

Keysight Spectrum Analyzer - Swept SA

RL RF 50 Ω DC CORREC SENSE:INT ALIGN AUTO 10:36:16 AM May 03, 2019

LNP PNO: Fast IFGain:High Trig: Free Run Avg Type: RMS Avg/Hold: 100/100

TRACE 1 2 3 4 5 6 TYPE M W W W W W W W W W DET A N N N N N N

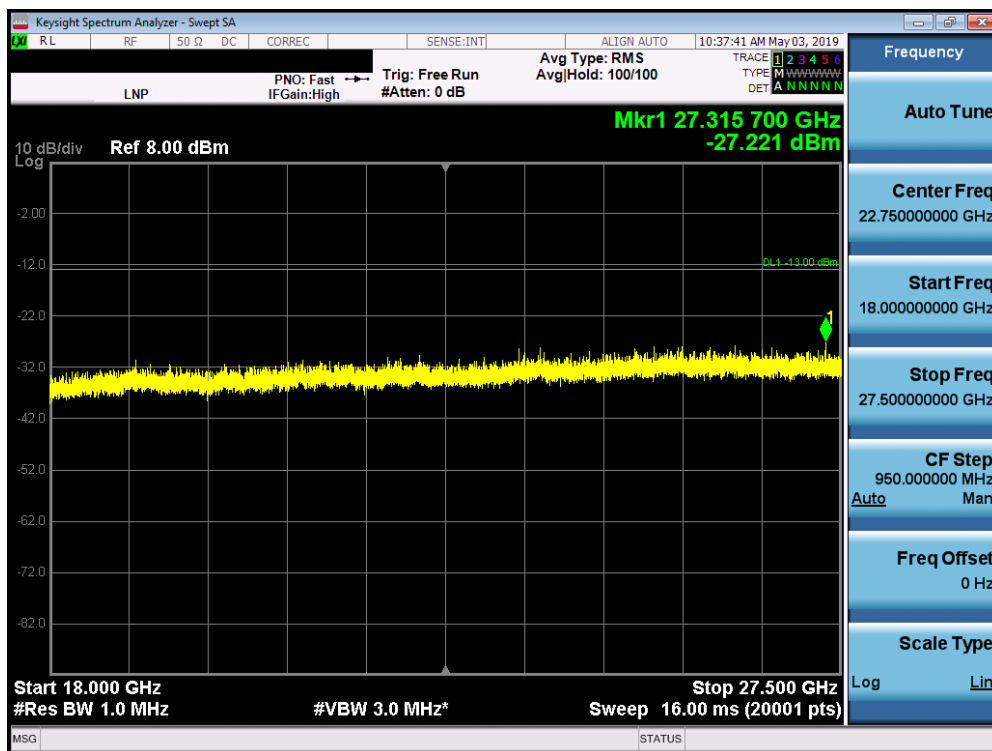
10 dB/div Ref 8.00 dBm

Mkr1 27.490 500 GHz -24.648 dBm

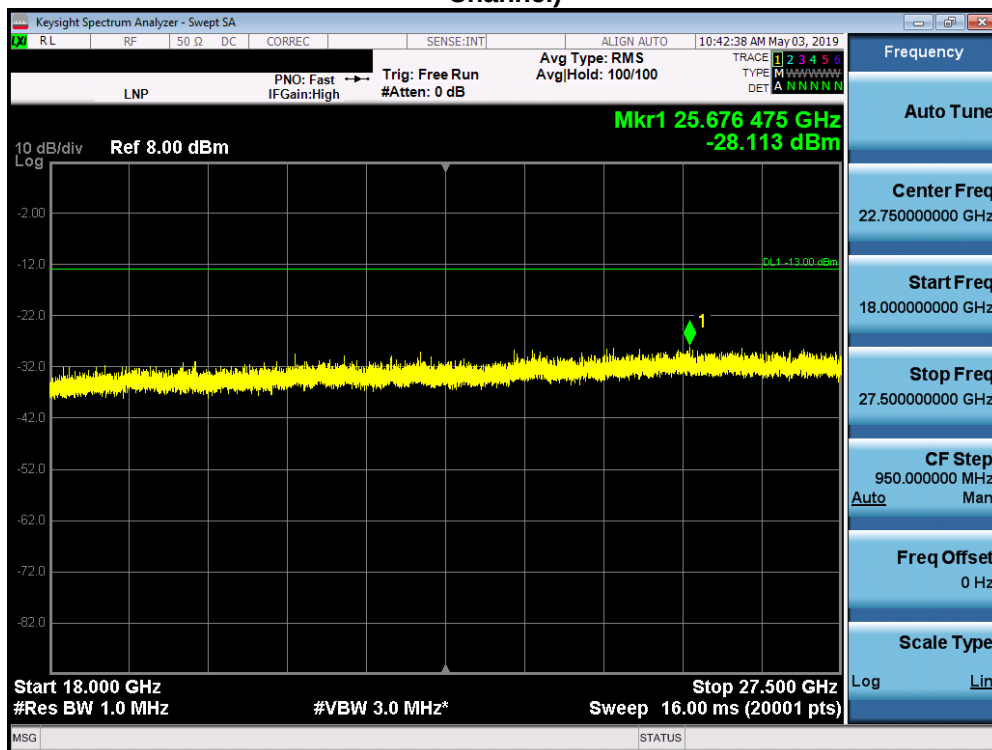
Start 18.000 GHz Stop 27.500 GHz #Res BW 1.0 MHz #VBW 3.0 MHz* Sweep 16.00 ms (20001 pts)

The display shows a spectrum plot with a yellow trace representing the signal. The trace is a noisy line at approximately -24.6 dBm across the frequency range from 18.000 GHz to 27.500 GHz. A green horizontal line is drawn at -13.00 dBm. The right sidebar shows various settings: Frequency (Auto Tune), Center Frequency (22.75000000 GHz), Start Frequency (18.00000000 GHz), Stop Frequency (27.50000000 GHz), CF Step (950.000000 MHz), Freq Offset (0 Hz), and Scale Type (Log).

FCC ID: ZNFV450VM	 MEASUREMENT REPORT (Class II Permissive Change)			Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset	Page 55 of 202	

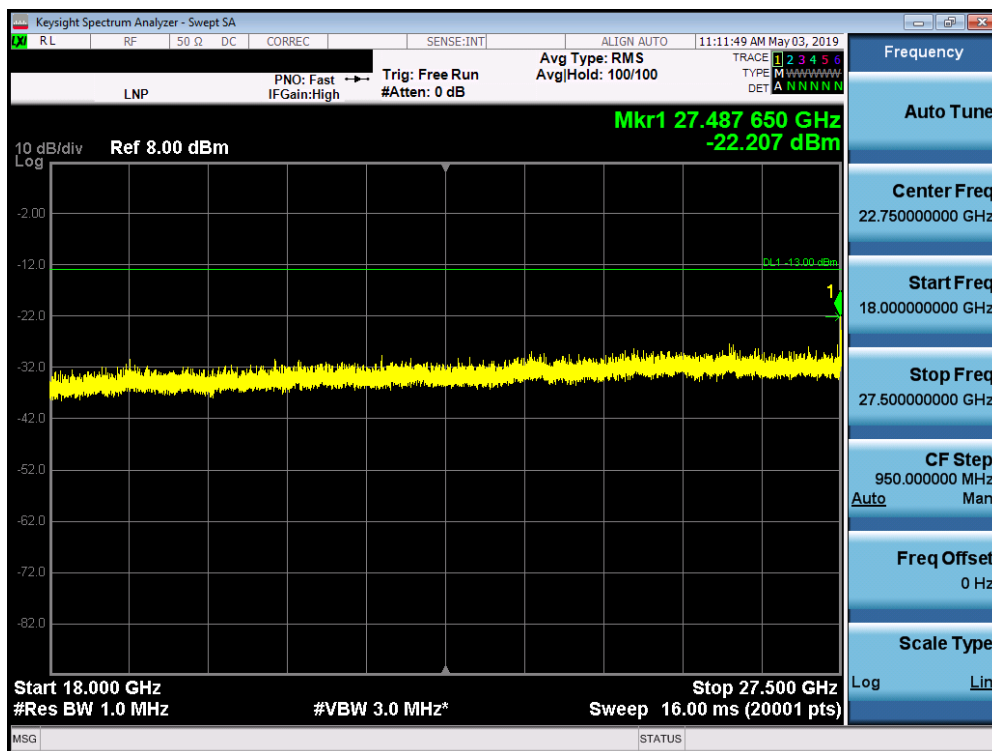


Plot 7-64. Horizontal Radiated Spurious Plot 18-27.5 GHz (QTM1 1CC-100MHz Bandwidth QPSK Mid Channel)

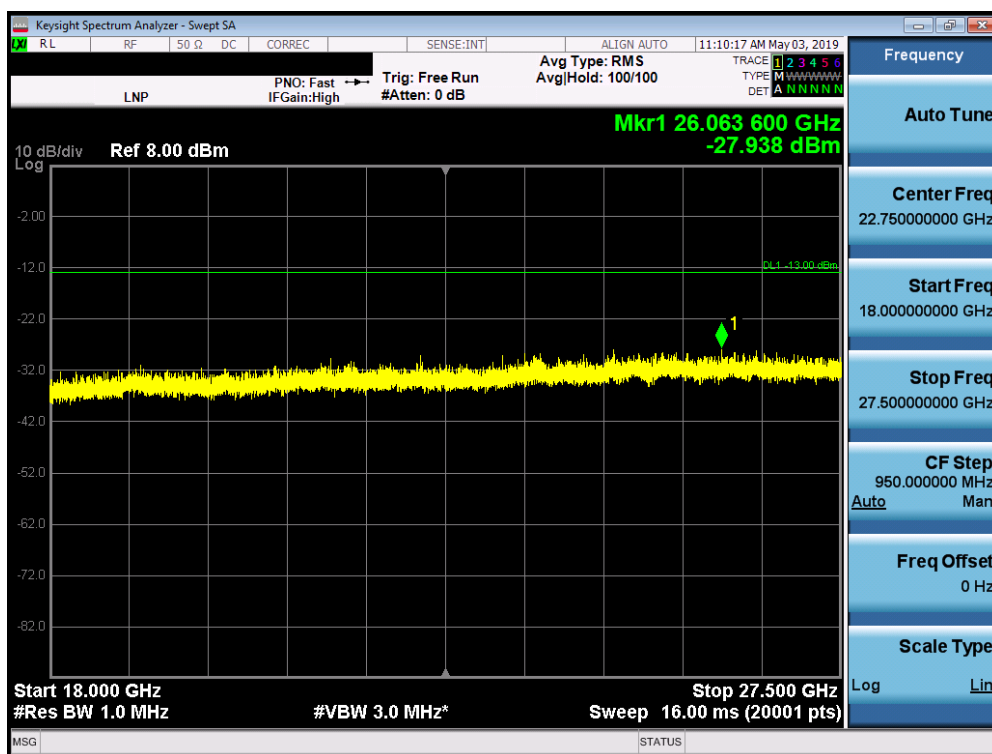


Plot 7-65. Horizontal Radiated Spurious Plot 18-27.5 GHz (QTM1 1CC-100MHz Bandwidth QPSK High Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 56 of 202

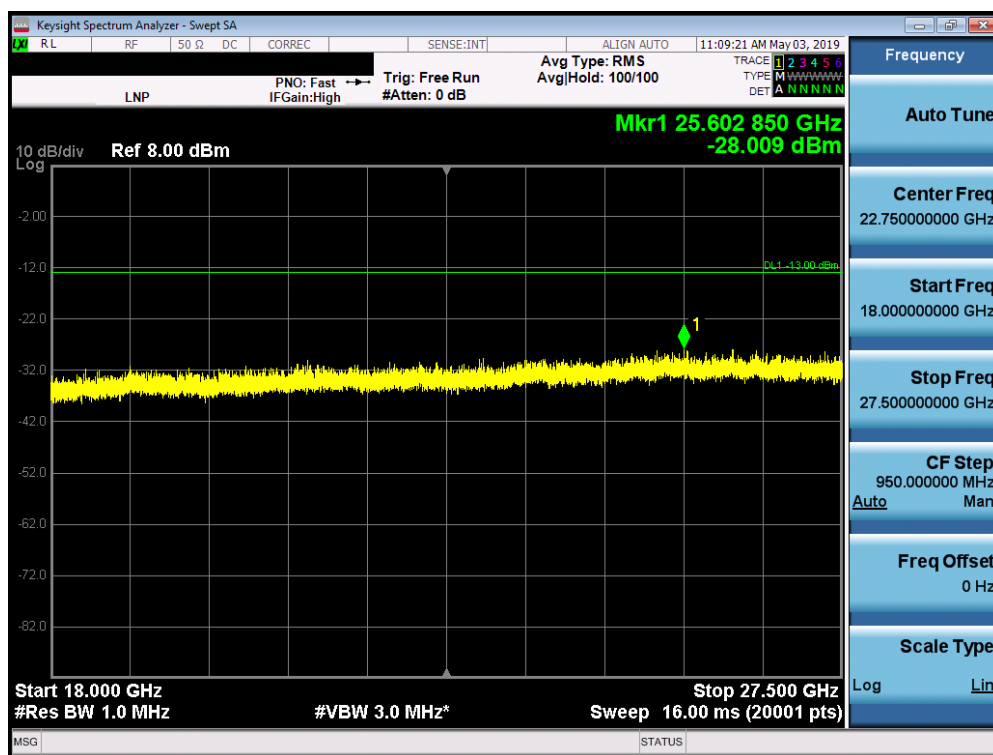


Plot 7-66. Vertical Radiated Spurious Plot 18-27.5 GHz (QTM1 1CC-100MHz Bandwidth QPSK Low Channel)



Plot 7-67. Vertical Radiated Spurious Plot 18-27.5 GHz (QTM1 1CC-100MHz Bandwidth QPSK Mid Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 57 of 202



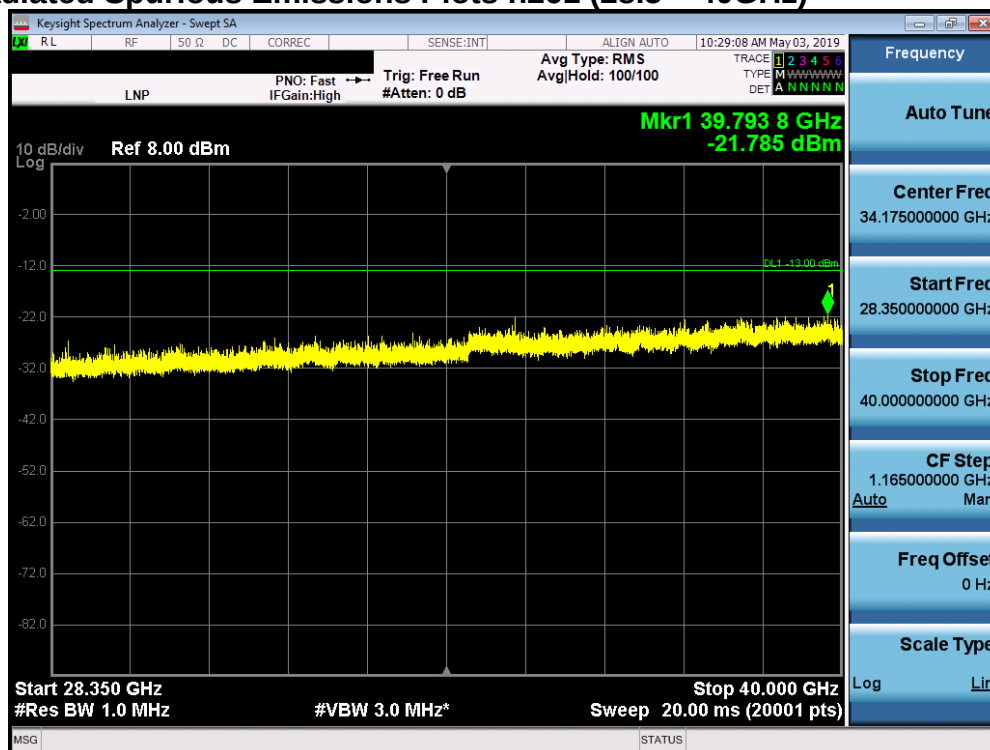
Plot 7-68. Vertical Radiated Spurious Plot 18-27.5 GHz (QTM1 1CC-100MHz Bandwidth QPSK High Channel)

Frequency [MHz]	Detector /Trace	Chan.	Bandwidth (MHz)	Mod.	Beam Polarization	Ant. Pos [H/V]	Ant. Height [cm]	Turntable Azimuth [degree]	RSE EIRP [dBm]	Limit [dBm]	Margin [dB]
27490.50	Maxh/RMS	Low	100	QPSK	H + V	H	150	225	-24.65	-13.00	-11.65
27315.70	Maxh/RMS	Mid	100	QPSK	H + V	H	-	-	-27.22	-13.00	-14.22
25676.48	Maxh/RMS	High	100	QPSK	H + V	H	-	-	-28.11	-13.00	-15.11
27487.65	Maxh/RMS	Low	100	QPSK	H + V	V	-	-	-22.21	-13.00	-9.21
26063.60	Maxh/RMS	Mid	100	QPSK	H + V	V	-	-	-27.94	-13.00	-14.94
25602.85	Maxh/RMS	High	100	QPSK	H + V	V	-	-	-28.01	-13.00	-15.01

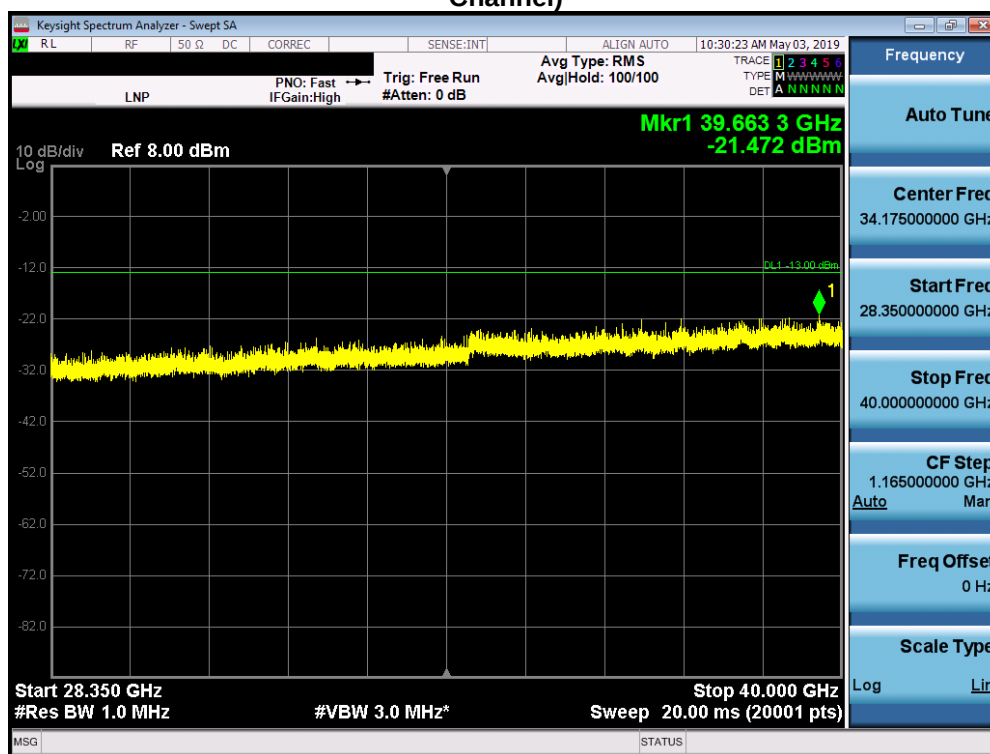
Table 7-12. Spurious Emissions QTM1 (18 – 27.5GHz)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)		LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset			Page 58 of 202

7.4.4 Radiated Spurious Emissions Plots n261 (28.5 – 40GHz)

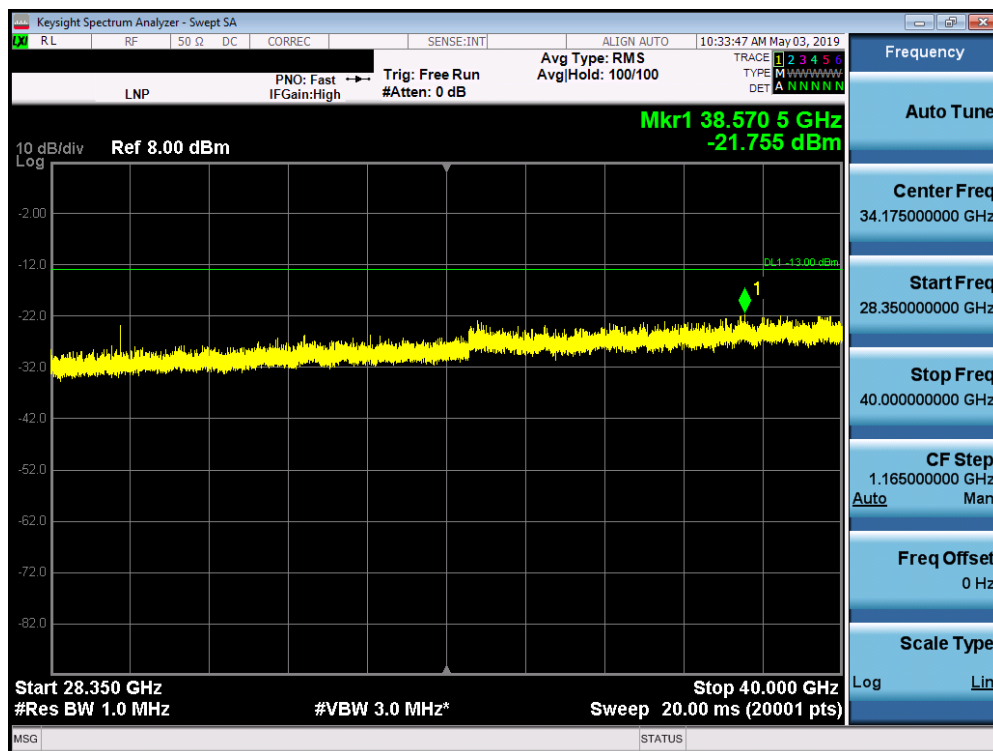


Plot 7-69. Horizontal Radiated Spurious Plot 28.5-40 GHz (QTM0 1CC-100MHz Bandwidth QPSK Low Channel)

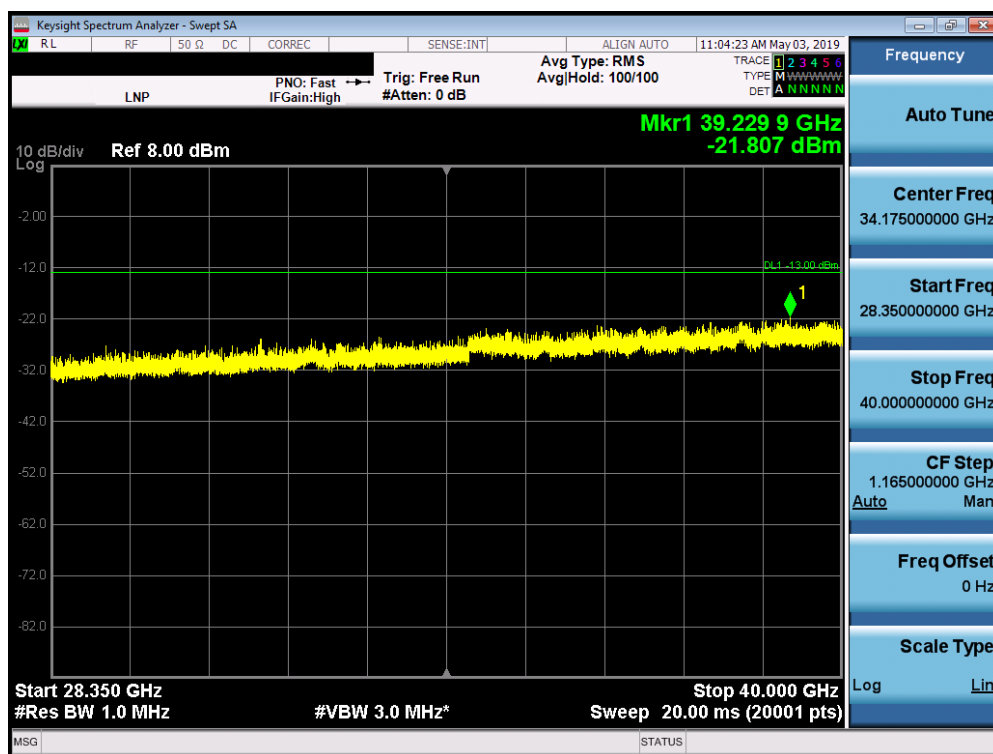


Plot 7-70. Horizontal Radiated Spurious Plot 28.5-40 GHz (QTM0 1CC-100MHz Bandwidth QPSK Mid Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 59 of 202

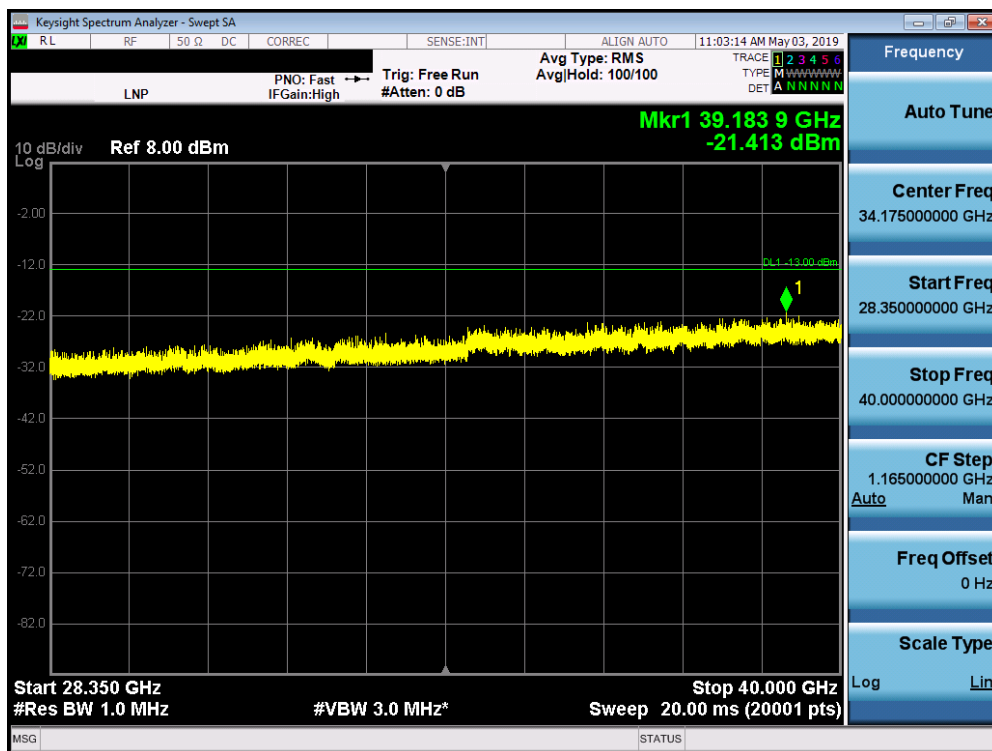


Plot 7-71. Horizontal Radiated Spurious Plot 28.5-40 GHz (QTM0 1CC-100MHz Bandwidth QPSK High Channel)

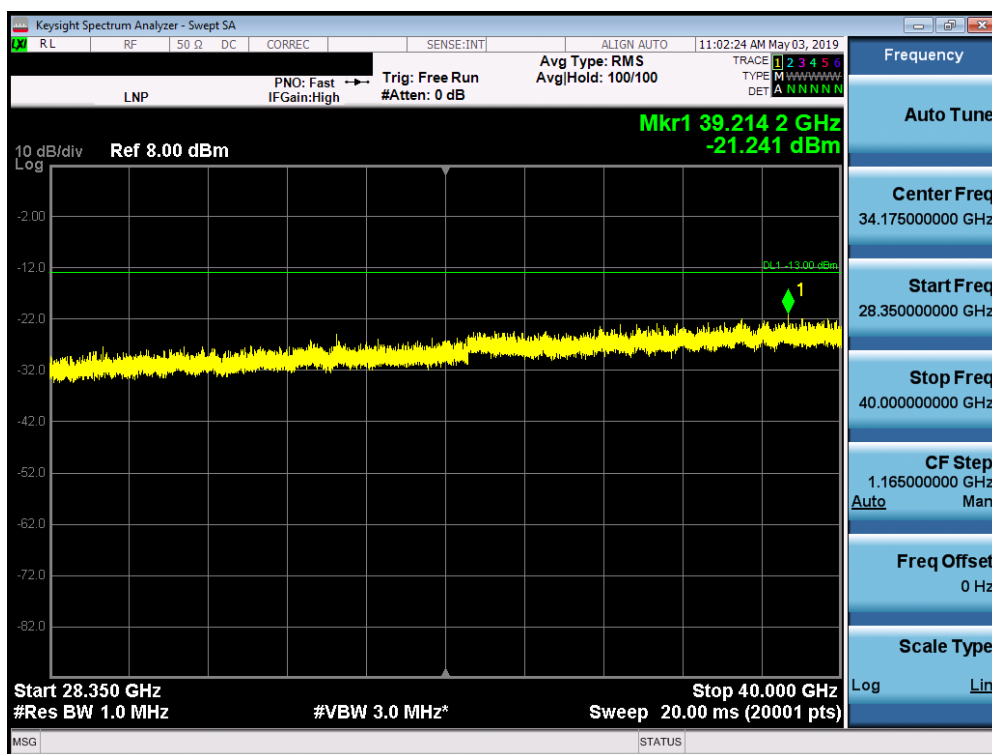


Plot 7-72. Vertical Radiated Spurious Plot 28.5-40 GHz (QTM0 1CC-100MHz Bandwidth QPSK Low Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 60 of 202



Plot 7-73. Vertical Radiated Spurious Plot 28.5-40 GHz (QTM0 1CC-100MHz Bandwidth QPSK Mid Channel)

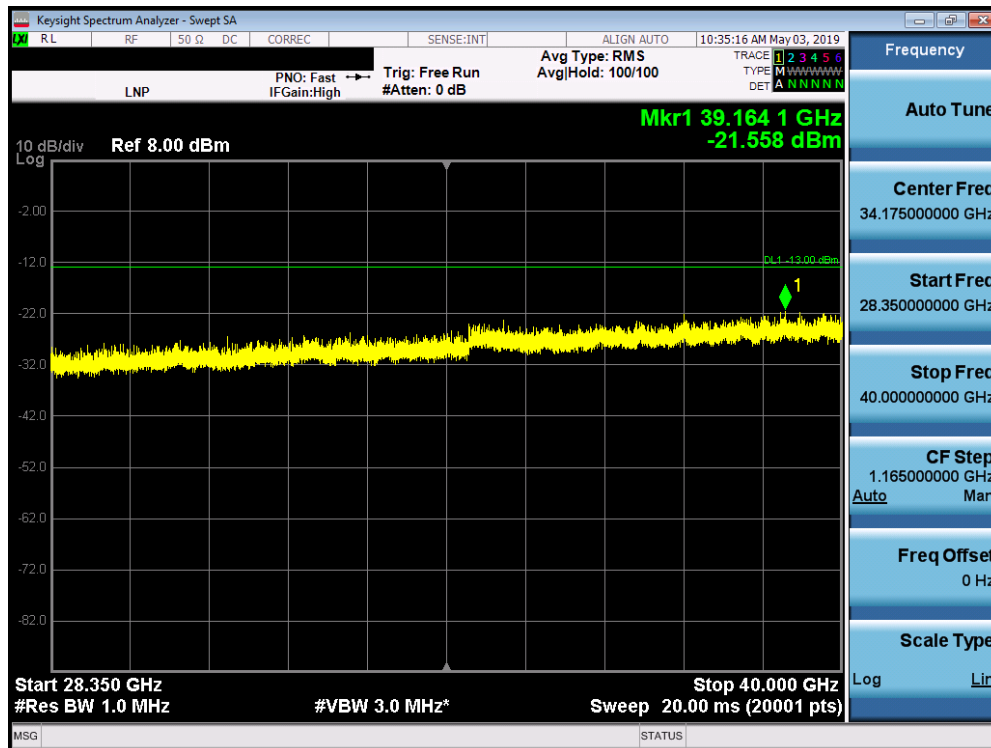


Plot 7-74. Vertical Radiated Spurious Plot 28.5-40 GHz (QTM0 1CC-100MHz Bandwidth QPSK High Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 61 of 202

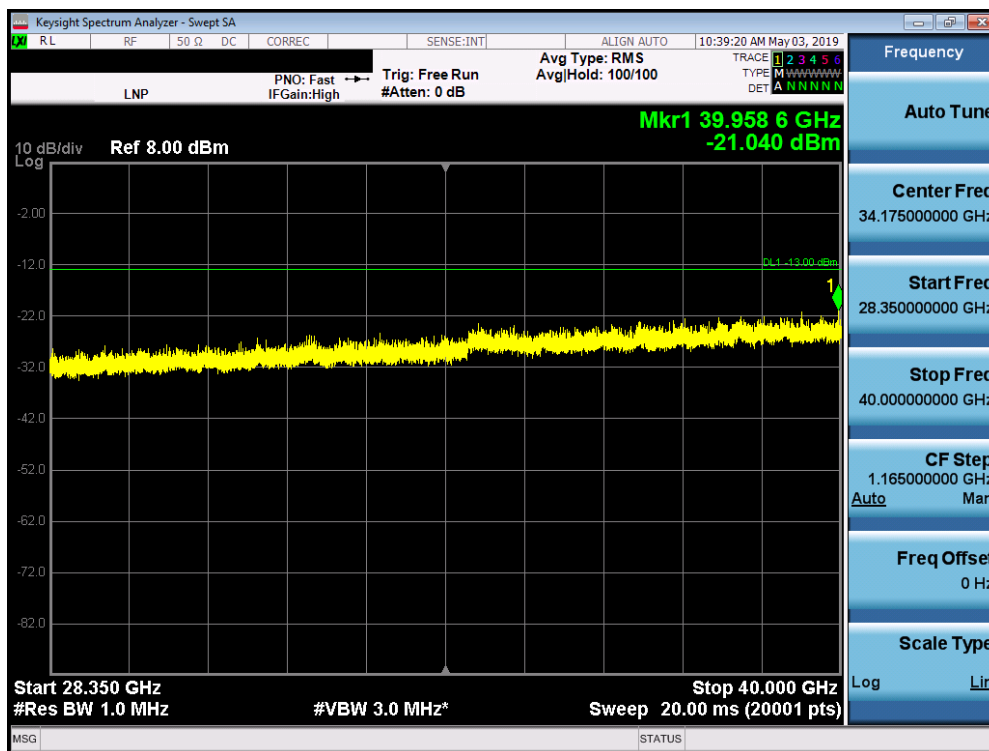
Frequency [MHz]	Detector /Trace	Chan.	Bandwidth (MHz)	Mod.	Beam Polarization	Ant. Pos [H/V]	Ant. Height [cm]	Turntable Azimuth [degree]	RSE EIRP [dBm]	Limit [dBm]	Margin [dB]
39793.80	Maxh/RMS	Low	100	QPSK	H + V	H	-	-	-21.79	-13.00	-8.79
39663.30	Maxh/RMS	Mid	100	QPSK	H + V	H	-	-	-21.47	-13.00	-8.47
38570.50	Maxh/RMS	High	100	QPSK	H + V	H	-	-	-21.76	-13.00	-8.76
39229.90	Maxh/RMS	Low	100	QPSK	H + V	V	-	-	-21.81	-13.00	-8.81
39183.90	Maxh/RMS	Mid	100	QPSK	H + V	V	-	-	-21.41	-13.00	-8.41
39214.20	Maxh/RMS	High	100	QPSK	H + V	V	-	-	-21.24	-13.00	-8.24

Table 7-13. Spurious Emissions QTM0 (28.35 – 40GHz)

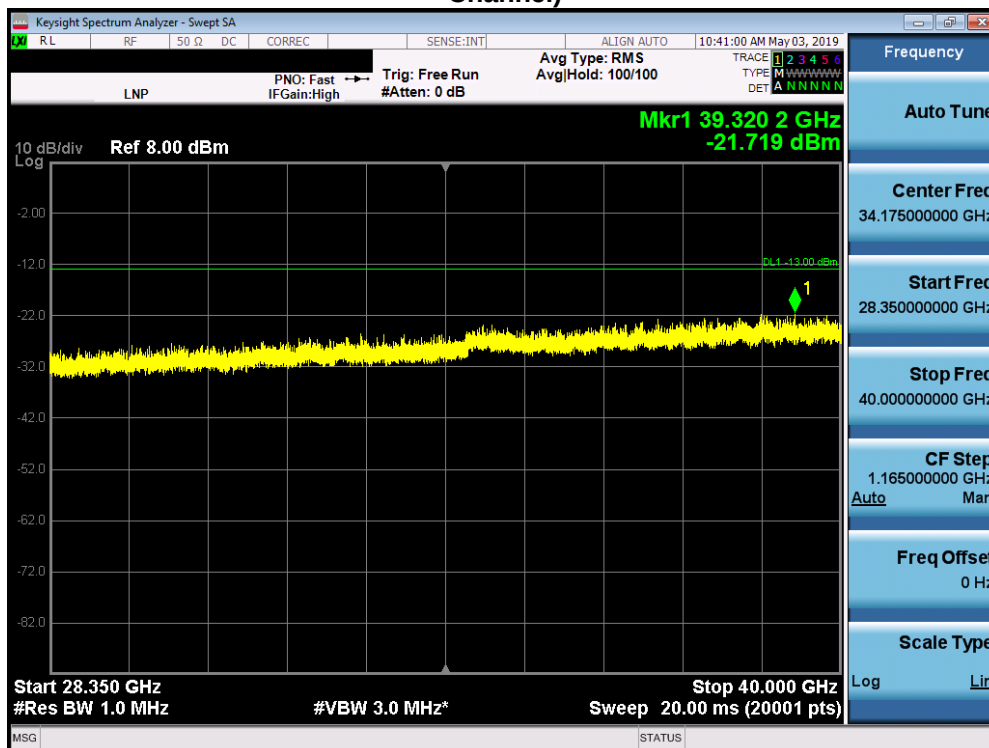


Plot 7-75. Horizontal Radiated Spurious Plot 28.5-40 GHz (QTM1 1CC-100MHz Bandwidth QPSK Low Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 62 of 202

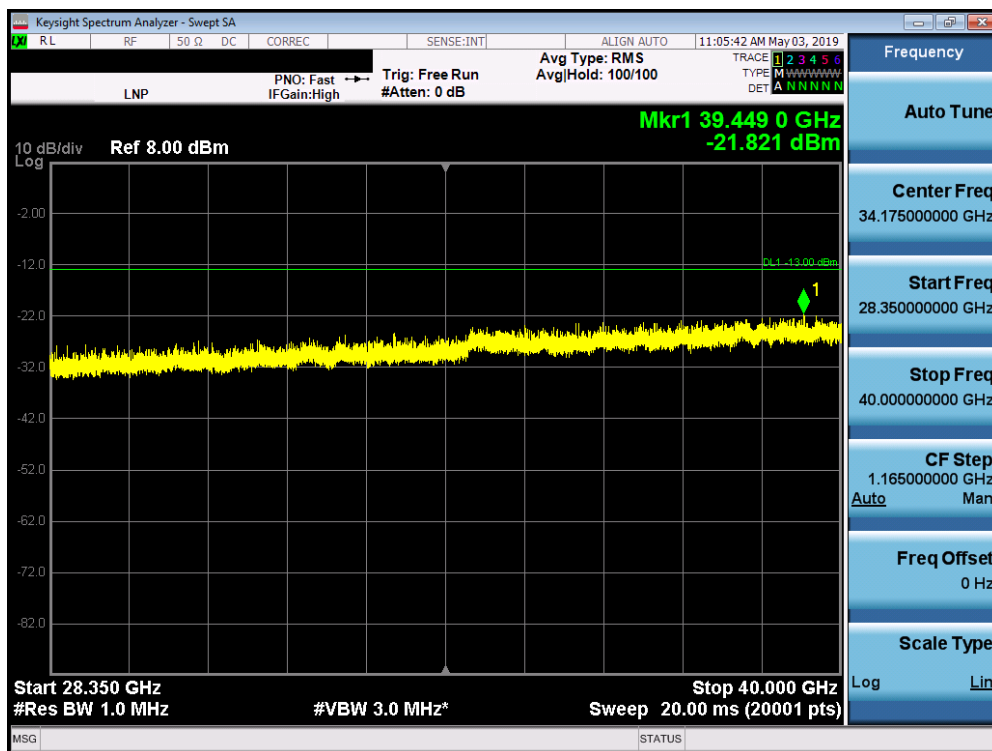


Plot 7-76. Horizontal Radiated Spurious Plot 28.5-40 GHz (QTM1 1CC-100MHz Bandwidth QPSK Mid Channel)

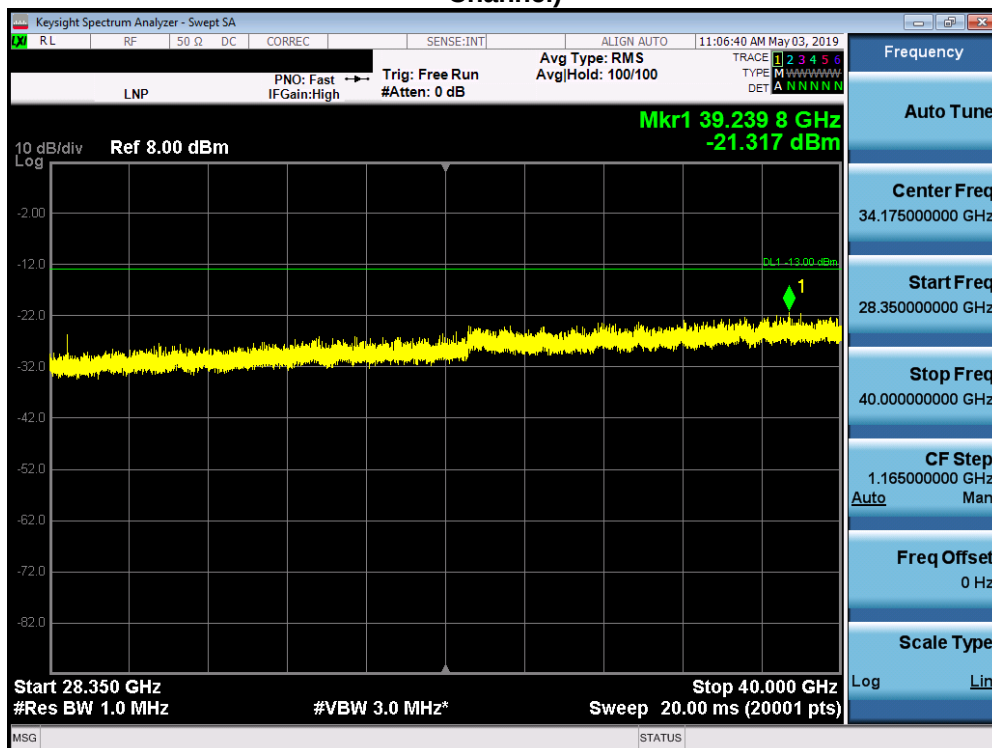


Plot 7-77. Horizontal Radiated Spurious Plot 28.5-40 GHz (QTM1 1CC-100MHz Bandwidth QPSK High Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 63 of 202

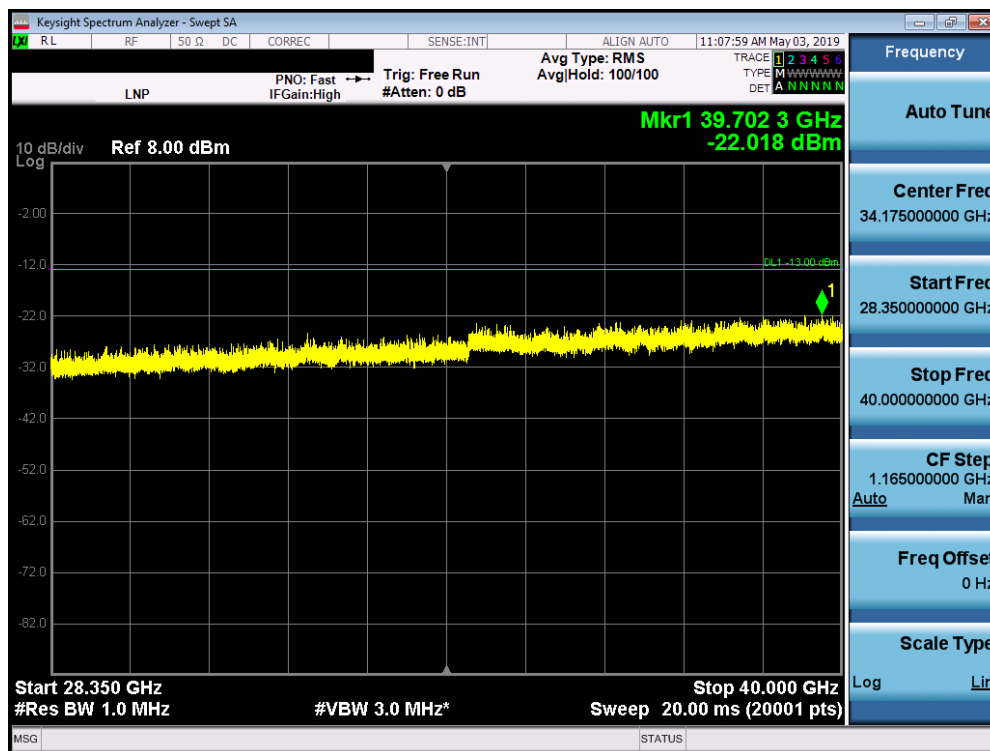


Plot 7-78. Vertical Radiated Spurious Plot 28.5-40 GHz (QTM1 1CC-100MHz Bandwidth QPSK Low Channel)



Plot 7-79. Vertical Radiated Spurious Plot 28.5-40 GHz (QTM1 1CC-100MHz Bandwidth QPSK Mid Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 64 of 202



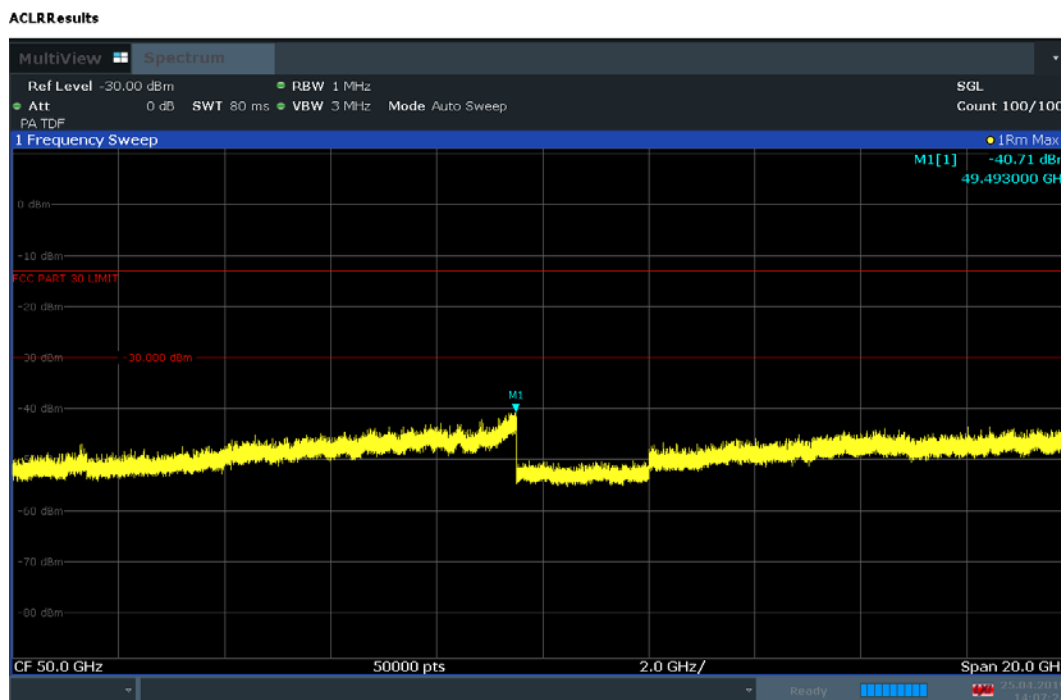
Plot 7-80. Vertical Radiated Spurious Plot 28.5-40 GHz (QTM1 1CC-100MHz Bandwidth QPSK High Channel)

Frequency [MHz]	Detector /Trace	Chan.	Bandwidth (MHz)	Mod.	Beam Polarization	Ant. Pos [H/V]	Ant. Height [cm]	Turntable Azimuth [degree]	RSE EIRP [dBm]	Limit [dBm]	Margin [dB]
39164.10	Maxh/RMS	Low	100	QPSK	H + V	H	-	-	-21.56	-13.00	-8.56
39958.60	Maxh/RMS	Mid	100	QPSK	H + V	H	-	-	-21.04	-13.00	-8.04
39320.20	Maxh/RMS	High	100	QPSK	H + V	H	-	-	-21.72	-13.00	-8.72
39449.00	Maxh/RMS	Low	100	QPSK	H + V	V	-	-	-21.82	-13.00	-8.82
39239.80	Maxh/RMS	Mid	100	QPSK	H + V	V	-	-	-21.32	-13.00	-8.32
39702.30	Maxh/RMS	High	100	QPSK	H + V	V	-	-	-22.02	-13.00	-9.02

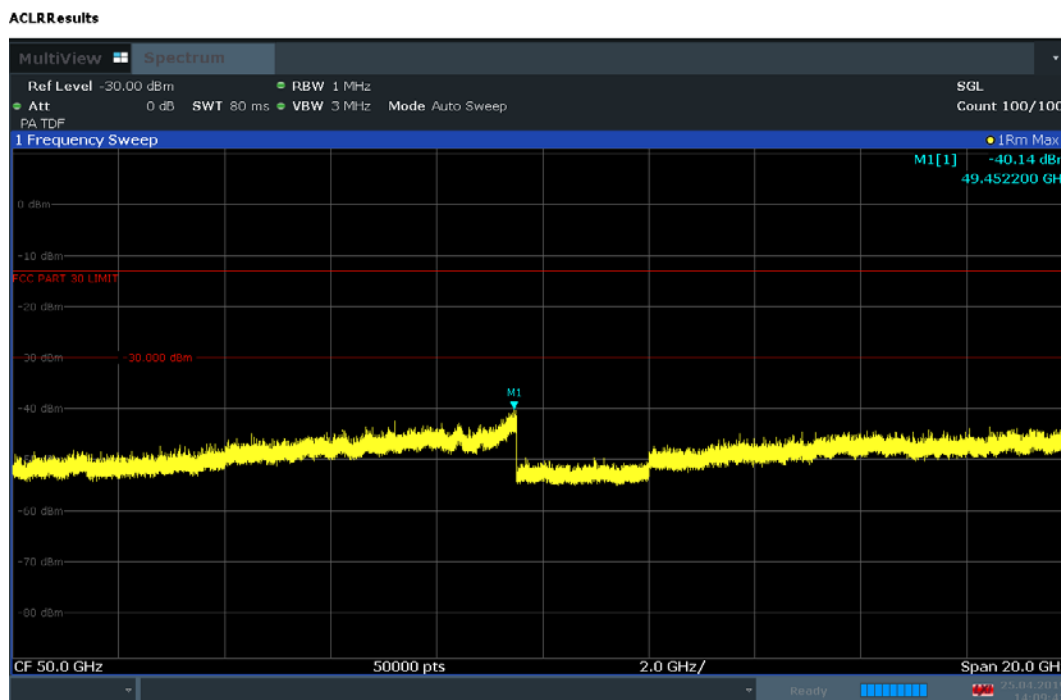
Table 7-14. Spurious Emissions QTM1 (28.35 – 40GHz)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)			Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset			Page 65 of 202

7.4.5 Radiated Spurious Emissions Plots n261 (40 – 60GHz)



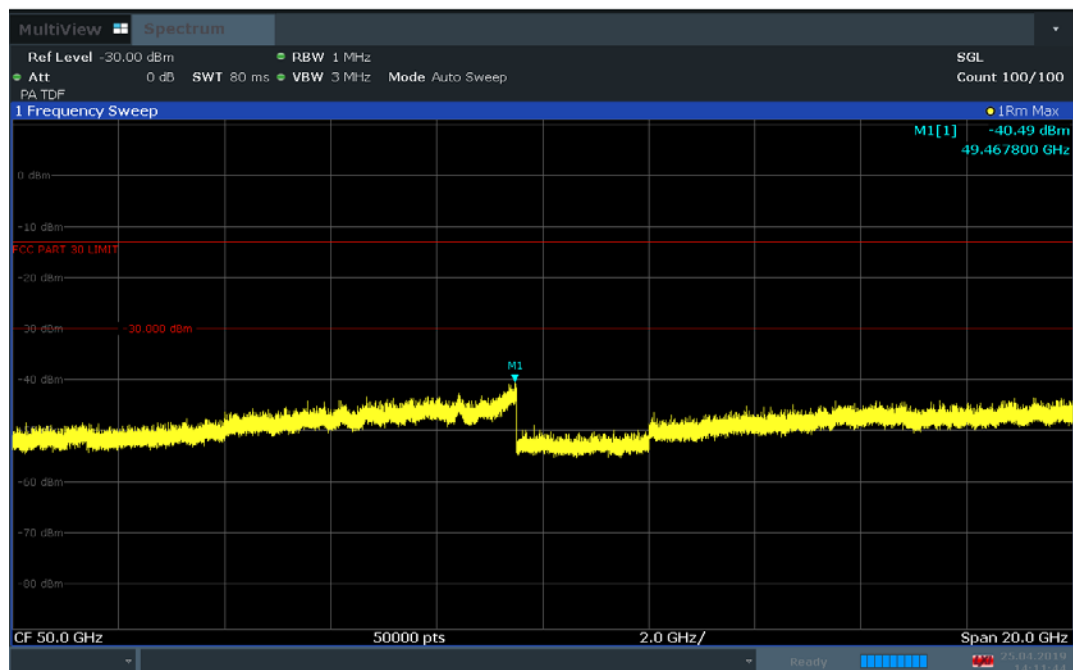
Plot 7-81. Horizontal Radiated Spurious Plot 40-60 GHz (QTM0 1CC-50MHz Bandwidth QPSK Low Channel)



Plot 7-82. Horizontal Radiated Spurious Plot 40-60 GHz (QTM0 1CC-50MHz Bandwidth QPSK Mid Channel)

FCC ID: ZNFV450VM		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 66 of 202

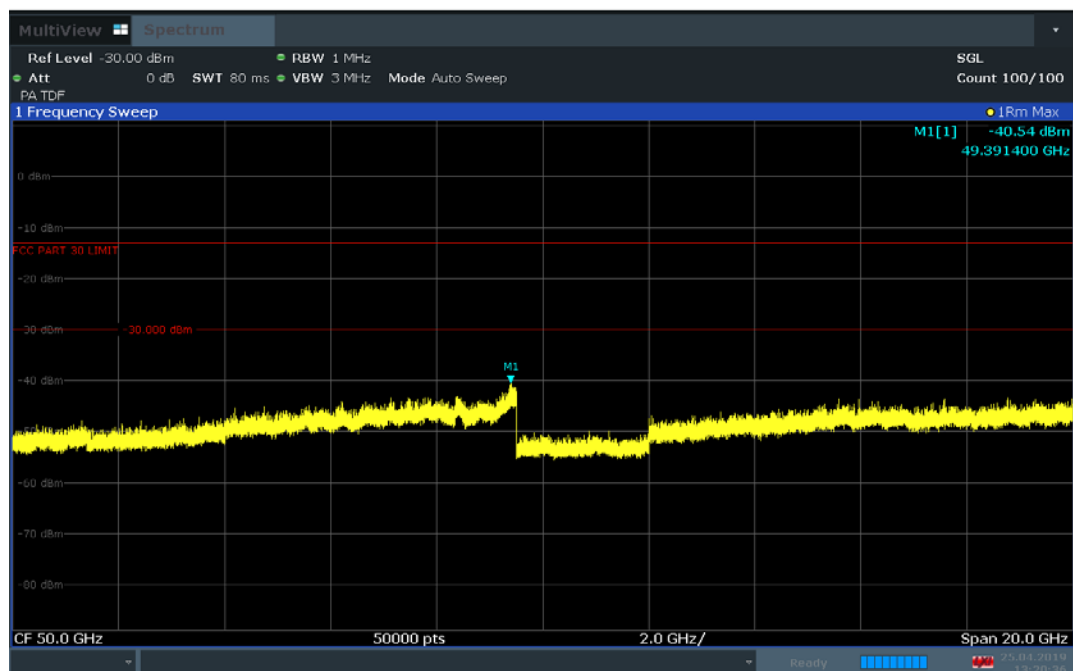
ACLRRResults



14:11:45 25.04.2019

Plot 7-83. Horizontal Radiated Spurious Plot 40-60 GHz (QTM0 1CC-50MHz Bandwidth QPSK High Channel)

ACLRRResults

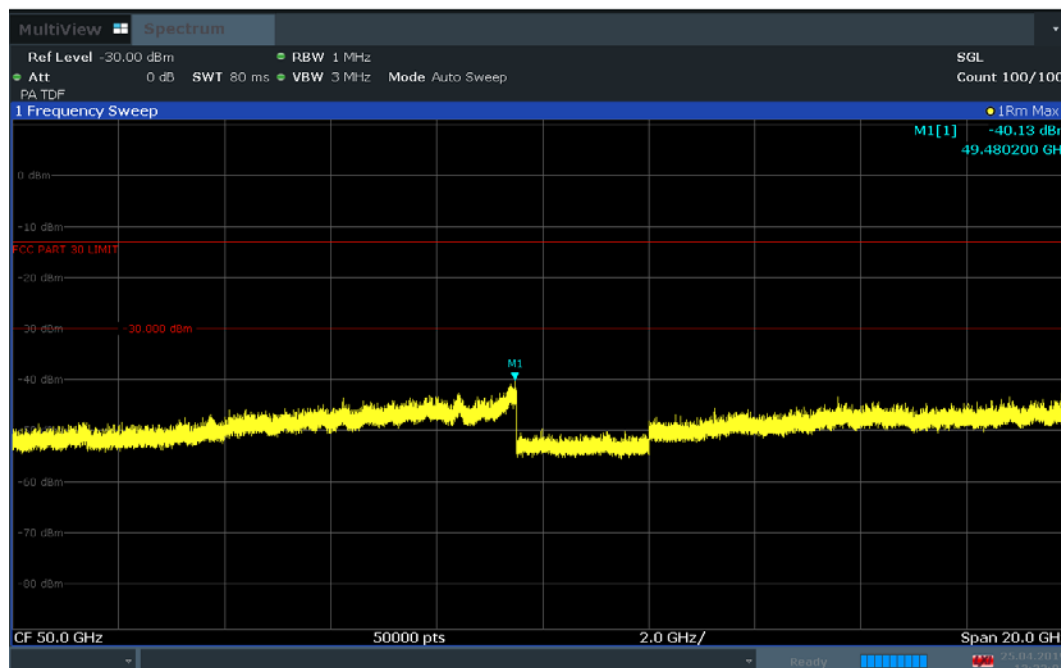


13:20:37 25.04.2019

Plot 7-84. Vertical Radiated Spurious Plot 40-60 GHz (QTM0 1CC-50MHz Bandwidth QPSK Low Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 67 of 202

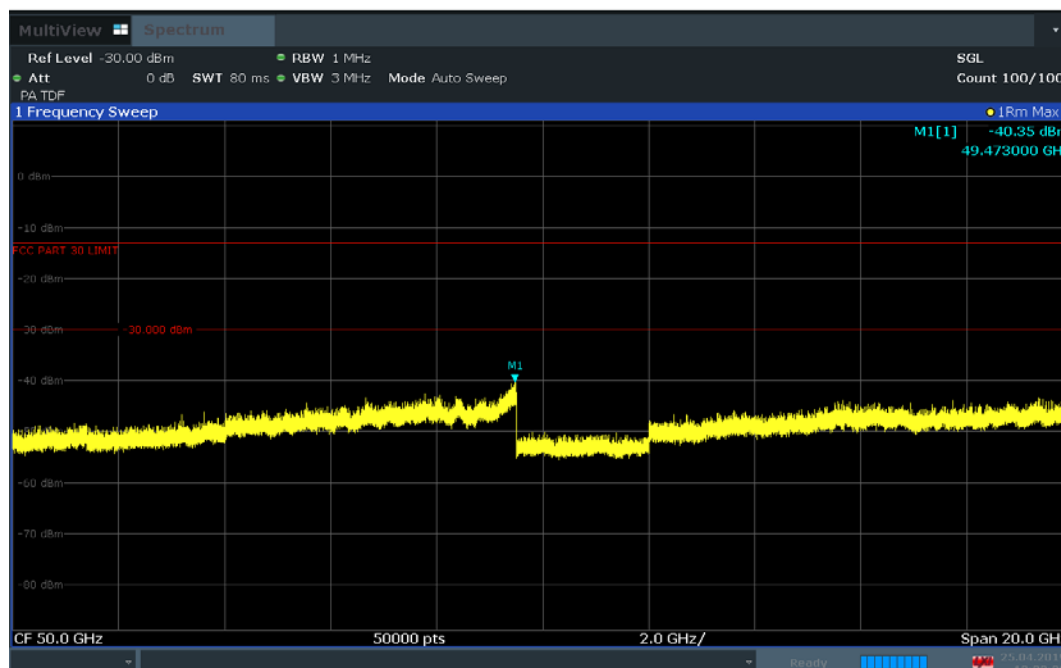
ACLRRResults



13:22:06 25.04.2019

Plot 7-85. Vertical Radiated Spurious Plot 40-60 GHz (QTM0 1CC-50MHz Bandwidth QPSK Mid Channel)

ACLRRResults



13:23:38 25.04.2019

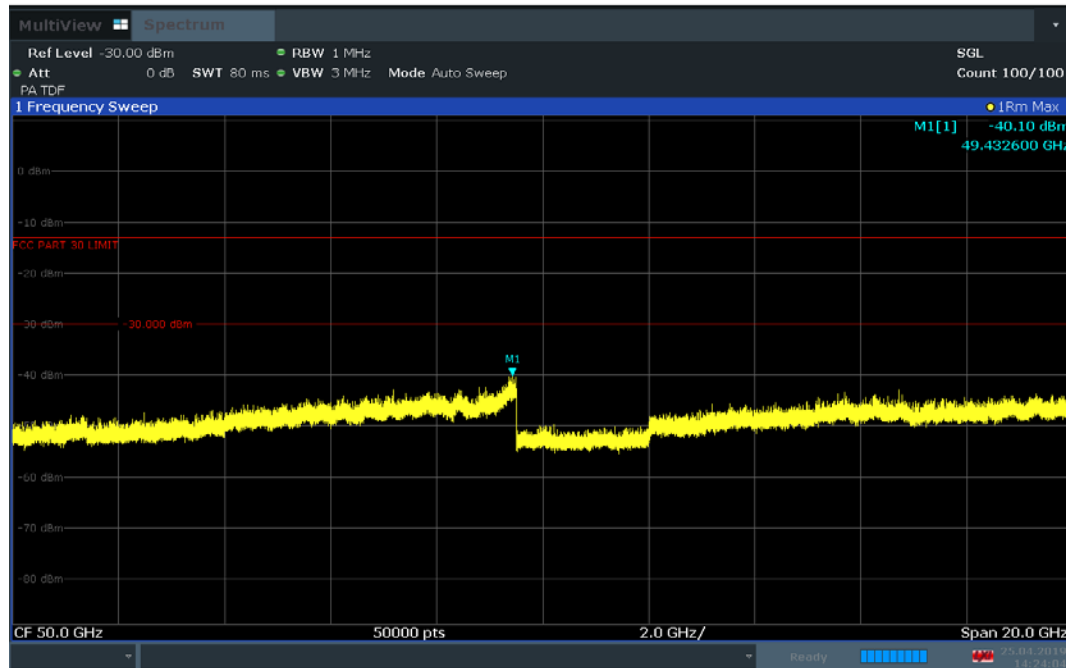
Plot 7-86. Vertical Radiated Spurious Plot 40-60 GHz (QTM0 1CC-50MHz Bandwidth QPSK High Channel)

FCC ID: ZNFV450VM		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 68 of 202

Frequency [MHz]	Detector /Trace	Chan.	Bandwidth (MHz)	Mod.	Beam Polarization	Ant. Pos [H/V]	Ant. Height [cm]	Turn Table Azimuth [degree]	RSE EIRP [dBm]	Limit [dBm]	Margin [dB]
49493.00	Maxh/RMS	Low	100	QPSK	H + V	H	-	-	-40.71	-13.00	-27.71
49452.20	Maxh/RMS	Mid	100	QPSK	H + V	H	-	-	-40.14	-13.00	-27.14
49467.80	Maxh/RMS	High	100	QPSK	H + V	H	-	-	-40.49	-13.00	-27.49
49391.40	Maxh/RMS	Low	100	QPSK	H + V	V	-	-	-40.54	-13.00	-27.54
49480.20	Maxh/RMS	Mid	100	QPSK	H + V	V	-	-	-40.13	-13.00	-27.13
49473.00	Maxh/RMS	High	100	QPSK	H + V	V	-	-	-40.35	-13.00	-27.35

Table 7-15. Spurious Emissions QTM0 (40 – 60GHz)

ACLRResults

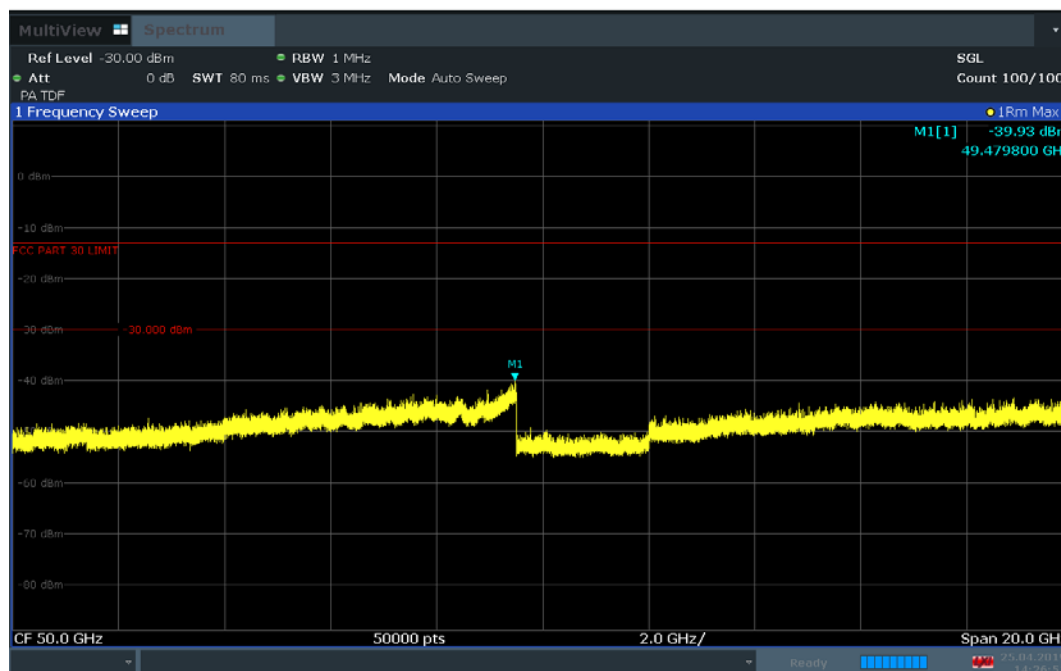


14:24:05 25.04.2019

Plot 7-87. Horizontal Radiated Spurious Plot 40-60 GHz (QTM1 1CC-100MHz Bandwidth QPSK Low Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 69 of 202

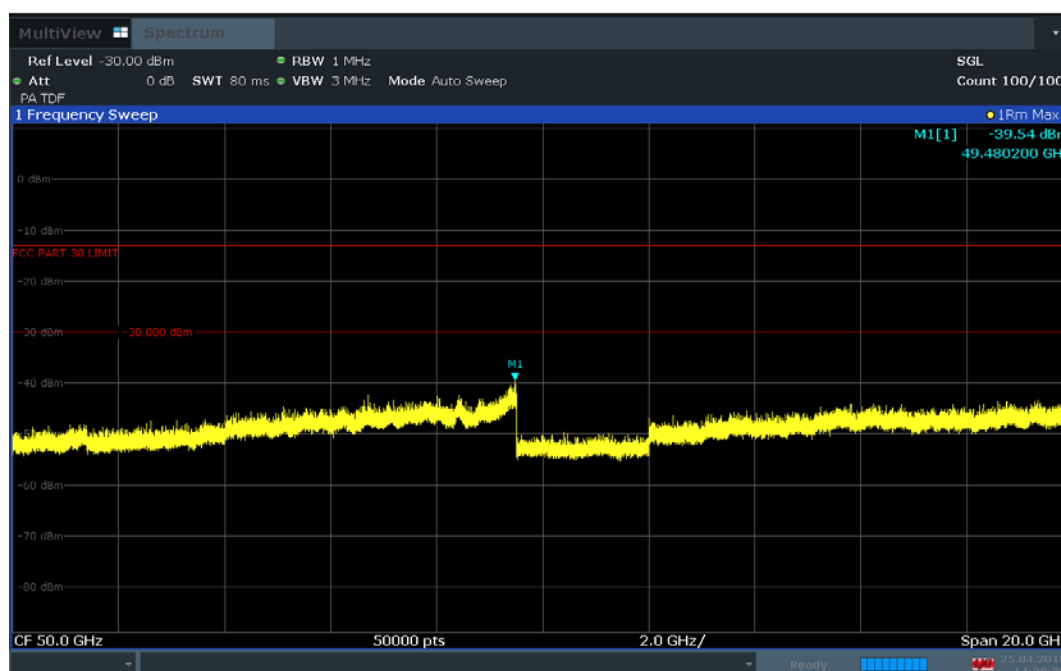
ACLRResults



14:26:51 25.04.2019

Plot 7-88. Horizontal Radiated Spurious Plot 40-60 GHz (QTM1 1CC-100MHz Bandwidth QPSK Mid Channel)

ACLRResults



14:29:20 25.04.2019

Plot 7-89. Horizontal Radiated Spurious Plot 40-60 GHz (QTM1 1CC-100MHz Bandwidth QPSK High Channel)

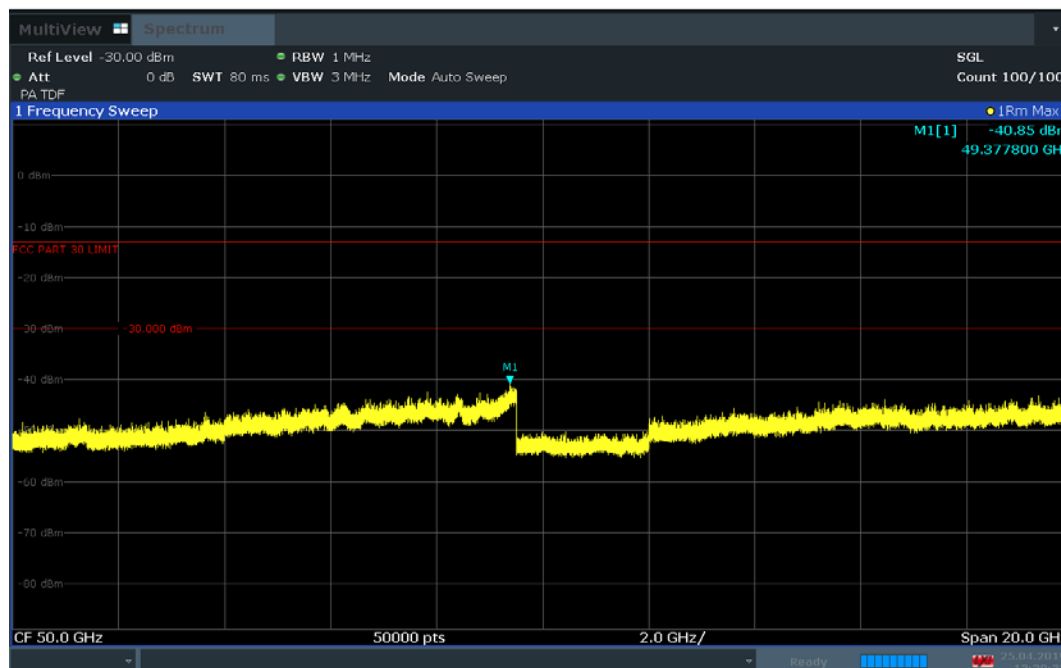
FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 70 of 202

© 2019 PCTEST Engineering Laboratory, Inc.

V1.0

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

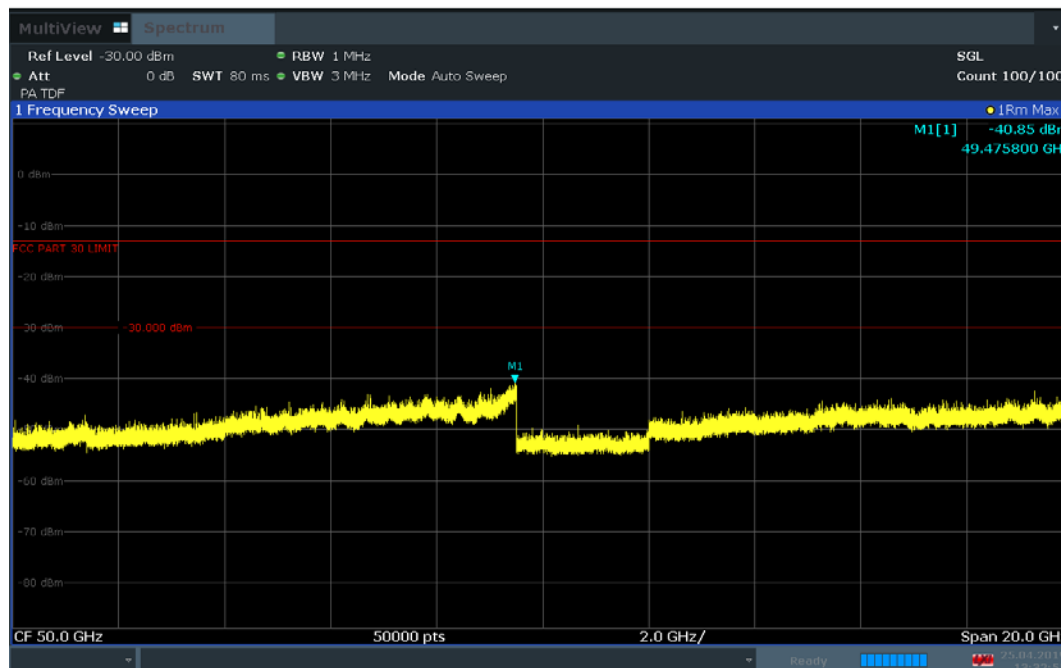
ACLRRResults



13:29:33 25.04.2019

Plot 7-90. Vertical Radiated Spurious Plot 40-60 GHz (QTM1 1CC-100MHz Bandwidth QPSK Low Channel)

ACLRRResults



13:32:55 25.04.2019

Plot 7-91. Vertical Radiated Spurious Plot 40-60 GHz (QTM1 1CC-100MHz Bandwidth QPSK Mid Channel)

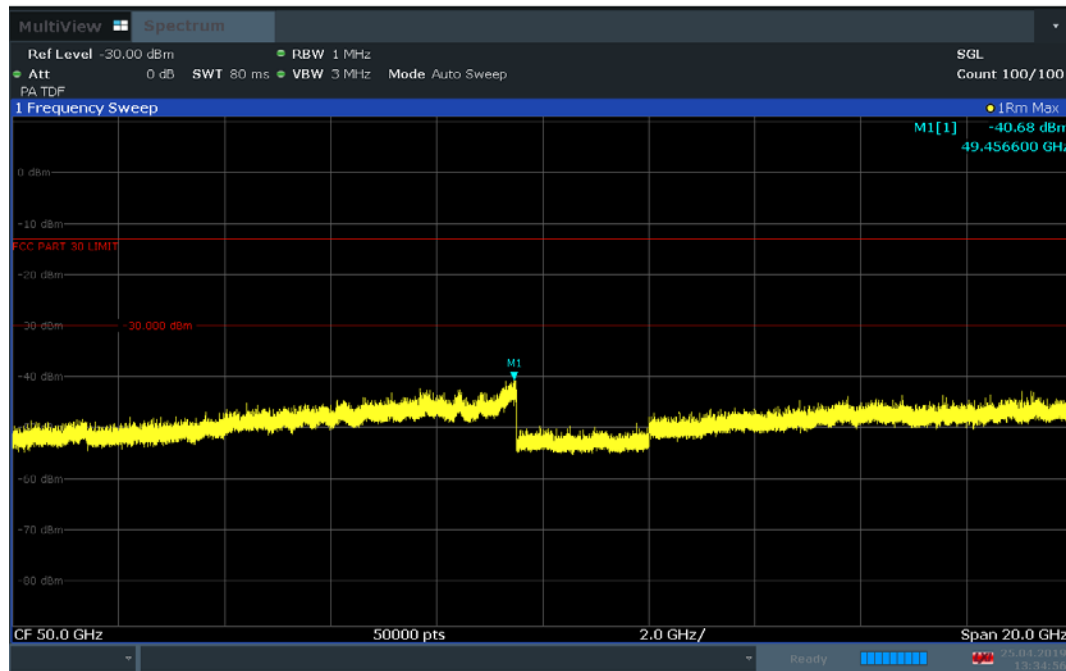
FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 71 of 202

© 2019 PCTEST Engineering Laboratory, Inc.

V1.0

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from PCTEST Engineering Laboratory, Inc. If you have any questions about this international copyright or have an enquiry about obtaining additional rights to this report or assembly of contents thereof, please contact INFO@PCTEST.COM.

ACLRResults



13:34:56 25.04.2019

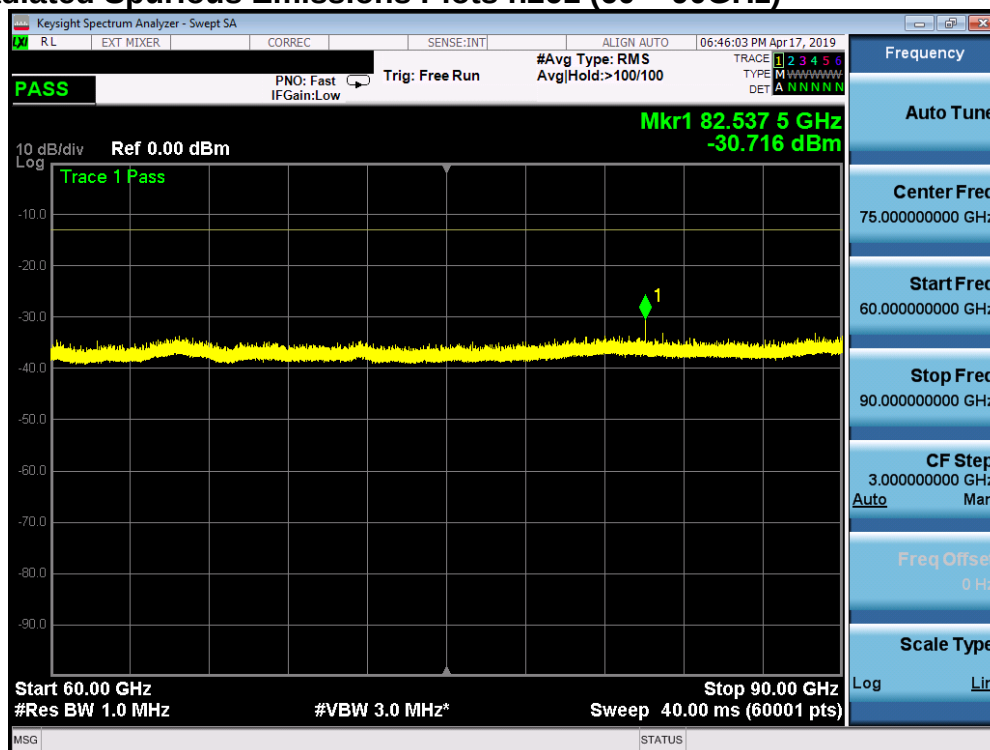
Plot 7-92. Vertical Radiated Spurious Plot 40-60 GHz (QTM1 1CC-100MHz Bandwidth QPSK High Channel)

Frequency [MHz]	Detector /Trace	Chan.	Bandwidth (MHz)	Mod.	Beam Polarization	Ant. Pos [H/V]	Ant. Height [cm]	Turn Table Azimuth [degree]	RSE EIRP [dBm]	Limit [dBm]	Margin [dB]
49432.60	Maxh/RMS	Low	100	QPSK	H + V	H	-	-	-40.10	-13.00	-27.10
49479.80	Maxh/RMS	Mid	100	QPSK	H + V	H	-	-	-39.93	-13.00	-26.93
49480.20	Maxh/RMS	High	100	QPSK	H + V	H	-	-	-39.54	-13.00	-26.54
49377.80	Maxh/RMS	Low	100	QPSK	H + V	V	-	-	-40.85	-13.00	-27.85
49475.80	Maxh/RMS	Mid	100	QPSK	H + V	V	-	-	-40.85	-13.00	-27.85
49456.60	Maxh/RMS	High	100	QPSK	H + V	V	-	-	-40.68	-13.00	-27.68

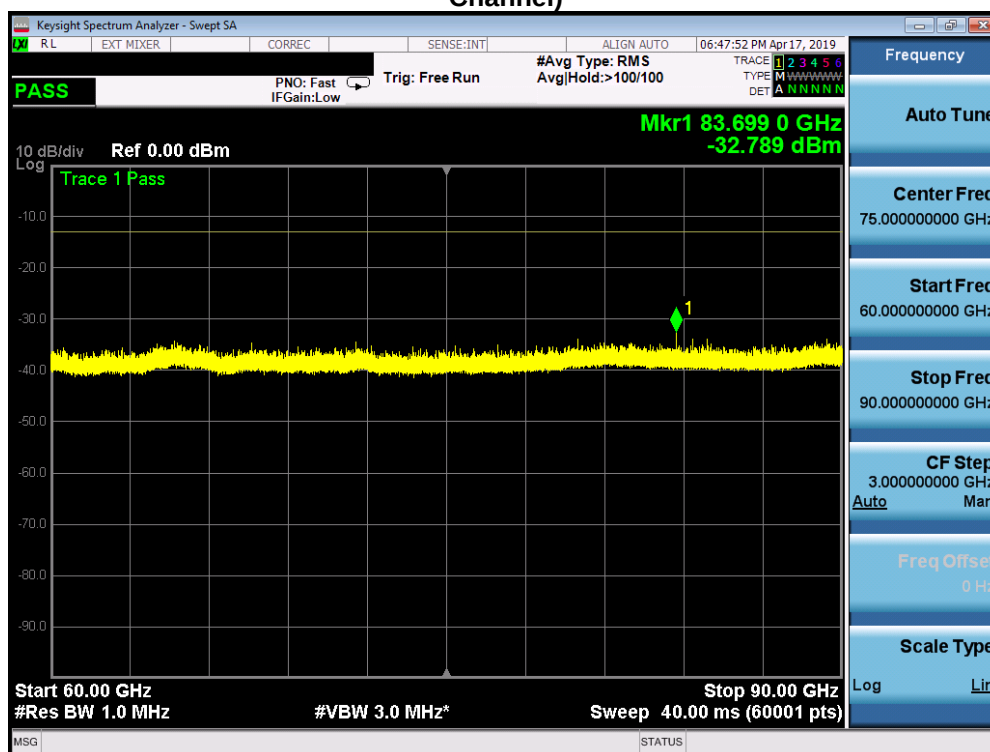
Table 7-16. Spurious Emissions QTM1 (40 – 60GHz)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)		LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset			Page 72 of 202

7.4.6 Radiated Spurious Emissions Plots n261 (60 – 90GHz)

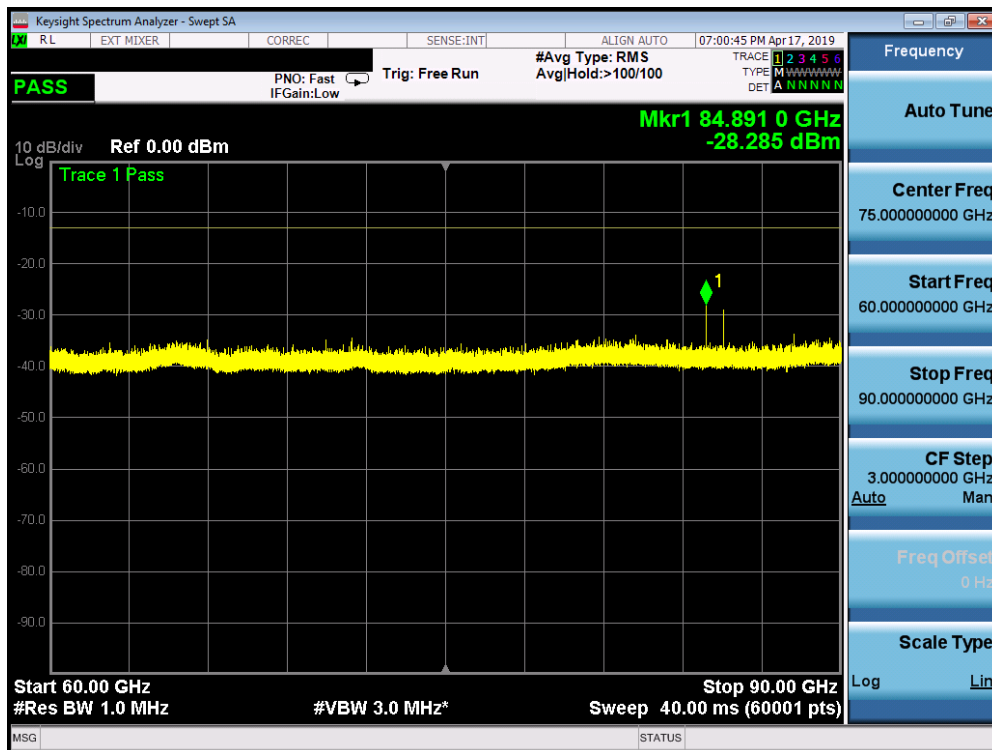


Plot 7-93. Horizontal Radiated Spurious Plot 60-90 GHz (QTM0 1CC-50MHz Bandwidth QPSK Low Channel)

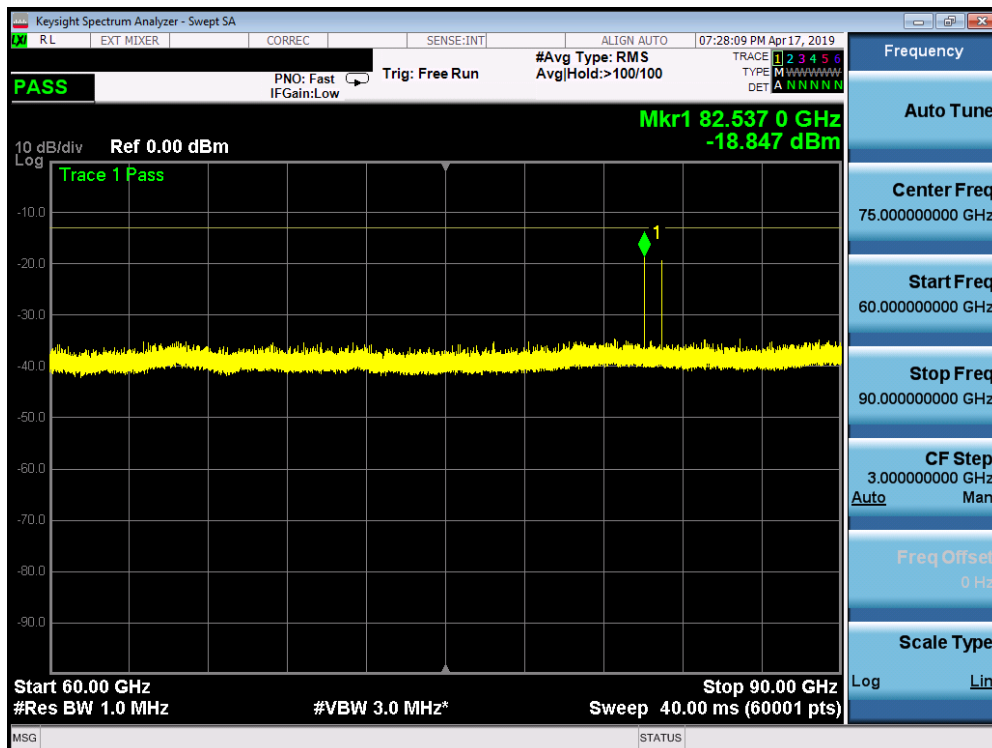


Plot 7-94. Horizontal Radiated Spurious Plot 60-90 GHz (QTM0 1CC-50MHz Bandwidth QPSK Mid Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 73 of 202

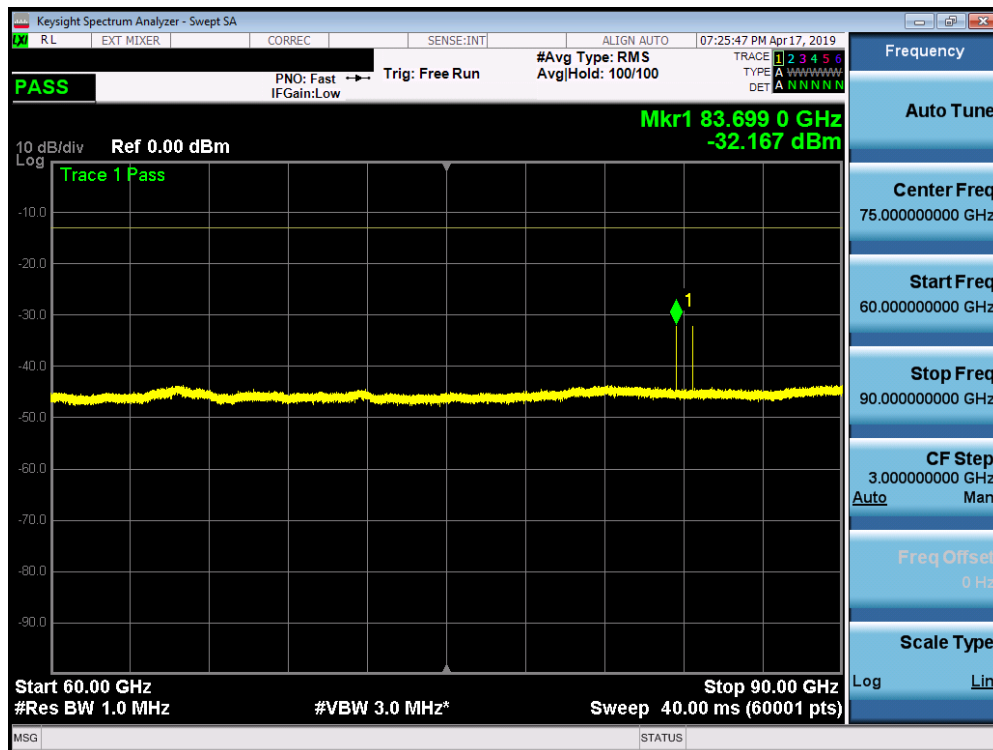


Plot 7-95. Horizontal Radiated Spurious Plot 60-90 GHz (QTM0 1CC-50MHz Bandwidth QPSK High Channel)

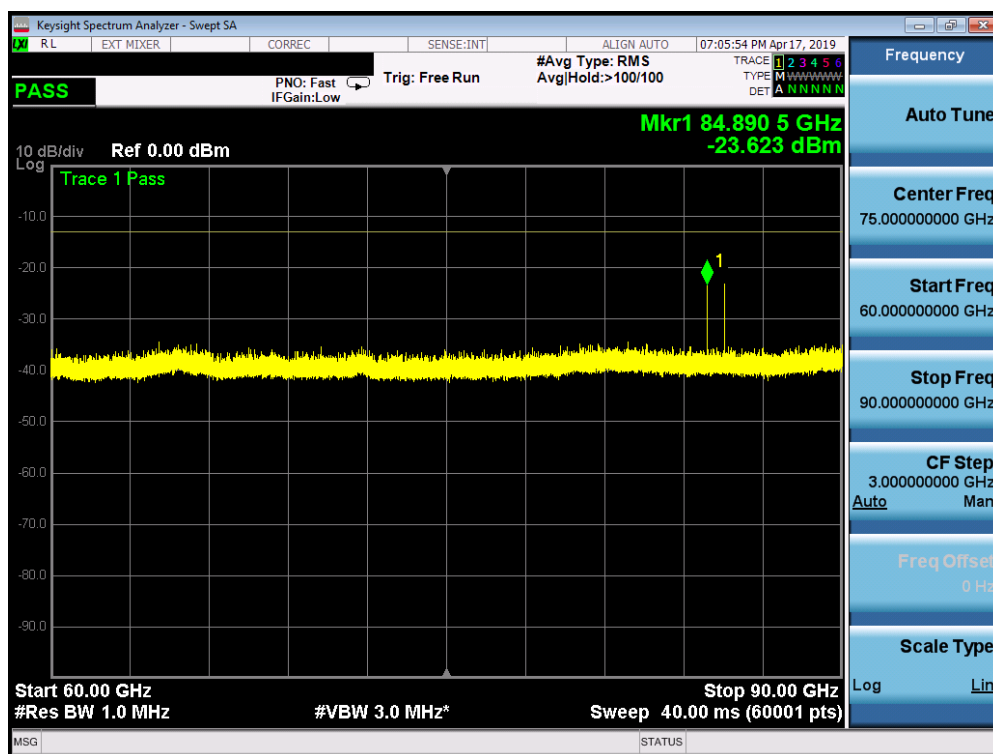


Plot 7-96. Vertical Radiated Spurious Plot 60-90 GHz (QTM0 1CC-50MHz Bandwidth QPSK Low Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 74 of 202



Plot 7-97. Vertical Radiated Spurious Plot 60-90 GHz (QTM0 1CC-50MHz Bandwidth QPSK Mid Channel)

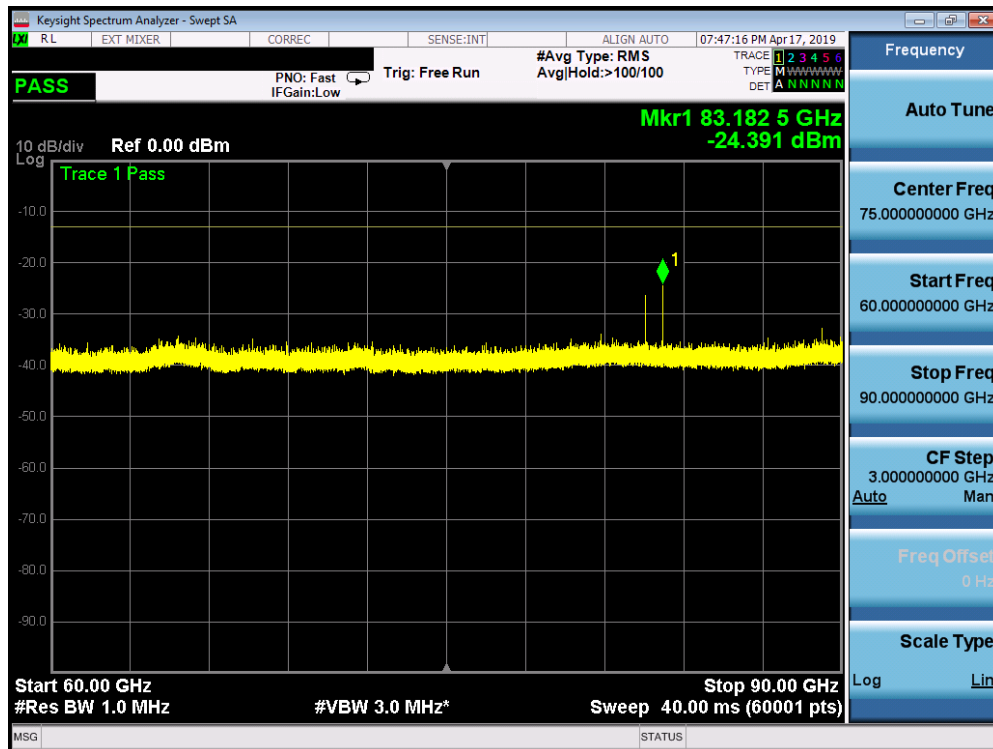


Plot 7-98. Vertical Radiated Spurious Plot 60-90 GHz (QTM0 1CC-50MHz Bandwidth QPSK High Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 75 of 202

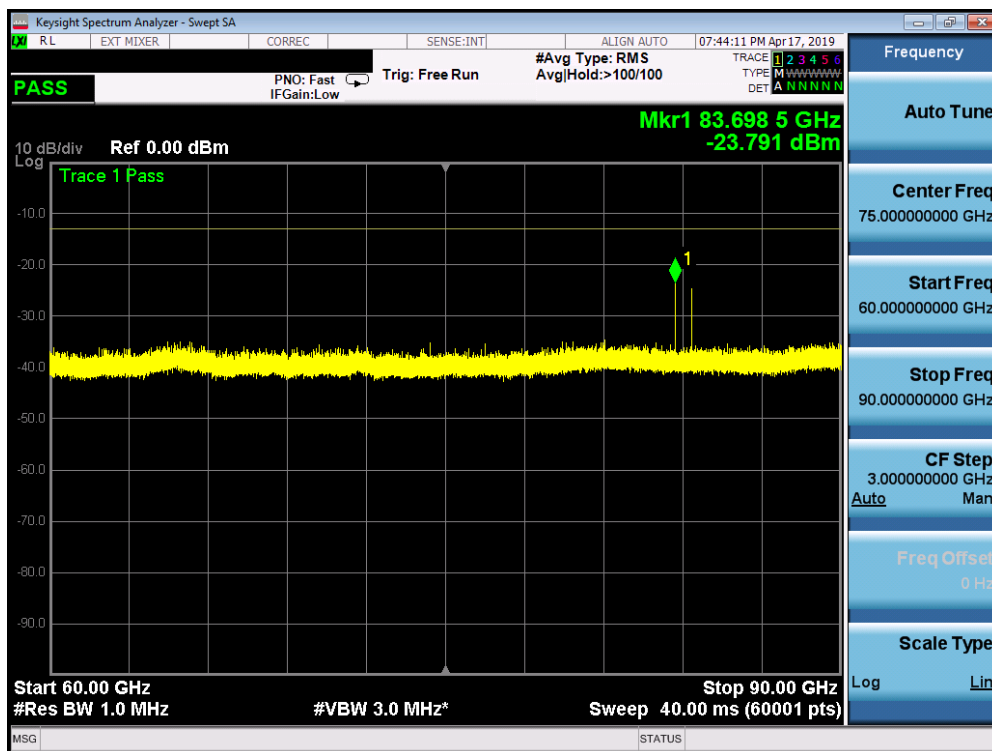
Frequency [MHz]	Detector /Trace	Chan.	Bandwidth (MHz)	Mod.	Beam Polarization	Ant. Pos [H/V]	Ant. Height [cm]	Turn Table Azimuth [degree]	RSE EIRP [dBm]	Limit [dBm]	Margin [dB]
82537.50	Maxh/RMS	Low	100	QPSK	H + V	H	150	113	-30.72	-13.00	-17.72
83699.00	Maxh/RMS	Mid	100	QPSK	H + V	H	150	110	-32.79	-13.00	-19.79
84891.00	Maxh/RMS	High	100	QPSK	H + V	H	150	114	-28.29	-13.00	-15.29
82537.00	Maxh/RMS	Low	100	QPSK	H + V	V	150	116	-18.85	-13.00	-5.85
83699.00	Maxh/RMS	Mid	100	QPSK	H + V	V	150	110	-32.17	-13.00	-19.17
84890.50	Maxh/RMS	High	100	QPSK	H + V	V	150	117	-23.62	-13.00	-10.62

Table 7-17. Spurious Emissions QTM0 (60 – 90GHz)

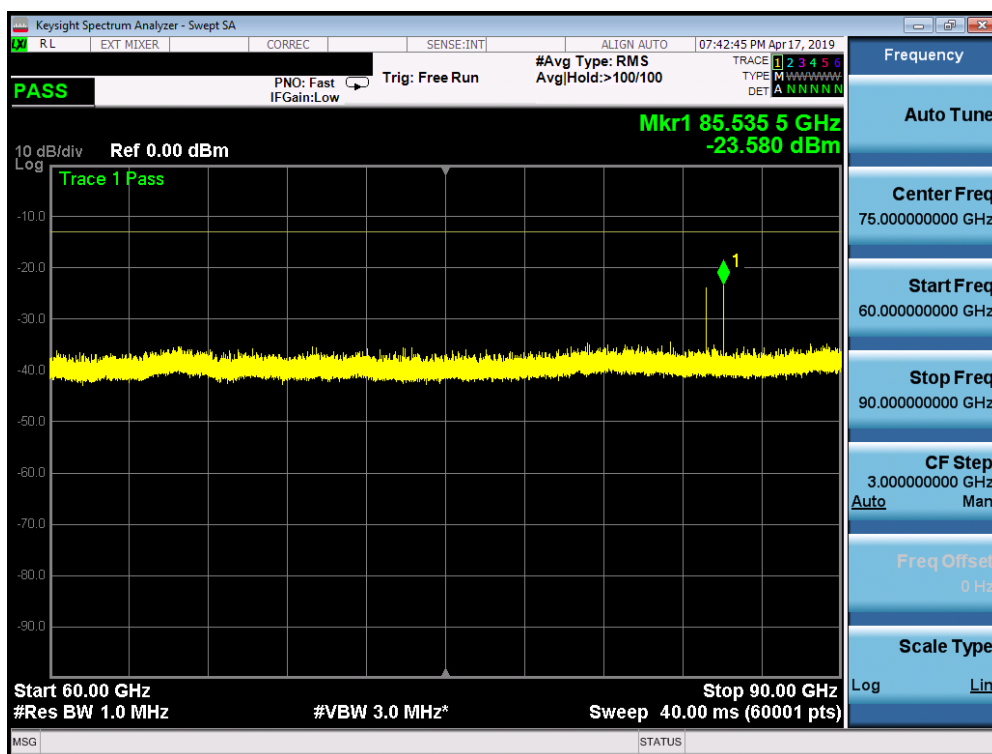


Plot 7-99. Horizontal Radiated Spurious Plot 60-90 GHz (QTM1 1CC-100MHz Bandwidth QPSK Low Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 76 of 202

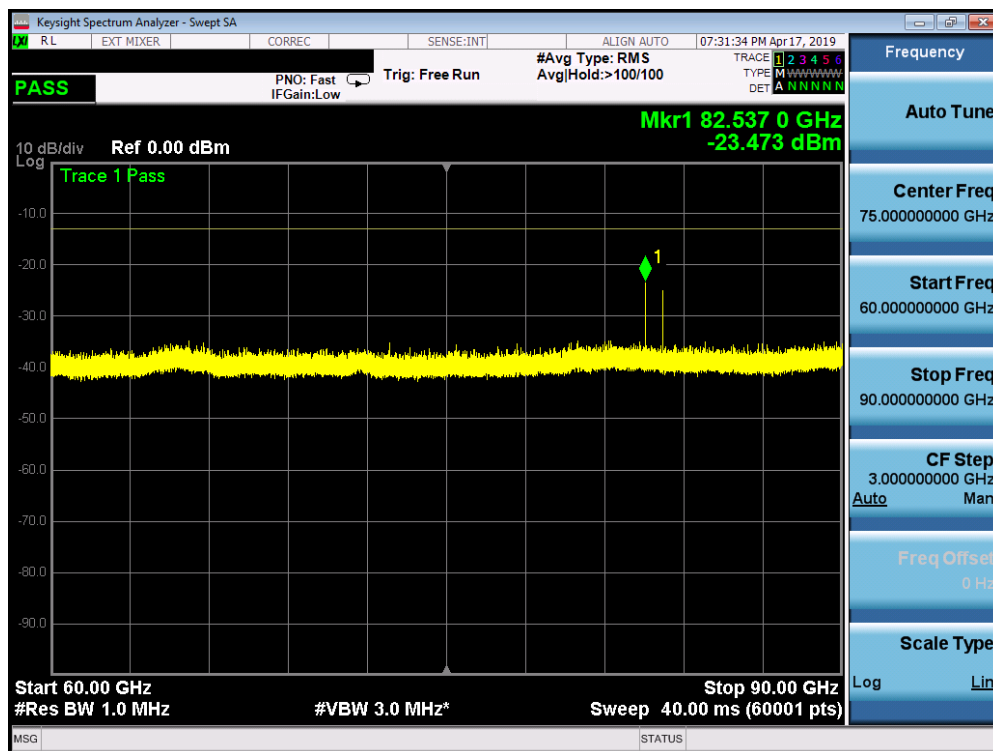


Plot 7-100. Horizontal Radiated Spurious Plot 60-90 GHz (QTM1 1CC-100MHz Bandwidth QPSK Mid Channel)

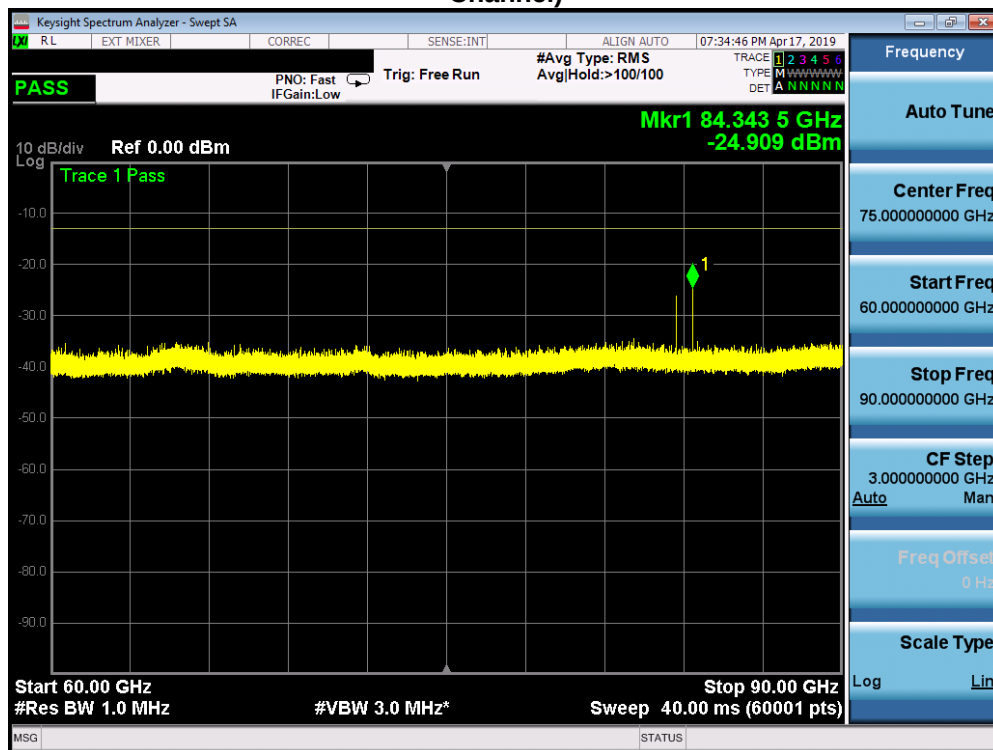


Plot 7-101. Horizontal Radiated Spurious Plot 60-90 GHz (QTM1 1CC-100MHz Bandwidth QPSK High Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 77 of 202

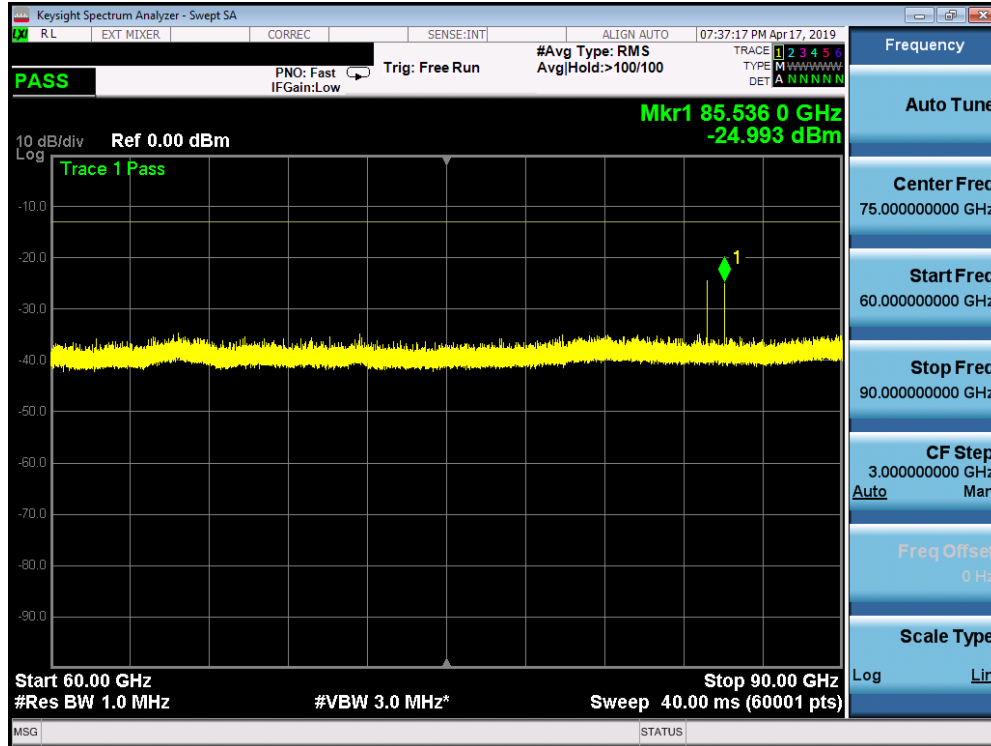


Plot 7-102. Vertical Radiated Spurious Plot 60-90 GHz (QTM1 1CC-100MHz Bandwidth QPSK Low Channel)



Plot 7-103. Vertical Radiated Spurious Plot 60-90 GHz (QTM1 1CC-100MHz Bandwidth QPSK Mid Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 78 of 202



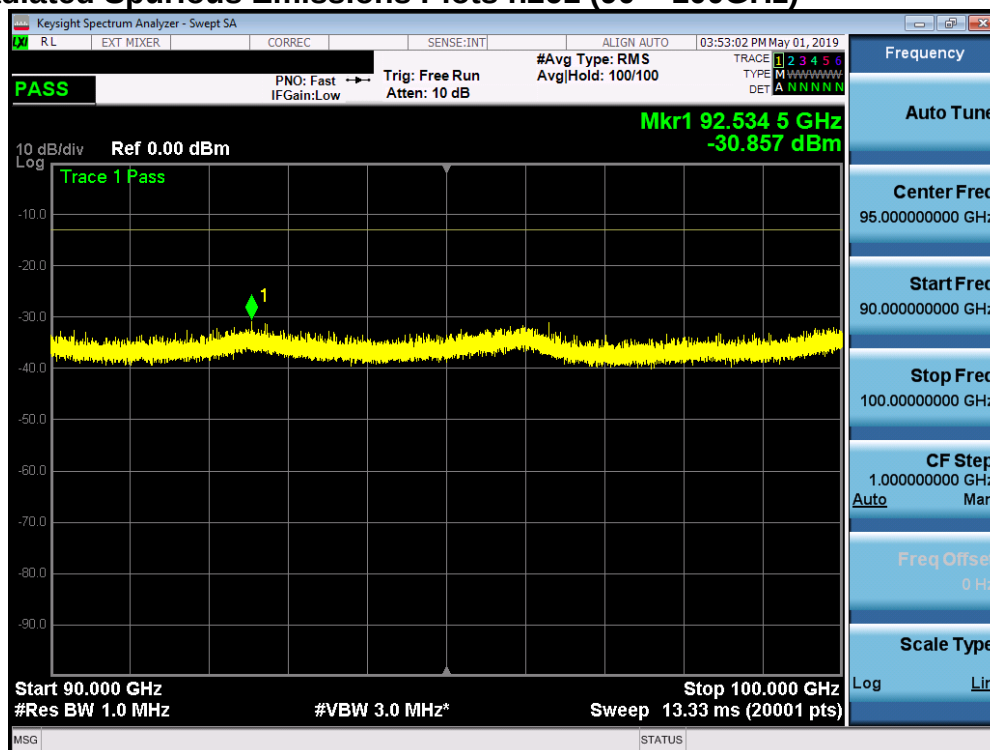
Plot 7-104. Vertical Radiated Spurious Plot 60-90 GHz (QTM1 1CC-100MHz Bandwidth QPSK High Channel)

Frequency [MHz]	Detector /Trace	Chan.	Bandwidth (MHz)	Mod.	Beam Polarization	Ant. Pos [H/V]	Ant. Height [cm]	Turn Table Azimuth [degree]	RSE EIRP [dBm]	Limit [dBm]	Margin [dB]
83182.50	Maxh/RMS	Low	100	QPSK	H + V	H	150	219	-24.39	-13.00	-11.39
83698.50	Maxh/RMS	Mid	100	QPSK	H + V	H	150	220	-23.79	-13.00	-10.79
85535.50	Maxh/RMS	High	100	QPSK	H + V	H	150	214	-23.58	-13.00	-10.58
82537.00	Maxh/RMS	Low	100	QPSK	H + V	V	150	213	-23.47	-13.00	-10.47
84343.50	Maxh/RMS	Mid	100	QPSK	H + V	V	150	210	-24.91	-13.00	-11.91
85536.00	Maxh/RMS	High	100	QPSK	H + V	V	150	218	-24.99	-13.00	-11.99

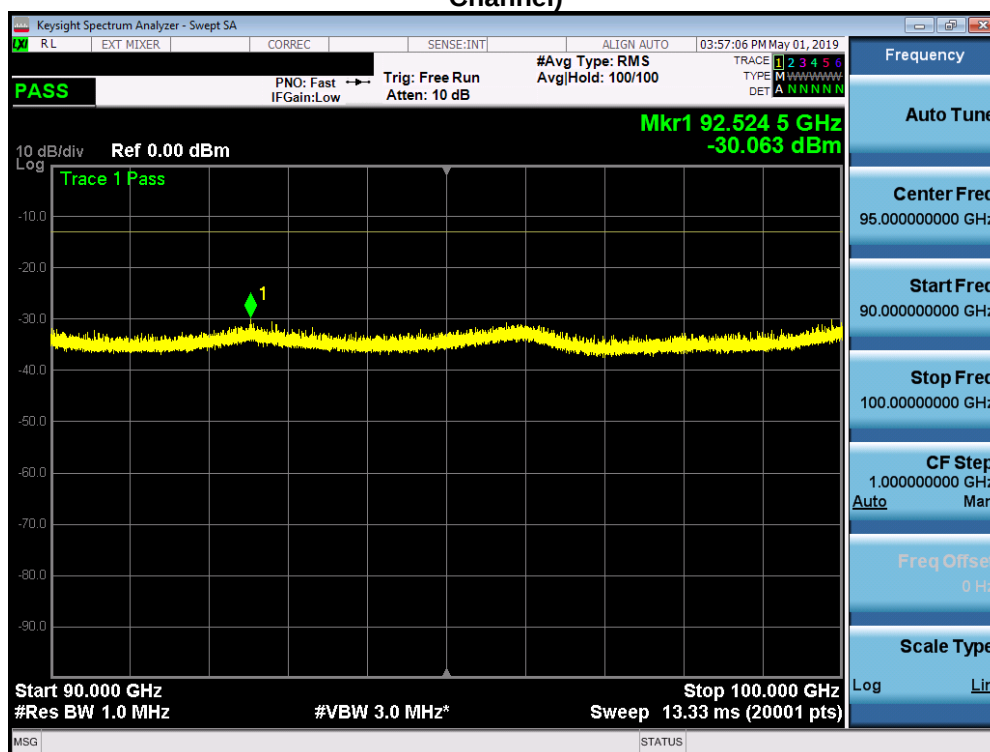
Table 7-18. Spurious Emissions QTM1 (60 – 90GHz)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 79 of 202

7.4.7 Radiated Spurious Emissions Plots n261 (90 – 100GHz)

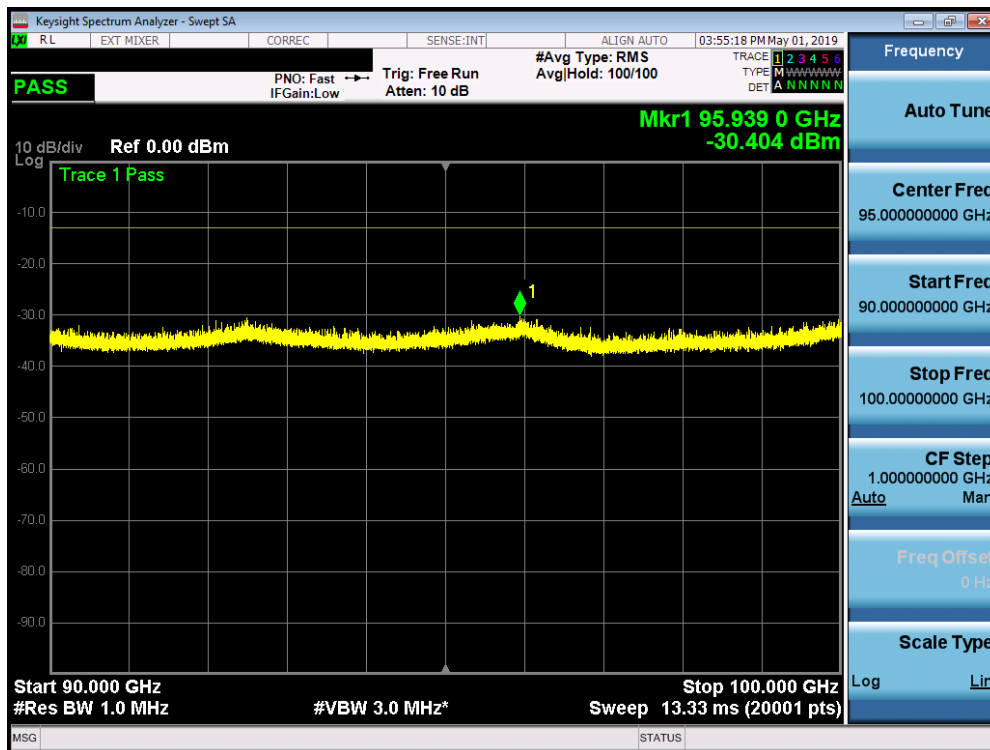


Plot 7-105. Horizontal Radiated Spurious Plot 90-100 GHz (QTM0 1CC-50MHz Bandwidth QPSK Low Channel)

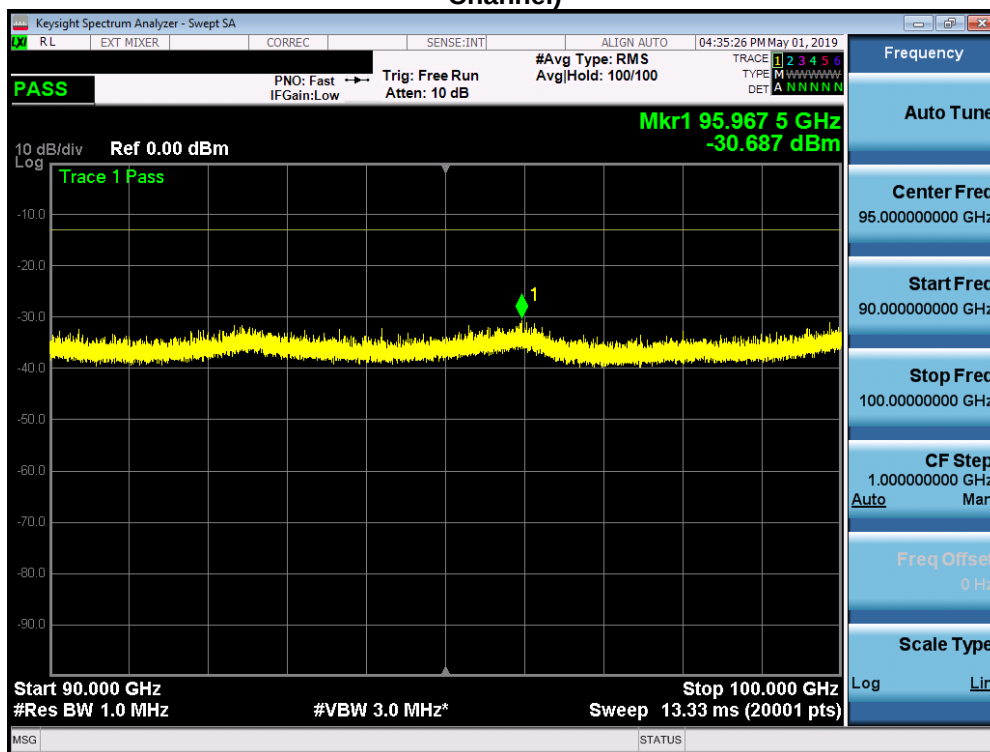


Plot 7-106. Horizontal Radiated Spurious Plot 90-100 GHz (QTM0 1CC-50MHz Bandwidth QPSK Mid Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 80 of 202

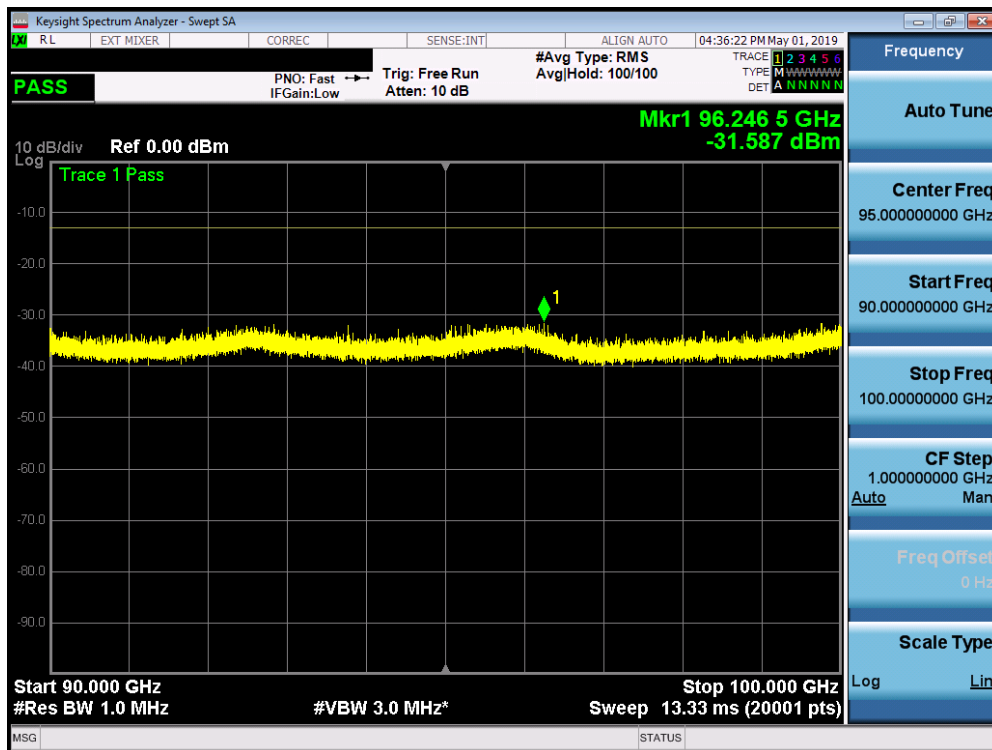


Plot 7-107. Horizontal Radiated Spurious Plot 90-100 GHz (QTM0 1CC-50MHz Bandwidth QPSK High Channel)

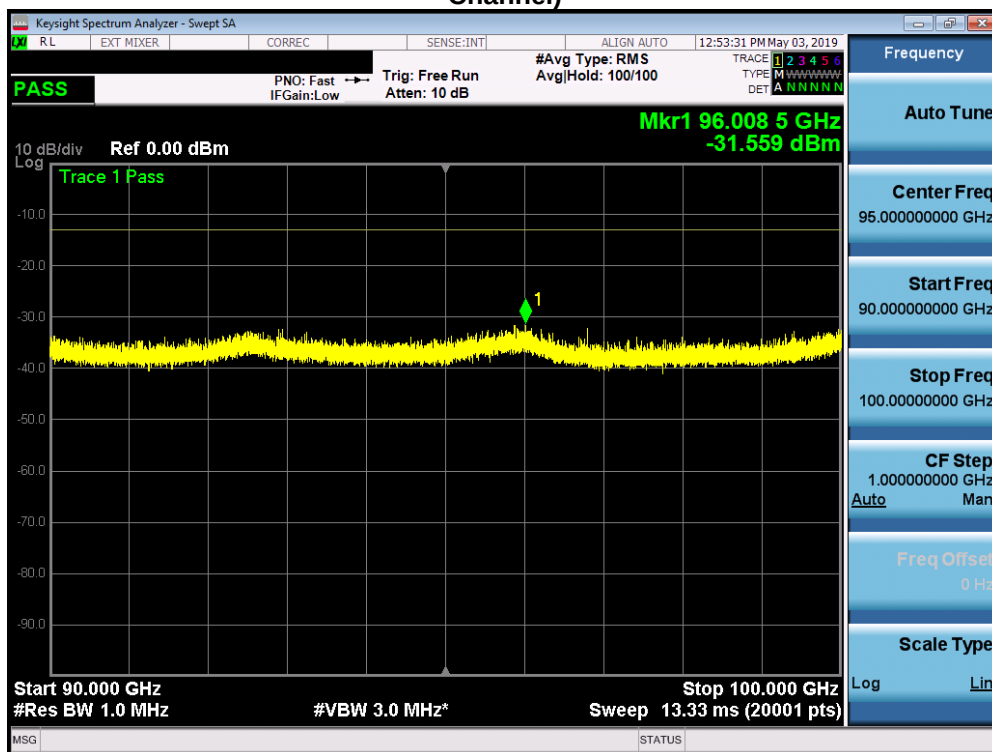


Plot 7-108. Vertical Radiated Spurious Plot 90-100 GHz (QTM0 1CC-50MHz Bandwidth QPSK Low Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 81 of 202



Plot 7-109. Vertical Radiated Spurious Plot 90-100 GHz (QTM0 1CC-50MHz Bandwidth QPSK Mid Channel)

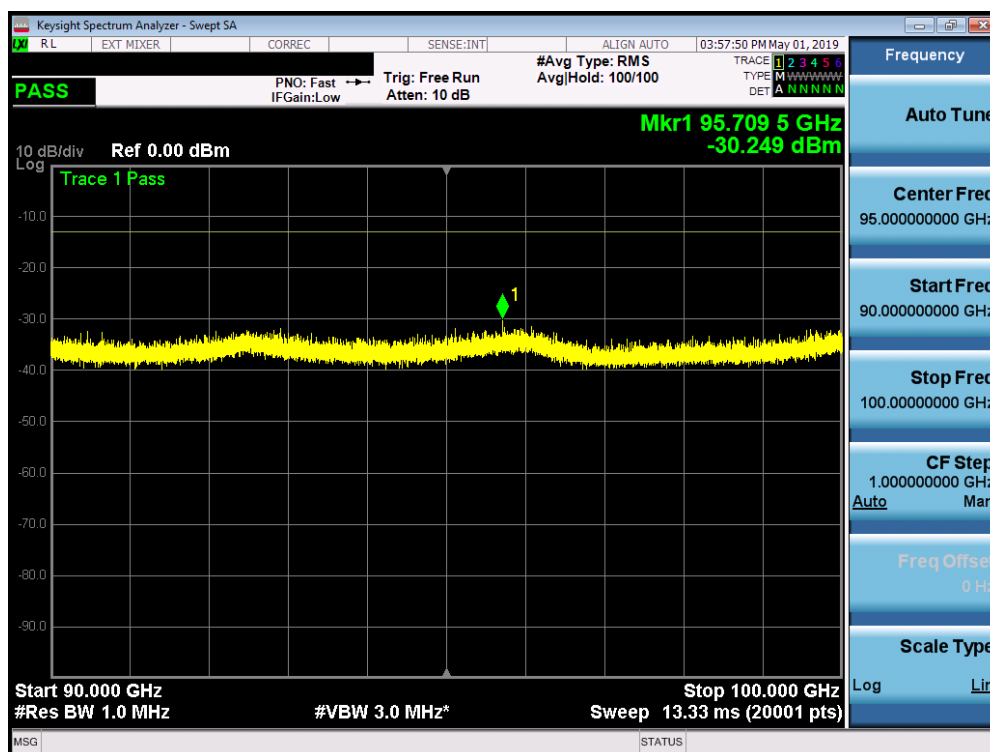


Plot 7-110. Vertical Radiated Spurious Plot 90-100 GHz (QTM0 1CC-50MHz Bandwidth QPSK High Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 82 of 202

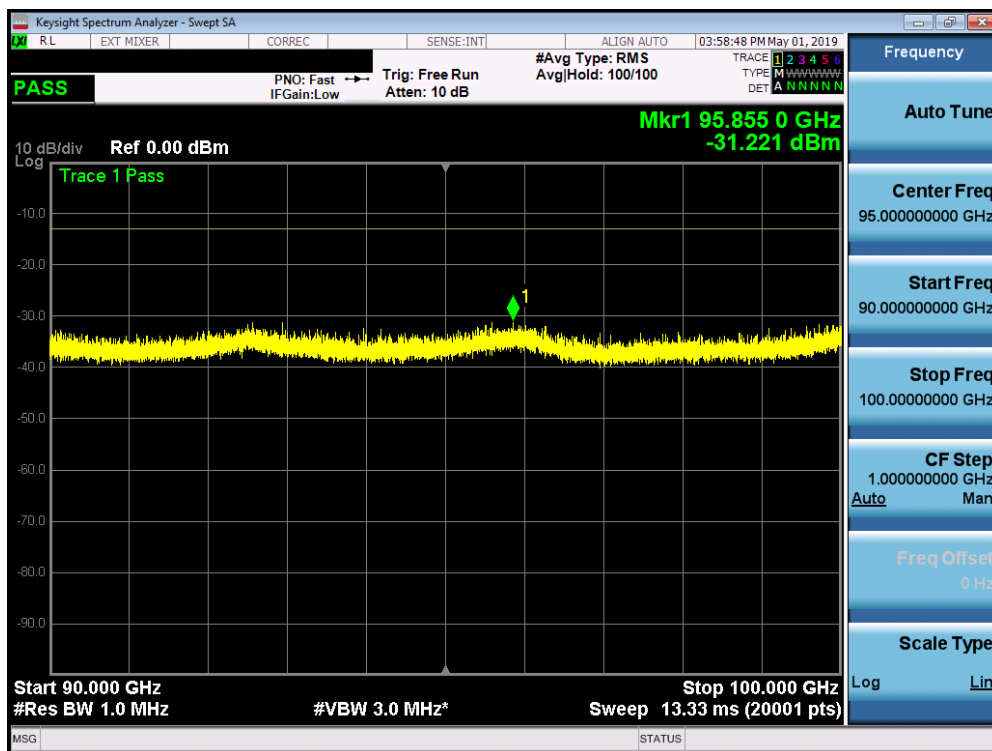
Frequency [MHz]	Detector/T race	Chan.	Bandwidth (MHz)	Mod.	Beam Polarization	Ant. Pos [H/V]	Ant. Height [cm]	Turn Table Azimuth [degree]	RSE EIRP [dBm]	Limit [dBm]	Margin [dB]
92534.50	Maxh/RMS	Low	100	QPSK	H + V	H	-	-	-30.86	-13.00	-17.86
92524.50	Maxh/RMS	Mid	100	QPSK	H + V	H	-	-	-30.06	-13.00	-17.06
95939.00	Maxh/RMS	High	100	QPSK	H + V	H	-	-	-30.40	-13.00	-17.40
95967.50	Maxh/RMS	Low	100	QPSK	H + V	V	-	-	-30.69	-13.00	-17.69
96246.50	Maxh/RMS	Mid	100	QPSK	H + V	V	-	-	-31.59	-13.00	-18.59
96008.50	Maxh/RMS	High	100	QPSK	H + V	V	-	-	-31.56	-13.00	-18.56

Table 7-19. Spurious Emissions QTM0 (90-100 GHz)

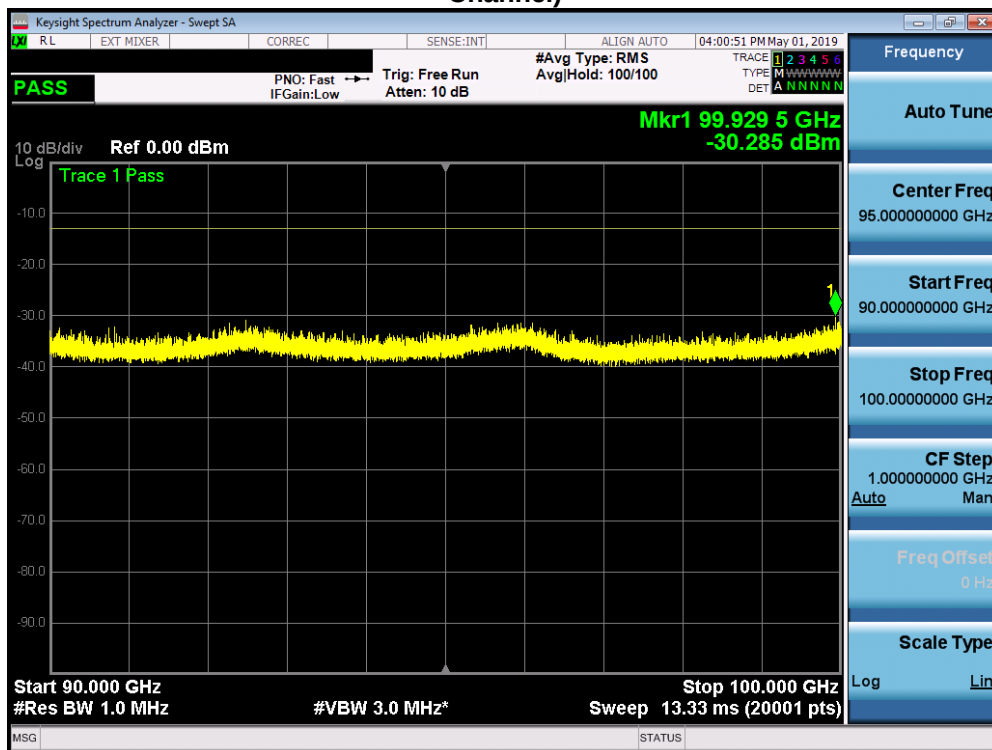


Plot 7-111. Horizontal Radiated Spurious Plot 90-100 GHz (QTM1 1CC-100MHz Bandwidth QPSK Low Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 83 of 202

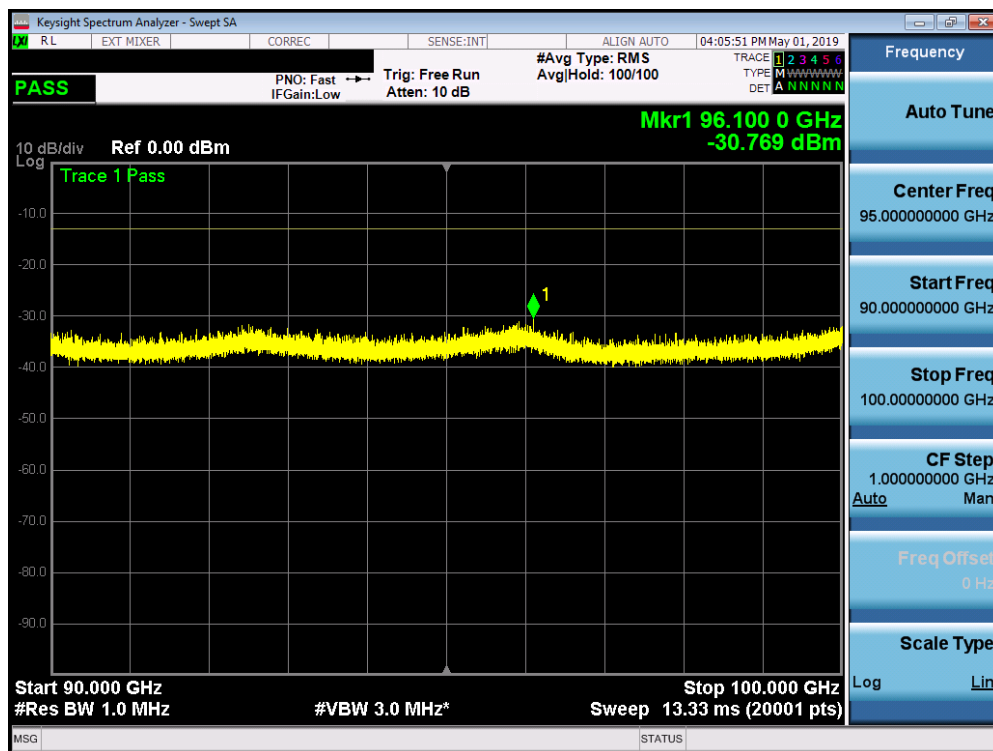


Plot 7-112. Horizontal Radiated Spurious Plot 90-100 GHz (QTM1 1CC-100MHz Bandwidth QPSK Mid Channel)

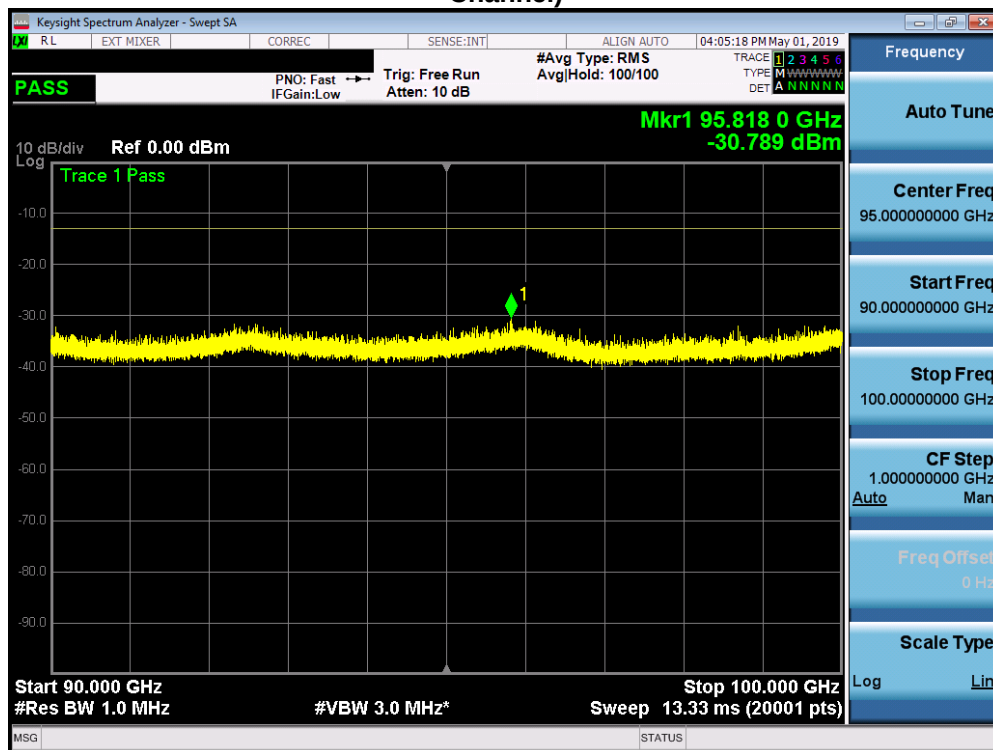


Plot 7-113. Horizontal Radiated Spurious Plot 90-100 GHz (QTM1 1CC-100MHz Bandwidth QPSK High Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 84 of 202

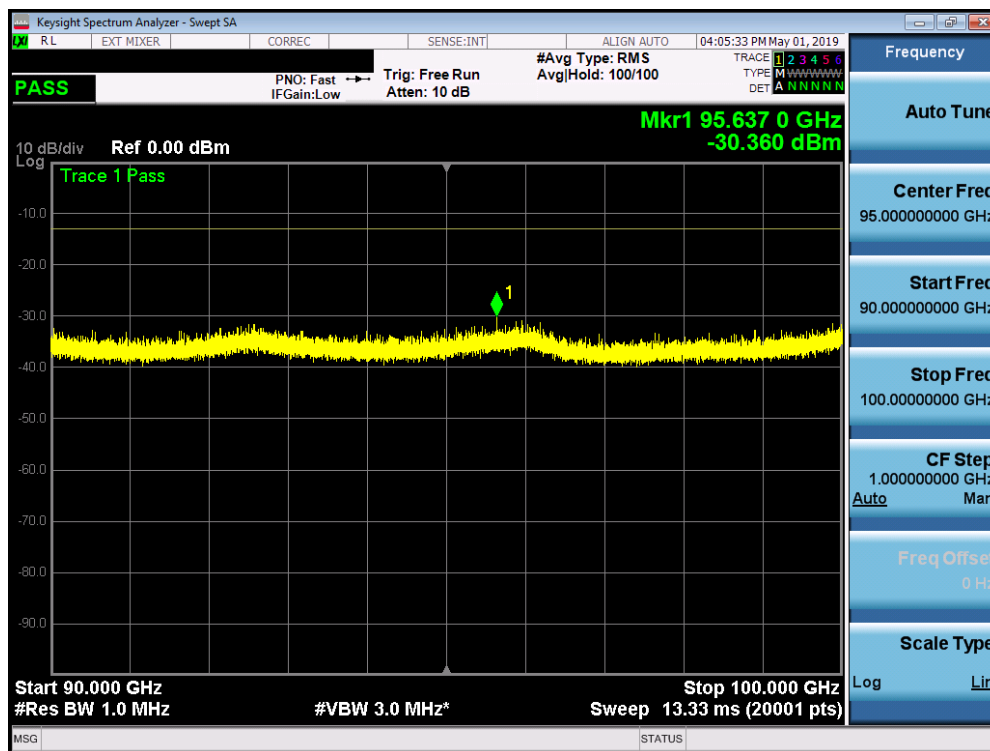


Plot 7-114. Vertical Radiated Spurious Plot 90-100 GHz (QTM1 1CC-100MHz Bandwidth QPSK Low Channel)



Plot 7-115. Vertical Radiated Spurious Plot 90-100 GHz (QTM1 1CC-100MHz Bandwidth QPSK Mid Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 85 of 202



Plot 7-116. Vertical Radiated Spurious Plot 90-100 GHz (QTM1 1CC-100MHz Bandwidth QPSK High Channel)

Frequency [MHz]	Detector/Trace	Chan.	Bandwidth (MHz)	Mod.	Beam Polarization	Ant. Pos [H/V]	Ant. Height [cm]	Turn Table Azimuth [degree]	RSE EIRP [dBm]	Limit [dBm]	Margin [dB]
95709.50	Maxh/RMS	Low	100	QPSK	H + V	H	-	-	-30.25	-13.00	-17.25
95855.00	Maxh/RMS	Mid	100	QPSK	H + V	H	-	-	-31.22	-13.00	-18.22
99929.50	Maxh/RMS	High	100	QPSK	H + V	H	-	-	-30.29	-13.00	-17.29
96100.00	Maxh/RMS	Low	100	QPSK	H + V	V	-	-	-30.77	-13.00	-17.77
95818.00	Maxh/RMS	Mid	100	QPSK	H + V	V	-	-	-30.79	-13.00	-17.79
95637.00	Maxh/RMS	High	100	QPSK	H + V	V	-	-	-30.36	-13.00	-17.36

Table 7-20. Spurious Emissions QTM1 (90-100 GHz)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)		LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 86 of 202	

Spurious Emissions EIRP Sample Calculation

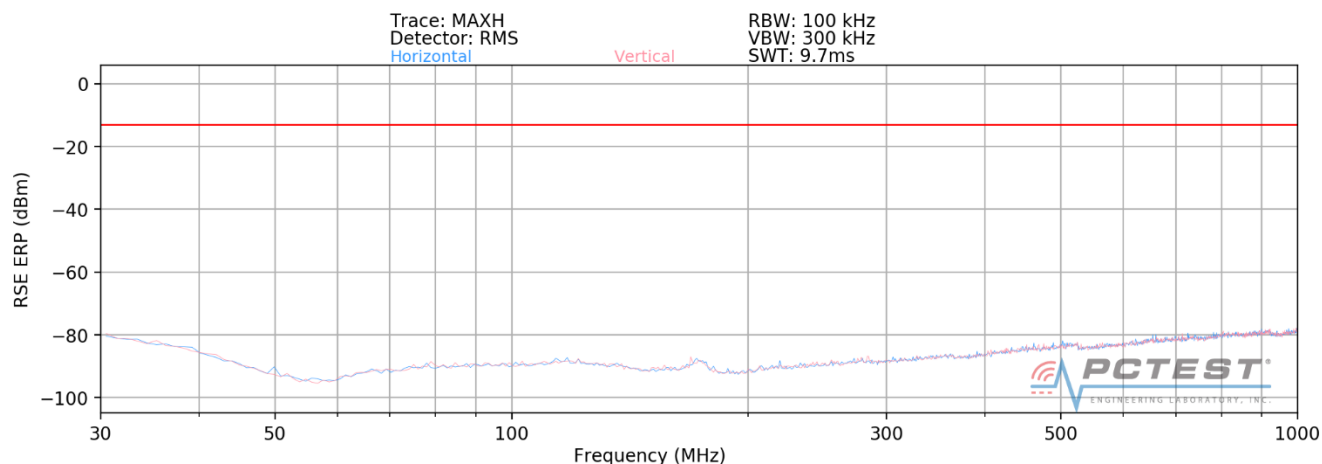
The raw radiated spurious level is converted to field strength in dB μ V/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 3 meters.

$$\begin{aligned}\text{Spurious Level [dB}\mu\text{V/m]} &= \text{Analyzer Level [dBm]} + \text{AFCL [dB/m]} + 107 \\ &= -56.01 \text{ dBm} - 22.64 \text{ dB/m} + 107 \\ &= 28.35 \text{ dB}\mu\text{V/m}\end{aligned}$$

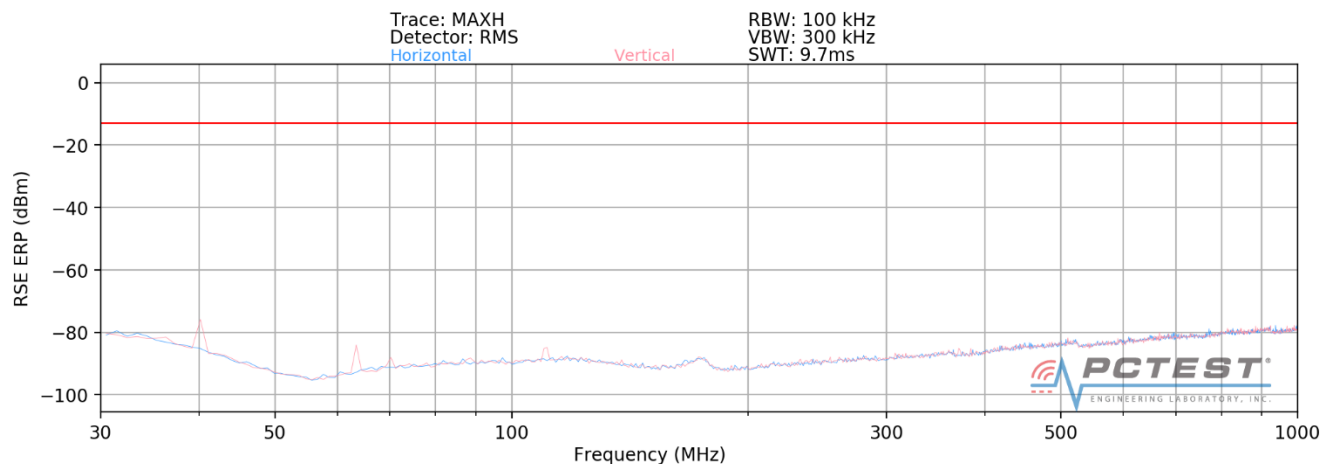
$$\begin{aligned}\text{RSE EIRP [dBm]} &= \text{Field Strength} + 20\text{Log}(D_m) - 104.8 \\ &= 28.35 \text{ dB}\mu\text{V/m} + 20\text{Log}(3) - 104.8 \\ &= -95.06 \text{ dBm}\end{aligned}$$

FCC ID: ZNFV450VM		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 87 of 202

7.4.8 Radiated Spurious Emissions Plots n260 (30MHz – 1GHz)



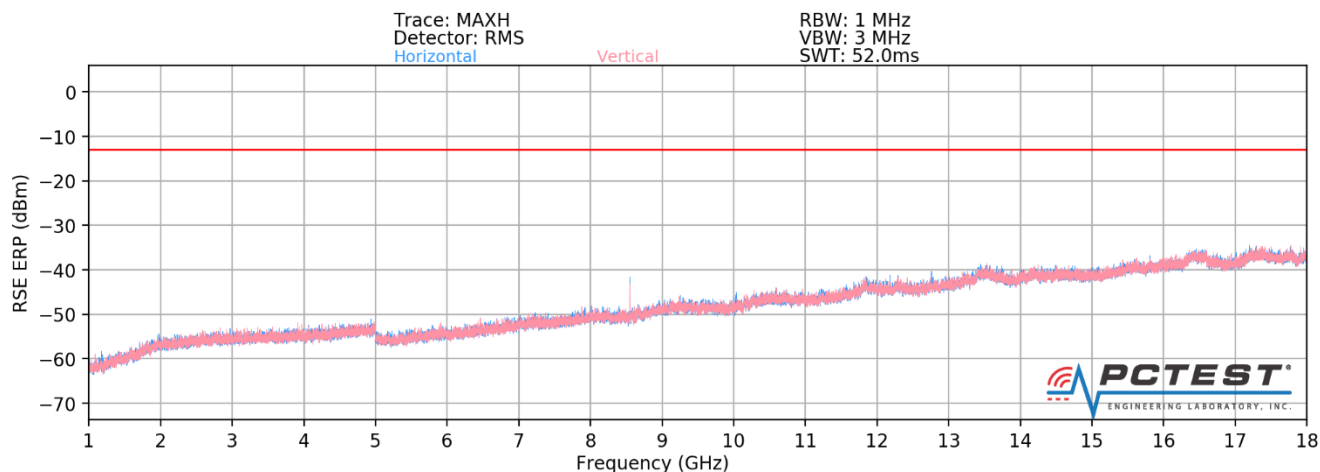
Plot 7-117. Radiated Spurious Plot 30 MHz - 1 GHz (QTM0 1CC-100MHz Bandwidth QPSK Mid Channel)



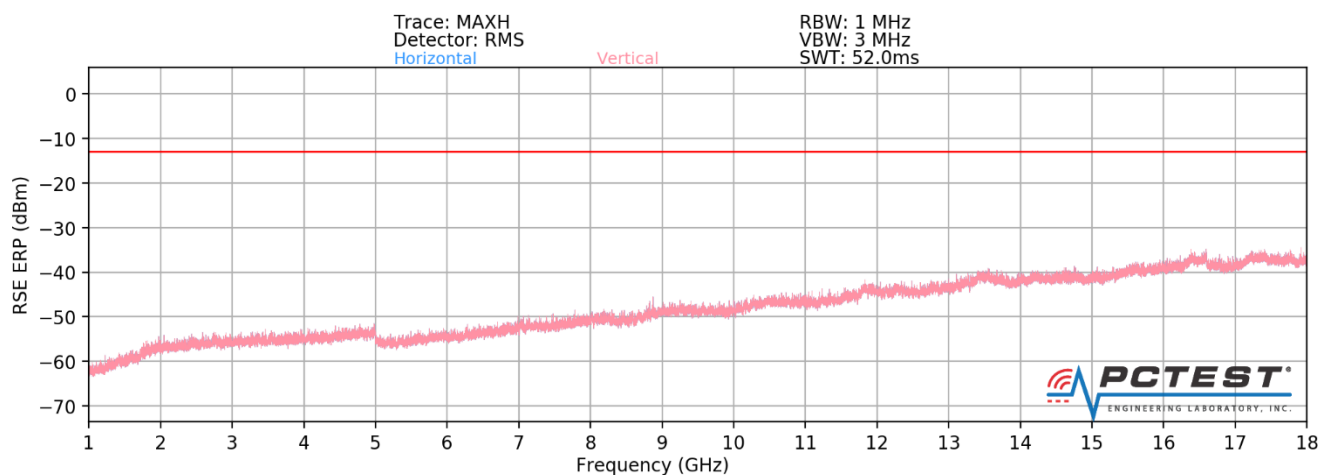
Plot 7-118. Radiated Spurious Plot 30 MHz - 1 GHz (QTM1 1CC100MHz Bandwidth QPSK Mid Channel)

FCC ID: ZNFV450VM		MEASUREMENT REPORT (Class II Permissive Change)		Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 88 of 202

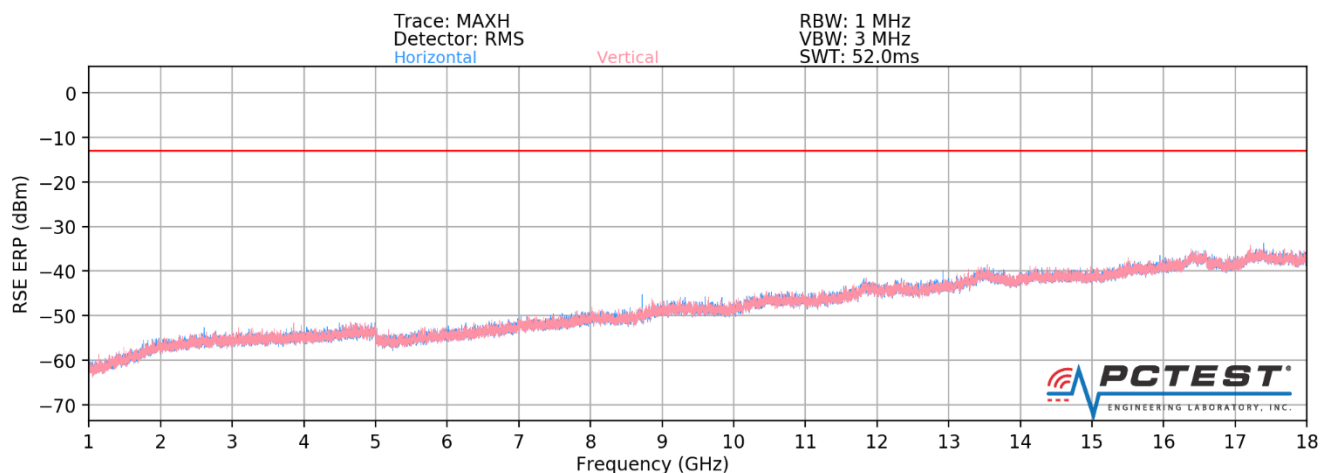
7.4.9 Radiated Spurious Emissions Plots n260 (1 – 18GHz)



Plot 7-119. Radiated Spurious Plot 1-18 GHz (QTM0 1CC-100MHz Bandwidth QPSK Low Channel)

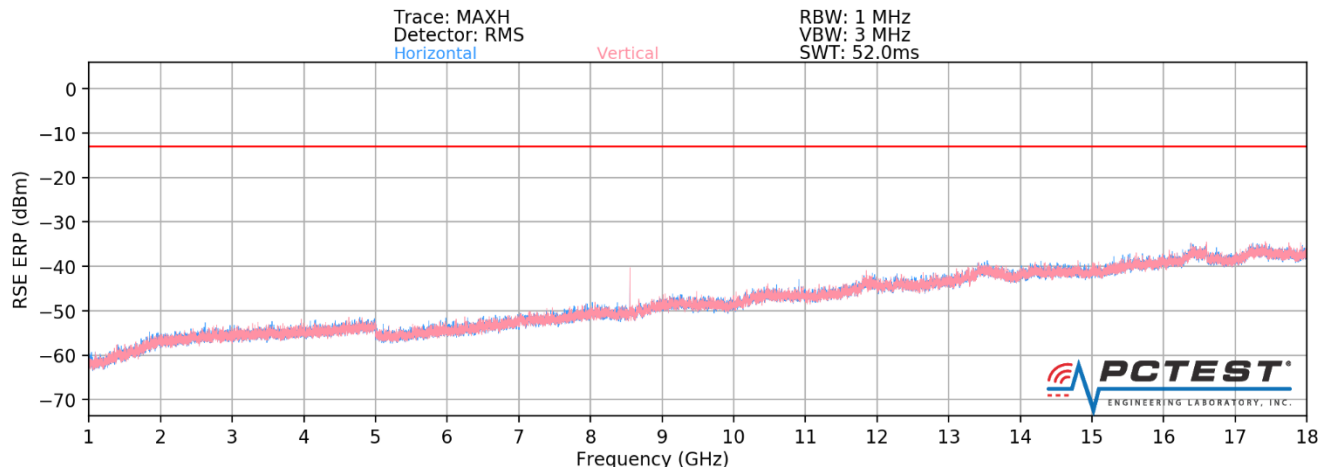


Plot 7-120. Radiated Spurious Plot 1-18 GHz (QTM0 1CC-100MHz Bandwidth QPSK Mid Channel)

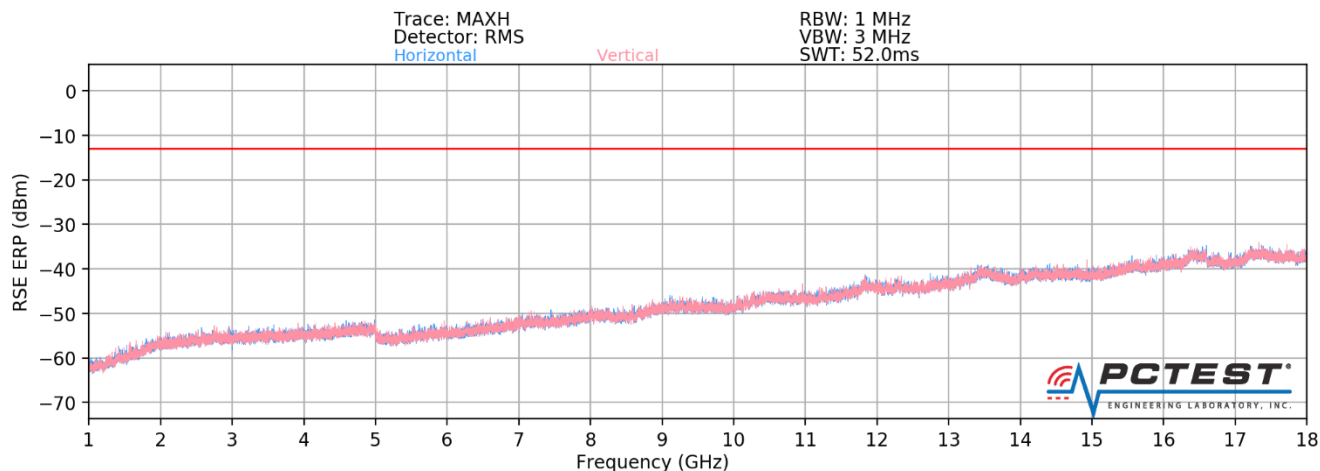


Plot 7-121. Radiated Spurious Plot 1-18 GHz (QTM0 1CC-100MHz Bandwidth QPSK High Channel)

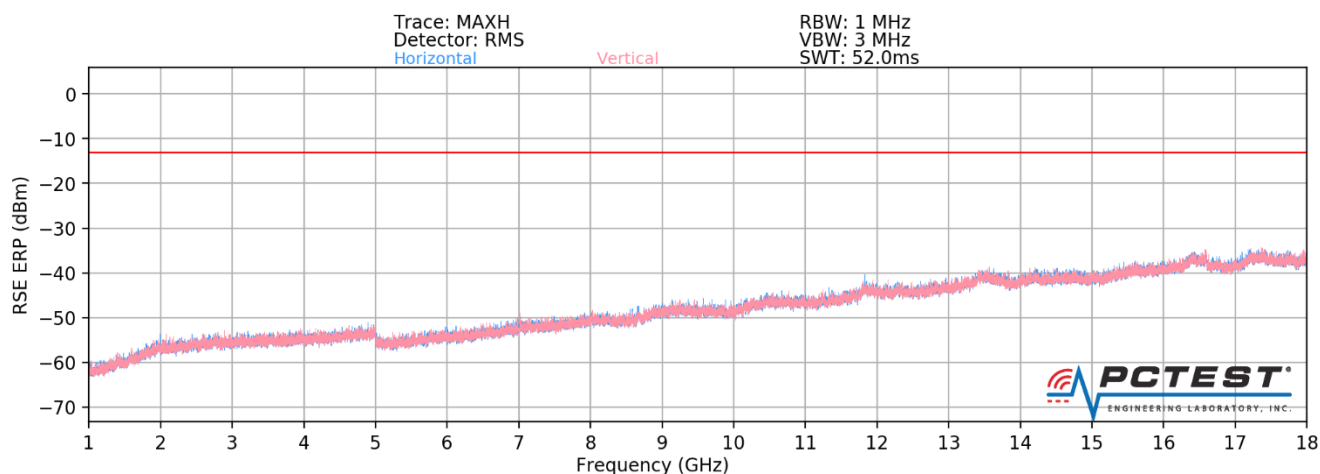
FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 89 of 202



Plot 7-122. Radiated Spurious Plot 1-18 GHz (QTM1 1CC-100MHz Bandwidth QPSK Low Channel)



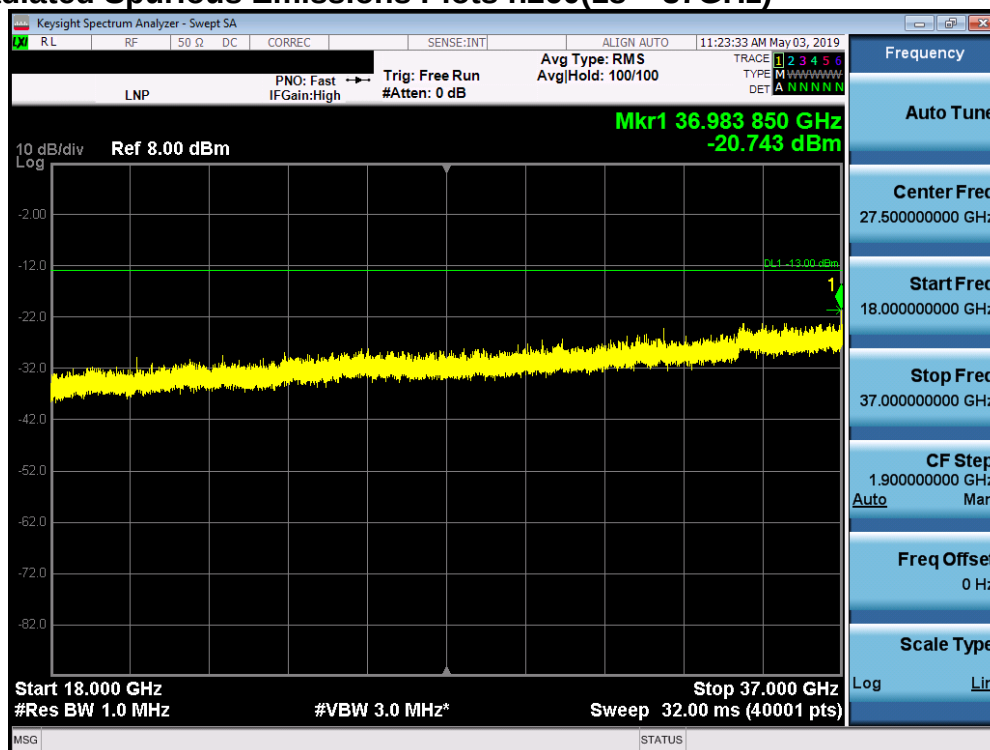
Plot 7-123. Radiated Spurious Plot 1-18 GHz (QTM1 1CC-100MHz Bandwidth QPSK Mid Channel)



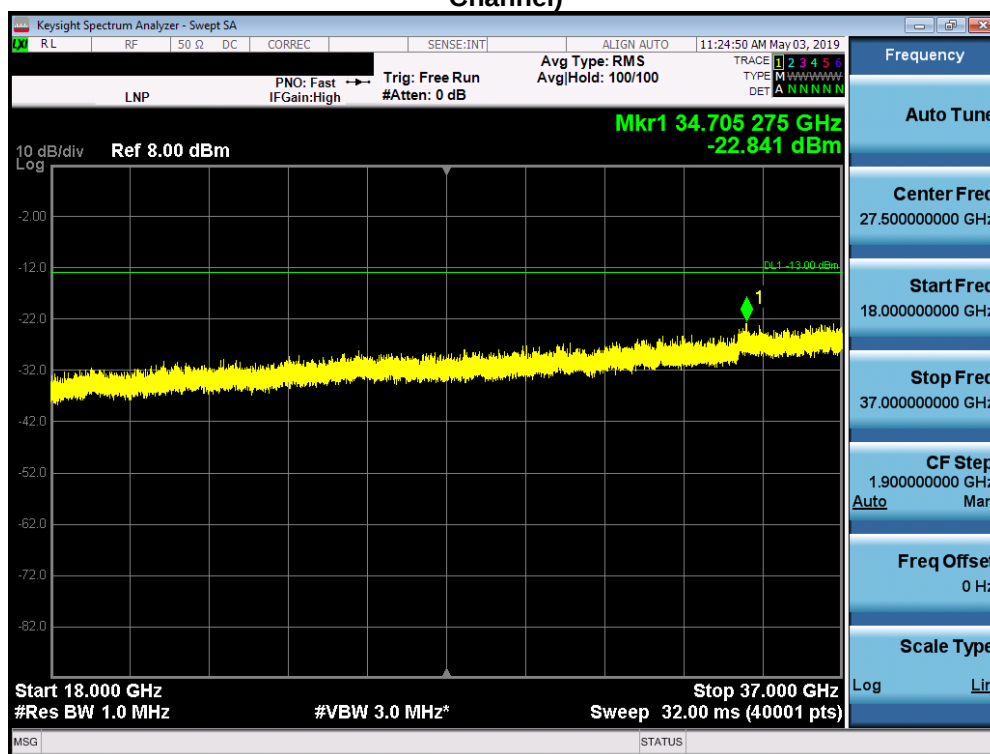
Plot 7-124. Radiated Spurious Plot 1-18 GHz (QTM1 1CC-100MHz Bandwidth QPSK High Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 90 of 202

7.4.10 Radiated Spurious Emissions Plots n260(18 – 37GHz)

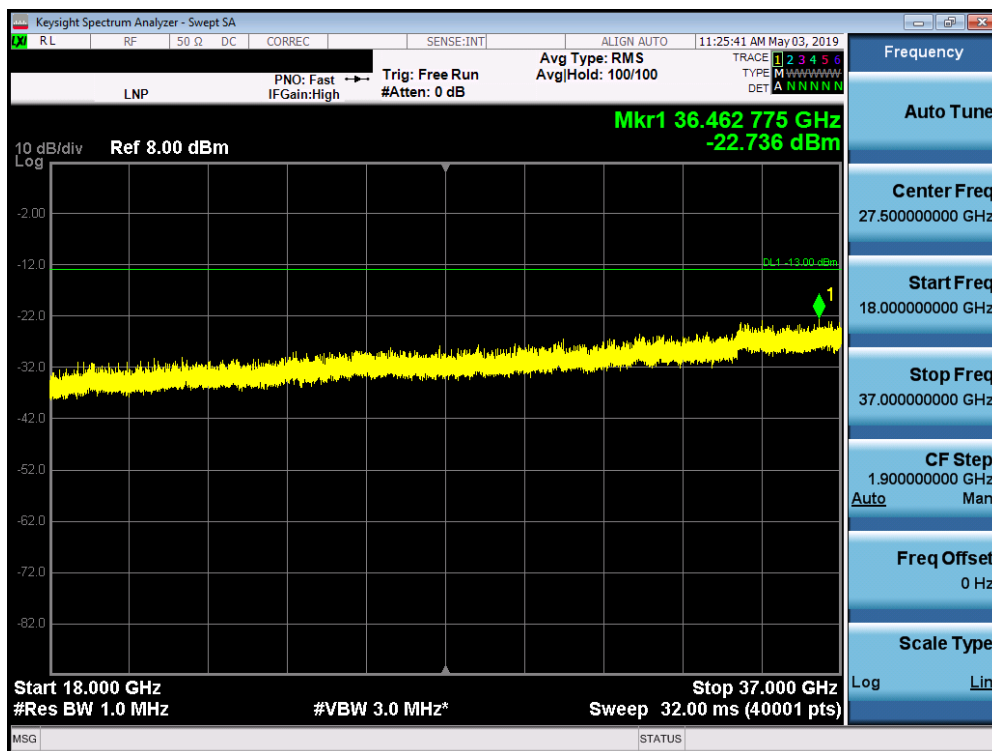


Plot 7-125. Horizontal Radiated Spurious Plot 18-38.5 GHz (QTM0 1CC-100MHz Bandwidth QPSK Low Channel)

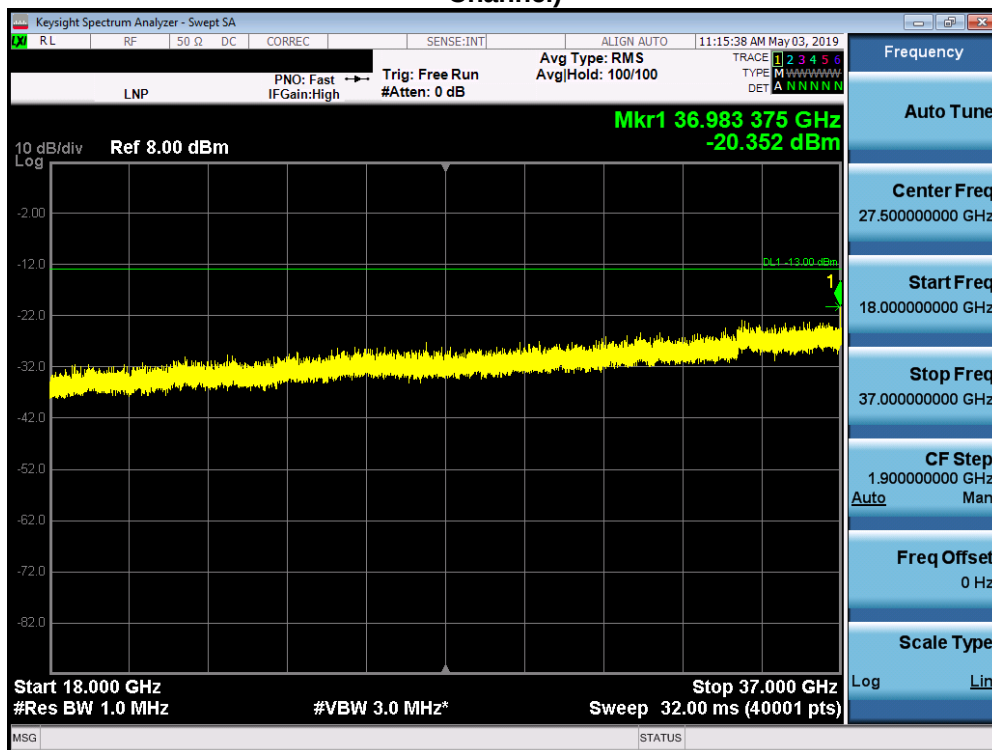


Plot 7-126. Horizontal Radiated Spurious Plot 18-38.5 GHz (QTM0 1CC-100MHz Bandwidth QPSK Mid Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 91 of 202



Plot 7-127. Horizontal Radiated Spurious Plot 18-38.5 GHz (QTM0 1CC-100MHz Bandwidth QPSK High Channel)



Plot 7-128. Vertical Radiated Spurious Plot 18-38.5 GHz (QTM0 1CC-100MHz Bandwidth QPSK Low Channel)

FCC ID: ZNFV450VM	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (Class II Permissive Change)	LG	Approved by: Quality Manager
Test Report S/N: 1M1903070034-14-R2.ZNF	Test Dates: 3/21/2019-5/3/2019	EUT Type: Portable Handset		Page 92 of 202