MURATA MANUFACTURING CO., LTD.

No. : HEMCG2-2468

Attention:

DATE : Sep. 23, 2014

Notification – Addition of MLCC Factory (Philippines Manufacturing Co.of Murata,Inc.)

Dear Valued Customer,
Murata would like to notify you of the addition of new MLCC factory ;
Philippines Manufacturing Co.of Murata,Inc., to support delivery of MLCC.

1. Applicable Product:

High Dielectric Constant Type Monolithic Ceramic Capacitor

Size:

(EIA)	(EIA-J Size)	Dimension (LXW)	Murata Type
0402	(1005)	1.0mmX0.5mm	GCM15 Series
0603	(1608)	1.6mmX0.8mm	GCM18 Series
0805	(2012)	2.0mmX1.25mm	GCM21 Series

Temperature Characteristics : Code (Public standard Code)

B(B1),R(R1),X5R(R6),X6S(C8),X7R(R7),X7S(C7),X8R(R9),X8L(L8)

Rated Voltage :

DC 100V and less

2. Changed Item:

Addition of MLCC Factory (Philippines Manufacturing Co.of Murata,Inc.)

3. Background

In response to the MLCC demand increase in overseas market, we are in the process of factory re-organization and relocation of production items based on following aspects.

- Increase the production ratio at overseas factory in the mid-long term point of view
- Risk management measures in preparation for natural disasters
- Supply capacity expansion by multi production sites
- Production items relocation to make the best use of advantage of each factory

Murata Philippines was established in Oct. 2012, and will be the second largest overseas factory next to Wuxi Murata Electronics Co., Ltd.

Most of GCM series demands comes from overseas customers, and is further expected to increase. We are going to respond to this challenge by expanding production capacity at Murata Philippines.

The products are produced with exactly the same machine, raw material and process control in Japan and overseas factory, so quality and electrical characteristics of Murata Philippines products are identical to those of all Murata factory.

4. Request

Please return this form with your signature by : March. 31. 2015

Please feel free to contact us, if you have any question or request on our proposal.
If there are no reply and inqury from you by this date, we will proceed this change.

5 .Others

As for new factory's products, they will be labeled as "MADE IN PHILIPPINE".

Yours very truly,

Y. Nakayama

Product Engineering Department
Capacitor Division Ⅰ
Fukui Murata MFG. Co., Ltd.

The notification for the acceptance

Date:
Company:
Signature:
Comment:

XXX(YYY)

Test Sheet of Monolithic Ceramic Capacitor
GCM18(0603/1608) series [High Dielectric Type]

muRata
INNOVATOR IN ELECTRONICS

Typical Murata Global Part No	Size (inch/mm)	Temp. Chara.	Cap.Value	Cap.Tol.	Volt.
GCM188R71H104KA57 (Philippine factory)	0603/1608	X7R	0.1uF	+/-10%	50V
GCM188R71H104KA57 (Japan factory)	0603/1608	X7R	0.1uF	+/-10%	50V

Data No. : 0603-R-013-2014
DATE: 2014.7.22

Murata Manufacturing Co., Ltd.

Operating Temperature Range / 使用温度範囲 : -55 ~ +125℃

Tested Item/ 試験項目	Tested Condition/ 試験条件	Result/試験結果 (Rejection Number/Sample Number)	
1.Terminal Strength / 固着性	Substrate/基板 : Glass-epoxy Pressurization Power / 加圧力 : 18N (GC*03/15 : 2N) Keeping Time / 保持時間 : 60±1s Solder Type / はんだ種類 : Sn-3.0Ag-0.5Cu Pressuring Speed/加圧速度 : 0.5 mm/sec	0/30	0/30
2.Vibration / 耐振性	Oscillation Frequency/振動周波数 : 10Hz to 2000Hz to 10Hz for 20min. Total Amplitude/全振幅 : 1.5 mm Time/時間 : A period of 12 items in each 3 mutually perpendicular directions. (Total 36 times)	0/30	0/30
3.Board Flex / 耐基板曲げ性	Substrate/基板 : Glass-epoxy (100mm × 40mm × 1.6mm*) * GCM03/15 : t=0.8mm Flexure/たわみ量 : ≦2（High Dielectric Type/高誘電率系) Keeping Time/保持時間 : 5±1s Pressure jig/加圧治具 : R4	0/30	0/30
4.Solderability / はんだ付け性	PRE-CONDITION / SOLDER TEMPERATURE / IMMERSION TIME 1. 155 deg.C, 4hours / 235 +/- 5 deg. C / 5sec 2. Steam aging 8hours +/-15minutes / 235 +/- 5 deg. C / 5sec 3. Steam aging 8hours +/-15minutes / 260 +/- 5 deg. C / 120sec	0/30	0/30
5.Resistance to soldering Heat/ はんだ耐熱性	Solder/はんだ : H60A (共晶はんだ) Solder Temperature/はんだ温度 : 260±5℃ Immersion Time/浸せき時間 : 10±1s Set at room temperature/放置時間 : 24±2 hours Preheating/試験前予熱 : 150+0/-10℃ for 1hour (for High Dielectric Type)	0/30	0/30
6.Temperature Cycle/温度ｻｲｸﾙ	Step / Time(min) / Cycles: 1000(for R7) / 300(for L8/R9) 1 / 15+/-3 / -55°C+0/-3 / -55°C+0/-3 2 / 1 / Room / Room 3 / 15+/-3 / 125°C+3/-0 / 150°C+3/-0 4 / 1 / Room / Room Preheating/試験前予熱 : 150+0/-10℃ for 1hour (for High Dielectric Type)	0/77	0/77
7.Moisture Resistance/ 耐湿性	Temperature/温度 : 25 to 65℃ Humidity/湿度 : 80%(RH) to 98%(RH) Time/時間 : One cycle 24-hour, 10 consecutive times	0/77	0/77
8.Biased Humidity/ 耐湿負荷	Temperature/温度 : 85±3℃ Humidity/湿度 : 80%(RH) to 85%(RH) Voltage/電圧 : (1)The Rated Voltage / 定格電圧 (2)1.3+0.2/-0vdc (add 6.8kΩ resistor) Time/時間 : 1000±12h	0/77	0/77
9.Operational Life/ 高温負荷	Temperature/温度 : Max. Operating Temp.±3℃ Voltage/電圧 : Apply 200% of the rated voltage / 定格電圧 x 200% Time/時間 : 1000±12h	0/77	0/77

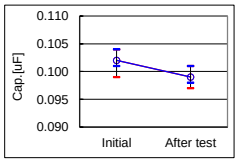
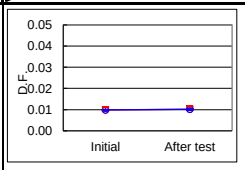
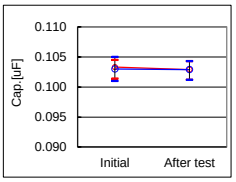
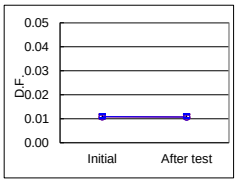
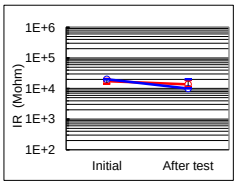
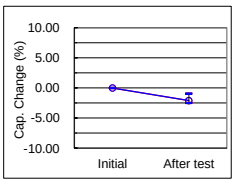
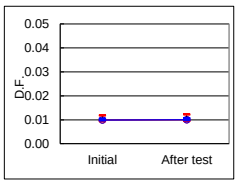
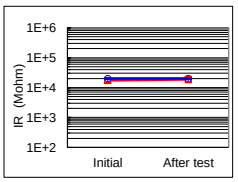
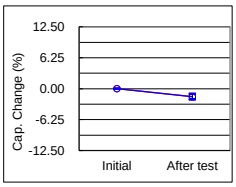
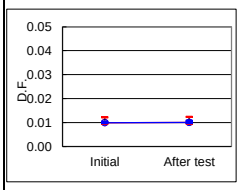
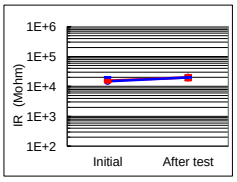
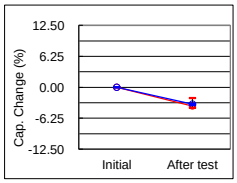
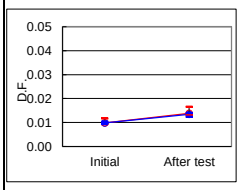
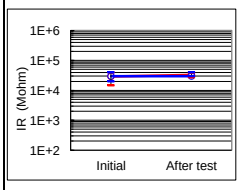
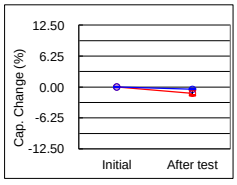
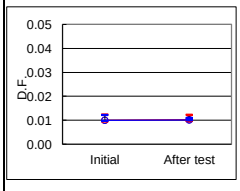
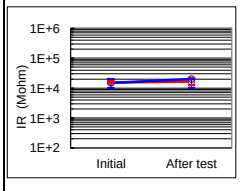
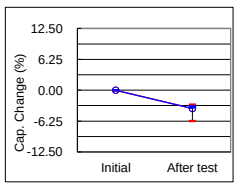
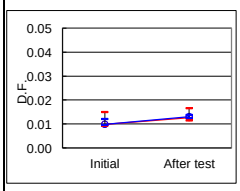
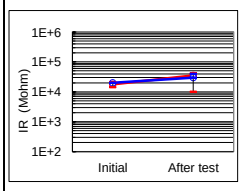
Note: These test condition and specification are for the typical item.

Test Result/試験結果データ

Data No. : 0603-R-013-2014

Typical Murata Global Part No	Size (inch/mm)	Temp. Chara.	Cap.Value	Cap.Tol.	Volt.
GCM188R71H104KA57 (Philippine factory)	0603/1608	X7R	0.1uF	+/-10%	50V
GCM188R71H104KA57 (Japan factory)	0603/1608	X7R	0.1uF	+/-10%	50V

AVE. MAX. MIN.
AVE. MAX. MIN.

Tested Item/ 試験項目	Confirmed Criteria/	Specification and Result / 規格値 および 試験結果		
1.Terminal Strength /固着性	Appearance/外観	No defects including no peeling of the termination. 端子電極のはく離及びその他異常はありません。	OK	
2.Vibration/ 耐振性	Appearance/外観	No defects /著しい異常はありません。	OK	 
	Capacitance/ 静電容量	0.09 to 0.11uF		
	D.F.	0.025 (max.)		
3.Board Flex / 耐基板曲げ性	Appearance/外観	No defects /著しい異常はありません。	OK	
	Capacitance Change/ 静電容量変化率(%)	±10% (within)	OK	
4.Solderability / はんだ付け性	Wetting area/ はんだ付き面積	95% of the termination is to be soldered evenly and continuously./ 端子電極の95%以上に切れ目なくはんだが付着しています。	OK	
5.Resistance to Soldering Heat/ はんだ耐熱性	Appearance/外観	No defects /著しい異常はありません。	OK	  
	Capacitance/ 静電容量	0.09 to 0.11uF		
	D.F.	0.025 (max.)		
	IR/絶縁抵抗(MΩ)	5.0E+03(min.)		
6.Temperature Cycle/ 温度ｻｲｸﾙ	Appearance/外観	No defects /著しい異常はありません。	OK	  
	Capacitance / 静電容量(%)	±10% (within)		
	D.F.	0.030 (max.)		
	IR/絶縁抵抗(MΩ)	5.0E+03(min.)		
7.Moisture Resistance/ 耐湿性	Appearance/外観	No defects /著しい異常はありません。	OK	  
	Capacitance Change/ 静電容量変化率(%)	±12.5% (within)		
	D.F.	0.030 (max.)		
	IR/絶縁抵抗(MΩ)	5.0E+03(min.)		
8.Biased Humidity/ 耐湿負荷(1)	Appearance/外観	No defects /著しい異常はありません。	OK	  
	Capacitance Change/ 静電容量変化率(%)	±12.5% (within)		
	D.F.	0.035 (max.)		
	IR/絶縁抵抗(MΩ)	5.0E+02(min.)		
8.Biased Humidity/ 耐湿負荷(2)	Appearance/外観	No defects /著しい異常はありません。	OK	  
	Capacitance Change/ 静電容量変化率(%)	±12.5% (within)		
	D.F.	0.035 (max.)		
	IR/絶縁抵抗(MΩ)	5.0E+02(min.)		
9.Operational Life/ 高温負荷	Appearance/外観	No defects /著しい異常はありません。	OK	  
	Capacitance Change/ 静電容量変化率(%)	±12.5% (within)		
	D.F.	0.035 (max.)		
	IR/絶縁抵抗(MΩ)	5.0E+02(min.)		

PPAP No. : P-140732
Date: 17.July.2014

PPAP PACKAGE

Family PPAP Package for the GCM Series

Addition of MLCC Factory
(Philippines Manufacturing Co. of Murata, Inc.)

INNOVATOR IN ELECTRONICS

MURATA MFG. CO., LTD

1. Process Flow Diagrams

*Please see attached Control plan (7).

2. Process FMEA

Process FMEA

Product series : GR*/GC* /GJ*Series (* : M,S,P,F,D,T)	Control Plan No. : -----	Doc. # : LEMC6604-PF001S
Product name : Chip type Monolithic Ceramic Capacitor	Core team : Process Eng., Factory QC, Mechanical Eng., Production, Production Control, Group QC	Date(Orig) : 22,Jun.,2005 / Date(Rev) : 26, Jun, 2013 Issued by : Quality Assurance Department

SPE : Use symbol [*] for special characteristics, or write the unique symbol that customer specified.

No	PROCESS FUNCTION	PROCESS PURPOSE	POTENTIAL FAILURE MODE	EFFECT(S) OF FAILURE	SEV	SPE	POTENTIAL CAUSE(S) OF FAILURE	OCC	CURRENT PROCESS CONTROL		DET	RPN	RECOMMENDED ACTIONS AND CONTROL METHODS	RESP. & TARGET COMPLETION DATE	ACTION RESULTS				
									PREVENTION	DETECTION					ACTION TAKEN	SEV	OCC	DET	RPN
1	CERAMIC MATERIAL INCOMING INSPECTION	Inspecting of ceramic material	Mis-judgement	Electrical characteristics defect	7		Mis-inspection of inspector	2		Double check by other person	5	70	None						
2	MIXING	Making uniformity of slurry by mixing of ceramic powder, solvent and binder.	Excess of slurry discharge by milling out	Delamination Capacitance defect Flash/IR failure Cross section defect by cutting	7		Excess binder Excess ceramic material Excess solvent	2	Double check for material weight Daily check	Measurement of slurry amount Electrical sorting	4	56	None						
			Lack of slurry discharge by milling out	Delamination Out of spec. for TC(temperature coefficient) Capacitance defect Flash/IR failure Cross section defect by cutting	7		Lack of binder Lack of ceramic material Lack of solvent Residue of slurry at milling	2	Double check for material weight Daily check	Measurement of slurry amount Electrical sorting Appearance check after cutting	4	56	None						
			High temperature of slurry	Flash/IR failure (insufficient dispersion) Capacitance defect Out of spec. for TC	7		Fast rotation speed at milling Excess of slurry discharge by milling out	3	Checking rotation speed Checking discharge amount by milling	Electrical sorting	4	84	None						
			Low temperature of slurry	Flash/IR failure (insufficient dispersion) Capacitance defect Out of spec. for TC	7		Slow rotation speed at milling Lack of slurry discharge by milling out	3	Checking rotation speed Checking discharge amount by milling	Electrical sorting	4	84	None						
			Variation of slurry viscosity after milling	Delamination Out of spec. for TC Capacitance defect Flash/IR failure Cross section defect by cutting	7		Variation of binder amount Variation of ceramic powder amount Variation of solvent amount Variation of slurry discharge at milling out	2	Double check for material weight Viscosity measurement Checking discharge amount by milling	Electrical sorting	4	56	None						
			Variation of slurry specific gravity after milling	Delamination Out of spec. for TC Capacitance defect Flash/IR failure Cross section defect by cutting	7		Variation of binder amount Variation of ceramic powder amount Variation of solvent amount Variation of slurry discharge at milling out	2	Double check for material weight Viscosity measurement Checking discharge amount by milling	Electrical sorting	4	56	None						
			Foreign material mixing	Flash/IR failure(void)	7		Worse partical count at clean room Insufficient cleansing Wearing off the consumption parts of mixing equipment	3	Control of clean condition Visual check Periodical check	Electrical sorting	4	84	None						

No	PROCESS FUNCTION	PROCESS PURPOSE	POTENTIAL FAILURE MODE	EFFECT(S) OF FAILURE	SEV	SPE	POTENTIAL CAUSE(S) OF FAILURE	OCC	CURRENT PROCESS CONTROL		DET	RPN	RECOMMENDED ACTIONS AND CONTROL METHODS	RESP. & TARGET COMPLETION DATE	ACTION RESULTS				
									PREVENTION	DETECTION					ACTION TAKEN	SEV	OCC	DET	RPN
3	DE-AIRING	Deairing of slurry by vacuum suck.	High viscosity	Flash/IR failure	7		Excess deairing time	3	Checking work order ticket Viscosity measurement	Electrical sorting	4	84	None						
			High specific gravity	Flash/IR failure	7		Excess deairing time	3	Checking work order ticket Measurement of specific gravity	Electrical sorting	4	84	None						
			Insufficient deairing	Flash/IR failure	7		Vacuum pump breakdown Leakage from piping and machinery	2	Periodical check Measurement of vacuum level	Electrical sorting	4	56	None						
			Foreign material mixing	Flash/IR failure(void)	7		Worse partical count at clean room Insufficient cleansing	3	Control of clean condition Visual check Periodical check	Electrical sorting	4	84	None						
4	CASTING	Making the dielectric sheet with uniform thickness.	Clog of filter	IR failure (Delamination) Capacitance defect	7		Insufficient crush Agglomeration Excess slurry drying Foreign material mixing	4	Checking liquid pressure	Electrical sorting	4	112	None						
			Pin-hole	Flash/IR failure	7		Foreign material adhesion to the roll Insufficient deairing	5	Visual check	Electrical sorting	4	140	None						
			Unpenetrated spot	Flash/IR failure	7		Foreign material adhesion to the roll Insufficient deairing	5	Visual check	Electrical sorting	4	140	None						
			Appearance defect	IR failure Capacitance defect	7		Insufficient crush Agglomeration Excess slurry drying Foreign material mixing Breakdown of sheeting head Film wrinkles Quick dry Large SSA(Specific surface area) of ceramic material Lack of binder	4	Daily check Incoming inspection	Electrical sorting	4	112	None						
			Sheet crumbs	Flash/IR failure	7		Green sheet crumbs in dryer Mistake setting of slit blade Decrease of slit blade effect	2	Cleaning inside of dryer Daily check Visual check	Electrical sorting	4	56	None						
			Foreign material mixing	Flash/IR failure(void)	7		Insufficient cleansing Worse partical count at clean room Mixing from film Decrease of roll adhesion	2	Visual check Control of clean condition Appearance check Daily check	Electrical sorting	4	56	None						

No	PROCESS FUNCTION	PROCESS PURPOSE	POTENTIAL FAILURE MODE	EFFECT(S) OF FAILURE	SEV	SPE	POTENTIAL CAUSE(S) OF FAILURE	OCC	CURRENT PROCESS CONTROL		DET	RPN	RECOMMENDED ACTIONS AND CONTROL METHODS	RESP. & TARGET COMPLETION DATE	ACTION RESULTS				
									PREVENTION	DETECTION					ACTION TAKEN	SEV	OCC	DET	RPN
			Variation of sheet thickness	Capacitance defect	7		Breakdown of X-ray-thickness equipment	4	Daily check	Electrical sorting	4	112	None						
				Dimension defect			Gear pump degradation and breakdown		Periodical check										
				Flash/IR failure			Nonconforming pressure of slurry pump		Checking liquid pressure										
							Clog of filter												
			Nonconforming condition of green sheet drying	Delamination	7		Machine breakdown	2	Periodical check	Electrical sorting	4	56	None						
							Nonconforming temperature of drying		Confirmation of condition										
							Nonconforming speed of fan rotation												
5	INNER ELECTRODE INCOMING INSPECTION	Inspecting of inner electrode paste	Mis-judgement	Electrical characteristics defect	7		Mis-inspection of inspector	2		Double check by other person	5	70	None						
6	PRINTING AND STACKING	Printing internal electrode on green sheet, and dry, and stacking correctly to get target capacitance.	Thick laydown	Delamination	8		Insufficient printing conditions (squeegee pressure,squeegee speed,distance)	6	Checking printing condition	Electrical sorting	4	192	None						
				Crack			Nonconformance of viscosity and specific gravity of paste		Incoming inspection of inner electrode	Periodical measurement of laydown thickness									
				Excess capacitance			Nonconformance of X-ray strength		Daily checking of X-ray measurement equipment										
				Dimension defect			Screen defect		Life control of screen										
							Nonconformance of paste stirring		Checking stirring time										
			Thin laydown	Insufficient capacitance	6		Insufficient printing conditions (squeegee pressure,squeegee speed,distance)	6	Checking printing condition	Electrical sorting	4	144	None						
				ESR defect			Nonconformance of viscosity and specific gravity of paste		Incoming inspection of inner electrode	Periodical measurement of laydown thickness									
				Dimension defect			Nonconformance of X-ray strength		Daily checking of X-ray measurement equipment										
							Screen defect		Life control of screen										
							Nonconformance of paste stirring		Checking stirring time										

No	PROCESS FUNCTION	PROCESS PURPOSE	POTENTIAL FAILURE MODE	EFFECT(S) OF FAILURE	SEV	SPE	POTENTIAL CAUSE(S) OF FAILURE	OCC	CURRENT PROCESS CONTROL		DET	RPN	RECOMMENDED ACTIONS AND CONTROL METHODS	RESP. & TARGET COMPLETION DATE	ACTION RESULTS				
									PREVENTION	DETECTION					ACTION TAKEN	SEV	OCC	DET	RPN
			Variation of electrode area	Variation of capacitance Flash/IR failure	7		Insufficient printing conditions (squeegee pressure,squeegee speed,distance) Nonconformance of viscosity and specific gravity of paste Screen defect	6	Checking printing condition Incoming inspection of inner electrode Life control of screen	Electrical sorting	4	168	None						
			Nonconformance of a sensing mark(sensing miss)	Capacitance failure Flash/IR failure	7		Insufficient printing conditions (squeegee pressure,squeegee speed,distance) Nonconformance of viscosity and specific gravity of paste Screen defect	6	Checking printing condition Incoming inspection of inner electrode Life control of screen	Electrical sorting	4	168	None						
			Foreign material mixing	Flash/IR failure (Void)	7		Nonconformance of particle count in clean room Nonconformance of paste condition Mixing Foreign material in the dryer Chipping or abrasion of cut blade Foreign material to dieset	5	Control of clean condition Incoming inspection Periodical cleaning Periodical exchange of cut blade Dieset cleaning	Electrical sorting	4	140	None						
			Nonconformance of drying condition	Delamination	7		Nonconformance of drying temperature Nonconformance of air blow at dryer Variation of staying time in dryer	5	Periodical temperature check Checking equipment condition Staying time check	Electrical sorting	4	140	None						
			Sheet Folding	Flash/IR failure Appearance defect	7		Clog of suction hole at stacking Variation of air pressure for blowing out at stacking	6	Equipment cleaning Periodical check	Electrical sorting Appearance check for printed sheet	4	168	None						
			Sheet wrinkles	Flash/IR failure	7		Variation of holding pressure Clog of suction hole at stacking Variation of air pressure for blowing out at stacking	6	Equipment cleaning Periodical check	Electrical sorting	4	168	None						
			Shifting electrode	Flash/IR failure Capacitance defect Appearance defect	7		Nonconformance of stacking condition Stretch of screen mesh Clog of suction hole at stacking	4	Cleaning and daily check Measurement of stretch of screen Periodical cleaning	Electrical sorting Appearance sorting	4	112	None						

No	PROCESS FUNCTION	PROCESS PURPOSE	POTENTIAL FAILURE MODE	EFFECT(S) OF FAILURE	SEV	SPE	POTENTIAL CAUSE(S) OF FAILURE	OCC	CURRENT PROCESS CONTROL		DET	RPN	RECOMMENDED ACTIONS AND CONTROL METHODS	RESP. & TARGET COMPLETION DATE	ACTION RESULTS				
									PREVENTION	DETECTION					ACTION TAKEN	SEV	OCC	DET	RPN
7	PRESSING	Pressing the stacked sheets and making green block of multilayer.	Insufficient deairing	Delamination	7		Degradation of a seal strength Degradation of a vacuum pump	1	Visual check Checking vacuum level	Electrical sorting	5	35	None						
			Large T dimension of green block	Peeled sheet Large T dimension Insufficient capacitance	7		Nonconformance of press condition Nonconformance of # of green sheet Thicker green sheet Thick laydown of inner electrode	4	Daily check	Measurement of T dimension for green block Measurement of T dimension after firing Appearance check after cutting Electrical sorting	4	112	None						
			Small T dimension of green block	Small T dimension Cross section defect by cutting Excess capacitance Flash/IR failure	7		Nonconformance of press condition Nonconformance of # of green sheet Thinner green sheet Thin laydown of inner electrode	4	Daily check	Measurement of T dimension for green block Measurement of T dimension after firing Appearance check after cutting Electrical sorting	4	112	None						
			Nonconformance of surface condition of green block	Appearance defect	2		Foreign material to dieset Green sheet adhesion	4	Dieset cleaning Jig cleaning	Appearance sorting	5	40	None						
8	CUTTING	Cutting green block and making each green chip of MLCC.	Small gap	Flash/IR failure Appearance defect	7		Block distortion by pressing Sensing error Alignment error Nonconformance of suction pressure Decrease of holding pressure	5	Daily check	Appearance check after cutting Electrical sorting	4	140	None						
			Bias cut	Flash/IR failure Appearance defect Dimension defect	7		Nonconformance of holding condition Decrease of preheating temperature on cut table Under limit of cut blade is high	5	Daily check	Appearance check after cutting Electrical sorting	4	140	None						
			Imperfect cutting	Peeled surface Flash/IR failure	7		Nonconformance of holding condition Decrease of preheating temperature on cut table Under limit of cut blade is high	5	Daily check	Appearance check after cutting Electrical sorting	4	140	The seting method of blade is change Improvement of under limit variation	Mar,2006 Mech.Eng, Section Process Eng.	Initial clamp is stopped Control of under limit	7 7	1 1	4 4	28 28
			Cross section defect	Appearance defect	1		Nonconformance of binder quantity Nonconformance of holding condition Decrease of preheating temperature on cut table	4	Daily check	Appearance check after cutting	5	20	None						

No	PROCESS FUNCTION	PROCESS PURPOSE	POTENTIAL FAILURE MODE	EFFECT(S) OF FAILURE	SEV	SPE	POTENTIAL CAUSE(S) OF FAILURE	OCC	CURRENT PROCESS CONTROL		DET	RPN	RECOMMENDED ACTIONS AND CONTROL METHODS	RESP. & TARGET COMPLETION DATE	ACTION RESULTS				
									PREVENTION	DETECTION					ACTION TAKEN	SEV	OCC	DET	RPN
9	GREEN CHIP GRINDING	Grinding a edge and corner of chip to get contact with inner electrode and termination.	Peeled edge	Nonconformance of heatproof strength	7		Fast barrel rotational speed Long grinding time Variation of charge quantity Wrong media	2	Daily check	Appearance check after firing	4	56	None						
			Crack or chipping of chip	Appearance defect Flash/IR failure	7		Variation of barrel rotational speed Variation of grinding time Variation of charge quantity Wrong media	2	Daily check	Appearance check after firing Electrical sorting	4	56	None						
			Insufficient edge radius	Peeled termination at corner Appearance defect Decrease of solder heatproof	6		Slow barrel rotational speed Short grinding time Variation of charge quantity	2	Daily check	Appearance check after firing	6	72	None						
			Excess edge radius	Flash/IR failure Appearance defect Mount mistake Tombstone at mounting	7		Fast barrel rotational speed Long grinding time Variation of charge quantity	2	Daily check	Appearance check after firing Electrical sorting	4	56	None						
			Inner electrode underexposure	Insufficient capacitor	7		Slow barrel rotational speed Short grinding time Variation of charge quantity	2	Daily check	Appearance check after firing Electrical sorting	4	56	None						
10	FIRING	Baking and sintering inner electrode and ceramic after each green chip cutting.	Variation of loading quantity for each sagger	Capacitance defect Out of spec. for TC ESR defect Decrease of solder heatproof	7		Nonconforming loading quantity	4	Using own loading cup for each ceramic material/and each chip size Checking sheet for firing	Electrical sorting Thermal shock test	4	112	None						
			Chipping at chip loading	Appearance defect	2		Improper automatic loading condition Using improper jig at automatic loading	2	Daily check Checking history for condition change of firing	Appearance sorting	5	20	None						

No	PROCESS FUNCTION	PROCESS PURPOSE	POTENTIAL FAILURE MODE	EFFECT(S) OF FAILURE	SEV	SPE	POTENTIAL CAUSE(S) OF FAILURE	OCC	CURRENT PROCESS CONTROL		DET	RPN	RECOMMENDED ACTIONS AND CONTROL METHODS	RESP. & TARGET COMPLETION DATE	ACTION RESULTS				
									PREVENTION	DETECTION					ACTION TAKEN	SEV	OCC	DET	RPN
			Insufficient decarbonization	Delamination	7		Wrong profile	4	Checking profile No.	Electrical sorting	4	112	None						
				Flash/IR failure			Nonconformance of gas flow rate		Checking gas flow rate										
				Capacitance defect			Nonconformance of temperature setting		Checking temperature										
							Nonconformance of inner pressure at firing kiln		Checking inside pressure of kiln										
							Nonconformance of O2(Oxygen) concentration		Checking carbon residual after baking out										
							Thermocouple breakdown O2 sensor breakdown												
			Excess decarbonization	Delamination	7		Wrong profile	4	Checking profile No.	Electrical sorting	4	112	None						
				Flash/IR failure			Nonconformance of gas flow rate		Checking gas flow rate										
				Capacitance defect			Nonconformance of temperature setting		Checking temperature										
							Nonconformance of inner pressure at firing kiln		Checking inside pressure of kiln										
							Nonconformance of O2 concentration		Checking carbon residual after baking out										
							Thermocouple breakdown O2 sensor breakdown												
			Excess sintering	Flash/IR failure	7		Wrong profile	4	Checking profile No.	Electrical sorting	4	112	None						
				Capacitance defect			Nonconformance of gas flow rate		Checking gas flow rate	Thermal shock test									
				Out of spec. for TC			Nonconformance of temperature setting		Checking temperature	Checking ring temperature									
				Decrease of solder heatproof			Nonconformance of inner pressure at firing kiln		Checking inside pressure of kiln										
							Nonconformance of O2 concentration												
							Thermocouple breakdown												
							O2 sensor breakdown		Verification by second sensor										

No	PROCESS FUNCTION	PROCESS PURPOSE	POTENTIAL FAILURE MODE	EFFECT(S) OF FAILURE	SEV	SPE	POTENTIAL CAUSE(S) OF FAILURE	OCC	CURRENT PROCESS CONTROL		DET	RPN	RECOMMENDED ACTIONS AND CONTROL METHODS	RESP. & TARGET COMPLETION DATE	ACTION RESULTS				
									PREVENTION	DETECTION					ACTION TAKEN	SEV	OCC	DET	RPN
			Insufficient sintering	Flash/IR failure Capacitance defect Out of spec. for TC	7		Wrong profile Nonconformance of gas flow rate Nonconformance of temperature setting Nonconformance of inner pressure at firing kiln Nonconformance of O2 concentration Thermocouple breakdown O2 sensor breakdown	4	Checking profile No. Checking gas flow rate Checking temperature Checking inside pressure of kiln Checking gas density Verification by second sensor	Electrical sorting Checking ring temperature	4	112	None						
			Delamination	Flash/IR failure	7		Wrong profile Nonconformance of gas flow rate Nonconformance of temperature setting Nonconformance of inner pressure at firing kiln Nonconformance of O2 concentration Thermocouple breakdown O2 sensor breakdown	4	Checking profile No. Checking gas flow rate Checking temperature Checking inside pressure of kiln Checking gas density Verification by second sensor	Electrical sorting Checking ring temperature	4	112	None						
			Coverage decrease of inner electrode	Capacitance defect ESR defect	6		Wrong profile Nonconformance of gas flow rate Nonconformance of temperature setting Nonconformance of inner pressure at firing kiln Nonconformance of O2 concentration Thermocouple breakdown O2 sensor breakdown	4	Checking profile No. Checking gas flow rate Checking temperature Checking inside pressure of kiln Checking gas density Verification by second sensor	Electrical sorting Checking ring temperature	4	96	None						
			Reaction defect/Pin hole on ceramic	Appearance defect	2		Foreign material mixing Chip drop from net sagger	6	Periodical sagger cleaning Rejection of spilling chip	Appearance sorting	5	60	None						

No	PROCESS FUNCTION	PROCESS PURPOSE	POTENTIAL FAILURE MODE	EFFECT(S) OF FAILURE	SEV	SPE	POTENTIAL CAUSE(S) OF FAILURE	OCC	CURRENT PROCESS CONTROL		DET	RPN	RECOMMENDED ACTIONS AND CONTROL METHODS	RESP. & TARGET COMPLETION DATE	ACTION RESULTS				
									PREVENTION	DETECTION					ACTION TAKEN	SEV	OCC	DET	RPN
			Crack	Flash/IR failure	7		Wrong profile	4	Checking profile No.	Electrical sorting	4	112	None						
							Nonconformance of gas flow rate		Checking gas flow rate	Checking ring temperature									
							Nonconformance of temperature setting		Checking temperature										
							Nonconformance of inner pressure at firing kiln		Checking inside pressure of kiln										
							Nonconformance of O2 concentration		Checking gas density										
							Thermocouple breakdown												
							O2 sensor breakdown		Verification by second sensor										
			Insufficient re-oxidation	Flash/IR failure	7		Wrong profile	4	Checking profile No.	Electrical sorting	4	112	None						
				Capacitance defect			Nonconformance of gas flow rate		Checking gas flow rate	Checking ring temperature									
							Nonconformance of temperature setting		Checking temperature										
							Nonconformance of inner pressure at firing kiln		Checking inside pressure of kiln										
							Nonconformance of O2 concentration		Checking gas density										
							Thermocouple breakdown O2 sensor breakdown		Verification by second sensor										
			Excess re-oxidation	Flash/IR failure	7		Wrong profile	4	Checking profile No.	Electrical sorting	4	112	None						
				Capacitance defect			Nonconformance of gas flow rate		Checking gas flow rate	Checking ring temperature									
				ESR defect			Nonconformance of temperature setting		Checking temperature										
							Nonconformance of inner pressure at firing kiln		Checking inside pressure of kiln										
							Nonconformance of O2 concentration		Checking gas density										
							Thermocouple breakdown O2 sensor breakdown		Verification by second sensor										
			Chipping at unloading	Appearance defect	7		Large shocking at unloading	1	Using shock absorber	Appearance sorting	5	35	None						
				Flash/IR failure					Limitation of height to drop										

No	PROCESS FUNCTION	PROCESS PURPOSE	POTENTIAL FAILURE MODE	EFFECT(S) OF FAILURE	SEV	SPE	POTENTIAL CAUSE(S) OF FAILURE	OCC	CURRENT PROCESS CONTROL		DET	RPN	RECOMMENDED ACTIONS AND CONTROL METHODS	RESP. & TARGET COMPLETION DATE	ACTION RESULTS				
									PREVENTION	DETECTION					ACTION TAKEN	SEV	OCC	DET	RPN
11	GRINDING	Making round corner and outline of the chip by grinding.Then exposing inner electrode to keep contact with termination.	Insufficient edge radius	Peeled termination at corner Appearance defect Decrease of solder heatproof	6		Slow barrel rotational speed Short grinding time Variation of charge quantity	4	Daily check	Appearance check after firing	6	144	None						
			Excess edge radius	Appearance defect Mount mistake Tombstone at mounting	5		Fast barrel rotational speed Long grinding time Variation of charge quantity	4	Daily check	Appearance check after firing Electrical sorting	4	80	None						
			Inner electrode underexposure	Insufficient capacitance	6		Slow barrel rotational speed Short grinding time Variation of charge quantity	4	Daily check	Appearance check after firing Electrical sorting	4	96	None						
			Crack or chipping of chip	Appearance defect Flash/IR failure	7		Variation of barrel rotational speed Variation of grinding time Variation of charge quantity	4	Daily check	Appearance check after firing Electrical sorting	4	112	None						
			Adhesion of alumina powder	Appearance defect Capacitance defect	6		Insufficient washing time Variation of charge quantity Insufficient washing water	4	Daily check	Appearance sorting after firing	6	144	None						
			Adhesion of grinding rubbish	Appearance defect	2		Insufficient washing time Variation of charge quantity Insufficient washing water	4	Daily check	Appearance sorting after firing	6	48	None						
			Insufficient drying condition (Time or Temp.)	Appearance defect	4		Decrease of drying temperature Insufficient drying time Decrease of air quantity	4	Daily check	Appearance sorting after firing	6	96	None						
12	APPEARANCE CHECK	Confirmation of appearance quality after firing of chip.	Outflow of defect	Appearance defect	2		Judgment(Rejection) error Error number of sampling for appearance checking	1	Distribution of limit standard Use of loupe Recording number of sampling for appearance checking to the work order ticket	Appearance sorting	4	8	None						
			Scratch	Appearance defect	2		Contact of sorting tool and chip(work)	4	Use of plastic tweezers	Appearance sorting	4	32	None						
13	TERMINATION MATERIAL INCOMING INSPECTION	Inspecting of termination paste	Mis-judgement	Electrical characteristics defect	7		Mis-inspection of inspector	2		Double check by other person	5	70	None						

No	PROCESS FUNCTION	PROCESS PURPOSE	POTENTIAL FAILURE MODE	EFFECT(S) OF FAILURE	SEV	SPE	POTENTIAL CAUSE(S) OF FAILURE	OCC	CURRENT PROCESS CONTROL		DET	RPN	RECOMMENDED ACTIONS AND CONTROL METHODS	RESP. & TARGET COMPLETION DATE	ACTION RESULTS				
									PREVENTION	DETECTION					ACTION TAKEN	SEV	OCC	DET	RPN
14	TERMINATION	Dipping termination to chip ends to get electric characteristics as capacitor	Crack or chipping of chip	Appearance defect Flash/IR failure	7		Shock in shaker Nonconformance of press pin	1	Daily check	Appearance check after termination Electrical sorting	4	28	None						
			Thick termination	Appearance defect Large dimension	4		Nonconformance of specific gravity of paste Setting failure of machine operation Excess chip height at pressing on paste coating	1	Checking specific gravity Checking chip height at pressing	Appearance check after termination Measurement of thickness of terminal ends	6	24	None						
			Thin termination	Capacitance defect ESR defect	3		Nonconformance of specific gravity of paste Setting failure of machine operation Low chip height at pressing on paste coating Chip drop	1	Checking specific gravity Checking chip height at pressing	Appearance check after termination Measurement of thickness of terminal ends	6	18	None						
			Large bandwidth, small gap dimension	Appearance defect Flash/IR failure	7		Nonconformance of specific gravity of paste Setting failure of machine operation Excess chip height at pressing on paste coating	4	Checking specific gravity Checking chip height at pressing	Checking bandwidth Checking gap dimension Appearance sorting Electrical sorting	4	112	None						
			Small bandwidth	Appearance defect Decrease of flex strength	7		Nonconformance of specific gravity of paste Setting failure of machine operation Low chip height at pressing on paste coating Chip drop	4	Checking specific gravity Checking chip height at pressing	Bandwidth measurement Appearance sorting	4	112	None						
			Shape defect	Appearance defect Dimension defect Poor solderability Flash/IR failure	7		Nonconformance of specific gravity of paste Setting failure of machine operation Quick drying	4	Checking specific gravity Checking temperature for termination drying	Checking dimension Appearance sorting Electrical sorting	4	112	None						
15	TERMINATION FIRING	Sintering termination to connect to inner electrode.	Peeled termination	Appearance defect	6		Rubbing at loading for termination firing	4	Limitation of height to drop	Appearance sorting	4	96	None						

No	PROCESS FUNCTION	PROCESS PURPOSE	POTENTIAL FAILURE MODE	EFFECT(S) OF FAILURE	SEV	SPE	POTENTIAL CAUSE(S) OF FAILURE	OCC	CURRENT PROCESS CONTROL		DET	RPN	RECOMMENDED ACTIONS AND CONTROL METHODS	RESP. & TARGET COMPLETION DATE	ACTION RESULTS				
									PREVENTION	DETECTION					ACTION TAKEN	SEV	OCC	DET	RPN
			Crack or chipping of chip	Appearance defect Flash/IR failure	7		Large shocking at loading for termination firing	4	Limitation of height to drop	Appearance sorting	4	112	None						
			Blistered termination	Appearance defect	6		Decrease of O2 concentration	4	Checking O2 concentration	Appearance sorting	4	96	None						
				Dimension defect			Insufficient exhaust gas rate		Checking exhaust gas temperature	Electrical sorting									
				Capacitance defect			Excess loading quantity		Use of measuring cup for chip loading										
				ESR defect			Thick termination		Measurement of termination thickness										
			Twin chips	Poor solderability	5		Insufficient zirconia powder	6	Use of measuring spoon for adding zirconia powder	Appearance sorting	4	120	None						
				Appearance defect			Excess loading quantity		Use of measuring cup for chip loading										
							Twin chip at termination firing												
							Excess water		Checking water rate										
							High temperature for termination firing		Checking fire temperature										
							Fast belt speed		Checking belt speed										
							High O2 concentration												
			Excess oxidation	Poor solderability	6		High O2 concentration	4	Checking O2 concentration	Electrical sorting	4	96	None						
				Capacitance defect			Excess water		Checking water rate										
				ESR defect			Insufficient loading quantity		Use of measuring cup for chip loading										
							Wide distance between saggers		Checking distance between saggers										
			Excess sintering	Capacitance defect	7		Nonconformance of O2 concentration	4	Checking O2 concentration	Electrical sorting	4	112	None						
				Poor solderability			High firing temperature		Checking temperature	Thermal shock test									
				ESR defect			Slow belt speed		Checking belt speed										
				Decrease of solder heatproof			Insufficient loading quantity		Use of measuring cup for chip loading										
				Decrease of flex strength															
			Insufficient sintering	Capacitance defect	7		Decrease of O2 concentration	4	Checking O2 concentration	Electrical sorting	4	112	None						
				ESR defect			Insufficient water		Checking water rate										
				Flash/IR failure			Excess loading quantity		Use of measuring cup for chip loading										
							Fast belt speed		Checking belt speed										
							Low firing temperature		Checking temperature										
16	ELECTRICAL PLATING	Plating Ni and Sn on the Ni termination to get good leaching and	Nonconformance of Ni plating thickness	Decrease of solder heatproof	7		Nonconformance of plating temperature	4	Controlling bath temperature	Appearance sorting	4	112							

No	PROCESS FUNCTION	PROCESS PURPOSE	POTENTIAL FAILURE MODE	EFFECT(S) OF FAILURE	SEV	SPE	POTENTIAL CAUSE(S) OF FAILURE	OCC	CURRENT PROCESS CONTROL		DET	RPN	RECOMMENDED ACTIONS AND CONTROL METHODS	RESP. & TARGET COMPLETION DATE	ACTION RESULTS				
									PREVENTION	DETECTION					ACTION TAKEN	SEV	OCC	DET	RPN
		solderability.		Decrease of flex strength			Nonconformance of current density		Controlling current and voltage at plating	Thermal shock test									
				Appearance defect			Nonconformance of plating time		Controlling plating time	Control chart of plating thickness									
							Nonconformance of loading Q'ty to barrel		Controlling of chip loading quantity										
							Nonconformance of Steel Ball(SB) diameter		Checking diameter of SB										
							Nonconformance of loading quantity of SB		Controlling SB loading quantity										
							Nonconformance of plating bath concentration		Controlling plating bath concentration										
							Nonconformance of pH		Checking pH										
							Insufficient contact to cathode (0603 or less size)		Preventing it so that the chip should not stick to barrel inside wall.				Changing shape of inside wall to uneven	2008/6/2 Mech.Eng, Section	Improved inside wall of barrel	7	2	4	56
			Nonconformance of Sn plating thickness	Poor solderability	5	*	Nonconformance of plating temperature	4	Controlling bath Temperature	Appearance sorting	4	80							
				Appearance defect			Nonconformance of current density		Controlling current and voltage at plating	Solderability check									
							Nonconformance of plating time		Controlling plating time	Control chart of plating thickness									
							Nonconformance of loading Q'ty to barrel		Controlling of chip loading quantity										
							Nonconformance of SB diameter		Checking diameter of SB										
							Nonconformance of loading quantity of SB		Controlling SB loading quantity										
							Nonconformance of plating bath concentration		Controlling plating bath concentration										
							Nonconformance of pH		Checking pH										
							Insufficient contact to cathode (0603 or less size)		Preventing it so that the chip should not stick to barrel inside wall.				Changing shape of inside wall to uneven	2008/6/2 Mech.Eng, Section	Improved inside wall of barrel	5	2	4	40
			Twin chips	Appearance defect	6		Nonconformance of brightner Q'ty	4	Controlling brightner Q'ty	Appearance sorting	4	96	None						
				Poor solderability			Nonconformance of barrel condition		Checking barrel condition										
			Growth of plate	Flash/IR failure	7		Nonconformance of SB diameter	4	Checking diameter of SB	Appearance sorting	4	112	None						
				Appearance defect			Nonconformance of loading quantity of SB		Controlling of chip loading quantity	Electrical sorting									
							Nonconformance of brightner Q'ty		Controlling brightner Q'ty										

No	PROCESS FUNCTION	PROCESS PURPOSE	POTENTIAL FAILURE MODE	EFFECT(S) OF FAILURE	SEV	SPE	POTENTIAL CAUSE(S) OF FAILURE	OCC	CURRENT PROCESS CONTROL		DET	RPN	RECOMMENDED ACTIONS AND CONTROL METHODS	RESP. & TARGET COMPLETION DATE	ACTION RESULTS				
									PREVENTION	DETECTION					ACTION TAKEN	SEV	OCC	DET	RPN
							Nonconformance of current density Nonconformance of plating bath concentration Nonconformance of barrel condition		Controlling current and voltage at plating Controlling plating bath concentration Checking barrel condition										
			Insufficient plating	Appearance defect Poor solderability	6		Nonconformance of barrel condition	2	Checking barrel condition	Appearance sorting	4	48	None						
			Nonconformance of plating time	Flash/IR failure Decrease of solder heatproof Decrease of reliability	7		Conveyance equipment breakdown	1	Daily check	Electrical sorting Thermal shock test	4	28	None						
			Insufficient cleansing	Flash/IR failure Appearance defect	7		Impure deionized water Insufficient washing frequency	4	Controlling conductivity of deionized water Daily check	Electrical sorting Appearance sorting	4	112	None						
			Insufficient drying condition (Time or Temp.)	Flash/IR failure Appearance defect	7		Control device breakdown Temperature drops Short drying time Excess loading quantity	2	Daily check Controlling dryer temperature Controlling drying time	Electrical sorting Appearance sorting	4	56	None						
			Excess drying	Poor solderability Appearance defect	6		Control device breakdown Temperature increase	2	Periodical check Controlling drying time	Appearance sorting	4	48	None						
			Separation miss of chip and SB	Mixture	6		Excess slope angle of belt at separation device Excess loading quantity Soiled conveyance part	2	Daily check Controlling of chip loading quantity	Electrical sorting	4	48	None						
			Crack or chipping of chip	Appearance defect	7		Large shock force at falling down from belt Large shock at loading Q'ty to hopper Large shock caused by stirring pin	2	Daily check	Appearance sorting Electrical sorting	4	56	None						
			Adhesion of rubbish	Decrease of solderability Appearance defect	5		Soiled belt Rubs caused by stirring	2	Daily check	Appearance sorting	4	40	None						

No	PROCESS FUNCTION	PROCESS PURPOSE	POTENTIAL FAILURE MODE	EFFECT(S) OF FAILURE	SEV	SPE	POTENTIAL CAUSE(S) OF FAILURE	OCC	CURRENT PROCESS CONTROL		DET	RPN	RECOMMENDED ACTIONS AND CONTROL METHODS	RESP. & TARGET COMPLETION DATE	ACTION RESULTS				
									PREVENTION	DETECTION					ACTION TAKEN	SEV	OCC	DET	RPN
17	ELECTRICAL SORTING	Sorting defect by measuring electrical characteristics of ceramic capacitor.	Outflow of capacitance defect	Capacitance defect	6		Nonconformance of measuring voltage Soiled terminal on sorting equipment Soiled termination of capacitor Abrasion of measurement terminals Nonconformance of room temperature Machine breakdown Nonconformance of aging time Nonconformance of measurement condition	4	Periodical check Machine cleaning Control of room temperature Time control Check sheet of sorting condition	Outgoing inspection	6	144	None						
			Outflow of DF defect	DF defect	6		Nonconformance of measuring voltage Soiled terminal on sorting equipment Soiled termination of capacitor Abrasion of measurement terminals Nonconformance of room temperature Machine breakdown Nonconformance of aging time Nonconformance of measurement condition	4	Periodical check Machine cleaning Control of room temperature Time control Check sheet of sorting condition	Outgoing inspection	6	144	None						
			Outflow of Flash/IR defect	Flash/IR failure	6		Nonconformance of flash test voltage Nonconformance of measurement condition Soiled terminal on sorting equipment Soiled termination of capacitor Abrasion of measurement terminals Nonconformance of room temperature and humidity Machine breakdown	4	Periodical check Check sheet of sorting condition Machine cleaning Control of room temperature and humidity	Outgoing inspection	6	144	None						

No	PROCESS FUNCTION	PROCESS PURPOSE	POTENTIAL FAILURE MODE	EFFECT(S) OF FAILURE	SEV	SPE	POTENTIAL CAUSE(S) OF FAILURE	OCC	CURRENT PROCESS CONTROL		DET	RPN	RECOMMENDED ACTIONS AND CONTROL METHODS	RESP. & TARGET COMPLETION DATE	ACTION RESULTS				
									PREVENTION	DETECTION					ACTION TAKEN	SEV	OCC	DET	RPN
			Contact failure	Capacitance defect DF defect Flash/IR failure	6		Small chip dimension Nonconforming shape of chip capacitor Nonconformance of measuring voltage Soiled terminal on sorting equipment Soiled termination of capacitor Abrasion of measurement terminals	4	Periodical check Machine cleaning	Outgoing inspection	6	144	None						
			Crack or chipping of chip	Appearance defect	2		High pressure of measurement terminal Position error on conveyance Shock at exhausting to bin on electrical sorting	2	Periodical check	Appearance sorting	4	16	None						
			Rubbing	Appearance defect Decrease of solderability	5		Uncleanly measurement terminal Soiled jig for conveyance Soiled termination of capacitor Excess charge quantity	4	Machine cleaning Periodical check Controlling charge quantity	Appearance sorting	4	80	None						
18	APPEARANCE SORTING	Sorting appearance failure(or defect) of chip capacitor	Outflow of defect	Appearance defect	7		Judgment(Rejection) error Mistake of # of sorting	1	Distribution of limit standard Use of loupe Recording # of sorting to the shop order ticket	Outgoing inspection	6	42	None						
			Scratch	Appearance defect	2		Contact of sorting tool and chip(work)	4	Use of plastic tweezers	Outgoing inspection	6	48	None						
19	OUTGOING INSPECTION	Verify compliance to specifications/customer requirements	Mis-inspection of appearance defect	Appearance defect	7		Inspector's mis-recognition of limit standard	1	Accuracy confirmation by periodic training program for inspector	Taping appearance check	5	35	None						
			Mis-inspection of characteristics defect	Capacitance defect DF defect Flash/IR failure	7		Pass of defect goods by overlooking	1	Cap/DF are judged by computer, TV/IR are judged by buzzer	Taping verifier	4	28	None						
			Wrong work order sheet	Wrong product	7		Mis-identification of inspection lot	1	Place and identification control of inspection lot	Collation of work order sheet's product name and label One-work / one-desk Collation of lot No., ticket	5	35	None						

No	PROCESS FUNCTION	PROCESS PURPOSE	POTENTIAL FAILURE MODE	EFFECT(S) OF FAILURE	SEV	SPE	POTENTIAL CAUSE(S) OF FAILURE	OCC	CURRENT PROCESS CONTROL		DET	RPN	RECOMMENDED ACTIONS AND CONTROL METHODS	RESP. & TARGET COMPLETION DATE	ACTION RESULTS				
									PREVENTION	DETECTION					ACTION TAKEN	SEV	OCC	DET	RPN
20	TAPING MATERIAL INCOMING INSPECTION	Inspecting of taping material	Mis-judgement	Taping machine breakdown Conveyance trouble at mounting	5		Mis-inspection of inspector	2		Double check by other person	5	50	None						
21	TAPING	Processing specific taping style according to customer demand(Spec.)	Stroke pitch error for tape loading	Conveyance trouble of mounting machine	5		Nonconformance of tape quality	3	Audit by vender	Indirect inspection	5	75	None						
			Nonconformance of peeling-off strength of top film	Defect regarding mounting	5		Nonconformance of heat-sealer temperature Nonconformance of heat-sealer pressure	3	Daily check	Checking peeling-off strength	4	60	None						
			Crack or chipping of chip	Appearance defect	7		Unsuitable position of terminals for electrical sorting Unsuitable position of conveyance system	2	Daily check	Appearance sorting	4	56	None						
			Crack	Flash/IR failure	7		Separation pin hits a capacitor by Air Cylinder	2	Daily check	Appearance sorting	4	56	The operation method of terminal is improved	Sep.2005 Production section	Air cylinder -> Solenoid valve	7	1	4	28
22	TAPING APPEARANCE CHECK	Check of taping appearance defect after wrapping	Lot mixing	Capacitance defect	6		Remained lot reel on the desk causes lot mixing to next lot	2	Thoroughness of confirmation above desk at lot exchange	Collation of work order sheet's product name and label One-work / one-desk Collation of lot No., ticket	5	60	None						
							Several lot on the desk causes lot mixing	2	Thoroughness of one-lot one-desk	Collation of work order sheet's product name and label One-work / one-desk Collation of lot No., ticket	5	60	None						
			Appearance defect passage	Appearance defect	7		Operator's mis-recognition of limit standard	2	Accuracy confirmation by periodic training program for operator	Double check by other person	5	70	None						
23	PACKING	Packing according to each specification	Wrong label	Wrong products	7		Human error	2	Operator education	Barcode check	4	56	None						
			Label removed from reel	No label	3		Low adhesive strength	2	Adhesive strength up	Label appearance check	6	36	None						
24	SHIPPING	Shipping to customer	Wrong shipping	Wrong delivery	2		Mis-check of operator	4	Barcode check		4	32	None						

3. Dimensional Results

*Please see attached Test results (4).

4. Material-, Performance Test Results

Representative item
GCM188R71H104KA57

AEC-Q200 Summary of Test Results

Murata P/N: GCM188R71H104KA57

Location of manufacture: Murata Philippine

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date before test:2014/3/31	Date after test:2014/5/25

#3 - High Temperature Exposure

test conditions : 1000hr , 150deg C

No. of samples:	77	Initial readings			Final readings			
No. of lots:	1	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Change in capacitance %
Spec limits	lower	0.090		5.0E+03			5.0E+03	-10.0
	upper	0.110	2.50			3.00		10.0
Measurement Statistics	minimum	0.100	0.94	1.4E+04	0.099	0.94	1.5E+04	-0.53
	maximum	0.105	1.17	2.1E+04	0.105	1.69	2.2E+04	-0.13
	mean	0.102	0.98	1.8E+04	0.102	1.01	1.9E+04	-0.33
	standard deviation	0.001	0.04	1.6E+03	0.001	0.09	1.7E+03	0.08
Presence of Failures		in spec	in spec	in spec	in spec	in spec	in spec	in spec

Test Data

Lot #	Sample	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Change in capacitance %
1	1	0.101	0.955	1.4E+04	0.101	0.984	1.5E+04	-0.33
	2	0.103	0.960	1.6E+04	0.102	0.990	1.7E+04	-0.28
	3	0.102	0.960	1.6E+04	0.102	0.979	1.6E+04	-0.25
	4	0.100	1.008	1.6E+04	0.100	1.049	1.7E+04	-0.13
	5	0.101	0.937	1.6E+04	0.100	0.976	1.7E+04	-0.22
	6	0.102	0.973	1.6E+04	0.101	0.993	1.6E+04	-0.27
	7	0.104	0.970	1.6E+04	0.104	1.000	1.7E+04	-0.24
	8	0.101	0.947	1.7E+04	0.100	0.986	1.8E+04	-0.22
	9	0.103	0.961	1.6E+04	0.102	1.001	1.7E+04	-0.29
	10	0.103	1.011	1.6E+04	0.102	1.042	1.7E+04	-0.25
	11	0.101	0.976	1.7E+04	0.100	0.985	1.8E+04	-0.35
	12	0.103	1.061	1.7E+04	0.103	1.072	1.7E+04	-0.34
	13	0.101	0.982	1.7E+04	0.101	1.023	1.8E+04	-0.15
	14	0.101	1.003	1.7E+04	0.101	1.034	1.8E+04	-0.21
	15	0.101	0.956	1.8E+04	0.101	0.956	1.9E+04	-0.28
	16	0.102	0.967	1.8E+04	0.101	0.987	1.9E+04	-0.25
	17	0.103	0.975	1.7E+04	0.103	0.995	1.8E+04	-0.32
	18	0.101	0.937	1.8E+04	0.101	0.956	1.8E+04	-0.30
	19	0.105	0.995	1.7E+04	0.105	1.015	1.8E+04	-0.34
	20	0.101	1.059	1.8E+04	0.101	1.694	1.9E+04	-0.52
	21	0.103	1.108	1.8E+04	0.103	1.131	1.9E+04	-0.36
	22	0.102	0.962	1.8E+04	0.102	0.971	1.9E+04	-0.37
	23	0.100	0.967	1.9E+04	0.099	0.977	2.0E+04	-0.38
	24	0.102	0.956	1.8E+04	0.102	0.966	1.8E+04	-0.42
	25	0.102	0.961	1.9E+04	0.102	0.971	2.0E+04	-0.39
	26	0.102	0.970	1.8E+04	0.102	0.989	1.9E+04	-0.39
	27	0.101	0.960	1.9E+04	0.101	0.970	2.0E+04	-0.33
	28	0.101	0.970	2.0E+04	0.101	1.000	2.1E+04	-0.32
	29	0.101	0.957	1.7E+04	0.101	0.977	1.8E+04	-0.35
	30	0.103	0.983	2.0E+04	0.103	1.013	2.1E+04	-0.34
	31	0.101	0.968	1.9E+04	0.101	0.988	1.9E+04	-0.33
	32	0.101	0.954	2.0E+04	0.101	0.964	2.2E+04	-0.35
	33	0.104	0.944	1.9E+04	0.104	0.963	2.0E+04	-0.31
	34	0.102	0.968	1.9E+04	0.102	0.988	2.0E+04	-0.32
	35	0.102	0.944	2.1E+04	0.101	0.964	2.2E+04	-0.34
	36	0.102	0.969	2.0E+04	0.102	0.988	2.1E+04	-0.34
	37	0.102	0.964	1.5E+04	0.101	0.994	1.6E+04	-0.32
	38	0.104	1.167	1.5E+04	0.104	1.192	1.6E+04	-0.36
	39	0.102	0.994	1.5E+04	0.102	1.015	1.5E+04	-0.36
	40	0.102	0.982	1.6E+04	0.102	0.982	1.7E+04	-0.44
	41	0.101	0.975	1.6E+04	0.100	0.975	1.7E+04	-0.50
	42	0.103	0.950	1.6E+04	0.102	0.941	1.7E+04	-0.53
	43	0.102	0.952	1.7E+04	0.102	0.972	1.8E+04	-0.41
	44	0.103	0.954	1.6E+04	0.103	0.983	1.7E+04	-0.40
	45	0.103	0.975	1.6E+04	0.103	1.005	1.8E+04	-0.32
	46	0.101	1.099	1.7E+04	0.100	1.122	1.8E+04	-0.36
	47	0.101	1.004	1.7E+04	0.101	1.025	1.8E+04	-0.41
	48	0.102	0.946	1.8E+04	0.102	0.975	1.9E+04	-0.46
	49	0.103	0.972	1.5E+04	0.102	0.992	1.6E+04	-0.48
	50	0.103	0.959	1.7E+04	0.103	0.979	1.8E+04	-0.45

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date before test:2014/3/31	Date after test:2014/5/25

#3 - High Temperature Exposure

test conditions : 1000hr , 150deg C

	51	0.103	0.950	1.7E+04	0.102	0.970	1.8E+04	-0.42
	52	0.105	0.976	1.7E+04	0.104	0.996	1.8E+04	-0.44
	53	0.102	0.946	1.8E+04	0.102	0.965	1.9E+04	-0.39
	54	0.102	0.951	1.6E+04	0.102	0.971	1.7E+04	-0.34
	55	0.102	0.939	1.8E+04	0.102	0.968	1.9E+04	-0.31
	56	0.102	0.936	1.8E+04	0.102	0.965	1.9E+04	-0.26
	57	0.102	0.963	1.7E+04	0.102	0.993	1.8E+04	-0.23
	58	0.103	0.957	1.8E+04	0.103	0.987	2.0E+04	-0.23
	59	0.102	0.947	1.8E+04	0.102	0.967	1.9E+04	-0.28
	60	0.102	0.958	1.9E+04	0.102	0.988	2.0E+04	-0.32
	61	0.102	0.964	1.9E+04	0.101	0.983	2.0E+04	-0.36
	62	0.104	1.034	1.7E+04	0.104	1.044	1.9E+04	-0.36
	63	0.103	0.945	2.0E+04	0.102	0.964	2.1E+04	-0.30
	64	0.102	0.965	2.0E+04	0.102	0.995	2.1E+04	-0.20
	65	0.104	0.943	1.8E+04	0.103	0.971	1.9E+04	-0.27
	66	0.104	0.956	1.9E+04	0.104	0.985	2.0E+04	-0.27
	67	0.103	1.000	1.9E+04	0.103	1.041	2.0E+04	-0.24
	68	0.103	0.976	2.0E+04	0.102	1.016	2.1E+04	-0.25
	69	0.104	0.988	2.0E+04	0.104	1.039	2.1E+04	-0.25
	70	0.103	0.978	2.0E+04	0.103	1.007	2.1E+04	-0.28
	71	0.102	0.953	2.0E+04	0.102	0.972	2.1E+04	-0.28
	72	0.104	0.945	1.9E+04	0.104	0.974	2.1E+04	-0.23
	73	0.104	0.961	1.5E+04	0.104	0.991	1.6E+04	-0.34
	74	0.103	1.013	1.6E+04	0.102	1.034	1.6E+04	-0.40
	75	0.104	1.006	1.5E+04	0.104	1.006	1.6E+04	-0.46
	76	0.102	1.005	1.7E+04	0.101	1.005	1.8E+04	-0.41
	77	0.104	0.960	1.6E+04	0.104	0.970	1.7E+04	-0.49

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date before test:2014/3/1	Date after test:2014/4/17

#4 - Temperature Cycling

test conditions : 1000cycles , -55deg C to 125deg C

No. of samples:	77	Initial readings			Final readings			
No. of lots:	1	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Change in capacitance %
Spec limits	lower	0.090		5.0E+03			5.0E+03	-10.0
	upper	0.110	2.50			3.00		10.0
Measurement Statistics	minimum	0.097	0.94	1.4E+04	0.096	0.95	1.5E+04	-2.48
	maximum	0.106	1.18	2.1E+04	0.104	1.22	2.3E+04	-0.92
	mean	0.103	0.99	1.7E+04	0.100	1.00	1.9E+04	-2.10
	standard deviation	0.001	0.04	1.6E+03	0.001	0.04	1.8E+03	0.18
Presence of Failures		in spec	in spec	in spec	in spec	in spec	in spec	in spec

Test Data

Lot #	Sample	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Change in capacitance %
1	1	0.101	1.003	1.4E+04	0.098	0.955	1.5E+04	-2.47
	2	0.101	0.980	1.6E+04	0.099	0.960	1.8E+04	-2.08
	3	0.102	0.989	1.5E+04	0.100	0.979	1.7E+04	-2.15
	4	0.103	1.029	1.5E+04	0.101	1.039	1.7E+04	-1.97
	5	0.103	0.956	1.5E+04	0.101	0.966	1.7E+04	-1.98
	6	0.101	0.983	1.6E+04	0.099	1.003	1.8E+04	-1.93
	7	0.102	0.960	1.6E+04	0.100	0.980	1.7E+04	-2.08
	8	0.101	0.966	1.6E+04	0.099	0.976	1.7E+04	-2.10
	9	0.102	0.961	1.6E+04	0.099	0.971	1.7E+04	-2.06
	10	0.102	1.021	1.6E+04	0.100	1.042	1.8E+04	-2.13
	11	0.103	0.976	1.6E+04	0.100	0.985	1.8E+04	-2.00
	12	0.103	1.061	1.7E+04	0.101	1.072	1.8E+04	-2.08
	13	0.102	1.002	1.7E+04	0.100	1.043	1.8E+04	-1.93
	14	0.101	1.014	1.7E+04	0.099	1.055	1.9E+04	-1.96
	15	0.103	0.966	1.7E+04	0.101	0.995	1.8E+04	-1.95
	16	0.102	0.967	1.7E+04	0.100	0.997	1.8E+04	-2.06
	17	0.101	0.985	1.8E+04	0.099	1.005	1.9E+04	-2.06
	18	0.102	0.937	1.8E+04	0.099	0.946	1.9E+04	-2.23
	19	0.101	1.015	1.8E+04	0.099	1.015	2.0E+04	-2.09
	20	0.101	1.038	1.8E+04	0.099	1.038	2.0E+04	-2.25
	21	0.102	1.120	1.8E+04	0.100	1.131	1.9E+04	-2.06
	22	0.102	0.962	1.8E+04	0.100	0.981	1.9E+04	-2.05
	23	0.097	0.967	1.8E+04	0.096	0.996	2.0E+04	-0.92
	24	0.102	0.966	1.8E+04	0.100	0.966	1.9E+04	-2.03
	25	0.103	0.961	1.8E+04	0.100	0.971	2.0E+04	-2.22
	26	0.101	0.979	1.8E+04	0.099	0.979	2.0E+04	-2.24
	27	0.102	0.970	1.8E+04	0.100	0.970	2.0E+04	-2.10
	28	0.102	0.980	1.8E+04	0.100	0.990	2.1E+04	-2.09
	29	0.103	0.967	1.7E+04	0.101	0.987	1.8E+04	-2.19
	30	0.103	0.983	2.0E+04	0.101	1.003	2.2E+04	-2.14
	31	0.101	0.978	1.9E+04	0.099	0.988	2.1E+04	-2.19
	32	0.102	0.964	2.1E+04	0.100	0.984	2.3E+04	-2.11
	33	0.101	0.954	1.9E+04	0.099	0.983	2.1E+04	-2.20
	34	0.102	0.978	1.9E+04	0.100	0.997	2.1E+04	-2.30
	35	0.102	0.944	1.9E+04	0.100	0.964	2.1E+04	-2.21
	36	0.103	0.978	1.9E+04	0.100	0.998	2.1E+04	-2.20
	37	0.104	0.974	1.5E+04	0.101	1.004	1.6E+04	-2.02
	38	0.102	1.179	1.5E+04	0.100	1.216	1.6E+04	-1.99
	39	0.101	1.015	1.5E+04	0.099	1.025	1.5E+04	-1.93
	40	0.102	0.972	1.6E+04	0.100	0.991	1.7E+04	-1.94
	41	0.102	0.975	1.6E+04	0.100	0.985	1.7E+04	-2.02
	42	0.104	0.950	1.6E+04	0.102	0.969	1.7E+04	-2.12
	43	0.102	0.962	1.7E+04	0.100	0.981	1.8E+04	-2.00
	44	0.104	0.964	1.6E+04	0.102	0.993	1.6E+04	-2.05
	45	0.102	0.985	1.7E+04	0.100	1.015	1.8E+04	-2.00
	46	0.102	1.122	1.7E+04	0.100	1.145	1.7E+04	-2.22
	47	0.104	1.045	1.6E+04	0.102	1.045	1.7E+04	-2.12
	48	0.105	0.985	1.8E+04	0.103	1.005	1.9E+04	-2.26
	49	0.102	0.992	1.5E+04	0.100	1.001	1.6E+04	-1.99
	50	0.103	0.998	1.7E+04	0.101	0.998	1.8E+04	-2.14

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date before test:2014/3/1	Date after test:2014/4/17

#4 - Temperature Cycling

test conditions : 1000cycles , -55deg C to 125deg C

	51	0.104	0.980	1.7E+04	0.101	0.990	1.8E+04	-2.01
	52	0.102	1.056	1.7E+04	0.100	0.996	1.8E+04	-2.07
	53	0.102	1.014	1.8E+04	0.100	0.985	1.9E+04	-2.01
	54	0.103	0.961	1.6E+04	0.101	1.049	1.7E+04	-1.87
	55	0.106	0.949	1.7E+04	0.104	0.978	1.9E+04	-2.02
	56	0.102	0.946	1.8E+04	0.100	0.965	2.0E+04	-1.98
	57	0.105	0.973	1.7E+04	0.103	0.993	1.8E+04	-2.22
	58	0.105	0.977	1.8E+04	0.103	0.997	1.9E+04	-2.22
	59	0.106	0.957	1.8E+04	0.103	0.977	1.9E+04	-2.21
	60	0.103	0.968	1.8E+04	0.101	0.988	2.0E+04	-2.05
	61	0.102	0.973	1.8E+04	0.100	0.983	2.0E+04	-2.07
	62	0.105	1.034	1.7E+04	0.103	1.044	1.8E+04	-2.20
	63	0.103	0.964	2.0E+04	0.101	0.974	2.1E+04	-2.36
	64	0.102	0.995	2.1E+04	0.100	0.985	2.2E+04	-2.48
	65	0.103	0.971	1.8E+04	0.100	0.962	2.0E+04	-2.40
	66	0.103	0.975	1.9E+04	0.100	0.975	2.0E+04	-2.28
	67	0.106	1.000	1.9E+04	0.104	1.021	2.0E+04	-2.09
	68	0.103	0.976	2.0E+04	0.100	0.996	2.1E+04	-2.23
	69	0.103	1.009	2.0E+04	0.101	1.029	2.2E+04	-2.12
	70	0.102	0.978	2.0E+04	0.100	0.997	2.1E+04	-2.12
	71	0.105	0.963	1.9E+04	0.103	1.002	2.1E+04	-2.12
	72	0.102	0.954	2.0E+04	0.100	1.013	2.2E+04	-1.98
	73	0.103	0.971	1.5E+04	0.101	0.981	1.6E+04	-2.24
	74	0.101	1.013	1.6E+04	0.099	1.013	1.7E+04	-2.25
	75	0.105	1.006	1.5E+04	0.103	1.016	1.6E+04	-2.10
	76	0.104	0.995	1.6E+04	0.102	1.005	1.8E+04	-2.04
	77	0.105	0.970	1.5E+04	0.102	0.980	1.6E+04	-2.09

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date test:2014/6/5	

#5 - Destructive Physical Analysis

Number of Samples: 5 Number of Lots: 1	Number of failures: 0

Lot #	Sample	Result (pass/fail)
1	1	pass
	2	pass
	3	pass
	4	pass
	5	pass

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date before test:2014/6/1	Date after test:2014/6/16

#6 - Moisture Resistance

test conditions : 10cycles(1cycle : 24hr) , 25deg C / 80% RH to 65deg C / 98% RH

No. of samples:	77	Initial readings			Final readings			
No. of lots:	1	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Change in capacitance %
Spec limits	lower	0.090		5.0E+03			5.0E+03	-12.5
	upper	0.110	2.50			3.00		12.5
Measurement Statistics	minimum	0.098	0.95	1.4E+04	0.096	0.96	1.6E+04	-2.16
	maximum	0.105	1.22	1.7E+04	0.104	1.24	2.4E+04	-1.03
	mean	0.102	1.00	1.6E+04	0.101	1.01	2.0E+04	-1.64
	standard deviation	0.001	0.04	6.4E+02	0.001	0.04	1.8E+03	0.32
Presence of Failures		in spec	in spec	in spec	in spec	in spec	in spec	in spec

Test Data

Lot #	Sample	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Change in capacitance %
1	1	0.101	0.974	1.4E+04	0.099	1.022	1.6E+04	-1.69
	2	0.102	0.990	1.6E+04	0.100	1.009	1.8E+04	-1.83
	3	0.100	0.989	1.6E+04	0.098	0.999	1.8E+04	-1.95
	4	0.102	1.039	1.5E+04	0.100	1.039	1.8E+04	-2.05
	5	0.103	0.976	1.5E+04	0.101	0.976	1.8E+04	-1.97
	6	0.102	1.003	1.6E+04	0.100	1.003	1.9E+04	-2.06
	7	0.102	0.990	1.5E+04	0.099	0.990	1.8E+04	-2.09
	8	0.103	0.966	1.5E+04	0.101	0.976	1.8E+04	-2.07
	9	0.101	0.971	1.6E+04	0.099	0.981	1.9E+04	-1.89
	10	0.102	1.042	1.5E+04	0.100	1.042	1.9E+04	-2.01
	11	0.101	0.995	1.5E+04	0.099	0.995	1.8E+04	-2.07
	12	0.102	1.072	1.5E+04	0.100	1.061	1.9E+04	-2.05
	13	0.103	1.023	1.5E+04	0.101	1.023	1.8E+04	-2.01
	14	0.101	1.034	1.6E+04	0.099	1.034	2.0E+04	-2.00
	15	0.102	0.956	1.5E+04	0.100	0.956	1.9E+04	-2.04
	16	0.103	0.967	1.5E+04	0.100	0.967	1.9E+04	-2.16
	17	0.101	1.005	1.6E+04	0.099	1.015	2.0E+04	-1.94
	18	0.101	0.946	1.5E+04	0.099	0.965	1.9E+04	-1.96
	19	0.098	1.025	1.5E+04	0.096	1.046	2.0E+04	-1.87
	20	0.103	1.059	1.5E+04	0.101	1.080	2.0E+04	-1.86
	21	0.101	1.143	1.5E+04	0.099	1.165	2.0E+04	-1.93
	22	0.102	0.981	1.6E+04	0.100	0.991	2.1E+04	-1.94
	23	0.101	0.977	1.5E+04	0.099	0.996	2.1E+04	-1.94
	24	0.104	0.975	1.5E+04	0.102	0.995	1.9E+04	-1.89
	25	0.103	0.971	1.5E+04	0.101	0.991	2.1E+04	-2.01
	26	0.105	0.989	1.5E+04	0.103	1.009	2.0E+04	-1.90
	27	0.104	0.979	1.5E+04	0.102	0.989	2.0E+04	-1.96
	28	0.102	0.990	1.5E+04	0.100	1.020	2.2E+04	-1.86
	29	0.103	0.977	1.4E+04	0.101	0.987	1.9E+04	-1.89
	30	0.103	0.993	1.6E+04	0.101	1.003	2.2E+04	-2.04
	31	0.102	0.988	1.6E+04	0.100	0.998	2.2E+04	-1.91
	32	0.103	0.964	1.5E+04	0.101	0.974	2.2E+04	-2.04
	33	0.102	0.963	1.5E+04	0.100	0.973	2.2E+04	-2.01
	34	0.102	0.988	1.5E+04	0.100	0.997	2.1E+04	-1.83
	35	0.102	0.954	1.5E+04	0.101	0.964	2.2E+04	-1.83
	36	0.102	0.988	1.5E+04	0.100	1.008	2.2E+04	-1.90
	37	0.104	0.994	1.5E+04	0.103	1.024	1.7E+04	-1.33
	38	0.102	1.216	1.6E+04	0.101	1.240	1.8E+04	-1.30
	39	0.101	1.015	1.5E+04	0.100	1.035	1.7E+04	-1.44
	40	0.102	0.991	1.6E+04	0.101	1.001	1.8E+04	-1.41
	41	0.103	0.985	1.6E+04	0.102	0.975	1.8E+04	-1.37
	42	0.103	0.960	1.6E+04	0.102	0.969	1.8E+04	-1.33
	43	0.103	0.991	1.5E+04	0.102	0.981	1.8E+04	-1.49
	44	0.104	1.003	1.6E+04	0.103	0.983	1.9E+04	-1.42
	45	0.102	1.005	1.6E+04	0.101	1.005	1.9E+04	-1.35
	46	0.103	1.133	1.6E+04	0.102	1.122	1.9E+04	-1.50
	47	0.102	1.045	1.6E+04	0.101	1.025	1.9E+04	-1.37
	48	0.103	0.975	1.7E+04	0.101	0.975	2.0E+04	-1.37
	49	0.102	0.992	1.4E+04	0.100	0.992	1.8E+04	-1.42
	50	0.104	0.998	1.6E+04	0.102	0.998	2.0E+04	-1.47

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date before test:2014/6/1	Date after test:2014/6/16

#6 - Moisture Resistance

test conditions : 10cycles(1cycle : 24hr) , 25deg C / 80% RH to 65deg C / 98% RH

	51	0.103	0.980	1.6E+04	0.101	0.980	2.0E+04	-1.46
	52	0.103	0.996	1.6E+04	0.101	1.006	2.0E+04	-1.40
	53	0.101	0.965	1.6E+04	0.100	0.975	2.0E+04	-1.32
	54	0.102	0.980	1.4E+04	0.101	0.990	1.9E+04	-1.20
	55	0.104	0.978	1.6E+04	0.102	0.997	2.0E+04	-1.45
	56	0.102	0.965	1.6E+04	0.101	0.975	2.1E+04	-1.38
	57	0.102	1.033	1.4E+04	0.101	1.073	1.9E+04	-1.24
	58	0.104	0.987	1.6E+04	0.102	1.007	2.1E+04	-1.47
	59	0.100	0.996	1.6E+04	0.099	0.977	2.1E+04	-1.33
	60	0.103	0.998	1.6E+04	0.101	1.017	2.1E+04	-1.29
	61	0.104	0.983	1.5E+04	0.102	1.013	2.1E+04	-1.24
	62	0.103	1.034	1.5E+04	0.102	1.086	2.1E+04	-1.11
	63	0.103	0.964	1.7E+04	0.102	0.993	2.3E+04	-1.07
	64	0.102	0.985	1.7E+04	0.101	1.014	2.3E+04	-1.17
	65	0.103	0.952	1.5E+04	0.102	0.981	2.1E+04	-1.31
	66	0.105	0.966	1.5E+04	0.104	0.985	2.1E+04	-1.30
	67	0.102	1.031	1.6E+04	0.100	1.041	2.2E+04	-1.18
	68	0.104	0.986	1.6E+04	0.102	1.006	2.2E+04	-1.37
	69	0.102	1.019	1.7E+04	0.101	1.060	2.4E+04	-1.03
	70	0.101	0.987	1.6E+04	0.100	0.997	2.3E+04	-1.28
	71	0.104	0.972	1.6E+04	0.102	1.002	2.2E+04	-1.32
	72	0.103	0.984	1.6E+04	0.102	1.023	2.4E+04	-1.31
	73	0.102	0.971	1.6E+04	0.101	0.981	1.7E+04	-1.47
	74	0.105	1.023	1.5E+04	0.103	1.023	1.6E+04	-1.60
	75	0.103	1.026	1.6E+04	0.101	0.996	1.8E+04	-1.63
	76	0.103	1.015	1.7E+04	0.101	1.005	1.9E+04	-1.45
	77	0.105	0.990	1.6E+04	0.103	0.970	1.7E+04	-1.56

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date before test:2014/5/30	Date after test:2014/8/7

#7 - Biased Humidity

Test Conditions : 1000hr , 85deg C / 85% RH , 1WV

No. of samples:	77	Initial readings			Final readings			
No. of lots:	1	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Change in capacitance %
Spec limits	lower	0.090		5.0E+03			5.0E+02	-12.5
	upper	0.110	2.50			3.50		12.5
Measurement Statistics	minimum	0.099	0.93	1.5E+04	0.096	1.32	2.8E+04	-4.15
	maximum	0.107	1.17	4.0E+04	0.103	1.66	3.9E+04	-2.18
	mean	0.103	0.98	2.9E+04	0.099	1.39	3.3E+04	-3.78
	standard deviation	0.001	0.04	7.3E+03	0.001	0.06	2.4E+03	0.22
Presence of Failures		in spec	in spec	in spec	in spec	in spec	in spec	in spec

Test Data

Lot #	Sample	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Change in capacitance %
1	1	0.101	1.00	2.0E+04	0.096	1.39	2.9E+04	-4.08
	2	0.101	0.97	2.3E+04	0.097	1.38	3.1E+04	-3.76
	3	0.101	0.97	2.2E+04	0.097	1.38	3.0E+04	-3.74
	4	0.103	1.02	2.2E+04	0.099	1.46	3.1E+04	-3.73
	5	0.101	0.95	2.2E+04	0.097	1.37	3.2E+04	-3.63
	6	0.101	0.98	2.3E+04	0.097	1.40	3.1E+04	-3.76
	7	0.101	0.97	2.2E+04	0.097	1.40	3.3E+04	-3.70
	8	0.101	0.95	3.2E+04	0.097	1.37	3.4E+04	-3.69
	9	0.102	0.96	2.2E+04	0.099	1.38	3.2E+04	-3.67
	10	0.102	1.02	2.3E+04	0.098	1.47	3.3E+04	-3.75
	11	0.101	0.97	2.3E+04	0.097	1.41	3.2E+04	-3.59
	12	0.102	1.06	2.3E+04	0.098	1.50	3.4E+04	-3.76
	13	0.100	1.00	2.4E+04	0.096	1.43	3.5E+04	-3.67
	14	0.101	1.02	2.3E+04	0.097	1.45	3.0E+04	-3.68
	15	0.102	0.96	2.4E+04	0.098	1.35	3.3E+04	-3.91
	16	0.099	0.99	3.2E+04	0.097	1.45	3.2E+04	-2.18
	17	0.100	0.99	2.4E+04	0.096	1.40	3.4E+04	-3.78
	18	0.102	0.96	2.4E+04	0.098	1.35	3.2E+04	-3.67
	19	0.103	0.99	2.4E+04	0.099	1.42	3.3E+04	-3.85
	20	0.101	1.03	2.5E+04	0.097	1.48	3.6E+04	-3.74
	21	0.103	1.11	2.4E+04	0.099	1.60	3.4E+04	-3.72
	22	0.102	0.95	2.5E+04	0.098	1.37	3.2E+04	-3.67
	23	0.103	0.96	2.4E+04	0.099	1.37	3.4E+04	-3.62
	24	0.102	0.95	2.4E+04	0.098	1.36	3.3E+04	-3.69
	25	0.102	0.94	2.4E+04	0.098	1.36	3.1E+04	-3.76
	26	0.103	0.97	2.4E+04	0.099	1.39	3.3E+04	-3.67
	27	0.101	0.96	2.4E+04	0.097	1.36	3.4E+04	-3.68
	28	0.101	0.98	2.6E+04	0.097	1.39	3.8E+04	-3.62
	29	0.103	0.98	2.3E+04	0.099	1.37	3.3E+04	-3.83
	30	0.102	0.99	2.6E+04	0.098	1.39	3.9E+04	-3.74
	31	0.105	1.00	2.5E+04	0.101	1.40	3.5E+04	-3.95
	32	0.101	0.97	2.7E+04	0.097	1.35	3.9E+04	-3.90
	33	0.103	0.97	2.5E+04	0.099	1.35	3.7E+04	-3.92
	34	0.102	0.97	2.5E+04	0.098	1.38	3.7E+04	-3.80
	35	0.101	0.93	2.5E+04	0.098	1.34	3.5E+04	-3.73
	36	0.101	0.97	2.5E+04	0.098	1.37	3.6E+04	-3.85
	37	0.104	0.97	3.6E+04	0.099	1.38	3.1E+04	-3.90
	38	0.101	1.17	3.5E+04	0.098	1.66	3.1E+04	-3.77
	39	0.103	0.99	3.6E+04	0.099	1.41	3.0E+04	-3.73
	40	0.104	0.98	3.5E+04	0.100	1.39	3.0E+04	-3.68
	41	0.102	0.97	3.9E+04	0.098	1.37	3.3E+04	-3.67
	42	0.103	0.95	3.5E+04	0.099	1.33	3.0E+04	-3.79
	43	0.101	0.98	3.9E+04	0.098	1.36	3.4E+04	-3.72
	44	0.102	0.99	3.7E+04	0.099	1.37	3.3E+04	-3.70
	45	0.105	0.99	3.7E+04	0.101	1.39	3.1E+04	-3.80
	46	0.102	1.12	3.7E+04	0.098	1.56	3.3E+04	-3.69
	47	0.102	1.01	3.7E+04	0.098	1.43	3.2E+04	-3.77
	48	0.102	0.98	4.0E+04	0.098	1.36	3.5E+04	-3.73
	49	0.101	0.96	3.5E+04	0.097	1.36	3.1E+04	-3.62
	50	0.102	0.97	3.7E+04	0.099	1.36	3.4E+04	-3.62

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date before test:2014/5/30	Date after test:2014/8/7

#7 - Biased Humidity

Test Conditions : 1000hr , 85deg C / 85% RH , 1WV

	51	0.104	0.98	3.4E+04	0.100	1.35	3.1E+04	-3.66
	52	0.103	0.99	3.4E+04	0.099	1.38	3.3E+04	-3.80
	53	0.103	0.96	3.7E+04	0.099	1.35	3.3E+04	-3.76
	54	0.103	0.96	3.3E+04	0.099	1.34	3.0E+04	-3.89
	55	0.104	0.95	3.6E+04	0.100	1.34	3.2E+04	-4.02
	56	0.103	0.96	3.6E+04	0.099	1.32	3.3E+04	-4.02
	57	0.101	0.97	3.8E+04	0.097	1.36	3.4E+04	-4.00
	58	0.104	0.98	3.6E+04	0.100	1.37	3.4E+04	-3.94
	59	0.103	0.95	3.9E+04	0.099	1.34	3.5E+04	-3.86
	60	0.104	0.99	3.5E+04	0.100	1.38	3.3E+04	-3.90
	61	0.106	0.98	3.6E+04	0.102	1.37	3.4E+04	-3.83
	62	0.103	1.03	3.7E+04	0.099	1.44	3.4E+04	-3.85
	63	0.103	0.95	3.9E+04	0.099	1.32	3.7E+04	-3.82
	64	0.103	0.96	3.7E+04	0.099	1.35	3.6E+04	-3.82
	65	0.105	0.94	3.4E+04	0.101	1.32	3.3E+04	-3.92
	66	0.102	0.96	3.6E+04	0.098	1.34	3.5E+04	-3.92
	67	0.103	1.00	3.7E+04	0.099	1.39	3.5E+04	-3.95
	68	0.102	0.99	3.7E+04	0.099	1.35	3.6E+04	-3.84
	69	0.102	1.00	3.8E+04	0.098	1.39	3.7E+04	-3.80
	70	0.106	1.01	3.6E+04	0.102	1.37	3.5E+04	-3.99
	71	0.104	0.97	3.7E+04	0.100	1.34	3.6E+04	-4.02
	72	0.104	0.97	3.5E+04	0.100	1.33	3.5E+04	-3.88
	73	0.105	0.96	1.5E+04	0.101	1.37	2.9E+04	-3.97
	74	0.104	1.01	1.5E+04	0.099	1.51	2.9E+04	-4.15
	75	0.107	1.00	1.5E+04	0.103	1.46	2.8E+04	-4.01
	76	0.103	1.01	1.7E+04	0.099	1.47	3.2E+04	-4.00
	77	0.103	0.96	1.6E+04	0.099	1.45	3.1E+04	-4.03

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date before test:2014/5/30	Date after test:2014/8/7

#7 - Biased Humidity

Test Conditions : 1000hr , 85deg C / 85% RH , 1.3V

No. of samples:	77	Initial readings			Final readings			
No. of lots:	1	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Change in capacitance %
Spec limits	lower	0.090		5.0E+03			5.0E+02	-12.5
	upper	0.110	2.50			3.50		12.5
Measurement Statistics	minimum	0.100	0.95	1.4E+04	0.099	0.97	1.3E+04	-1.70
	maximum	0.107	1.24	1.5E+06	0.105	1.23	2.2E+04	-0.69
	mean	0.103	1.00	3.7E+04	0.101	1.03	1.6E+04	-1.27
	standard deviation	0.001	0.05	1.7E+05	0.001	0.04	1.1E+03	0.14
Presence of Failures		in spec	in spec	in spec	in spec	in spec	in spec	in spec

Test Data

Lot #	Sample	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Change in capacitance %
1	1	0.101	0.964	1.4E+04	0.100	1.080	1.5E+04	-0.86
	2	0.101	0.980	1.6E+04	0.100	1.049	1.8E+04	-1.13
	3	0.101	0.989	1.5E+04	0.100	1.049	1.6E+04	-1.23
	4	0.100	1.039	1.6E+04	0.099	1.081	1.7E+04	-1.24
	5	0.101	0.976	1.5E+04	0.100	1.015	1.6E+04	-1.38
	6	0.103	1.003	1.5E+04	0.101	1.033	1.6E+04	-1.41
	7	0.102	0.990	1.5E+04	0.101	1.020	1.6E+04	-1.40
	8	0.101	0.976	1.5E+04	0.100	0.995	1.6E+04	-1.36
	9	0.102	0.981	1.5E+04	0.101	1.001	1.6E+04	-1.38
	10	0.102	1.042	1.5E+04	0.100	1.063	1.6E+04	-1.42
	11	0.102	0.985	1.5E+04	0.101	1.005	1.6E+04	-1.42
	12	0.100	1.061	1.6E+04	0.099	1.082	1.6E+04	-1.37
	13	0.103	1.033	1.5E+04	0.102	1.043	1.7E+04	-1.31
	14	0.101	1.034	1.6E+04	0.099	1.055	1.7E+04	-1.29
	15	0.101	0.956	1.6E+04	0.100	0.985	1.6E+04	-1.28
	16	0.103	0.977	1.5E+04	0.102	1.026	1.6E+04	-1.21
	17	0.103	0.995	1.5E+04	0.102	1.065	1.6E+04	-1.12
	18	0.102	0.946	1.5E+04	0.101	1.032	1.6E+04	-0.97
	19	0.104	1.025	1.5E+04	0.103	1.076	1.6E+04	-1.21
	20	0.101	1.048	1.5E+04	0.100	1.090	1.7E+04	-1.28
	21	0.103	1.154	1.5E+04	0.101	1.188	1.6E+04	-1.27
	22	0.103	0.971	1.5E+04	0.102	1.011	1.6E+04	-1.24
	23	0.105	0.986	1.5E+04	0.103	1.026	1.5E+04	-1.31
	24	0.101	0.966	1.5E+04	0.100	1.014	1.6E+04	-1.17
	25	0.105	0.981	1.5E+04	0.104	1.010	1.6E+04	-1.24
	26	0.102	0.989	1.5E+04	0.101	1.019	1.6E+04	-1.23
	27	0.102	0.970	1.5E+04	0.101	1.009	1.6E+04	-1.23
	28	0.102	0.990	1.5E+04	0.100	1.040	1.7E+04	-1.23
	29	0.102	0.977	1.5E+04	0.101	1.017	1.6E+04	-1.17
	30	0.103	1.003	1.6E+04	0.102	1.033	1.7E+04	-1.14
	31	0.101	0.988	1.6E+04	0.100	1.018	1.7E+04	-1.21
	32	0.101	0.964	1.7E+04	0.100	1.003	1.8E+04	-1.19
	33	0.103	0.983	1.6E+04	0.102	1.012	1.7E+04	-1.17
	34	0.102	0.978	1.5E+04	0.101	1.007	1.6E+04	-1.25
	35	0.103	0.954	1.6E+04	0.101	0.973	1.7E+04	-1.29
	36	0.101	0.978	1.6E+04	0.100	1.008	1.7E+04	-1.26
	37	0.104	0.994	1.5E+04	0.102	1.044	1.6E+04	-1.19
	38	0.102	1.192	1.6E+04	0.100	1.228	2.2E+04	-1.31
	39	0.103	1.015	1.5E+04	0.101	1.046	1.3E+04	-1.33
	40	0.105	0.982	1.5E+04	0.104	1.011	1.5E+04	-1.38
	41	0.101	0.975	1.6E+04	0.100	1.005	1.6E+04	-1.38
	42	0.104	0.960	1.5E+05	0.102	0.979	1.6E+04	-1.41
	43	0.103	0.991	1.5E+04	0.102	1.001	1.6E+04	-1.33
	44	0.102	0.993	1.6E+04	0.100	1.013	1.7E+04	-1.31
	45	0.105	0.995	1.5E+04	0.104	1.015	1.5E+04	-1.36
	46	0.101	1.111	1.6E+04	0.100	1.145	1.7E+04	-1.34
	47	0.104	1.025	1.5E+06	0.102	1.056	1.6E+04	-1.32
	48	0.102	0.985	1.7E+04	0.100	1.005	1.7E+04	-1.29
	49	0.102	0.992	1.4E+04	0.101	1.001	1.4E+04	-1.38
	50	0.103	0.988	1.6E+04	0.101	0.998	1.6E+04	-1.42

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date before test:2014/5/30	Date after test:2014/8/7

#7 - Biased Humidity

Test Conditions : 1000hr , 85deg C / 85% RH , 1.3V

	51	0.102	0.970	1.6E+04	0.100	0.980	1.6E+04	-1.35
	52	0.101	0.996	1.6E+04	0.100	1.016	1.7E+04	-1.36
	53	0.104	0.975	1.6E+04	0.102	1.004	1.6E+04	-1.29
	54	0.102	0.971	1.4E+04	0.101	1.020	1.5E+04	-1.13
	55	0.103	0.959	1.6E+04	0.101	0.988	1.8E+04	-1.29
	56	0.103	0.965	1.6E+04	0.102	0.985	1.9E+04	-1.29
	57	0.103	0.983	1.5E+04	0.102	1.003	1.5E+04	-1.39
	58	0.104	0.997	1.5E+04	0.102	1.007	1.6E+04	-1.33
	59	0.105	0.967	1.5E+04	0.104	0.986	1.6E+04	-1.36
	60	0.103	0.998	1.6E+04	0.102	1.008	1.6E+04	-1.35
	61	0.103	0.983	1.6E+04	0.102	1.003	1.6E+04	-1.35
	62	0.104	1.023	1.5E+04	0.102	1.044	1.5E+04	-1.35
	63	0.103	0.964	1.7E+04	0.102	0.984	1.7E+04	-1.29
	64	0.102	0.985	1.7E+04	0.101	1.005	1.7E+04	-1.22
	65	0.104	0.952	1.5E+04	0.103	0.981	1.5E+04	-1.24
	66	0.104	0.966	1.6E+04	0.103	0.995	1.6E+04	-1.20
	67	0.102	1.010	1.6E+04	0.101	1.031	1.6E+04	-1.24
	68	0.105	0.996	1.6E+04	0.104	1.006	1.6E+04	-1.40
	69	0.103	1.009	1.7E+04	0.102	1.019	1.7E+04	-1.33
	70	0.103	0.997	1.6E+04	0.102	1.007	1.7E+04	-1.31
	71	0.103	0.992	1.6E+04	0.101	0.992	1.7E+04	-1.34
	72	0.102	0.974	1.6E+04	0.101	0.984	1.8E+04	-1.31
	73	0.104	0.971	1.5E+04	0.103	1.020	1.6E+04	-1.20
	74	0.107	1.034	1.5E+04	0.105	1.075	1.6E+04	-1.28
	75	0.103	1.026	1.6E+04	0.103	1.067	1.7E+04	-0.69
	76	0.106	1.239	1.6E+04	0.104	1.046	1.8E+04	-1.70
	77	0.104	1.158	1.5E+04	0.104	1.029	1.6E+04	-0.74

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date before test:2014/4/25	Date after test:2014/6/20

#8 - Operational Life

test conditions : 1000hr ,125deg C , 2WV

No. of samples:	77	Initial readings			Final readings			
No. of lots:	1	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Change in capacitance %
Spec limits	lower	0.090		5.0E+03			5.0E+02	-12.5
	upper	0.110	2.50			3.50		12.5
Measurement Statistics	minimum	0.096	0.93	1.4E+04	0.092	1.15	1.0E+04	-6.23
	maximum	0.105	1.50	2.1E+04	0.101	1.66	4.1E+04	-2.90
	mean	0.102	0.99	1.8E+04	0.098	1.27	3.5E+04	-3.69
	standard deviation	0.001	0.07	1.6E+03	0.001	0.09	4.2E+03	0.37
Presence of Failures		in spec	in spec	in spec	in spec	in spec	in spec	in spec

Test Data

Lot #	Sample	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Change in capacitance %
1	1	0.102	0.955	14274.278	0.098	1.302	32355.031	-4.09
	2	0.103	0.970	16610.070	0.098	1.313	34258.268	-4.02
	3	0.101	0.989	16004.494	0.097	1.326	34009.550	-3.87
	4	0.099	1.081	16091.005	0.096	1.392	35199.073	-3.78
	5	0.101	0.966	16091.005	0.097	1.308	35199.073	-3.78
	6	0.101	0.973	16820.940	0.097	1.333	34631.346	-3.64
	7	0.101	0.970	16820.940	0.098	1.317	34631.346	-3.60
	8	0.103	0.966	16091.005	0.099	1.269	22125.132	-3.77
	9	0.104	0.961	15917.983	0.101	1.305	33825.714	-3.62
	10	0.103	1.032	16177.516	0.100	1.386	34377.221	-3.60
	11	0.101	0.966	16545.186	0.098	1.301	34063.619	-3.42
	12	0.100	1.039	18297.030	0.097	1.404	36594.059	-3.40
	13	0.100	0.992	18199.705	0.097	1.340	36399.410	-3.53
	14	0.101	1.003	17810.407	0.097	1.345	36610.280	-3.61
	15	0.096	0.956	18394.354	0.092	1.285	38832.526	-3.54
	16	0.102	0.957	18199.705	0.098	1.283	37410.505	-3.51
	17	0.103	0.985	17907.731	0.100	1.326	35815.462	-3.48
	18	0.101	0.927	18199.705	0.098	1.271	37410.505	-3.41
	19	0.103	0.995	17280.528	0.099	1.340	38627.063	-4.07
	20	0.102	1.048	17188.610	0.097	1.376	39432.694	-4.04
	21	0.101	1.108	19108.068	0.097	1.451	39221.824	-3.85
	22	0.100	0.952	19416.263	0.096	1.246	39854.434	-3.89
	23	0.103	0.957	17280.528	0.099	1.233	38627.063	-4.00
	24	0.102	0.946	18491.679	0.098	1.229	36983.358	-3.78
	25	0.102	0.951	18799.874	0.098	1.216	37599.747	-3.77
	26	0.103	0.970	18005.056	0.099	1.227	37010.393	-3.90
	27	0.103	0.950	19005.337	0.099	1.205	35009.831	-3.76
	28	0.102	0.990	19518.994	0.098	1.230	38010.673	-3.72
	29	0.101	0.977	18383.540	0.098	1.214	35847.904	-3.68
	30	0.102	0.993	20978.864	0.098	1.223	40908.784	-3.69
	31	0.102	0.988	20005.618	0.098	1.217	40011.235	-3.75
	32	0.101	0.964	20654.448	0.097	1.188	41308.897	-3.66
	33	0.101	0.954	19210.800	0.097	1.226	10110.947	-3.62
	34	0.104	0.958	17421.108	0.100	1.195	36777.895	-3.63
	35	0.101	0.935	20113.756	0.097	1.166	40227.512	-3.62
	36	0.102	0.969	21005.898	0.098	1.226	40011.235	-3.56
	37	0.103	0.994	15166.421	0.099	1.302	33366.126	-3.81
	38	0.103	1.192	15004.213	0.100	1.541	31008.707	-3.72
	39	0.102	1.025	15485.429	0.098	1.323	32906.537	-3.61
	40	0.102	0.972	16177.516	0.098	1.279	33366.126	-3.43
	41	0.102	0.955	16350.537	0.099	1.261	33722.983	-3.37
	42	0.103	0.941	15571.940	0.099	1.248	31143.880	-3.41
	43	0.101	0.942	17464.363	0.098	1.256	33901.411	-3.36
	44	0.102	0.954	17188.610	0.099	1.249	32355.031	-3.47
	45	0.101	0.975	15917.983	0.097	1.276	33825.714	-3.30
	46	0.103	1.111	17188.610	0.099	1.451	34377.221	-3.31
	47	0.102	1.025	17188.610	0.098	1.315	34377.221	-3.42
	48	0.104	0.975	17923.952	0.100	1.251	34793.554	-3.48
	49	0.102	1.497	16253.213	0.095	1.259	30700.513	-6.23
	50	0.103	0.998	18199.705	0.099	1.255	35388.315	-3.45

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date before test:2014/4/25	Date after test:2014/6/20

#8 - Operational Life

test conditions : 1000hr ,125deg C , 2WV

	51	0.102	0.980	17713.082	0.098	1.244	34442.104	-3.38
	52	0.099	1.006	18199.705	0.096	1.660	35388.315	-2.90
	53	0.102	0.955	17907.731	0.098	1.238	34820.588	-3.41
	54	0.101	0.971	17156.169	0.098	1.274	33409.381	-3.39
	55	0.101	0.949	17713.082	0.097	1.201	36410.224	-3.97
	56	0.103	0.946	17810.407	0.099	1.168	35620.813	-3.81
	57	0.102	0.973	18286.216	0.098	1.192	35609.999	-3.78
	58	0.103	0.987	19210.800	0.099	1.196	37410.505	-3.93
	59	0.104	0.967	19313.531	0.100	1.172	37610.561	-3.85
	60	0.102	0.998	18199.705	0.098	1.197	37410.505	-3.83
	61	0.102	1.023	19005.337	0.098	1.162	37010.393	-3.93
	62	0.105	1.076	17875.290	0.101	1.253	33868.970	-3.81
	63	0.103	0.993	19827.189	0.099	1.157	39654.378	-3.85
	64	0.103	1.005	19724.458	0.099	1.172	38410.786	-3.92
	65	0.104	0.981	18388.947	0.100	1.154	36777.895	-3.93
	66	0.102	0.985	19573.064	0.098	1.161	37188.821	-3.85
	67	0.105	1.021	19416.263	0.101	1.225	37810.617	-3.79
	68	0.102	0.986	20005.618	0.099	1.185	38010.673	-3.62
	69	0.102	1.009	20762.587	0.098	1.212	39448.915	-3.62
	70	0.102	0.978	20005.618	0.098	1.197	39010.954	-3.61
	71	0.104	0.963	20438.171	0.100	1.179	37810.617	-3.69
	72	0.103	0.974	19681.202	0.100	1.198	38378.344	-3.69
	73	0.102	0.961	15831.473	0.098	1.255	33641.879	-3.73
	74	0.104	1.013	15004.213	0.100	1.334	32008.988	-3.51
	75	0.104	0.986	15744.962	0.100	1.301	31489.923	-3.44
	76	0.101	0.975	16696.580	0.098	1.289	34436.697	-3.45
	77	0.105	0.950	16004.494	0.101	1.257	32008.988	-3.43

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229

#9 - External Visual Examination

Number of Samples: 812 Number of Lots: 1	Number of failures: 0

Lot #	Test No.	Result (pass/fail)
	3	pass
	4	pass
	5	pass
	6	pass
	7-1	pass
	7-2	pass
	8	pass
	10	pass
	12-1	pass
	12-2	pass
	12-3	pass
	13	pass
	14	pass
	15	pass
	16	pass
	17	pass
	18	pass
	18	pass
	18	pass
	19	pass
	21	pass
	22	pass
	23	pass

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date test:2014/6/28	

#10 - Physical Dimensions

Number of Samples: 30 Number of Lots: 1		Readings at Room Temp: 25C					
		Length (mm)	Width	Thickness	e1	e2	g
Spec limits	lower	1.50	0.70	0.70	0.20	0.20	0.50
	upper	1.70	0.90	0.90	0.50	0.50	
Measurement Statistics	minimum	1.658	0.814	0.850	0.327	0.336	0.919
	maximum	1.676	0.832	0.864	0.385	0.396	0.964
	mean	1.667	0.823	0.857	0.358	0.366	0.943
	standard deviation	0.005	0.005	0.003	0.014	0.014	0.013
Presence of failures		in spec	in spec	in spec	in spec	in spec	in spec
Measurements	Sample	Length (mm)	Width	Thickness	e1	e2	g
	1	1.663	0.821	0.854	0.348	0.396	0.919
	2	1.666	0.828	0.858	0.340	0.365	0.961
	3	1.670	0.817	0.854	0.345	0.381	0.945
	4	1.666	0.823	0.855	0.368	0.336	0.963
	5	1.659	0.826	0.853	0.327	0.373	0.960
	6	1.669	0.827	0.858	0.362	0.363	0.945
	7	1.666	0.822	0.864	0.349	0.353	0.964
	8	1.667	0.829	0.852	0.349	0.369	0.949
	9	1.672	0.820	0.853	0.356	0.383	0.933
	10	1.665	0.825	0.857	0.348	0.376	0.941
	11	1.658	0.826	0.852	0.367	0.354	0.938
	12	1.664	0.824	0.855	0.350	0.359	0.956
	13	1.666	0.825	0.861	0.363	0.346	0.957
	14	1.667	0.822	0.857	0.385	0.340	0.942
	15	1.665	0.816	0.856	0.335	0.389	0.941
	16	1.667	0.819	0.854	0.373	0.348	0.946
	17	1.663	0.816	0.860	0.355	0.358	0.950
	18	1.670	0.814	0.856	0.358	0.352	0.960
	19	1.662	0.821	0.860	0.337	0.375	0.950
	20	1.663	0.816	0.855	0.352	0.371	0.940
	21	1.674	0.820	0.857	0.369	0.361	0.944
	22	1.676	0.824	0.862	0.370	0.362	0.944
	23	1.675	0.828	0.858	0.366	0.371	0.937
	24	1.663	0.821	0.859	0.384	0.360	0.920
	25	1.675	0.827	0.860	0.369	0.381	0.925
	26	1.673	0.832	0.858	0.361	0.358	0.955
	27	1.668	0.831	0.858	0.361	0.371	0.936
	28	1.667	0.828	0.860	0.359	0.376	0.932
	29	1.675	0.825	0.858	0.380	0.375	0.919
	30	1.669	0.825	0.850	0.363	0.381	0.926

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date before test:2014/6/2	Date after test:2014/6/2

#12 Resistance to solvents

Number of Samples: 5 Number of Lots: 1	*test conditions* A : 1 part (by volume) of isopropyl alcohol and 3 parts (by volume) of mineral sperits , 25deg C 3min immersion test conditions B : terpene defluxer, 25deg C 3min immersion test conditions C : 42 parts(by volume) of water and 1 part (by volume) of propylene glycol monomethylether and 1 part (by volume) of monoethanolamine, 63-70deg C 3min immersion

Number of Samples: 5 Number of Lots: 1	Number of failures: 0	
A	1	No Failure
	2	No Failure
	3	No Failure
	4	No Failure
	5	No Failure
B	1	No Failure
	2	No Failure
	3	No Failure
	4	No Failure
	5	No Failure
C	1	No Failure
	2	No Failure
	3	No Failure
	4	No Failure
	5	No Failure

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date before test:2014/5/30	Date after test:2014/5/31

#13 - Mechanical Shock

test conditions : shock pulse : 1500g's, 0.5ms, 15.4ft/s, 3 times each of 6 orientations

No. of samples:	30	Initial readings			Final readings			
No. of lots:	1	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Change in capacitance %
Spec limits	lower	0.090		5.0E+03	0.090		5.0E+03	
	upper	0.110	2.50		0.110	2.50		
Measurement Statistics	minimum	0.100	0.92	1.4E+04	0.097	0.94	1.7E+04	-3.09
	maximum	0.106	1.11	2.0E+04	0.102	1.11	2.0E+04	-2.86
	mean	0.102	0.98	1.7E+04	0.099	0.98	1.8E+04	-2.98
	standard deviation	0.001	0.04	1.3E+03	0.001	0.04	6.4E+02	0.07
Presence of Failures		in spec	in spec	in spec	in spec	in spec	in spec	in spec

Test Data

Lot #	Sample	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Change in capacitance %
1	1	0.101	0.94	1.4E+04	0.098	0.955	1.8E+04	-3.04
	2	0.100	0.95	1.7E+04	0.097	0.960	1.9E+04	-3.04
	3	0.101	0.97	1.6E+04	0.098	0.969	1.8E+04	-3.04
	4	0.101	1.01	1.6E+04	0.098	1.008	1.9E+04	-3.09
	5	0.102	0.97	1.6E+04	0.099	0.966	1.8E+04	-2.99
	6	0.103	0.98	1.6E+04	0.100	1.013	1.8E+04	-3.00
	7	0.101	0.98	1.7E+04	0.098	0.970	1.9E+04	-2.98
	8	0.102	0.95	1.6E+04	0.099	0.956	1.8E+04	-2.96
	9	0.106	0.98	1.6E+04	0.102	0.971	1.7E+04	-3.03
	10	0.102	1.01	1.7E+04	0.099	1.021	1.8E+04	-2.89
	11	0.100	0.96	1.7E+04	0.097	0.976	1.8E+04	-2.89
	12	0.102	1.04	1.7E+04	0.099	1.050	1.9E+04	-2.96
	13	0.101	1.01	1.7E+04	0.098	1.013	1.9E+04	-3.04
	14	0.103	1.00	1.7E+04	0.100	1.003	1.8E+04	-3.05
	15	0.103	0.96	1.7E+04	0.100	1.004	1.8E+04	-3.02
	16	0.103	1.00	1.7E+04	0.100	0.967	1.8E+04	-3.08
	17	0.102	1.00	1.7E+04	0.099	0.995	1.8E+04	-3.09
	18	0.101	0.92	1.8E+04	0.098	0.937	1.8E+04	-3.02
	19	0.100	0.98	1.9E+04	0.097	0.985	1.9E+04	-2.96
	20	0.102	1.03	1.8E+04	0.099	1.016	1.9E+04	-3.01
	21	0.102	1.11	1.8E+04	0.099	1.108	1.9E+04	-3.02
	22	0.104	0.95	1.8E+04	0.101	0.952	1.8E+04	-3.00
	23	0.102	0.97	1.8E+04	0.099	0.967	1.8E+04	-2.95
	24	0.101	0.95	1.8E+04	0.098	0.946	1.8E+04	-2.87
	25	0.103	0.96	1.9E+04	0.100	0.961	1.9E+04	-2.93
	26	0.102	0.96	1.9E+04	0.100	0.960	1.9E+04	-2.87
	27	0.102	0.95	1.9E+04	0.099	0.950	1.8E+04	-2.86
	28	0.103	0.97	2.0E+04	0.100	0.980	2.0E+04	-2.95
	29	0.103	0.97	1.7E+04	0.100	0.967	1.7E+04	-2.93
	30	0.104	0.96	2.0E+04	0.101	0.973	1.9E+04	-2.92

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date before test:2014/5/30	Date after test:2014/5/31

#14 - Vibration

test conditions : 5g's for 20min, 12 cycles each of 3 orientations, test frequency 10 - 2000Hz

No. of samples:	30	Initial readings			Final readings			
No. of lots:	1	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Change in capacitance %
Spec limits	lower	0.090		5.0E+03	0.090		5.0E+03	
	upper	0.110	2.50		0.110	2.50		
Measurement Statistics	minimum	0.099	0.94	1.3E+04	0.097	0.98	1.8E+04	-2.86
	maximum	0.104	1.11	2.0E+04	0.101	1.15	2.4E+04	-2.66
	mean	0.102	0.98	1.8E+04	0.099	1.02	2.1E+04	-2.77
	standard deviation	0.001	0.04	1.5E+03	0.001	0.04	1.5E+03	0.06
Presence of Failures		in spec	in spec	in spec	in spec	in spec	in spec	in spec

Test Data

Lot #	Sample	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Change in capacitance %
1	1	0.099	0.936	1.5E+04	0.097	1.003	1.8E+04	-2.66
	2	0.100	0.960	1.7E+04	0.097	1.000	2.0E+04	-2.76
	3	0.101	0.950	1.6E+04	0.099	0.989	1.9E+04	-2.82
	4	0.100	1.008	1.7E+04	0.097	1.039	2.0E+04	-2.73
	5	0.101	0.947	1.6E+04	0.098	0.976	1.9E+04	-2.76
	6	0.102	0.973	1.7E+04	0.099	1.003	2.0E+04	-2.85
	7	0.101	0.970	1.7E+04	0.098	1.010	2.0E+04	-2.78
	8	0.103	0.956	1.6E+04	0.100	0.986	1.9E+04	-2.84
	9	0.103	0.961	1.6E+04	0.100	0.991	1.9E+04	-2.86
	10	0.102	1.021	1.7E+04	0.100	1.052	2.0E+04	-2.84
	11	0.102	0.966	1.7E+04	0.099	0.995	1.9E+04	-2.86
	12	0.103	1.050	1.7E+04	0.100	1.082	2.1E+04	-2.83
	13	0.101	0.992	1.8E+04	0.098	1.023	2.1E+04	-2.82
	14	0.101	1.014	1.8E+04	0.098	1.045	2.1E+04	-2.81
	15	0.103	0.946	1.8E+04	0.100	0.975	2.1E+04	-2.84
	16	0.103	0.967	1.7E+04	0.100	0.997	2.0E+04	-2.85
	17	0.100	0.985	1.8E+04	0.098	1.025	2.1E+04	-2.79
	18	0.101	0.937	1.8E+04	0.098	0.985	2.1E+04	-2.69
	19	0.101	0.985	1.8E+04	0.098	1.035	2.1E+04	-2.67
	20	0.103	1.038	1.8E+04	0.101	1.080	2.1E+04	-2.71
	21	0.103	1.108	1.9E+04	0.100	1.154	2.2E+04	-2.79
	22	0.104	0.962	1.9E+04	0.101	1.001	2.2E+04	-2.77
	23	0.100	0.957	1.9E+04	0.098	0.996	2.3E+04	-2.72
	24	0.101	0.946	1.8E+04	0.098	0.995	2.2E+04	-2.73
	25	0.102	0.961	1.3E+04	0.099	1.000	2.3E+04	-2.70
	26	0.101	0.960	1.9E+04	0.098	1.009	2.3E+04	-2.71
	27	0.102	0.960	1.9E+04	0.099	1.009	2.3E+04	-2.75
	28	0.102	0.970	2.0E+04	0.099	1.010	2.4E+04	-2.79
	29	0.101	0.957	1.8E+04	0.098	0.997	2.2E+04	-2.77
	30	0.103	0.973	2.0E+04	0.101	1.023	2.3E+04	-2.72

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date before test:2014/5/30	Date after test:2014/5/30

#15 - Resistance to Soldering Heat

Test Conditions : soldering , 260C 10sec immersion

Number of Samples: 30 Number of Lots: 1	Number of failures: 0

Lot #	Sample	Result
1	1	No failure
	2	No failure
	3	No failure
	4	No failure
	5	No failure
	6	No failure
	7	No failure
	8	No failure
	9	No failure
	10	No failure
	11	No failure
	12	No failure
	13	No failure
	14	No failure
	15	No failure
	16	No failure
	17	No failure
	18	No failure
	19	No failure
	20	No failure
	21	No failure
	22	No failure
	23	No failure
	24	No failure
	25	No failure
	26	No failure
	27	No failure
	28	No failure
	29	No failure
	30	No failure

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date before test:2014/6/1	Date after test:2014/6/22

#16 - Thermal Shock

Test conditions : 300Cycles (-55deg C to 125deg C) , Maximum transfer time 20sec , keeping time 15min

No. of samples:	30	Initial readings			Final readings			
No. of lots:	1	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Change in capacitance %
Spec limits	lower	0.090		5.0E+03			5.0E+03	-10.00
	upper	0.110	2.50			2.50		10.00
Measurement Statistics	minimum	0.100	0.94	1.5E+04	0.098	0.94	1.6E+04	-2.31
	maximum	0.105	1.13	2.0E+04	0.103	1.13	2.0E+04	-1.88
	mean	0.102	0.99	1.8E+04	0.100	0.99	1.8E+04	-2.12
	standard deviation	0.001	0.04	1.4E+03	0.001	0.04	1.1E+03	0.10
Presence of Failures		in spec	in spec	in spec	in spec	in spec	in spec	in spec

Test Data

Lot #	Sample	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Capacitance uF	Dissipation Factor %	IR 25C Mohm	Change in capacitance %
1	1	0.101	0.945	1.7E+04	0.099	0.953	1.7E+04	-2.14
	2	0.103	0.960	1.9E+04	0.101	0.968	1.8E+04	-2.06
	3	0.102	0.969	1.8E+04	0.100	0.990	1.8E+04	-2.10
	4	0.100	1.029	1.8E+04	0.098	1.048	1.9E+04	-1.98
	5	0.101	0.956	1.8E+04	0.098	0.959	1.9E+04	-2.31
	6	0.102	0.993	1.8E+04	0.100	0.948	1.7E+04	-2.04
	7	0.104	0.980	1.8E+04	0.102	0.981	1.7E+04	-2.10
	8	0.101	0.956	1.8E+04	0.099	0.971	1.8E+04	-2.02
	9	0.103	0.961	1.9E+04	0.100	0.953	1.8E+04	-2.22
	10	0.103	1.021	1.9E+04	0.100	1.042	1.9E+04	-2.27
	11	0.101	0.966	1.8E+04	0.098	0.959	1.8E+04	-2.19
	12	0.103	1.061	2.0E+04	0.101	1.071	1.8E+04	-2.01
	13	0.101	1.002	1.9E+04	0.099	1.018	1.9E+04	-2.09
	14	0.101	1.024	2.0E+04	0.099	1.029	1.9E+04	-2.14
	15	0.101	0.946	1.9E+04	0.099	0.941	1.9E+04	-2.00
	16	0.102	0.977	1.9E+04	0.099	0.965	1.8E+04	-2.07
	17	0.103	0.985	1.5E+04	0.101	0.985	2.0E+04	-2.23
	18	0.101	0.937	1.5E+04	0.099	0.952	2.0E+04	-2.05
	19	0.105	1.005	1.6E+04	0.103	0.976	1.7E+04	-2.25
	20	0.101	1.038	1.6E+04	0.099	1.037	1.6E+04	-2.05
	21	0.103	1.131	1.6E+04	0.101	1.132	1.8E+04	-2.15
	22	0.102	0.971	1.6E+04	0.100	0.941	1.9E+04	-1.88
	23	0.100	0.967	1.7E+04	0.098	0.977	1.6E+04	-2.28
	24	0.102	0.956	1.6E+04	0.100	0.977	1.7E+04	-2.09
	25	0.102	0.961	1.7E+04	0.100	0.993	1.9E+04	-2.15
	26	0.102	0.979	1.7E+04	0.100	0.969	1.8E+04	-2.16
	27	0.101	0.989	1.6E+04	0.099	0.993	1.7E+04	-2.22
	28	0.101	1.000	1.7E+04	0.099	0.953	1.8E+04	-2.19
	29	0.101	0.987	1.6E+04	0.099	0.992	1.7E+04	-2.14
	30	0.103	1.013	1.8E+04	0.101	1.025	1.6E+04	-2.02

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date before test:2014/6/26	Date after test:2014/6/26

#17 - ESD Test

Test conditions : charge capacitor 150pF, discharge resistor 2000ohm

Number of Samples: 15 Number of Lots: 1		Greatest Breakdown Voltage with no failures
Breakdown Voltage	Sample	Result (pass/fail)
25kV A.D.	1	pass
	2	pass
	3	pass
	4	pass
	5	pass
	6	pass
	7	pass
	8	pass
	9	pass
	10	pass
	11	pass
	12	pass
	13	pass
	14	pass
	15	pass

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date test:2014/6/23	

#18 - Solderability

test conditions : 1.soldering 235C 5sec immersion, 2.soldering 235C 5sec immersion, 3.soldering 260C 120sec immersion

Number of Samples: 15 Number of Lots: 1	Number of failures: 0

Test No.	Sample	Result (pass/fail)
1	1	pass
	2	pass
	3	pass
	4	pass
	5	pass
	6	pass
	7	pass
	8	pass
	9	pass
	10	pass
	11	pass
	12	pass
	13	pass
	14	pass
	15	pass
2	1	pass
	2	pass
	3	pass
	4	pass
	5	pass
	6	pass
	7	pass
	8	pass
	9	pass
	10	pass
	11	pass
	12	pass
	13	pass
	14	pass
	15	pass
3	1	pass
	2	pass
	3	pass
	4	pass
	5	pass
	6	pass
	7	pass
	8	pass
	9	pass
	10	pass
	11	pass
	12	pass
	13	pass
	14	pass
	15	pass

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date test:2014/6/2	

#19 - Electrical Characterization

test conditions : 1+/-0.1KHz, 1+/-0.2Vrms

Number of Samples: 30 Number of Lots: 1		Readings at Room Temp: 25C			at Min Operating Temperature: -55C			at Max Operating Temperature: 125C			
		Capacitance uF	Dissipation Factor %	Insulation Resistance Mohm	Capacitance uF	Dissipation Factor %	Change in capacitance %	Capacitance uF	Dissipation Factor %	Insulation Resistance Mohm	Change in capacitance %
Spec limits	lower	0.090		5.0E+03			-15.00			1.0E+02	-15.00
	upper	0.110	2.50				15.00				15.00
Measurement Statistics	minimum	0.100	0.98	1.4E+04	0.101	2.00	0.95	0.090	0.79	4.7E+02	-9.93
	maximum	0.105	1.19	1.6E+04	0.106	2.40	1.01	0.095	0.97	5.6E+02	-9.65
	mean	0.102	1.055	1.5E+04	0.103	2.10	0.99	0.092	0.848	5.2E+02	-9.78
	standard deviation	0.001	0.049	5.6E+02	0.001	0.08	0.02	0.001	0.041	1.8E+01	0.06
Presence of failures		in spec	in spec	in spec	in spec	in spec	in spec	in spec	in spec	in spec	in spec
Measurements	Sample	Capacitance uF	Dissipation Factor %	Insulation Resistance Mohm	Capacitance uF	Dissipation Factor %	Change in capacitance %	Capacitance uF	Dissipation Factor %	Insulation Resistance Mohm	Change in capacitance %
	1	0.102	1.051	1.4E+04	0.103	2.031	0.98	0.092	0.830	5.0E+02	-9.82
	2	0.102	1.078	1.6E+04	0.103	2.057	0.96	0.092	0.843	5.5E+02	-9.86
	3	0.102	1.098	1.4E+04	0.104	2.067	1.01	0.092	0.830	5.2E+02	-9.75
	4	0.101	1.090	1.5E+04	0.102	2.192	0.99	0.091	0.896	5.2E+02	-9.73
	5	0.101	0.976	1.5E+04	0.102	2.056	1.00	0.091	0.836	5.3E+02	-9.76
	6	0.101	1.052	1.5E+04	0.102	2.104	0.99	0.091	0.834	5.2E+02	-9.81
	7	0.104	0.999	1.5E+04	0.105	2.084	1.00	0.094	0.857	4.9E+02	-9.79
	8	0.105	0.985	1.5E+04	0.106	2.052	0.99	0.095	0.842	5.1E+02	-9.75
	9	0.100	1.000	1.5E+04	0.101	2.037	1.01	0.090	0.810	5.6E+02	-9.86
	10	0.101	1.062	1.5E+04	0.102	2.195	0.98	0.092	0.893	5.5E+02	-9.80
	11	0.102	1.024	1.5E+04	0.103	2.075	0.96	0.092	0.802	5.1E+02	-9.81
	12	0.102	1.093	1.5E+04	0.103	2.236	0.99	0.092	0.879	5.3E+02	-9.77
	13	0.102	1.063	1.5E+04	0.103	2.142	1.00	0.092	0.872	5.3E+02	-9.79
	14	0.101	1.106	1.6E+04	0.102	2.162	1.01	0.091	0.916	5.2E+02	-9.74
	15	0.101	0.994	1.5E+04	0.102	2.023	0.98	0.091	0.829	5.4E+02	-9.71
	16	0.102	1.016	1.5E+04	0.103	2.087	0.99	0.092	0.838	5.3E+02	-9.76
	17	0.101	1.045	1.5E+04	0.102	2.123	0.96	0.091	0.872	5.2E+02	-9.80
	18	0.101	1.032	1.6E+04	0.102	1.997	0.95	0.091	0.792	5.5E+02	-9.85
	19	0.102	1.065	1.5E+04	0.103	2.121	0.99	0.092	0.857	5.3E+02	-9.74
	20	0.103	1.132	1.5E+04	0.105	2.239	1.00	0.093	0.915	5.1E+02	-9.82
	21	0.102	1.188	1.5E+04	0.103	2.402	0.98	0.092	0.971	5.2E+02	-9.69
	22	0.103	1.030	1.5E+04	0.104	2.046	1.01	0.093	0.836	5.1E+02	-9.65
	23	0.101	1.025	1.6E+04	0.102	2.084	0.97	0.091	0.818	5.4E+02	-9.78
	24	0.102	1.092	1.5E+04	0.103	2.042	1.00	0.092	0.819	5.3E+02	-9.75
	25	0.103	1.020	1.5E+04	0.104	2.050	0.98	0.093	0.792	5.1E+02	-9.93
	26	0.103	1.038	1.5E+04	0.103	2.077	0.96	0.092	0.815	5.1E+02	-9.80
	27	0.102	1.028	1.6E+04	0.103	2.075	1.00	0.092	0.794	5.1E+02	-9.83
	28	0.103	1.069	1.5E+04	0.104	2.104	1.00	0.093	0.851	5.2E+02	-9.82
	29	0.103	1.046	1.4E+04	0.104	2.058	0.98	0.093	0.852	4.7E+02	-9.65
	30	0.103	1.142	1.6E+04	0.104	2.107	0.98	0.093	0.839	5.5E+02	-9.83

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date before test:2014/5/27	Date after test:2014/5/27

#21 - Board Flex

test conditions : bend board at 2mm for 5sec
pass/fail criteria : cap change within +/-10%

Test Data

Number of Samples: 30 Number of Lots: 1	Number of failures: 0

Lot #	Sample	Result (pass/fail)
1	1	pass
	2	pass
	3	pass
	4	pass
	5	pass
	6	pass
	7	pass
	8	pass
	9	pass
	10	pass
	11	pass
	12	pass
	13	pass
	14	pass
	15	pass
	16	pass
	17	pass
	18	pass
	19	pass
	20	pass
	21	pass
	22	pass
	23	pass
	24	pass
	25	pass
	26	pass
	27	pass
	28	pass
	29	pass
	30	pass

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date before test:2014/5/27	Date after test:2014/5/27

#22 - Terminal Strength (SMD)

Test conditions : Force of 1.8kgf for 60sec

Number of Samples: 30 Number of Lots: 1	Number of failures: 0

Lot #	Sample	Result (pass/fail)
1	1	pass
	2	pass
	3	pass
	4	pass
	5	pass
	6	pass
	7	pass
	8	pass
	9	pass
	10	pass
	11	pass
	12	pass
	13	pass
	14	pass
	15	pass
	16	pass
	17	pass
	18	pass
	19	pass
	20	pass
	21	pass
	22	pass
	23	pass
	24	pass
	25	pass
	26	pass
	27	pass
	28	pass
	29	pass
	30	pass

AEC-Q200 Summary of Test Results

Customer P/N: N/A	Murata P/N: GCM188R71H104KA57
Location of manufacture: Murata Philippine	Lot No: AL12X229
Date test:2014/7/5	

#23 - Beam Load

Test conditions : Apply a force until the part brakes
pass/fail criteria : 0805 size or smaller: 20N over (t>0.5mm), 8N over (t<=0.5mm)
1206 size or bigger: 15N over (t<1.25mm), 54.5N over (t>=1.25mm)

Number of Samples: 30 Number of Lots: 1	Number of failures: 0

Lot #	Sample	Result (pass/fail)
1	1	pass
	2	pass
	3	pass
	4	pass
	5	pass
	6	pass
	7	pass
	8	pass
	9	pass
	10	pass
	11	pass
	12	pass
	13	pass
	14	pass
	15	pass
	16	pass
	17	pass
	18	pass
	19	pass
	20	pass
	21	pass
	22	pass
	23	pass
	24	pass
	25	pass
	26	pass
	27	pass
	28	pass
	29	pass
	30	pass

5. Measurement Systems Analysis Studies

標準類番号:F40M906H

Gage Repeatability and Reproducibility Analysis Repor - Average and Range Method

Approved by	Checked by	Drawn by
Tomohiro Hori	Tomohiro Hori	Michelle Aquino

Characteristics	Capacitance	Judgment	ACCEPTABLE
Gage name	C meter	Date	2014/5/15
Gage type	E4981A	Environment conditions	
Gage number	MY48103	Temp.:℃	25℃ (Range 23～27)
Name,type,number of test fixures,cables,etc.		Hum.:%RH	56.3% (Range 20～70)
GCM1885C1H222		others	-
Part name	GRM18	Process,location,etc.	
Part specifications	Lower limit 2.09 / Upper limit 2.31	Outgoing Inspection	
Appraisers and Qualifications	A: Monaliza Pasion Inspector	B: Lovelyn Tayco Inspector	C: May Grace Lumpas inspector
Method,procedure,software,number	-	Name,type,number of standards,materials,tools,etc.	-

unit	nf

Appraiser / Trial No.		PART 1	2	3	4	5	6	7	8	9	10	AVERAGE	
A	1	2.20933	2.22076	2.20274	2.25619	2.21944	2.22360	2.24091	2.24750	2.23689	2.19098	2.22483	
	2	2.20934	2.22074	2.20275	2.25619	2.21942	2.22359	2.24090	2.24748	2.23688	2.19100	2.22483	
	3	2.20933	2.22077	2.20274	2.25620	2.21940	2.22357	2.24090	2.24749	2.23693	2.19098	2.22483	
	AVERAGE	2.20933	2.22076	2.20274	2.25619	2.21942	2.22359	2.24090	2.24749	2.23690	2.19099	2.22483	$\bar{X}_a$
	RANGE	0.00000	0.00004	0.00001	0.00001	0.00003	0.00003	0.00001	0.00002	0.00005	0.00002	0.00002	$\bar{R}_a$
B	1	2.20936	2.22077	2.20274	2.25620	2.21940	2.22362	2.24094	2.24750	2.23697	2.19099	2.22485	
	2	2.20932	2.22077	2.20274	2.25617	2.21942	2.22358	2.24090	2.24749	2.23687	2.19099	2.22482	
	3	2.20932	2.22077	2.20274	2.25617	2.21944	2.22363	2.24092	2.24751	2.23686	2.19099	2.22483	
	AVERAGE	2.20934	2.22077	2.20274	2.25618	2.21942	2.22361	2.24092	2.24750	2.23690	2.19099	2.22484	$\bar{X}_b$
	RANGE	0.00004	0.00000	0.00001	0.00003	0.00004	0.00005	0.00004	0.00002	0.00011	0.00001	0.00003	$\bar{R}_b$
C	1	2.20935	2.22076	2.20274	2.25615	2.21937	2.22358	2.24088	2.24750	2.23685	2.19097	2.22481	
	2	2.20931	2.22073	2.20270	2.25614	2.21935	2.22358	2.24087	2.24745	2.23684	2.19095	2.22479	
	3	2.20929	2.22072	2.20269	2.25614	2.21937	2.22355	2.24086	2.24744	2.23680	2.19039	2.22472	
	AVERAGE	2.20932	2.22074	2.20271	2.25614	2.21936	2.22357	2.24087	2.24746	2.23683	2.19077	2.22478	$\bar{X}_c$
	RANGE	0.00006	0.00005	0.00005	0.00001	0.00001	0.00003	0.00002	0.00005	0.00005	0.00058	0.00009	$\bar{R}_c$
PART AVG Xp		2.20933	2.22075	2.20273	2.25617	2.21940	2.22359	2.24090	2.24748	2.23688	2.19092	0.06526	R_p

$\bar{\bar{R}} = (\bar{R}_a + \bar{R}_b + \bar{R}_c)/K$	K=3	$\bar{\bar{R}}$	0.00005
$\bar{X}_{diff} = Max\ \bar{X} - Min\ \bar{X}$		$\bar{X}_{diff}$	0.00006
$UCL\ (R) = \bar{\bar{R}} * D4$	D4=2.58	UCL(R)	0.00013
$LCL\ (R) = \bar{\bar{R}} * D3$	D3=0.00	LCL(R)	0.00000

計算式	定数	項目	σ	指標	%Process	%TV	%Tol
$EV = \bar{\bar{R}} * K1$	K1=0.5908	Repeatability	0.00003	%EV			0.08%
$AV = \sqrt{(\bar{X}_{diff} * K2)^2 - EV^2/(N * R)}$	K2=0.5231	Reproducibility	0.00003	%AV			0.08%
$GRR = \sqrt{EV^2 + AV^2}$	K3=0.3146	GAGE R & R	0.00004	%R&R			0.11%
$TV = Tolerance/6$ $TV = ProcessVar/6$	$PV = R_p * K3$	Part Variation	0.03667	%PV			100.00%
$PV = \sqrt{TV^2 - GRR^2}$	$TV = \sqrt{GRR^2 + PV^2}$	Total Variation	0.03667				
$ndc = 1.41\ PV/GRR$	$P_p = Tolerance/6TV$	Process Variation		P_p			1.00
		Tolerance	0.22	ndc			1234

Acceptability Criteria	%R&R
Acceptable	under 10%
*Acceptable based upon importance of application	10% to 30%
Not Acceptable	over 30%

Gage Repeatability and Reproducibility Analysis Repor - Average and Range Method

Approved by	Checked by	Drawn by
Tomohiro Hori	Tomohiro Hori	Michelle Aquino

Characteristics	IR	Judgment	ACCEPTABLE
Gage name	IR Meter	Date	2014/5/15
Gage type	10833A	Environment conditions	
Gage number	MY48103443	Temp.:℃	25°C (Range 23 ～27)
Name,type,number of test fixures,cables,etc.		Hum.:%RH	55.5% (Range 20～70)
GCM188R71H104		others	-
Part name	GRM18	Process,location,etc.	
Part specifications	Lower limit 10.00 / Upper limit 16.00	Outgoing Inspection	
Appraisers and Qualifications	A: Monaliza Pasion Inspector	B: Lovelyn Tayco Inspector	C: May Grace Lumpas Inspector
Method,procedure,software,number	-	Name,type,number of standards,materials,tools,etc.	-

unit	log Ω

Appraiser	Trial No.	PART 1	2	3	4	5	6	7	8	9	10	AVERAGE	
A	1	10.33	10.39	10.24	10.25	10.31	10.44	10.25	10.10	10.27	10.56	10.31	
	2	10.46	10.45	10.30	10.08	10.41	10.33	10.04	10.12	10.27	10.32	10.28	
	3	10.44	10.35	10.15	10.05	10.32	10.33	10.13	10.05	10.15	10.55	10.25	
	AVERAGE	10.41	10.40	10.23	10.13	10.35	10.37	10.14	10.09	10.23	10.48	10.28	$\bar{X}_a$
	RANGE	0.13	0.10	0.15	0.20	0.10	0.11	0.21	0.07	0.12	0.24	0.14	$\bar{R}_a$
B	1	10.25	10.14	10.16	10.02	10.25	10.29	10.49	10.20	10.11	10.08	10.20	
	2	10.06	10.16	10.29	10.24	10.27	10.29	10.57	10.10	10.08	10.01	10.21	
	3	10.10	10.24	10.28	10.17	10.02	10.20	10.51	10.29	10.06	10.04	10.19	
	AVERAGE	10.14	10.18	10.24	10.14	10.18	10.26	10.52	10.20	10.08	10.04	10.20	$\bar{X}_b$
	RANGE	0.19	0.10	0.13	0.22	0.25	0.09	0.08	0.19	0.05	0.07	0.14	$\bar{R}_b$
C	1	10.06	10.22	10.18	10.16	10.39	10.03	10.22	10.01	10.36	10.04	10.17	
	2	10.26	10.16	10.00	10.28	10.09	10.25	10.26	10.26	10.42	10.04	10.20	
	3	10.22	10.08	10.07	10.09	10.42	10.14	10.27	10.12	10.37	10.04	10.18	
	AVERAGE	10.18	10.15	10.08	10.18	10.30	10.14	10.25	10.13	10.38	10.04	10.18	$\bar{X}_c$
	RANGE	0.20	0.14	0.18	0.19	0.33	0.22	0.05	0.25	0.06	0.00	0.16	$\bar{R}_c$
PART AVG Xp		10.24	10.24	10.19	10.15	10.28	10.26	10.30	10.14	10.23	10.19	0.17	R_p

$\bar{\bar{R}} = (\bar{R}_a + \bar{R}_b + \bar{R}_c)/K$	K=3	$\bar{\bar{R}}$	0.15
$\bar{X}_{diff} = Max\ \bar{X} - Min\ \bar{X}$		$\bar{X}_{diff}$	0.10
$UCL\ (R) = \bar{\bar{R}} * D4$	D4=2.58	UCL(R)	0.38
$LCL\ (R) = \bar{\bar{R}} * D3$	D3=0.00	LCL(R)	0.00

計算式	定数	項目	σ	指標	%Process	%TV	%Tol
$EV = \bar{\bar{R}} * K1$	K1=0.5908	Repeatability	0.0870	%EV			8.70%
$AV = \sqrt{(\bar{X}_{diff} * K2)^2 - EV^2/(N * R)}$	K2=0.5231	Reproducibility	0.0486	%AV			4.86%
$GRR = \sqrt{EV^2 + AV^2}$	K3=0.3146	GAGE R & R	0.0997	%R&R			9.97%
$TV = Tolerance/6$ $TV = ProcessVar/6$	$PV = R_p * K3$	Part Variation	0.9950	%PV			99.50%
$PV = \sqrt{TV^2 - GRR^2}$	$TV = \sqrt{GRR^2 + PV^2}$	Total Variation	1.0000				
$ndc = 1.41\ PV/GRR$	$P_p = Tolerance/6TV$	Process Variation		P_p			1.00
		Tolerance	6.0000	ndc			14

Acceptability Criteria	%R&R
Acceptable	under 10%
*Acceptable based upon importance of application	10% to 30%
Not Acceptable	over 30%

Gage Repeatability and Reproducibility Analysis Repor - Average and Range Method

Approved by	Checked by	Drawn by
Tomohiro Hori	Tomohiro Hori	Michelle Aquino

Characteristics	Dimension (length)	Judgment	ACCEPTABLE
Gage name	Digital Caliper	Date	2014/5/14
Gage type	CD-15CPX	Environment conditions	
Gage number	12321328	Temp.:℃	25°C (Range 23～27)
Name,type,number of test fixures,cables,etc.		Hum.:%RH	56.3% (Range 20～70)
GCM188R71H104		others	-
Part name	GRM18	Process,location,etc.	
Part specifications	Lower limit 1.53 / Upper limit 1.67	Outgoing Inspection	
Appraisers and Qualifications	A: Monaliza Pasion Inspector	B: Lovelyn Tayco Inspector	C: May Grace Lumpas Inspector
Method,procedure,software,number	-	Name,type,number of standards,materials,tools,etc.	-

unit	mm

Appraiser	Trial No.	PART 1	2	3	4	5	6	7	8	9	10	AVERAGE	
A	1	1.60	1.61	1.60	1.60	1.60	1.60	1.61	1.61	1.60	1.60	1.60	
	2	1.60	1.60	1.60	1.61	1.60	1.60	1.61	1.61	1.60	1.60	1.60	
	3	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.61	1.60	1.60	
	AVERAGE	1.60	1.60	1.60	1.60	1.60	1.60	1.61	1.61	1.60	1.60	1.60	$\bar{X}_a$
	RANGE	0.00	0.01	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.00	0.01	$\bar{R}_a$
B	1	1.60	1.60	1.61	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	
	2	1.60	1.60	1.61	1.60	1.60	1.61	1.60	1.60	1.60	1.60	1.60	
	3	1.60	1.60	1.61	1.60	1.60	1.60	1.60	1.60	1.60	1.61	1.60	
	AVERAGE	1.60	1.60	1.61	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	$\bar{X}_b$
	RANGE	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	$\bar{R}_b$
C	1	1.60	1.61	1.60	1.60	1.60	1.61	1.61	1.60	1.61	1.61	1.61	
	2	1.60	1.61	1.60	1.60	1.60	1.60	1.61	1.60	1.61	1.61	1.60	
	3	1.60	1.61	1.60	1.60	1.60	1.61	1.61	1.60	1.61	1.61	1.61	
	AVERAGE	1.60	1.61	1.60	1.60	1.60	1.61	1.61	1.60	1.61	1.61	1.60	$\bar{X}_c$
	RANGE	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	$\bar{R}_c$
PART AVG Xp		1.60	1.60	1.60	1.60	1.60	1.60	1.61	1.60	1.60	1.60	0.01	R_p

$\bar{\bar{R}} = (\bar{R}_a + \bar{R}_b + \bar{R}_c)/K$ K=3

$\bar{X}_{diff} = Max\ \bar{X} - Min\ \bar{X}$

$UCL\ (R) = \bar{\bar{R}} * D4$ D4=2.58

$LCL\ (R) = \bar{\bar{R}} * D3$ D3=0.00

$\bar{\bar{R}}$	0.00
$\bar{X}_{diff}$	0.00
UCL(R)	0.01
LCL(R)	0.00

計算式	定数	項目	σ	指標	%Process	%TV	%Tol
$EV = \bar{\bar{R}} * K1$	K1=0.5908	Repeatability	0.0016	%EV			6.75%
$AV = \sqrt{(\bar{X}_{diff} * K2)^2 - EV^2/(N * R)}$	K2=0.5231	Reproducibility	0.0015	%AV			6.61%
$GRR = \sqrt{EV^2 + AV^2}$	K3=0.3146	GAGE R & R	0.0022	%R&R			9.45%
$TV = Tolerance/6$ $TV = ProcessVar/6$	$PV = R_p * K3$	Part Variation	0.0232	%PV			99.60%
$PV = \sqrt{TV^2 - GRR^2}$	$TV = \sqrt{GRR^2 + PV^2}$	Total Variation	0.0233				
$ndc = 1.41\ PV/GRR$	$P_p = Tolerance/6TV$	Process Variation		P_p			1.00
		Tolerance	0.1400	ndc			14.85381

Acceptability Criteria	%R&R
Acceptable	under 10%
*Acceptable based upon importance of application	10% to 30%
Not Acceptable	over 30%

6. Qualified Laboratory Documentation

BUREAU VERITAS
Certification

PHILIPPINE MANUFACTURING COMPANY OF MURATA INC.

Lot 2-A Phase 1B First Philippine Industrial Park, Pantay Bata, Tanauan Batangas 4232, Philippines

Bureau Veritas Certification certify that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the management system standard detailed below

Standard

ISO 9001:2008

Scope of certification

Manufacture of Chip Type Monolithic Ceramic Capacitors

Certification cycle start date: **06 MAY 2014**

Subject to the continued satisfactory operation of the organisation's Management System, this certificate expires on**: 05 MAY 2017**

Original certification date: **06 MAY 2014**

Certificate No.: **330291-UK**

Version A, Revision date: **06 MAY 2014**

Certification Authority

UKAS MANAGEMENT SYSTEMS

008

Certification body address: Brandon House, 180 Borough High Street, London SE1 1LB, United Kingdom
Local office: 8F Ramon Magsaysay Center 1680 Roxas Blvd. cor J. Quintos St., Ermita, Manila, Philippines

Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organisation.
To check this certificate validity please call: **+632 521 1068**

7. Control Plan

Ｑ Ｃ 工 程 図 ／Control Plan

段 階 Phase	[ ] 試作 [ ] 量産試作 [*] 量産 [ ]Prototype [ ]Pre-launch [*]Production	工場名 / Supplier/Plant	㈱出雲村田製作所（㈱イワミ村田製作所）/ Izumo Murata Mfg.Co.,Ltd.(Iwami Murata Mfg.Co.,Ltd.) PHILIPPINE MANUFACTURING CO. OF MURATA, INC.	制定日 Date(Orig.)	2014/6/20
品 番 / ｼﾘｰｽﾞ Part No.	GCM/GCF/GCD ｼﾘｰｽﾞ GCM/GCF/GCD series			最新改訂日 Date(Rev.)	
品 種 Product Name	ﾁｯﾌﾟ積層ｾﾗﾐｯｸｺﾝﾃﾞﾝｻ Chip type Monolithic Ceramic Capacitor	CFT	製造技術、生産技術、品質管理、製造 Process Eng., Product Eng., Quality Control, Mechanical Eng., Production	文書No. Document No.	LEMC66P0-006

特殊特性：特殊特性として[◎]を使用する。

Special char.：Use symbol [◎] for special characteristics.

工程フロー Process Flow 補助工程 Sub	本工程 Main	No.	工程名/作業概要 PROCESS NAME	材料･設備･治具 MACHINES,JIGS,TOOLS METERS,FIXTURES 製造用 Mfg.	試験･検査用 TEST,INSP.	管理項目 CONTROL PARAMETERS 原因系 PROCESS	結果系 PRODUCT	特殊特性 Special Char.	管理幅 仕様／公差 CONTROL RANGE SPEC./TOLE.	ｻﾝﾌﾟﾘﾝｸﾞﾌﾟﾗﾝ ｻﾝﾌﾟﾙｻｲｽﾞ 品質水準／頻度 SAMPLING PLAN SAMPLE SIZE LEVEL/FREQ.	管理方法 記録 ﾎﾟｶﾖｹの方法 CONTROL METHOD RECORD ERROR-PROOFING	担当者 PERSON IN CHARGE	対応計画 是正処置 REACTION PLAN /CORRECTIVE ACTION	関連標準類 RELATED STANDARDS
誘電体原料 Ceramic material		1	誘電体原料 受入検査 INCOMING INSPECTION (Ceramic material)				粉体特性 Powder characteristics		原料受入検査規格 Material incoming insp. std.	原料ﾛｯﾄ毎 Every raw material lot	出荷検査ﾃﾞｰﾀの確認 Outgoing inspection data from vendor	検査員 Inspector	工程異常処理規定 Process abnormal disposal std.	原料受入検査規格 Material incoming insp. std.
							電気特性 Electrical characteristics			原料ﾛｯﾄ毎 Every raw material lot	検査成績書 Inspection report			
							外観 Appearance			原料ﾛｯﾄ毎 Every raw material lot	検査成績書 Inspection report			
		2	調合 MIXING	調合機 Mixing machine			吐出量 Flow out amount		原料調合加工標準 Material mixing std.	調合ﾛｯﾄ毎 Every mixing lot	作業伝票 Work order sheet	作業者 Operator	工程異常処理規定 Process abnormal disposal std.	原料調合加工標準 Material mixing std.
						回転数 Rotation speed				調合ﾛｯﾄ毎 Every mixing lot	作業伝票 Work order sheet			
					天秤 Balance	調合量 Amount of mixture				調合ﾛｯﾄ毎 Every mixing lot	作業伝票 Work order sheet			
					ﾀｲﾏｰ Timer	時間 Time				調合ﾛｯﾄ毎 Every mixing lot	作業伝票 Work order sheet			
					粘度計 Viscometer		ｽﾗﾘｰ粘度 Slurry viscosity			調合ﾛｯﾄ毎 Every mixing lot	作業伝票 Work order sheet			
					比重計 Gravimeter		ｽﾗﾘｰ比重 Slurry spec. gravity			調合ﾛｯﾄ毎 Every mixing lot	作業伝票 Work order sheet			
シート製造工程まで出雲村田製作所 Until No.4 process, the manufacturing is carried out in Izumo Murata		3	脱泡 DE-AIRING	脱泡装置 De-airing machine	粘度計 Viscometer		粘度 Viscosity		脱泡加工標準 De-airing std.	調合ﾛｯﾄ毎 Every mixing lot	作業伝票 Work Order Sheet	作業者 Operator	工程異常処理規定 Process abnormal disposal std.	脱泡加工標準 De-airing std.
					真空度計 Manometer	真空度 Vacuum degree				調合ﾛｯﾄ毎 Every mixing lot	作業伝票 Work Order Sheet			
		4	ｼｰﾄ製造 CASTING	ｼｰﾄ製造機 Casting machine			ｼｰﾄ状態 Sheet Condition		ｼｰﾄ製造加工標準 Sheet casting std.	ﾛｯﾄ毎 Every lot	記録紙 Record Sheet	作業者 Operator	工程異常処理規定 Process abnormal disposal std.	ｼｰﾄ製造加工標準 Sheet casting std.
						乾燥温度 Drying temp.				ﾛｯﾄ毎 Every lot	記録紙 Record Sheet			
					膜厚測定器 X-ray thickness equipment		ｼｰﾄ厚み Sheet thickness			常時ﾓﾆﾀﾘﾝｸﾞ All time monitoring	ﾁｬｰﾄ Chart			
			輸送 TRANSPORTING											
		5	ｼｰﾄ受入検査				外観		ｼｰﾄ受入検査規格	原料ﾛｯﾄ毎 原料ﾛｯﾄ毎	出荷検査データの確認 検査成績書	検査員	工程異常処理規定	ｼｰﾄ受入検査規格

工程フロー Process Flow 補助工程 Sub	本工程 Main	No.	工程名/作業概要 PROCESS NAME	材料・設備・治具 MACHINES,JIGS,TOOLS METERS,FIXTURES 製造用 Mfg.	試験・検査用 TEST,INSP.	管理項目 CONTROL PARAMETERS 原因系 PROCESS	結果系 PRODUCT	特殊特性 Special Char.	管理幅 仕様／公差 CONTROL RANGE SPEC./TOLE.	ｻﾝﾌﾟﾘﾝｸﾞﾌﾟﾗﾝ ｻﾝﾌﾟﾙｻｲｽﾞ 品質水準／頻度 SAMPLING PLAN SAMPLE SIZE LEVEL/FREQ.	管理方法 記録 ﾎﾟｶﾖｹの方法 CONTROL METHOD RECORD ERROR-PROOFING	担当者 PERSON IN CHARGE	対応計画 是正処置 REACTION PLAN /CORRECTIVE ACTION	関連標準類 RELATED STANDARDS
			INCOMING INSPECTION （CERAMICS				Appearance		Ceramic sheet incoming insp. std.	Every raw material lot Every raw material lot Every raw material lot	Outgoing inspection data from vendor Inspection report	Inspector	Process abnormal disposal std.	Ceramic sheet incoming insp. std.
内部電極材料 Electrode paste		6	内部電極受入検査 INCOMING INSPECTION (Electrode paste)		比重計□ Gravimeter		比重 Specific gravity		内部電極受入 検査規格 Inner electrode incoming insp. std.	ﾍﾟｰｽﾄﾛｯﾄ毎 Every paste lot	検査成績書 Inspection report	検査員 Inspector	工程異常処理規定 Process abnormal disposal std.	内部電極受入 検査規格 Inner electrode incoming insp. std.
					粘度計 Viscometer		粘度 Viscosity			ﾍﾟｰｽﾄﾛｯﾄ毎 Every paste lot	検査成績書 Inspection report			
							外観 Appearance			ﾍﾟｰｽﾄﾛｯﾄ毎 Every paste lot	検査成績書 Inspection report			
		7	内部電極印刷及び積み重ね PRINTING AND STACKING	内部電極印刷機 Printing machine			印刷状態 Printing condition		内部電極印刷 加工標準 Inner Electrode printing std.	加工標準による Depend on process std.	ﾁｪｯｸｼｰﾄ Check sheet	作業者 Operator	工程異常処理規定 Process abnormal disposal std.	内部電極印刷 加工標準 Inner Electrode printing std.
				積み重ね機 Stacking machine		ｼｮｯﾄ数 Screen Shots				加工標準による Depend on process std.	電子ﾒﾃﾞｨｱ Electric data base			
						ｽｷｰｼﾞ圧 Squeegee Pressure				ﾛｯﾄ毎 Every lot	電子ﾒﾃﾞｨｱ Electric data base			
						ｽｸﾘｰﾝﾃﾞｨｽﾀﾝｽ Screen Distance				ﾛｯﾄ毎 Every lot	電子ﾒﾃﾞｨｱ Electric data base			
					膜厚測定機 X-ray thickness meter		電極厚み Electrode thickness			加工標準による Depend on process std.	ｸﾞﾗﾌ Graph			
				乾燥機 Dry machine	温度計 Thermometer	乾燥温度 Drying temp.				加工標準による Depend on process std.	ﾁｪｯｸｼｰﾄ Check sheet			
		8	圧着 PRESSING	真空パック機 Vacuum pressure	真空度計 Vacuum gauge	真空度 Vacuum degree			圧着加工標準 Pressing std.	加工標準による Depend on process std.	ﾁｪｯｸｼｰﾄ Check sheet	作業者 Operator	工程異常処理規定 Process abnormal disposal std.	圧着加工標準 Pressing std.
				ﾌﾟﾚｽ機 Pressing machine	圧力計 Pressure gauge	ﾌﾟﾚｽ圧力 Pressure				加工標準による Depend on process std.	ｸﾞﾗﾌ又はﾁｪｯｸｼｰﾄ Graph or Check sheet			
					温度計 Thermometer	水温 Water temp.				加工標準による Depend on process std.	ｸﾞﾗﾌ又はﾁｪｯｸｼｰﾄ Graph or Check sheet			
					ﾏｲｸﾛﾒｰﾀｰ Micrometer		ﾌﾞﾛｯｸ厚み Block thickness			ﾛｯﾄ毎 Every lot	ｸﾞﾗﾌ Graph			
		9	ｶｯﾄ CUTTING	切断機 Cutting machine	拡大鏡 Magnifier		切断状態 Cutting condition		ｶｯﾄ加工標準 Cutting std.	ﾌﾞﾛｯｸ毎 Every block	電子ﾒﾃﾞｨｱ Electronic media	作業者 Operator	工程異常処理規定 Process abnormal disposal std.	ｶｯﾄ加工標準 Cutting std.
					表面温度計 Surface thermometer	予熱/ﾃｰﾌﾞﾙ温度 Pre-heating / table temp.				加工標準による Depend on process std.	ｸﾞﾗﾌ Graph			
		10	ｶｯﾄ （ﾀﾞｲｼﾝｸﾞ） CUTTING (Dicing saw)	切断機 Cutting machine	設備設定 Auto count	ｶｯﾄ刃ﾗｲﾌ Cut blade life			ｶｯﾄ加工標準 Cutting std.	指定回数 Every cut	電子ﾒﾃﾞｨｱ Electronic media	作業者 Operator	工程異常処理規定 Process abnormal disposal std.	ｶｯﾄ加工標準 Cutting std.
					ﾌﾛｰﾒｰﾀｰ Folw meter	水流量 Water flow				加工標準による Depend on process std.	ﾁｪｯｸｼｰﾄ Check sheet			
					圧力計 Pressure gauge	水圧力 Water pressure				加工標準による Depend on process std.	ﾁｪｯｸｼｰﾄ Check sheet			
		11	生ﾕﾆｯﾄ研磨 RAW UNIT GRINDING	研磨装置 Grinding machine		回転時間 Rotation time			ﾕﾆｯﾄ研磨加工標準 Unit grinding std.	ﾛｯﾄ毎 Every lot	作業伝票 Work order sheet	作業者 Operator	工程異常処理規定 Process abnormal disposal std.	ﾕﾆｯﾄ研磨加工標準 Unit grinding std.
						回転数 Rotation speed				ﾛｯﾄ毎 Every lot	作業伝票 Work order sheet			
						ﾁｬｰｼﾞ量 Charging Q'ty				ﾛｯﾄ毎 Every lot	作業伝票 Work order sheet			
		12	焼成 FIRING				さや詰め量 Q'ty per Sagger		焼成加工標準 Firing std.	さや毎 Every sagger	記録紙 Record sheet	作業者 Operator	工程異常処理規定 Process abnormal disposal std.	焼成加工標準 Firing std.
				焼成炉 Kiln	自動温度記録計 Auto temp.	温度ｶｰﾌﾞ、時間 Temp. curve,				加工標準による Depend on process std.	温度記録紙 Temp. record sheet			

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					recorder	Time								
					ﾌﾛｰﾒｰﾀｰ Flow meter	ｶﾞｽ流量 Gas flow amount				加工標準による Depend on process std.	ﾁｪｯｸｼｰﾄ Check sheet			
					酸素濃度計 Oxygen density meter	酸素濃度 Oxygen density				加工標準による Depend on process std.	ﾁｪｯｸｼｰﾄ Check sheet			
		13	ﾕﾆｯﾄ研磨 GRINDING	研磨装置 Grinding machine		回転時間 Rotation time			ﾕﾆｯﾄ研磨加工標準 Unit grinding std.	ﾛｯﾄ毎 Every lot	作業伝票 Work order sheet	作業者 Operator	工程異常処理規定 Process abnormal disposal std.	ﾕﾆｯﾄ研磨加工標準 Unit grinding std.
						回転数 Rotation speed				ﾛｯﾄ毎 Every lot	作業伝票 Work order sheet			
						ﾁｬｰｼﾞ量 Charging Q'ty				ﾛｯﾄ毎 Every lot	作業伝票 Work order sheet			
		14	外観ﾁｪｯｸ APPEARANCE CHECK		拡大鏡 Magnifier		外観 Appearance		焼成済外観ﾁｪｯｸ加工標準 Appearance checking std.	指定個数/ﾛｯﾄ Sampling number / lot	作業伝票 Work order sheet	作業者 Operator	工程異常処理規定 Process abnormal disposal std.	焼成済外観ﾁｪｯｸ加工標準 Appearance checking std.
					ﾀﾞｲﾔﾙﾉｷﾞｽ Caliper		寸法 Dimension			指定個数/ﾛｯﾄ Sampling number / lot	作業伝票 Work order sheet			
外部電極材料 Termination paste		15	外部電極受入検査 INCOMING INSPECTION (Termination paste)		比重計 Gravimeter		比重 Specific gravity		外部電極受入検査規格 Termination paste incoming insp. std.	ﾍﾟｰｽﾄﾛｯﾄ毎 Every paste lot	検査成績書 Inspection report	検査員 Inspector	工程異常処理規定 Process abnormal disposal std.	外部電極受入検査規格 Termination paste incoming insp. std.
					粘度計 Viscometer		粘度 Viscosity			ﾍﾟｰｽﾄﾛｯﾄ毎 Every paste lot	検査成績書 Inspection report			
							外観 Appearance			ﾍﾟｰｽﾄﾛｯﾄ毎 Every paste lot	検査成績書 Inspection report			
		16	外部電極塗布 TERMINATION	外部電極塗布機 Terminating machine	比重計 Gravimeter	ﾍﾟｰｽﾄ比重 Paste specific gravity			外部電極塗布加工標準 Terminating std.	加工標準による Depend on process std.	ﾁｪｯｸｼｰﾄ Check sheet	作業者 Operator	工程異常処理規定 Process abnormal disposal std.	外部電極塗布加工標準 Terminating std.
					拡大鏡 Magnifier		外観 Appearance			加工標準による Depend on process std.	電子ﾒﾃﾞｨｱ Electronic media			
					測定器 Measuring machine		寸法 Dimension			加工標準による Depend on process std.	ｸﾞﾗﾌ Graph			
		17	外部電極焼成 TERMINATION FIRING	さや詰め機 Saggering machine		さや詰め量 Q'ty per Sagger			外部電極焼成加工標準 Termination firing std.	加工標準による Depend on process std.	作業伝票 Work Order Sheet	作業者 Operator	工程異常処理規定 Process abnormal disposal std.	外部電極焼成加工標準 Termination firing std.
				外部電極焼付炉 Kiln	自動温度記録計 Auto temp. recorder	焼成温度 Firing temp.				加工標準による Depend on process std.	温度記録紙 Temp. record sheet			
						ﾍﾞﾙﾄｽﾋﾟｰﾄﾞ Belt speed				加工標準による Depend on process std.	ﾁｪｯｸｼｰﾄ Check sheet			
					酸素濃度計 Oxygen density meter	酸素濃度 Oxygen density				加工標準による Depend on process std.	ﾁｬｰﾄ Chart			
		18	外部電極めっき TERMINATION PLATING	自動めっき装置 Auto plating equipment	膜厚測定機 X-ray thickness meter		めっき厚み Plating thickness	◎	めっき加工標準 Plating std.	加工標準による Depend on process std.	ｸﾞﾗﾌ graph	作業者 Operator	工程異常処理規定 Process abnormal disposal std.	めっき加工標準 Plating std.
					電流計 Current meter	電流値 Current value				加工標準による Depend on process std.	電子ﾒﾃﾞｨｱ Electronic media			
					温度計 Thermometer	槽温度 Bath temp.				加工標準による Depend on process std.	ｸﾞﾗﾌ graph			
					PHﾒｰﾀｰ PH meter	PH PH				加工標準による Depend on process std.	ｸﾞﾗﾌ graph			
						浴濃度（Ni&Tin） Concentration (Ni&Tin)				加工標準による Depend on process std.	ﾁｪｯｸｼｰﾄ Check sheet			
							チャージ量			ﾛｯﾄ毎	電子ﾒﾃﾞｨｱ			

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							Charging Q'ty			Every lot	Electronic media			
				分離機 Separator										
		19	特性選別 ELECTRICAL SORTING	特性選別機 Electrical sorting machine	Cﾒｰﾀｰ Capacitance meter		静電容量 Capacitance		測定選別加工標準 Electrical characteristics sorting std.	100%xﾛｯﾄ毎 100% / lot	電子ﾒﾃﾞｨｱ Electronic media	作業者 Operator	工程異常処理規定 Process abnormal disposal std.	測定選別加工標準 Electrical characteristics sorting std.
							Q/DF Q/DF			100%xﾛｯﾄ毎 100% / lot	電子ﾒﾃﾞｨｱ Electronic media			
					IRﾒｰﾀｰ Resistance meter		絶縁抵抗 IR			100%xﾛｯﾄ毎 100% / lot	電子ﾒﾃﾞｨｱ Electronic media			
							耐電圧 Withstanding voltage			100%xﾛｯﾄ毎 100% / lot	電子ﾒﾃﾞｨｱ Electronic media			
		20	外観選別 APPEARANCE SORTING		拡大鏡 Magnifier		外観 Appearance		外観選別加工標準 Appearance sorting std.	抜取り又は100%xﾛｯﾄ毎 Sampling or 100% / lot	電子ﾒﾃﾞｨｱ Electronic media	作業者 Operator	工程異常処理規定 Process abnormal disposal std.	外観選別加工標準 Appearance sorting std.
					自動外選機 Appearance sorting machine									
		21	出荷検査 OUTGOING INSPECTION		Cﾒｰﾀｰ Capacitance meter		静電容量 Capacitance		出荷検査規格 Outgoing insp. std.	ISO2859-1 LevelⅡ AQL : 0.25n *1	電子ﾒﾃﾞｨｱ又は 検査成績書 Electronic media or Inspection report	検査員 Inspector	工程異常処理規定 Process abnormal disposal std.	出荷検査規格 Outgoing insp. std.
							DF/Q DF/Q			AQL : 0.25n				
					IRﾒｰﾀｰ Resistance meter		絶縁抵抗 IR			AQL : 0.04n				
					耐圧試験機 Flash tester		耐電圧 Withstanding voltage			AQL : 0.04n				
					拡大鏡 Magnifier		外観 Appearance			AQL : 0.65n/0.65/2.5				
					ﾀﾞｲﾔﾙﾉｷﾞｽ、もしくは ﾏｲｸﾛﾒｰﾀｰ Caliper or Micrometer		寸法 Dimension			ISO2859-1 Level S-4 AQL : 0.65n				
							内部解析 (ﾃﾞﾗﾐ、ﾎﾞｲﾄﾞ) Inner analysis (Derami,Void)			n=10				
包装材料 Taping material		22	包装材料受入検査 INCOMING INSPECTION(※) (Taping material)		工具顕微鏡 Microscope		外観 Appearance		包装材料受入 検査規格 Taping material incoming insp. std.	材料ﾛｯﾄ毎 Every lot	検査成績書 Inspection report	検査員 Inspector	工程異常処理規定 Process abnormal disposal std.	包装材料受入 検査規格 Taping material incoming insp. std.
							寸法 Dimension			材料ﾛｯﾄ毎 Every lot	検査成績書 Inspection report			
		23	ﾃｰﾋﾟﾝｸﾞ TAPING	ﾃｰﾋﾟﾝｸﾞ機 Taping machine	Cﾒｰﾀｰ Capacitance meter		静電容量 Capacitance		ﾃｰﾋﾟﾝｸﾞ加工標準 Taping std.	100%xﾛｯﾄ毎 100% / lot	作業伝票 Work order sheet	作業者 Operator	工程異常処理規定 Process abnormal disposal std.	ﾃｰﾋﾟﾝｸﾞ加工標準 Taping std.
					自動外選機 Appearance sorting machine		外観 Appearance		外観選別加工標準 Appearance sorting std.	100%xﾛｯﾄ毎 100% / lot	作業伝票 Work order sheet			外観選別加工標準 Appearance sorting std.
					剥し力測定器		剥し力			加工標準による	ｸﾞﾗﾌ			

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					Peel off force tester		Peel off force			Depend on process std.	Graph			
						シール温度 Sealing temp				ﾛｯﾄ毎 Every lot	作業伝票 Work order sheet			
	◇	24	ﾃｰﾋﾟﾝｸﾞ外観ﾁｪｯｸ TAPING APPEARANCE SORTING		目視 Visual		ﾘｰﾙ外観 Reel appearance		ﾃｰﾋﾟﾝｸﾞ外観選別 加工標準 Taping appearance sorting std.	加工標準による Depend on process std.	作業伝票 Work order sheet	作業者 Operator	工程異常処理規定 Process abnormal disposal std.	ﾃｰﾋﾟﾝｸﾞ外観選別 加工標準 Taping appearance sorting std.
	◇	25	包装検査 REEL INSPECTION		目視 Visual		品番 Part No.		包装検査規格 Taping inspection std.	ﾛｯﾄ毎 Every lot	作業伝票 Work order sheet	検査員 Inspector	工程異常処理規定 Process abnormal disposal std.	包装検査規格 Taping inspection std.
	○	26	個装 PACKING		ﾊﾞｰｺｰﾄﾞﾘｰﾀﾞｰ Bar code reader		ﾗﾍﾞﾙ表示内容 Label contents		個装加工標準 Packing std.	ﾛｯﾄ毎 Every lot	作業伝票 Work order sheet	作業者 Operator	工程異常処理規定 Process abnormal disposal std.	個装加工標準 Packing std.
							数量 Amount			ﾛｯﾄ毎 Every lot	作業伝票 Work order sheet			
							外観 Appearance			ﾛｯﾄ毎 Every lot	作業伝票 Work order sheet			
	▽	27	出荷 SHIPPING											

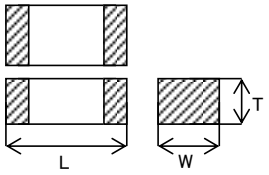
*1: 0.25n%は、AQL 0.25%でのｻﾝﾌﾟﾘﾝｸﾞｻｲｽﾞを意味し、判定はAc:Re＝0:1(n)で行う。
0.25n% means that sampling size is AQL 0.25% and judgment is Ac:Re = 0:1

Chip Monolithic Ceramic Capacitor

Electrical Characteristics Data

	Murata Global Part No	Size (inch/mm)	Temp. Chara.	Cap.Value	Cap.Tol.	Volt.	Durability (%Rated Volt.)
Item 1	GCM188R71H104KA57_Murata Philippine	0603/1608	X7R	0.1uF	+/-10%	50V	200 %
Item 2	GCM188R71H104KA57_Murata Japan	0603/1608	X7R	0.1uF	+/-10%	50V	200 %

1. Dimension



(mm)

	L	W	T
Item 1	1.6+/-0.1	0.8+/-0.1	0.8+/-0.1
Item 2	1.6+/-0.1	0.8+/-0.1	0.8+/-0.1

2. Cap,DF,IR

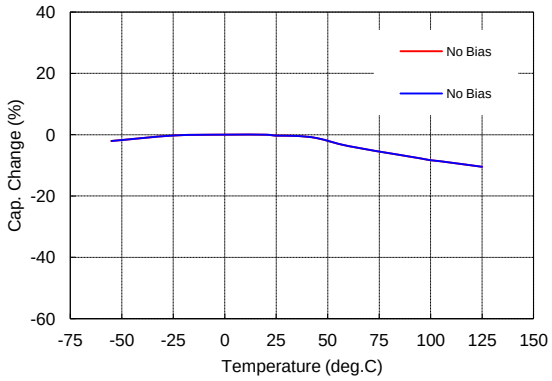
Capacitance,DF 1kHz , 1Vrms

IR 50V , 120s

Spec	Cap.[μF]	DF	IR[M ohm]
Item 1	0.09 to 0.11	0.025 max.	5.0E+03 min.
Item 2	0.09 to 0.11	0.025 max.	5.0E+03 min.

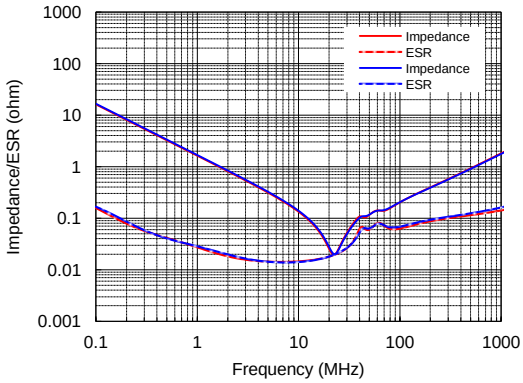
3. Capacitance - Temperature Characteristics

1kHz , 1Vrms Equipment: HP4284A



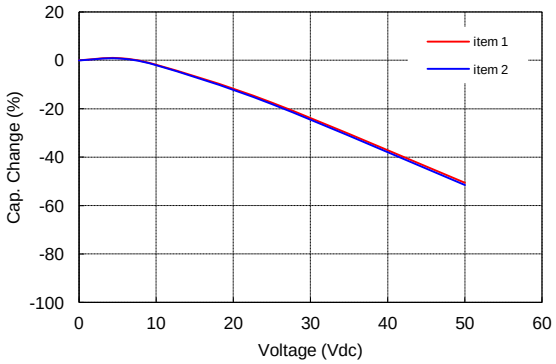
4. Impedance/ESR - Frequency

Equipment: E5071C(PC-SMA-SR/YOKOWO)



5. Capacitance - DC Voltage Characteristics

1kHz , 1Vrms Equipment: HP4284A



6. Capacitance - AC Voltage Characteristics

1kHz Equipment: HP4284A