Procedural Review Voting Sheet
2011 Cycle 6

REGION: NA
COMMITTEE: Silicon Wafer
EVENT: NA Fall Standards Meetings
DATE OF MEETING: October 25, 2011
PLACE OF MEETING: Intel, Santa Clara, CA
COMMITTEE CO-CHAIRS: Dinesh Gupta (STA), Noel Poduje (SMS)
SEMI STAFF: Kevin Nguyen

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

I. Document Number & Title

5313	**Reapproval of SEMI MF1535-0707, Test Method for Carrier Recombination Lifetime in Silicon Wafers by Noncontact Measurement of Photoconductivity Decay by Microwave Reflectance**

II. Tally (Staff to fill in)

Voting Tally: As-cast tally after close of 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)

0	
As Cast Ballot Tally Summary For Document 5313	
Return Percentage: **60.00%**	**TC Member Returns: 51** **TC Member Distribution: 85**
Total votes Received: 54	*Number of Abstains: 40*
Number of Accepts: 12 **Accept %:** 85.71%	**Number of Rejects:** 2
Total Comments: 0	**Total Rejects:** 2
Comment Issuer(s):	*Reject Issuer(s):* AFF_PWC - Peter Wagner AFF_Sinton - Ronald Sinton

A&R		**Not approved**
	Reason:	

III. Rejects

Reject 1 (Peter Wagner/Self)

Negative 1 of Reject 1

Negative	Referenced Section			
	Reason	Reject MF1535 is no longer necessary and should be withdrawn because PV9 is now available, which is a more recent and improved standard regarding lifetime measurement.		
	Withdrawal	x	No withdrawal made	GO TO "Related" section
			Withdrawal document received by staff on XXXX	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	
	Motion by/2nd by			
	Discussion			
	Result of Vote (check ONE)			
			[Negative is related] > 1/3	GO TO "Persuasive"
			[Negative is not related] < 2/3	
			2/3=< [Negative is not related]	GO TO "Final" → (B)
Persuasive	Motion and Reason		Negative is related and persuasive (needs over 1/3 votes to pass)	
		x	Negative is related and not persuasive (needs 2/3 or more votes to pass)	
			Reason	This is not a technical reason. MF1535 is still technical valid document. Nothing was justify PV9 is MF1535's replacement. In addition, this ballot is for reapproval, not for withdrawal.
	Motion by/2nd by	Dinesh Gupta (STA)/Jaydeep Sinha (KLA-Tencor)		
	Discussion			
	Result of Vote (check ONE)	4-1		
			[Negative is related and persuasive] > 1/3	GO TO "Final" → (E)
			[Negative is related and not persuasive] < 2/3	
		x	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 "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 ¶ 9.5.3.3.2)

[redacted]		It is mutually agreed upon to term the negative "not significant"	**GO TO → (D)**
[redacted]		It is mutually agreed upon to term the negative "significant"	**GO TO → (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 → (C)**

Final	Negative is:			
		(A)	withdrawn (counted under **h** in disposition)	
		(B)	not related (counted under **i** in disposition)	
	x	**(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

1	Original number of Negatives	**(g)**
	# of Negatives withdrawn	**(h)**
1	# of Negatives found not related	**(i)**
	# of Negatives found not significant	**(j)**

Final		**g**-(**h**+**i**+**j**)=0	☐ Reject **is Not Valid and is not** included in the denominator of § VI. Approval Conditions Check
	x	**g**-(**h**+**i**+**j**)>0	☐ Reject **is** included in the denominator of § VI. Approval Conditions Check
		Reject without a Negative	☐ **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:	

Reject 2 (Ron Sinton/Sinton Instruments)

Negative 1 of Reject 2

Negative	Referenced Section	
	Reason	The definition of lifetime specific to this standard, as shown in Fig.3 in MF-1535, is given as two fit parameters to a microwave-reflectance data trace. The fit parameters reported from this definition do not correspond to the physical carrier recombination lifetime defined in SEMIM59, which follows from the original definitions by Shockley. From a discussion of microwave reflectance measurements in Bullis and Huff, 1996[1]: "In all cases, it is assumed that the decay of the microwave signal is proportional to the recombination of the excess electron-hole pairs; Schofthaler and Brendel show that this assumption is valid only under certain experimental conditions." The scope of MF1535, specifically paragraph 2.3, clearly violates the cited conditions. There are two choices to fix this. 1) Delete all references to "carrier recombination lifetime", "surface recombination lifetime" and "carrier lifetime" in the standard (including in the title). Then the standard is concerned only with reporting the microwave reflectance fit parameters, □1 (primary mode lifetime of the microwave signal) and □e (1/e lifetime of the microwave signal). Each instance of "lifetime" should refer specifically to either "□e" or "□1". Each of the 139 references to "lifetime" should be specific as to what is meant. The title of the standard could be Test Method for Non-Contact Microwave-Reflectance-Signal Lifetime in Silicon Wafers. Or: 2) Specify the conditions as in Schofthaler and Brendel[2] under which the reported values are valid carrier recombination lifetime measurements, and restrict this standard to these cases only. The conclusion of Schofthaler and Brendel reads: "It is shown by calculating microwave reflection transients after pulsed laser excitation that effective carrier lifetime measurements require (a) low-injection conditions, (b) homogeneous carrier generation, and (c) carefully adjusted reflector distance for linear response as outlined by Figs. 7 and 11. When these precautions are observed, the contactless time-resolved microwave reflection technique is a powerful and sensitive method for measuring effective carrier lifetimes in semiconductors." [1] Bullis and Huff, "Interpretation of Carrier Recombination Lifetime and Diffusion Length Measurements in Silicon", J. Electrochem. Soc., Vol. 143, No. 4, April 1996. [2] M. Schofthaler and R. Brendel , "Sensitivity and transient response of microwave reflection measurements", J. Appl. Phys., Vol. 77, No. 7, 1 April 1995.

Withdrawal	x	No withdrawal made	GO TO "Related" section
		Withdrawal document received by staff on XXXX	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	
	Motion by/2nd by			
	Discussion			
	Result of Vote (check ONE)			
			[Negative is related] > 1/3	**GO TO "Persuasive"**
			[Negative is not related] < 2/3	
			2/3=< [Negative is not related]	**GO TO "Final" → (B)**
Persuasive	**Motion and Reason**		Negative is related and persuasive **(needs over 1/3 votes to pass)**	
		x	Negative is related and not persuasive **(needs 2/3 or more votes to pass)**	
			Reason	Even though the terms and definitions in the document could be improved, they are widely used and accepted in the industry and do not constitute a technical basis for not reapproving this document
	Motion by/2nd by		Dinesh Gupta (STA)/Jaydeep Sinha (KLA-Tencor)	
	Discussion			
	Result of Vote (check ONE)		4-1	
			[Negative is related and persuasive] > 1/3	**GO TO "Final" → (E)**
			[Negative is related and not persuasive] < 2/3	
		x	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 "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 ¶ 9.5.3.3.2)**			
			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 → (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 → (C)**
Final		Negative is:		
			(A) withdrawn (counted under **h** in disposition)	
			(B) not related (counted under **i** in disposition)	
		x	**(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 2

Negative	**Referenced Section**			
	Reason		There are three definitions of "injection" used interchangeably in 61 instances in this standard and related information. The definitions contradict each other and confuse users of this standard. I would recommend that "injection level", "low-injection", and "high-injection" refer only to the SEMI M-59 standard device-physics definition, with units of cm-3. 5.127 Injection level – the ratio of the density of excess carriers generated by photons or other means to the equilibrium density of majority carriers in an extrinsic semiconductor crystal or wafer. (SEMI M59 - 1107) Laser power injection, injection level (light source intensity), laser injection level, and other "injection" references should be changed to "laser photon density", with units of photons/cm2 in each case in order to clearly distinguish this from the standard semiconductor-physics definition of injection level. This confusion and proposed partial solution was previously discussed by Bullis and Huff[1].	
Withdrawal		x	No withdrawal made	**GO TO "Related" section**
			Withdrawal document received by staff on XXXX	**GO TO "Final" → (A)**
	Motion and		"Related" is mutually agreed upon.	

Related	**Reason**		***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		
	Motion by/2nd by				
	Discussion				
	Result of Vote (check ONE)				
			[Negative is related] > 1/3	**GO TO "Persuasive"**	
			[Negative is not related] < 2/3		
			2/3=< [Negative is not related]	**GO TO "Final" → (B)**	
Persuasive	**Motion and Reason**		Negative is related and persuasive **(needs over 1/3 votes to pass)**		
		x	Negative is related and not persuasive **(needs 2/3 or more votes to pass)**		
			Reason	Even though the terms and definitions in the document could be improved, they are widely used and accepted in the industry and do not constitute a technical basis for not reapproving this document	
	Motion by/2nd by		Dinesh Gupta (STA)/Jaydeep Sinha (KLA-Tencor)		
	Discussion		The negative was upheld and the vote failed to meet the Regs Section 9.6.4.3, which requires 2/3 of vote to pass a motion finding not persuasive. Therefore, motion failed. The committee encouraged dr. Sinton to submit a SNARF to revise this document in future meetings.		
	Result of Vote (check ONE)		3-2		
		x	[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 "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 ¶ 9.5.3.3.2)**				
			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 → (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 → (C)**	
Final		Negative is:			
			(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)		
		x	**(E)** related and persuasive	**DOCUMENT FAILS**	
			Comment generated. See comment #x		
A&R		**Not approved**			
		Reason:			

Disposition of Reject 1

	Original number of Negatives			**(g)**
	# of Negatives withdrawn			**(h)**
	# of Negatives found not related			**(i)**
	# of Negatives found not significant			**(j)**
Final		**g**-(**h**+**i**+**j**)=0	☐ Reject **is Not Valid and is not** included in the denominator of § VI. Approval Conditions Check	
	x	**g**-(**h**+**i**+**j**)>0	☐ Reject **is** included in the denominator of § VI. Approval Conditions Check	
		Reject without a Negative	☐ **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:	

Additional reject is attached in PDF file below

SEMIMF1535Sinton2011.pdf

IV. Comments

There was no comment submitted

V. Summary of Editorial Changes

No editorial change was proposed.

VI. 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 document fails.

		Accepts		(Accepts + Valid			
Approval Rate	=		/		=	#DIV/0!	>=90%

A&R		Not approved
		Reason:

VII. Safety Check

See § 14 of the Regulations for further information

Motion:			This is not a Safety Document: when all safety-related information is removed, the document is still technically sound and complete.
			This is a Safety Document: when all safety-related information is removed, the document is not technically sound and complete.
			Safety Checklist (Regulations ¶ 14.3) is complete and has been included with the document throughout the balloting process.
Motion by/2nd by			

Discussion		None
Vote		
A&R		**Not approved**
		Reason:

VIII. 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

	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.		
		No potentially material patented technology or copyrighted items are known	**GO TO SECTION IX**
		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.	**GO TO SECTION IX**
		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		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-XX
	Final Action		Motion Passed
			Motion Failed
A&R			**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.

IX. Action for this document

Motion		This document passed committee review as balloted and will be forwarded to the A&R for procedural review.
		This document passed committee review with editorial changes and will be forwarded to the A&R for procedural review.
	x	This document failed committee review and will be returned to the task force for rework.
		This document failed committee review and work will be discontinued.
Motion by/2nd by		Dinesh Gupta (STA)/Ron Sinton (Sinton Instruments)
Discussion		None
Vote		4-0

Final Action	x	Motion passed
		Motion failed
A&R		**Approved**
		Not approved
	Reason:	