Schedule of Scope to Certificate of Approval

Independent Testing Laboratory

IECQ Certificate No.: IECQ-L CEP 23.0002

CB Certificate No.: IECQ-L 2023.005

Schedule Number: IECQ-L CEP 23.0002-S **Rev No.: 5** **Revision Date: 2025/08/27**

№	Products, Materials	Items,Parameter		Title, Code of specification, standard or method used
		№	Items,Parameter	
1	Integrated Circuits（MCU、Memory、Controller）	1	Input Clamping Voltage V_{IK}	Semiconductor Devices Integrated Circuits Part2：Digital Integrated Circuits GB/T 17574-1998 Article 6，Section 2，Part IV
		2	Output High Level Voltage V_{OH}	Semiconductor Devices Integrated Circuits Part2：Digital Integrated Circuits GB/T 17574-1998 Article 1，Section 2，Part IV
		3	Output Low Level Voltage V_{OL}	Semiconductor Devices Integrated Circuits Part2：Digital Integrated Circuits GB/T 17574-1998 Article 1，Section 2，Part IV
		4	Input High Level Current I_{IH}	Semiconductor Devices Integrated Circuits Part2：Digital Integrated Circuits GB/T 17574-1998 Article 2，Section 2，Part IV
		5	Input Low Level Current I_{IL}	Semiconductor Devices Integrated Circuits Part2：Digital Integrated Circuits GB/T 17574-1998 Article 2，Section 2，Part IV
		6	Power Supply Current I_{CC}	Semiconductor Devices Integrated Circuits Part2：Digital Integrated Circuits GB/T 17574-1998 Article 1，Section 3，Part IV
		7	Output Low Level Power Supply Current I_{CCL}	Semiconductor Devices Integrated Circuits Part2：Digital Integrated Circuits GB/T 17574-1998 Article 4，Section 2，Part IV
		8	Output High Level Power Supply Current I_{CCH}	Semiconductor Devices Integrated Circuits Part2：Digital Integrated Circuits GB/T 17574-1998 Article 4，Section 2，Part IV
		9	Output transmission delay time from low level to high level t_{PLH}	Semiconductor Devices Integrated Circuits Part2：Digital Integrated Circuits GB/T 17574-1998 Article 4.1.2，Section 3，Part IV
		10	Output transmission delay time from high level to low level t_{PHL}	Semiconductor Devices Integrated Circuits Part2：Digital Integrated Circuits GB/T 17574-1998 Article 4.1.2，Section 3，Part IV
		11	Output transmission delay time from high resistance state to high level t_{PZH}	Semiconductor Devices Integrated Circuits Part2：Digital Integrated Circuits GB/T 17574-1998 Article 4.5，Section 3，Part IV
		12	Output transmission delay time from high resistance state to low level t_{PZL}	Semiconductor Devices Integrated Circuits Part2：Digital Integrated Circuits GB/T 17574-1998 Article 4.5，Section 3，Part IV
		13	Output transmission delay time from high level to high resistance state t_{PHZ}	Semiconductor Devices Integrated Circuits Part2：Digital Integrated Circuits GB/T 17574-1998 Article 4.5，Section 3，Part IV
		14	Output transmission delay time from low level to high resistance state t_{PHZ} t_{PLZ}	Semiconductor Devices Integrated Circuits Part2：Digital Integrated Circuits GB/T 17574-1998 Article 4.5，Section 3，Part IV

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2	Integrated Circuits (Voltage comparator)	1	Input Offset Voltage V_{IO}	Basic Principle of Voltage Comparator Test Method SJ/T 10805-2018 Section 5.1
		2	Input Offset Current I_{IO}	Basic Principle of Voltage Comparator Test Method SJ/T 10805-2018 Section 5.3
		3	Input Bias Current I_{IB}	Basic Principle of Voltage Comparator Test Method SJ/T 10805-2018 Section 5.5
		4	Output High Level Voltage V_{OH}	Basic Principle of Voltage Comparator Test Method SJ/T 10805-2018 Section 5.13
		5	Output Low Level Voltage V_{OL}	Basic Principle of Voltage Comparator Test Method SJ/T 10805-2018 Section 5.14
3	Integrated Circuits (Operational Amplifier)	1	Input Offset Voltage V_{IO}	Test Methods for Operational Amplifiers of Semiconductor Integrated Circuits QJ 2491/1993 Section 5.1
		2	Input Offset Current I_{IO}	Test Methods for Operational Amplifiers of Semiconductor Integrated Circuits QJ 2491/1993 Section 5.4
		3	Input Bias Current I_{IB}	Test Methods for Operational Amplifiers of Semiconductor Integrated Circuits QJ 2491/1993 Section 5.7
		4	Open-loop gain A_{VD}	Test Methods for Operational Amplifiers of Semiconductor Integrated Circuits QJ 2491/1993 Section 5.10
		5	Commo Mode Rejection Ratio K_{CMR}	Test Methods for Operational Amplifiers of Semiconductor Integrated Circuits QJ 2491/1993 Section 5.11
		6	Output Voltage Conversion Rate SR	Test Methods for Operational Amplifiers of Semiconductor Integrated Circuits QJ 2491/1993 Section 5.21
		7	Gain Bandwidth G.BW	Test Methods for Operational Amplifiers of Semiconductor Integrated Circuits QJ 2491/1993 Section 5.32
4	Integrated Circuits (Voltage Regulator)	1	Output Votage V_o	Test Methods for Voltage Regulators of Semiconductor Integrated Circuits GB/T 4377-2018 Section 4.17
		2	Votage Regulation SV	Test Methods for Voltage Regulators of Semiconductor Integrated Circuits GB/T 4377-2018 Section 4.1
		3	Current Regulation ST	Test Methods for Voltage Regulators of Semiconductor Integrated Circuits GB/T 4377-2018 Section 4.2
5	Integrated Circuits (Analog Switch)	1	Analog Voltage Operating Range V_A	Test Methods for Analog Switch of Semiconductor Integrated Circuits GB/T 14028-2018 Section 2.1
		2	On-resistance R_{ON}	Test Methods for Analog Switch of Semiconductor Integrated Circuits GB/T 14028-2018 Section 2.2
		3	Cut-off State Drain Current ID(OFF)	Test Methods for Analog Switch of Semiconductor Integrated Circuits GB/T 14028-2018 Section 2.4

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6	Discrete Semiconductor Devices - Diodes（Voltage regulation diodes，switching diodes，current regulation diodes，transient suppressiondiodes）	1	Forward Voltage V_F	Discrete Semiconductor Devices Part3：Signal（including switch）and Adjustment Diodes GB/T 6571-1995 Article 2，Section 1，Part IV
		2	Reverse Current I_R	Discrete Semiconductor Devices Part3：Signal（including switch）and Adjustment Diodes GB/T 6571-1995 Article 1，Section 1，Part IV
		3	Operating Voltage V_Z	Discrete Semiconductor Devices Part3：Signal（including switch）and Adjustment Diodes GB/T 6571-1995 Article 1，Section 2，Part IV
		4	Differential Resistance r_z	Discrete Semiconductor Devices Part3：Signal（including switch）and Adjustment Diodes GB/T 6571-1995 Article 2，Section 2，Part IV
		5	Breakdown Voltage $V_{(BR)}$	Semiconductor Devices Discrete Devices and Integrated Circuits Part2：Rectiflers GB/T 4023-2015 Article 7.1.3
7	Discrete Semiconductor Devices - Bipolar transisitor	1	Collector-base cut-off Current I_{CBO}	Semiconductor Devices Discrete Devices and Integrated Circuits Part7：Bipolar transisitor GB/T4587-2023 Article 2.1，Section 1，Part IV
		2	Emitter-base cut-off current I_{EBO}	Semiconductor Devices Discrete Devices and Integrated Circuits Part7：Bipolar transisitor GB/T4587-2023 Article 2.2，Section 1，Part IV
		3	Collecrtor-emitter cut-off current I_{CEO}	Semiconductor Devices Discrete Devices and Integrated Circuits Part7：Bipolar transisitor GB/T4587-2023 Article 3，Section 1，Part IV
		4	Collector-emitter saturation voltage V_{CEsat}	Semiconductor Devices Discrete Devices and Integrated Circuits Part7：Bipolar transisitor GB/T4587-2023 Article 4，Section 1，Part IV
		5	Base-emitter saturation voltage V_{BEsat}	Semiconductor Devices Discrete Devices and Integrated Circuits Part7：Bipolar transisitor GB/T4587-2023 Article 5，Section 1，Part IV
		6	Commom emitter forword current transmission hfe	Semiconductor Devices Discrete Devices and Integrated Circuits Part7：Bipolar transisitor GB/T4587-2023 Article 9.6，Section 1，Part IV
		7	Collector-base breakdown voltage $V_{(BR)CBO}$	Test Method for semiconductor discrete devices GJB 128B-2021 Method 3001
		8	Emitter-base breakdown voltage $V_{(BR)EBO}$	Test Method for semiconductor discrete devices GJB 128B-2021 Method 3026
8	Discrete Semiconductor Devices -Field effect transisitor	1	Gate cut-off current I_{GSS}	Semiconductor Devices Discrete Devices and Integrated Circuits Part8：Field effect transisitor GB/T 4586-1994 Article 2，Part IV
		2	Drain cut-off current I_{DSS}	Semiconductor Devices Discrete Devices and Integrated Circuits Part8：Field effect transisitor GB/T 4586-1994 Article 4，Part IV

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		3	Gate-source threshold voltage $V_{GS(th)}$	Semiconductor Devices Discrete Devices and Integrated Circuits Part8：Field effect transisitor GB/T 4586-1994 Article 6，Part IV
		4	Small signal short circuit forward transconductance gfs	Semiconductor Devices Discrete Devices and Integrated Circuits Part8：Field effect transisitor GB/T 4586-1994 Article 10，Part IV
		5	Static source-leakage on-state resistance $r_{DS(on)}$	Semiconductor Devices Discrete Devices and Integrated Circuits Part8：Field effect transisitor GB/T 4586-1994 Article 15，Part IV
		6	Drain-source breakdown voltage $V_{(BR)DSS}$	Test methods for discrete semiconductor devices Part3 MIL-STD-750-3-2019 Method：3407.1
9	AEC-Q100 Reliability Test	1	Preconditioning（PC）	Muisture/Reflow Sensitivity Classification for Nonhermetic Surface Mount Devices JEDEC J-STD-020F-2022 Preconditioning of Nonhermetic Surface Mount Devices Prior to Reliability Testing JEDEC JESD22-A113I-2020
		2	Temperature-Humidity-Bias（THB）	Steady-State Temperature-Humidity Bias Life Test JEDEC JESD22-A101D.01-2021
		3	Biased HAST（HAST）	Highly Accelerated Temperature and Humidity Stress Test JEDEC JESD22-A110E.01-2021
		4	Autoclave（AC）	Accelerated Moisture Resisitance-Unbiased Autoclave JEDEC JESD22-A102E-2015
		5	Unbiased HAST（UHAST）	Accelerated Moisture Resisitance-Unbiased HAST JEDEC JESD22-A118B.01-2021
		6	Temperature-Humidity（without Bias）（TH）	Steady-State Temperature-Humidity Bias Life Test JEDEC JESD22-A101D.01-2021
		7	Temperature Cycling（TC）	Temperature Cycling JEDEC JESD22-A104F.1-2023
		8	High Temperature Strorage Life（HTSL）	High Temperature Strorage Life JEDEC JESD22-A103E.01-2021
		9	High Temperature Operating Life（HTOL）	Temperature，Bias，and Operating Life JEDEC JESD22-A108G-2022
		10	Early Life Failure Rate（ELFR）	Early Life Failure Rate AEC Q100-008A-2003
		11	NVM Endurance，Data Retention，and Operational Life（EDR）	NVM Endurance，Data Retention，and Operational Life AEC Q100-005D1-2012
		12	Wire Bond Shear（WBS）	Wire Bond Shear AEC Q100-001C-1998

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		13	Wire Bond Pull（WBP）	Test Methods for Microelectronic Devices MIL-STD-883L-2019 Method2011.10
		14	Solderability(SD)	Solderability JESD22-B102E-2007
		15	Physical Dimensions(PD)	Physical Dimensions JEDEC JESD22-B100B-2003
		16	Solder Ball Shear(SBS)	Solder Ball Shear AEC Q100-010A-2003
		17	Lead Integrity(LI)	Lead Integrity JESD22-B105E-2017
		18	Mechanical Shock(MS)	Mechanical Shock-Component and Subassembly JEDEC JESD22-B110B.01-2019
		19	Variable Frequency Vibration(VFV)	Variable Frequency Vibration JEDEC JESD22-B103B.01-2016
		20	Constant Acceleration(CA)	Test Methods for Microelectronic Devices MIL-STD-883L-2019 Method 2001
		21	Gross/Fine Leak(GFL)	Test Methods for Microelectronic Devices MIL-STD-883L-2019 Method 1014
		22	Die Shear(DS)	Test Methods for Microelectronic Devices MIL-STD-883L-2019 Method 2019
		23	Electrostatic Discharge Charged Devices Mode（CDM）	Electrostatic Discharge Charged Devices Mode AEC Q100-011-2019
10	AEC-Q101 Reliability Test	1	Preconditioning（PC）	Muisture/Reflow Sensitivity Classification for Nonhermetic Surface Mount Devices JEDEC J-STD-020F-2022 Preconditioning of Nonhermetic Surface Mount Devices Prior to Reliability Testing JEDEC JESD22-A113I-2020
		2	Biased HAST（HAST）	Highly Accelerated Temperature and Humidity Stress Test JEDEC JESD22-A110E.01-2021
		3	High Humidity，High Temperature Reverse Bias（H^3TRB）	High Humidity，High Temperature Reverse Bias JEDEC JESD22-A101D.01-2021
		4	Unbiased HAST（UHAST）	Accelerated Moisture Resisitance-Unbiased HAST JEDEC JESD22-A118B.01-2021
		5	Autoclave（AC）	Accelerated Moisture Resisitance-Unbiased Autoclave JEDEC JESD22-A102E-2015
		6	Temperature Cycling（TC）	Temperature Cycling JEDEC JESD22-A104F.01-2023
		7	Intermittent Operational Life(IOL)	Test Methods for Discrete Semiconductor Devices MIL-STD-750-1B-2023 Method 1037.3

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		8	High Temperature Reverse Bias（HTRB）	Test Methods for Discrete Semiconductor Devices MIL-STD-750-1B-2023Method 1038.5、1039.4
		9	Steady State Operational（SSOP）	Test Methods for Discrete Semiconductor Devices MIL-STD-750-1B-2023 Method 1038.5
		10	High Temperature Gate Bias（HTGB）	Temperature，Bias，and Operating Life JEDEC JESD22-A108G-2022
		11	Physical Dimensions(PD)	Physical Dimensions JEDEC JESD22-B100B-2003
		12	Wire Bond Shear Strength（WBS）	Wire Bond Shear Strength AEC Q101-003A-2005 JEDEC JESD22-B116B-2017
		13	Wire Bond Pull Strength（WBP）	Test Methods for Discrete Semiconductor Devices MIL-STD-750-2A-2020 Method 2037.1 Qualification Requirements For Components Using Copper（Cu）Wire Interconnections AEC Q006-2015
		14	Die Shear（DS）	Test Methods for Discrete Semiconductor Devices MIL-STD-750-2A-2020 Method 2017.3
		15	Terminal Strength（TS）	Test Methods for Discrete Semiconductor Devices MIL-STD-750-2A-2020 Method 2036.5
		16	Resistance to Solvents（RTS）	Mark Permanency JEDEC JESD22-B107D-2011
		17	Resistance to Solder Heart (RSH)	Evaluation Procedure for Determining Capability to Bottom Side Board Attach by Full Body Solder Immersion of Small Surface Mount Solid State Devices JEDEC JESD22-A111B-2018
				Resistance to Soldering Temperature for Through-Hole Mounted Devices JEDEC JESD22-B106E-2016
		18	Solderability(SD)	Solderability Tests for Component Leads，Terminations，Lugs，Terminals and Wires J-STD-002E-2017
		19	Constant Acceleration(CA)	Test Methods for Discrete Semiconductor Devices MIL-STD-750-2A-2020 Method 2006
		20	Vibration，Variable Frequency(VVF)	Vibration，Variable Frequency JEDEC JESD22-B103B.01-2016
		21	Mechanical Shock(MS)	Mechanical Shock-Component and Subassembly JEDEC JESD22-B110B.01-2019
		22	Hermeticity(HER)	Hermeticity JEDEC JESD22-A109B-2011
		23	External Visual（EV）	External Visual JEDEC JESD22-B101D-2022
		24	ESD HBM Characterization（ESDC）	ESD HBM Characterization AEC Q101-005-2019

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