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Model **Keyboard(UH0G)/Mouse(MH0GC)/Dongle(DHN0)**

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Model Keyboard(UH0G)/Mouse(MH0GC)/Dongle(DHN0)

1 Product Description

1.1 Introduction

This document contains a functional and performance specification of 2.4G Kits.

1.2 Feature Description

1.2.1 Keyboard

Wireless Technology Two-way 2.4GHz Radio Frequency

Wireless Operating Range on USB2.0 port: 10m (typical)

Wireless Operating Range on USB3.0 port: 8m, without RF interference.

Battery 2 AAA alkaline

Compatibility Chrome Rev.2, 5423.0.0

LED behavior:

1. When battery voltage $\leq 2.2V$, battery low indicator (amber LED) will flash 10 times after stop typing and LED will flash again when typing resumes. (on / off : 200ms /400ms)
2. When battery voltage $\leq 2.0V$ keyboard will be shut down
3. Pairing state : LED will turn on for 10secs than off.
4. Disconnect state : LED will flash 1 min if keyboard do not connect with dongle (on / off : 100ms / 1900ms)
5. Pairing success : LED off

Switch activation mechanism: membrane

Travel distance: 1.4mm+/-0.25mm

Peak load before make (normal key): 60g+/-15g

Material and Color				
	Description	Material	Color	Texture
Wireless Keyboard	Upper case	PC+ABS	Snow White	Glossy/Hi polish
	Lower Case	PC+ABS	Snow White	VDI 27
	HP Work mark		PMS 8403C	
	Battery door	PC+ABS or ABS	Snow white	VDI 27
	Rubber feet	Silicon Rubber/Shore 50A	PMS Cool Gray 7C	MT11007
	Keycap	ABS	Snow White	VDI27
	Keyboard Legend		PMS 429C	
	Regulatory Label		Snow White/PMS Cool Gray 7C	Satin
	Connect Button	PC+ABS or ABS	Connect Blue/HP SP1285	MT11000



Model Keyboard(UH0G)/Mouse(MH0GC)/Dongle(DHN0)

1.2.2 Mouse

Wireless Technology : Two-way 2.4GHz Radio Frequency

Wireless Operating Range on USB2.0 port: 10m (typical)

Wireless Operating Range on USB3.0 port: 8m, without RF interference.

Battery 2 AA alkaline

Compatibility Chrome Rev.2, 5423.0.0

LED behavior:

1. When battery voltage $\leq 2.2V$, battery low indicator (amber LED) will flash 10 times after stop typing and LED will flash again when typing resumes. (on / off : 200ms /400ms)
2. When battery voltage $\leq 2.0V$ keyboard will be shut down
3. Pairing state : LED will turn on for 10secs than off.
4. Disconnect state : LED will flash 1 min if keyboard do not connect with dongle (on / off : 100ms / 1900ms)
5. Pairing success : LED off

Button 2 buttons, scroll button (3-button Type)

Tracking Sensor Pixart 3204 optical sensor

Tracking Resolution 1000 dpi

Tracking Speed up to 30 ips

Acceleration Speed 10G

Material and Color				
	Description	Material	Color	Texture
Wireless Mouse	Top cover	ABS	Snow White	Bright Polish
	Bottom Case	ABS	Snow White	VDI27
	Inside Case	ABS	Snow White	VDI27/Bright Polish
	Island	ABS	Snow White	Bright Polish
	Scroll wheel	Silicon Rubber	PMS 8403C	Matte
	Battery Tab	ABS	Snow White	VDI27
	Glide feet	Teflon	Snow White	
	HP Logo		PMS 8403C	
	Sliding Button	ABS	Snow White	High Polish
	Connect Button	ABS	Connect Blue/HP SP1285	MT11000
	Bottom Case Graphic		PMS 8403C	
	Bottom Label	TBD	Snow White/PMS 8403C	

1.2.3 Dongle

Wireless Technology Two-way 2.4GHz Radio Frequency

Wireless Operating Range on USB2.0 port: 10m (typical)

Wireless Operating Range on USB3.0 port: 8m, without RF interference.



Model Keyboard(UH0G)/Mouse(MH0GC)/Dongle(DHN0)

Nano Receiver (17.9mm long) that plugs into USB port

Full Speed USB 1.1

1.2.4 Anti-Interference 2.4Ghz Radio Frequency

The multi-channel architecture along with auto channel switch capability will be also required to guarantee the hassle-free 2.4GHz wireless connection.

2 Physical Specification

2.1 Dimension

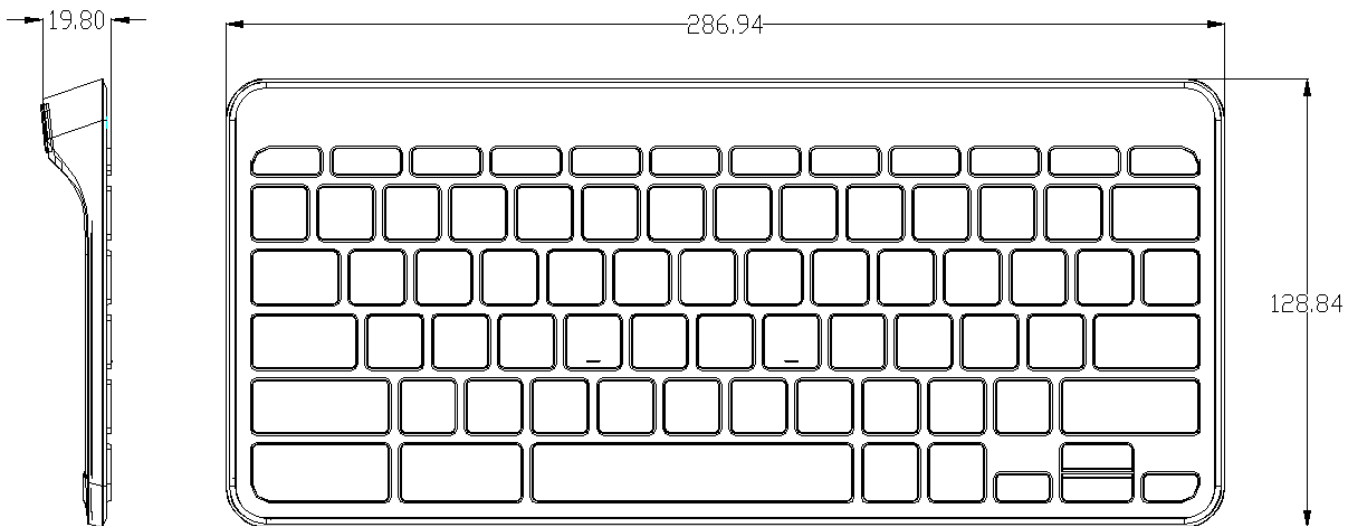
2.1.1 Keyboard PART:

Height: 19.8mm \pm 0.5mm

Width: 128.84mm \pm 0.5mm

Length: 286.94mm \pm 1mm

Weight: 460 \pm 30g (with battery)



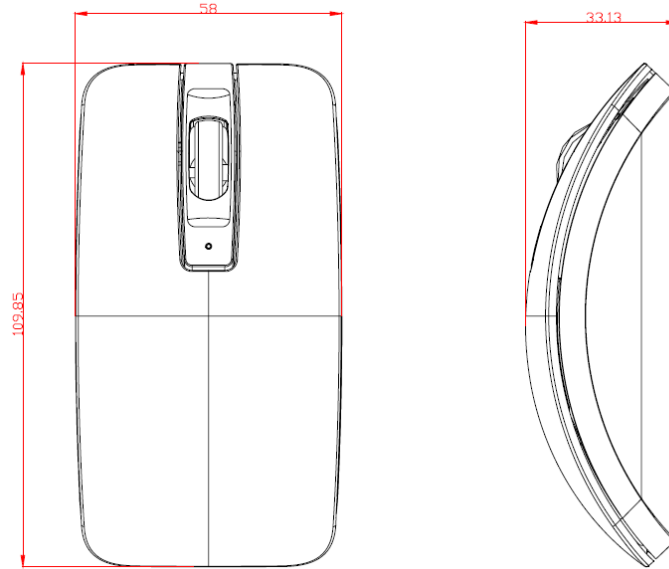
2.1.2 MOUSE PART:

Height 33.13 \pm 0.50mm



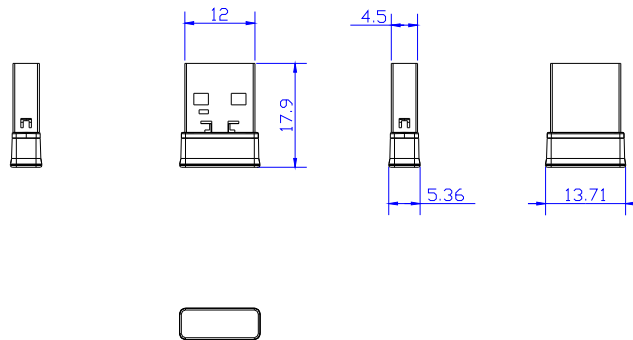
Model Keyboard(UH0G)/Mouse(MH0GC)/Dongle(DHN0)

Width 58.00±0.50mm
Length 109.85±0.50mm



2.1.3 DONGLE PART:

Length: 12 mm (for reference)
Width: 4.5 mm (for reference)
Height: 17.9 mm (for reference)



2.2 PCB

Material: FR4
Flammability: UL 94V0



Model Keyboard(UH0G)/Mouse(MH0GC)/Dongle(DHN0)

2.3 Weight

Keyboard unit : 460g (include battery)

Mouse unit : 111.05g (include battery)

Dongle unit : 2g

2.4 Enclosure

Keyboard PART

PC+ABS

Mouse PART

ABS

DONGLE PART

ABS

2.5 Foot Pad

Keyboard PART

Silicon Rubber Shore 50A

Mouse PART

Material: Teflon

3 Mechanical Specifications

3.1 Keyboard Mechanical Specifications

3.1.1 Key switch Specifications

3.1.1.1 Movement

Pressing a key strongly will not affect the ON/OFF function of other key.

3.1.1.2 Force Applied off Center

The force required operating a key switch when applied to any part of the corner or finger-dish of a keycap shall be no more than twice the force required to depress the switch at the center of the key switch stem

3.1.1.3 Diagrams

(1). Total Travel (Te) :

Total travel is defined as the vertical displacement of the key measured from rest to the point when the force is 150 grams.

Total travel shall be 1.4 ± 0.25 mm.

(2). Drop Force (Fd) :



Model Keyboard(UH0G)/Mouse(MH0GC)/Dongle(DHN0)

30%~65% of peak force (F_p) for small keys

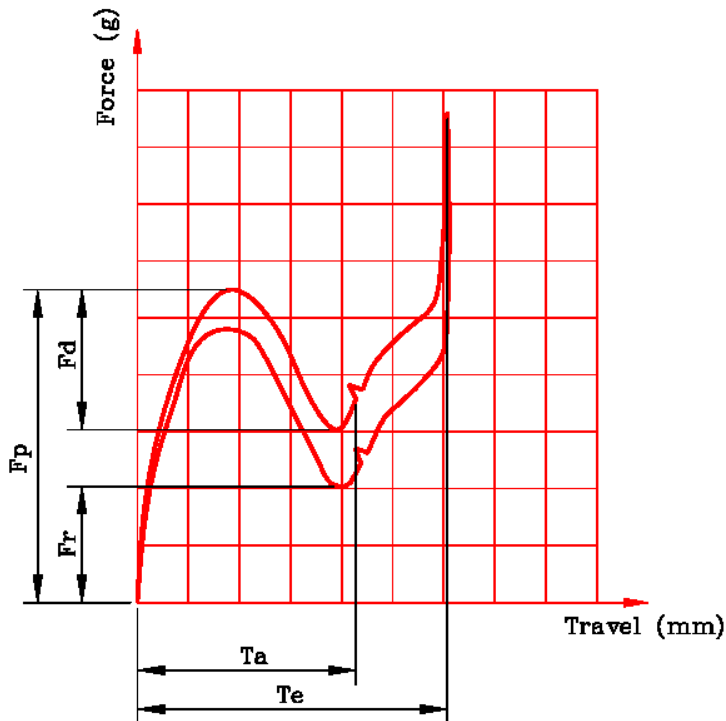
35%~65% of peak force (F_p) for other keys

(3). Peak Force (F_p) : 60 ± 15 grams.

(4). Return Force (F_r) :

After key switch is released, the minimum return force shall be 10 grams. After life test, the key shall have to be lifted up with enough return force successfully

(5). No functional defect and all key can be lifted up successfully after switch life test.



3.1.2 Other Specifications

3.1.2.1 Keycap Retention Force

(1) Normal keys : 800 g min. pulling force applied opposite to the direction of keyboard operation.

(2) Small keys : 700 g min. pulling force applied opposite to the direction of keyboard operation.

3.1.2.2 Keycap Gaps

Gaps between adjacent row or column of keys: 3.00 ± 0.4 mm

3.1.2.3 Slant

Less than 0.4mm for all size keycap with lattice.



Model Keyboard(UH0G)/Mouse(MH0GC)/Dongle(DHN0)

3.1.2.4 Ergonomics

Key caps height profile meet DIN standard with height of C row under 30 mm. Legend printings in key cap is meet ANSI standard, which is applying to all keys. The printed characters are visible within 30 cm distance from any viewing angle and contrast of printing exceeds 3:1. Adjustable tilt legs located in lower casework allowing unit can be adjusted to comfortable angle for user to operate. Tactile feeling feedback for users ensures proper make and break for each key press.

3.1.2.5 Gap for the Keyboard

The product state put on the standard surface or plate. Four corners must land at the same time than measure the distance between the bulge(Rubber feet) and the surface with plug gauge. The gap $\leq 0.5\text{mm}$

3.1.2.6 Keyboard operation force

The keyboard operation force is $150\pm 30\text{gf}$ ◦

3.2 Mouse

3.2.1 Operating force

Operating force of Left & Right Button: $75 \pm 35\text{gf}$

Operating force of Middle Button: $150 \pm 50\text{gf}$

Scroll rotate force: $30 \pm 20\text{gf} \cdot \text{cm}$

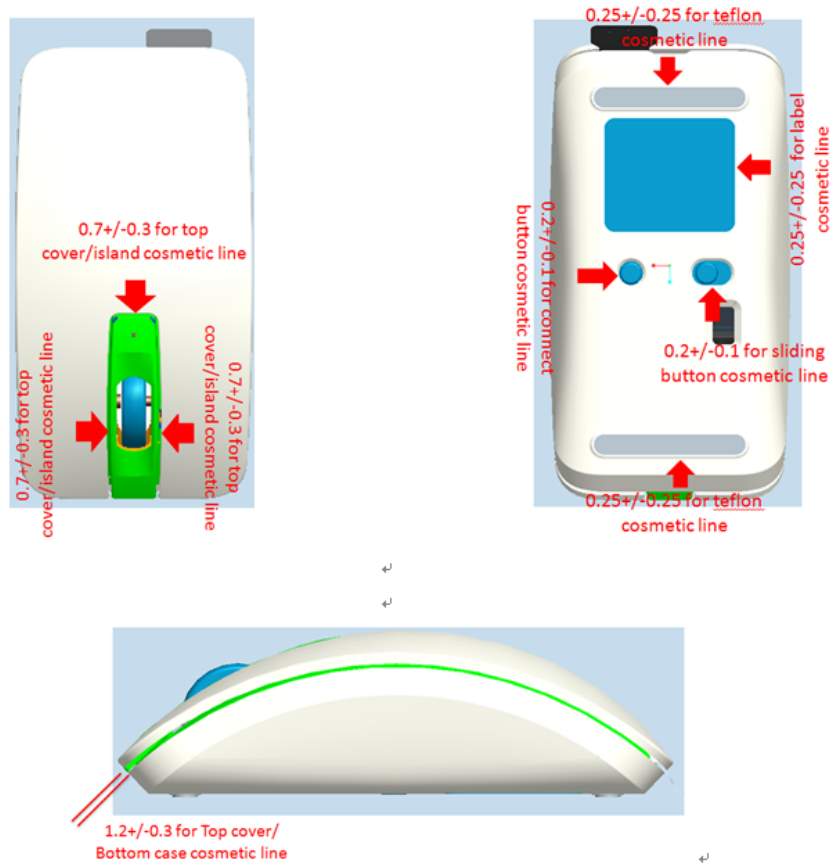
Operating force of Slide Switch: $300 \pm 50\text{gf}$

Operating force of ID BUTTON: $80 \pm 30\text{gf}$

3.2.2 Gap and Step



Model Keyboard(UH0G)/Mouse(MH0GC)/Dongle(DHN0)



4 Electrical Specifications

4.1 Power Rating

4.2.1 Keyboard unit:

Power consumption: (input DC3V)

Working Mode : <10 mA (LED lit ON Max)

Standby Mode : <0.025 mA (Max)

Sleeping Mode <0.025 mA (Max)

4.2.2 Mouse unit

Power consumption is measured on white paper (input DC3V):

Working Mode : <10 mA

Stop : <1.5 mA

Sleeping Mode <0.1 mA

4.2.3 Receiver unit



Model Keyboard(UH0G)/Mouse(MH0GC)/Dongle(DHN0)

USB power consumption: < 50mA.
 USB suspend mode current: < 2.5mA

4.3 Battery Life

Keyboard unit:

- ◆ 6 months

Mouse unit:

- ◆ Up to 6 months

2.4G Wireless Keyboard(nRF24LE1), Akline Battery, AAA*2				
Device operating (at 3V dc)	Operating Hours/Day	Working Current	Power consumption	Remark
Working (MCU power consumption)	2	2.5	5	(a) Scenario: Assume 8 hours working time everyday, it actually using time is 4 hours during 8 hours per day, it equal to continuously using keyboard 2 hours per day. (b) Fomula of calculating current: (Max+Min)/2, (5mA+0mA)/2=2.5mA, stroke key two times.
Standby (Sleep) state power consumption	22	0.03	0.66	
Device being Power_off state	9.6	0.03	0.288	No power switch. Weekend=48hours. 48hours/5(working days)=9.6hours
Daily Power consumption			5.948	
Battery capacity	1150			Akline Battery, AAA*2 (In serial connection: 1150 mAH)
Battery Life				
Daily base	/	193.3		Battery Life(8 hours / per day) (a) 2 hours continous working state (b) 22 hours being standby state
Weekly base	/	38.7		Battery Life (5 days / per week)
Monthly base	/	9.7		Battery Life (20 days / per month)
2.4G Wireless Mouse(nRF24LE1), Akline Battery, AA*2				
Device operating (at 3V dc)	Operating Hours/Day	Working Current	Power consumption	Remark
Working (MCU power consumption)	2	5	10	(a) Scenario: Assume 8 hours working time everyday, it actually using time is 4 hours during 8 hours per day, it equal to continuously using Mouse 2 hours per day. (b) Fomula of calculating current: (Max+Min)/2, (8mA+0mA)/2=4mA, stroke key two times.
Standby (Sleep) state power consumption	22	0.05	1.1	
Device being Power_off state	0	0	0	
Daily Power consumption			11.1	
Battery capacity	2600			Akline Battery, AA*2 (In serial connection: 1150 mAH)
Battery Life				
Daily base	/	234.2		Battery Life(8 hours / per day) (a) 2 hours continous working state (b) 22 hours being standby state
Weekly base	/	46.8		Battery Life (5 days / per week)
Monthly base	/	11.7		Battery Life (20 days / per month)

4.4 Mouse Tracking

Sensor: Pixart 3204 optical Sensor
 Tracking Resolution: 1000dpi



Model Keyboard(UH0G)/Mouse(MH0GC)/Dongle(DHN0)

Tracking Speed: up to 30 ips

4.5 RF Specifications

A simple data transmitter/receiver pair operating at 2.4GHz range.

Channels: Mouse(CH77) / Keyboard (CH73) / Dongle (73)

Bandwidth: 1M

Modulation: GFSK

Data Rate (Maximum): 2Mbps

Voltage (Supply) : 1.9~3.6V

Transmitter Output Power- Programmable Output power up to 0 dBm

Channel Switching Time: <100us

Wireless Operating Range on USB2.0 port: 10m (typical)

Wireless Operating Range on USB3.0 port: 8m, without RF interference

Sensitivity: <-94dBm

4.6 Keyboard LED Indication

POWER ON:

- Pairing state : LED will turn on for 10secs than off.
- Pairing success : LED off
- Disconnect state : LED will flash 1 min if keyboard do not connect with dongle (on / off : 100ms / 1900ms)
- If battery voltage > 2.0V and ≤ 2.2V battery low indicator (amber LED) will flash 10 times continuously. (on / off : 200ms /400ms)
- If the battery voltage ≤ 2.0V. Keyboard shut down, NO any LED indicates

Battery Low:

- ◆ When battery voltage > 2.0V and ≤ 2.2V, battery low indicator (amber LED) will flash 10 times after stop typing and LED will flash again when typing resumes

4.7 Mouse LED Indication

POWER ON:

- Pairing state : LED will turn on for 10secs than off.
- Pairing success : LED off
- Disconnect state : LED will flash 1 min if keyboard do not connect with dongle (on / off : 100ms / 1900ms)
- If battery voltage > 2.0V and ≤ 2.2V battery low indicator (amber LED) will flash 10 times continuously. (on / off : 200ms /400ms)
- If the battery voltage ≤ 2.0V. Keyboard shut down, NO any LED indicates

Battery Low:

- ◆ When battery voltage > 2.0V and ≤ 2.2V, battery low indicator (amber LED) will flash 10 times after stop typing and LED will flash again when typing resumes



Model Keyboard(UH0G)/Mouse(MH0GC)/Dongle(DHN0)

6 Regulations and Certifications

6.1 EMI Test (conduction and radiation)

European Standard: EN 55022: 2010/AC: 2011, Class B.

Frequency Range of Test: From 30MHz to 1000 MHz

Test Distance: 10 M

Temperature: 15~35 °C

Relative Humidity: 30~60 % RH

6.2 ESD Test

6.2.1 Keyboard unit:

Basic standard: EN55024:2010

Generic standard: IEC 61000-4-2:2008

Testing Criteria Air Discharge to EUT		
Severity Level	Level +/-	Acceptance Criteria
1	4KV	B
2	8KV	B
3	10KV	B
4	12KV	B
5	15KV	C
Testing Criteria Contact Discharge to EUT		
Severity Level	Level +/-	Acceptance Criteria
1	2KV	B
2	4KV	B
3	6KV	B
4	8KV	B

6.2.2 Mouse unit:

Basic standard: EN55024:2010

Generic standard: IEC 61000-4-2:2008

Testing Criteria Air Discharge to EUT		
Severity Level	Level +/-	Acceptance Criteria
1	4KV	B
2	8KV	B
3	10KV	B



Model Keyboard(UH0G)/Mouse(MH0GC)/Dongle(DHN0)

4	12KV	B
5	15KV	C
Testing Criteria Contact Discharge to EUT		
Severity Level	Level +/-	Acceptance Criteria
1	2KV	B
2	4KV	B
3	6KV	B
4	8KV	B

6.2.3 Dongle unit:

Basic standard: EN55024:2010

Generic standard: IEC 61000-4-2:2008

Testing Criteria Air Discharge to EUT		
Severity Level	Level +/-	Acceptance Criteria
1	4KV	B
2	8KV	B
3	10KV	B
4	12KV	B
5	15KV	C
Testing Criteria Contact Discharge to EUT		
Severity Level	Level +/-	Acceptance Criteria
1	2KV	B
2	4KV	B
3	6KV	B
4	8KV	B

6.3 EFT Test

Basic standard: EN55024:2010

Generic standard: IEC61000-4-4: 2012

Performance Criteria: B

Test Voltage: ± 2 KV on AC power port for one minute;
 ± 1 KV on signal /control lines .

Temperature: 15~35 °C

Relative Humidity: 30~60 % RH

9 Green Requirement

- ◆ Follow as regulation: RoHS, RoHS2



Model Keyboard(UH0G)/Mouse(MH0GC)/Dongle(DHN0)

◆ Requirement of Primax Green part:

Comply with Primax QW-5Q002"Green product Chemical Substances Specification".

Follow customer's specification as required.

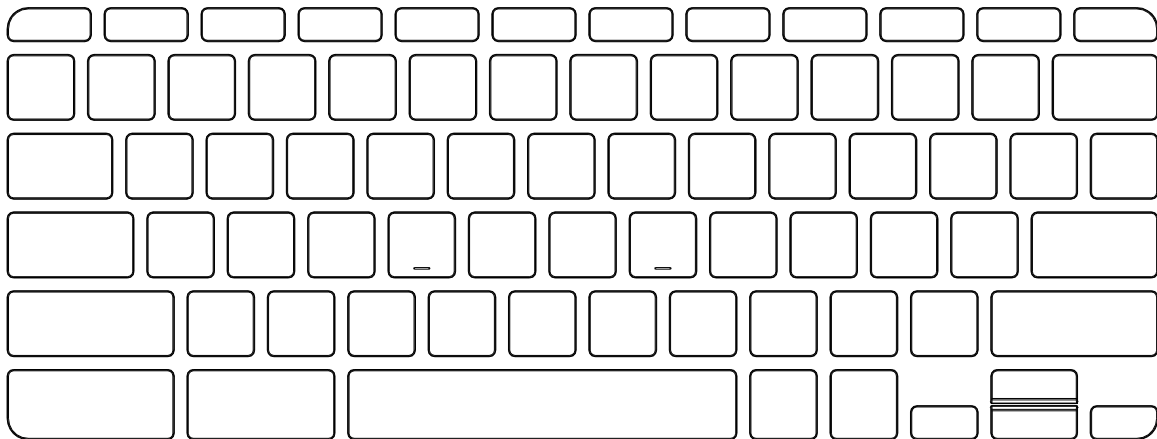
China ROHS Require.

◆ Products must meet **HP Standard 011 General Specification for the Environment**

-	Countries	-	Worldwide
-	ESTAR 5.0	-	Some models
-	EPEAT Level	-	Some models
-	EUP Lot 3 (Late 2011)	-	Yes
-	EUP Lot 6 Tier 2 (< .5W)	-	TBD
-	EUP Lot 6 Tier 1 (< 1W)	-	Yes
-	BFR/CFR/PVC Free	-	no
-	ROHS 2 Compliance	-	Yes
-	Recycled Packaging	-	Yes
-	Recycled Plastic content	-	TBD ****

10 Keyboard Layout

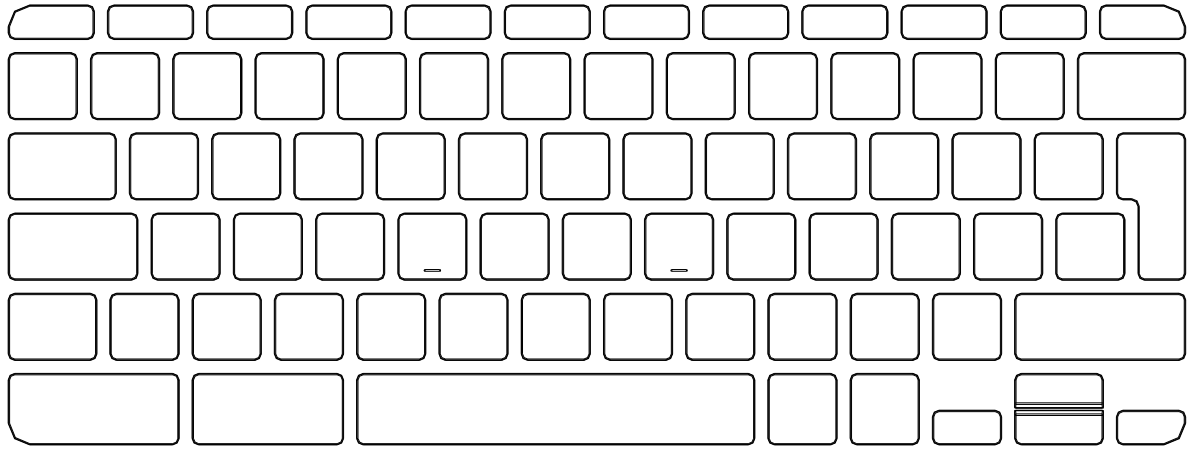
10.1 74 keys layout (US)



10.2 75 keys layout (UK)



Model Keyboard(UH0G)/Mouse(MH0GC)/Dongle(DHN0)





Model Keyboard(UH0G)/Mouse(MH0GC)/Dongle(DHN0)

FCC Statement :

Federal Communications Commission (FCC) Statement

15.21

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

15.105(b)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- 1) this device may not cause harmful interference and
- 2) this device must accept any interference received, including interference that may cause undesired operation of the device.

FCC RF Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.



Model Keyboard(UH0G)/Mouse(MH0GC)/Dongle(DHN0)

Industry Canada (IC) Statement

Canada, Industry Canada (IC)

This Class B digital apparatus complies with Canadian ICES-003 and RSS-210.

This device complies with Industry Canada licence-exempt RSS standard(s).

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Canada, avis d'Industry Canada (IC)

Cet appareil numérique de classe B est conforme aux normes canadiennes ICES-003 et RSS-210.

Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas causer d'interférence et (2) cet appareil doit accepter toute interférence, notamment les interférences qui peuvent affecter son fonctionnement.

Informations concernant l'exposition aux fréquences radio (RF)

La puissance de sortie émise par l'appareil de sans fil **Darfon Electronics Corp.** est inférieure à la limite d'exposition aux fréquences radio d'Industry Canada (IC). Utilisez l'appareil de sans fil **Darfon Electronics Corp.** de façon à minimiser les contacts humains lors du fonctionnement normal.



Model Keyboard(UH0G)/Mouse(MH0GC)/Dongle(DHN0)

cULus Caution

CAUTION
RISK OF EXPLOSION IF BATTERY IS REPLACED
BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING
TO THE INSTRUCTIONS

ATTENTION
IL Y A RISQUE D'EXPLOSION SI LA BATTERIE EST REMPLACÉE
PAR UNE BATTERIE DE TYPE INCORRECT.
METTRE AU REBUT LES BATTERIES USAGÉES
CONFORMÉMENT AUX INSTRUCTIONS

Operating High Temperature

Condition: Product power on

Temperature: 40°C

Humidity: 90%RH

Operating Low Temperature

Condition: Product power on

Temperature: 0°C