

Procedural Review Voting Sheet 2014 Cycle 1

REGION: **North America**
 COMMITTEE: **Silicon Wafer**
 EVENT: **SEMICON West 2014**
 DATE OF MEETING: **July 8, 2014**
 PLACE OF MEETING: **San Francisco Marriott Marquis, San Francisco, CA**
 COMMITTEE CO-CHAIRS: **Noel Poduje (SMS), Dinesh Gupta (STA)**
 SEMI STAFF: **Kevin Nguyen**

A&R Voter: **Name/Company**
 Date: **200X/MM/DD**

I. Document Number & Title

Document 5664	Line Items Revision to SEMI M59-0211, Terminology for Silicon Technology
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II-1 Line item 1

Line Item 1	Remove the definitions for 1/e lifetime (e) and primary mode lifetime (t1) from SEMI M59 and decrement paragraph numbers accordingly.
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1. Tally (**Staff to fill in**)

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

A minimum of 60% of the voting interests that have voting members within the technical committee must return votes. (Regulations ¶ 9.6.1)

	Return		Distribution		Return Rate	
Yellow	56	÷	91	=	61.5%	>=60%
Lilac & Others	25					
Total Vote	81					
Reject	0					
Accept	30					

A&R		Not approved
	Reason:	

2. Rejects

There was no reject received for ballot 5664 of line item 1.

3. Comments

There was no comment received for ballot 5664 of line item 1.

4. Summary of Editorial Changes

There was no editorial change proposed for ballot 5664 of line item 1.

5. Approval Conditions Check

APPROVAL CONDITION 1: All negatives have been discussed and were withdrawn, found not related, or not persuasive. (Regulations ¶ 9.6.2)

APPROVAL CONDITION 2: At least 90% of the sum of the valid accept and reject votes must be accept. (Regulations ¶ 9.6.3)

Note: if both approval conditions are not satisfied, the balloted item fails.

Approval Rate	=	30	/	30	=	100.0%		≥	90%

6. Preliminary action for this line item

Motion	<input checked="" type="checkbox"/>	This line item passed committee review as balloted.
	<input type="checkbox"/>	This line item passed committee review with editorial changes
	<input type="checkbox"/>	This line item failed committee review and will be returned to the task force for rework.
	<input type="checkbox"/>	This line item failed committee review and work will be discontinued.
Motion by/ 2nd by	Murray Bullis (Materials & Metrology)/Ron Sinton (Sinton Instruments)	
Discussion	None	
Vote	9-0	
Final Action	<input checked="" type="checkbox"/>	Motion passed
	<input type="checkbox"/>	Motion failed
A&R	<input type="checkbox"/>	Approved
	<input type="checkbox"/>	Not approved
	Reason:	

II-2 Line item 2

Line Item 2	Correct the definition for recombination lifetime as shown.
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1. Tally (Staff to fill in)

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

A minimum of 60% of the voting interests that have voting members within the technical committee must return votes. (Regulations ¶ 9.6.1)

	Return		Distribution		Return Rate	
Yellow	56	÷	91	=	61.5%	≥60%
Lilac & Others	25					
<hr/>						
Total Vote	81					
Reject	1					
Accept	28					

A&R	Not approved
	Reason:

2. Rejects

Reject 1 (Ron Sinton (Sinton Instruments))

Negative 1 of Reject 1

Negative	Referenced Section	*TF/Committee to fill in if necessary	
		Reason	<p>Negative 1. The Definition of minority-carrier is not given in this yellow ballot, but is extremely relevant.</p> <p>5.157 <i>minority carrier</i> — type of charge carrier constituting less than one half the total charge-carrier concentration in extrinsic semiconductor (e.g., electrons in p-type material).</p>
	Withdrawal	No withdrawal made	GO TO "Related" section

	x	Withdrawal document received by staff on 7/8/2014	GO TO "Final" → (A)	
Related	Motion and Reason	"Related" is mutually agreed upon.		
		*This motion can be appended to the motion for Persuasive (See Persuasive Section)		
		Negative is related (needs over 1/3 votes to pass)		
		Negative is not related (needs 2/3 or more votes to pass)		
		Reason	XXXX	
	Motion by/2nd by	Name (Company)/Name (Company)		
	Discussion			
	Result of Vote (check ONE)	XX-XX		
			[Negative is related] > 1/3	GO TO "Persuasive"
			[Negative is not related] < 2/3	
		2/3=< [Negative is not related] <90%	GO TO "Final" → (B)	
		90% =< [Negative is not related]	GO TO "Not Significant Finding Option"	
Persuasive	Motion and Reason	Negative is related and persuasive (needs over 1/3 votes to pass)		
		Negative is related and not persuasive (needs 2/3 or more votes to pass)		
		Reason	XXXX	
	Motion by/2nd by	Name (Company)/Name (Company)		
	Discussion			
	Result of Vote (check ONE)	XX-XX		
			[Negative is related and persuasive] > 1/3	GO TO "Final" → (E)
			[Negative is related and not persuasive] < 2/3	
			2/3=<[Negative is related and not persuasive] <90%	GO TO "Final" → (C)
			90% =< [Negative is related and not persuasive]	GO TO "Not Significant Finding Option"
Not Significant Finding Option	This option can only be used in either case of "if the committee finds a negative not related by a vote equal to or greater than 90% of the persons voting on the action" or "if the committee finds a negative not persuasive by a vote equal to or greater than 90% of the persons voting on the action". (Regulations ¶ 9.5.3.1.4, 9.5.3.3.2)			
		It is mutually agreed upon to term the negative "not significant"	GO TO → (D)	
		It is mutually agreed upon to term the negative "significant"	GO TO → (B) OR (C)	
	Motion	The negative is "not significant".		
	Motion by/2nd by	Name (Company)/Name (Company)		
	Vote		XX-XX Motion passed with simple majority	GO TO → (D)
			XX-XX Motion failed with simple majority	GO TO → (B) OR (C)

Final	Negative is:		
	x	(A) withdrawn (counted under h in disposition)	
		(B) not related (significant) (counted under i in disposition)	
		(C) related and not persuasive (significant)	
		(D) not significant (counted under j in disposition)	
		(E) related and persuasive	DOCUMENT FAILS
	Comment generated. See comment #x		
A&R	Not approved		
	Reason:		

Negative 2 of Reject 1

gat	Referenced Section	*TF/Committee to fill in if necessary

	Reason	<p>Negative 2. The proposed definition for minority-carrier lifetime in the background statement for 5664 would invalidate the current practice for lifetime measurements for SEMI M1. The motivation given to delete the phrase from M59 based on this controversial proposal is premature. M1 would need to be revised prior to changing the definition for minority-carrier lifetime. This line-item effectively changes the definition to imply that minority-carrier lifetime refers only to a bulk recombination lifetime of the wafer.</p> <p>None of the SEMI lifetime-measurement standards specifically report the SRH bulk lifetime, which is an interpreted parameter based on lifetime measurements on wafers.</p> <p>For a lifetime measurement on a wafer, the measured lifetime depends on Auger recombination, radiative recombination, Shockley-Read-Hall (SRH) recombination, and surface recombination. The interpretation of measured lifetime to report the SRH lifetime is possible but this not described in SEMI standards to date.</p> <p>In SEMI MF 1535, the user is instructed to use a surface passivation, for example as described in the Yablonovitch (reference 13 in MF-1535). That paper actually shows that the resulting lifetime on lowly-doped high-quality wafers is due primarily to surface recombination and Auger recombination (due to excess electron hole pairs). The MF1535 procedure would not report SRH lifetime for these wafers. The report also does not contain sufficient detail to allow the interpretation separation of these effects to report the SRH bulk lifetime.</p> <p>Similarly, SEMI MF-1535 has a scope including 0.05 Ohm-cm wafers. 0.05 ohm-cm p-type wafers would be limited by Auger bulk recombination to have a lifetime less than 20 μs. The measured lifetime of an oxidized wafer of this type would, in most cases, be almost entirely due to Auger recombination and surface recombination rather than SRH recombination.</p> <p>In actual practice, the lifetimes reported by the SEMI MF-1535 procedure and report would only approximate the SRH lifetime in the case that the wafers have perfect surface passivation, yet were heavily contaminated or had highly-defective crystalline structure. In general, most results reported from this standard would not closely approximate the SRH bulk lifetime of the wafer.</p> <p>SEMI MF28 is designed to report bulk lifetime under very low-level injection conditions, but does not distinguish between SRH and Auger bulk lifetime.</p> <p>PV-13 includes the methodology for reporting bulk lifetime based on wafer measurements, but does not specify how to separate this bulk lifetime into its Auger, SRH, and radiative components.</p>	
	Withdrawal		GO TO "Related" section
	x	Withdrawal document received by staff on 7/8/2014	GO TO "Final" → (A)
d Relate	Motion and Reason	<p>"Related" is mutually agreed upon.</p> <p>*This motion can be appended to the motion for Persuasive (See Persuasive Section)</p>	

			Negative is related (needs over 1/3 votes to pass)		
			Negative is not related (needs 2/3 or more votes to pass)		
		Reason	XXXX		
	Motion by/2nd by	Name (Company)/Name (Company)			
	Discussion				
	Result of Vote (check ONE)		XX-XX		
			[Negative is related] > 1/3	GO TO "Persuasive"	
			[Negative is not related] < 2/3		
			2/3=< [Negative is not related] <90%	GO TO "Final" → (B)	
			90% =< [Negative is not related]	GO TO "Not Significant Finding Option"	
	Persuasive	Motion and Reason		Negative is related and persuasive (needs over 1/3 votes to pass)	
				Negative is related and not persuasive (needs 2/3 or more votes to pass)	
			Reason	XXXX	
		Motion by/2nd by	Name (Company)/Name (Company)		
		Discussion			
Result of Vote (check ONE)			XX-XX		
			[Negative is related and persuasive] > 1/3	GO TO "Final" → (E)	
			[Negative is related and not persuasive] < 2/3		
			2/3=<[Negative is related and not persuasive] <90%	GO TO "Final" → (C)	
			90% =< [Negative is related and not persuasive]	GO TO "Not Significant Finding Option"	
Not Significant Finding Option		This option can only be used in either case of "if the committee finds a negative not related by a vote equal to or greater than 90% of the persons voting on the action" or "if the committee finds a negative not persuasive by a vote equal to or greater than 90% of the persons voting on the action". (Regulations ¶ 9.5.3.1.4, 9.5.3.3.2)			
				It is mutually agreed upon to term the negative "not significant"	GO TO → (D)
				It is mutually agreed upon to term the negative "significant"	GO TO → (B) OR (C)
		Motion		The negative is "not significant".	
		Motion by/2nd by	Name (Company)/Name (Company)		
	Vote		XX-XX Motion passed with simple majority	GO TO → (D)	
			XX-XX Motion failed with simple majority	GO TO → (B) OR (C)	
	Final		Negative is:		
x		(A)	withdrawn (counted under h in disposition)		
		(B)	not related (significant) (counted under i in disposition)		
		(C)	related and not persuasive (significant)		

	(D)	not significant (counted under j in disposition)	
	(E)	related and persuasive	DOCUMENT FAILS
		Comment generated. See comment #x	
A&R		Not approved	
		Reason:	

Disposition of Reject 1

2	Original number of Negatives	(g)
2	# of Negatives withdrawn	(h)
	# of Negatives found not related	(i)
	# of Negatives found not significant	(j)
Final	x $g-(h+i+j)=0$	<input type="checkbox"/> Reject is Not Valid and is not included in the denominator of <u>V. Approval Conditions Check</u>
	$g-(h+i+j)>0$	<input type="checkbox"/> Reject is included in the denominator of <u>V. Approval Conditions Check</u>
	Reject without a Negative	<input type="checkbox"/> Not Valid

Note: If all of the negative material included with a reject vote is withdrawn, determined to be not related, or determined to be not significant, the reject vote is not valid. (Regulations ¶ 9.4.3.3)

A&R		Not approved
		Reason:

3. Comments

There was no comment received for ballot 5664 of line item 2.

4. Summary of Editorial Changes

There was no editorial change proposed for ballot 5664 of line item 2.

5. Approval Conditions Check

APPROVAL CONDITION 1: All negatives have been discussed and were withdrawn, found not related, or not persuasive. (Regulations ¶ 9.6.2)

APPROVAL CONDITION 2: At least 90% of the sum of the valid accept and reject votes must be accept. (Regulations ¶ 9.6.3)

Note: if both approval conditions are not satisfied, the balloted item fails.

			Accepts		(Accepts + Valid Rejects)					
Approval Rate	=	28	/	28	=	100.0%		≥90%		

III. Safety Check

This section applies to the entire document.
See Section 14 of the Regulations for further information

Motion:	<input checked="" type="checkbox"/>	This is not a Safety Document: when all safety-related information is removed, the document is still technically sound and complete.
	<input type="checkbox"/>	This is a Safety Document: when all safety-related information is removed, the document is not technically sound and complete.
	<input type="checkbox"/>	Safety Checklist is complete and has been included with the document throughout the balloting process. (Regulations ¶ 14.3)
Motion by/ 2nd by		Noel Poduje (SMS)/ Peter Wagner (Consultant)
Discussion		None
Vote		9-0 Motion passed
A&R	<input type="checkbox"/>	Not approved
	<input type="checkbox"/>	Reason:

IV. Intellectual Property Check

Note: This ballot may be all or part of a Standard or Safety Guideline. This IP check applies to the entire Standard or Safety Guideline. See § 15 of the Regulations for further information

<input checked="" type="checkbox"/>	The meeting chair asked those present in person or by electronic link, if they were aware of any potentially material patented technology or copyrighted items* in the Standard or Guideline.		
	<input checked="" type="checkbox"/>	No potentially material patented technology or copyrighted items are known	
	<input type="checkbox"/>	Potentially material patented technology or copyrighted items are known but a Letter of Assurance (LOA) or copyright release for such material has been obtained or presented to the committee.	
	<input type="checkbox"/>	Potentially material patented technology or copyrighted items are known but an LOA or copyright release for some of the material(s) has NOT been obtained or presented to the committee	
	MOTION	<input type="checkbox"/>	Ask ISC for special permission to publish
		<input type="checkbox"/>	Quit activity
<input type="checkbox"/>		Wait for LOA for patented technology or release of copyrighted items.	

	Motion by/2nd by	Name (Company)/Name (Company)	
	Discussion	XXXX	
	Vote	XX-XX	
	Final Action	<input type="checkbox"/>	Motion Passed
<input type="checkbox"/>		Motion Failed	
A&R	<input checked="" type="checkbox"/>	Not approved	
		Reason:	

* 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 ballot.

V. Action for this document

Motion (Check all applicable items)	<input checked="" type="checkbox"/>	Line item(s) [1] and [2] passed committee review as balloted and will be forwarded to the A&R for procedural review.
	<input type="checkbox"/>	Line item(s) [X], [X] and [X] passed committee review with editorial changes and will be forwarded to the A&R for procedural review.
	<input type="checkbox"/>	Line item(s) [X], [X] and [X] failed committee review and will be returned to the task force for rework.
	<input type="checkbox"/>	Line item(s) [X], [X] and [X] failed committee review and work will be discontinued.
Motion by/ 2nd by	Murray Bullis (Materials & Metrology)/ Noel Poduje (SMS)	
Discussion	None	
Vote	12-0	
Final Action	<input checked="" type="checkbox"/>	Motion passed
	<input type="checkbox"/>	Motion failed
A&R	<input checked="" type="checkbox"/>	Approved
	<input type="checkbox"/>	Not approved
		Reason: