

## Table of contents(目錄)

## Paper

1-1.Line&Load Regulation And Temperature Chafaile Character (輸入&負荷及溫度變動特性)-----	4
1-2.Ripple And Noise Character(紋波特性)-----	5~6
1-3.Over-Voltage Protection (過電壓保護特性)-----	7
1-4.Over-Current Protection (過電流保護特性)-----	8
1-5.Dynamic ripple Character(動態負載特性)-----	9
1-6.Efficiency Character(效率特性)-----	10
1-7.Input&Load Change Character(輸入&負荷變動特性)-----	11
1-8.Inrush Current (浪涌電流)-----	12
1-9.Turn On Delay(開機爬升延遲時間)-----	13
2-1.Hold Up Time Character (保持時間)-----	14
2-2.Low Vac Shut Off (輸入欠壓關斷特性)-----	15
2-3. Over Shoot(過沖特性)-----	16
2-4.Under Shoot(下沖特性)-----	17
2-5.Leak Current (漏電流特性)-----	18

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)

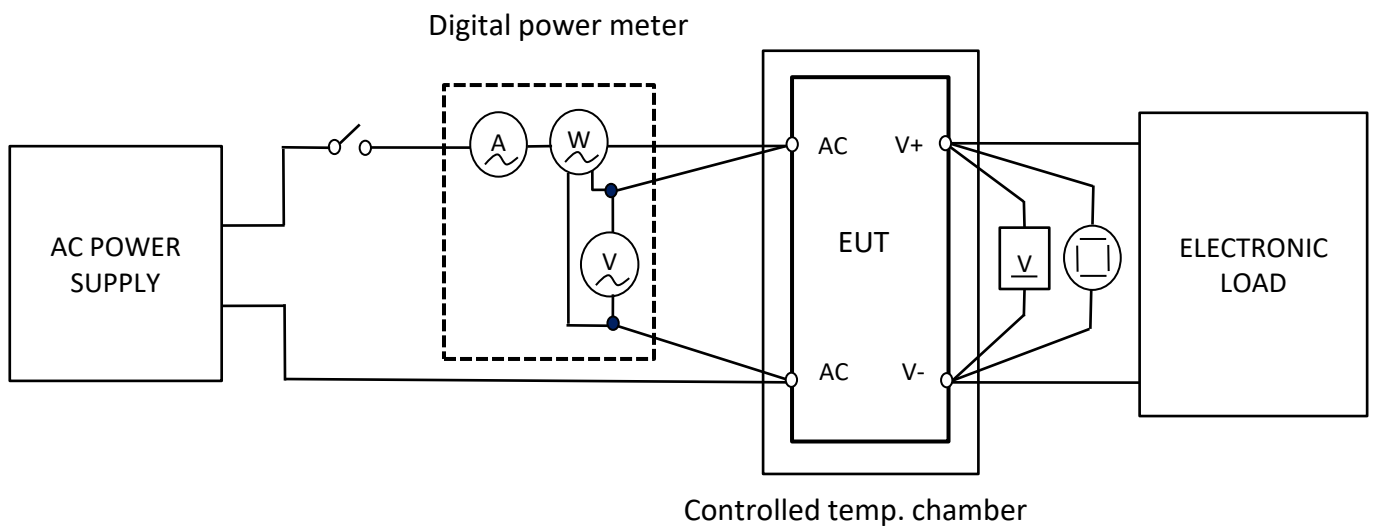
Turn On Delay(開機爬升延遲時間)

Hold Up Time Character (保持時間)

Low Vac Shut Off (輸入欠壓關斷特性)

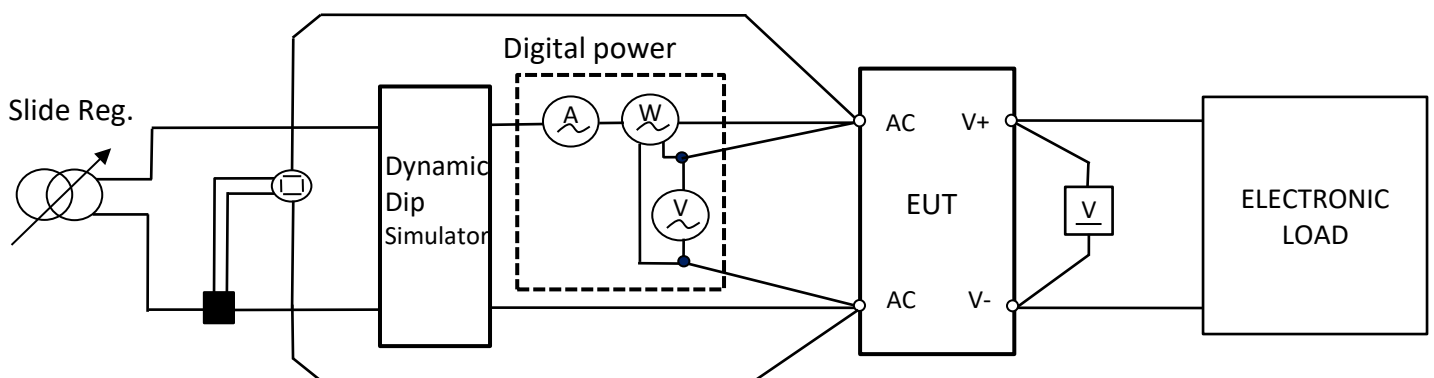
Over Shoot(過沖特性)

Under Shoot(下沖特性)



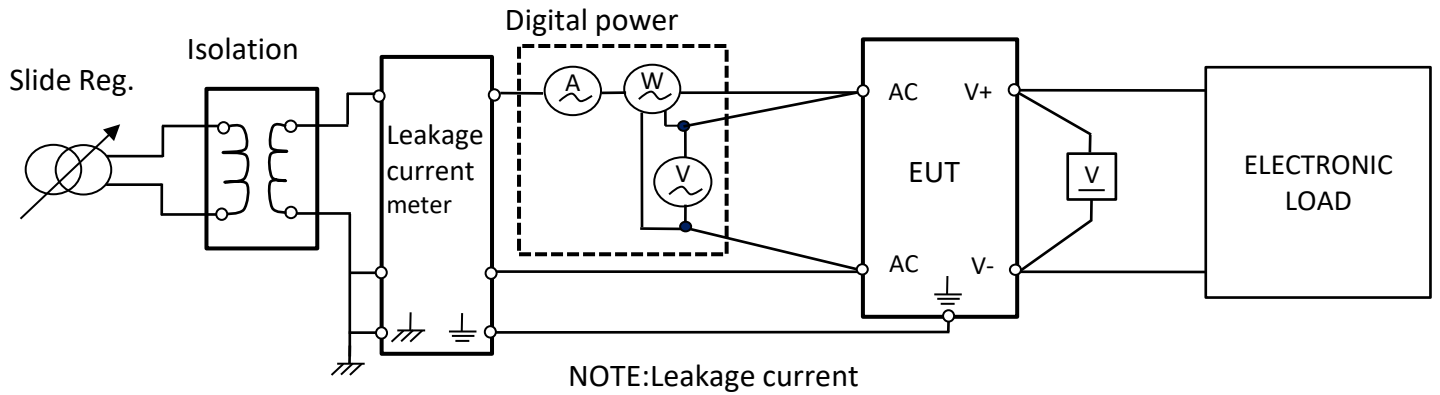
## Circuit 2 特性回路2

Inrush Current (浪涌電流)



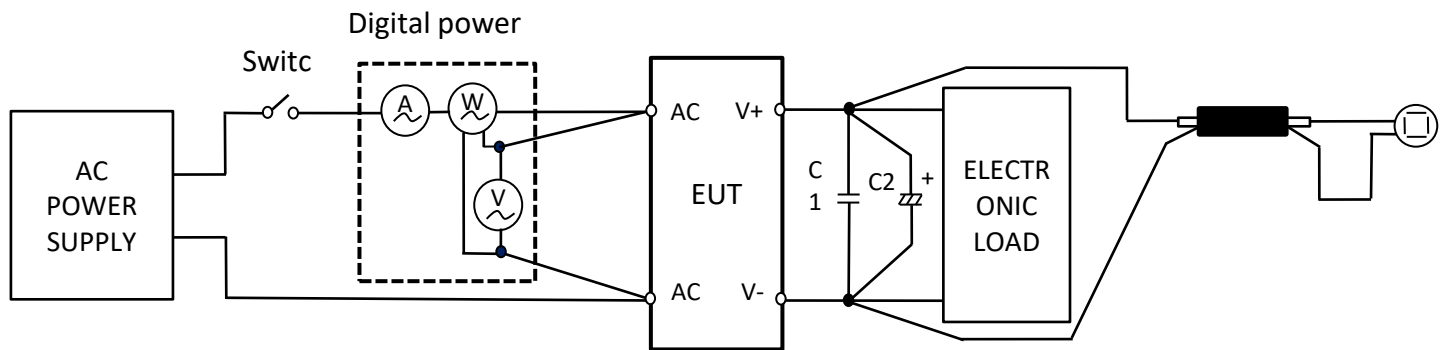
## Circuit 3 特性回路3

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&Load Regulation And Temperature Chafaile Character (輸入&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	12.0V
----------------	-------

※ Character Data(特性數據) :

O/P \ I/P	85Vac/63Hz	100Vac/60Hz	240Vac/50Hz	265Vac/47Hz	Line Regulation $\leq 2\%$
0%	12.307V	12.308V	12.31V	12.311V	0.03%
25%	12.234V	12.235V	12.236V	12.237V	0.03%
50%	12.161V	12.162V	12.162V	12.162V	0.01%
75%	12.088V	12.088V	12.087V	12.087V	0.01%
100%	12.014V	12.015V	12.013V	12.012V	0.03%
Load Regulation: $\leq 10\%$	2.44%	2.44%	2.48%	2.49%	

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

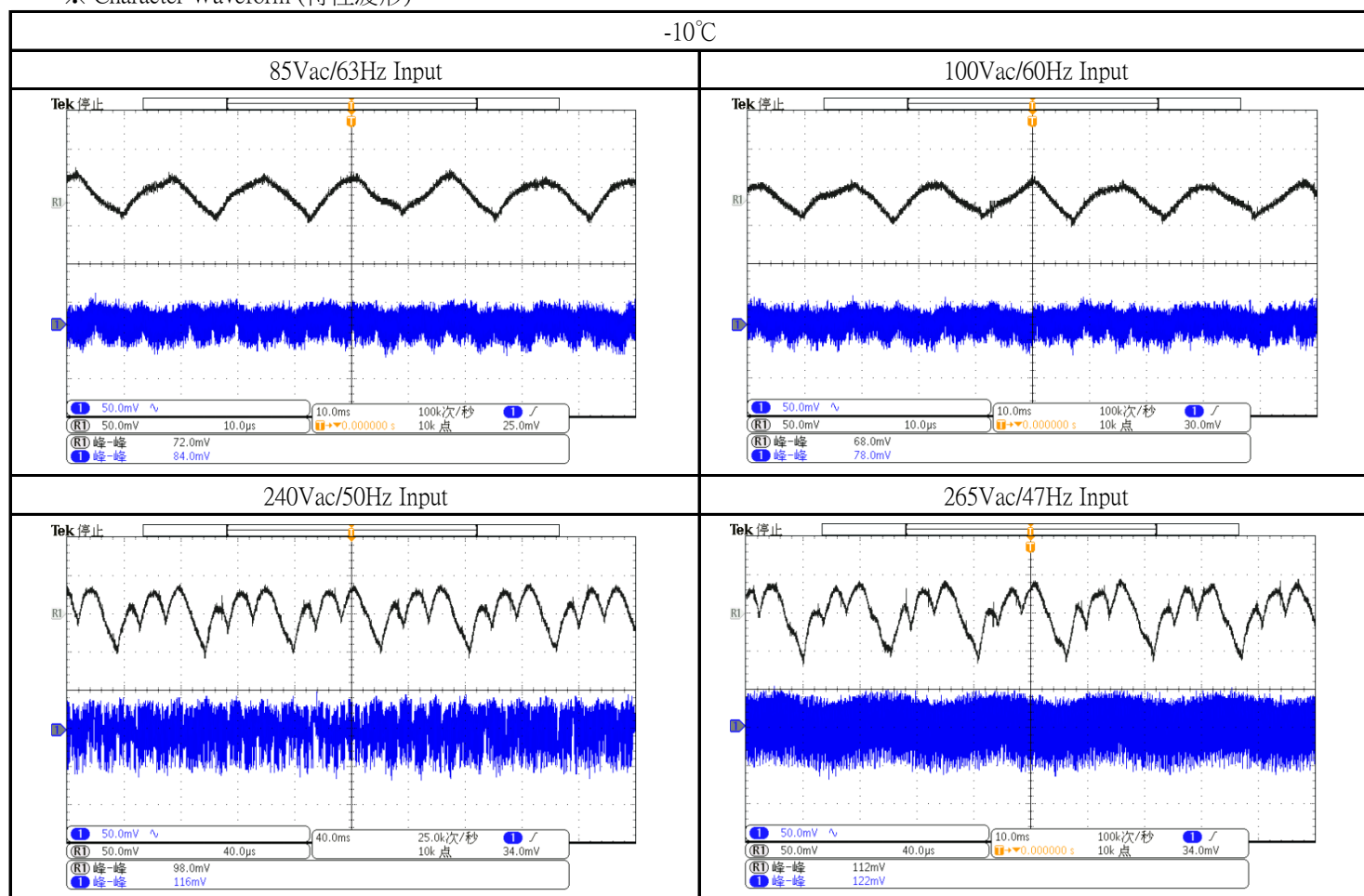
※ Character Condition(特性條件):

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	72.0mV	84.0mV	68.0mV	78.0mV	98.0mV	116.0mV	112.0mV	122.0mV

※ Character Waveform (特性波形):



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

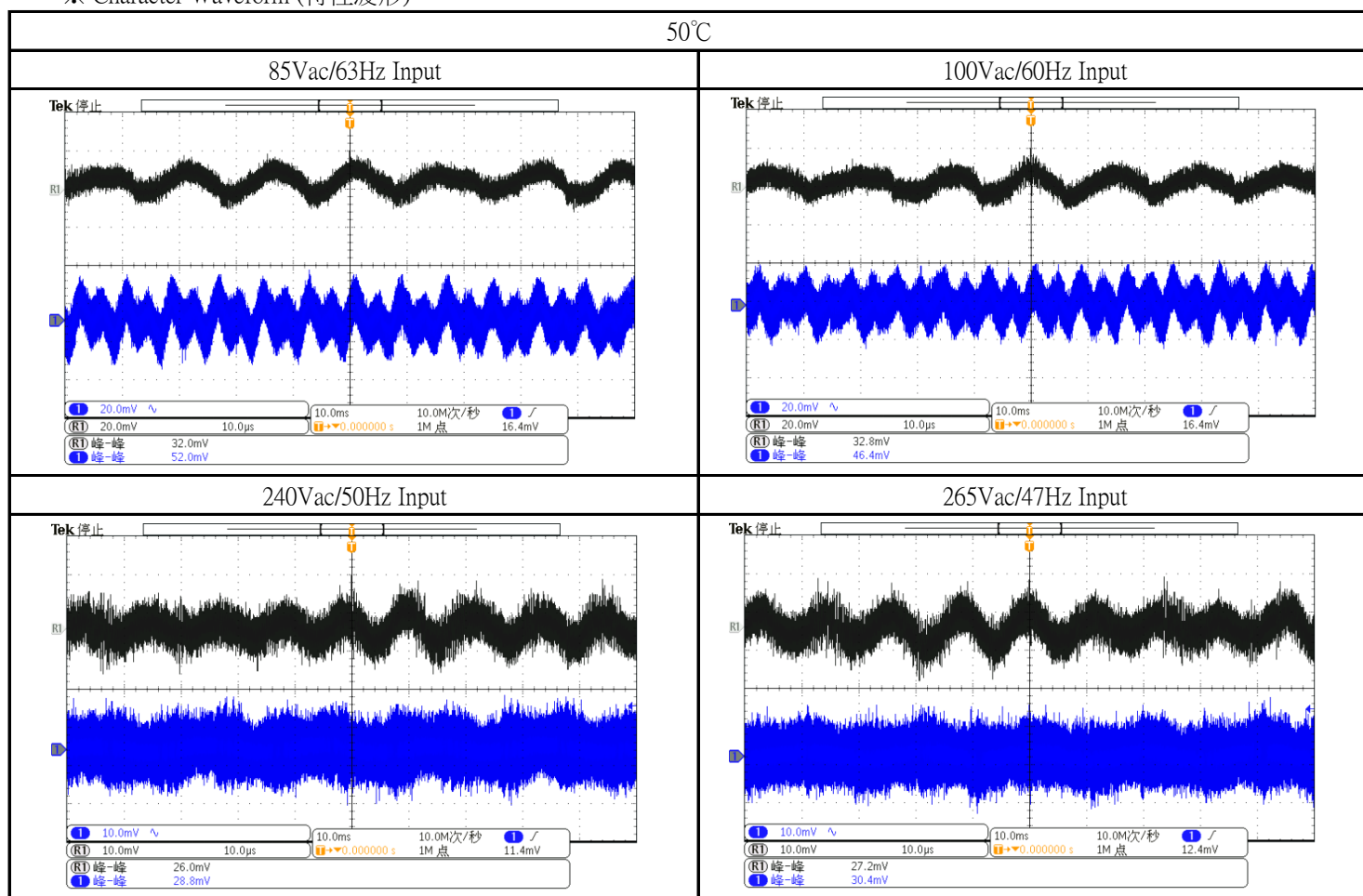
※ Character Condition(特性條件):

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)	50°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
50°C	32.0mV	52.0mV	32.8mV	46.4mV	26.0mV	28.8mV	27.2mV	30.4mV

※ Character Waveform (特性波形):



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

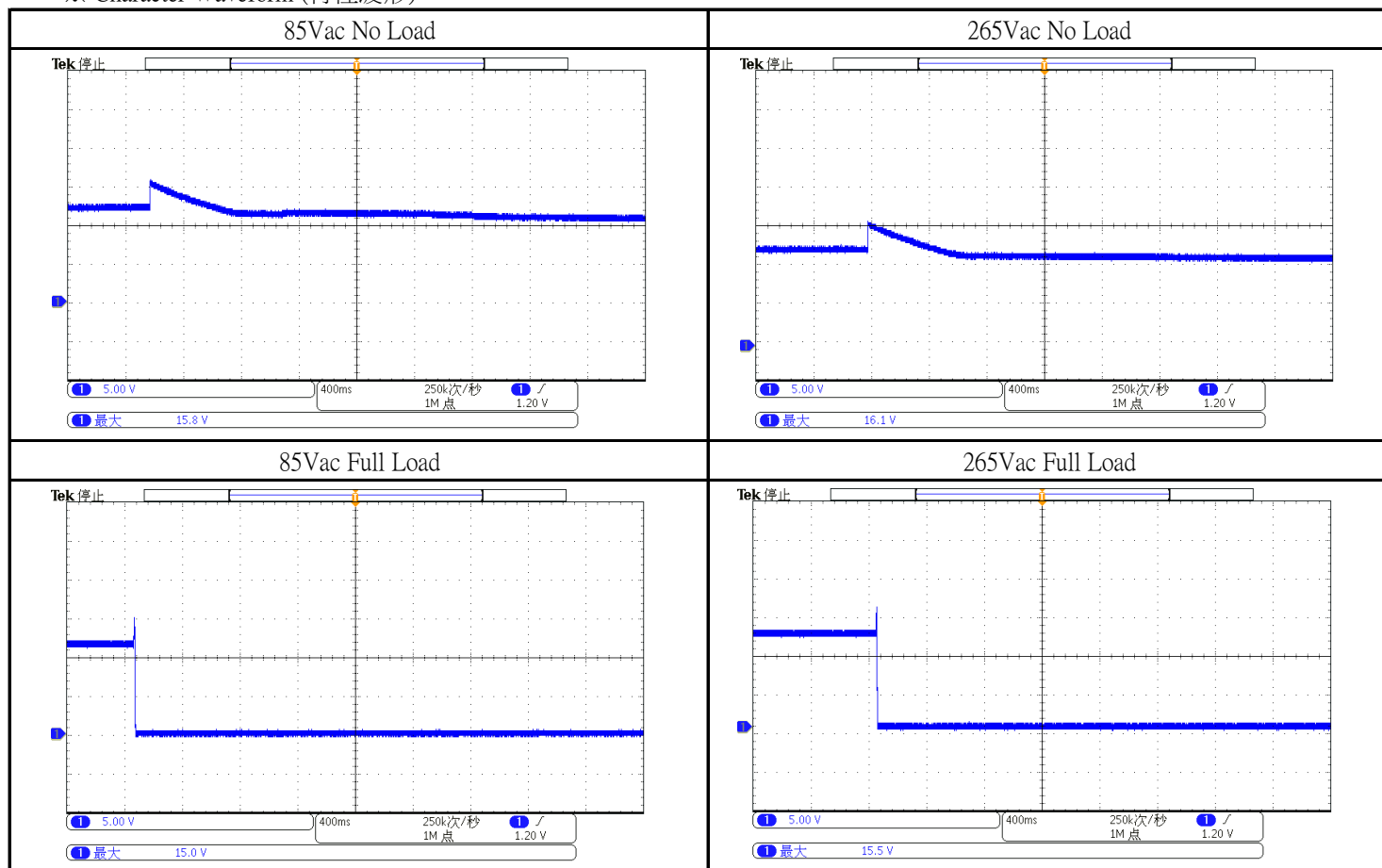
※ Character Condition(特性條件):

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	15.8V	15.0V	16.1V	15.5V

※ Character Waveform (特性波形):



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

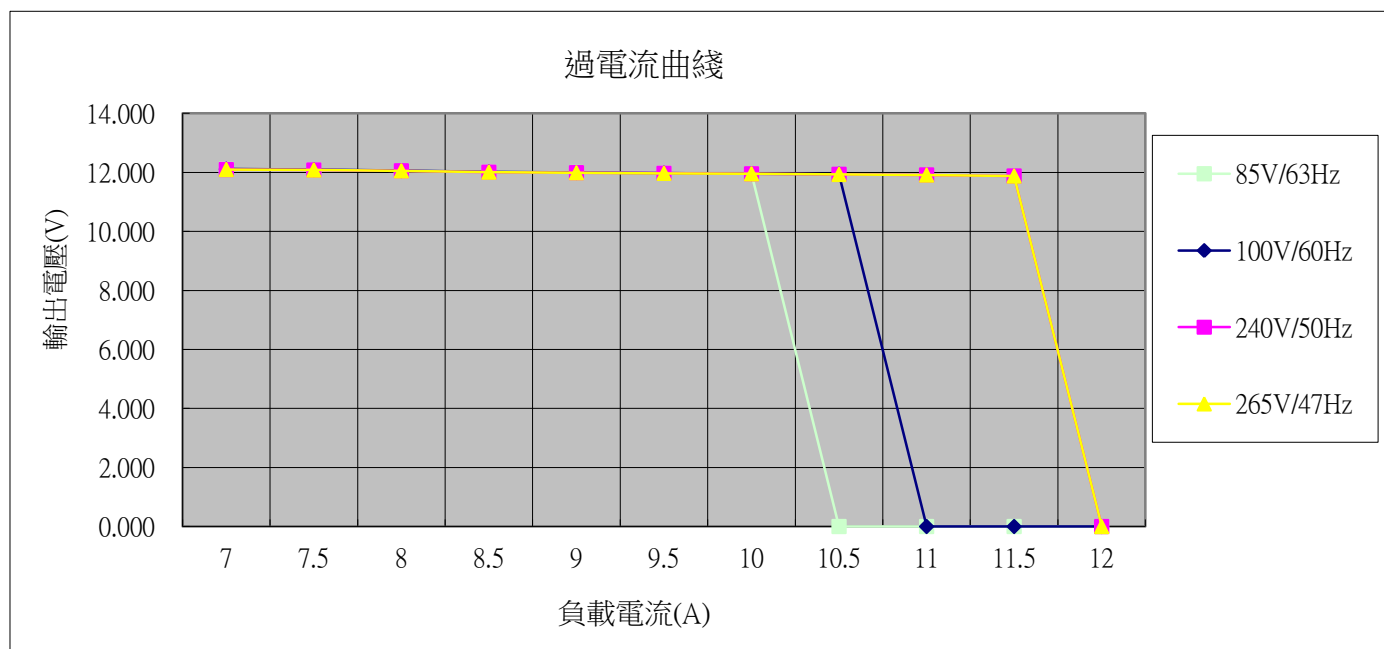
※ Character Condition(特性條件):

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	10.5A	11.0A	12.0A	12.0A

I/P	85V/63Hz										
Voltage(V)	12.111	12.088	12.055	12.015	11.996	11.977	11.958	0.000	0	0	0
Current(A)	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12
I/P	100V/60Hz										
Voltage(V)	12.113	12.092	12.060	12.016	11.996	11.977	11.959	11.939	0.000	0	0
Current(A)	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12
I/P	240V/50Hz										
Voltage(V)	12.098	12.083	12.056	12.009	11.991	11.972	11.954	11.935	11.914	11.878	0
Current(A)	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12
I/P	265V/47Hz										
Voltage(V)	12.098	12.081	12.053	12.008	11.989	11.970	11.952	11.932	11.910	11.876	0
Current(A)	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12





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

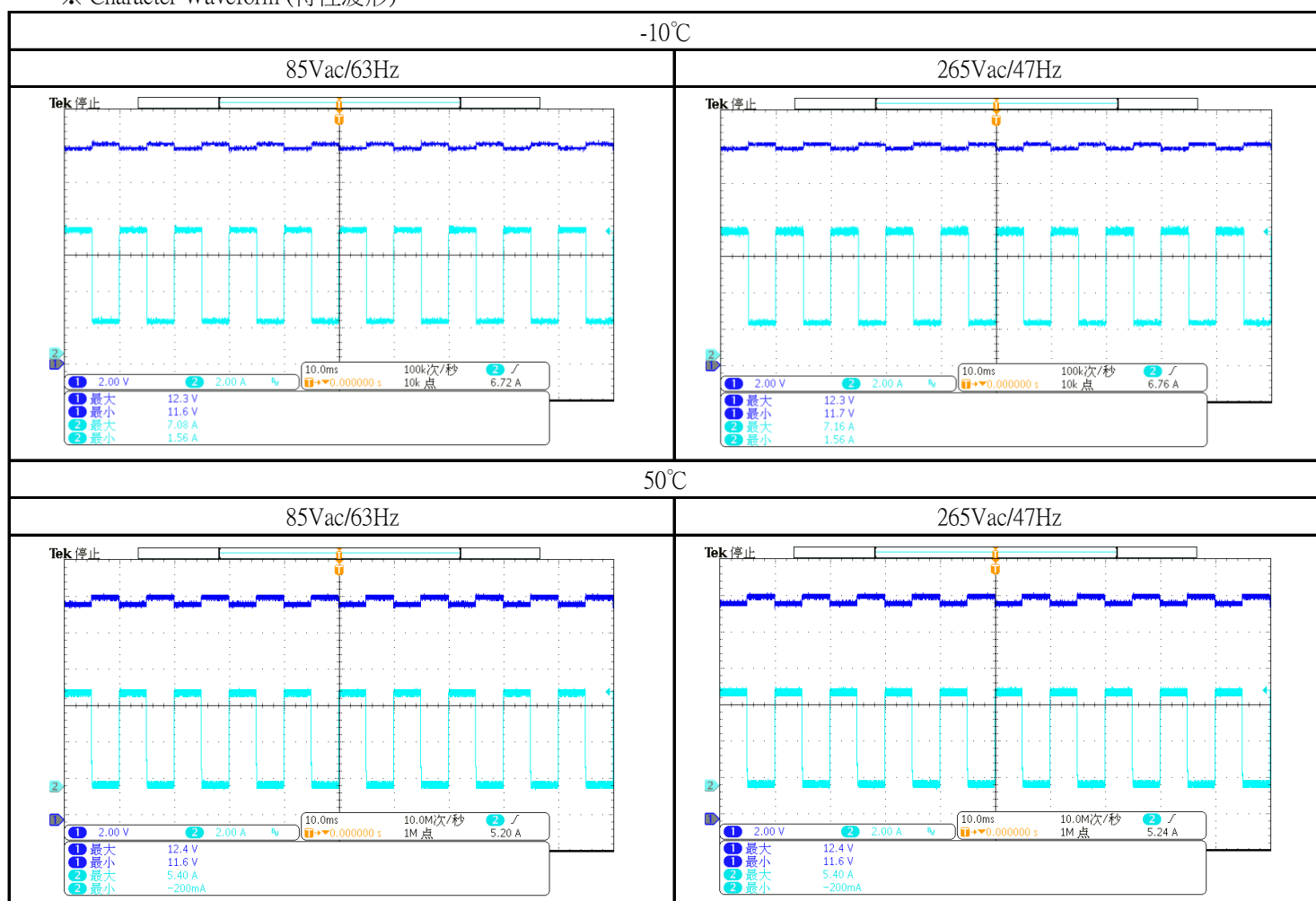
※ Character Condition(特性條件):

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 /50°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	12.3V	11.6V	12.3V	11.7V
50°C	12.4V	11.6V	12.4V	11.6V

※ 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)	8.5A

※ 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 (%)	0.064W	0.178W
10%	0.85A	11.74	10.450	89.01%	12.03	10.450	86.87%		
25%	2.125A	28.85	26.11	90.50%	28.84	26.02	90.22%		
50%	4.25A	58.01	52.14	89.88%	57.4	51.71	90.09%		
75%	6.375A	87.89	78.03	88.78%	85.9	77.08	89.73%		
100%	8.5A	117.97	103.78	87.97%	115.35	102.14	88.55%		
Average				89.28%			89.65%		

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 )	0.023	0.0532
	Input Power ( W )	0.053	0.23
Input change with full load			
Full Load		Input Condition	
		85V/63Hz	265Vac/47Hz
	Input Current ( A )	2.11	0.73
	Input Power ( W )	121.7	116.8

## 1-8.Inrush Current (浪涌電流)

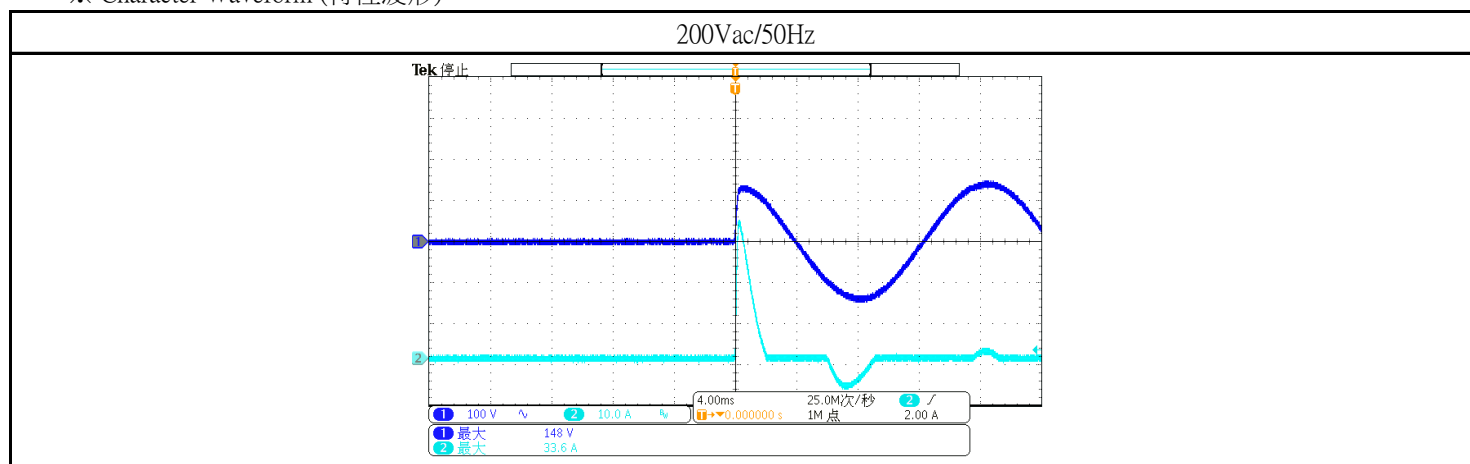
※ Character Condition(特性條件)：

1	I/P Voltage(Vac)(輸入電壓)	200Vac
2	I/P Frequency(Hz)(輸入頻率)	50Hz
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
		200Vac/50Hz
Character Result		33.6A

※ Character Waveform (特性波形)：



## 1-9.Turn On Delay(開機爬升延遲時間)

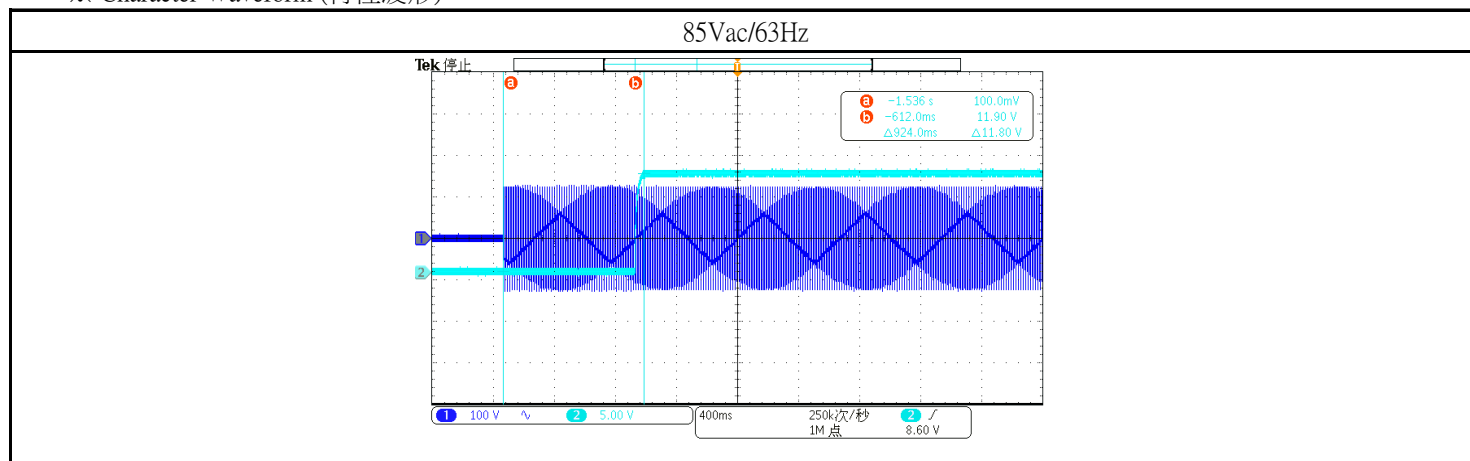
※ Character Condition(特性條件)：

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	0.924S

※ Character Waveform (特性波形)：



## 2-1. Hold Up Time Character (保持時間)

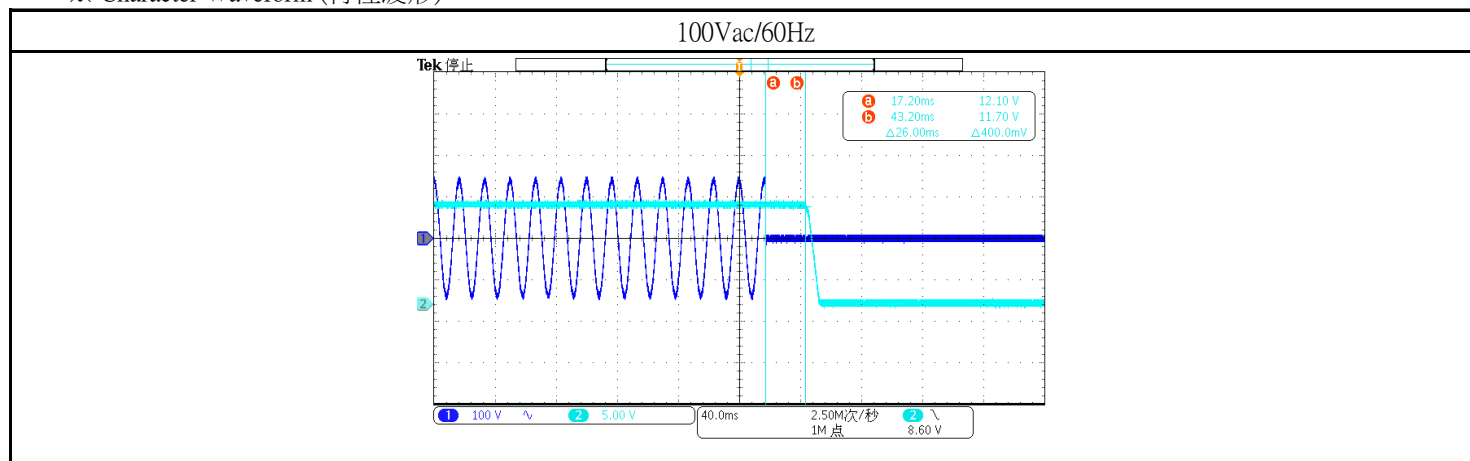
※ Character Condition(特性條件) :

1	I/P Voltage(Vac)(輸入電壓)	100Vac
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) :

Hold up time	
I/P	100Vac/60Hz
Character Result	26.0mS

※ 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	56.0V
85~0Vac Input	
O/P	Full Load
Brown out	49.0V

## 2-3. Over Shoot(過沖特性)

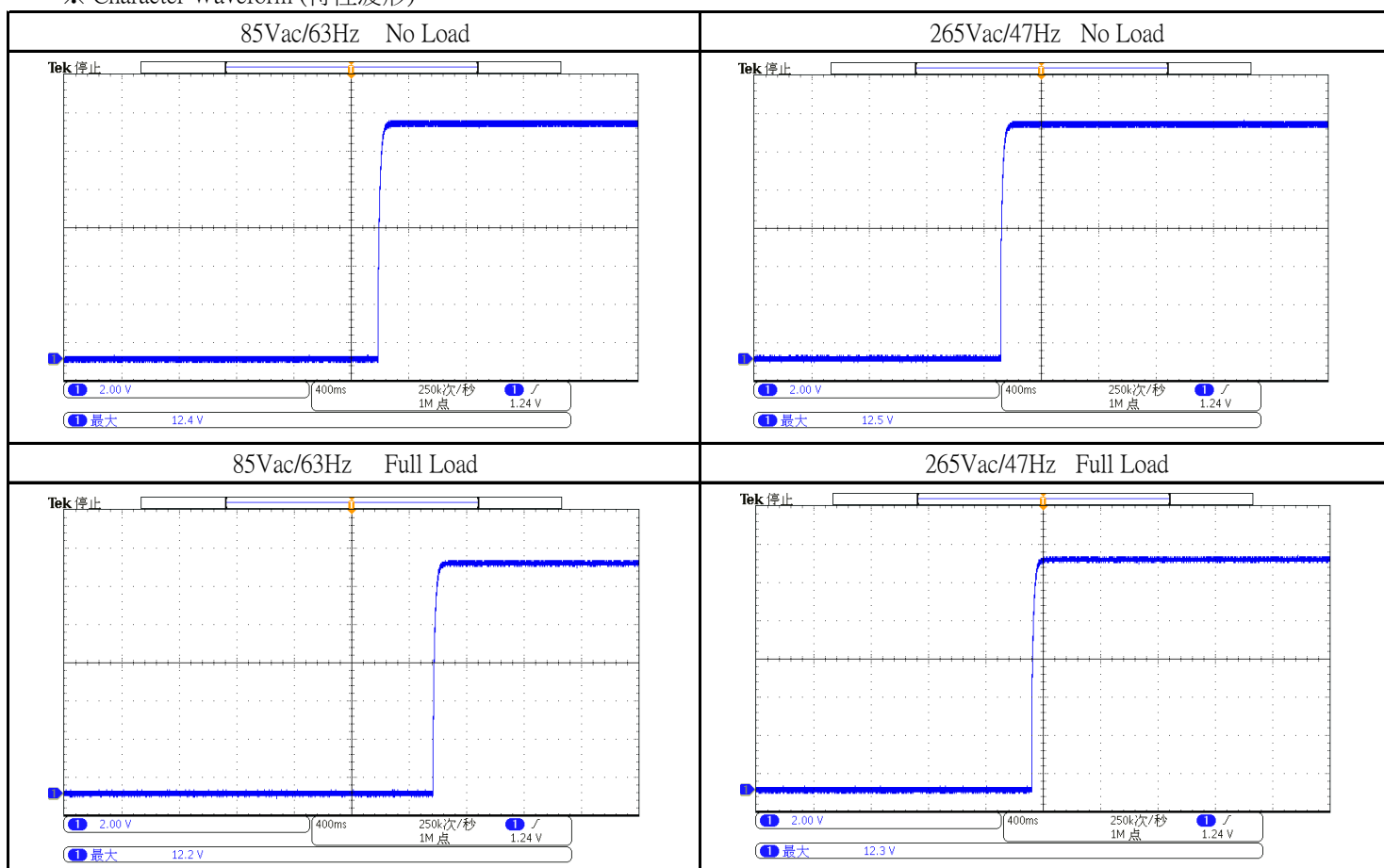
※ Character Condition(特性條件):

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	12.4V	12.5V	12.2V	12.3V

※ Character Waveform (特性波形):





## 2-4.Under Shoot(下沖特性)

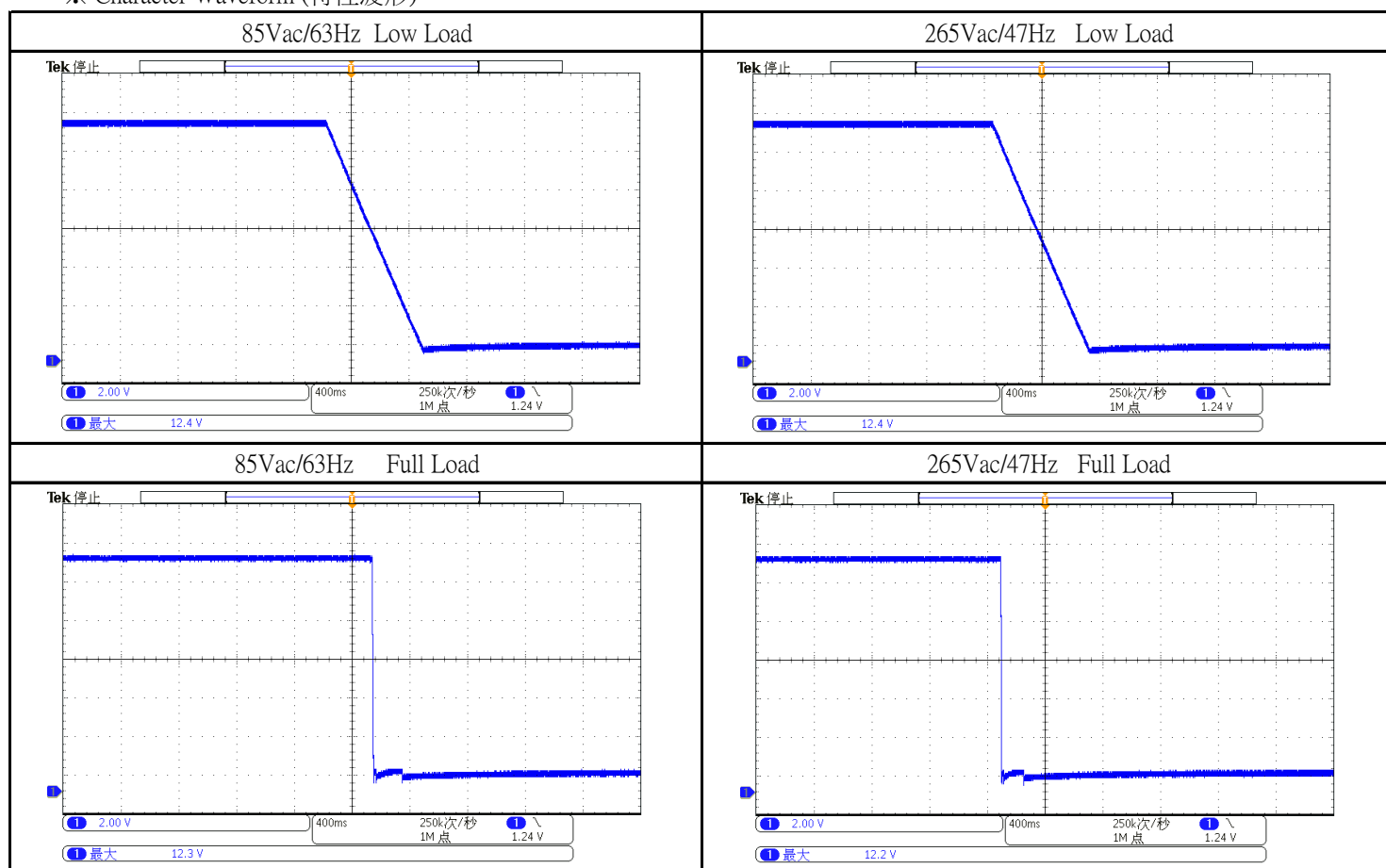
※ Character Condition(特性條件):

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)	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	12.4V	12.4V	12.3V	12.2V

※ 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)	0.5
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	0.206	-	0.204	-	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 0.5 mA r.m.s with terminal A connected to the earth terminal of the unit with Switch "e" closed.