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1.8 A possible classification			
STIMULATION D.U	.T ANALYSIS	TECHNIQUE	
electrical	electrical	Electrical testing (IDDQ,)	
optical	electrical	Pumping (OBIC,)	
electrical	optical	Probing (Reflectometry,)	
optical	optical	Pumping-Probing (fs acoustic,)	
<i>ESREF 2004</i> Zurich – October 4-8 th , 2004			

































































2.1 Thermal laser stimulation		
Outline		
2.1.1 Basic of t	thermal laser stimulation	
2.1.2 TLS simu	Ilation	
2.1.3 Case stu	dies	
2.1.4 TLS impr	ovement	
2.1.5 Seebeck	Effect Imaging	
Principle		
Metal – doped	Si thermocouple	
Validation on to	est structure	
Case studies		
Practical cons	iderations	
2.1.6 Dynamic	thermal laser stimulation	
2.1.7 Thermal	laser stimulation summary	
ESREF 2004	Zurich – October 4-8th, 2004	


































































OUTLINE		
1. Laser Testing at a Glance		
2. Pump modes		
2.1 Thermal laser stimulation		
2.2 Photoelectric laser stimulation		
2.3 Dynamic pump modes		
3. Probe modes		
4. Emerging techniques under investigation		
5. Conclusion		
<i>ESREF 2004</i> Zurich – October 4-8 th , 2004		

















































































































Références		
 [COL94] E.I. Cole Jr, J.M. Soden, J.L. Rife, D.L. Barton, and C.L. Henderson, « Novel Failure Analysis Techniques Using Photon Probing With a Scanning Optical Microscope », Proceedings of the International Reliability Physics Symposium, IEEE, p. 388-398, 1994. [COL98] E.I. Cole Jr., P. Tangyunyong, and D.L. Barton, « Backside Localization of Open and Shorted IC Interconnections », 36th Annual International Reliability Physics Symposium, IEEE, p. 129-136, 1998. [COL99] E.I. Cole Jr., P. Tangyunyong, D.A. Benson, and D.L. Barton, « TIVA et SEI Developments for Enhanced Front and Backside Interconnection Failure Analysis », Microelectronic Reliability, Vol. 39, p. 991-996, 1999. [DAV00] Brennan Davis, Wilson Chi, "Antireflection coatings for Semiconductor failure analysis", ISTFA 2000 [DL99] S. Dilhaire, J. Altet, S. Jorez, E. Schaub, A. Rubio, W. Claeys, "Fault localisation in Ics by goniometric laser probing of thermal induced surface waves", Microel. Reliab., vol. 39, 1999, pp 919-923 [EL011Travis Eiles, Patrick Pardy, "Liquid Immersion Objective for High-Resolution Optical 		
 [FAL01] A. Falk, "Advanced LIVA/TIVA Techniques", ISTFA 2001 [FIR03] A. Firiti, D. Lewis, F. Beaudoin, P. Perdu, G. Haller, Y. Danto and P. Fouillat, "Implementing Thermal and Photoelectric Laser Stimulation in a Failure analysis Laboratory", International Symposium on the Physical and Failure Analysis of Integrated Circuits (IPFA) 2003 		
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