No. TCE - MRF - 5008B
Sep. 17, 2007

ENVIRONMENTAL AND PHYSICAL TEST RESULTS

耐候・物理試験結果

TYPE: CERAMIC RESONATOR
品 種: セラミック発振子

PART NUMBER: CSTCR4M00G55B-B0
品 番

QUALITY CONTROL SECTION
TOYAMA MURATA MFG. CO., LTD.
株式会社富山村田製作所
品質管理部 品質管理課

DRAWN BY
作成 A. Inamoto
CHECKED BY
確認 M. Yamanaka
APPROVED BY
承認 K. Sakai

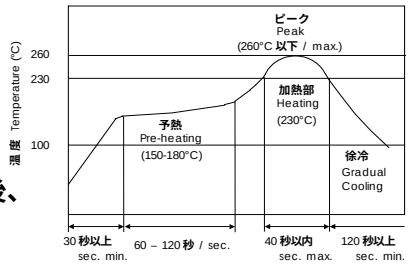
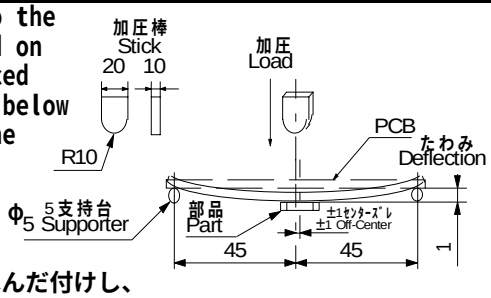
SUMMARY OF TEST RESULTS (1/2)
試験結果

PART NUMBER:CSTCR4M00G55B-B0
品　番

TEST ITEM 試験項目	TEST CONDITION 試験条件	QUANTITY (PCS.) ｻﾝﾌﾟﾙ数	JUDGEMENT 判定	PAGE ﾍﾟｰｼﾞ
①Dry Heat (Storage) 高温放置	After being placed in a chamber with +125±2°C for 1000 hours and then being placed in natural condition for 1 hour, resonator shall be measured. 温度+125±2°Cに1000時間保持し、常温に取出し1時間放置後測定する。	10	GOOD	3
②Cold (Storage) 低温放置	After being placed in a chamber with -55±2°C for 1000 hours and then being placed in natural condition for 1 hour, resonator shall be measured. 温度-55±2°Cに1000時間保持し、常温に取出し1時間放置後測定する。	10	GOOD	4
③Damp Heat (Storage) 湿中放置	After being placed in a chamber with 90 to 95% R.H. at +60±2°C for 1000hours and then being placed in natural condition for 1 hour,resonator shall be measured. 温度+60±2°C,湿度90～95%R.H.の恒温湿槽に1000時間保持し、常温に取出し1時間放置後測定する。	10	GOOD	5
④Thermal Shock 熱衝撃	After being kept at room temperature, resonator shall be placed at temperature of -55°C. After 30 minutes at this temperature, resonator shall be within a few minutes placed at temperature of +125°C. After 30 minutes at this temperature, resonator shall be returned to -55°C again. After 500 above cycles, resonator shall be returned to room temperature. And resonator shall be measured after being placed in natural condition for 1 hour. 温度-55°Cの恒温槽中に30分間保持後2～3分間の内に温度+125°Cの恒温槽中に30分間保持する。これを1ｻｲｸﾙとし500ｻｲｸﾙ行い常温に取り出し1時間後測定する。	10	GOOD	6
⑤Vibration 振動	Resonator shall be measured after being applied vibration of amplitude of 1.5mm with 10 to 55Hz band of vibration frequency to each of 3 perpendicular directions for 2 hours. 振動周波数10～55Hz全振幅1.5mmの振動x,y,zの3方向に各2時間印加後測定する。	10	GOOD	7
⑥Random Drop 落下	Resonator shall be measured after 3 times random drops from the height of 1.0m on wood board. 1.0mの高さから木板上に3回自然落下させた後測定する。	10	GOOD	8
⑦Resistance to Soldering Heat (Soldering Iron) はんだ耐熱性 (コテ付け)	Soldering iron of +350±5°C shall be placed 0.5mm above from electrode of resonator. Melting solder through soldering iron shall be applied to electrode for 3±0.5 seconds, then being place in natural condition for 24 hours, resonator shell be measured. 電極部より0.5mm以上離した場所に温度+350±5°Cのはんだごてを設置し糸はんだを溶かして、電極部にはんだを3±0.5秒間当て、常温に取出し24時間後測定する。	10	GOOD	9

SUMMARY OF TEST RESULTS (2/2)
試験結果

PART NUMBER:CSTCR4M00G55B-B0
品　番

TEST ITEM 試験項目	TEST CONDITION 試験条件	QUANTITY (PCS.) ｻﾝﾌﾟﾙ数	JUDGEMENT 判定	PAGE ﾍﾟｰｼﾞ
⑧Resistance to Soldering Heat (Reflow) はんだ耐熱性 （リフロー）	Resonator shall be passed through the reflow furnace with the condition shown in the right profile for 2 times. And it shall be measured after keeping for 1hour at room temperature. 右図のﾌﾟﾛﾌｧｲﾙのﾘﾌﾛｰ炉に2回通した後、常温に取出し1時間放置後測定する。 	10	GOOD	10
⑨Solderability はんだ付け性	LF Solder (Sn-3Ag-0.5Cu) Lead terminals are immersed in rosin for 5 seconds and then immersed in a soldering bath at +245±5°C for 3.0±0.5 seconds. Preconditioning : 105°C,100%R.H., for 4 hours. LFはんだ (Sn-3Ag-0.5Cu) PCT装置にて温度+105°C、湿度100%R.H.飽和の条件で4時間のｴｰｼﾞﾝｸﾞをした後、ﾛｼﾞﾝﾒﾀﾉｰﾙ液に5秒間浸漬後、+245±5°Cの溶融はんだ中に3.0±0.5秒間浸す。	10	GOOD	11
⑩Bend Board 基板たわみ	Resinator is soldered onto the center of PCB which is laid on the 2 small supporters spaced 90mm. PCB deflected to 1mm below from horizontal level by the pressing force with 20×10. R10 stick. The force is supplied for 1 second, 5 times repeatably. 支点間90mmのﾌﾟﾘﾝﾄ基板ｾﾝﾀｰにはんだ付けし、ﾌﾟﾘﾝﾄ基板の裏面中央より加圧棒で1回1秒の割合で5回加圧する。 	10	GOOD	12
⑪Temperature Characteristics 温度特性	Resonator shall be measured after being placed in a chamber with -40°C/-20°C/+0°C/+25°C/+50°C/+80°C/+100°C/+125°C for 20 minutes. 試験温度-40°C/-20°C/+0°C/+25°C/+50°C/+80°C/+100°C/+125°Cに20分保持した後測定する。	10	GOOD	13

①～⑧、⑩　－－ Judged by Table.1
判定は第１表に基づく

⑨　－－ Lead terminals shall be wet with solder more than 90% of immersed surface.
浸漬した後、端子部分の90%以上にはんだが付着する。

⑪　－－Judged by Table.2
判定は第２表に基づく

表1　Table1.

項　目　Item	規　格　Specification
発振周波数の変化 Oscillating Frequency Drift	±0.3%（初期値に対し） ±0.3%(from initial value)
共振抵抗 Resonant Impedance	60Ω以下 60Ωmax.

表2　Table2.

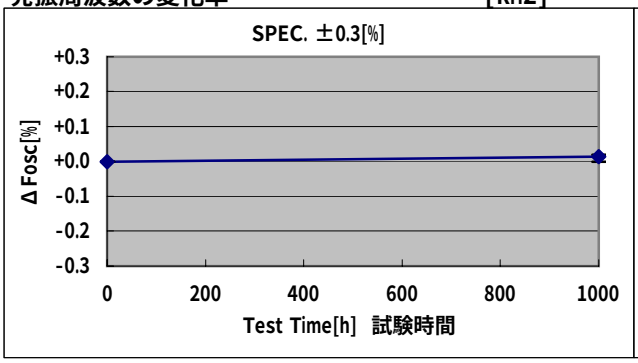
項　目　Item	規　格　Specification
発振周波数の変化 Oscillating Frequency Drift	±0.15%（初期値に対し） ±0.15%(from initial value)

DRY HEAT(STORAGE) TEST RESULTS
高温放置試験結果

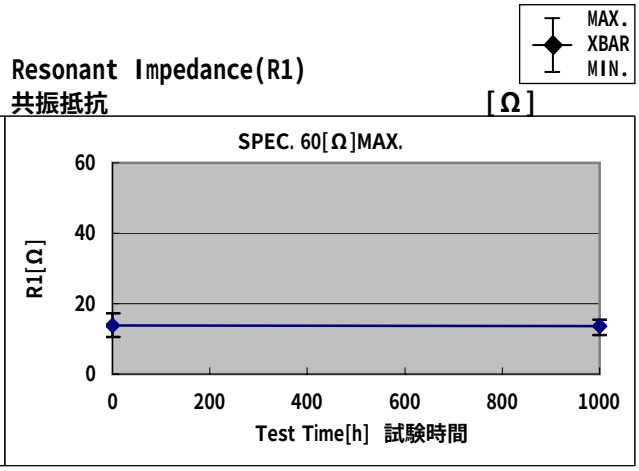
PART NUMBER:CSTCR4M00G55B-B0 (n=10pcs.)
品　番

CONDITION: After being placed in a chamber with +125±2°C for 1000 hours
試験条件 and then being placed in natural condition for 1 hour,
resonator shall be measured.
温度+125±2°Cに1000時間保持し、常温に取出し1時間放置後測定する。

ΔOscillating Frequency (Fosc)
発振周波数の変化率 [kHz]



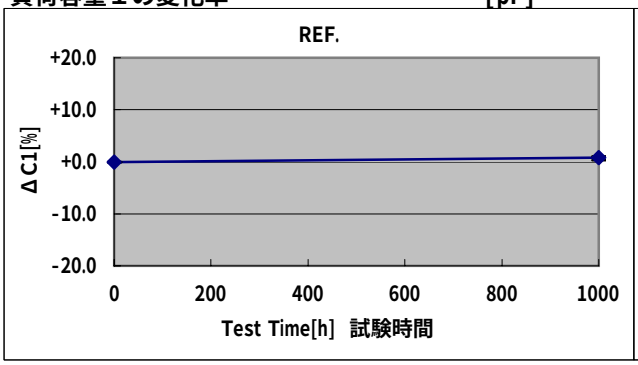
Resonant Impedance(R1)
共振抵抗 [Ω]



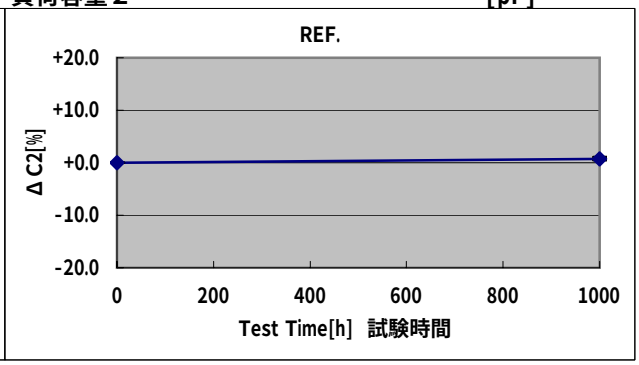
	0[h] [kHz]	1000[h] [kHz]	Variation 変化率[%]
XBAR	3998.65	3999.21	+0.0140
MAX.	4004.3	4005.0	+0.020
MIN.	3993.7	3994.4	+0.000
STD.DEV	3.20	3.22	0.0054

	0[h] [Ω]	1000[h] [Ω]	Variation 変化量[Ω]
XBAR	13.75	13.59	-0.16
MAX.	17.2	15.5	+1.1
MIN.	10.5	11.1	-1.9
STD.DEV	2.33	1.52	1.08

ΔLoad Capacitance(C1)
負荷容量１の変化率 [pF]



ΔLoad Capacitance(C2)
負荷容量２ [pF]



	0[h] [pF]	1000[h] [pF]	Variation 変化率[%]
XBAR	37.48	37.77	+0.77
MAX.	39.4	39.7	+1.1
MIN.	34.3	34.5	+0.3
STD.DEV	1.88	1.88	0.25

	0[h] [pF]	1000[h] [pF]	Variation 変化率[%]
XBAR	37.57	37.84	+0.71
MAX.	41.0	41.2	+1.1
MIN.	33.0	33.2	+0.5
STD.DEV	2.50	2.52	0.21

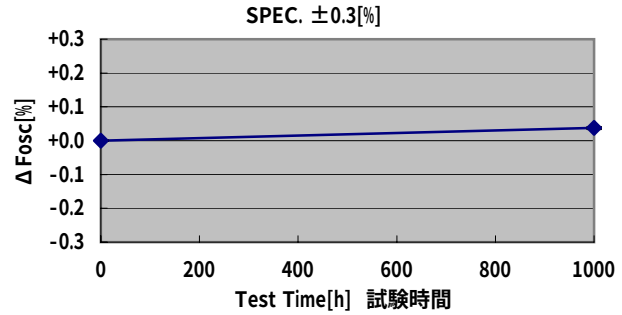
DATE (BEFORE TEST) : 2004/4/19 25℃ 51%R.H.
(AFTER TEST) : 2004/5/31 27℃ 56%R.H.

COLD(STORAGE) TEST RESULTS
低温放置試験結果

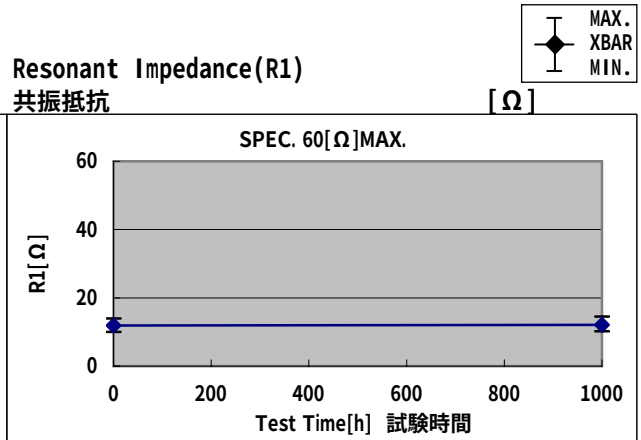
PART NUMBER:CSTCR4M00G55B-B0 (n=10pcs.)
品　番

CONDITION: After being placed in a chamber with -55±2°C for 1000 hours
試験条件 and then being placed in natural condition for 1 hour,
resonator shall be measured.
温度-55±2°Cに1000時間保持し、常温に取出し1時間放置後測定する。

ΔOscillating Frequency (Fosc)
発振周波数の変化率 [kHz]



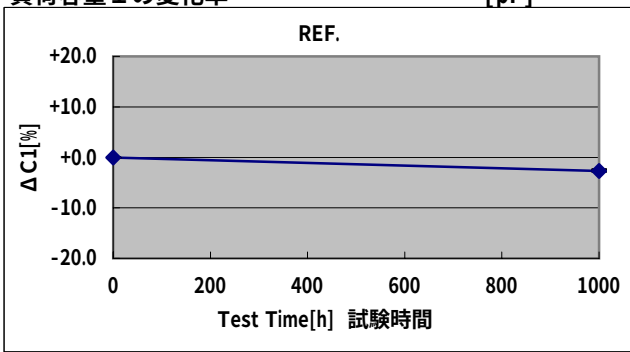
Resonant Impedance(R1)
共振抵抗 [Ω]



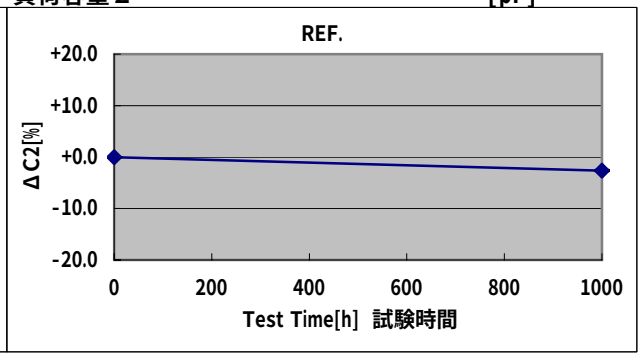
	0[h] [kHz]	1000[h] [kHz]	Variation 変化率[%]
XBAR	3998.50	4000.01	+0.0379
MAX.	4002.8	4004.2	+0.040
MIN.	3996.1	3997.6	+0.035
STD.DEV	1.96	1.92	0.0022

	0[h] [Ω]	1000[h] [Ω]	Variation 変化量[Ω]
XBAR	11.86	12.08	+0.22
MAX.	14.0	14.5	+0.6
MIN.	10.0	10.2	-0.5
STD.DEV	1.53	1.51	0.30

ΔLoad Capacitance(C1)
負荷容量１の変化率 [pF]



ΔLoad Capacitance(C2)
負荷容量２ [pF]



	0[h] [pF]	1000[h] [pF]	Variation 変化率[%]
XBAR	37.84	36.82	-2.69
MAX.	40.4	39.3	-2.4
MIN.	34.2	33.3	-2.8
STD.DEV	1.97	1.91	0.13

	0[h] [pF]	1000[h] [pF]	Variation 変化率[%]
XBAR	38.55	37.54	-2.63
MAX.	41.4	40.3	-2.5
MIN.	35.1	34.2	-2.7
STD.DEV	1.88	1.83	0.07

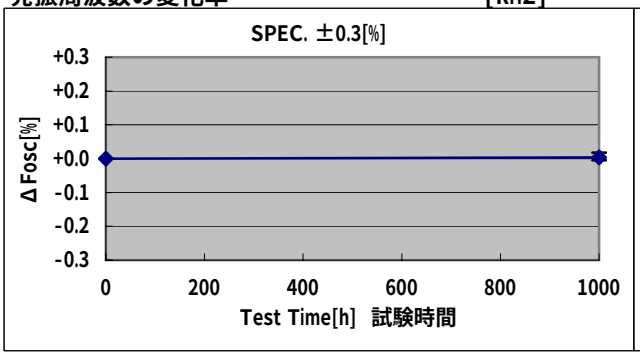
DATE (BEFORE TEST) : 2004/4/19 25°C 51%R.H.
(AFTER TEST) : 2004/5/31 27°C 56%R.H.

DAMP HEAT(STORAGE) TEST RESULTS
湿中放置試験結果

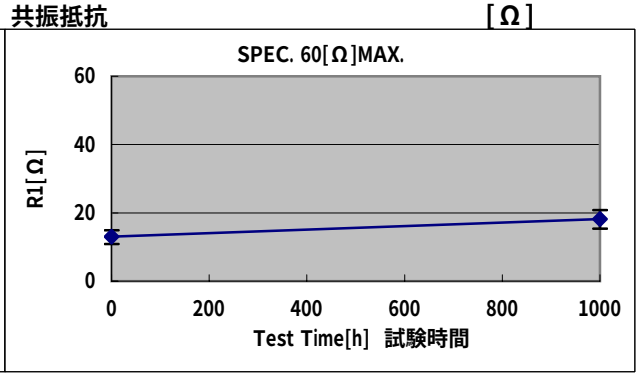
PART NUMBER:CSTCR4M00G55B-B0 (n=10pcs.)
品　番

CONDITION: After being placed in a chamber with 90 to 95% R.H. at +60±2°C
試験条件 for 1000hours and then being placed in natural condition
for 1 hour,resonator shall be measured.
温度+60±2°C,湿度90～95%R.H.の恒温湿槽に1000時間保持し、常温に取出し
1時間放置後測定する。

ΔOscillating Frequency (Fosc)
発振周波数の変化率 [kHz]



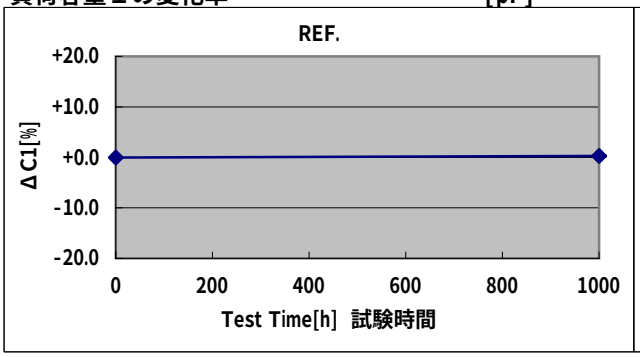
Resonant Impedance(R1)
共振抵抗 [Ω]



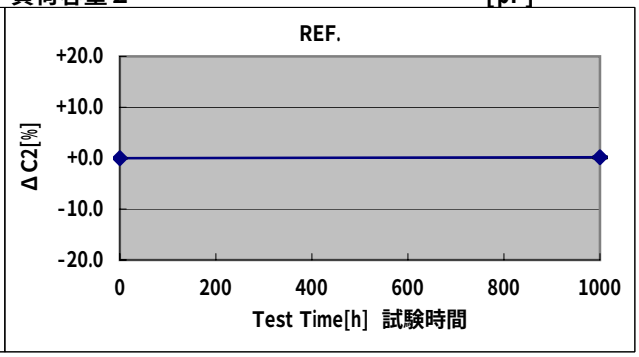
	0[h] [kHz]	1000[h] [kHz]	Variation 変化率[%]
XBAR	3997.67	3997.82	+0.0040
MAX.	4001.8	4001.7	+0.018
MIN.	3992.4	3992.6	-0.005
STD.DEV	2.80	2.81	0.0065

	0[h] [Ω]	1000[h] [Ω]	Variation 変化量[Ω]
XBAR	12.99	18.16	+5.17
MAX.	14.9	20.8	+6.8
MIN.	10.9	15.4	+3.0
STD.DEV	1.29	1.89	1.14

ΔLoad Capacitance(C1)
負荷容量１の変化率 [pF]



ΔLoad Capacitance(C2)
負荷容量２ [pF]



	0[h] [pF]	1000[h] [pF]	Variation 変化率[%]
XBAR	38.60	38.70	+0.26
MAX.	41.8	41.9	+0.3
MIN.	35.5	35.6	+0.2
STD.DEV	2.12	2.12	0.05

	0[h] [pF]	1000[h] [pF]	Variation 変化率[%]
XBAR	37.32	37.40	+0.22
MAX.	41.3	41.4	+0.3
MIN.	34.5	34.5	+0.0
STD.DEV	2.25	2.25	0.12

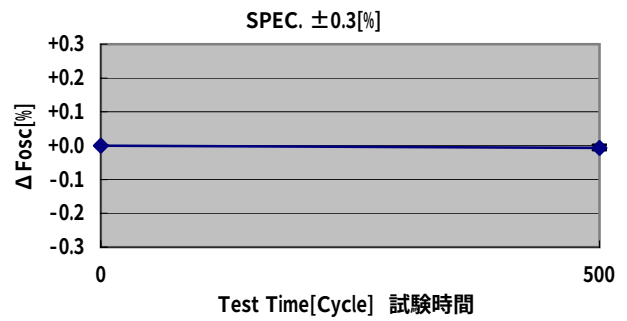
DATE (BEFORE TEST) : 2004/4/19 25°C 51%R.H.
(AFTER TEST) : 2004/5/31 27°C 56%R.H.

THERMAL SHOCK TEST RESULTS
熱衝撃試験結果

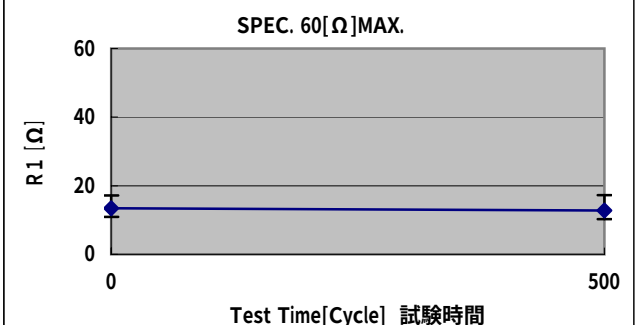
PART NUMBER:CSTCR4M00G55B-B0 (n=10pcs.)
品　番

CONDITION: After being kept at room temperature, resonator shall be placed at
試験条件 temperature of -55°C. After 30 minutes at this temperature, resonator shall be within a few minutes placed at temperature of +125°C. After 30 minutes at this temperature, resonator shall be returned to -55°C again. After 500 above cycles, resonator shall be returned to room temperature. And resonator shall be measured after being placed in natural condition for 1 hour.
温度-55°Cの恒温槽中に30分間保持後2～3分間の内に温度+125°Cの恒温槽中に30分間保持する。これを1ｻｲｸﾙとし500ｻｲｸﾙ行い常温に取り出し1時間後測定する。

ΔOscillating Frequency (Fosc)
発振周波数の変化率 [kHz]



Resonant Impedance(R1)
共振抵抗 [Ω]

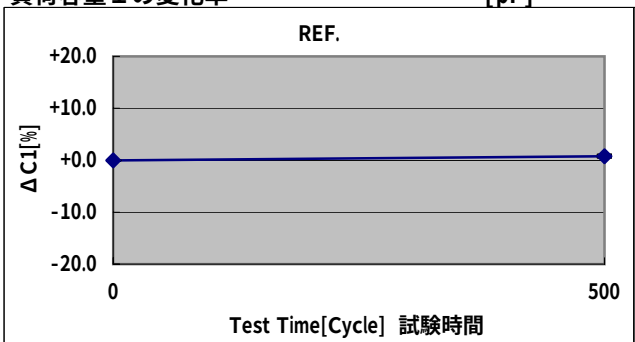


MAX.
XBAR
MIN.

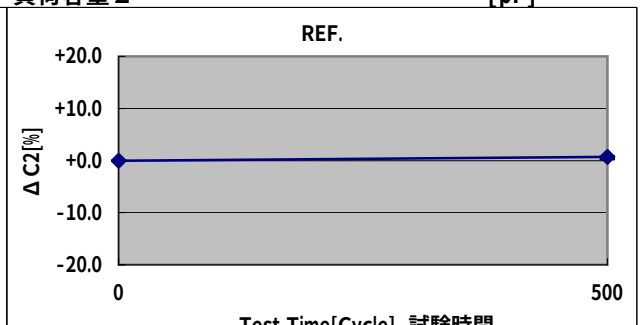
	0[Cycle] [kHz]	500[Cycles] [kHz]	Variation 変化率[%]
XBAR	3999.33	3999.05	-0.0070
MAX.	4002.1	4001.7	+0.003
MIN.	3995.7	3995.8	-0.013
STD.DEV	2.15	2.04	0.0045

	0[Cycle] [Ω]	500[Cycles] [Ω]	Variation 変化量[Ω]
XBAR	13.45	12.83	-0.62
MAX.	17.2	17.3	+0.4
MIN.	10.9	10.3	-1.7
STD.DEV	2.17	2.64	0.72

ΔLoad Capacitance(C1)
負荷容量１の変化率 [pF]



ΔLoad Capacitance(C2)
負荷容量２ [pF]



	0[Cycle] [pF]	500[Cycles] [pF]	Variation 変化率[%]
XBAR	37.39	37.68	+0.78
MAX.	38.9	39.2	+1.1
MIN.	34.7	34.9	+0.5
STD.DEV	1.30	1.31	0.21

	0[Cycle] [pF]	500[Cycles] [pF]	Variation 変化率[%]
XBAR	37.48	37.74	+0.69
MAX.	39.7	40.0	+0.8
MIN.	35.5	35.6	+0.3
STD.DEV	1.24	1.26	0.19

DATE (BEFORE TEST) : 2004/4/19 25°C 51%R.H.
(AFTER TEST) : 2004/5/31 27°C 56%R.H.

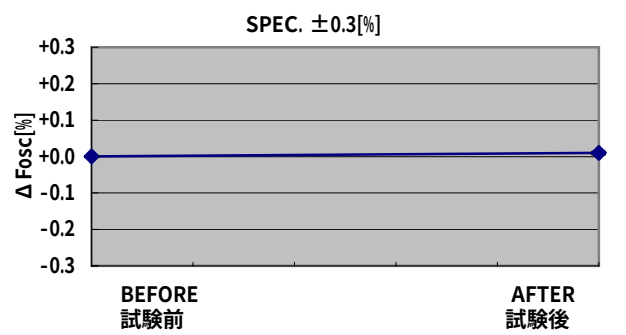
VIBRATION TEST RESULTS
振動試験結果

PART NUMBER:CSTCR4M00G55B-B0 (n=10pcs.)
品　番

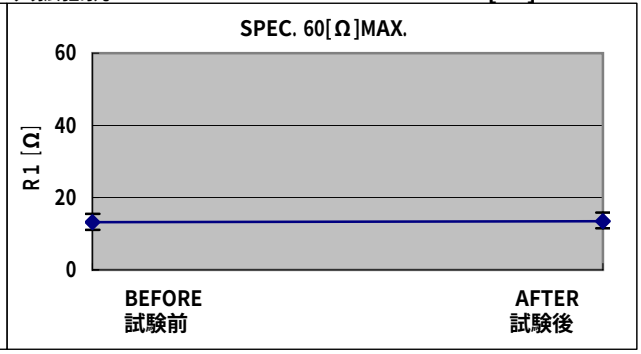
CONDITION: Resonator shall be measured after being applied vibration of amplitude of 1.5mm with 10 to 55Hz band of vibration frequency to each of 3 perpendicular directions for 2 hours.
試験条件 振動周波数10～55Hz全振幅1.5mmの振動x,y,zの3方向に各2時間印加後測定する。

MAX.
XBAR
MIN.

ΔOscillating Frequency (Fosc)
発振周波数の変化率 [kHz]



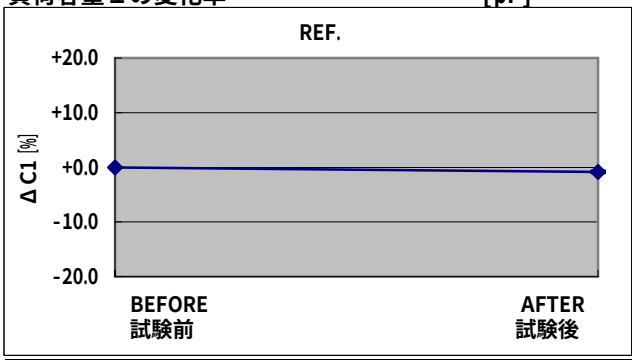
Resonant Impedance(R1)
共振抵抗 [Ω]



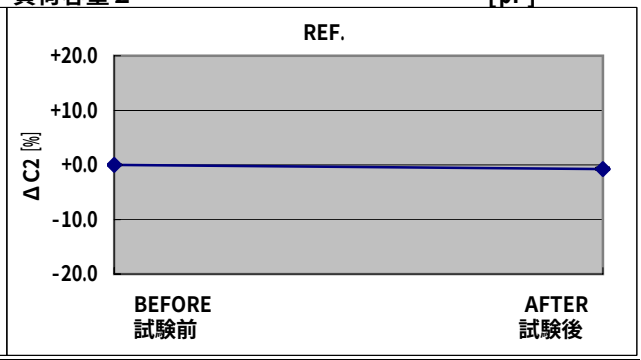
	BEFORE 試験前[kHz]	AFTER 試験後[kHz]	Variation 変化率[%]
XBAR	3998.43	3998.82	+0.0098
MAX.	4001.5	4001.8	+0.013
MIN.	3994.0	3994.3	+0.007
STD.DEV	2.35	2.34	0.0021

	BEFORE 試験前[Ω]	AFTER 試験後[Ω]	Variation 変化量[Ω]
XBAR	13.18	13.47	+0.29
MAX.	15.5	15.9	+0.6
MIN.	11.1	11.5	-0.3
STD.DEV	1.36	1.31	0.26

ΔLoad Capacitance(C1)
負荷容量１の変化率 [pF]



ΔLoad Capacitance(C2)
負荷容量２ [pF]



	BEFORE 試験前[pF]	AFTER 試験後[pF]	Variation 変化率[%]
XBAR	37.73	37.42	-0.82
MAX.	42.5	42.1	-0.6
MIN.	34.4	34.2	-1.0
STD.DEV	2.55	2.50	0.10

	BEFORE 試験前[pF]	AFTER 試験後[pF]	Variation 変化率[%]
XBAR	37.76	37.47	-0.78
MAX.	39.8	39.5	-0.5
MIN.	34.7	34.4	-0.9
STD.DEV	1.52	1.52	0.10

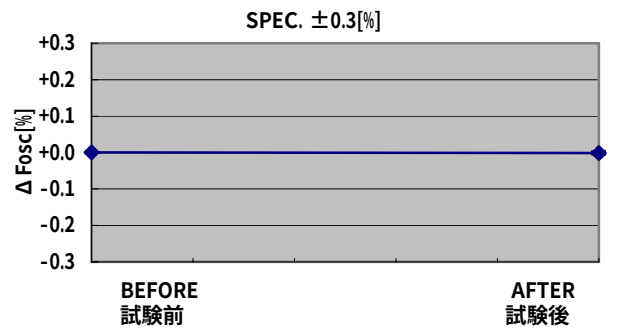
DATE (BEFORE TEST) : 2004/4/19 25℃ 51%R.H.
(AFTER TEST) : 2004/4/20 27℃ 55%R.H.

RANDOM DROP TEST RESULTS
落下試験結果

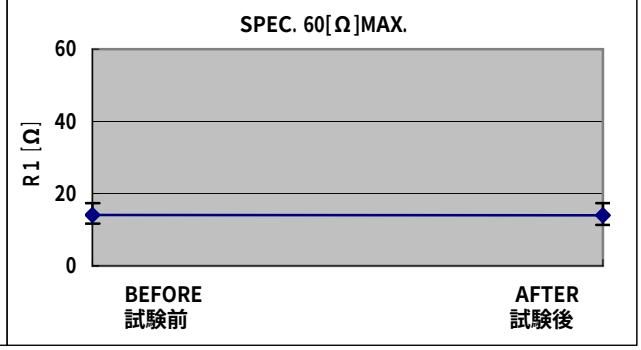
PART NUMBER:CSTCR4M00G55B-B0 (n=10pcs.)
品　番
CONDITION: Resonator shall be measured after 3 times random drops from
試験条件 the height of 1.0m on wood board.
1.0mの高さから木板上に3回自然落下させた後測定する。

MAX.
XBAR
MIN.

ΔOscillating Frequency (Fosc)
発振周波数の変化率 [kHz]



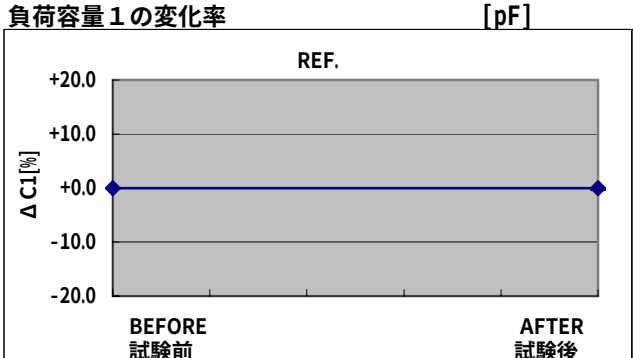
Resonant Impedance(R1)
共振抵抗 [Ω]



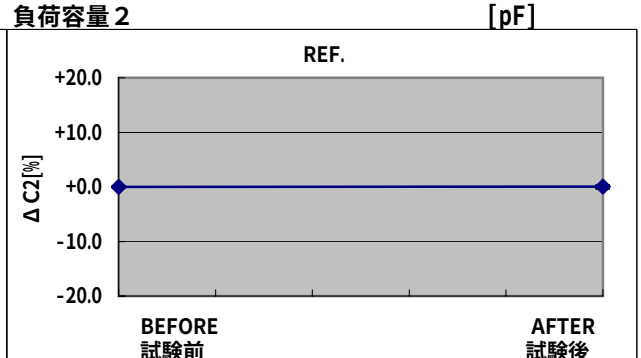
	BEFORE 試験前[kHz]	AFTER 試験後[kHz]	Variation 変化率[%]
XBAR	3998.64	3998.59	-0.0013
MAX.	4003.5	4003.3	+0.003
MIN.	3995.1	3994.9	-0.005
STD.DEV	2.67	2.65	0.0029

	BEFORE 試験前[Ω]	AFTER 試験後[Ω]	Variation 変化量[Ω]
XBAR	14.12	14.00	-0.12
MAX.	17.4	17.4	+0.2
MIN.	11.7	11.3	-0.7
STD.DEV	1.99	2.11	0.31

ΔLoad Capacitance(C1)
負荷容量１の変化率 [pF]



ΔLoad Capacitance(C2)
負荷容量２ [pF]



	BEFORE 試験前[pF]	AFTER 試験後[pF]	Variation 変化率[%]
XBAR	37.88	37.87	-0.03
MAX.	39.9	39.9	+0.0
MIN.	35.4	35.4	-0.3
STD.DEV	1.49	1.50	0.09

	BEFORE 試験前[pF]	AFTER 試験後[pF]	Variation 変化率[%]
XBAR	36.91	36.92	+0.03
MAX.	38.7	38.6	+0.3
MIN.	35.1	35.1	-0.3
STD.DEV	1.31	1.29	0.17

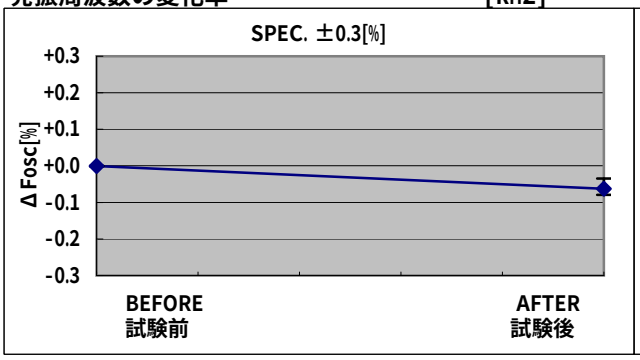
DATE (BEFORE TEST) : 2004/4/19 25℃ 51%R.H.
(AFTER TEST) : 2004/4/20 27℃ 55%R.H.

RESISTANCE TO SOLDERING HEAT(SOLDERING IRON) TEST RESULTS
はんだ耐熱性（コテ付け）試験結果

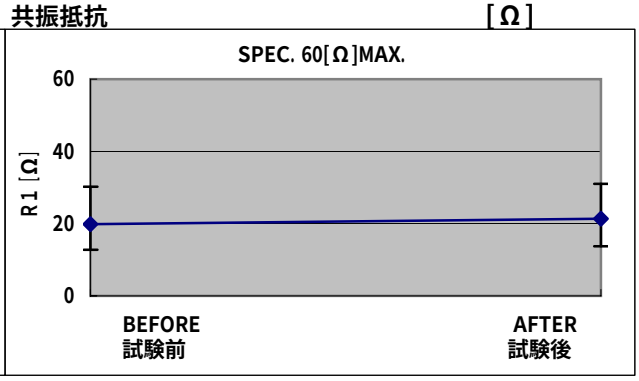
PART NUMBER:CSTCR4M00G55B-B0 （n=10pcs.）
品　番

CONDITION: Soldering iron of +350±5℃ shall be placed 0.5mm above from electrode
試験条件 of resonator. Melting solder through soldering iron shall be applied to electrode for 3±0.5 seconds, then being place in natural condition for 24 hour, resonator shell be measured.
電極部より0.5mm以上離した場所に温度+350±5℃のはんだごてを設置し糸はんだを溶かして、電極部にはんだを3±0.5秒間当て、常温に取出し24時間後測定する。

ΔOscillating Frequency (Fosc)
発振周波数の変化率 [kHz]



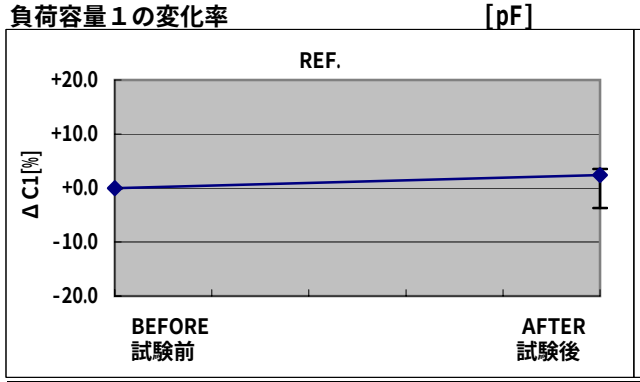
Resonant Impedance(R1)
共振抵抗 [Ω]



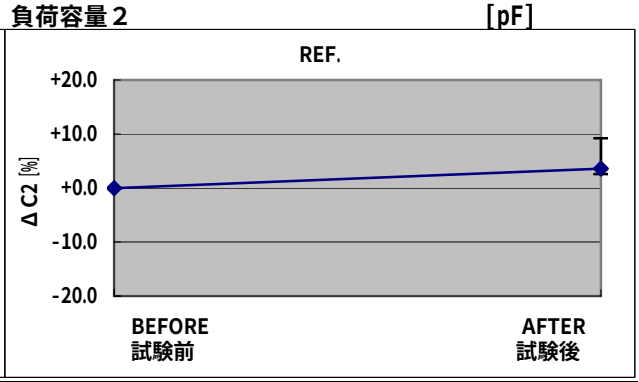
	BEFORE 試験前[kHz]	AFTER 試験後[kHz]	Variation 変化率[%]
XBAR	4002.50	4000.00	-0.0622
MAX.	4008.4	4005.6	-0.035
MIN.	3996.4	3993.3	-0.079
STD.DEV	3.27	3.36	0.0128

	BEFORE 試験前[Ω]	AFTER 試験後[Ω]	Variation 変化量[Ω]
XBAR	19.81	21.38	+1.57
MAX.	30.2	31.0	+8.7
MIN.	12.8	13.7	-0.9
STD.DEV	5.29	5.79	2.75

ΔLoad Capacitance(C1)
負荷容量１の変化率 [pF]



ΔLoad Capacitance(C2)
負荷容量２ [pF]



	BEFORE 試験前[pF]	AFTER 試験後[pF]	Variation 変化率[%]
XBAR	38.61	39.55	+2.42
MAX.	40.1	41.3	+3.5
MIN.	37.3	36.0	-3.7
STD.DEV	0.97	1.53	2.16

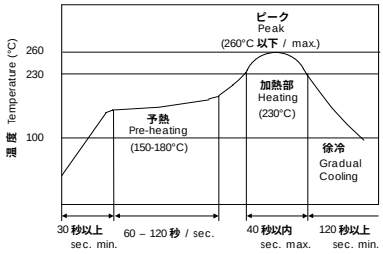
	BEFORE 試験前[pF]	AFTER 試験後[pF]	Variation 変化率[%]
XBAR	38.68	40.07	+3.60
MAX.	42.3	43.4	+9.2
MIN.	37.0	38.2	+2.6
STD.DEV	1.63	1.87	1.98

DATE (BEFORE TEST)： 2004/4/19 25℃ 51%R.H.
(AFTER TEST)： 2004/4/20 27℃ 55%R.H.

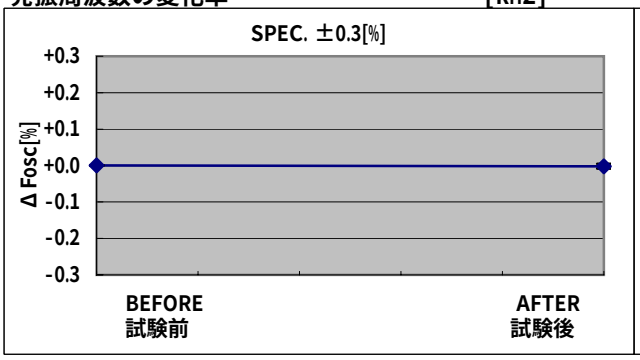
RESISTANCE TO SOLDERING HEAT(REFLOW) TEST RESULTS
はんだ耐熱性（リフロー）試験結果

PART NUMBER:CSTCR4M00G55B-B0 （n=10pcs.）
品　番

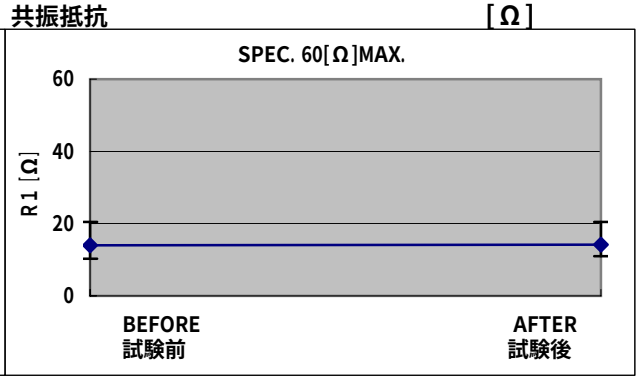
CONDITION: Resonator shall be passed through the reflow furnace with the condition shown in the right profile for 2 times. And it shall be measured after keeping for 1hour at room temperature.
試験条件 右図のﾌﾟﾛﾌｧｲﾙのﾘﾌﾛｰ炉に2回通した後、常温に取出し1時間放置後測定する。



ΔOscillating Frequency (Fosc)
発振周波数の変化率 [kHz]



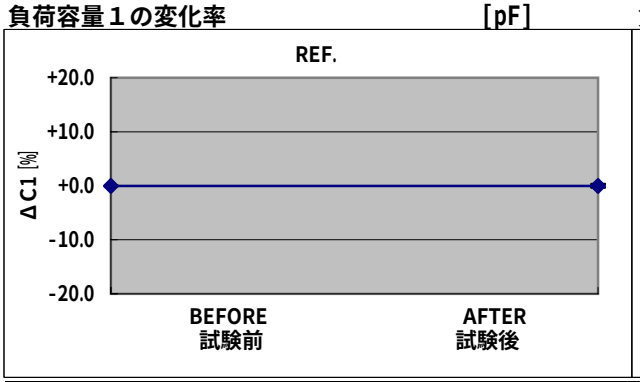
Resonant Impedance(R1)
共振抵抗 [Ω]



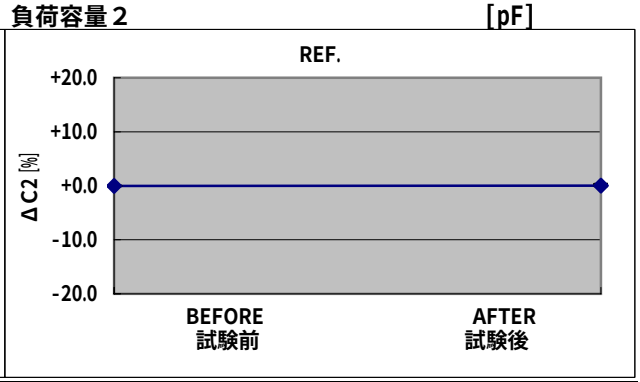
	BEFORE 試験前[kHz]	AFTER 試験後[kHz]	Variation 変化率[%]
XBAR	3999.30	3999.21	-0.0023
MAX.	4003.0	4003.0	+0.005
MIN.	3996.0	3995.7	-0.008
STD.DEV	2.01	2.05	0.0042

	BEFORE 試験前[Ω]	AFTER 試験後[Ω]	Variation 変化量[Ω]
XBAR	13.96	14.19	+0.23
MAX.	20.5	20.5	+1.1
MIN.	10.3	11.0	-0.2
STD.DEV	3.17	3.02	0.48

ΔLoad Capacitance(C1)
負荷容量１の変化率 [pF]



ΔLoad Capacitance(C2)
負荷容量２ [pF]



	BEFORE 試験前[pF]	AFTER 試験後[pF]	Variation 変化率[%]
XBAR	37.05	37.05	+0.00
MAX.	38.5	38.5	+0.3
MIN.	35.4	35.4	-0.3
STD.DEV	0.99	0.99	0.14

	BEFORE 試験前[pF]	AFTER 試験後[pF]	Variation 変化率[%]
XBAR	37.23	37.24	+0.03
MAX.	39.4	39.4	+0.3
MIN.	35.2	35.2	+0.0
STD.DEV	1.14	1.14	0.09

DATE (BEFORE TEST) : 2004/4/19 25°C 51%R.H.
(AFTER TEST) : 2004/4/20 27°C 55%R.H.

SOLDERABILITY TEST RESULTS
はんだ付性試験結果

PART NUMBER:CSTCR4M00G55B-B0 (n=10pcs.)
品　番
CONDITION: LF Solder (Sn-3Ag-0.5Cu)
試験条件 Lead terminals are immersed in rosin for 5 seconds and then immersed in a soldering bath at +245±5℃ for 3.0±0.5 seconds.
Preconditioning : 105℃,100%R.H., for 4 hours.
LFはんだ (Sn-3Ag-0.5Cu)
PCT装置にて温度+105℃、湿度100%R.H.飽和の条件で4時間のｴｰｼﾞﾝｸﾞをした後、
ﾛｼﾞﾝﾒﾀﾉｰﾙ液に5秒間浸漬後、+245±5℃の溶融はんだ中に3.0±0.5秒間浸す。

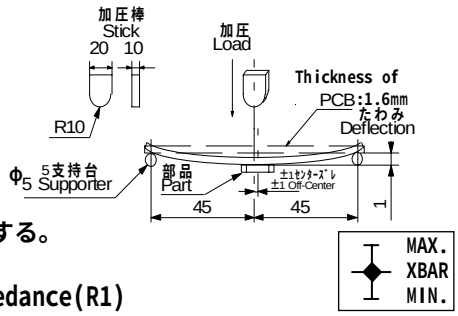
Character 特性	Covered New Solder Area
NO.	AFTER TEST
1	More Than 90 % of Area Being Tested. 端子の90%以上にはんだが付着しています
2	More Than 90 % of Area Being Tested. 端子の90%以上にはんだが付着しています
3	More Than 90 % of Area Being Tested. 端子の90%以上にはんだが付着しています
4	More Than 90 % of Area Being Tested. 端子の90%以上にはんだが付着しています
5	More Than 90 % of Area Being Tested. 端子の90%以上にはんだが付着しています
6	More Than 90 % of Area Being Tested. 端子の90%以上にはんだが付着しています
7	More Than 90 % of Area Being Tested. 端子の90%以上にはんだが付着しています
8	More Than 90 % of Area Being Tested. 端子の90%以上にはんだが付着しています
9	More Than 90 % of Area Being Tested. 端子の90%以上にはんだが付着しています
10	More Than 90 % of Area Being Tested. 端子の90%以上にはんだが付着しています

DATE： 2004/4/20 25℃ 52%R.H.

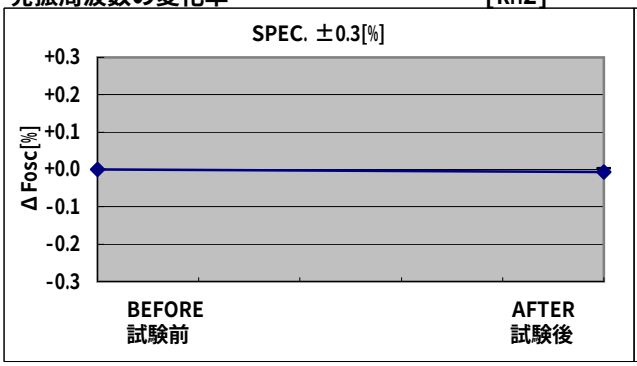
BEND BOARD TEST RESULTS
基板たわみ試験結果

PART NUMBER:CSTCR4M00G55B-B0 (n=10pcs.)
品　番

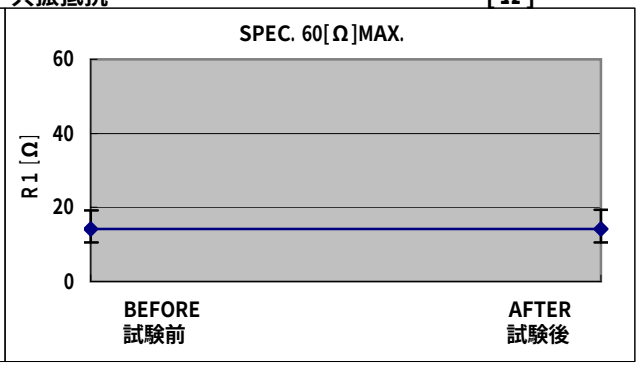
CONDITION: Resonator is soldered onto the center of PCB
試験条件 which is laid on the 2 small supporters spaced 90mm. PCB deflected to 1mm below from horizontal level by the pressing force with 20×10. R10 stick. The force is supplied for 1 second, 5 times repeatably.
支点間90mmのﾌﾟﾘﾝﾄ基板ｾﾝﾀｰにはんだ付けし、
ﾌﾟﾘﾝﾄ基板の裏面中央より加圧棒で1回1秒の割合で5回加圧する。



ΔOscillating Frequency (Fosc)
発振周波数の変化率 [kHz]



Resonant Impedance(R1)
共振抵抗 [Ω]

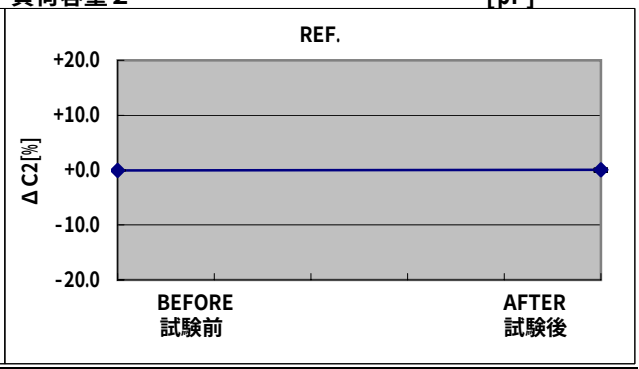


	BEFORE 試験前[kHz]	AFTER 試験後[kHz]	Variation 変化率[%]
XBAR	3996.68	3996.41	-0.0070
MAX.	3999.2	3999.1	+0.003
MIN.	3993.4	3993.1	-0.013
STD.DEV	1.69	1.79	0.0047

	BEFORE 試験前[Ω]	AFTER 試験後[Ω]	Variation 変化量[Ω]
XBAR	14.12	14.21	+0.09
MAX.	19.2	19.3	+0.8
MIN.	10.5	10.6	-1.0
STD.DEV	2.84	2.74	0.48

ΔLoad Capacitance(C1)
負荷容量１の変化率 [pF]

ΔLoad Capacitance(C2)
負荷容量２ [pF]



	BEFORE 試験前[pF]	AFTER 試験後[pF]	Variation 変化率[%]
XBAR	38.10	38.12	+0.06
MAX.	40.3	40.3	+0.3
MIN.	33.9	34.0	+0.0
STD.DEV	1.74	1.72	0.13

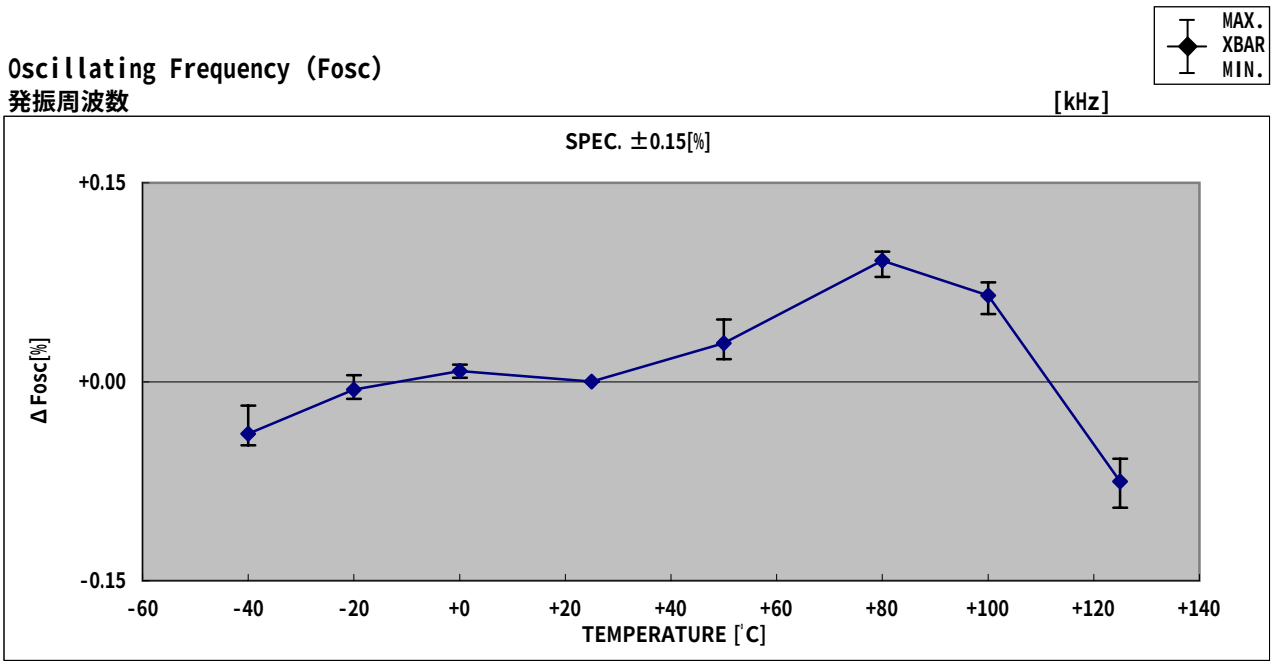
	BEFORE 試験前[pF]	AFTER 試験後[pF]	Variation 変化率[%]
XBAR	37.58	37.60	+0.05
MAX.	41.3	41.4	+0.3
MIN.	36.1	36.1	-0.3
STD.DEV	1.60	1.60	0.18

DATE (BEFORE TEST) : 2004/4/19 25℃ 51%R.H.
(AFTER TEST) : 2004/4/20 27℃ 55%R.H.

TEMPERATURE CHARACTARISTICS TEST RESULTS
温度特性試験結果

PART NUMBER:CSTCR4M00G55B-B0 (n=10pcs.)
品　番
CONDITION: Resonator shall be measured after being placed in a chamber
試験条件 with -40℃/-20℃/+0℃/+25℃/+50℃/+80℃/+100℃/+125℃ for 20 minutes.
試験温度-40℃/-20℃/+0℃/+25℃/+50℃/+80℃/+100℃/+125℃に20分保持した後測定する。

Oscillating Frequency (Fosc)
発振周波数 [kHz]



	25[℃] [kHz]	-40[℃] [kHz]	Variation 変化率[%]	-20[℃] [kHz]	Variation 変化率[%]	0[℃] [kHz]	Variation 変化率[%]	50[℃] [kHz]	Variation 変化率[%]
XBAR	3993.50	3991.94	-0.0392	3993.27	-0.0060	3993.83	+0.0081	3994.67	+0.0291
MAX.	3995.1	3993.6	-0.018	3995.0	+0.005	3995.6	+0.013	3996.2	+0.047
MIN.	3991.4	3989.9	-0.048	3991.2	-0.013	3991.8	+0.003	3993.0	+0.017
σn-1	1.12	1.04	0.0082	1.08	0.0053	1.08	0.0037	0.91	0.0092

	25[℃] [kHz]	80[℃] [kHz]	Variation 変化率[%]	100[℃] [kHz]	Variation 変化率[%]	125[℃] [kHz]	Variation 変化率[%]		
XBAR	3993.50	3997.15	+0.0914	3996.09	+0.0651	3990.50	-0.0752		
MAX.	3995.1	3999.0	+0.098	3998.0	+0.075	3992.6	-0.058		
MIN.	3991.4	3994.6	+0.079	3993.4	+0.051	3987.9	-0.095		
σn-1	1.12	1.29	0.0059	1.35	0.0081	1.49	0.0142		

DATE： 2004/4/21 26℃ 68%R.H.