1. LTE Uplink Carrier Aggregation configurations

LTE Inter-Band Carrier Aggregation

According to October 2018 TCB workshop, Uplink CA SAR test Guidance as follows;

- Provide the single uplink SAR values you have obtained for the relevant SAR configurations and frequency bands that employ inter-band uplink carrier aggregation.
- If the single uplink 1-g SAR values for each band are both less than 0.8 W/kg and the algebraic summation of the 1-g SAR values are less than 1.45 W/kg no additional measurements need to be performed.
- If one of the single uplink 1-g SAR values is greater than 0.8 W/kg, instead of algebraically summing the 1-g SAR values, sum up the SAR distributions, similar to the enlarged zoom scan (volume scan) procedures found in FCC KDB Publication 865664 D01 SAR Measurement 100 MHz to 6GHz v01.
- If the algebraic sum of the 1-g SAR values is > 1.45 W/kg additional measurements may have to be made. Submit a KDB inquiry for additional guidance.

Maximum Output Power (Tune-up Limit) and SAR test exemption for LTE UL Carrier Aggregation

Test positions and test channels used for the testing below are based on the standalone worst-case SAR results.
UL CA is same target power with standalone LTE.

UL CA Inter-bands	RF exposure Conditions	Antenna		Standalone worst-case position					UL CA					
				Tune-up Limit (dBm)		Volume	Reported SAR (W/kg)		Tune-up Limit (dBm)		Volume	Reported SAR (W/kg)		
		CC1	CC2	CC1	CC2		CC1	CC1	CC1	CC2		CC1	CC2	CC1 + CC2
CA_2A-4A	Head	Main Ant.1	Main Ant.3	24.5	18.5	1-g	0.096	0.785	24.5	18.5	1-g	Please refer to Section 12.20		
	Body-worn	Main Ant.1	Main Ant.3	24.5	22.5	1-g	0.722	0.165	24.5	22.5	1-g			
	Hotspot	Main Ant.1	Main Ant.3	21.0	18.5	1-g	1.222	0.405	21.0	18.5	1-g			
	Product Specific 10-g	Main Ant.1	Main Ant.3	24.5 / 21.0	22.5	10-g	1.744	N/A	24.5 / 21.0	22.5	10-g			
CA_2A-4A	Head	Main Ant.3	Main Ant.1	18.5	24.5	1-g	0.791	0.066	18.5	24.5	1-g	Please refer to Section 12.21		
	Body-worn	Main Ant.3	Main Ant.1	22.5	24.5	1-g	0.147	0.490	22.5	24.5	1-g			
	Hotspot	Main Ant.3	Main Ant.1	18.5	21.0	1-g	0.450	0.977	18.5	21.0	1-g			
	Product Specific 10-g	Main Ant.3	Main Ant.1	22.5	24.5 / 21.0	10-g	N/A	1.697	22.5	24.5 / 21.0	10-g			
CA_12A-66A (CA_4A-12A)	Head	Main Ant.1	Main Ant.1	25.0	24.5	1-g	0.161	0.066	25.0	24.5	1-g	Please refer to Section 12.22		
	Body-worn	Main Ant.1	Main Ant.1	25.0	24.5	1-g	0.181	0.490	25.0	24.5	1-g			
	Hotspot	Main Ant.1	Main Ant.1	25.0	21.0	1-g	0.335	0.977	25.0	21.0	1-g			
	Product Specific 10-g	Main Ant.1	Main Ant.1	25.0	24.5 / 21.0	10-g	N/A	1.697	25.0	24.5 / 21.0	10-g			
CA_5A-66A (CA_4A-5A)	Head	Main Ant.1	Main Ant.1	25.0	24.5	1-g	0.208	0.066	25.0	24.5	1-g	Please refer to Section 12.23		
	Body-worn	Main Ant.1	Main Ant.1	25.0	24.5	1-g	0.341	0.490	25.0	24.5	1-g			
	Hotspot	Main Ant.1	Main Ant.1	25.0	21.0	1-g	0.680	0.977	25.0	21.0	1-g			
	Product Specific 10-g	Main Ant.1	Main Ant.1	25.0	24.5 / 21.0	10-g	N/A	1.697	25.0	24.5 / 21.0	10-g			

Conclusion:

1. Please refer to Section 12. All UL CA configurations are evaluated according to Uplink CA SAR test guidance of October 2018 TCB workshop.

2. For CA_4A-12A, it is subset of CA_12A-66A.

3. For CA_4A-5A, It is subset of CA_5A-66A.

2. LTE Downlink Carrier Aggregation configurations

1. DL Inter Band(2CC)

E-UTRA CA configuration	Bandwidth Combination Set	E-UTRA Band	Bandwidth						Max Aggregated BW
			1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
2A-4A	(0)	Band 2	Yes	Yes	Yes	Yes	Yes	Yes	40
		Band 4			Yes	Yes	Yes	Yes	
	(1)	Band 2			Yes	Yes			20
		Band 4			Yes	Yes			
	(2)	Band 2			Yes	Yes	Yes	Yes	40
		Band 4			Yes	Yes	Yes	Yes	
2A-5A	(0)	Band 2			Yes	Yes	Yes	Yes	30
		Band 5			Yes	Yes			
	(1)	Band 2			Yes	Yes			20
		Band 5			Yes	Yes			
2A-12A	(0)	Band 2			Yes	Yes	Yes	Yes	30
2A-17A	(0)	Band 2			Yes	Yes			20
		Band 17			Yes	Yes			
2A-66A	(0)	Band 2	Yes	Yes	Yes	Yes	Yes	Yes	40
		Band 66			Yes	Yes	Yes	Yes	
	(1)	Band 2			Yes	Yes			20
		Band 66			Yes	Yes			
	(2)	Band 2			Yes	Yes	Yes	Yes	40
		Band 66			Yes	Yes	Yes	Yes	
4A-5A	(0)	Band 2			Yes	Yes			20
		Band 71			Yes	Yes			
	(1)	Band 4			Yes	Yes	Yes	Yes	30
		Band 5			Yes	Yes			
4A-12A	(0)	Band 4	Yes	Yes	Yes	Yes			20
		Band 12			Yes	Yes			
	(1)	Band 4	Yes	Yes	Yes	Yes	Yes	Yes	30
		Band 12			Yes	Yes			
	(2)	Band 4			Yes	Yes	Yes	Yes	30
		Band 12		Yes	Yes	Yes			
	(3)	Band 4			Yes	Yes			20
		Band 12			Yes	Yes			
	(4)	Band 4			Yes	Yes	Yes	Yes	30
		Band 12			Yes	Yes			
	(5)	Band 4			Yes	Yes	Yes		20
		Band 12			Yes				
4A-13A	(0)	Band 4			Yes	Yes	Yes	Yes	30
		Band 13				Yes			
	(1)	Band 4			Yes	Yes			20
		Band 13				Yes			
4A-17A	(0)	Band 4			Yes	Yes			20
		Band 17			Yes	Yes			
5A-41A	(0)	Band 5			Yes	Yes			30
		Band 41						Yes	
5A-66A	(0)	Band 5			Yes	Yes			30
		Band 66			Yes	Yes	Yes	Yes	
12A-66A	(0)	Band 12			Yes	Yes			20
		Band 66	Yes	Yes	Yes	Yes			
	(1)	Band 12			Yes	Yes			30
		Band 66	Yes	Yes	Yes	Yes	Yes	Yes	
	(2)	Band 12		Yes	Yes	Yes			30
		Band 66			Yes	Yes	Yes	Yes	
	(3)	Band 12			Yes	Yes			20
		Band 66			Yes	Yes			
	(4)	Band 12			Yes	Yes			30
		Band 66			Yes	Yes	Yes	Yes	
	(5)	Band 12			Yes				20
		Band 66			Yes	Yes	Yes		
26A-41A	(0)	Band 26			Yes	Yes	Yes		35
		Band 41			Yes	Yes	Yes	Yes	
2A-13A	(0)	Band 2			Yes	Yes	Yes	Yes	30
		Band 13				Yes			
	(1)	Band 2			Yes	Yes			20
		Band 13				Yes			

2. DL Inter Band(3CC)

E-UTRA CA configuration	Bandwidth Combination Set	E-UTRA Band	Bandwidth						Max Aggregated BW
			1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
2A-4A-5A	(0)	Band 2			Yes	Yes	Yes	Yes	50
		Band 4			Yes	Yes	Yes	Yes	
		Band 5			Yes	Yes			
2A-4A-13A	(0)	Band 2			Yes	Yes	Yes	Yes	50
		Band 4			Yes	Yes	Yes	Yes	
		Band 13				Yes			
4A-4A-12A	(0)	Band 4	4A-4A BCS 0						50
		Band 12			Yes	Yes			
4A-4A-17A	(0)	Band 4	4A-4A BCS 0						60
		Band 17			Yes	Yes	Yes	Yes	
5A-66A-66A	(0)	Band 5			Yes	Yes			50
		Band 12			Yes	Yes			
12A-66A-66A	(0)	Band 12	66A-66A BCS 0						50
		Band 66							
26A-41C	(0)	Band 26			Yes	Yes	Yes		55
		Band 66	41C BCS 1						

3. DL Intra Band(non-contiguous)

E-UTRA CA configuration	Bandwidth Combination Set	E-UTRA Band	Allowed Channel BW Per Carrier (MHz)				Max Aggregated BW
			1st Carrier	2nd Carrier	3rd Carrier	4th Carrier	
2A-2A	(0)	Band 2	5, 10, 15, 20	5, 10, 15, 20			40
4A-4A	(0)	Band 4	5, 10, 15, 20	5, 10, 15, 20			40
	(1)	Band 4	5, 10	5, 10			20
41A-41A	(0)	Band 41	10, 15, 20	10, 15, 20			40
	(1)	Band 41	5, 10, 15, 20	5, 10, 15, 20			40
41A-41C	(0)	Band 41	5, 10, 15, 20	41C BCS 1			60
		Band 41	41C BCS 1		5, 10, 15, 20		
41A-41D	(0)	Band 41	15, 20	BCS 0			80
		Band 41	41D BCS 0	5, 10, 15, 20			
41C-41C	(0)	Band 41	41C BCS 1				80
41C-41D	(0)	Band 41	41C BCS 0	41D BCS 0			100
66A-66A	(0)	Band 66	5, 10, 15, 20	5, 10, 15, 20			40

4. DL Intra Band(contiguous)

E-UTRA CA configuration	Bandwidth Combination	E-UTRA Band	Allowed Channel BW Per Carrier (MHz)					Max Aggregated
			1st Carrier	2nd Carrier	3rd Carrier	4th Carrier	5th Carrier	
41C	(0)	Band 41	10	20				40
			15	15, 20				
			20	10, 15, 20				
	(1)	Band 41	5, 10	20				40
			15	15, 20				
			20	5, 10, 15, 20				
	(2)	Band 41	10	15, 20				40
			15	10, 15, 20				
			20	10, 15, 20				
	(3)	Band 41	10	20				40
			20	20				
41D	(0)	Band 41	10	20	15			60
			10	15, 20	20			
			15	20	10, 15			
			15	10, 15, 20	20			
			20	15, 20	10			
			20	10, 15, 20	15, 20			
41E	(0)	Band 41	15, 20	15, 20	15, 20	20		80
66B	(0)	Band 66	5	5, 10, 15				20
			10	5, 10				
			15	5				
66C	(0)	Band 66	5	20				40
			10	15, 20				
			15	10, 15, 20				
			20	5, 10, 15, 20				
2C	(0)	Band 2	5	20				40
			10	15, 20				
			15	10, 15, 20				
			20	5, 10, 15, 20				

LTE Downlink Carrier Aggregation Combinations

The DL CA power measurement conditions for various CC's combinations were determined according LTE DL CA SAR Test Exclusion guidance in TCB workshop note (April 2018). Only yellow highlighted cells need power measurement. The following power measurements were performed with a single carrier uplink; CA for this particular project only supports one (1) uplink and up to four (5) downlinks.

LTE Release 10 Carrier Aggregation

Index	2CC	Restriction	Completely Covered by Measurement Superset
2CC#1	2A-2A		
2CC#2	2C		
2CC#3	2A-4A		3CC#1
2CC#4	2A-5A		3CC#1
2CC#5	2A-12A		
2CC#6	2A-13A		3CC#2
2CC#7	2A-17A	B17 SCC Only	
2CC#8	2A-66A		
2CC#9	4A-4A		3CC#3
2CC#10	4A-5A		3CC#1
2CC#11	4A-12A		3CC#3
2CC#12	4A-13A		3CC#2
2CC#13	4A-17A	B17 SCC Only	3CC#4
2CC#14	5A-41A	B41 SCC Only	
2CC#15	5A-66A		3CC#5
2CC#16	12A-66A		3CC#6
2CC#17	26A-41A	B41 SCC Only	
2CC#18	41A-41A		
2CC#19	41C		4CC#2
2CC#20	66A-66A		3CC#5
2CC#21	66B		
2CC#22	66C		

Index	3CC	Restriction	Completely Covered by Measurement Superset
3CC#1	2A-4A-5A		
3CC#2	2A-4A-13A		
3CC#3	4A-4A-12A		
3CC#4	4A-4A-17A	B17 SCC Only	
3CC#5	5A-66A-66A		
3CC#6	12A-66A-66A		
3CC#7	26A-41C	B41 SCC Only	
3CC#8	41A-41C		
3CC#9	41D		

Index	4CC	Restriction	Completely Covered by Measurement Superset
4CC#1	41A-41D		
4CC#2	41C-41C		
4CC#3	41E		

Index	5CC	Restriction	Completely Covered by Measurement Superset
5CC#1	41C-41D		

Note:

Only yellow highlight cells need power measurement according to LTE DL CA SAR test Exclusion in TCB workshop (April.2018).

LTE Release 10 Carrier Aggregation with 4x4 MIMO

Index	2CC	Restriction	Completely Covered by Measurement Superset
2CC#1	2A-[4A]		3CC#1
2CC#2	2A-[66A]		
2CC#3	[4A]-[4A]		3CC#3
2CC#4	[4A]-5A		3CC#1
2CC#5	[4A]-12A		3CC#3
2CC#6	[4A]-13A		3CC#2
2CC#7	[4A]-17A	B17 SCC Only	3CC#4
2CC#8	5A-[41A]	B41 SCC Only	
2CC#9	5A-[66A]		3CC#5
2CC#10	12A-[66A]		3CC#6
2CC#11	26A-[41A]	B41 SCC Only	
2CC#12	[41A]-[41A]		
2CC#13	[41C]		4CC#2
2CC#14	[66A]-[66A]		3CC#5

Index	3CC	Restriction	Completely Covered by Measurement Superset
3CC#1	2A-[4A]-5A		
3CC#2	2A-[4A]-13A		
3CC#3	[4A]-[4A]-12A		
3CC#4	[4A]-[4A]-17A	B17 SCC Only	
3CC#5	5A-[66A]-[66A]		
3CC#6	12A-[66A]-[66A]		
3CC#7	26A-[41C]	B41 SCC Only	
3CC#8	[41A]-[41C]		
3CC#9	[41D]		

Index	4CC	Restriction	Completely Covered by Measurement Superset
4CC#1	[41A]-[41D]		
4CC#1	[41A]-[41D]		
4CC#2	[41C]-[41C]		
4CC#3	[41E]		

Note:

Only yellow highlight cells need power measurement according to LTE DL CA SAR test Exclusion in TCB workshop (April.2018).
[*] is 4X4 MIMO configuration.

Single Carrier Downlink 4x4 MIMO output power results

LTE Bands	Modulation	BW (MHz)	Channel	Freq. (MHz)	RB/Offset	LTE Rel 8 Tx. Power [dBm]	DL 4x4 MIMO Tx. Power [dBm]	Delta
LTE B4	QPSK	20	20175	1732.5	1/0	23.0	23.0	-0.04
LTE B66	QPSK	20	132072	1720	1/49	23.3	23.3	-0.03
LTE B41	QPSK	20	40620	2593	1/0	23.8	23.7	-0.05

Note:

According to LTE Test Conditions in TCB workshop (May, 2017), SAR is excluded for LTE downlink 4x4 MIMO operation when uplink output with DL MIMO does not exceed highest uplink output power configuration without DL MIMO by more than 1/4 dB. And for DL MIMO with carrier aggregation, the same SAR test exclusion procedure is considered.

DL CA output power results

E-UTRA CA configutation (BCS)	Bands					UL					DL																LTE Rel 8 Tx. Power [dBm]	LTE Rel 10 Tx. Power [dBm]	Delta
	PCC	SCC	SCC	SCC	SCC	PCC					PCC			SCC1			SCC2			SCC3			SCC4					
	1st	2nd	3rd	4th	5th	Mode	BW (MHz)	Channel	Freq. (MHz)	RB/Offset	BW (MHz)	Channel	Freq. (MHz)	BW (MHz)	Channel	Freq. (MHz)	BW (MHz)	Channel	Freq. (MHz)	BW (MHz)	Channel	Freq. (MHz)	BW (MHz)	Channel	Freq. (MHz)			
2A-2A	2A	2A				QPSK	20	19100	1900	1/0	20	1100	1980	20	700	1940										23.44	23.40	-0.04
2C	2C	2C				QPSK	20	19100	1900	1/0	20	1100	1980	20	902	1960.2										23.44	23.42	-0.02
2A-12A	2A	12A				QPSK	20	19100	1900	1/0	20	1100	1980	10	5095	737.5										23.44	23.40	-0.04
	12A	2A				QPSK	10	23095	707.5	1/25	10	5095	737.5	20	900	1960										23.94	23.84	-0.10
2A-17A	2A	17A				QPSK	20	19100	1900	1/0	20	1100	1980	10	5790	740										23.44	23.49	0.05
2A-66A	2A	66A				QPSK	20	19100	1900	1/0	20	1100	1980	20	66786	2145										23.44	23.40	-0.04
	66A	2A				QPSK	20	132072	1720	1/49	20	66536	2120	20	900	1960										23.31	23.20	-0.11
5A-41A	5A	41A				QPSK	10	20525	836.5	1/25	10	2525	881.5	20	40620	2593										24.13	24.08	-0.05
26A-41A	26A	41A				QPSK	15	26865	831.5	1/37	15	8865	876.5	20	2593	40620										23.67	23.61	-0.06
41A-41A	41A	41A				QPSK	20	40620	2593	1/0	20	40620	2593	20	39750	2506										23.75	23.65	-0.10
66B	66B	66B				QPSK	15	132322	1745	1/37	15	66786	2145	5	66693	2135.7										22.63	22.68	0.05
66C	66C	66C				QPSK	20	132072	1720	1/49	20	66536	2120	20	66734	2139.8										23.31	23.40	0.09
2A-4A-5A	2A	4A	5A			QPSK	20	19100	1900	1/0	20	1100	1980	20	2175	2132.5	10	2525	881.5							23.44	23.43	-0.01
	4A	2A	5A			QPSK	20	20175	1732.5	1/0	20	2175	2132.5	20	900	1960	10	2525	881.5							23.02	22.96	-0.06
	5A	2A	4A			QPSK	10	20525	836.5	1/25	10	2525	881.5	20	900	1960	20	2175	2132.5							24.13	24.15	0.02
2A-4A-13A	2A	4A	13A			QPSK	20	19100	1900	1/0	20	1100	1980	20	2175	2132.5	10	5230	751							23.44	23.42	-0.02
	4A	2A	13A			QPSK	20	20175	1732.5	1/0	20	2175	2132.5	20	900	1960	10	5230	751							23.02	22.88	-0.14
	13A	2A	4A			QPSK	10	23230	782	1/0	10	5230	751	20	900	1960	20	2175	2132.5							23.12	23.20	0.08
4A-4A-12A	4A	4A	12A			QPSK	15	20025	1717.5	1/37	15	2025	2117.5	15	2325	2147.5	10	5095	737.5							22.66	22.61	-0.05
	12A	4A	4A			QPSK	10	23095	707.5	1/25	10	5095	737.5	15	2025	2117.5	15	2325	2147.5							23.94	24.00	0.06
4A-4A-17A	4A	4A	17A			QPSK	15	20025	1717.5	1/37	15	2025	2117.5	15	2325	2147.5	10	5790	740							22.66	22.64	-0.02
5A-66A-66A	5A	66A	66A			QPSK	10	20525	836.5	1/25	10	2525	881.5	20	66536	2120	20	67036	2170							24.13	24.11	-0.02
	66A	66A	5A			QPSK	20	132072	1720	1/49	20	66536	2120	20	67036	2170	10	2525	881.5							23.31	23.29	-0.02
12A-66A-66A	12A	66A	66A			QPSK	10	23095	707.5	1/25	10	5095	737.5	20	66536	2120	20	67036	2170							23.94	23.99	0.05
	66A	66A	12A			QPSK	20	132072	1720	1/49	20	66536	2120	20	67036	2170	10	5095	737.5							23.31	23.20	-0.11
26A-41C	26A	41C	41C			QPSK	15	26865	831.5	1/37	15	8865	876.5	20	40620	2593	20	40422	2573.2							23.67	23.71	0.04
41A-41C	41A	41C	41C			QPSK	20	40620	2593	1/0	20	40620	2593	20	39750	2506	20	39948	2525.8							23.75	23.71	-0.04
	41C	41C	41A			QPSK	20	40620	2593	1/0	20	40620	2593	20	40422	2573.2	20	39750	2506							23.75	23.63	-0.12
41D	41D	41D	41D			QPSK	20	40620	2593	1/0	20	40620	2593	20	40422	2573.2	20	40224	2553.4							23.75	23.74	-0.01
41A-41D	41A	41D	41D	41D		QPSK	20	40620	2593	1/0	20	40620	2593	20	41490	2680	20	41292	2660.2	20	41094	2640.4				23.75	23.74	-0.01
	41D	41D	41D	41A		QPSK	20	40620	2593	1/0	20	40620	2593	20	40422	2573.2	20	40224	2553.4	20	41490	2680				23.75	23.71	-0.04
41C-41C	41C	41C	41C	41C		QPSK	20	40620	2593	1/0	20	40620	2593	20	40422	2573.2	20	41490	2680	20	41292	2660.2				23.75	23.69	-0.06
41E	41E	41E	41E	41E		QPSK	20	40620	2593	1/0	20	40620	2593	20	40422	2573.2	20	40224	2553.4	20	40026	2533.6				23.75	23.68	-0.07
41C-41D	41C	41C	41D	41D	41D	QPSK	20	40620	2593	1/0	20	40620	2593	20	40422	2573.2	20	41490	2680	20	41292	2660.2	20	41094	2640.4	23.75	23.88	0.13
	41D	41D	41D	41C	41C	QPSK	20	40620	2593	1/0	20	40620	2593	20	40422	2573.2	20	40224	2553.4	20	41490	2680	20	41292	2660.2	23.75	23.74	-0.01

Note:

1. Per KDB 941225 D05A LTE Rel. 10 KDB Inquiry Sheet: SAR is excluded for Carrier Aggregation when measured power does not exceed LTE Release 8 by more than a 1/4 dB.
2. When the same frequency band is used for both contiguous and non-contiguous in DL CA Intra band, power was measured using the configuration with the largest aggregated bandwidth and maximum output power among the contiguous and non-contiguous in DL CA Intra band configurations.

DL CA with 4x4 MIMO output power results

E-UTRA CA	Bands				UL					DL													LTE Rel 8 Tx. Power [dBm]	LTE Rel 10 Tx. Power [dBm]	Delta
	PCC	SCC	SCC	SCC	PCC					PCC			SCC1			SCC2			SCC3					
	1st	2nd	3rd	4th	Mode	BW (MHz)	Channel	Freq. (MHz)	RB/Offset	BW (MHz)	Channel	Freq. (MHz)	BW (MHz)	Channel	Freq. (MHz)	BW (MHz)	Channel	Freq. (MHz)	BW (MHz)	Channel	Freq. (MHz)			
2A-66A	2A	[66A]			QPSK	20	19100	1900	1/0	20	1100	1980	20	66786	2145							23.44	23.40	-0.04
	[66A]	2A			QPSK	20	132072	1720	1/49	20	66536	2120	20	900	1960							23.31	23.26	-0.05
5A-41A	5A	[41A]			QPSK	10	20525	836.5	1/25	10	2525	881.5	20	40620	2593							24.13	24.10	-0.03
26A-41A	26A	[41A]			QPSK	15	26865	831.5	1/37	15	8865	876.5	20	2593	40620							23.67	23.62	-0.05
41A-41A	[41A]	41A			QPSK	20	40620	2593	1/0	20	40620	2593	20	39750	2506							23.75	23.72	-0.03
	41A	[41A]			QPSK	20	40620	2593	1/0	20	40620	2593	20	39750	2506							23.75	23.70	-0.05
	[41A]	[41A]			QPSK	20	40620	2593	1/0	20	40620	2593	20	39750	2506							23.75	23.70	-0.05
2A-4A-5A	2A	[4A]	5A		QPSK	20	19100	1900	1/0	20	1100	1980	20	2175	2132.5	10	2525	881.5				23.44	23.40	-0.04
	[4A]	2A	5A		QPSK	20	20175	1732.5	1/0	20	2175	2132.5	20	900	1960	10	2525	881.5				23.02	22.97	-0.05
	5A	2A	[4A]		QPSK	10	20525	836.5	1/25	10	2525	881.5	20	900	1960	20	2175	2132.5				24.13	24.10	-0.03
2A-4A-13A	2A	[4A]	13A		QPSK	20	19100	1900	1/0	20	1100	1980	20	2175	2132.5	10	5230	751				23.44	23.39	-0.05
	[4A]	2A	13A		QPSK	20	20175	1732.5	1/0	20	2175	2132.5	20	900	1960	10	5230	751				23.02	22.98	-0.04
	13A	2A	[4A]		QPSK	10	23230	782	1/0	10	5230	751	20	900	1960	20	2175	2132.5				23.12	23.11	-0.01
4A-4A-12A	[4A]	4A	12A		QPSK	15	20025	1717.5	1/37	15	2025	2117.5	15	2325	2147.5	10	5095	737.5				22.66	22.63	-0.03
	[4A]	[4A]	12A		QPSK	15	20025	1717.5	1/37	15	2025	2117.5	15	2325	2147.5	10	5095	737.5				22.66	22.71	0.05
	4A	[4A]	12A		QPSK	15	20025	1717.5	1/37	15	2025	2117.5	15	2325	2147.5	10	5095	737.5				22.66	22.64	-0.02
	12A	[4A]	4A		QPSK	10	23095	707.5	1/25	10	5095	737.5	15	2025	2117.5	15	2325	2147.5				23.94	23.89	-0.05
	12A	[4A]	[4A]		QPSK	10	23095	707.5	1/25	10	5095	737.5	15	2025	2117.5	15	2325	2147.5				23.94	23.90	-0.04
4A-4A-17A	[4A]	4A	17A		QPSK	15	20025	1717.5	1/37	15	2025	2117.5	15	2325	2147.5	10	5790	740				22.66	22.60	-0.06
	[4A]	[4A]	17A		QPSK	15	20025	1717.5	1/37	15	2025	2117.5	15	2325	2147.5	10	5790	740				22.66	22.60	-0.06
	4A	[4A]	17A		QPSK	15	20025	1717.5	1/37	15	2025	2117.5	15	2325	2147.5	10	5790	740				22.66	22.68	0.02
5A-66A-66A	5A	[66A]	66A		QPSK	10	20525	836.5	1/25	10	2525	881.5	20	66536	2120	20	67036	2170				24.13	24.11	-0.02
	5A	[66A]	[66A]		QPSK	10	20525	836.5	1/25	10	2525	881.5	20	66536	2120	20	67036	2170				24.13	24.14	0.01
	[66A]	66A	5A		QPSK	20	132072	1720	1/49	20	66536	2120	20	67036	2170	10	2525	881.5				23.31	23.29	-0.02
	66A	[66A]	5A		QPSK	20	132072	1720	1/49	20	66536	2120	20	67036	2170	10	2525	881.5				23.31	23.31	0.00
	[66A]	[66A]	5A		QPSK	20	132072	1720	1/49	20	66536	2120	20	67036	2170	10	2525	881.5				23.31	23.24	-0.07
12A-66A-66A	12A	[66A]	66A		QPSK	10	23095	707.5	1/25	10	5095	737.5	20	66536	2120	20	67036	2170				23.94	23.90	-0.04
	12A	[66A]	[66A]		QPSK	10	23095	707.5	1/25	10	5095	737.5	20	66536	2120	20	67036	2170				23.94	23.95	0.01
	[66A]	66A	12A		QPSK	20	132072	1720	1/49	20	66536	2120	20	67036	2170	10	5095	737.5				23.31	23.33	0.02
	[66A]	[66A]	12A		QPSK	20	132072	1720	1/49	20	66536	2120	20	67036	2170	10	5095	737.5				23.31	23.31	0.00
	66A	[66A]	12A		QPSK	20	132072	1720	1/49	20	66536	2120	20	67036	2170	10	5095	737.5				23.31	23.29	-0.02
26A-41C	26A	[41C]	[41C]		QPSK	15	26865	831.5	1/37	15	8865	876.5	20	40620	2593	20	40422	2573.2				23.67	23.64	-0.03
41A-41C	[41A]	41C	41C		QPSK	20	40620	2593	1/0	20	40620	2593	20	2506	39750	20	39948	2525.8				23.75	23.71	-0.04
	41A	[41C]	[41C]		QPSK	20	40620	2593	1/0	20	40620	2593	20	2506	39750	20	39948	2525.8				23.75	23.70	-0.05
	[41A]	[41C]	[41C]		QPSK	20	40620	2593	1/0	20	40620	2593	20	2506	39750	20	39948	2525.8				23.75	23.77	0.02
	41C	41C	[41A]		QPSK	20	40620	2593	1/0	20	40620	2593	20	40422	2573.2	20	39750	2506				23.75	23.74	-0.01
	[41C]	[41C]	41A		QPSK	20	40620	2593	1/0	20	40620	2593	20	40422	2573.2	20	39750	2506				23.75	23.65	-0.10
	[41C]	[41C]	[41A]		QPSK	20	40620	2593	1/0	20	40620	2593	20	40422	2573.2	20	39750	2506				23.75	23.71	-0.04
41D	[41D]	[41D]	[41D]		QPSK	20	40620	2593	1/0	20	40620	2593	20	40422	2573.2	20	40224	2553.4				23.75	23.70	-0.05
41A-41D	[41A]	41D	41D	41D	QPSK	20	40620	2593	1/0	20	40620	2593	20	41490	2680	20	41292	2660.2	20	41094	2640.4	23.75	23.66	-0.09
	[41A]	[41D]	[41D]	[41D]	QPSK	20	40620	2593	1/0	20	40620	2593	20	41490	2680	20	41292	2660.2	20	41094	2640.4	23.75	23.64	-0.11
	41A	[41D]	[41D]	[41D]	QPSK	20	40620	2593	1/0	20	40620	2593	20	41490	2680	20	41292	2660.2	20	41094	2640.4	23.75	23.71	-0.04
	[41D]	[41D]	[41D]	41A	QPSK	20	40620	2593	1/0	20	40620	2593	20	40422	2573.2	20	40224	2553.4	20	41490	2680	23.75	23.73	-0.02
	[41D]	[41D]	[41D]	[41A]	QPSK	20	40620	2593	1/0	20	40620	2593	20	40422	2573.2	20	40224	2553.4	20	41490	2680	23.75	23.68	-0.07
	41D	41D	41D	[41A]	QPSK	20	40620	2593	1/0	20	40620	2593	20	40422	2573.2	20	40224	2553.4	20	41490	2680	23.75	23.72	-0.03
41C-41C	[41C]	[41C]	41C	41C	QPSK	20	40620	2593	1/0	20	40620	2593	20	40422	2573.2	20	41490	2680	20	41292	2660.2	23.75	23.70	-0.05
	[41C]	[41C]	[41C]	[41C]	QPSK	20	40620	2593	1/0	20	40620	2593	20	40422	2573.2	20	41490	2680	20	41292	2660.2	23.75	23.70	-0.05
	41C	41C	[41C]	[41C]	QPSK	20	40620	2593	1/0	20	40620	2593	20	40422	2573.2	20	41490	2680	20	41292	2660.2	23.75	23.77	0.02
41E	[4E]	[4E]	[4E]	[4E]	QPSK	20	40620	2593	1/0	20	40620	2593	20	40422	2573.2	20	40224	2553.4	20	40026	2533.6	23.75	23.66	-0.09

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