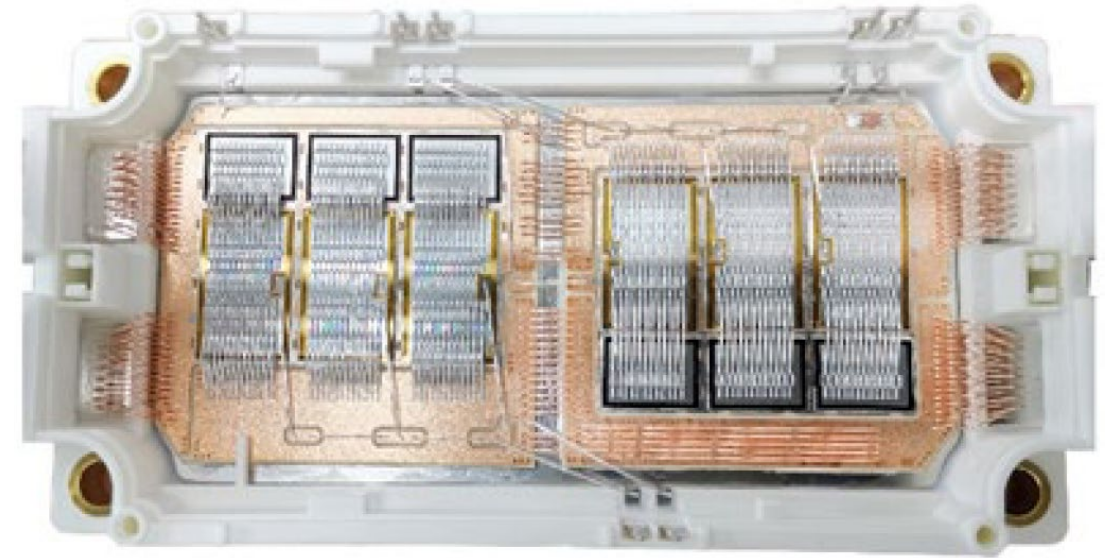
HiPaks and
StakPaks



Medium power
modules

1200V 2x 900A medium power module

LoPak is a multi-application capable module for both active front-ends or machine-side converters

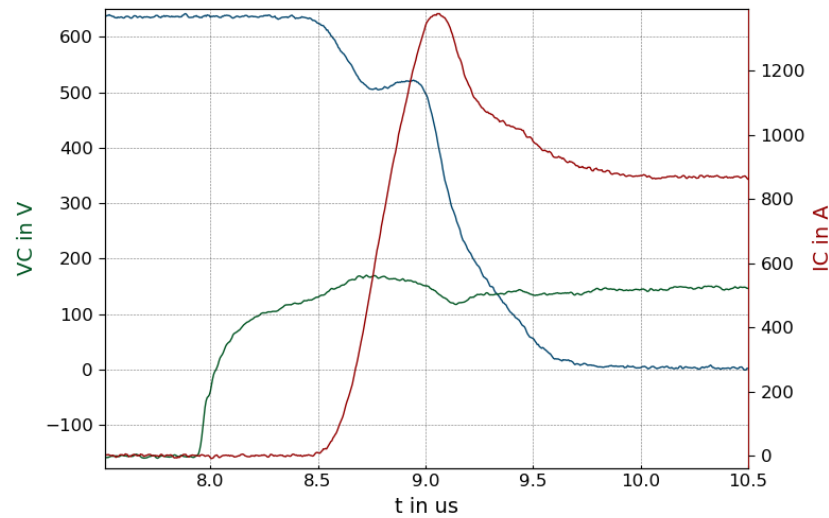


**Our newest product will offer prospective customers upgrading capabilities to existing and future designs.
Our 1200V LoPak builds upon our experience in high-performance and high-reliable devices.**

Waveforms for nominal conditions:

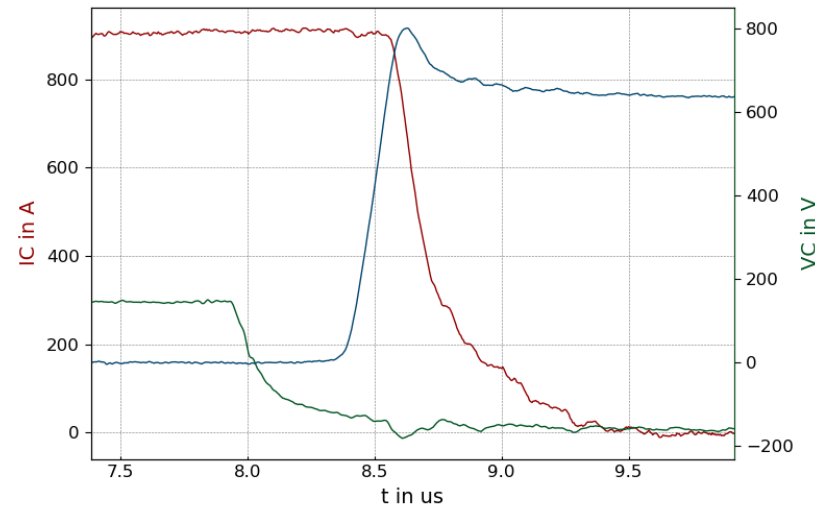
$V_{DC}=630V$, $I_C=900A$, $R_G=0.51\Omega$, $V_{GE}=\pm 15V$, $L_s=30nH$

IGBT turn-on @ 175 °C

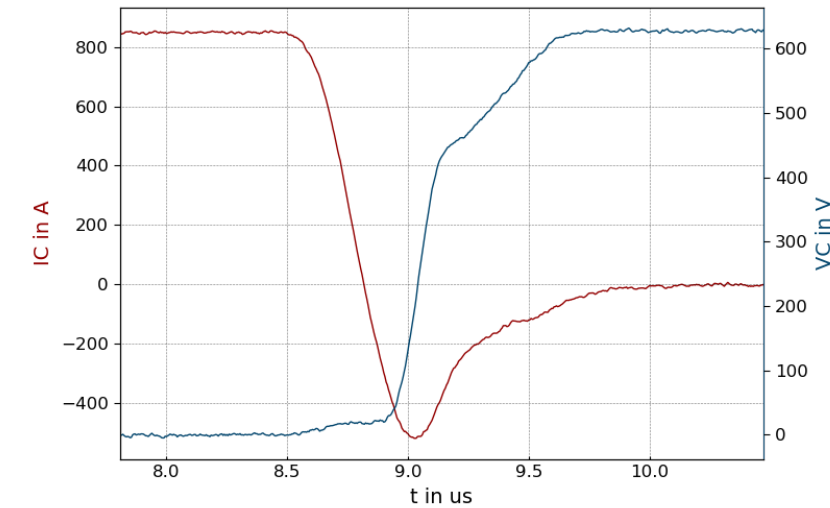


Red trace: I_C in A
Blue trace: V_C in V
Green trace: $10 \cdot V_{GE}$ in V

IGBT turn-off @ 175 °C

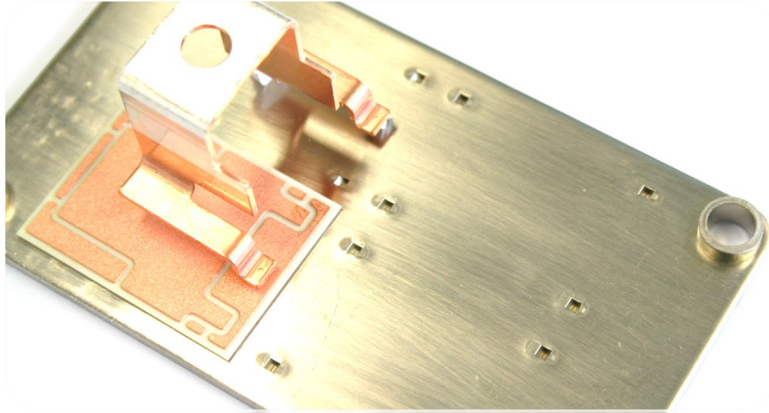


Diode turn-off @ 175 °C



LoPak IGBT module features: Forefront package technology

Proven concepts of HiPak modules applied



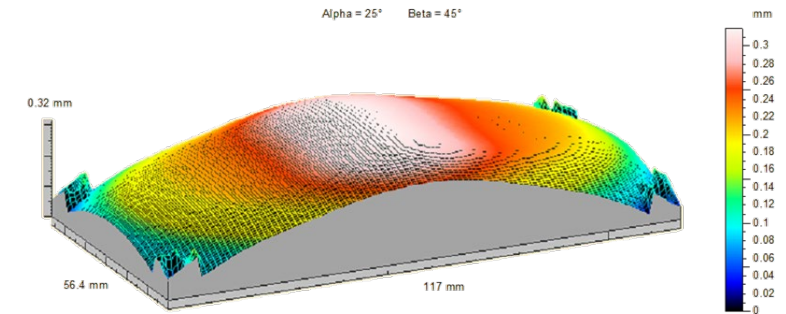
Spacer for substrate solder

- Higher lifetime under cyclic load
- Homogeneous solder thickness



Embedded terminals

- Press-fit auxiliary connections and main terminals are molded into the housing frame
- Higher lifetime under cyclic load and robust against vibration
- Easy mounting of the driver PCB



Pre-bowed and stamped baseplate

- Higher thermal utilization → more power and/or higher lifetime
- Reduced gap and lower interface resistance to heat sink
- Minimized grease pump-out

HITACHI

