

Temperature test report

(1) Temperature Test



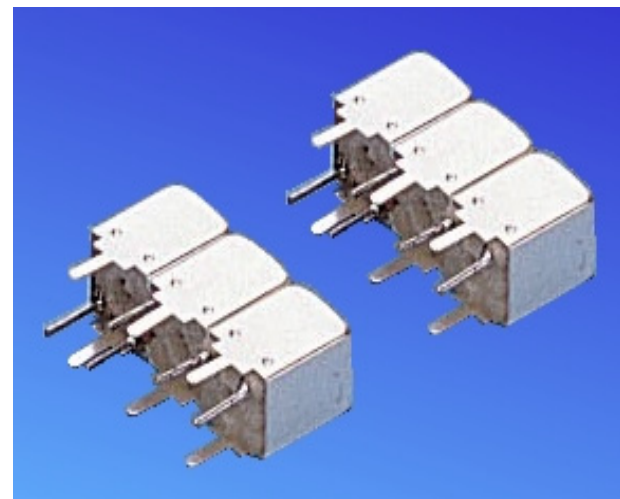
Testing Organization:
Temwell Corporation



Testing Machine:
Temperature & Humidity Tester Chamber
THS-A4C-100 STD

Testing Specification:
Operation Temperature: - 30°C ~ + 70°C
Storage Temperature: - 30°C ~ + 80°C

(2) Test subject:



Item:
Helical Band Pass Filter 5W3 Series
1. TTW3588-1575.86M (50Ω)
2. TTW3536B-2452.80M (50Ω)
3. TTWL3473F-614.09M (75Ω)

Require:
Operation Temperature: - 30°C ~ + 70°C
Storage Temperature: - 30°C ~ + 80°C

(3) Testing and test result:

Part number 1

TTW3588-1575.86M (50Ω)

Electrical Characteristics Spec. Approval Sheet

Parts Name : TTW3588B-1575.86M (Triple Tuning)

Date : MAR.09.2005

(1) For -30°C~+70°C Temperature ΔF Draft vs. Spec's Approval.

Items	Temp °C	Time Age Hour	Fo MHz	BW(MHz) Fo to ~ -(-3dB)	BW(MHz) Fo to ~ +(-3dB)	Total -3BW (MHz)	IL (dB)	R.L. S11 (dB)	Atten. Fo-100M (dB)	Atten. Fo+100M (dB)	Pass
SPEC	-30°C~+70°C	--	1575.86	> 20.0	> 20.0	> 40.0	< 3.5	> 12.0	>32.0	>28.0	Pass

	Temp °C	Time Age Hour	Fo MHz	BW(MHz) Fo to ~ -(-3dB)	BW(MHz) Fo to ~ +(-3dB)	Total -3BW (MHz)	IL (dB)	R.L. S11 (dB)	Atten. Fo-100M (dB)	Atten. Fo+100M (dB)	Pass
f1	-30°C	1.5 H	1575.86	23.26	32.07	55.33	1.73	22.55	39.18	30.07	Pass
f2	-20°C	0.5 H	1575.86	24.06	31.40	55.46	1.79	24.76	38.95	30.21	Pass
f3	-10°C	0.5 H	1575.86	25.00	30.34	55.34	1.86	28.49	38.64	30.50	Pass
f4	+0°C	0.5 H	1575.86	25.80	29.40	55.20	1.94	30.23	38.41	30.73	Pass
f5	+10°C	0.5 H	1575.86	26.60	28.60	55.20	2.03	31.06	38.15	30.97	Pass
f6	+25°C	0.5 H	1575.86	27.53	27.54	55.07	2.19	28.58	37.73	31.28	Pass
f7	+40°C	0.5 H	1575.86	29.26	25.80	55.06	2.34	24.15	37.23	31.63	Pass
f8	+50°C	0.5 H	1575.86	30.33	24.74	50.07	2.43	24.4	36.90	31.88	Pass
f9	+60°C	0.5 H	1575.86	33.40	21.67	55.07	2.85	18.23	35.95	32.59	Pass
f10	+70°C	0.5 H	1575.86	33.66	21.14	54.80	2.81	20.15	35.52	32.81	Pass
f11	+80°C	0.5 H	1575.86	35.13	19.80	54.93	2.97	19.02	37.71	31.25	Note

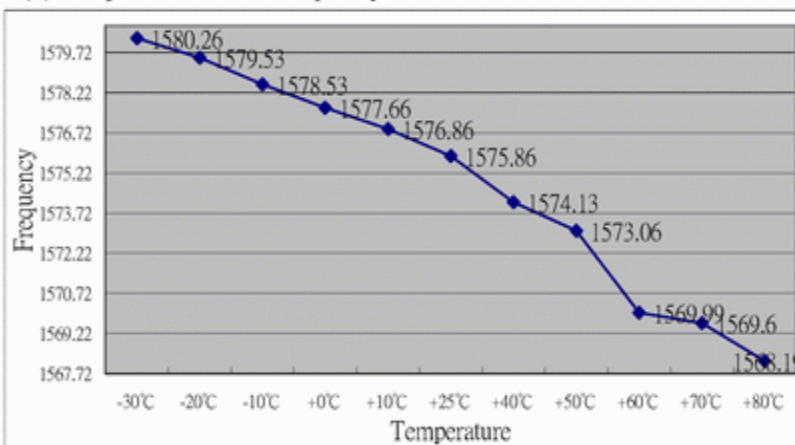
Note : The aging test data at +80°C is just only for your kind reference.

Temperature Aging Test Report

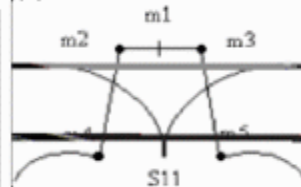
(2) Temperature & Time Process & Fo Frequency

	Temp °C	Time Age Hour	Δf%(MHz)		Fo MHz	At -3dB MHz	At -3dB MHz	-3BW MHz	IL (dB)	S11 (dB)	Atten. Fo-100M (dB)	Atten. Fo+100M (dB)
			Temp. Draft (-30~+70°C)	< Fo×0.5% (Tolerance)								
f1	-30°C	1.5H	0.279%	(4.40M)	1580.26	1552.60	1607.93	55.33	1.67	28.95	39.18	30.07
f2	-20°C	0.5H	0.232%	(3.67M)	1579.53	1551.80	1607.26	55.46	1.74	29.83	38.95	30.21
f3	-10°C	0.5H	0.169%	(2.67M)	1578.53	1550.86	1606.20	55.34	1.84	30.02	38.64	30.50
f4	+0°C	0.5H	0.114%	(1.80M)	1577.66	1550.06	1605.26	55.20	1.94	29.60	38.41	30.73
f5	+10°C	0.5H	0.063%	(1.00M)	1576.86	1549.26	1604.46	55.20	2.02	28.57	38.15	30.97
f6	+25°C	0.5H	0.000%	(0.00M)	1575.86	1548.33	1603.40	55.07	2.19	27.26	37.73	31.28
f7	+40°C	0.5H	0.109%	(1.73M)	1574.13	1546.60	1601.66	55.06	2.35	25.51	37.23	31.63
f8	+50°C	0.5H	0.177%	(2.80M)	1573.06	1545.53	1600.60	55.07	2.46	25.88	36.90	31.88
f9	+60°C	0.5H	0.372%	(5.87M)	1569.99	1542.46	1597.53	55.07	2.79	25.30	35.95	32.59
f10	+70°C	0.5H	0.397%	(6.26M)	1569.60	1542.20	1597.00	54.80	2.91	25.47	35.52	32.81
f11	+80°C	0.5H	0.486%	(7.67M)	1568.19	1540.73	1595.66	54.93	2.19	30.48	37.71	31.25

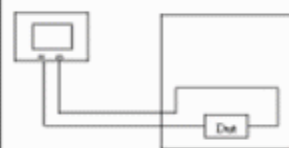
(3) Temperature VS Fo Frequency



(4) Makers



(5) HP-8714E Temperature Chamber



Result

PASS

Electrical Characteristics Spec. Approval Sheet

Parts Name : TTW3536B-2452.80M 5W046RB3.2 (Triple Tuning)

Date : MAR.21.2005

(1) For -30°C~+70°C Temperature ΔF Draft vs. Spec's Approval.

Items	Temp °C	Time Age Hour	Fo MHz	BW(MHz) Fo to ~ -(-3dB)	BW(MHz) Fo to ~ +(-3dB)	Total -3BW (MHz)	IL (dB)	R.L. S11 (dB)	Atten. Fo-300M (dB)	Atten. Fo+300M (dB)	Pass
SPEC	-30°C~+70°C	--	2452.80	>50.00	>50.00	>100.00	<2.50	>12.00	>36.00	>28.00	Pass

	Temp °C	Time Age Hour	Fo MHz	BW(MHz) Fo to ~ -(-3dB)	BW(MHz) Fo to ~ +(-3dB)	Total -3BW (MHz)	IL (dB)	R.L. S11 (dB)	Atten. Fo-300M (dB)	Atten. Fo+300M (dB)	Pass
f1	-30°C	1.5 H	2452.80	54.00	67.60	121.60	1.15	15.60	42.04	29.62	Pass
f2	-20°C	0.5 H	2452.80	55.00	66.40	121.40	1.19	16.88	41.80	29.76	Pass
f3	-10°C	0.5 H	2452.80	56.00	65.40	121.40	1.25	18.48	41.75	29.87	Pass
f4	+0°C	0.5 H	2452.80	56.80	64.80	121.60	1.32	20.27	41.59	29.97	Pass
f5	+10°C	0.5 H	2452.80	58.00	63.60	121.60	1.39	22.25	41.44	30.08	Pass
f6	+25°C	0.5 H	2452.80	60.80	60.80	121.60	1.54	28.65	40.99	30.56	Pass
f7	+40°C	0.5 H	2452.80	63.40	58.60	122.00	1.67	27.52	40.62	30.73	Pass
f8	+50°C	0.5 H	2452.80	65.00	57.20	122.20	1.79	25.06	40.39	30.96	Pass
f9	+60°C	0.5 H	2452.80	68.80	53.20	122.00	2.05	19.96	39.73	31.30	Pass
f10	+70°C	0.5 H	2452.80	70.40	51.80	122.20	2.17	18.46	39.56	31.50	Pass
f11	+80°C	0.5 H	2452.80	72.00	50.60	122.60	2.29	17.00	39.37	31.71	Note

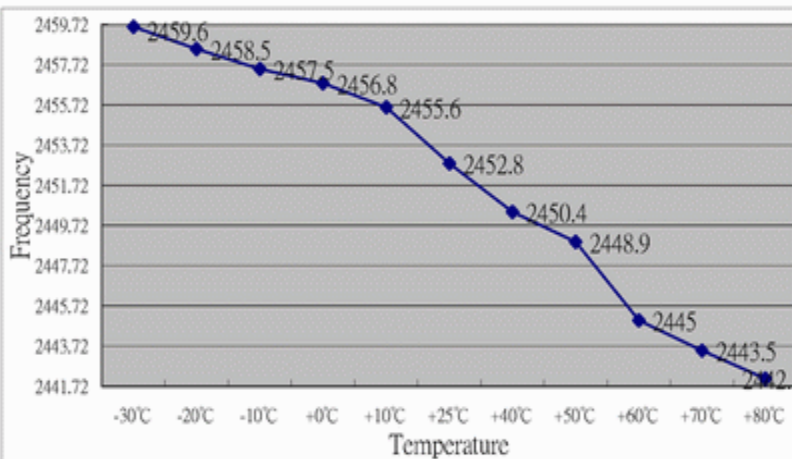
Note : The aging test data at +80°C is just only for your kind reference.

Temperature Aging Test Report

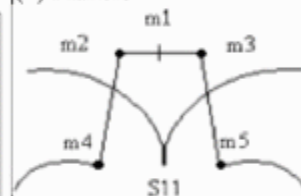
(2) Temperature & Time Process & Fo Frequency

	Temp °C	Time Age Hour	Δf(%) (MHz)		Fo MHz	At -3dB MHz	At -3dB MHz	-3BW MHz	IL (dB)	S11 (dB)	Atten. Fo-300M (dB)	Atten. Fo+300M (dB)
			Temp. Draft (-30~+70°C)	< Fo×0.5% (Tolerance)								
f1	-30°C	1.5H	0.277%	(6.80M)	2459.60	2398.80	2520.40	121.60	1.01	27.00	42.04	29.62
f2	-20°C	0.5H	0.232%	(5.70M)	2458.50	2397.80	2519.20	121.40	1.07	27.61	41.80	29.76
f3	-10°C	0.5H	0.191%	(4.70M)	2457.50	2396.80	2518.20	121.40	1.17	27.11	41.75	29.87
f4	+0°C	0.5H	0.163%	(4.00M)	2456.80	2396.00	2517.60	121.60	1.26	27.55	41.59	29.97
f5	+10°C	0.5H	0.114%	(2.80M)	2455.60	2394.80	2516.40	121.60	1.35	27.50	41.44	30.08
f6	+25°C	0.5H	0.000%	(0.00M)	2452.80	2392.00	2513.60	121.60	1.53	24.48	40.99	30.56
f7	+40°C	0.5H	0.097%	(2.40M)	2450.40	2389.40	2511.40	122.00	1.67	26.73	40.62	30.73
f8	+50°C	0.5H	0.159%	(3.90M)	2448.90	2387.80	2510.00	122.20	1.80	29.77	40.39	30.96
f9	+60°C	0.5H	0.318%	(7.80M)	2445.00	2384.00	2506.00	122.00	2.07	32.27	39.73	31.30
f10	+70°C	0.5H	0.379%	(9.30M)	2443.50	2382.40	2504.60	122.20	2.19	29.54	39.56	31.50
f11	+80°C	0.5H	0.436%	(10.70M)	2442.10	2380.80	2503.40	122.60	2.30	28.41	39.37	31.71

(3) Temperature VS Fo Frequency



(4) Makers



(5) HP-8714E Temperature Chamber



Result

PASS

Electrical Characteristics Spec. Approval Sheet

Parts Name : TTWL3473F-614.09M (Triple Tuning)

Date : APR.06.2005

(1) For -30°C~+70°C Temperature ΔF Draft vs. Spec's Approval.

Items	Temp °C	Time Age Hour	Fo MHz	BW(MHz) Fo to ~ -(-3dB)	BW(MHz) Fo to ~ +(-3dB)	Total -3BW (MHz)	IL (dB)	R.L. S11 (dB)	Atten. Fo-100M (dB)	Atten. Fo+100M (dB)	Pass
SPEC	-30°C~+70°C	--	614.09	>13.00	>13.00	>26.00	<3.00	>12.00	>38.00	>38.00	Pass

	Temp °C	Time Age Hour	Fo MHz	BW(MHz) Fo to ~ -(-3dB)	BW(MHz) Fo to ~ +(-3dB)	Total -3BW (MHz)	IL (dB)	R.L. S11 (dB)	Atten. Fo-100M (dB)	Atten. Fo+100M (dB)	Pass
f1	-30°C	1.5 H	614.09	15.03	17.71	32.74	1.29	14.12	42.86	41.38	Pass
f2	-20°C	0.5 H	614.09	15.16	17.51	32.67	1.38	14.54	42.82	41.58	Pass
f3	-10°C	0.5 H	614.09	15.43	17.17	32.60	1.49	15.12	42.63	41.74	Pass
f4	+0°C	0.5 H	614.09	15.63	16.84	32.47	1.63	15.58	42.63	41.87	Pass
f5	+10°C	0.5 H	614.09	15.76	16.64	32.40	1.78	16.00	42.50	42.07	Pass
f6	+25°C	0.5 H	614.09	16.16	16.17	32.33	2.03	16.54	42.21	42.33	Pass
f7	+40°C	0.5 H	614.09	16.56	15.44	32.00	2.21	16.81	41.88	42.71	Pass
f8	+50°C	0.5 H	614.09	16.89	15.04	31.93	2.31	16.78	41.67	42.90	Pass
f9	+60°C	0.5 H	614.09	18.09	13.44	31.53	2.49	16.43	41.17	43.45	Pass
f10	+70°C	0.5 H	614.09	18.57	13.01	31.58	2.52	16.35	40.78	43.64	Pass
f11	+80°C	0.5 H	614.09	19.09	12.37	31.46	2.53	16.20	40.55	43.95	Note

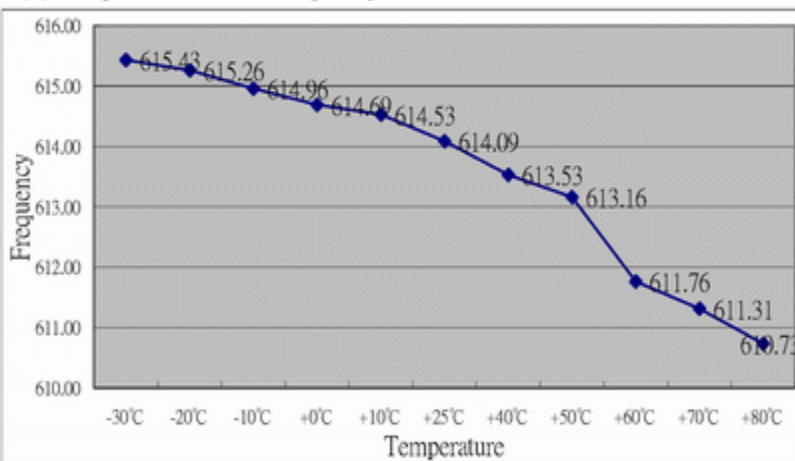
Note : The aging test data at +80°C is just only for your kind reference.

Temperature Aging Test Report

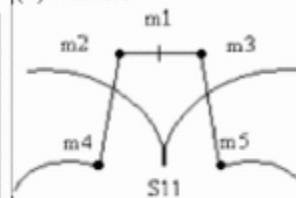
(2) Temperature & Time Process & Fo Frequency

	Temp °C	Time Age Hour	Δf%(MHz)		Fo MHz	At -3dB MHz	At -3dB MHz	-3BW MHz	IL (dB)	S11 (dB)	Atten. Fo-100M (dB)	Atten. Fo+100M (dB)
			Temp. Draft (-30~+70°C)	< Fo×0.5% (Tolerance)								
f1	-30°C	1.5H	0.218%	(1.34M)	615.43	599.06	631.80	32.74	1.30	15.58	42.86	41.38
f2	-20°C	0.5H	0.190%	(1.17M)	615.26	598.93	631.60	32.67	1.39	15.79	42.82	41.58
f3	-10°C	0.5H	0.141%	(0.87M)	614.96	598.66	631.26	32.60	1.50	15.83	42.63	41.74
f4	+0°C	0.5H	0.097%	(0.60M)	614.69	598.46	630.93	32.47	1.64	15.89	42.63	41.87
f5	+10°C	0.5H	0.071%	(0.44M)	614.53	598.33	630.73	32.40	1.77	16.26	42.50	42.07
f6	+25°C	0.5H	0.000%	(0.00M)	614.09	597.93	630.26	32.33	2.03	16.55	42.21	42.33
f7	+40°C	0.5H	0.091%	(0.56M)	613.53	597.53	629.53	32.00	2.19	16.85	41.88	42.71
f8	+50°C	0.5H	0.151%	(0.93M)	613.16	597.20	629.13	31.93	2.26	17.00	41.67	42.90
f9	+60°C	0.5H	0.379%	(2.33M)	611.76	596.00	627.53	31.53	2.46	16.86	41.17	43.45
f10	+70°C	0.5H	0.452%	(2.78M)	611.31	595.52	627.10	31.58	2.48	16.72	40.78	43.64
f11	+80°C	0.5H	0.547%	(3.36M)	610.73	595.00	626.46	31.46	2.51	16.30	40.55	43.95

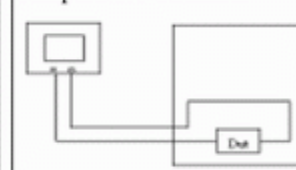
(3) Temperature VS Fo Frequency



(4) Makers



(5) HP-8714E Temperature Chamber



Result

PASS