



U.S. dime size reference

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SQ-SEN, ASX & MIN PRODUCT FAMILY

TILT, SHOCK & VIBRATION SENSORS

PRODUCT WEIGHTS AND MFG LOCATION

PRODUCT	PER UNIT WEIGHT (G)	PACKAGED WEIGHT (2000 PCS REEL, KG)	MANUFACTURING LOCATION
SQ-SEN-200	0.29	1.0	USA
SQ-SEN-390	0.27	0.9	USA
SQ-SEN-645B	0.32	1.1	USA
SQ-SEN-660	0.31	1.1	USA
SQ-SEN-675	0.30	1.0	USA
SQ-SEN-815	0.26	1.0	USA
SQ-SEN-830	0.27	1.0	USA
SQ-SEN-845	0.26	0.9	USA
SQ-ASA-xxx	0.30	1.0	USA
SQ-ASB-xxx	0.30	1.0	USA
SQ-ASD-xxx	0.30	1.0	USA
SQ-ASE-xxx	0.30	1.0	USA
SQ-MIN-200	0.04	0.26	USA

ESD LEVEL

Products in the SQ-SEN, SQ-ASx and SQ-MIN product family are electromechanical switches, and are not affected by ESD.

MOISTURE SENSITIVITY LEVEL

Products in the SQ-SEN, SQ-ASx and SQ-MIN product family are not sensitive to moisture, and are considered MSL1.

TAPE AND REEL INFORMATION



Conductive carrier tape, pressure sealed cover tape, 13" or 7" diameter reels.

SYMBOL	13" REEL SEN/ASx	7" REEL SEN/ASx	13" REEL MIN	7" REEL MIN
Diameter	13"	7"	13"	7"
Center Hole Diameter	0.5"	0.5"	0.5"	0.5"
Overall Width	0.85"	0.85"	0.7"	0.7"

FUNCTION

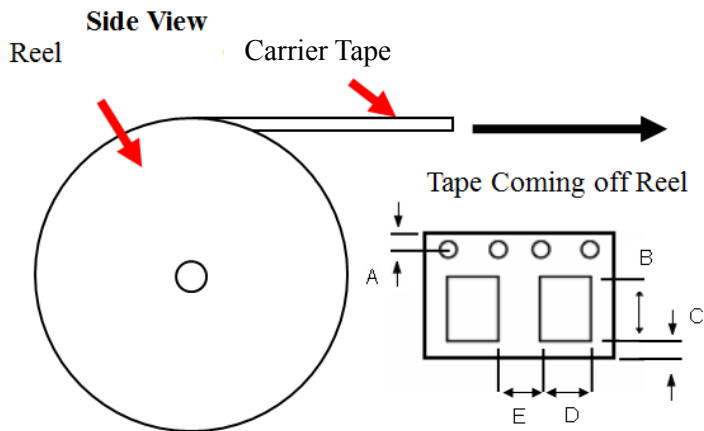
- Organized, clean packaging for SQ-SEN/ASx and SQ-MIN product lines

FEATURES

- 13" Diameter Reel** - Standard quantity 2,000 pcs-SEN/ASx; 5,000 pcs-MIN
- 7" Diameter Reel** - Standard quantity 500 pcs-SEN/ASx; 2,000 pcs-MIN
- Pressure Sealed Cover Tape**

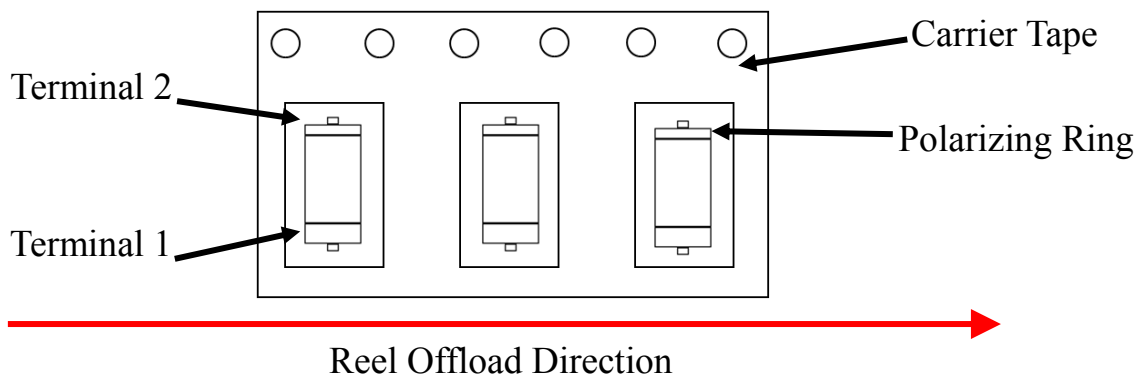
DESCRIPTION

The carrier tape is 16mm (SQ-SEN/ASx) or 12mm wide (SQ-MIN) on a plastic reel in a planetary wound format. The carrier tape can be continuous, or have one or more splices. It can come in two different reel diameter sizes, 13" and 7", and can carry standard quantities of 2,000 and 500 SEN/Asx parts; or 5,000 and 2,000 MIN parts, respectively.



SEN/ASx	
SYMBOL	MM
A	2
B	8.5
C	2.5
D	4
E	4
Width of Carrier Tape	16
Depth of Pocket	4

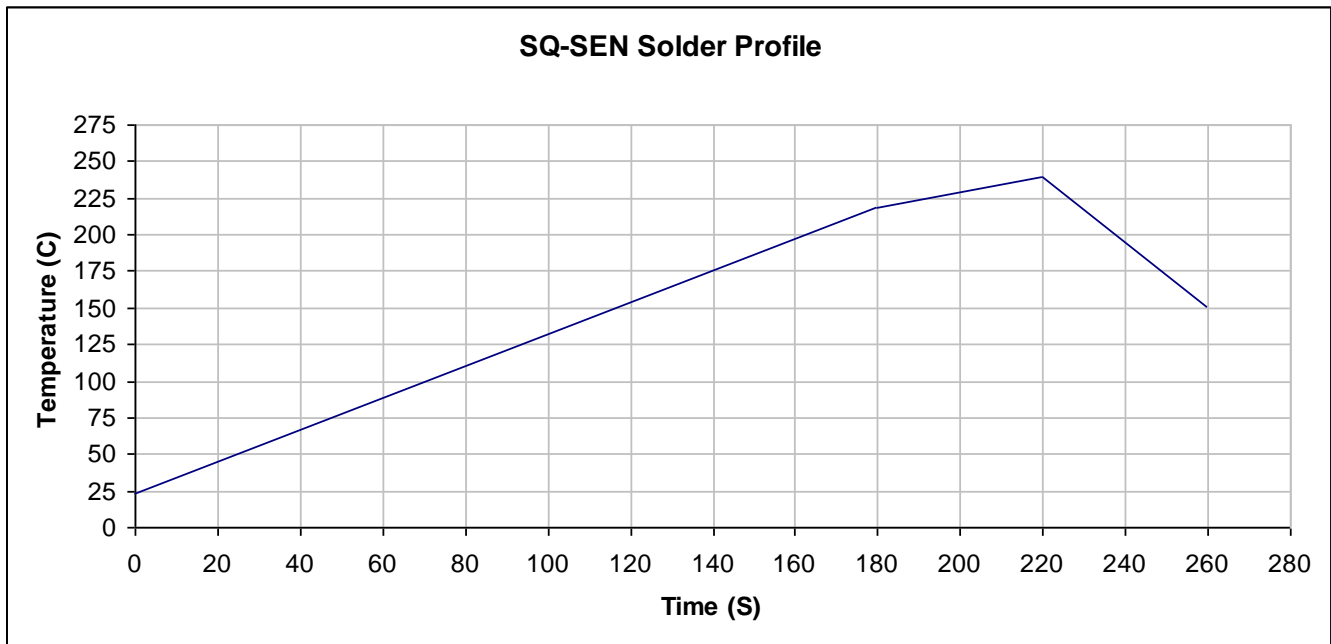
MIN	
SYMBOL	MM
A	1.75
B	3.9
C	2.8
D	2.3
E	1.7
Width of Carrier Tape	12
Depth of Pocket	2.25



RELIABILITY

Expected useable life (minimum):	1,000,000,000 on/off cycles
Test conditions:	Random vibration profile from 1 Hz to 100 Hz at 0.5 gRMS
Shock survivability (minimum):	10,000 g, 0.1ms half sine, 3x any axis
Expected shelf life (minimum):	7 years

RECOMMENDED SOLDER PROFILE



Time (S)	Temperature (C)	Rate (C/S)
0	23	
180	218	1.1
220	240	0.6
260	150	-2.3

WHITEPAPER: SIGNALQUEST SURFACE MOUNT PROCESSING VALIDATION

Prepared by: J. Chick at Janco Electronics, Inc. Dover NH 03821

Date: March 3, 2010

Abstract: This experiment was run to evaluate the automated surface mount (SMT) processing of Signal Quest's SQ-SEN-200 Omnidirectional Tilt and Vibration Sensor. This includes evaluating 3 different PCB land patterns, solder paste stencil (thickness and aperture sizes/reduction) and coming up with a successful thermal profile. Two printed circuit panels were supplied, each with 3 board images, each image containing 26 placements of 3 different land patterns. One panel was run through our SMT process completely and used as a thermal profile board. Once thermal profiling was complete, the second panel was then run through to represent a production example. The process was a leadfree, aqueous wash SMT reflow process. Out of the three styles of SMT layouts tested on the assembly, all passed IPC 610 Class 3 without defects (100% yield).

Method: The following is a description of the equipment and process steps used to assemble the PCB panels.

- Application of Lead free solderpaste. A Speedline Accuflex screenprinter was used, applying Aimsolder WS488 SAC305 Type III leadfree solderpaste. The solder stencil was 6 mils thick, laser cut and polished, with the apertures cut the same size as the pads on the board (no pad reduction was used for this assembly). Screenprinter program settings were setup in accordance with the parameters described in Aimsolder's WS488 SAC305 datasheet (referenced at the end of this report).
- The sensors were placed using an Assembleon Topaz XI2 pick and place machine. The pick-up nozzle used was Assembleon nozzle number 76A, which is used for MELF package styles up to 2.2mm in diameter. Despite the sensor being 3.3mm in diameter, the machine had no problems placing these parts.
- The panels were reflowed in a Vitronics XPM2 820 convection reflow oven using the straight ramp profile parameters specified in the Aimsolder WS488 SAC305 datasheet. The panels were then sent through our automated Triton aqueous wash machine with wash and rinse temperatures set at 146C using deionized water.

The first panel was run through the complete process using an initial oven recipe made by our reflow oven prediction software. This panel was then wired with 6 thermocouples (see referenced document "SQ-SEN-200 Thermal Profile.pdf" for thermocouple locations). The panel was rerun through the reflow oven to get an initial thermal profile. Adjustments were made to the oven zone settings to tweak the profile and then the panel was run again to verify that the oven settings produced a good profile. The final thermal profile is recorded and referenced at the end of this document (SQ-SEN-200 Thermal Profile.pdf).

Two locations were chosen at random on the profile board (location A19 in the rightside image and B6 in the center image). These locations were drilled from the bottom of the PCB into the component, where thermocouples were inserted. The panel was rerun through the reflow oven to record the internal component temperatures at these locations (referenced document "SQ-SEN-200 Component Thermal Profile.pdf").

Finally, the second panel was run completely through the process using the finished programs and reflow profile, to represent a production assembly. The production panel was sent to Janco's Quality Audit department for 100% inspection. No hand touch-up soldering was done to either the profile or the final panel.

SQ-SEN, ASX & MIN PRODUCT FAMILY

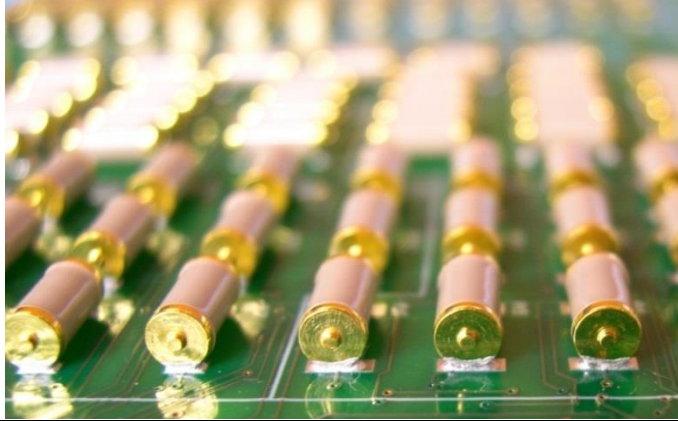
TILT, SHOCK & VIBRATION SENSORS

Results: The results of this experiment are broken up by the following process variables which a manufacturer will encounter when placing one of these vibration sensors: PCB land pattern, Stencil design, optimized thermal profile.

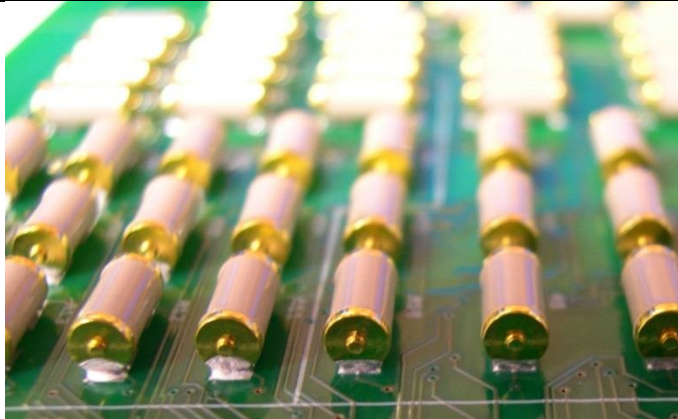
- **PCB Land Pattern:** Three different PCB land patterns were evaluated during this process. The first pattern was 1.2mm x 3.3mm pads with a 6mm pitch (Land 1). The second pattern was 1.2mm x 2.1mm with a 6mm pitch (Land 2). The final pattern was 3mm x 2.1mm with a 5mm pitch (Land 3). All 3 patterns produced solder joints that pass IPC 610 Class 3, with 100% yield. All pattern styles showed sufficient solder, and the parts remained centered in the pads throughout assembly. Land 3 showed infrequent, random solder balls evident after reflow, which were removed by our aqueous wash machine. This is not considered a defect per our process, since there was no solder balls remaining after wash – but this does indicate that an excess of solder paste is present. This could pose a problem for manufacturers using a no clean process, where the board does not see an aqueous wash – pad reduction could alleviate this problem if using Land 3 is desired. Lands 1 and 2 showed no defects before or after wash, with virtually no difference in solder joint quality. As an aside, Land 2 is currently used on the Signal Quest SQ-ASSY-MWC assembly with excellent results, and requires a smaller footprint than Land 1. See photos at the end of the results section for visual comparison between Land patterns.
- **Stencil Design:** For this process, we used a 6 mil thick, laser cut and polished stainless steel stencil. Apertures were cut on a 1 to 1 scale with the pads on the board. No pad reduction was used. Printer parameters were set to match our solder paste recommended settings. This thickness stencil with no pad reduction put down a sufficient amount of solder paste to achieve a good solder joint on all land patterns. NOTE: If a thinner stencil were required due to fine pitch parts on the assembly, solder volumes would vary and possibly be insufficient. Land 3 and 1 would most likely be adequate as is, but Land 2 being the smallest footprint may or may not put enough solder paste down on a 5 mil (or lower) stencil. Overprinting with a larger stencil aperture than the Land 2 pattern could help to prevent this.
- **Thermal Profile:** Available for reference is the final thermal profile used on the production panel (SQ-SEN-200 Thermal Profile.pdf). Also provided is the internal component temperature seen during reflow (see referenced document “SQ-SEN-200 Component Thermal Profile.pdf”). The Aimsolder WS488 ramp to spike profile was modeled with the following key parameters: Time Above Liquidous (TAL) of 30-60 seconds – liquidous temperature being 218C. Peak temperature should be between 230C to 245C, and be reached in about 3 to 3 and 1/2 minutes. Our results were as follows: Peak temperatures for this profile ranged from 236.5C to 241C, and were reached between the 3:28 and 3:36 minute mark. Time above liquidous ranged from 46 to 52 seconds. Following our solder vendor’s recommended parameters produced quality solder joints with zero defects. Our recommendation would be for assemblers placing this component to follow their own brand of solder’s recommended parameters, as the flux used in their solder paste may activate at different temperatures. The provided profile would best serve as reference only. Note: As a respectful observation, the SQ-SEN-200 datasheet addendum recommends a solder profile bringing the component up to 260C for a peak temp. This temperature is the maximum temperature before failure for most SMT components being manufactured today. Bringing an assembly to this temperature could cause catastrophic failure to many or all other components on a given assembly, and is not necessary to achieve a good solder joint with the SQ-SEN-200 component. Recommending this peak temperature could cause many problems for assemblers using this component.

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Land 1 -(1.2mm x 3.3mm pads with a 6mm pitch)



Land 2 -(1.2mm x 2.1mm pads with a 6mm pitch)



Land 3 -(3 mm x 2.1mm pads with a 5mm pitch)

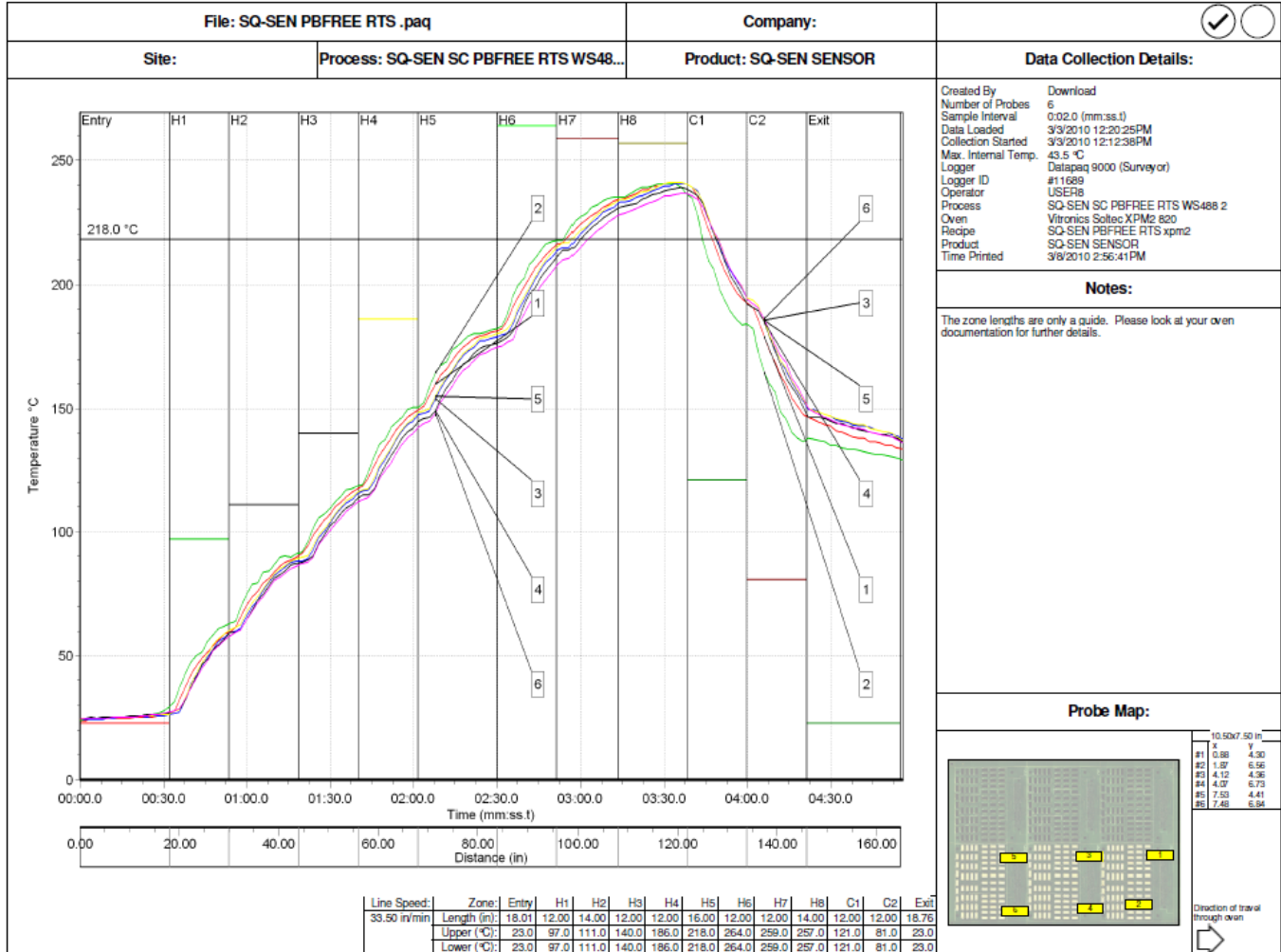
REFERENCES:

- SQ-SEN-200 Component Thermal Profile.pdf – Thermal profile of component internal temperatures as seen during finalized thermal profile at 2 locations.
- SQ-SEN-200 Thermal Profile.pdf – Thermal profile of panel at 6 locations using finalized thermal profile.
- Aimsolder WS488 SAC305 datasheet.pdf – publicly available reference document provided by Aimsolder for printing and reflowing WS488 SAC305 solderpaste.
- SQ-SEN-200 Addendum

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TILT, SHOCK & VIBRATION SENSORS

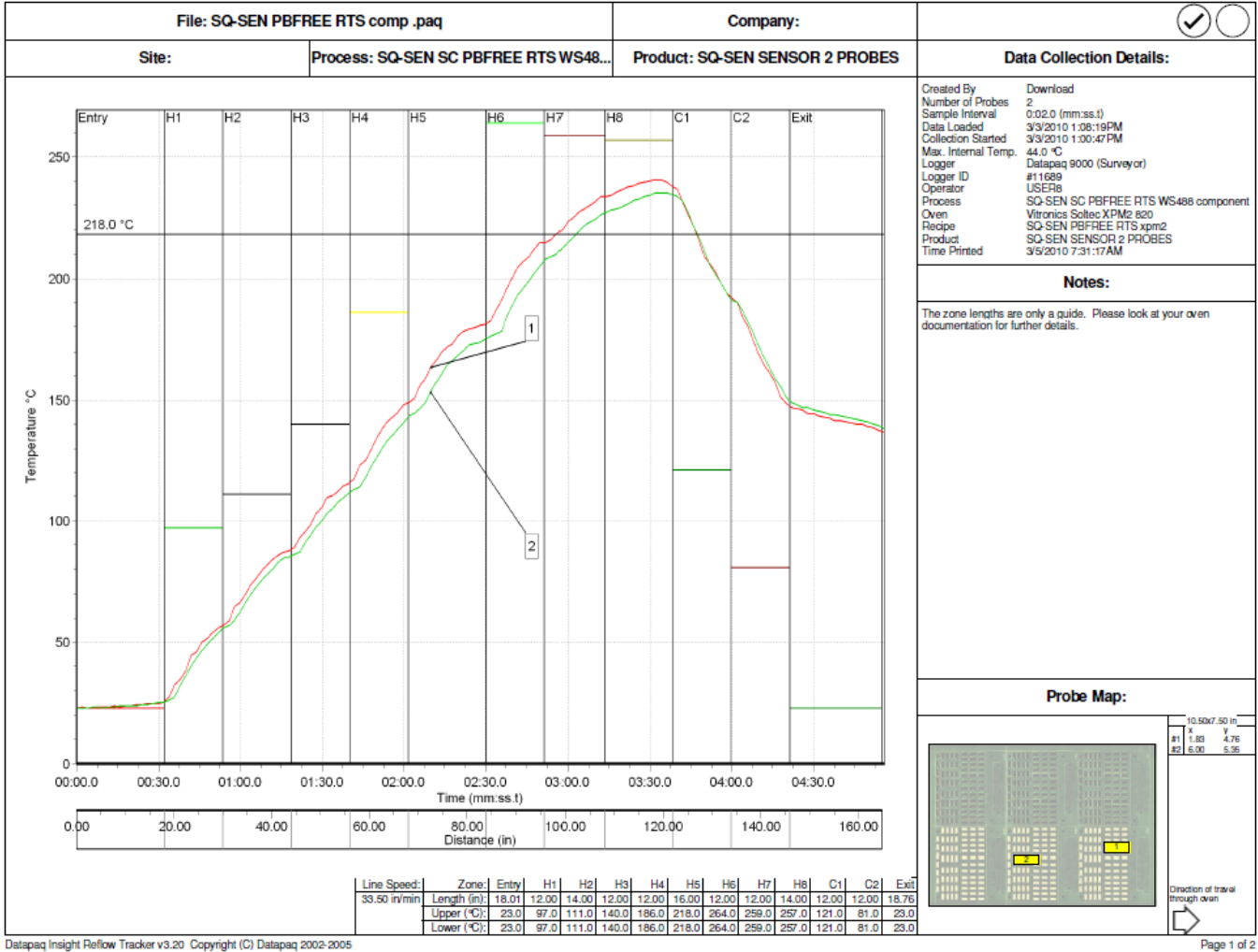
SQ-SEN-200 THERMAL PROFILE (REFERENCED IN WHITE PAPER)



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SQ-SEN-200 COMPONENT THERMAL PROFILE (REFERENCED IN WHITE PAPER)



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File: SQ-SEN PBFREE RTS comp .paq			Company:			✔ ○								
Site:		Process: SQ-SEN SC PBFREE RTS WS48...		Product: SQ-SEN SENSOR 2 PROBES										
Probe	Reflow Results							Maximum / Minimum						
	Positive Slope (°C/sec)	Positive Slope Time (mm:ss.t)	Rise Time (150.0 - 175.0 °C) (mm:ss.t)	Time Above Liquidus (218.0 °C) (mm:ss.t)	Peak Temperature (°C)	Delta T (°C)	Negative Slope (°C/sec)	Maximum (°C)	Max. Reached (mm:ss.t)	Mean (°C)	Deviation From 0.0 °C	Standard Deviation	Minimum (°C)	Min. Reached (mm:ss.t)
#1 (°C) A19 FRONT IMAGE	2.22	02:38.0	00:18.0	00:52.0	240.5	5.5	-2.70	240.5	03:32.0	140.7	+240.5	69.7	23.0	00:00.0
#2 (°C) B6 CENTER IMAGE	2.06	02:40.0	00:22.0	00:44.0	235.0		-2.58	235.0	03:32.0	137.2	+235.0	68.3	23.0	00:00.0
Probe	Time at Temperature		Slopes			Peak Difference								
	Time Above 218.0 °C (mm:ss.t)	Time To Reach 218.0 °C (mm:ss.t)	Positive Slope (°C/sec)	Negative Slope (°C/sec)	Mean Slope (°C/sec)	Peak Difference (°C)	Time Reached (mm:ss.t)							
#1 (°C) A19 FRONT IMAGE	00:52.0	02:56.0	2.22	-2.70	0.60	191.0	02:36.0							
#2 (°C) B6 CENTER IMAGE	00:44.0	03:04.0	2.06	-2.58	0.61	178.0								

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ADDENDUM

SQ-SEN, ASX & MIN PRODUCT FAMILY

TILT, SHOCK & VIBRATION SENSORS

ENVIRONMENTAL DIRECTIVE COMPLIANCE

ROHS: EU DIRECTIVE 2002/95/EU - RESTRICTION ON USE OF HAZARDOUS SUBSTANCES IN ELECTRICAL AND ELECTRONIC EQUIPMENT

SignalQuest, LLC certifies that based on the information available to us from our raw material suppliers, products designated to be RoHS compliant conform to the requirements of the European Union's Restriction on Use of Hazardous Substances in Electrical and Electronic Equipment ("RoHS") Directive, 2002/95/EU.

SignalQuest's terms "Lead-Free" or "Pb-Free" mean component products that are compatible with current RoHS requirements for all 6 substances (see table below), including the requirement that lead not exceed 0.1% by weight in homogenous materials. Where designed to be soldered at high temperatures, SignalQuest's Pb-Free products are suitable for use in specified lead-free processes. This status is based on SignalQuest's understanding of RoHS and SignalQuest's knowledge of the materials that go into its products as of the date of disclosure of Pb-Free information.*

Banned Substance	Percent Composition
Cadmium (Cd)	0.01%
Lead (Pb)	0.1%
Mercury (Hg)	0.1%
Hexavalent Chromium (Cr6+)	0.1%
Poly Brominated Biphenyls (PBB)	0.1%
Poly Brominated Diphenyl Ethers (PBDE)	0.1%

PFOS - PFOA: EU DIRECTIVE 2006/122/EC - RESTRICTIONS ON THE MARKETING AND USE OF CERTAIN DANGEROUS SUBSTANCES AND PREPARATIONS CONCERNING PERFLUOROOCCTANE SULFONATES AND PERFLUOROOCCTANOIC ACID

SignalQuest, LLC certifies that to its knowledge the product lines listed above do not contain any intentional additives any Perfluorooctane Acid or Perfluorooctane Sulfonates as identified in EU Directive 2006/122/EC.

To the best of our knowledge, none of these materials are generated during production. Since we do not expect these materials to be present, we do not specifically run any analysis on our raw materials or end product to measure for these materials. We maintain files for all materials used in the manufacture and packaging of the above listed products assuring no PFOS or PFOA is used in their manufacturing process.

Although the above mentioned substances are not intentionally added, this does not exclude the presence of negligibly slight traces due to among other things, impurities in the components supplied by external parties and used in production.¹

¹ **Important Information and Disclaimer:** This information is believed to be accurate and refers to the laws, regulations, and products at the date of issue. SignalQuest bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. SignalQuest has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. SignalQuest and SignalQuest's suppliers consider certain information to be proprietary, and thus, CAS numbers and other limited information may not be available for release. It is the responsibility of our customers to determine that their use of SignalQuest products is safe, lawful, and technically suitable for their applications.

In no event shall SignalQuest's liability arising out of such information exceed the total purchase price of the SignalQuest part(s) at issue sold by SignalQuest to Customer on an annual basis.

See SignalQuest's Standard Terms and Conditions of Sale for additional information available at www.signalquest.com/terms.



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Materials Science Division

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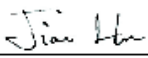
EMSL Case No.: 360902393
Sample(s) Received: 10/28/09
Dates of Analysis: 11/11/09
Date Printed: 11/12/09
Reported By: J. Hu

- Laboratory Report -

Hazardous Substances in Electrical and Electronic Equipment

Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

Compiled by:


Jian Hu, Ph.D.
Senior Materials Scientist

November 12, 2009

Date

QA/QC :


Eugenia Mirica, Ph.D.
Senior Materials Scientist

November 12, 2009

Date



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EMSL Case No.: 360902393
Sample(s) Received: 10/28/09
Dates of Analysis: 11/11/09
Date Printed: 11/12/09
Reported By: J. Hu

Procurement of Samples and Analytical Overview:

The sample for analysis arrived at EMSL Analytical's corporate laboratory in Westmont, NJ on October 28, 2009. The package arrived in satisfactory condition with no evidence of damage to the contents. The purpose of the analysis is to determine compliance with RoHS directive 2002/95/EC. The data reported herein has been obtained using some or all of the following equipment and methodologies.

Methods & Equipment:

Inductively Coupled Plasma Spectrometry (ICP)
Gas Chromatography / Mass Spectrometry (GC/MS)
X-Ray Fluorescence Spectrometry (XRF): Standardless Analysis Method using
Bruker AXS Spectra^{plus} software package
Ion Chromatography (IC)
Cold Vapor Atomic Absorption Spectrometry (CVAA)
Graphite Furnace Atomic Absorption Spectrometry (GFAA)

SQ-SEN, ASX & MIN PRODUCT FAMILY

TILT, SHOCK & VIBRATION SENSORS



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Reported By: J. Hu

Phone: (603)448-6266 Fax: (603)619-6330

- Certificate of Analysis -

Sample ID: 1 - SQ-SEN-200/390/645B/660/815/830/845
Material Description: Plastic sheath

This material meets the requirements of Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC, as of the date of this analysis.

<i>Analyte</i>	<i>Limit</i>	<i>Pass/Fail</i>
Lead	<1000 ppm	Pass
Cadmium	<100 ppm	Pass
Mercury	<1000 ppm	Pass
Hexavalent Chromium	<1000 ppm	Pass
PBBs	<1000 ppm	Pass
PBDEs	<1000 ppm	Pass

<i>Sample ID</i>	<i>Analyte</i>	<i>Concentration (mg/kg)</i>	<i>LOD (mg/kg)</i>	<i>Analytical Instrument</i>
1 - SQ-SEN 200/390/645B /660/815/830/845 Plastic sheath	Lead	<LOD	23	XRF
	Cadmium	<LOD	6	XRF
	Mercury	<LOD	23	XRF
	Chromium	<LOD	10	XRF
	Hexavalent Chromium	N/R	--	IC
	Bromine	<LOD	12	XRF
	PBBs	N/R	--	GC/MS
	PBDEs	N/R	--	GC/MS

NOTES: 1 mg/kg = 1 ppm; 1000 mg/kg = 1000 ppm = 0.1%
N/R = Value Not Reported by Laboratory
Hexavalent Chromium not reported because Chromium was not detected.
PBBs/PBDEs not reported because Bromine was not detected.

SQ-SEN, ASX & MIN PRODUCT FAMILY

TILT, SHOCK & VIBRATION SENSORS



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Dates of Analysis: 11/11/09
Date Printed: 11/12/09
Reported By: J. Hu

Phone: (603)448-6266 Fax: (603)619-6330

- Certificate of Analysis -

Sample ID: 1 - SQ-SEN-200/390/645B/660/815/830/845
Material Description: Metal components

This material meets the requirements of Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC, as of the date of this analysis.

<i>Analyte</i>	<i>Limit</i>	<i>Pass/Fail</i>
Lead	<1000 ppm	Pass
Cadmium	<100 ppm	Pass
Mercury	<1000 ppm	Pass
Hexavalent Chromium	<1000 ppm	Pass
PBBs	<1000 ppm	Pass
PBDEs	<1000 ppm	Pass

<i>Sample ID</i>	<i>Analyte</i>	<i>Concentration (mg/kg)</i>	<i>LOD (mg/kg)</i>	<i>Analytical Instrument</i>
1 - SQ-SEN 200/390/645B /660/815/830/845 Metal components	Lead	<LOD	110	XRF
	Cadmium	<LOD	6	XRF
	Mercury	<LOD	140	XRF
	Chromium	<LOD	140	XRF
	Hexavalent Chromium	N/R	--	IC
	Bromine	<LOD	50	XRF
	PBBs	N/R	--	GC/MS
	PBDEs	N/R	--	GC/MS

NOTES: 1 mg/kg = 1 ppm; 1000 mg/kg = 1000 ppm = 0.1%
N/R = Value Not Reported by Laboratory
Hexavalent Chromium not reported because Chromium was not detected.
PBBs/PBDEs not reported because Bromine was not detected.



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Date Printed: 11/12/09
Reported By: J. Hu

Descriptions & Definitions:

None Detected (ND) denotes the absence of an analyte in the subsample analyzed. Trace levels of the analyte may be present in the sample below the limit of detection (LOD).

Limit of Detection (LOD): The minimum concentration that can be theoretically achieved for a given analytical procedure in the absence of matrix or sample processing effects. Particle analysis is limited to a single occurrence of an analyte particle in the sub-sample analyzed.

Limit of Quantitation (LOQ): The minimum concentration of an analyte that can be measured within specified limits of precision and accuracy during routine laboratory operating conditions

The results are obtained using the methods and sampling procedures as described in the report or as stated in the published standard methods, and are only guaranteed to the accuracy and precision consistent with the used methods and sampling procedures. Any change in methods and sampling procedure may generate substantially different results. EMSL Analytical, Inc. assumes no responsibility or liability for the manner in which the results are used or interpreted.



ADDENDUM

SQ-SEN, ASX & MIN PRODUCT FAMILY

TILT, SHOCK & VIBRATION SENSORS

CONFLICT MINERALS STATEMENT

In observance of the US LAW 'Dodd-Frank Wall Street Regulation and Consumer Protection Act we assert the following part number do not contain any of the following "Conflict Minerals":

- Columbite-tantalite (coltan)
- Cassiterite
- Wolframiteuu

The below listed parts do contain Gold (Au) and the source of this gold is from a certified Conflict-free source.

COMPLIANT SIGNALQUEST PART NUMBERS:

SQ-SEN-200 , SQ-MIN-200, SQ-SEN-390, SQ-SEN-645B, SQ-SEN-660, SQ-SEN-675, SQ-SEN-815, SQ-SEN-830, SQ-SEN-845, SQ-ASA-xxx, SQ-ASB-xxx, SQ-ASC-xxx, SQ-ASD-xxx, SQ-ADE-xxx

Note: Please see the following page for the supplier's letter.

SQ-SEN, ASX & MIN PRODUCT FAMILY

TILT, SHOCK & VIBRATION SENSORS

METALOR[®]

Metalor Technologies USA
Advanced Coatings Division

TO: Metalor Chemical customers

January, 2011

RE: Conflict Free Gold update from METALOR :

You may know that there is new legislation in Washington, the Dodd-Frank Act, Section 1502, that requires disclosure of the use of gold in manufactured products, and an extensive report if it is "conflict gold" sourced in the Democratic Republic of the Congo and its nine neighboring countries. Metalor does not acquire gold from the DRC, or any of its neighbors. Nevertheless we are following developments closely, making changes, and would like to bring you up to date.

There are several industry initiatives that aim to validate gold as conflict free. The World Gold Council (WGC), the Responsible Jewelry Council (RJC), and the Electronic Industry Citizenship Coalition and Global e-Sustainability Initiative (EICC-GeSI), have all been actively working and preparing programs. Metalor has been closely working with all three. Their schedule is now being driven by the Dodd-Frank Act, which requires the U.S. Securities and Exchange Commission to issue regulations that will direct and guide disclosures about conflict gold. The regulations are due to be issued by April 15, 2011, and a product manufacturer's initial disclosure will relate to its use of gold in its next full fiscal year after that, so probably for calendar year 2012. No manufacturer wants to disclose that it has used DRC-sourced gold, and so it will want to assure a conflict-free supply chain by the end of 2011, if not much earlier.

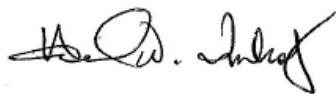
The three industry initiatives are on their way to completion within this schedule. The WGC is internally circulating draft programs to certify the gold supply chain from mine to refiner. The RJC program has published lengthy discussion papers, and will be conducting workshops over the next few months. The EICC-GeSI program has begun preliminary audits of gold refiners, including Metalor, and is preparing a protocol for its final validating audits. It plans to publish a list of validated gold refiners by September 2011. We cannot say for sure – right now - if these industry certification programs will meet every requirement of the Dodd-Frank Act and future SEC regulations, but they are all aware of the new law, and are working to meet its anticipated requirements. The Dodd-Frank Act itself does not dictate any particular protocol or degree of due diligence for the *initial* disclosure - whether or not gold that is used in a product has its origin in the DRC or adjoining country. So we do not know if a manufacturer can say "no DRC gold" based upon "good faith" and "reasonable efforts" or whether that answer may require intense supply chain due diligence. We do know that you will need to protect your reputations and brand names. Metalor and the industry programs under development, all aim to provide that kind of protection.

For the time being, Metalor has established gold production programs that result in a segregated "conflict-free" metal product. Right now, many gold refiners do not do this – they do not separate raw materials according to their physical origin, because there is no metallurgical reason to do so. Economies of scale dictate large processes, often continuous, with raw materials mixed from many compatible feedstocks. However the concerns about conflict minerals appear to now make DRC-origin gold into a contaminant, such that even a very small amount of gold from the DRC or its adjoining countries will make any batch into which it is mixed a "dirty" product.

In order to supply the needs of the Electronic/Semiconductor industry on a continuing basis, Metalor's Marin, Switzerland facility is refining to a 4N Au standard from 100% recycled gold sources, with complete traceability via SAP. This process will be shared and incorporated into the North Attleboro operations as well. The process should be ready for audit towards the end of Q1 in Marin, Switzerland and shortly thereafter in North Attleboro, MA USA.

This is an issue that is rapidly developing, and we want you to know that we are working to stay involved in developments, and will share them with you.

Sincerely,



Howard Imhof
ACD USA Division Manager



ADDENDUM

SQ-SEN, ASX & MIN PRODUCT FAMILY

TILT, SHOCK & VIBRATION SENSORS

INTRINSIC SAFETY NOTICE

SignalQuest hereby certifies that tilt and vibration sensors products containing the SignalQuest part prefix SQ-SEN, SQ-ASx and SQ-MIN do not contain any discrete resistive, capacitive or inductive components.