

2.10 3rd Generation DIP and Mini-DIP-IPM (Dual-in-line Package Intelligent Power Modules)

Features:

- Employing 5th generation planar IGBT chips with 0.6µm design rule or CSTBT™ technology with superior loss performance
- Ultra compact dual or single-in-line transfer mold package (compatible with 2nd generation)
- Including driver and protection circuitry (UV, SC)
- DIP-IPM with reduction of thermal resistance by 20%
- 2500V_{rms} isolation voltage
- High-active interface logic for direct connection to a 3V or 5V MCU
- Highest reliability and optimised EMI performance
- Available from 3A to 50A / 600V for motor ratings from 0.1kW to 3.7kW
- Optional with open emitter topology for vector control
- All Mitsubishi DIP and Mini-DIP-IPMs have lead-free terminals
- From January 2006 onwards, all DIP and Mini-DIP-IPMs will be supplied with completely lead-free technology



Line-up DIP, Mini-DIP & SIP-IPM

Type	Isolation Voltage (V)	V _{CES} (V)	Motor Rating (kW)						
			0.1	0.2	0.4	0.75	1.5	2.2	3.7
Super-DIP	2500	600					PS21065	PS21067	PS21069
DIP						PS21864-P	PS21865-P	PS21867-P	PS21869-P
Mini-DIP				PS21562-P PS21562-SP*	PS21563-P PS21563-SP*	PS21564-P PS21564-SP*			
SIP			PS21661-FR PS21661-RZ						

* Open Emitter Topology

Type Number	Electrical Characteristics												Thermal & Mechanical Characteristics		Package-No.
	V _{CES} (V)	Applicable Motor Ratings (kW)	I _C (A)	f _C (kHz)	Isolation Voltage (V)	V _{CE(sat)} @ T _J =25°C (V)		Typical Switching Times					IGBT R _{th(j-f)} (°C/W)	Diode R _{th(j-f)} (°C/W)	
								t _{on} (μs)	t _{rr} (μs)	t _{c(on)} (μs)	t _{off} (μs)	t _{c(off)} (μs)			
						Typ.	Max.								
Mini-DIP-IPM 600 Volt															
PS21562-P	600	0.2	5	20	2500	1.6	2.1	1.20	0.30	0.40	1.30	0.50	6.0	6.5	D4
PS21563-P	600	0.4	10	20	2500	1.6	2.1	1.20	0.30	0.40	1.40	0.50	5.0	6.5	D4
PS21564-P	600	0.75	15	20	2500	1.45	1.95	1.20	0.30	0.40	1.50	0.50	4.5	6.5	D4
DIP-IPM 600 Volt															
PS21864-P	600	0.75	15	20	2500	1.7	2.2	1.50	0.30	0.50	1.40	0.50	2.30	3.2	D3
PS21865-P	600	1.5	20	20	2500	1.6	2.1	1.30	0.30	0.40	1.60	0.50	1.90	3.0	D3
PS21867-P	600	2.2	30	20	2500	1.6	2.1	1.30	0.30	0.40	1.70	0.50	1.65	3.0	D3
PS21869-P	600	3.7	50	20	2500	1.5	2.0	1.30	0.30	0.40	2.00	0.65	1.42	2.0	D3
Mini-DIP-IPM 600 Volt With Open Emitter Topology															
PS21562-SP	600	0.2	5	20	2500	1.6	2.1	1.20	0.30	0.40	1.30	0.50	6.0	6.5	D5
PS21563-SP	600	0.4	10	20	2500	1.6	2.1	1.20	0.30	0.40	1.40	0.50	5.0	6.5	D5
PS21564-SP	600	0.75	15	20	2500	1.45	1.95	1.20	0.30	0.40	1.50	0.50	4.5	6.5	D5
Super-DIP-IPM 600 Volt With Open Emitter TopologySIP-IPM 600 Volt															
PS21065	600	1.5	20	20	2500	1.6	2.1	1.30	0.30	0.40	1.60	0.50	1.90	2.85	D6*
PS21067	600	2.2	30	20	2500	1.6	2.1	1.30	0.30	0.40	1.70	0.50	1.65	2.55	D6*
PS21069	600	3.7	50	20	2500	1.5	2.0	1.30	0.30	0.40	2.00	0.65	1.42	2.30	D6*
SIP-IPM 600 Volt															
PS21661-RZ/-FR	600	0.1	3	15	2500	1.6	2.15	0.85	0.20	0.35	1.00	0.55	9.0	9.0	SIP1

* Package drawing D6 see under 2.8. 1200V DIP-IPM, p. 50

Technical drawing of a heat sink assembly, showing dimensions in millimeters (mm). The drawing includes a top view, a side view, and a detail view of the heat sink side.

Top View Dimensions:

- Overall width: $27 \times 2.8 (=75.6)$
- Overall height: 31 ± 0.5
- Internal width segments: 8.5 ± 0.3 , 10 ± 0.3 , 10 ± 0.3 , 10 ± 0.3 , 20 ± 0.3
- Internal height segments: 3.4 , 5.6 , 7.8 , 9.1 , 11.1 , 12.1 , 14.1 , 15.1 , 17.1 , 18.1 , 19.1 , 21.1
- Mounting hole diameter: $2 - \phi 4.5 \pm 0.2$
- Mounting hole position: 10 ± 0.3
- Heat sink side label: Heat sink side

Side View Dimensions:

- Overall height: 12.8 ± 0.3 (16.0 ± 0.5)
- Heat sink side label: Heat sink side

Detail View Dimensions:

- Overall height: 34.9 ± 0.5
- Internal height segments: 13.4 ± 0.5 , 21.4 ± 0.5 , 11.1 , 11.0 , 1.5 , 1.5
- Heat sink side label: Heat sink side

Other Dimensions:

- Overall width: 79 ± 0.5
- Overall height: 11.5 ± 0.5
- Internal width segments: 8.5 ± 0.3 , 10 ± 0.3 , 10 ± 0.3 , 10 ± 0.3 , 20 ± 0.3
- Internal height segments: 3.4 , 5.6 , 7.8 , 9.1 , 11.1 , 12.1 , 14.1 , 15.1 , 17.1 , 18.1 , 19.1 , 21.1
- Mounting hole diameter: $2 - \phi 4.5 \pm 0.2$
- Mounting hole position: 10 ± 0.3
- Heat sink side label: Heat sink side

Figure 1: Dimensions of the heat sink. The figure consists of three views: a top view, a front view, and a side view. The top view shows a rectangular layout with dimensions (1.778 x 26) and (1.778) for the main body, and (0.5) for the side flange. It also shows a (30.5) width for the base and a (0.5) thickness for the top flange. The front view shows a trapezoidal shape with a top width of (41), a bottom width of (49), and a height of (30.5). It includes dimensions for the base flange: (7.62 x 4), (41), (42), and (49). The side view shows a cross-section with a top width of (5), a bottom width of (1.25), and a height of (17.6). It also shows a (35°) angle and a (1.2) thickness for the side flange. Labels include 'HEAT SINK SIDE', 'DUMMY PIN', 'Type name, Lot No.', '(PH2 DEPTH 2)', and '(PH2.5)'.

Technical drawing of a container with dimensions: 17.5 x 26 cm x 40 cm x 2.8 cm. The drawing shows the top view with a grid of 17.5 x 26 cm and a side view with a height of 40 cm. The container has a flat bottom and a lid. The lid is labeled "HEAT SINK SIDE" and has a height of 2.8 cm. The container body has a height of 30.5 cm. The drawing includes various dimensions and labels for the container's structure.