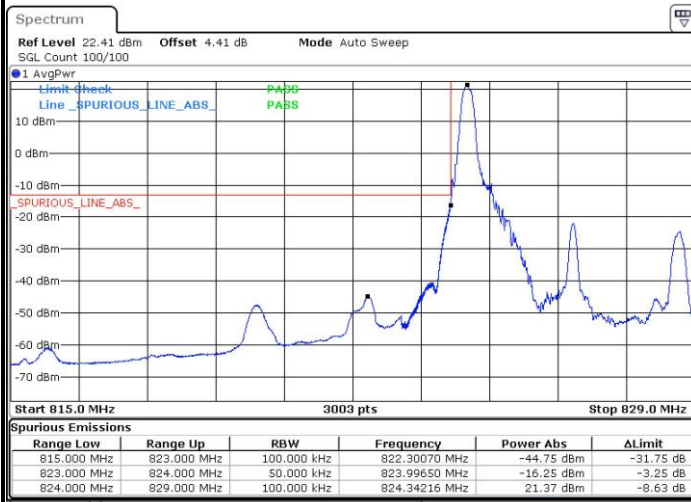




LTE Band 5 / 5MHz / QPSK

Lowest Band Edge / 1 RB



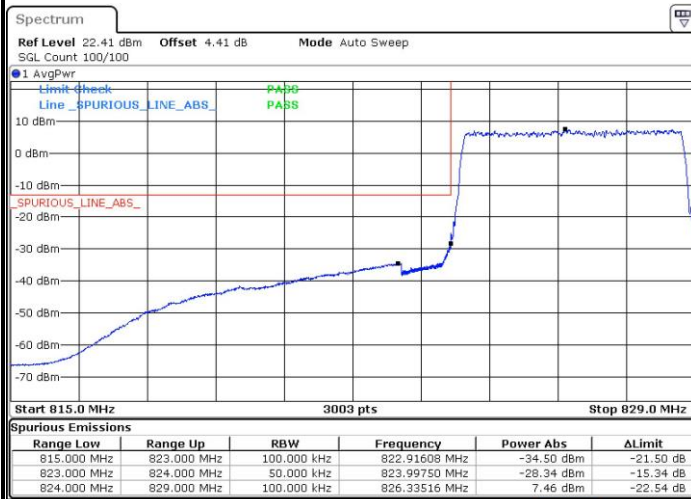
Date: 19 JAN 2017 19:41:21

Highest Band Edge / 1 RB



Date: 19 JAN 2017 19:53:15

Lowest Band Edge / Full RB



Date: 19 JAN 2017 19:44:39

Highest Band Edge / Full RB

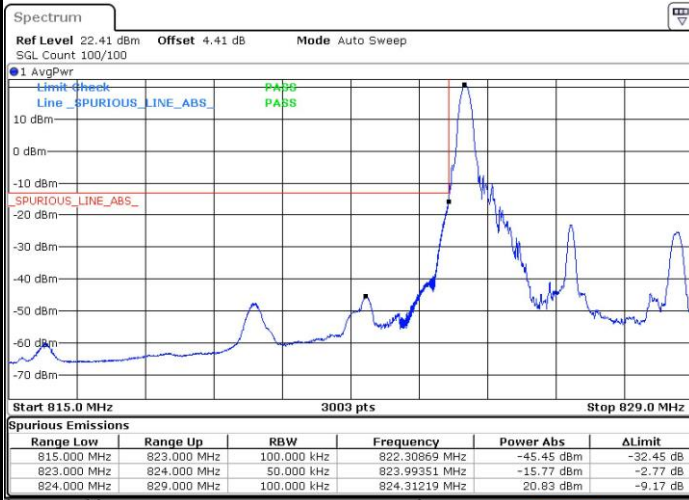


Date: 19 JAN 2017 19:56:34



LTE Band 5 / 5MHz / 16QAM

Lowest Band Edge / 1RB



Highest Band Edge / 1 RB



Lowest Band Edge / Full RB



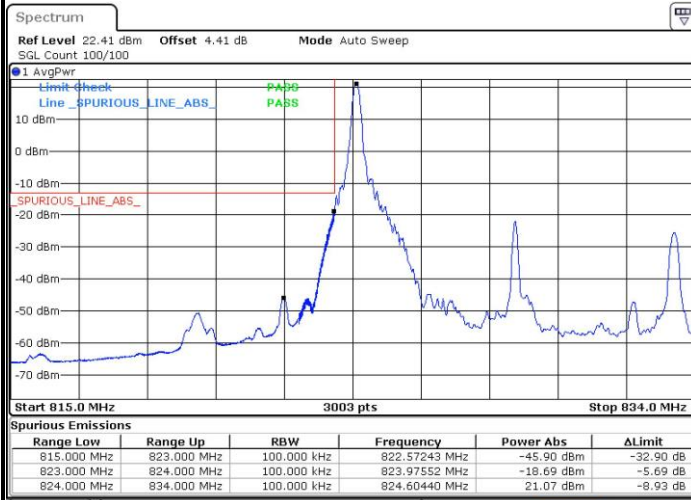
Highest Band Edge / Full RB





LTE Band 5 / 10MHz / QPSK

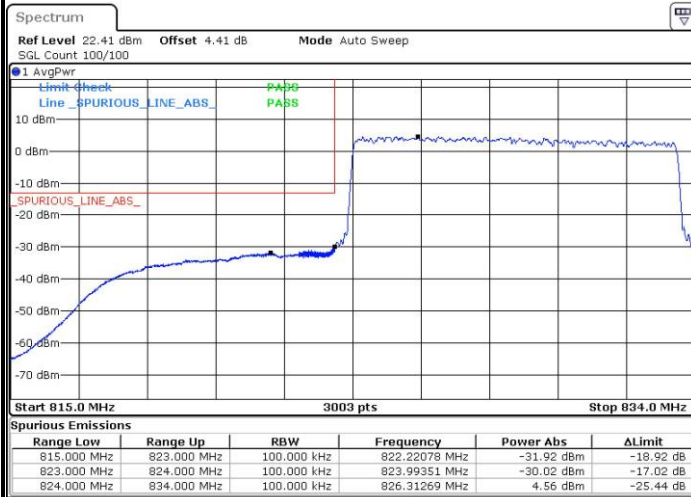
Lowest Band Edge / 1 RB



Highest Band Edge / 1 RB



Lowest Band Edge / Full RB



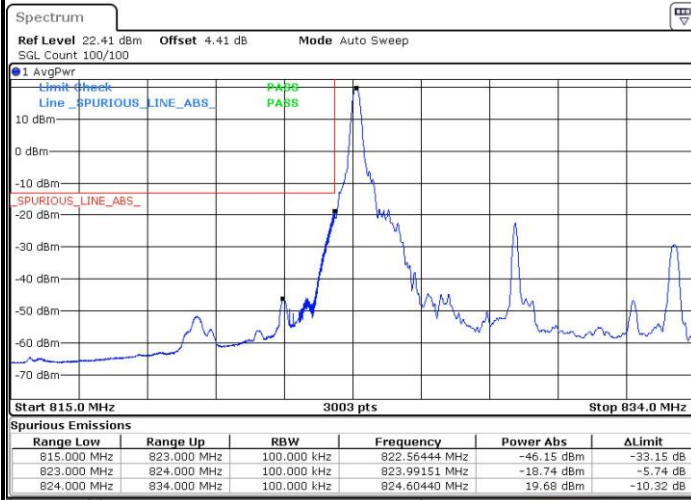
Highest Band Edge / Full RB





LTE Band 5 / 10MHz / 16QAM

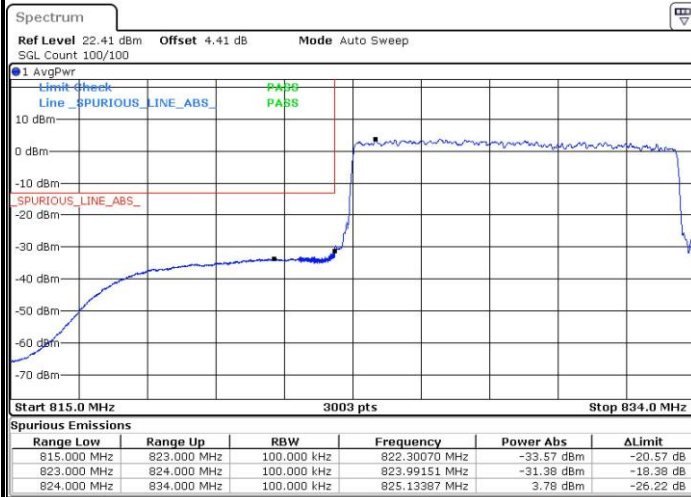
Lowest Band Edge / 1 RB



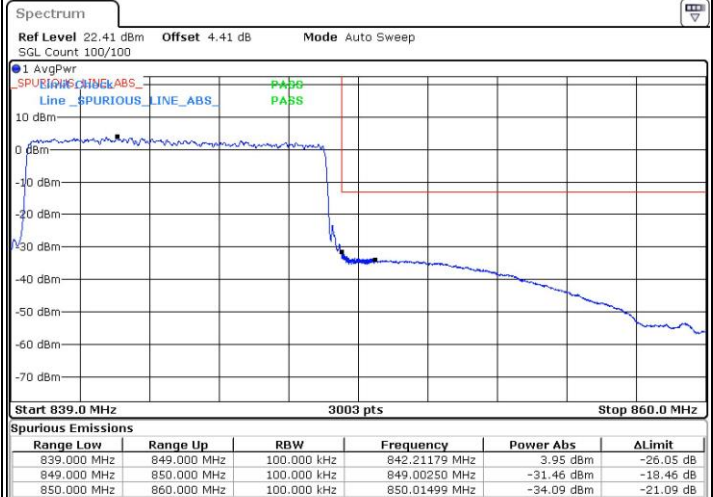
Highest Band Edge / 1 RB



Lowest Band Edge / Full RB

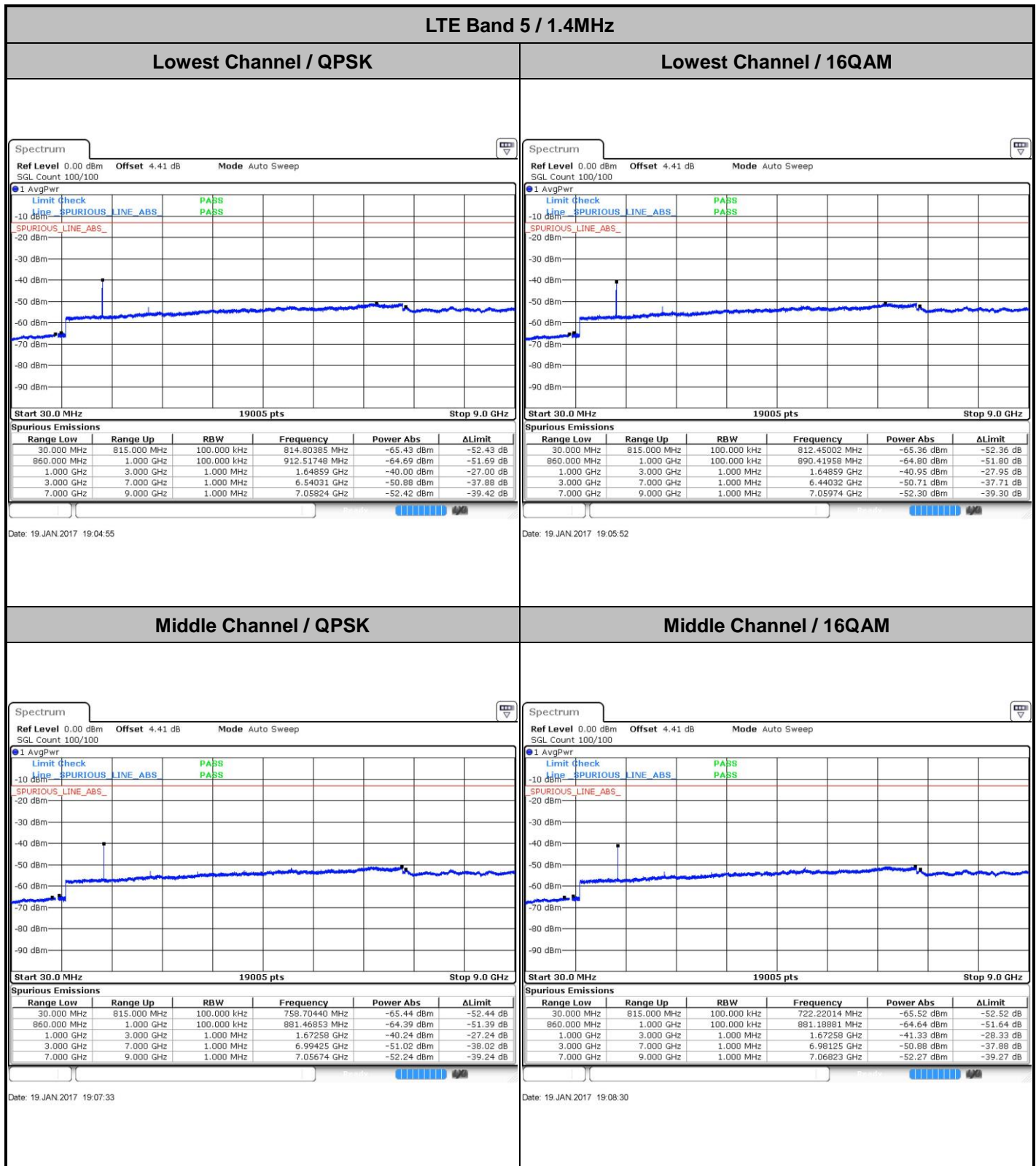


Highest Band Edge / Full RB





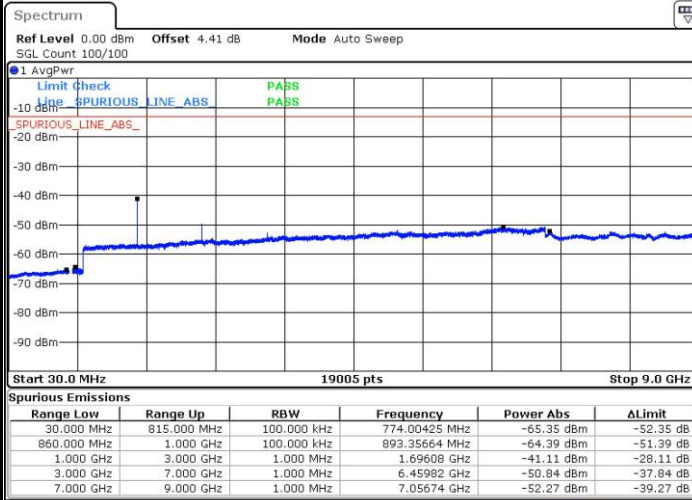
Conducted Spurious Emission





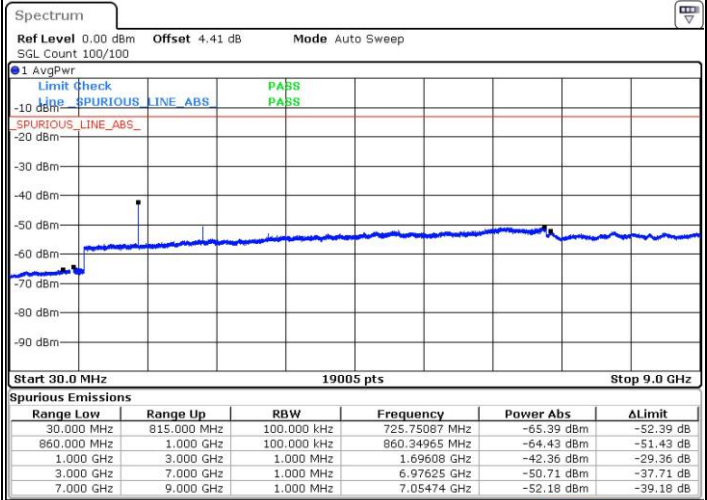
LTE Band 5 / 1.4MHz

Highest Channel / QPSK



Date: 19 JAN 2017 19:16:49

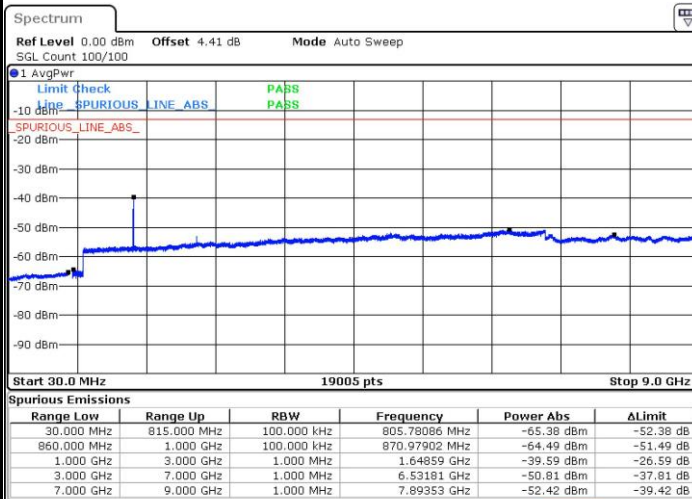
Highest Channel / 16QAM



Date: 19 JAN 2017 19:17:46

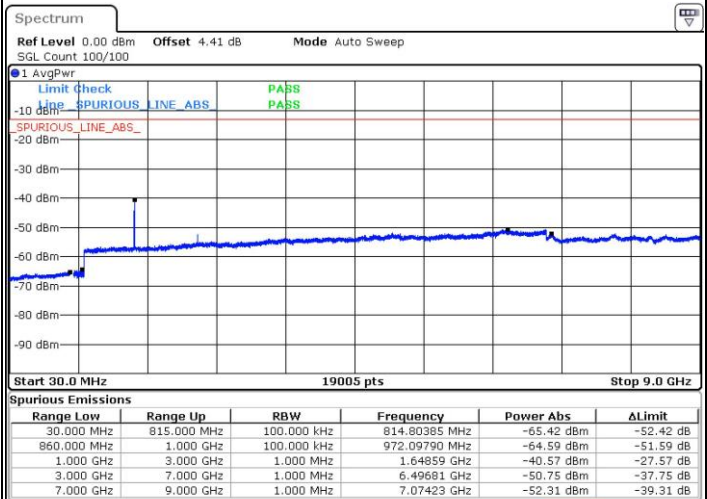
LTE Band 5 / 3MHz

Lowest Channel / QPSK



Date: 19 JAN 2017 19:26:05

Lowest Channel / 16QAM

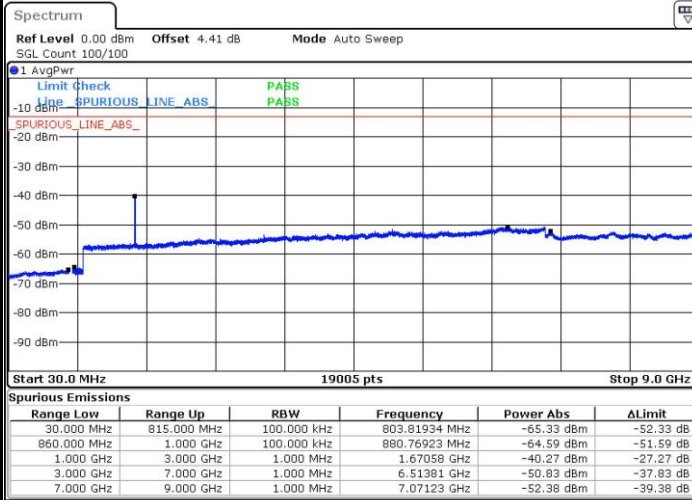


Date: 19 JAN 2017 19:27:02



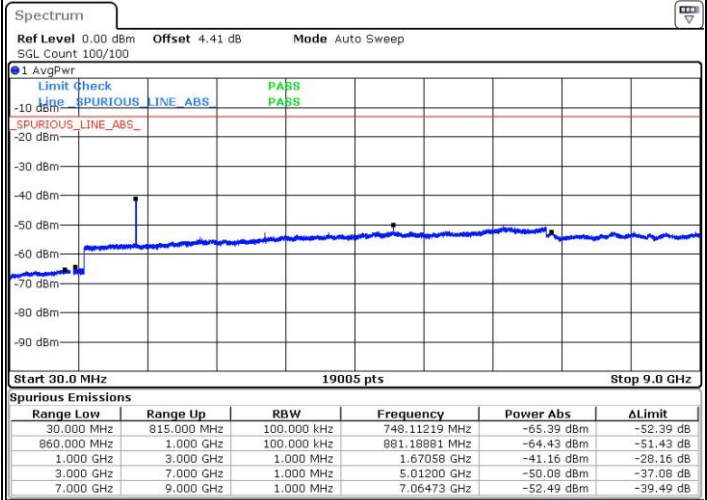
LTE Band 5 / 3MHz

Middle Channel / QPSK



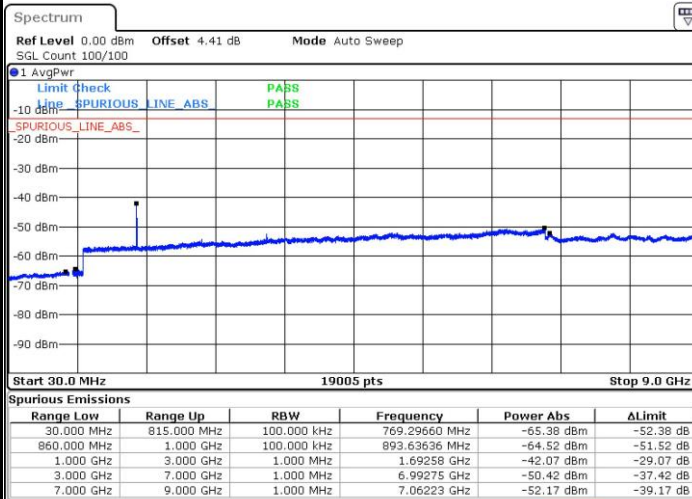
Date: 19 JAN 2017 19:28:44

Middle Channel / 16QAM



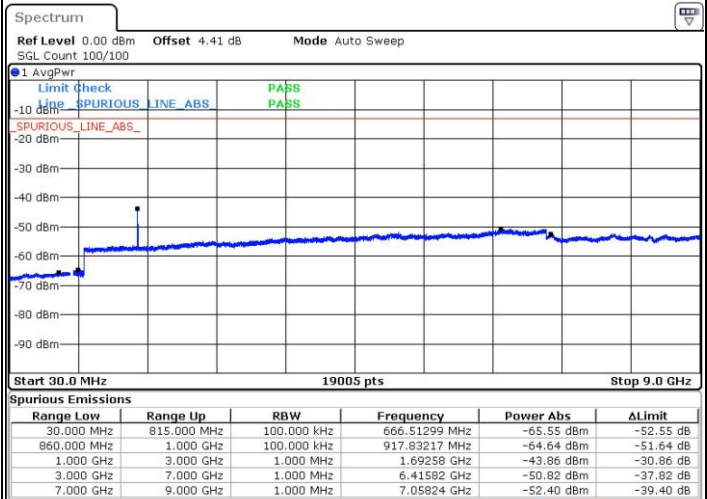
Date: 19 JAN 2017 19:29:40

Highest Channel / QPSK



Date: 19 JAN 2017 19:37:59

Highest Channel / 16QAM

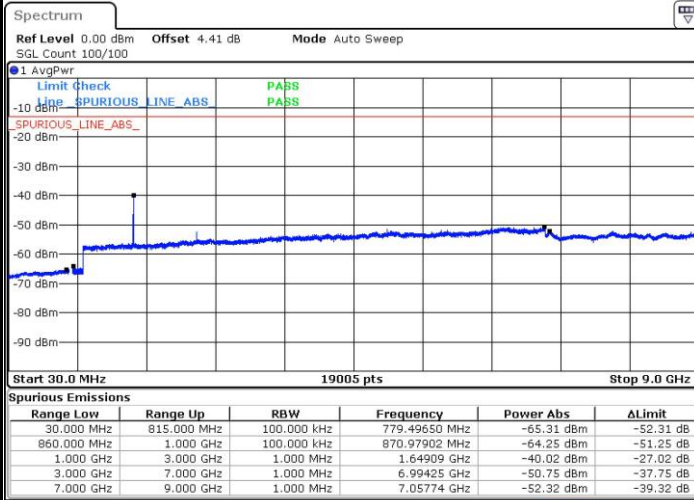


Date: 19 JAN 2017 19:38:56



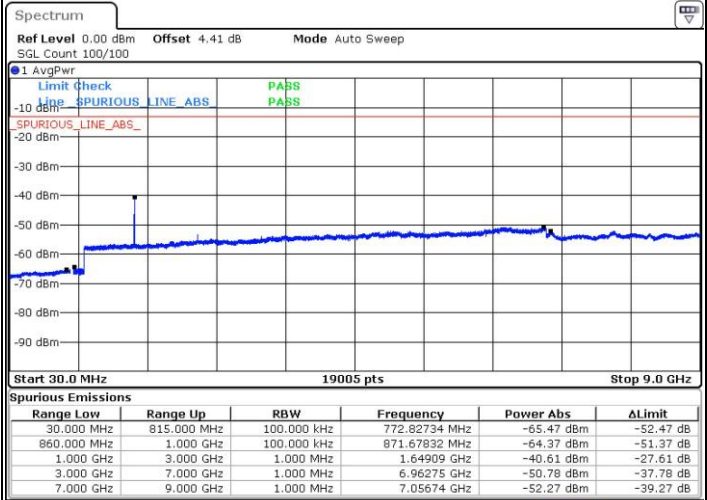
LTE Band 5 / 5MHz

Lowest Channel / QPSK



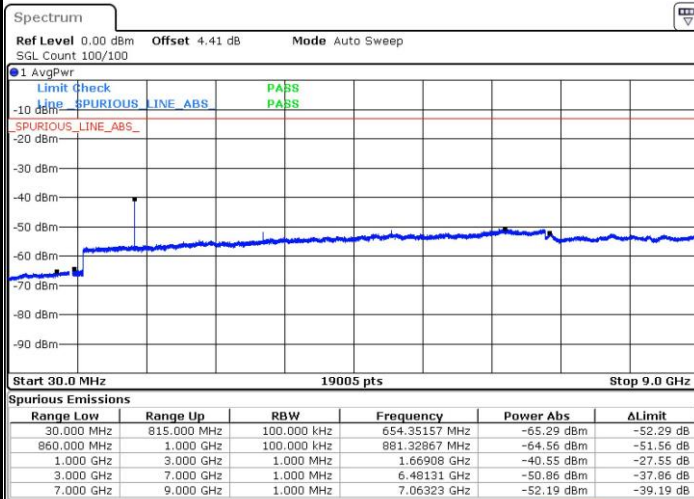
Date: 19 JAN 2017 19:47:14

Lowest Channel / 16QAM



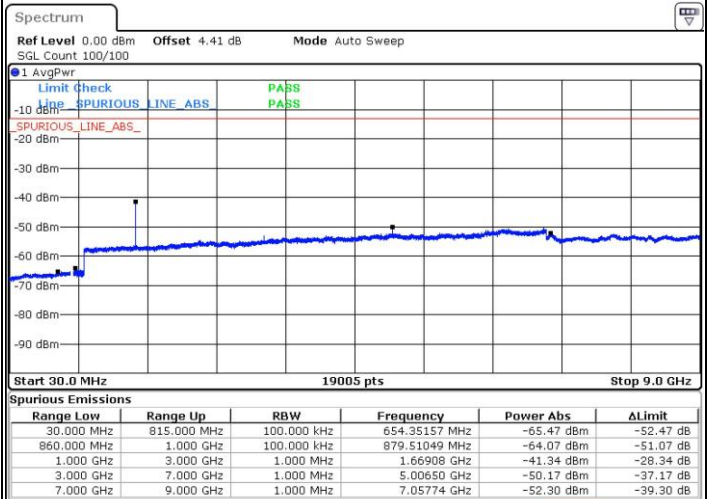
Date: 19 JAN 2017 19:48:11

Middle Channel / QPSK



Date: 19 JAN 2017 19:49:53

Middle Channel / 16QAM

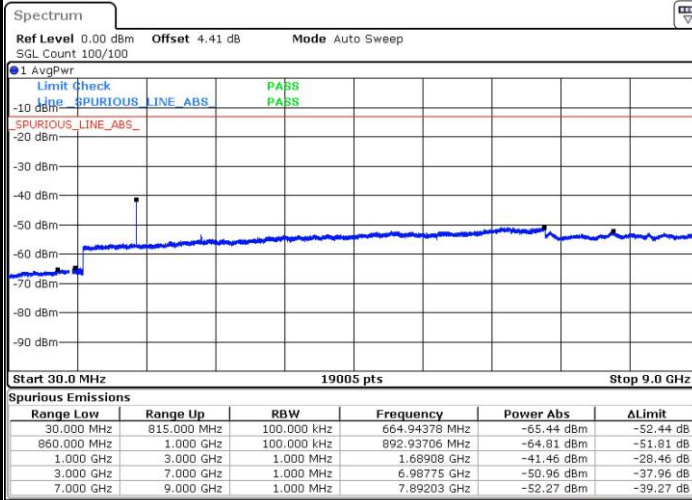


Date: 19 JAN 2017 19:50:50



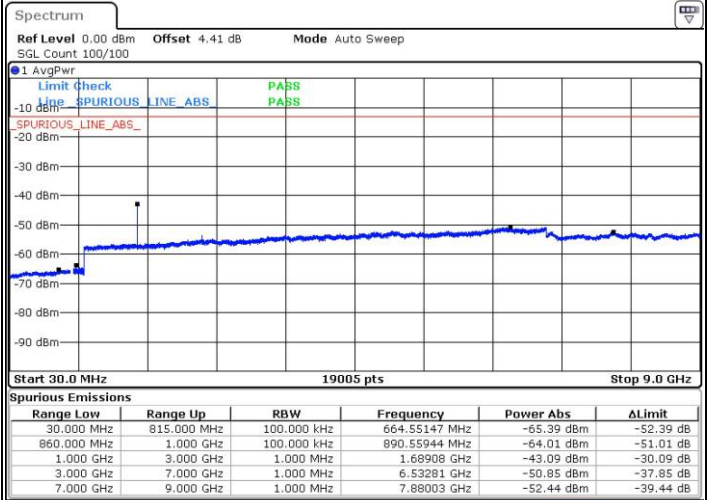
LTE Band 5 / 5MHz

Highest Channel / QPSK



Date: 19 JAN 2017 19:59:09

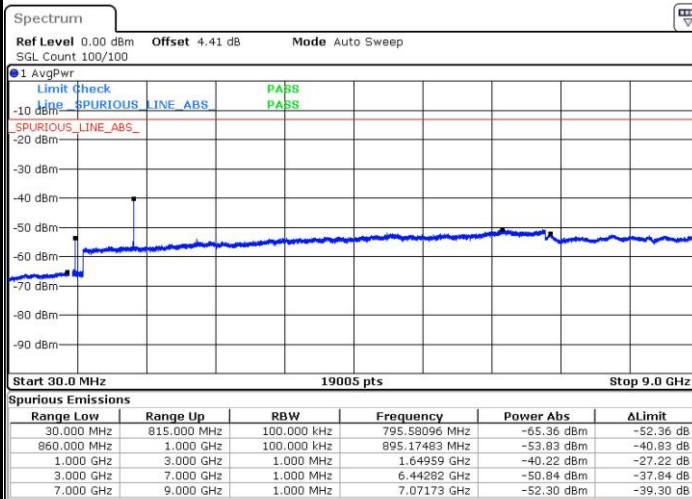
Highest Channel / 16QAM



Date: 19 JAN 2017 20:00:06

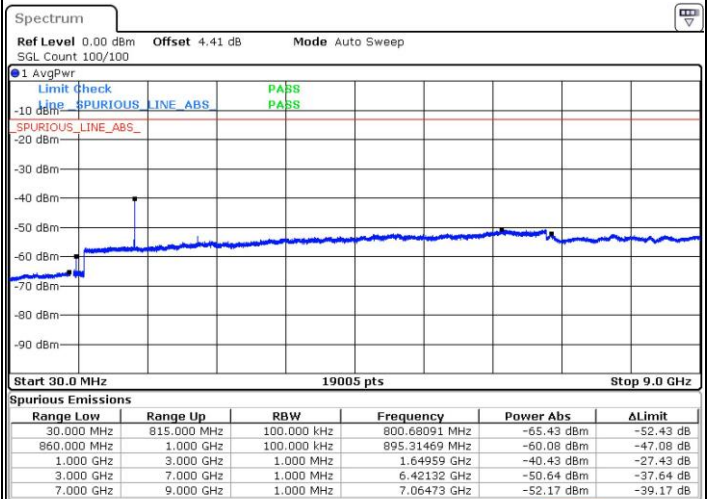
LTE Band 5 / 10MHz

Lowest Channel / QPSK



Date: 19 JAN 2017 20:08:24

Lowest Channel / 16QAM

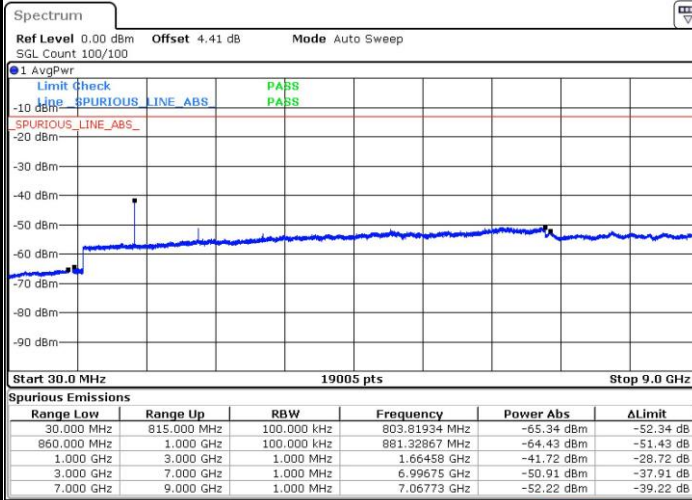


Date: 19 JAN 2017 20:09:21



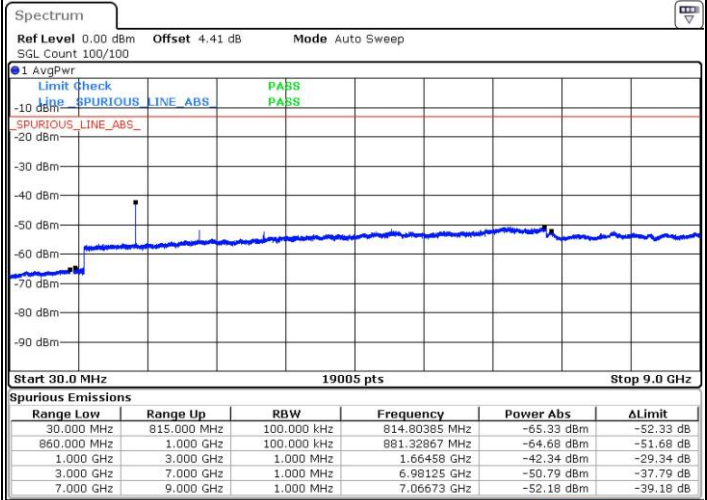
LTE Band 5 / 10MHz

Middle Channel / QPSK



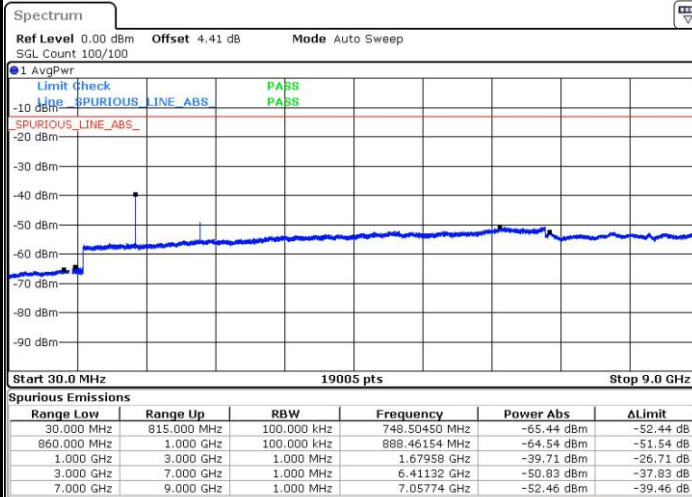
Date: 19 JAN 2017 20:11:03

Middle Channel / 16QAM



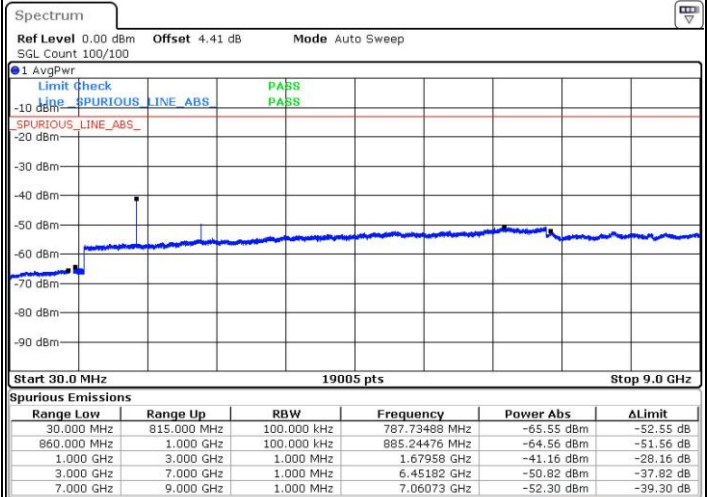
Date: 19 JAN 2017 20:11:59

Highest Channel / QPSK



Date: 19 JAN 2017 20:20:19

Highest Channel / 16QAM



Date: 19 JAN 2017 20:21:16

**Frequency Stability**

Test Conditions		LTE Band 5 (QPSK) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 10MHz	2.5ppm
		Deviation (ppm)	Result
50	Normal Voltage	0.0022	PASS
40	Normal Voltage	0.0013	
30	Normal Voltage	0.0014	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0010	
0	Normal Voltage	0.0024	
-10	Normal Voltage	0.0025	
-20	Normal Voltage	0.0005	
-30	Normal Voltage	0.0019	
20	Maximum Voltage	0.0010	
20	Normal Voltage	0.0026	
20	Battery End Point	0.0016	

Note: Normal Voltage =3.85 V. ; Battery End Point (BEP) =3.45 V. ; Maximum Voltage =4.40 V.



Appendix B. Test Results of Radiated Test

Radiated Spurious Emission

LTE Band 5 / 1.4MHz / QPSK / RB Size 1 Offset 0									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1672	-45.54	-13	-32.54	-46.03	-47.40	1.19	5.20	H
	2508	-51.09	-13	-38.09	-54.56	-53.31	1.53	5.90	H
	3345	-61.84	-13	-48.84	-65.79	-64.63	1.76	6.70	H
	4179	-68.24	-13	-55.24	-72.87	-71.39	1.90	7.20	H
	5015.76	-66.71	-13	-53.71	-72.94	-71.29	2.17	8.90	H
	1672	-45.39	-13	-32.39	-45.55	-47.25	1.19	5.20	V
	2508	-53.59	-13	-40.59	-55.7	-55.81	1.53	5.90	V
	3345	-64.96	-13	-51.96	-68.28	-67.75	1.76	6.70	V
	4179.8	-66.99	-13	-53.99	-73.1	-70.14	1.90	7.20	V
	5016	-63.03	-13	-50.03	-71.58	-67.61	2.17	8.90	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

LTE Band 5 / 3MHz / QPSK / RB Size 1 Offset 0									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1670	-44.76	-13	-31.76	-45.37	-46.62	1.19	5.20	H
	2506	-51.30	-13	-38.30	-54.80	-53.52	1.53	5.90	H
	3339	-63.40	-13	-50.40	-67.35	-66.19	1.76	6.70	H
	4176	-68.69	-13	-55.69	-73.32	-71.84	1.90	7.20	H
	5010	-67.34	-13	-54.34	-73.57	-71.92	2.17	8.90	H
	1670	-44.45	-13	-31.45	-44.7	-46.31	1.19	5.20	V
	2506	-54.56	-13	-41.56	-56.54	-56.78	1.53	5.90	V
	3342	-65.97	-13	-52.97	-69.29	-68.76	1.76	6.70	V
	4176	-66.76	-13	-53.76	-72.87	-69.91	1.90	7.20	V
	5010	-62.16	-13	-49.16	-70.71	-66.74	2.17	8.90	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



LTE Band 5 / 5MHz / QPSK / RB Size 1 Offset 0									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1668	-44.18	-13	-31.18	-45.00	-46.04	1.19	5.20	H
	2502	-51.53	-13	-38.53	-55.06	-53.75	1.53	5.90	H
	3336	-64.62	-13	-51.62	-68.57	-67.41	1.76	6.70	H
	4171	-68.62	-13	-55.62	-73.25	-71.77	1.90	7.20	H
	5007	-66.66	-13	-53.66	-72.89	-71.24	2.17	8.90	H
	1668	-44.02	-13	-31.02	-44.32	-45.88	1.19	5.20	V
	2502	-53.88	-13	-40.88	-55.9	-56.10	1.53	5.90	V
	3336	-64.84	-13	-51.84	-68.16	-67.63	1.76	6.70	V
	4171	-66.70	-13	-53.70	-72.81	-69.85	1.90	7.20	V
	5007	-61.54	-13	-48.54	-70.09	-66.12	2.17	8.90	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

LTE Band 5 / 10MHz / QPSK / RB Size 1 Offset 0									
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	1664	-41.15	-13	-28.15	-42.08	-43.01	1.19	5.20	H
	2496	-49.32	-13	-36.32	-53.40	-51.54	1.53	5.90	H
	3327	-62.34	-13	-49.34	-66.29	-65.13	1.76	6.70	H
	4160	-68.11	-13	-55.11	-72.74	-71.26	1.90	7.20	H
	4992	-63.11	-13	-50.11	-69.34	-67.69	2.17	8.90	H
	1664	-41.75	-13	-28.75	-42.46	-43.61	1.19	5.20	V
	2496	-53.65	-13	-40.65	-55.74	-55.87	1.53	5.90	V
	3327	-61.31	-13	-48.31	-64.63	-64.10	1.76	6.70	V
	4160	-66.55	-13	-53.55	-72.66	-69.70	1.90	7.20	V
	4992	-59.09	-13	-46.09	-67.64	-63.67	2.17	8.90	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



Appendix D. Product Equality Declaration

HMD Global Oy

Tel:

Date:

Product Equality Declaration

We, HMD Global Oy declares on our sole responsibility for the product as below:

Certification information					
SKU	Row	LatAm	Row	LatAm	APAC
Number of SIM's supported	SKU1	SKU2	SKU1	SKU2	SKU1
	SS	SS	DS	DS	SS/DS
Model Name	TA-1020	TA-1028	TA-1032	TA-1038	TA-1020/ TA-1032

The differences between Row, Latam, APAC as below:

■ RF section

1. Antenna pattern and matching has no difference

2. Frequency band difference

• Radio Functionality Matrix -Same Row indicates Signal Path is Shared among SKUs					
Bands / Model	SKU1-SS TA-1020	SKU1-DS TA-1032	SKU2-SS TA-1028	SKU2-DS TA-1038	Remark
GSM 850	V	V	V	V	No difference
GSM 900	V	V	V	V	No difference
GSM 1800	V	V	V	V	No difference
GSM 1900	V	V	V	V	No difference
LTE 1	V	V	X	X	No difference
LTE 2	X	X	V	V	U3404 for SKU1 SMT is B40 DRX SAW; U3404 for SKU2 is B2DRX SAW
LTE 3	V	V	V	V	No difference
LTE 4	X	X	V	V	U3304 Only for W_B4 Tx/PRX; LTE B4 TX/PRX
LTE 5	V	V	X	X	U3408 only for SKU1 LTE B5 DRX
LTE 7	V	V	V	V	No difference
LTE 8	V	V	X	X	Z3404 only for SKU1 LTE band8 DRX
LTE 12	X	X	V	V	U3311 SMT is different, SKU1 SMT is the Duplexer of B20, SKU2 SMT is the Duplexer of B12/B17.
LTE 17	X	X	V	V	U3311 SMT is different, SKU1 SMT is the Duplexer of B20, SKU2 SMT is the Duplexer of B12/B17.
LTE 20	V	V	X	X	U3311 SMT is different, SKU1 SMT is the Duplexer of B20, SKU2 SMT is the Duplexer of B12/B17
LTE 28	V	V	V	V	NUL3336 SMT is different for SKU1& SKU2.
LTE 38	V	V	V	V	No difference
LTE 40	V	V	X	X	U3404 SKU1 SMT is the DRX SAW of LTE B40, SKU2 SMT is the DRX of LTE B2; U3202 is only for SKU1Tx/PRx of LTE B40.
WCDMA 1	V	V	V	V	No difference
WCDMA 2	V	V	V	V	No difference
WCDMA 4	X	X	V	V	U3304 Only for W_B4 Tx/PRX;LTE B4 TX/PRX
WCDMA 5	V	V	V	V	No difference
WCDMA 8	V	V	V	V	No difference
WLAN 2.4GHz	V	V	V	V	No difference
WLAN 5GHz	V	V	V	V	No difference
Bluetooth	V	V	V	V	No difference
NFC	V	V	V	V	No difference

3. Board difference

		SKU1-SS TA-1020	SKU1-DS TA-1032	SKU2-SS TA-1028	SKU2-DS TA-1038
WWAN	IC (MT6169)	No difference			
	Component on PCB	No difference			
	Antenna 1	No difference			
BT	IC (MT6625LN)	No difference			
		No difference			
	Component on PCB	No difference			
	Antenna	No difference			
WLAN 2.4GHz	IC (MT6625LN)	No difference			
	Component on PCB	No difference			
	Antenna	No difference			
WLAN 5GHz	IC (MT6625LN)	No difference			
	Component on PCB	No difference			
	Antenna	No difference			
NFC	IC MT6605	No difference			
	Component on PCB	No difference			
	Antenna	No difference			
E-compass	IC	No difference			
	Component on PCB	No difference			
SAR cap Sensor	IC	No difference			
	Component on PCB	No difference			

■ SW section

There is no different for SW design. Only the UI will show different model name.

■ Mechanical section

There is only one different for the structure of SIM Card. For hardware system design is the same.

SKU	SKU1-SS TA-1020	SKU1-DS TA-1032	SKU2-SS TA-1028	SKU2-DS TA-1038	Remark
SIM Slot	Single SIM	Dual SIM	Single SIM	Dual SIM	NA

Except listings above, the others are all the same.

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COMPANY: HMD Global

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Appendix E. Reference Report

Please refer to Sporton report number FG711304-01B which is issued separately.