

Before After

Advantages of using HCPCB to Power Electronics Unit

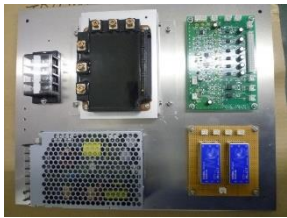
Advantages of using High Current PCB



- Handling High Current on PCB
- Efficient Heat Dissipation / Thermal Management
- Eliminating Cables and Wires
- Integrating external Bus Bar into PCB
- Miniaturization / Space Saving
- Improving Reliability of PCB and Product

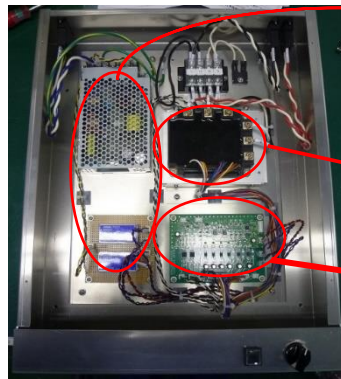
Case Study of Motor Controller Unit

Standard Unit



【PCB】
0.5oz 2Layers
Parts: One side mounting
【IPM】
Commercial Item /
Cable Connection
【DCDC Converter】
Commercial Item /
Cable Connection

BEFORE



Converter

AFTER



IPM

Control
Circuit

High Current PCB

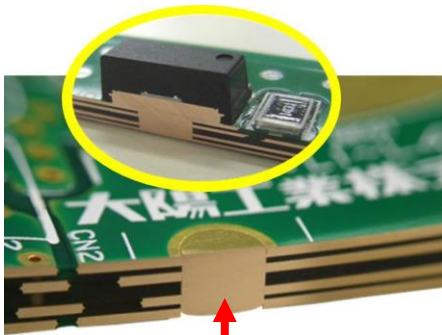


【PCB】
8.6oz 4Layers / Combination PCB
Parts: Both side mounting
【IPM】
Design IPM as a part of circuit
(Used Discrete IGBT)
【DCDC Converter】
Design DCDC Converter
as a part of circuit

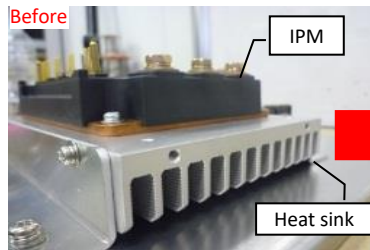
Integrate all parts to one consolidated PCB!

Number of Parts → 16% Reduction
Volume → 60% Save Space
Total Cost → 11% Down

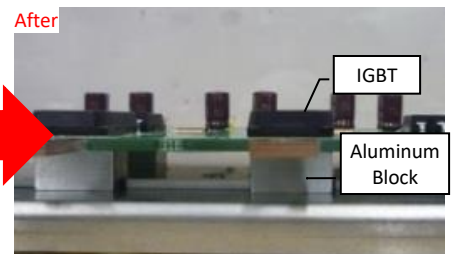
Included Power Supply and Control part on one PCB!



Copper Inlay PCB



Heat sink which is used for IPM
at "Before" was eliminated.



Using metal case
for heat dissipation
by using Copper inlay !



Taiyo Kogyo
Website

TAIYO KOGYO. CO., LTD.

Confidential

<Breakdown of Parts Count Reduction >

	BEFORE (pcs)	AFTER (pcs)	Difference (pcs)	Reduction Rate (%)
Total Parts number	508	427	-81	-15.94%

Breakdown

PCB Component	133	271	+138	+103.76%
Harness Component	240 (22pcs.)	97 (9pic.)	-143 (13pcs.)	-59.58%
Connector (Outside PCB)	17	2	-15	-88.23%
Others	118	57	-61	-51.69%

	BEFORE (min)	AFTER (min)	Difference (min)	Reduction Rate (%)
Total Process	285	70	-215	-75.44%

Breakdown

Assembly	45	30	-15	-33.33%
Wiring	60	10	-50	-83.33%
Harness Processing	180	30	-150	-83.33%

Total Cost Reduction : **11%**

Before / After Specification of Driver

DC & 3 phase AC Motor Driver

BEFORE → Driving Power Supply ~ 400V
Controlled Source 5V 15V

(Need Power Supply Separately)

Continuous rating 50A

AFTER → Driving Power Supply
30~400V

Controlled Source 5V 15V

(Generate from Driving Power Supply)

Continuous rating 60A

Control System: PWM

Function: Short Trip Monitor

Current Monitor

The unit became smaller.

