

## Thermal Shock Character(熱循環特性)

※Character Condition(特性條件):

|   |                         |               |
|---|-------------------------|---------------|
| 1 | I/P Voltage(Vac)(輸入電壓)  | /             |
| 2 | I/P Frequency(Hz)(輸入頻率) | /             |
| 3 | Output Load(輸出負載)       | /             |
| 4 | Ambient Temp.(°C)(環境溫度) | -30°C ~ 75°C  |
| 5 | Recovery Time/恢復時間      | Room temp. 2H |
| 6 | Sample Size(取樣數)        | 3PCS          |

※Character Equipment(特性設備):

| ITEM | Equipment Item(設備)                       | Model No. / Manufacturer(製造商和型號) |
|------|--|----------------------------------|
| 1    | Temperature Camber (恆溫箱)                 | HUA QI/100L                      |
| 2    | AC Source(變頻器)                           | ALL POWER/APG-1005N              |
| 3    | Power Meter(功率表)                         | YOKOGAWA/WT310                   |
| 4    | DC Load(DC負載)                            | ITECH/IT8512+                    |
| 5    | Voltage insulation Characterer (耐壓絕緣特性儀) | EXTECH/7122                      |

※Character Condition:

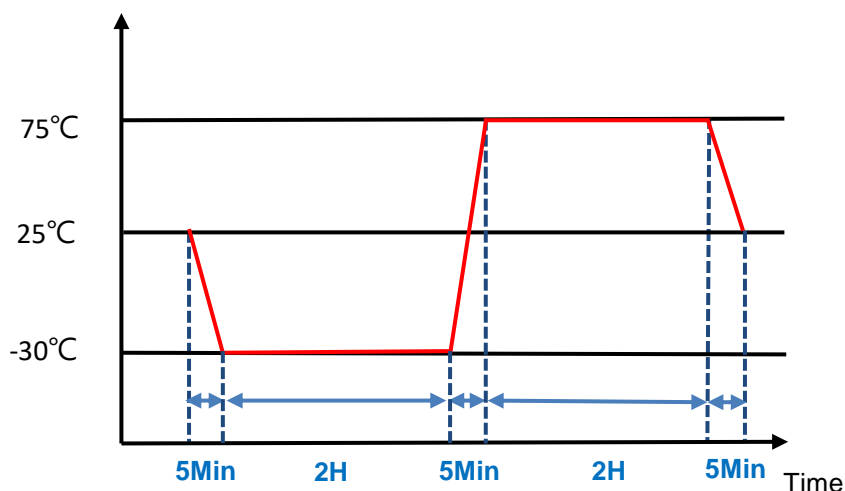
| Heat Cycle Character |   |
|----------------------|---|
| Condition:           | POWER UNIT at Tstg min (2hours)- Tstg max (2hours) for 100cycles. |

※Performance Criteria:

|   |  |
|---|--|
| After Heat impulse Character and the inspection depend on | a. Parts can't break and damage./產品不能有明顯外觀不良，如開裂/脫落/變形等          |
|   | b. Specification of electricity can't loss efficiency/電性必須滿足產品規格 |
|   | c. Hi-Pot & insulation resist can't loss efficiency/安規性能不能降低     |

※Character Data(特性數據):

| NO. | Character                | Cycle | Point a | Point b | Point c | / |
|-----|--------------------------|-------|---------|---------|---------|---|
| 1   | Tstg: -30°C ↔ Tstg: 75°C | 100   | OK      | OK      | OK      | / |
| 2   |                          | 100   | OK      | OK      | OK      | / |
| 3   |                          | 100   | OK      | OK      | OK      | / |



Vibration Character(震動特性)

※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)        | 3PCS      |
| 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+                    |
| 4    | Vibration generator(震動發生器) | KONGJIAN ZHONGLI / HG-70ZY       |

※Character Condition：

| Vibration Character |           |
|---------------------|-----------|
| Frequency range：    | 10Hz-55Hz |
| Acceleration：       | 2G        |
| Direction：          | X,Y,Z     |

※Performance Criteria:

|  |   |
|--|---|
| After vibration Character that standart by | a. No marked defects shall be allowed for appearance and inner parts like crack, peeling, deformation etc. by drop Character.(產品不能有明顯外觀不良，如開裂/脫落/變形等) |
|  | b.Safety Character must not be reduced(安規性能不能降低)  |
|  | c. The electrical function are normal.(電性功能正常)  |

※Character Data(特性數據)：

| NO. | Before(Vo) | Time | After(Vo) | Point a | Point b | Point c | / | / |
|-----|------------|------|-----------|---------|---------|---------|---|---|
| 1   | 14.81      | 3H   | 14.81     | OK      | OK      | OK      | / | / |
| 2   | 14.81      |      | 14.81     | OK      | OK      | OK      | / | / |
| 3   | 14.81      |      | 14.81     | OK      | OK      | OK      | / | / |

## Noise Simulate Character (噪音特性)

### ※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 Equipment(特性設備):

| ITEM | Equipment Item(設備)                      | Model No. / Manufacturer(製造商和型號) |
|------|---|----------------------------------|
| 1    | High Frequecny Noise Simulator(高頻噪音特性儀) | PRM-24A/PRIMA                    |
| 2    | AC Source(變頻器)                          | ALL POWER/APG-1005N              |
| 3    |   |                                  |

## AC Line Impulse Noise Character

### ※Character Condition(特性條件):

|                            |  |
|----------------------------|--|
| <b>1) Asynchronous</b>     |  |
| Source voltage / Frequency | 100VAC / 60Hz, Single phase.                         |
| Pulse duration             | 50ns , 1000 ns                                       |
| Period repetition          | 10 ms  |
| Polarity                   | Positive / Negative, ±                               |
| Severity levels            | 2 KV for AC line.                                    |
| Character time             | 1 minutes for each Character condition.              |
| Phase angle                | 0~360 degrees.( Time of 3 times Character is 10sec ) |
| <b>2)Synchronous</b>       |  |
| Source voltage / Frequency | 100VAC / 60Hz, Single phase.                         |
| Pulse duration             | 50ns , 1000 ns                                       |
| Period repetition          | 10~35 ms. ( Time of 3 times Character is 10sec )     |
| Polarity                   | Positive / Negative, ±                               |
| Severity levels            | 2 KV for AC line.                                    |
| Character time             | 1 minutes for each Character condition.              |
| Phase angle                | 0~180 degrees.                                       |

### ※Performance Criteria(判定標準):

|  |  |
|--|--|
| <input checked="" type="radio"/> Criteria A: | The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.  |
| <input type="radio"/> Criteria B:            | The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. |
| <input type="radio"/> Criteria C:            | Temporary loss of function is allowed, provided the function self recoverable or can be restored by the operation of controls  |

### ※Character Results(特性結果): Pass

MODEL NO. : UNOPT3050-150035SA

## (1)算出方法 Calculating Method

根据MIL-HDBK-217的零件数量可靠性预测进行计算每个部件的单个故障率 $\lambda_G$ ，MTBF通过每个部件的计数计算。

Calculated based on part count reliability projection of MIL-HDBK-217. Individual failure rates  $\lambda_G$  is given to each part and MTBF is calculated by the count of each part.

計算公式：

$$MTBF = \frac{1}{\lambda_{equip}} = \frac{1}{\sum_{i=1}^n N_i(\lambda_g \pi_Q)_i} \times 10^6 \text{時間(Hours)}$$

$\lambda_{equip}$ ： 設備總故障率(故障/10<sup>6</sup>時間)

Total Equipment Failure Rate (Failures / 10<sup>6</sup> Hours)

$\lambda_G$ ： 第 i 個通用零件的一般故障率(故障/10<sup>6</sup>時間)

Generic Failure Rate for The ith Generic Part(Failures / 10<sup>6</sup> Hours)

$N_i$ ： 第i類零件的數量

Quantity of ith Generic Part

$n$ ： 不同通用零件類別的數量

Number of Different Generic Part Categories

$\pi_Q$ ： 品質因數

Quality Factor

# MTBF

[illegible]

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