MITSUBISHI ELECTRIC
Changes for the Better

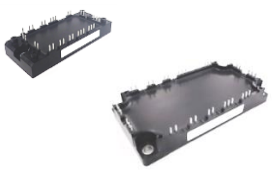
T-Series IGBT Modules – NX-Type

The Mitsubishi Electric 7th Generation NX-Type IGBTs greatly simplify the design of medium power inverters for various applications like industrial drives, wind power, solar power and UPS. Features such as an industry standard low profile package, significantly improved thermal impedance and very low loss, 7th Generation CSTBT™ technology facilitate a very efficient, economical and robust inverter design.
The NX-Type line-up has been expanded up to 1000A/1200V and all new 1700V and 650V line-up of dual modules to suit a wider power range of applications. Design effort is minimized as the 7th Generation NX-Type employs the same standard packaging and features previously introduced for the 5th and 6th Generation NX-Type. The newly developed SLC-Technology of the 7th Generation NX-Type enables the design of inverters with higher output current, higher power density and improved reliability in both power and temperature cycling.

Product Advantages

- Low-loss 7th generation CSTBT™
- SLC assembly technology
- Warpage suppression
- $T_{j,max}$ of 175°C for switching operation
- Low-profile package
- Integral Thermistor

User benefits	Achieved by
Extended module life time	High thermal cycling capability by Insulated Metal Baseplate (IMB)
	pump-out free by matched thermal expansion coefficients
Reduction of assembly costs	PressFit terminals
	PC-TIM (pre-applied **P**hase **C**hange **T**hermal **I**nterface **M**aterial)
	production lot-independant paralleling capability
Compactness and extended power range	Low loss 7th gen. Chipset
	Low thermal resistance $R_{th(j-c)}$
	Reduced package inductance by single pattern layout
scalable platform concepts	full power rating line-up of 650V, 1200V and 1700V modules

Circuit	Topology	Package outline	Package size	650V	1200V	1700V
2in1	D		62mm x 152mm	300A 450A 600A	225A 300A 450A 600A 800A	225A 300A 450A 600A
			114mm x 110mm		1000A	
6in1	T		62mm x 122mm	100A 150A 200A	100A 150A 200A	100A 150A
7in1	R		62mm x 122mm	150A 200A	100A 150A	
CIB	M		45mm x 107.5mm	50A 75A 100A	35A 50A 75A	
			62mm x 122mm	100A 150A	75A 100A 150A	

Industrial Wind Solar

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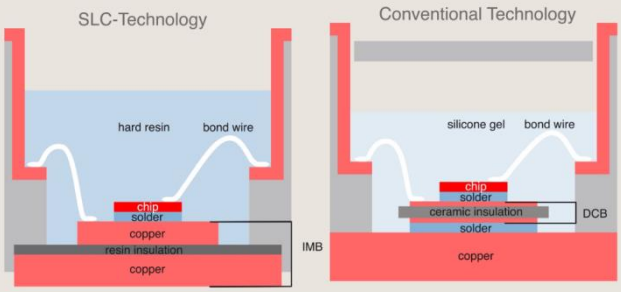
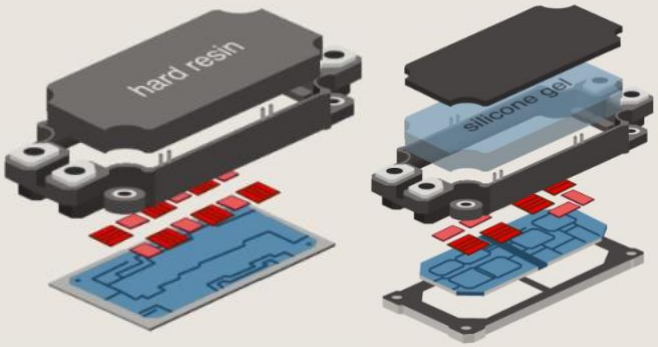
SLC (SoLid Cover)-Technology

new



SLC-Technology is a newly developed package technology combining a resin-insulated metal baseplate and hard direct potting resin.

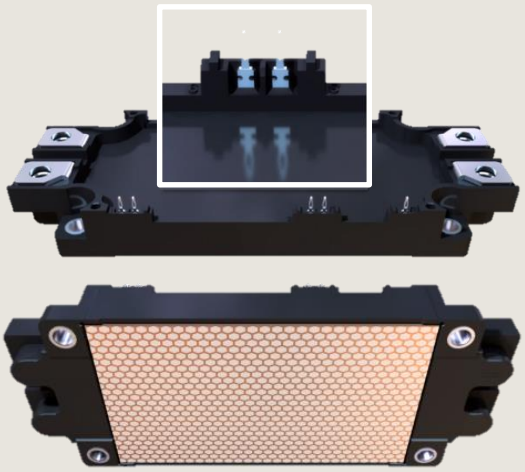
The **IMB** (Insulated Metal Baseplate) combines an electrically insulating resin layer with a top and bottom side copper layer by direct bonding, thus eliminating the substrate solder layer and the baseplate.
Less layers and matched thermal expansion coefficients lead to high thermal cycling capability, exceeding several times the conventional capability. At the same time, the thermal resistance at same chip size is reduced by 30% compared to conventional modules having Aluminium-Oxide insulation.



The SLC concept utilizes one common substrate instead of multiple ceramic substrates. This approach expands the effective area available for mounting chips and eliminates wire bond interconections. Hence, the IMB is a key element of the SLC-Technology for high power density and low stray inductance.

The new NX-package has been developed with **direct potting resin** instead of silicone gel. This hard mold was designed to match the CTE (Coefficient of Termal Expansion) of the copper aswell as the insulation material of the IMB. Therefore the bi-metall effect is suppressed and the module offers warpage-free behavior effectively preventing the pump-out effect of the thermal interface material. This eanbles a long term reliable thermal connection to the heatsink.

User-friendly design features



The NX-Type of 7th Generation IGBT modules line-up contains press-fit as well as solder pin types. The newly developed “needle eye”-pintype has a self adjusting shape for easy assembly.

The light weight package is also available as an option with applied PC-TIM. This removes the need to apply grease and achieves lower thermal contact resistance.
Both features enable a highly reliable mounting process even in harsh enviroments and easy maintenance in the field.

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