

Voter	No.	Item
Comments for Doc 6767 " Test Method for flatness of silicon carbide wafers by optical interference		
	1	1 Title
	2	2 Scope
	3	
	4	
	5	
	6	3. Ref. Standards & Doc
	7	5 Summary of test method
	8	6 Apparatus

M Yoshise/Consultant, Japna AWG TF  
Leader under Japan Silicon  
/Self\_MasanoriYoshise

**#1**

9

10. Procedure

10

11

12

11 Calculation

13

14

12 Precision & Bias

15

Kranert, Christian/Fraunhofer <b>#2</b>	1	
Obara, Masayoshi/SEC <b>#3</b>	1	Title
	2	2.1
	3	
	4	
Barbieri, Tom/Cree <b>#4</b>	1	Section 10: Procedure
	2	Section 11: Calculations
	3	Section 11.3: Bow and Warp Determination
	4	

Tsunaki, Hidetoshi/Kobelco <b>#5</b>	1	Figure 1
Vargas-Bernal, Rafael/ITSdl		
Weber, Arnd Dietrich/SiCry <b>#6</b>	1	Section 5
	2	
	3	
	4	Figure 1
	5	
	6	
	1	2 Scope

T Yamamoto/Consultant, Japan SiC substrate & epitaxial wafer DENSO <b>#7</b>	2	
	3	
	4	
	5	3. Ref. Standards & Doc
	6	6 Apparatus
	7	10. Procedure
竹田, 隆二/Global Wafers Japan <b>#8</b>	1	General
	2	
	3	
	4	10
	5	3.2

Valley, John/JV Consultant <b>#9</b>	1	Section 10
Ma, Aris/AK Optics <b>#10</b>	1	

Total Voting Interests/Votes: 86/107
Voting Interest Accepts: 49 (83.05%)
Voting Interest Rejects: 10
Voting Interest Returns: 65
Voting Interest Distribution: 106
Return Percentage: 61.32%

Comments for Doc 6768 " Test Method for Micropipe Density of Silicon Carbide Wafer by Laser Reflection"		
Kranert, Christian/Fraunhofer	1	Purpose
	2	
	3	

	4	
Barbieri, Tom/Cree <b>#1</b>	1	Section 2: Scope
	2	Section 3: Referenced Standards and Documents
	3	Section 5.5: Sea gull signature
	4	
Vargas-Bernal, Rafael/ITSdl		6.1.3, 6.1.5, and 14.1.3. , 6.1.4
Weber, Arnd-Dietrich/SiCry <b>#2</b>	1	
	2	Figure 2
	3	

Yamamoto, Toshimasa/DENSO	1	2 Scope
	2	3. Ref. Standards & Doc
	3	5 Summary of test method
		6 Apparatus
		7 Disturbing Factors
		8 Test Environments
		9 Sample
		10 Test Area
		11 Procedure
		12 Calculations
		13 Precision and Bias
		14 Report
竹田, 隆二/Global Wafers Japan <b>#3</b>	1	General
	2	
	3	



	4	
	5	11
	6	3.2
Valley, John/JV Consultant <b>#4</b>	1	
Ma, Aris/AK Optics <b>#5</b>	1	
Total Voting Interests/Votes: 86/107		
Voting Interest Accepts: 49 (90.74%)		
Voting Interest Rejects: 5		
Voting Interest Returns: 65		
Voting Interest Distribution: 106		
Return Percentage: 61.32%		

Comments for Doc 6769 " Test Method for Residual Stress of Silicon Carbide Wafers by Photoelastic"		
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Kranert, Christian/Fraunhofer <b>#1</b>	1	Purpose
	2	point 2.2
	3	
	4	Table 1
	5	point 5.7
	6	Apparatus
	7	

	8	Point 6.1.7
	9	Sample
	10	Procedure
	11	Point 11.4
	12	Precision and Bias
	13	Point 12.2
Barbieri, Tom/Cree		

Vargas Bernal, Rafael/ITSdl		4.2.2, 12.1
Weber, Arnd-Dietric/SiCry <b>#2</b>	1	Section 10
	2	
	3	
	4	
	5	Seciton 2.2
	6	4.2.2
竹田, 隆二/Global Wafers Japan	1	General
	2	

#3	3	
	4	10
Valley, John/JV Consultant		Section 7
Ma, Aris/AK Optics	1	
#4		
Wang, Ronghua/XINGUAN		
Total Voting Interests/Votes: 86/107		
Voting Interest Accepts: 49 (92.45%)		
Voting Interest Rejects: 4		
Voting Interest Returns: 65		
Voting Interest Distribution: 106		
Return Percentage: 61.32%		

Position	Comments
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about standard name	He thinks "Flatness" defined by SEMI does not include Bow/Warp. This must be changed.
Item 2.1	His point is TTV; Now use GBIR. M55 uses GBIR
	He says: LTV; SEMI doesn't defined SEMI LTV. Need to change to SBIR as M55 SiC wafer specification uses
	Bow Warp: Reviewed documents of 6767. The measurement method is different "Bow/Warp" definition.
Item 2.2	Wafer dia of 50.8mm is not specified in M55 which specify 3 inch, 100mm 150mm and 200mm
Item 3.2	China National Standard: Need to be used ISO 146441-1 which is most widely used
about Fig 1	Figure 1 shows principal of single surface interferometry measurement. If so, there is inconsistency with description in calculation of item 11. Also it is required to show wafer reference plane for TTV/LTV (GBIR/SBIR) and Bow/Warp measurement. Need to add either horizontal or vertical measurement to clarify gravity effect cancellation.
6	Wafer holding: For (Bow/Warp) measurement the wafer is not be clamped. But no description how to hold the wafer within item 6 or other appropriate place.

10.1.2 & 10.2.2	TTV(GBIR)/LTV(SBIR) chuck vs Bow/Warp chuck. No description how difference each chuck. This description is at appropriater position other than Procedure
10.1.3	Optical adjusting film: Is this used for optical positioning to find proper plane ? If so, this is a part of claibration and not use for normal measurement procedure.
10.2.5	"Level the sample " is to measure front surface only. Then this is not to measure Bow/Warp.
11.2.1	Edge Exclusion:There is no Edge Exclusion discussion. Need to put exclusion to define measurement area. The measurement data are very dependent on exclusion area due to edge roll off. Additionally it is necessary to specify area size (site size) and it's array data.
11.3	Bow Warp measurement: This is inconsistent message between the information Fig1 of single side measurement and item 10.2.5 which indicate the measurements both fron/back suraces. Bow/Warp measurement SEMI defined is required double side measurement and claluate as " $((\text{Front surface}) - (\text{back surface}))/2$ " as equsion (5) and (6). The mothod of single surace is "Sori"
12.1	(2)150mm wafer at 3 labo: Can not understand well. Which labo can certify and why 150mm and no 200mm which must be larger values
12.2 & 12.3	Specified % of repeatability/reporducibilty: What percentage are specified. Percentage against average of 5 times measurement ?

	<p>The Document in the present form does not allow to replicate the procedure and calculations. Further, it is not clear which benefit the present Document has over applying the established Standards for silicon (MF1530, MF1390), which are not even mentioned, to silicon carbide. If there is a benefit, this should be made clear in the Purpose section, which currently contains just generic statements. Without going through the Document, the main issue is that the Procedure section rather reads like the manual of certain device than a general procedure which enables any party to apply the Standard. Particularly, the Procedure must explain how to obtain the measurement values used for the calculations (<math>t_{max}</math>, <math>t_{min}</math>), but these values are not even defined in the Document.</p>
	<p>Flatness' defined by SEMI does not include Bow/Warp. This must be changed.</p>
	<p>TTV; Now use GBIR. M55 uses GBIR</p>
	<p>SEMI doesn't defined SEMI LTV. Need to change to SBIR as M55 SiC wafer specification uses</p>
	<p>Bow Warp: Reviewed documents of 6767. The measurement method is different 'Bow/Warp' definition.</p>
	<p>Is this section with regards to a specific instrument? The procedural steps are so detailed as to suggest a specific instrument, which therefore should be referenced in the document.</p>
	<p>It is highly recommended hat the authors include figures to clarify the different parameters (<math>t_{max}</math>, <math>t_{min}</math>, <math>a_0</math>, <math>b_0</math>, etc) referenced in this section</p>
	<p>The bow calculation must be performed relative to a specified reference datum plane that should be clarified in this section. The standard fails to define the colinear datum plane for reference to determine bow.</p>
	<p>The calculation for warp should not include the factor of <math>\frac{1}{2}</math>.</p>



	<p>In the figure 1, flat chuck is not expressed, so it is difficult to understand the configuration of the measurement apparatus.</p> <p>It is also difficult to understand how to measure distance a/b and how to calculate the reference plane.</p>
	Some '.' are required, please to verify. In section 2.1, delete one space in 'Bow, '.
	Please clarify in the document (section 5), between which surfaces are creating the observed fringes (Prism to back surface, or prism to front surface, or front to back surface ) – This is essential to judge the procedure itself
	Definition of site and site dimensions (11.2.1): field size for LTV calculation, edge exclusion, how to treat partial fields ) – please specify these
	Gravity effects are not considered at all
	<p>Mechanical fixation of wafer and vacuum chuck does not match to figure 1 (shows the wafer on the Prism that seems to serve as the chuck at the same time?)</p> <p>In case the possible physical setup has the optics from top please check the formulas for any missing negative signs.</p>
	Missing explanation how to evaluate the fringe pattern into a geometrical information. The relevant parameters needed (as incident angels, wavelength of light ) should be listed as a minimum. Also physical limitations of the method should be included (steep thickness changes, scattering at the edge, roughness or defects at the wafer surface)
	Instructions to judge the validity of the data should be added, e.g. when the fringes are weak in contrast or distorted and cannot be evaluated on the complete wafer area. (e.g. 98% of the area must show valid fringes)
2.1	TTV; We use GBIR for example in M55-0921.

	LTV; SEMI doesn't defined LTV. Need to change to SBIR as M55 SiC wafer specification uses.
	Bow Warp: Reviewed documents of 6767. The measurement method is different "Bow/Warp" definition.
2.2	Wafer dia of 50.8mm is not specified in M55-0921 which specify 3 inch, 100mm 150mm and 200mm This is because it is no longer used in commercial applications, and the 50.8mm was removed in the revision of <b>M55-0921</b> .
3.2	China National Standard: Rather than using the China National Standard, it is better to refer to ISO 146441-1.
6	Wafer holding: For (Bow/Warp) measurement the wafer should not be clamped. But no description how to hold the wafer within item 6 or other appropriate place.
10.1.2 & 10.2.2	TTV(GBIR)/LTV(SBIR) chuck vs Bow/Warp chuck. No description how difference each chuck. This description is at appropriate position other than Procedure
	"7. Disturbing Factor" is not including item for SEMI Procedure manual at table 10. It shall be replaced to "Limitation".
	"8. Test Environments" is not including item for SEMI Procedure Manual at table 10. It shall be replaced to optimized item as "Limitation" or another item.
	"9. Sample" shall be replaced to "Test specimens".
	This description has image for particular equipment for reader. This document shall not be given these images for reader. Then, this sentence shall be removed and make optimized expressions.
	China national standard can be used, however here would be better adapted to use ISO document than GB 50073.

	<p>This Test Method is written as if it is an operators guide to a specific piece of equipment (see Section 10) rather than a general purpose test method that encourages a competitive market for solutions. It is also written with terms that are not well defined or not generally accepted (e.g., fixed mirror and moving mirror in section 5.1 do not track with Figure 1 call outs). Section 7 is called 'Disturbing Factors' but appears to be the Limitations section. In general, both form and content need to become technically precise to achieve Test Method acceptance.</p>
	<p>The standard shall not be based on specific testing tools</p>

	<p>Purpose: The Purpose is formulated in a completely generic form. It should however specifically explain the benefit of the present Standard, i.e. why is this very Standard required and beneficial for the industry? This section could also include the advantages of this method with respect to other approaches to detect micropipes.</p>
	<p>Some details on the test equipment should be added: Is the beam focused on the wafer surface? Is the imaging detector just a photo diode or is it an areal detector (CCD or similar)? These scheme in Fig. 1 shows some additional optics on the detector side of the beam what are these? What should be the setting of the polarizer?</p>
	<p>What is the size of the seagull shapes? Which spatial resolution is required for the measurement?</p>

	<p>There are also several other methods to detect micropipes how do the absolute values of this Test Method compare to these other approaches? Are there any scientific publications on this approach which can be referenced?</p>
	<p>Does this test method apply to on axis wafers, off axis wafers, or both? Are special considerations to the test method required when dealing with wafers of different orientation?</p>
	<p>Semi M81 should be included as a referenced standard.</p>
	<p>Semi M81 is the established Semi standard for defects in SiC. In Semi M81, micropipes are defined as having a linear appearance when viewed through an optical microscope in transmission mode (Figure 1) and appear as hexagonal pits when decorated with molten KOH etch (Figure 11). If the authors of 6768 wish to establish the new</p> <p>The authors need to provide additional clarity on how the instrument is tuned in order to accurately produce the sea gull signature</p>
	<p>and' is required in 6.1.3, 6.1.5, and 14.1.3. In 6.1.4 is placed 'and' in a wrong place.</p>
	<p>Reject, because the described procedure simply does not work in general, or it works only in very specific preconditions of surface preparation that are not mentioned at all.</p>
	<p>Figure 2 relies on the reflection channel. (stated in section 5.5)</p>
	<p>The detection makes use of small slope of the wafer surface in the transition from surface into the micropipe. This strongly depends on the process and quality of surface preparation.</p>

2.3	<p>Section 10.2 specifies the exclusion area according to the wafer size, so the corresponding wafer size should be described in the Scope. For example following sentence will be described.</p> <p>"2.3 This Standard applies to the flatness test of silicon carbide single crystal wafers with a diameter of 76.2 mm, 100 mm, 150 mm, 200 mm and a thickness from 0.1 mm to 1 mm."</p>
3.2	<p>China National Standard: Rather than using the China National Standard, it is better to refer to ISO 146441-1.</p>
	<p>Figure 1 seems to show the basic measurement method. However, there is no mention of the wafer size, rotation speed of the rotary table, position, etc., which are considered to affect the accuracy. It is difficult to analogize that the standard can be followed to identify the micropipe density. It is desirable to describe the configuration drawings and test procedures in more detail.</p>
	<p>"7. Disturbing Factor" is not including item for SEMI Procedure manual at table 10. It shall be replaced to "Limitation".</p>
	<p>"8. Test Environments" is not including item for SEMI Procedure Manual at table 10. It shall be replaced to optimized item as "Limitation" or another item.</p>
	<p>"9. Sample" shall be replaced to "Test specimens".</p>

	<p>"10 Test Area" is not including item for SEMI Procedure Manual at table 10. It shall be replaced to optimized item.</p>
	<p>This description has image for particular equipment for reader. This document shall not be given these images for reader. Then, this sentence shall be removed and make optimized expressions.</p>
	<p>China national standard can be used, however here would be better adapted to use ISO document than GB 50073.</p>
	<p>Similar comments to Doc 6767 above. For example '5.3 The instrument has one laser (405 nm) incident on the sample at oblique angle.' is a product brochure statement and does not belong in a SEMI Standard Test Method. What are the spatial resolution and other requirements? Let the market develop new, smarter, faster solutions to the problems. Do not write a test method for a single existing piece of equipment except using that equipment as a basis, not an exclusive requirement.</p>
	<p>The standard shall not be based on specific testing tools</p>

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	<p>1. Purpose: The Purpose is formulated in a completely generic form. It should however specifically explain the benefit of the present Standard, i.e. why is this very Standard required and beneficial for the industry?</p>
	<p>2. In point 2.2, it should read 4H and 6H instead of 4h and 6h</p>
	<p>3. The Document is missing limitations. Even though this point is not mandatory for a Test Procedure Document, I expect several limitations of the proposed Test Method, e.g. regarding the range of stress that can be probed.</p>
	<p>In Table 1, Ia and Ib are not defined.</p>
	<p>5. In point 5.7, C is defined as 'material constant, the unit is usually N/mm<sup>2</sup>, namely MPa'. For a Test Method, this value needs to be defined very precisely. From the present definition, it is not even clear which physical value is meant (probably the photoelastic constant). Since the result of the calculation critically depends on this value, I assess it to be mandatory that a value is given to obtain standardized results. However, this probably is currently not possible due to missing data from scientific literature.</p>
	<p>6. Apparatus: The Document defines a microscope to be used by image acquisition. Microscope optics usually are equipped with optics with high numerical aperture which means divergent rays being involved. Divergent rays are obviously critical for the results of birefringence measurements due to the natural birefringence of hexagonal SiC. To get standardized results, the NA should be specified or limitations in dependence on the NA should be given.</p>
	<p>7. Apparatus: The central wave length of the light source or its acceptable range should be specified.</p>

	<p>8. Point 6.1.7 states that a 'black and white camera' shall be used, however, obviously a monochrome camera is meant. A 'black and white camera' would have a pixel depth of just 1 bit. This point further requires the pixel depth to be at least 8bit. This seems a bit low and probably strongly limits the sensitivity of the measurement. The specification of the dynamic range (and maybe also of the linearity) also seems to be a better specification. Ideally, the Standard would give the range of detectable stress using the described approach in dependence on the dynamic range of the camera.</p>
	<p>9. Sample: Several specifications, which are obviously critical for birefringence measurements, are not given here: Crystal orientation, acceptable offcut, surface quality, wafer curvature, maybe others</p>
	<p>10. Procedure: Point 10.2 mentions a fixture. However, the Standard does not define whether the sample shall be mounted horizontally or vertically. This information is essential due to the influence of gravity.</p>
	<p>11. Point 11.4 states state the calculation has to be obtained by a special calculation software. If this is just an algorithm implementing the given formulae, then it should not be called 'special calculation software'. Otherwise, the calculations carried out by that software must be defined so that the procedure is reproducible.</p>
	<p>12. Precision and Bias: Since the result of the Test is not a scalar number, but 2D images/data, error needs to be defined.</p>
	<p>13. Point 12.2 requires every laboratory to have at least two identical setups. Thus, the limitation 'same laboratory' should be removed. Further, also the limitation to 'same model' of the equipment seems arbitrary particularly the purpose of a Standard is to obtain reliable data independent of laboratory and equipment.</p>
	<p>Does this test method apply to on axis wafers, off axis wafers, or both? Are special considerations to the test method required when dealing with wafers of different orientation?</p>



	In subsection 4.2.2, verify 'Function. ...', I believe that 'Function.' must be deleted. In subsection 12.1 separate '90°and'.
	which wavelength/type of lightsource, explain what 'correct' orientation exactly is (10.1)
	will the complete wafer be imaged in one shot, or will there be a mapping of small spots?:
	(6.1.7) says CD camera with > 5million pixels and the specimen shall cover >50% of the picture frame, however 6.1.1 says polarized light microscope (this cannot do a complete picture, it could do a mapping but this is not mentioned or explained in the document)
	the document does not consider that SiC itself has an optical axis (c axis), that typically is tilted at 4 deg off on wafers for high power applications. Semiinsulating material is usually on axis. So in the images of the apparatus there might be a significant background signal from tilt. It is not clear, if this will be considered and cancelled out mathematically with the given formulas please add clarification.
	Section 2.2: the duration of surface preparation '4h and 6h ... polishing' is not related to the test method. Instead it should say e.g. wafers prepared with an optical polish.
	<p>"7. Disturbing Factor" is not including item for SEMI Procedure manual at table 10. It shall be replaced to "Limitation".</p> <p>"8. Test Environments" is not including item for SEMI Procedure Manual at table 10. It shall be replaced to optimized item as "Limitation" or another item.</p>

	"9. Sample" shall be replaced to "Test specimens".
	This description has image for particular equipment for reader. This document shall not be given these images for reader. Then, this sentence shall be removed and make optimized expressions.
	I believe the section 7 Disturbing Factors should be called Limitations.
	The standard shall not be based on specific testing tools
	Fig.1 is not clear enough.

Ref	Response	Reject
		Accept Comments
		Abstain Comments
M1 Figures of M1-1 and M1-11	We agree his suggestion , and we will make technical change.We will change the name as "Test Method for GBIR,SBIR , Bow and Warp of silicon carbide wafers by optical interference".	
M1 R3-7.7, M55	We agree his suggestion , and we will make technical change.we will replace TTV with GBIR.	
M55 SiC Waf	We agree his suggestion , and we will make technical change.we will replace LTV with SBIR.	
M1 A1-6	We agree his suggestion , and we will make technical change.In detail We will modify the test schematic and calculation formula.	
M55	We agree his suggestion , and we will make technical change.We will cancel Wafer dia of 50.8mm.	
	We agree his suggestion , and we will make technical change.We will replace ISO 14644-1 with GB 50073.	
	We agree his suggestion , and we will make technical change.Based on the above modified test schematic diagram and calculation formula, the required 4 parameters can be obtained through single-surface test.Because it is a horizontal test, there is no gravity effect.	
	We agree his suggestion , and we will make technical change.The sample is free to lay horizontally on chuck.	

	We agree his suggestion , and we will make technical change.We will add to the description of the requirement for chuck. The chuck used to measure the 4 parameters is the same.
	We agree his suggestion , and we will make technical change.We will add item of “ Calibration and Standardization”.
	We will explain in detail why "Level the sample " .Based on the above modified schematic, we calculate the back surface information from the front surface information and thickness. Then export the shape parameters based on the information on the front and back surfaces.
	We agree his suggestion , and we will make technical change.We will add Edge Exclusion 1mm for 3 inch,3mm for 4、 6、 8 inch add site size(1 cm2).1 square centimeter
M1 Figures of M1-1 and M1-11	We agree his suggestion , and we will make technical change.we have explained above.
	We agree his suggestion , and we will make technical change.We will add more samples (including 8 inches)for comparison experiments.
	ve agree his suggestion , and we will make technical change.we'll give definition of precision.repeatability is Standard deviation between different measurements in the same laboratory reporducibilty is Standard deviation between means of different laboratory measurements.

	We agree his suggestion , and we will make technical change.This standard is Superiority over MF1530, MF1390, because MF1530, MF1390 apply Position sensor which is based on inductive capacitance, so the sample must be conductive material.This standard has no conductivity requirements for the sample, and the resolution is higher, close to tens of nanometers.
	same as above
	same as above
	same as above
	same as above
	We agree his suggestion , and we will make technical change.We will weaken the description of specific equipment in the procedure.
	same as above
	same as above
	same as above

	same as above
	We agree his suggestion , and we will make editorial change
	same as above
	same as above
	same as above
	same as above
	same as above
	We agree his suggestion , and we will make technical change.The front surface position information is equal to Sensitivity times the number of stripes. Add “Limitation”.
	We agree his suggestion , and we will make technical change.we'll add the identification rules of the number of stripes in different stripe states.
M1 R3-7.7, M55	same as above

M55 Specification for SiC Wafer	same as above
M1 A1-6	same as above
M55-0921	same as above
	same as above
	same as above
	same as above
	We agree his suggestion , and we will make technical change.we'll make item name modification.
	We agree his suggestion , and we will make technical change.we'll make item name modification.
	We agree his suggestion , and we will make technical change.we'll make item name modification.
	same as above
	same as above

	same as above
	same as above

	<p>We agree his suggestion , and we will make technical change. we will add purpose as that: Micropipes directly affect device performance. Method mentioned in M81 is Transmission Polarized Interferometry Imaging: sample must be Double-sided polishing. KOH etching method is destructive. This method is non-destructive and requires only one-surface polishing.</p>
	<p>We agree his suggestion , and we will make technical change. We will revise the schematic and add a lot of new information, such as spot size, micropipe topography, etc.</p>
	same as above



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We agree his suggestion , and we will make technical change.we'll add some comparison experiments with other different methods.

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YES,For different off-axis wafers, This method is also available, no additional operation is required

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We agree his suggestion , and we will add.

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same as above

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We agree his suggestion.The laser is just focused on the upper surface.and sea gull signature will appear.

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We agree his suggestion , and we will make editorial change.

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Based on the new schematic, generally polished surfaces will do

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We agree his suggestion , and we will make editorial change.we will delete "channel".

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same as above

We agree his suggestion , and we will make editorial change.

We agree his suggestion , and we will replace ISO 14644-1 with GB 50073.

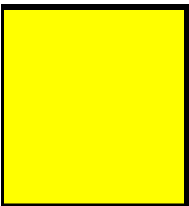
We agree his suggestion , and we will make technical change.we will add scanning mode and corresponding parameter requirements.

We agree his suggestion , and we will make technical change.we'll make item name modification.

We agree his suggestion , and we will make technical change.we'll make item name modification.

We agree his suggestion , and we will make technical change.we'll make item name modification.

	We agree his suggestion , and we will make technical change.we'll make item name modification.
	We agree his suggestion , and we will make technical change.We will weaken the description of specific equipment in the procedure.
	same as above
	same as above
	same as above



	We agree his suggestion , and we will make technical change.we will add purpose as that:Stress directly affects epitaxial quality and device performance.
	We agree his suggestion , and we will make editorial change.
	We agree his suggestion , and we will make technical change.we will replace item interference factor with limitations.
	We agree his suggestion , and we will make technical change.we will add Ia and Ib defination.
	We agree his suggestion , and we will make technical change.we will add the calibration of the constant C.
	We agree his suggestion , and we will make technical change.we will add NA requirements.
	We agree his suggestion , and we will make technical change.we will add wave length requirements.

	We agree his suggestion , and we will make technical change.we will add camera dynamic range requirements.
	We agree his suggestion , and we will make technical change.we will add Sample refinement requirements.
	We agree his suggestion , and we will make technical change.The sample is placed horizontally.
	We agree his suggestion , and we will make technical change.we will delete specialized computing software.
	We agree his suggestion , and we will make technical change.We will use repeatability and reproducibility as the precision.
	same as above
	We agree his suggestion , and we will make technical change.For off axis wafers, Adjust the wafer angle to keep the optical axis consistent with the C direction.

	We agree his suggestion , and we will make editorial change.
	We agree his suggestion , and we will make technical change.Visible light is ok,'correct' orientation meaans to coaxial.
	We agree his suggestion , and we will make technical change.we will need six shots.
	We agree his suggestion , and we will make technical change.It's not a mapping, it's a shot, and the resolution increases as the field of view shrinks.
	same as above
	We agree his suggestion , and we will make editorial change.
	We agree his suggestion , and we will make editorial change.
	We agree his suggestion , and we will make technical change.we'll make item name modification.
	We agree his suggestion , and we will make technical change.we'll make item name modification.

	We agree his suggestion , and we will make technical change.we'll make item name modification.
	We agree his suggestion , and we will make technical change.We will weaken the description of specific equipment in the procedure.
	same as above
	same as above
	same as above