

附表 3-2:

批准证书附件

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No	Products, Materials	Items, Parameter		Title, Code of specification, standard or method used	Restriction or limitation	measuring capacity	Note
		序号	名称				
1	IC(MOS random access memories)	1	ALL "0" and "1" function test	Semiconductor devices Integrated circuits Part 2:Digital integrated circuits GB/T 17574-1998	Accredited only for: Voltage:-1V~6V Current:-200mA~200mA Maximum 512 channels	Power current: 0mA~1A Maximum frequency: 0HZ~800MHZ	
		2	Function test of calibration board	Semiconductor devices Integrated circuits Part 2:Digital integrated circuits GB/T 17574-1998	Accredited only for: Voltage:-1V~6V Current:-200mA~200mA Maximum 512 channels	Power current: 0mA~1A Maximum frequency: 0HZ~800MHZ	
		3	Output high level voltage V_{OH}	Semiconductor devices Integrated circuits Part 2:Digital integrated circuits GB/T 17574-1998	Accredited only for: Voltage:-1V~6V Current:-200mA~200mA Maximum 512 channels	Power current: 0mA~1A Maximum frequency: 0HZ~800MHZ	
		4	Output low level Voltage V_{OL}	Semiconductor devices Integrated circuits Part 2:Digital integrated circuits GB/T 17574-1998	Accredited only for: Voltage:-1V~6V Current:-200mA~200mA Maximum 512 channels	Power current: 0mA~1A Maximum frequency: 0HZ~800MHZ	
		5	Input load current I_{LI}	Semiconductor devices Integrated circuits Part 2:Digital integrated circuits GB/T 17574-1998	Accredited only for: Voltage:-1V~6V Current:-200mA~200mA Maximum 512 channels	Power current: 0mA~1A Maximum frequency: 0HZ~800MHZ	

		6	Operative state power current I_{cc}	Semiconductor devices Integrated circuits Part 2:Digital integrated circuits GB/T 17574-1998	Accredited only for: Voltage:-1V~6V Current:-200mA~200mA Maximum 512 channels	Power current: 0mA~1A Maximum frequency: 0HZ~800MHZ	
		7	Maintain state power current I_{ccs}	Semiconductor devices Integrated circuits Part 2:Digital integrated circuits GB/T 17574-1998	Accredited only for: Voltage:-1V~6V Current:-200mA~200mA Maximum 512 channels	Power current: 0mA~1A Maximum frequency: 0HZ~800MHZ	
2	IC (voltage regulators)	1	Output voltage V_o	Semiconductor integrated circuits.Measuring method of voltage regulators GB/T 4377-2018	Accredited only for: Voltage:-40V~40V Current:-1A~1A Maximum 48 channels		
		2	Voltage regulation rate S_V	Semiconductor integrated circuits.Measuring method of voltage regulators GB/T 4377-2018	Accredited only for: Voltage:-40V~40V Current:-1A~1A Maximum 48 channels		
		3	Current regulation Rate S_r	Semiconductor integrated circuits.Measuring method of voltage regulators GB/T 4377-2018	Accredited only for: Voltage:-40V~40V Current:-1A~1A Maximum 48 channels		
3	IC (analogue switch)	1	Analog switch operating range V_A	Semiconductor integrated circuits.Measuring method of analogue switch GB/T 14028-2018	Accredited only for: Voltage:-40V~40V Current:-1A~1A Maximum 48 channels		
4	IC (DC-DC Convertor)	1	Output voltage V_o	The measuring methods of DC/DC converters for hybrid integrated circuits SJ 20646-1997	Accredited only for: Voltage:-40V~40V Current:-1A~1A Maximum 48 channels		
		2	Output current I_o	The measuring methods of DC/DC converters for hybrid integrated circuits SJ 20646-1997	Accredited only for: Voltage:-40V~40V Current:-1A~1A Maximum 48 channels		

		3	Voltage regulation rate S_V	The measuring methods of DC/DC converters for hybrid integrated circuits SJ 20646-1997	Accredited only for: Voltage:-40V~40V Current:-1A~1A Maximum 48 channels		
		4	Current regulation rate S_I	The measuring methods of DC/DC converters for hybrid integrated circuits SJ 20646-1997	Accredited only for: Voltage:-40V~40V Current:-1A~1A Maximum 48 channels		
5	IC(microprocessors)	1	Input high level current I_{IH}	Semiconductor devices Integrated circuits Part 2:Digital integrated circuits GB/T 17574-1998	Accredited only for: Voltage:-1V~6V Current:-200mA~200mA Maximum 512 channels		
		2	Input low level current I_{IL}	Semiconductor devices Integrated circuits Part 2:Digital integrated circuits GB/T 17574-1998	Accredited only for: Voltage:-1V~6V Current:-200mA~200mA Maximum 512 channels		
		3	Static working current I_{SB}	Semiconductor devices Integrated circuits Part 2:Digital integrated circuits GB/T 17574-1998	Accredited only for: Voltage:-1V~6V Current: -200mA~200mA		
		4	Dynamic working current I_A	Semiconductor devices Integrated circuits Part 2:Digital integrated circuits GB/T 17574-1998	Accredited only for: Voltage:-1V~6V Current:-200mA~200mA Maximum 512 channels		
		5	Function test	Semiconductor devices Integrated circuits Part 2:Digital integrated circuits GB/T 17574-1998	Accredited only for: Voltage:-1V~6V Current:-200mA~200mA Maximum 512 channels		
		6	Output high level voltage V_{OH}	Semiconductor devices Integrated circuits Part 2:Digital integrated circuits GB/T 17574-1998	Accredited only for: Voltage:-1V~6V Current:-200mA~200mA Maximum 512 channels		

		7	Output low level voltage V_{OL}	Semiconductor devices Integrated circuits Part 2:Digital integrated circuits GB/T 17574-1998	Accredited only for: Voltage:-1V~6V Current:-200mA~200mA Maximum 512 channels		
		8	Iutput high level voltage V_{IH}	Semiconductor devices Integrated circuits Part 2:Digital integrated circuits GB/T 17574-1998	Accredited only for: Voltage:-1V~6V Current:-200mA~200mA Maximum 512 channels		
		9	Iutput low level voltage V_{IL}	Semiconductor devices Integrated circuits Part 2:Digital integrated circuits GB/T 17574-1998	Accredited only for: Voltage:-1V~6V Current:-200mA~200mA Maximum 512 channels		
6	Resistance (Fixed resistor、 Metalster、 Film resistor、Wire-wound resistor、 Potentiometer)	1	Resistance value	Finxed resistors for use in electronic equipment Part 1: Generic specification GB/T 5729-2003	Accredited only for: Resistance range : 0.00001 Ω ~99.9999M Ω	0.00001 Ω ~99.9999M Ω	
		2	Terminal resistance	Potentiometers for electronic equipment Part 1: General specification GB/T 15298-1994	Accredited only for: Resistance range : 0.00001 Ω ~99.9999M Ω	0.00001 Ω ~99.9999M Ω	
7	Diode (Zener diode、 Switch-diode、 Rectifier diode、 Schottky Diode、 TVS 、LED、 Silicon power switching diode)	1	Forward voltage	Semiconductor devices discrete devices and integrated circuits Part 2:Rectifier diodes GB/T 4023-2015	Only pulse method is used for testing; Accredited only for: Voltage: 0V~2000V, Current: 0A~200A	Voltage: 0V~2000V, Current: 0A~200A	
		2	Reverse current	Semiconductor devices discrete devices and integrated circuits Part 2:Rectifier diodes GB/T 4023-2015	Only direct-current method is used for testing; Accredited only for: Voltage: 0V~2000V, Current: 0A~200A	Voltage: 0V~2000V, Current: 0A~200A	

		3	Breakdown voltage	Semiconductor devices discrete devices and integrated circuits Part 2: Rectifier diodes GB/T 4023-2015	Accredited only for: Voltage: 0V~2000V, Current Range: 0A~200A	Voltage: 0V~2000V, Current: 0A~200A	
		4	Working voltage	Semiconductor devices-Discrete devices. part3:singal (including switching) and regulator diodes GB/T 6571-1995	Accredited only for: Voltage: 0V~2000V, Current Range: 0A~200A	Voltage: 0V~2000V, Current: 0A~200A	
		5	Differential resistance	Semiconductor devices-Discrete devices. part3:singal (including switching) and regulator diodes GB/T 6571-1995	Accredited only for: Voltage: 0V~2000V, Current Range: 0A~200A	Voltage: 0V~2000V, Current: 0A~200A	
8	Triode (Switching triode, Power Transistor)	1	Collector-Base electrode breakdown voltage	Semiconductor discrete devices and dntegrated circuits. Part 7: Bipolar transistors GB/T 4587-1994	Accredited only for: Voltage: 0V~2000V, Current: 0A~200A	Voltage: 0V~2000V, Current: 0A~200A	
		2	Emitter-Base electrode breakdown voltage	Semiconductor discrete devices and dntegrated circuits. Part 7: Bipolar transistors GB/T 4587-1994	Accredited only for: Voltage: 0V~2000V, Current: 0A~200A	Voltage: 0V~2000V, Current: 0A~200A	
		3	Collector-Base electrode cutoff current	Semiconductor discrete devices and dntegrated circuits. Part 7: Bipolar transistors GB/T 4587-1994	Accredited only for: Voltage: 0V~2000V, Current: 0A~200A	Voltage: 0V~2000V, Current: 0A~200A	
		4	Collector-Emitter Saturation voltage	Semiconductor discrete devices and dntegrated circuits. Part 7: Bipolar transistors GB/T 4587-1994	Accredited only for: Voltage: 0V~2000V, Current: 0A~200A	Voltage: 0V~2000V, Current: 0A~200A	
		5	Emitter-Base electrode cutoff current	Semiconductor discrete devices and dntegrated circuits. Part 7: Bipolar transistors GB/T 4587-1994	Accredited only for: Voltage: 0V~2000V, Current: 0A~200A	Voltage: 0V~2000V, Current: 0A~200A	

		6	Collector-Emitter Cutoff current	Semiconductor discrete devices and dntegrated circuits. Part 7: Bipolar transistors GB/T 4587-1994	Accredited only for: Voltage: 0V~2000V, Current: 0A~200A	Voltage: 0V~2000V, Current: 0A~200A	
		7	Forward current transfer ratio of common-emitter	Semiconductor discrete devices and dntegrated circuits. Part 7: Bipolar transistors GB/T 4587-1994	Accredited only for: Voltage: 0V~2000V, Current: 0A~200A	Voltage: 0V~2000V, Current: 0A~200A	
9	Field effect transistor (JFET、JGFET)	1	Drain-source breakdown voltage	Transistor Electrical Test Methods For Semiconductor Devices Part 3: Test Methods 3000 Through 3999 MIL-STD-750-3-2019 Method 3407.1	Accredited only for: Voltage: 0V~2000V, Current: 0A~200A	Voltage: 0V~2000V, Current: 0A~200A	
		2	Threshold voltage	Semiconductor devices. Discrete devices. Part 8: Field-effect transistors GB/T 4586-1994 Chapter IV Article 6	Accredited only for: Voltage: 0V~2000V, Current: 0A~200A	Voltage: 0V~2000V, Current: 0A~200A	
		3	Gate cutoff current	Semiconductor devices. Discrete devices. Part 8: Field-effect transistors GB/T 4586-1994 Chapter IV Article 2	Accredited only for: Voltage: 0V~2000V, Current: 0A~200A	Voltage: 0V~2000V, Current: 0A~200A	
		4	Drain current	Semiconductor devices. Discrete devices. Part 8: Field-effect transistors GB/T 4586-1994 Chapter IV Article 3	Accredited only for: Voltage: 0V~2000V, Current: 0A~200A	Voltage: 0V~2000V, Current: 0A~200A	

		5	On-state-drain source resistance	Semiconductor devices. Discrete devices. Part 8:Field-effect transistors GB/T 4586-1994 Chapter IV Article 16	Accredited only for: Voltage: 0V~2000V, Current: 0A~200A	Voltage: 0V~2000V, Current: 0A~200A	
10	AECQ-100 Integrated circuits Test	1	Preconditioning	Moisture/Reflow Sensitivity Classification for Nonhermetic Surface Mount Devices JEDEC J-STD-020F-2022	Accredited only for surface mount devices	Temperature 25 °C to 150 °C; Humidity: 30% RH to 98% RH Reflow welding temperature: 25°C -300°C	
				Preconditioning of Nonhermetic Surface Mount Devices Prior to Reliability Testing JEDEC JESD22-A113I-2020			
		2	Biased steady-state damp heat	Steady-state temperature-humidity bias life test JEDEC JESD22-A101D. 01-2021	Test only: Range of conditions Temperature : 25 °C to 150 °C; Humidity: 30% RH to 98% RH	Temperature: 25°C-150°C; Humidity: 30%RH-98%RH	
		3	Biased-HAST	Highly Accelerated Temperature and Humidity Stress Test (HAST) JEDEC JESD22-A110E. 01-2021	Test only: Range of conditions Temperature : 105°C to 150 °C; Humidity: 65% RH to 100% RH	Temperature: 105°C~150°C; Humidity: 65%RH-100%RH	
		4	Autoclave	Accelerated Moisture Resistance-Unbiased Autoclave JEDEC JESD22-A102E-2015	Test only: Range of conditions Temperature : 100°C to 134 °C; Humidity: 100% RH	Temperature: 100°C-134°C; Humidity:100%RH	

		5	Unbiased-HAST	Accelerated Moisture Resistance-Unbiased HAST JEDEC JESD22-A118B. 01-2021	Test only: Range of conditions Temperature : 105°C to 150 °C; Humidity: 65% RH to 100% RH	Temperature: 105°C-150°C; Humidity: 65%RH~100%RH	
		6	Temperature-Humidity (without Bias)	Steady-State Temperature-Humidity Bias Life Test JEDEC JESD22-A101D. 01-2021	Test only: Range of conditions Temperature : 25°C to 150 °C; Humidity: 30% RH to 98% RH	Temperature: 25°C-150°C; Humidity: 30%RH-98%RH	
		7	Temperature Cycling	Temperature Cycling JEDEC JESD22-A104F. 01-2023	Test only: Range of conditions Temperature range: -65°C -150°C	Temperature: -65°C-150°C;	
		8	High Temperature Storage Life	High Temperature Storage Life JEDEC JESD22-A103E. 01-2021	Accredited only for condition A、B、C、D	Temperature: 25°C-150°C;	
		9	High Temperature operating Life	Temperature, Bias, and Operating Life JEDEC JESD22- A108G-2022	Accredited only for Temperature: 25°C~150°C	Temperature: 25°C-150°C;	
		10	Early Life Failure Rate	Early Life Failure Rate AEC-Q100-008A-2003	Accredited only for Temperature: 25°C~150°C	Temperature: 25°C-150°C;	
		11	NVM Endurance, Data Retention, and Operational Life	Non-Volatile Memory Program/Erase Endurance, Data Retention, and Operational life test AEC-Q100-005D1-2012	Accredited only for Temperature: 25°C~150°C	Temperature: 25°C-150°C;	

		12	Wire Bond Shear	Wire Bond Shear Test AEC-Q100-001C-1998	ALL	Shear force \leq 100 kg	
		13	Wire Bond Pull	Test Method Standard Microcircuits MIL-STD-883L-2019 Method 2011.10	Accredited only for condition C, D; tension \leq 100g	Tensile \leq 100g	
		14	Solderability	Solderability Tests for Component Leads, Terminations, Lugs, Terminals and Wires J-STD-002E-2017	Dip and reflow soldering only	Temperature: 25°C-350°C	
		15	Physical Dimensions	Physical Dimensions JEDEC JESD22-B100B-2003	Size \leq 400 mm	Accuracy: 0.0001 mm	
		16	Solder Ball Shear	Solder Ball Shear Test AEC-Q100-010A-2003	ALL	Shear force \leq 100 kg	
		17	Lead Integrity	Lead Integrity JEDEC JESD22-B105E-2017	Accredited only for condition A, B	Pull \leq 4 kg	
		18	Mechanical Shock	Mechanical Shock-Device and Subassembly JEDEC JESD22-B110B.01-2019	Accredited only for condition A, B, F	Acceleration \leq 50000g	
		19	Variable Frequency Vibration	Vibration, Variable Frequency JEDEC JESD22-B103B.01-2016	Accredited only for Sweep frequency vibration condition 1	Frequency range: 5HZ~2000HZ Acceleration \leq 50g	
		20	Constant Acceleration test	Test Method Standard Microcircuits MIL-STD-883L-2019 Method 2001.4	Accredited only for condition A-E	Acceleration \leq 50000g	

		21	Sealing test	Test Method Standard Microcircuits MIL-STD-883L-2019 Method 1014.17	Accredited only for condition A, C	Fine Leak:Tracer gas He Gross Leak:Fluorocarbon	
		22	Die Shear	Test Method Standard Microcircuits MIL-STD-883L-2019 Method 2019.10	Accredited only for surface mount devices	Shear force ≤ 100 kg	
11	AECQ-101 Discrete devices Test	1	Preconditioning	Preconditioning of Nonhermetic Surface Mount Devices Prior to Reliability Testing JEDEC JESD22-A113I-2020	Accredited only for surface mount devices	Temperature 25 °C to 150 °C; Humidity: 30% RH to 98% RH Reflow welding temperature: 25°C -300°C	
				Moisture/Reflow Sensitivity Classification for Nonhermetic Surface Mount Devices JEDEC J-STD-020F-2022			
		2	Visual	External Visual JEDEC JESD22- B101D-2022	Magnification: 7.5X~100X	Magnification: 7.5X~100X	
		3	High Temperature Reverse Bias test	Test Method Standard Environmental Test Methods For Semiconductor Devices. Part 1:Test Methods 1000 Through 1999 MIL-STD-750-1A -2016 Method 1028.5-1029.4	Accredited only for condition A	Voltage ≤ 1500 V Temperature: 25°C-175°C;	
		4	High Temperature Gate Bias test	Temperature, Bias, and Operating Life JEDEC JESD22 A108G-2022	Test only: Range of conditions Voltage ≤ 1500 V Temperature: 25~175°C	Voltage ≤ 1500 V Temperature: 25°C-175°C;	
		5	Temperature Cycling	Temperature Cycling JEDEC JESD22-A104F. 01-2023	Test only: Range of conditions Temperature: -65°C-150°C	Temperature: -65°C -150°C	

		6	Unbiased Highly Accelerated Stress Test	Accelerated Moisture Resistance-Unbiased HAST JEDEC JESD22-A118B. 01-2021	Test only: Range of conditions Temperature:105°C-150°C; Humidity:65%RH~100%RH	Temperature: 105°C-150°C; Humidity: 65%RH~100%RH	
		7	Highly Accelerated Stress Test	Highly Accelerated Temperature and Humidity Stress Test (HAST) JEDEC JESD22-A110E. 01-2021	Test only: Range of conditions Temperature:105°C-150°C; Humidity:65%RH~100%RH	Temperature: 105°C-150°C; Humidity: 65%RH~100%RH	
		8	High Humidity High Tem. Reverse Bias	Steady-State Temperature-Humidity Bias Life Test JEDEC JESD22-A101D. 01-2021	Test only: Range of conditions Temperature:25°C-150°C; Humidity:30%RH~98%RH	Temperature: 25°C-150°C; Humidity: 30%RH~98%RH	
		9	Intermittent Operational Life	Test Method Standard Environmental Test Methods For Semiconductor Devices. Part 1:Test Methods 1000 Through 1999 MIL-STD-750-1A-2016 Method 1037.3	For no heat dissipation conditions only	Power≤10W	
		10	Physical Dimension	Physical Dimensions JEDEC JESD22-B100B-2003	Size ≤400 mm	Accuracy: 0.0001 mm	
		11	Terminal Strength	Test Method Standard Mechanical Test Methods For Semiconductor Devices Part 2: Test Methods 2001 Through 2999 MIL-STD-750-2A-2018 Method 2036.5	Accredited only for condition A, E	Pulling ≤4 kg	

		12	Resistance to Solvents	Mark Permanency JEDEC JESD22-B107D-2011	Only for ink marking	Mixed solvent 1: pure isopropyl alcohol 75 jet fuel Mixed solvent 2: turpentine Mixed solvent 3: Deionized water, ethylene glycol - butyl ether, monoethanolamine	
		13	Constant Acceleration	Test Method Standard Mechanical Test Methods For Semiconductor Devices Part 2: Test Methods 2001 Through 2999 MIL-STD-750-2A-2018 Method 2006.2	Accredited only for condition A-E	Acceleration ≤ 5000g	
		14	Variable Frequency Vibration	Vibration, Variable Frequency JEDEC JESD22-B103B.01-2016	Accredited only for Sweep vibration condition 1	Frequency range: 5HZ~2000HZ Acceleration ≤ 50g	
		15	Mechanical Shock	Mechanical Shock-Device and Subassembly JEDEC JESD22-B110B.01-2019	Accredited only for condition A, B, F	Acceleration ≤ 5000g	
		16	Sealing test	Hermiticity JEDEC JESD22-A109B-2011	Accredited only for condition A, C	Fine Leak: Tracer gas He Gross Leak: Fluorocarbon	
		17	Resistance to Solder Heat	Evaluation Procedure for Determining Capability Bottom Side Board Attach by Full Body Solder Immersion of Small Surface Mount SOLID state Devices JEDEC JESD22-A111B-2018	Dip and reflow soldering only	Temperature: ≤ 350°C	

			Resistance to Solder Shock for Through-Hole Mounted Devices JEDEC JESD22-B106E-2016	Dip and reflow soldering only	Temperature: ≤350℃	
		18	Solderability Tests for Component Leads, Terminations, Lugs, Terminals and Wires J-STD-002E-2017	Dip and reflow soldering only	Temperature: 25℃-350℃	
		19	Wire Bond pull Test Method Standard Mechanical Test Methods For Semiconductor Devices Part 2: Test Methods 2001 Through 2999 MIL-STD-750-2A-2018	ALL	Pulling ≤100kg	
		20	Wire Bond Shear Wire Bond Shear Test AEC-Q101-003A-2005	ALL	Shear force ≤100kg	
		21	Die Shear Test Method Standard Mechanical Test Methods For Semiconductor Devices Part 2: Test Methods 2001 Through 2999 MIL-STD-750-2A-2018 Method 2017.3	ALL	Shear force ≤100kg	