Temperature test report

(1) Temperature Test

Testing Organization:

Temwell Corporation

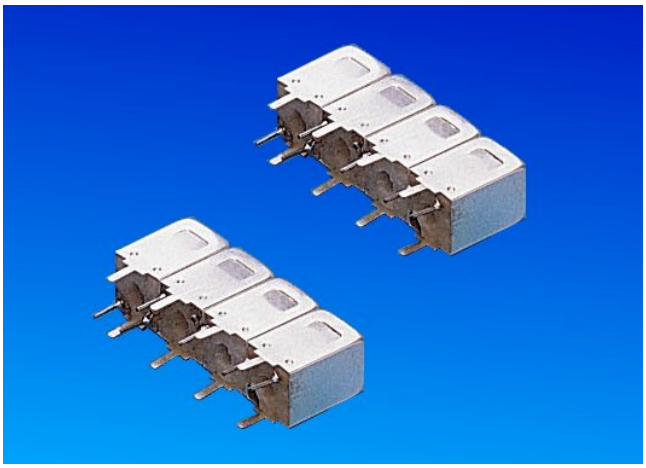
Testing Machine:

Temperature & Humidity Tester Chamber
THS-A4C-100 STD

Testing Specification:

Operation Temperature: - 30℃ ~ + 70℃
Storage Temperature: - 30℃ ~ + 80℃

(2) Test subject:



Item:

Helical Band Pass Filter 7H6 Series
1. TS66109D-140M
2. TS66110D-468M
3. TS66111A-888M

Require:

Operation Temperature: - 30℃ ~ + 70℃
Storage Temperature: - 30℃ ~ + 80℃

(3) Testing and test result:

Part number 1	TS66109D-140M

Electrical Characteristics Spec. Approval Sheet

Parts Name: TS66109D-140M (Triple Tuning) Date: 2023.09.20

(1) For -20℃~+70℃ Temperature △F Draft vs. Spec's Approval.

Items	Temp ℃	Time Age Hour	Fo MHz	BW(MHz) Fo to~ -(-3db)	BW(MHz) Fo to~ +(-3db)	Total -3BW (MHz)	IL (dB)	RL S11 (db)	Atten Fo-10M (dB)	Atten Fo+10M (dB)	Pass
SPEC	-20℃~+70℃	--	140	> 2.5	> 2.5	> 5	< 6.0	> 12	> 60	> 50	Pass

	Temp ℃	Time Age Hour	Fo MHz	BW(MHz) Fo to~ -(-3db)	BW(MHz) Fo to~ +(-3db)	Total -3BW (MHz)	IL (dB)	RL S11 (db)	Atten Fo-10M (dB)	Atten Fo+10M (dB)	Pass
f1	-30℃	1.5H	140.57	2.50	3.64	6.14	4.51	22.86	84.66	56.04	Pass
f2	-20℃	0.5H	140.56	2.60	3.63	6.23	4.51	22.72	100.82	55.61	Pass
f3	-10℃	0.5H	140.45	2.60	3.50	6.10	4.64	22.01	85.96	56.20	Pass
f4	0℃	0.5H	140.45	2.60	3.50	6.10	4.64	21.03	80.68	56.46	Pass
f5	+10℃	0.5H	140.08	2.72	2.87	5.59	4.66	23.80	72.31	51.51	Pass
f6	+25℃	0.5H	140.25	2.77	3.27	6.04	4.90	22.44	94.74	57.53	Pass
f7	+40℃	0.5H	140.09	2.90	3.09	5.99	5.13	22.44	89.25	58.31	Pass
f8	+50℃	0.5H	140.13	2.87	3.13	6.00	5.09	22.66	83.80	58.29	Pass
f9	+60℃	0.5H	139.78	3.18	2.75	5.93	5.42	20.60	82.88	59.16	Pass
f10	+70℃	0.5H	139.74	3.22	2.70	5.92	5.58	19.91	77.76	60.35	Pass
f11	+80℃	0.5H	139.74	3.22	2.70	5.92	5.57	19.93	82.74	59.53	Pass

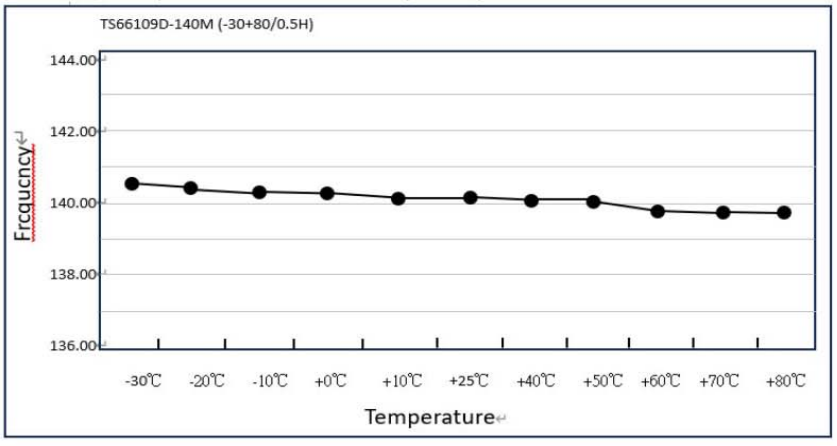
Note:The aging test data at +80℃ is just only for your kind reference

Temperatuer Aging Test Report

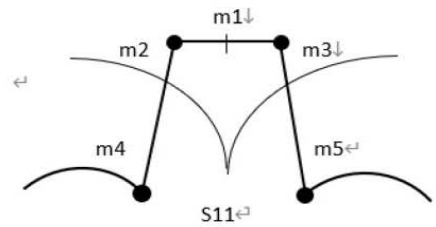
(2) Temperature & Time Process & Fo Frequrcy

	Temp ℃	Time Age Hour	△f(%)(MHz) Temp.Draft(-20~+70℃) < Fox0.5%(Tolerance)	Fo MHz	At-3dB MHz	At+3dB MHz	-3BW (MHz)	IL (dB)	RL S11 (dB)	Atten Fo-10M (dB)	Atten Fo+10M (dB)
f1	-30℃	1.5H	0.407% (0.57M)	140.57	137.50	143.64	6.14	4.51	22.86	84.66	56.04
f2	-20℃	0.5H	0.400% (0.56M)	140.56	137.50	143.63	6.13	4.51	22.72	100.82	55.61
f3	-10℃	0.5H	0.321% (0.45M)	140.45	137.40	143.50	6.10	4.64	22.01	85.96	56.20
f4	0℃	0.5H	0.321% (0.45M)	140.45	137.40	143.50	6.10	4.64	21.03	80.68	56.46
f5	+10℃	0.5H	0.057% (0.08M)	140.08	137.28	142.87	5.59	4.66	23.80	72.31	51.51
f6	+25℃	0.5H	0.178% (0.25M)	140.25	137.23	143.27	6.04	4.90	22.44	94.74	57.53
f7	+40℃	0.5H	0.064% (0.09M)	140.09	137.10	143.09	5.99	5.13	22.44	89.25	58.31
f8	+50℃	0.5H	0.092% (0.13M)	140.13	137.13	143.13	6.00	5.09	22.66	83.80	58.29
f9	+60℃	0.5H	0.157% (0.22M)	139.78	136.82	142.75	5.93	5.42	20.60	82.88	59.16
f10	+70℃	0.5H	0.186% (0.26M)	139.74	136.78	142.70	5.92	5.58	19.91	77.76	60.35
f11	+80℃	0.5H	0.186% (0.26M)	139.74	136.78	142.70	5.92	5.57	19.93	84.74	59.53

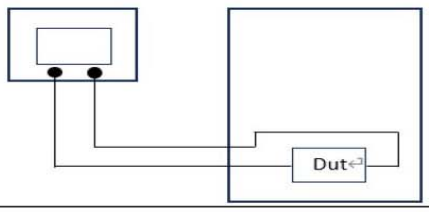
(3)Temperature VS Fo Frequency



(4) Makers



(5) E5071C Temperature Chamber



Result	PASS

Part number 2	TS66110D-468M

Electrical Characteristics Spec. Approval Sheet

Parts Name: TS66110D-468M (Triple Tuning)

Date: 2023.09.20

(1) For -20℃~+70℃ Temperature △F Draft vs. Spec's Approval.

Items	Temp ℃	Time Age Hour	Fo MHz	BW(MHz) Fo to~ -(-3db)	BW(MHz) Fo to~ +(-3db)	Total -3BW (MHz)	IL (dB)	RL S11 (db)	Atten Fo-50M (dB)	Atten Fo+50M (dB)	Pass
SPEC	-20℃~+70℃	--	468	> 4.0	> 4.0	> 8.0	< 7.5	> 12	> 60	> 50	Pass

	Temp ℃	Time Age Hour	Fo MHz	BW(MHz) Fo to~ -(-3db)	BW(MHz) Fo to~ +(-3db)	Total -3BW (MHz)	IL (dB)	RL S11 (db)	Atten Fo-50M (dB)	Atten Fo+50M (dB)	Pass
f1	-30℃	1.5H	469.27	4.08	6.62	10.70	5.55	31.67	79.09	83.87	Pass
f2	-20℃	0.5H	469.22	4.11	6.55	10.66	5.58	33.35	78.10	82.83	Pass
f3	-10℃	0.5H	469.11	4.19	6.41	10.60	5.61	39.79	87.18	89.34	Pass
f4	0℃	0.5H	468.92	4.34	6.17	10.51	5.63	35.94	88.69	83.66	Pass
f5	+10℃	0.5H	468.64	4.55	5.83	10.38	5.79	30.72	85.77	79.94	Pass
f6	+25℃	0.5H	468.10	4.99	5.19	10.18	6.50	44.05	77.70	90.62	Pass
f7	+40℃	0.5H	468.05	5.03	5.13	10.16	6.41	30.25	82.04	94.95	Pass
f8	+50℃	0.5H	467.83	5.22	4.88	10.10	6.57	27.96	84.14	81.08	Pass
f9	+60℃	0.5H	467.10	5.89	4.09	9.98	7.04	24.74	80.50	79.68	Pass
f10	+70℃	0.5H	467.07	5.93	4.06	9.99	7.05	24.49	80.63	84.41	Pass
f11	+80℃	0.5H	467.06	5.93	4.06	9.99	7.05	24.60	84.75	85.01	Pass

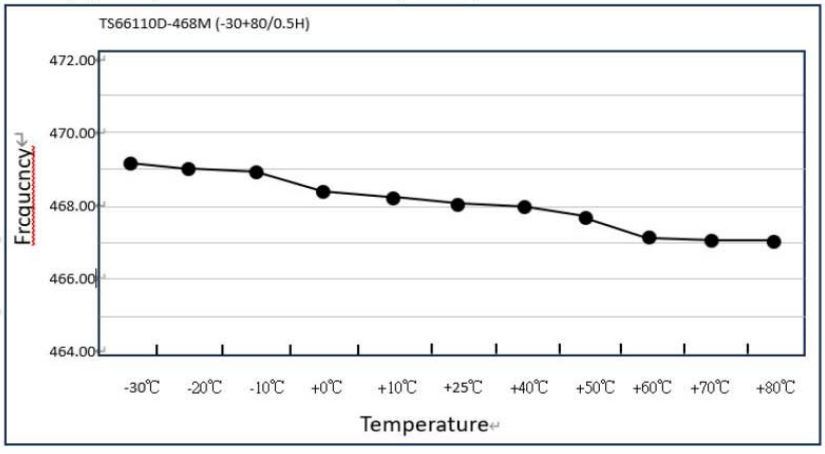
Note:The aging test data at +80℃ is just only for your kind reference

Temperatuer Aging Test Report

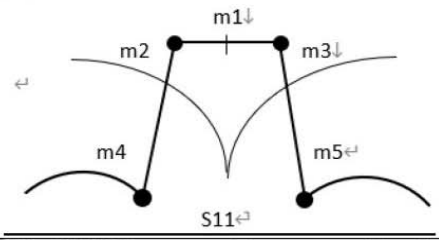
(2) Temperature & Time Process & Fo Frequrcy

	Temp ℃	Time Age Hour	△f(%)(MHz) Temp.Draft(-20~+70℃) < Fox0.5%(Tolerance)	Fo MHz	At-3dB MHz	At+3dB MHz	-3BW (MHz)	IL (dB)	RL S11 (dB)	Atten Fo-50M (dB)	Atten Fo+50M (dB)
f1	-30℃	1.5H	0.271% (1.27M)	469.27	463.92	474.62	10.70	5.55	31.67	79.09	83.87
f2	-20℃	0.5H	0.260% (1.22M)	469.22	463.89	474.55	10.66	5.58	33.35	78.10	82.83
f3	-10℃	0.5H	0.237% (1.11M)	469.11	463.81	474.41	10.60	5.61	39.79	87.18	89.34
f4	0℃	0.5H	0.196% (0.92M)	468.92	463.66	474.17	10.51	5.63	35.94	88.69	83.66
f5	+10℃	0.5H	0.136% (0.64M)	468.64	463.45	473.83	10.38	5.79	30.72	85.77	79.94
f6	+25℃	0.5H	0.021% (0.10M)	468.10	463.01	473.19	10.18	6.50	44.05	77.70	90.62
f7	+40℃	0.5H	0.010% (0.05M)	468.05	462.97	473.13	10.16	6.41	30.25	82.04	94.95
f8	+50℃	0.5H	0.036% (0.17M)	467.83	462.78	472.88	10.10	6.57	27.96	84.14	81.08
f9	+60℃	0.5H	0.192% (0.90M)	467.10	462.11	472.09	9.98	7.04	24.74	80.50	79.68
f10	+70℃	0.5H	0.199% (0.93M)	467.07	462.07	472.06	9.99	7.05	24.49	80.63	84.41
f11	+80℃	0.5H	0.186% (0.94M)	467.06	462.07	472.06	9.99	7.05	24.60	84.75	85.01

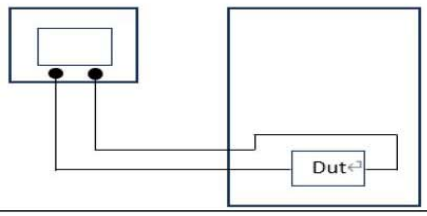
(3)Temperature VS Fo Frequency



(4) Makers



(5) E5071C Temperature Chamber



Result	PASS

Part number 3	TS66111A-888M

Electrical Characteristics Spec. Approval Sheet

Parts Name: TS66111A-880M (Triple Tuning)

Date: 2023.09.20

(1) For -20℃~+70℃ Temperature △F Draft vs. Spec's Approval.

Items	Temp ℃	Time Age Hour	Fo MHz	BW(MHz) Fo to~ -(-3db)	BW(MHz) Fo to~ +(-3db)	Total -3BW (MHz)	IL (dB)	RL S11 (db)	Atten Fo-50M (dB)	Atten Fo+50M (dB)	Pass
SPEC	-20℃~+70℃	--	880	> 5.0	> 5.0	> 10	< 7.5	> 12	> 60	> 50	Pass

	Temp ℃	Time Age Hour	Fo MHz	BW(MHz) Fo to~ -(-3db)	BW(MHz) Fo to~ +(-3db)	Total -3BW (MHz)	IL (dB)	RL S11 (db)	Atten Fo-50M (dB)	Atten Fo+50M (dB)	Pass
f1	-30℃	1.5H	881.71	8.05	11.46	19.51	5.64	12.16	72.44	61.14	Pass
f2	-20℃	0.5H	881.70	8.05	11.46	19.51	5.64	12.17	72.68	58.90	Pass
f3	-10℃	0.5H	881.42	8.25	11.09	19.34	5.72	19.34	74.92	60.96	Pass
f4	0℃	0.5H	880.78	8.75	10.31	19.06	5.93	19.05	72.40	60.16	Pass
f5	+10℃	0.5H	880.69	8.80	10.18	18.98	6.12	18.97	77.59	60.99	Pass
f6	+25℃	0.5H	880.32	9.12	9.76	18.88	6.23	18.87	77.09	60.05	Pass
f7	+40℃	0.5H	879.88	9.47	9.23	18.70	6.55	18.69	77.22	59.68	Pass
f8	+50℃	0.5H	879.40	9.83	8.64	18.47	6.67	18.47	76.57	59.93	Pass
f9	+60℃	0.5H	878.43	10.67	7.53	18.20	6.99	18.20	77.88	60.93	Pass
f10	+70℃	0.5H	878.43	10.68	7.55	18.23	7.01	18.22	78.65	60.81	Pass
f11	+80℃	0.5H	877.80	11.23	6.83	18.06	7.18	18.05	73.93	59.20	Pass

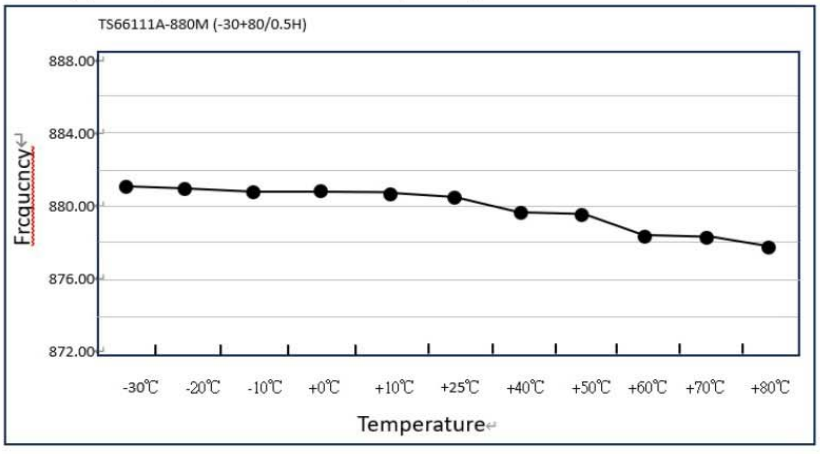
Note:The aging test data at +80℃ is just only for your kind reference

Temperatuer Aging Test Report

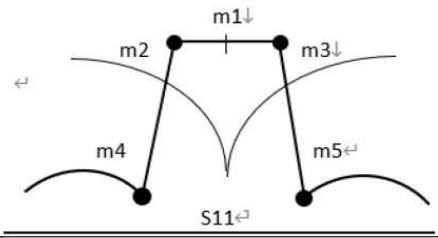
(2) Temperature & Time Process & Fo Frequrcy

	Temp ℃	Time Age Hour	△f(%)(MHz) Temp.Draft(-20~+70℃) < Fox0.5%(Tolerance)	Fo MHz	At-3dB MHz	At+3dB MHz	-3BW (MHz)	IL (dB)	RL S11 (dB)	Atten Fo-50M (dB)	Atten Fo+50M (dB)
f1	-30℃	1.5H	0.194% (1.71M)	881.71	871.95	891.46	19.51	5.64	12.16	72.44	61.14
f2	-20℃	0.5H	0.193% (1.70M)	881.70	871.95	891.46	19.51	5.64	12.17	72.68	58.90
f3	-10℃	0.5H	0.161% (1.42M)	881.42	871.75	891.09	19.34	5.72	19.34	74.92	60.96
f4	0℃	0.5H	0.088% (0.78M)	880.78	871.25	890.31	19.06	5.93	19.05	72.40	60.16
f5	+10℃	0.5H	0.078% (0.69M)	880.69	871.20	890.18	18.98	6.12	18.97	77.59	60.99
f6	+25℃	0.5H	0.036% (0.32M)	880.32	889.76	870.88	18.88	6.23	18.87	77.09	60.05
f7	+40℃	0.5H	0.013% (0.12M)	879.88	889.23	870.53	18.70	6.55	18.69	77.22	59.68
f8	+50℃	0.5H	0.068% (0.60M)	879.40	888.64	870.17	18.47	6.67	18.47	76.57	59.93
f9	+60℃	0.5H	0.178% (1.57M)	878.43	869.33	887.53	18.20	6.99	18.20	77.88	60.93
f10	+70℃	0.5H	0.178% (1.57M)	878.43	869.32	887.55	18.23	7.01	18.22	78.65	60.81
f11	+80℃	0.5H	0.250% (2.20M)	877.80	868.77	886.83	18.06	7.18	18.05	73.93	59.20

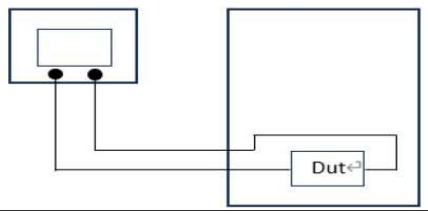
(3)Temperature VS Fo Frequency



(4) Makers



(5) E5071C Temperature Chamber



Result	PASS