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Evaluation Method 評價方法

Circuit used for determination 特性電路圖

## Circuit 1 特性回路1

Line&Load Regulation And Temperature Chafaile Character (輸入&負荷及溫度變動特性)

Over-Voltage Protection (過電壓保護特性)

Over-Current Protection (過電流保護特性)

Dynamic ripple Character(動態負載特性)

Efficiency Character(效率特性)

Input&Load Change Character(輸入&負荷變動特性)

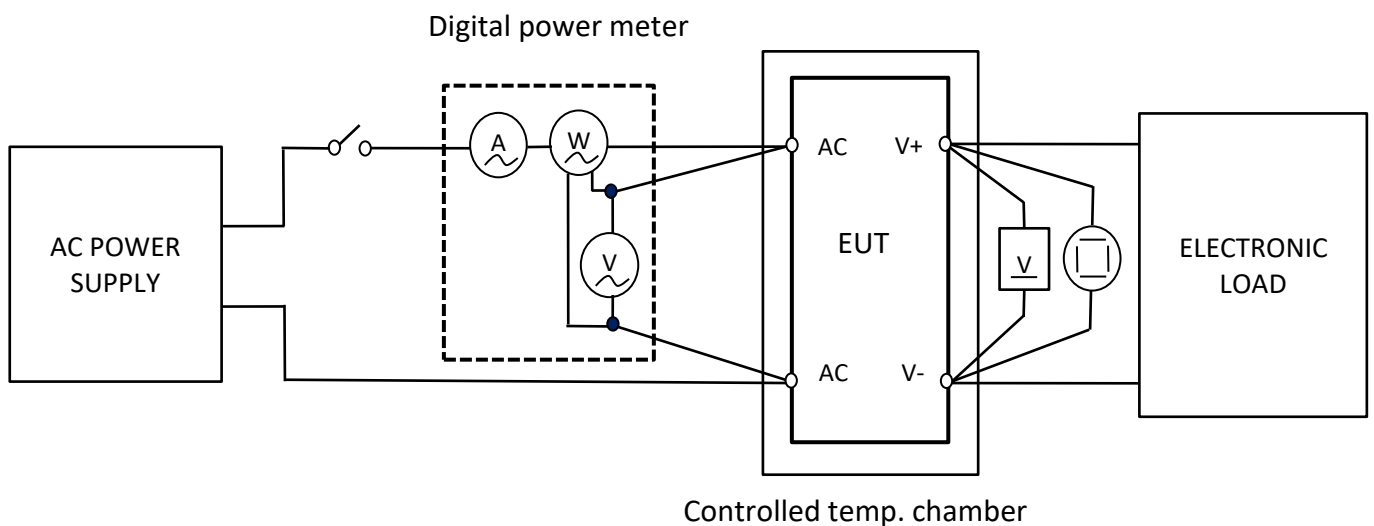
Turn On Delay(開機爬升延遲時間)

Hold Up Time Character (保持時間)

Low Vac Shut Off (輸入欠壓關斷特性)

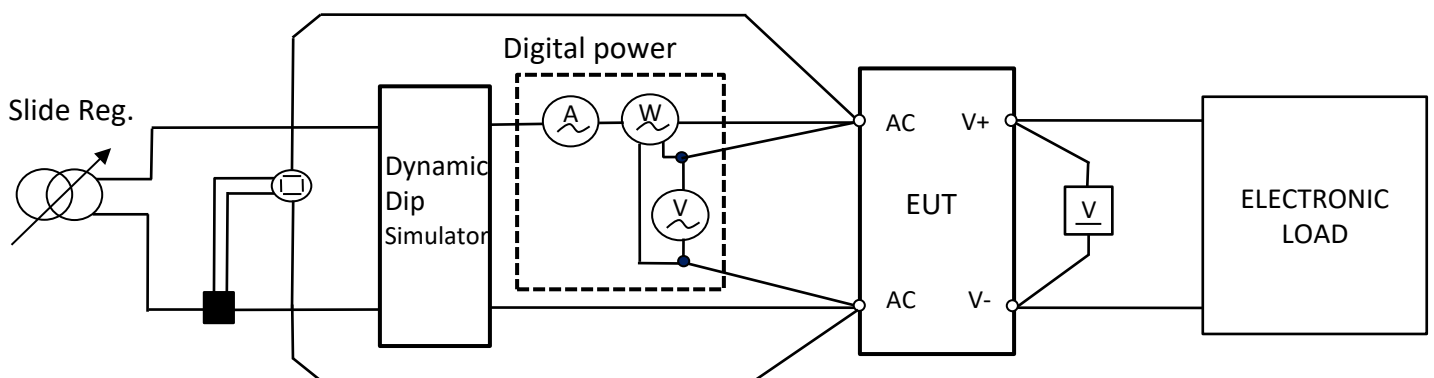
Over Shoot(過沖特性)

Under Shoot(下沖特性)



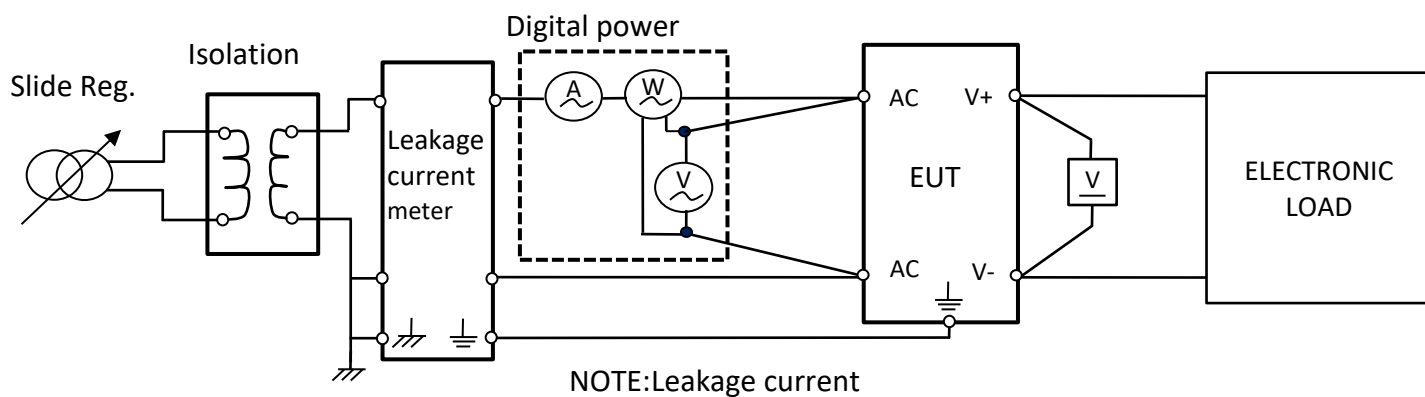
## Circuit 2 特性回路2

Inrush Current (浪涌電流)



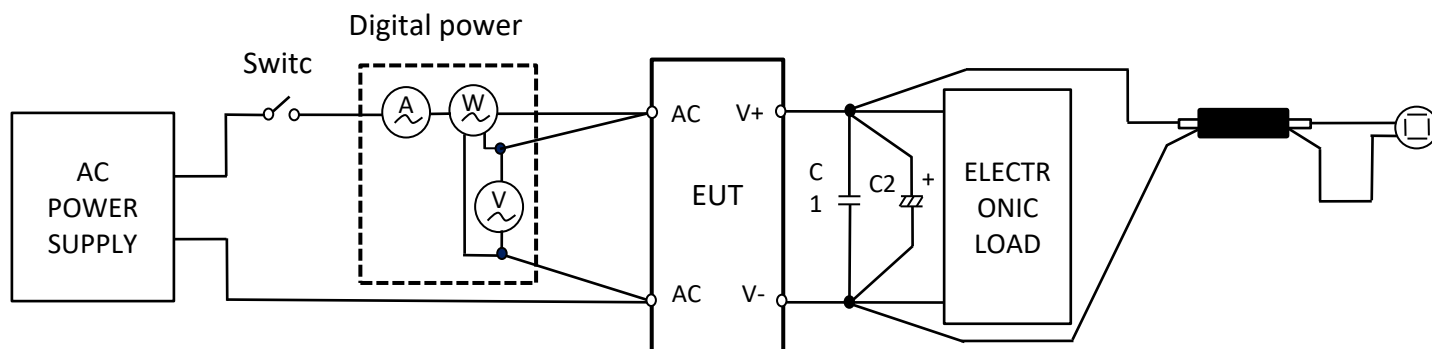
## Circuit 3 特性回路3

Leak Current (漏電流特性)



## Circuit 4 特性回路4

Ripple And Noise Character(紋波特性)



C1 : 0.1 $\mu$ F CERAMICS CAPACITOR

C2 : 10 $\mu$  100V ALUMINUM CAPACITOR

THE BANDWIDTH OF OSCILLOSCOPE IS SET WITH 20MHz

## 1.ELECTRICAL FUNCTION Character(電氣特性)

## 1-1.Line&amp;Load Regulation And Temperature Chafaile Character (輸入&amp; 負荷及溫度變動特性)

※ Character Condition(特性條件) :

1	I/P Voltage(Vac)(輸入電壓)	85Vac/100Vac/240Vac/265Vac
2	I/P Frequency(Hz)(輸入頻率)	47Hz ~63Hz
3	Output Load(輸出負載)	0%,25%,50%,75%,100% Of Full Load
4	Regulation(調整率)	Load Regulation: $\leq 10\%$ ; Line Regulation $\leq 2\%$
5	Ambient Temp.(°C)(環境溫度)	25°C
6	Sample Size(取樣數)	1PCS

Output voltage	48.0V
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※ Character Data(特性數據) :

I/P O/P	85Vac/63Hz	100Vac/60Hz	240Vac/50Hz	265Vac/47Hz	Line Regulation $\leq 2\%$
0%	48.032V	48.029V	48.029V	48.022V	0.02%
25%	48.031V	48.031V	48.061V	48.058V	0.06%
50%	48.025V	48.024V	48.073V	48.075V	0.11%
75%	48.091V	48.073V	48.084V	48.09V	0.04%
100%	48.132V	48.125V	48.098V	48.098V	0.07%
Load Regulation: $\leq 10\%$	0.22%	0.21%	0.14%	0.16%	

## 1-2.1 Ripple And Noise Character (紋波與雜訊)

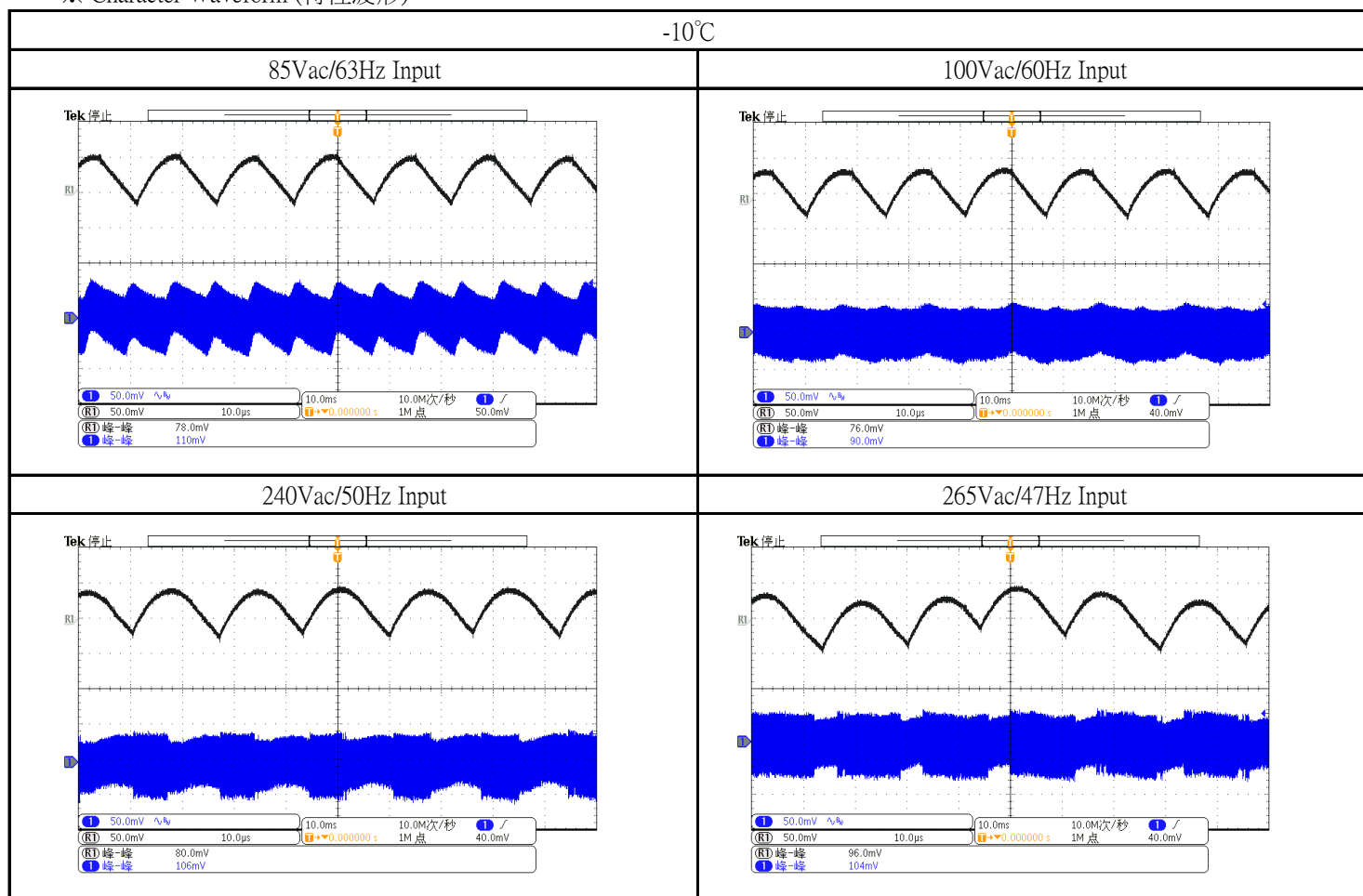
※ Character Condition(特性條件):

1	I/P Voltage(Vac)(輸入電壓)	85Vac/100Vac/240Vac/265Vac
2	I/P Frequency(Hz)(輸入頻率)	47Hz ~63Hz
3	Output Load(輸出負載)	Full Load
4	Ambient Temp.(°C)(環境溫度)	-10°C
5	Sample Size(取樣數)	1PCS

※ Character Data(特性數據):

I/P	85Vac/63Hz		100Vac/60Hz		240Vac/50Hz		265Vac/47Hz	
ITEM	Ripple	Noise	Ripple	Noise	Ripple	Noise	Ripple	Noise
-10°C	78.0mV	110.0mV	76.0mV	90.0mV	80.0mV	106.0mV	96.0mV	104.0mV

※ Character Waveform (特性波形):



## 1-2.3 Ripple And Noise Character (紋波與雜訊)

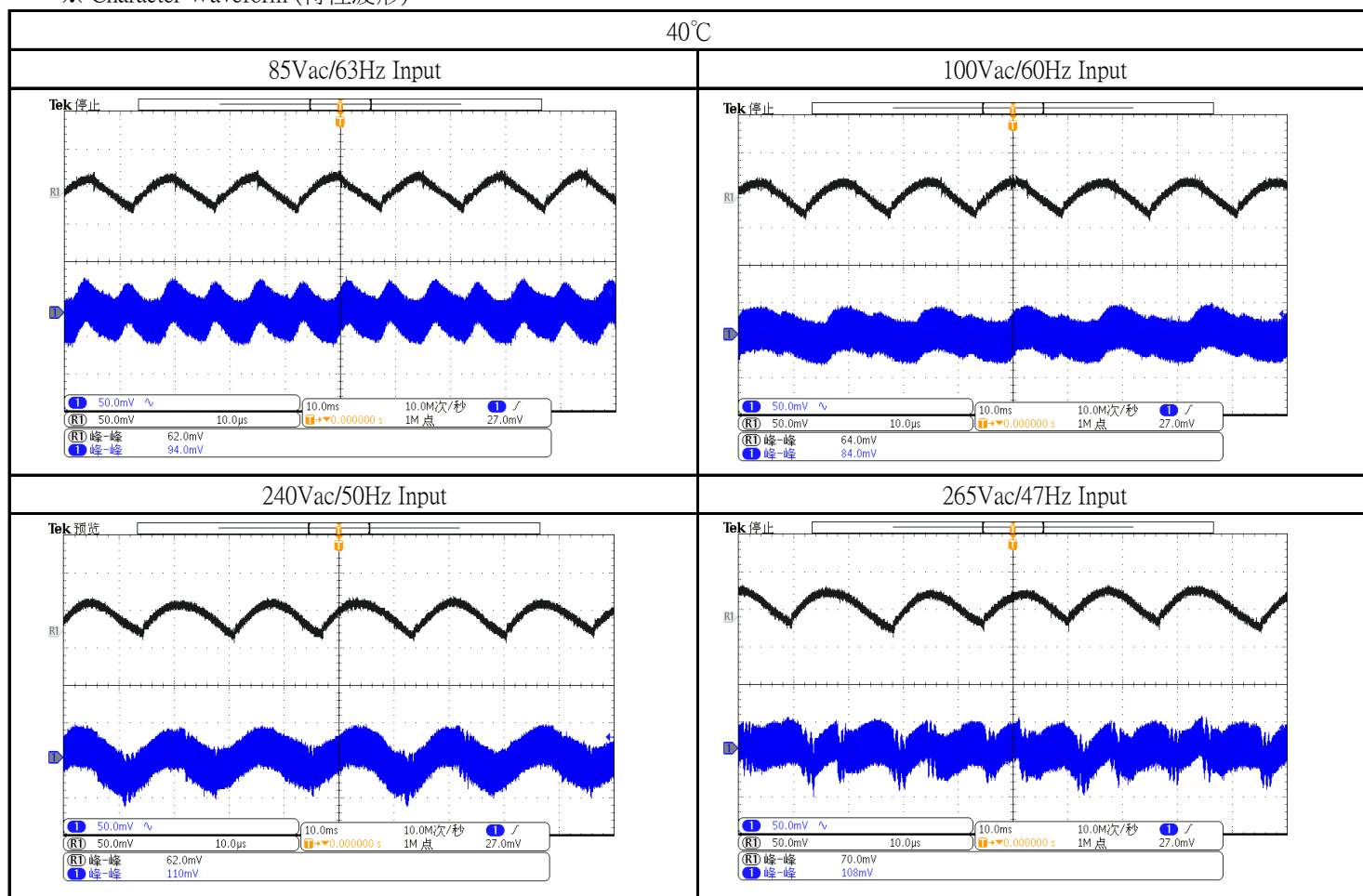
※ Character Condition(特性條件):

1	I/P Voltage(Vac)(輸入電壓)	85Vac/100Vac/240Vac/265Vac
2	I/P Frequency(Hz)(輸入頻率)	47Hz ~63Hz
3	Output Load(輸出負載)	Full Load
4	Ambient Temp.(°C)(環境溫度)	40°C
5	Sample Size(取樣數)	1PCS

※ Character Data(特性數據):

I/P	85Vac/63Hz		100Vac/60Hz		240Vac/50Hz		265Vac/47Hz	
ITEM	Ripple	Noise	Ripple	Noise	Ripple	Noise	Ripple	Noise
40°C	62.0mV	94.0mV	64.0mV	84.0mV	62.0mV	110.0mV	70.0mV	108.0mV

※ Character Waveform (特性波形):



## 1-3.Over-Voltage Protection(過電壓保護特性)

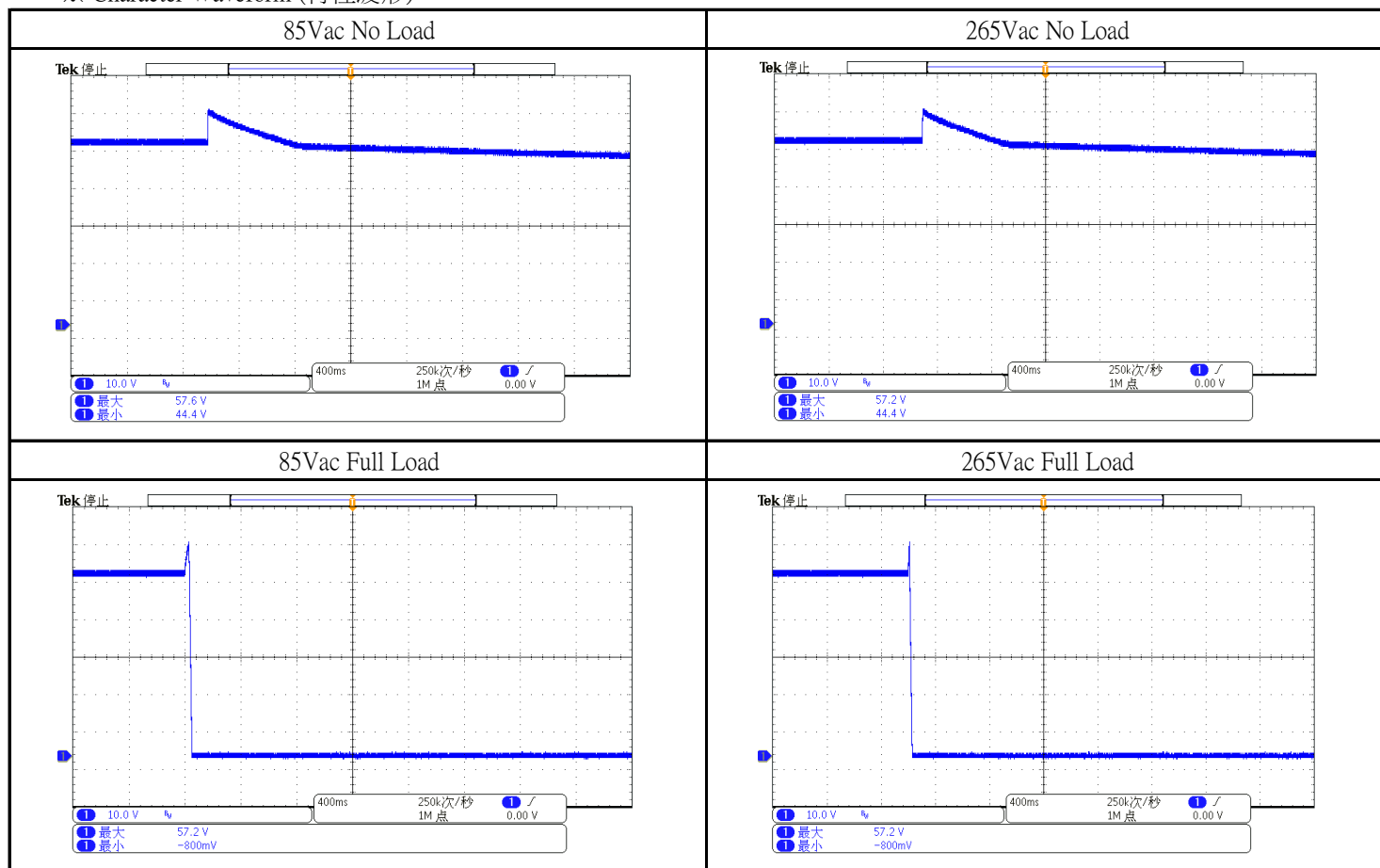
※ Character Condition(特性條件):

1	I/P Voltage(Vac)(輸入電壓)	85Vac/265Vac
2	I/P Frequency(Hz)(輸入頻率)	47Hz /63Hz
3	Output Load(輸出負載)	No/Full Load
4	Ambient Temp.(°C)(環境溫度)	25°C
5	Sample Size(取樣數)	1PCS

※ Character Data(特性數據):

O/P	No Load		Full Load	
I/P	85Vac/63Hz	265Vac/47Hz	85Vac/63Hz	265Vac/47Hz
Character Result	57.6V	57.2V	57.2V	57.2V

※ Character Waveform (特性波形):



## 1-4.Over-Current Protection(過電流保護特性)

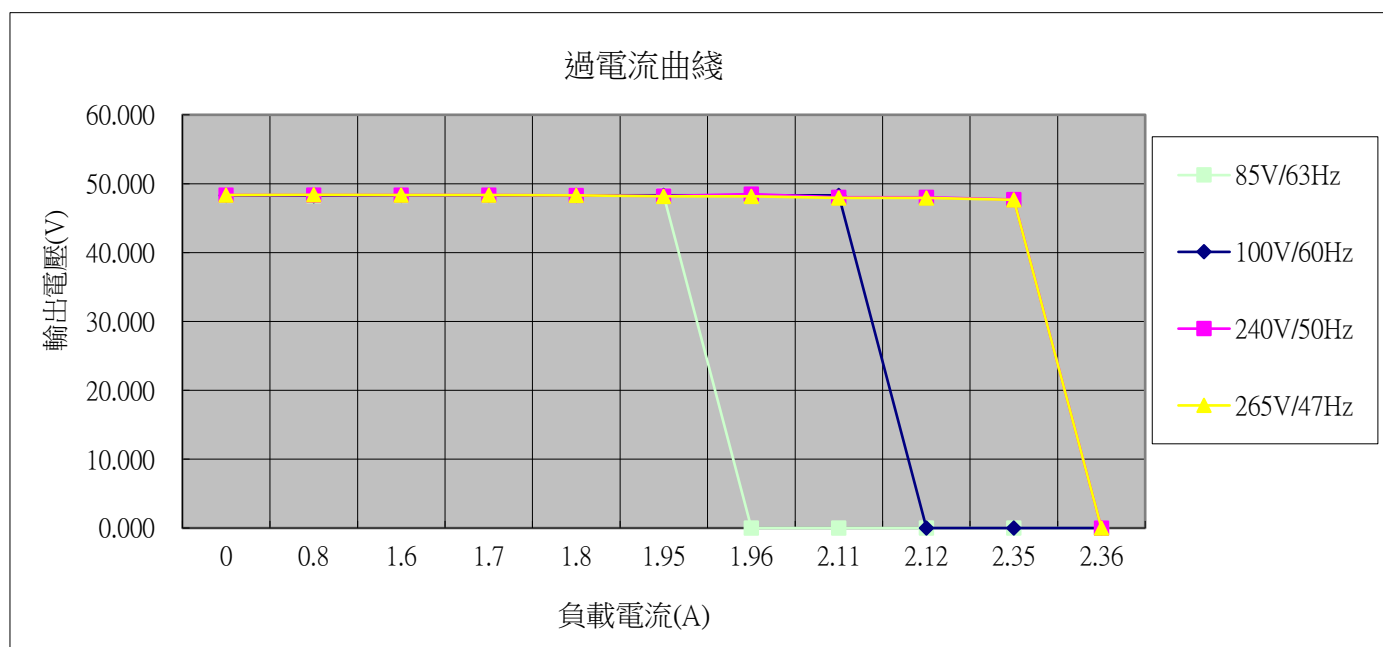
※ Character Condition(特性條件):

1	I/P Voltage(Vac)(輸入電壓)	85Vac/100Vac/240Vac/265Vac
2	I/P Frequency(Hz)(輸入頻率)	47Hz ~63Hz
3	Output Load(輸出負載)	Full Load
4	Ambient Temp.(°C)(環境溫度)	25°C
5	Sample Size(取樣數)	1PCS

※ Character Data(特性數據):

I/P	85V/63Hz	100V/60Hz	240V/50Hz	265V/47Hz
O.C.P點	1.96A	2.12A	2.36A	2.36A

I/P	85V/63Hz										
Voltage(V)	48.308	48.260	48.307	48.308	48.308	48.309	0	0	0	0	0
Current(A)	0	0.8	1.6	1.7	1.8	1.95	1.96	2.11	2.12	2.35	2.36
I/P	100V/60Hz										
Voltage(V)	48.308	48.260	48.307	48.308	48.308	48.314	48.311	48.311	0	0	0
Current(A)	0	0.8	1.6	1.7	1.8	1.95	1.96	2.11	2.12	2.35	2.36
I/P	240V/50Hz										
Voltage(V)	48.347	48.357	48.335	48.344	48.316	48.195	48.485	48.047	48.048	47.721	0
Current(A)	0	0.8	1.6	1.7	1.8	1.95	1.96	2.11	2.12	2.35	2.36
I/P	265V/47Hz										
Voltage(V)	48.359	48.381	48.361	48.358	48.328	48.158	48.145	47.945	47.942	47.651	0
Current(A)	0	0.8	1.6	1.7	1.8	1.95	1.96	2.11	2.12	2.35	2.36





## 1-5. Dynamic ripple Character(動態負載特性)

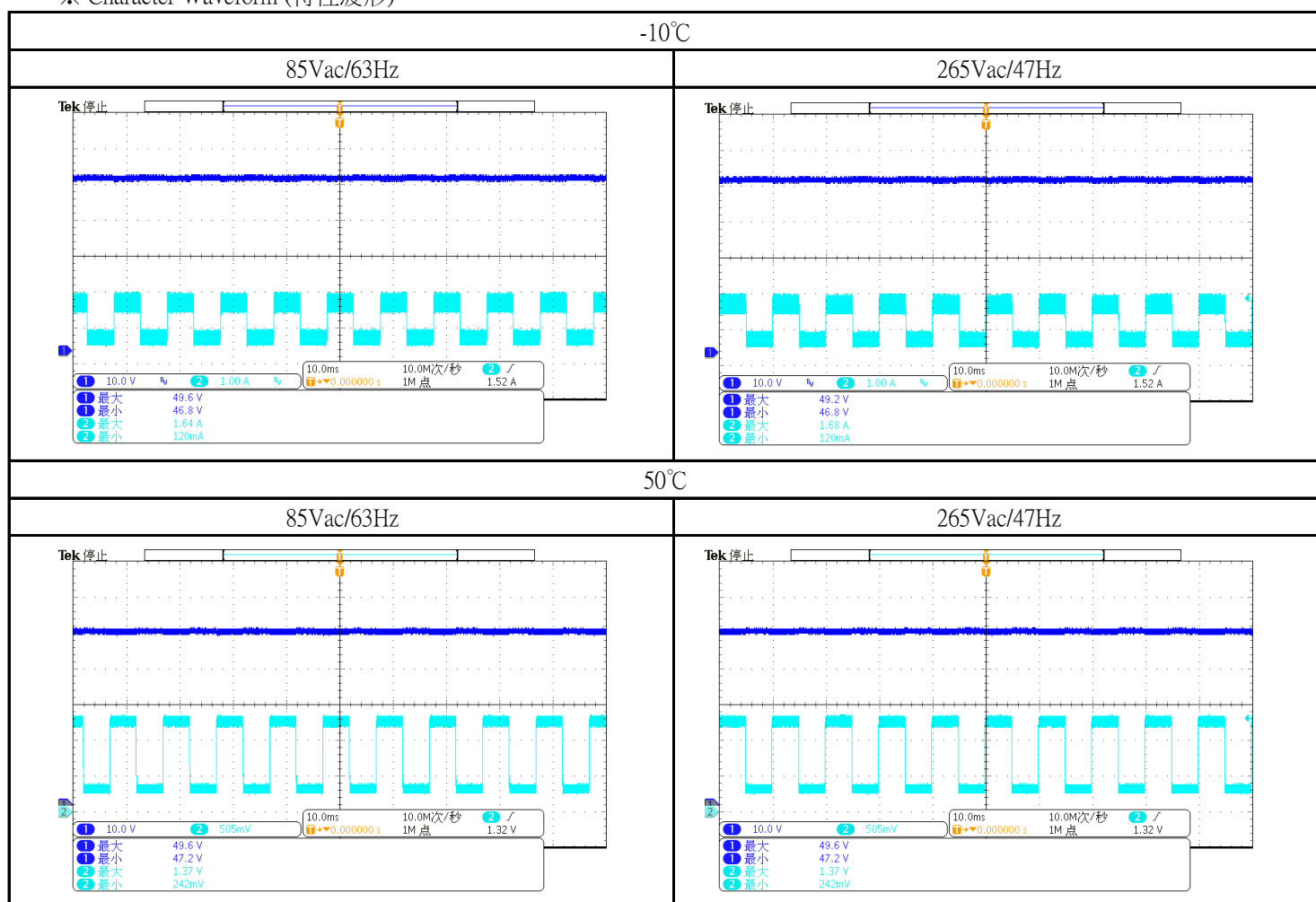
※ Character Condition(特性條件):

1	I/P Voltage(Vac)(輸入電壓)	85Vac/265Vac
2	I/P Frequency(Hz)(輸入頻率)	47Hz /63Hz
3	Output Load(輸出負載)	20%-80% Full Load,TH=5ms,TL=5ms,Slew rate=0.1A/us
4	Ambient Temp.(°C)(環境溫度)	- 10°C /40°C
5	Sample Size(取樣數)	1PCS

※ Character Data(特性數據):

I/P	85Vac/63Hz		265Vac/47Hz	
O/P	Max	Min	Max	Min
-10°C	49.6V	46.8V	49.2V	46.8V
50°C	49.6V	47.2V	49.6V	47.2V

※ Character Waveform (特性波形):



## 1-6.Efficiency Character(效率特性)

※ Character Condition(特性條件):

1	I/P Voltage(Vac)(輸入電壓)	115Vac/230Vac
2	I/P Frequency(Hz)(輸入頻率)	50Hz / 60Hz
3	Output Load(輸出負載)	0%,10%,25%,50%,75%,100% of Full Load
4	Ambient Temp.(°C)(環境溫度)	25°C
5	Sample Size(取樣數)	1PCS
6	Output Load(輸出負載)	2.0A

※ Character Data(特性數據):

使用線材	N/A
------	-----

Efficiency								Stand by consumption	
Load		10% 25% 50% 75% 100%						0%	
I/P		115Vac/60Hz			230Vac/50Hz			Input 115V/60Hz	230V/50HZ
O/P Load		Pin (W)	Pout (W)	Efficiency (%)	Pin (W)	Pout (W)	Efficiency (%)	0.09W	0.17W
10%	0.16A	8.61	7.76	90.13%	8.84	7.73	87.44%		
25%	0.4A	21.25	19.38	91.20%	21.43	19.34	90.25%		
50%	0.8A	42.57	38.70	90.91%	42.65	38.66	90.64%		
75%	1.2A	63.98	57.98	90.62%	63.86	57.96	90.76%		
100%	1.6A	86.51	77.41	89.48%	84.95	77.28	90.97%		
Average				90.55%			90.66%		

1-7.Input&Load Change Character(輸入& 負荷變動特性)

※ Character Condition(特性條件) :

1	I/P Voltage(Vac)(輸入電壓)	85Vac~265Vac
2	I/P Frequency(Hz)(輸入頻率)	47Hz ~63Hz
3	Output Load(輸出負載)	No Load and Full Load
4	Ambient Temp.(°C)(環境溫度)	25°C
5	Sample Size(取樣數)	1PCS
6		

※ Character Equipment(特性設備) :

ITEM	Equipment Item(設備)	Model No. / Manufacturer(製造商和型號)
1	AC Source(變頻器)	ALL POWER/APG-1005N
2	Power Meter(功率表)	YOKOGAWA/WT310
3	DC Load(DC負載)	ITECH/IT8512+

※ Character Data(特性數據) :

Input change with no load			
No Load		Input Condition	
		85V/63Hz	265Vac/47Hz
	Input Current ( A )	0.012	0.027
	Input Power ( W )	0.082	0.28
Input change with full load			
Full Load		Input Condition	
		85V/63Hz	265Vac/47Hz
	Input Current ( A )	1.748	0.674
	Input Power ( W )	87.92	84.51

## 1-8.Inrush Current (浪涌電流)

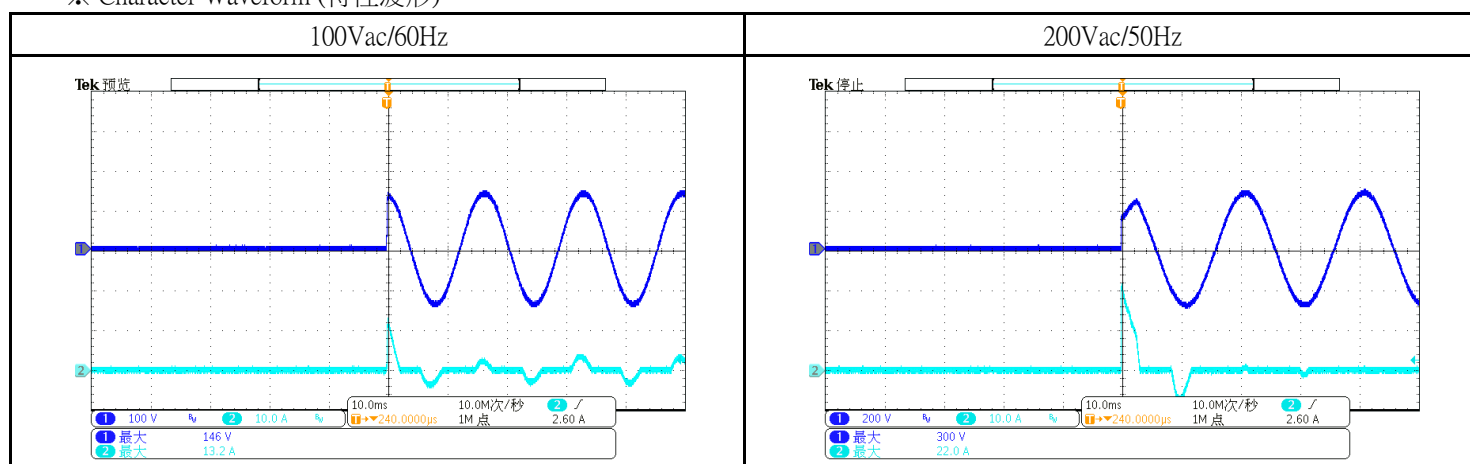
※ Character Condition(特性條件)：

1	I/P Voltage(Vac)(輸入電壓)	100Vac/200Vac
2	I/P Frequency(Hz)(輸入頻率)	50Hz /60Hz
3	Output Load(輸出負載)	Full Load
4	Ambient Temp.(°C)(環境溫度)	25°C
5	Sample Size(取樣數)	1PCS

※ Character Data(特性數據)：

Inrush Current		
I/P \ O/P I(A)	Full Load	Full Load
	100Vac/60Hz	200Vac/50Hz
Character Result	13.2A	22.0A

※ Character Waveform (特性波形)：



## 1-9.Turn On Delay(開機爬升延遲時間)

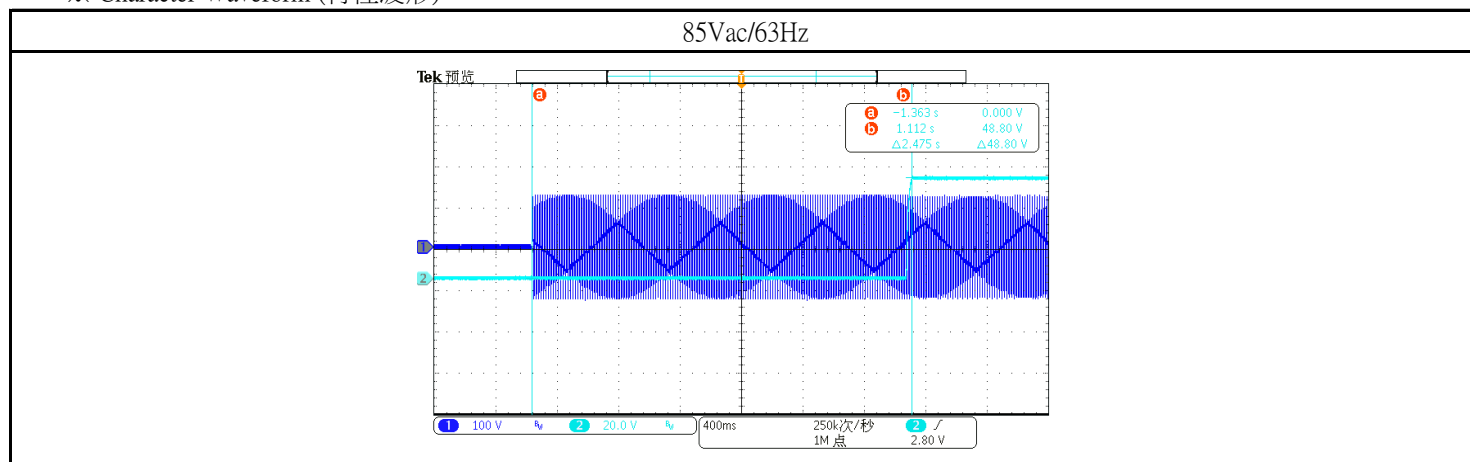
※ Character Condition(特性條件)：

1	I/P Voltage(Vac)(輸入電壓)	85Vac
2	I/P Frequency(Hz)(輸入頻率)	63Hz
3	Output Load(輸出負載)	Full Load
4	Ambient Temp.(°C)(環境溫度)	25°C
5	Sample Size(取樣數)	1PCS

※ Character Data(特性數據)：

Turn on delay time	
I/P	85Vac/63Hz
Character Result	2.475S

※ Character Waveform (特性波形)：



## 2-1. Hold Up Time Character (保持時間)

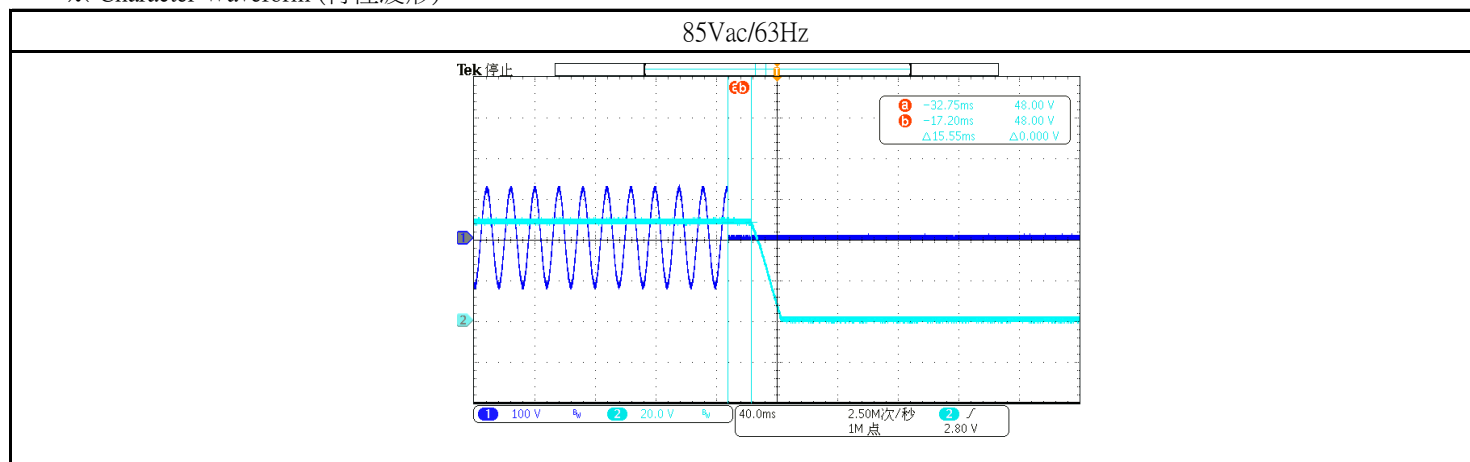
※ Character Condition(特性條件)：

1	I/P Voltage(Vac)(輸入電壓)	85Vac
2	I/P Frequency(Hz)(輸入頻率)	63Hz
3	Output Load(輸出負載)	Full Load
4	Ambient Temp.(°C)(環境溫度)	25°C
5	Sample Size(取樣數)	1PCS

※ Character Data(特性數據)：

Hold up time	
I/P	85Vac/63Hz
Character Result	15.55mS

※ Character Waveform (特性波形)：



## 2-2. Low Vac Shut Off (輸入欠壓關斷特性)

※ Character Condition(特性條件):

1	I/P Voltage(Vac)(輸入電壓)	0~85Vac
2	I/P Frequency(Hz)(輸入頻率)	60Hz
3	Output Load(輸出負載)	Full Load
4	Ambient Temp.(°C)(環境溫度)	25°C
5	Sample Size(取樣數)	1PCS

※ Character Data(特性數據):

LOW Vac SHUT OFF	
0~85Vac Input	
O/P	Full Load
Brown in	75.0V
85~0Vac Input	
O/P	Full Load
Brown out	68.0V

## 2-3. Over Shoot(過沖特性)

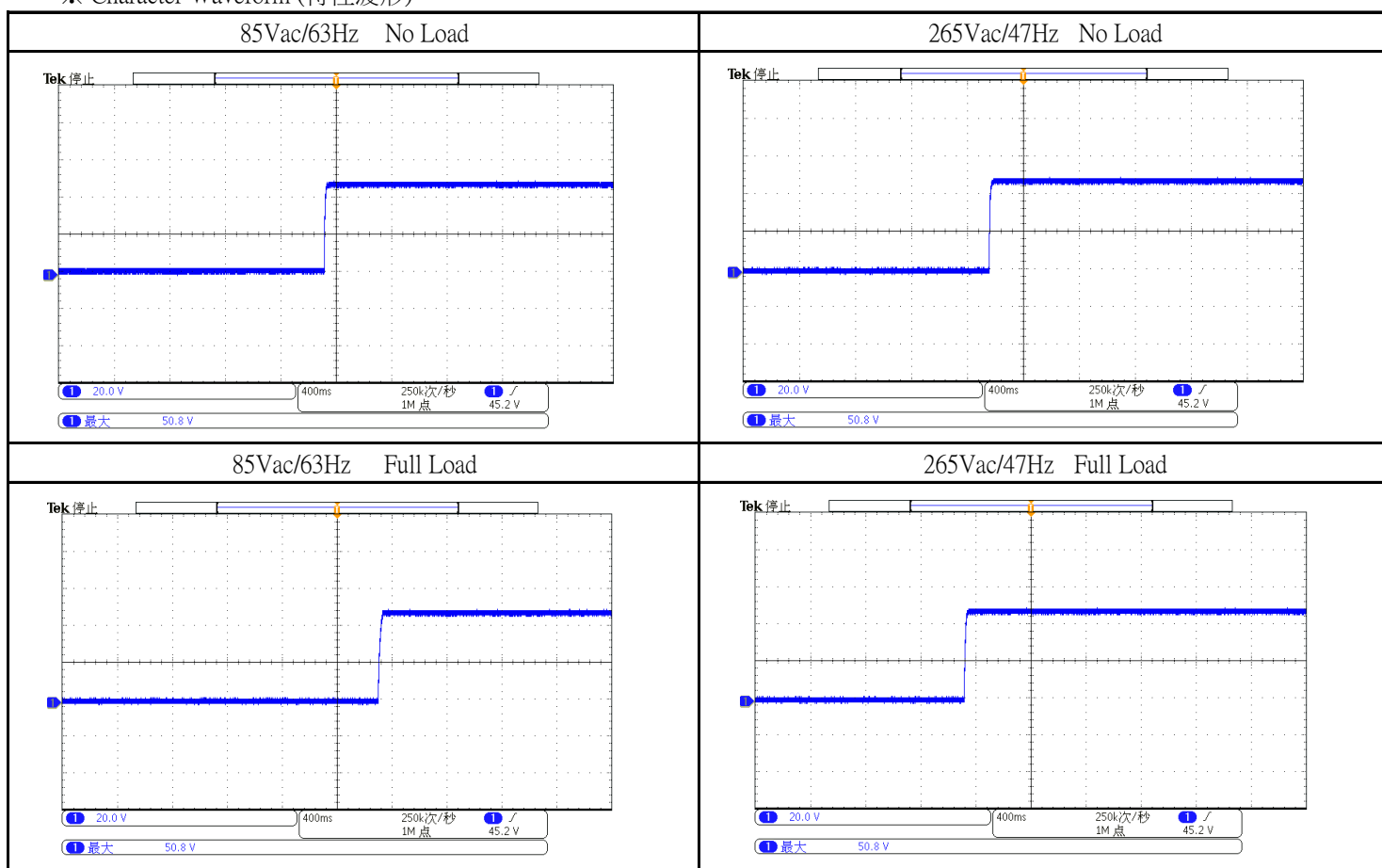
※ Character Condition(特性條件):

1	I/P Voltage(Vac)(輸入電壓)	85Vac/265Vac
2	I/P Frequency(Hz)(輸入頻率)	47Hz /63Hz
3	Output Load(輸出負載)	No Load/Full Load
4	Ambient Temp.(°C)(環境溫度)	25°C
5	Sample Size(取樣數)	1PCS

※ Character Data(特性數據):

Over Shoot				
O/P	No Load		Full Load	
I/P	85Vac/63Hz	265Vac/47Hz	85Vac/63Hz	265Vac/47Hz
Character Result	50.8V	50.8V	50.8V	50.8V

※ Character Waveform (特性波形):





## 2-4.Under Shoot(下冲特性)

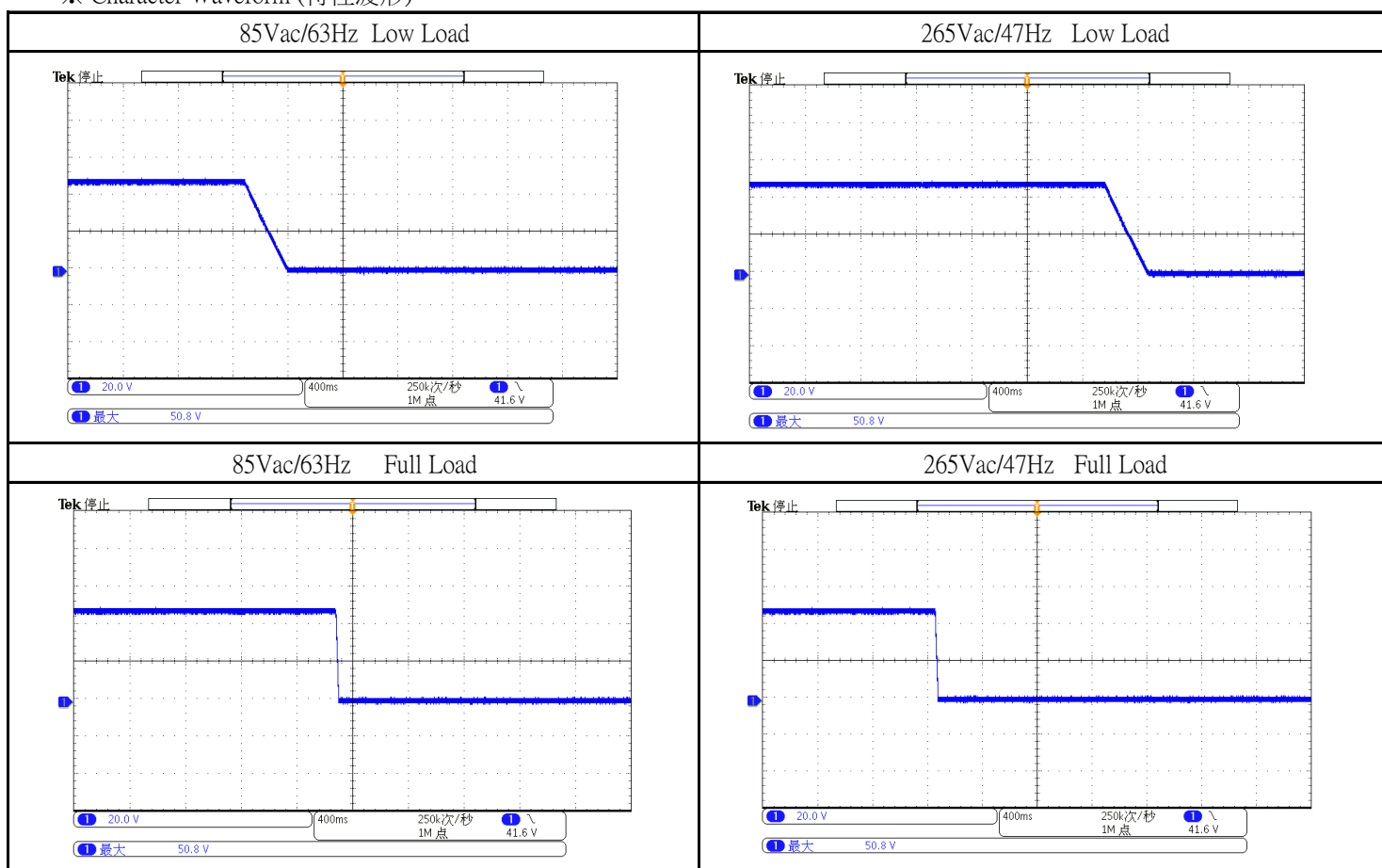
※ Character Condition(特性條件):

1	I/P Voltage(Vac)(輸入電壓)	85Vac/265Vac
2	I/P Frequency(Hz)(輸入頻率)	47Hz /63Hz
3	Output Load(輸出負載)	Low/Full Load
4	Ambient Temp.(°C)(環境溫度)	25°C
5	Sample Size(取樣數)	1PCS

※ Character Data(特性數據):

Under Shoot				
O/P	0.1A		Full Load	
I/P	85Vac/63Hz	265Vac/47Hz	85Vac/63Hz	265Vac/47Hz
Character Result	50.8V	50.8V	50.8V	50.8V

※ Character Waveform (特性波形):



## 2-5.Leak Current(漏電流特性)

※Character Condition(特性條件) :

1	I/P Voltage(Vac)(輸入電壓)	265Vac
2	I/P Frequency(Hz)(輸入頻率)	50Hz
3	Output Load(輸出負載)	No Load
4	Ambient Temp.(°C)(環境溫度)	25°C
5	Sample Size(取樣數)	1PCS
6		

※Character Equipment(特性設備) :

ITEM	Equipment Item(設備)	Model No. / Manufacturer(製造商和型號)
1	Leak current Characterer(泄漏電流特性儀)	VG2301
2		
3		
4		

### LEAK CURRENT CHARACTER

Spec.(mA MAX)	5
O/P	No Load
I/P	265Vac

※Character Data :

### SINGLE-PHASE EQUIPMENT

The Character was made in all combinations to the normal and reverse polarity of the supply circuit(Polarity Switch P1)

Terminal A (Switch"s") of Measuring Instrument Connected to:	Switch"e" Position	Touch Current (mA r.m.s.)				
		Polarity P1/Primary Switch Condition				
		Normal/On	Normal/Off	Reverse/On	Reverse/Off	Judgement
Output	Closed	0.012	-	0.012	-	Pass

- ☐ The touch current [did not] exceed \_\_\_\_\_ mA r.m.s with terminal A connected to the earth terminal of the unit with Switch "e" opened.
- ☒ The touch current [did not] exceed 5 mA r.m.s with terminal A connected to the earth terminal of the unit with Switch "e" closed.