

ELITE ELECTRONIC ENGINEERING , INC.

1516 Centre Circle  
Downers Grove, IL 60515

February 8, 2001

Frank Cooperich  
Federal Communications Commission  
Laboratory Division  
7435 Oakland Mills Road  
Columbia, MD 21046

Re: FCC ID: GIFPI04  
Applicant: Badger Meter Inc  
Correspondence Reference Number: 1409  
731 Confirmation Number: TC 99717  
Date of Original Email: 02/08/2001

Subject:

In response to your inquiry we submit the following:

The TCB certification was granted based on a channel bandwidth of 25 KHz in accordance with Sec. 90.203 (j)(iii) of the FCC Rules. The subject equipment meets the spectrum efficiency standard of Sec 90.203 (j)(3) which requires that the equipment must be capable of supporting a minimum data rate of 4800 bps per 6.25 kHz of channel bandwidth. For a 25 kHz channel, the requirement translates to a minimum data rate of 19.2 kbps.

The equipment complies with this requirement. The attached plot of the modulated RF output is from the original test report but with several comments added to help clarify its purpose. This plots show that the equipment is capable of supporting a data rate of 19.2 kbps.

Responses to your specific questions:

1. Since the equipment meets the spectrum efficiency standard for a 25 kHz channel. The emission limit under Section 90.210(c) applies instead of limit listed in Section 90.210(d). The occupied BW plots show that the equipment meets Section 90.210(c) requirements.
2. The measured occupied bandwidth of 13.5 kHz is within the 20 kHz authorized bandwidth limit under Section 90.209 Table for the 25 kHz channel bandwidth.
3. The rated frequency stability of 5 ppm will satisfy the requirement under Section 90.213 for a mobile stations with a 25 kHz channel bandwidth.

The above responses should clarify our position and justify the TCB certification grant. We ask that the TCB certification be re-instated.

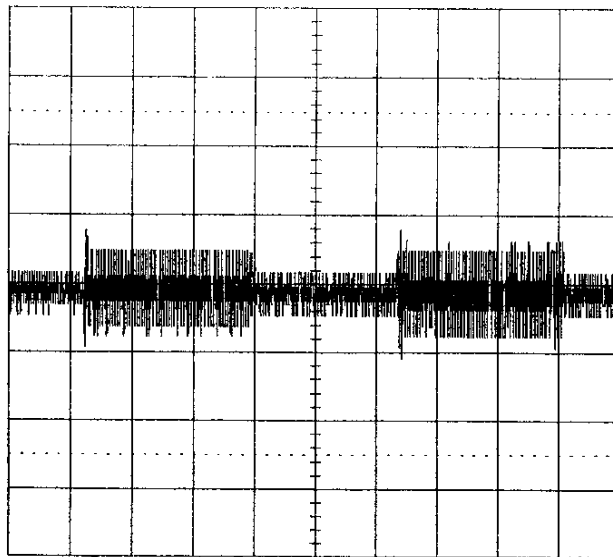
Thank you for your time and patience.  
Sincerely,

Raymond J. Klouda

ETR 23083

4-Oct-00  
14:33:22

2  
20  $\mu$ s  
10.0 mV  
0.8 mV



50  $\mu$ s

1 disabled  
2 50 mV DC  
3 10 mV DC  
4 disabled

$\Delta t$

48.5  $\mu$ s

$\frac{1}{\Delta t}$

20.60 kHz

1 GS/s

2 DC 5mV

☐ STOPPED

measured value > 19.2 kbps.

RF Output

Datarate = 19.2 kbps

Complies w/ Sec 90.203(j)(3)  
for spectrum efficiency

$$\frac{19.2 \text{ kbps}}{25 \text{ kHz}} = \frac{4800 \text{ bps}}{6.25 \text{ kHz}}$$

ELITE ELECTRONIC ENGINEERING INC.  
ENGINEERING TEST REPORT NO.

MANUFACTURER : GRANITE COMM.  
MODEL NO. : BADGER P.I.  
SERIAL NO. : 0002  
TEST DESCRIPT.: FCC-90 SPECTRUM EFFICIENCY  
TEST MODE : TRANSMIT @ 451.35MHz

DATA RATE : 19.2 kbps