Integrated Device Technology, Inc.
6024 Silver Creek Valley Road, San Jose, CA - 95138

PRODUCT/PROCESS CHANGE NOTICE (PCN)

PCN #: **A1208-06** Date: November 16, 2012
Product Affected: SOIC-16

Date Effective: February 16, 2013

MEANS OF DISTINGUISHING CHANGED DEVICES:
- ■ Product Mark
- ☐ Back Mark
- ☐ Date Code
- ☐ Other

Change in ordering part#

Contact: Bimla Paul
Title: Product Quality Assurance
Phone #: (408) 574-6419
Fax #: (408) 284-8362
E-mail: Bimla.Paul@idt.com

Attachment: ■ Yes ☐ No

Samples: Available upon request

DESCRIPTION AND PURPOSE OF CHANGE:

- ☐ Die Technology
- ☐ Wafer Fabrication Process
- ☐ Assembly Process
- ☐ Equipment
- ■ Material
- ☐ Testing
- ■ Manufacturing Site
- ☐ Data Sheet
- ☐ Other

This notification is to advise our customers to switch to the RoHS-compliant version of the device. The new part is pin-to-pin compatible with the old part. There are no changes to the electrical parameters or MSL specification.

The last time buy for the old part is May 16, 2013, with last ship date August 16, 2013.

There are multiple material changes. See attachment 1, Table 1 for the qualification summary and material set details.

The new products are distinguished by a change to the orderable part numbers. See attachment 2 for details.

The new parts use a different crystal, part number CM7V-T1A from Micro Crystal. See attachment 3 for the data sheet and material declaration of the new crystal.

RELIABILITY/QUALIFICATION SUMMARY:

Qualification has passed. There is no change in MSL rating.

CUSTOMER ACKNOWLEDGMENT OF RECEIPT:

IDT records indicate that you require written notification of this change. Please use the acknowledgement below or E-Mail to grant approval or request additional information. If IDT does not receive acknowledgement within 30 days of this notice it will be assumed that this change is acceptable.
IDT reserves the right to ship either version manufactured after the process change effective date until the inventory on the earlier version has been depleted.

Customer: _____ ☐ ***Approval for shipments prior to effective date.***

Name/Date: _____ E-Mail Address: _____

Title: _____ Phone# /Fax# : _____

CUSTOMER COMMENTS:

_____
_____
_____

IDT ACKNOWLEDGMENT OF RECEIPT:

RECD. BY: _____ DATE _____

Integrated Device Technology, Inc.
6024 Silver Creek Valley Road, San Jose, CA - 95138

PRODUCT/PROCESS CHANGE NOTICE (PCN)

ATTACHMENT 1 - PCN # : A1208-06

PCN Type: Material and Manufacturing Location Change

Data Sheet Change: Yes, new part is RoHS-compliant. No change in MSL specification.

Detail Of Change:

This notification is to advise our customers to switch to the RoHS-compliant version of the device. The new part is pin-to-pin compatible with the old part. There are no changes to the electrical parameters or MSL specification.

The last time buy for the old part is May 16, 2013, with last ship date August 16, 2013.

There are multiple material changes. See attachment 1, Table 1 for the qualification summary and material set details.

The new products are distinguished by a change to the orderable part numbers. See attachment 2 for details.

The new parts use a different crystal, part number CM7V-T1A from Micro Crystal. See attachment 3 for the data sheet and material declaration of the new crystal.

Table 1: Material info

Description	Old	New
Fab Location	Fab 4	TSMC
Assembly Location	Hana	Carsem
Crystal Type	MS3V-T1N	CM7V-T1A
Mold Compound	G600	CEL-8240HF10LX
Die Attach	84-1LMISR4	QMI1519
Bond Wire	Au Wire	Au Wire
RoHS-Compliant	No	Yes

PRODUCT/PROCESS CHANGE NOTICE (PCN)

ATTACHMENT 1 - PCN # : A1208-06

Qualification Test Plan and Qual Data

Product Type: IDT1337	
Device Family: AP510 Package Type: SOIC-16L	Process Technology: 0.18 um Fab Location: TSMC

Test Description

Test	Conditions	Lot #1	Lot #2	Lot #3
Device Characterization	IDT's data sheet conditions	5/0	5/0	5/0
High Temperature Operating Life (Dynamic)	JESD22-A108, +125°C @ 1000 hours or equivalent	77/0	77/0	77/0
Early Failure Rate (Dynamic)	JESD22-A108, +125°C @ 48 hours or equivalent	1176/0	1167/0	1171/0
ESD: Human Body Model	Mil-Std-883, method 3015, JESD22-A114-B	5/0	N/A	N/A
ESD: Charged Device Model	JESD22-C101B.01	5/0	N/A	N/A
Latch-up	EIA/JESD78	6/0	N/A	N/A
Solderability	JESD22-B102D	5/0	5/0	5/0
Temperature Cycle	JESD22-A104, @ -55°C to 125°C for 700 cycles or equivalent	25/0	25/0	25/0
Highly-Accelerated Temperature and Humidity Stress Test (HAST)	JESD22-A110, @130°C/85%RH static bias at Vccmax for 100 hours	25/0	25/0	25/0
High Temperature Storage	JESD22-A103A, @150°C for 1000 hours	25/0	25/0	25/0
Moisture Resistance	JESD22A-A113D	25/0 Level 3	25/0 Level 3	N/A
Mechanical Vibration	JESD22B-103A 20 to 2000Hz/20G Peak	15/0	15/0	15/0
Mechanical Shock	JESD22B-104C 1500G Peak/0.5msec	15/0	15/0	15/0
Wire Pull Strength	MIL-STD-883D, 2011.7	5/0	5/0	5/0
Ball Shear Strength	JESD22-B11	5 /0	5/0	5/0

ATTACHMENT 2 - PCN # : A1208-06

Affected Part Numbers

Old Part Number	New Part Number
1337GCSRI	1337AGCSRGI
1337GCSRI8	1337AGCSRGI8

Test Report

No. : CE/2011/A5193A Date : 2011/11/03 Page : 1 of 10

MICRO CRYSTAL AG
MUEHLESTRASSE 14, CH-2540, GRENCHEN, SWITZERLAND

The following sample(s) was/were submitted and identified by/on behalf of the client as:

Sample Description	:	QUARTZ CRYSTAL RESONATOR
Style/Item No.	:	CC-TYPES (CC1/CC4/CC5/CC6/CC7/CM7/CM8) WITH MARKING
Manufacturer/Vendor	:	MICRO CRYSTAL AG
Country Of Origin	:	SWITZERLAND
Sample Receiving Date	:	2007/07/20 AND 2008/02/14 AND 2010/08/31 AND 2011/10/27
Testing Period	:	2007/07/20 TO 2007/07/30 AND 2007/07/30 TO 2007/08/03 AND 2008/02/14 TO 2008/02/21 AND 2010/08/31 TO 2010/09/07 AND 2011/10/27 TO 2011/11/03

==========

Test Result(s) : Please refer to next page(s).

* This report is combined with reports of CE/2010/86004A and CE/2011/A5193 *

Chenyu Kung / Operation Manager
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory – Taipei

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MICRO CRYSTAL AG
MUEHLESTRASSE 14, CH-2540, GRENCHEN, SWITZERLAND

Test Result(s)

PART NAME No.1 : QUARTZ CRYSTAL (CE/2007/74957)
PART NAME No.2 : QUARTZ CRYSTAL (CE/2008/21880)
PART NAME No.3 : QUARTZ CRYSTAL (CE/2010/86004)
PART NAME No.4 : QUARTZ CRYSTAL (CE/2011/A5193)

Test Item(s)	Unit	Method	MDL	Result			
				No.1	No.2	No.3	No.4
Cadmium (Cd)	mg/kg	With reference to IEC 62321, Ed. 1 111/54/CDV. Determination of Cadmium by ICP-AES.	2	n.d.	---	---	---
	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	---	---	n.d.	n.d.
Lead (Pb)	mg/kg	With reference to IEC 62321, Ed. 1 111/54/CDV. Determination of Lead by ICP-AES.	2	n.d.	---	---	---
	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	---	---	n.d.	n.d.
Mercury (Hg)	mg/kg	With reference to IEC 62321, Ed. 1 111/54/CDV. Determination of Mercury by ICP-AES.	2	n.d.	---	---	---
	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	---	---	n.d.	n.d.
Hexavalent Chromium Cr(VI) by alkaline extraction	mg/kg	With reference to IEC 62321, Ed. 1 111/54/CDV. Determination of Hexavalent Chromium for non-metallic samples by UV/Vis Spectrometry.	2	n.d.	---	---	---
Hexavalent Chromium Cr(VI)	mg/kg	With reference to IEC 62321: 2008 and performed by UV-VIS.	2	---	---	n.d.	n.d.
Antimony (Sb)	mg/kg	With reference to US EPA Method 3050B for Antimony Content. Analysis was performed by ICP-AES.	2	---	n.d.	---	---
Phosphorus (P)	mg/kg	With reference to US EPA 3050B for Phosphorus Content. Analysis was performed by ICP-AES.	2	---	n.d.	---	---

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MUEHLESTRASSE 14, CH-2540, GRENCHEN, SWITZERLAND

Test Item(s)	Unit	Method	MDL	Result			
				No.1	No.2	No.3	No.4
Halogen							
Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC.	50	---	n.d.	---	---
Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC.	50	---	n.d.	---	---
Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC.	50	---	n.d.	---	---
Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC.	50	---	n.d.	---	---
Sum of PBBs	mg/kg	With reference to IEC 62321: 2008 and performed by GC/MS.	-	---	---	n.d.	n.d.
Monobromobiphenyl			5	---	---	n.d.	n.d.
Dibromobiphenyl			5	---	---	n.d.	n.d.
Tribromobiphenyl			5	---	---	n.d.	n.d.
Tetrabromobiphenyl			5	---	---	n.d.	n.d.
Pentabromobiphenyl			5	---	---	n.d.	n.d.
Hexabromobiphenyl			5	---	---	n.d.	n.d.
Heptabromobiphenyl			5	---	---	n.d.	n.d.
Octabromobiphenyl			5	---	---	n.d.	n.d.
Nonabromobiphenyl			5	---	---	n.d.	n.d.
Decabromobiphenyl			5	---	---	n.d.	n.d.
Sum of PBDEs			-	---	---	n.d.	n.d.
Monobromodiphenyl ether			5	---	---	n.d.	n.d.
Dibromodiphenyl ether			5	---	---	n.d.	n.d.
Tribromodiphenyl ether			5	---	---	n.d.	n.d.
Tetrabromodiphenyl ether			5	---	---	n.d.	n.d.
Pentabromodiphenyl ether			5	---	---	n.d.	n.d.
Hexabromodiphenyl ether			5	---	---	n.d.	n.d.
Heptabromodiphenyl ether			5	---	---	n.d.	n.d.
Octabromodiphenyl ether			5	---	---	n.d.	n.d.
Nonabromodiphenyl ether			5	---	---	n.d.	n.d.
Decabromodiphenyl ether			5	---	---	n.d.	n.d.

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MICRO CRYSTAL AG
MUEHLESTRASSE 14, CH-2540, GRENCHEN, SWITZERLAND

Test Item(s)	Unit	Method	MDL	Result			
				No.1	No.2	No.3	No.4
Sum of PBBs	mg/kg	With reference to IEC 62321, Ed. 1 111/54/CDV. Determination of PBB and PBDE by GC/MS.	-	n.d.	---	---	---
Monobromobiphenyl			5	n.d.	---	---	---
Dibromobiphenyl			5	n.d.	---	---	---
Tribromobiphenyl			5	n.d.	---	---	---
Tetrabromobiphenyl			5	n.d.	---	---	---
Pentabromobiphenyl			5	n.d.	---	---	---
Hexabromobiphenyl			5	n.d.	---	---	---
Heptabromobiphenyl			5	n.d.	---	---	---
Octabromobiphenyl			5	n.d.	---	---	---
Nonabromobiphenyl			5	n.d.	---	---	---
Decabromobiphenyl			5	n.d.	---	---	---
Sum of PBDEs			-	n.d.	---	---	---
Monobromodiphenyl ether			5	n.d.	---	---	---
Dibromodiphenyl ether			5	n.d.	---	---	---
Tribromodiphenyl ether			5	n.d.	---	---	---
Tetrabromodiphenyl ether			5	n.d.	---	---	---
Pentabromodiphenyl ether			5	n.d.	---	---	---
Hexabromodiphenyl ether			5	n.d.	---	---	---
Heptabromodiphenyl ether			5	n.d.	---	---	---
Octabromodiphenyl ether			5	n.d.	---	---	---
Nonabromodiphenyl ether			5	n.d.	---	---	---
Decabromodiphenyl ether			5	n.d.	---	---	---

Note：

1. mg/kg = ppm；0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
4. " - " = Not Regulated
5. "---" = Not Conducted

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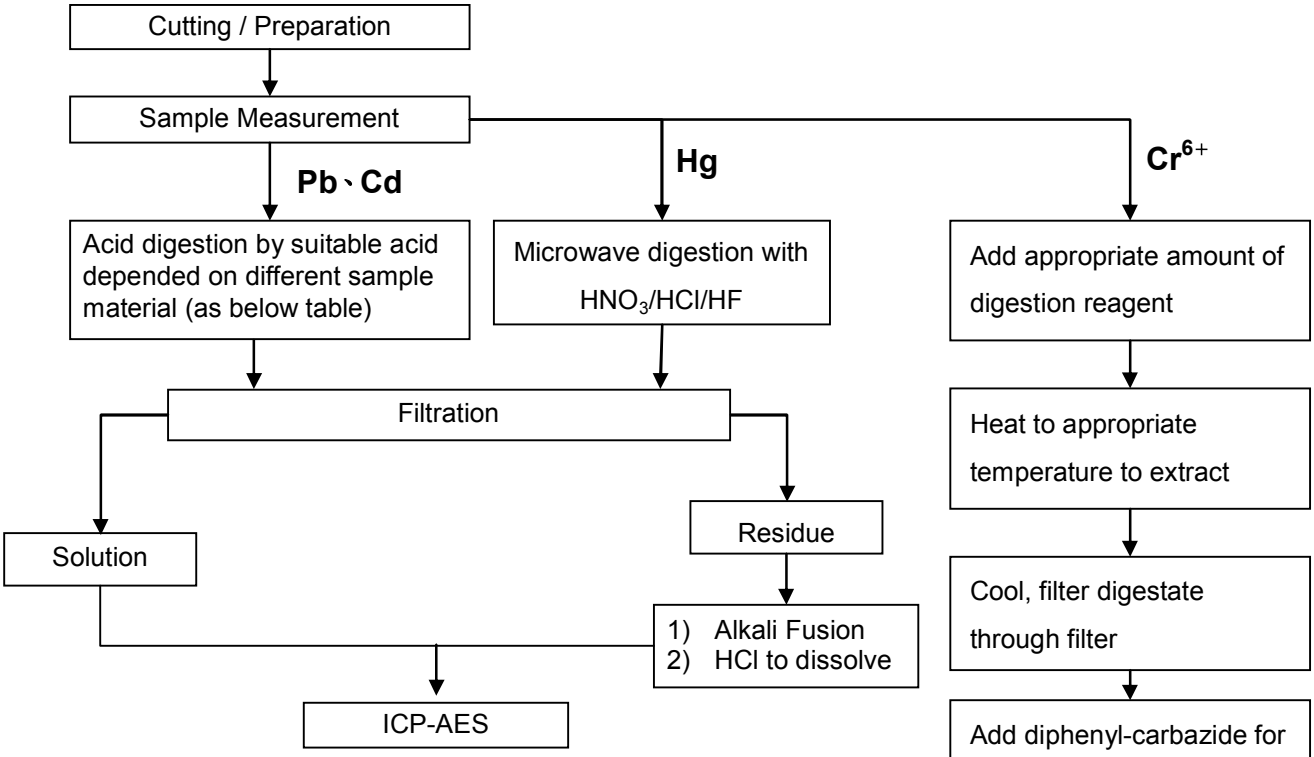
MICRO CRYSTAL AG
MUEHLESTRASSE 14, CH-2540, GRENCHEN, SWITZERLAND

1) These samples were dissolved totally by pre-conditioning method according to below flow chart. （Cr^{6+} test method excluded）
2) Name of the person who made measurement: Climbgreat Yang
3) Name of the person in charge of measurement: Troy Chang



Sample Material	Digestion Acid
Steel, copper, aluminum, solder	Aqua regia, HNO_3, HCl, HF, H_2O_2
Glass	HNO_3/HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO_3
Plastic	H_2SO_4, H_2O_2, HNO_3, HCl
Others	Any acid to total digestion

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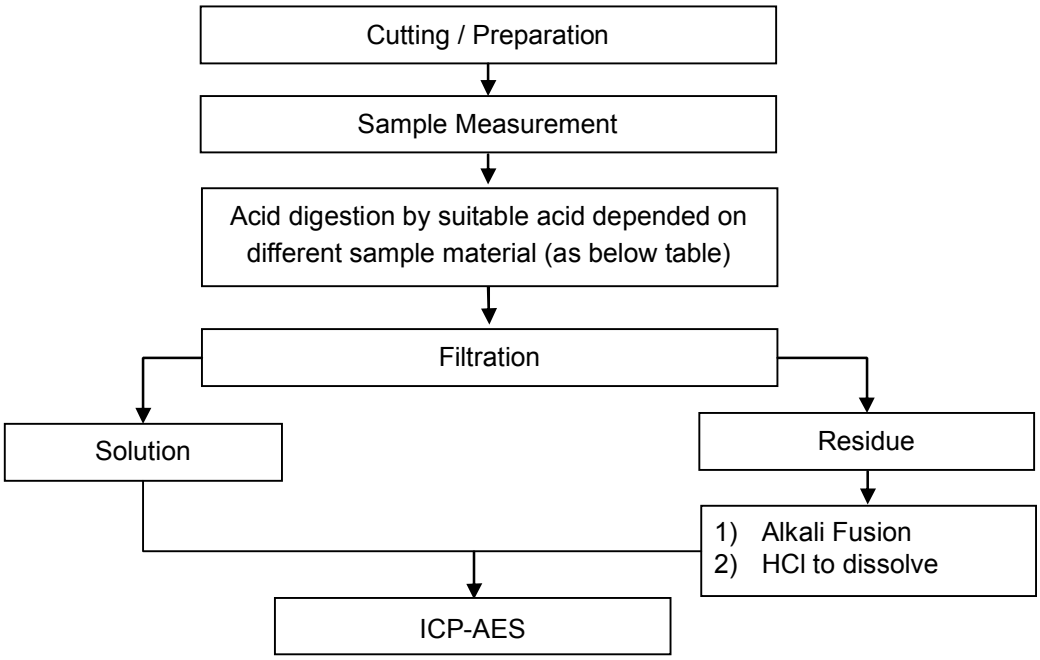
MICRO CRYSTAL AG
MUEHLESTRASSE 14, CH-2540, GRENCHEN, SWITZERLAND

1) These samples were dissolved totally by pre-conditioning method according to below flow chart.
2) Name of the person who made measurement: Climbgreat Yang
3) Name of the person in charge of measurement: Troy Chang

Flow Chart of digestion for the elements analysis performed by ICP-AES



Steel, copper, aluminum, solder	Aqua regia, HNO_3, HCl, HF, H_2O_2
Glass	HNO_3/HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO_3
Plastic	H_2SO_4, H_2O_2, HNO_3, HCl
Others	Any acid to total digestion

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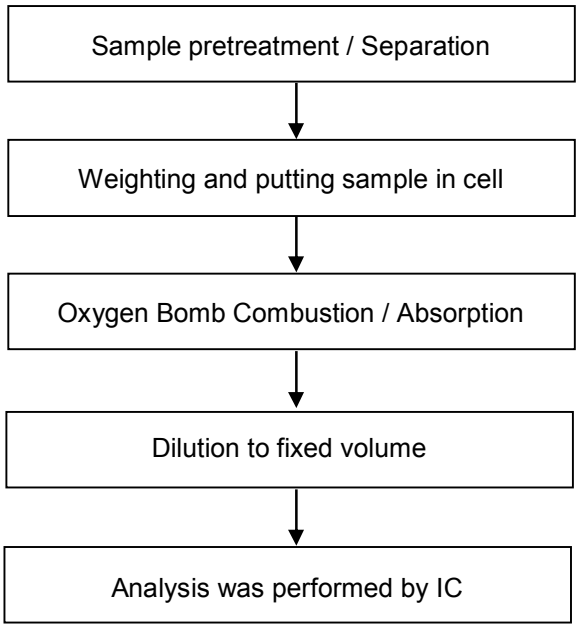
MICRO CRYSTAL AG
MUEHLESTRASSE 14, CH-2540, GRENCHEN, SWITZERLAND

Analytical flow chart of halogen content

1) Name of the person who made measurement: Rita Chen
2) Name of the person in charge of measurement: Troy Chang



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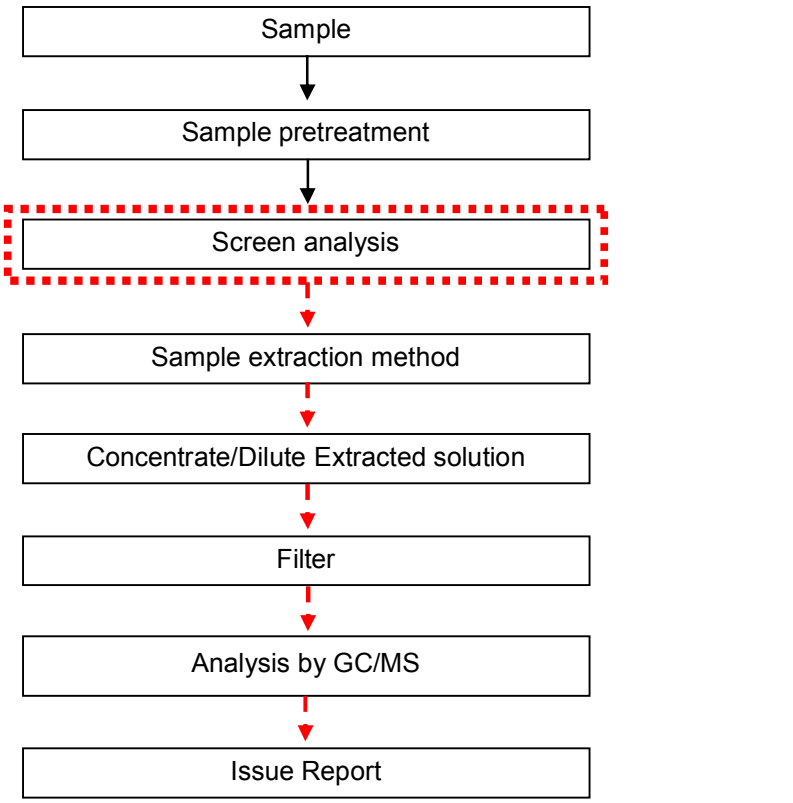
MICRO CRYSTAL AG
MUEHLESTRASSE 14, CH-2540, GRENCHEN, SWITZERLAND

Analytical flow chart

- Name of the person who made measurement: Roman Wong
- Name of the person in charge of measurement: Troy Chang

【Test Items: PBB/PBDE, TBBP-A-bis 】

First testing process ⟶ Optional screen process ····· Confirmation process



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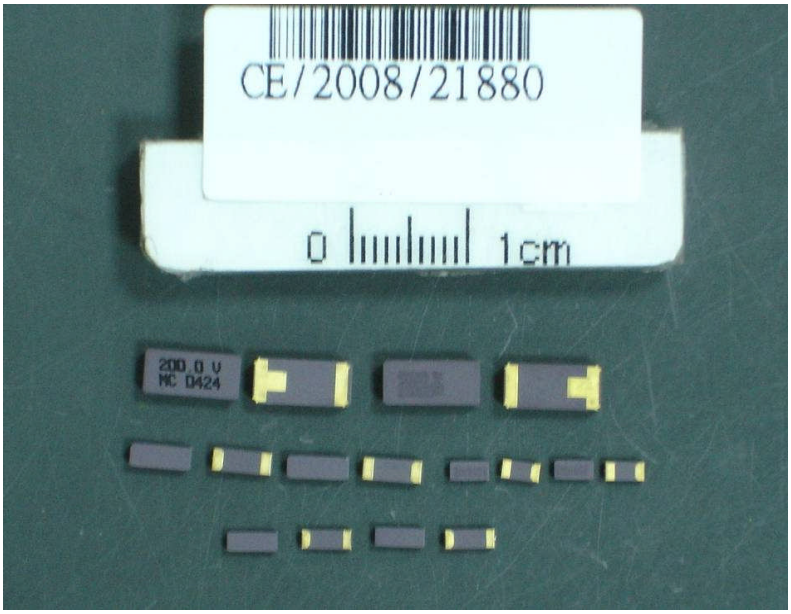
MUEHLESTRASSE 14, CH-2540, GRENCHEN, SWITZERLAND

*** The tested sample / part is marked by an arrow if it's shown on the photo. ***

PART NAME No.1

PART NAME No.2



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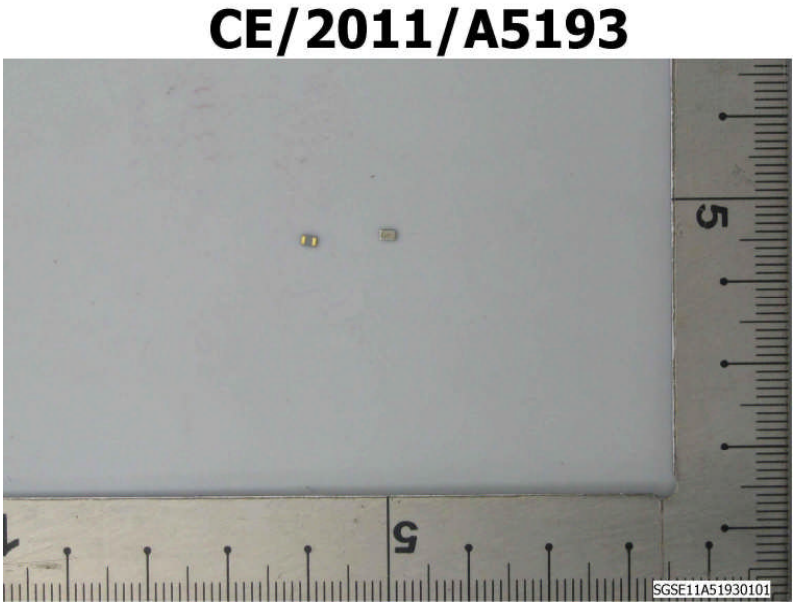
MICRO CRYSTAL AG
MUEHLESTRASSE 14, CH-2540, GRENCHEN, SWITZERLAND

PART NAME No.3

PART NAME No.4



** End of Report **

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MICRO CRYSTAL SWITZERLAND

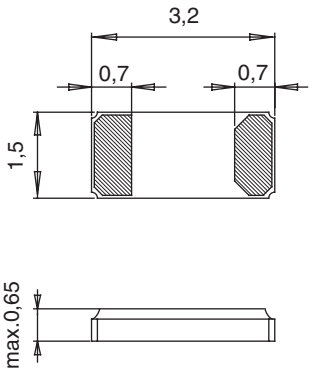
CM7V-T1A

Tuning Fork Crystal 32.768 kHz

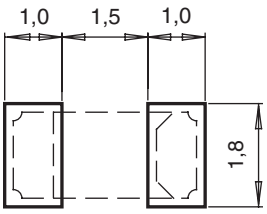
100% leadfree, RoHS - compliant

DIMENSIONS

Package:



Recommended Solder Pad:



All dimensions in mm typical

Miniature SMT ceramic package with metal lid
Low package height 0.65 mm max.
SMD-package in Tape and Reel
Ind. and Ext. temperature ranges
AEC-Q200 automotive compliant
High stability, Low aging
Low power consumption
High shock and vibration resistance

DESCRIPTION:

This SMD ceramic package with metal lid has been specially designed for miniature industrial, telecom and portable applications. This part is available for extended operating temperature range and is compliant with the AEC-Q200 quality standards for automotive applications.
A special crystal manufacturing process is used to achieve improved electrical characteristics and a miniaturized blank size.

For pick-and-place equipment, the parts are available in 12 mm tape:
7" (178 mm) reel with 1'000 crystals
7" (178 mm) reel with 3'000 crystals
13" (330 mm) reel with 14'000 crystals

ELECTRICAL CHARACTERISTICS AT 25°C:

Nominal Frequency 1)	**F_L**	**32.768**	**kHz**
Load capacitance 2)	C_L	7.0 / 9.0 / 12.5	pF
Frequency tolerance 3)	ΔF/F	+/-20	ppm
	ΔF/F	+/-100	ppm
Series resistance typ./max.	R_S	50 / 70	kΩ
Motional capacitance typ.	C_1	3.7	fF
Static capacitance typ.	C_0	1.2	pF
Drive level max.	P	1.0	µW
Insulation resistance min.	R_i	500	MΩ
Aging first year max.	ΔF/F	+/-3	ppm
Turnover temperature	T_0	25 +/-5	°C
Frequency vs. temperature	$\Delta F/F_0$	$-0.035\ ^{ppm}/_{°C^2}\ (T - T_0)^2$ +/-10%	ppm

1) Other frequencies on request.
2) Other load capacitances on request.
3) Tighter and wider frequency tolerances on request.

STANDARD FREQUENCIES:

Frequency kHz
32.768
Other frequencies on request

ENVIRONMENTAL CHARACTERISTICS:

		Conditions	Max. Dev.
Storage temp. range		–55 to +125°C	
TA Operating temperature range		–40 to +85°C	
TB Extended oper. temp. range		–40 to +125°C	
Shock resistance	ΔF/F	5000 g, 0.3 ms, ½ sine	+/-5 ppm
Vibration resistance	ΔF/F	20 g / 10–2000 Hz	+/-5 ppm

TERMINATIONS AND PROCESSING:

Type	Termination	Processing
CM7V-T1A	For SMD mounting Au plated pads	Reflow soldering 260°C / 20 s max.

PRODUCT DESCRIPTION AND ORDERING INFORMATION:

CM7V–T1A **32.768kHz** **12.5pF** **+/-20ppm** **TA** **QC**

Frequency F_L

C_L Load Capacitance
7.0 pF
9.0 pF
12.5 pF

Frequency tolerance
+/- 20 ppm
+/- 100 ppm

Temperature Range
TA = -40 to 85°C (Standard)
TB = -40 to +125°C

Optional:
if not defined,
‚Standard' will apply

Qualification
QC = Commercial (Standard)
QA = Automotive AEC-Q200

A unique part number will be generated for each product specification, i.e:

20xxxx-MG01	1'000 pcs (in 12mm tape on 7" reel)
20xxxx-MG03	3'000 pcs (in 12mm tape on 7" reel)
20xxxx-PG14	14'000 pcs (in 12mm tape on 13" reel)

Please contact us.

All specifications subject to change without notice.

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