
TABLE OF CONTENTS

1.0 SCOPE AND PURPOSE.....	1
1.1 SCOPE	1
1.2 PURPOSE	1
2.0 REFERENCED PUBLICATIONS.....	1
3.0 DEFINITION OF TERMS.....	1
4.0 PERSONNEL SAFETY	2
4.1 TRAINING.....	2
4.2 PERSONNEL SAFETY.....	2
5.0 REQUIRED EQUIPMENT	3
5.1 CDM ESD TESTER.....	3
5.1.1 <i>Current Sensing Element</i>	3
5.1.2 <i>Ground Plane</i>	3
5.1.3 <i>Field Plate/Field Plate Dielectric Layer</i>	4
5.1.4 <i>Charging Resistor</i>	4
5.2 WAVEFORM MEASUREMENT EQUIPMENT.....	4
5.2.1 <i>Cable Assemblies</i>	4
5.2.2 <i>Oscilloscope</i>	4
5.2.3 <i>Attenuator</i>	4
5.3 VERIFICATION MODULES (METAL DISCS).....	4
5.4 CAPACITANCE METER	4
5.5 OHMMETER	4
6.0 PERIODIC TESTER QUALIFICATION, WAVEFORM RECORDS, AND WAVEFORM VERIFICATION REQUIREMENTS	5
6.1 OVERVIEW OF REQUIRED CDM TESTER EVALUATIONS.....	5
6.2 WAVEFORM CAPTURE HARDWARE.....	5
6.3 WAVEFORM CAPTURE SETUP	5
6.4 WAVEFORM CAPTURE PROCEDURE	5
6.5 CDM TESTER QUALIFICATION/REQUALIFICATION PROCEDURE.....	6
6.5.1 <i>CDM Tester Qualification/Requalification Procedure</i>	6
6.5.2 <i>Conditions Requiring CDM Tester Qualification/Requalification</i>	6
6.6 CDM TESTER QUARTERLY AND ROUTINE WAVEFORM VERIFICATION PROCEDURE.....	7
6.6.1 <i>Quarterly Waveform Verification Procedure</i>	7
6.6.2 <i>Routine Waveform Verification Procedure</i>	7
6.7 WAVEFORM CHARACTERISTICS	7
6.8 DOCUMENTATION.....	9
6.9 PROCEDURE FOR EVALUATING FULL CDM TESTER CHARGING OF A DEVICE.....	9
7.0 CDM ESD TESTING REQUIREMENTS AND PROCEDURES	9

7.1	TESTER AND DEVICE PREPARATION	9
7.2	TEST REQUIREMENTS	10
7.2.1	Test Temperature and Humidity	10
7.2.2	Device Test	10
7.3	TEST PROCEDURES	10
7.3.1	Sample Size	10
7.3.2	Initial Test Voltage	10
7.3.3	Stressing the Pins	11
7.3.4	Field-Induced Charging Method	11
7.3.5	Allowance for Reduced Testing on Large Supply Pin Groups	11
7.4	CDM TEST RECORDING/REPORTING GUIDELINES	11
7.4.1	CDM Test Recording	11
7.4.2	CDM Reporting Guidelines	11
7.5	TESTING OF DEVICES IN SMALL PACKAGES	12
8.0	CDM CLASSIFICATION CRITERIA	12

Annexes

Annex A (Normative):	Verification Module (Metal Disc) Specifications and Cleaning Guidelines for Verification Modules and Testers	13
Annex B (Normative):	Capacitance Measurement of Verification Modules (Metal Discs)	15
Annex C (Normative):	Testing of Small Package Integrated Circuits and Discrete Semiconductors (ICDS)	16
Annex D (Normative):	Determination of Withstand Thresholds for Devices to Be Reported with Multiple Thresholds	18
Annex E (Informative):	History and Motivation Behind the Creation of a Joint CDM Test Standard	20
Annex F (Informative):	CDM Tester Electrical Schematic	22
Annex G (Informative):	Sample Oscilloscope Setup and Waveform	23
Annex H (Informative):	Field-Induced CDM Tester Discharge Procedures	25
Annex I (Informative):	Waveform Verification Procedures Using Factor/Offset and Software Voltage Adjustment Method	27
Annex J (Informative):	Determining the Appropriate Charge Time (Delay) for Full Charging of a Large Module or Device	34
Annex K (Informative):	Bibliography	35
Annex L (Informative):	Revision History for ANSI/ESDA/JEDEC JS-002	36

Figures

Figure 1:	Simplified CDM Tester Hardware Schematic	3
Figure 2:	CDM Characteristic Positive/Negative Waveform and Parameters	8
Figure 3:	Verification Module Thickness, Flatness, Dishing, and Doming Illustrations	14
Figure 4:	Simplified CDM Tester Electrical Schematic	22
Figure 5:	8-GHz TC 500, Small Verification Module (Oscilloscope Adjusts for Attenuation)	23
Figure 6:	8-GHz TC 500, Large Verification Module (Oscilloscope Adjusts for Attenuation)	24
Figure 7:	Single Discharge Procedure	25
Figure 8:	Dual Discharge Procedure	26

Figure 9: Example of a Waveform Verification Flow for Qualification and Quarterly Checks Using the Factor/Offset Adjustment Method	28
Figure 10: Example of a Waveform Verification Flow for the Routine Checks Using the Factor/Offset Adjustment Method	29
Figure 11: Example of the Impact of Factor Adjustment on the Average I_p for the Large Verification Module	30
Figure 12: Example of a Waveform Verification Flow for Qualification and Quarterly Checks Using the Software Voltage Adjustment Method	31
Figure 13: Example of a Waveform Verification Flow for the Routine Checks Using the Software Voltage Adjustment Method	32
Figure 14: Example Characterization of Charge Time (Delay) Versus I_p	34

Tables

Table 1: CDM Waveform Characteristics	7
Table 2: CDM ESDS Device Classification Levels	12
Table 3: Specification for CDM Tester Verification Modules (Metal Discs)	13
Table 4: Inclusion of Lower ESD Level High-Speed Pin Data	19
Table 5: Example Waveform Parameter Recording Table for the Factor/Offset Adjustment Method	33
Table 6: Example Waveform Parameter Recording Table for the Software Voltage Adjustment Method	33