

**Summary Report: Cameron Health Q-TECH Programmer FCC Test Report****DN-12856, Rev A**

## 1 Executive Summary

This report references three detailed reports:

NWEMC Testing Report: Cameron Health Q-TECH Programmer (Referred to below as NWEMC – Q-TECH) – subject of the current application for equipment authorization.

NWEMC Testing Report: Cameron Health SQRX Pulse Generator (Referred to below as NWEMC – SQRX) – subject of a separate application for equipment authorization.

Cameron Health Testing Report: System Telemetry Testing At Cameron Health (Referred to below as CH – Telemetry) – attached hereto as an appendix.

This report documents the testing and test results showing compliance with applicable sections of the FCC Regulations relating to the operational aspects of the Cameron Health Q-TECH Programmer. The Q-TECH Programmer is part of the Cameron Health S-ICD® System, which also includes the SQRX Pulse Generator. To the extent necessary, this report will include discussion or analysis of relevant features of the SQRX Pulse Generator.

\* S-ICD® is a registered trademark of Cameron Health, Incorporated.

## 2 Applicable Regulations

The Cameron Health Q-TECH Programmer is intended for use as part of a medical implant system having telemetry capabilities intended to use the Medical Implant Communications Service band (MICS). This document covers:

§95.628	MICS Transmitters	Subparts (a)-(f)
§95.631	Emission Types	Subpart (h) MICS Stations
§95.633	Emission Bandwidth	Subpart (e) For transmitters in the MICS
§95.635	Unwanted Emissions	Subpart (d) For transmitters designed to operate in the MICS
§95.639	Maximum Transmitter Power	Subpart (f)

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§95.645	Control Accessibility	
§95.649	Power Capability Controls	
§95.1211	Channel Use Policy	Included based on Email with FCC.

Several subsections that are identified above are applicable to only one of the Q-TECH or SQRX; those that do not apply for this report are indicated in the table below. For “system” requirements, reference is made to testing reports for both the Q-TECH and SQRX.

### 3 Section-by-Section Analysis

Rule	Subject Matter	Applicable Report	Comments
§95.628(a)(1)	The monitoring system BW is equal to or greater than the emission BW of intended transmission.	NWEMC – SQRX & NWEMC – Q-Tech & CH – Telemetry	NWEMC - SQRX shows emission BW of SQRX is 107 kHz (pp 36-39). CH – Telemetry shows 20 dB down receive points are spaced greater than 130 kHz (§5.1).
§95.628(a)(2)	Within 5 seconds prior to initiating a communications session, circuitry must monitor the intended channel for at least 10 milliseconds.	CH – Telemetry	CH – Telemetry shows that the Q-TECH monitors the communications channel for more than 10 milliseconds immediately prior to initiating communication (§5.2).
§95.628(a)(3)	Threshold power level of better than $10\log(B)(Hz) - 150$ (dBm/Hz) + G (dBi)	NWEMC – SQRX & CH – Telemetry	B is the emission BW of SQRX, found in NWEMC – SQRX as 107 kHz (pp 36-39). G is the gain of the antenna, measured as explained in CH – Telemetry (§5.3). Analysis showing the threshold power level is also explained in CH – Telemetry (§5.4).
§95.628(a)(4), sentences 1 & 3.	MICS communications may be started if channel has signal below power threshold of (a)(3) or, if no channel having that low	CH – Telemetry	As noted in communication with FCC, rules do not prohibit single channel operation. Since no channeling scheme is required, this portion of this

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	signal is available, may use channel with lowest ambient power level.		section has been read as set forth in CH – Telemetry and passed (§5.5).
§95.628(a)(4), sentence 2.	Communication session may continue as long as any silent period does not last more than 5 seconds.	CH – Telemetry	No such silent periods occur as shown in CH – Telemetry (§5.6).
§95.628(a)(5)	Alternate channel selection protocol.	n/a	This provision is explicitly optional and is not used in the S-ICD® System.
§95.628(b)	MICS Communications initiated by implant	n/a	Section limits SQRX ability to initiate communication; does not specify Q-TECH activity.
§95.628(c)	Reference to out of band attenuation per §95.635	n/a	See reference for §95.635, below.
§95.628(d)	Authorized emission bandwidth less than 300 kHz – single device.  Authorized emission bandwidth less than 300 kHz – session requirement.	NWEMC – SQRX & NWEMC - Q-TECH	NWEMC - Q-TECH shows BW of 101 kHz (pp 36-39) centered at 403.514-403.516 kHz (pp 40-45).  NWEMC - SQRX shows BW of 107 kHz (pp 36-39) centered at 403.512-403.514 MHz (pp 32-35).  Combined numbers demonstrate session BW less than 300 kHz.
§95.628(e)(1)	Frequency stability for medical implant transmitter.	n/a	Applies to the implant.
§95.628(e)(2)	Frequency stability for programmer.	NWEMC – Q-TECH	NWEMC – Q-TECH shows frequency stability is better than 100 ppm across specified temperature range (pp 40-45).
§95.628(f)	“The provisions of this section shall not be used to extend the range of spectrum occupied over space or time for the purpose of denying fair access to spectrum for other	n/a	The Applicant has no such intent.

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	MICS devices.”		
§95.631(h)	“A MICS station may transmit any emission type appropriate for communications in this service. Voice communications, however, are prohibited.”	n/a	The Q-TECH does not have any capability for capturing voice and/or transmitting voice communications via the MICS circuitry.
§95.633(e)(1) & (e)(3)	Emission Bandwidth less than 300 kHz, measured to 20 dB down points using approximately 1 % RBW.	NWEMC – Q-TECH	NWEMC – Q-TECH shows a bandwidth of 101 kHz (pp 36-39), measured by NWEMC using applicable guidelines.
§95.633(e)(2)	Less than 300 kHz BW may be used, provided that unwanted emissions are attenuated per §95.635 and power radiated in any 300 kHz BW does not exceed 25 $\mu$ W EIRP.	NWEMC – Q-TECH	Three items indicated: NWEMC – Q-TECH shows bandwidth of 101 kHz (pp 36-39), attenuation rules met (pp 10-29), and power does not exceed maximum (pp 30-35).
§95.635(d)(1)	Unwanted Emissions out of MICS Band.	NWEMC – Q-TECH	NWEMC – Q-TECH shows tests performed as “Receiver Spurious Emissions” and “Field Strength of Radiated Emissions,” and tests passed (pp 10-24).
§95.635(d)(2-3)	Test methods for (d)(1) and (d)(4-5) for implantable devices.	n/a	Regulations apply only to implant.
§95.635(d)(4-5)	Unwanted emissions within and adjacent to MICS Band.	NWEMC – Q-TECH	NWEMC – Q-TECH shows this test performed as “Emission Mask,” and indicates the test is passed (pp 25-29).
§95.639(f)	Maximum Transmitter Power less than 25 $\mu$ W.	NWEMC – Q-TECH	NWEMC – Q-TECH shows this test performed as “Field Strength of Fundamental” and indicates the test was passed (pp 30-35).
§95.645	“No control, switch or other type of adjustment which, when manipulated, can	n/a	No such controls are accessible to the user.

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	result in a violation of the rules shall be accessible from the transmitter operating panel or from exterior of the transmitter enclosure.”		
§95.649	“No ... MICS ... unit shall incorporate provisions for increasing its transmitter power to any level in excess of the limits specified in §95.639.”	n/a	No such controls are accessible to the user.
§95.1211	Channel Use Policy	CH-Telemetry	As discussed in CH-Telemetry, §5.5, testing was shown to show simultaneous, close proximity operation of two CH S-ICD systems each incorporating a Q-Tech programmer with low Bit Error Rate.