Thermal Sensing Board

SPECIFICATIONS

MODEL : HLT-SDBF1

Customer P/N :

APPROVED **2021.09.27**

H·L Data Storage

Development Department

Confidential

TO :

APPLICATION

MODEL : HLT-SDBF1
Customer P/N :

APPLICANT		
Traced by	Checked by	Approved by
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H·L Data Storage

Revision History

Revision No.	Date of Rev.	Contents of Revision	Changed page
0.1	2021.06.18	Initial Update	
0.2	2021.06.24	Modify STANDARD PERFORMANCE	5
0.3	2021.09.24	Modify GENERAL SPECIFICATIONS Modify RELIABILITY	3 6
0.4	2021.09.27	Modify STANDARD PERFORMANCE (Add Software) Modify RELIABILITY	5 ~ 8 9

CONTENTS

1. SCOPE OF DOCUMENT

■ This document describes the specification of Thermal Sensing Board "HLT-SDBF1".

■ The provisions of this document maybe altered upon agreement between both parties.

■ If any disagreement should arise, these two parties shall meet in good faith to resolve the problem.

■ Within the range of these specifications, parts are subject to change without notice for technical improvement.

■ Please be sure to observe the following each time you deliver your finished and/or semi-finished products containing the device(s). Otherwise, HLDS may not be able to assume the responsibility for things to happen.

- Always use the device(s) within conditions given in the specifications.
- Never given additional process to the device(s).
- Before use, be sure to read this instruction manual and use the product safely and correctly.
- The illustrations in the user manual may differ from the actual product, and the contents may be partially changed without notice to the user for performance improvement.
- To use the product in connection with another device, first check that the device is compatible with the product.

2. GENERAL SPECIFICATIONS

Items	Specifications
Display	29 Inch / 1920 x 540 (Support Touch Display)
CPU	RK3288 (4 x A17)
RAM / eMMC	1GB / 8GB
RGB Camera	HD (1280x720), SD(640 x480)
Thermal Sensor	Heimann 32x32, HTPA32x32dR2L5.0/0.85F7.7eHiC
LED Lighting	O
Speaker	O
Wi-Fi / BT	Wi-Fi 2.4G / BT 4.2(Profile : A2DP, HID)
Ethernet	10M/100M Adaptive Ethernet
USB	Type-A 1ea, OTG 1ea / Format : FAT32, NTFS
Other I/O	Relay
Power	DC 12V / 4A (Power consumption 35W - Typical)
Dimensions	226 x 775 x 42mm (W x H x D)
Mass	About 4.0 Kg
Operating temperature and humidity	5℃ to +35℃, below 65%RH (without dew, frost) (Recommendation 25℃)
Storage temperature and humidity (Transportation)	-20℃ to +60℃, below 90%RH (without dew, frost)
Appearance	Fig.1
Operating System	Android 7.1.2
Detection distance (Face/Thermal/Mask)	0.3m ~ 0.8m (Recommendation : 0.5m)
Detection time (Face/Thermal/Mask each.)	Under 5sec
Thermal detection range	32 ~ 42℃ (±0.3℃)
Thermal detection accuracy	≤±0.3˚C at 0.5m about 25˚C ambient temperature
Thermal detection precision	≤±0.3˚C at 0.5m about 25˚C ambient temperature
Face recognition probability	≥ 90% without mask (tentative)
Mask detection probability	≥ 95% (tentative)
Face registration count	About 1.000 people
QR code read	O
Support movie format	Webm (VP9)
Languages	Korean/Japanese/English

***1 The detection distance or face recognition speed may vary depending on the usage environment.**

3. STANDARD CONDITIONS OF EVALUATION

(1) Environment Temperature 25℃ ± 2 ℃

Humidity 60% ± 5 %[RH]

We can adopt temperature range 15 ℃～35 ℃ ,humidity range 45%～65%[RH] If it occurs no doubt about judgment.

(2) Environment of Operating Condition

5℃ to +35℃, below 65%RH (without dew, frost)

(3) Evaluation

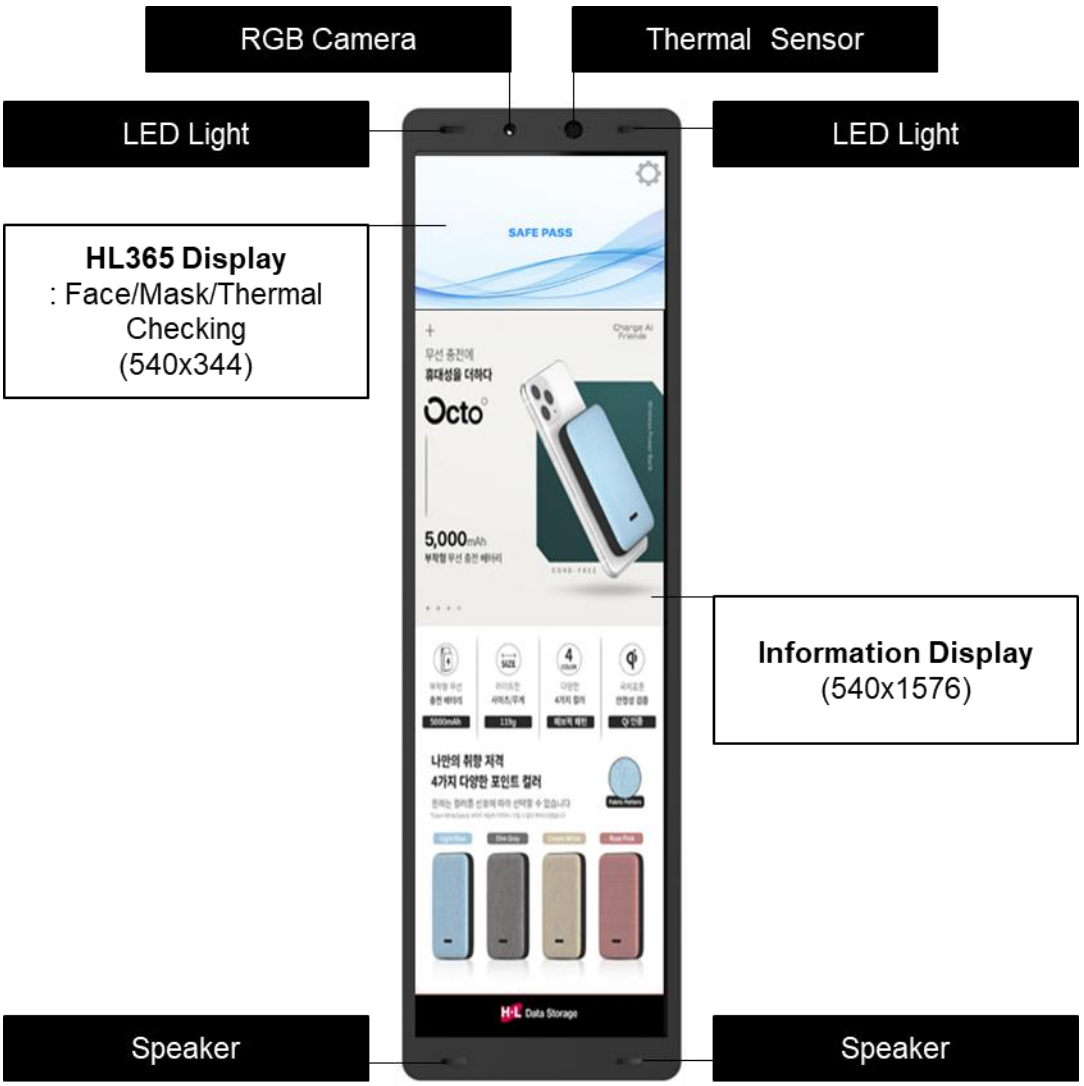
Use HLDS standard measuring equipment.

Note.

(1) The detection distance or face recognition speed may vary depending on the usage environment.

4. STANDARD PERFORMANCE

Detection Quality Validation Metrics		
Item	Spec.	Remark
Detection distance (Face/Thermal/Mask)	0.3m ~ 0.8m (Recommendation : 0.5m)	
Thermal detection range	32 ~ 42℃ (±0.3℃)	
Face registration number	About 1,000 people	
Detection time (Face/Thermal/Mask each.)	Under 5sec	



※ For Mask & Thermal detection metric test methodology, refer to “HLDS SAFE PASS PLUS User Manual".

4. STANDARD PERFORMANCE

Software Function Validation Metrics		
Item	Spec.	Remark
Normal Performance Test 1. Change password 2. Log-In 3. Device setting 4. Device operating 5. Face recognition 6. Change Account	On/Off by function, change of setting value and confirmation of operation ※ Environment Temperature 25℃ ± 2 ℃ Humidity 60% ± 5 %[RH]	
Temperature measurement	Repeat measurement during 2 hours (5 times / sets) every 30 minutes using blackbody. (Under ±0.3℃) ※ Environment Temperature 25℃ ± 2 ℃ Humidity 60% ± 5 %[RH] ※ Distance between TSB1 & blackbody is 50cm.	
Face registration	1. With Mask : Up to 80% 2. Without Mask : Up to 90% ※ Environment Temperature 25℃ ± 2 ℃ Humidity 60% ± 5 %[RH] ※ When the face is aligned with the indicator line.	
QR Code	1. QR code + Face recognition 2. Check QR code only : Save QR code only KR COVID QR (Naver, Kakao, PASS) ※ Environment Temperature 25℃ ± 2 ℃ Humidity 60% ± 5 %[RH] ※ When the QR is aligned with the indicator line. (Check QR code only case)	

※ For Mask & Thermal detection metric test methodology, refer to “HLDS SAFE PASS PLUS User Manual ".

4. STANDARD PERFORMANCE

Software Function Validation Metrics		
Item	Spec.	Remark
Mask detection	Up to 95% ※ Environment Temperature 25℃ ± 2 ℃ Humidity 60％ ± 5 ％[RH] ※ When the face is aligned with the indicator line.	
Information Display	1. Video play - Format : WEBM(VP9) - File size : Maximum 150MB - Resolution : 540 x 1586 (pixel) ※ Interruption may occur depending on the state of the file. 2. Image display - Format : JPG, PNG - File size : Maximum 10MB - Resolution : 540 x 1586 (pixel) ※ Environment Temperature 5℃ to +35℃, below 65%RH (without dew, frost)	

※ For Mask & Thermal detection metric test methodology, refer to “HLDS SAFE PASS PLUS User Manual ".

4. STANDARD PERFORMANCE

Software Function Validation Metrics		
Item	Spec.	Remark
Web Server (PC)	1. User Management - Check function operation. (Individual Add, Collective Add & Edit, Show, Delete function) 2. Device Setting - Check function operation. (Volume, LED brightness, Log, Software update) 3. Heat Check - Check function operation. (Show visitor list, Save list) 4. Display - Check function operation. (Video & Image upload, manage play list etc.)	

※ For Mask & Thermal detection metric test methodology, refer to “HLDS SAFE PASS PLUS User Manual ".

5. RELIABILITY

Examination item	Quantity	Examination condition
High temperature storage test	2	Should be measured after following conditions Leave it for 48hours in 60℃ Leave it for 16hours normal temp. and humidity
Low temperature storage test	2	Should be measured after following conditions Leave it for 48hours in -20℃ Leave it for 16hours normal temp. and humidity
Temperature cycling test	1	Should be measured after following conditions Leave in temp. cycle for 10 cycles. → 1 cycle: -20℃(1hour)<->60℃(1Hour) Leave it for 16hours normal temp. and humidity
High temperature and high humidity storage test	2	Should be measured after following conditions Leave it for 48 hours in 60℃,85% Leave it for 16hours normal temp. and humidity
Package drop test	1 Box	Free-fall at 6 face in 50cm.
Package vibration test	1 Box	10~500Hz, Double amplitude, every 40 mins in X,Y and Z directions 1.5G
ESD	3	Non operation(Turn off) contact 6kV, Air 8kV Operation Air 8kV

※ NOTE1. No condensation during above test.
※ NOTE2. The drop test of a single unit is not guaranteed.

6. LIFE TEST

Environment	Temperature 25℃ ± 2 ℃ Humidity 60% ± 5 % [RH] We can adopt temperature range 15 ℃ ~ 35 ℃ ,humidity range 45%~75%[RH,] If it occurs no doubt about judgment.	10,950Hrs

※ 10,950Hrs : 3 Years x 365 days x 10Hrs

※ M.T.B.F conversion diagram

1) Confidence Level : 90%
2) Total Test Time : $T = \sum_{n=1}^{N}(t * n)$ t : Real test time of each unit, n : Number of unit
3) Acceleration Factor $AF = EXP^{(-E/K)*(1/T1 - 1/T2)} = EXP^{(-E/K)*(1/45 - 1/25)} = 4.34$

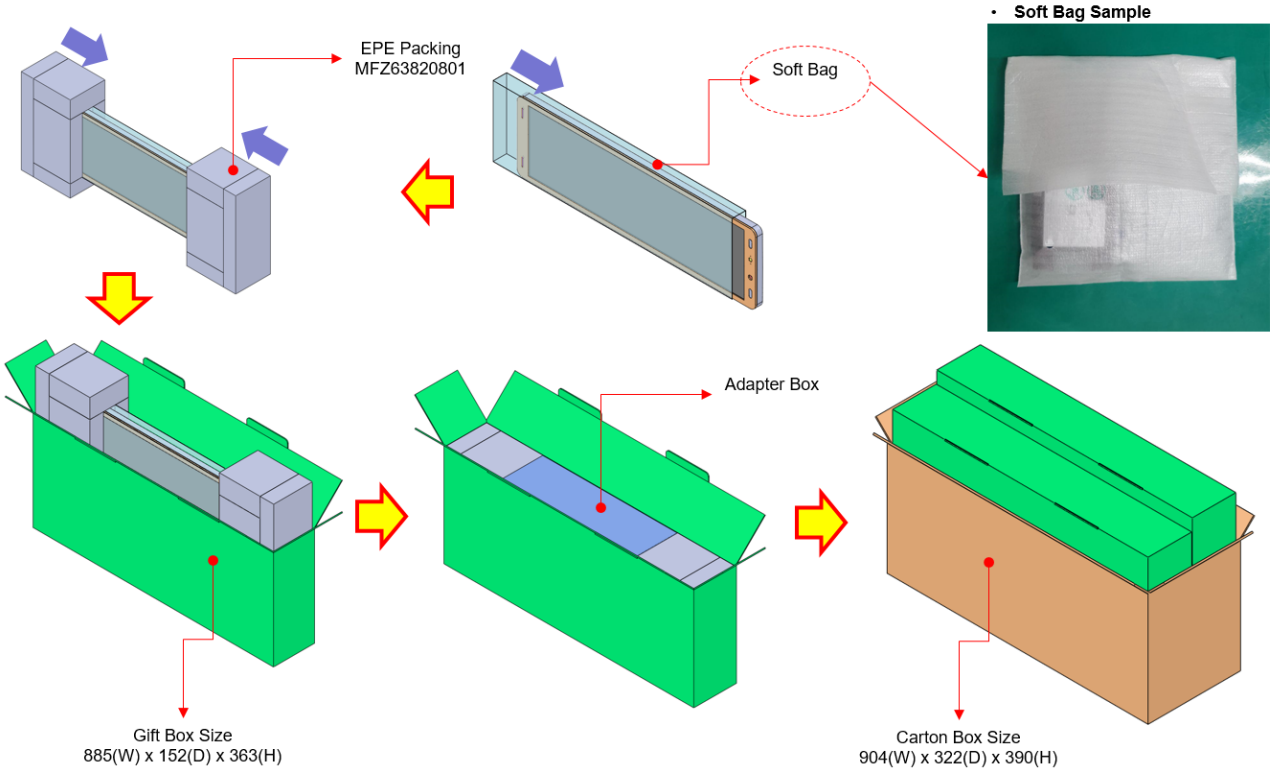
"*E : Activity Energy (0.6eV) K : Boltzman Const.(0.00008617)"
T1 : Test Temp.(Absolute Temp.) T2: Standard Temp. (Absolute Temp.)

4) Estimated Failure constant : Ef =2.3 (According to distribution factor of Poisson)
5) M.T.B.F

17520POH Duty 62.5%
MTBF = (T ÷ Ef) x AF = ((t x n) ÷ Ef) x AF1
t = (MTBF x Ef) ÷(n x AF1)
= ((17520 x 0.625) x 2.3) ÷(15 x 4.34)
= About 390.5 Hours = About 16.3 days

※ Test Condition(MTBF) : 40℃ chamber, 15 units
Temperature measurement before/after test (thermal sensor evaluation),
LCD illuminance measurement (dark room condition),
Speaker Sound check, RGB performance, and appearance check

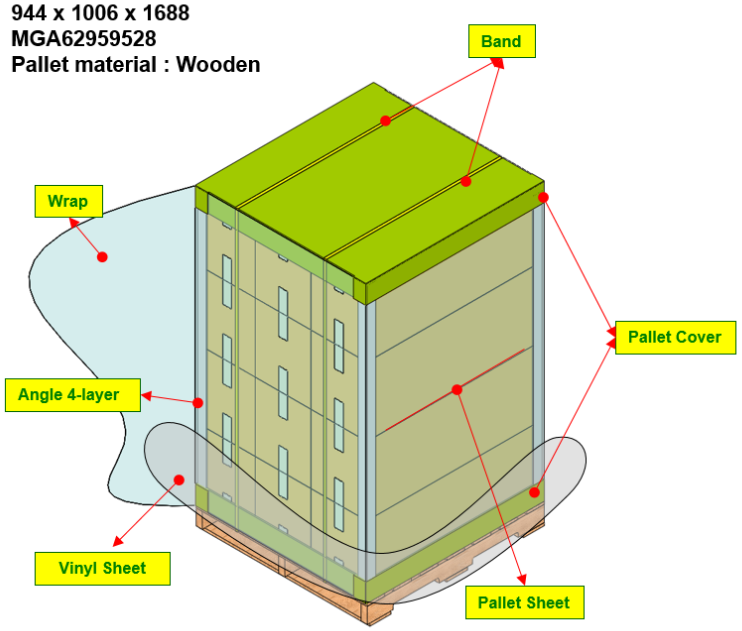
7. PACKING SPECIFICATION



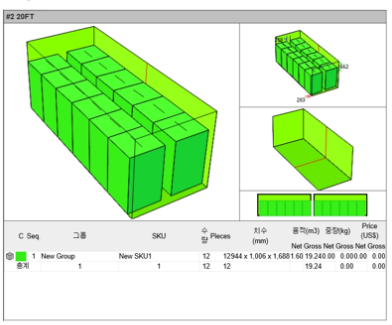
Transportation

1 x 3 x 4 = 12 shipping box
24 units/pallet

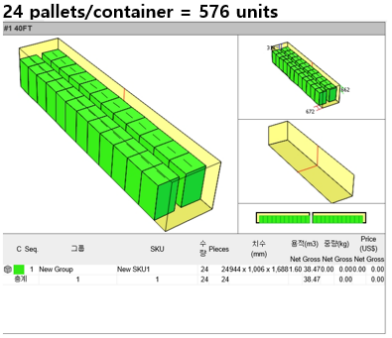
Pallet size
944 x 1006 x 1688
MGA62959528
Pallet material : Wooden



20ft Container
1 x 3 x 4 = 12 shipping box
24 units/pallet
12 pallets/container = 288 units



40ft Container
1 x 3 x 4 = 12 shipping box
24 units/pallet
24 pallets/container = 576 units



8. HANDLING

(1) Do not disassemble this Thermal Sensing Board.

(2) Do not leave this Thermal Sensing Board in high temperature and humidity.

(3) Do not shock to this Thermal Sensing Board.

(4) Do not install outdoors. (indoor use only)

(5) Install the product in a safe place so that it does not fall over.

(6) Do not install the product near a heat source such as an air conditioner or heater.

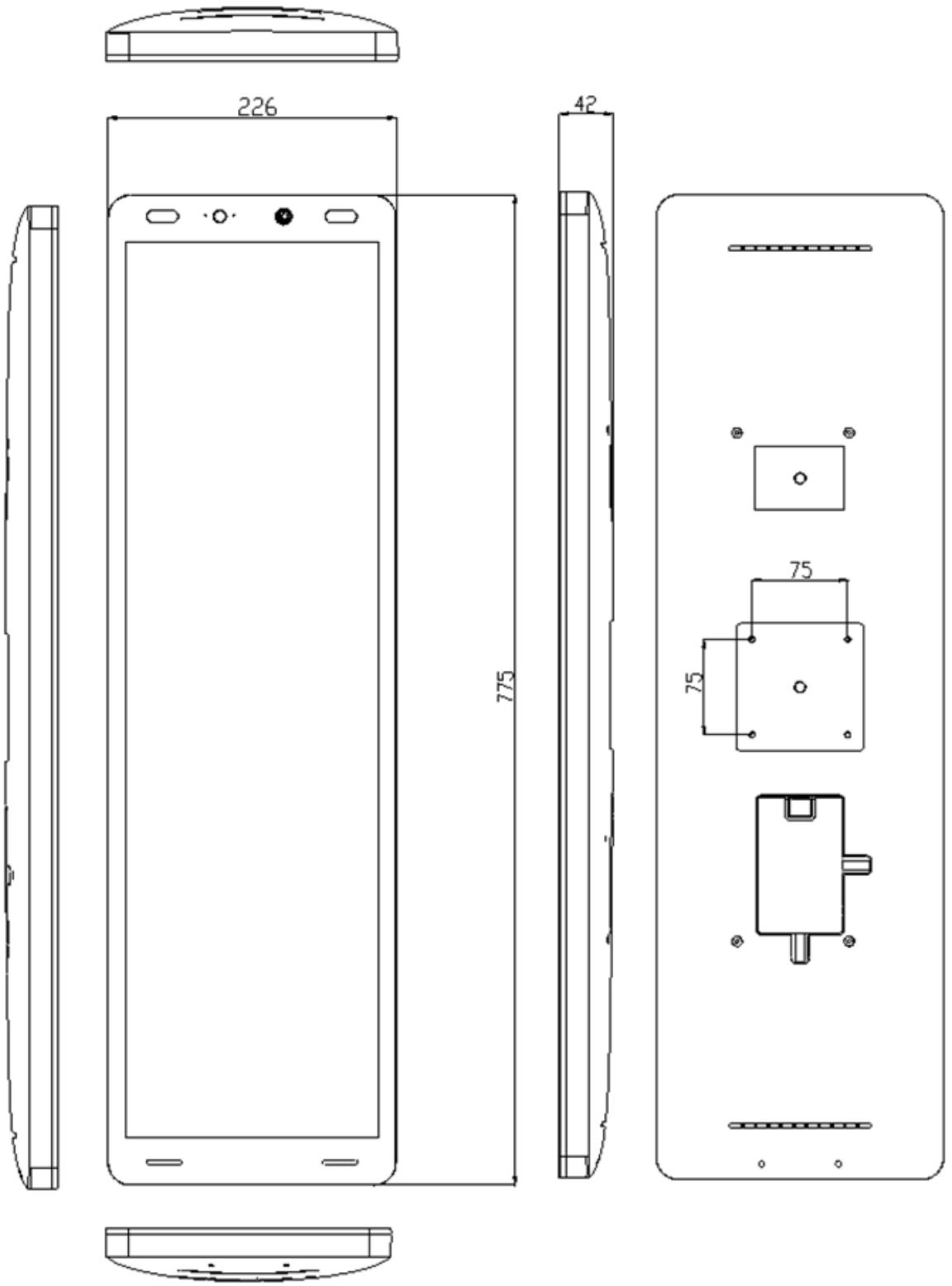
(7) Do not apply excessive force to the button or the screen, or press it with a pointed tool.

(8) Do not install the product in a place exposed to direct sunlight (sunlight, electric lamp, etc.).

※ Please refer to “HLDS Thermal Sensing Board User Manual" for details.

9. ATTACHMENT

Fig. 1 APPEARANCE DIAGRAM



Manufacturer information

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Product Description

Device Type	Thermal Sensing Terminal	
Operating Frequency	Bluetooth	2 402 MHz ~ 2 480 MHz
	Bluetooth LE	2 402 MHz ~ 2 480 MHz
	WLAN 2.4 GHz	2 412 MHz ~ 2 472 MHz (802.11b/g/n(HT20))
		2 422 MHz ~ 2 462 MHz (802.11n(HT40))
RF Output Power	Bluetooth	7.86 dBm
	Bluetooth LE	2.31 dBm
	WLAN 2.4 GHz	9.17 dBm(802.11b) 5.30 dBm(802.11g) 4.74 dBm(802.11n_HT20) 2.66 dBm(802.11n_HT40)
Modulation Type	Bluetooth	GFSK for 1 Mbps, π/4-DQPSK for 2 Mbps, 8-DPSK for 3 Mbps
	Bluetooth LE	GFSK
	WLAN 2.4 GHz	802.11b: DSSS Modulation(DBPSK/DQPSK/CCK) 802.11g/n(HT20)/n(HT40): OFDM Modulation(BPSK/QPSK/16QAM/64QAM)
Antenna Type	PCB Antenna	
Antenna Gain	1.16 dBi	
Rated Supply Voltage	DC 12 V	
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)	24 MHz	

FCC Information to User

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 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 con−nected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution

Modifications not expressly approved by the party responsible for compliance could void the user’ s authority to operate the equipment.

FCC Compliance Information : 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.

IMPORTANT NOTE:

FCC RF Radiation Exposure Statement:

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body. This transmitter must not be co−located or operating in conjunction with any other antenna or transmitter.