



TEST DATA OF MAX1600F
M1F-IHGF-00
(100V INPUT)

Modular power supply

Oct. 10, 2000

Approved by : Hajime Goto
Hajime Goto Design Manager

Prepared by : Yuichi Takahashi
Yuichi Takahashi Design Engineer

INPUT : AC 90~132 V

OUTPUT : V1: 15.0 V 27 A
V2: 18.0 V 22 A
V3: 24.0 V 17 A
V4: 28.0 V 14.5 A

コーセル株式会社

COSEL CO., LTD.

CONTENTS

1. Line Regulation	1
静的入力変動	
2. Input Current (by Load Power)	3
入力電流 (負荷特性)	
3. Input Power (by Load Power)	4
入力電力 (負荷特性)	
4. Efficiency (by Input Voltage)	5
効率 (入力電圧特性)	
5. Efficiency (by Load Power)	6
効率 (負荷特性)	
6. Power Factor (by Input Voltage)	7
力率 (入力電圧特性)	
7. Power Factor (by Load Power)	8
力率 (負荷特性)	
8. Hold-Up Time	9
出力保持時間	
9. Instantaneous Interruption Compensation	13
瞬時停電保障	
10. Load Regulation	17
静的負荷変動	
11. Ripple Voltage (by Load Current)	19
リップル電圧 (負荷特性)	
12. Ripple-Noise	23
リップルノイズ	
13. Overcurrent Protection	27
過電流保護	
14. Overvoltage Protection	29
過電圧保護	
15. Inrush Current	31
突入電流	
16. Dynamic Load Responce	32
動的負荷変動	
17. Rise and Fall Time	36
立上り、立下り時間	
18. Ambient Temperature Drift	38
周囲温度変動	
19. Minimum Input Voltage for Regulated Output Voltage	40
最低レギュレーション電圧	
20. Ripple Voltage (by Ambient Temperature)	42
リップル電圧 (周囲温度特性)	
21. Time Lapse Drift	44
経時ドリフト	
22. Output Voltage Accuracy	46
定電圧精度	
23. Harmonic Current	47
高調波電流	
24. Condensation	49
結露特性	
25. Leakage Current	50
漏洩電流	
26. Line Noise Tolerance	51
入力雑音耐量	
27. Conducted Emission	52
雑音端子電圧	
28. Figure of Testing Circuitry	53
測定回路図	

(Final Page 54)



COSEL																																			
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300.00	69.8	70.2	70.6																																																														
600.00	76.3	76.6	77.4																																																														
900.00	78.2	78.7	79.9																																																														
1200.00	78.7	79.3	80.6																																																														
1500.00	78.5	79.1	80.6																																																														
1615.00	78.0	78.9	80.4																																																														
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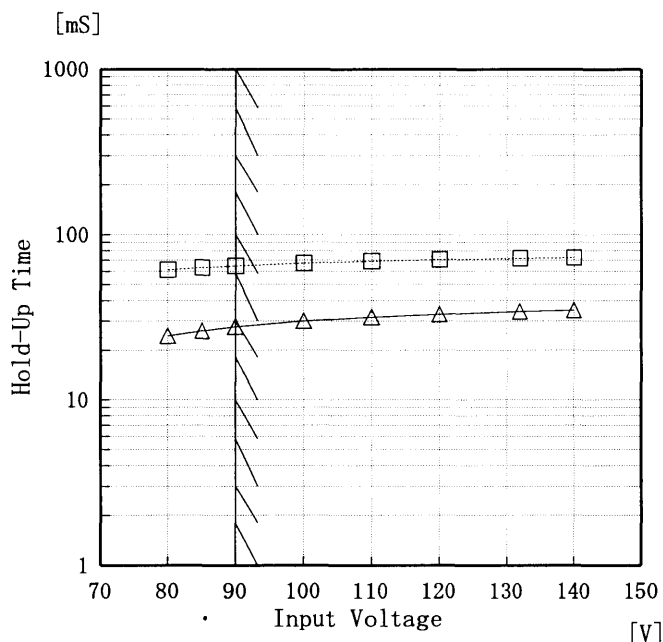
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Model	MAX1600F	Temperature	25°C
Item	Hold-Up Time 出力保持時間	Testing Circuitry	Figure A

Object V3: +24.0V17A

1. Graph □ Load 50%
△ Load 100%



This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.

Note: Slanted line shows the range of the rated input voltage.

出力保持時間とは、入力電圧断から出力電圧が、定電圧精度の規格範囲を保持しているところまでの時間。

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2. Values

Input Voltage [V]	Hold-Up Time [mS]	
	Load 50%	Load 100%
75	—	—
80	61	24
85	63	26
90	65	28
100	67	30
110	69	32
120	71	33
132	72	34
140	73	35



Model		MAX1600F	Temperature	25°C																																
Item		Hold-Up Time 出力保持時間	Testing Circuitry	Figure A																																
Object		V4: +28.0V 14.5A																																		
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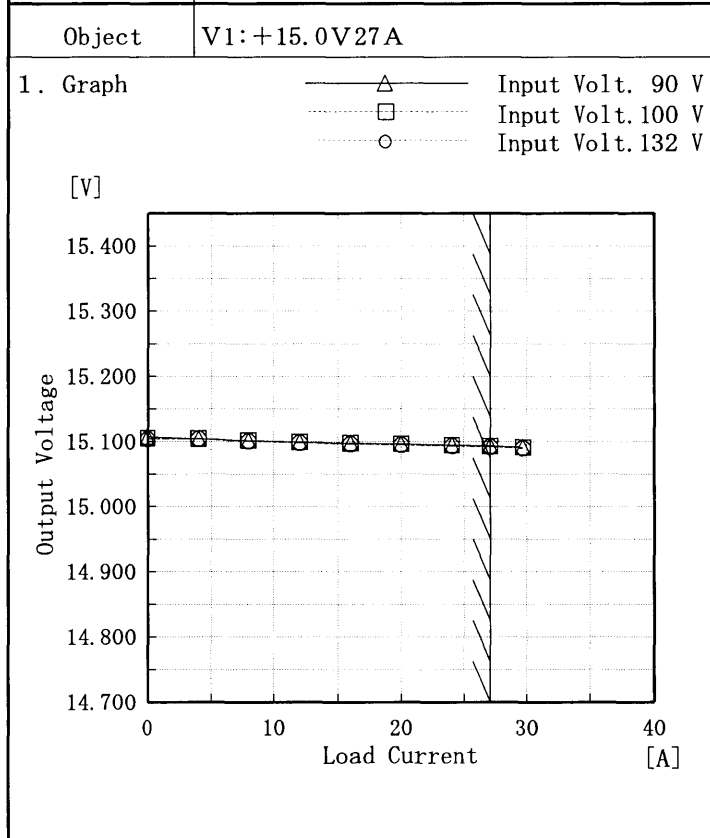
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<p>1. Graph</p> <p>—△— Input Volt. 90 V - - - □ - - - Input Volt. 100 V - - - ○ - - - Input Volt. 132 V</p> <p>Instantaneous Compensation Time [mS]</p> <p>Load Current [A]</p>				<p>2. Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="3">Time [mS]</th> </tr> <tr> <th>Input Volt. 90[V]</th> <th>Input Volt. 100[V]</th> <th>Input Volt. 132[V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>3.0</td><td>30</td><td>36</td><td>38</td></tr> <tr><td>6.0</td><td>30</td><td>31</td><td>38</td></tr> <tr><td>9.0</td><td>30</td><td>30</td><td>37</td></tr> <tr><td>12.0</td><td>28</td><td>30</td><td>35</td></tr> <tr><td>15.0</td><td>26</td><td>29</td><td>32</td></tr> <tr><td>17.0</td><td>23</td><td>28</td><td>31</td></tr> <tr><td>18.7</td><td>22</td><td>26</td><td>31</td></tr> <tr><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>—</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>—</td><td>—</td><td>—</td><td>—</td></tr> </tbody> </table>				Load Current [A]	Time [mS]			Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 132[V]	0.0	—	—	—	3.0	30	36	38	6.0	30	31	38	9.0	30	30	37	12.0	28	30	35	15.0	26	29	32	17.0	23	28	31	18.7	22	26	31	—	—	—	—	—	—	—	—	—	—	—	—
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Model		MAX1600F		Temperature		25°C																																																				
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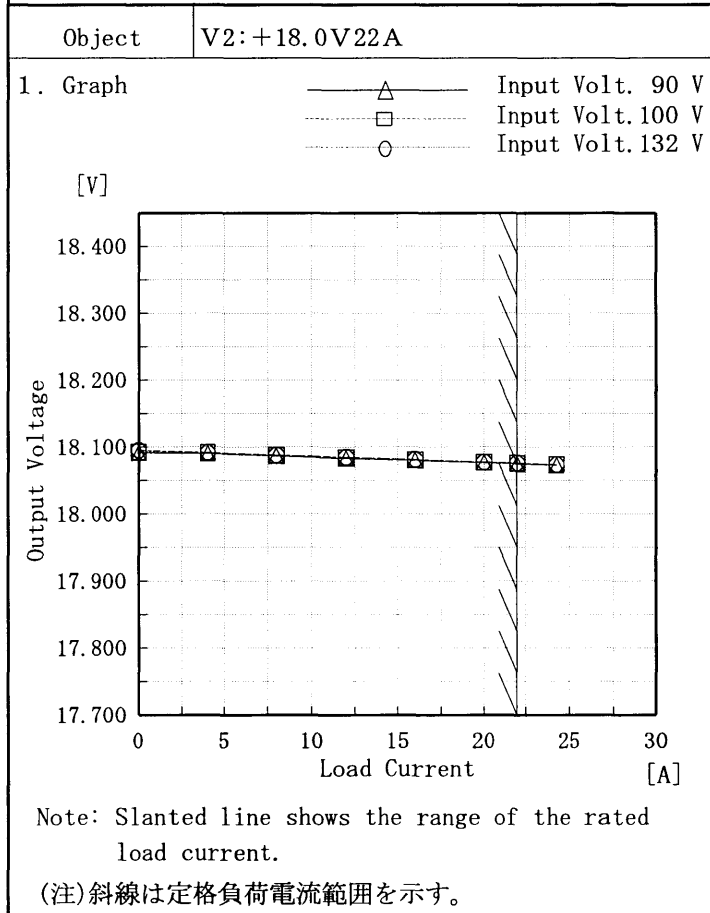


Model	MAX1600F	Temperature	25°C
Item	Load Regulation 静的負荷変動	Testing Circuitry	Figure A



2. Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.0	15.108	15.105	15.104
4.0	15.104	15.105	15.104
8.0	15.102	15.102	15.101
12.0	15.099	15.099	15.099
16.0	15.098	15.098	15.097
20.0	15.096	15.096	15.095
24.0	15.095	15.095	15.093
27.0	15.094	15.093	15.092
29.7	15.092	15.091	15.090
—	—	—	—



2. Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 132[V]
0.0	18.092	18.093	18.096
4.0	18.091	18.092	18.092
8.0	18.087	18.088	18.088
12.0	18.083	18.084	18.085
16.0	18.080	18.081	18.081
20.0	18.077	18.078	18.078
22.0	18.075	18.076	18.076
24.2	18.073	18.074	18.074
—	—	—	—
—	—	—	—



COSEL																																																		
Model	MAX1600F	Temperature	25°C																																															
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Object	V4: +28.0V14.5A																																																	
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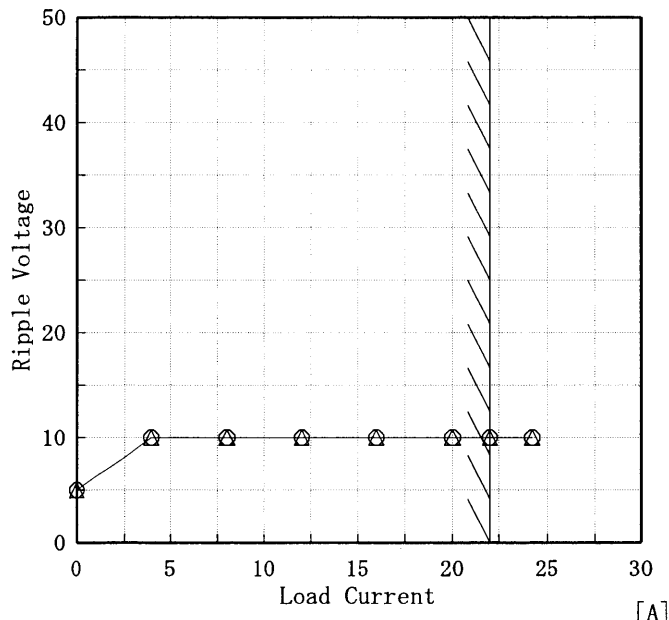
Model		MAX1600F	Temperature	25°C																																						
Item		Ripple Voltage (by Load Current) リップル電圧 (負荷特性)	Testing Circuitry	Figure A																																						
Object		V1: +15.0V27A																																								
1. Graph		<p>—△— Input Volt. 90V</p> <p>---○--- Input Volt. 132V</p>	2. Values																																							
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Load Current [A]	Ripple Output Voltage [mV]																																									
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Model	MAX1600F	Temperature	25°C
Item	Ripple Voltage (by Load Current) リップル電圧(負荷特性)	Testing Circuitry	Figure A

Object V2: +18.0V22A

1. Graph
 [mV] —△— Input Volt. 90V
 —○— Input Volt. 132V



Ripple Voltage is shown as p-p in the figure below.

Note: Slanted line shows the range of the rated load current.

リップル電圧は、下図 p-p 値で示される。
 (注)斜線は定格負荷電流範囲を示す。

T1: Due to AC Input Line
 入力商用周期
 T2: Due to Switching
 スイッチング周期

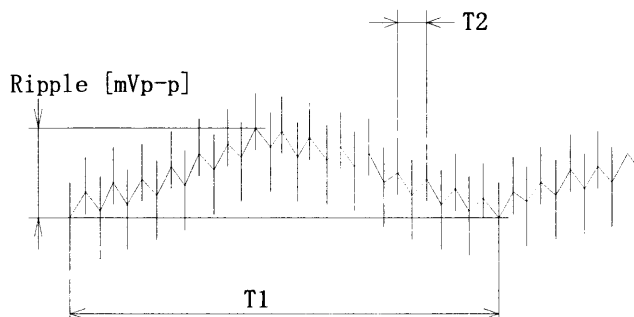


Fig. Complex Ripple Wave Form
 図 リップル波形詳細図

2. Values

Load Current [A]	Ripple Output Voltage [mV]	
	Input Volt. 90 [V]	Input Volt. 132 [V]
0.0	5	5
4.0	10	10
8.0	10	10
12.0	10	10
16.0	10	10
20.0	10	10
22.0	10	10
24.2	10	10
—	—	—
—	—	—
—	—	—



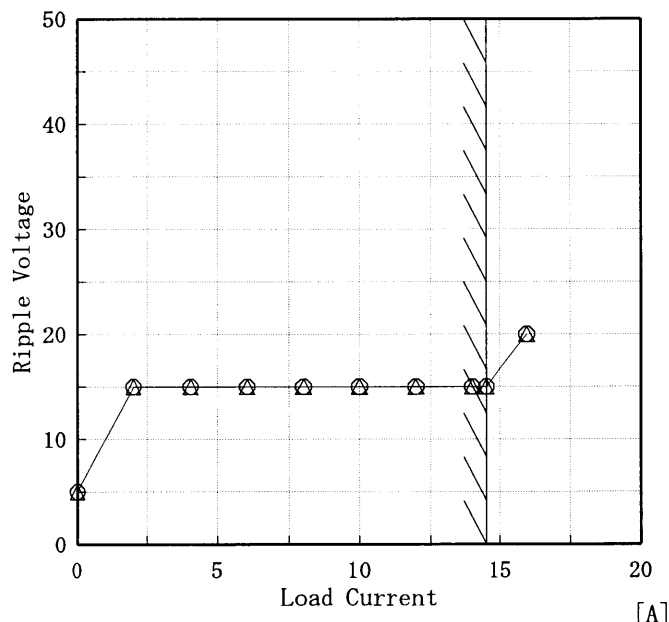
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Model	MAX1600F	Temperature	25°C																																						
Item	Ripple Voltage (by Load Current) リップル電圧(負荷特性)	Testing Circuitry	Figure A																																						
Object	V3: +24.0V17A																																								
<p>1. Graph</p> <p style="text-align: right;">—△— Input Volt. 90V -○- Input Volt. 132V</p>		<p>2. Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="2">Ripple Output Voltage [mV]</th> </tr> <tr> <th>Input Volt. 90 [V]</th> <th>Input Volt. 132 [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>5</td><td>5</td></tr> <tr><td>3.0</td><td>10</td><td>10</td></tr> <tr><td>6.0</td><td>10</td><td>10</td></tr> <tr><td>9.0</td><td>10</td><td>10</td></tr> <tr><td>12.0</td><td>10</td><td>10</td></tr> <tr><td>15.0</td><td>10</td><td>10</td></tr> <tr><td>17.0</td><td>10</td><td>10</td></tr> <tr><td>18.7</td><td>10</td><td>10</td></tr> <tr><td>—</td><td>—</td><td>—</td></tr> <tr><td>—</td><td>—</td><td>—</td></tr> <tr><td>—</td><td>—</td><td>—</td></tr> </tbody> </table>		Load Current [A]	Ripple Output Voltage [mV]		Input Volt. 90 [V]	Input Volt. 132 [V]	0.0	5	5	3.0	10	10	6.0	10	10	9.0	10	10	12.0	10	10	15.0	10	10	17.0	10	10	18.7	10	10	—	—	—	—	—	—	—	—	—
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Model	MAX1600F	Temperature	25°C
Item	Ripple Voltage (by Load Current) リップル電圧(負荷特性)	Testing Circuitry	Figure A

Object V4: +28.0V14.5A

1. Graph
 [mV] —△— Input Volt. 90V
 -○- Input Volt. 132V



Ripple Voltage is shown as p-p in the figure below.

Note: Slanted line shows the range of the rated load current.

リップル電圧は、下図 p-p 値で示される。
 (注) 斜線は定格負荷電流範囲を示す。

T1: Due to AC Input Line
 入力商用周期
 T2: Due to Switching
 スイッチング周期

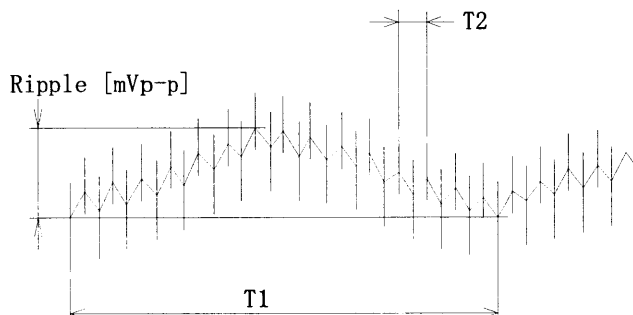


Fig. Complex Ripple Wave Form
 図 リップル波形詳細図

2. Values

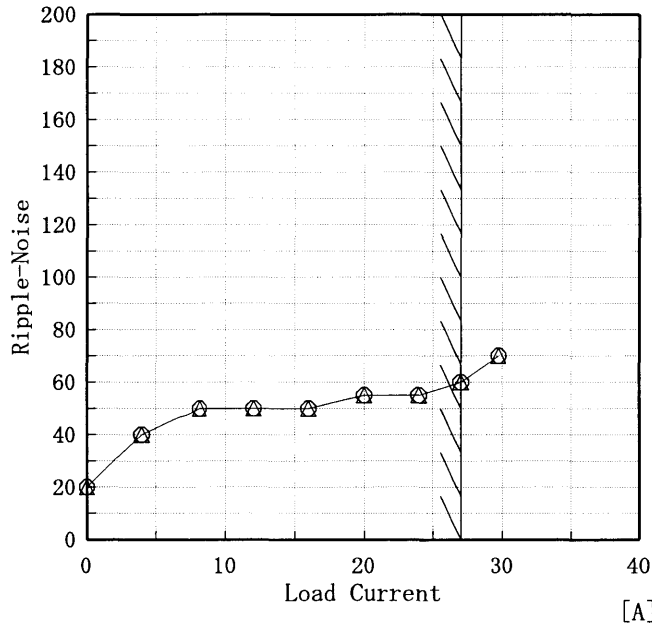
Load Current [A]	Ripple Output Voltage [mV]	
	Input Volt. 90 [V]	Input Volt. 132 [V]
0.0	5	5
2.0	15	15
4.0	15	15
6.0	15	15
8.0	15	15
10.0	15	15
12.0	15	15
14.0	15	15
14.5	15	15
16.0	20	20
—	—	—



Model	MAX1600F	Temperature	25°C
Item	Ripple-Noise リップルノイズ	Testing Circuitry	Figure A

Object V1: +15.0V27A

1. Graph —△— Input Volt. 90V
-○- Input Volt. 132V



Ripple-Noise is shown as p-p in the figure below.
 Note: Slanted line shows the range of the rated load current.

リップルノイズは、下図 p-p 値で示される。
 (注)斜線は定格負荷電流範囲を示す。

T1: Due to AC Input Line
 入力商用周期
 T2: Due to Switching
 スイッチング周期

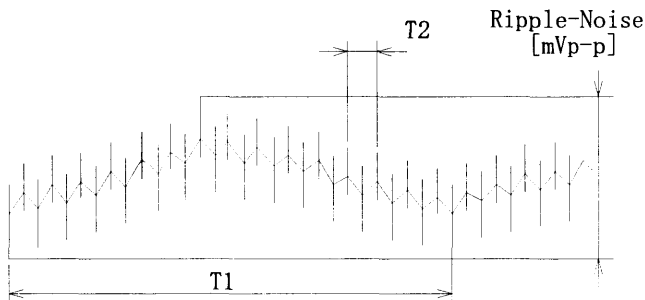


Fig. Complex Ripple Wave Form
 図 リップル波形詳細図

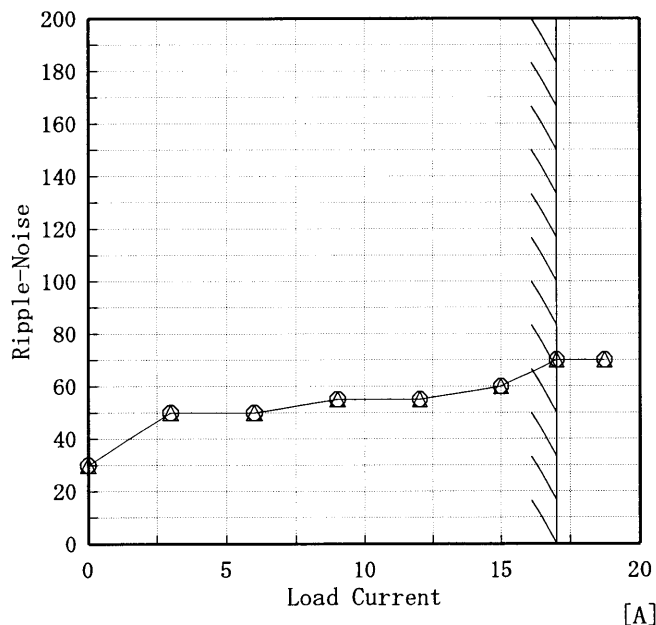
2. Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 90 [V]	Input Volt. 132 [V]
0.0	20	20
4.0	40	40
8.0	50	50
12.0	50	50
16.0	50	50
20.0	55	55
24.0	55	55
27.0	60	60
29.7	70	70
—	—	—
—	—	—



Model	MAX1600F	Temperature	25°C
Item	Ripple-Noise リップルノイズ	Testing Circuitry	Figure A
Object	V3: +24.0V17A		

1. Graph
 [mV]
 —△— Input Volt. 90V
○..... Input Volt. 132V



2. Values

Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 90 [V]	Input Volt. 132 [V]
0.0	30	30
3.0	50	50
6.0	50	50
9.0	55	55
12.0	55	55
15.0	60	60
17.0	70	70
18.7	70	70
—	—	—
—	—	—
—	—	—

Ripple-Noise is shown as p-p in the figure below.
 Note: Slanted line shows the range of the rated load current.

リップルノイズは、下図 p-p 値で示される。
 (注) 斜線は定格負荷電流範囲を示す。

T1: Due to AC Input Line
 入力商用周期
 T2: Due to Switching
 スイッチング周期

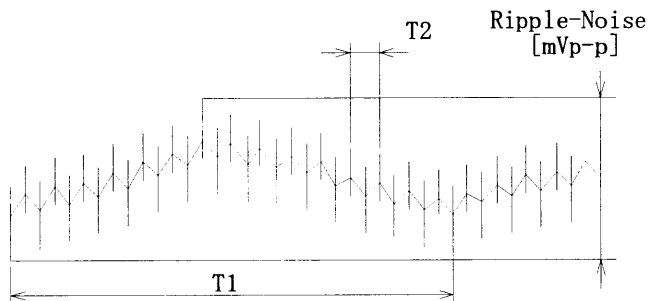
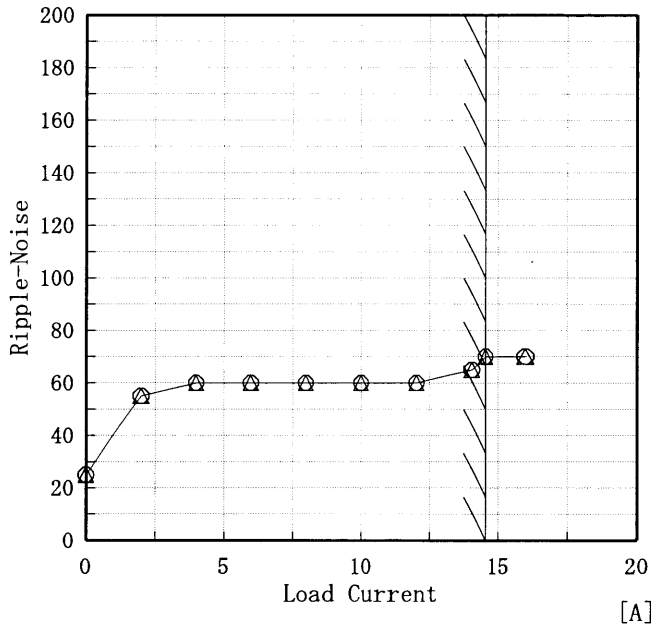


Fig. Complex Ripple Wave Form
 図 リップル波形詳細図



Model	MAX1600F	Temperature	25°C
Item	Ripple-Noise リップルノイズ	Testing Circuitry	Figure A
Object	V4: +28.0V 14.5A		

1. Graph
 [mV]
 —△— Input Volt. 90V
 -○- Input Volt. 132V



Ripple-Noise is shown as p-p in the figure below.
 Note: Slanted line shows the range of the rated load current.

リップルノイズは、下図 p-p 値で示される。
 (注) 斜線は定格負荷電流範囲を示す。

T1: Due to AC Input Line
 入力商用周期
 T2: Due to Switching
 スイッチング周期

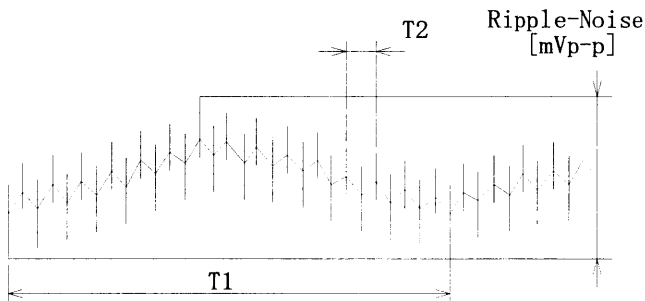


Fig. Complex Ripple Wave Form
 図 リップル波形詳細図

2. Values

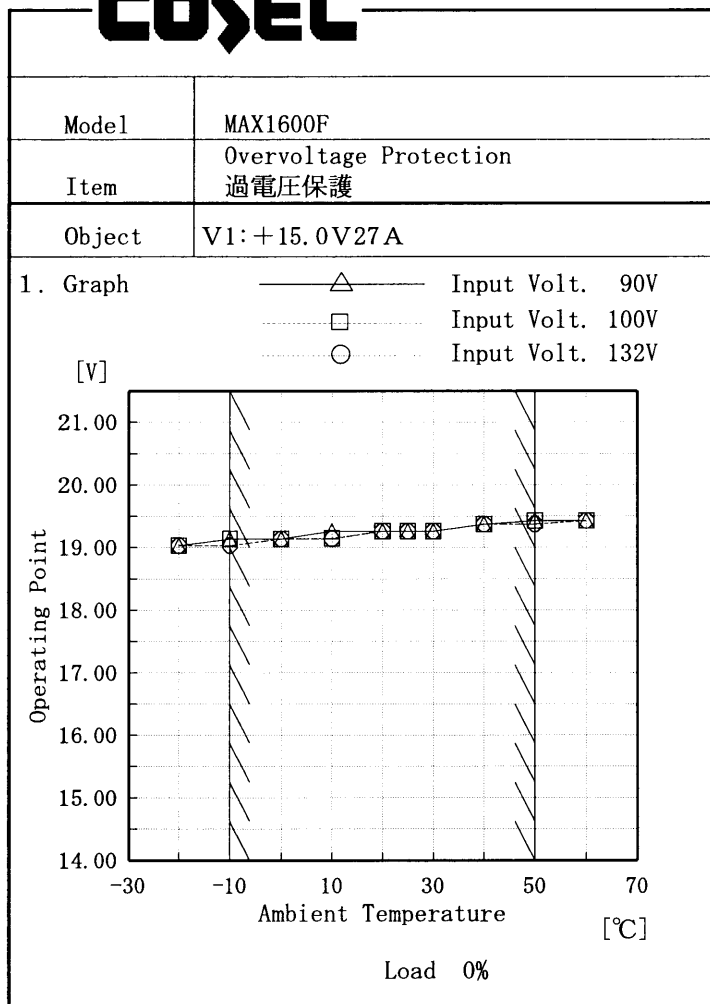
Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 90 [V]	Input Volt. 132 [V]
0.0	25	25
2.0	55	55
4.0	60	60
6.0	60	60
8.0	60	60
10.0	60	60
12.0	60	60
14.0	65	65
14.5	70	70
16.0	70	70
—	—	—



COSEL																																																										
Model	MAX1600F	Temperature	25°C																																																							
Item	Overcurrent Protection 過電流保護	Testing Circuitry	Figure A																																																							
Object	V1: +15.0V27A																																																									
<p>1. Graph</p> <p> Input Volt. 90 V Input Volt. 100 V Input Volt. 132 V </p> <p>Note: Slanted line shows the range of the rated load current. Intermittent operation occurs when the output voltage is from 12V to 0V.</p>		<p>2. Values</p> <table border="1"> <thead> <tr> <th rowspan="2">Output Voltage [V]</th> <th colspan="3">Load Current [A]</th> </tr> <tr> <th>Input Volt. 90[V]</th> <th>Input Volt. 100[V]</th> <th>Input Volt. 132[V]</th> </tr> </thead> <tbody> <tr><td>15.00</td><td>31.40</td><td>31.79</td><td>32.04</td></tr> <tr><td>14.25</td><td>31.40</td><td>31.76</td><td>32.02</td></tr> <tr><td>13.50</td><td>31.42</td><td>31.78</td><td>32.03</td></tr> <tr><td>12.00</td><td>31.59</td><td>31.90</td><td>32.16</td></tr> <tr><td>10.50</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>9.00</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>7.50</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>6.00</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>4.50</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>3.00</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>1.50</td><td>—</td><td>—</td><td>—</td></tr> <tr><td>0.00</td><td>—</td><td>—</td><td>—</td></tr> </tbody> </table>		Output Voltage [V]	Load Current [A]			Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 132[V]	15.00	31.40	31.79	32.04	14.25	31.40	31.76	32.02	13.50	31.42	31.78	32.03	12.00	31.59	31.90	32.16	10.50	—	—	—	9.00	—	—	—	7.50	—	—	—	6.00	—	—	—	4.50	—	—	—	3.00	—	—	—	1.50	—	—	—	0.00	—	—	—
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Object	V2: +18.0V22A																																																									
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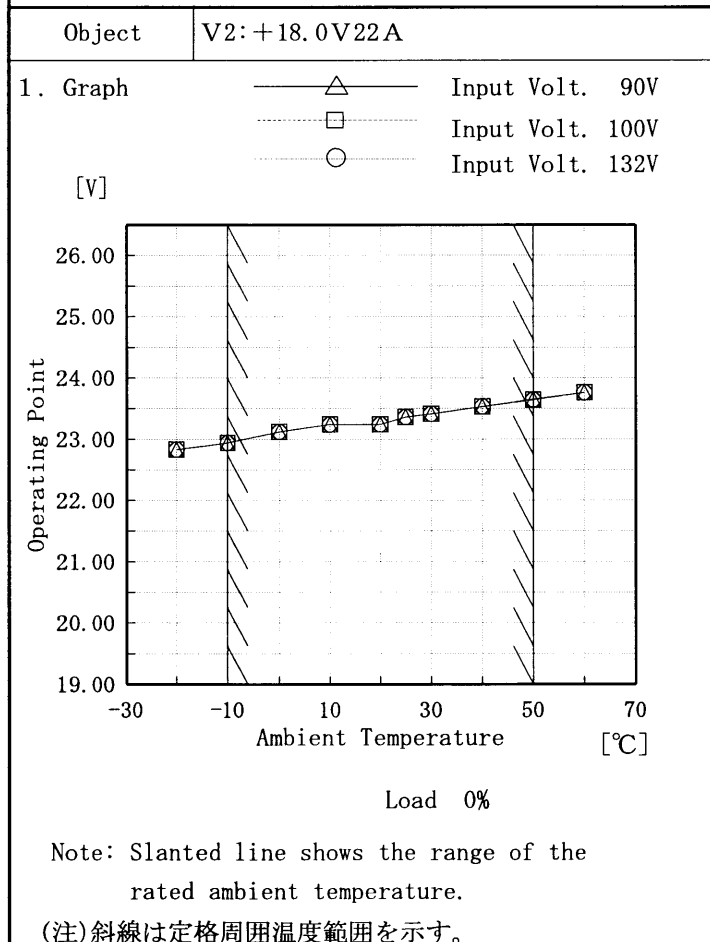
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Testing Circuitry Figure A

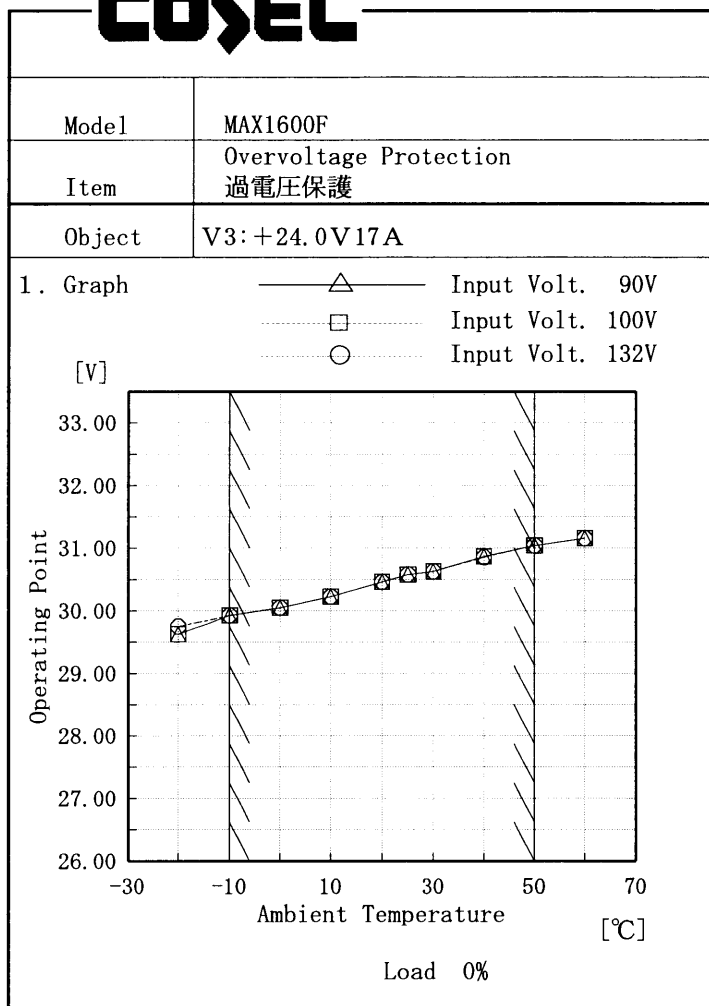
2. Values

Ambient Temperature [°C]	Operating Point [V]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	19.03	19.03	19.03
-10	19.14	19.14	19.03
0	19.14	19.14	19.14
10	19.26	19.15	19.14
20	19.26	19.26	19.26
25	19.26	19.26	19.26
30	19.26	19.26	19.26
40	19.37	19.37	19.37
50	19.43	19.43	19.37
60	19.43	19.43	19.43
—	—	—	—



2. Values

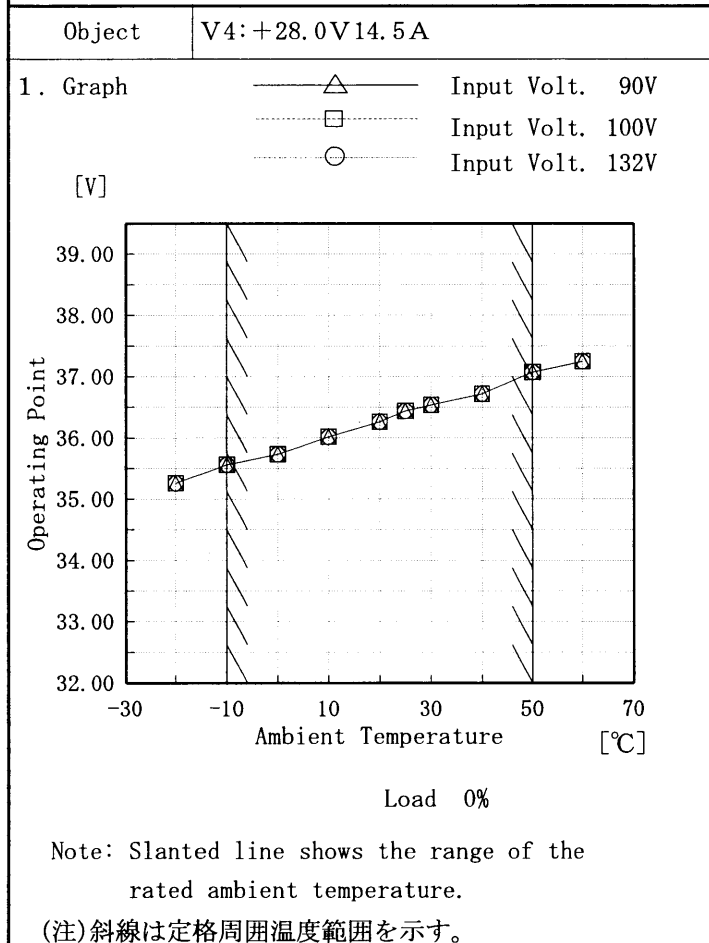
Ambient Temperature [°C]	Operating Point [V]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	22.83	22.83	22.83
-10	22.94	22.94	22.94
0	23.12	23.12	23.12
10	23.24	23.24	23.24
20	23.24	23.24	23.24
25	23.36	23.36	23.36
30	23.41	23.41	23.41
40	23.53	23.53	23.53
50	23.65	23.64	23.64
60	23.76	23.76	23.76
—	—	—	—



Testing Circuitry Figure A

2. Values

Ambient Temperature [°C]	Operating Point [V]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	29.63	29.63	29.75
-10	29.93	29.93	29.93
0	30.05	30.05	30.05
10	30.23	30.23	30.23
20	30.46	30.46	30.46
25	30.58	30.58	30.58
30	30.63	30.63	30.63
40	30.87	30.87	30.86
50	31.04	31.04	31.04
60	31.16	31.16	31.16
—	—	—	—

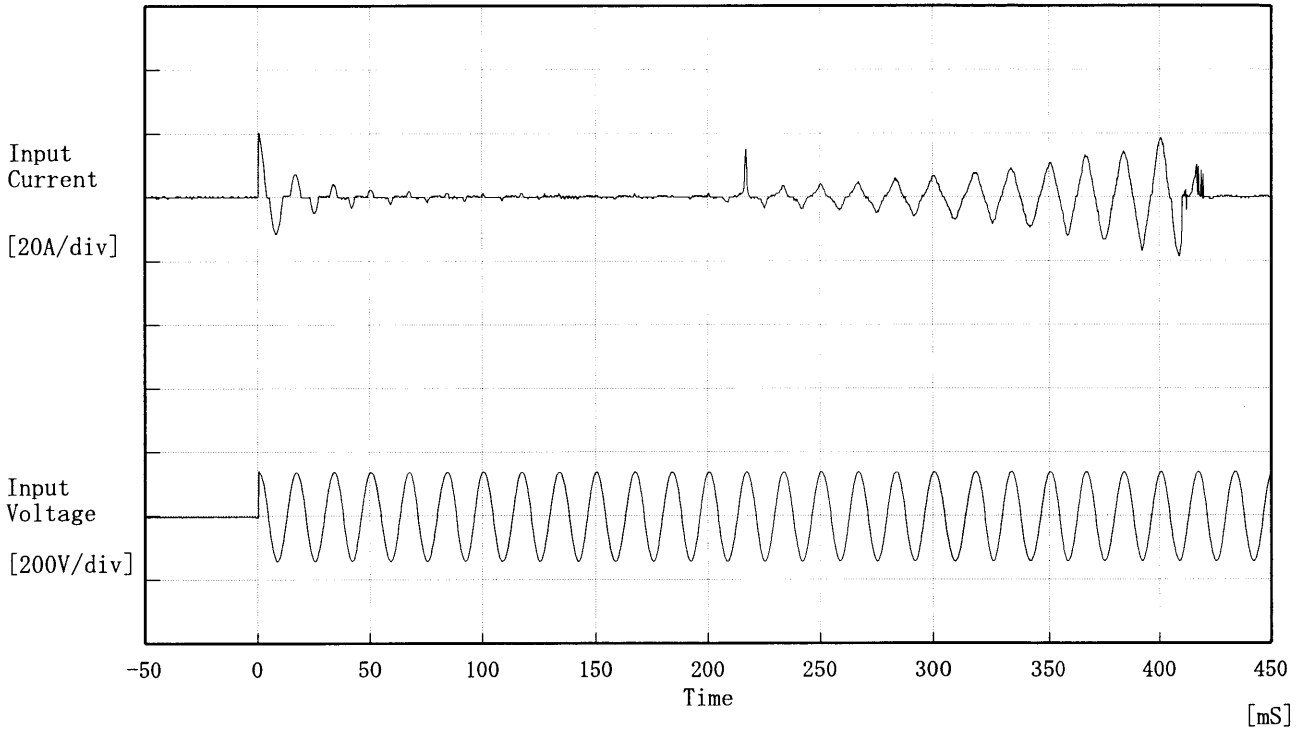


2. Values

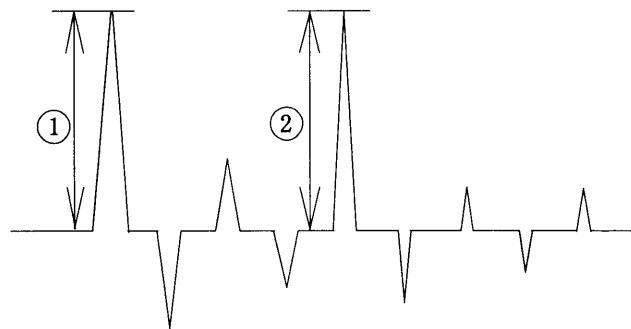
Ambient Temperature [°C]	Operating Point [V]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	35.26	35.26	35.26
-10	35.56	35.56	35.56
0	35.73	35.73	35.73
10	36.02	36.02	36.02
20	36.26	36.26	36.26
25	36.44	36.44	36.44
30	36.54	36.54	36.54
40	36.72	36.72	36.72
50	37.07	37.07	37.07
60	37.25	37.25	37.25
—	—	—	—



Model		MAX1600F	Temperature		25°C
Item		Inrush Current 突入電流	Testing Circuitry		Figure A
Object		_____			



Input Voltage 100 V
 Frequency 60 Hz
 Load 100 %
 Inrush Current
 ① 20.40 [A]
 ② 18.60 [A]

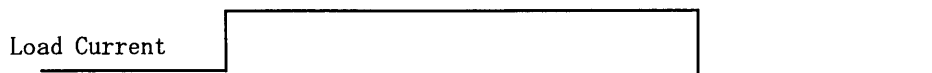




Model	MAX1600F	Temperature	25°C
Item	Dynamic Load Responce 動的負荷変動	Testing Circuitry	Figure A
Object	V1: +15.0V27A		

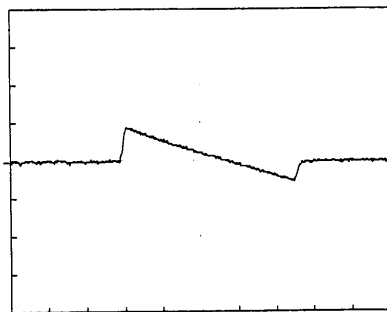
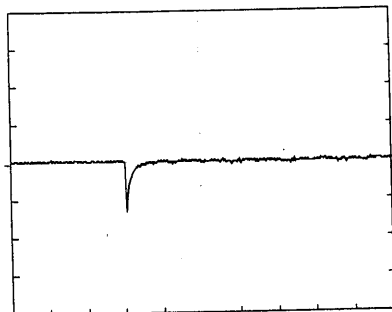
Input Volt. 100 V

Cycle 1000 mS



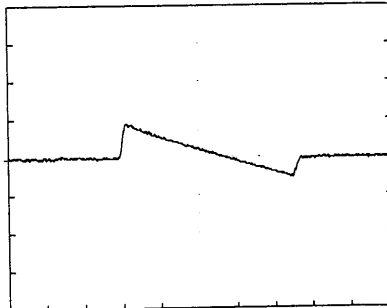
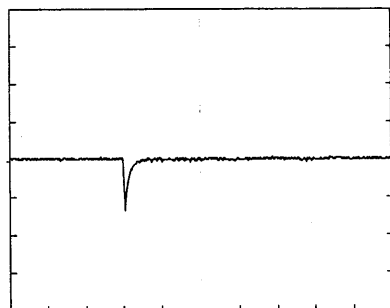
Load 0% ↔

Load 100 %



Load 0% ↔

Load 50 %



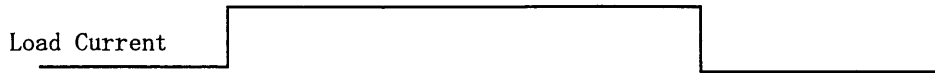
500 mV/div

5 mS/div

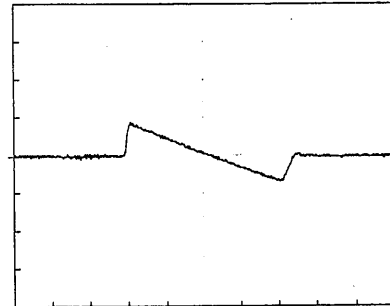
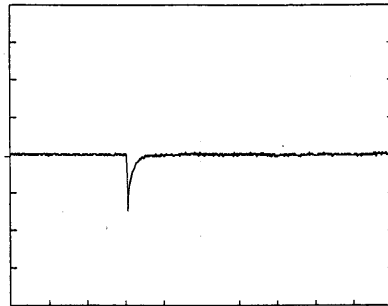


Model	MAX1600F	Temperature	25°C
Item	Dynamic Load Responce 動的負荷変動	Testing Circuitry	Figure A
Object	V2: +18.0V22A		

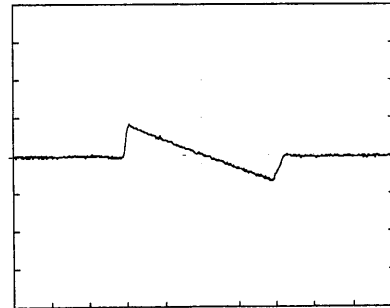
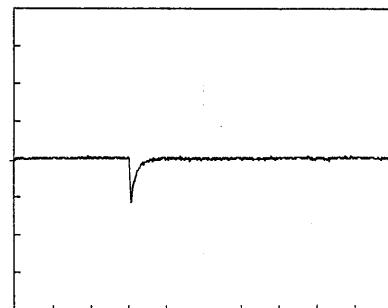
Input Volt. 100 V
Cycle 1000 mS



Load 0% ↔
Load 100 %



Load 0% ↔
Load 50 %



500 mV/div

5 mS/div

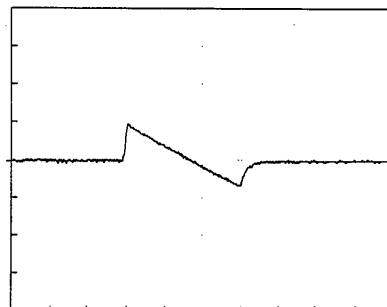
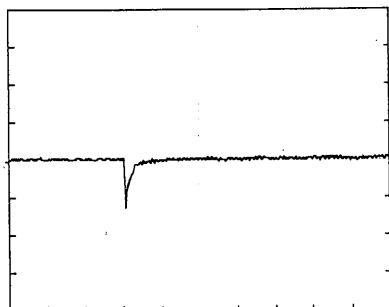


Model	MAX1600F	Temperature	25°C
Item	Dynamic Load Responce 動的負荷変動	Testing Circuitry	Figure A
Object	V3: +24.0V17A		

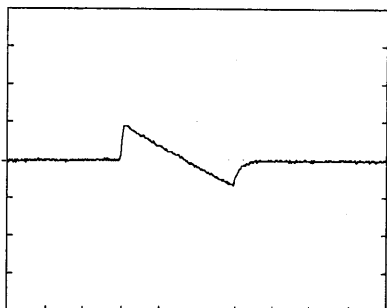
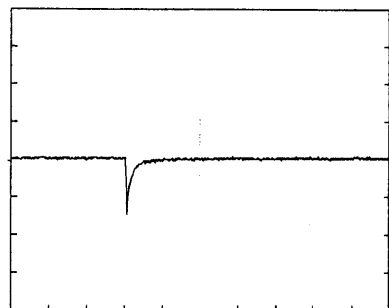
Input Volt. 100 V
Cycle 1000 mS



Load 0% ↔
Load 100 %



Load 0% ↔
Load 50 %



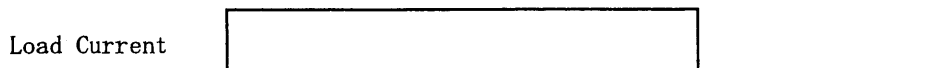
500 mV/div

5 mS/div

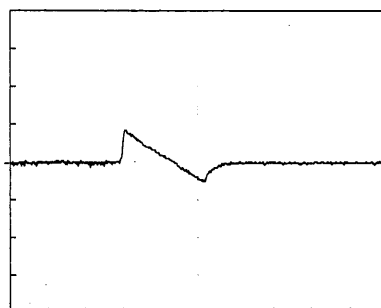
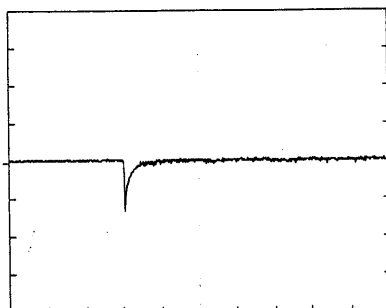


Model	MAX1600F	Temperature	25°C
Item	Dynamic Load Responce 動的負荷変動	Testing Circuitry	Figure A
Object	V4:+28.0V14.5A		

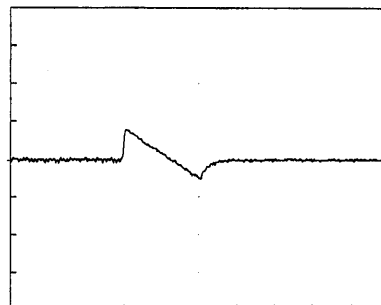
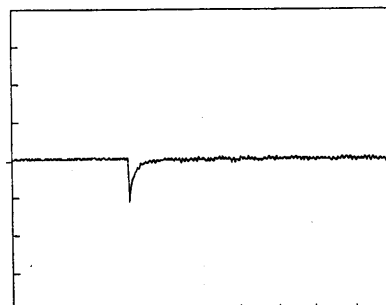
Input Volt. 100 V
Cycle 1000 mS



Load 0% ↔
Load 100 %



Load 0% ↔
Load 50 %



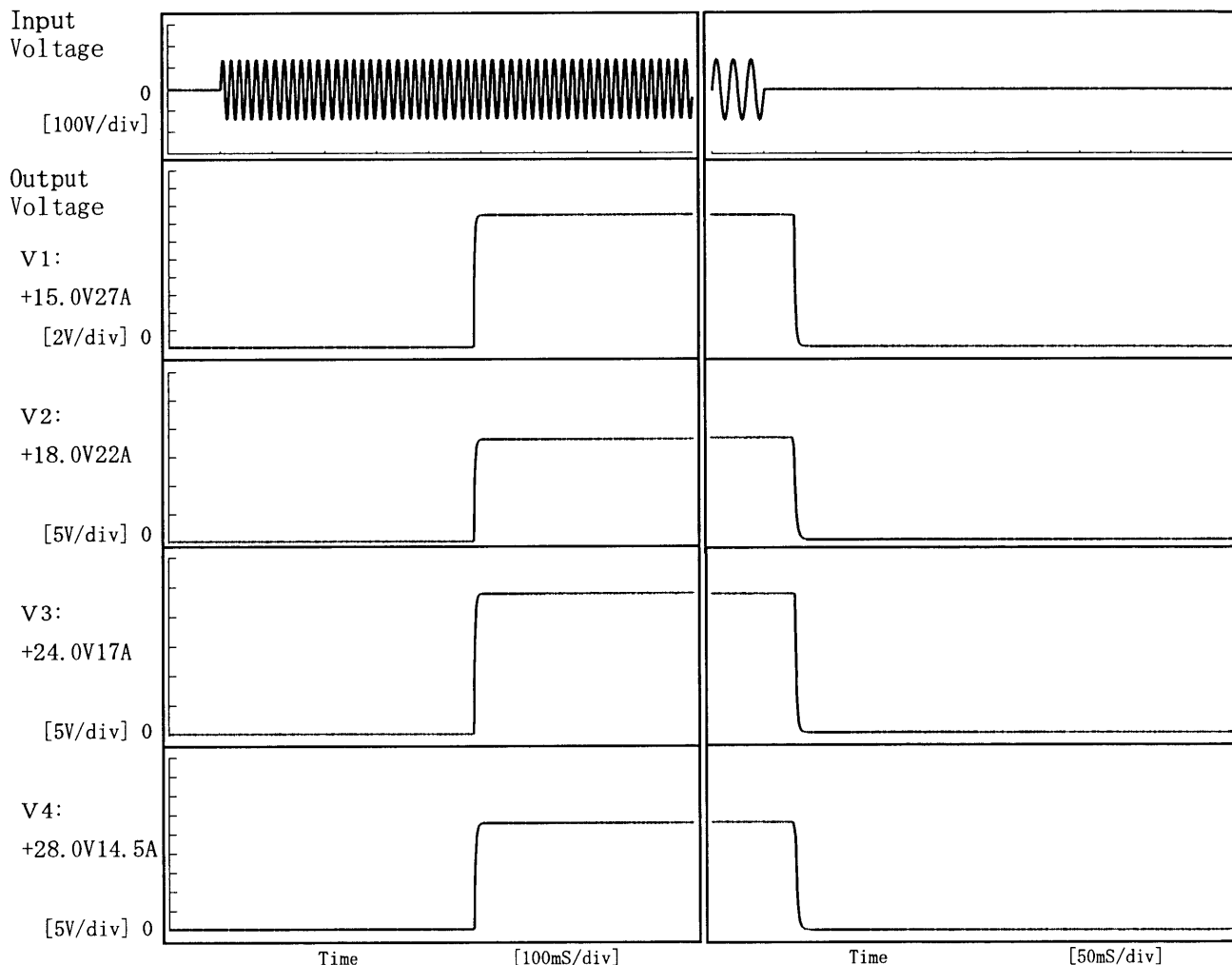
500 mV/div

5 mS/div



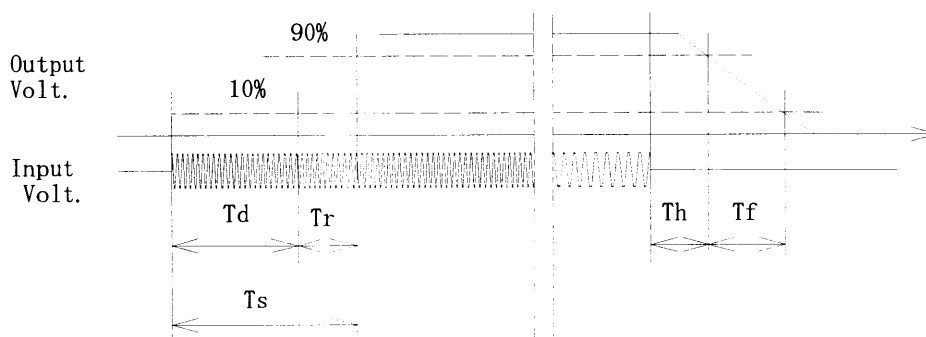
Model	MAX1600F	Temperature	25°C
Item	Rise and Fall Time 立上り、立下り時間	Testing Circuitry	Figure A
Object	_____	Load Power	100 %
		Input Volt.	100 V

1. Graph



2. Values

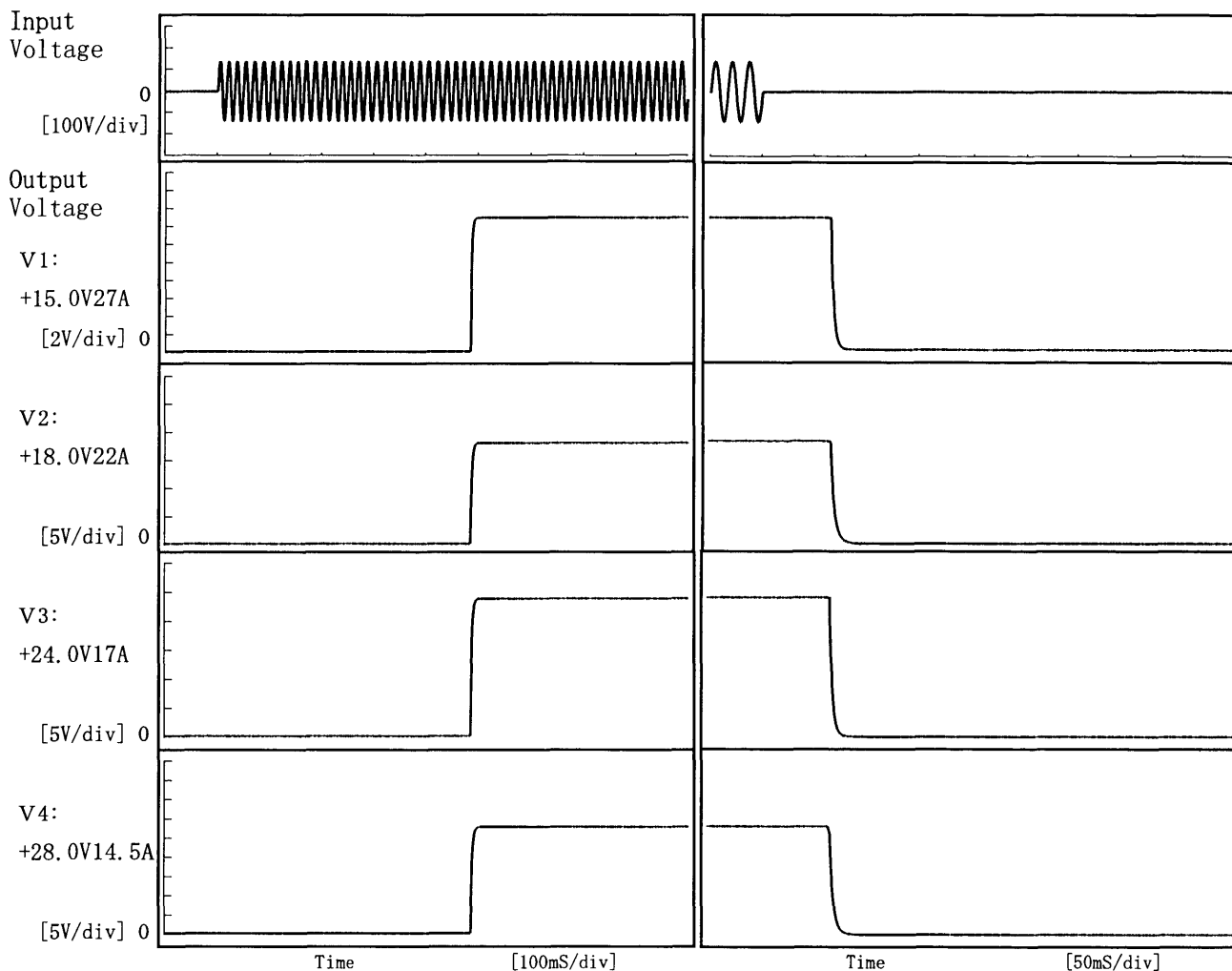
Output	Time	T _d	T _r	T _s	T _h	T _f
V1		483.5	4.5	488.0	30.3	3.0
V2		483.5	5.5	489.0	30.0	4.3
V3		483.5	6.0	489.5	30.3	3.0
V4		483.5	6.5	490.0	29.3	4.5





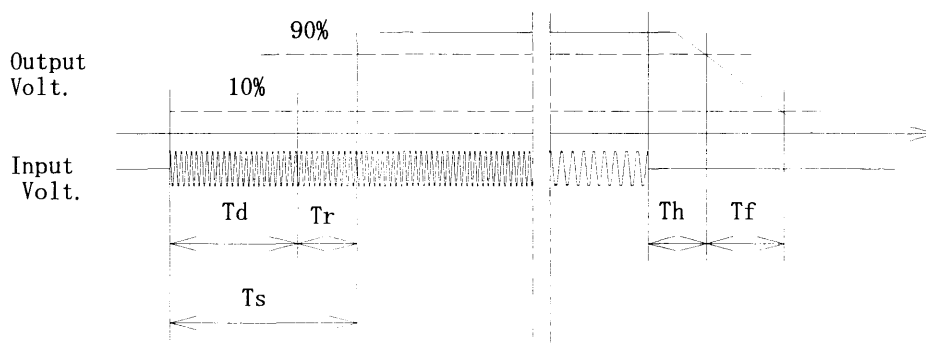
Model	MAX1600F	Temperature	25°C
Item	Rise and Fall Time 立上り、立下り時間	Testing Circuitry	Figure A
Object	_____	Load Power	50 %
		Input Volt.	100 V

1. Graph



2. Values

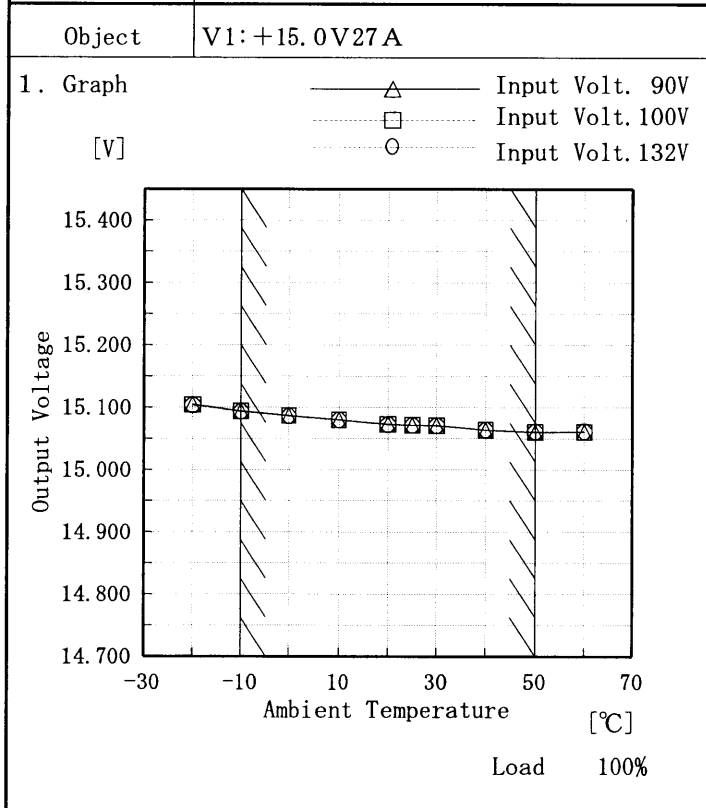
Output	Time	T _d	T _r	T _s	T _h	T _f
V1		484.5	4.5	489.0	67.5	5.8
V2		484.5	5.5	490.0	67.5	8.3
V3		484.5	5.5	490.0	67.5	5.8
V4		484.5	6.0	490.5	67.3	7.3





Model	MAX1600F
Item	Ambient Temperature Drift 周囲温度変動

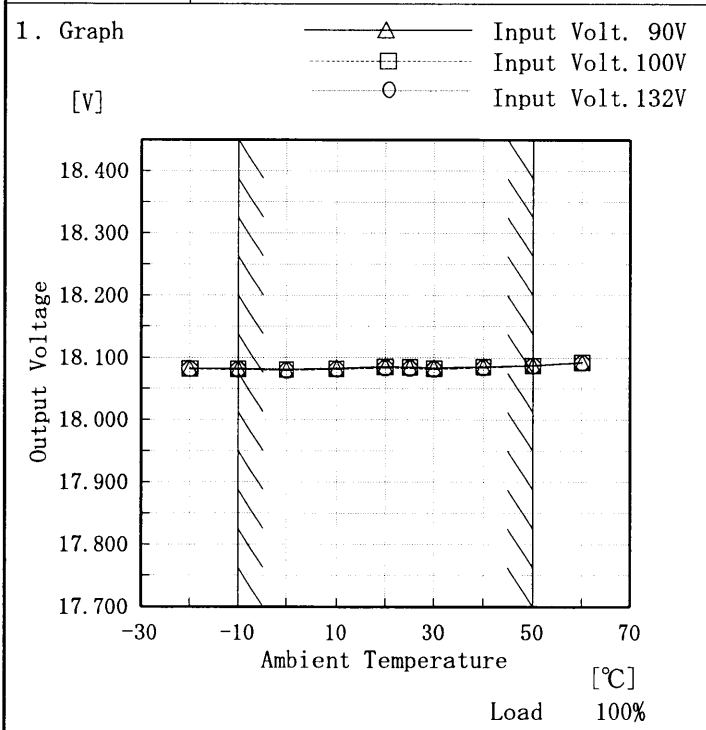
Testing Circuitry Figure A



2. Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	15.105	15.104	15.103
-10	15.094	15.094	15.093
0	15.087	15.087	15.086
10	15.080	15.080	15.080
20	15.073	15.073	15.072
25	15.071	15.072	15.072
30	15.071	15.071	15.071
40	15.064	15.064	15.064
50	15.060	15.061	15.061
60	15.060	15.061	15.062
-	-	-	-

Object V2: +18.0V22A



2. Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 90[V]	Input Volt. 100[V]	Input Volt. 132[V]
-20	18.083	18.082	18.081
-10	18.082	18.081	18.081
0	18.081	18.080	18.079
10	18.083	18.082	18.081
20	18.085	18.085	18.083
25	18.085	18.084	18.083
30	18.083	18.083	18.082
40	18.085	18.085	18.084
50	18.087	18.087	18.087
60	18.092	18.092	18.092
-	-	-	-

Note: Slanted line shows the range of the rated ambient temperature.

(注)斜線は定格周囲温度範囲を示す。

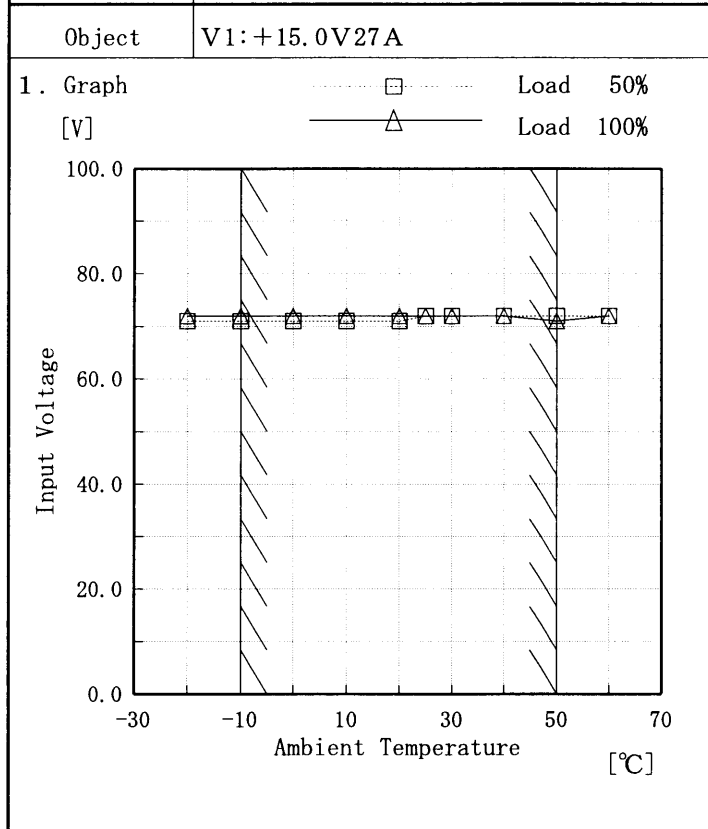


COSEL																																																						
Model	MAX1600F	Testing Circuitry Figure A																																																				
Item	Ambient Temperature Drift 周囲温度変動																																																					
Object	V3: +24.0V17A	2. Values																																																				
1. Graph	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> </div> <div style="width: 45%;"> <p>—△— Input Volt. 90V - - -□- - - Input Volt. 100V - - -○- - - Input Volt. 132V</p> </div> </div> <p style="text-align: right;">Load 100%</p>																																																					
Object	V4: +28.0V14.5A	2. Values																																																				
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		<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th rowspan="2">Ambient Temperature [°C]</th> <th colspan="3">Output Voltage [V]</th> </tr> <tr> <th>Input Volt. 90 [V]</th> <th>Input Volt. 100 [V]</th> <th>Input Volt. 132 [V]</th> </tr> </thead> <tbody> <tr><td>-20</td><td>24.020</td><td>24.019</td><td>24.016</td></tr> <tr><td>-10</td><td>24.032</td><td>24.031</td><td>24.028</td></tr> <tr><td>0</td><td>24.045</td><td>24.044</td><td>24.042</td></tr> <tr><td>10</td><td>24.061</td><td>24.060</td><td>24.058</td></tr> <tr><td>20</td><td>24.079</td><td>24.078</td><td>24.077</td></tr> <tr><td>25</td><td>24.089</td><td>24.088</td><td>24.086</td></tr> <tr><td>30</td><td>24.098</td><td>24.098</td><td>24.096</td></tr> <tr><td>40</td><td>24.116</td><td>24.115</td><td>24.114</td></tr> <tr><td>50</td><td>24.134</td><td>24.133</td><td>24.132</td></tr> <tr><td>60</td><td>24.146</td><td>24.146</td><td>24.145</td></tr> <tr><td>—</td><td>—</td><td>—</td><td>—</td></tr> </tbody> </table>		Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 90 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]	-20	24.020	24.019	24.016	-10	24.032	24.031	24.028	0	24.045	24.044	24.042	10	24.061	24.060	24.058	20	24.079	24.078	24.077	25	24.089	24.088	24.086	30	24.098	24.098	24.096	40	24.116	24.115	24.114	50	24.134	24.133	24.132	60	24.146	24.146	24.145	—	—	—	—
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Ambient Temperature [°C]	Output Voltage [V]																																																					
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<p>Note: Slanted line shows the range of the rated ambient temperature. (注)斜線は定格周囲温度範囲を示す。</p>																																																						



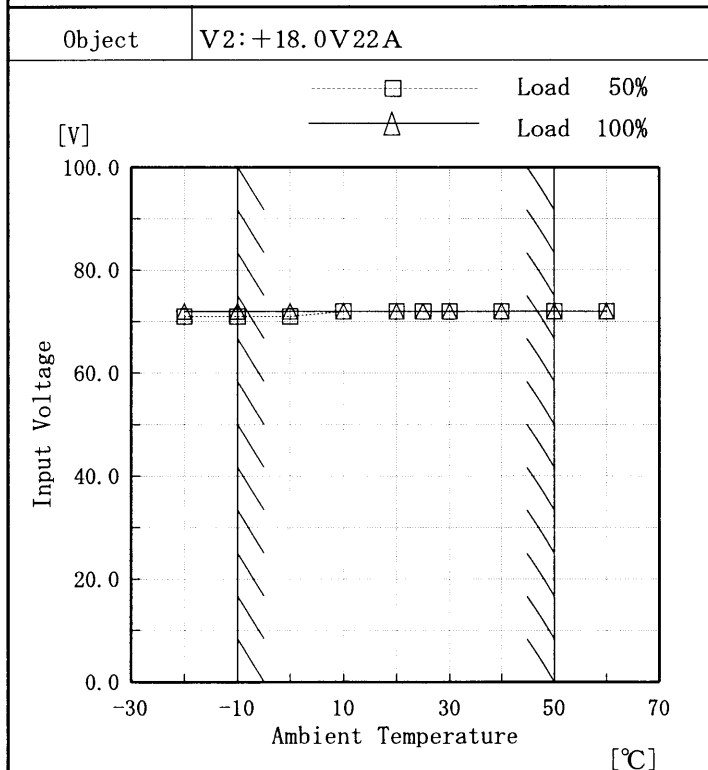
Model	MAX1600F
Item	Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧

Testing Circuitry Figure A



2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	71	72
-10	71	72
0	71	72
10	71	72
20	71	72
25	72	72
30	72	72
40	72	72
50	72	71
60	72	72
—	—	—



2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	71	72
-10	71	72
0	71	72
10	72	72
20	72	72
25	72	72
30	72	72
40	72	72
50	72	72
60	72	72
—	—	—

Note: Slanted line shows the range of the rated ambient temperature.

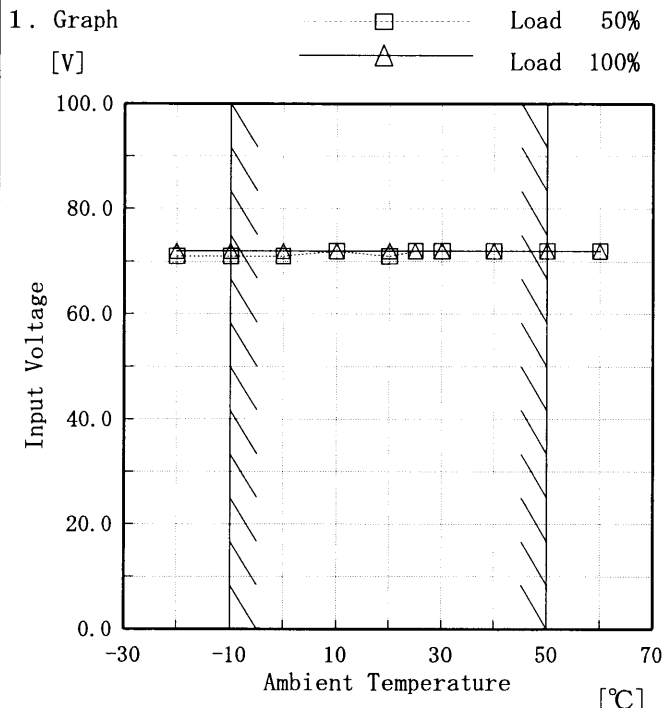
(注)斜線は定格周囲温度範囲を示す。



Model	MAX1600F
Item	Minimum Input Voltage for Regulated Output Voltage 最低レギュレーション電圧

Testing Circuitry Figure A

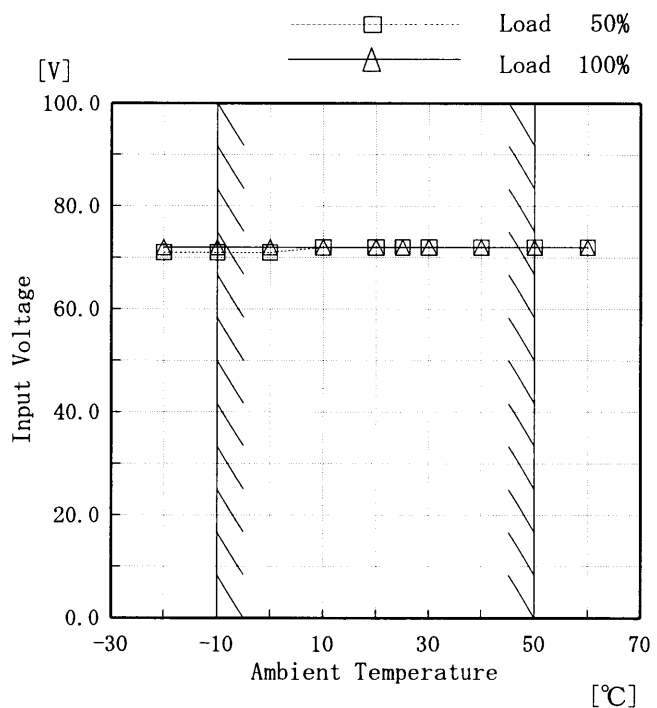
Object	V3: +24.0V17A
--------	---------------



2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	71	72
-10	71	72
0	71	72
10	72	72
20	71	72
25	72	72
30	72	72
40	72	72
50	72	72
60	72	72
—	—	—

Object	V4: +28.0V14.5A
--------	-----------------



2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	71	72
-10	71	72
0	71	72
10	72	72
20	72	72
25	72	72
30	72	72
40	72	72
50	72	72
60	72	72
—	—	—

Note: Slanted line shows the range of the rated ambient temperature.

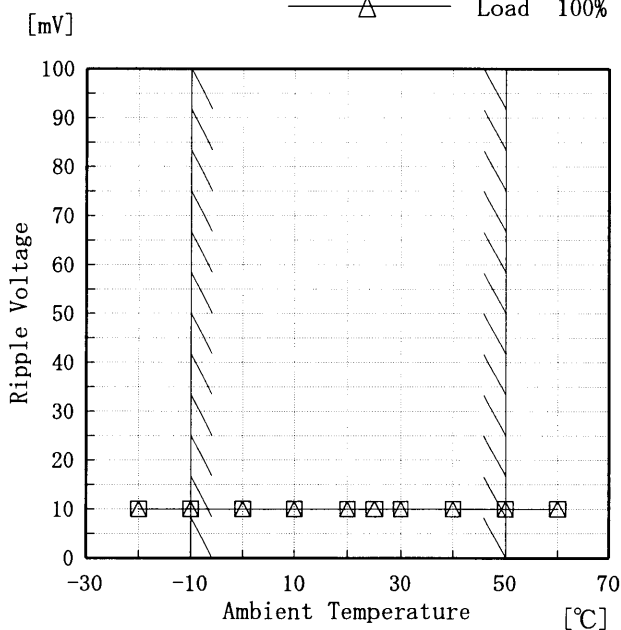
(注)斜線は定格周囲温度範囲を示す。



Model	MAX1600F
Item	Ripple Voltage (by Ambient Temp.) リップル電圧 (周囲温度特性)
Object	V1: +15.0V27A

Testing Circuitry Figure A

1. Graph -----□----- Load 50%
-----△----- Load 100%



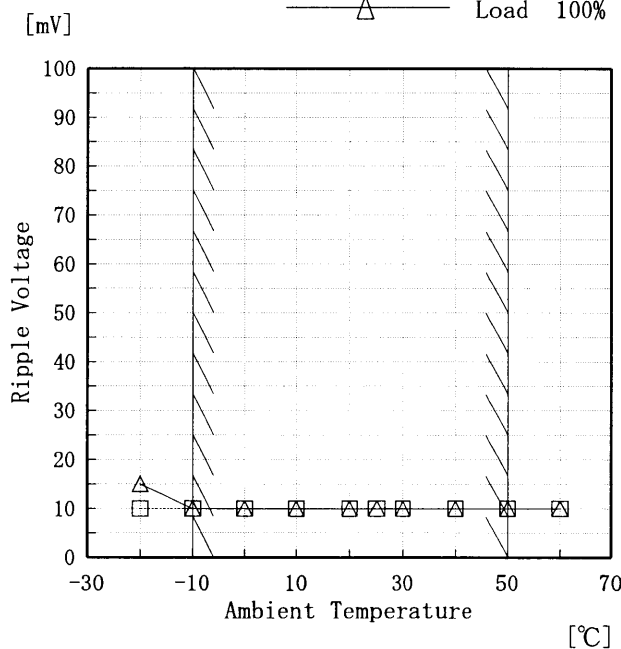
Input Volt. 100 V

2. Values

Ambient Temperature [°C]	Ripple Output Voltage [mV]	
	Load 50%	Load 100%
-20	10	10
-10	10	10
0	10	10
10	10	10
20	10	10
25	10	10
30	10	10
40	10	10
50	10	10
60	10	10
—	—	—

Object	V2: +18.0V22A
--------	---------------

1. Graph -----□----- Load 50%
-----△----- Load 100%



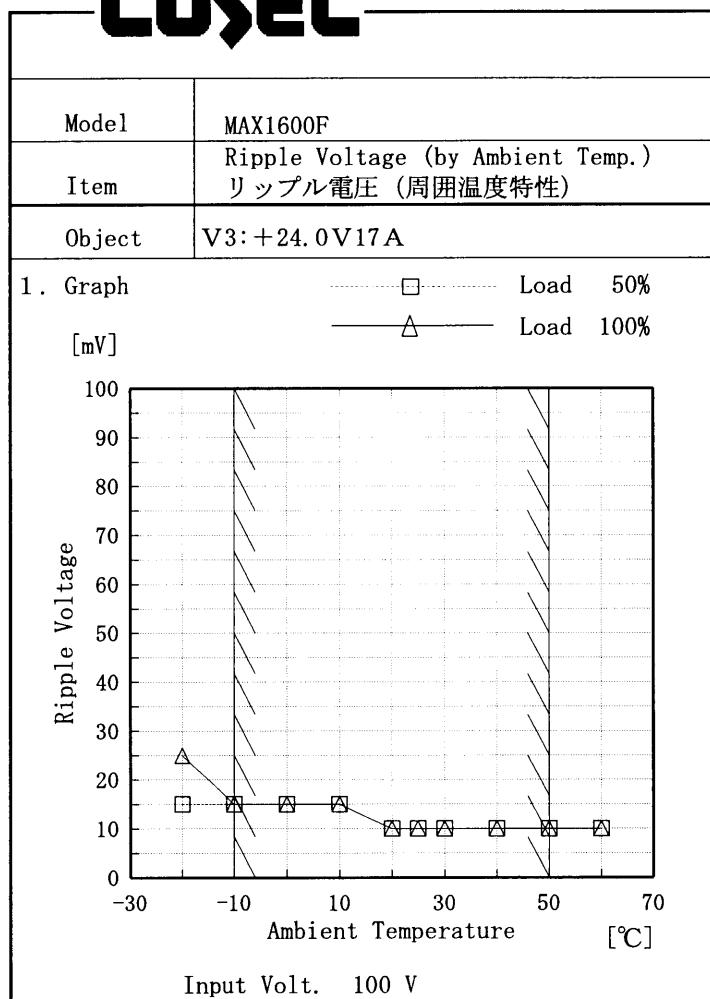
Input Volt. 100 V

2. Values

Ambient Temperature [°C]	Ripple Output Voltage [mV]	
	Load 50%	Load 100%
-20	10	15
-10	10	10
0	10	10
10	10	10
20	10	10
25	10	10
30	10	10
40	10	10
50	10	10
60	10	10
—	—	—

Note: Slanted line shows the range of the rated ambient temperature.

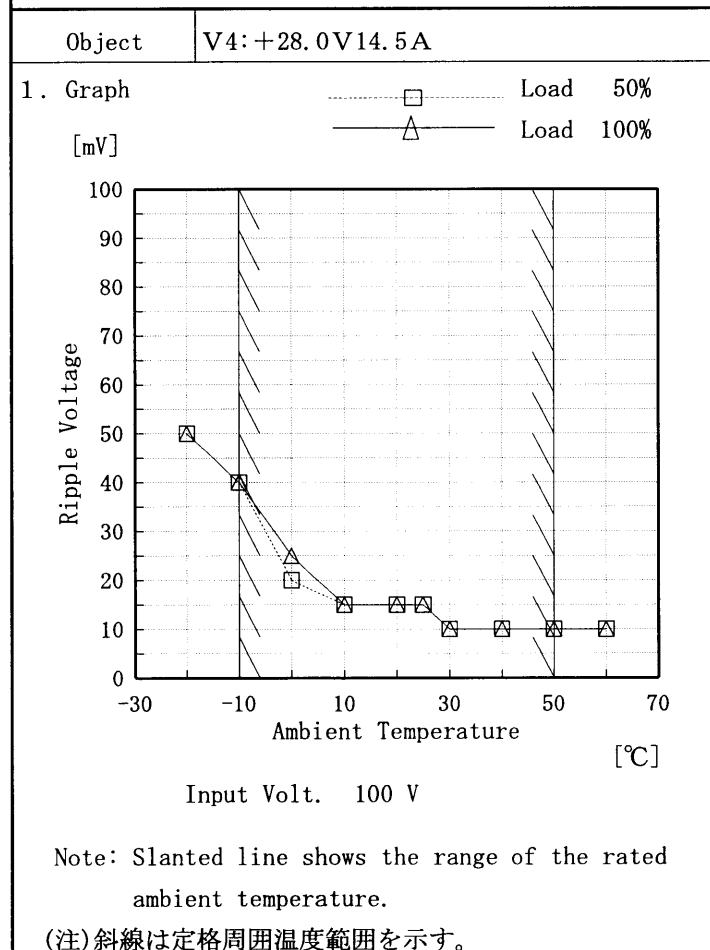
(注)斜線は定格周囲温度範囲を示す。



Testing Circuitry Figure A

2. Values

Ambient Temperature [°C]	Ripple Output Voltage [mV]	
	Load 50%	Load 100%
-20	15	25
-10	15	15
0	15	15
10	15	15
20	10	10
25	10	10
30	10	10
40	10	10
50	10	10
60	10	10
—	—	—



2. Values

Ambient Temperature [°C]	Ripple Output Voltage [mV]	
	Load 50%	Load 100%
-20	50	50
-10	40	40
0	20	25
10	15	15
20	15	15
25	15	15
30	10	10
40	10	10
50	10	10
60	10	10
—	—	—



COSEL																									
Model	MAX1600F	Temperature	25°C																						
Item	Time Lapse Drift 経時ドリフト	Testing Circuitry	Figure A																						
Object	V1: +15.0V27A																								
<p>1. Graph</p> <p style="text-align: center;">Time [H]</p> <p style="text-align: center;">Input Volt. 100V Load 100%</p>		<p>2. Values</p> <table border="1"> <thead> <tr> <th>Time since start [H]</th> <th>Output Voltage [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>15.077</td></tr> <tr><td>0.5</td><td>15.091</td></tr> <tr><td>1.0</td><td>15.091</td></tr> <tr><td>2.0</td><td>15.091</td></tr> <tr><td>3.0</td><td>15.091</td></tr> <tr><td>4.0</td><td>15.091</td></tr> <tr><td>5.0</td><td>15.091</td></tr> <tr><td>6.0</td><td>15.091</td></tr> <tr><td>7.0</td><td>15.091</td></tr> <tr><td>8.0</td><td>15.091</td></tr> </tbody> </table>		Time since start [H]	Output Voltage [V]	0.0	15.077	0.5	15.091	1.0	15.091	2.0	15.091	3.0	15.091	4.0	15.091	5.0	15.091	6.0	15.091	7.0	15.091	8.0	15.091
Time since start [H]	Output Voltage [V]																								
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7.0	15.091																								
8.0	15.091																								
Object	V2: +18.0V22A																								
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COSEL																									
Model	MAX1600F	Temperature	25°C																						
Item	Time Lapse Drift 経時ドリフト	Testing Circuitry	Figure A																						
Object	V3: +24.0V17A																								
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COSEL		Testing Circuitry Figure A
Model	MAX1600F	
Item	Output Voltage Accuracy 定電圧精度	

1. Output Voltage Accuracy 定電圧精度

This is defined as the value of the output voltage, regulation load, ambient temperature and input voltage varied at random in the range as specified below.

周囲温度、入力電圧、負荷電流を下記仕様内で、任意に変動させたときの出力電圧の変動をいう。

Temperature 周囲温度 : -10~50 °C

Input Voltage 入力電圧 : 90~132 V

Load Current 負荷電流 (V1) : 0~27 A (V2) : 0~22 A (V3) : 0~17 A (V4) : 0~14.5 A

* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$
 定電圧精度(変動値) = $\pm(\text{出力電圧の最高値} - \text{出力電圧の最低値}) / 2$

* Output Voltage Accuracy (Ration) = $\frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$

定電圧精度(変動率) = $\frac{\text{変動値}}{\text{定格出力電圧}} \times 100$

2. Values

Object	V1: +15.0V27A					
Item	Temperature [°C]	Input Voltage [V]	Output Current [A]	Output Voltage [V]	Output Voltage Accuracy [mV]	Output Voltage Accuracy(Ration) [%]
Maximum Voltage	-10	132	0	15.109	±20	±0.1
Minimum Voltage	50	132	27	15.069		

Object	V2: +18.0V22A					
Item	Temperature [°C]	Input Voltage [V]	Output Current [A]	Output Voltage [V]	Output Voltage Accuracy [mV]	Output Voltage Accuracy(Ration) [%]
Maximum Voltage	50	132	0	18.111	±17	±0.1
Minimum Voltage	-10	132	22	18.078		

Object	V3: +24.0V17A					
Item	Temperature [°C]	Input Voltage [V]	Output Current [A]	Output Voltage [V]	Output Voltage Accuracy [mV]	Output Voltage Accuracy(Ration) [%]
Maximum Voltage	50	132	0	24.152	±64	±0.3
Minimum Voltage	-10	132	17	24.024		

Object	V4: +28.0V14.5A					
Item	Temperature [°C]	Input Voltage [V]	Output Current [A]	Output Voltage [V]	Output Voltage Accuracy [mV]	Output Voltage Accuracy(Ration) [%]
Maximum Voltage	50	132	0.0	28.085	±27	±0.1
Minimum Voltage	-10	132	14.5	28.031		

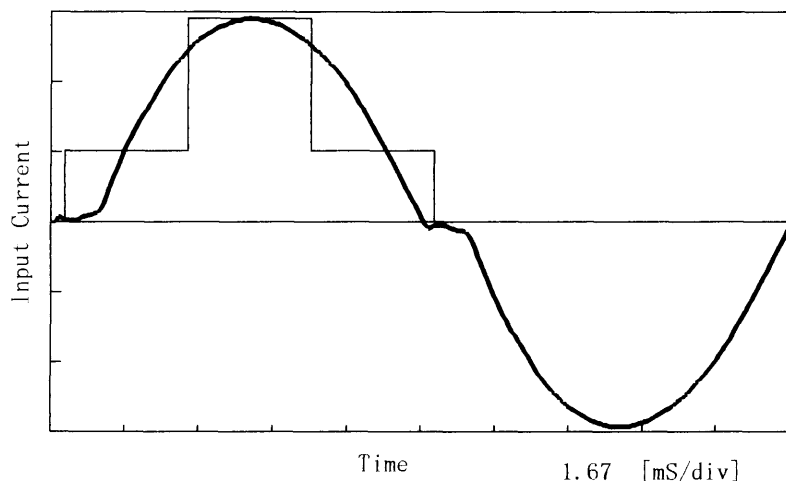


Model		MAX1600F	Temperature	25°C
Item		Harmonic Current 高調波電流	Testing Circuitry	Figure E
Object				

1. Input Current Waveform

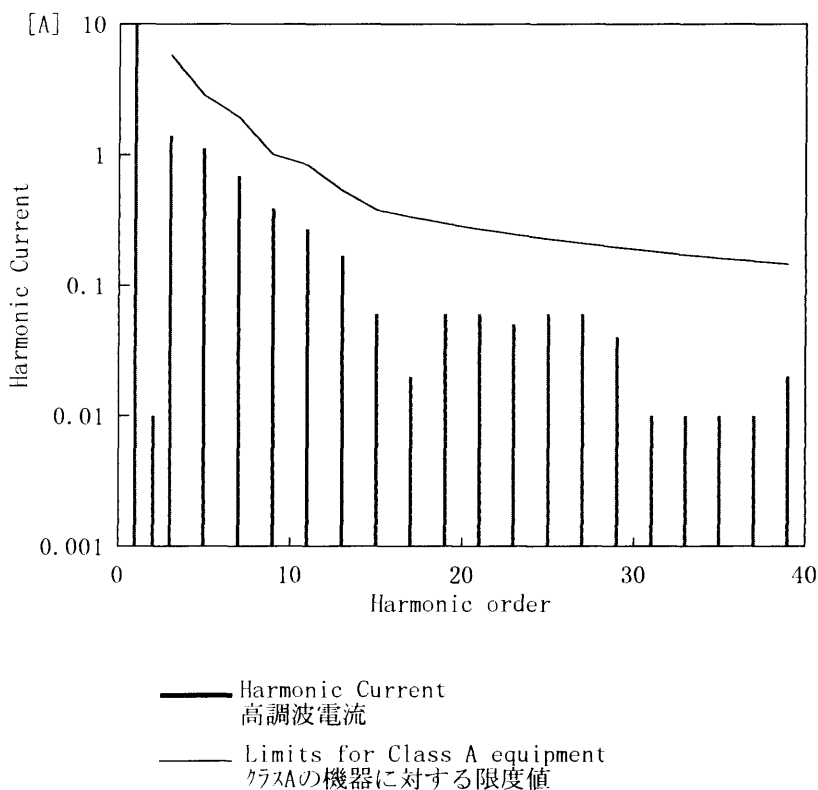
— Input Current
 — Envelope of the input current to classify equipment as Class D
 クラスDの機器を決定するための入力電流包絡線

10 A/div



Conditions	Values
Input Voltage [V]	100.0
Input Current [A]	19.3
Active Power [W]	1922.5
Apparent Power [VA]	1933.8
Frequency [Hz]	60
Power Factor	0.994
Output Power [W]	1500

2. Harmonic Current



Harmonics order 高調波次数	Limits 限度値 [A]	Values 測定値 [A]
1	—	*****
2	—	0.01000
3	5.75000	1.40000
4	—	0.00000
5	2.85000	1.12000
6	—	0.00000
7	1.92500	0.69000
8	—	0.00000
9	1.00000	0.39000
10	—	0.00000
11	0.82500	0.27000
12	—	0.00000
13	0.52500	0.17000
14	—	0.00000
15	0.37500	0.06000
16	—	0.00000
17	0.33088	0.02000
18	—	0.00000
19	0.29605	0.06000
20	—	0.00000
21	0.26786	0.06000
22	—	0.00000
23	0.24457	0.05000
24	—	0.00000
25	0.22500	0.06000
26	—	0.00000
27	0.20833	0.06000
28	—	0.00000
29	0.19397	0.04000
30	—	0.00000
31	0.18145	0.01000
32	—	0.00000
33	0.17045	0.01000
34	—	0.00000
35	0.16071	0.01000
36	—	0.00000
37	0.15203	0.01000
38	—	0.00000
39	0.14423	0.02000
40	—	0.00000

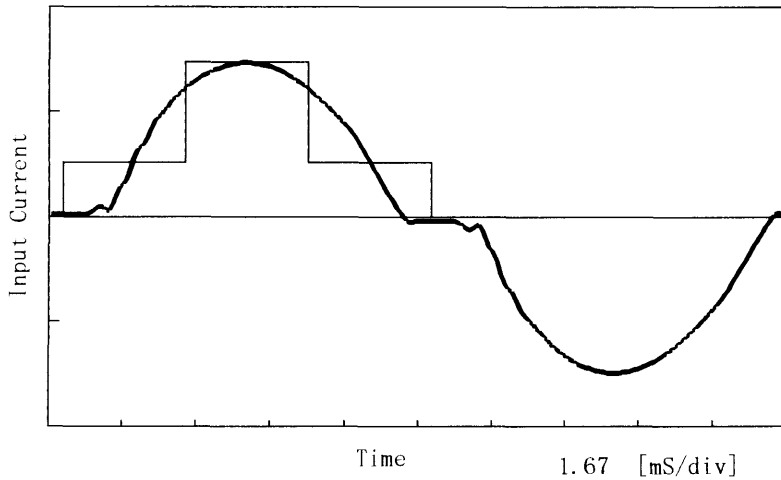


Model		MAX1600F	Temperature	25°C
Item		Harmonic Current 高調波電流	Testing Circuitry	Figure E
Object				

1. Input Current Waveform

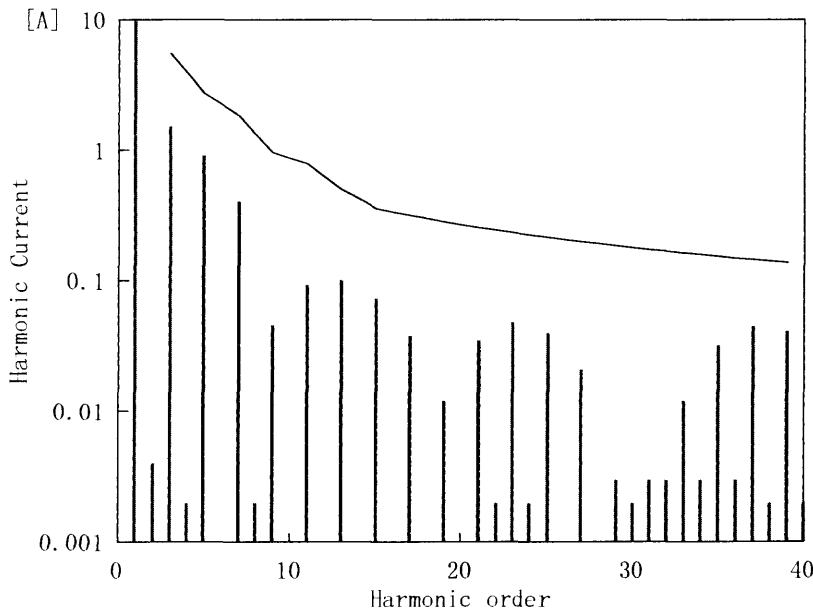
Input Current
 Envelope of the input current to classify equipment as Class D
 クラスDの機器を決定するための入力電流包絡線

10 A/div



Conditions	Values
Input Voltage [V]	100.0
Input Current [A]	9.86
Active Power [W]	968.1
Apparent Power [VA]	985.8
Frequency [Hz]	60
Power Factor	0.982
Output Power [W]	750

2. Harmonic Current



Harmonic Current
 高調波電流
 Limits for Class A equipment
 クラスAの機器に対する限度値

Harmonics order 高調波次数	Limits 限度値 [A]	Values 測定値 [A]
1	—	*****
2	—	0.00400
3	5.48755	1.52100
4	—	0.00200
5	2.71992	0.91100
6	—	0.00100
7	1.83714	0.40700
8	—	0.00200
9	0.95436	0.46600
10	—	0.00100
11	0.78734	0.09300
12	—	0.00100
13	0.50104	0.10200
14	—	0.00000
15	0.35788	0.07400
16	—	0.00000
17	0.31578	0.03800
18	—	0.00100
19	0.28254	0.01200
20	—	0.00100
21	0.25563	0.03500
22	—	0.00200
23	0.23340	0.04800
24	—	0.00200
25	0.21473	0.04000
26	—	0.00100
27	0.19882	0.02100
28	—	0.00100
29	0.18511	0.00300
30	—	0.00200
31	0.17317	0.00300
32	—	0.00300
33	0.16267	0.01200
34	—	0.00300
35	0.15338	0.03200
36	—	0.00300
37	0.14509	0.04500
38	—	0.00200
39	0.13765	0.04100
40	—	0.00200



COSEL		
Model	MAX1600F	
Item	Condensation 結露特性	Testing Circuitry Figure A

1. Condensation test 結露特性試験

Testing procedure is as follows.

- ① Keeping and cooling the unit in a tank at -10°C for an hour with the input off.
- ② Taking it out of the tank and dewing itself in a room where the temperature is 25°C and the humidity is 40%RH.
- ③ Testing electrical characteristics of the unit to confirm there be no fault.

入力を切った状態で、恒温槽で-10°Cに冷却しておき、約1時間後に恒温槽から取り出し、室温25°C、湿度40%RHの状態におき結露させ、その電気的特性の測定を行い、異常のないことを確認する。

2. Values

Object	V1: +15.0V27A
--------	---------------

Item	Data	Testing Conditions
Output Voltage [V]	15.036	Input Volt.: 100V, Load Current:27A
Line Regulation [mV]	6	Input Volt.: 90~132V, Load Current:27A
Load Regulation [mV]	20	Input Volt.: 100V, Load Current:0~27A

Object	V2: +18.0V22A
--------	---------------

Item	Data	Testing Conditions
Output Voltage [V]	18.079	Input Volt.: 100V, Load Current:22A
Line Regulation [mV]	6	Input Volt.: 90~132V, Load Current:22A
Load Regulation [mV]	22	Input Volt.: 100V, Load Current:0~22A

Object	V3: +24.0V17A
--------	---------------

Item	Data	Testing Conditions
Output Voltage [V]	24.076	Input Volt.: 100V, Load Current:17A
Line Regulation [mV]	4	Input Volt.: 90~132V, Load Current:17A
Load Regulation [mV]	17	Input Volt.: 100V, Load Current:0~17A

Object	V4: +28.0V14.5A
--------	-----------------

Item	Data	Testing Conditions
Output Voltage [V]	28.044	Input Volt.: 100V, Load Current:14.5A
Line Regulation [mV]	5	Input Volt.: 90~132V, Load Current:14.5A
Load Regulation [mV]	22	Input Volt.: 100V, Load Current:0~14.5A



Model		MAX1600F	Temperature	25°C
Item		Leakage Current 漏洩電流		
Object		_____		

1. Results

Standards	Leakage Current [mA]		
	Input Volt. 85 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]
(A) DENTORI	0.40	0.45	0.65
(B) IEC60950	0.45	0.50	0.65

2. Condition

Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

交流入力の特徴について測定し、その大きい方を漏洩電流測定値とする。

Standards	Leakage Current [mA]		
	Input Volt. 170 [V]	Input Volt. 230 [V]	Input Volt. 264 [V]
(B) IEC60950	—	—	—



COSEL																												
Model	MAX1600F																											
Item	Line Noise Tolerance 入力雑音耐量	Temperature	25°C																									
		Testing Circuitry	Figure C																									
<p>1. Results</p> <p>Conditions</p> <p>Input Voltage :100 V Pulse Input Duration:1 min. or more</p> <p>Pulse Voltage :2000 V Load :100 %</p> <p>Pulse Cycle :10 mS</p>																												
Object	V 1 : +15.0V27A																											
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Model		MAX1600F	Temperature		25°C
Item		Conducted Emission 雑音端子電圧	Testing Circuitry		Figure D
Object					

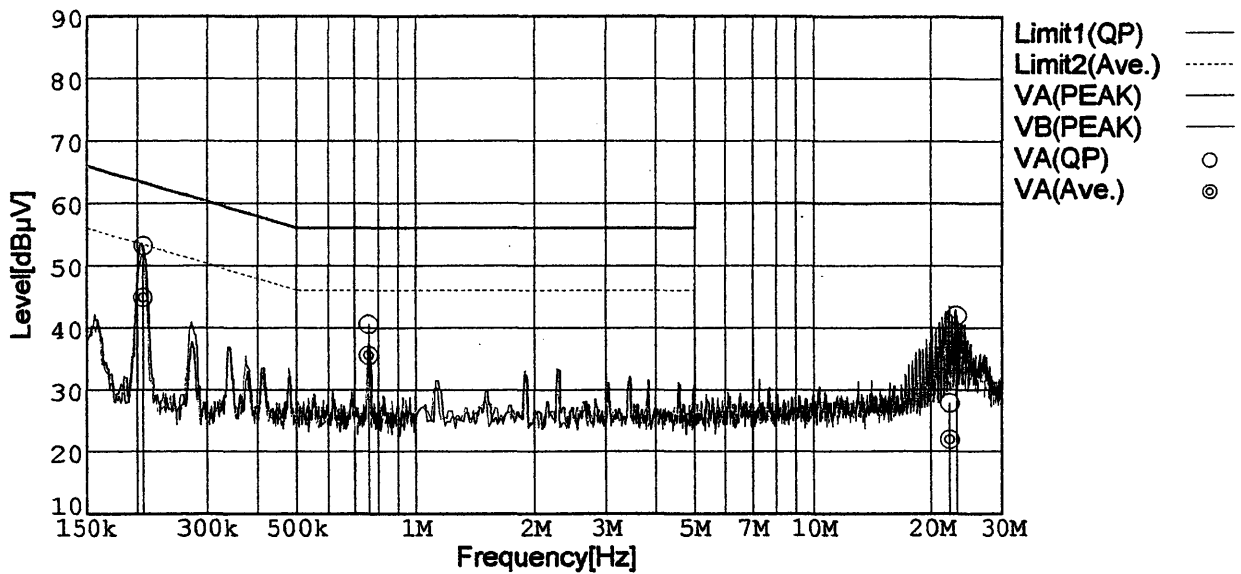
1. Graph

Remarks

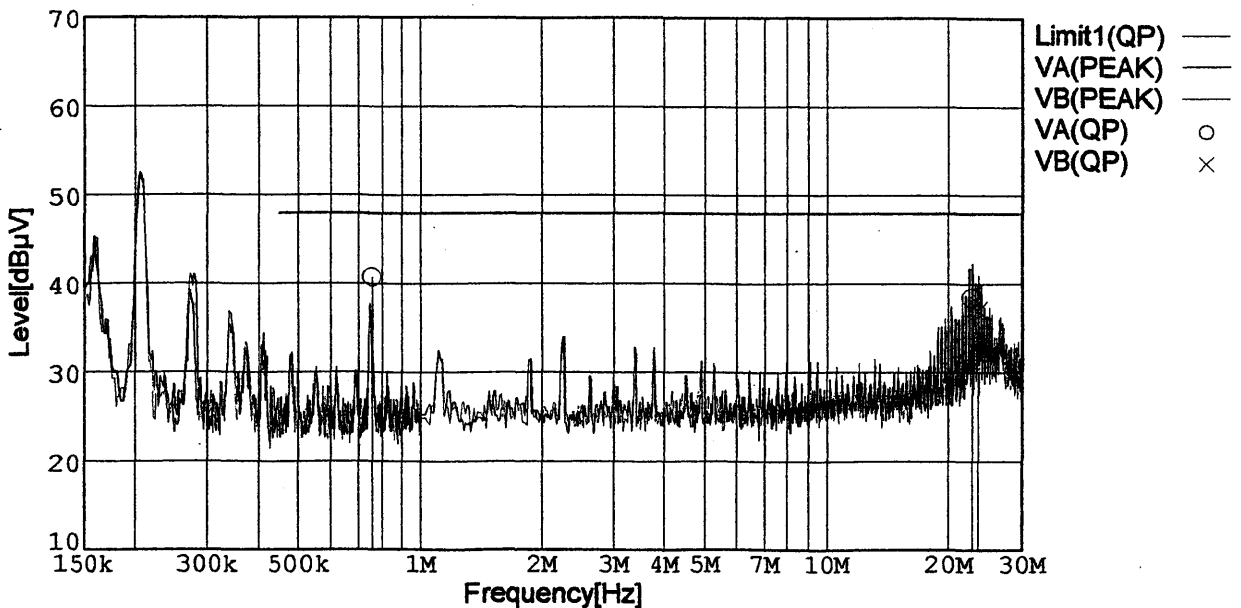
Input Volt. 100 V (VCCI Class B)
 120 V (FCC Class B)
 Load 100 %

Limit1: [VCCI] Class B(QP)

Limit2: [VCCI] Class B(Ave.)



Limit1: [FCC Part15] Class B



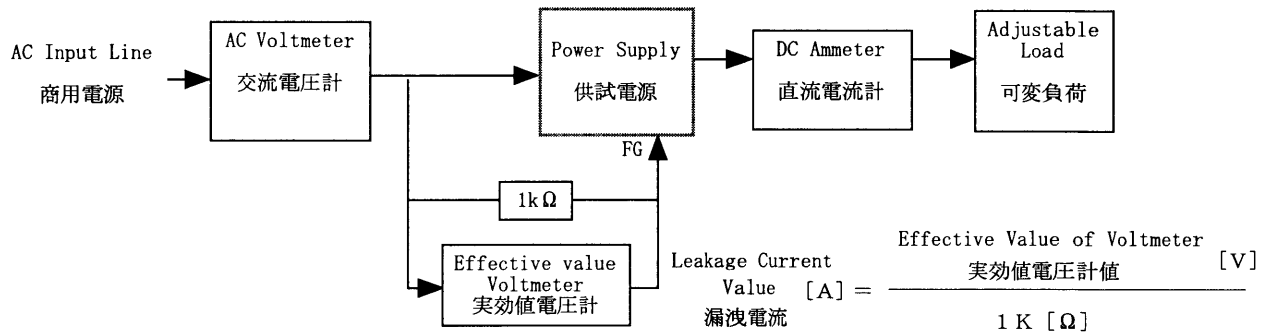
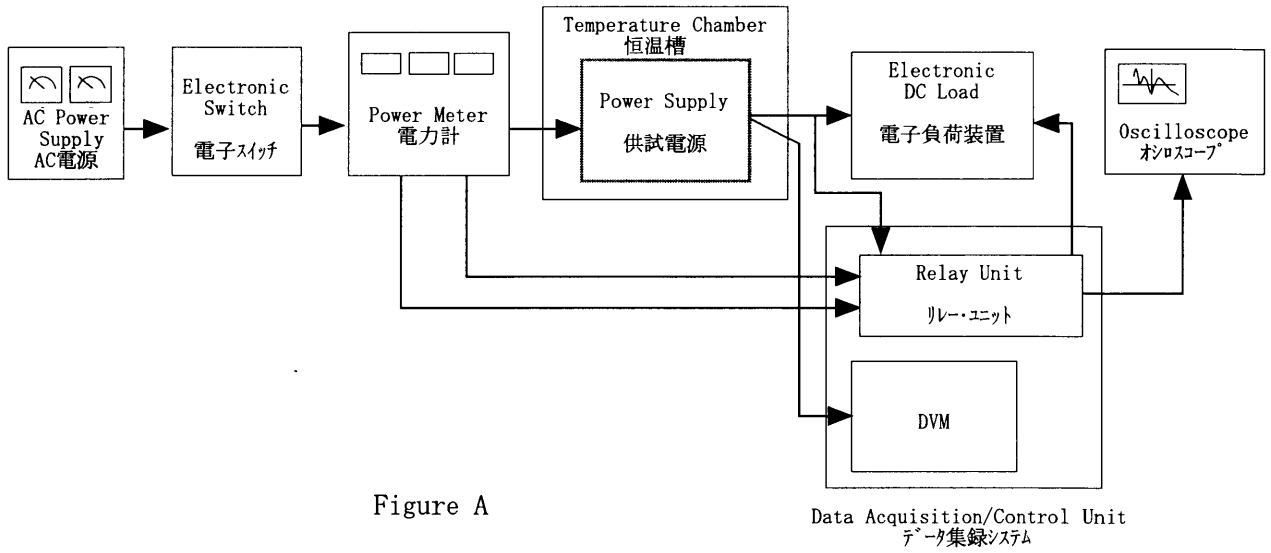


Figure B (DENTORI)

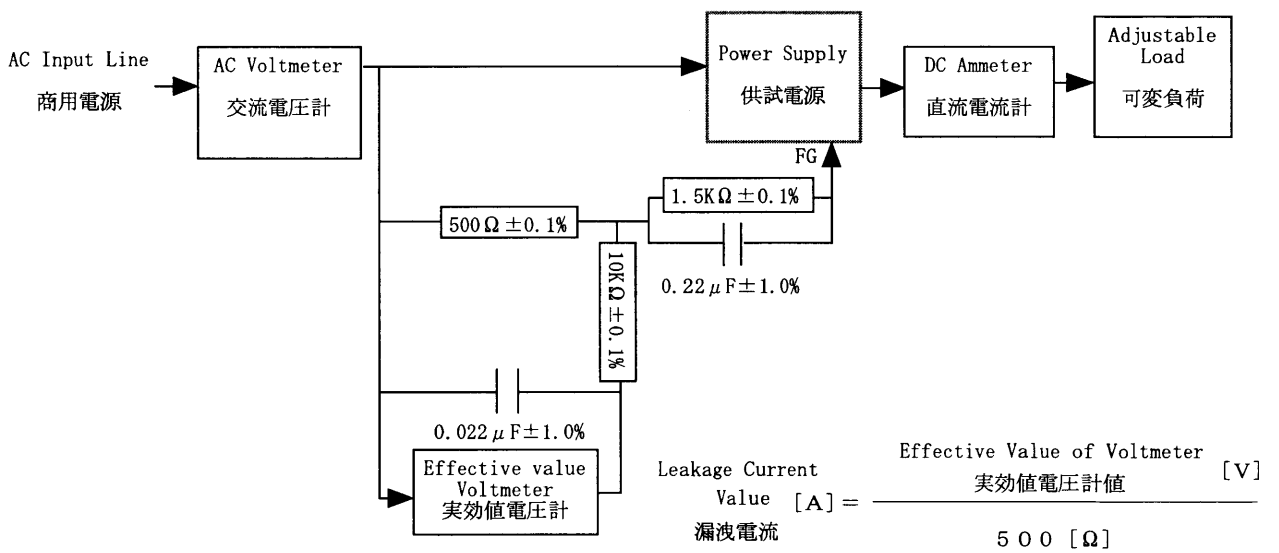


Figure B (IEC60950)

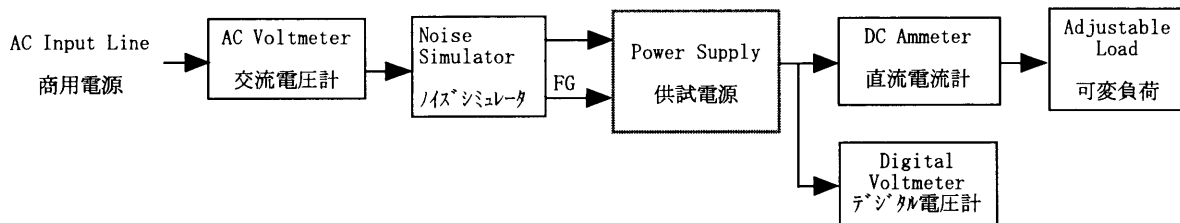


Figure C

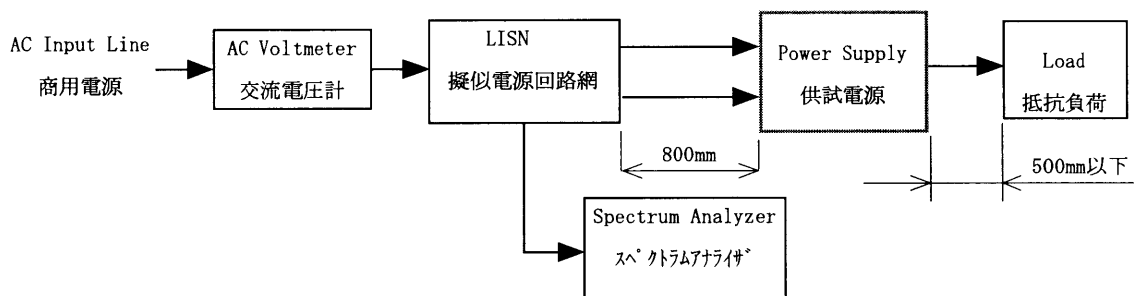


Figure D

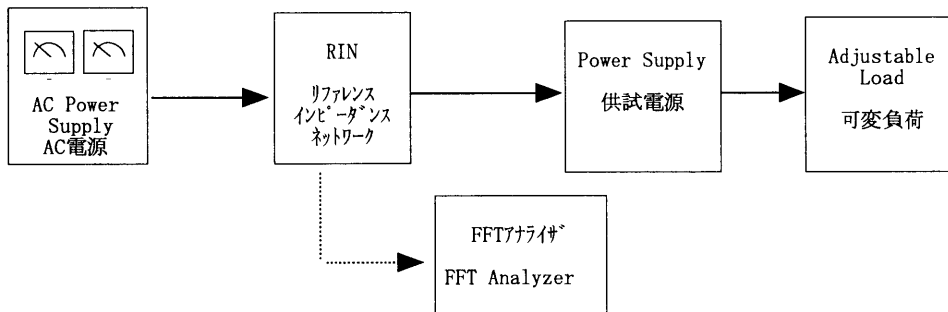


Figure E