
Temperature and Humidity Sensor Specification

(JL-THS-8101)

Model name	Temperature and Humidity Sensor			Specification			
		Model	SW-THS-8101	Revision	A/0		

1、Application scope

Electrical power equipment, refrigerators and air conditioners, humidification/dehumidification equipment, storage, industrial automation, and other fields.

2、Model name code

SW - T H S - 8 1 01

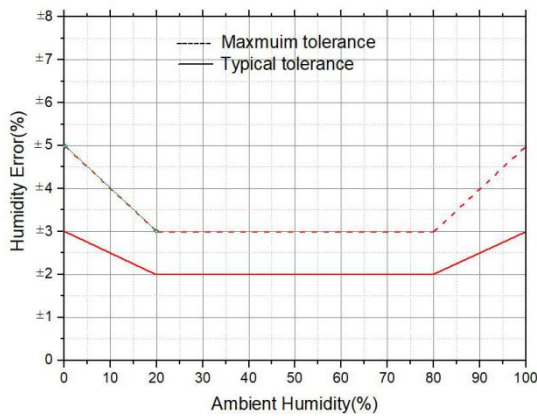
Company code	Temperature	Humidity	Output type	Chip type	Package way	Serial No.
			S=SDM	B	1=No potting resin	
			P=PWM	C	2=Potting resin required	
			D=digital, Sensibus and I ² C	D		
				X		

3、Electrical Characteristics

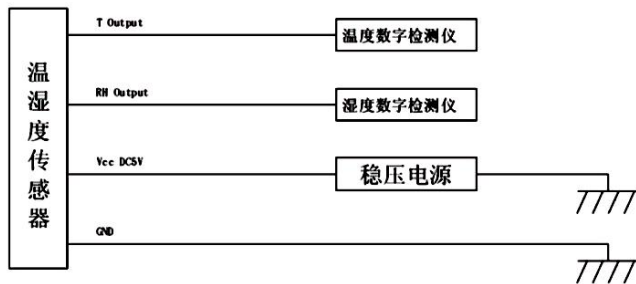
- 3.1 Operating voltage: $5 \pm 0.1V$ DC
- 3.2 Work current: < 1 mA
- 3.3 Power consumption: < 5 mW

4、Basic Parameters

- 4.1 Measuring range: Humidity 0~100%RH, Temperature $-30 \sim 80^\circ C$
- 4.2 Accuracy: Humidity $\pm 3\%$ RH, Temperature $\pm 1.5^\circ C$
- 4.3 Normal operating range: Humidity 10~90%RH, Temperature $-30 \sim 80^\circ C$
- 4.4 Response time: 8s 1/e (63%)
- 4.5 Typical and maximum tolerance of relative humidity at $25^\circ C$: See below Figure 1



4.6 Detection circuit diagram: See below Figure 2



图二

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4.7 Low temperature

4.7.1 Low temperature storage 4.7.1 Low temperature storage: Comply with 4.2 after test 6.2.1.

4.7.2 Low temperature operation: Comply with 4.2 after test 6.2.2

4.8 High Temperature

4.8.1 High temperature storage: Comply with 4.2 after test 6.3.1

4.8.2 High temperature operation: Comply with 4.2 after test 6.3.2

4.9 Constant humidity & heat: Comply with 4.2 after test 6.4

4.10 Thermal cycling: Comply with 4.2 after test 6.5

4.11 Drop test: Comply with 4.2 after test 6.6

4.12 Vibration test: Comply with 4.2 after test 6.7

4.13 Reliability test: Comply with 4.2 after test 6.8

5 Quality Standard (GB2828 Normal Level II, Single Sampling)

Inspection Item	Specification	Inspection Method	Criterion
Dimensions	Per assembly drawing	Caliper/ruler	AQL 2.5
Appearance	Per inspection standard	Visual	AQL 2.5
※Low temp. storage	According to 4.7.1	According to 6.2.1	n=5 c=0
※Low temp. operation	According to 4.7.2	According to 6.2.2	n=5 c=0
※High temp. storage	According to 4.8.1	According to 6.3.1	n=5 c=0
※High temp. operation	According to 4.8.2	According to 6.3.2	n=5 c=0
※Constant humidity & heat	According to 4.9	According to 6.4	n=5 c=0
※Thermal cycling	According to 4.10	According to 6.5	n=5 c=0
※Drop	According to 4.11	According to 6.6	n=5 c=0
※Vibration	According to 4.12	According to 6.7	n=5 c=0
※Reliability	According to 4.13	According to 6.8	n=5 c=0

Note: Items marked ※ are for design / material changes only.

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6 Test & Inspection Methods

6.1 Test conditions: $25 \pm 2^\circ \text{C}$, 50%~60%RH

6.2 Low Temperature

6.2.1 Storage: Lower limit $\pm 2^\circ \text{C}$, \leq lower RH limit $\pm 5\% \text{RH}$, 96h, recover 2h

6.2.2 Operation: Lower limit $\pm 2^\circ \text{C}$, \leq lower RH limit $\pm 5\% \text{RH}$, 24h, recover 2h

6.3 High Temperature

6.3.1 Storage: Upper limit $\pm 2^\circ \text{C}$, \leq upper RH limit $\pm 5\% \text{RH}$, 96h, recover 2h

6.3.2 Operation: Upper limit $\pm 2^\circ \text{C}$, \leq upper RH limit $\pm 5\% \text{RH}$, 24h, recover 2h

6.4 Constant humidity & heat: $60 \pm 2^\circ \text{C}$, $93 \pm 3\% \text{RH}$, 96h, recover 1h

6.5 Thermal shock: Upper temp 2h \rightarrow lower temp 2h, 5 cycles, transfer 2~5min, recover 2h

6.6 Drop: 1000mm free fall to hard wood, 3 times

6.7 Vibration: 10Hz~75Hz, 1.5mm amplitude, 3 directions, 2h each, powered on

6.8 Reliability: 85°C , 85%RH, continuous 240h

7 Dimensions

7.1 Outline dimensions: See assembly drawing

7.2 Housing material: PC

7.3 Lead specification: UL1007, 24AWG, length per customer request

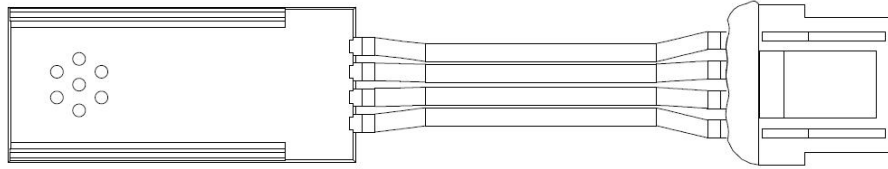
7.4 Terminal & connector: Per customer request

7.5 Lead strength: $\geq 19.6 \text{N}$ for 1min, no looseness

7.6 Terminal lead strength: $\geq 29.4 \text{N}$ for 1min, no looseness

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8、Wiring Diagram



序号	线序颜色	接线示意
①	灰色	V _{RH}
②	绿色	V _T
③	黑色	V _{CC}
④	白色	GND

9、Humidity Measurement

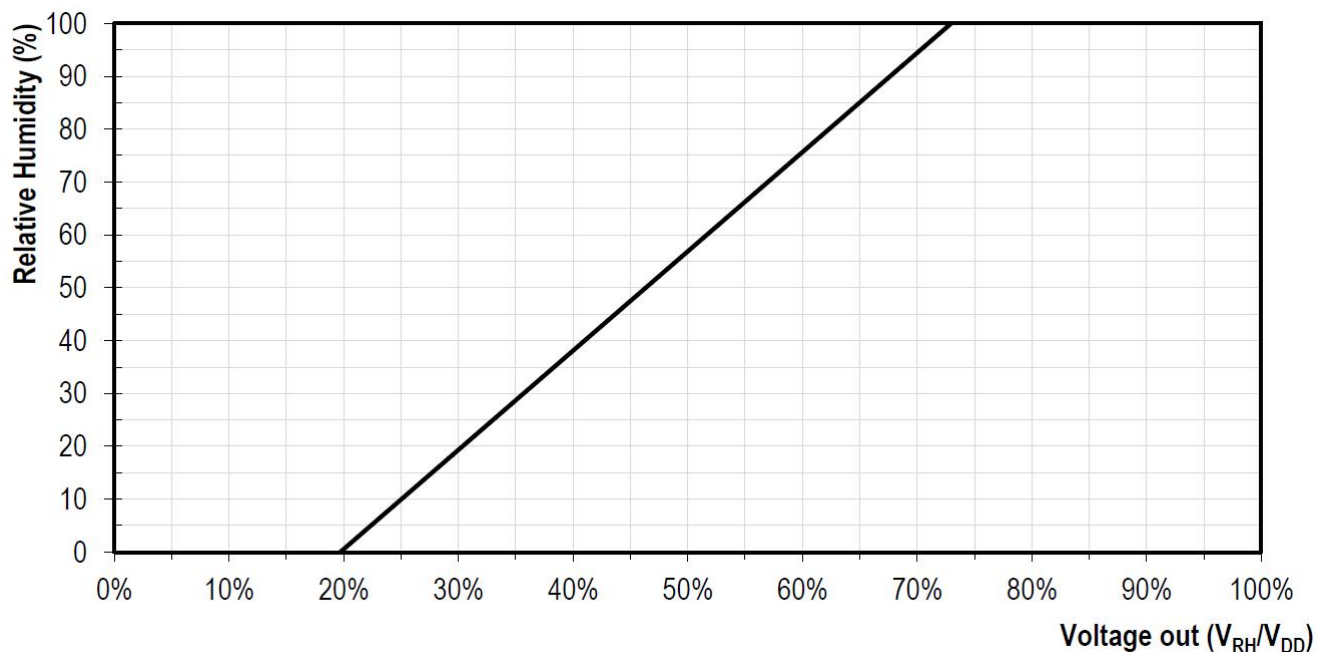
9.1 Output Voltage vs. Humidity at 25° C

RH(%)	10%	15%	20%	25%	30%	35%	40%	45%	50%
Output (V)	1.28	1.42	1.54	1.67	1.81	1.94	2.07	2.21	2.34
RH(%)	55%	60%	65%	70%	75%	80%	85%	90%	95%
Output (V)	2.47	2.60	2.74	2.87	3.00	3.14	3.27	3.40	3.53

9.2 Relative Humidity (RH) = $-20.20/0.5313 + (100.0/0.5313) \times (V_{RH} / V_{CC})$

$$\text{Relative Humidity(RH)} = -\frac{20.20}{0.5313} + \frac{100.0}{0.5313} \times \frac{V_{RH}}{V_{CC}}$$

9.3 RH vs. output voltage curve: See diagram



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10、Temperature Output (R T Table, see Figure 5)

11 Packaging

11.1 Inner bag: 5 pcs/bag, silver anti static bag

11.2 Inner box: 10 bags/box, 50 pcs/box

11.3 Outer carton: 12 boxes/carton, 600 pcs/carton

12 Storage Conditions

12.1 Temperature: 10~50° C, Humidity: 20%~60%RH

12.2 Avoid corrosive / oxidizing gases

13 Reference Standards

13.1 GB/T 2423.1 Low temperature test

13.2 GB/T 2423.2 Dry heat test

13.3 GB/T 2423.3 Steady damp heat test

13.4 GB/T 2423.5 Shock test

13.5 GB/T 2423.8 Free fall test

13.6 GB/T 2423.10 Vibration test

13.7 GB/T 2423.22 Temperature change test

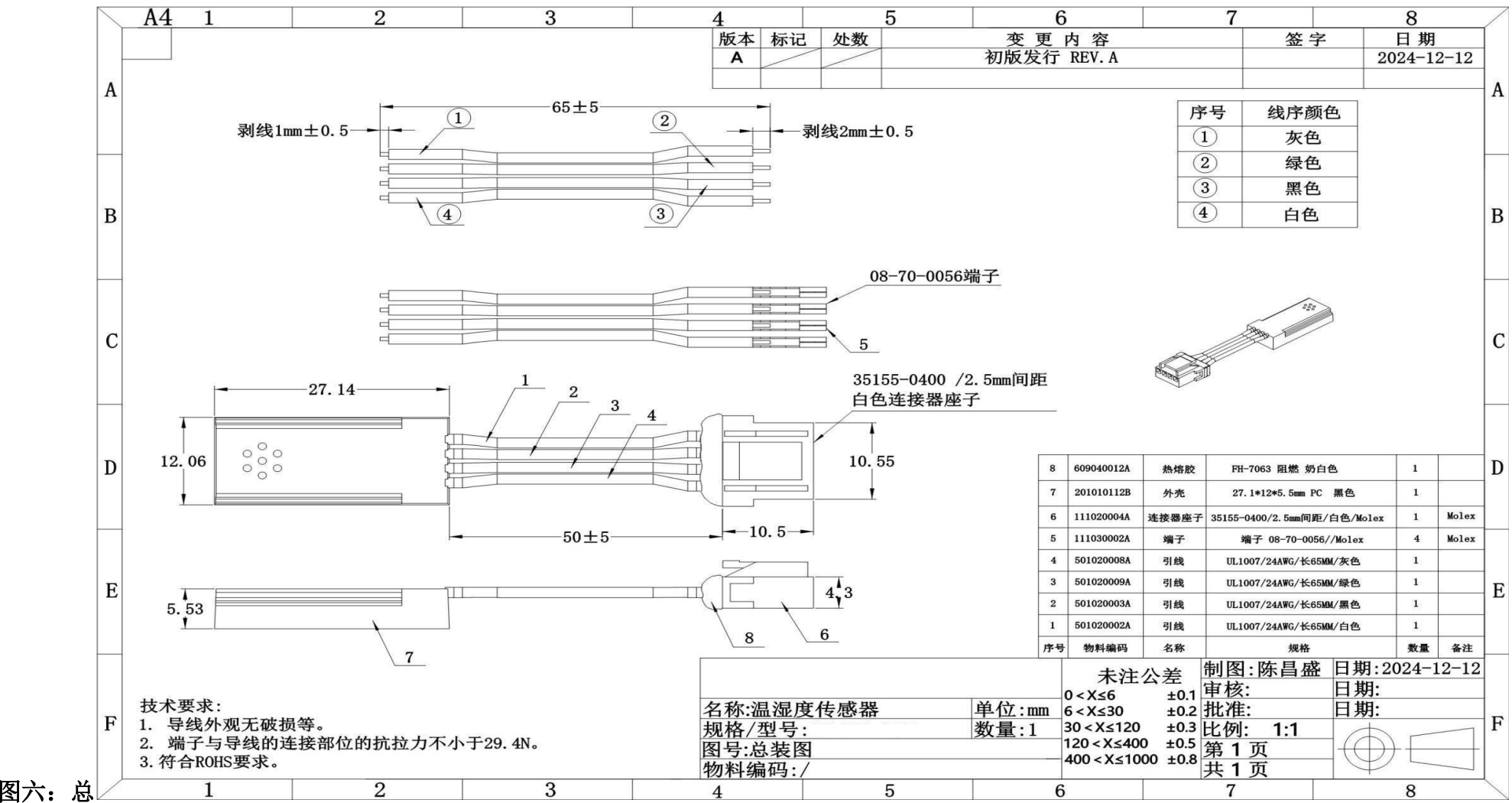
Figure 5:

SDNT1608X103□3380□ R-T

Temp(°C)	Resistance(KΩ)	Tem(°C)	Resistance(KΩ)	Temp(°C)	Resistance(KΩ)	Temp(°C)	Resistance(KΩ)
-40	208.15	2	25.46	44	5.05	86	1.40
-39	196.57	3	24.38	45	4.88	87	1.37
-38	185.71	4	23.35	46	4.72	88	1.33
-37	175.82	5	22.37	47	4.57	89	1.29
-36	165.96	6	21.44	48	4.42	90	1.26
-35	156.97	7	20.55	49	4.27	91	1.23
-34	148.53	8	19.70	50	4.13	92	1.19
-33	140.60	9	18.90	51	4.00	93	1.16
-32	133.14	10	18.13	52	3.87	94	1.13
-31	126.12	11	17.39	53	3.75	95	1.10
-30	119.52	12	16.69	54	3.63	96	1.07
-29	113.30	13	16.02	55	3.51	97	1.05
-28	107.45	14	15.39	56	3.40	98	1.02
-27	101.93	15	14.78	57	3.30	99	0.99

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-26	96.73	16	14.20	58	3.19	100	0.97
-25	91.83	17	13.64	59	3.09	101	0.95
-24	87.21	18	13.11	60	3.00	102	0.92
-23	82.85	19	12.61	61	2.91	103	0.90
-22	78.73	20	12.12	62	2.82	104	0.88
-21	74.85	21	11.66	63	2.73	105	0.85
-20	71.18	22	11.22	64	2.65	106	0.83
-19	67.71	23	10.79	65	2.57	107	0.81
-18	64.43	24	10.39	66	2.49	108	0.79
-17	61.33	25	10.00	67	2.42	109	0.77
-16	58.40	26	9.63	68	2.35	110	0.76
-15	55.62	27	9.27	69	2.28	111	0.74
-14	53.00	28	8.93	70	2.21	112	0.72
-13	50.51	29	8.61	71	2.15	113	0.70
-12	48.16	30	8.30	72	2.10	114	0.69
-11	45.93	31	8.00	73	2.03	115	0.67
-10	43.81	32	7.71	74	1.97	116	0.65
-9	41.81	33	7.43	75	1.91	117	0.64
-8	39.91	34	7.17	76	1.86	118	0.62
-7	38.11	35	6.92	77	1.80	119	0.61
-6	36.40	36	6.67	78	1.75	120	0.60
-5	34.77	37	6.44	79	1.70	121	0.58
-4	33.23	38	6.22	80	1.66	122	0.57
-3	31.77	39	6.00	81	1.61	123	0.56
-2	30.38	40	5.80	82	1.57	124	0.54
-1	29.05	41	5.60	83	1.52	125	0.53
0	27.80	42	5.41	84	1.48		
1	26.60	43	5.23	85	1.44		



图六: 总