IEC QUALITY ASSESSMENT SYSTEM (IECQ)
covering Electronic Components,
Assemblies, Related Materials and Processes
For rules and details of the IECQ visit www.iecq.org

Schedule of Scope to Certificate of Approval

Independent Testing Laboratory

IECQ Certificate No.: IECQ-L JQAJP 13.0002

CB Certificate No.: JQAQ0002-001-T

TESTD PARTS

Fixed capacitor, Fixed resistor, Potentiometer, Varistor, Thermistor,Connector, Relay,Switch, Printed circuit board, Semiconductor Devices, Semiconductor Integrated Circuit and Optical Component

ENVIRONMENTAL TEST

IEC 60068-2-1:2013	Cold
IEC 60068-2-2:2007	Dry heat
IEC 60068-2-11:1981	Salt mist
IEC 60068-2-14:2009	Change of temperature
IEC 60068-2-20:2008	Test methods for solderability and resistance to soldering heat of devices with leads
IEC 60068-2-30:2005	Damp heat, cyclic (12+12-hour cycle)
IEC 60068-2-38:2009	Composite temperature/humidity cyclic test
JIS C 60068-2-42:1993	Sulphur dioxide test for contacts and connections
JIS C 60068-2-43:1993	Hydrogen sulphide test for contacts and connections
IEC 60068-2-45:1980	Immersion in cleaning solvents
IEC 60068-2-52:1996	Salt mist, cyclic (sodium chloride solution)
IEC 60068-2-54:2006	Soldering. Solderability testing by the wetting balance method
IEC 60068-2-58:2004	Test methods for solderability, resistance to dissolution of metallization and to soldering heat of SMD
IEC 60068-2-60:1995	Flowing mixed gas corrosion test
IEC 60068-2-66:1994	Damp heat, steady state (unsaturated pressurized vapour)
IEC 60068-2-78:2012	Damp heat, steady state
JIS K 6259-1:2015	Rubber, vulcanized or thermoplastic- Determination of ozone resistance- Part 1: Static and dynamic strain testing
MIL STD 202G	Test method standard electronic and electrical component parts
MIL STD 883J	Test method standard microcircuts

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MECHANICAL TEST

IEC 60068-2-6:2007 Vibration (sinusoidal)
IEC 60068-2-21:2006 Robustness of terminations and integral mounting devices
IEC 60068-2-27:2008 Shock
IEC 60068-2-31:2008 Rough handling shocks, primarily for equipment-type specimens
IEC 60068-2-53:2010 Tests and Guidance: Combined climatic (temperature/humidity) and dynamic (vibration/shock) tests

STRESS TEST

JEITA ED-4701/302:2013
Environmental and endurance test methods for semiconductor devices (Stress test I-2)

Test method 304A Human body model electrostatic discharge (HBM/ESD)
Test method 305C Charged device model electrostatic discharge (CDM/ESD)
Test method 306B Latch-up

JEITA ED-4701/600:2013
Environmental and endurance test methods for semiconductor devices (Specific test for discrete semiconductors)

Test method 601 Power cycling test (Molding type)
Test method 602 Power cycling test (Non-molding type/short time)
Test method 603 Power cycling test (Non-molding type/long time)

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LED OPTICAL CHARACTERISTIC TEST

JIS C 7801:2009	Measuring methods of lamps for general lighting
JIS C 8152-1:2012	Photometry of white light emitting diode for general lighting — Part 1: LED packages
JIS C 8152-2:2012	Photometry of white light emitting diode for general lighting — Part 2: LED modules and LED light engines
JIS C 8105-5:2011	Luminaires — Part 5: Gonio-photometric method

OTHER TEST

Failure Analysis, Construction Analysis, Elemental Analysis,Thermal Analysis and Internal Gas Analysis of Electronic component, including Electrical Analysis, NDE (Non-destructive Engineering), PhysicalAnalysis, Chemical Analysis and
Sample Preparation (Decap, X-section, etc),

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MEASUREMENT RANGE

Passive component

Type / Part name	Measurable property value	Measuring range
Fixed capacitor	(1)Voltage endurance (DC)	: AC,DC 0 ~ 5kV
	(2)Insulation resistance	: $5 \times 10^5 \Omega \sim 10^{14}\Omega$
	(3)leakage current	: $1\times10^{-3} \sim 10$ A^{-11}
	(4)Capacitance	: 18pF ~ 1F *
	(5)*Dielectric loss tangent(D factor)*	: *10* min*
	(6)Impedanc	: $1\Omega \sim 10^{*}$MΩ
	(7)Temperature properties and gap of the capacitance.	: Temperature range -40℃ ~ +150℃
	Attention : * The mark varies according to measurement frequency.	
Fixed resistor	(1)Resistance value	:1 Ω ~ 100MΩ
	(2)Resistance temperature properties and gap of the resistance level.	:Temperature range -55℃ ~ +150℃
	(3)Voltage factor	:±0.02%/V
	(4)Insulation resistance	: $5 \times 10^5 \Omega \sim 2\times0^{14}\Omega$
	(5)Voltage endurance	: AC,DC 0 ~ 5kV
Variable resistor *potentiometer	(1)Resistance value	: 1 Ω ~ 100MΩ
	(2)Mutual deviations	: ±3%
	(3)Resistance temperature properties and gap of the resistance level.	:Temperature range -40℃ ~ +150℃
	(4)Insulation resistance	: $5 \times 10^5 \Omega \sim 10^{14}\Omega$
	(5)Voltage endurance	: AC,DC 0 ~ 5kV
	(6)Rotational noise	:Noise voltage 1mV
	(7)Intensive contact resistance	:1 mΩ
Varistor	Voltage at reference current	:1500V(1mA min)
Thermistor	(1)resistance value	:1Ω ~ 1000kΩ
	(2)The thermistor fixed number	:Temperature range -50℃ ~ +300℃

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MEASUREMENT RANGE

Active component part [Individual semiconductor part]

Type / Part name	Measurable property value	Measuring range
Transistor *Bipolar	(1)Collector-base breakdown voltage (2)Collector-emitter breakdown voltage (3)Emitter base breakdown voltage (4)Collector base interception electric current (5)Collector emitter interception electric current (6)Emitter base interception electric current (7)The collector emitter saturation voltage (8)DC current gain	:1V ~ 1.5kV :1V ~ 1.5kV :100V min :1nA ~ 100mA :1nA ~ 100mA :1nA ~ 100mA :7V min (I_C < 17A) :25 ~ 25,000 (I_C < 17A)
Transistor *Field effect form	(1)Gate source breakdown voltage (2)Gate leak electric current (3)Drain current (4)The gate cut-off voltage (5)The drain source saturation voltage	:1V ~ 1.5kV :1pA ~ 100mA :1nA ~ 1A : ~ 100V :7V min (I_D < 17A)
Diode *Small signal *I rectify a small electric current *Constant voltage *Small electric current switching	(1)Forward voltage (2)Reverse current (3)Breakdown voltage (4)Zener voltage (5)Dynamic resistance (6)Temperature coefficient	:7V min (I_F < 17A) :1na ~ 100mA (V_R < 100V) :1V ~ 1.5kV :100V min :50Ω max :Temperature range -55℃ ~ +150℃
Thyristor *3 reverse-blocking terminals *Small electric current	(1)Off electric current (2)Reverse current (3)ON-state voltage (4)Gate trigger (5)Holding current	:1mA (V_L < 1kV) :1na ~ 1mA (V_L < 1kV) :7V (I_{TM} < 10A) :1000V min :10A (V_{TM} < 7V)

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MEASUREMENT RANGE

Active component part Semicondctor Devices [Integrated circuit]

Type / Part name	Measurable property value	Measuring range
TTL IC	(1)The high-level output voltage	:±30V
	(2)The low-level output voltage	:±30V
	(3)The input clamp voltage	:±30V
	(4)High-level input electric current	:±300mA
	(5)Low-level input electric current	:±300mA
	(6)Output short circuit current	:±300mA
	(7)High-level power supply electric current	:±300mA
	(8)Low-level power supply electric current	:±300mA
CMOS IC	(1)The high-level output voltage	:±30V
	(2)The low-level output voltage	:±30V
	(3)The high-level input voltage	:±20V
	(4)Low-level input electric current	:±20V
	(5)High-level output electric current	:±300mA
	(6)Low-level output electric current	:±300mA
	(7)Static consumption electric current	:±300mA
	(8)Input current	:±300mA
Analog semiconductor integrated circuit *Monolithic op-amp	(1)Input-offset voltage	:10μV ~ 128mV
	(2)Input offset current	:20pA ~ 16μA
	(3)Input bias current	:20pA ~ 16μA
	(4)Open loop voltage gain	:0.1V/mV ~ 1.2V/μV
	(5)The max power voltage	:10mV ~ 50V
	(6)Power consumption	:5mW ~ 6.4W
	(7)Common mode rejection ratio	:38 ~ 116dB
	(8)Supply voltage rejection ratio	:38 ~ 116dB
	(9)Aspect input voltage range	:100mV ~ 25V
	(10)Slew rate	:0.1 ~ 125V/μS

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MEASUREMENT RANGE

Mechanical device

Type / Part name	Measurable property value	Measuring range
Connector (Electronic equipment use)	(1)Insulationresistanc (2)Withstand voltage (3)Contact resistance under low voltage, the low electric current (4)Chattering of the contact.	:$5\times 10^5\Omega \sim 2\times10^{14}\Omega$:AC,DC 0 ~ 5kV :1mΩ ~ 100Ω :1μsec max
Relay (Small form for control)	(1)Withstand voltage (2)Insulation resistance (3)Direct current resistance of the coil (4)Contact resistance (5)Operating voltage (6)Must-release voltage (7)Operation time (8)Recovery time (9)Bounces of the point of contact (10)Chattering of the point of contact	:AC,DC 0 ~ 5kV :$5\times 10^5\Omega \sim 2\times10^{14}\Omega$:1Ω ~ 10kΩ :1mΩ ~ 100Ω :1V max :1V max :1msec max :1msec max :1μsec max :1μsec max
Switch (Electronic equipment use)	(1)Contact resistance (2)Insulation resistance (3)Withstand voltage (4)Electrostatic capacity (5)Change of the contact resistance	:1mΩ ~ 100Ω :$5\times10^5\Omega \sim 2\times10^{14}\Omega$: AC,DC 0 ~ 5kV :18pF ~ 1F :1mΩ max
Printed circuit board	(1)Resistance of the plating part of the conductor and through hall part. (2)Withstand voltage (3)Insulation resistance	 :1mΩ ~ 1000Ω : AC,DC 0 ~ 5kV : $5\times10^5\Omega \sim 10^{14}\Omega$

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MEASUREMENT RANGE

Optical component

Type / Part name	Measurable property value Measuring range
Luminescent diode (It is for indication.)	(1)Forward voltage :7V min (2)Reverse current :1mA min (3)Luminous intensity(Relative value) :----
LED (It is for illumination.)	1.Integrating sphere (1)Total luminous flux[lm] :Measurable wavelength range 350nm ~ 1000nm :F[lm] :min 32lm ~ In sunshine (2)Color temperature[K] :---- (3)Chromaticity coordinate :---- (4)The number of the color rendering evaluations :Ra,R1 ~ R14 2.The light distribution measurement. (1)Light distribution curve :Measurable wavelength range 360nm ~ 830nm :Photometric distance 2m ~ 12m, (2)Light intensity(Reference) :Photometric distance Luminous intensity :2.0m : 9 ~ 3,680,000[cd] :3.0m : 20 ~ 8,200,000[cd] :6.0m : 83 ~ 33,000,000[cd] :12m : 330 ~ 132,000,000[cd] (3)Color temperature : ---- (4)Chromaticity coordinate :---- (5)The number of the color rendering evaluations : Ra,R1 ~ R14

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