Record of Line-item Letter Ballot Review by TC Chapter for Procedural Review

Region/Locale: North America
Global Technical Committee: Silicon Wafer
TC Chapter Cochairs: Dinesh Gupta/STA, Noel Poduje/SMS
Standards Staff: Kevin Nguyen

	Scheduled in Background Statement	Actual
Date	07/11/2017	07/11/2017
Location	San Francisco Marriott Marquis	San Francisco Marriott Marquis
Reason for Change of Date and/or Location (if changed)		

Note: See *Regulations* ¶ 9.5 Exception for allowable reason to change.

Document Information

I. Document Number, Title, Lists of Line Items

Document Number	Document Title
5915	Line Item Revision to SEMI M1-1016: Specification For Polished Single Crystal Silicon Wafers (To add Illustration of Flatness Metrics for Silicon Wafers)

List of Line		Line Item Title
	Line Item 1	To add figures to newly provided Related Information 4 of M1 to illustrate the flatness metrics for silicon wafers and to add Table A1-1 to Appendix 1 with references for the figures added.

Line Item 1 Adjudication

II. Tally

Standards staff to fill in.

Voting Tally: As-cast tally after close of voting period

Note: A minimum of 60% of the Voting Interests that have TC Members within the global technical committee that issued the Letter Ballot must return Votes. (*Regulations* ¶ 9.7.1.1)

Voting Tally:

Voting Interest:	Returned Votes		Distribution		Return Rate	
Letter Ballot	52	÷	86	=	60.5%	≥60%
Intercommittee Ballot	31					
Voting Interest Reject(s)	1		Total Voters with Rejects			1
Voting Interest Accept(s)	39					

Note: See *Regulations* § 3.2.1 for definition of Voting Interest.

III. Rejects

Voting Interest Reject 1 (Voting Interest Name: Materials & Metrology)

Voter Reject 1 (Voter: Murray Bullis/ Materials & Metrology)

Negative 1

Negative	Referenced Section/ Paragraph	*TF/TC Chapter to fill in, including text in the ballot if necessary.		
		1. It is not at all clear why the figures are relegated to a separate Relegated Information section (RI-4). I believe these should be included in Appendix 1.		
	Negative Text	*Original complete Negative text (e.g., issue, justification, suggestion) should be copied.		
TF input (optional)				
Withdrawal (check one)			No Negative withdrawal made by Voter.	GO TO "Related" subsection
			Withdrawal document received by Standards staff on MM/DD/YYYY.	GO TO "Final" subsection → (A)
Related	Motion and Reason (check one)	x	'Related' is mutually agreed upon. (Needs no motion.)	GO TO "Persuasive" subsection
			Negative is not related. (Needs ≥2/3 votes to pass.)	
			Reason	XXXX
	Motion by/ 2nd by	Name (Company)/Name (Company)		
	Discussion			
	Result of Vote (check one)	XX Y-XX N; Motion passed/failed.		
			[Negative is not related.] < 2/3	GO TO "Persuasive" subsection
			2/3 ≤ [Negative is not related.]	GO TO "Final" subsection → (B)
Persuasive	Motion and Reason (check one)	x	Negative is related and persuasive. (Needs >1/3 votes to pass.)	
			Negative is related and not persuasive. (Needs ≥2/3 votes to pass.)	

			Reason	XXXX			
	Motion by/ 2nd by	Fritz Passek (Siltronic)/Naoyuki Kawaii (Self)					
	Discussion						
	Result of Vote (check one)	8 **Y**-0 **N**; Motion passed					
		x	[Negative is related and persuasive.] > 1/3	**Is a technical change recommended? (check one)**	x	**Y**	**GO TO "Address by Technical Change Option" subsection**
			[Negative is related and not persuasive.] < 2/3			**N**	**GO TO "Final" subsection → (E)**
			2/3 ≤ [Negative is related and not persuasive.] < 90%	**GO TO "Final" subsection → (C)**			
			90% ≤ [Negative is related and not persuasive.]	**GO TO "Not Significant Finding Option" subsection**			

Address by Technical Change Option

Technical Change Recommendations

Original section/paragraph number and at least one full sentence are required in "FROM" and "TO" fields.

Technical Changes — **1**

FROM:

Table A1-1 Acronyms for Flatness Measurements

Acronym	*Expanded Form of Acronym*	*Reference Figure*
GBIR	Global Flatness, Back-surface, Ideal, Range	Figure R4-2
GF3R	Global Flatness, Front-surface, 3-point plane, Range	Not illustrated
GF3D	Global Flatness, Front-surface,3-point plane, Deviation	Not illustrated
GFLR	Global Flatness, Front-surface, Least-squares fit, Range	Figure R4-3
GFLD	Global Flatness, Front-surface, Least-squares fit, Deviation	Not illustrated
SBIR	Site Flatness, Back-surface, Ideal, Range	Figure R4-6
SBID	Site Flatness, Back-surface, Ideal, Deviation	Figure R4-7
SF3R	Site Flatness, Front-surface, 3-point plane (global), Range	Not illustrated
SF3D	Site Flatness, Front-surface, 3-point plane (global), Deviation	Not illustrated
SFLR	Site Flatness, Front-surface, Least-squares fit (global), Range	Not illustrated
SFLD	Site Flatness, Front-surface, Least-squares fit (global),	Not illustrated
SFQR	Site Flatness, Front-surface, Least-squares fit (site), Range	Figure R4-4
SFQD	Site Flatness, Front-surface, Least-squares fit (site), Deviation	Figure R4-5
SFSR	Site Flatness, Front-surface, Least-squares fit (subsite), Range[1)]	Not illustrated
SFSD	Site Flatness, Front-surface, Least-squares fit (subsite), Deviation [2)]	Not illustrated

TO:

Table A1-1 Acronyms for Flatness Measurements

Acronym	*Expanded Form of Acronym*	*Reference Figure*
GBIR	Global Flatness, Back-surface, Ideal, Range	Figure ~~R~~A1-5~~4 2~~
GF3R	Global Flatness, Front-surface, 3-point plane, Range	Not illustrated
GF3D	Global Flatness, Front-surface,3-point plane, Deviation	Not illustrated
GFLR	Global Flatness, Front-surface, Least-squares fit, Range	Figure ~~R~~A1-6~~4 3~~
GFLD	Global Flatness, Front-surface, Least-squares fit, Deviation	Not illustrated
SBIR	Site Flatness, Back-surface, Ideal, Range	Figure ~~R~~A1-9~~4 6~~
SBID	Site Flatness, Back-surface, Ideal, Deviation	Figure ~~R~~A1-10~~4 7~~
SF3R	Site Flatness, Front-surface, 3-point plane (global), Range	Not illustrated
SF3D	Site Flatness, Front-surface, 3-point plane (global), Deviation	Not illustrated
SFLR	Site Flatness, Front-surface, Least-squares fit (global), Range	Not illustrated
SFLD	Site Flatness, Front-surface, Least-squares fit (global),	Not illustrated
SFQR	Site Flatness, Front-surface, Least-squares fit (site), Range	Figure ~~R~~A1-9~~4 4~~
SFQD	Site Flatness, Front-surface, Least-squares fit (site), Deviation	Figure ~~R~~A1-10~~4 5~~
SFSR	Site Flatness, Front-surface, Least-squares fit (subsite), Range[1)]	Not illustrated
SFSD	Site Flatness, Front-surface, Least-squares fit (subsite), Deviation [2)]	Not illustrated

Justification (If necessary)

2

FROM: Entire

RELATED INFORMATION 4

FLATNESS ILLUSTRATION

R4-1 Introduction

R4-1.1 All flatness measurement parameters are calculated using a thickness data set (ideal chucked backside reference or equivalent)

……..

TO: Existing Appendix 1

APPENDIX 1 FLATNESS DECISION TREE

~~**RELATED INFORMATION 4**~~
A1-4 Flatness Illustration

~~**R4-1**~~**A1-4.1 Introduction**

~~R4-1.1~~A1-4.1.1 All flatness measurement parameters are calculated using a thickness data set (ideal chucked backside reference or equivalent)

……

Justification:

Move entire Related Information 4 to Appendix 1. Flatness Illustrations are an official part of the M1, so it must be the appendix section.

Motion			Negative is addressed by the technical change(s).		
Motion by/2nd by			Fritz Passek (Siltronic)/Naoyuki Kawaii (Self)		
Discussion					
Result of Vote (check one)			8 **Y**-0 **N**; Motion passed		
			x	2/3 ≤ [Negative is addressed by the technical change(s).]	**GO TO "Incorporation of the Technical Change" subsection**
				[Negative is not addressed by the technical change(s).] < 2/3	**GO TO "Final" subsection → (E)**
Incorporation of the Technical Change	**Motion**		To incorporate the technical change(s).		
	Motion by/2nd by		Tetsuya Nakai (SUMCO)/Fritz Passek (Siltronic)		
	Discussion				
	Result of Vote (check one)		9 **Y**-0 **N**; Motion passed		
			x	90% ≤ [Agree to incorporate.]	**GO TO "Final" subsection → (F)**
				[Disagree to incorporate.]>10%	**GO TO "Final" subsection → (E)**
Final	**(check if applicable)**		**(A)**	Withdrawn **(counted under h in disposition)**	
			(B)	Not related **(counted under i in disposition)**	
			(C)	Related and not persuasive (significant)	
			(D)	Not significant **(counted under j in disposition)**	
			(E)	Related and persuasive and not addressed by technical change	**DOCUMENT FAILS**
		x	**(F)**	Addressed by technical change **(counted under k disposition)**	
	(check if applicable)		Comment generated. **See Section V-(ii) Comment #** X.		

This table is needed for each Negative.

Negative 2

Negative	Referenced Section/ Paragraph	*TF/TC Chapter to fill in, including text in the ballot if necessary.					
	Negative Text	2. The word “backside” should not be used in SEMI standards; use “back surface” (with no hyphen) throughout the document.					
TF input (optional)							
Withdrawal (check one)			No Negative withdrawal made by Voter.				GO TO “Related” subsection
			Withdrawal document received by Standards staff on MM/DD/YYYY.				GO TO “Final” subsection → (A)
Related	Motion and Reason (check one)	x	‘Related’ is mutually agreed upon. (Needs no motion.)				GO TO “Persuasive” subsection
			Negative is not related. (Needs ≥2/3 votes to pass.)				
			Reason	XXXX			
	Motion by/ 2nd by	Name (Company)/Name (Company)					
	Discussion						
	Result of Vote (check one)	XX Y-XX N; Motion passed/failed.					
			[Negative is not related.] < 2/3				GO TO “Persuasive” subsection
			2/3 ≤ [Negative is not related.]				GO TO “Final” subsection → (B)
Persuasive	Motion and Reason (check one)		Negative is related and persuasive. (Needs >1/3 votes to pass.)				
		x	Negative is related and not persuasive. (Needs ≥2/3 votes to pass.)				
			Reason	This is an editorial correction.			
	Motion by/ 2nd by	Tetsuya Nakai (SUMCO)/Fritz Passek (Siltronic)					
	Discussion						
	Result of Vote (check one)	9 Y-0 N; Motion passed.					
			[Negative is related and persuasive.] > 1/3	Is a technical change recommended? (check one)		Y	GO TO “Address by Technical Change Option” subsection
			[Negative is related and not persuasive.] < 2/3			N	GO TO “Final” subsection → (E)
			2/3 ≤ [Negative is related and not persuasive.] < 90%	GO TO “Final” subsection → (C)			

		x	90% ≤ [Negative is related and not persuasive.]	**GO TO "Not Significant Finding Option" subsection**
Not Significant Finding Option	**This option can be used only "if the TC Chapter finds a Negative not persuasive by a vote equal to or greater than 90% of the persons voting on the action". (*Regulations* ¶ 9.6.4.4.2)**			
	Use of "Not significant finding option" (check one)	x	It is mutually agreed upon to term the Negative "not significant".	**GO TO "Final" subsection → (D)**
			It is mutually agreed upon to term the Negative "significant".	**GO TO "Final" subsection → (C)**
			Whether or not the Negative is "not significant" is decided by a vote.	
	Motion	The Negative is "not significant".		
	Motion by/ 2nd by	Name (Company)/Name (Company)		
	Vote		XX **Y**-XX **N**; Motion passed with simple majority	**GO TO "Final" subsection → (D)**
			XX **Y**-XX **N**; Motion failed with simple majority	**GO TO "Final" subsection → (C)**
Final	**(check if applicable)**		**(A)** Withdrawn **(counted under h in disposition)**	
			(B) Not related **(counted under i in disposition)**	
			(C) Related and not persuasive (significant)	
		x	**(D)** Not significant **(counted under j in disposition)**	
			(E) Related and persuasive and not addressed by technical change	**DOCUMENT FAILS**
			(F) Addressed by technical change **(counted under k disposition)**	
	(check if applicable)	x	Comment generated. **See Section V-(ii) Comment #** X.	

Negative 3

Negative	**Referenced Section/ Paragraph**	***TF/TC Chapter to fill in, including text in the ballot if necessary.**		
	Negative Text	**3. Do not use hyphens for front surface or least squares.**		
TF input (optional)				
Withdrawal (check one)		x	No Negative withdrawal made by Voter.	**GO TO "Related" subsection**
			Withdrawal document received by Standards staff on MM/DD/YYYY.	**GO TO "Final" subsection → (A)**
Related	**Motion and Reason (check one)**	~~x~~	'Related' is mutually agreed upon. **(Needs no motion.)**	**GO TO "Persuasive" subsection**
			Negative is not related. **(Needs ≥2/3 votes to pass.)**	
			Reason	XXXX

	Motion by/ 2nd by	**Name (Company)/Name (Company)**					
	Discussion						
	Result of Vote (check one)	XX **Y**-XX **N**; Motion passed/failed.					
			[Negative is not related.] < 2/3				**GO TO "Persuasive" subsection**
			2/3 ≤ [Negative is not related.]				**GO TO "Final" subsection → (B)**
Persuasive	**Motion and Reason (check one)**		Negative is related and persuasive. **(Needs >1/3 votes to pass.)**				
		x	Negative is related and not persuasive. **(Needs ≥2/3 votes to pass.)**				
			Reason	This is an editorial correction.			
	Motion by/ 2nd by	Tetsuya Nakai (SUMCO)/Fritz Passek (Siltronic)					
	Discussion						
	Result of Vote (check one)	9 **Y**-0 **N**; Motion passed					
			[Negative is related and persuasive.] > 1/3	**Is a technical change recommended? (check one)**		**Y**	**GO TO "Address by Technical Change Option" subsection**
			[Negative is related and not persuasive.] < 2/3			**N**	**GO TO "Final" subsection → (E)**
			2/3 ≤ [Negative is related and not persuasive.] < 90%	**GO TO "Final" subsection → (C)**			
		x	90% ≤ [Negative is related and not persuasive.]	**GO TO "Not Significant Finding Option" subsection**			
Not Significant Finding Option	**This option can be used only "if the TC Chapter finds a Negative not persuasive by a vote equal to or greater than 90% of the persons voting on the action". (*Regulations* ¶ 9.6.4.4.2)**						
	Use of "Not significant finding option" (check one)	x	It is mutually agreed upon to term the Negative "not significant".				**GO TO "Final" subsection → (D)**
			It is mutually agreed upon to term the Negative "significant".				**GO TO "Final" subsection → (C)**
			Whether or not the Negative is "not significant" is decided by a vote.				
	Motion	The Negative is "not significant".					
	Motion by/ 2nd by	Name (Company)/Name (Company)					
	Vote		XX **Y**-XX **N**; Motion passed with simple majority				**GO TO "Final" subsection → (D)**
			XX **Y**-XX **N**; Motion failed with simple majority				**GO TO "Final" subsection → (C)**
Final	**(check if applicable)**		**(A)**	Withdrawn **(counted under h in disposition)**			
			(B)	Not related **(counted under i in disposition)**			
			(C)	Related and not persuasive (significant)			
		x	**(D)**	Not significant **(counted under j in disposition)**			

		(E)	Related and persuasive and not addressed by technical change	DOCUMENT FAILS
		(F)	Addressed by technical change (counted under k disposition)	
	(check if applicable)	x	Comment generated. See Section V-(ii) Comment # X.	

Disposition of Voting Interest Reject 1

Check only when the Document has not been failed.

3	Original number (#) of Negatives			(g)
#	Number of Negatives withdrawn			(h)
#	Number of Negatives found not related			(i)
2	Number of Negatives found not significant			(j)
1	Number of Negatives addressed by technical change (Negative becomes not significant)			(k)
Final	x	**g** - (**h** + **i** +**j** + **k**) = 0	Reject is Not Valid and is not included in the denominator of § VI. *Approval Conditions Check*	
		g - (**h** + **i** +**j** + **k**) >0	Reject is included in the denominator of § VI. *Approval Conditions Check*	
		Reject without a Negative	Not Valid	

Note: If all of the Negatives included with a Reject Vote are withdrawn, determined to be not related, or determined to be not significant, the Reject Vote is not valid. (*Regulations* ¶ 9.4.3.3)
Note: A Negative addressed by a technical change is automatically considered to be not significant. (*Regulations* ¶ 9.6.4.4.2)

IV. Other Technical Issues

V. Comments

None

V-(ii) Comments Created by Handling Negative

Comment (Created by Handling Negative) NC – 1

Comme	*TF/TC Chapter to fill in	
	2. The word “backside” should not be used in SEMI standards; use “back surface” (with no hyphen) throughout the document.	
Action	The TC Chapter agreed to do one of the following actions.	
	*No motion is required in this step.	
		Already addressed by Commenter #, Comment #
		No further action was taken by the TC Chapter.

		Refer to the TF for more consideration.	
		New business	
	x	Editorial change	
	Options for editorial change **(check one)**		**Case 1: No vote in this section:**
			To be included and voted on as a group in § VI. Editorial Changes Other than Those Voted on in § V.
		x	**Case 2: Voted in this section:**
			Original section number and at least one full sentence are required in "FROM" and "TO" fields.
Editorial Changes	**1**	**FROM: throughout ballot** backside front side	
		TO: throughout ballot back surface front surface	
		Justification: **For consistency the term "back surface" and "front surface" are currently used in SEMI M1.**	

Motion	To approve above editorial change(s)
Motion by/2nd by	Tetsuya Nakai (SUMCO)/Fritz Passek (Siltronic)
Discussion	XXXX
Vote	9 **Y**-0 **N**; Motion passed

Comment (Created by Handling Negative) NC – 2

Comme	***TF/TC Chapter to fill in**		
	3. Do not use hyphens for front surface or least squares.		
Action	**The TC Chapter agreed to do one of the following actions.**		
	***No motion is required in this step.**		
		Already addressed by Commenter #, Comment #	
		No further action was taken by the TC Chapter.	
		Refer to the TF for more consideration.	
		New business	
	x	Editorial change	
	Options for editorial		**Case 1: No vote in this section:**
			To be included and voted on as a group in § VI. Editorial Changes Other than Those Voted on in § V.
		x	**Case 2: Voted in this section:**

	change (check one)		**Original section number and at least one full sentence are required in "FROM" and "TO" fields.**
Editorial Changes	**1**	**FROM: throughout ballot** front-surface least-squares	
		TO: throughout ballot front surface least squares	
		Justification: **Deleting hyphen from "front-surface" and "least-square" for editorial correction.**	

Motion	To approve above editorial change(s)
Motion by/2nd by	Tetsuya Nakai (SUMCO)/Fritz Passek (Siltronic)
Discussion	XXXX
Vote	9 **Y**-0 **N**; Motion passed

VI. Editorial Changes Other than Those Voted on in § V

Original section/paragraph number and at least one full sentence are required in "FROM" and "TO" fields.

See above section for editorial changes.

VII. Approval Conditions Check

VII. - (i). Approval Rate

APPROVAL CONDITION 1: All Negatives have been discussed and were withdrawn, found not related, found not persuasive, or addressed by a technical change. (*Regulations* ¶ 9.7.1.2)

APPROVAL CONDITION 2: At least 90% of the sum of valid Voting Interest Accept and Voting Interest Reject Votes must be Accept. (*Regulations* ¶ 9.7.1.3)

Note: If both approval conditions are not satisfied, the Document fails.

		Accepts		**(Accepts + Valid Rejects)**				
Approval Rate	=	**39**	/	**39**	=	**100.0%**		**≥90%**

VII. – (ii) Approval Level (check one)

Note: See *Regulations* § 9.7.2 for further information.

	Globally Approved (No Ratification Ballot needed): **Line Item 1 meets the Letter Ballot approval conditions for the global technical committee.**
X	**Need a Ratification Ballot:** **Line Item 1 meets the Letter Ballot approval conditions for the TC Chapter and a Ratification Ballot will be issued to validate technical changes.**

Checks for Entire Document Including All Approved Line Items

VIII. Safety Check

Note: This Safety check applies to the entire Standard or Safety Guideline including all the approved Line Items. See § 15 of the *Regulations* for further information.

Motion	x	**This is not a Safety Document**, when all safety-related information is removed, the Document is still technically sound and complete. (*Regulations* ¶ 8.7.1)
		This is a Safety Document, when all safety-related information is removed, the Document is not technically sound and complete. (*Regulations* ¶ 8.7.2)
		Safety Checklist (*Regulations* ¶ 15.3) is complete and has been included with the Document throughout the balloting process. (*Regulations* ¶ 15.1.2)
Motion by/2nd by		Tetsuya Nakai (SUMCO)/Kurt Haller (KLA-Tencor)
Discussion		XXXX
Vote		9 **Y**-0 **N**; Motion passed

IX. Intellectual Property (IP) Check

Note: This IP check applies to the entire Standard or Safety Guideline including all the approved Line Items. See § 16 of the *Regulations* for further information.

x	The TC Chapter meeting chair asked those participating, if they were aware of any potentially material patented technology or copyrighted items* in the Standard or Guideline. (*Regulations* ¶ 8.8.1)		
	x	No potentially material patented technology or reproduction of copyrighted items is known.	**GO TO SECTION X.**
		Potentially material patented technology or reproduction of copyrighted items is known, but a Letter of Assurance (LOA) or copyright release letter for such items has been obtained or presented to the TC Chapter.	**GO TO SECTION X.**
		Potentially material patented technology or reproduction of copyrighted items is known and use of such materials is technically justified by the TC Chapter, but an LOA or copyright release letter for some of the item(s) has NOT been obtained or presented to the TC Chapter.	
	Motion		Ask ISC for special permission to publish.
			Quit activity.
			Wait for LOA for patented technology or release of copyrighted items.
	Motion by/2nd by	Name (Company)/Name (Company)	
	Discussion	XXXX	
	Vote	XX **Y**-XX **N**	
	Final Action		Motion passed
			Motion failed

*** Note: Such potentially material patented technology or copyrighted items might have become known since the Standard or Safety Guideline was last reviewed, or might become relevant due to this Letter Ballot.**

X. Action for This Document

Motion (Check all applicable items)		Line item(s) [X], [X] and [X] passed TC Chapter review as balloted and will be forwarded to the ISC A&R SC for procedural review.
		Line item(s) [X], [X] and [X] passed TC Chapter review with editorial changes and will be forwarded to the ISC A&R SC for procedural review.
	x	Line item(s) [1] passed TC Chapter review with technical changes and with editorial changes and will be forwarded to the ISC A&R SC for procedural review. A Ratification Ballot will be issued to verify the technical changes.
		Line item(s) [X], [X] and [X] failed TC Chapter review and will be returned to the TF for rework.
		Line item(s) [X], [X] and [X] failed TC Chapter review and work will be discontinued.

Motion by/ 2nd by	Tetsuya Nakai (SUMCO)/Fritz Passek (Siltronic)	
Discussion	XXXX	
Vote	9 **Y**-0 **N**	
Final Action	x	Motion passed
		Motion failed

Standards staff to record the result of the A&R procedural review here:

A&R		**Line item(s) [X], [X] and [X] are Approved for publication**
		Line item(s) [X], [X] and [X] are Approved pending acceptance of the Ratification Ballot
		Line item(s) [X], [X] and [X] are Not approved
	Reason:	