


| REV. | Description | Date |
|------|---|----------|
| S00 | 102A-199075 增加 ADP-65DW Y2G 與 ADP-65DW Y2E 做成系列 | 09/19'19 |
| S01 | 102A-19A015 ADD ADP-65DW X2E/X2G/Z2E/Z2G MODEL NAME | 10/03'19 |
| 00 | 102A-208075 ADD ADP-65DW ZZD MODEL NAME MODIFY ITEM3.2/3.3/3.4 FOR 65DW ZZD 102A-208053 ADD ADP-65DW X2L /Y2L/Z2L/ X2M/Y2M/Z2M/MODEL NAME Release mass production spec | 08/17'20 |
| 01 | 102A-215078 ADD MODEL ADP-65DW X2R/Y2R/Z2R | 05/27'21 |
| 02 | 102A-21A225 ADD MODEL ADP-65DW EBA/ZBA/WBA/YCA | 10/28'21 |
| 03 | 102A-21C116 ADD MODEL ADP-65DW EBAEA/EBAEB/EBAEC/ EBAED/EBAEE | 12/17'21 |
| 04 | 102A-225021 ADD MODEL ADP-65DW EBAEF | 05/10'22 |
| 05 | 102A-225145 ADD MODEL ADP-65DW Y2S,Y2T,X2S,X2T,Z2S,Z2T | 05/19'22 |
| 06 | 102A-232059 ADD MODEL NAME: ADP-65DW X2E5/X2L5/Y2E5/Y2L5 Add Model list and Item3 (3.2) (3.5) for new model. | 02/14'23 |
| 07 | 102A-244019 ADD MODEL ADP-65DW ZBB 102A-244020 ADD MODEL ADP-65DW ZBC | 04/08'24 |
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|--|-------|-------------|----------------------------|--|-----------|
|  台達電子工業股份有限公司 DELTA ELECTRONICS, INC. | | | | DESCRIPTION : 電氣規格(Electrical Specification) | |
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| Date | Drawn | Design (EE) | Design (ME) | DOCUMENT NAME. : ES-65DW X2X | REV. |
| 04/08'24 | 邱美淳 | 劉峰明/蔡仁傑 | 陳俊豪/張伯毅/ 吳岱洋/蔡柏崢 吳和諺 | | 07 |

MODEL LIST

| MODEL NAME | TYPE |
|---|------|
| ADP-65DW Y2E/Y2G/Y2L/Y2M/Y2R/YCA/Y2S/Y2T/Y2E5/Y2L5 | US |
| ADP-65DW X2E/X2G/X2L/X2M/X2R/X2S/X2T/ X2E5/ X2L5 | CN |
| ADP-65DW Z2E/Z2G/Z2L/Z2M/Z2D/Z2R/ZBA/Z2S/Z2T/ZBB/ZBC | EU |
| ADP-65DW EBA/EBAEA/EBAEB/EBAEC/ EBAED/EBAEE/EBAEF | AU |
| ADP-65DW WBA | UK |

1. ELECTRICAL

1.1 Input Characteristics:

1.1.1 Nominal Voltage

It is normal for **100 ~ 240Vac** input AC voltage.

1.1.2 Input Voltage Range

The Adapter shall operate from **90 ~ 264Vac**.

1.1.3 Rated Frequency

It is normal for **50Hz** or **60Hz** and single phase.

1.1.4 Frequency Range

The Adapter shall operate with an input frequency from **47 Hz** to **63 Hz**.

1.1.5 Input Current

1.5A Max at **100Vac** input voltage.

1.1.6 Inrush Current Limit (cold start)

The I^2t shall less then 22% of the Fuse.

1.1.7 Efficiency (Warm Up)

1.1.7.1 **86.0 %** min. at nominal input voltage, maximum load and measured at the end of DC cable. (Warm up)



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1.1.7.2 Active mode efficiency:

More than **88%** of average efficiency of **25%,50%,75%** and **100%** load tested at **115Vac/60Hz** and **230Vac/50Hz**. (Warm up after 30min)

1.1.7.3 The efficiency at **10%** loading shall be more than **79%** measure at **115Vac/60Hz** and **230Vac/50Hz**.

1.1.8 No Load Power Consumption

Maximum non-load power consumption is less than **0.21W** at **115Vac/60Hz** and **230Vac/50Hz**

1.1.9 Power saving requirement

115Vac/60Hz, 230Vac/50Hz.

| DC POWER(W) | AC Spec. Power (W) |
|-------------|----------------------|
| 18.0 | <21 |
| 11.0 | <14 |
| 3 | <5 |
| 1.65 | <3 |
| 1.5 | <2.2 |
| 1 | <1.6 |
| 0.25 | <0.45 |

1.2 Output Characteristics:

1.2.1 Rated Voltage

The rated output voltage is specified at **19V**.

1.2.2 Voltage Range

The output voltage will be performed **18.5V~20.5V** when the load is **0A~3.42A** steadily.

1.2.3 Current

This Adapter can work from **0 A** to **3.42A** and output voltage is in section 1.2.2 specified range.

1.2.4 Output Ripple and Noise

Output ripple voltage is **300 mV** peak to peak. AMB : 25deg-C

Measured methods:

T1. Performed by **20M** Hz bandwidth in oscilloscope.

T2. Applied **0.1uF** high frequency capacitor and **10uF** electrolytic capacitor across output connector terminals.

T3. Measured at the end of DC cable.



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04/08'24

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吳和諺

ES-65DW X2X

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T4. 47Hz and 63Hz tested at 90Vac and 264Vac.

1.2.5 Turn On delay time

The Adapter shall switch on in less than **3 seconds** at input voltage is 100Vac~240Vac.

1.2.6 Hold –up time

The output voltage shall be sustained **5mS** within regulation requirement after loss 100Vac and maximum load.

1.2.7 Rise time

DC output rise time from 10% to 90% of output voltage shall be less than **40mS** at nominal line and maximum load.

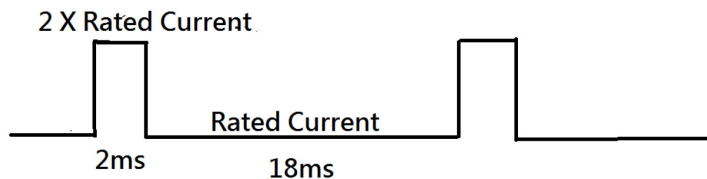
1.2.8 Overshoot

The output overshoot at turn on shall not exceed **5%** of normal voltage value with or without the load connected.

1.2.9 Peak load

The adapter shall support below loading condition without and damage, safety issues and protection happen.

The output voltage shall more than **17V** at input voltage is **100-240Vac/50Hz** in 25°C.



1.2.10 Surge load:

The adapter shall support a surge load with 120% of maximum load for 1min , maximum load for 9min and Output Voltage more than 18.0V at input voltage is 100-240Vac in 25°C.



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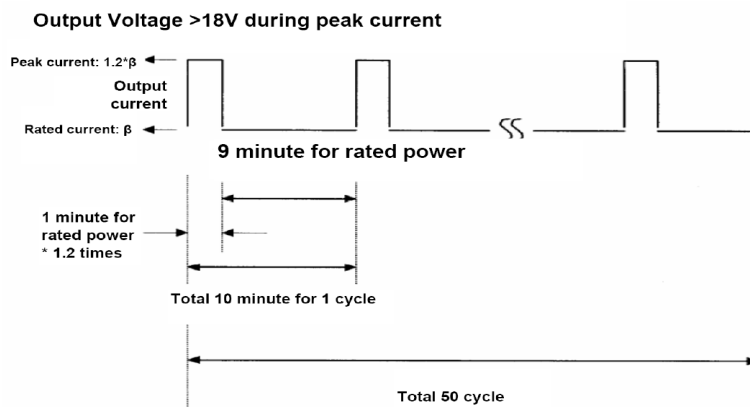
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吳和諺

ES-65DW X2X

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1.2.11 Load transient response

The adapter must within regulation when applied a step load from 0.05A to 100% load at 2.5A/us slew rate , 50% Duty cycle , Frequency be operated 100Hz and 100KHz in 25°C.

The output voltage will be performed **18.05V~20.5VV**.

1.2.12 Protection

1.2.12.1 Over Voltage Protection

The output shall be protected to latch off at over-voltage condition maximum value can't be over **27V**

That might be return to normal state by AC reset.

1.2.12.2 Over Current Protection

The maximum constant current shall be more than **4.1A** and be less than **5.4A** at 90Vac and 264Vac.


The adaptor shall be **auto-recovery**.

1.2.12.3 Short Circuit protection

Output can be shorted without damage. The adaptor shall be auto-recovery. (It will enter into normal condition when the fault condition is removed.)

1.2.12.4 Over Temperature Protection

No deformation and no discoloration on case and will be shut down. That will be return to normal state by ac reset.

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2 Environmental

2.1 Temperature

2.1.1 Operating

The AC Adapter shall be capable of operating at full load with an ambient temperature range of 0°C to +40°C.

2.1.2 Shipping/Storage

The AC Adapter shall be capable of withstanding ambient temperature from -30°C to +80°C.

2.2 Humidity

2.2.1 Operating

The AC Adapter shall be capable of operation in relative humidity of 5% to 90% relative humidity, non-condensing.

2.2.2 Shipping/storage

The AC Adapter shall be capable of withstanding ambient relative humidity of 5% to 95% relative humidity, non-condensing.

2.3 Immunity

2.3.1 Lightning Surge Immunity

This is to follow the norm of IEC-1000-4-5 Level 3 requirements.

L-N +1KV/1.2 * 50uS 5 times No function error.

L-FG, N-FG +2KV/1.2 * 50uS 5 times No damage

2.3.2 Electric Fast Transients(EFT)

This is to follow the norm of IEC-1000-4-4/1995 (EN 61000-4-4) Level 3 requirements

2.4 Electrostatic Discharge (ESD)

This Adapter is capable to withstand ESD test voltage at any point around the enclosure as below.

±15KV air discharge performance criterion B.

±12KV air discharge performance criterion A.

±8KV contact discharge performance criterion A.

2.5 Surface Temperature rise

Ambient 25°C; input voltage 100Vac/240Vac case temperature rise ≤ 40°C with system loading (95%) on bakelite

2.6 Dielectric Withstand Voltage (HI – POT)

Between AC input and secondary AC 3KV test time 1 minute; 100% of line products of this Adapter shall be applied 3000Vac for 2 seconds between AC input terminals and output terminals. Cut off current 3mA.



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2.7 Leakage Current

Y cap no more than 220pF.

Leakage current no more than 20uA(max) at 240Vac/50Hz.for delta product line.

2.8 Insulation Resistance

The insulation resistance shall be not less than **30M** ohms after application of **500Vdc/10mA for 1 minute**.

2.9 Electromagnetic Interference (EMI)

The adapter shall comply with the following national standards.

(a) FCC Part 15.

(b) CISPR 22 Class B.

(c) The limits shall be meet with a margin more than 4dB with all system applicable.

2.10 MTBF

2.10.1 MTBF (Mean-Time-Between-Failures) Calculation

The calculated MTBF shall be **150,000** hours of continuous operation at **25°C**, maximum load and 100Vac / 240Vac.

2.10.2 Electrolytic aluminum cap. Lifetime

The lifetime is least 13140 hours in Full load at 25°Cat 100Vac/60Hz and 240Vac/50Hz.

2.11 Acoustic test

Input Condition: Vin: 90Vac / 264Vac

Load Condition: Dynamic Load follower ASUS Spec

Static Load (from 0A to Full Load , 0.1A pre step)

NB ADAPTER SPEC :

Static Load

WM Type : Microphone at a distance of 10cm from the surface and noise level is less than **20dB**

Dynamic Load


WM Type : Microphone at a distance of 10cm from the surface and noise level is less than **25dB**

3.Mechanical

3.1 Outline Dimension: 63.0 * 63.0 * 28.5 mm, Color: Black

3.2 US PIN: ADP-65DW Y2E/Y2G/Y2L/Y2M/Y2R/YCA/Y2S/Y2T/Y2E5/Y2L5

CN PIN: ADP-65DW X2E/X2G/X2L/X2M/X2R/X2S/X2T/X2E5/X2L5

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EU PIN: ADP-65DW Z2E/Z2G/Z2L/Z2M/ZZD/Z2R/ZBA/Z2S/Z2T/ZBB/ZBC

UK PIN: ADP-65DW WBA

AU PIN: ADP-65DW EBA

3.3 DC Cable Length: 2000 mm for all model, except ADP-65DW ZZD/ZBB/ZBC

DC Cable Length: 1800 mm for ADP-65DW ZZD/ZBB/ZBC

AD Cable Length: 2300 mm for ADP-65DW YCA/ZBA/WBA/EBA

3.4 DC Cable Type: UL1571 20AWG for all model, except ADP-65DW ZZD

DC Cable Type: UL1571 #18AWG for ADP-65DW ZZD/YCA/ZBA/WBA/EBA

DC Cable Type: UL11352 #18AWG for ADP-65DW ZBB/ZBC

3.5 DC Connector Dimension:

| Model Name | Item | | | |
|---|-------------------------------|----------------------|--------|--------|
| | Outside Dimension (-) | Inside Dimension (+) | ID Pin | Length |
| ADP-65DW Y2E/X2E/Z2E/Y2L/X2L/Z2L/X2E/X2E5/X2L5 /Y2E5/Y2L5 | 5.5 | 2.5 | NA | 11.0 |
| ADP-65DW Y2G/X2G/Z2G/Y2M/X2M/Z2M/X2S/Y2S/Z2S /ZBB | 4.0 | 1.2 | NA | 9.8 |
| ADP-65DW YZ/ZZ/DZ/EZ/EZA/YCA/ZBA /WBA/EBA | 2pin jack: CHENGSHUO 2PJ-005B | | | |
| ADP-65DW X2R/Y2R/Z2R/X2T/Y2T/Z2T/ZBB | 4.5 | 2.9 | 0.6 | 10.0 |
| ADP-65DW ZBC | 4.0 | 1.7 | N/A | 11.0 |

3.6 Adapter Weight: US/CN: 169.5g $\pm 2.5\%$

EU: 178.1g $\pm 2.5\%$

UK: TBD

AU: 205g $\pm 2.5\%$



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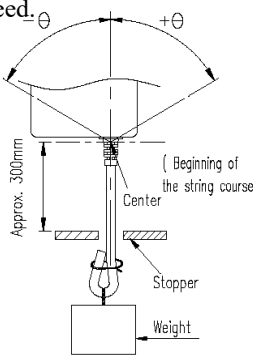
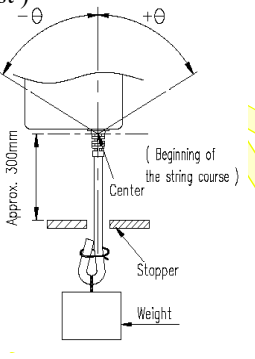



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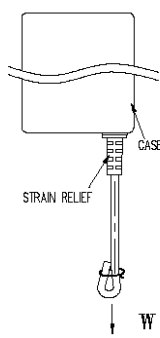
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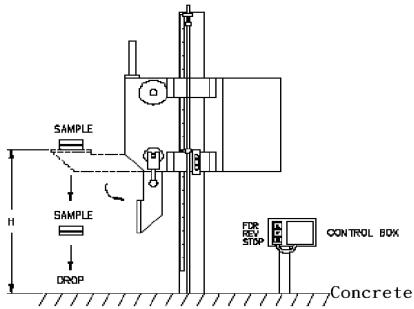
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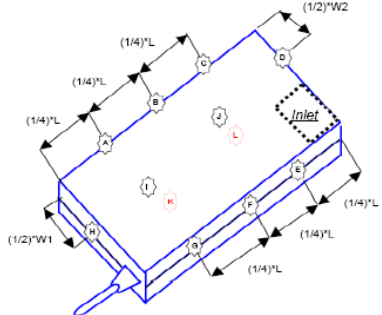
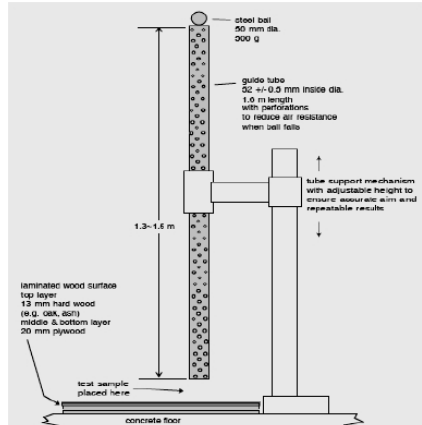

| Mechanical characteristics | | | | | |
|---|---|--|----------------------------|---|------|
| Item | | Conditions | | Specification | |
| 1. | Cord flexibility test (Delta spec) | <p>Hang the specified weight and swing it to one direction and return to the original position then swing to the opposite direction and return to the original position. This constitutes one cycle. The DC power supply shall be subjected to the specified cycles a specified speed.</p> <p>1. Weight: 200g 2. Swing angle (θ): 0 ~ 180° 3. Cycles: 1000,3000,10000cycles 4. Speed: 40 cycles/min. 5. Compliance: plug SR, case SR.</p>  | | <p>Disconnection rate of the wire shall be 1000 cycles –less 10% 3000 cycles – less 20% 10000 cycles – less 100% without damage to the insulations, etc..</p> | |
| 2. | Cord flexibility test (Customer Spec.) | <p>Hang the specified weight and swing it to one direction and return to the original position then swing to the opposite direction and return to the original position. This constitutes one cycle. The DC power supply shall be subjected to the specified cycles a specified speed. (If the cable is without core don't need core SR test)</p> <p>1. Weight: 200g 2. Swing angle (θ): 90° 3. Cycles: 3000 cycles 4. Speed: 40 cycles/min. 5. Compliance: plug SR, case SR.</p>  | | <p>Disconnection rate of the wire shall be 30% or less for plug SR, core SR and 10% or less for case SR, without damage to the insulations, etc..</p> | |
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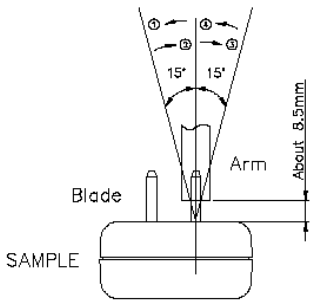
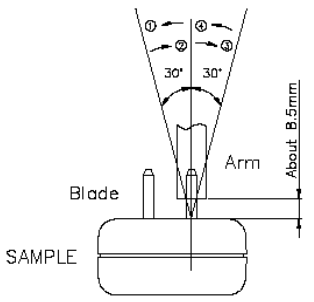
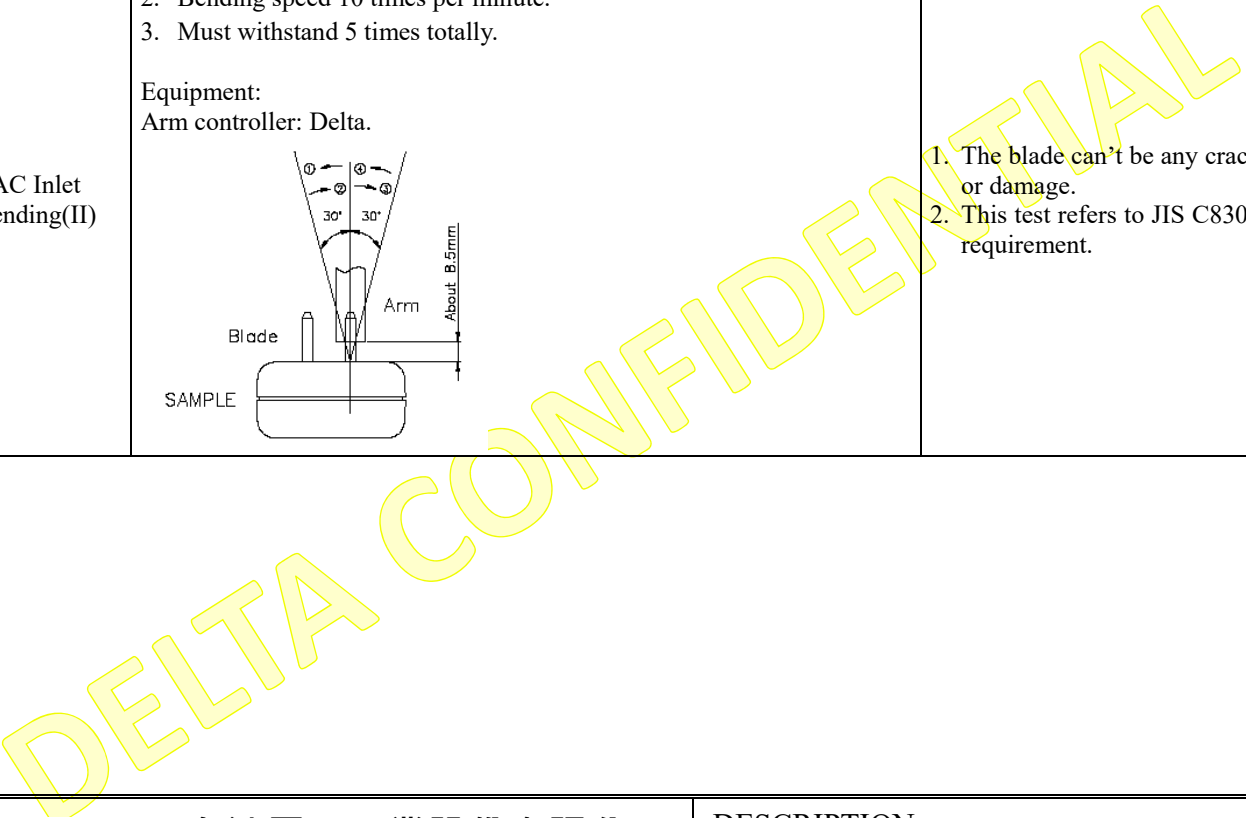

| Item | | Conditions | Specification |
|------|-------------------|--|---|
| 3. | Cord tensile test | <p>A static load shall be applied and sustained for a period. Excessive load shall not be applied in this test, unless special request.</p> <p>Load (w): 10 kgf Durance: 60 sec</p>  | Contact part and bushing shall not be detached. |
| 4. | Vibration | <p>Non-operating, Random vibration:</p> <p>5~100 Hz 0.015 G2/Hz 100~137 Hz 6 dB/oct 137~350 Hz 0.008 G2/Hz 350~500 Hz -6 dB/oct</p> <p>Acceleration: 2.09 Grms Duration: 20 min. Direction: X,Y,Z</p> | <p>1. PSU must operate with specification after non-operation test.</p> <p>2. PSU shall be no mechanical damage after test.</p> |
| 5. | Shock | <p>Non-operating</p> <p>1. Pulse: Half sine wave. 2. Peak acceleration: 50 G 3. Duration: 11 ms 4. Number of shock: 1 shock per each direction, 6 directions.</p> | <p>1. PSU must operate with specification after non-operation test.</p> <p>2. PSU shall be no mechanical damage after test.</p> |

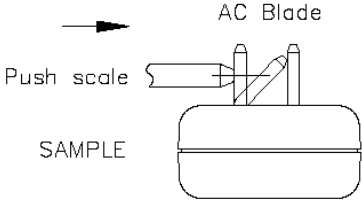
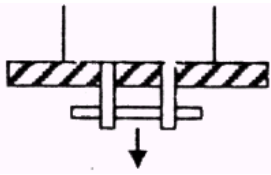
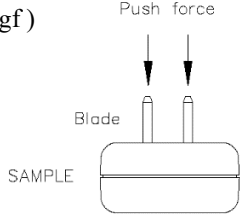

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|  台達電子工業股份有限公司 DELTA ELECTRONICS, INC. | | DESCRIPTION : 電氣規格(Electrical Specification) | |
| <small>THESE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF DELTA ELECTRONICS, INC. AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SELL OF APPARATUSES OR DEVICES WITHOUT PERMISSION.</small> | | MODEL NO. : ADP-65DW X2X | |
| Date | Drawn | Design (EE) | Design (ME) |
| 04/08'24 | 邱美淳 | 劉峰明/蔡仁傑 | 陳俊豪/張伯毅/ 吳岱洋/蔡柏崢 吳和諺 |
| DOCUMENT NAME. : | | | REV. |
| ES-65DW X2X | | | 07 |

| Item | | Conditions | Specification |
|------|-----------------------------------|--|---|
| 6. | Drop test (with outline label) | <ol style="list-style-type: none"> Operating <ol style="list-style-type: none"> The drop height: H= 76 cm. The drop orientation: 6 face for each. Power on Non-operating <ol style="list-style-type: none"> Drop height: H= 110 cm. The drop orientation: 6 face for each. Low height drop Drop TIMES: 130 times for every surface (six side), 780 times in total. Test surface material : The concrete Drop height: 10cm Equipment:  | <ol style="list-style-type: none"> ATS function Pass. No PWB copper pad peeling and broken. No soldering crack. No component broken.. Hi-pot test pass with specific condition. Test Finger can't touch the Hazardous Voltage of the product. |

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| Item | | Conditions | Specification |
|--|-------------------------------------|--|---|
| 7. | Ball impact (with outline label) | <div>1. Steel ball: 0.54 kgf .</div> <div>2. Drop height: 30 cm.</div> <div>3. A horizontal surface of laminated wood of hardwood at least 13mm thick, mounted on two layers of plywood each 19mm to 20mm thick, all supported on a concrete floor.</div> <div>4. Impact location: Classify according to DUT's dimension. LxWxH L+W <150 B,D,F,H,I,K 150<L+W <200 A,C,D,E,G,H,I,J,K,L 200<L+W A,B,C,D,E,F,G,H,I,J,K,L</div> <div></div> <div>5. Equipment:</div> <div></div> | <div>1. Hi-pot test pass with specific condition.</div> <div>2. Test Finger can't touch the Hazardous Voltage of the product.</div> |
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| Item | | Conditions | Specification |
|--|----------------------|--|---|
| 8. | AC Inlet Bending(I) | 1. Bending angle 15 °for either side. 2. Bending speed 10 times per minute. 3. Must withstand 30 times totally. Equipment: Arm controller: Delta.  | 1. The blade can't be any crack or damage. 2. This test refers to JIS C8303 requirement. |
| 9. | AC Inlet Bending(II) | 1. Bending angle 30 °for either side. 2. Bending speed 10 times per minute. 3. Must withstand 5 times totally. Equipment: Arm controller: Delta.  | 1. The blade can't be any crack or damage. 2. This test refers to JIS C8303 requirement. |
| <div>  </div> | | | |
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| Item | | Conditions | Specification |
|------|-------------|--|---|
| 10. | Push Force | <p>Push one side blade to touch another side. The force must over 4.08kgf. Equipment: Push-Pull force measurement controller (50kgf)</p>  | No electrical or mechanical problem happened and no abnormality found in the shape. |
| 11 | Load Weight | <p>A static load 351b (15.9kg) / 2min for both pin to downside. Equipment: Load weight controller: Delta.</p>  | No electrical or mechanical problem happened and no abnormality found in the shape. |
| 12. | Push Blade | <p>Push both pin to inside that must withstand 20kgf / 1 min. Equipment: Push-pull force measurement controller (50kgf)</p>  | No electrical or mechanical problem happened and no abnormality found in the shape |
| 13. | Side Thrust | <p>External enclosures are subjected to a steady force 250N±10N for a period of 5 sec. Sample: 2pcs Test point: feature of product end. Equipment: Push-Pull force measurement controller (0 ~ 50kgf).</p>  | At worst case condition, there are no damage on plastic case and socket and MUST keep the minimum safety distance 5.0mm |



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MODEL NO. :

ADP-65DW X2X

Date

Drawn

Design (EE)

Design (ME)

DOCUMENT NAME. :

REV.

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劉峰明/蔡仁傑


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吳岱洋/蔡柏崢
吳和諺

ES-65DW X2X

07

Product Applications: Notebook
Product Ingress protection(IP) rating: Not requirement(IP00)

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