



PRODUCT SPECIFICATION

FILE NO	1-HJ08 V3.0A for 3.3V
DATE	2020/09/15

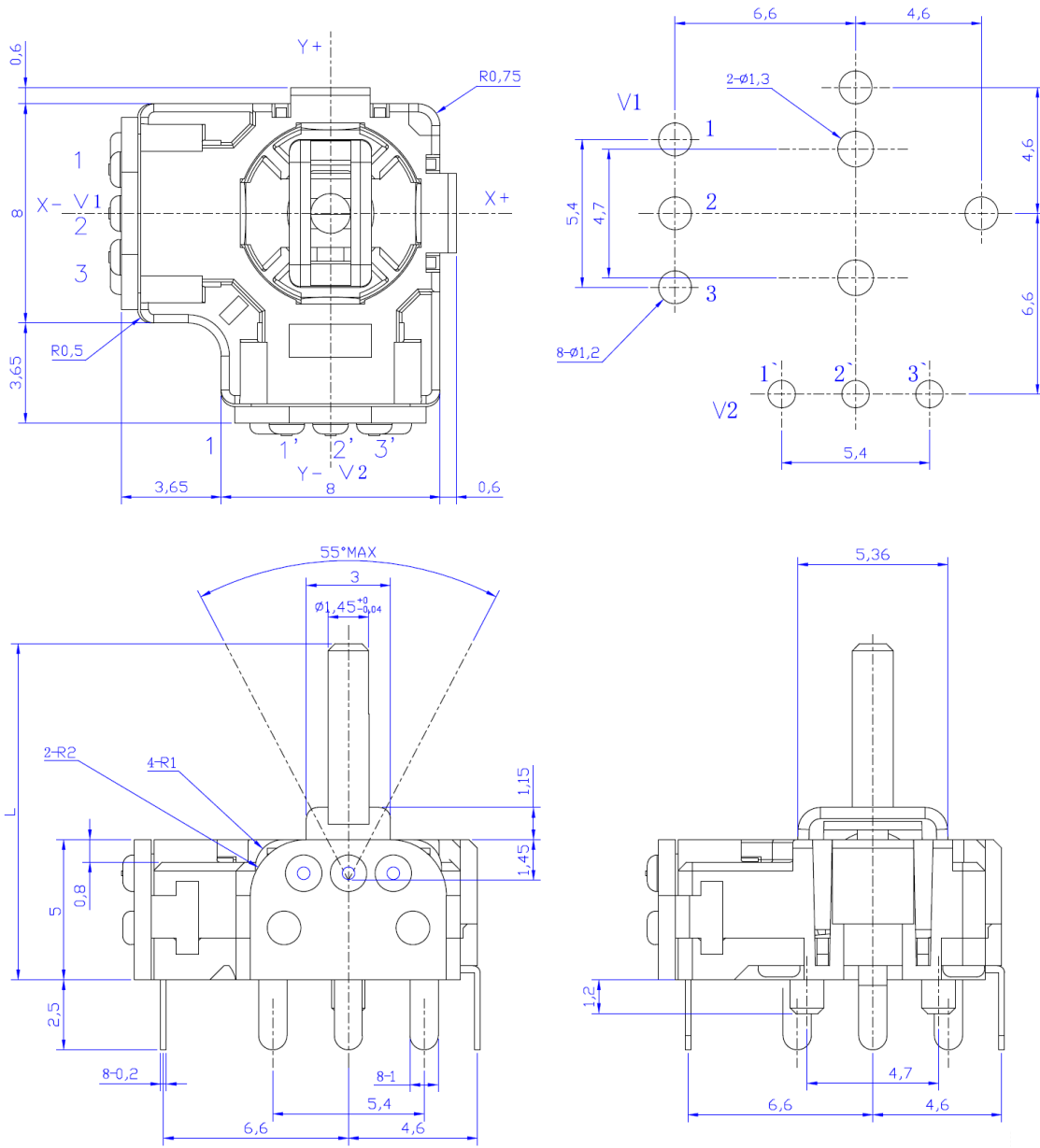
ITEM NO	MODEL	CUSTOMER P/N
1	HJ-08S (with tact switch)	
2	HJ-08N (without tact switch)	
CHINA PATENTED		


MANAGER	MARKETING	ENG	QA

CUSTOMER APPROVAL		

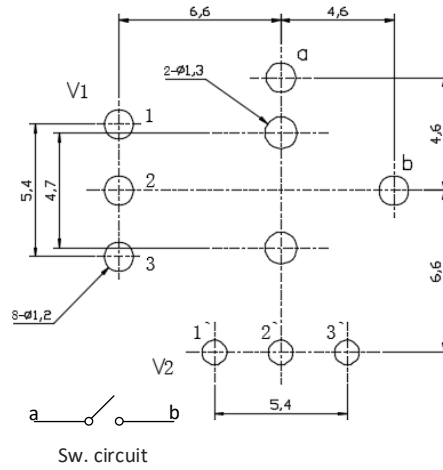
MODEL	PRODUCT	
HJ08	Contactless Mini 3D Joystick	

1. OUTLINE DIMENSIONS



 MST Magnesensor Technology	DRAWING NO KSA1036-P	DATE 2020.09.15
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2. PIN DESCRIPTION



Pin No.	Description	Signal	Remark
1	“Y” axis input	Vdd=3.3~6.0VDC	Control directions may vary due to different installation directions of joystick
2	“Y” axis output	Y-Vout	
3	“Y” axis ground	Ground	
1'	“X” axis input	Vdd=3.3~6.0VDC	
2'	“X” axis output	X-Vout	
3'	“X” axis ground	Ground	

3. APPLICATION SCOPE

This products is suitable for many kind of electronic products such as mobility devices, game pads and remote control devices.

4. MODEL

HJ-08 S or N (“S” for switch type or “N”for non-switch)

5. APPEARANCE

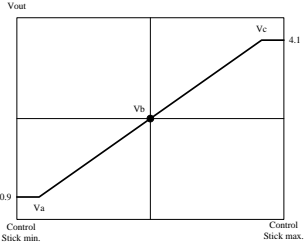
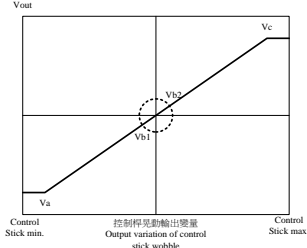
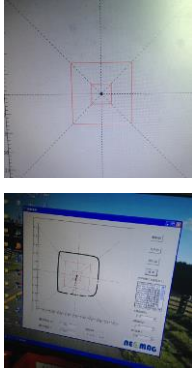


There shall be no remarkable damage in the visual inspection. Products shall be judged by boundary samples if there are any doubts.

6. INSTALLATION DIMENSIONS

REFER TO CLAUSE 1 OUTLINE DIMENSIONS

7. MAX RATING			
NO.	ITEM	TESTING METHOD AND CONDITION	SPECIFICATION
7.1	Operating Temp		-30 ~ +105°C
7.2	Storage Temp		-10 ~ +60°C
7.3	Operating Voltage		2.5~ 6.5 VDC
7.4	Operating Current	@Vdd=3.3V	Max: <5 mA x 2 Typical: <2.5mA x 2
8. SPECIFICATION			
8.1	Joystick Rotation type	Thumb Operating	2D Rotating plus momentum sw.
8.2	Joystick operating angle	Engineering Projector	55° Max.
8.3	Electrical Continuity angle		N/A
8.4	Theoretical Electrical angle		N/A
8.5	Power	@Vdd=5.0V @Vdd=3.3V @Vdd=2.5V	0.025W 0.015W 0.008W
8.6	Rotational torque	Thumb Operating	120 ± 50 gf.cm;
8.7.1	Tact Switch op force	Press Tact Switch by thumb	600 ± 250 gf
8.7.2	Switch travel	Depress the rotating shaft will trigger the momentum switch and accompanied with slight “CLICK”sound.	≅0.5 mm *Not applicable for HJ08-N
8.8	Independent Linearity		N/A
8.9	Control Stick rotation wobble	Engineering Projector	±2.5° Max.
8.10	Contact Noise	Lead to Lead	<3mV
8.11	Output Current	Apprx.: 1.33mA x 2 @ 2.5V 1.65mA x 2 @ 3.0V 2.0mA x 2 @ 5.0V	B=0 Gs
8.12	Output Bandwidth		<20 KHz
8.13	Output Response Time		3 μS
8.14	Output Voltage Range	@VDD=3.3V Vout= ≅ 0.7V ~ ≅ 2.6V	Va~Vc= ≅ 0.7 ~ ≅ 2.6V
		@VDD=5.0V Vout= ≅ 0.7V ~ ≅ 4.3V	Va~Vc= ≅ 0.7 ~ ≅ 4.3V

8.15	Center Output Range For VCC=3.3V Application (97% is the compensation coefficient)	Output & Tracking Testing System	 <p>Calculation: $V_b = (V_c + V_a) / 2 * 97\% \pm 5\%$</p>
8.16	Output variation of control stick wobble	Output & Tracking Testing System	 <p>Calculation: Max. 1.5% (Vc-Va), or $\cong 50\text{mV} @ V_{dd}=5.0\text{V}$</p>
8.17	Output Tracking	Output & Tracking Testing System	 <p>True Output</p>
9. RELIABILITY			
9.1	Cycle Life	Cycle Life Tester	2-Million cycles min.
9.2	Momentum Switch Cycle Life	Pressing by Thumb For HJ-08S Only	200K cycles Not applicable for HJ08-N
9.3	High Temp	96 hours@80±2°C	Output variation <2%;
9.4	Low Temp	96 hours@-30±2°C	Output variation <2%;
9.5	Humid	96 hours@60±2°C, 90~95% RH	Output variation <2%;
9.6	Dipping Test	10s@260°C	Output Variation <1%
9.7	Soldering Condition		

9.7.1	Reflow soldering	N/A	
9.7.2	Wave soldering	<div data-bbox="794 309 1347 689" style="text-align: center;"> <p>The graph, titled 'WAVE SOLDERING', shows a temperature profile over time. The y-axis is labeled 'TEMPERATURE' and the x-axis is labeled 'TIME: SECOND(sec)'. The profile starts at a baseline, rises to a plateau at 150±10°C for 60±10 seconds. It then rises at a rate of 2-5°C/sec to a second plateau at 260±5°C for 10±1 second. Finally, it cools down.</p> </div> <p>Wave soldering is also applicable for manual soldering. The product can suffer 300°@10sec, but be noted that the term is for extreme condition, not for standard operating procedure.</p>	
10. ENVIRONMENTAL		ROHS	Compliant
10.1	ESD; HUMAN	MIL-STD-883G Method 3015.7	(±)1000V ~ 4000V, Step : (±)500V
10.2	ESD; MACHINE	JEDEC EIA/JESD22-A115	(±)100V ~ 300V, Step : (±)50V
11. X/Y Axis Output Curve		Linear	