258 South Taylor Avenue
Louisville, Colorado 80027
Ph: 303.447.2745 • E: info@xetawave.com

xetawave.com

XETAWAVE
CUSTOM RF SOLUTIONS

Justification for Use of Emission Designator G1D and Substitution of 16PSK and 32PSK Modulations for 16QAM and 32QAM (Xeta2m-T)

The Xeta2m-T was tested for compliance with the FCC Part 90 emission masks for the following frequency bands, modulations, and channel spacing (occupied bandwidths):

217-220 MHz Band (per paragraphs 90.209, 90.210, and 90.259):

12.5 KHz Spacing (11.25 KHz occupied bandwidth): MSK, QPSK, 8PSK, 16QAM, 32QAM
25 KHz Spacing (20 KHz occupied bandwidth): MSK, QPSK, 8PSK, 16QAM, 32QAM
Two 25 KHz Aggregate (45 KHz occupied bandwidth): MSK, QPSK, 8PSK, 16QAM, 32QAM

220-222 MHz Band (per paragraphs 90.209, 90.210, and Part 90, Subpart T):

Three 5 KHz Aggregate (14 KHz occupied bandwidth): MSK, QPSK, 8PSK, 16QAM, 32QAM
Ten 5 KHz Aggregate (49 KHz occupied bandwidth): MSK, QPSK, 8PSK, 16QAM, 32QAM

Since QAM is not an allowable emission designator (W1D) for telemetry operations under paragraph 90.207(i), the Xeta2m-T will use phase modulations 16PSK and 32PSK (emission designator G1D). Per 47CFR paragraph 2.201(c)(3), phase modulation can be used wherever frequency modulation is acceptable. Paragraph 90.207(i) allows the use of frequency modulation (emission designator F1D) for telemetry operations.

For the Xeta2m-T, the worst case spectral emission is the 8PSK modulation. The 8PSK modulation has been tested as part of the formal qualification testing at NTS, and it complies with the applicable Part 90 emission masks for both frequency bands and all occupied bandwidths.

Therefore, Xetawave requests that 16PSK and 32PSK (emission designator G1D) be substituted for the 16QAM and 32QAM modulations in the TCB application and FCC filing. The 8PSK modulation emission masks represent the worst case,

258 South Taylor Avenue
Louisville, Colorado 80027
Ph: 303.447.2745 • E: info@xetawave.com

xetawave.com

and the emission mask test results in the Xeta2m-T test report reflect that the product is compliant for the 16PSK and 32PSK modulations.

David Greene
Senior RF Engineer
Xetawave LLC