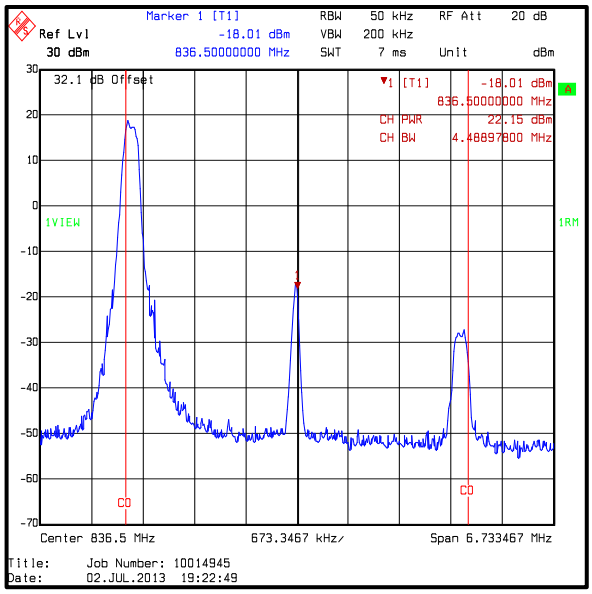
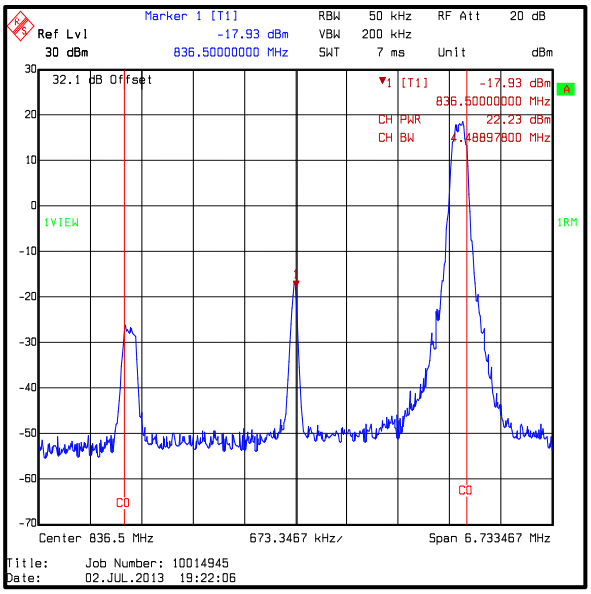
Transmitter Output Power (ERP) (continued)

Results: 5 MHz Channel Bandwidth / Middle Channel / QPSK

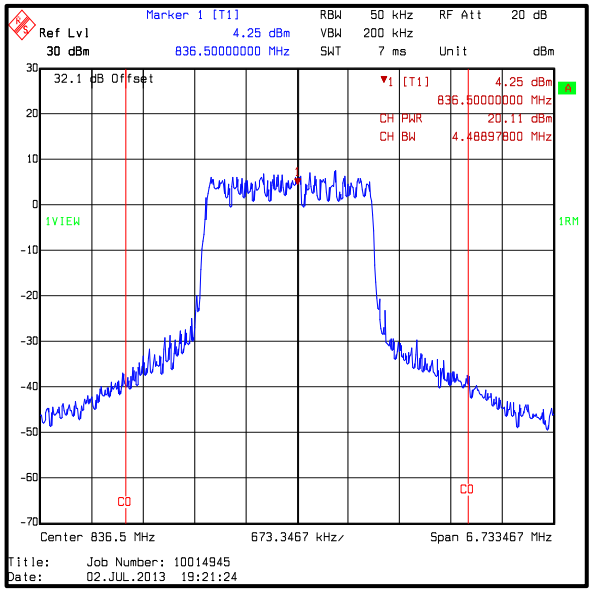
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
836.5	1	0	22.2	-6.18	16.02	38.5	22.48	Complied
836.5	1	24	22.2	-6.18	16.02	38.5	22.48	Complied
836.5	12	6	20.1	-6.18	13.92	38.5	24.58	Complied
836.5	25	0	19.9	-6.18	13.72	38.5	24.78	Complied



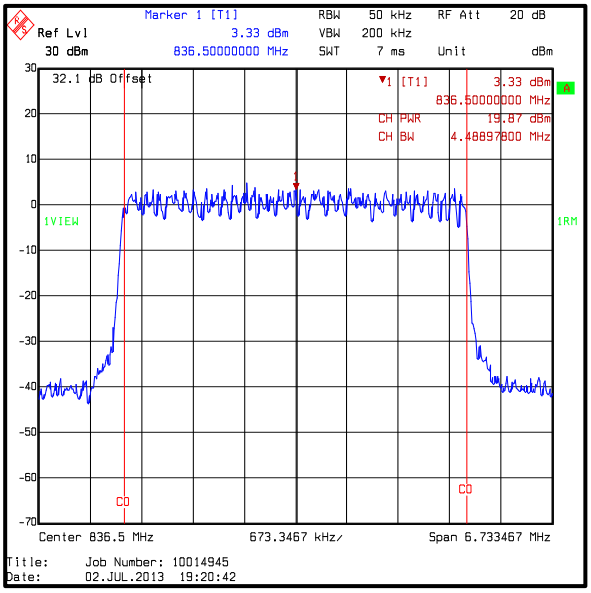
QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (24 offset)



QPSK / 12 Resource Blocks (6 offset)

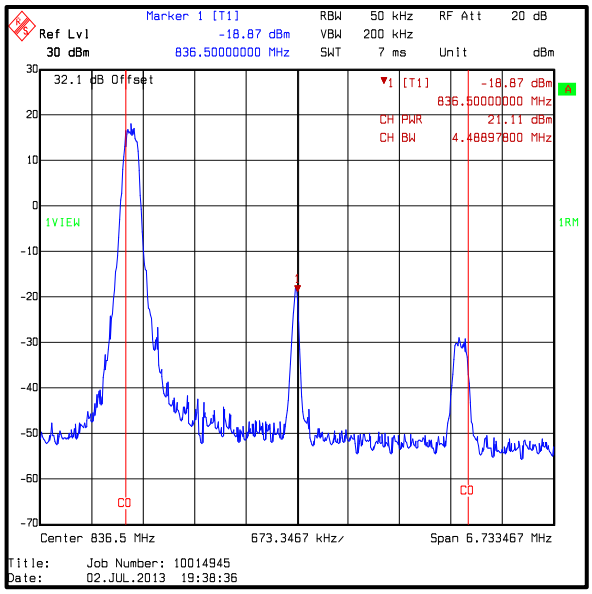


QPSK / 25 Resource Blocks (0 offset)

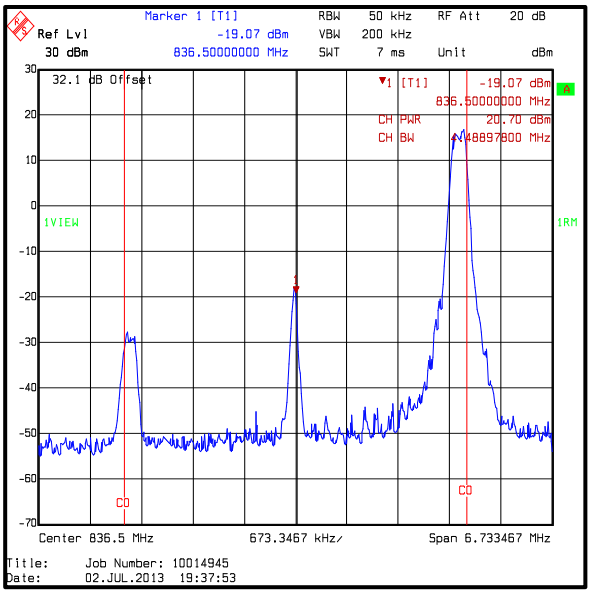
Transmitter Output Power (ERP) (continued)

Results: 5 MHz Channel Bandwidth / Middle Channel / 16QAM

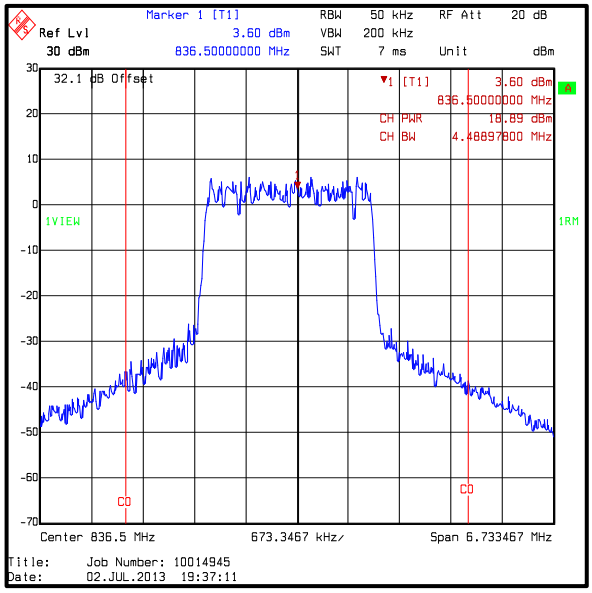
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
836.5	1	0	21.1	-6.18	14.92	38.5	23.58	Complied
836.5	1	24	20.7	-6.18	14.52	38.5	23.98	Complied
836.5	12	6	18.9	-6.18	12.72	38.5	25.78	Complied
836.5	25	0	18.9	-6.18	12.72	38.5	25.78	Complied



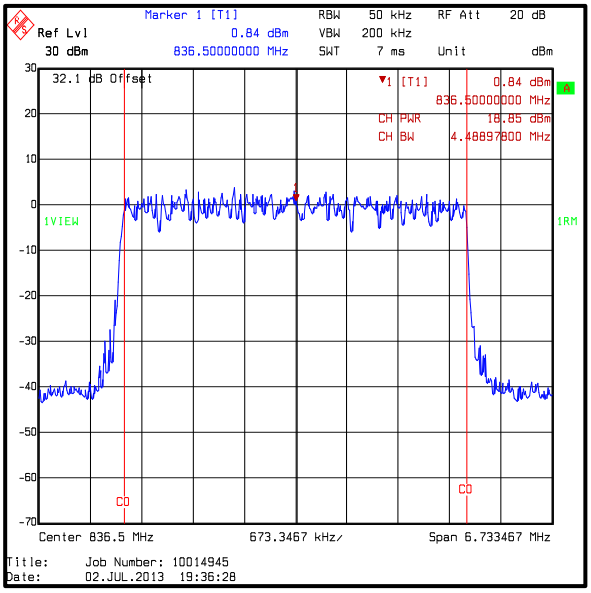
16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (24 offset)



16QAM / 12 Resource Blocks (6 offset)

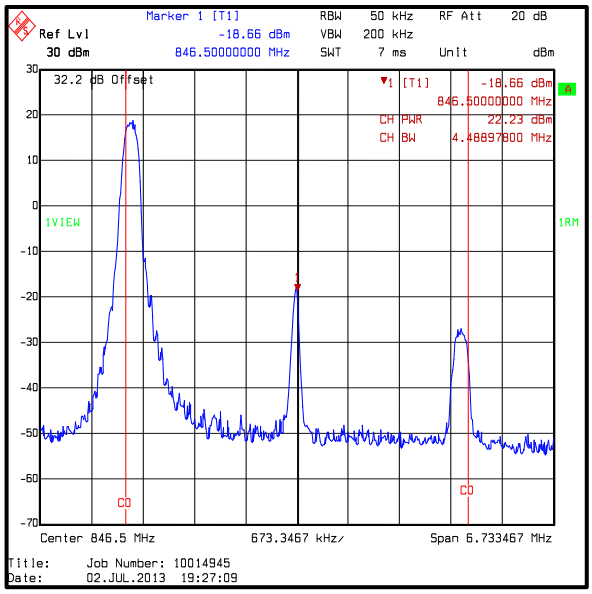


16QAM / 25 Resource Blocks (0 offset)

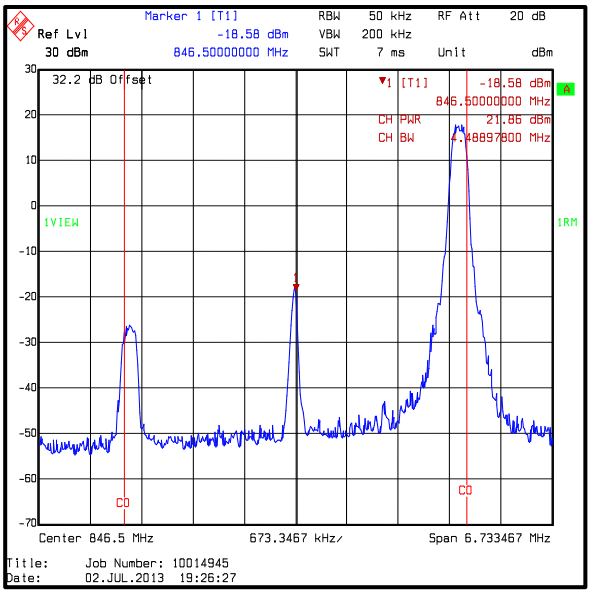
Transmitter Output Power (ERP) (continued)

Results: 5 MHz Channel Bandwidth / Top Channel / QPSK

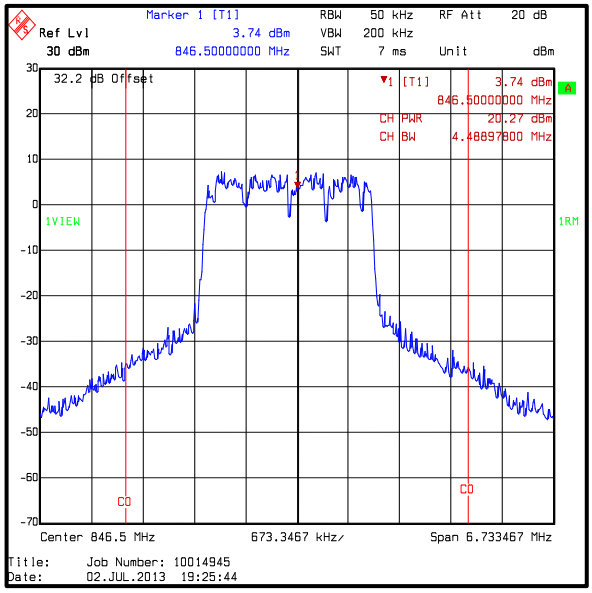
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
846.5	1	0	22.2	-6.18	16.02	38.5	22.48	Complied
846.5	1	24	21.9	-6.18	15.72	38.5	22.78	Complied
846.5	12	6	20.3	-6.18	14.12	38.5	24.38	Complied
846.5	25	0	20.2	-6.18	14.02	38.5	24.48	Complied



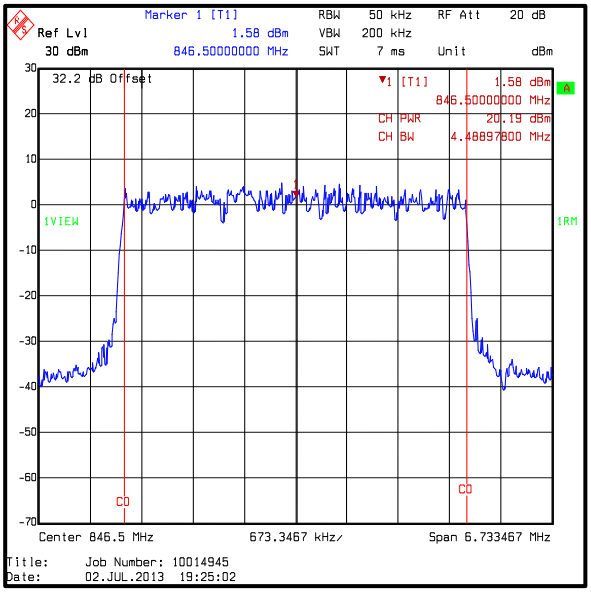
QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (24 offset)



QPSK / 12 Resource Blocks (6 offset)

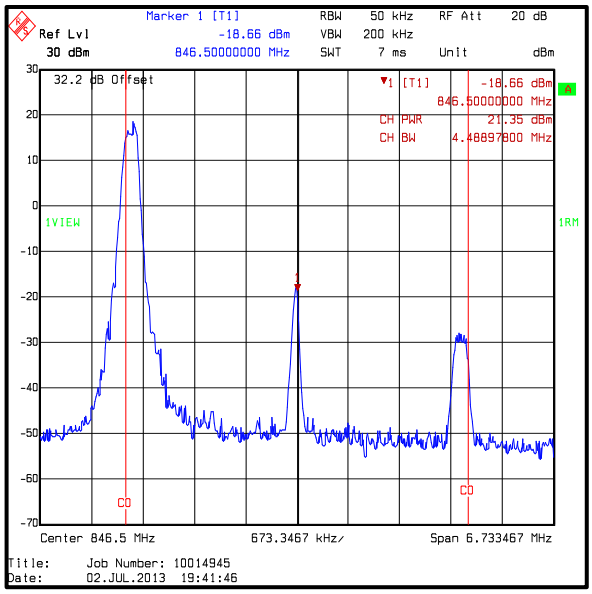


QPSK / 25 Resource Blocks (0 offset)

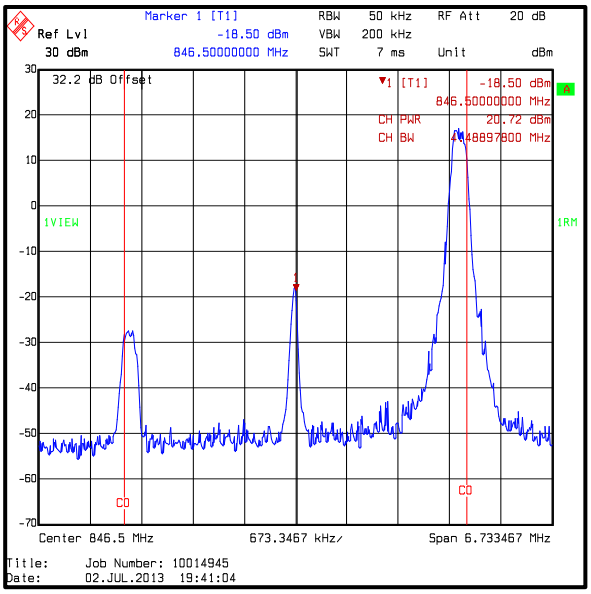
Transmitter Output Power (ERP) (continued)

Results: 5 MHz Channel Bandwidth / Top Channel / 16QAM

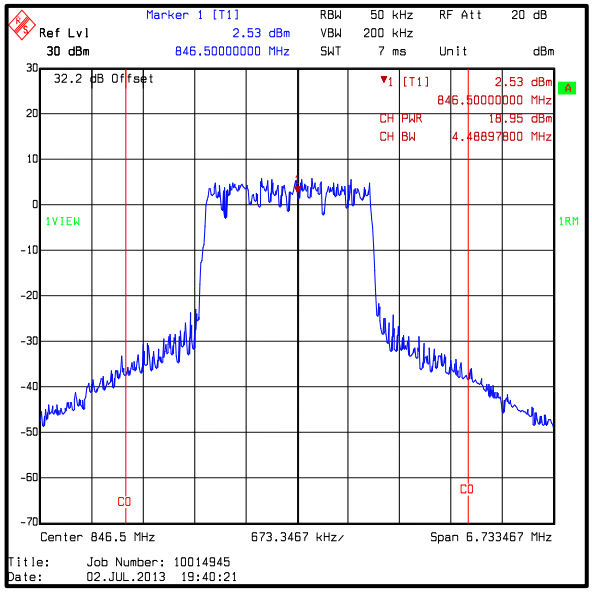
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
846.5	1	0	21.4	-6.18	15.22	38.5	23.28	Complied
846.5	1	24	20.7	-6.18	14.52	38.5	23.98	Complied
846.5	12	6	19.0	-6.18	12.82	38.5	25.68	Complied
846.5	25	0	19.0	-6.18	12.82	38.5	25.68	Complied



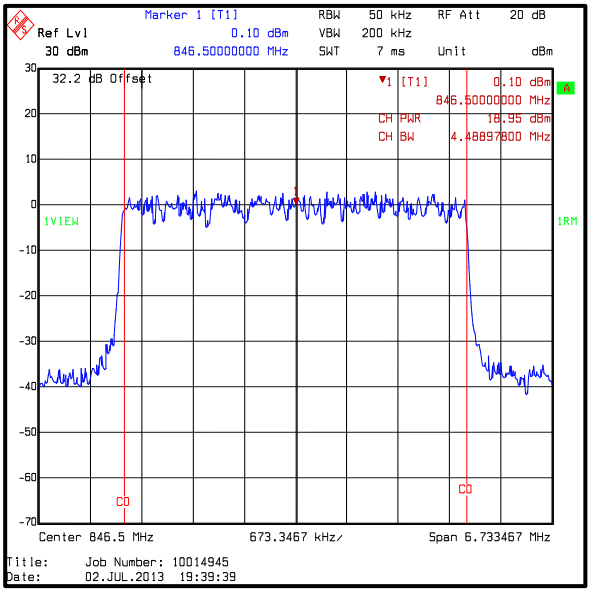
16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (24 offset)



16QAM / 12 Resource Blocks (6 offset)

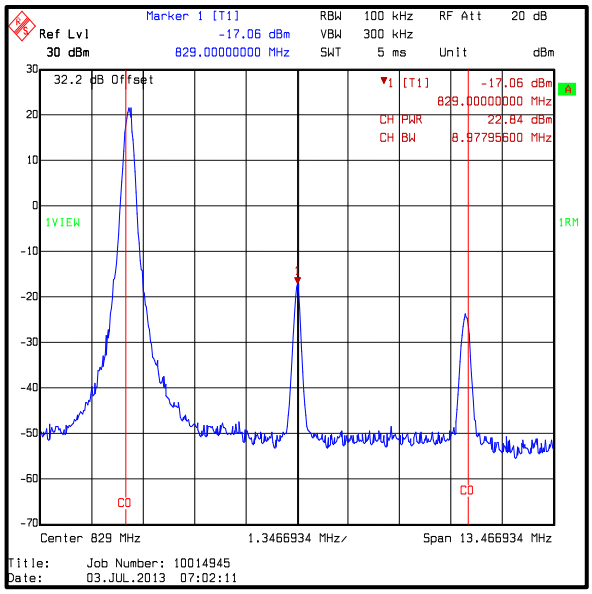


16QAM / 25 Resource Blocks (0 offset)

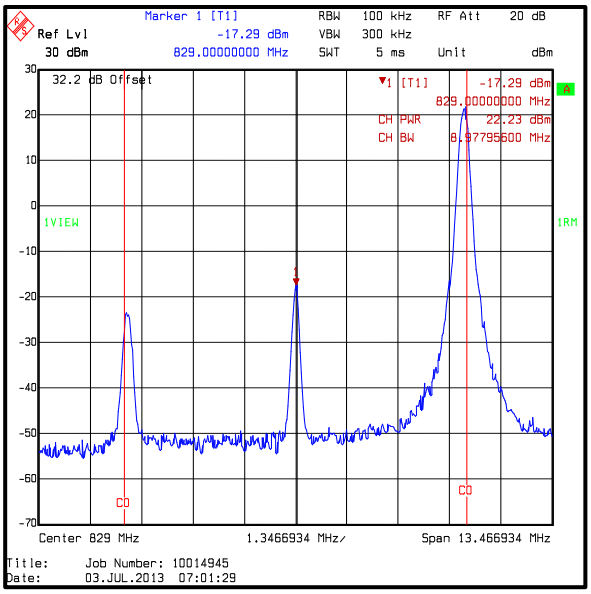
Transmitter Output Power (ERP) (continued)

Results: 10 MHz Channel Bandwidth / Bottom Channel / QPSK

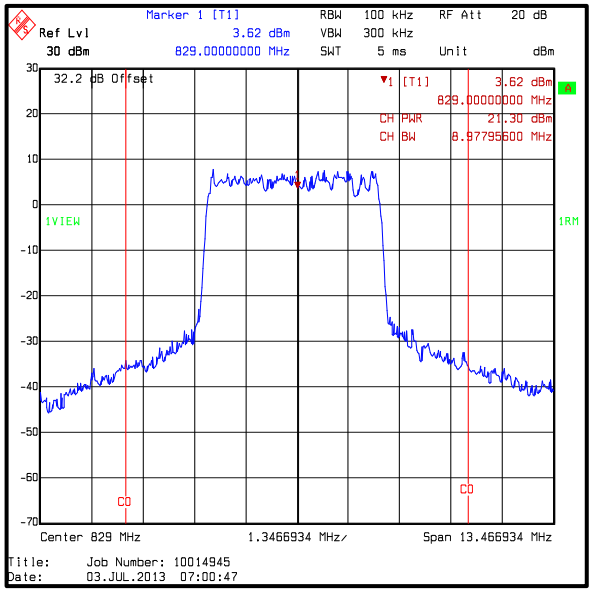
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
829	1	0	22.8	-6.18	16.62	38.5	21.88	Complied
829	1	49	22.2	-6.18	16.02	38.5	22.48	Complied
829	25	12	21.3	-6.18	15.12	38.5	23.38	Complied
829	50	0	21.2	-6.18	15.02	38.5	23.48	Complied



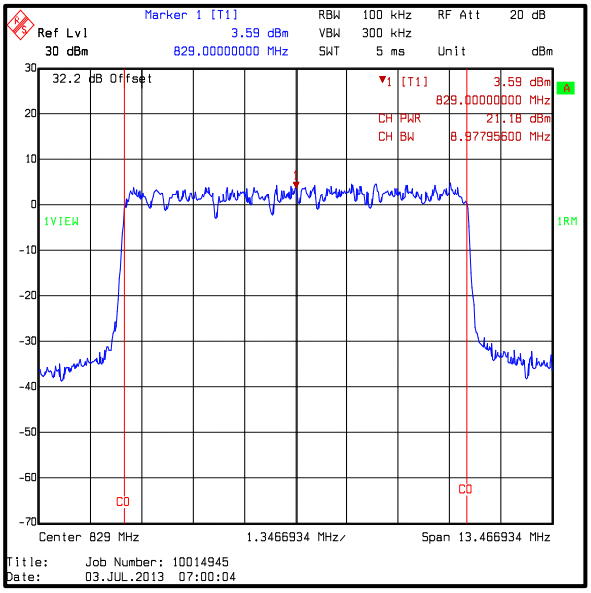
QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (49 offset)



QPSK / 25 Resource Blocks (12 offset)

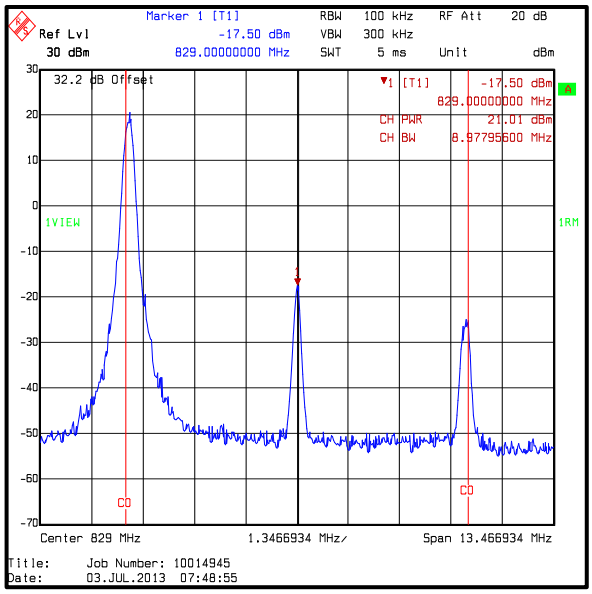


QPSK / 50 Resource Blocks (0 offset)

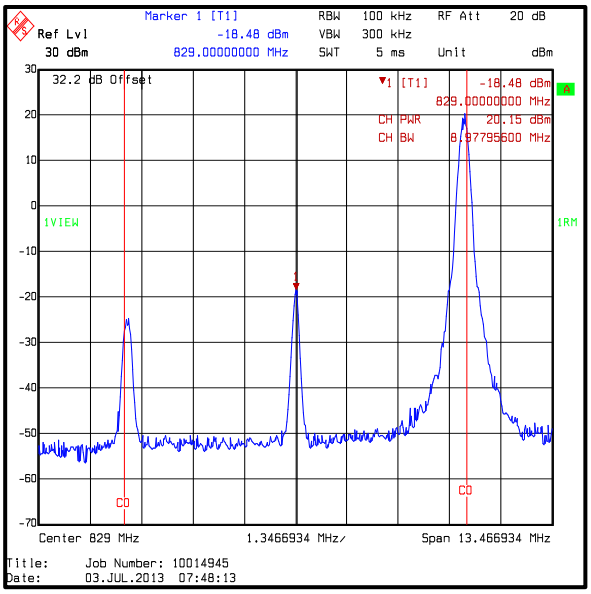
Transmitter Output Power (ERP) (continued)

Results: 10 MHz Channel Bandwidth / Bottom Channel / 16QAM

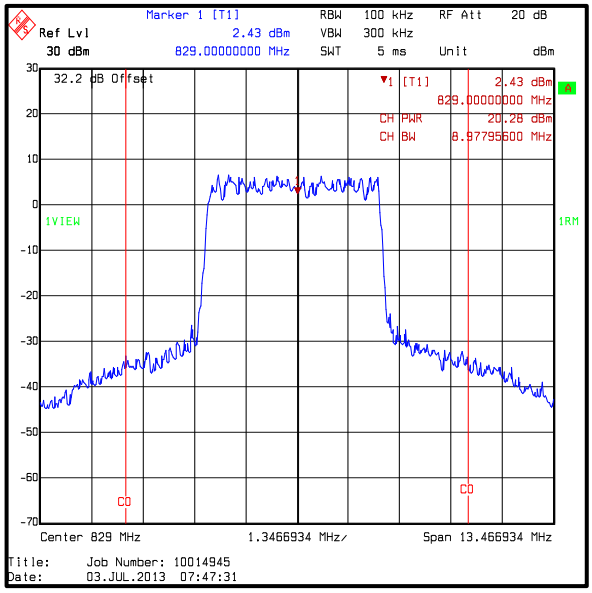
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
829	1	0	21.0	-6.18	14.82	38.5	23.68	Complied
829	1	49	20.2	-6.18	14.02	38.5	24.48	Complied
829	25	12	20.3	-6.18	14.12	38.5	24.38	Complied
829	50	0	20.1	-6.18	13.92	38.5	24.58	Complied



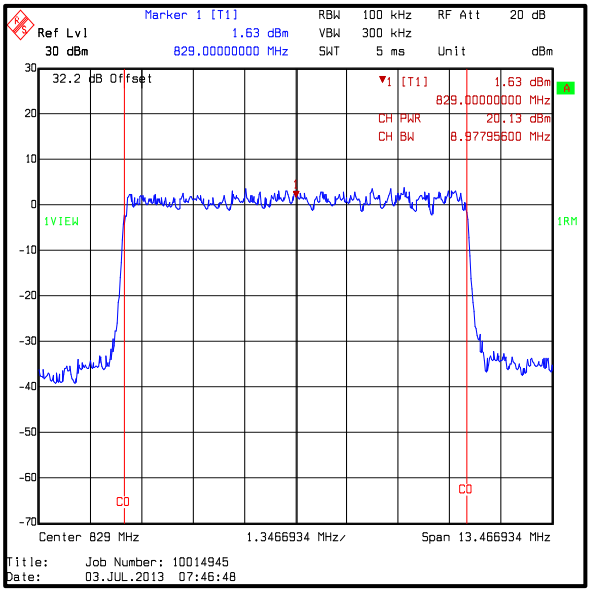
16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (49 offset)



16QAM / 25 Resource Blocks (12 offset)

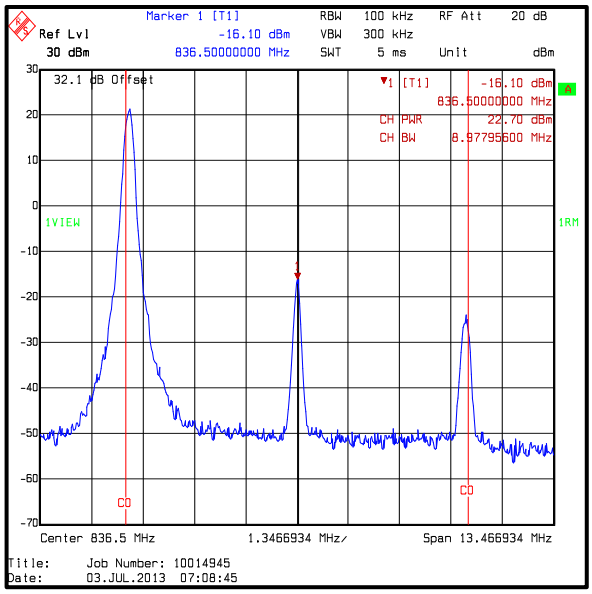


16QAM / 50 Resource Blocks (0 offset)

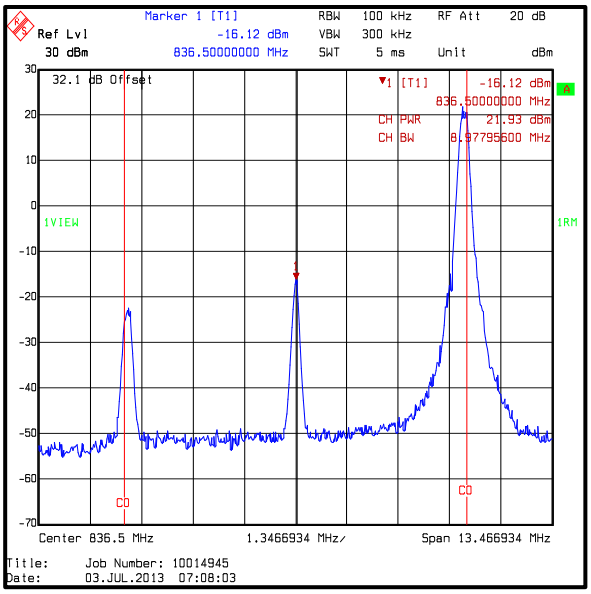
Transmitter Output Power (ERP) (continued)

Results: 10 MHz Channel Bandwidth / Middle Channel / QPSK

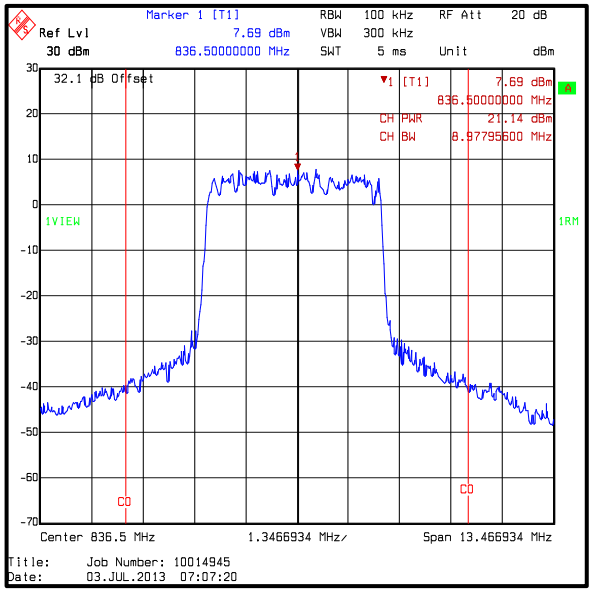
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
836.5	1	0	22.7	-6.18	16.52	38.5	21.98	Complied
836.5	1	49	21.9	-6.18	15.72	38.5	22.78	Complied
836.5	25	12	21.1	-6.18	14.92	38.5	23.58	Complied
836.5	50	0	21.0	-6.18	14.82	38.5	23.68	Complied



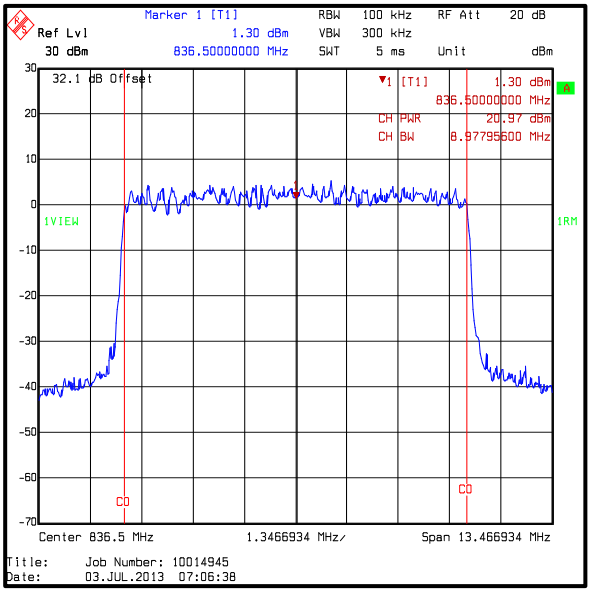
QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (49 offset)



QPSK / 25 Resource Blocks (12 offset)

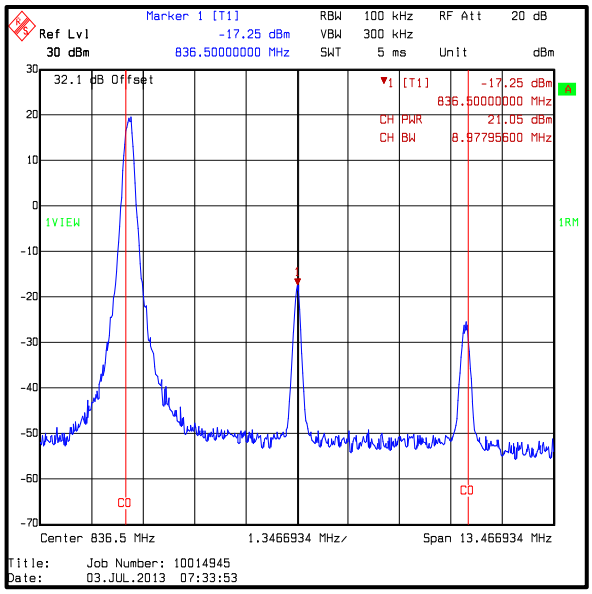


QPSK / 50 Resource Blocks (0 offset)

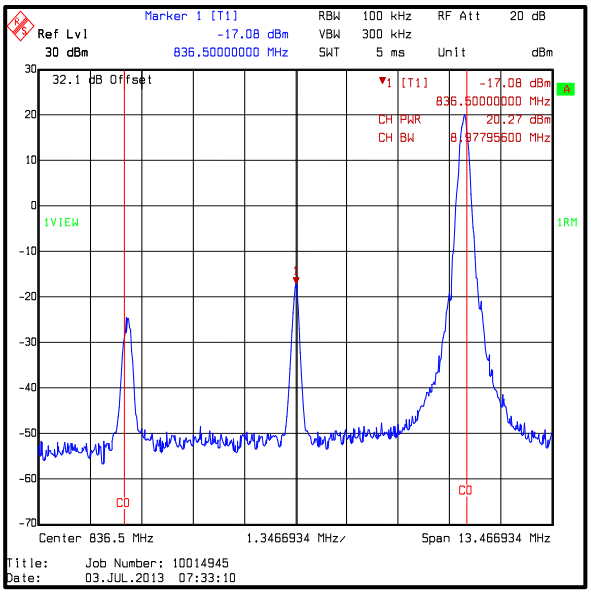
Transmitter Output Power (ERP) (continued)

Results: 10 MHz Channel Bandwidth / Middle Channel / 16QAM

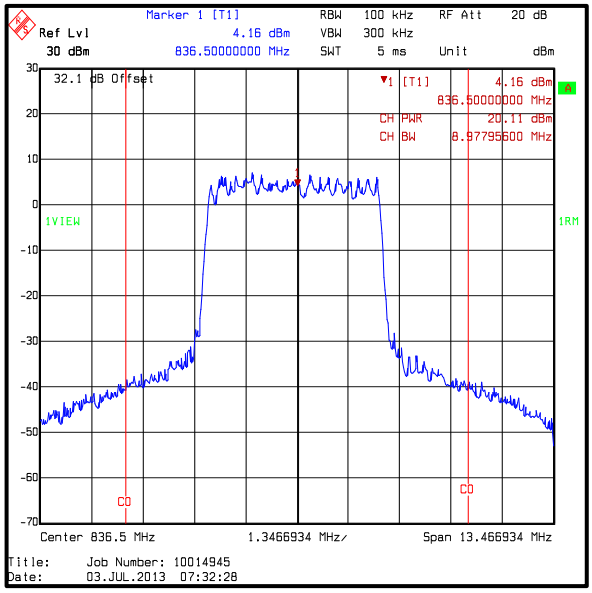
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
836.5	1	0	21.1	-6.18	14.92	38.5	23.58	Complied
836.5	1	49	20.3	-6.18	14.12	38.5	24.38	Complied
836.5	25	12	20.1	-6.18	13.92	38.5	24.58	Complied
836.5	50	0	20.0	-6.18	13.82	38.5	24.68	Complied



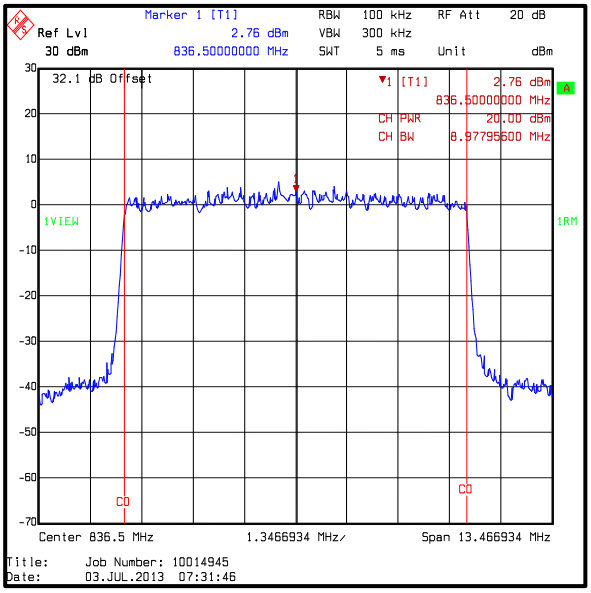
16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (49 offset)



16QAM / 25 Resource Blocks (12 offset)

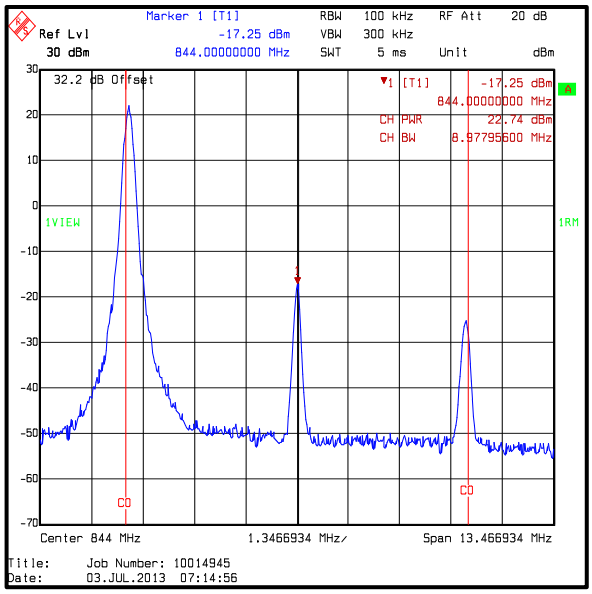


16QAM / 50 Resource Blocks (0 offset)

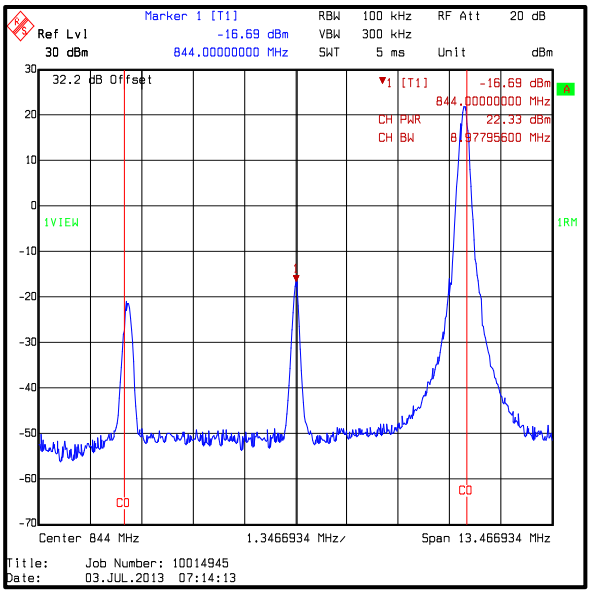
Transmitter Output Power (ERP) (continued)

Results: 10 MHz Channel Bandwidth / Top Channel / QPSK

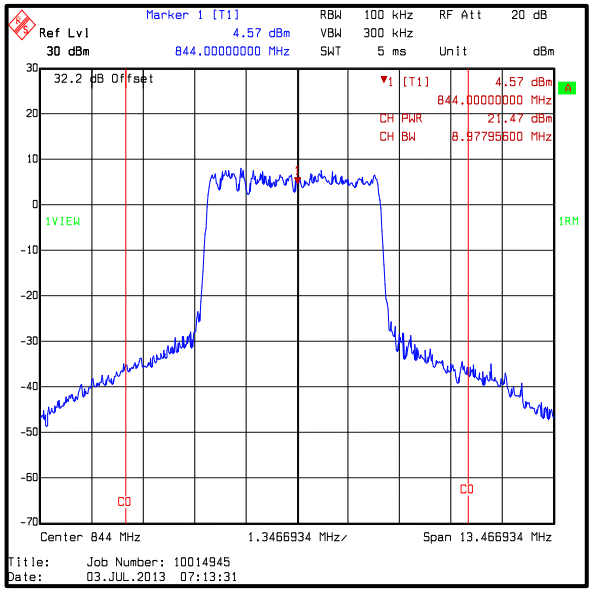
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
844	1	0	22.7	-6.18	16.52	38.5	21.98	Complied
844	1	49	22.3	-6.18	16.12	38.5	22.38	Complied
844	25	12	21.5	-6.18	15.32	38.5	23.18	Complied
844	50	0	21.3	-6.18	15.12	38.5	23.38	Complied



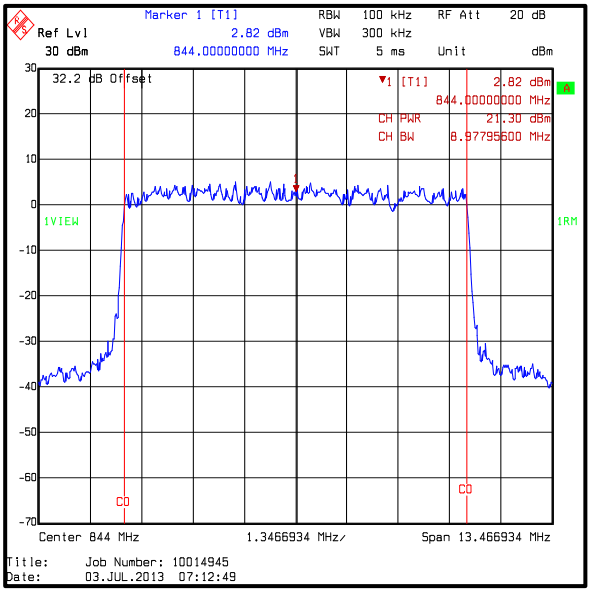
QPSK / 1 Resource Block (0 offset)



QPSK / 1 Resource Block (49 offset)



QPSK / 25 Resource Blocks (12 offset)

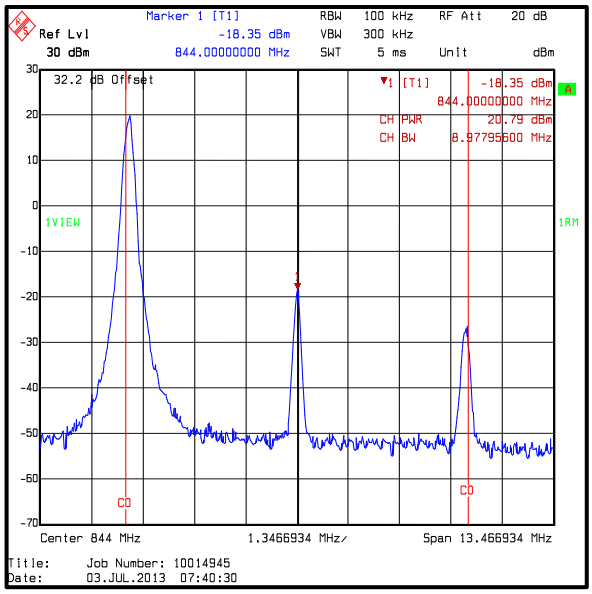


QPSK / 50 Resource Blocks (0 offset)

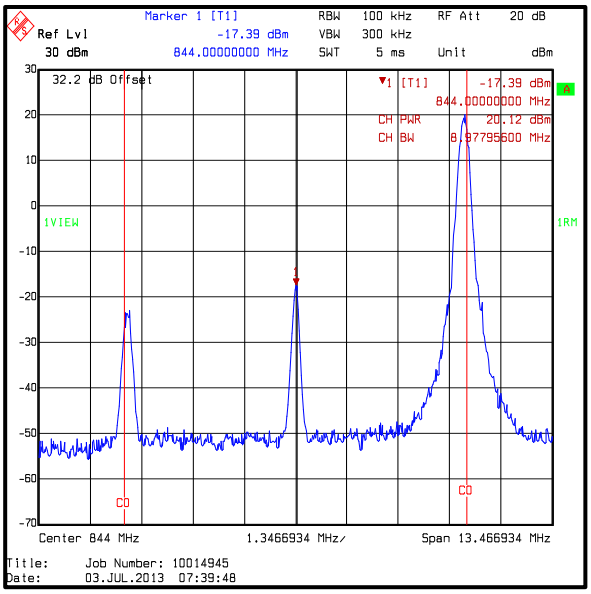
Transmitter Output Power (ERP) (continued)

Results: 10 MHz Channel Bandwidth / Top Channel / 16QAM

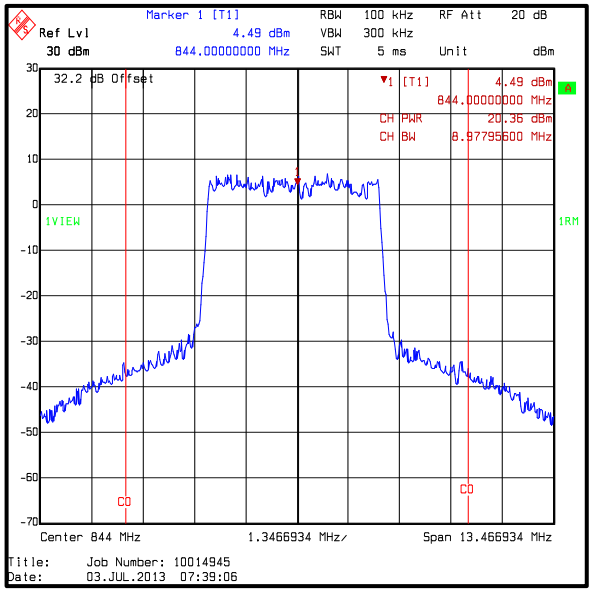
Frequency (MHz)	Resource Block(s)	Resource Block Offset	Conducted RF Power (dBm)	Antenna Gain (dBd)	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
844	1	0	20.8	-6.18	14.62	38.5	23.88	Complied
844	1	49	20.1	-6.18	13.92	38.5	24.58	Complied
844	25	12	20.4	-6.18	14.22	38.5	24.28	Complied
844	50	0	20.3	-6.18	14.12	38.5	24.38	Complied



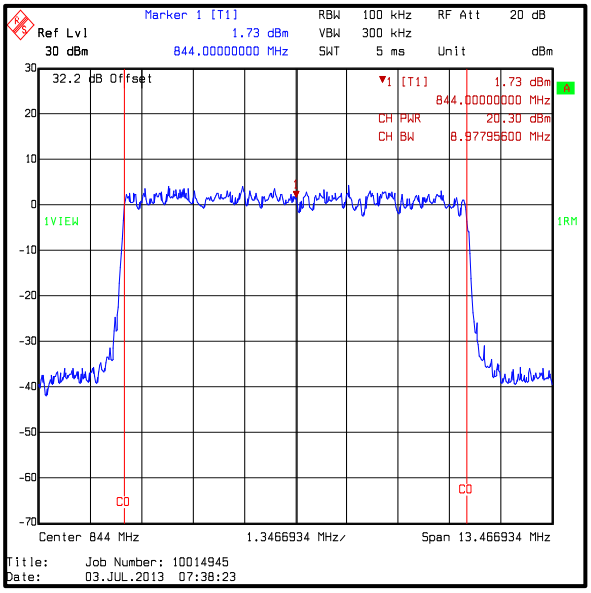
16QAM / 1 Resource Block (0 offset)



16QAM / 1 Resource Block (49 offset)



16QAM / 25 Resource Blocks (12 offset)



16QAM / 50 Resource Blocks (0 offset)

Transmitter Output Power (ERP) (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermometer / Hygrometer station	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12
L1014	Test Receiver	Rohde & Schwarz	ESIB 40	100014	10 May 2014	24
A2143	Attenuator	AtlanTec RF	AN18-20	081120-23	10 May 2014	12
A1368	Directional Coupler	Pasternack Enterprises	PE2214-10	None stated	Calibrated before use	-
M1021	Signal Generator	Rohde & Schwarz	SMP 02	833286/004	05 Feb 2014	12
M199	Power Meter	Rohde & Schwarz	NRVS	827023/075	15 May 2014	12
M1267	Thermal Power Sensor	Rohde & Schwarz	NRV-Z52	100155	14 May 2014	12

5.2.2. Transmitter Occupied Bandwidth

Test Summary:

Test Engineer:	Ben Mercer	**Test Date:**	27 June 2013
Test Sample IMEI:	004402451256097		

FCC Reference:	Part 2.1049
Test Method Used:	As detailed in KDB 971168 D01 Section 4.2

Environmental Conditions:

Temperature (°C):	23 to 25
Relative Humidity (%):	38 to 40

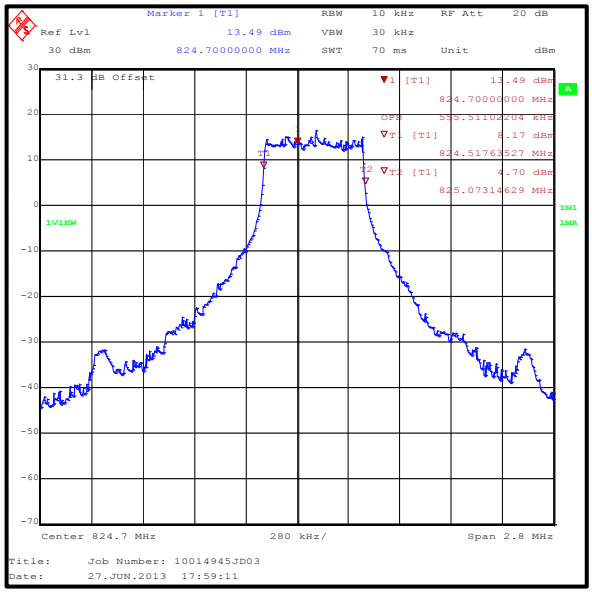
Note(s):

1. Occupied bandwidth (99% bandwidth) was measured using a test receiver occupied bandwidth function.
2. Measurements were performed with the EUT transmitting with QPSK and 16QAM modulation schemes, with resource block settings as detailed in section 4.3 of this report.
3. All plots for measurements performed on the 27th June have an incorrect title.

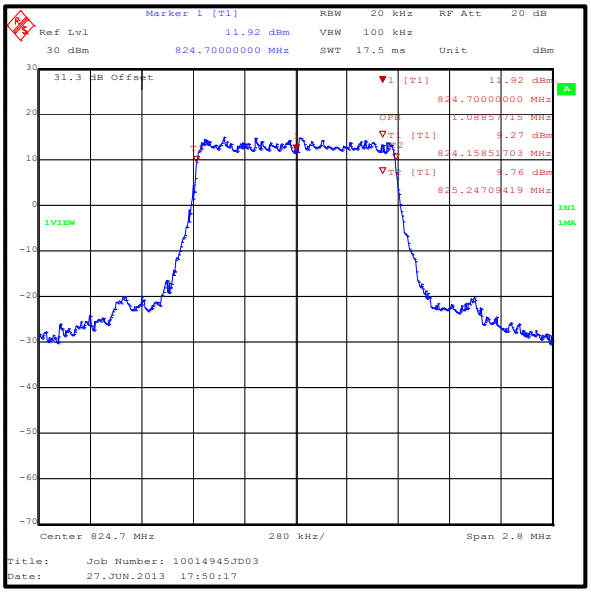
Transmitter Occupied Bandwidth (continued)

Results: 1.4 MHz Channel Bandwidth / Bottom Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
824.7	3	2	10	30	0.556
824.7	6	0	20	100	1.089



QPSK / 3 Resource Blocks (2 offset)

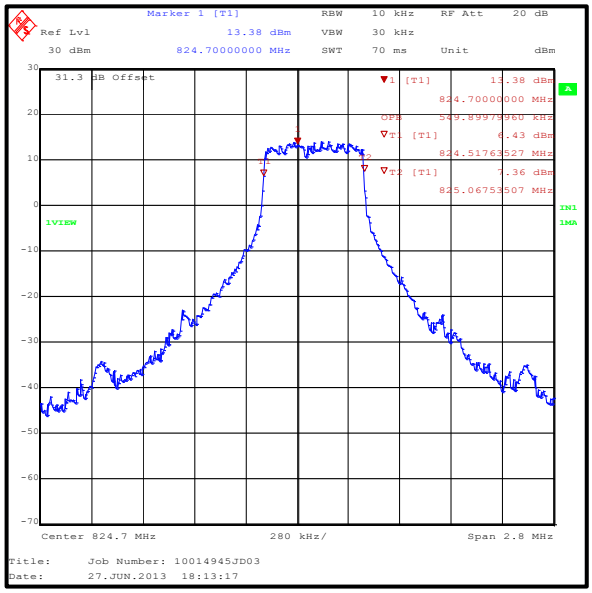


QPSK / 6 Resource Blocks (0 offset)

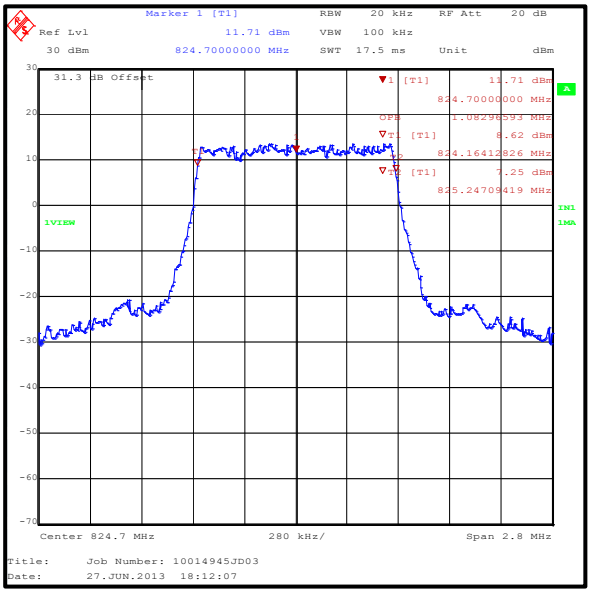
Transmitter Occupied Bandwidth (continued)

Results: 1.4 MHz Channel Bandwidth / Bottom Channel / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
824.7	3	2	10	30	0.550
824.7	6	0	20	100	1.083



16QAM / 3 Resource Blocks (2 offset)

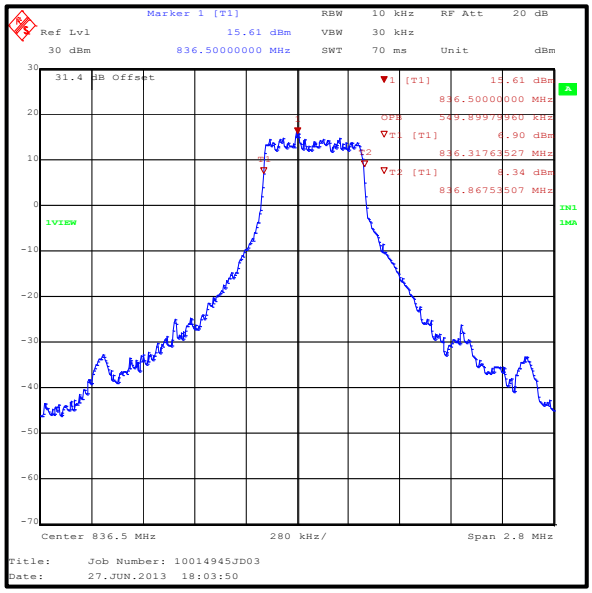


16QAM / 6 Resource Blocks (0 offset)

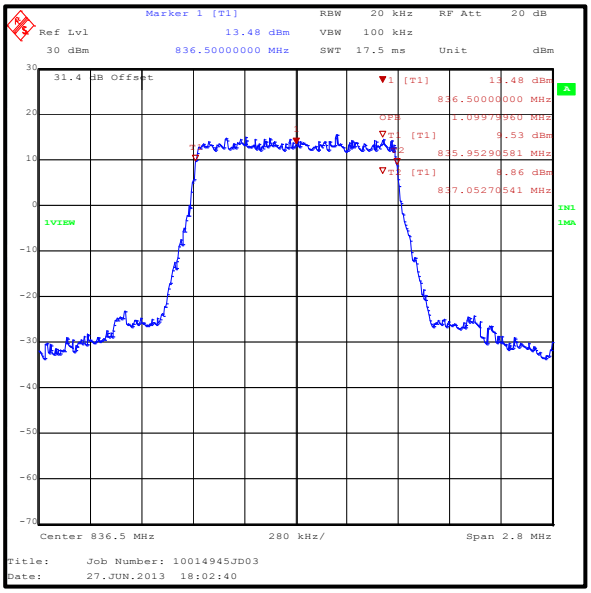
Transmitter Occupied Bandwidth (continued)

Results: 1.4 MHz Channel Bandwidth / Middle Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
836.5	3	2	10	30	0.550
836.5	6	0	20	100	1.100



QPSK / 3 Resource Blocks (2 offset)

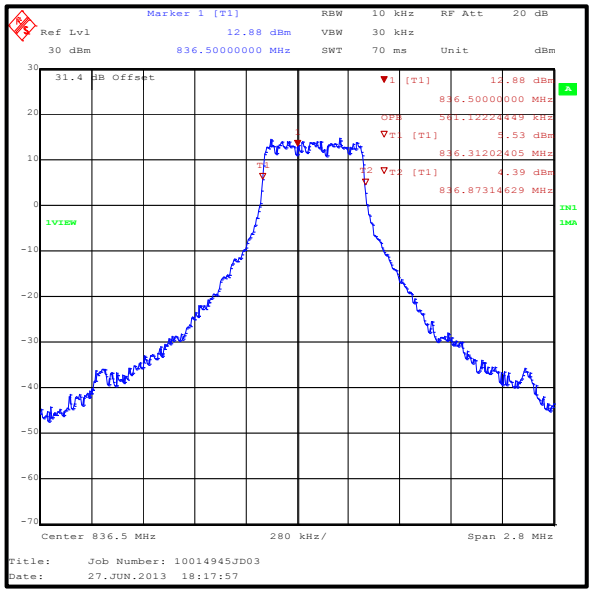


QPSK / 6 Resource Blocks (0 offset)

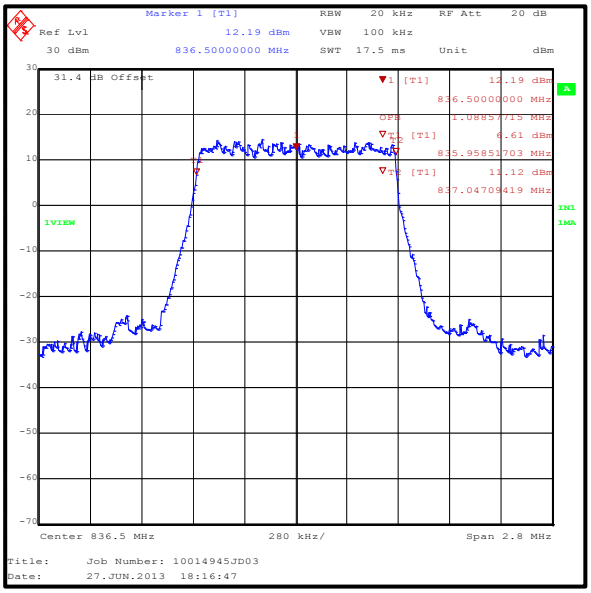
Transmitter Occupied Bandwidth (continued)

Results: 1.4 MHz Channel Bandwidth / Middle Channel / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
836.5	3	2	10	30	0.561
836.5	6	0	20	100	1.089



16QAM / 3 Resource Blocks (2 offset)

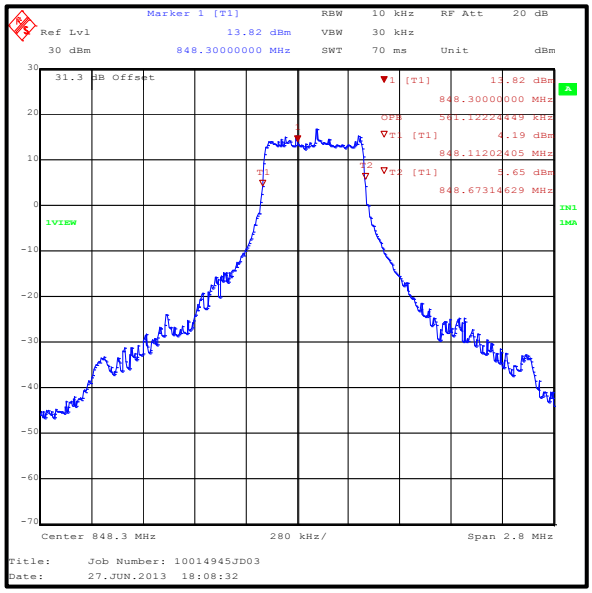


16QAM / 6 Resource Blocks (0 offset)

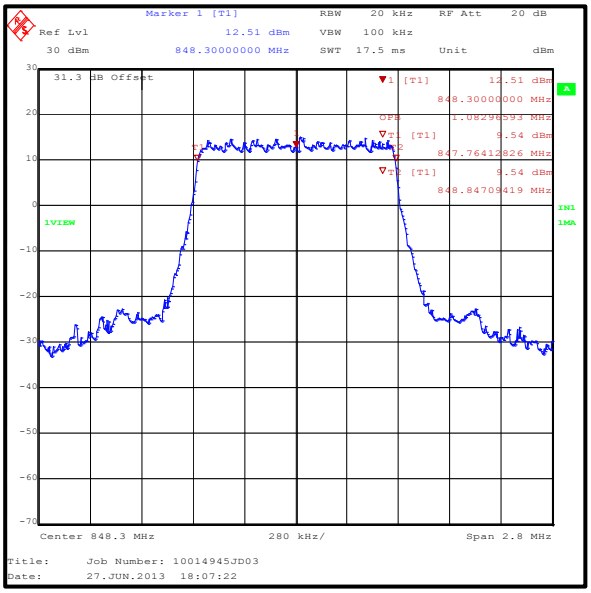
Transmitter Occupied Bandwidth (continued)

Results: 1.4 MHz Channel Bandwidth / Top Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
848.3	3	2	10	30	0.561
848.3	6	0	20	100	1.083



QPSK / 3 Resource Blocks (2 offset)

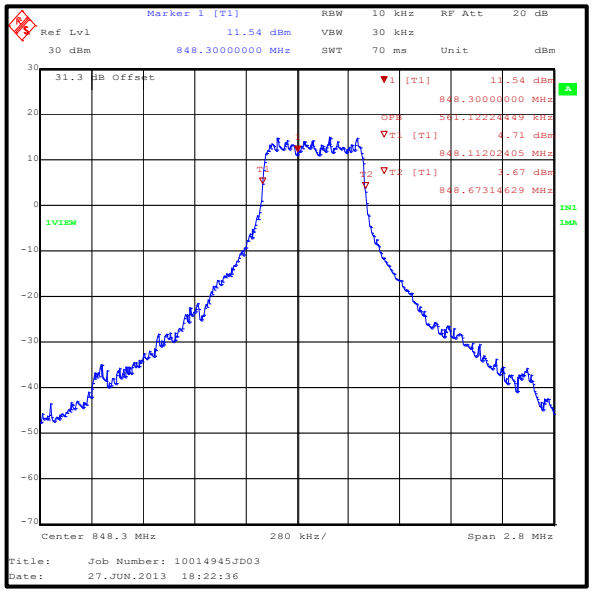


QPSK / 6 Resource Blocks (0 offset)

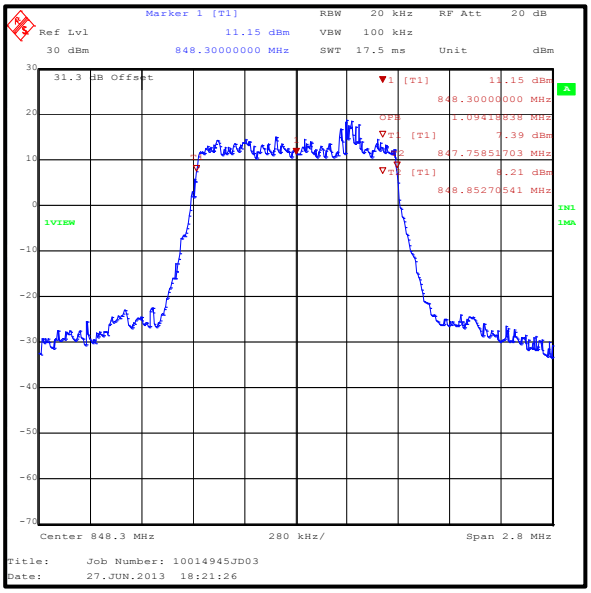
Transmitter Occupied Bandwidth (continued)

Results: 1.4 MHz Channel Bandwidth / Top Channel / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
848.3	3	2	10	30	0.561
848.3	6	0	20	100	1.094



16QAM / 8 Resource Blocks (4 offset)

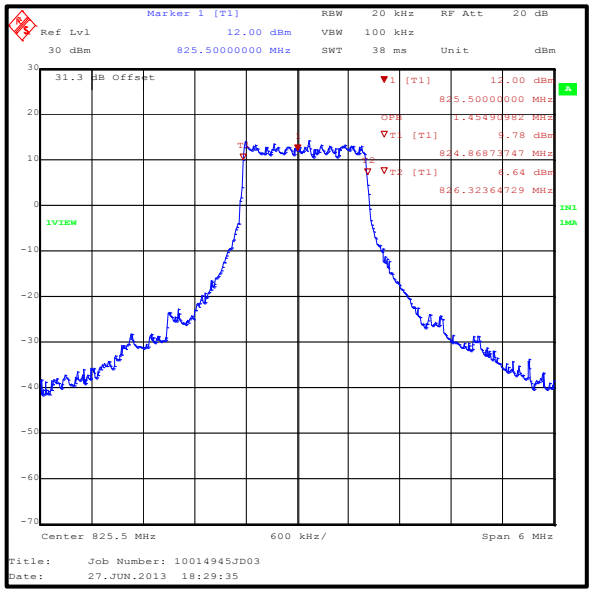


16QAM / 15 Resource Blocks (0 offset)

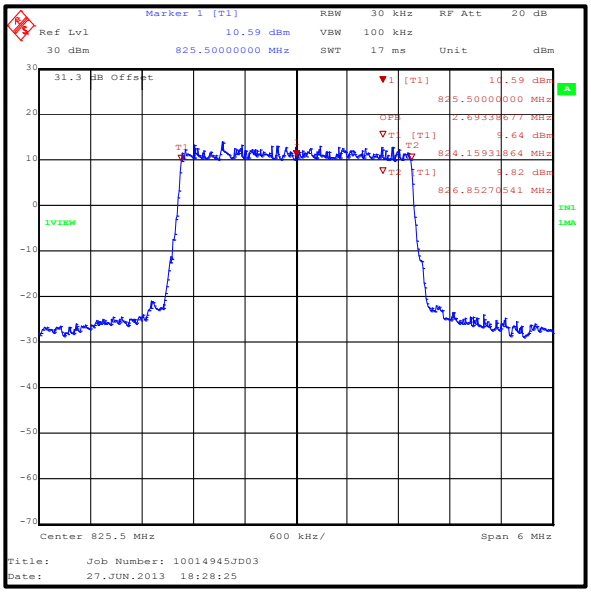
Transmitter Occupied Bandwidth (continued)

Results: 3 MHz Channel Bandwidth / Bottom Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
825.5	8	4	20	100	1.455
825.5	15	0	30	100	2.693



QPSK / 8 Resource Blocks (4 offset)

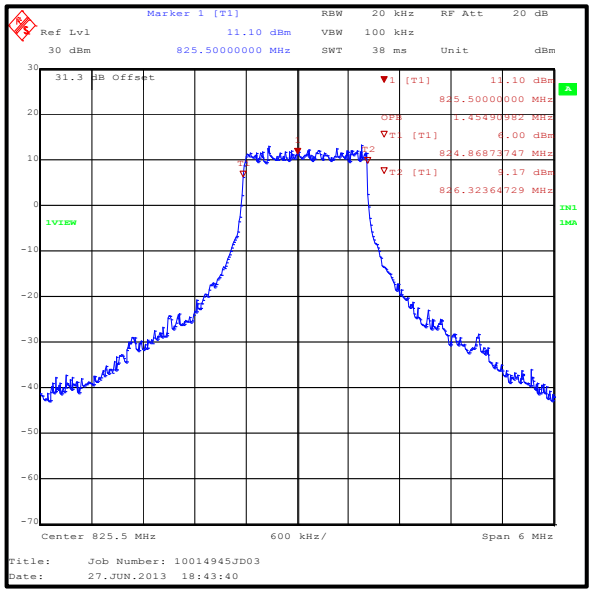


QPSK / 15 Resource Blocks (0 offset)

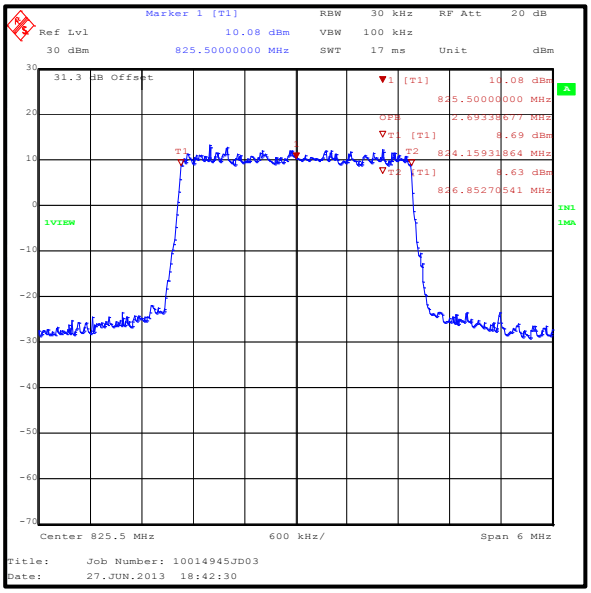
Transmitter Occupied Bandwidth (continued)

Results: 3 MHz Channel Bandwidth / Bottom Channel / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
825.5	8	4	20	100	1.455
825.5	15	0	30	100	2.693



16QAM / 8 Resource Blocks (4 offset)

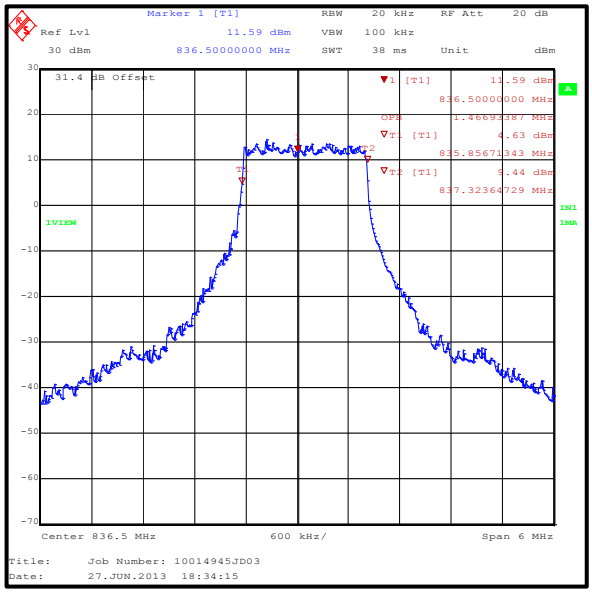


16QAM / 15 Resource Blocks (0 offset)

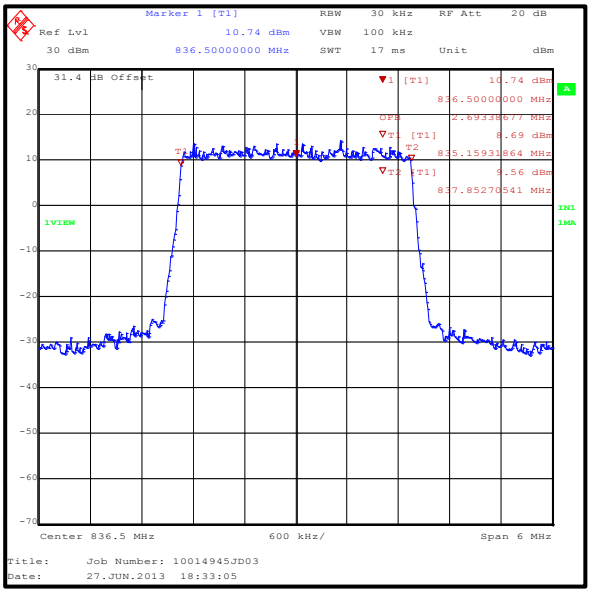
Transmitter Occupied Bandwidth (continued)

Results: 3 MHz Channel Bandwidth / Middle Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
836.5	8	4	20	100	1.467
836.5	15	0	30	100	2.693



QPSK / 8 Resource Blocks (4 offset)

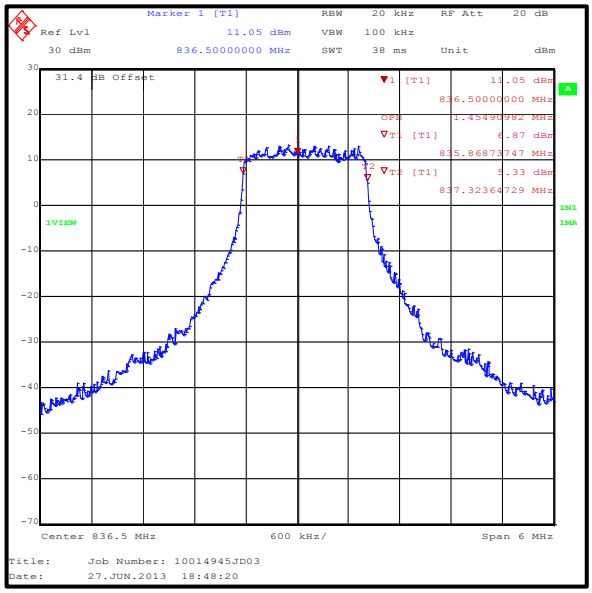


QPSK / 15 Resource Blocks (0 offset)

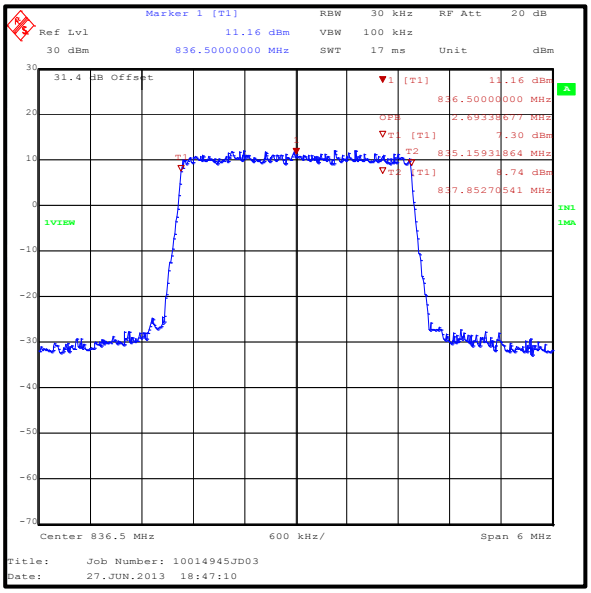
Transmitter Occupied Bandwidth (continued)

Results: 3 MHz Channel Bandwidth / Middle Channel / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
836.5	8	4	20	100	1.455
836.5	15	0	30	100	2.693



16QAM / 8 Resource Blocks (4 offset)

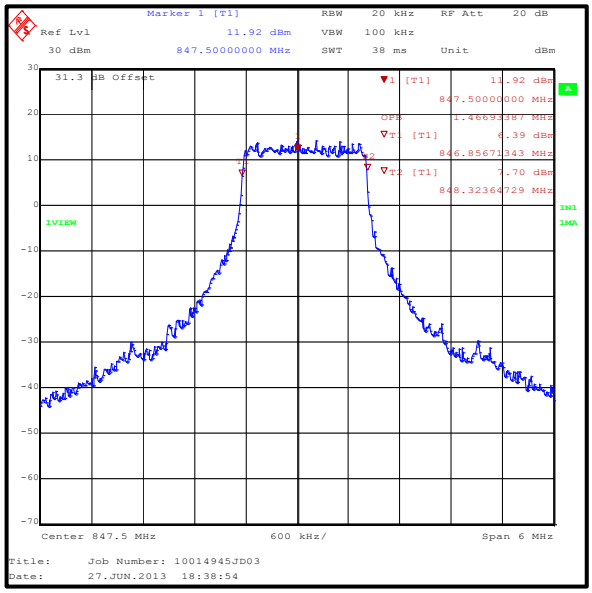


16QAM / 15 Resource Blocks (0 offset)

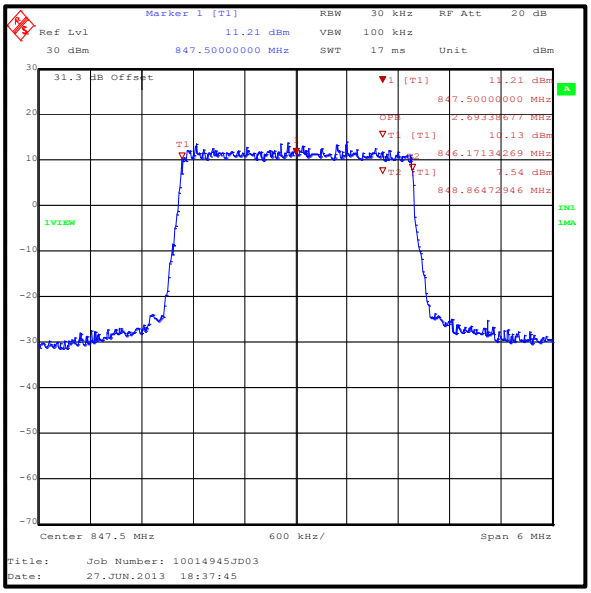
Transmitter Occupied Bandwidth (continued)

Results: 3 MHz Channel Bandwidth / Top Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
847.5	8	4	20	100	1.467
847.5	15	0	30	100	2.693



QPSK / 8 Resource Blocks (4 offset)

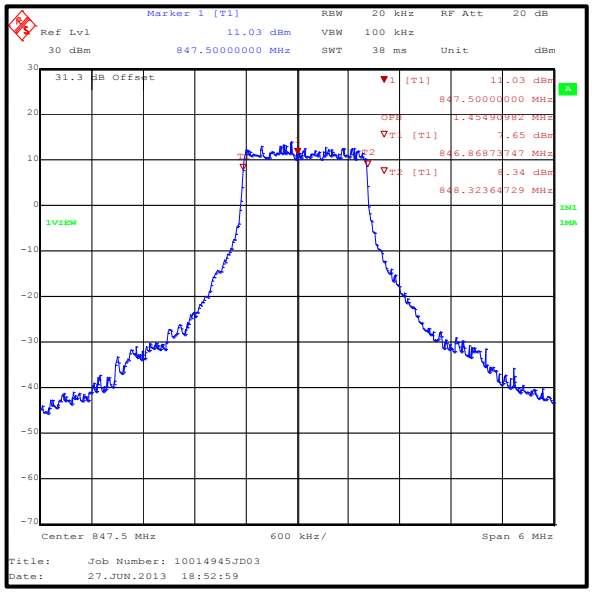


QPSK / 15 Resource Blocks (0 offset)

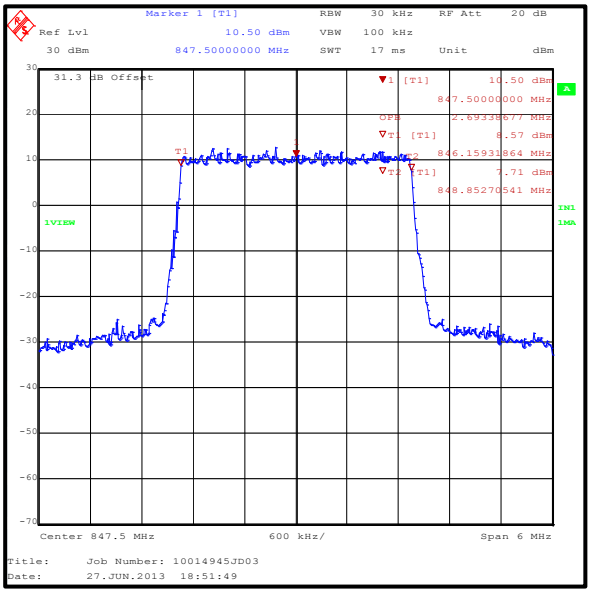
Transmitter Occupied Bandwidth (continued)

Results: 3 MHz Channel Bandwidth / Top Channel / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
847.5	8	4	20	100	1.455
847.5	15	0	30	100	2.693



16QAM / 8 Resource Blocks (4 offset)

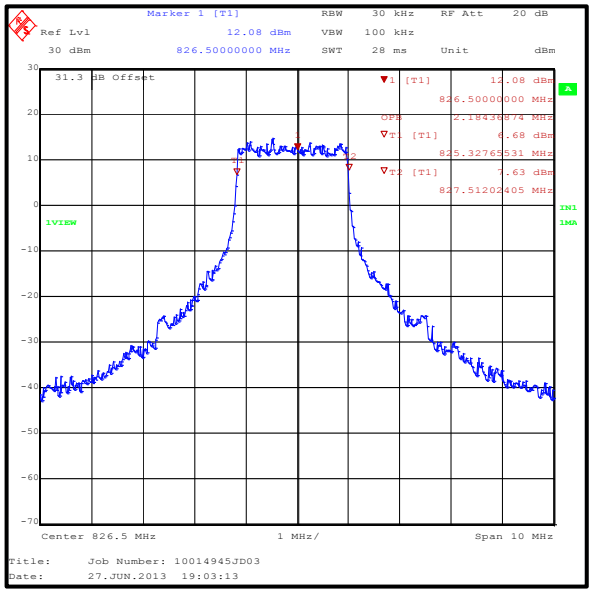


16QAM / 15 Resource Blocks (0 offset)

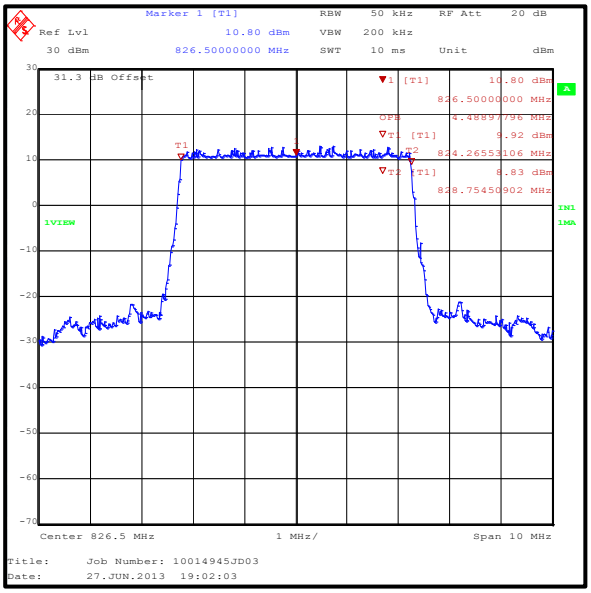
Transmitter Occupied Bandwidth (continued)

Results: 5 MHz Channel Bandwidth / Bottom Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
826.5	12	6	30	100	2.184
826.5	25	0	50	200	4.489



QPSK / 12 Resource Blocks (6 offset)

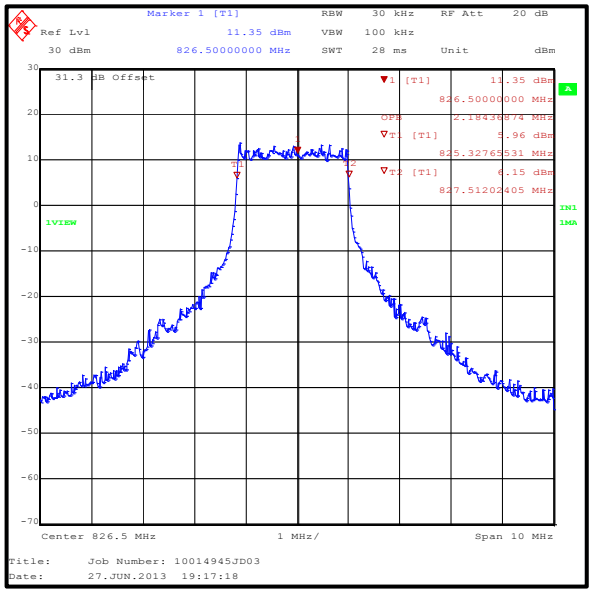


QPSK / 25 Resource Blocks (0 offset)

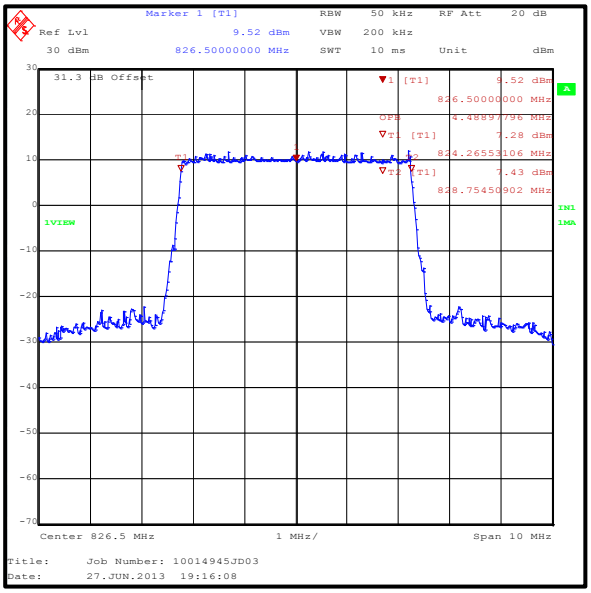
Transmitter Occupied Bandwidth (continued)

Results: 5 MHz Channel Bandwidth / Bottom Channel / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
826.5	12	6	30	100	2.184
826.5	25	0	50	200	4.489



16QAM / 12 Resource Blocks (6 offset)

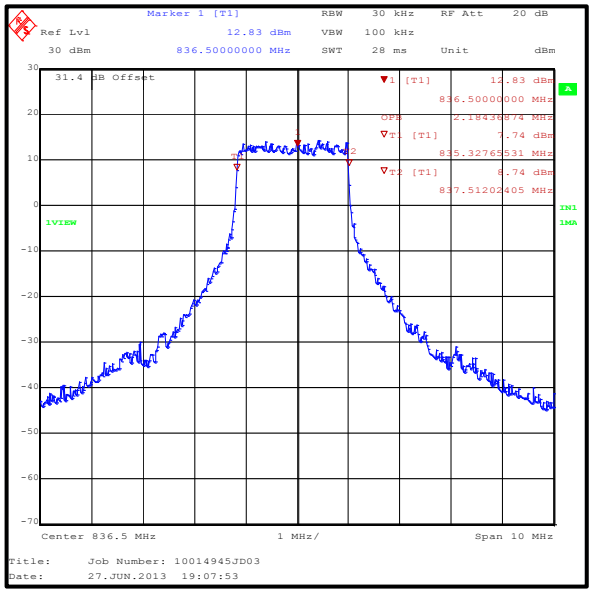


16QAM / 25 Resource Blocks (0 offset)

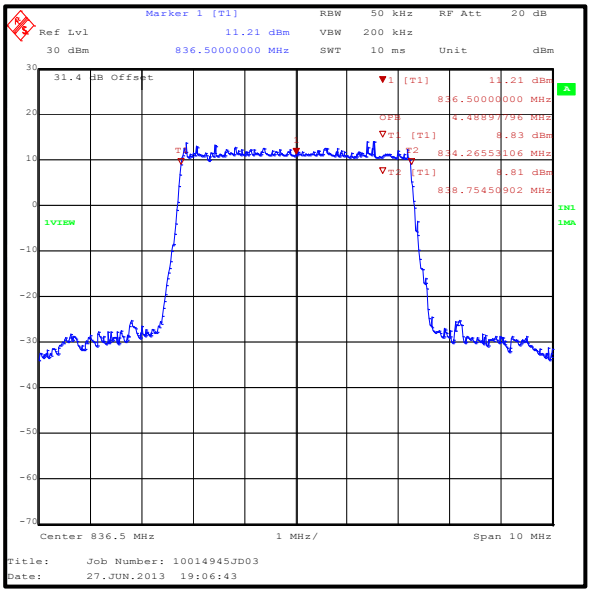
Transmitter Occupied Bandwidth (continued)

Results: 5 MHz Channel Bandwidth / Middle Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
836.5	12	6	30	100	2.184
836.5	25	0	50	200	4.489



QPSK / 12 Resource Blocks (6 offset)

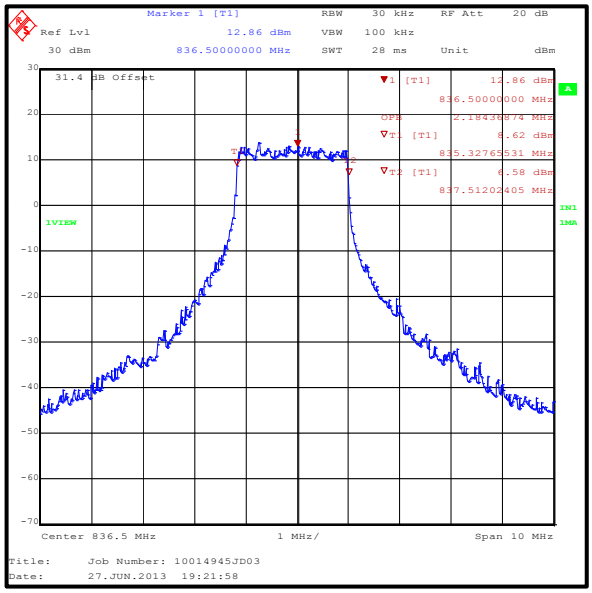


QPSK / 25 Resource Blocks (0 offset)

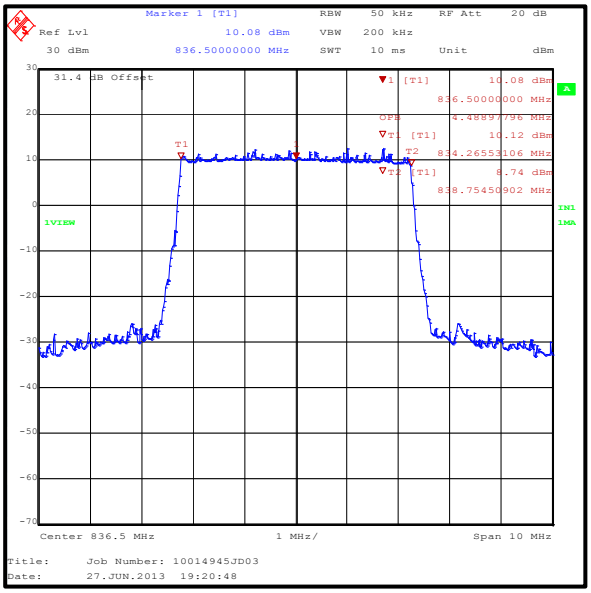
Transmitter Occupied Bandwidth (continued)

Results: 5 MHz Channel Bandwidth / Middle Channel / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
836.5	12	6	30	100	2.184
836.5	25	0	50	200	4.489



16QAM / 12 Resource Blocks (6 offset)

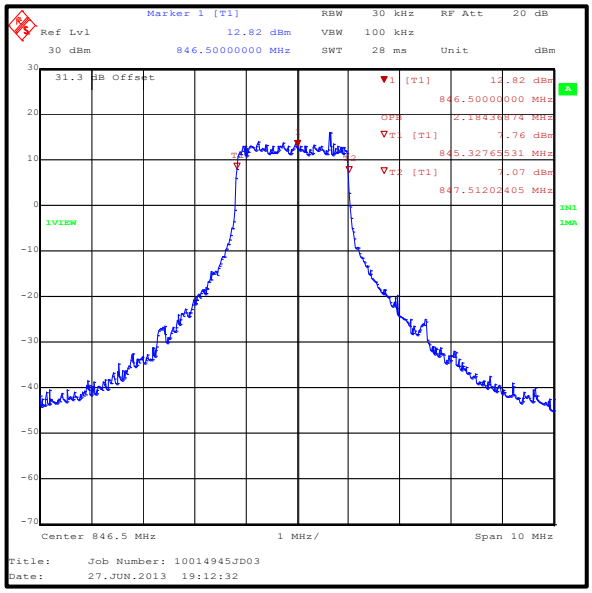


16QAM / 25 Resource Blocks (0 offset)

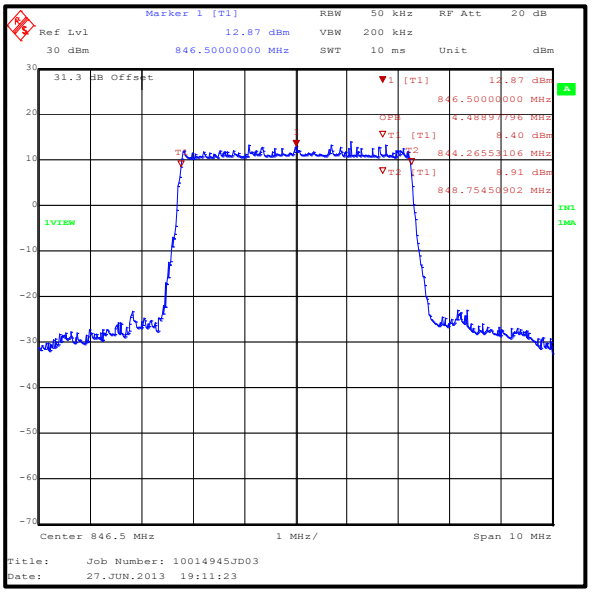
Transmitter Occupied Bandwidth (continued)

Results: 5 MHz Channel Bandwidth / Top Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
846.5	12	6	30	100	2.184
846.5	25	0	50	200	4.489



QPSK / 12 Resource Blocks (6 offset)

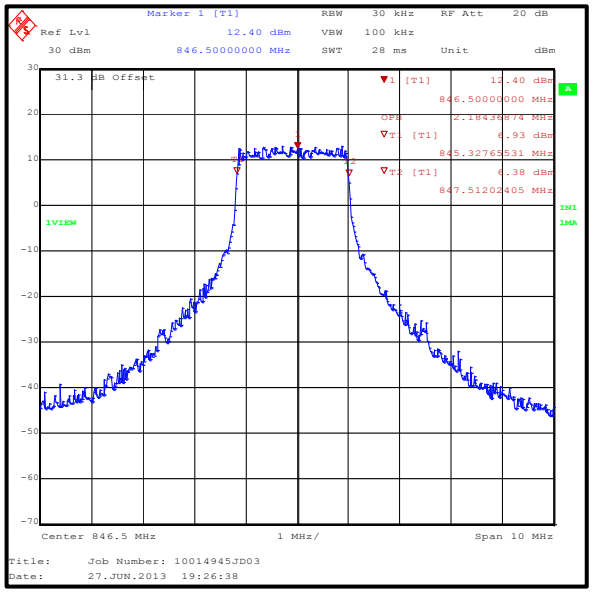


QPSK / 25 Resource Blocks (0 offset)

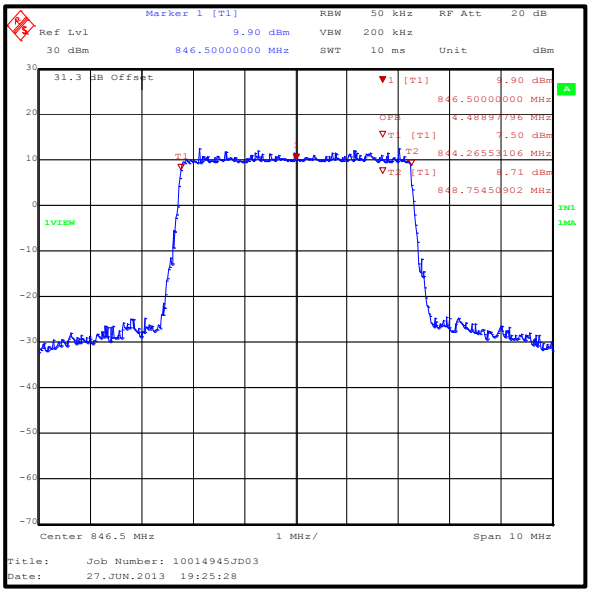
Transmitter Occupied Bandwidth (continued)

Results: 5 MHz Channel Bandwidth / Top Channel / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
846.5	12	6	30	100	2.184
846.5	25	0	50	200	4.489



16QAM / 12 Resource Blocks (6 offset)

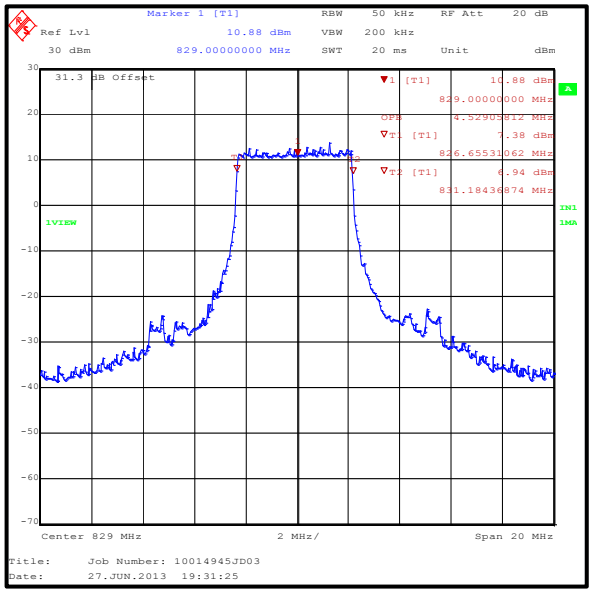


16QAM / 25 Resource Blocks (0 offset)

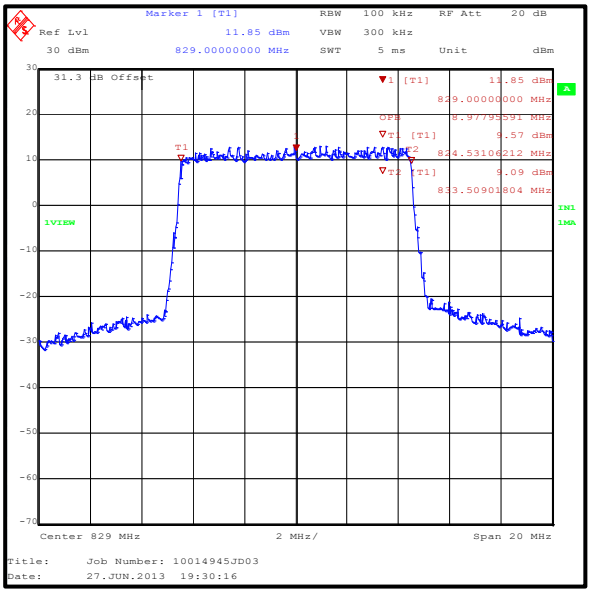
Transmitter Occupied Bandwidth (continued)

Results: 10 MHz Channel Bandwidth / Bottom Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
829	25	12	50	200	4.529
829	50	0	100	300	8.978



QPSK / 25 Resource Blocks (12 offset)

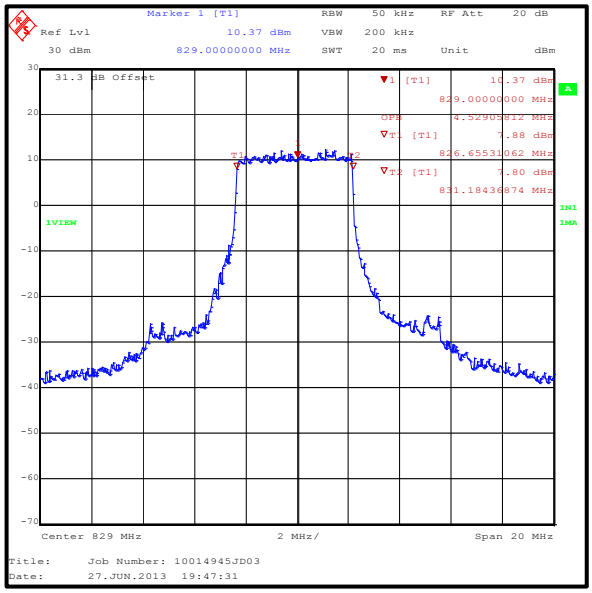


QPSK / 50 Resource Blocks (0 offset)

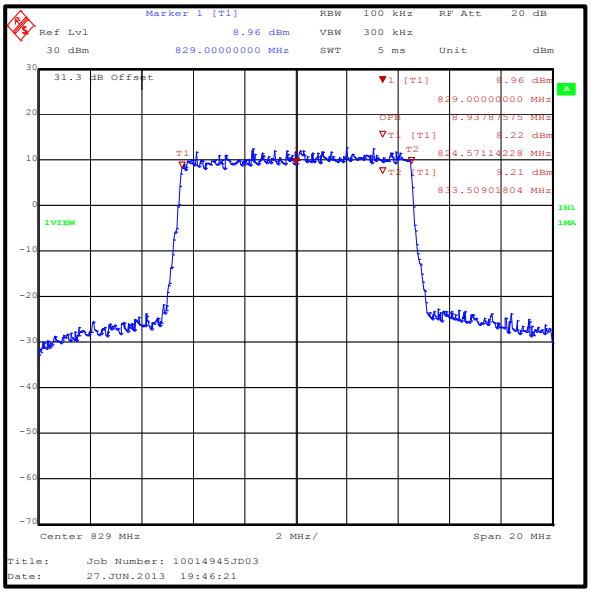
Transmitter Occupied Bandwidth (continued)

Results: 10 MHz Channel Bandwidth / Bottom Channel / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
829	25	12	50	200	4.529
829	50	0	100	300	8.938



16QAM / 25 Resource Blocks (12 offset)

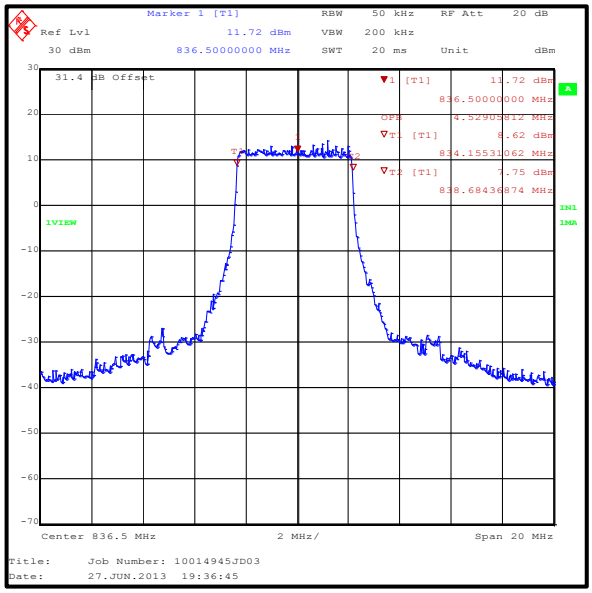


16QAM / 50 Resource Blocks (0 offset)

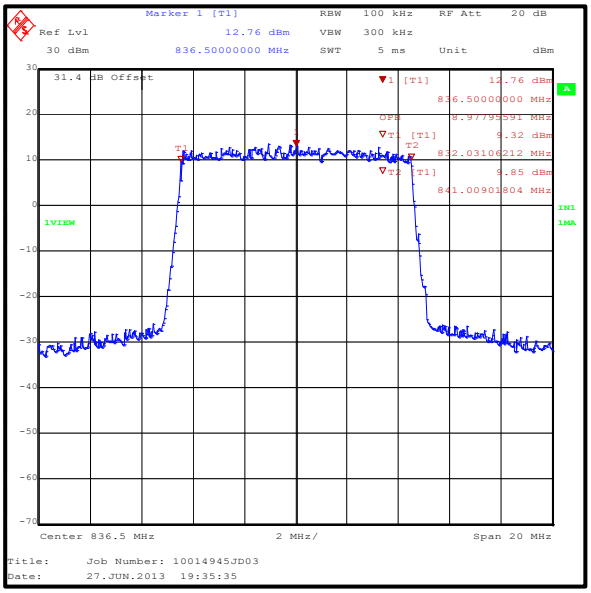
Transmitter Occupied Bandwidth (continued)

Results: 10 MHz Channel Bandwidth / Middle Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
836.5	25	12	50	200	4.529
836.5	50	0	100	300	8.978



QPSK / 25 Resource Blocks (12 offset)

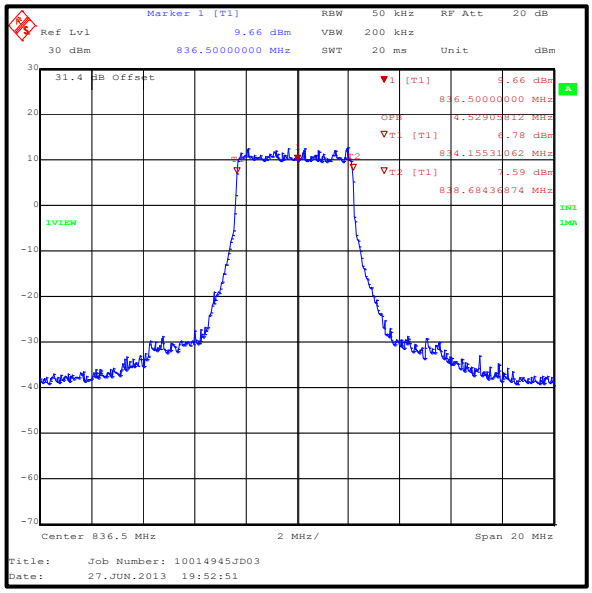


QPSK / 50 Resource Blocks (0 offset)

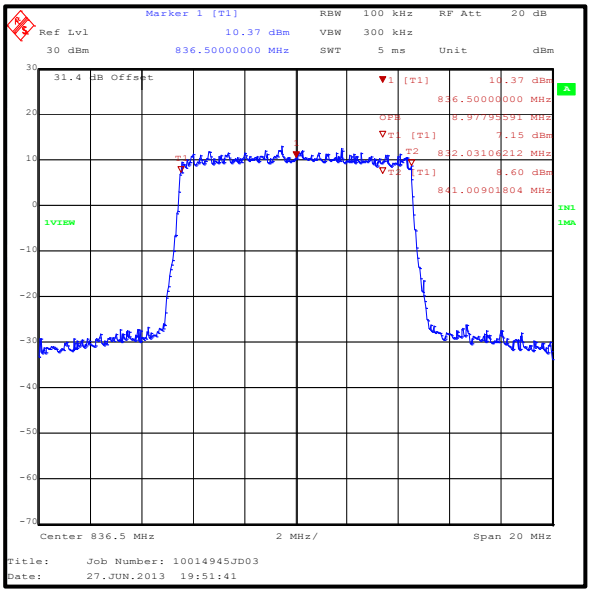
Transmitter Occupied Bandwidth (continued)

Results: 10 MHz Channel Bandwidth / Middle Channel / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
836.5	25	12	50	200	4.529
836.5	50	0	100	300	8.978



16QAM / 25 Resource Blocks (12 offset)

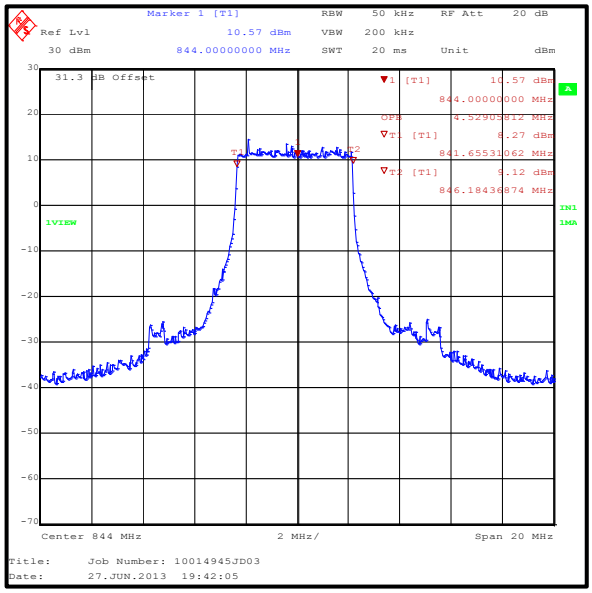


16QAM / 50 Resource Blocks (0 offset)

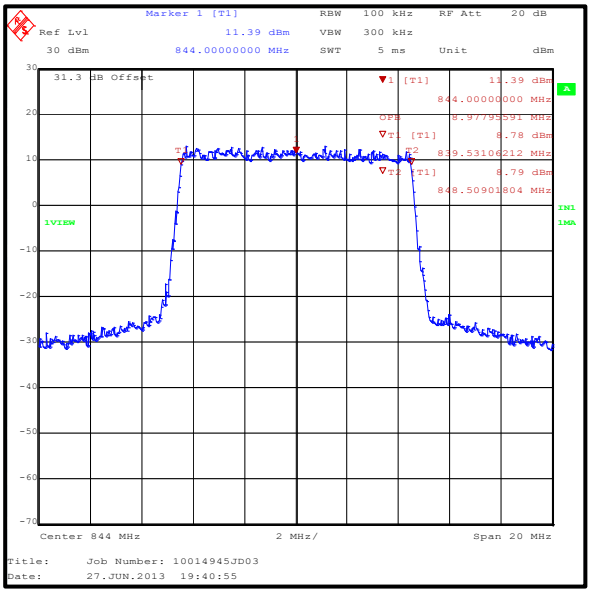
Transmitter Occupied Bandwidth (continued)

Results: 10 MHz Channel Bandwidth / Top Channel / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
844	25	12	50	200	4.529
844	50	0	100	300	8.978



QPSK / 25 Resource Blocks (12 offset)

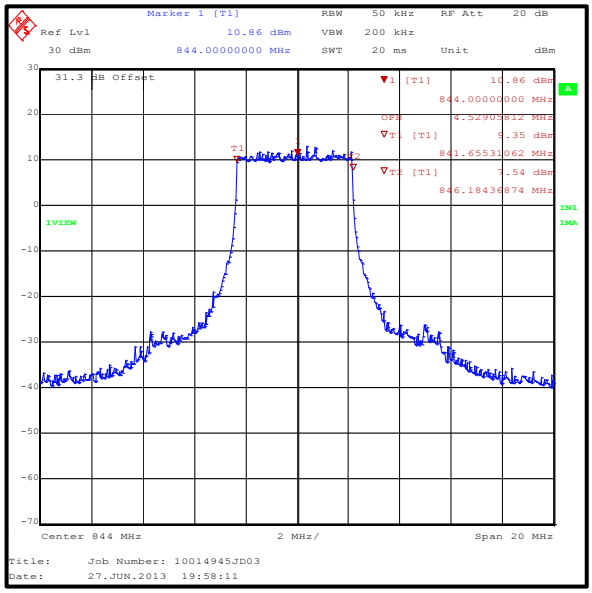


QPSK / 50 Resource Blocks (0 offset)

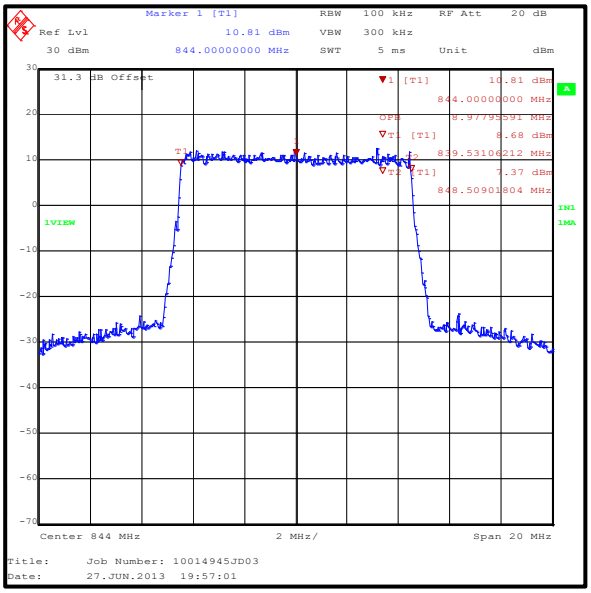
Transmitter Occupied Bandwidth (continued)

Results: 10 MHz Channel Bandwidth / Top Channel / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Resolution Bandwidth (kHz)	Video Bandwidth (kHz)	Occupied Bandwidth (MHz)
844	25	12	50	200	4.529
844	50	0	100	300	8.978



16QAM / 25 Resource Blocks (12 offset)



16QAM / 50 Resource Blocks (0 offset)

Transmitter Occupied Bandwidth (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermometer / Hygrometer station	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12
L1014	Test Receiver	Rhode & Schwarz	ESIB 40	100014	10 May 2014	12
A1368	Directional Coupler	Pasternack	PE2214-10	None	Calibrated before use	-
A2143	Attenuator	AtlanTecRF	AN18-20	081120-23	10 May 2014	12
S0523	DC Power Supply	TTi	PL320	224235	Calibrated before use	-
M1269	Multimeter	Fluke	179	90250210	30 Jul 2013	12

5.2.3. Transmitter Out of Band Radiated Emissions

Test Summary:

Test Engineer:	Nick Steele	**Test Date:**	07 July 2013
Test Sample IMEI:	004402451263820		

FCC Reference:	Parts 2.1053 & 22.917
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12 referencing FCC CFR Part 2.1053
Frequency Range:	30 MHz to 9 GHz
Configuration:	10 MHz QPSK, 1RB, 0 Offset

Environmental Conditions:

Temperature (°C):	23 to 27
Relative Humidity (%):	38 to 49

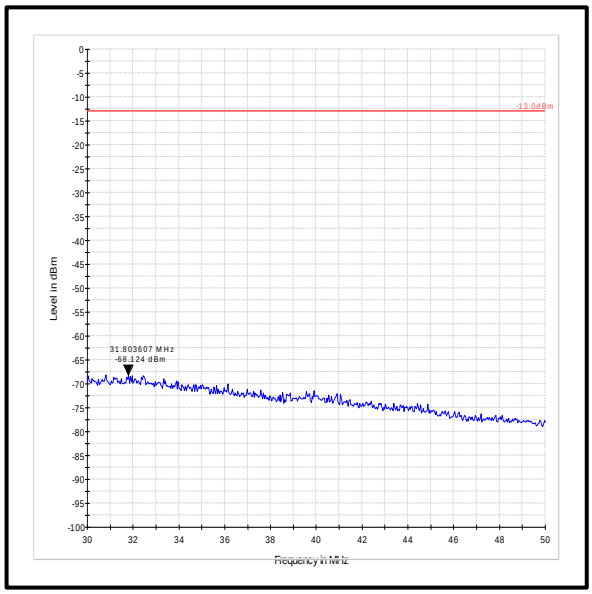
Note(s):

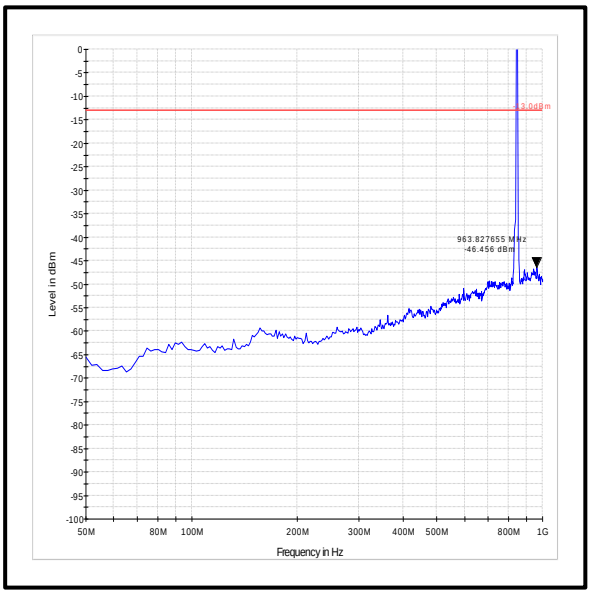
1. The EUT was set to transmit with a 10 MHz channel bandwidth, QPSK modulation applied and 1 resource block with 0 offset, as this was found to be the worst case modulation scheme with regards to emissions after preliminary investigations and, as this mode emits the highest transmit output power level, it was deemed to be the worst case
2. The emission seen on the 30 MHz to 1 GHz plot at approximately 836.5 MHz is the EUT carrier.
3. No spurious emissions were detected above the measurement system noise floor therefore the highest peak noise floor reading of the measuring receiver was recorded in the table below.
4. Measurements below 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.
5. Pre-scans above 1 GHz were performed in a fully anechoic chamber (Asset Number K0002) at a distance of 3 metres. The EUT was placed at a height of 1.5 metres above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 metres above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber (Asset Number K0001) at a distance of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

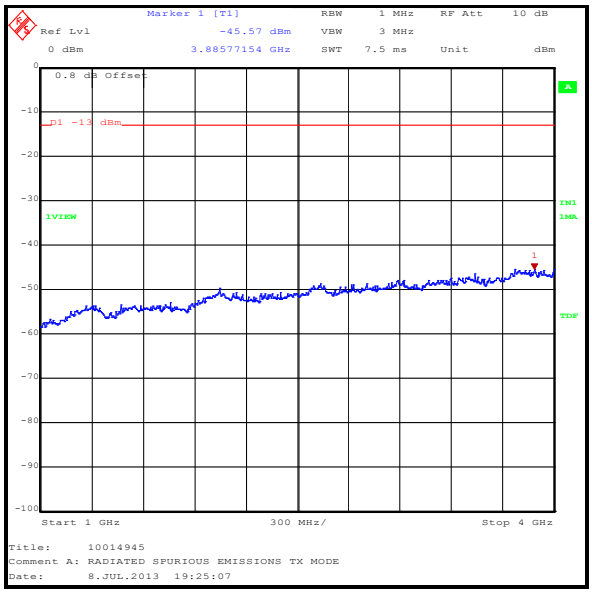
Results:

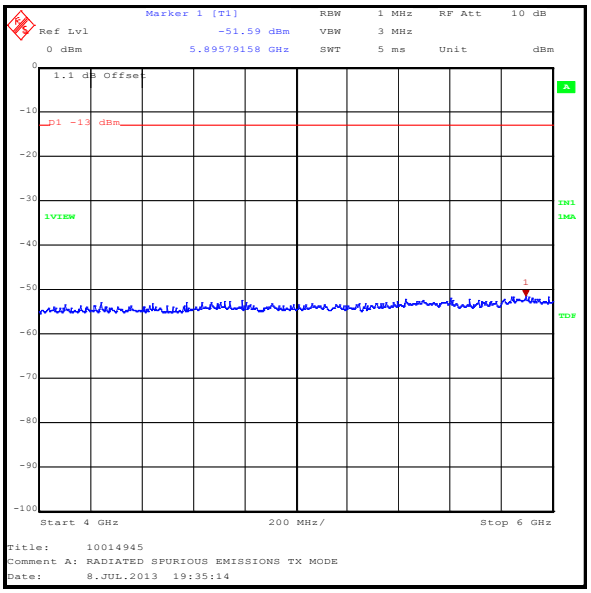
Frequency (MHz)	Peak Level (dBm)	Limit (dBm)	Margin (dB)	Result
8739.479	-44.9	-13.0	31.9	Complied

Transmitter Out of Band Radiated Emissions (continued)

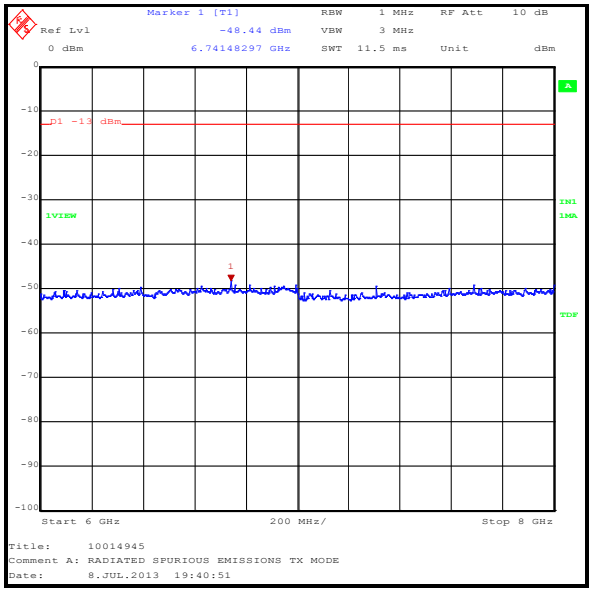


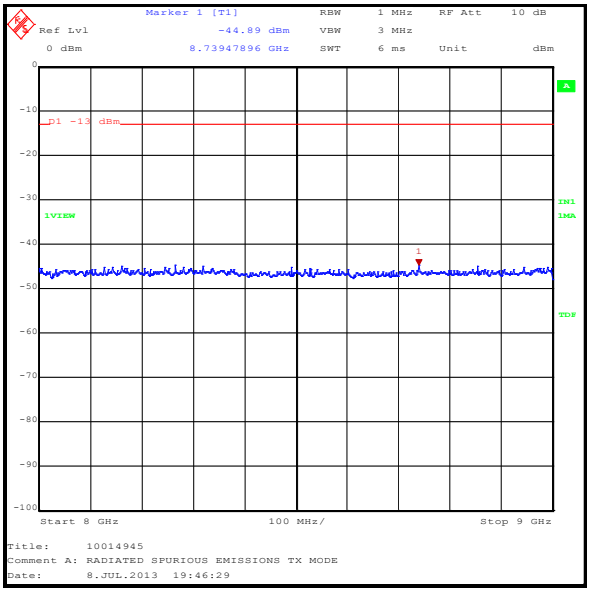






Transmitter Out of Band Radiated Emissions (continued)





Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1622	Thermometer / Hygrometer station	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	24 Oct 2013	12
G0543	Amplifier	Sonoma	310N	230801	05 Oct 2013	3
M1273	Test Receiver	Rohde & Schwarz	ESIB 26	100275	07 Feb 2014	12
A1834	Attenuator	Hewlett Packard	8491B	10444	27 Jan 2014	12
A490	Antenna	Chase	CBL6111A	1590	09 Apr 2014	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	04 Nov 2013	12
M1124	Test Receiver	Rohde & Schwarz	ESIB 26	100046K	14 Aug 2013	12
A1534	Pre-Amplifier	Hewlett Packard	8449B	3008A00405	04 Nov 2013	12
A1818	Antenna	EMCO	3115	00075692	04 Nov 2013	12
A253	Antenna	Flann Microwave	12240-20	128	04 Nov 2013	12
A254	Antenna	Flann Microwave	14240-20	139	04 Nov 2013	12
A255	Antenna	Flann Microwave	16240-20	519	04 Nov 2013	12
A1974	High Pass Filter	AtlanTecRF	AFH-01000	090000283	19 Apr 2014	12
A1396	Attenuator	Huber & Suhner	6810.17.B	757987	10 May 2014	12

5.2.4. Transmitter Radiated Emissions at Band Edges

Test Summary:

Test Engineer:	Mark Percival	**Test Dates:**	10 July 2013 & 14 July 2013
Test Sample IMEI:	004402451263820		

FCC Reference:	Parts 2.1053 & 22.917
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.12 referencing FCC CFR Part 22.917

Environmental Conditions:

Temperature (°C):	22 to 24
Relative Humidity (%):	36 to 37

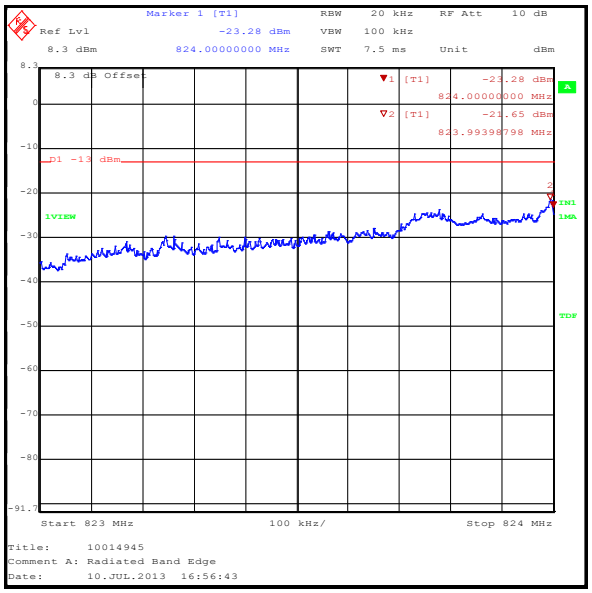
Note(s):

1. Measurements were performed with the EUT transmitting QPSK and 16QAM modulation schemes, with maximum resource block settings.

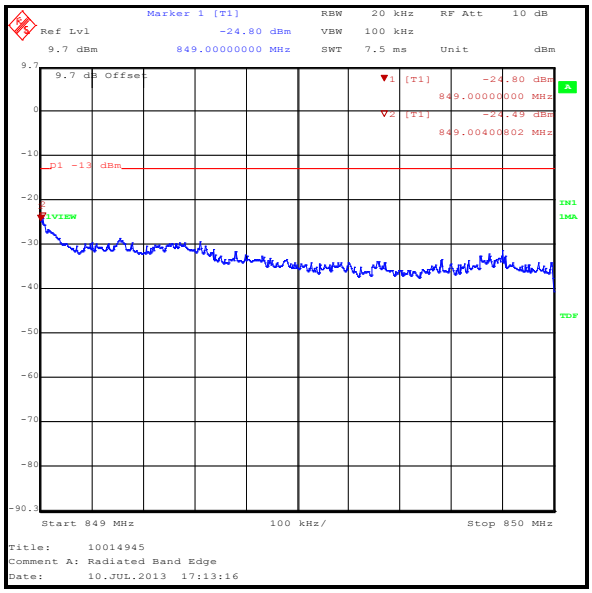
Transmitter Radiated Emissions at Band Edges (continued)

Results: 1.4 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
823.994	6	0	-21.7	-13.0	8.7	Complied
824	6	0	-23.3	-13.0	10.3	Complied
849	6	0	-24.8	-13.0	11.8	Complied
849.004	6	0	-24.5	-13.0	11.5	Complied



QPSK / Lower Band Edge

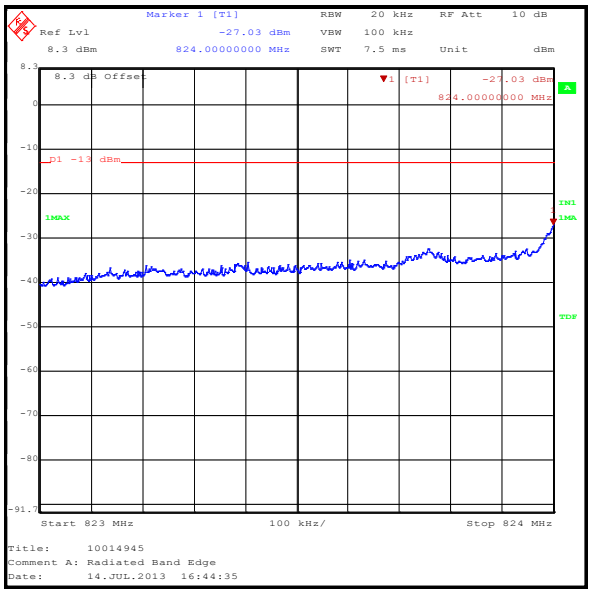


QPSK / Upper Band Edge

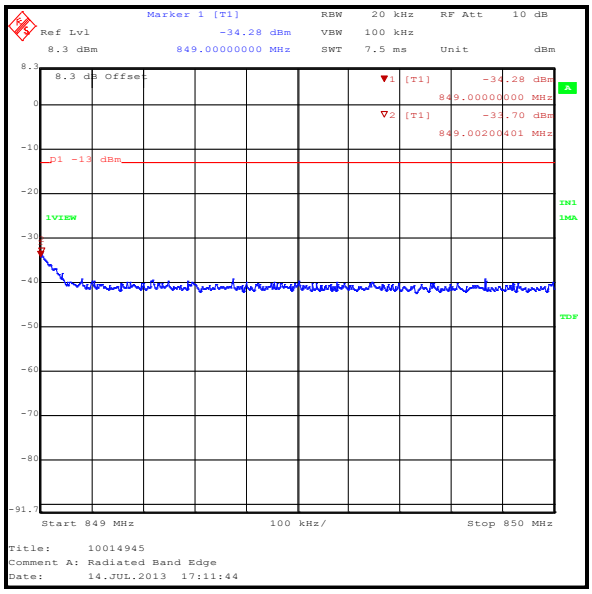
Transmitter Radiated Emissions at Band Edges (continued)

Results: 1.4 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	6	0	-27.0	-13.0	14.0	Complied
849	6	0	-34.3	-13.0	21.3	Complied
849.002	6	0	-33.7	-13.0	20.7	Complied



16QAM / Lower Band Edge

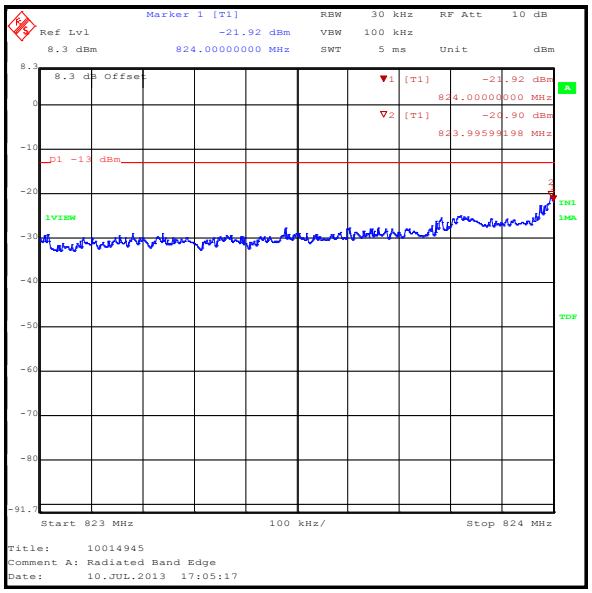


16QAM / Upper Band Edge

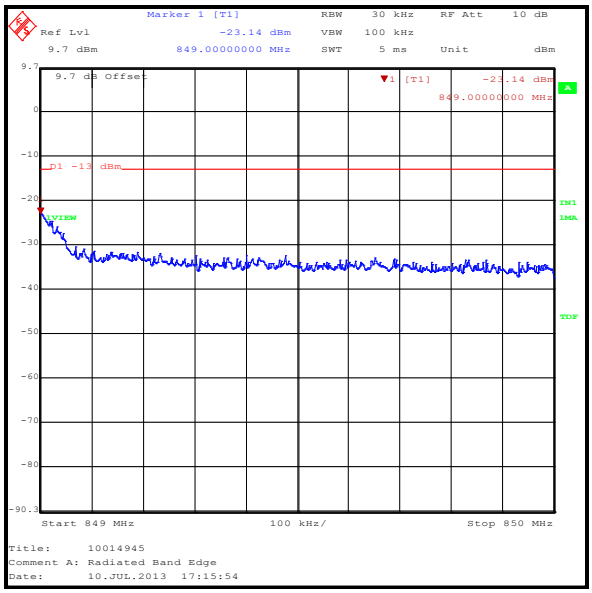
Transmitter Radiated Emissions at Band Edges (continued)

Results: 3 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
823.996	15	0	-20.9	-13.0	7.9	Complied
824	15	0	-21.9	-13.0	8.9	Complied
849	15	0	-23.1	-13.0	10.1	Complied



QPSK / Lower Band Edge

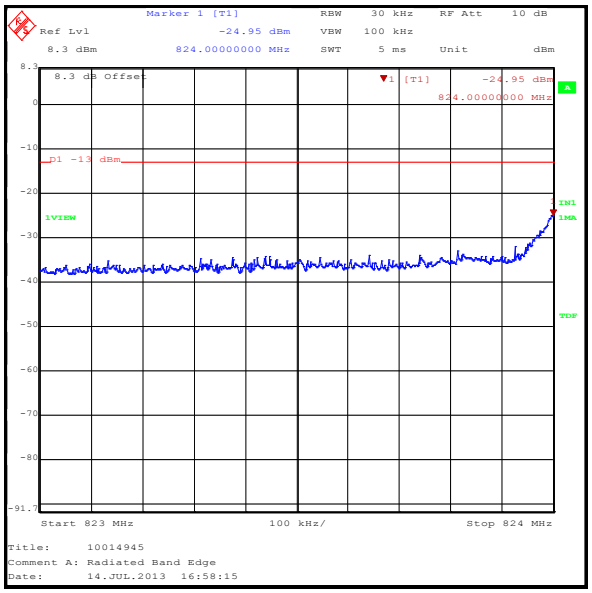


QPSK / Upper Band Edge

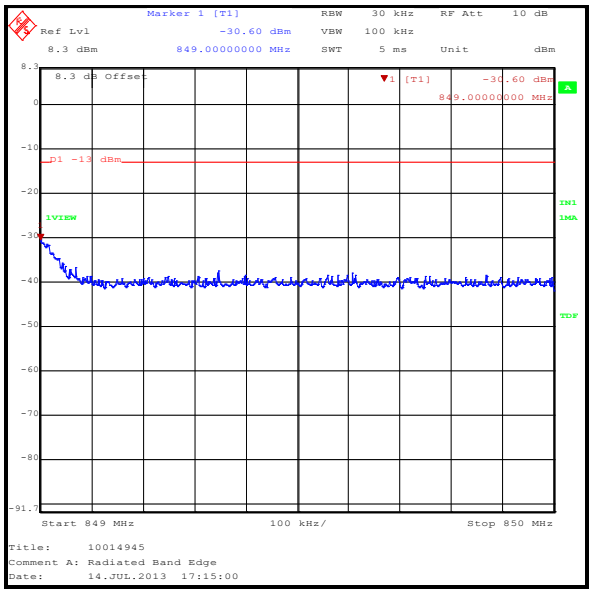
Transmitter Radiated Emissions at Band Edges (continued)

Results: 3 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	15	0	-25.0	-13.0	12.0	Complied
849	15	0	-30.6	-13.0	17.6	Complied



16QAM / Lower Band Edge

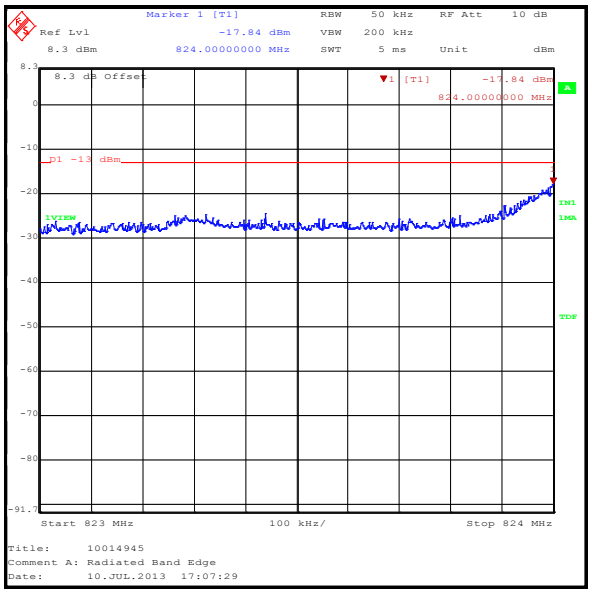


16QAM / Upper Band Edge

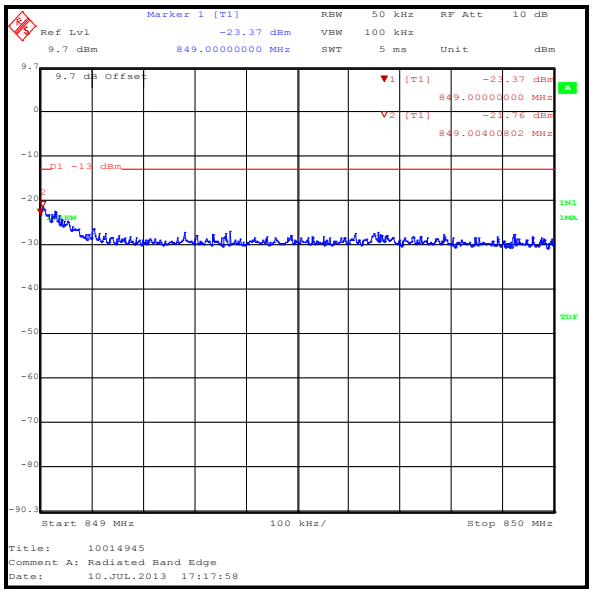
Transmitter Radiated Emissions at Band Edges (continued)

Results: 5 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	25	0	-17.8	-13.0	4.8	Complied
849	25	0	-23.4	-13.0	10.4	Complied
849.004	25	0	-21.8	-13.0	8.8	Complied



QPSK / Lower Band Edge

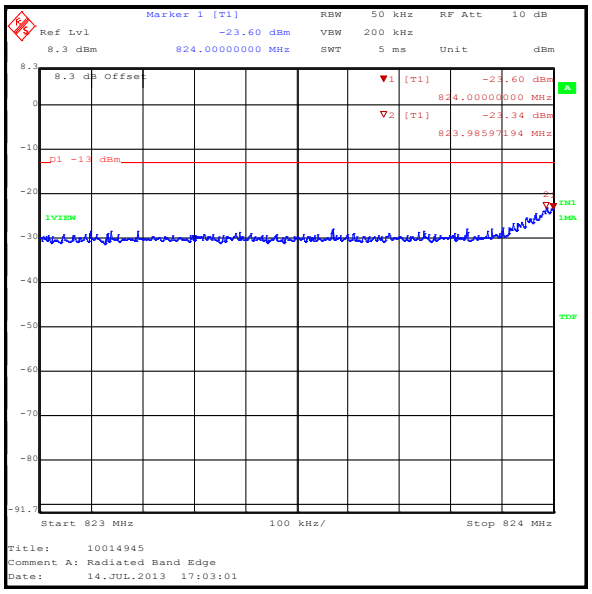


QPSK / Upper Band Edge

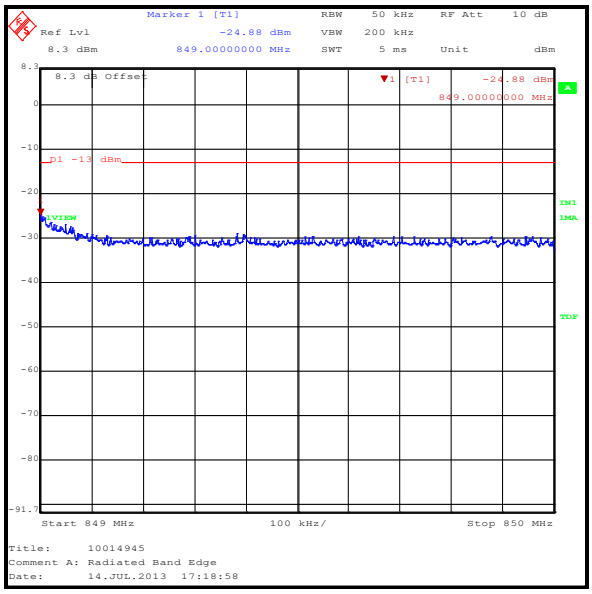
Transmitter Radiated Emissions at Band Edges (continued)

Results: 5 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
823.986	25	0	-23.3	-13.0	10.3	Complied
824	25	0	-23.6	-13.0	10.6	Complied
849	25	0	-24.9	-13.0	11.9	Complied



16QAM / Lower Band Edge

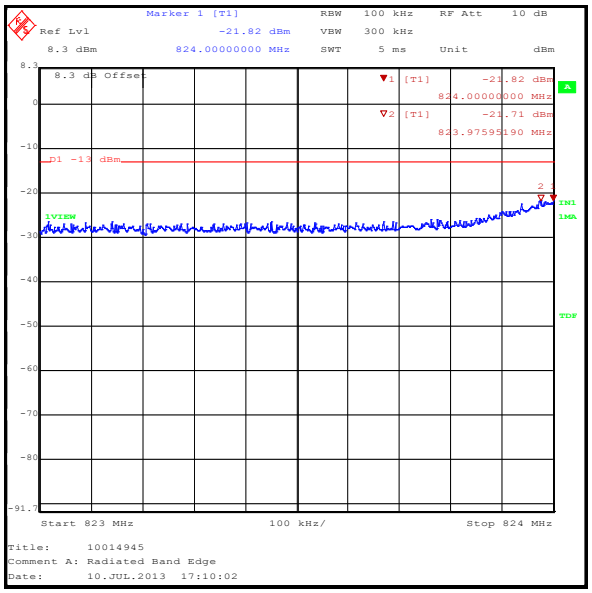


16QAM / Upper Band Edge

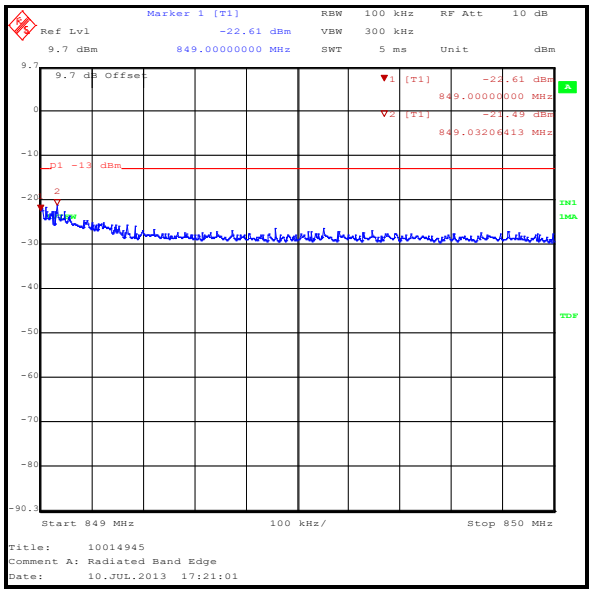
Transmitter Radiated Emissions at Band Edges (continued)

Results: 10 MHz Channel Bandwidth / QPSK

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
823.976	50	0	-21.7	-13.0	8.7	Complied
824	50	0	-21.8	-13.0	8.8	Complied
849	50	0	-22.6	-13.0	9.6	Complied
849.032	50	0	-21.5	-13.0	8.5	Complied



QPSK / Lower Band Edge

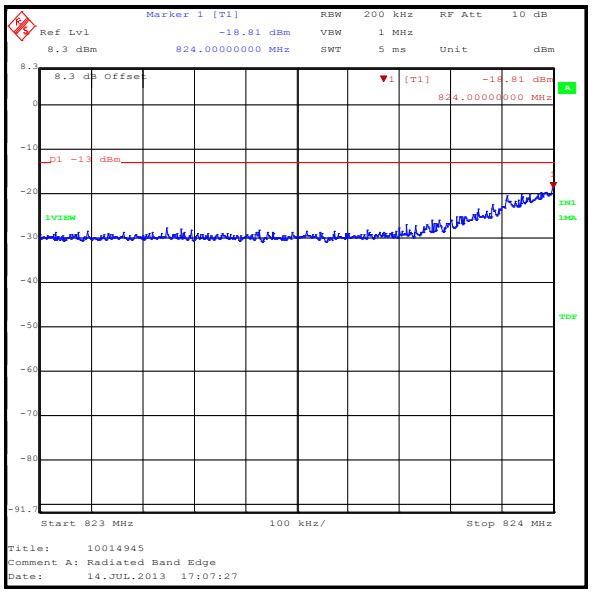


QPSK / Upper Band Edge

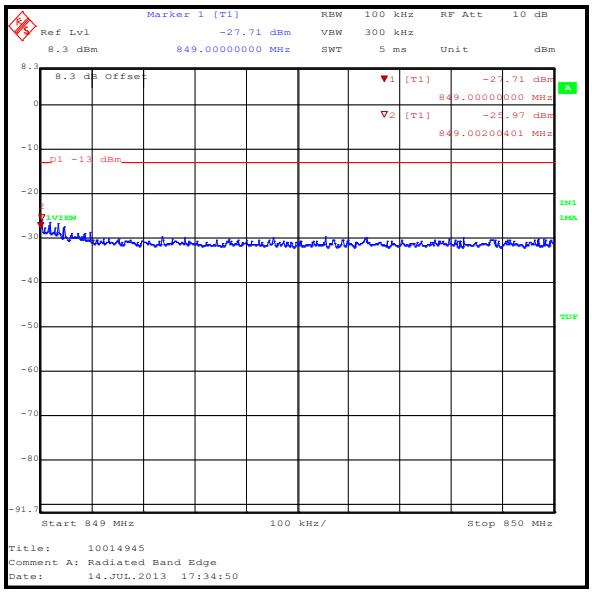
Transmitter Radiated Emissions at Band Edges (continued)

Results: 10 MHz Channel Bandwidth / 16QAM

Frequency (MHz)	Resource Block(s)	Resource Block Offset	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	25	0	-18.8	-13.0	5.8	Complied
849	25	0	-27.7	-13.0	14.7	Complied
849.002	25	0	-26.0	-13.0	13.0	Complied



16QAM / Lower Band Edge



16QAM / Upper Band Edge

Transmitter Radiated Emissions at Band Edges (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1656	Thermometer / Hygrometer station	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12
K0002	3m RSE Chamber	Rainford	N/A	N/A	04 Nov 2013	12
M1124	Test Receiver	Rohde & Schwarz	ESIB 26	100046K	14 Aug 2013	12
A288	Antenna	Chase	CBL6111A	1589	15 Aug 2013	12
A1396	Attenuator	Huber & Suhner	6810.17.B	757987	10 May 2014	12

5.2.5. Transmitter Frequency Stability (Temperature Variation)

Test Summary:

Test Engineers:	Ahmed Ali & Nick Steele	**Test Dates:**	09 July 2013 & 10 July 2013
Test Sample IMEI:	004402451254886		

FCC Reference:	Parts 2.1055 & 22.355
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.2 referencing FCC CFR Part 2.1055

Environmental Conditions:

Ambient Temperature (°C):	23 to 24
Ambient Relative Humidity (%):	38 to 42

Note(s):

1. A voltage variation jig was connected to the EUT which was powered via a bench power supply.
2. Frequency error was measured using a calibrated Rohde and Schwarz CMW 500 Universal Radio Communications Tester in accordance with current Rohde and Schwarz application notes. The EUT was connected by suitable RF cables to the CMW 500. A bi-directional communications link was established between the EUT and CMW 500. The frequency meter value was recorded.
3. Temperature was monitored throughout the test with a calibrated digital thermometer.

Results: Middle Channel (836.5 MHz)

Temperature (°C)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
-30	836.500005	5	0.0060	2.5	2.4940	Complied
-20	836.500007	7	0.0084	2.5	2.4916	Complied
-10	836.500006	6	0.0072	2.5	2.4928	Complied
0	836.500006	6	0.0072	2.5	2.4928	Complied
10	836.500006	6	0.0072	2.5	2.4928	Complied
20	836.500006	6	0.0072	2.5	2.4928	Complied
30	836.500006	6	0.0072	2.5	2.4928	Complied
40	836.500006	6	0.0072	2.5	2.4928	Complied
50	836.500007	7	0.0084	2.5	2.4916	Complied

Transmitter Frequency Stability (Temperature Variation) (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermometer / Hygrometer station	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12
M1752	Radio Comms Tester	Rohde & Schwarz	CMW 500	139551	19 Jun 2014	12
E0513	Environmental Chamber	TAS	LT600 Series 3	23900506	Calibrated before use	-
M1643	Thermometer	Fluke	52II	18890136	19 Mar 2014	12
S0557	DC power supply	TTI	EL303R	395819	Calibrated before use	-
M1269	Multimeter	Fluke	179	90250210	30 Jul 2013	12

5.2.6. Transmitter Frequency Stability (Voltage Variation)

Test Summary:

Test Engineers:	Ahmed Ali & Nick Steele	**Test Dates:**	09 July 2013 & 10 July 2013
Test Sample IMEI:	004402451254886		

FCC Reference:	Part 2.1055 & 22.355
Test Method Used:	As detailed in ANSI TIA-603-C-2004 Section 2.2.2 referencing FCC CFR Part 2.1055

Environmental Conditions:

Temperature (°C):	23 to 24
Relative Humidity (%):	38 to 42

Note(s):

1. A voltage variation jig was connected to the EUT which was powered via a bench power supply.
2. Frequency error was measured using a calibrated Rohde and Schwarz CMW 500 Universal Radio Communications Tester in accordance with current Rohde and Schwarz application notes. The EUT was connected by suitable RF cables to the CMW 500. A bi-directional communications link was established between the EUT and CMW 500. The frequency meter value was recorded.
3. Voltage was monitored throughout the test with a calibrated digital voltmeter.

Results: Middle Channel (836.5 MHz)

Supply Voltage (V)	Measured Frequency (MHz)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)	Margin (ppm)	Result
3.6	836.500006	6	0.0072	2.5	2.4928	Complied
4.2	836.500005	5	0.0060	2.5	2.4940	Complied

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
M1659	Thermometer / Hygrometer station	JM Handelspunkt	30.5015.13	None stated	24 May 2014	12
M1752	Radio Comms Tester	Rohde & Schwarz	CMW 500	139551	19 Jun 2014	12
E0513	Environmental Chamber	TAS	LT600 Series 3	23900506	Calibrated before use	-
M1643	Thermometer	Fluke	52II	18890136	19 Mar 2014	12
S0557	DC power supply	TTI	EL303R	395819	Calibrated before use	-

6. Measurement Uncertainty

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor such that a confidence level of approximately 95% is maintained. For the purposes of this document “approximately” is interpreted as meaning “effectively” or “for most practical purposes”.

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
Conducted Output Power	824 to 849 MHz	95%	±1.13 dB
Frequency Stability	824 to 849 MHz	95%	±0.92 ppm
Occupied Bandwidth	824 to 849 MHz	95%	±0.92 ppm
Radiated Spurious Emissions	30 MHz to 1 GHz	95%	±5.65 dB
Radiated Spurious Emissions	1 GHz to 9 GHz	95%	±2.94 dB

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty the published guidance of the appropriate accreditation body is followed.

7. Report Revision History

Version Number	Revision Details		
	Page No(s)	**Clause**	**Details**
1.0	-	-	Initial Version