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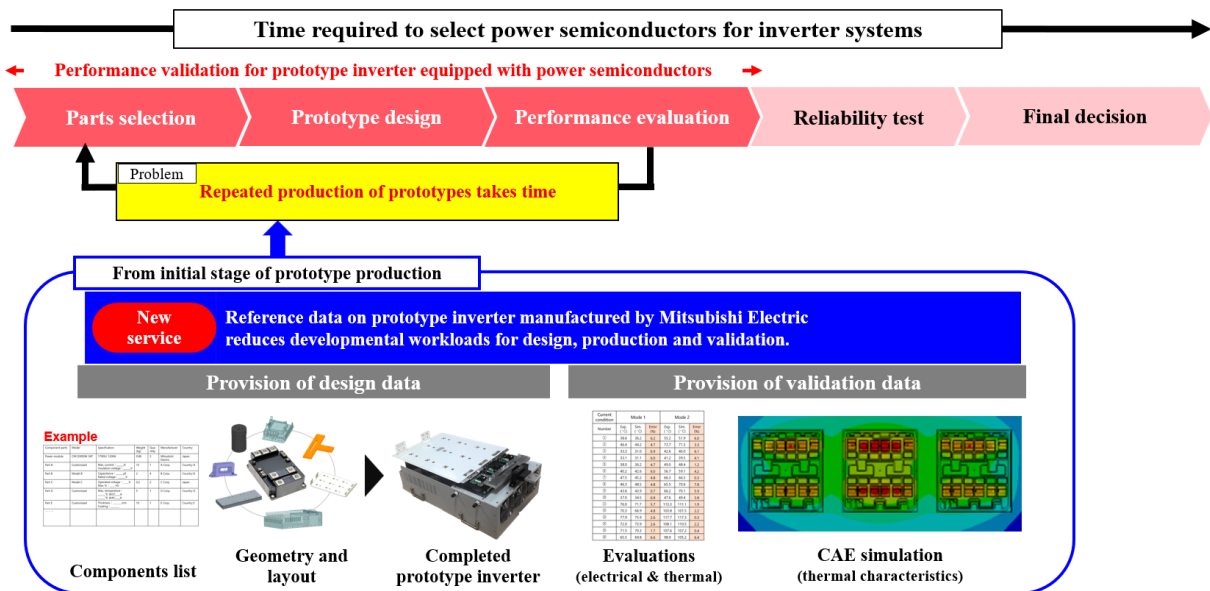
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Mitsubishi Electric to Launch Support Service for Accelerated System Development with LV100 Power Semiconductors

Provision of prototype data will lighten ease inverter system development workloads



Adoption flow of power semiconductors for inverter systems and service details provided lately

TOKYO, June 6, 2024 – [Mitsubishi Electric Corporation](https://www.mitsubishi-electric.com) (TOKYO: 6503) announced today that it will launch a web-based service on June 28 to provide data on the design and validation of a proprietary prototype inverter* equipped with a module containing three LV100 insulated gate bipolar transistors (IGBTs), aiming to help customers accelerate their development of high-power inverters for applications such as photovoltaic power-generation systems. Customers involved in developing prototype inverter systems with LV100 packages are expected to use reference information provided by the service to reduce their design, manufacture and validation workloads. The service will be exhibited at major trade shows, including Power Conversion Intelligent Motion (PCIM) Europe 2024 in Nuremberg, Germany from June 11 to 13.

* Redeveloped based on the prototype inverter co-developed by Tamura Corporation, National Taipei University of Technology (NTUT) and Mitsubishi Electric Corporation

The prototype inverter includes a package of three parallel LV100 industrial IGBTs in a module measuring 100mm x 140mm module, typical of those used in high-power inverter systems. The reference data will include design data, such as geometry, component layout and electrical circuitry, as well as evaluation data such as temperatures, short-circuit protection, current balance and computer-aided engineering (CAE) validation results.

Details of New Service

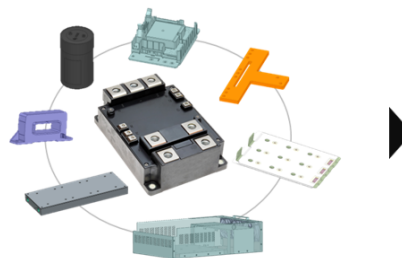
1) Prototype inverter components list and design information will reduce design workload

- The service will provide a list of components for Mitsubishi Electric’s proprietary prototype inverter and design information covering parts configuration, electrical circuitry, etc., helping to reduce the burden of parts selection and design.
- This module is widely used as a standard package for power semiconductor modules in high-capacity inverter systems, so information provided by the service will contribute to the design of inverter systems using the same package for other applications.

Example

Component parts	Model	Specification	Weight (kg)	Quantity	Manufacturer	Country
Power module	CM1200DW-34T	1700V/ 1200A	0.86	3	Mitsubishi Electric	Japan
Part A	Customized	Max. current : ____A Insulation voltage : ____V	13	1	A Corp.	Country A
Part B	Model B	Capacitance : ____μF Rated voltage : ____V	2	4	B Corp.	Country B
Part C	Model C	Operated voltage : ____V Max. f.c : ____Hz	0.2	2	C Corp.	Japan
Part D	Customized	Max. temperature : ____°C @DC ____A ____°C @95% ____A	5	1	D Corp.	Country D
Part E	Customized	Thickness : ____mm Coating : ____	10	1	E Corp.	Country E
...						

Components list



Geometry and layout information



Prototype inverter (proprietary design)

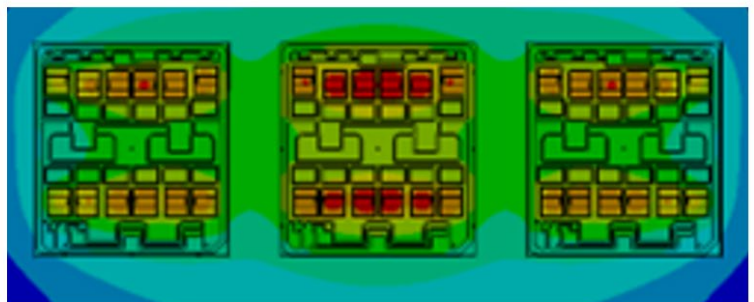
2) Prototype inverter validation data reduces design, manufacture and evaluation workloads

- Validation data based on CAE analysis and evaluation data on temperatures, short-circuit protection, current balance, surge voltage, etc. for power modules, which tend to be burdensome when developing high-capacity inverter systems, helps to reduce design, manufacture and validation workloads.
- The reference validation data will also contribute to design and manufacture accuracy for prototypes developed according to each customer's design standards.

Validation data

Current condition Number	Mode 1			Mode 2		
	Exp. (°C)	Sim. (°C)	Error (%)	Exp. (°C)	Sim. (°C)	Error (%)
①	38.6	36.2	6.2	55.2	51.9	6.0
②	46.4	44.2	4.7	73.7	71.3	3.3
③	33.3	31.0	6.9	42.6	40.0	6.1
④	33.1	31.1	6.0	41.2	39.5	4.1
⑤	38.0	36.2	4.7	49.0	48.4	1.2
⑥	40.2	42.6	6.0	56.7	59.1	4.2
⑦	47.5	45.2	4.8	66.3	66.5	0.3
⑧	46.3	48.5	4.8	65.5	70.6	7.8
⑨	43.6	43.9	0.7	66.2	70.1	5.9
⑩	37.0	34.5	6.8	47.6	49.4	3.8
⑪	76.0	71.7	5.7	113.3	111.1	1.9
⑫	70.3	66.9	4.8	103.8	101.5	2.2
⑬	77.9	75.9	2.6	117.7	117.3	0.3
⑭	72.0	73.9	2.6	108.1	110.5	2.2
⑮	71.5	70.3	1.7	107.6	107.2	0.4
⑯	65.5	69.8	6.6	98.9	105.2	6.4

Thermal evaluation data (Experimental values for components)



Thermal simulation data

Specification of Proprietary Prototype Inverter

Name	Power stack with CM1200DW-34T (prototype inverter)
Application	Renewable energy
System capacity	2MW
Topology	2-level inverter; 1 stack corresponds to 1 arm of 3-phase inverter
DC voltage	~1100V
Assumed system voltage	AC 690V(±10%)
IGBT specification	CM1200DW-34T (1700V / 1200A) × 3 in parallel
Cooling specification	Water cooling
Geometry	795mm×423mm×289mm (L×W×H)
Weight	65kg

The demand for power semiconductors as key devices that can contribute to decarbonization is growing rapidly. However, selecting the right device is a difficult process involving complex designs for heat dissipation, current balance, fault protection and insulation, etc., which results in the need to devote much time to the design, manufacture and evaluation of inverter prototypes.

Website

www.MitsubishiElectric.com/semiconductors/powerdevices/

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About Mitsubishi Electric Corporation

With more than 100 years of experience in providing reliable, high-quality products, Mitsubishi Electric Corporation (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. Mitsubishi Electric enriches society with technology in the spirit of its “Changes for the Better.” The company recorded a revenue of 5,257.9 billion yen (U.S.\$ 34.8 billion*) in the fiscal year ended March 31, 2024. For more information, please visit www.MitsubishiElectric.com

*U.S. dollar amounts are translated from yen at the rate of ¥151=U.S.\$1, the approximate rate on the Tokyo Foreign Exchange Market on March 31, 2024