



PRODUCT SPECIFICATION



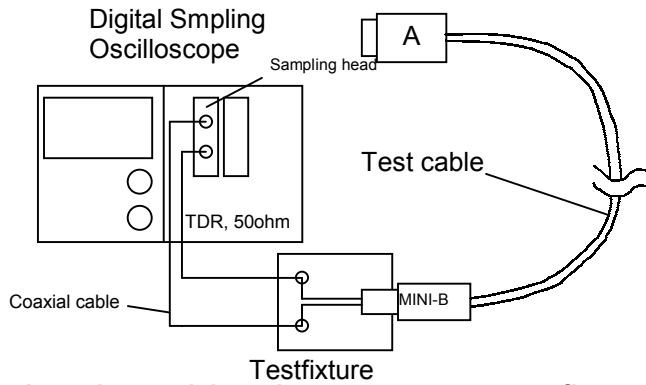
LANGUAGE

JAPANESE
ENGLISH

4 - 1 . 電気的性能 Electrical Performance

項目 Item	条件 Test Condition	規格 Requirement	
		TYPE A	MINI-B
4-1-1 接触抵抗 Contact Resistance	コネクタを嵌合させ、開放電圧20mV以下、短絡電流100mA以下にて測定する。但し電線の導体抵抗は除く。(EIA-364-23) Mate connectors, measure by dry circuit, 20mV maximum, 100mA maximum. Except wire conductor resistance.(EIA-364-23)	30 milliohms maximum 初期及び1500回挿抜後 Initial and afterMate/Un-mate 1500 cycles	50 milliohms maximum 初期及び5000回挿抜後 Initial and afterMate/Un-mate 5000 cycles
4-1-2 絶縁抵抗 Insulation Resistance	コネクタを嵌合及び未嵌合状態にし、隣接するターミナル間及びターミナル、アース間にDC500V〔TYPE A〕かDC100V〔MINI-B〕を印加し測定する。(EIA-364-21) Mate/un-mate connectors, apply 500V〔TYPE A〕DC or 100V〔MINI-B〕DC between adjacent terminals or ground. (EIA-364-21)	1000 Megaohms minimum	100 Megaohms minimum
4-1-3 耐電圧 Dielectric Strength	コネクタを嵌合及び未嵌合状態にし、隣接するターミナル間及びターミナル、アース間にAC(rms) 500〔TYPE A〕V(実効値)か、AC(rms) 100〔MINI-B〕V(実効値)を1分間印可する。(EIA-364-20) Mate/Un-mate connectors, apply 100V AC(rms) for 1 minute between adjacent terminals or ground.(EIA-364-20)	異常なきこと No Breakdown	
4-1-4 温度上昇 Temperature Rise	コネクタを嵌合させ、最大許容電流を通電し、コネクタの温度上昇分を測定する。(EIA-364-70) Mate connectors and measure the temperature rise of contact when the maximum AC rated current is passed. (EIA-364-70)	温度上昇 Temperature Rise 30 maximum	
4-1-5 静電容量 Capacitance	未嵌合コネクタの隣接する回路間を1kHzで測定する。(EIA-364-30) Measured between adjacent circuits of unmated connectors at 1kHz.(EIA-364-30)	2pF maximum	
4-1-6 ケーブルインピーダンス Cable Impedance	試験治具にケーブルを繋ぎ、TDRにて測定する。装置は次ページ参照。 Connect the cable to test fixture, measure by TDR. Measurement configuration are next pages.	< USB1.1 > Diff.Impedance(rt=4ns) 76.5 ~ 103.5 ohms	
		< USB2.0 > Diff.Impedance(rt=0.5ns) 76.5 ~ 103.5 ohms Com.Impedance(rt=0.5ns) 21 ~ 39 ohms	

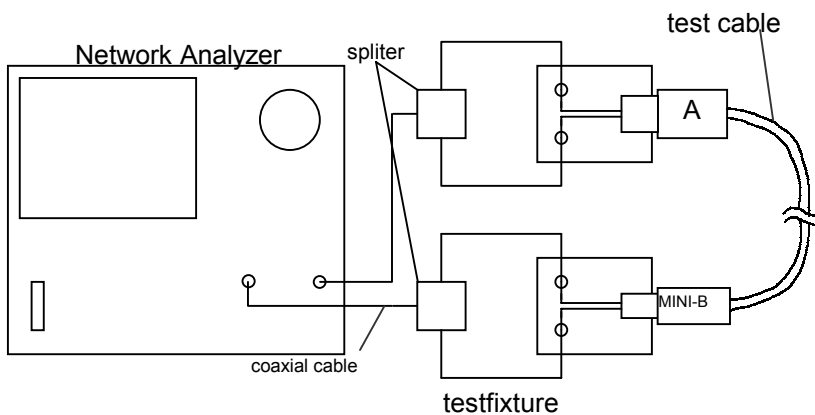
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REV.	J2003-0961	THIS DOCUMENT CONTAINS INFORMATION THAT IS PROPRIETARY TO MOLEX INC. AND SHOULD NOT BE USED WITHOUT WRITTEN PERMISSION		
	2002/10/08			
	KTAKAHASHI			
	DESCRIPTION			
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Impedance, delay, skew measurement configuration

Frequency (MHz)	Attenuation (max.) (dB/cable)
0.064	0.08
0.256	0.11
0.512	0.13
0.772	0.15
1	0.20
4	0.39
8	0.57
12	0.67
24	0.95
48	1.35
96	1.90
200	3.20
400	5.80

< USB2.0 >



Attention measurement configuration

項目 Item	条件 Test Condition	規格 Requirement	
		TYPE A	MINI-B
4-1-7 減衰量 Attenuation	試験治具にコネクタを嵌合させ、ネットワークアナライザにて測定する。装置は上記参照。 Connect connector to attenuation test fixture, measure by Network Analyzer. Measurement configuration are upper pages.	上記参照 Reference upper pages	
4-1-8 伝播遅延 Propagation Delay	試験治具にケーブルを繋ぎ、TDRにて測定する。装置は上記参照。 Connect the cable to test fixture, measure by TDR. Measurement configuration are upper pages.	<USB 1.1> 26ns/cable max.	<USB 2.0> 5.2ns/m max.
4-1-9 伝播遅延差 Propagation Delay Skew	試験治具にケーブルを繋ぎ、TDRにて測定する。装置は上記参照。 Connect the cable to test fixture, measure by TDR. Measurement configuration are upper pages.	<USB 1.1> 400ps/cable max.	<USB 2.0> 100ps/cable max.

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4 - 2 . 機械的性能、その他 Mechanical Performance and others

項目 Item	条件 Test Condition	規格 Requirement	
		TYPE A	MINI-B
4-2-1 初回挿入力 / 初回抜去力 First Time Mating and First Time Un-mating Force	1 分間に12.5mm以下の速さで挿入、抜去する。 (EIA-364-13) Mate and un-mate connector at maximum rate of 12.5mm per minute. (EIA-364-13)	初回挿入力 First Time Mating Force	35N (3.57kgf) maximum
		初回抜去力 First Time Un-Mating Force	10N (1.02kgf) minimum 7N (0.71kgf) minimum
4-2-2 繰り返し挿抜 Repeated Mate / Unmate	1時間に200回以下の速さで挿入、抜去を1500〔TYPE A〕回か、5000〔MINI-B〕回繰り返す。 (EIA-364-09) Mate and unmate up to 5000 cycles repeatedly at maximum rate of 200 cycles per hour. (EIA-364-09)	外観 Appearance	異常なきこと No Breakdown
		接触抵抗 Contact Resistance	30 milliohms maximum 50 milliohms maximum
		挿入力 Mating Force	1 ~ 1500 Cycles 35N (3.57kgf) maximum 1 ~ 5000 Cycles 35N (3.57kgf) maximum
		抜去力 Un-Mating Force	1 ~ 1500 Cycles 10N (1.02kgf) minimum 1 Cycle 7N (0.71kgf) minimum 2 ~ 5000 Cycles 3N (0.30kgf) minimum
4-2-3 ケーブル保持力 Cable Pull-Out	コネクタに装着されたケーブルを軸上に50Nで1分間引っ張る。(USB:40N,1分間) (EIA-364-38) Apply axial pull out force on the cable assembled in the connector at a rate of 50N for 1 minute.(USB:40N,1minute) (EIA-364-38)	外観 Appearance	異常なきこと No Breakdown
		接触抵抗 Contact Resistance	30 milliohms maximum 50 milliohms maximum
4-2-4 ターミナル保持力 Terminal Retention Force	ハウジングに装着されたターミナルを毎分25±3mmの速さで引っ張る。 Apply axial pull out force on the terminal assembled in the housing at a rate of 25±3mm minimum.	4N(0.41kgf) minimum	
4-2-5 ナット保持力 Nut Retention Force	フランジ部ナットにトルク 19.6 N・cm (2.0 kgf・cm)を負荷する。 Apply Torques on the nut of flange parts.	異常なきこと No Damage	

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		TYPE A	MINI-B
4-2-6 耐振動性 Vibration	DC 100mA通電状態にて、第6項に示す振動を嵌合軸を含む互いに垂直な3方向に各15分間加える。 (EIA-364-28) Mate connectors and subject to the following vibration conditions (refer to 6 clause), for a period of 15 minutes in each of 3 mutually perpendicular axes, passing DC 100mA during the test. (EIA-364-28)	外観 Appearance	異常なきこと No Damage
		接触抵抗 Contact Resistance	30 milliohms maximum 50 milliohms maximum
		瞬断 Discontinuity	1.0 microsecond maximum
4-2-7 耐衝撃性 Shock	DC 100mA通電状態にて、嵌合軸を含む互いに垂直な6方向に294m/s ² (30G)の衝撃を各3回加える。 (EIA-364-27) Mate connectors and subject to the following shock conditions. 3 shocks shall be applied along 3 mutually perpendicular axes, passing DC 100mA current during the test. (Total of 18 shocks) Test pulse : Half Sine Peak value : 294m/s ² (30G) Duration : 11ms (EIA-364-27)	外観 Appearance	異常なきこと No Damage
		接触抵抗 Contact Resistance	30 milliohms maximum 50 milliohms maximum
		瞬断 Discontinuity	1.0 microsecond maximum
4-2-8 耐熱性 Heat Resistance	コネクタを嵌合させ、85±2℃の雰囲気中に250時間放置後取り出し、1～2時間室温に放置する。 (EIA-364-17) Mate connectors and expose to 85±2 degree centigrade for 250 hours. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed. (EIA-364-17)	外観 Appearance	異常なきこと No Damage
		接触抵抗 Contact Resistance	30 milliohms maximum 50 milliohms maximum
		耐電圧 Dielectric Strength	4-1-3項満足のこと Must meet 4-1-3
		絶縁抵抗 Insulation Resistance	4-1-2項満足のこと Must meet 4-1-2

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項目 Item	条件 Test Condition	規格 Requirement	
		TYPE A	MINI-B
4-2-9 耐寒性 Cold	コネクタを嵌合させ、-55±2℃の 雰囲気中に96時間放置後取り出し、 1～2時間室温に放置する。 Mate connectors and expose to -55 ± 2 degree centigrade for 96 hours. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed.	外観 Appearance	異常なきこと No Damage
		接触抵抗 Contact Resistance	30 milliohms maximum 50 milliohms maximum
		耐電圧 Dielectric Strength	4-1-3項満足のこと Must meet 4-1-3
		絶縁抵抗 Insulation Resistance	4-1-2項満足のこと Must meet 4-1-2
4-2-10 耐湿性 Humidity	コネクタを嵌合させ、第7項に示す 耐湿性サイクル試験（7サイクル）後 取り出し、1～2時間室温に放置する。 (EIA-364-31 Method) Mate connectors and expose to humidity in 7 cycles at 7 clause. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed. (EIA-364-31 Method)	外観 Appearance	異常なきこと No Damage
		接触抵抗 Contact Resistance	30 milliohms maximum 50 milliohms maximum
		耐電圧 Dielectric Strength	4-1-3項満足のこと Must meet 4-1-3
		絶縁抵抗 Insulation Resistance	4-1-2項満足のこと Must meet 4-1-2

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項目 Item	条件 Test Condition	規格 Requirement		
		TYPE A	MINI -B	
4-2-11 温度サイクル Temperature Cycling	コネクタを嵌合させ、-55 ± 3 ℃に30分 +85 ± 2 ℃に30分、これを 1サイクルとし、10サイクル繰り返す。 但し、温度移行時間は10 ~ 15分以内と する。試験後1 ~ 2時間室温に放置する。 Mate connectors and subject to the following conditions for 10 cycles. Upon completion of the exposure period, the specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed. 1 cycle a) -55 ± 3 degree centigrade 30 minutes b) +85 ± 2 degree centigrade 30 minutes Transit time shall be within 10 to 15 minutes.	外観 Appearance	異常なきこと No Damage	
		接触抵抗 Contact Resistance	30 milliohms maximum	50 milliohms maximum
		耐電圧 Dielectric Strength	4-1-3項満足のこと Must meet 4-1-3	
		絶縁抵抗 Insulation Resistance	4-1-2項満足のこと Must meet 4-1-2	
4-2-12 塩水噴霧 Salt Spray	コネクタを嵌合させ、35 ± 2 ℃にて 5 ± 1% 重量比の塩水を 48 ± 4時間噴霧 し試験後常温で水洗いした後、 室温で乾燥させる。 (JIS C5028/MIL-STD-202 試験法101) Mate connectors and expose to the following salt mist conditions. Upon completion of the exposure period, salt deposits shall be removed by a gentle wash or dip in running water which the specified measurements shall be performed. NaCl solution concentration: 5 ± 1% Spray time : 48 ± 4 hours Ambient temperature : 35 ± 2 ℃ (JIS C5028/MIL-STD-202 Method101)	外観 Appearance	目視にて著しい サビが無いこと By visual inspection without noticeable rust.	
		接触抵抗 Contact Resistance	60 milliohms maximum	100 milliohms maximum
4-2-13 亜硫酸ガス SO ₂ Gas	コネクタを嵌合させ、40 ± 2 ℃にて 50 ± 5ppmの亜硫酸ガスに24時間放置す る Mate connectors and expose to 50 ± 5ppm SO ₂ Gas, ambient temperature 40 ± 2 ℃ for 24 hours.	外観 Appearance	異常なきこと No Damage	
		接触抵抗 Contact Resistance	60 milliohms maximum	100 milliohms maximum

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		TYPE A	MINI-B
4-2-14	硫化水素ガス H ₂ S Gas コネクタを嵌合させ、35±2℃にて 相対湿度80%,3±1ppmの硫化水素ガスに 96時間放置する Mate connectors and expose to 3±1ppm H ₂ S Gas, ambient temperature 35±2℃, humidity approx 80% for 96 hours.	外観 Appearance	異常なきこと No Damage
		接触抵抗 Contact Resistance	60 milliohms maximum 100 milliohms maximum
4-2-15	非移行性 Migration 2枚のPS板(50x50x3)の間に20~30mm 間隔で60mmの長さの試料を2本置き、 これを2枚のガラス板に挟み、500gの オモリを乗せ暴露試験を行う。 (第8項参照) 20~30mm to for 2 sheets of Polystyrene migration boards(50x50x3) two data of the length of the role of 60mm are put in an interval and this putting it to 2 sheets of glass plates 500g of are loaded do a disclosure test (refer to 8 clause) 温度 Temperature : 60 時間 Duration : 48h	PS板に著しい移行跡が無い事。 There shall not be remarkable conduct in a polystyrene migration board.	
4-2-16	半田付け性 Solderability 端子先端より0.5mmの位置まで、 245±5 の半田に4~5秒浸す。 (EIA-364-52 Category 2) Dip soldertails into the molten solder [held at 245±5 degree centigrade] up to 0.5mm from the bottom of the housing for 4~5 seconds. (EIA-364-52 Category 2)	濡れ性 Solder Wetting	浸漬面積の95% minimum 95% of immersed area must show no voids, pin holes

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項目 Item	条件 Test Condition	規格 Requirement
4-2-17 半田耐熱性 Resistance to Soldering heat	<p>下記の他は、JIS C 0050 (方法1A または2) に準拠。 For procedures other than specified below, refer to IEC Pub. 68-2-20. Test Tb Method 1A or 2</p> <p>ディップ Solder bath method 温度：260±3 時間：10±1秒 Solder temperature :260±3 Immersion time:10±1s 浸漬深さ：基板面まで Thickness of printed wiring board プリント基板の厚さ：0.8mm Thickness of P.C.B : 0.8mm</p> <p>手半田 Solder iron method 温度：370～400 時間：2～5秒 Solder temperature :370～400 Immersion time:2～5s 但し、端子に異常のないこと。 However, excessive pressure shall not be applied to the terminal.</p>	<p>外觀の変形および端子などの 著しいガタがなく、電気的性能を 満足すること。 Without deformation of case or excessive looseness of the terminals(pin). Electrical characteristics shall be satisfied</p>

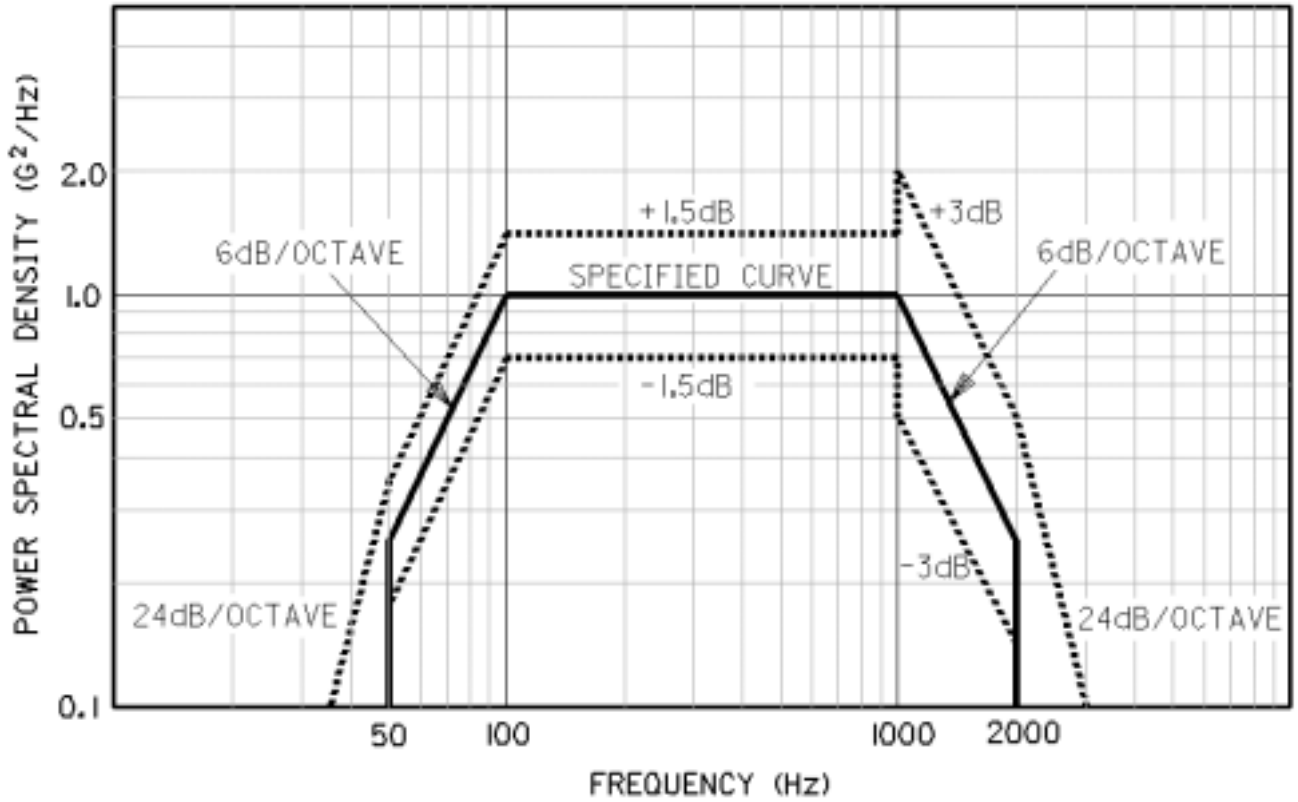
【 5 . 外觀形状、寸法及び材質 PRODUCT SHAPE, DIMENSIONS AND MATERIALS 】

図面参照 Refer to the drawing.

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【 6 . 振動条件 VIBRATION CONDITION 】

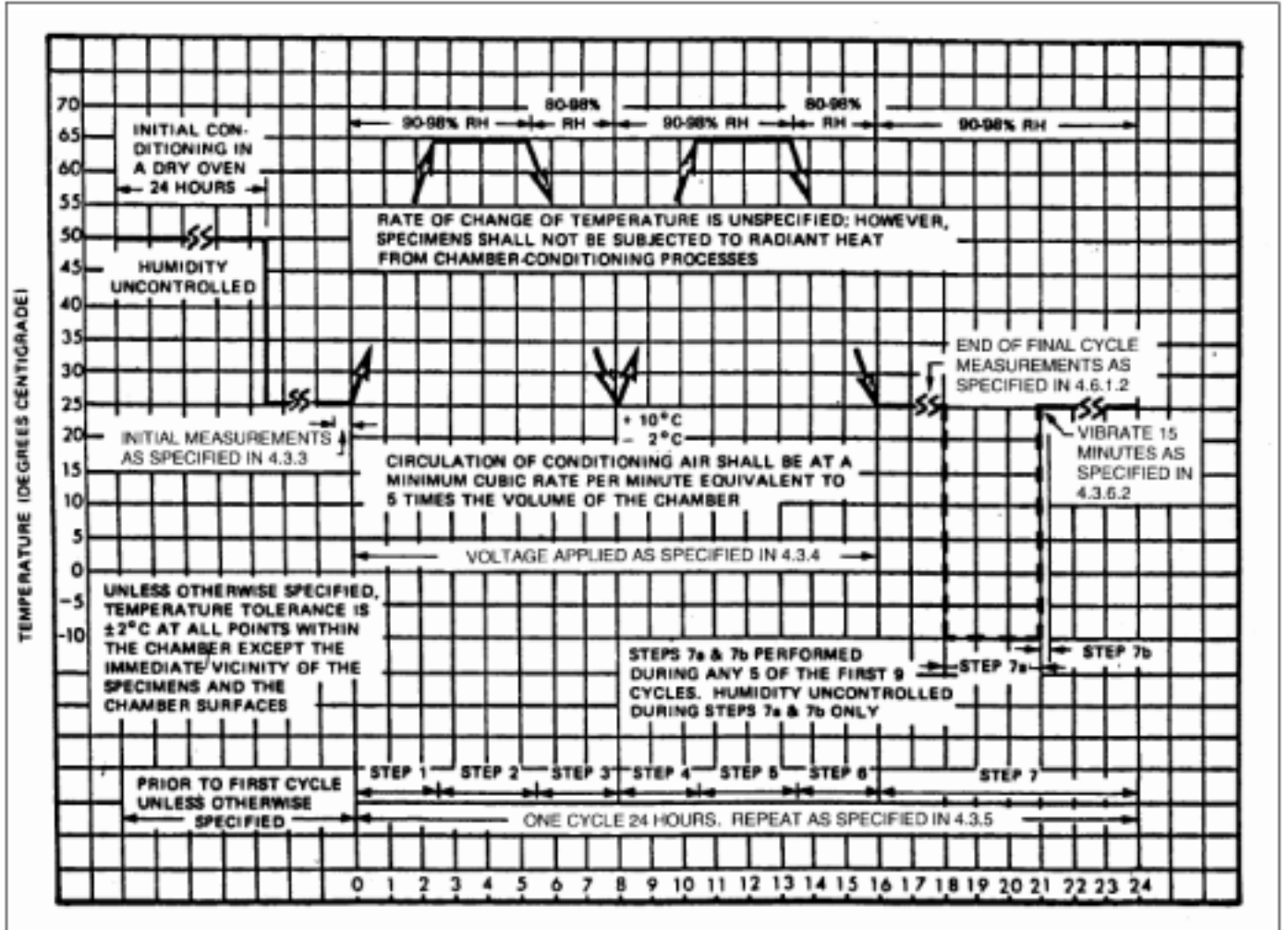


Power spectral density, G ² /Hz	Overall rms G minimum
0.02	5.35

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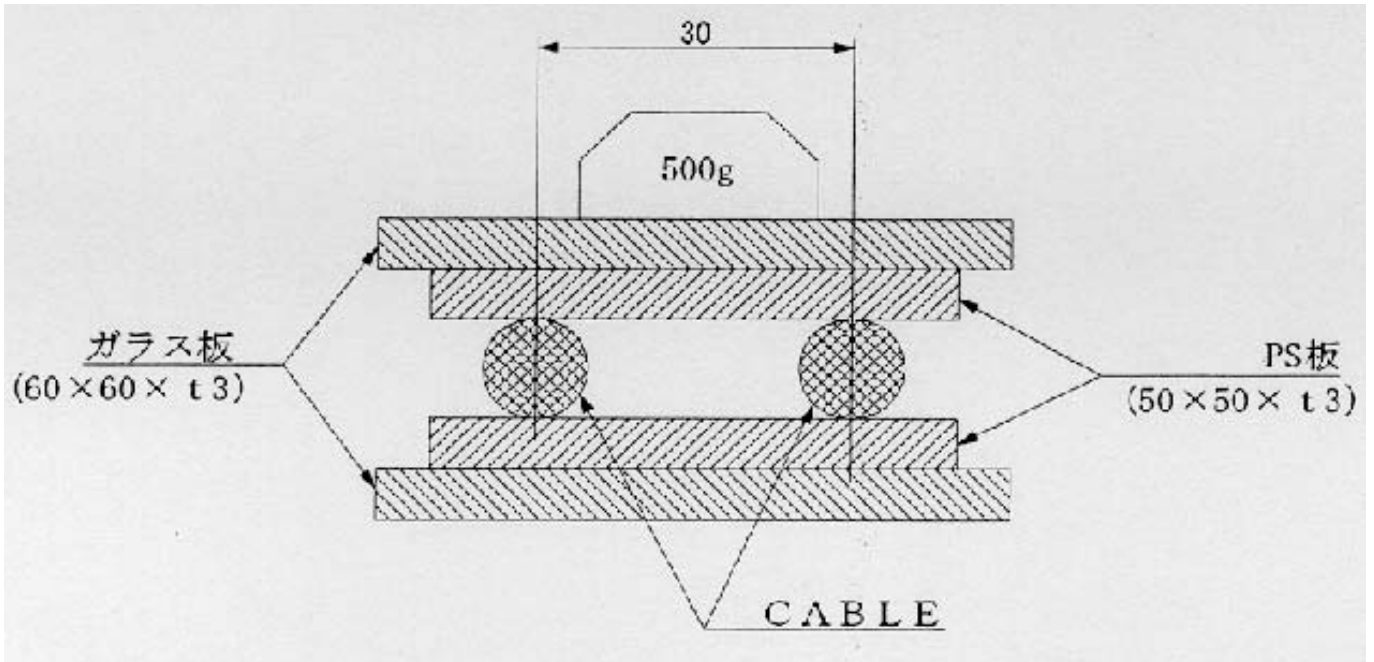
【7. 耐湿性条件 HUMIDITY CONDITION】



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【 8 . 非移行性試験条件 MIGRATION CONDITION】



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