

KCTL Inc.

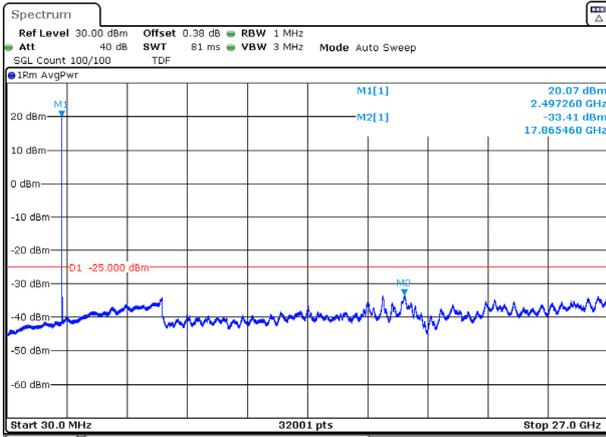
65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

Report No.:
KR20-SRF0024

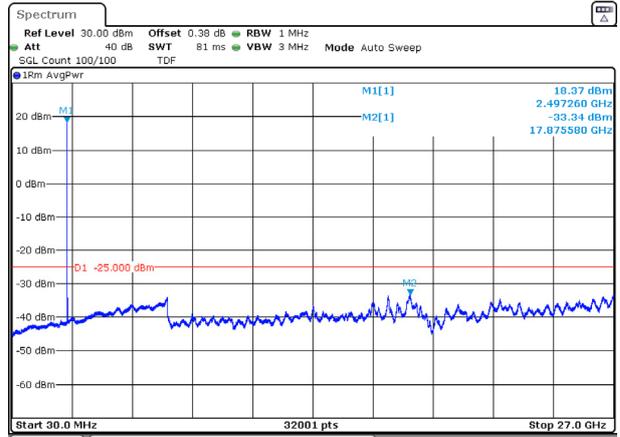
Page (26) of (49)



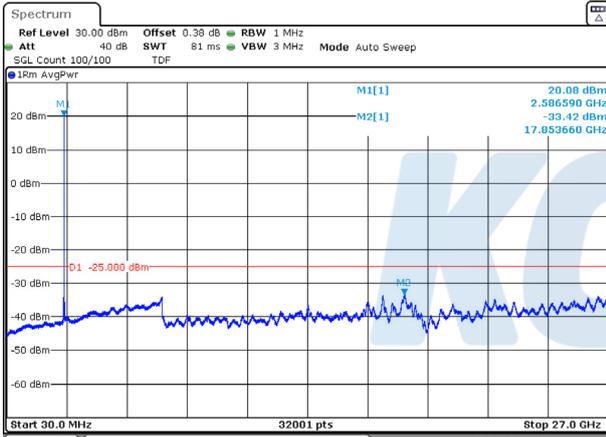
15M BW / QPSK / Low ch.



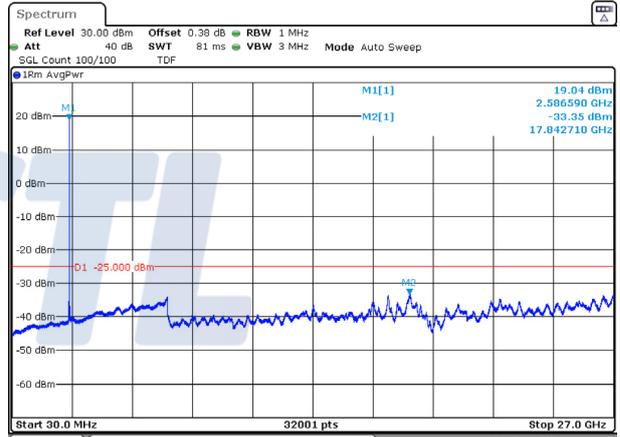
15M BW / 16QAM / Low ch.



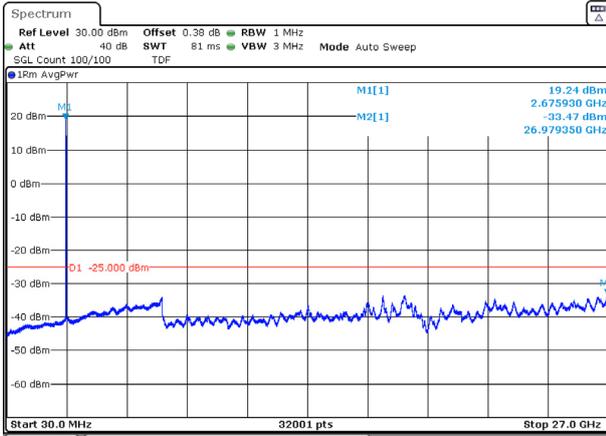
15M BW / QPSK / Mid ch.



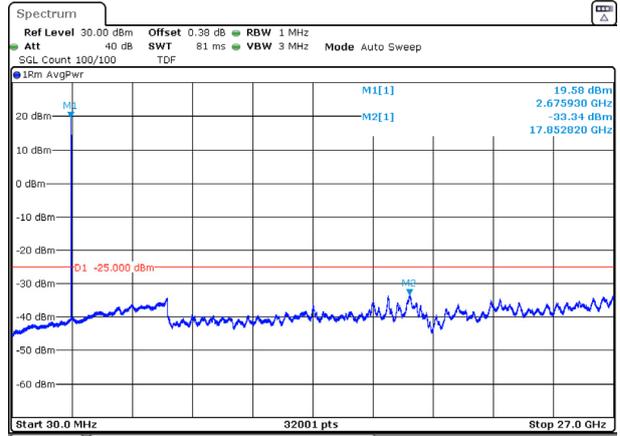
15M BW / 16QAM / Mid ch.



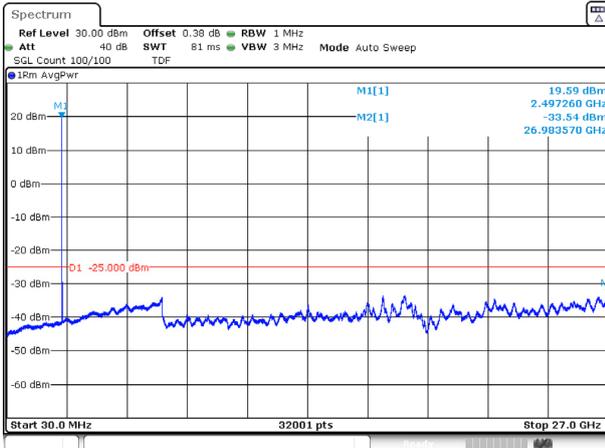
15M BW / QPSK / High ch.



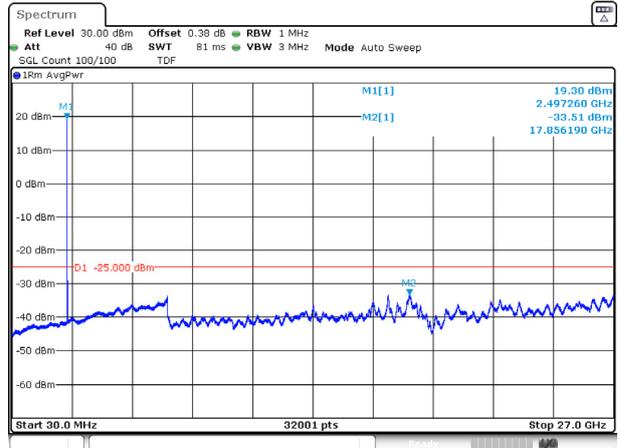
15M BW / 16QAM / High ch.



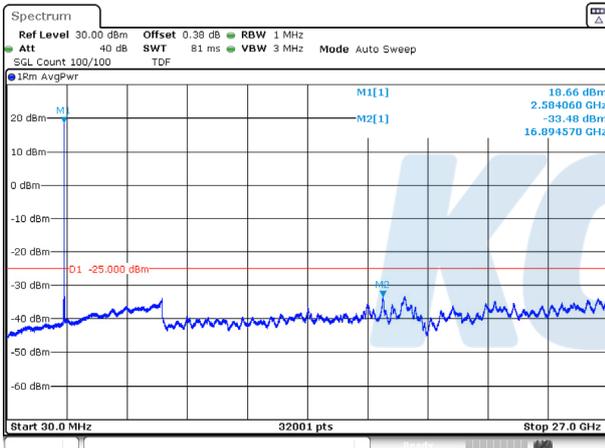
20M BW / QPSK / Low ch.



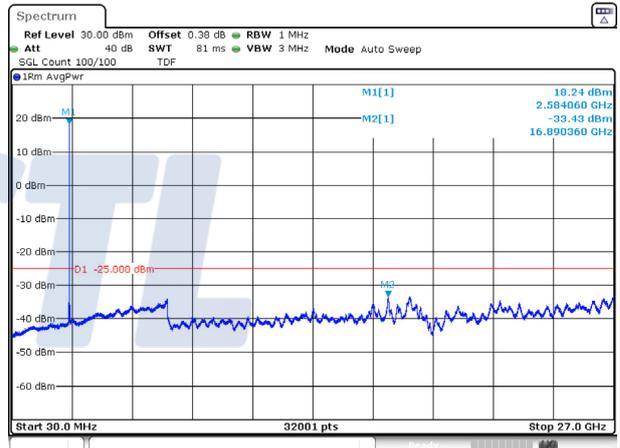
20M BW / 16QAM / Low ch.



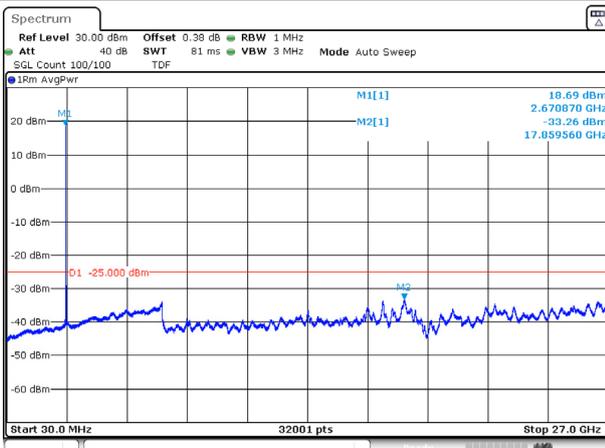
20M BW / QPSK / Mid ch.



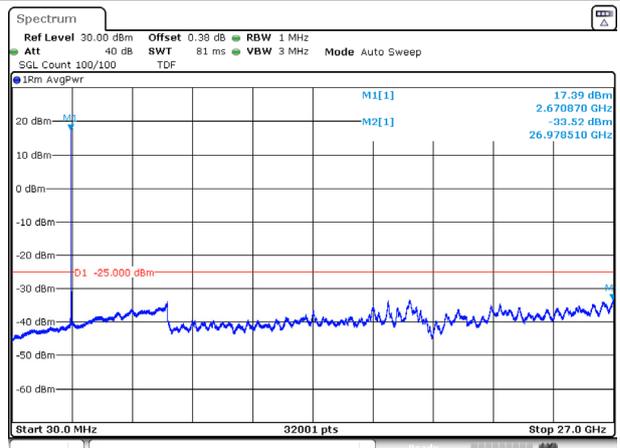
20M BW / 16QAM / Mid ch.



20M BW / QPSK / High ch.

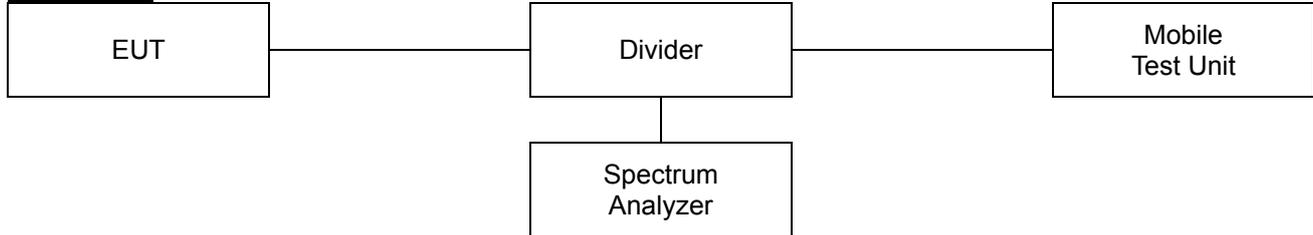


20M BW / 16QAM / High ch.



7.4. Band Edge Emissions at Antenna Terminal

Test setup



Limit

According to §27.53(m)(4), the attenuation factor shall be not less than $40 + 10\log(P_{\text{Watts}})$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10\log(P_{\text{Watts}})$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10\log(P_{\text{Watts}})$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10\log(P_{\text{Watts}})$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10\log(P_{\text{Watts}})$ dB at or below 2490.5 MHz.

Test procedure

971168 D01 v03r01 - Section 6

ANSI C63.26-2015 – Section 5.7

Test settings

- 1) Start frequency was set to 30 MHz and stop frequency was set to at least 10th the fundamental frequency.
- 2) Span was set large enough so as to capture all out of band emissions near the band edge.
- 3) Set the RBW > 1% of the emission bandwidth.
- 4) Set the VBW $\geq 3 \times$ RBW.
- 5) Set the number of sweep points $\geq 2 \times$ Span/RBW
- 6) Detector = RMS
- 7) Trace mode = trace average
- 8) Sweep time should be auto for peak detection. For RMS detection the sweep time should be set as follows:
 - a) If the device can be configured to transmit continuously (duty cycle $\geq 98\%$), set the (sweep time) > (number of points in sweep) \times (symbol period) (e.g., by a factor of 10 \times symbol period \times number of points) Increasing the sweep time (i.e., slowing the sweep speed) will allow for averaging over multiple symbols.
 - b) If the device cannot transmit continuously (duty cycle < 98%), a gated sweep shall be used when possible (i.e., gate triggered such that the analyzer only sweeps when the device is transmitting at full power), set the sweep time > (number of points in sweep) \times (symbol period) but the sweep time shall always be maintained at a value that is less than or equal to the minimum transmission time
 - c) If the device cannot be configured to transmit continuously (duty cycle > 98%), and a free-running sweep must be used, set the sweep time so that the averaging is performed over multiple on/off cycles by setting the sweep time

> (number of points in sweep) × (transmitter period) (i.e., the transmit on-time + the off-time). The spectrum analyzer readings shall subsequently be corrected by [10 log (1/duty cycle)]. This assumes that the transmission period and duty cycle is relatively constant (duty cycle variation $\leq \pm 2\%$).

d) If the device cannot be configured to transmit continuously and a free-running sweep must be used, and if the transmissions exhibit a non-constant duty cycle (duty cycle variations $> \pm 2\%$), set the sweep time so that the averaging is performed over the on-period by setting the sweep time $>$ (symbol period) × (number of points), while also maintaining the sweep time $<$ (transmitter on-time). The trace mode shall be set to max hold, since not every display point will be averaged only over just the on-time. Thus, multiple sweeps (e.g., 100) in maximum hold are necessary to ensure that the maximum power is measured.

9) Allow trace to fully stabilize.

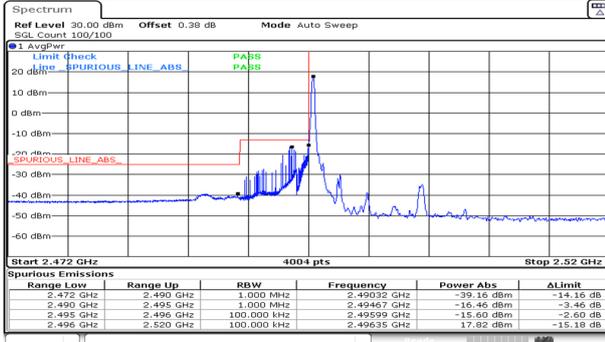
Notes:

1. Per 27.53(m)(6), in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz).
2. The EUT was setup to maximum output power as its lowest and highest channel with all bandwidth, modulation and RB configurations.

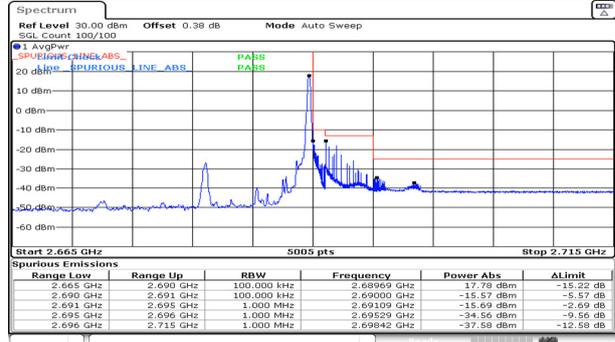
Test results

Test mode: LTE Band 41

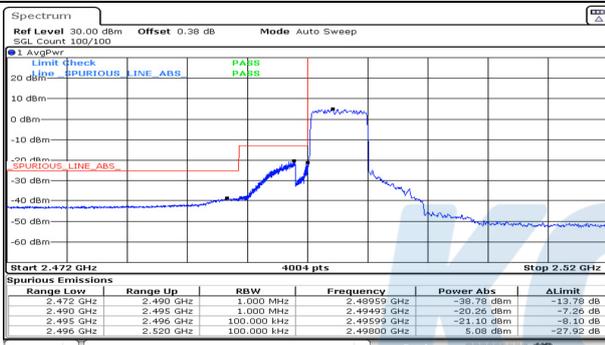
5M BW / QPSK / Low ch. / 1RB



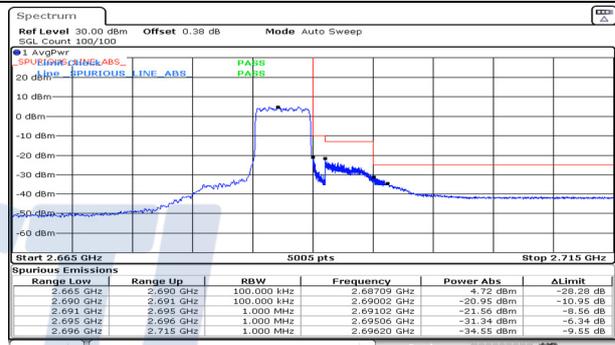
5M BW / QPSK / High ch. / 1RB



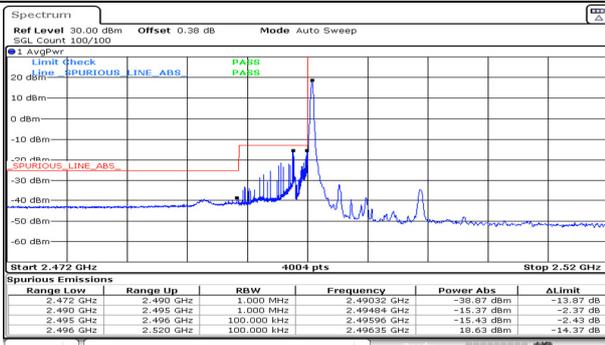
5M BW / QPSK / Low ch. / FRB



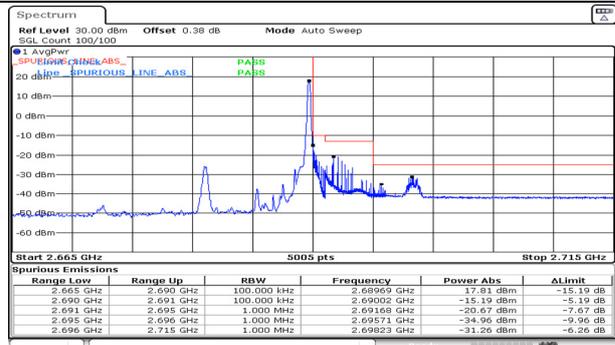
5M BW / QPSK / High ch. / FRB



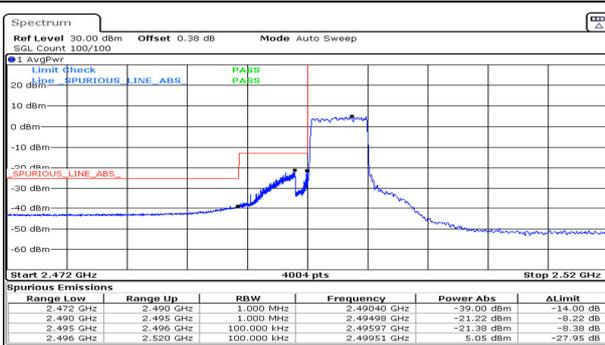
5M BW / 16QAM / Low ch. / 1RB



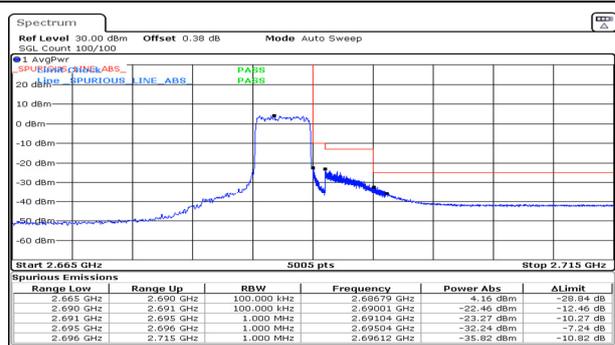
5M BW / 16QAM / High ch. / 1RB



5M BW / 16QAM / Low ch. / FRB



5M BW / 16QAM / High ch. / FRB



KCTL Inc.

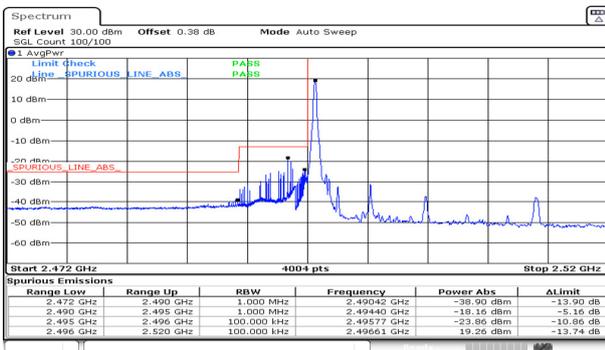
65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

Report No.:
KR20-SRF0024

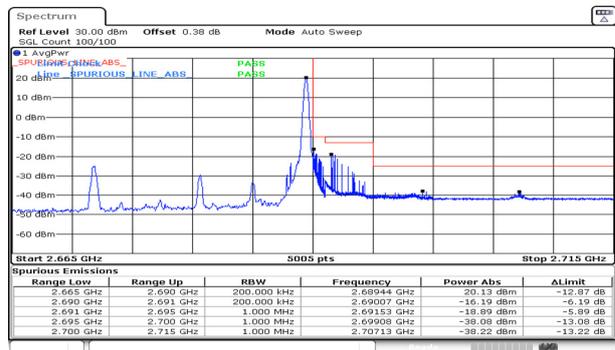
Page (31) of (49)



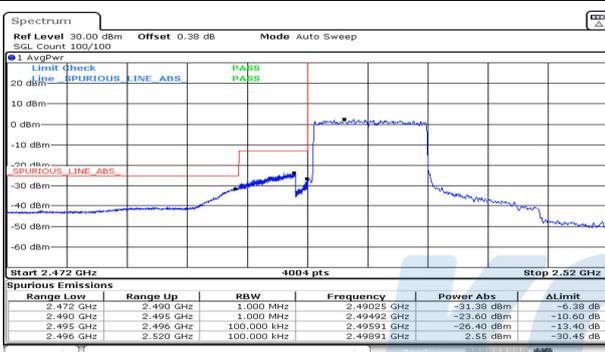
10M BW / QPSK / Low ch. / 1RB



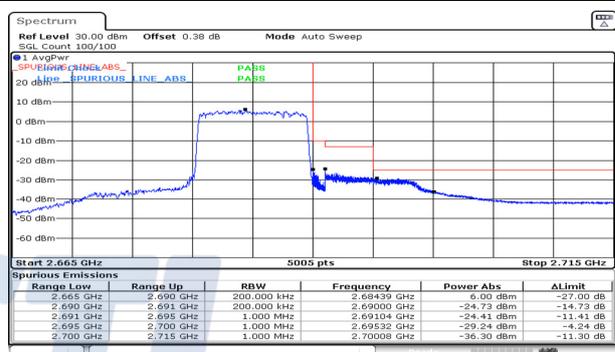
10M BW / QPSK / High ch. / 1RB



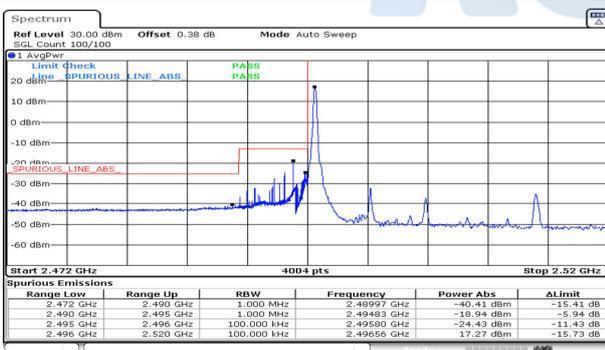
10M BW / QPSK / Low ch. / FRB



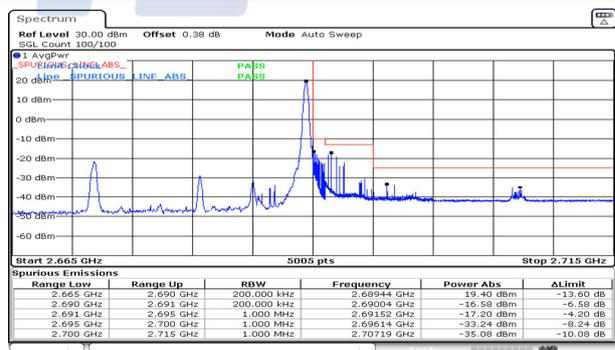
10M BW / QPSK / High ch. / FRB



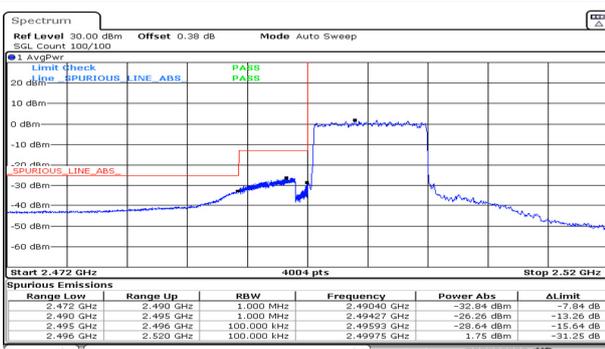
10M BW / 16QAM / Low ch. / 1RB



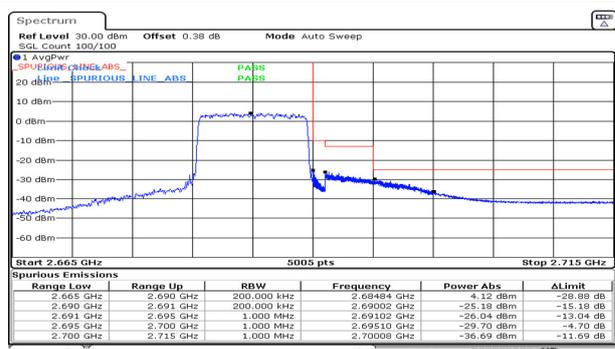
10M BW / 16QAM / High ch. / 1RB



10M BW / 16QAM / Low ch. / FRB



10M BW / 16QAM / High ch. / FRB



This test report shall not be reproduced, except in full, without the written approval

KCTL Inc.

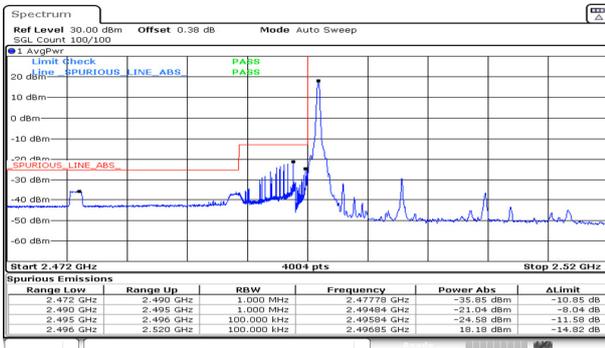
65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

Report No.:
KR20-SRF0024

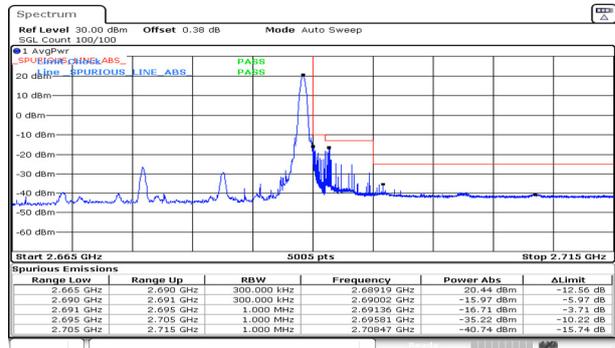
Page (32) of (49)



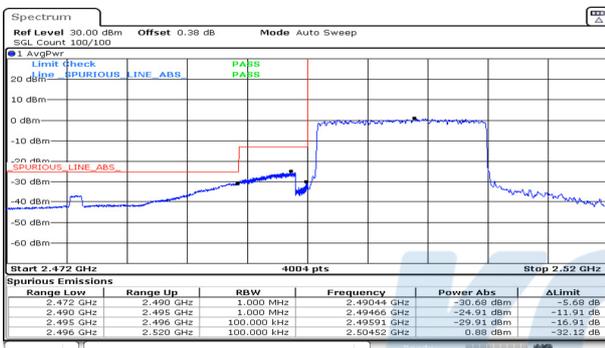
15M BW / QPSK / Low ch. / 1RB



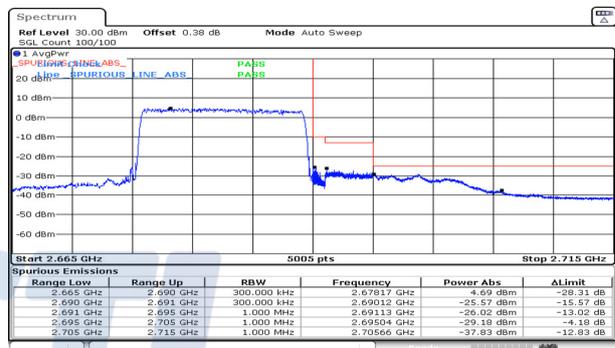
15M BW / QPSK / High ch. / 1RB



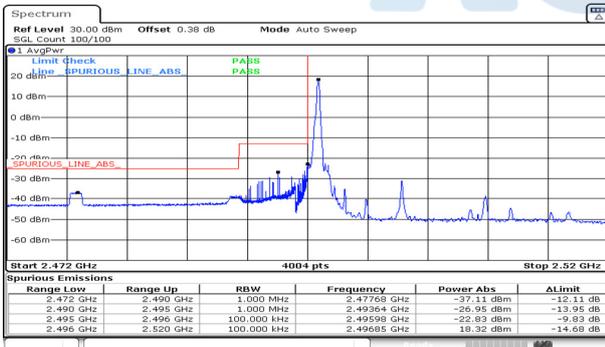
15M BW / QPSK / Low ch. / FRB



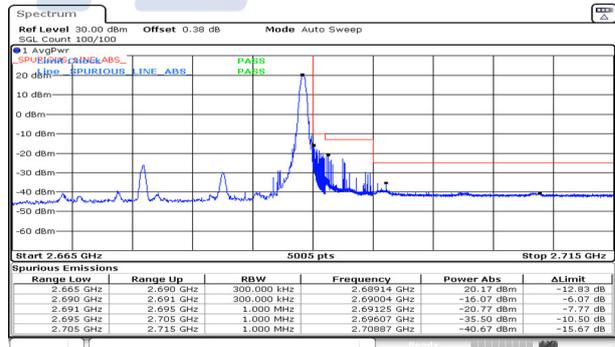
15M BW / QPSK / High ch. / FRB



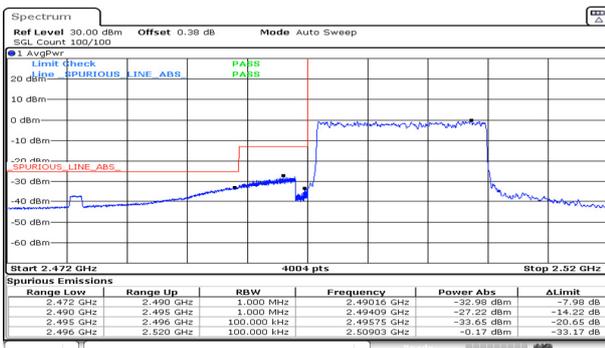
15M BW / 16QAM / Low ch. / 1RB



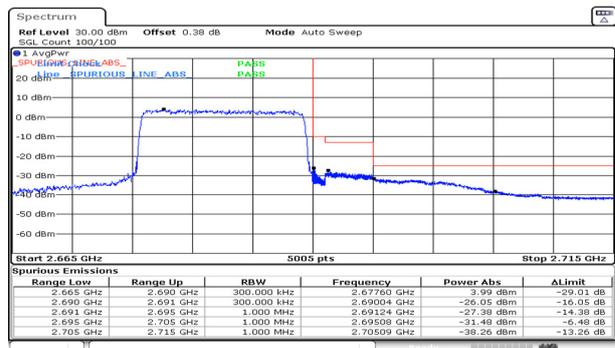
15M BW / 16QAM / High ch. / 1RB



15M BW / 16QAM / Low ch. / FRB



15M BW / 16QAM / High ch. / FRB



This test report shall not be reproduced, except in full, without the written approval