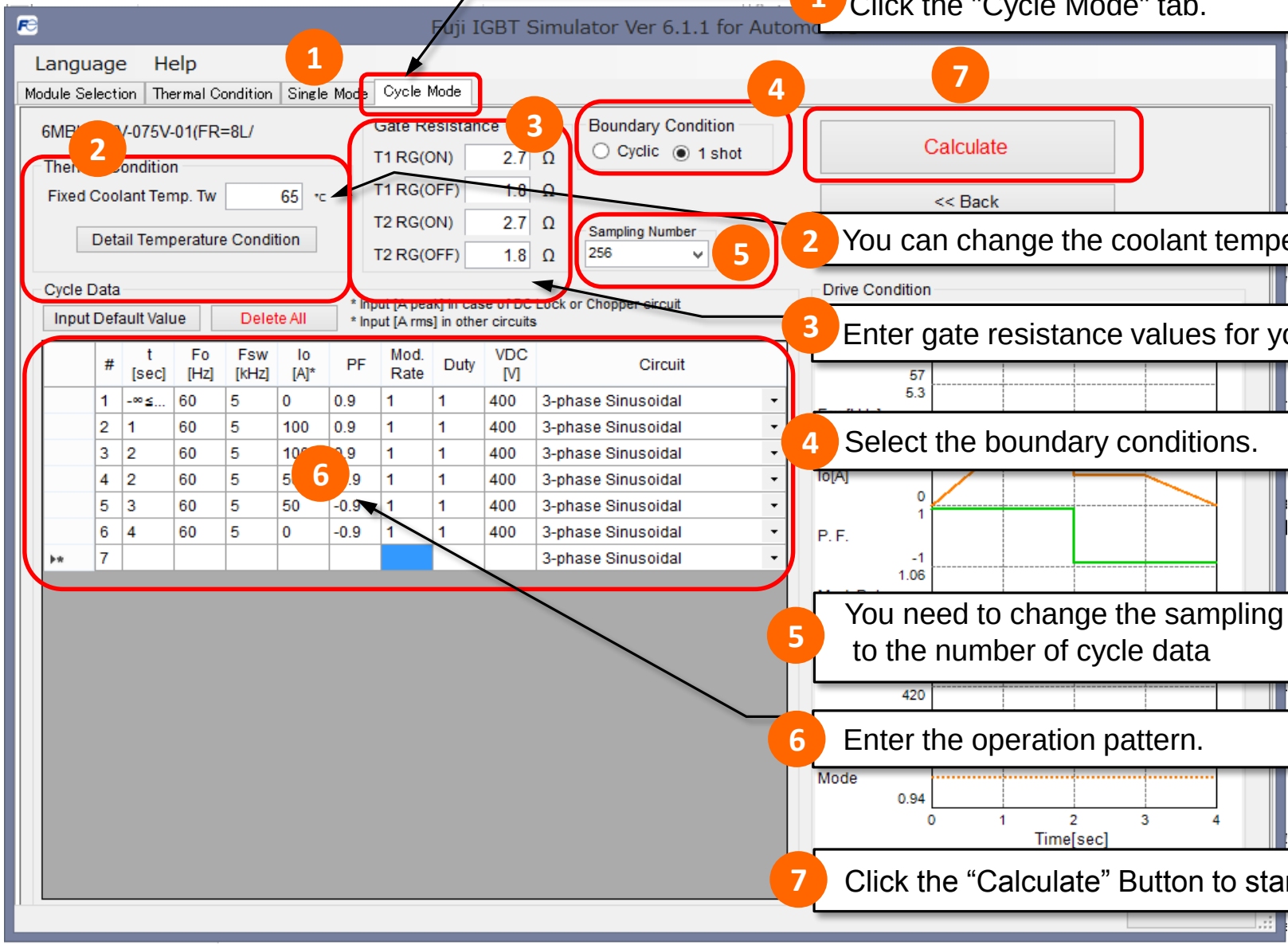
Cycle mode calculation manual of large capacity data (Fuji IGBT Simulator for Automotive)

Cycle Mode Calculation

Cycle mode input screen



1 Click the "Cycle Mode" tab.

2 You can change the coolant temperature here.

3 Enter gate resistance values for your calculation.

4 Select the boundary conditions.

5 You need to change the sampling number according to the number of cycle data

6 Enter the operation pattern.

7 Click the “Calculate” Button to start the computation.

Fig.1 Cycle mode input screen

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Operation pattern input and calculation method

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When calculating the loss, it is necessary to select a value in the sampling number selection box that is equal to or larger than the number of data of the operation pattern entered in the ⑥ field. However, if the number of data becomes too large, calculation time may be long depending on PC capability. Also, data of 8192 or more can not be input.

The loss calculation procedure in such a case is shown below.

1) Divide operation pattern into appropriate data size
2) Enter the divided data in the ⑥ field respectively
3) Calculate
4) Save the output data
5) Combine the output data created separately

1) Divide operation pattern into appropriate data size

In the case of the operation pattern (output current I_O [Arms]) as shown in Fig. 2,considering finally combining the output data, it is desirable to divide the data at the point where the output current is zero or where the output current is stable.

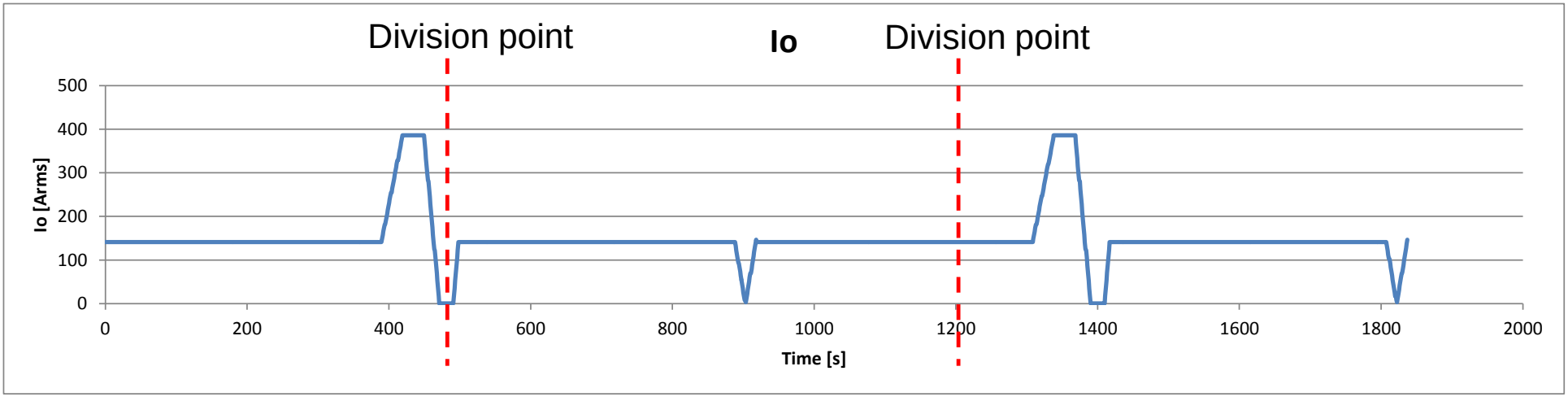

Fig.2 Example of operation pattern

1) Divide the operation pattern into appropriate data sizes

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Also, when it is necessary to divide at the point where the output current fluctuates as shown in Fig. 3, divide it so that data A and data B overlap each other as shown in Fig.4

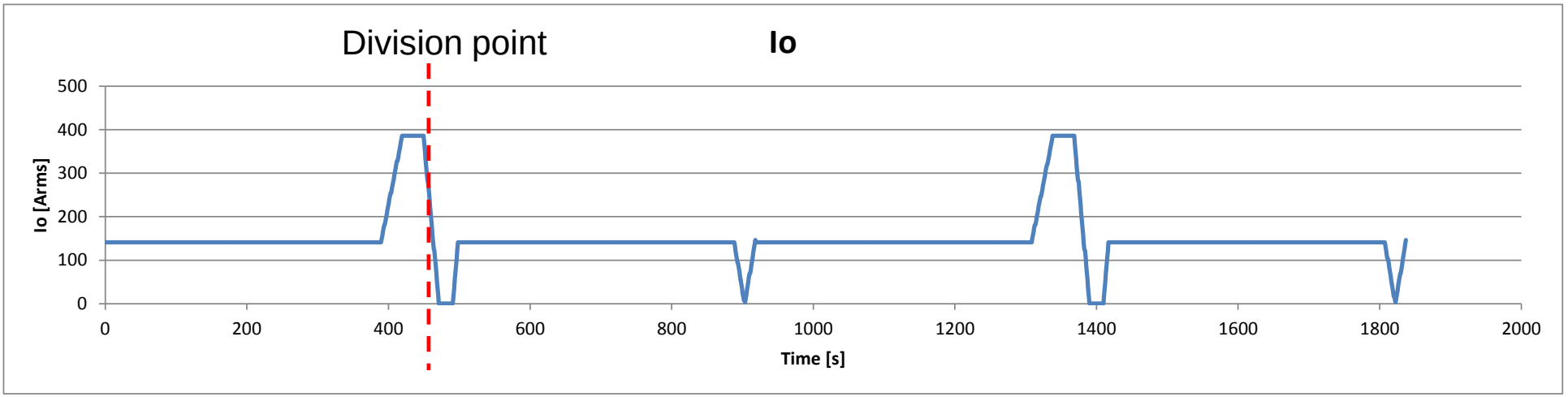

Fig.3 Division point

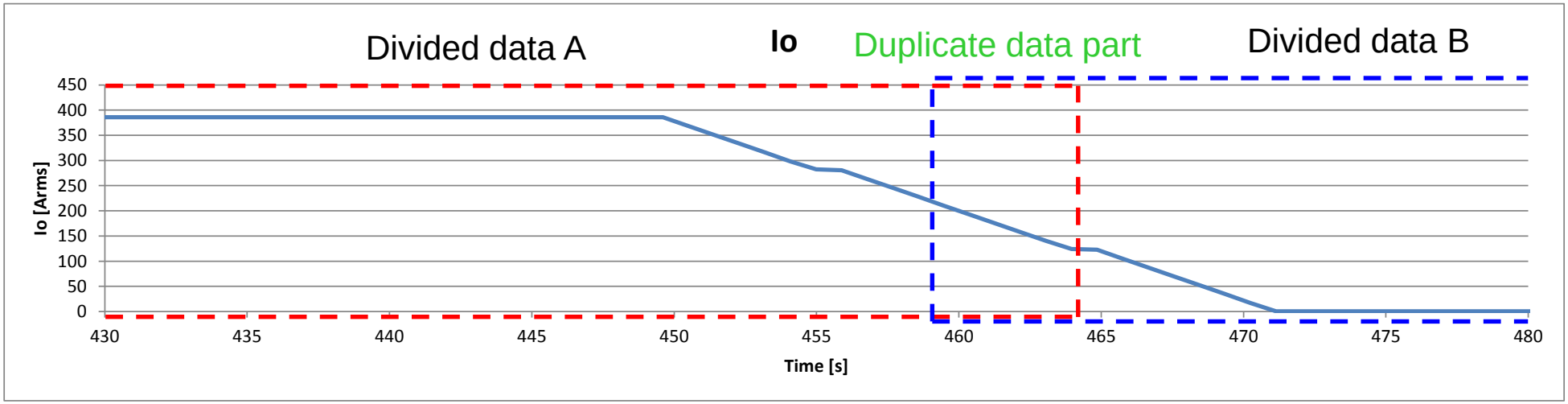

Fig.4 Divided data

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2) Enter the divided data in the ⑥ field respectively

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In the case of operation data entered in Excel etc., it is possible to copy and paste the operation data at once by creating the number of lines equal to or more than the number of operation data in the ⑥ field.

Copy for Excel sheet

	A	B	C	D	E	F	G	H	I	J
1										
2		Time	Fo	Fsw	Io	PF	MOD	Duty	Vdc	
3		0	345	10	140	0.55	1		400	
4		1	345	10	140	0.55	1		400	
5		2	345	10	140	0.55	1		400	
6		3	345	10	140	0.55	1		400	
7		4	345	10	140	0.55	1		400	
8		5	345	10	140	0.55	1		400	
9		6	345	10	140	0.55	1		400	
10		7	345	10	140	0.55	1		400	
11		8	345	10	140	0.55	1		400	
12		9	345	10	140	0.55	1		400	
13		10	345	10	140	0.55	1		400	
14		11	345	10	140	0.55	1		400	
15		12	345	10	140	0.55	1		400	
16		13	345	10	140	0.55	1		400	
17		14	345	10	140	0.55	1		400	
18		15	345	10	140	0.55	1		400	
19		16	345	10	140	0.55	1		400	
20		17	345	10	140	0.55	1		400	

Paste data

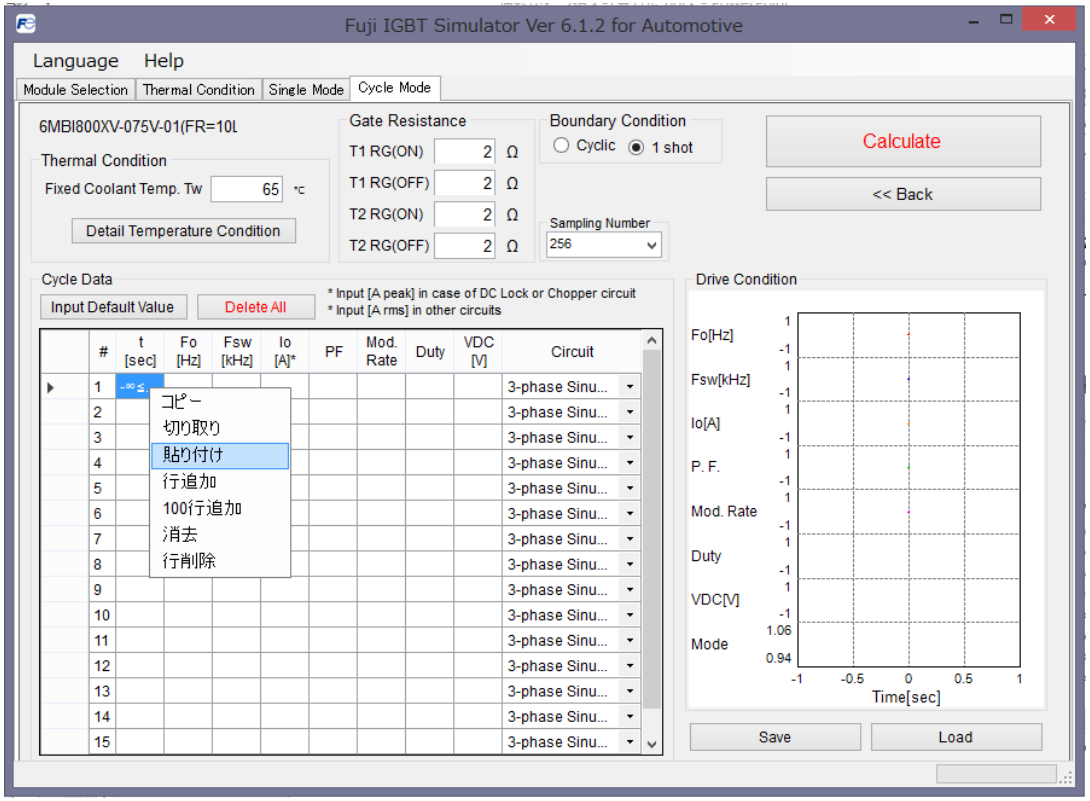

Fig.5 Data input

3) Calculate

Please set other necessary conditions and start calculation.

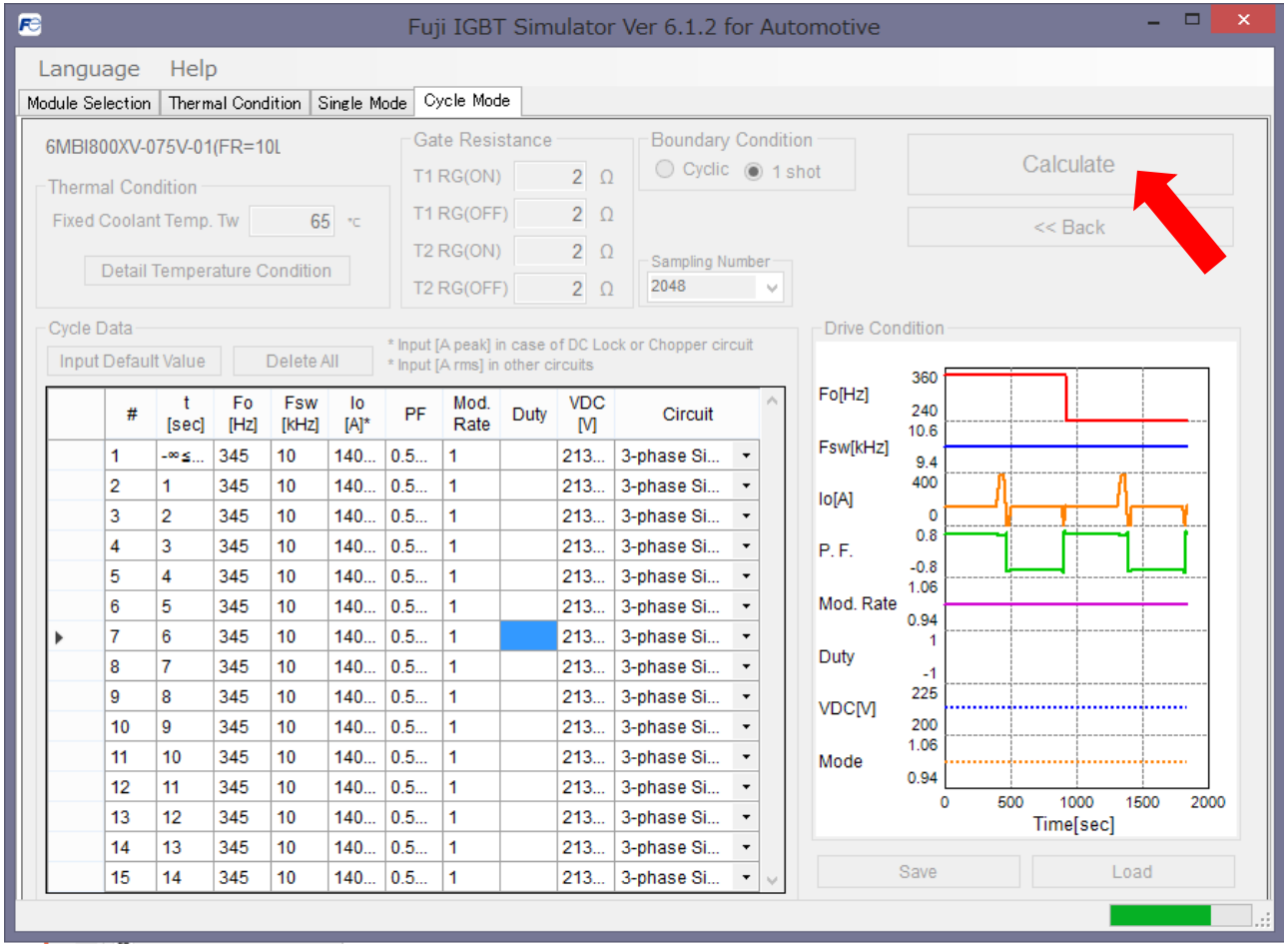

Fig.6 Calculation

4) Save the output data

Please save the output data after calculation is completed.

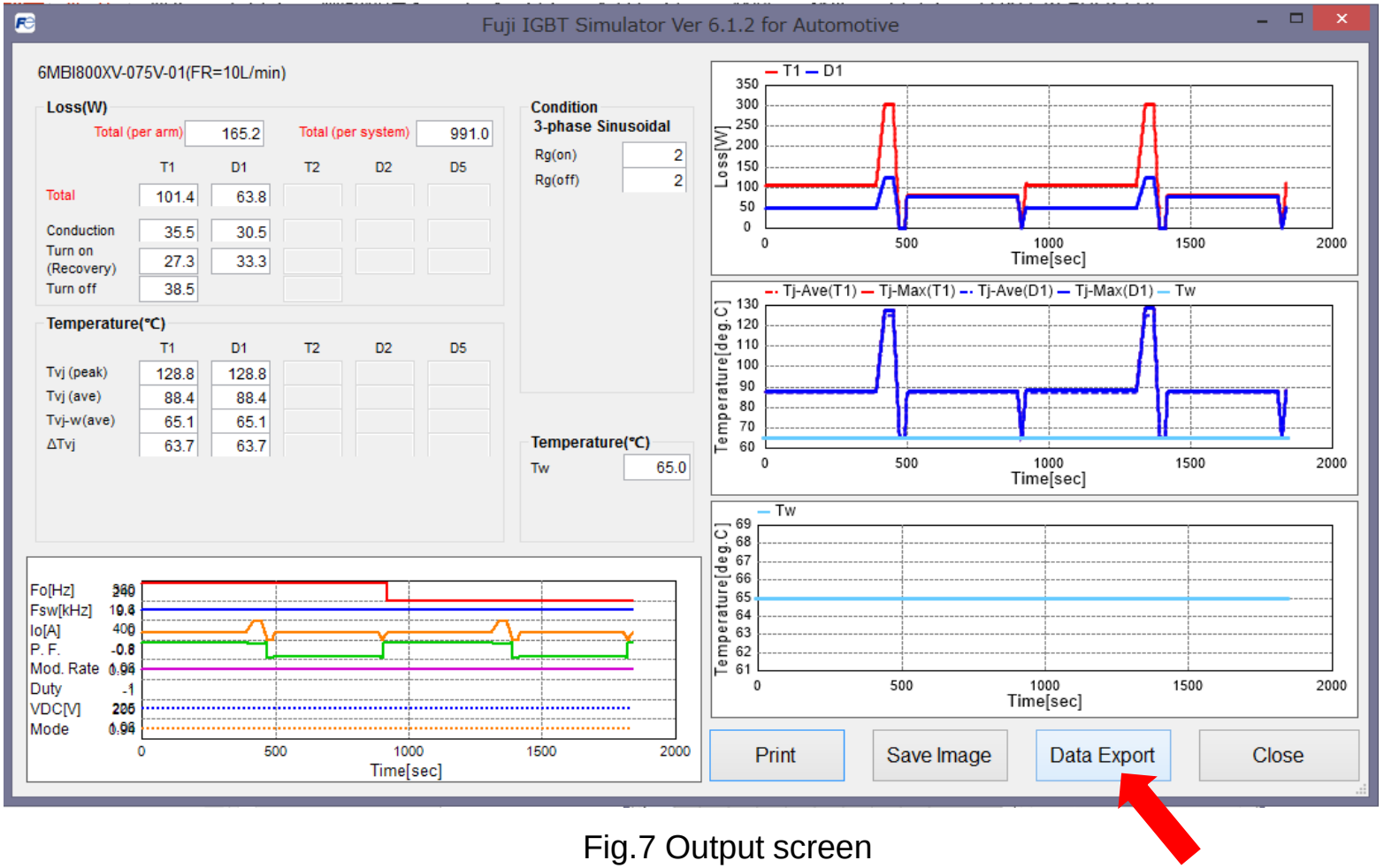

Fig.7 Output screen

5) Combine the output data created separately

Please combine the divided output data at the point where the junction temperature is almost the same.

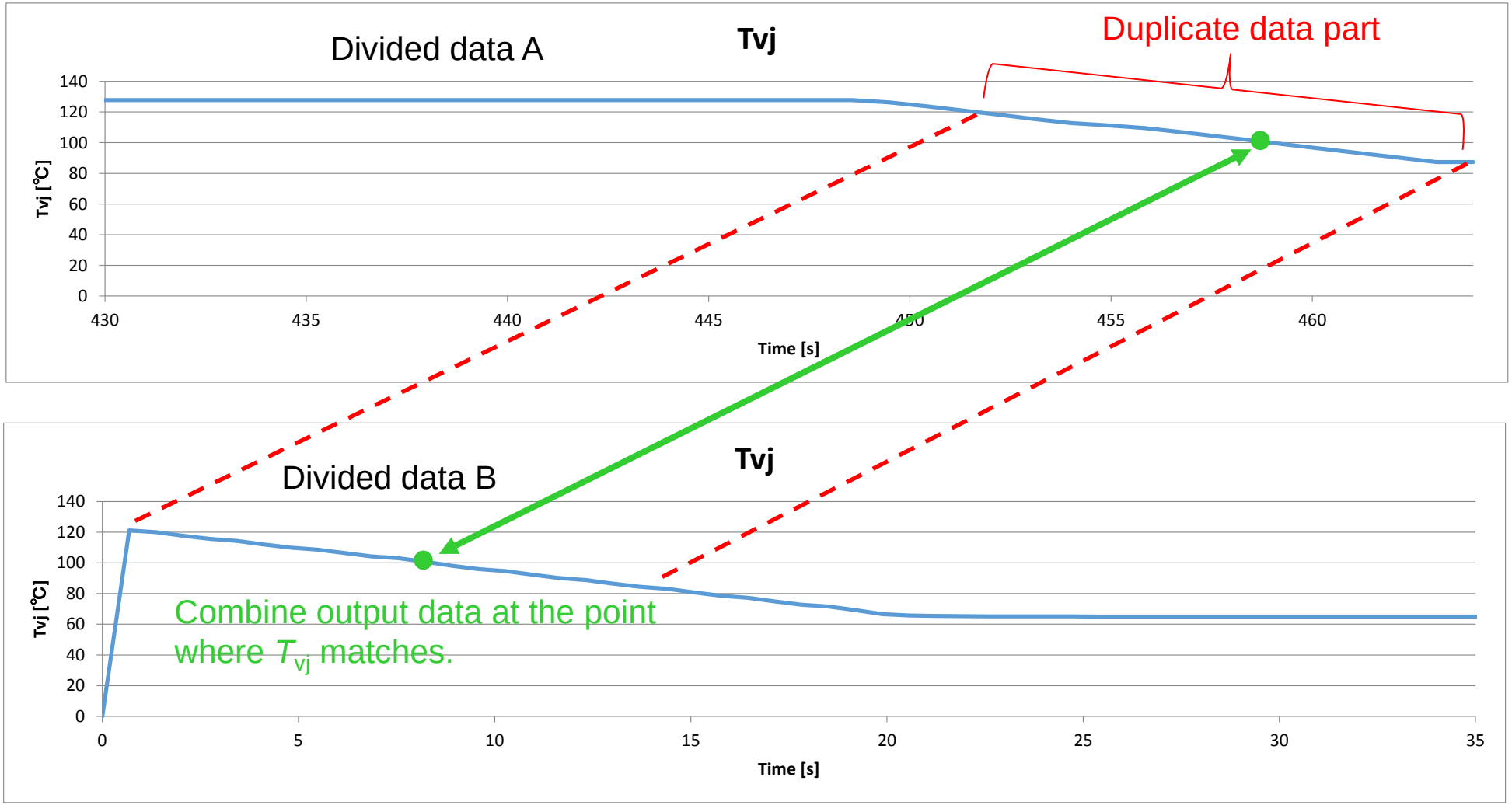

Fig.8 Combination point of data

5) Combine the output data created separately

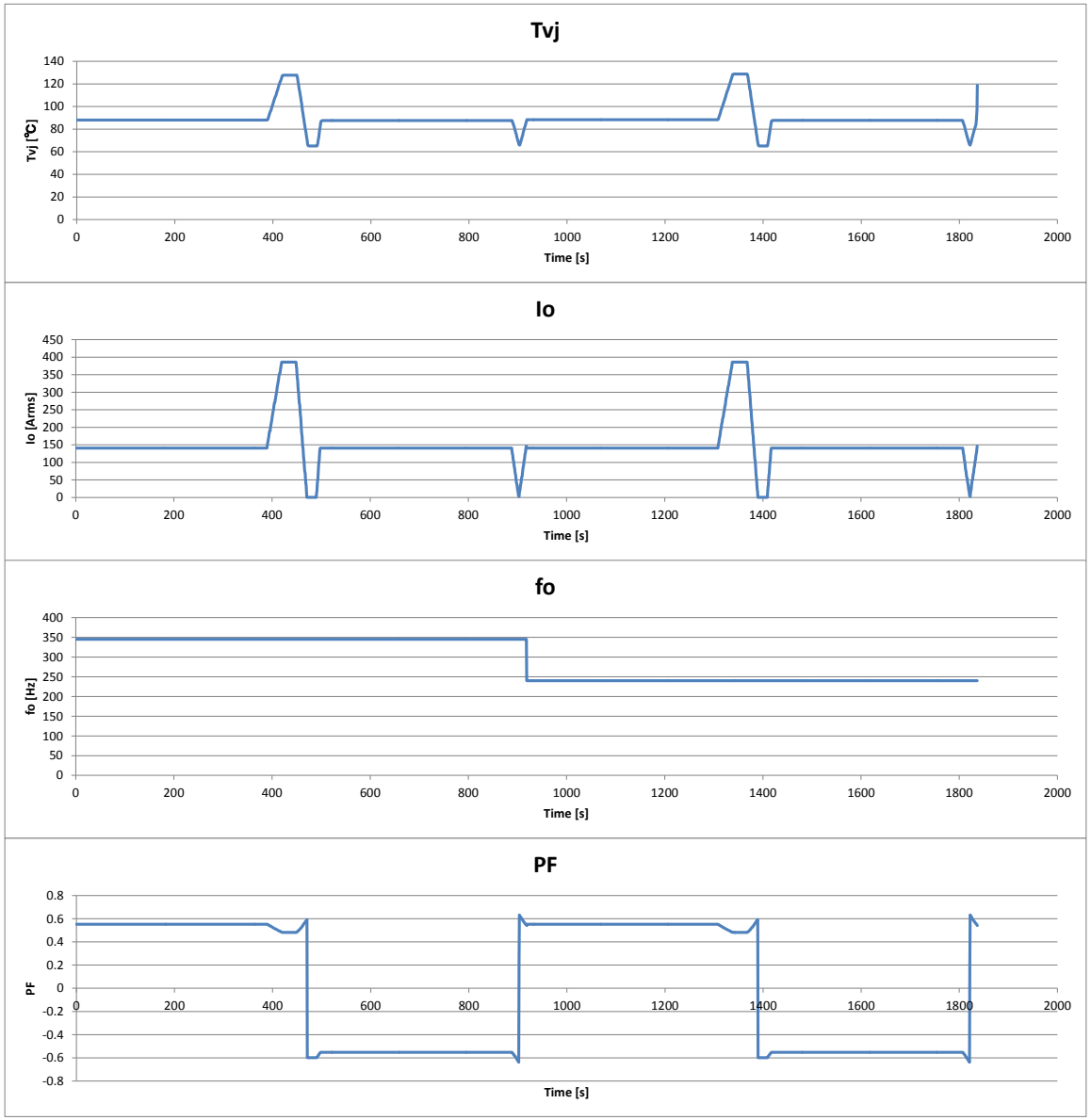

Fig.9 Combined data

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Further Information

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