TIANGXI
COMPONENTS

APPROVAL SHEET

RoHS Compliant

CUSTOMER:	MINYX servis s.r.o.
DESCRIPTION:	HC-49/S 12.288MHz Quartz Crystal Resonator
MANUFACTURER PART NO.:	QM 12.288MHz 30ppm 20pF -20~+70°C
CUSTOMER PART NO:	
USED IN MODEL:	
REVISION	A1

承　　认　　APPROVAL		
工程部 TECHNOLOGY DEPT.	品质部 QUALITY DEPT.	采购部 PURCHASING DEPT.

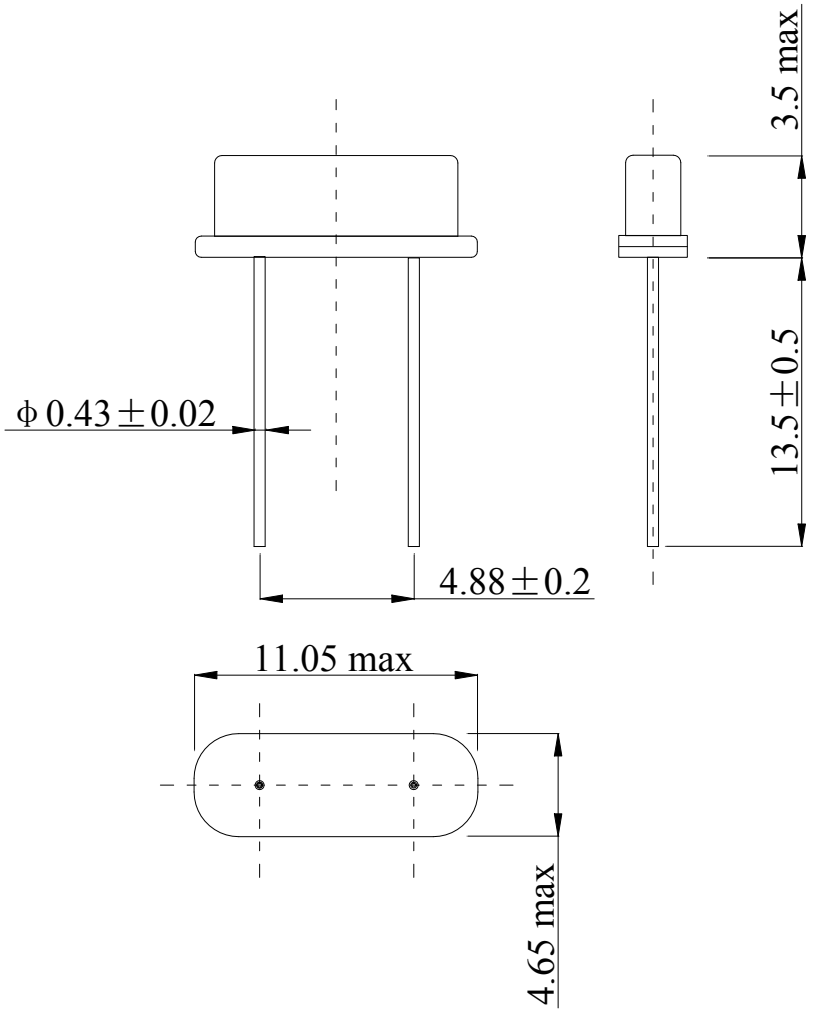
Date: March 18, 2020

Rev	Revise page	Revise contents	Date	Ref.No.	Reviser
A1	ALL	Initial released		N/A	

1. QUARTZ CRYSTAL UNIT SPECIFICATION

1.1 Frequency:	12.288MHz
1.2 Mode of Oscillation	AT Fundamental
1.3 Holder type :	HC-49/S
1.4 Frequency tolerance:	±30ppm at 25℃
1.5. Equivalent resistance (Rr):	50Ω Max.
1.6 Operating temperature range:	-20℃ To +70℃
1.7 Storage temperature range:	-40℃ To +85℃
1.8. Frequency stability:	±30ppm at -20℃ To +70℃
1.9 Loading capacitance (CL) :	20pF
1.10 Drive level (DL):	100 uW Typical
1.11 Shunt Capacitance (C0):	7.0pF MAX
1.12 Insulation resistance (IR) :	More than 500M ohms at DC 100V
1.13 Circuit:	Measured in S&A 250B
1.14 Aging:	±3 ppm Max (+25℃ 1st Year)
1.15 Dimensions and marking	Refer to page.3
1.16 Other	RoHS Compliant (Pb free)

2. MARKING & DIMENSIONS



*Marking should be printed as following:

Logo, Nominal Frequency

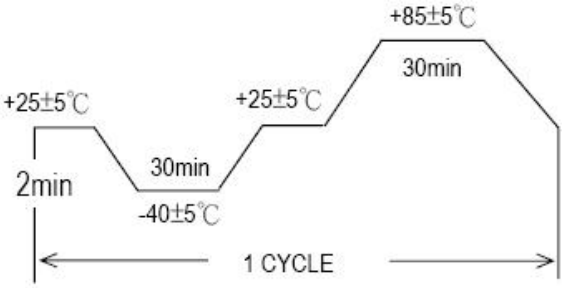
Logo：T

Nominal Frequency：（ex. 3.579545MHz➔3.579545）

Marking: Laser marking

3.MECHANICAL/ENVIRONMENTAL CHARACTERISTICS

NO.	项 目 ITEM	条 件 CONDITIONS	规 格 SPECIFICATIONS
3.1	漏气试验 Leaking Test	完全浸入 90±3℃热水中 3 分钟。 Fully immersed into hot water at 90℃ ±3℃ for 3 minutes.	无气泡存在 no air bubble are visible.
3.2		用氦质谱仪测试或加压测绝缘电阻 Take measurements with a helium leakage detector，or measure insulation resistance under pressure.	1×10^{-8} Pa.m^3 /s Max or IR≥500MΩ
3.3	跌落试验 Drop Test	高度 75cm，自由落体于 3cm 木板上，6 次 Dropping 6 times from the height of 75 cm onto hard wooden board of thickness more than 30mm.	频率变化±5ppm 以内, 电阻变化 15%以内 The crystal must meet: Δf≤±5ppm ΔR≤15%
3.4	振动试验 Vibration Test	频率 10~55Hz，振幅 1.5mm，时间 1.5 分钟循环，在 XYZ 方向各 2 小时。 Vibration Frequency: 10~55Hz Cycle: 1.5 Min. Amplitude: 1.5mm P-P. Direction: X.Y.Z Time: 2 Hours / Each Direction	频率变化±5ppm 以内, 电阻变化 15%以内 The crystal must meet: Δf≤±5ppm ΔR≤15%
3.5	可 焊 性 Solderability Test	从引线末端至距底部 2mm 处放入 230℃±5℃焊槽内,时间：5±0.5 秒。 The terminal lead wire is to be soaked in a 230℃ ±5℃ tin trough for 5±0.5 seconds.	沾锡面≥90%.频率变化±5ppm 以内,电阻变化 15%以内 Tin over the wire≥90% The crystal must meet: Δf≤±5ppm ΔR≤15%
3.6	耐低温性 Low Temperature Enduring	在-40℃±3℃下,放置 96 小时,取出后在常温下恢复 2 小时。 The samples crystal is to be tested after being placed in the environment of -40C±3℃ for 96 hours, and recovered to room temperature for 2 hours.	频率变化±5ppm 以内, 电阻变化 15%以内 The crystal must meet: Δf≤±5ppm ΔR≤15%
3.7	耐高温性 High Temperature Enduring	在+85℃±3℃下放置 96 小时,取出后在常温下恢复 2 小时。 The samples crystal is to be tested after being heated at +85±3℃ for 96 hours, and cooled to room temperature for 2 hours.	频率变化±5ppm 以内, 电阻变化 15%以内 The crystal must meet: Δf≤±5ppm ΔR≤15%

3.8	恒定湿热 Humidity	在 40±3℃、RH 93%±2%下放置 96 小时,取出后恢复 2 小时。 The temperature is at 40±3℃, and at 93% ±2% RH after 96 hours， and cooled to room temperature for 2 hours.	外观无异常, 频率变化±5ppm 以内, 电阻变化 15%以内 The crystal must meet: Δf≤±5ppm ΔR≤15%
3.9	耐焊接热 Resistance to Solder Heat	引线端子应插入 350±5℃的焊接槽中 3±0.5 秒或 260±5℃的焊接槽中 10±0.5 秒，插入深度为从引线末端至距底部 2mm 处，而后放在自然环境中 1 小时，再进行测试。 Lead terminals are immersed up to 1.5mm from resonator's body in soldering bath of 350±5℃ for 3±0.5 sec. And then resonator shall be measured after being placed in room temperature for 1 hour.	外观无异常, 频率变化±5ppm 以内, 电阻变化 15%以内 The crystal must meet: Δf≤±5ppm ΔR≤15%
3.10	热冲击 Thermal shock	在-40℃保持30分钟，+85℃保持30分钟，循环10次。 Should be satisfied after supplying the following temperature cycle (10 cycles). (Refer to Fig-4). Temperature shift from low to high, high to low shall be done in 1℃/min.  Fig-4	外观无异常, 频率变化±5ppm 以内, 电阻变化 15%以内 The crystal must meet: Δf≤±5ppm ΔR≤15%

4. PACKAGE 包装

4.1 Quantity of package:

250 pieces of crystal unit per bag

2500 pieces of crystal unit per inner box，10 bags

25000 pieces of crystal unit per carton，10 inner boxes