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Shibata et al.

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(54) **POWER SEMICONDUCTOR MODULE**

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(73) Assignee: **ROHM CO., LTD.**, Kyoto (JP)

(**) Term: **15 Years**

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(30) **Foreign Application Priority Data**

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(52) **U.S. Cl.**
USPC **D13/182**

(58) **Field of Classification Search**
USPC D13/182; 257/678, 684, 690, 691; 361/679.01, 713, 728, 736, 760, 761, 772, 361/775, 783, 820; 174/250, 253; 438/15, 25, 26, 51, 55, 63, 64, 106
CPC . H01L 21/00; H01L 2224/42; H01L 2224/43; H01L 2021/00; H01L 2021/02; H01L 2021/04; H01L 21/4814; H01L 21/4846; H01L 21/4871; H01L 21/67144; H01L 23/12; H01L 23/13; H01L 23/14; H01L 23/147; H01L 2924/171; H01L 2924/1711; H01L 2924/1715; H01L 2924/17151; H01L 2924/181; H01L 2924/1811; H01L 2924/1815; H01L 2924/19042; H01L 2924/1905; H01L 2224/08054; H01L 23/58; H05B 41/14; G02B 6/4256; G02B 6/4257; G02B 6/4261; G02B 6/4262; G02B 6/428; G02B 6/4281; H05K 1/14; H05K 1/141; H05K 1/142; H05K 1/144; H05K 1/18; H05K 1/181; H05K 1/182; H05K 1/026; H02B 1/015; H02B 1/00
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,347,160 A *	9/1994	Sutrina	H01L 24/72 257/678
5,471,089 A *	11/1995	Nagatomo	H01L 23/50 257/691
6,078,501 A	6/2000	Catrambone et al.	
6,774,465 B2	8/2004	Lee et al.	
D699,693 S *	2/2014	Otsuka	D13/182
D748,595 S	2/2016	Bertalan et al.	

(Continued)

FOREIGN PATENT DOCUMENTS

JP	1536191	10/2015
JP	1536359	10/2015

(Continued)

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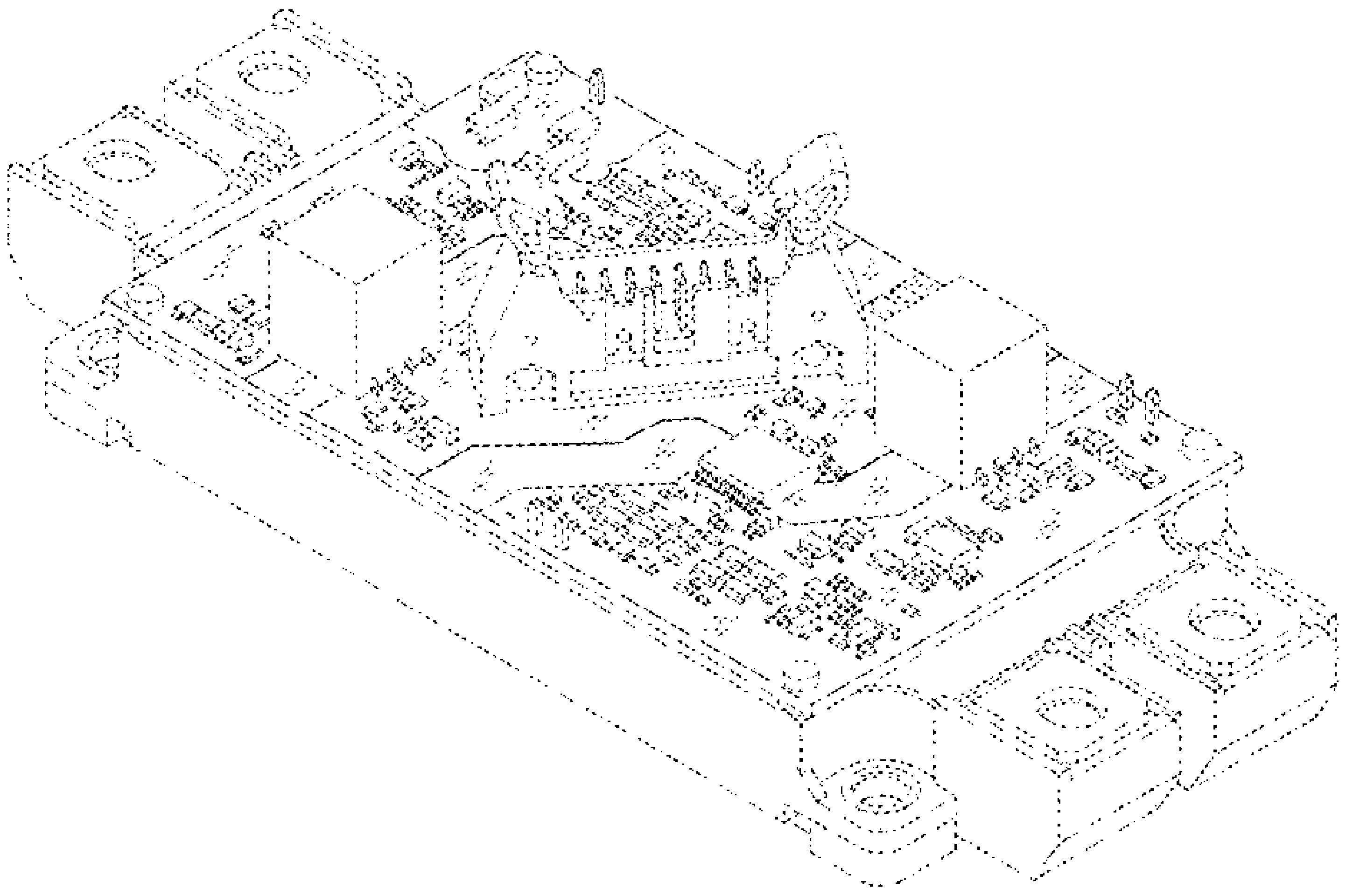
(57) **CLAIM**

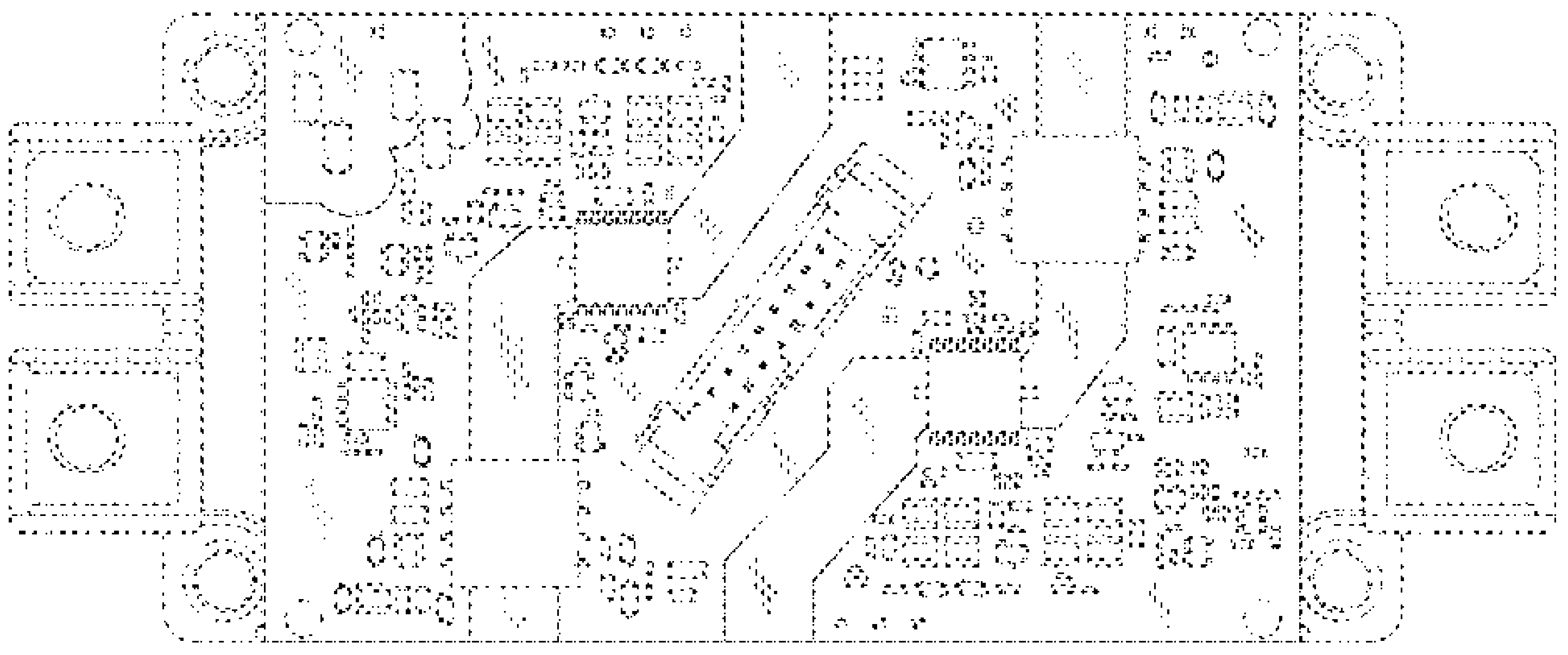
The ornamental design for a power semiconductor module, as shown and described.

DESCRIPTION

FIG. **1** is a front, top and right side perspective view of a power semiconductor module showing our new design;
FIG. **2** is a front view thereof;
FIG. **3** is a rear view thereof;
FIG. **4** is a top plan view thereof;
FIG. **5** is an enlarged right side view thereof; and,
FIG. **6** is an enlarged left side view thereof.
The broken lines illustrate portions of the power semiconductor module that form no part of the claimed design.

1 Claim, 6 Drawing Sheets





(56) References Cited

U.S. PATENT DOCUMENTS

D754,084	S		4/2016	Kawase	
D762,185	S		7/2016	Muehlensiep et al.	
D762,597	S		8/2016	Bertalan et al.	
9,418,975	B1		8/2016	Yoneyama et al.	
D766,851	S		9/2016	Yoneyama et al.	
D772,184	S		11/2016	Soyano et al.	
D774,479	S		12/2016	Soyano et al.	
D775,091	S		12/2016	Edenharter et al.	
D775,593	S		1/2017	Edenharter et al.	
D776,071	S		1/2017	Edenharter et al.	
D785,577	S		5/2017	Kawase	
9,660,356	B1		5/2017	Nakamura	
D790,491	S		6/2017	Hayashida et al.	
D798,832	S		10/2017	Hayashida et al.	
D799,439	S		10/2017	Hayashiguchi	
D805,485	S		12/2017	Kawase	
D810,706	S		2/2018	Soyano et al.	
D847,103	S		4/2019	Sawada	
D847,104	S		4/2019	Sawada	
D858,467	S		9/2019	Sawada	
D864,132	S		10/2019	Sawada	
D875,058	S	*	2/2020	Sawada	D13/182
D883,240	S	*	5/2020	Fathauer	H05K 1/115 D13/182
D887,998	S	*	6/2020	Krasnopolski	D13/182
D887,999	S	*	6/2020	Chen	D13/182
D888,674	S	*	6/2020	Chen	D13/182
D892,754	S		8/2020	Beckedahl et al.	
D903,611	S		12/2020	Sannai et al.	
D903,612	S		12/2020	Soyano et al.	
D904,325	S	*	12/2020	Omichi	D13/182
D909,319	S	*	2/2021	Nordeen	D13/182
2001/0038143	A1		11/2001	Sonobe et al.	
2008/0142948	A1		6/2008	Matsumoto	
2014/0168900	A1	*	6/2014	Korich	H05K 7/1432 361/709
2016/0190915	A1		6/2016	Horiuchi et al.	
2016/0276927	A1	*	9/2016	Das	H01L 23/3735
2016/0284618	A1		9/2016	Tsukamoto et al.	
2016/0336245	A1		11/2016	Egusa et al.	
2016/0372392	A1	*	12/2016	Sakamoto	H01L 23/055

FOREIGN PATENT DOCUMENTS

JP	1536360	10/2015
JP	1585830	9/2017
JP	1585831	9/2017
JP	1585962	9/2017
JP	1603793	5/2018
JP	1603980	5/2018
JP	1605558	6/2018

* cited by examiner

Fig.1

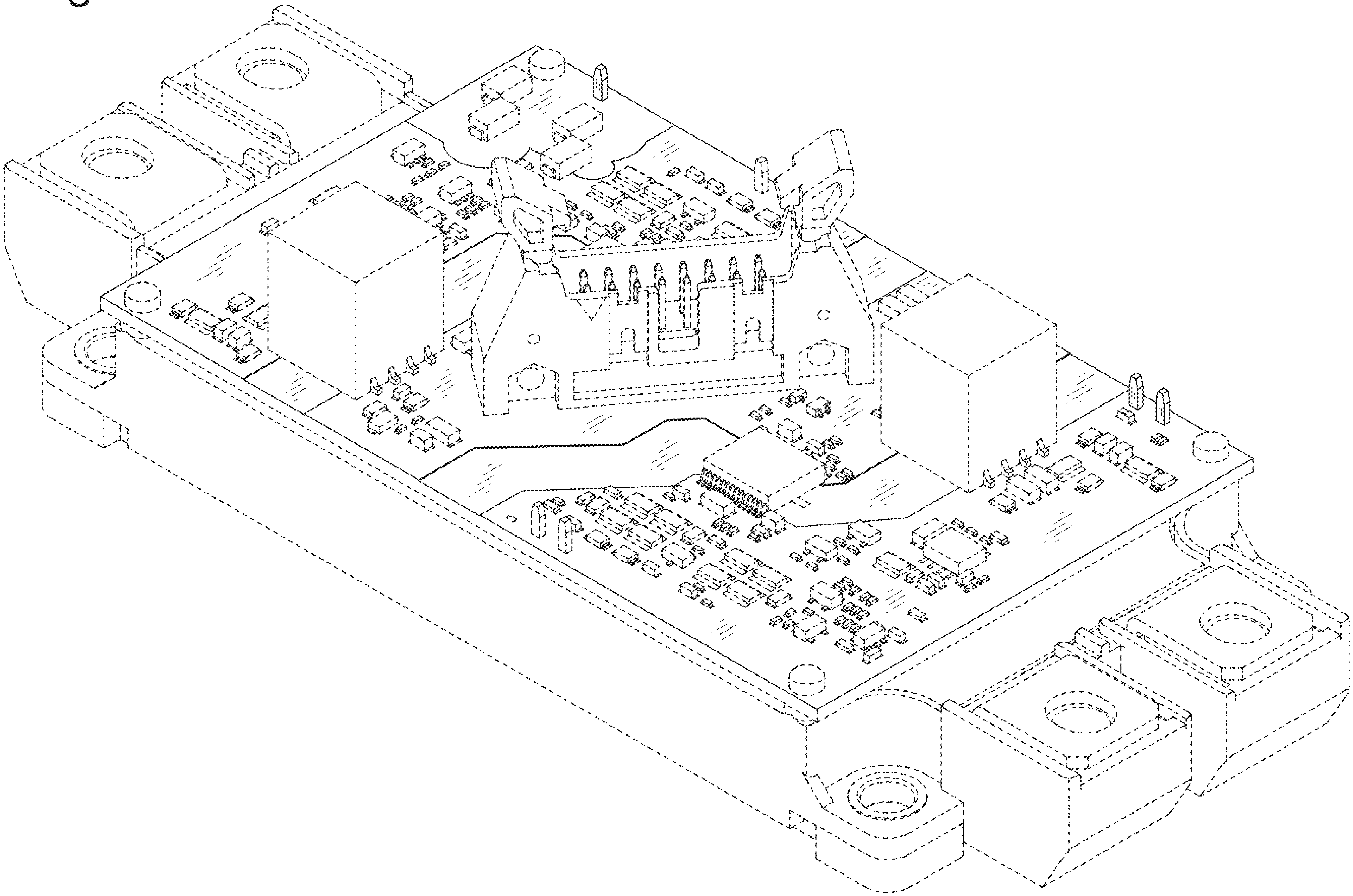


FIG.2

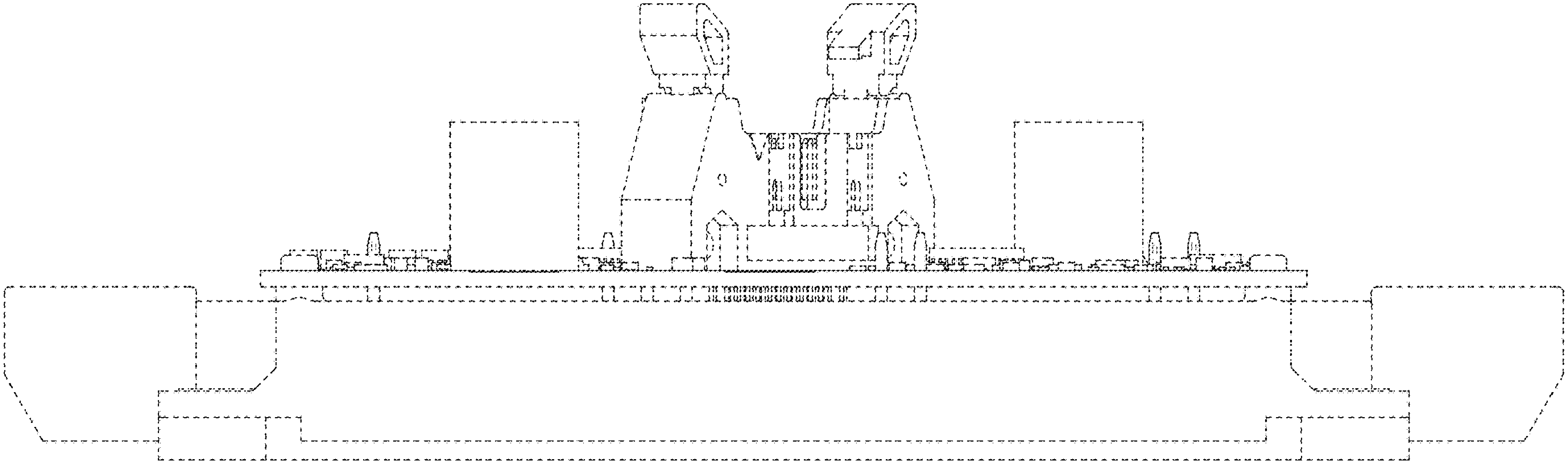


FIG.3

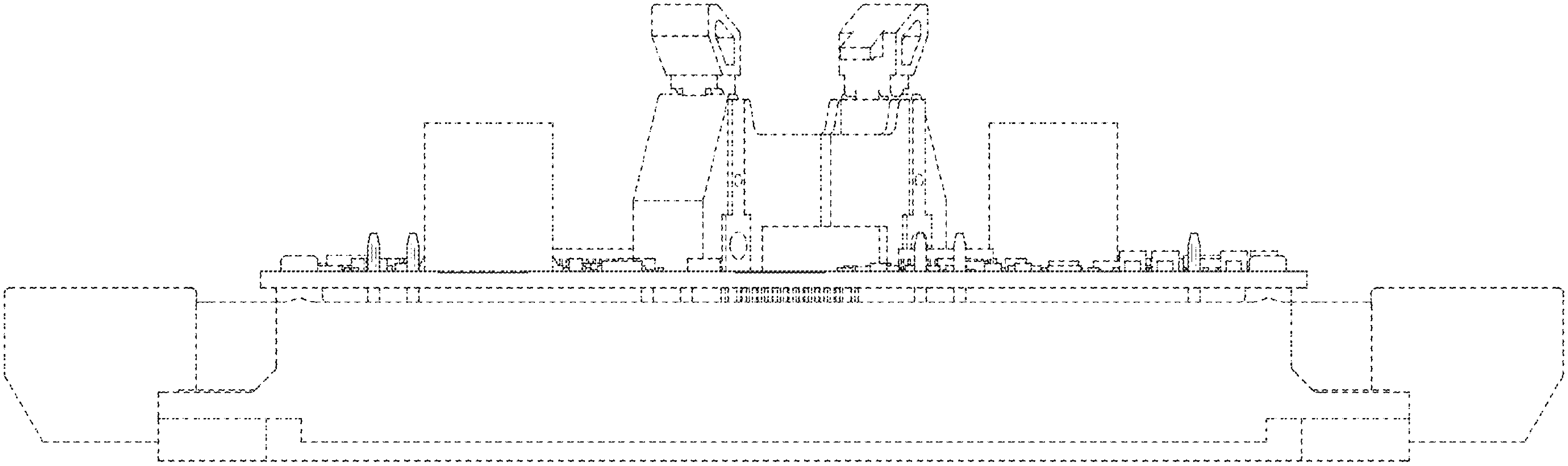


FIG.4

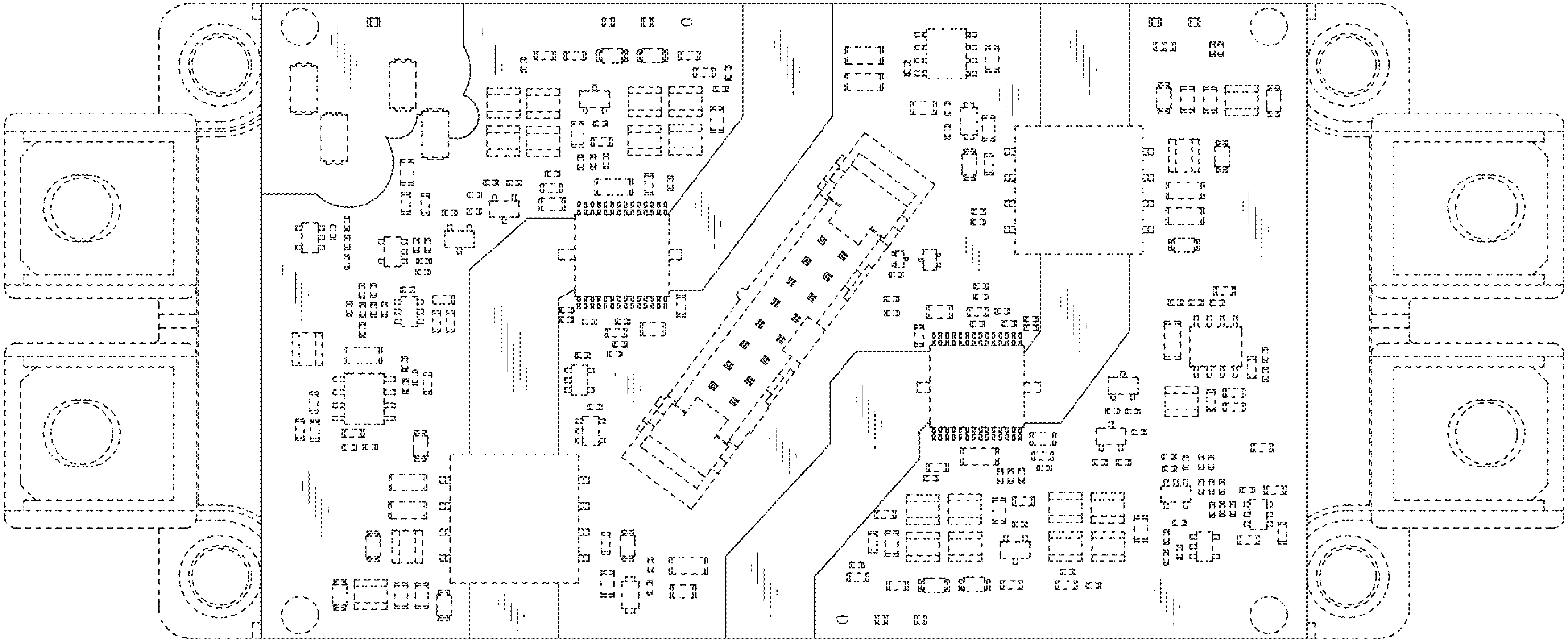


FIG.5

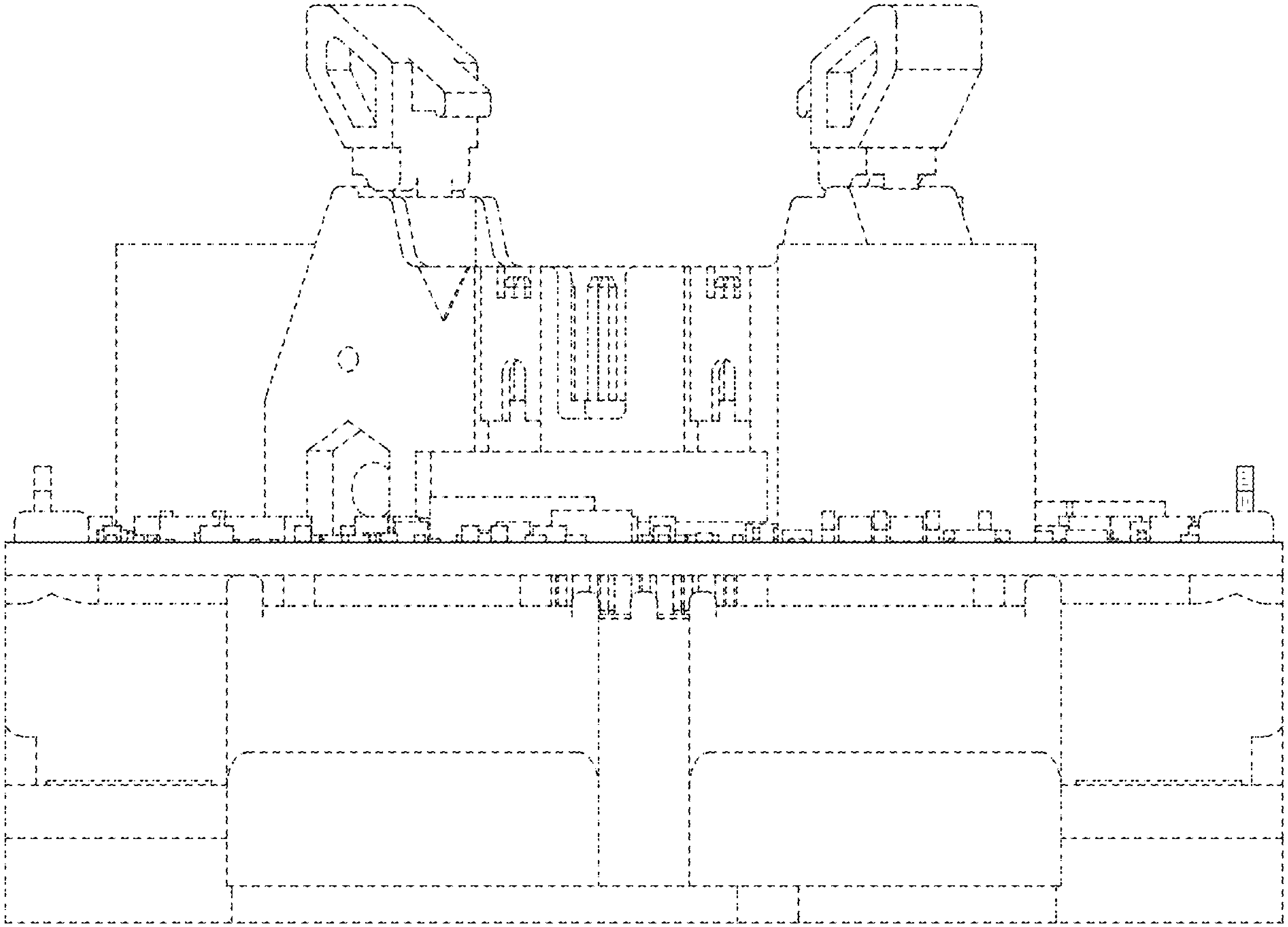


FIG.6