IN THE UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

PROCOMM INTERNATIONAL PTE. LTD.,	)	
	)	
Plaintiff,	)	
	)	Case No. 2:24-cv-00009-RWS-RSP
v.	)	
	)	**JURY TRIAL DEMANDED**
VERIZON COMMUNICATIONS, INC., CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS, TELEFONAKTIEBOLAGET LM ERICSSON, and ERICSSON INC.,	)	
	)	
Defendants.	)	

DEFENDANTS' OPPOSITION TO PLAINTIFF PROCOMM INTERNATIONAL PTE. LTD.'S MOTION FOR LEAVE TO AMEND INFRINGEMENT CONTENTIONS

TABLE OF CONTENTS

I. ARGUMENT AND CITATIONS TO AUTHORITY 1

A. '813 Patent 1

1. The Court Should Deny Plaintiff's Attempt to Add Additional Claims 2

2. The Court Should Deny Plaintiff's Belated Attempt to Add Doctrine of Equivalents Theories 7

3. The Court Should Deny Plaintiff's Belated Attempts to Add New Literal Infringement Theories 8

B. '521 Patent 9

1. The Court Should Deny Plaintiff's Belated Attempt to Add Claim 19 Into the Case 10

2. The Court should Deny Plaintiff's Belated Attempt to Add a Doctrine of Equivalence Theory 10

C. '100 Patent 11

1. The Court Should Deny Plaintiff's Belated Attempt to Assert Infringement Against Ericsson's 4G Downlink CoMP Feature 12

2. The Court Should Deny Plaintiff's Belated Attempt to Accuse Verizon's Use of Third-Party DAS Systems 14

TABLE OF AUTHORITIES

Cases

Alacritech Inc. v. CenturyLink, Inc., 2017 WL 3007464 (E.D. Tex. July 14, 2017).....15

Connectel, LLC v. Cisco Sys., Inc., 391 F. Supp. 2d 526 (E.D. Tex. 2005) 1, 15

Intel. Ventures I LLC v. T-Mobile USA, Inc., 2:17-cv-00577, slip op. (Dkt. 109) (E.D. Tex. Aug. 9, 2017).....5

Papst Licensing BmbH & Co., KG v. Apple, Inc., 2020 WL 11613777 (E.D. Tex. July 1, 2020).....5

Realtime Data, LLC v. MetroPCS Tx., LLC, 2012 WL 12903695 (E.D. Tex. Apr. 19, 2012) 4, 6, 10

Sycamore IP Holdings LLC v. AT&T Corp., 2018 WL 1695231 (E.D. Tex. Apr. 6, 2018) 1

UltimatePointer, LLC v. Nintendo Co., Ltd., et al., No. 6:11-CV-496 [Dkt. # 269].....15

"The Local Patent Rules 'are designed to require parties to crystalize their theories of the case and to prevent a 'shifting sands' approach to patent litigation.'" *Sycamore IP Holdings LLC v. AT&T Corp.*, 2018 WL 1695231, at *10 (E.D. Tex. Apr. 6, 2018) (citation omitted). The "Patent Rules demonstrate high expectations as to plaintiff's preparedness before bringing suit," specifically, plaintiffs are required to "rigorously analyze all publicly available information before bringing suit and … explain with great detail their theories of infringement." *Connectel, LLC v. Cisco Sys., Inc.*, 391 F. Supp. 2d 526, 527-528 (E.D. Tex. 2005) (quotations and citations omitted).

In contravention of these requirements, Plaintiff's infringement positions to date have been the definition of shifting sands. Now, nearly one year after the service of its original, operative Infringement Contentions on March 20, 2024, rather than be up front as to the true scope of its proposed amendments, Plaintiff hides the ball, arguing that the February 2025 Proposed Amendments merely "clarify and further refine" (Dkt. 46 at 9) the March 2024 Contentions. If that is all Plaintiff did, Defendants would not object. Instead, Plaintiff's proposed amended contentions (the "February 2025 Proposed Amendments" (Exs. 1-6))—which are at least the fourth set of proposed amendments Plaintiff has served on Defendants before seeking the present leave—attempt to insert into the case additional asserted claims, new accused products, and new theories of infringement (including wholly new doctrine of equivalents theories). The Court should deny Plaintiff's Motion to Amend for the reasons set forth below.

I. ARGUMENT AND CITATIONS TO AUTHORITY

A. '813 Patent

The '813 Patent claims a panel antenna comprising certain features. In the operative March 2024 Contentions, Plaintiff asserted independent claim 1 and one of its dependents, claim 4. Dkt. 46 Ex. 8. In support thereof, Plaintiff charted a single product—Ericsson's Street Macro 6701—

and included annotated images of a teardown of that product. *Id.*[1]

In the February 2025 Proposed Amendments, Plaintiff limits its infringement allegations to Ericsson's Street Macro 6701 and 6705, and the AIR 1652, 1672, 5331, 5332, and 4455 (including Verizon's use of those devices in its network). Exs. 4, 5. To the extent that Plaintiff is now limiting its infringement allegations to these specifically-identified Ericsson products—and has dropped its allegations as to all other Ericsson products, as well as third party products provided by Samsung and Nokia to the extent deployed in Verizon's network—Defendants do not object. As shown below, however, Plaintiff's proposed amended contentions attempt much more, and on that basis, Defendants object.

1. The Court Should Deny Plaintiff's Attempt to Add Additional Claims

The February 2025 Proposed Amendments seek to add dependent claim 5 (which depends from claim 4), and dependent claim 6 (which depends from claim 5), reproduced below:

- **Claim 4**: the panel antenna of claim 1, further comprising a communications hub coupled to each micro radio.
- **Claim 5**: the panel antenna of claim 4, further comprising a calibration radio.
- **Claim 6:** the panel antenna of claim 5, wherein the communications hub and calibration radio are mounted on an interior surface of the rear panel, and a rear heat sink is mounted on an exterior surface of the rear panel.

According to Plaintiff, the proposed addition of these claims is "consistent with Procomm's review of Defendants' non-public technical productions and Ericsson's source code." Dkt. 46 at 5.

Plaintiff's justification is specious. As an initial matter, source code cannot form the basis for Plaintiff's attempt to add claims 5 and 6 into the case. The '813 Patent is directed to structural

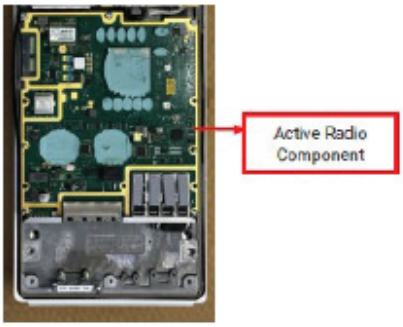
[1] Despite only charting the Ericsson Street Macro 6701, Plaintiff broadly alleged infringement by "Ericsson's Macro, Massive MIMO, Street Macro and Small Cell Products, including but not limited to Ericsson's Street Macro 6701, and other small cell products used in Verizon's network, including but not limited to Samsung small cell products and Nokia small cell products." Ex. 8.

elements and limitations—source code is not relevant to infringement. This is further evidenced by the fact that Plaintiff made no reference to source code in any of its various sets of proposed amended contentions, despite having access to Ericsson's source code since June 2024.

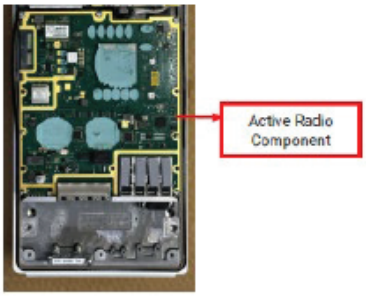
Furthermore, there is no basis for Plaintiff to argue that it needed Ericsson's confidential information to assert claims 5 and 6 after the Court-imposed deadline. Independent claim 1 (from which these claims ultimately depend) recites a "panel antenna comprising" certain structural elements. Likewise, claims 5 and 6 are directed to certain structural requirements—adding a "calibration radio" (claim 5), and adding limitations on where the "communications hub and calibration radio are mounted" (claim 6). Prior to serving its operative contentions, Plaintiff appears to have purchased and conducted a teardown of an Ericsson Street Macro 6701. *See* Dkt. 46 and 4 n. 4 (noting that it included "photos of reverse engineered Accused Product meeting claim limitations" for both the '813 and '521 Patents). The February 2025 Proposed Amendments confirm that such a teardown provided Plaintiff with the information necessary to assert these claims at the outset of the case.

For example, the first image for claim 5 in the February 2025 Proposed Amendments is identical to the image contained in the operative March 2024 Contentions for claim 4 (from which claim 5 depends). *Compare* Ex. 5, at 49-50:

For example, the AIR1281 included in the Street Macro 6701 has a radio dedicated to calibrating RF signals.



with Ex. 8, at 7:

4	The panel antenna of claim 1, further comprising a communications hub coupled to each micro radio.	**The Accused Instrumentalities contain a communications hub coupled to each micro radio, as shown in the exemplary images below of the internal communication electronics for the unit. (See claim limitations 1[b] and 1[d]).** 

The other additions to the claim chart for claim 5 are just images from the teardown confirming that the accused products have a radio. *See* Ex. 5, at 50-54. There is no need for Ericsson's confidential documentation to allege that such radio components might be considered a "calibration radio" (as required for claim 5). Indeed, documentation publicly available on the FCC's Office of Engineering and Technology's website discusses configuration modes, deployment scenarios and other information for the SM 6701 similar to that upon which Plaintiff now relies. *See*, *e.g.*, Exs. 39-42 attached hereto. Thus, Defendants' subsequent document production does not justify Plaintiff's failure to assert claim 5 in its March 2024 Contentions. Likewise, the physical location of what Plaintiff alleges is the claimed "communications hub" (relevant to claim 6) is not dependent upon Ericsson's confidential information. This is confirmed by, *e.g.*, the fact that the February 2025 Proposed Amendments again point to the same teardown images as the March 2024 Contentions. *Compare* Ex. 5 at 55, *with* Ex. 8 at 3.

Under these circumstances, Plaintiff cannot meet the standard for amendment. First, Plaintiff was not diligent in asserting these claims and cannot show good cause for waiting nearly a year after the original deadline to seek leave to add them. *See*, *e.g.*, *Realtime Data, LLC v. MetroPCS Tx., LLC*, 2012 WL 12903695 (E.D. Tex. Apr. 19, 2012) (defendant failed to demonstrate good cause to amend its infringement contentions where information cited in support

of new claims was duplicative of publicly available documents or earlier-produced documents). Plaintiff knew as early as July 17, 2024, that it would need to seek leave to amend the March 2024 Contentions to add new claims. Ex. 17 ("Please let us know by July 24 whether Defendants will oppose our motion for leave to amend the contentions."). Rather than seek leave to add the claims then, Plaintiff instead continued to alter the scope of its infringement case through multiple rounds of additional proposed amendments. Plaintiff characterizes this as an "attempted effort to avoid an opposed motion" (Dkt. 46 at 9), but has not articulated any reason as to why it could not have asserted these claims at the outset or "moved to amend at an earlier time." *Papst Licensing BmbH & Co., KG v. Apple, Inc.*, 2020 WL 11613777, *3 (E.D. Tex. July 1, 2020) ("Papst's reliance on facts and arguments known before its final claim election and well before its motion for leave to amend demonstrates that Papst did not act diligently in seeking to assert Claim 14.").

Second, Plaintiff pays lip service to the importance of adding these claims. Unlike in *Intellectual Ventures* (cited by Plaintiff at p. 12), this is not a situation in which "without the amendments … Plaintiff cannot prove infringement." *Intel. Ventures I LLC v. T-Mobile USA, Inc.*, 2:17-cv-00577, slip op., at 5 (Dkt. 109) (E.D. Tex. Aug. 9, 2017). To the contrary, claims 5-6 depend on asserted claims 1 and 4, and the same sets of products are accused of infringing each. In short, Plaintiff will be able to assert the '813 Patent against the full scope of accused products even without the addition of these new dependent claims, rendering them less important.

Third, Defendants would suffer significant prejudice if the Court allows Plaintiff to add these additional claims at this stage of the case. Defendants served their Invalidity Contentions on June 12, 2024, based on the still-operative March 2024 contentions. If Plaintiff is permitted to add new asserted claims, Defendants will need to search for and assess additional prior art, as well as amend their invalidity contentions to address these new claims. "[A]dding new claims … typically

results in more significant prejudice to defendants." *Realtime Data, LLC v. Metropcs Texas, LLC*, 2012 WL 12903695, at *3 (E.D. Tex. Apr. 19, 2012).

Plaintiff's contention of no prejudice to Defendants does not hold water. According to Plaintiff, Defendants would not suffer prejudice because they have "been on notice since July 17, 2024 that Procomm intended to assert additional claims of the '813 and '521 Patents." Dkt. 46 at 13 (citing *Harris Corp.*, 2019 WL 4247067, at *3). Given that Defendants' invalidity contentions were timely served on June 12, 2024, purported notice by Plaintiff on July 17, 2024, does not cure that particular prejudice. Moreover, Plaintiff's argument actually demonstrates the prejudice to Defendants and the lack of diligence by Plaintiff. Rather than move for leave to add the claims in July, Plaintiff repeatedly promised to do so and then dragged its feet.[2] Plaintiff cites no authority for the proposition that Defendants should undertake the expense and effort to generate and move for leave to amended invalidity contentions to address new claims based on mere *proposed* amendments by a Plaintiff. Such a requirement would be unreasonable, particularly where, as here, a plaintiff continues to shift its infringement contentions.[3] In other words, until Plaintiff filed this Motion—over 11 months after it served the operative March 2024 Contentions—Defendants could not even be sure Plaintiff actually intended to proceed with its assertion of these additional claims. Accordingly, the Court should deny Plaintiff's attempt to add claims 5 and 6 of the '813 Patent.

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[2] Plaintiff repeatedly promised to move for leave to amend its contentions, but failed to do so. *See*, *e.g.*, Ex. 23 at 3 (7/26/24 email stating that "[w]e intend to seek leave to serve the amended contentions" served on 7/17); Ex. 24 at 2 (9/12/24 email: Plaintiff proposed that it would move for leave to amend based on its October 2024 contentions by early November); Ex. 19 at 3 (11/21/24 email: "Procomm would like to move to amend its infringement contentions in early December."); Ex. 35 at 2 (2/24/25 email confirming that during the 2/4/25 meet and confer, Plaintiff stated its intent to move for leave to amend based on the January 2025 amendments, but had not done so).

[3] Despite serving three sets of proposed amended infringement contentions for the '377 Patent (including as recently as 1/17/25), Plaintiff ultimately dismissed that patent altogether. Ex. 28.

2. The Court Should Deny Plaintiff's Belated Attempt to Add Doctrine of Equivalents Theories

The Court should also deny the motion to amend to add Plaintiff's new doctrine of equivalents ("DOE") infringement theories. *See*, *e.g.*, Ex. 5 at 27 and 33. In one of these new theories, for example, Plaintiff argues the claim requirement of mounting components to "an internal surface of the first side wall" can be satisfied by being "mounted to the rear panel and/or at the intersection of the first side and the rear panel," which vitiates the claim language. *Id.*

As a threshold matter, because Plaintiff failed to inform the Court that the February 2025 Proposed Amendments included new DOE theories (while its operative March 2024 Contentions did not include DOE at all), Plaintiff has not set forth any explanation as to why it could not have asserted DOE at the original deadline, why the DOE theories are important (especially since Plaintiff maintains a literal infringement theory), any prejudice that might result if the DOE theories are not allowed, or the availability of a continuance to cure such prejudice. For this reason alone, the Motion should be denied on this aspect of the proposed amendments.

Nor can Plaintiff meet any of these standards. Plaintiff has not been diligent. Contrary to the Local Rules, Plaintiff did not set forth any DOE theory for the '813 Patent in its operative March 2024 Contentions. Nor did Plaintiff assert DOE in its proposed amendments served in July 2024 or October 2024. Rather, it was not until Plaintiff's January 2025 proposed amended contentions, *i.e.*, Plaintiff's third set of proposed amended contentions (and fourth overall, including the operative March 2024 contentions), that it included any DOE theories. Ex. 30 at 26, 32. There is no justifiable reason for such a delay. The new DOE theories could have been asserted from the outset and appear to have been added now as nothing more than a blatant attempt to vitiate the claim language to get around the obvious shortcomings in Plaintiff's literal infringement read as expressed by Defendants in various letters, emails, and meet and confers over the span of nearly

a year. Moreover, the addition of DOE theories would prejudice Defendants insofar as inclusion of these theories would open an entire new world of prior art (where an "internal surface of the first side wall" can be "the rear panel and/or at the intersection of the first side and the rear panel"), necessitating supplemental invalidity contentions for all asserted claims. The prejudice to Defendants associated with supplementing invalidity contentions cannot be alleviated merely by a continuance. Prior art searching, review, analysis, and charting are very costly, and Defendants should not have to undertake that significant expense to accommodate Plaintiff's lack of diligence.

Because Plaintiff has not acted diligently and has not otherwise shown why the addition of these new DOE infringement theories are important, its motion should be denied.

3. The Court Should Deny Plaintiff's Belated Attempts to Add New Literal Infringement Theories

The February 2025 Proposed Amendments also seek to add new literal infringement theories. These new theories were added in response to Defendants' February 10, 2025, letter to Plaintiff setting forth the frivolous nature of Plaintiff's infringement allegations for the '813 Patent. Specifically, Plaintiff for the first time alleged that a "side wall" does not really require a "wall" at all, but instead can be a smattering of bits and pieces of different (even unspecified) components: "the first side wall includes portions of the other components located on the underside of and below the PAAM board, including the EMC wall, EMC gasket, radio board, and heat pipe." Ex. 5 at 9. Plaintiff made similar new allegations for the "internal cover" requirement, contending that "the internal cover includes the PAAM Board, the PAAM cover, and the EMC wall." *Id.* at 15, 16.

While these proposed amendments serve only to highlight the frivolous nature of Plaintiff's infringement allegations for the '813 Patent, that is an issue for another day. The more salient fact here is that Plaintiff has not provided any justification for its delay in alleging this new infringement theory. Indeed, these theories were not present in *any* of Plaintiff's prior proposed

amendments, including the very recent January 10, 2025, proposed amendments. Thus, these new theories have nothing to do with subsequent document production by Defendants and are instead apparently designed solely to provide cover to Plaintiff in response to Defendants' February 10, 2025, letter explaining the serious flaws in Plaintiff's infringement case.

More importantly, these proposed new infringement theories are prejudicial to Defendants, as they would drastically expand the scope of the claims—a "side wall" is apparently not required to be a wall at all, and a "cover" can even be an "EMC *wall*," according to Plaintiff's new theories. The claim scope resulting from these new theories would open up entirely new applications of the existing prior art, to say nothing of vastly expanding the universe of available prior art. This would necessitate not only the costly re-working of existing invalidity contention charts, but further research and analysis of additional prior art by Defendants.

B. '521 Patent

The '521 Patent claims structural limitations and methods associated with cooling a sealed environment for housing electronics. In Plaintiff's operative March 2024 Contentions, Plaintiff asserted claims 1, 4-5, 14-16. Ex. 9.[4]

In the February 2025 Proposed Amendments, Plaintiff limits its infringement allegations to Ericsson's Street Macro 6701 and 6705, and the AIR 1279 and 5332. Exs. 4, 6. Defendants do not object to Plaintiff limiting its infringement allegations to these specifically-identified Ericsson products—and the dropping of allegations as to all other Ericsson products, as well as third party

[4] Like the '813 Patent, Plaintiff alleged that each of these claims were infringed by "Ericsson's Macro, Massive MIMO, Street Macro and Small Cell Products, including but not limited to Ericsson's Street Macro 6701, and other small cell products used in Verizon's network, including but not limited to Samsung small cell products and Nokia small cell products." Ex. 9. In support thereof, however, Plaintiff once again charted a single product—Ericsson's Street Macro 6701—and included annotated images of a teardown of that product. *Id.*

products provided by Samsung and Nokia to the extent deployed in Verizon's network.[5]

Plaintiff's proposed amendments attempt much more, and on that basis, Defendants object.

1. The Court Should Deny Plaintiff's Belated Attempt to Add Claim 19 Into the Case

Claim 19 is a method claim that was first identified as part of Plaintiff's proposed amended contentions served on July 17, 2024. Nevertheless, Plaintiff waited until the instant Motion to seek leave to add it to the case, demonstrating its lack of diligence. Plaintiff presents no arguments as to why it could not have alleged infringement of claim 19 from the outset. Plaintiff also fails to even attempt to explain why assertion of claim 19, in addition to independent claim 14, is important to its case. As to prejudice, like the attempt to add new claims to the '813 Patent, the addition of claim 19 into the case would require Defendants to supplement their invalidity contentions, which results in more prejudice. *Realtime Data, LLC v. Metropcs Texas, LLC*, 2012 WL 12903695, at *3. The Court should thus deny the attempt to add claim 19 of the '521 Patent.

2. The Court should Deny Plaintiff's Belated Attempt to Add a Doctrine of Equivalence Theory

Plaintiff's proposed amendments also attempt to belatedly add DOE arguments for claim 14 (and newly-asserted claim 19), which the Court should deny. *See* Ex. 6, at 23, 25, 51 ("To the extent 'draw[ing] an airflow' requires a fan blowing out from the chamber instead of into the chamber, this limitation is met under the doctrine of equivalents.").

First, Plaintiff was not diligent; it could have included a DOE theory in its original infringement contentions, but elected not to do so. Plaintiff did not need Ericsson's confidential documents to come up with its DOE theory. Plaintiff conducted a teardown of the Ericsson Street Macro 6701 and knew the location of the fans and how the fans would operate, *i.e.*, whether the

[5] Claims 1, 4-5, 15-16 are no longer asserted. Dkt. 43-1 at 3 n3.

flans blow air out of the chamber or into the chamber). Demonstrating this fact, Plaintiff's operative March 2024 Contentions (i.e., before it proposed a DOE theory) described the fan configuration, alleging that the accused Street Macro 6701 "has a cooling unit that includes two airflows, one drawn through the Venture inlet by the pull of the fans, and a second flowing from the smaller opening opposite the fan shroud at the base of the heatsink . . . . The Fan Shroud includes an outlet for expelling the heated air." Ex. 9 at 8-9; *see also id.* at 9 ("[I]n Ericsson's Street Macro 6701, the path of the first airflow runs from the large external opening to the fan shroud through the chamber adjacent to the heat sink fins."). Plaintiff provides no explanation for why it could not have included DOE alongside this literal infringement theory, in accordance with the Patent Local Rules. Second, Plaintiff also fails to explain the importance of this new DOE theory, particularly given Plaintiff maintains its literal infringement theory for the same set of accused products. The Court should thus deny Plaintiff's attempt to add a DOE theory.

C. '100 Patent

In the March 2024 Infringement Contentions, Plaintiff generically identified Accused Instrumentalities[6] infringe via two independent functionalities: (1) "multi-transmission point and joint transmission technology and other protocols involving the transmission of RF signals from multiple antennas ('mTRP')"; and (2) "Verizon's distributed antenna system technology ('DAS Systems')". Ex. 7 at 2. As discussed further below, Plaintiff was clear that its mTRP theory was limited to functionality allegedly released in 5G, and not older 4G networks.

Defendants object to two aspects of Plaintiff's proposed amendment: (1) the proposed addition of a new infringement theory asserted against a new batch of products, *i.e.*, allegations as

[6] "Accused Instrumentalities" were again generically identified as "Verizon DAS systems, Ericsson's Macro, Massive MIMO, Street Macro and Small Cell Products, including but not limited to Ericsson's Street Macro 6701, and other small cell products used in Verizon's network, including but not limited to Samsung small cell products and Nokia small cell products." *Id.* at 1.

to certain 4G LTE functionality under the mTRP theory; and (2) all theories of infringement as to Verizon's use of third-party DAS solutions provided by Samsung, Nokia, and Corning.

1. The Court Should Deny Plaintiff's Belated Attempt to Assert Infringement Against Ericsson's 4G Downlink CoMP Feature

In the March 2024 Contentions, Plaintiff's accusations as to its mTRP theory were directed solely to functionality introduced in the new 5G releases. *See* Ex. 7 at 2, 15 ("Both DAS Systems and mTRP transmit wireless communication signals (e.g., to 5G user equipment ('UE'))."); *id. at* 3-4, 16-17 (referencing Releases 16-18 of the 3GPP technical specifications which relate to 5G NR functionality); *id. at* 8-9 (same); *id. at* 10, 26 ("In these various 5G joint transmission implementations … . The various 5G revisions teach … ."); *id. at* 13 ("An antenna in a e.g., a 5G network is capable of receiving multiple RF signals."); *id. at* 27 ("Among other things, base stations in, e.g., 5G networks are for processing RF signals."). The term "5G" is referenced 38 times in the March 2024 Contentions; the term "4G": 0 times.

After reviewing Defendants' core technical production and Ericsson's source code, Plaintiff served proposed amended contentions on July 17, 2025 (Ex. 17), that purportedly "provided greater detail about which Accused Products performed which infringing functions and identified additional examples, excluding Ericsson-specific nomenclature, showing how such products infringe." Dkt. 46 at 5. Importantly, the mTRP theory was again limited to 5G functionality, with term "5G" referenced 92 times and no accusations as to any 4G functionality. Ex. 38 (7/17/24 Claim Chart for '100 Patent, attached hereto). Plaintiff also identified several exhibits, seven of which were technical specifications from the 5G specification. *Id.* at 126. There are no references to the 4G technical specifications. *See generally id.* Although deficient on their face, Defendants confirmed that Plaintiff's allegations were limited to 5G functionality:

> From what we can gather, **Plaintiff alleges only that Ericsson's alleged "high-speed train enhancement" feature, as allegedly implemented in Verizon's 5G network, is**

> **relevant and accused**. … To the extent that Plaintiff believes that other features have been accused, Plaintiff would need to set forth where in the contentions such features have been identified and charted through the whole of the claim elements.

Ex. 22, at 2 (emphasis added). Plaintiff never disputed this assertion or otherwise alleged that the July 2024 Proposed Contentions set forth a 4G-based infringement theory.

That Plaintiff's mTRP theory was limited to 5G functionality was further confirmed in the parties' correspondence following the service of the July 2024 Proposed Contentions:

- Plaintiff's 8/23/24 email, which sought additional information from Verizon regarding certain 5G mTRP functionality. Ex. 25 at 9.
- Defendants' 9/3/24 response, which made clear that Ericsson did not deploy the accused 5G functionality and that Plaintiff had not otherwise identified any non-Ericsson products of infringing the patent when used in Verizon's 5G network. *Id.* at 7.
- Plaintiff's 9/19/24 response again sought documentation "sufficient to show how and where in Verizon's networks" certain 5G mTRP technology is implemented. *Id.* at 3-4.
- Defendants' 9/25/24 response, which again confirmed that Ericsson's products do not implement the accused 5G mTRP technology. Ex. 25 at 1.

In the proposed amended infringement contentions presently before the Court, however, instead of limiting its assertions to "the 5G mTRP technology identified in the claim chart," Plaintiff also accuses "all other Ericsson products to the extent they implement the Downlink CoMP feature, which is identified as a 'licensed feature' with 'one license for each node' and the feature identity FAJ 121 4223 and as described in the accompanying claim chart." Ex. 1 at 1. Downlink CoMP (FAJ 121 4223) is a feature only available on 4G networks and is separate and distinct from anything involving 5G Releases 16-18 or the 5G mTRP functionality identified in either the March 2024 Contentions or the July 2024 Proposed Contentions. *See e.g.*, *id.* at 2 ("In LTE Advanced, for example, the at-issue technology is referred to as Coordinated Multipoint (CoMP) joint transmission."); *id.* at 5 (noting that Feature identity FAJ 121 4223 relates to LTE networks), 6 (referencing 3GPP Release 11, coined as "3GPP LTE CoMP").

The Court should deny Plaintiff's attempt to expand the scope of the case to include these previously unaccused 4G products and functionality. Plaintiff plainly was not diligent in seeking to add a 4G theory to the case for the '100 Patent or to accuse 4G products. It provides no justification for waiting until nearly a year to move to amend its contentions to add an entirely new swath of accused products, *i.e.*, Ericsson's products that implement 4G DL CoMP functionality. Nor does Plaintiff explain why it could not have accused such functionality at the outset, or even after reviewing Ericsson's source code back in July 2024.

Plaintiff's proposed amended contentions with respect to 4G DL CoMP functionality also are not important for two reasons. First, Plaintiff will still be able to proceed on its 5G-based mTRP theory. Although Ericsson has confirmed numerous times that it does not deploy 5G-based mTRP functionality in any of its products, the proposed amended contentions reiterate that Plaintiff nevertheless seeks to proceed with an "offer to sell" theory of liability. Ex. 2 at n. 2; *see also id.* at 6. Second, the proposed amended contentions do not actually chart how Ericsson's 4G DL CoMP feature allegedly meets many of the limitations. *See*, *e.g.*, Ex. 2 at 68-69 (failing to chart how any Ericsson products implementing 4G DL CoMP meets limitation 15[c]), 124-127 (same as to 15[f]), 174-175 (same as to 15[i]). Because claim 19 simply refers back to the claim 15 allegations, similar deficiencies exist with respect to that claim, too.

Defendants would suffer great prejudice if these amendments were allowed, as it will require Defendants to identify additional witnesses and collect additional documents, with little time before the close of fact discovery and expert reports.

For these reasons, the Court should deny the amendments adding 4G DL CoMP.

2. The Court Should Deny Plaintiff's Belated Attempt to Accuse Verizon's Use of Third-Party DAS Systems

In addition to the accused Ericsson products, the proposed Amended Contentions provide

that "the Accused Instrumentalities further include DAS installations that are configured to infringe the 100 patent as described in the accompanying claim chart implemented by third-party components including Nokia's DAS-RFM, Ai and Multiband Indoor (MBI), Corning Spider Cloud's SCRN-310,SCRN-320, and SCRN-220, and Samsung's LAA Femto, eFemto, sFemto, and uFemto." Ex. 1. Plaintiff, however, fails to actually chart these products as required by the Patent Local Rules. Instead, it simply recites the claim language and alleges that such systems—which are provided by third parties and are not alleged to infringe due to compliance with any identified standard—"operate in a similar fashion as Ericsson's RDS." *See generally* Ex. 3. Plaintiff provides no justification for such an assertion and otherwise makes no attempt to identify what aspects of each third-party system are alleged to meet the various claim limitations. For this reason, the proposed amendments clearly are not important, as they do not satisfy the local rules.

While it "is possible for a plaintiff to use a single chart for multiple products, if separate charts would be identical for each product . . .[,] broad conclusory allegations that the products are similar do not allow Plaintiffs to circumvent the Local Rules." *UltimatePointer, LLC v. Nintendo Co., Ltd., et al.*, No. 6:11-CV-496 [Dkt. # 269] at 5 (E.D. Tex. May 28, 2013) (citation omitted). Further, "more than a perfunctory submission is required. Plaintiffs are expected to rigorously analyze all publicly available information before bringing suit and must explain with great detail their theories of infringement." *Connectel, LLC v. Cisco Sys*., 391 F. Supp. 2d 526, 528 (E.D. Tex. 2005). "[C]atch-all language used in Plaintiff's infringement contentions has no effect and may be disregarded by Defendant." *Alacritech Inc. v. CenturyLink, Inc.*, 2017 WL 3007464, at 17-18 (E.D. Tex. July 14, 2017). Plaintiff fails to meet any of these standards as to the non-Ericsson products.

Finally, Plaintiff's Motion fails to set forth any arguments in support of these specific proposed amendments and thus the Motion should be denied for that reason alone.

Dated: March 14, 2025

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that on March 14, 2025, the foregoing was electronically filed in compliance with Local Rule CV-5(a) and served via the Court's electronic filing system on all counsel who have consented to electronic service.

/s/ *Deron R. Dacus*
Deron R. Dacus

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EXHIBIT 39

Ackred. Nr 1761
Provning
ISO/IEC 17025

Rapport utfärdad av ackrediterat provningslaboratorium
Test report issued by an Accredited Testing Laboratory

EMF Test Report: Ericsson Street Macro 6701 B261 (FCC)

Document number:	GFTL-19:000819 Uen Rev B	**Date of report:**	2019-09-19
Testing laboratory:	Ericsson EMF Research Laboratory Ericsson AB SE-164 80 Stockholm Sweden	**Company/Client:**	Shigeru Kawabata Ericsson AB Mobilvägen 12 22 362, Lund Sweden
Tests performed by:	Paramananda Joshi	**Dates of tests:**	2019-07-03 to 2019-07-09 (Rev A) 2019-09-16 to 2019-09-18 (Rev B)
Manufacturer and market name(s) of device:	Ericsson Street Macro 6701 B261		
Testing has been performed in accordance with:	FCC OET Bulletin 65 IEC 62232:2017		
Test results:	RF exposure compliance boundaries (exclusion zones) related to the limits in FCC 47 CFR 1.1310 to be included in the Customer Product Information (CPI) for Ericsson Street Macro 6701 B261.		
Additional information:			

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Summary of EMF Test Report[1]

Equipment under test (EUT)

Product name	Street Macro 6701		
Product number	KRK 101 01/1 KRK 101 01/2 KRK 101 01/11 KRK 101 01/21		
Supported bands, Tx frequency range (GHz) and standards	B261	27.5 – 28.35	NR
Duplexing technology and fraction of downlink transmission time to total time	TDD (72.1 %)		
Exposure environment	General public/uncontrolled, Workers/controlled		
EIRP[2,3] (dBm) and IEC 62232 installation class [4]	45.1, 48.1, 51.1 (Configuration Mode 1) 48.1, 51.1, 54.1 (Configuration Mode 2)	E100, E100, E+ E100, E+, E+	

Results

RF exposure compliance boundaries, outside of which the exposure is below the general public (GP) and workers (W) exposure limits, are listed below.

Dimensions of the box-shaped compliance boundary for general public (GP) and workers (W) exposure for Street Macro 6701 applicable in markets employing the FCC RF exposure limits for maximum output power with power tolerance and TDD downlink duty cycle included.

Mode and output power for Street Macro 6701							Dimensions of the box-shaped compliance boundary (m)							
							Distance in front of EUT		Width		Height		Distance behind EUT	
Band	**Standard**	**Config Mode[4]**	**Nominal total EIRP**	**Power tolerance**	**TDD DL duty cycle**	**Sector shapes**	**GP**	**W**	**GP**	**W**	**GP**	**W**	**GP**	**W**
B261	NR	1	47 dBm	1.5 dB	72.1 %	Hotspot1	0.7	0.3	0.8	0.7	1.0	1.0	0.2	0.2
B261	NR	1, 2	50 dBm	1.5 dB	72.1 %	Hotspot1, Hotspot2, Macro3, Macro3b[5]	0.9	0.4	1.1	0.7	1.0	1.0	0.2	0.2
B261	NR	1, 2	53 dBm	1.5 dB	72.1 %	Hotspot1, Hotspot2, Macro3, Macro3b	1.3	0.6	1.5	0.7	1.0	1.0	0.2	0.2
B261	NR	2	56 dBm	1.5 dB	72.1 %	Hotspot2, Macro3, Macro3b	1.8	0.8	2.1	1.0	1.0	1.0	0.2	0.2

For the power levels specified in the table which include tolerances, and the upward rounding of compliance boundary dimensions to the nearest decimeter, the specified results are conservative.

[1] This page contains a summary of the test results. The full report provides a complete description of all test details and results.
[2] The stated EIRP value is the maximum total EIRP without including power tolerance and is obtained using the antenna patterns provided by the client.
[3] These values are provided for the lowest, the middle and the highest output power level in Table 3.
[4] Configuration Mode
[5] Sector shape Macro3 with a down-tilt of 7.5º.

1 General information

The test results presented in this report define compliance boundaries for Street Macro 6701 B261. Outside of these compliance boundaries, the radio frequency (RF) exposure levels are below the limits specified by the Federal Communications Commission (FCC) [1]. The tests were performed by calculations in accordance with the Ericsson RF exposure calculation procedure for base stations [2], which is in conformity with the FCC OET Bulletin 65 [3] and IEC 62232:2017 [4].

It should be noted that the test results presented in this test report are valid for the frequency range specified in Table 1, for the antenna properties specified in Table 2, and for the power level, the power tolerance and TDD downlink duty cycle specified in Table 3. These data as well as the applied antenna pattern files were supplied by the client and may affect the validity of the results.

Proposed EMF health and safety information for inclusion in the Customer Product Information (CPI) is provided in Appendices A, B and C.

2 Equipment under test

Tables 1 and 2 below summarize the technical data for the equipment under test (EUT) and the antenna properties for the integrated antenna. Table 3 lists the nominal total output power levels from the radio unit and the total time-averaged output power including output power tolerance and the TDD downlink duty cycle for Configuration Mode 1 and Configuration Mode 2. In Configuration Mode 1, the phased array antenna module (PAAM) of the product is divided into two halves, each containing 2 x 24 subarrays. In this configuration, the product can generate four beams, one for each array half and polarization. In Configuration Mode 2, the full array, containing 4 x 24 subarrays, can generate two beams, one for each polarization.

EMF compliance assessments were conducted for each configuration mode at the lowest, the middle and the highest output power level in Table 3.

The EUT related data in Tables 1-3 were supplied by the client.

Table 1 Technical data for the EUT.

Product name and product number	Street Macro 6701		KRK 101 01/1 KRK 101 01/2 KRK 101 01/11 KRK 101 01/21
Supported bands, Tx frequency range (GHz), and standards	B261	27.5 – 28.35	NR
Dimensions[6], H x W x D (mm)	531 × 200 × 125		
Duplexing technology and fraction of downlink transmission time to total time	TDD (72.1 %)		
Exposure environment	General public/uncontrolled, Workers/controlled		
EIRP[2,3] (dBm) and IEC 62232 installation class [4]	45.1, 48.1, 51.1 (Configuration Mode 1) 48.1, 51.1, 54.1 (Configuration Mode 2)		E100, E100, E+ E100, E+, E+

[6] The dimensions of the EUT exclude mounting brackets.

Table 2 Properties of the integrated antenna.

Type	Phased Array Antenna Module (PAAM)
Number of antenna panels	2 (Configuration Mode 1) 1 (Configuration Mode 2)
Number of beams	4 (Configuration Mode 1) 2 (Configuration Mode 2)
Gain[7] (dBi)	25.6 (Configuration Mode 1) 28.6 (Configuration Mode 2)
EIRP[8] (dBm) per beam	41-47 in a step size of 1 dB (Configuration Mode 1) 47-53 in a step size of 1 dB (Configuration Mode 2)
Horizontal HPBW[9] (degrees)	4.1°
Vertical HPBW[9] (degrees)	20.9° (Configuration Mode 1) 10.4° (Configuration Mode 2)
Number of antenna elements (N_H, N_V) per antenna panel	(24, 4) (2 polarizations) for Configuration Mode 1 (24, 8) (2 polarizations) for Configuration Mode 2
Element separation distance (Δ_H, Δ_V) (mm)	(5.288, 6.406)
Maximum scan range in horizontal plane (degrees)	±60°
Maximum scan range in vertical plane (degrees)	±15°

Table 3 EUT configuration with nominal output power level and total power level including output power tolerance and TDD downlink duty cycle.

Band	Standard	Config Mode	Nominal total output power (dBm/W)	TDD downlink duty cycle	Power tolerance (dB)	Total time-averaged output power (dBm/W)
B261	NR	1, 2	21 / 0.125	72.1 %	1.5	21.1 / 0.128
B261	NR	1, 2	22 / 0.158	72.1 %	1.5	22.1 / 0.161
B261	NR	1, 2	23 / 0.200	72.1 %	1.5	23.1 / 0.203
B261	NR	1, 2	24 / 0.250	72.1 %	1.5	24.1 / 0.256
B261	NR	1, 2	25 / 0.316	72.1 %	1.5	25.1 / 0.322
B261	NR	1, 2	26 / 0.398	72.1 %	1.5	26.1 / 0.405
B261	NR	1, 2	27 / 0.500	72.1 %	1.5	27.1 / 0.510

3 Exposure conditions

The EUT is intended to be installed on walls, poles and similar structures making it possible to ensure that the general public has no access to the EMF compliance boundary. Other installation related exposure conditions are not reasonably foreseeable for the EUT.

The maximum TDD downlink duty cycle was considered to obtain the maximum time-averaged output power. Other factors such as beam scanning in elevation and azimuth, RBS utilization, and scheduling time are reasonably foreseeable and will significantly reduce the time-averaged power and the RF exposure. These factors were however not considered in this assessment, which adds to the conservativeness of the obtained compliance boundaries.

4 EMF compliance boundary calculations

The RF exposure was evaluated using calculations performed according to the Ericsson RF Exposure Calculation Procedure for Base Stations [2], which conforms to FCC OET Bulletin 65 [3] and IEC 62232 [4]. The calculations were made using the far-field spherical formula. The first step in calculating the compliance boundary was to use the spherical far-field formula to estimate power density:

$$S_{\mathrm{sph}}(\theta, \phi) = \frac{P_{\mathrm{a}} G(\theta, \phi)}{4\pi r^2},$$

[7] The stated gain value is the maximum gain of antenna per panel obtained from the antenna patterns provided by the client .
[8] The stated EIRP value is the nominal maximum value without power tolerance included.
[9] The stated half-power beam widths are for broadside beam.

where S,P_a, G, r, θ, and ϕ denote the power density, the total time-averaged power accepted by antenna, the antenna gain, the distance from the antenna, and the angular variables in a spherical coordinate system, respectively. The total time-averaged power delivered to the antenna include tolerances and the TDD downlink duty cycle. The envelope of antenna gains for all possible traffic beams was obtained from far-field measurements provided by the client. Such envelope patterns were provided for two different frequencies, specifically 27.7 GHz and 28 GHz within Band 261.

There are different available coverage shapes of the beam envelope pattern depending on deployment scenarios (Hotspot1 for Configuration Mode 1, and Hotspot2, Macro3 and Macro3b[5] for Configuration Mode 2). Maximum gain values, corresponding to the envelope patterns, were used in the above equation to estimate power density for each sector shape. The maximum gain value of the antenna considering all possible scan directions and sector shapes was found to be 25.6 dBi for Configuration Mode 1 and 28.6 dBi for Configuration Mode 2.

The compliance distance for the spherical model, $\mathrm{CD}_{\mathrm{sph}}(\theta, \phi)$ was obtained for each sector shape by solving the following equation for r:

$$\frac{S_{\mathrm{sph}}(r, \theta, \phi)}{S_{\mathrm{gp,w}}^{\mathrm{lim}}} = 1,$$

where $S_{\mathrm{gp,w}}^{\mathrm{lim}}$ denotes the FCC power density reference levels for general public/uncontrolled and workers/controlled exposure in the frequency range used by the EUT. RF EMF exposure limits are given in Table 4 [1].

Table 4 RF EMF exposure limits applicable for the frequency range used by the EUT [1].

Quantity	General public / Uncontrolled exposure limit	Workers / Controlled exposure limit
Power density S (W/m^2)	10	50

Based on the calculated compliance distances, a box-shaped compliance boundary was determined. To comply with the FCC requirement of a minimum test separation distance for a non-portable device of 20 cm, the minimum distance from the EUT to the compliance boundary was set to 20 cm.

5 Results

A box-shaped compliance boundary is used, characterized by its width, height, and the compliance distances behind and in front of the equipment, see Figure 1. Outside of this box, the RF exposure is below the exposure limits.

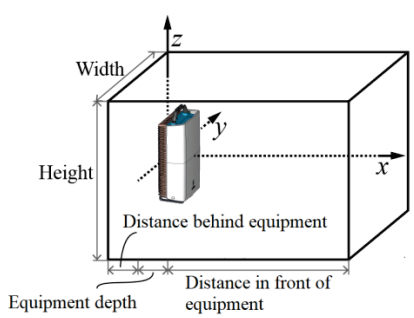

Figure 1 Box-shaped structure specifying the compliance boundary for the tested RBS product.

In Figure 2 to Figure 5 compliance distance results as obtained using the far-field spherical formula for general public (blue line) and workers (red line) exposure are given for the tested configuration leading to the largest compliance boundary for each sector shape. Results are provided for the FCC exposure limits. Also shown are the resulting symmetric compliance boundaries (black lines, solid for general public, dashed for workers exposure). The reported compliance boundary dimensions are given in Table 5 rounded upwards to the nearest decimeter.

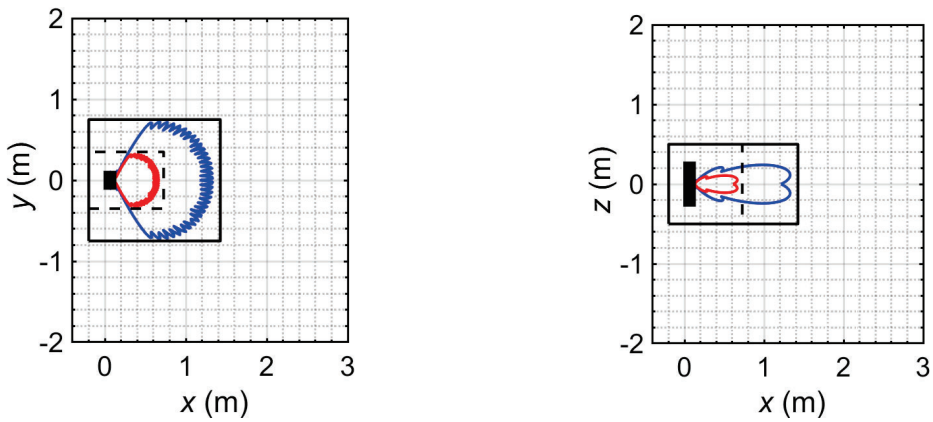

Figure 2 Compliance boundaries for general public (black solid line) and workers (black dashed line) exposure for markets where the FCC exposure limits apply for Hotspot1 sector shape (Config Mode 1). The blue solid lines correspond to compliance distance results for general public exposure obtained using the spherical models. The solid red lines indicate the corresponding compliance distance results for workers exposure. The EUT is shown from above (left) and from the side (right) with its backplane located at $x = 0$ m. Mode: B261 (28 GHz) (NR). Total power delivered to the antenna: 0.51 W.

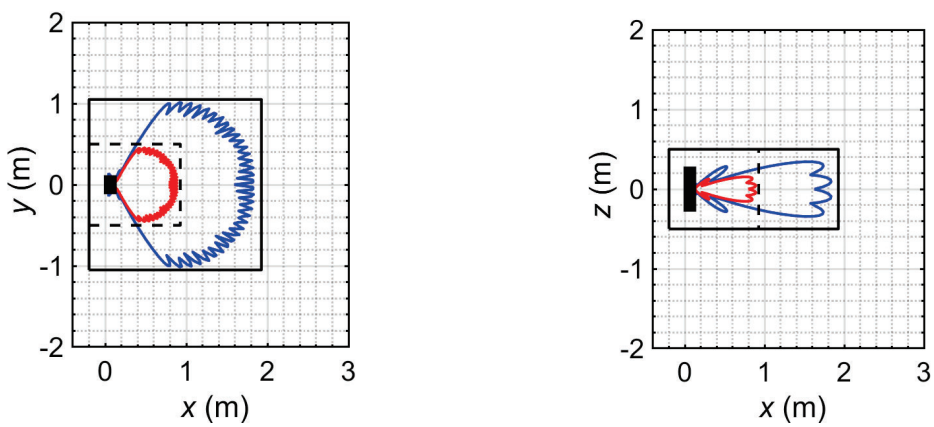

Figure 3 Compliance boundaries for general public (black solid line) and workers (black dashed line) exposure for markets where the FCC exposure limits apply for Hotspot2 sector shape (Config Mode 2). The blue solid lines correspond to compliance distance results for general public exposure obtained using the spherical models. The solid red lines indicate the corresponding compliance distance results for workers exposure. The EUT is shown from above (left) and from the side (right) with its backplane located at $x = 0$ m. Mode: B261 (28 GHz) (NR). Total power delivered to the antenna: 0.51 W.

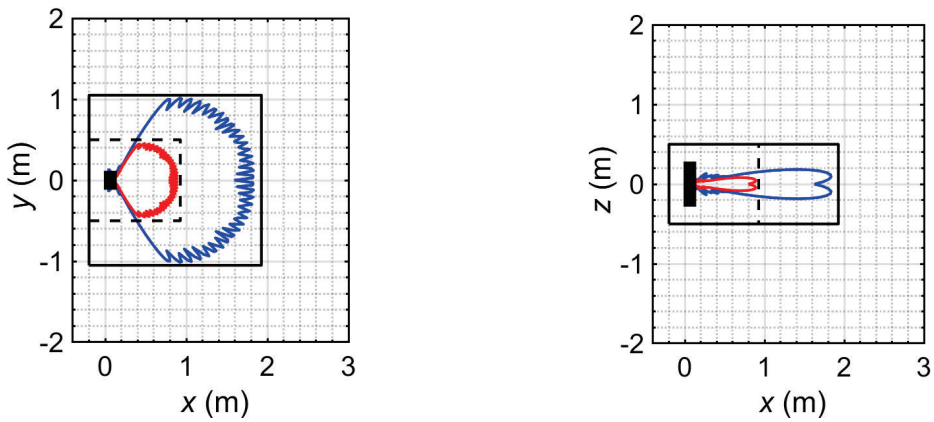

Figure 4 Compliance boundaries for general public (black solid line) and workers (black dashed line) exposure for markets where the FCC exposure limits apply for Macro3 sector shape (Config Mode 2). The blue solid lines correspond to compliance distance results for general public exposure obtained using the spherical models. The solid red lines indicate the corresponding compliance distance results for workers exposure. The EUT is shown from above (left) and from the side (right) with its backplane located at $x = 0$ m. Mode: B261 (28 GHz) (NR). Total power delivered to the antenna: 0.51 W.

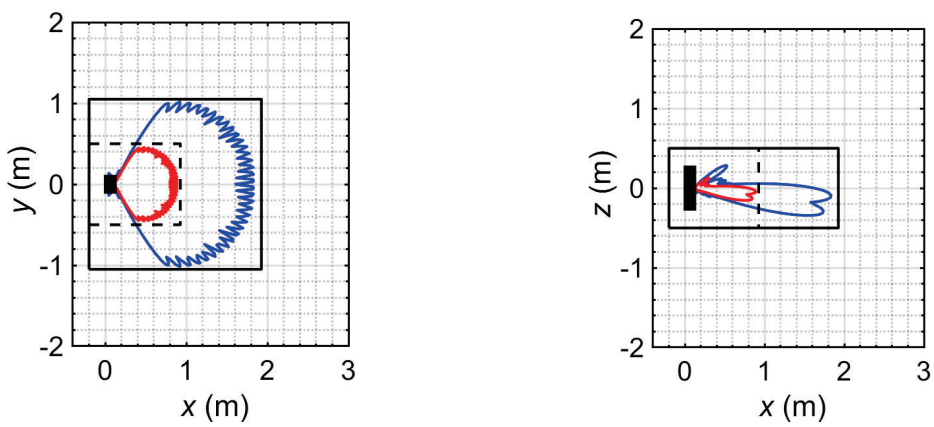

Figure 5 Compliance boundaries for general public (black solid line) and workers (black dashed line) exposure for markets where the FCC exposure limits apply for Macro3b sector shape (Config Mode 2). The blue solid lines correspond to compliance distance results for general public exposure obtained using the spherical models. The solid red lines indicate the corresponding compliance distance results for workers exposure. The EUT is shown from above (left) and from the side (right) with its backplane located at $x = 0$ m. Mode: B261 (28 GHz) (NR). Total power delivered to the antenna: 0.51 W.

Table 5 Dimensions of the box-shaped compliance boundary for general public (GP) and workers (W) exposure for Street Macro 6701 applicable in markets employing the FCC RF exposure limits for maximum output power with power tolerance and TDD downlink duty cycle included.

Mode and output power for Street Macro 6701							Dimensions of the box-shaped compliance boundary (m)							
							Distance in front of EUT		Width		Height		Distance behind EUT	
Band	**Standard**	**Config Mode[4]**	**Nominal total EIRP**	**Power tolerance**	**TDD DL duty cycle**	**Sector shapes**	**GP**	**W**	**GP**	**W**	**GP**	**W**	**GP**	**W**
B261	NR	1	47 dBm	1.5 dB	72.1 %	Hotspot1	0.7	0.3	0.8	0.7	1.0	1.0	0.2	0.2
B261	NR	1, 2	50 dBm	1.5 dB	72.1 %	Hotspot1, Hotspot2, Macro3, Macro3b[5]	0.9	0.4	1.1	0.7	1.0	1.0	0.2	0.2
B261	NR	1, 2	53 dBm	1.5 dB	72.1 %	Hotspot1, Hotspot2, Macro3, Macro3b	1.3	0.6	1.5	0.7	1.0	1.0	0.2	0.2
B261	NR	2	56 dBm	1.5 dB	72.1 %	Hotspot2, Macro3, Macro3b	1.8	0.8	2.1	1.0	1.0	1.0	0.2	0.2

For the power levels specified in the table which include tolerances, and the upward rounding of compliance boundary dimensions to the nearest decimeter, the specified results are conservative.

6 Uncertainty

For the input parameters defined in the test report, the calculated compliance boundary dimensions determined according the approach described in Section 4 results in an exposure assessment which is conservative. The compliance boundary dimensions were determined by comparing the evaluated RF exposure directly with the limits.

7 Conclusion

The Ericsson Street Macro 6701 B261 has been tested using methods and procedures specified in FCC OET Bulletin 65 [3] and IEC 62232:2017 [4]. The results in Section 5 show the compliance boundary dimensions for the considered configuration of the product. Outside of these compliance boundaries, the RF exposure is below the limits specified in [1].

8 References

[1] FCC, Code of Federal Regulations CFR title 47, part 1.1310 “Radiofrequency radiation exposure limits”, Federal Communications Commission (FCC), August 1997.

[2] GFTE-16:001718 Uen, “Ericsson RF exposure calculation procedure for base stations”.

[3] FCC, “Evaluating compliance with FCC guidelines for human exposure to radiofrequency electromagnetic fields. OET Bulletin 65. Edition 97-01.” Federal Communications Commission (FCC), Office of Engineering and Technology, August 1997.

[4] IEC 62232:2017, Determination of RF field strength, power density and SAR in the vicinity of radiocommunication base stations for the purpose of evaluating human exposure, June 2017.

[5] Ericsson, LME-12:001904 Uen, “Exposure to radio frequency electromagnetic fields”.

9 Revision history

Rev.	Date	Description
A	2019-07-10	First revision
B	2019-09-19	Added results for Configuration Mode 1 and 2 at different power levels.

Appendix A. Information to be included in the CPI

Table A.1 lists the compliance boundaries (exclusion zones), outside of which the RF EMF exposure from Street Macro 6701 is below the limits applicable in:

- USA (47 CFR 1.1310)

Information is provided for the theoretical maximum exposure condition.

Table A.1: Dimensions of the box-shaped compliance boundary for general public (GP) and occupational (O) exposure applicable in USA and markets employing the FCC RF exposure limits.

Mode and output power for Street Macro 6701							Dimensions of the box-shaped compliance boundary (m)							
							Distance in front of equipment		Width		Height		Distance behind equipment	
Band	**Standard**	**Config-uration Mode**	**Nominal total EIRP**	**IEC 62232 installation class**	**Power tolerance**	**TDD DL duty cycle**	**GP**	**W**	**GP**	**W**	**GP**	**W**	**GP**	**W**
B261	NR	1	47 dBm	E100	1.5 dB	72.1 %	0.7	0.3	0.8	0.7	1.0	1.0	0.2	0.2
B261	NR	1, 2	50 dBm	E100	1.5 dB	72.1 %	0.9	0.4	1.1	0.7	1.0	1.0	0.2	0.2
B261	NR	1, 2	53 dBm	E+	1.5 dB	72.1 %	1.3	0.6	1.5	0.7	1.0	1.0	0.2	0.2
B261	NR	2	56 dBm	E+	1.5 dB	72.1 %	1.8	0.8	2.1	1.0	1.0	1.0	0.2	0.2

(1) The compliance boundaries are determined for maximum output power with power tolerance and TDD downlink duty cycle included.

Appendix B. Guidelines on how to install the product

The Ericsson Street Macro 6701 product (KRK 101 01/1, KRK 101 01/2, KRK 101 01/11, KRK 101 01/21) shall be installed to make sure that the general public does not have access to the applicable RF EMF compliance boundary. The compliance boundary dimensions were determined for the product transmitting in free space.

Appendix C. Guidelines for workers during installation, maintenance, and repair of the product

For Ericsson Street Macro 6701 product (KRK 101 01/1, KRK 101 01/2, KRK 101 01/11, KRK 101 01/21), if work needs to be performed within the compliance boundary applicable for workers, the radio equipment shall be powered off, or the power be reduced to a level ensuring that the RF EMF exposure is below the relevant exposure limit for workers.

If work is conducted on behalf of Ericsson, minimum EMF related requirements are provided in [5].

Appendix D. Picture of Street Macro 6701

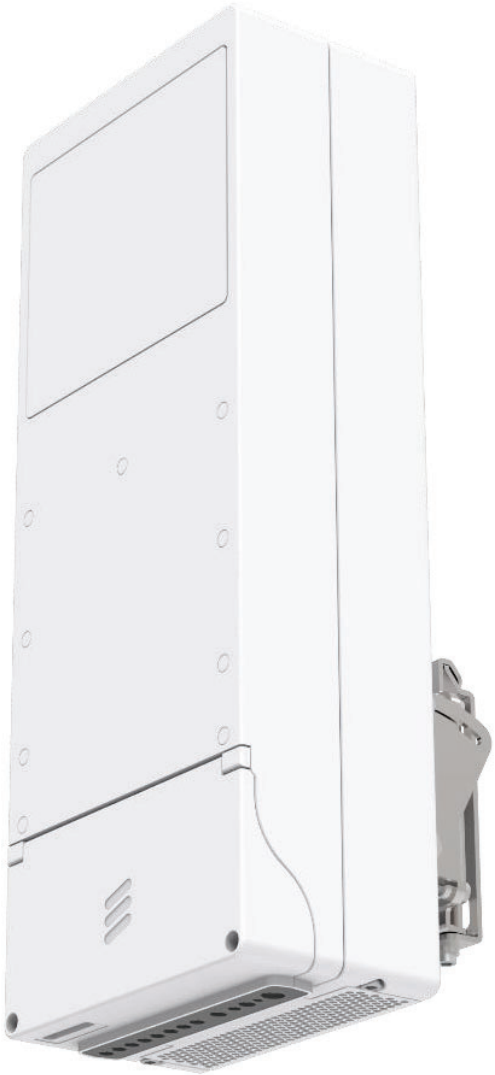

Figure D.1 Picture of Street Macro 6701

EXHIBIT 40

REPORT

issued by an Accredited Testing Laboratory

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Date	Reference	Page
2019-10-17 Rev1 2022-10-20	9P06454-Rev1	1 (55)

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Ericsson AB
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Radio measurements on SM 6701 B261 with FCC ID: TA8AKRK10101

Rev1 2022-10-20: Frequency stability added

Product name: SM 6701 B261
Product number: KRK 101 01/1

RISE Research Institutes of Sweden AB
Electronics - EMC

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Summary ... 3
Description of the test object ... 4
Purpose of test ... 5
Operation modes during measurements ... 5
Measurements ... 6
References ... 6
RISE Measurement equipment ... 7
EAB Measurement equipment ... 7
Uncertainties ... 8
Reservation ... 8
Delivery of test object ... 8
Manufacturer's representative ... 8
Test engineers ... 8
Test participant(-s) ... 8
Test frequencies used for radiated measurements ... 9
Test setup: radiated measurements ... 10
RF power output measurements according to CFR 47 §30.202 ... 11
Test set-up and procedure ... 11
Results ... 13
Limits ... 14
Occupied bandwidth measurements according to CFR47 §2.1049 ... 15
Test set-up and procedure ... 15
Results ... 16
Field strength of spurious radiation measurements according to CFR 47 §30.203 ... 22
Rise Measurement equipment ... 28
EAB Measurement equipment ... 28
Results ... 29
Limits ... 30
Frequency stability measurements according to 47 CFR §2.1055 ... 52
Test set-up and procedure ... 52
Results ... 53
Remark ... 53
Photos of test object ... 54

Summary

Standard Listed part of	Compliant
FCC CFR 47 part 30 Subpart C	
2.1046/ 30.202 RF power output	Yes
2.1049 Occupied bandwidth	Yes
2.1053/ 30.203 Field strength of spurious radiation	Yes
2.1055 Frequency stability	Yes

Description of the test object

Equipment:	Street Macro radio, SM 6701 B261 Product number: KRK 101 01/1 FCC ID: TA8AKRK10101
Hardware revision state:	R1C
Tested configuration:	3GPP NR TDD
Frequency band:	TX/ RX: 27500 – 28350 MHz
IBW:	400 MHz
Nominal Output power (EIRP):	53 dBm/ Polarization
RF configurations:	TX Diversity, SU and MU MIMO up to 2 layers 1x(2x2), Contiguous Spectrum (CS) and Non-Contiguous spectrum (NCS), Carrier Aggregation (CA) intra-band supported
Antenna beam steering:	Azimuth ±60 deg, elevation ±15 deg
Channel bandwidth(s)/ Sub Carrier Spacing:	100 MHz/ 120 kHz
Modulations:	QPSK, 16QAM and 64QAM
Emission designators:	95M9W7D
Emission designators Carrier Aggregation:	195MW7D (2x 100 MHz), 308MW7D (3x 100 MHz) 396MW7D (4x 100 MHz)
RF power Tolerance:	+1.5/ -2.0 dB

The information above is supplied by the manufacturer.

EX-1019
Ericsson Inc. and Verizon Wireless v. Procomm International PTE Ltd.
000039

Purpose of test

The purpose of the tests is to verify compliance to the performance characteristics specified in applicable items of FCC CFR 47 Part 30.

Operation modes during measurements

The measurements were performed with the test object transmitting test models as defined in 3GPP TS 38.141-2. Test model NR FR2 TM 1.1 is used to represent QPSK, test model NR FR2 TM 3.2 to represent 16QAM, test model NR FR2 TM 3.1 to represent 64QAM modulation

The settings below were deemed representative for worst case settings, for all traffic scenarios when settings with different modulations and RF configurations was found to represent worst case settings.

MIMO mode, NR FR2 TM1.1, QPSK with the beams locked in boresight.

All measurements were performed with the test object configured for maximum transmit power.

The measurement shall be done during active part of transmission, or if the measurement is performed with constant duty cycle <98%, the result shall be adjusted for the duty cycle according to ANSI C63.26 5.2.4.3.4. The duty cycle was measured to 74% and to compensate for this 1.33 dB was added to the test results.

Measurements

The test object was powered with 120 VAC 60 Hz by an external power supply. Additional connections are documented in the setup drawings for radiated measurements.

RISE 10 MHz reference was connected to the signal analyser as external reference, during all measurements.

Far field distance for power, OBW and Band edge measurements is 3.5 m, based on the EUT antenna dimensions and the highest transmitter frequency (28.35 GHz).

Far field distances for OOB emissions is based on the measurement antenna dimension and highest frequency in the measure range :

Frequency range [GHz]	Far field distance [m]	Measured distance [m]
18 – 26.5	0.73	4
26.5 – 40	0.49	4
40 – 60	0.34	3
60 – 80	0.18	1
80 – 100	0.16	1

Formula for far field distance calculation:

$R = 2x\ D^2/\lambda$

References

Measurements were done according to relevant parts of the following standards:

CFR 47 part 30, October 2018
ANSI C63.26-2015
KDB 842590 D01 Upper Microwave Flexible Use Service V01
3GPP TS 38.141-2 V15.2.0 (2019-06)
3GPP TR 37.842 V13.2.0 (2017-03)

EX-1019
Ericsson Inc. and Verizon Wireless v. Procomm International PTE Ltd.
000041

RISE Measurement equipment

	Calibration Due	RISE number
Anechoic chamber, Hertz	2020-11	BX50194
R&S FSW 43	2020-09	902 073
R&S ESU	2020-07	901 553
R&S ZNB 40	2020-07	BX50051
RF Cable VNA-calibration	2020-01	BX50189
RF Cable VNA-calibration	2020-01	BX50190
RF Cable	2020-04	BX50236
RF Cable	2020-09	BX50192
Bilog antenna Schaffner 6143A	2021-08	504 079
Flann STD Gain Horn Antenna 20240-20	-	BX92412
Flann STD Gain Horn Antenna 22240-20	-	BX92413
Flann STD Gain Horn Antenna 24240-20	-	BX92414
Flann STD Gain Horn Antenna 26240-20	-	BX92415
Flann STD Gain Horn Antenna 27240-20	-	BX92416
Mixer FS-Z60	2020-12	BX90566
Mixer FS-Z90	2021-01	BX90567
Mixer FS-Z110	2020-07	BX81425
Miteq, Low Noise Amplifier	2020-01	503 278
EMCO Horn Antenna 3115	2021-07	502 175
EMCO Horn Antenna 3115	2022-02	902 212
EMCO Horn Antenna 3116	2021-07	503 279
µComp Nordic, Low Noise Amplifier	2020-01	901 544
RF Cable	2020-01	BX81431
RF Cable	2020-04	BX81423
RF Cable	2020-09	503 681
RF Cable FSW-B21	2020-10	BX62069
RF Cable FSW-B21	2020-10	BX62073
Temperature and humidity meter, Testo 615	2020-06	503 498

Frequency stability 2022-07

	Calibration Due	RISE number
R&S FSW 43	2023-01	902 073
RF Cable	2023-04	BX50236
EMCO Horn Antenna 3116	2024-06	503 279
Temperature Chamber	-	503 360
Testo 635, temperature and humidity meter	2023-07	504 203
Multimeter Fluke 87	2023-05	502 190

EAB Measurement equipment

Calibrated at RISE before testing.

	Calibration Due	S/N
SWH010 HPF 30-40 GHz	2020-09	ST010619225
SSL036 LPF 26.5 GHz	2020-09	ST012717003

Uncertainties

Measurement and test instrument uncertainties are described in the quality assurance documentation ”SP-QD 10885”. The uncertainties are calculated with a coverage factor k=2 (95% level of confidence).
Compliance evaluation is based on a shared risk principle with respect to the measurement uncertainty.

Reservation

The test results in this report apply only to the particular test object as declared in the report.

Delivery of test object

The test object was delivered: 2019-09-24.

Manufacturer’s representative

Mikael Jansson, Ericsson AB.

Test engineers

Tomas Lennhager and Karl Flysjö, RISE

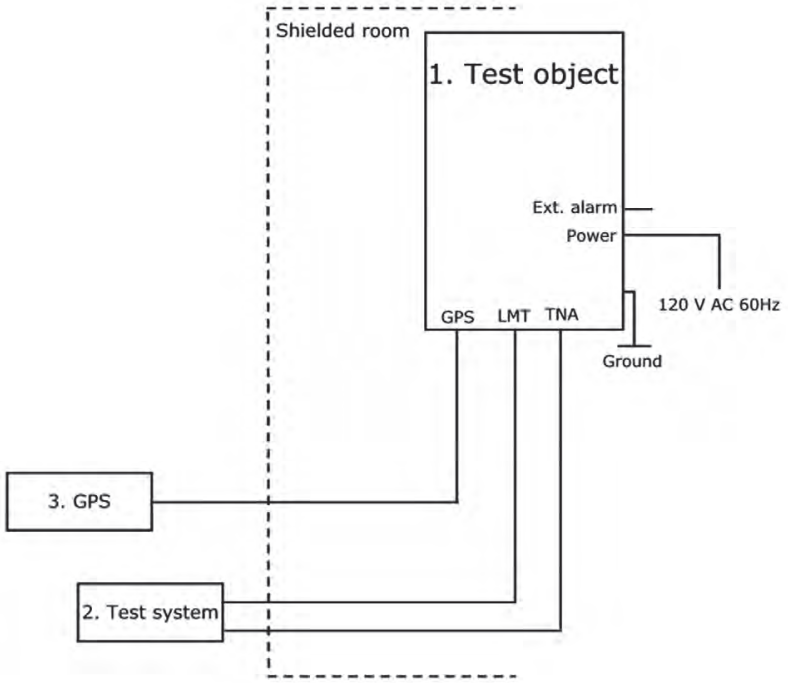
Test participant(-s)

Mikael Jansson, Henry Liu, Xiang Yue and Allen Hu. Ericsson AB.

Test frequencies used for radiated measurements

Frequency Hor/ Ver [MHz]	Symbolic name	Comment
27550.08	BL_{100}	100 MHz BW, TX bottom Lower band
27874.92	TL_{100}	100 MHz BW, TX Top Lower band
27975.00	BH_{100}	100 MHz BW, TX Bottom High band
28299.96	TH_{100}	100 MHz BW, TX Top High band
27550.08 27650.04	$BL2_{100}$	100 MHz BW, TX 2 carrier Bottom Lower band
28200.00 28299.96	$TH2_{100}$	100 MHz BW, TX 2 carrier Top High band
27550.08 27650.04 27849.96	$BL3_{100}$	100 MHz BW, TX 3 carrier Bottom Lower band
27550.08 27650.04 27849.96	$BCA3_{100}$	100 MHz BW, TX 3 carrier Bottom Lower band for CA
27999.96 28200.00 28299.96	$TH3_{100}$	100 MHz BW, TX 3 carrier Top High band
27550.08 27650.04 27750.00 27849.96	$BL4_{100}$	100 MHz BW, TX 4 carrier Bottom Lower band
27999.96 28099.92 28200.00 28299.96	$TH4_{100}$	100 MHz BW, TX 4 carrier Top High band

Test setup: radiated measurements



Test object:

1.	AC: SM 6701, KRK 101 01/1, rev. R1C, s/n: E23A768788 With Radio Software: CXP2030055/1, rev. R2B206, RBS Software: CXP9024418/6, rev. R77A152F1 FCC ID: TA8AKRK10101 For Frequency stability test 2022-07 AC: SM 6701, KRK 101 01/11, rev. R1C, s/n: E23A806920 With Radio Software: CXP9024418, rev. R58A89 FCC ID: TA8AKRK10101

Functional test equipment:

2.	Computer, Apple Mac mini, BAMS - 100196432
3.	GPS Active Antenna, KRE 101 2082/1 GPS 02 01, NCD 901 41/1, rev. R1D, s/n: A401804384

Interfaces:

Power input configuration AC: 120 VAC 60Hz	Power
LMT, shielded multi-wire	Signal
TN A, shielded multi-wire	Signal
GPS, shielded multi-wire	Signal
EXT Alarm, shielded multi-wire	Signal
TN B, Optical Interface Link, single mode opto fibre	Signal
TN C, Optical Interface Link, single mode opto fibre	Signal
Ground wire	Ground

RF power output measurements according to CFR 47 §30.202

Date	Temperature	Humidity
2019-09-30	24 °C ± 3 °C	28 % ± 5 %
2019-10-01	23 °C ± 3 °C	30 % ± 5 %

Test set-up and procedure

The test object was located in a anechoic chamber. The measuring antenna was aligned to the centre of the PAAM. A turn table was used to find the highest output power. A signal analyzer with the channel power function activated was used to measure the output power with the RMS detector activated. The bandwidth setting of the channel power function was set to 100 MHz.

A substitution measurement defined in 3GPP TR 37.842 chapter 10.3.1.1.2 was used to get the actual correction factor (Transducer factor A-D in the figure 1 below) with a Network analyzer (ZNB 40).

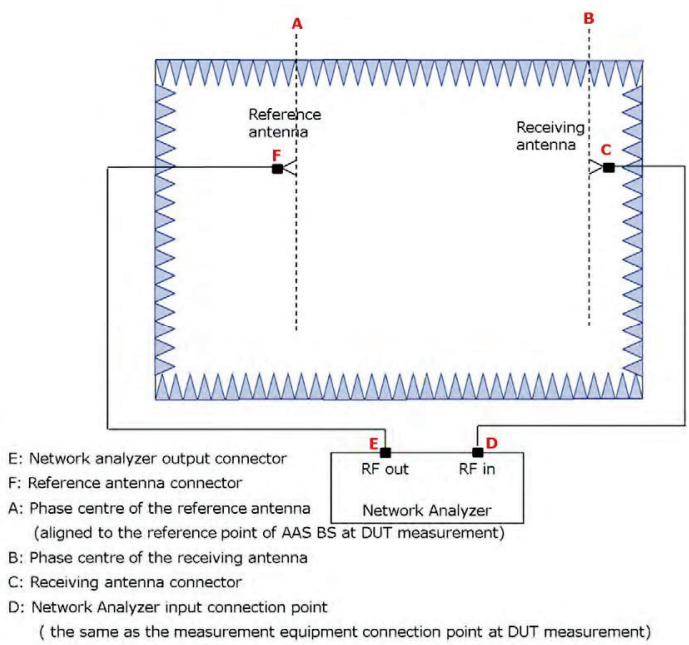


Figure 1: Indoor Anechoic Chamber calibration system setup for EIRP

Stage 1 - Calibration:

1) Connect the reference antenna and the receiving antenna to the measurement RF out port and RF in port of the network analyzer, respectively, as shown in figure 1.
2) Install the reference antenna with its *beam peak direction* and the height of its phase centre aligned with the receiving antenna.
3) Set the centre frequency of the network analyzer to the carrier centre frequency of the tested signal for EIRP measurement of the EUT and measure $LF_{EIRP,\,E\rightarrow D}$, which is equivalent to 20log|S21| (dB) obtained by the network analyzer:
   $LF_{EIRP,\,E\rightarrow D}$: Pathloss between E and D in figure 1.
4) Measure the cable loss, $LF_{EIRP,\,E\rightarrow F}$ between the reference antenna connector and the network analyzer connector:

EX-1019
Ericsson Inc. and Verizon Wireless v. Procomm International PTE Ltd.
000046

$LF_{EIRP, E \rightarrow F}$: Cable loss between E and F in figure 1.

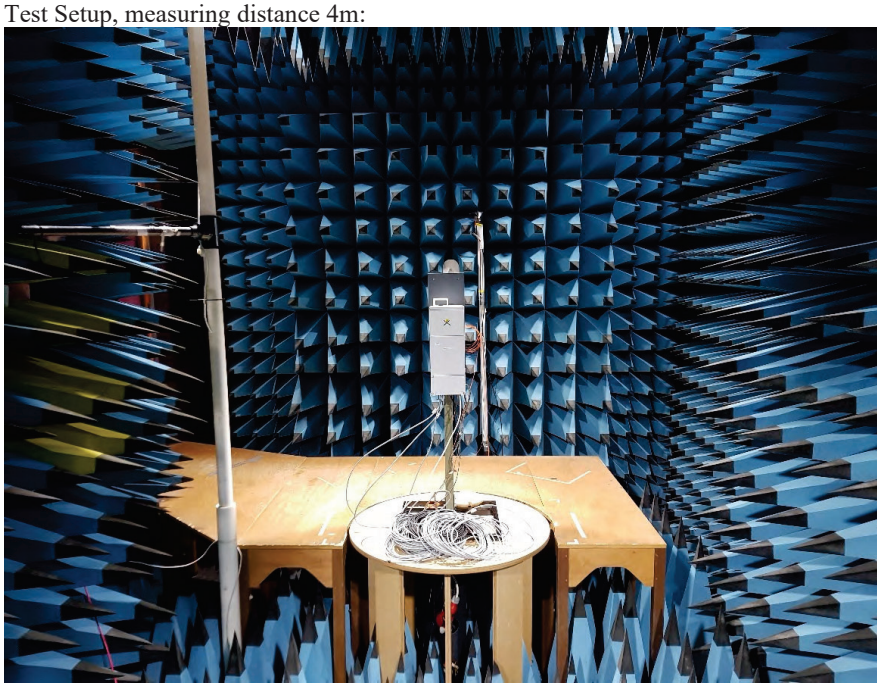
5) Calculate the calibration value between A and D with the following formula:
$L_{EIRP\_cal, A \rightarrow D} = LF_{EIRP, E \rightarrow D} + G_{REF\_ANT\_EIRP, A \rightarrow F} - LF_{EIRP, E \rightarrow F}$.
$L_{EIRP\_cal, A \rightarrow D}$: Calibration value between A and D in figure 1. Was implemented in the spectrum analyzer as a transducer.
$G_{REF\_ANT\_EIRP, A \rightarrow F}$: Antenna gain of the reference antenna.

Stage 2 - Measurement:

6) Uninstall the reference antenna and install the EUT with the manufacturer declared coordinate system reference point in the same place as the phase centre of the reference antenna. The manufacturer declared coordinate system orientation of the EUT is set to be aligned with the testing system.
7) Measure the mean power, $P_{R\_EUT\_EIRP, D}$, D in figure 1.
8) Calculate the EIRP with the following formula:

$$EIRP = P_{R\_EUT\_EIRP, D} + L_{EIRP\_cal, A \rightarrow D}$$

Test Setup, measuring distance 4m:



Measurement equipment	RISE number
Anechoic chamber, Hertz	BX50194
R&S FSW 43	902 073
R&S ZNB 40	BX50051
EMCO Horn Antenna 3116	503 279
FLANN Std gain 22240-20	BX92413
RF Cable	BX81423
Testo 615, temperature and humidity meter	503 498

Measurement uncertainty: 3.3 dB

Results

Single carrier

Beam index 0 Boresight, Bandwidth 100MHz
Rated output power per 100 MHz EIRP, 1x 53 dBm/ Polarization.

		Output power per 100 MHz, EIRP [RMS dBm] Vertical/ Horizontal
Modulation	Symbolic name	PAAM 0
QPSK	BL_{100}	53.25/ 52.90
QPSK	TL_{100}	52.57/ 52.42
QPSK	BH_{100}	52.79/ 52.80
QPSK	TH_{100}	52.38 / 52.37

2-Carrier

Beam index 0 Boresight, Bandwidth 100MHz
Rated output power per 100 MHz EIRP, 2x 50.0 dBm/ Polarization.

		Output power per 100 MHz, EIRP [RMS dBm] Vertical/ Horizontal	
Modulation	Symbolic name	Carrier 1	Carrier 2
QPSK	$BL2_{100}$	50.47/ 49.97	51.05/ 50.22
QPSK	$TH2_{100}$	49.81/ 49.78	49.66/ 49.19

EX-1019
Ericsson Inc. and Verizon Wireless v. Procomm International PTE Ltd.
000048

3-Carrier

Beam index 0 Boresight, Bandwidth 100MHz
Rated output power per 100 MHz EIRP, 3x 48.2 dBm/ Polarization.

		Output power per 100 MHz, EIRP [RMS dBm] Vertical/ Horizontal		
Modulation	Symbolic name	Carrier 1	Carrier 2	Carrier 3
QPSK	$BL3_{100}$	48.70/ 47.80	49.02/ 48.86	49.66/ 49.31
QPSK	$TH3_{100}$	48.11/ 47.48	48.09/ 47.76	48.23/ 47.97

4-Carrier

Beam index 0 Boresight, Bandwidth 100MHz
Rated output power per 100 MHz EIRP, at 4x 47.0 dBm/ Polarization.

		Output power per 100 MHz, EIRP [RMS dBm] Vertical/ Horizontal			
Modulation	Symbolic name	Carrier 1	Carrier 2	Carrier 3	Carrier 4
QPSK	$BL4_{100}$	47.70/ 46.85	48.09/ 48.00	48.35/ 48.05	48.55/ 48.45
QPSK	$TH4_{100}$	47.30/ 46.50	47.29/ 47.42	47.25/ 46.84	47.12/ 47.06

Limits

CFR47 §30.202 Power limits.

(a) For fixed and base stations operating in connection with mobile systems, the average power of the sum of all antenna elements is limited to an equivalent isotopically radiated power (EIRP) density of +75dBm/100 MHz. For channel bandwidths less than 100 MHz the EIRP must be reduced proportionally and linearly based on the bandwidth relative to 100 MHz.

Complies?	Yes

EX-1019
Ericsson Inc. and Verizon Wireless v. Procomm International PTE Ltd.
000049

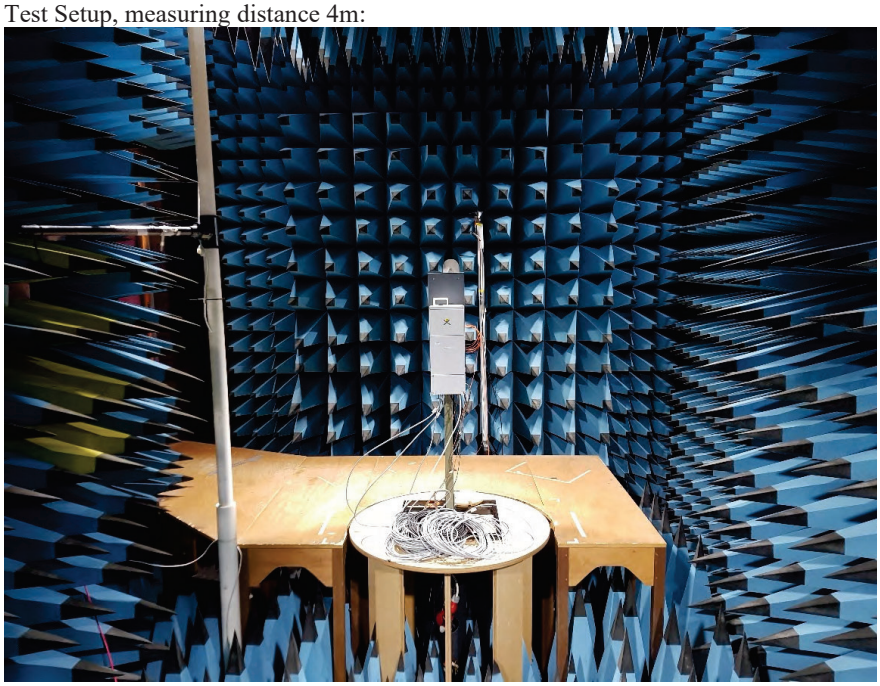
Occupied bandwidth measurements according to CFR47 §2.1049

Date	Temperature	Humidity
2019-09-30	24 °C ± 3 °C	28 % ± 5 %
2019-10-01	23 °C ± 3 °C	30 % ± 5 %
2019-10-03	23 °C ± 3 °C	21 % ± 5 %

Test set-up and procedure

The test object was located in a anechoic chamber. The measuring antenna was aligned to the centre of the of the PAAM. A turn table was used to find the highest output power. A signal analyzer with Peak detector and max hold was used to measure the OBW.

Test Setup, measuring distance 4m:



Measurement equipment	RISE number
Anechoic chamber, Hertz	BX50194
R&S FSW 43	902 073
R&S ZNB 40	BX50051
EMCO Horn Antenna 3116	503 279
FLANN Std gain 22240-20	BX92413
RF Cable	BX81423
Testo 615, temperature and humidity meter	503 498

Measurement uncertainty: 3.3 dB

Results

Bandwidth: 100MHz

Modulation: QPSK

Diagram	Symbolic name	Polarization	Occupied BW (99%) [MHz]
1	BL_{100}	Hor	95.856
2	BL_{100}	Ver	95.613
3	TL_{100}	Hor	95.529
4	TL_{100}	Ver	95.451
5	BH_{100}	Hor	94.968
6	BH_{100}	Ver	94.938
7	TH_{100}	Hor	95.564
8	TH_{100}	Ver	95.497

Carrier Aggregation, Bandwidth: 100MHz, Modulation: QPSK

Diagram	Symbolic name	Polarization	Occupied BW (99%) [MHz]
9	CA_{2x100}	Hor	194.946
10	CA_{2x100}	Ver	195.029
11	CA_{3x100}	Hor	296.946
12	CA_{3x100}	Ver	307.580
13	CA_{4x100}	Hor	394.798
14	CA_{4x100}	Ver	395.763

Diagram 1:

Diagram 2:

Diagram 3:

Diagram 4:

Diagram 5:

Diagram 6:

Diagram 7:

Diagram 8:

Diagram 9:

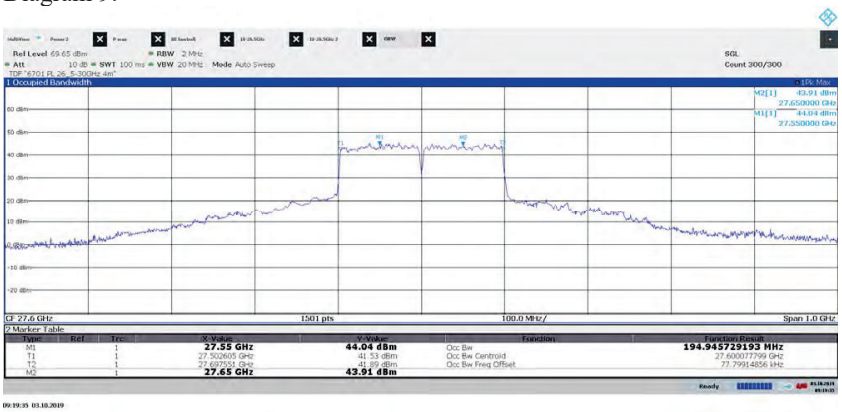


Diagram 10:

Diagram 11:

Diagram 12:

Diagram 13:

Diagram 14:

Field strength of spurious radiation measurements according to CFR 47 §30.203

Date	Temperature	Humidity
2019-10-01	23 °C ± 3 °C	30 % ± 5 %
2019-10-02	23 °C ± 3 °C	23 % ± 5 %
2019-10-03	23 °C ± 3 °C	21 % ± 5 %
2019-10-04	23 °C ± 3 °C	20 % ± 5 %
2019-10-07	23 °C ± 3 °C	18 % ± 5 %
2019-10-08	23 °C ± 3 °C	21 % ± 5 %

The measurements were performed with both horizontal and vertical polarization of the antenna. The measurement was performed with a RBW of 1 MHz. The antenna distance and test object height in the different frequency ranges is descried below.

In the test range from 40 – 100 GHz
A propagation loss in free space was calculated. The used formula was
$\gamma = 20\log\left(\frac{4\pi D}{\lambda}\right)$, γ is the propagation loss and D is the antenna distance.
For 40 – 60 GHz *D* was 3.0 m and for 60 – 100 GHz *D* was 1.0 m.

In the test range from 30MHz – 40 GHz a substitution measurement defined in 3GPP TR 37.842 chapter 10.3.1.1.2 was used to get the actual correction factor (Transducer factor A-D in the figure 1 below) with a Network analyzer (ZNB 40).

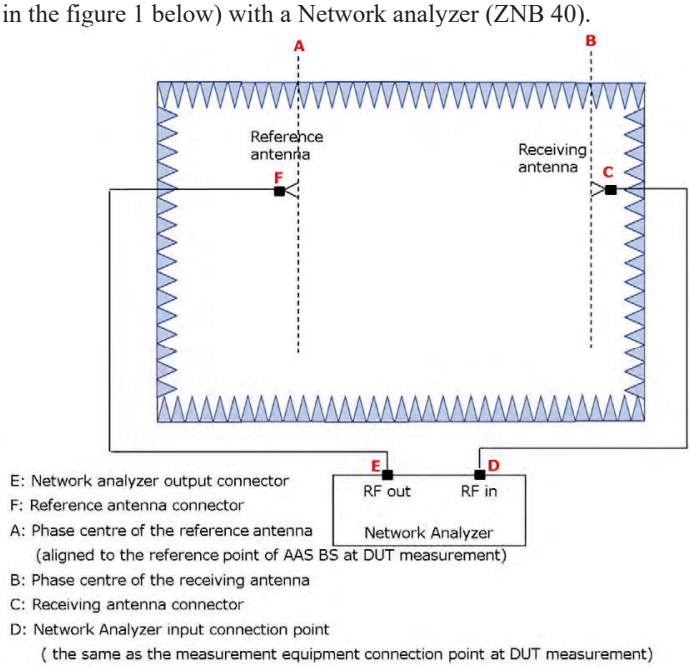


Figure 1: Indoor Anechoic Chamber calibration system setup for EIRP

Stage 1 - Calibration:

1) Connect the reference antenna and the receiving antenna to the measurement RF out port and RF in port of the network analyzer, respectively, as shown in figure 1.
2) Install the reference antenna with its *beam peak direction* and the height of its phase centre aligned with the receiving antenna.

EX-1019
Ericsson Inc. and Verizon Wireless v. Procomm International PTE Ltd.
000057

3) Set the centre frequency of the network analyzer to the carrier centre frequency of the tested signal for EIRP measurement of the EUT and measure $LF_{EIRP, E\rightarrow D}$, which is equivalent to 20log|S21| (dB) obtained by the network analyzer:
$LF_{EIRP, E\rightarrow D}$: Pathloss between E and D in figure 1.
4) Measure the cable loss, $LF_{EIRP, E\rightarrow F}$ between the reference antenna connector and the network analyzer connector:
$LF_{EIRP, E\rightarrow F}$: Cable loss between E and F in figure 1.
5) Calculate the calibration value between A and D with the following formula:
$L_{EIRP\_cal, A\rightarrow D} = LF_{EIRP, E\rightarrow D} + G_{REF\_ANT\_EIRP, A\rightarrow F} - LF_{EIRP, E\rightarrow F}$.
$L_{EIRP\_cal, A\rightarrow D}$: Calibration value between A and D in figure 1. Was implemented in the spectrum analyzer as a transducer.
$G_{REF\_ANT\_EIRP, A\rightarrow F}$: Antenna gain of the reference antenna.

Stage 2 - Measurement:
6) Uninstall the reference antenna and install the EUT with the manufacturer declared coordinate system reference point in the same place as the phase centre of the reference antenna. The manufacturer declared coordinate system orientation of the EUT is set to be aligned with the testing system.
7) Measure the mean power, $P_{R\_EUT\_EIRP, D}$, D in figure 1.
8) Calculate the EIRP with the following formula:

$$EIRP = P_{R\_EUT\_EIRP, D} + L_{EIRP\_cal, A\rightarrow D}$$

The measurement procedure was as the following:

1. An EIRP pre-scan with the measurement antenna in horizontal and vertical polarization is performed with RMS detector and Max Hold on the spectrum analyzer. The turn table was slowly rotating form 0-360 degrees.

2. EIRP spurious radiation on frequencies closer than 10 dB to the TRP limit in the pre-scan a manual search for maximum response was done.

3. If the recorded EIRP value was above the TRP limit, a TRP measurement was done according to KDB 842590 D01 chapter 4.4. Overview of the methods.

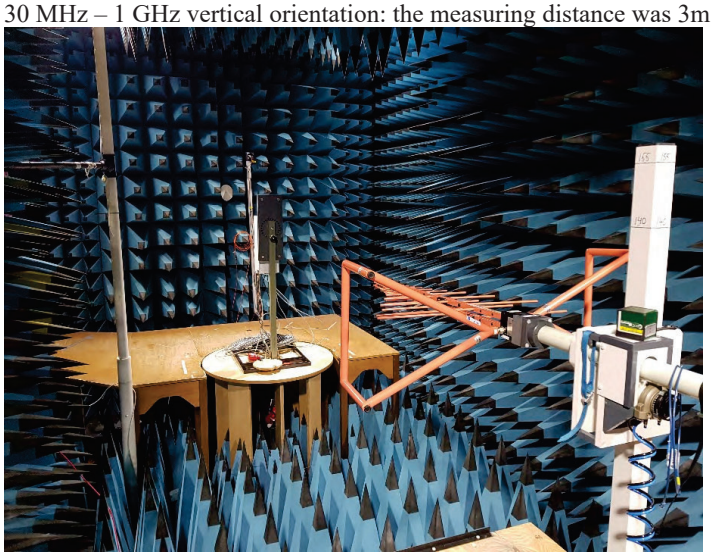
    a. Two Cut method according to KDB 842590 D01 chapter 4.4.2.2
        i. EUT set in vertical orientation
        ii. EIRP measurement samples with horizontal and vertical polarization of the measurement antenna. Angular step size based on frequency and dimension of the EUT
        iii. EUT set in horizontal orientation
        iv. EIRP measurement samples with horizontal and vertical polarization of the measurement antenna. Angular step size based on frequency and dimension of the EUT.
        v. TRP = EIRP measurement samples averaged+ΔTRP.
        (ΔTRP = Margin factor based on grid selection).

EX-1019
Ericsson Inc. and Verizon Wireless v. Procomm International PTE Ltd.
000058

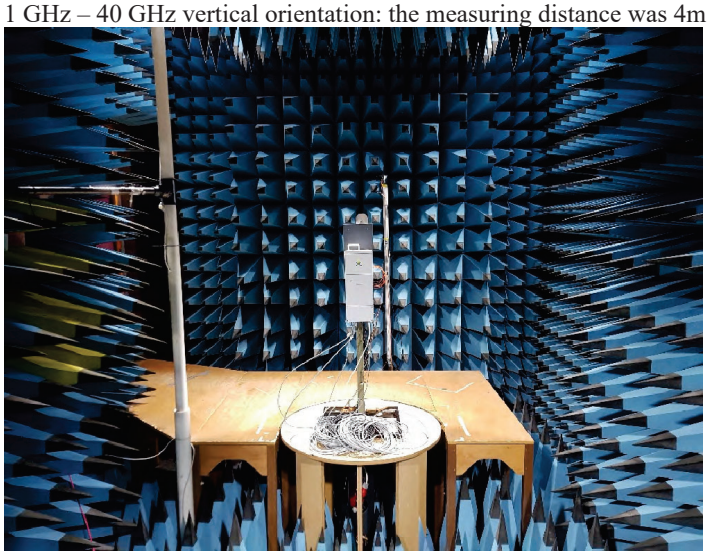
b. Two Cut method when pattern multiplication is applicable and used according to KDB 842590 D01 chapter 4.4.2.3
   i. EUT set in vertical orientation
   ii. EIRP measurement samples with horizontal and vertical polarization of the measurement antenna. Angular step size based on frequency and dimension of the EUT
   iii. EUT set in horizontal orientation
   iv. EIRP measurement samples with horizontal and vertical polarization of the measurement antenna. Angular step size based on frequency and dimension of the EUT.
   v. TRP is calculated using the formula in Appendix E of KDB 842590 D01
c. EIRP to Conducted Power Conversion in Band Edge Using Antenna Gain according to KDB 842590 D01 chapter 4.4.2.5
   i. Convert each radiated measurement to conducted power/BW using the equations:
      Conducted Power level (dBm) at any frequency/BW = Measured EIRP level (dBm)/BW – EUT antenna Gain (dBi)
   ii. Sum the radiated power Horizontal and Vertical polarisations for total conducted power level/BW.
   iii. Evaluate the pass/fail decision by comparing total conducted power level/BW against the applicable TRP limit.

The test set-up during the spurious radiation measurements is shown in the pictures below:

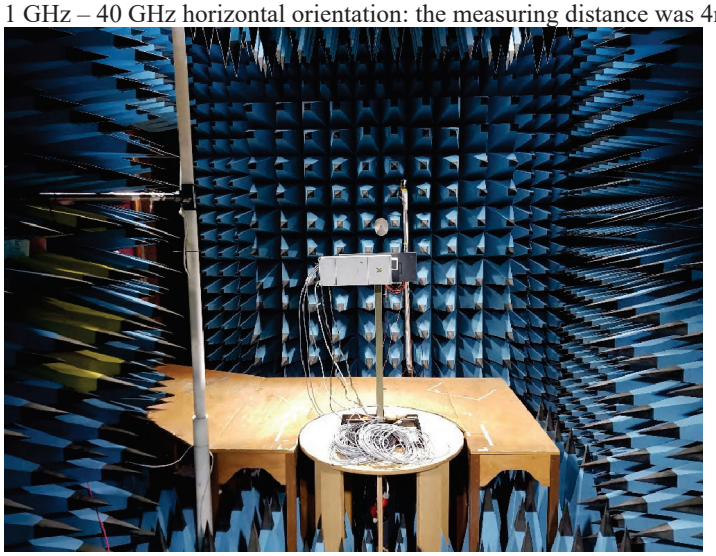
30 MHz – 1 GHz vertical orientation: the measuring distance was 3m



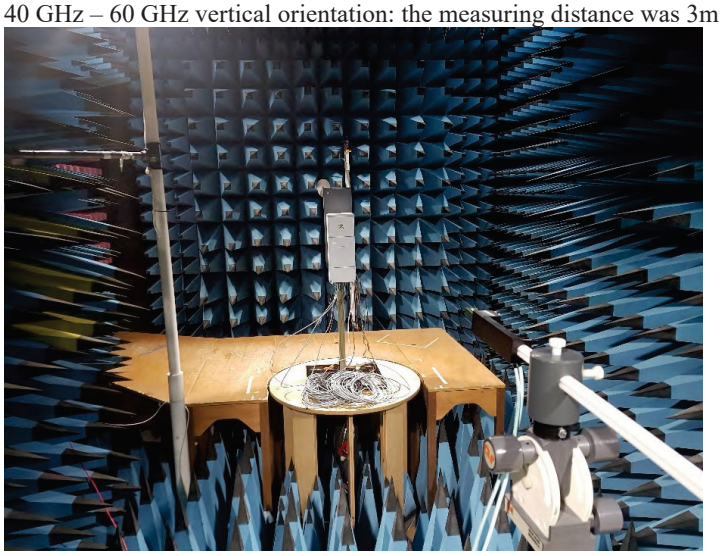
1 GHz – 40 GHz vertical orientation: the measuring distance was 4m



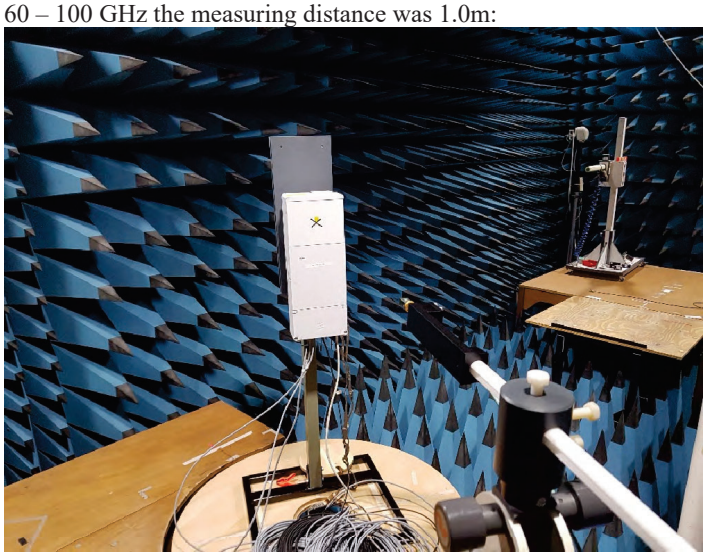
1 GHz – 40 GHz horizontal orientation: the measuring distance was 4m



40 GHz – 60 GHz vertical orientation: the measuring distance was 3m



60 – 100 GHz the measuring distance was 1.0m:



EX-1019
Ericsson Inc. and Verizon Wireless v. Procomm International PTE Ltd.
000062

Rise Measurement equipment

Measurement equipment	RISE number
Anechoic chamber, Hertz	BX50194
R&S FSW 43	902 073
R&S ESU 26	901 553
R&S ZNB 40	BX50051
EMCO Horn Antenna 3116	503 279
Bilog antenna Schaffner 6143	504 079
Flann STD Gain Horn Antenna 20240-20	BX92412
Flann STD Gain Horn Antenna 22240-20	BX92413
Flann STD Gain Horn Antenna 24240-20	BX92414
Flann STD Gain Horn Antenna 26240-20	BX92415
Flann STD Gain Horn Antenna 27240-20	BX92416
Mixer FS-Z60	BX90566
Mixer FS-Z90	BX90567
Mixer FS-Z110	BX81425
Miteq, Low Noise Amplifier	503 278
EMCO Horn Antenna 3115	502 175
EMCO Horn Antenna 3115	501 548
µComp Nordic, Low Noise Amplifier	901 544
RF Cable	BX81423
RF Cable	503 681
RF Cable FSW-B21	BX62069
RF Cable FSW-B21	BX62073
Temperature and humidity meter, Testo 615	503 498

EAB Measurement equipment

Calibrated at RISE before testing

	S/N
SWH010 HPF 30-40 GHz	ST010619225
SSL036 LPF 26,5 GHz	ST012717003

Results

The diagrams represents worst case configurations for each frequency range.

Diagram	Symbolic name	Pol	Frequency range	Measurement method	"Early exit?"
15a	BL_{100}	Hor	30-1000 MHz	Pre scan EIRP	Yes
15b	BL_{100}	Ver	30-1000 MHz	Pre scan EIRP	Yes
16a	BL_{100}	Hor	1-18 GHz	Pre scan EIRP	Yes
16b	BL_{100}	Ver	1-18 GHz	Pre scan EIRP	Yes
17a	BL_{100}	Hor	18-26.5 GHz	Pre scan EIRP	No
17b	BL_{100}	Ver	18-26.5 GHz	Pre scan EIRP	No
17c	BL_{100}	Hor/Ver	25.47-25.57 GHz	Two cut TRP	Compliant to TRP limit
18a	BL_{100}	Hor	26.5-30 GHz	Pre scan EIRP	No
18b	BL_{100}	Ver	26.5-30 GHz	Pre scan EIRP	No
18c	BL_{100}	Hor	27-27.51 GHz	Pre scan EIRP	No*
18d	BL_{100}	Ver	27-27.51 GHz	Pre scan EIRP	No*
18e	BL_{100}	Hor/Ver	27.3-27.5 GHz	Pattern multiplication TRP	Compliant to TRP limit
19a	$BL3_{100}$	Hor	27-27.51 GHz	Pre scan EIRP	No*
19b	$BL3_{100}$	Ver	27-27.51 GHz	Pre scan EIRP	No*
19c	$BL3_{100}$	Hor/Ver	27.3-27.5 GHz	Pattern multiplication TRP	Compliant to TRP limit
20a	TL_{100}	Hor	27.625-28.225 GHz	Pre scan EIRP	Yes*
20b	TL_{100}	Ver	27.625-28.225 GHz	Pre scan EIRP	Yes*
21a	BH_{100}	Hor	27.625-28.225 GHz	Pre scan EIRP	Yes*
21b	BH_{100}	Ver	27.625-28.225 GHz	Pre scan EIRP	Yes*
22a	TH_{100}	Hor	26.5-30 GHz	Pre scan EIRP	No
22b	TH_{100}	Ver	26.5-30 GHz	Pre scan EIRP	No
22c	TH_{100}	Hor	28.34-28.85 GHz	Pre scan EIRP	No*
22d	TH_{100}	Ver	28.34-28.85 GHz	Pre scan EIRP	No*
22e	TH_{100}	Hor/Ver	28.35-28.55 GHz	Pattern multiplication TRP	Compliant to TRP limit
23a	$TH3_{100}$	Hor	28.34-28.85 GHz	Pre scan EIRP	No*
23b	$TH3_{100}$	Ver	28.34-28.85 GHz	Pre scan EIRP	No*
23c	$TH3_{100}$	Hor/Ver	28.35-28.85 GHz	Pattern multiplication TRP	Compliant to TRP limit
24a	BL_{100}	Hor	30-40 GHz	Pre scan EIRP	No
24b	BL_{100}	Ver	30-40 GHz	Pre scan EIRP	No
25c	BL_{100}	Hor/Ver	30.57-30.67 GHz	Two cut TRP	Compliant to TRP limit
26a	BL_{100}	Hor	40-60 GHz	Pre scan EIRP	Yes
26b	BL_{100}	Ver	40-60 GHz	Pre scan EIRP	Yes
27a	BL_{100}	Hor	60-80 GHz	Pre scan EIRP	Yes
27b	BL_{100}	Ver	60-80 GHz	Pre scan EIRP	Yes
28a	BL_{100}	Hor	80-100 GHz	Pre scan EIRP	Yes
28b	BL_{100}	Ver	80-100 GHz	Pre scan EIRP	Yes

* Conducted power calculated using antenna gain.

Measurement uncertainty: 30 – 1000 MHz 3.1 dB
1 – 18 GHz, 3.0 dB
18 – 40 GHz, 3.1 dB
40 – 60 GHz, 2.27 dB
60 – 75 GHz, 2.70 dB
75 – 100 GHz, 4.24 dB

Limits

CFR 47 §30.203 Emission limits.

(a) The conductive power or the total radiated power of any emission outside a licensee's frequency block shall be −13 dBm/MHz or lower. However, in the bands immediately outside and adjacent to the licensee's frequency block, having a bandwidth equal to 10 percent of the channel bandwidth, the conductive power or the total radiated power of any emission shall be −5 dBm/MHz or lower.

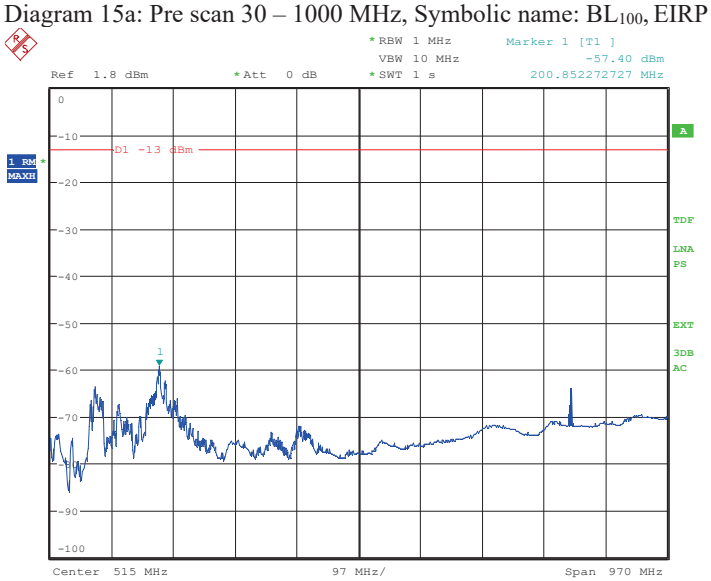
(b)(1) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater.

(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges as the design permits.

(3) The measurements of emission power can be expressed in peak or average values.

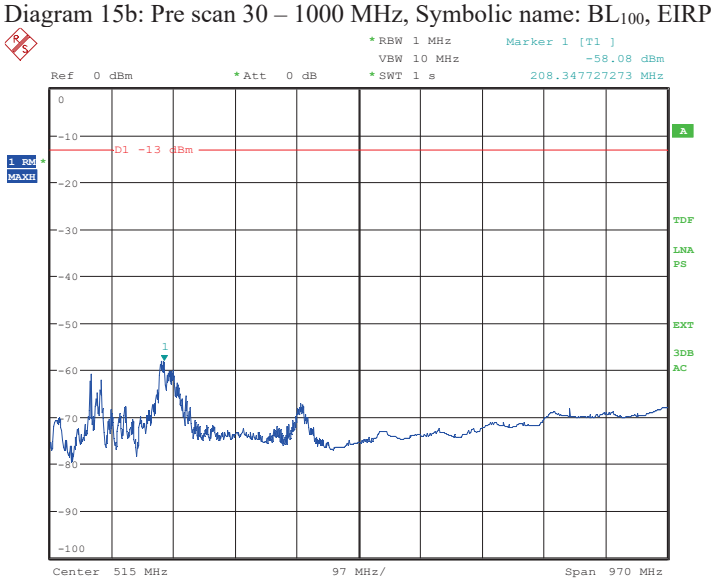
Complies?	Yes

Diagram 15a: Pre scan 30 – 1000 MHz, Symbolic name: BL_{100}, EIRP Horizontal polarization



Date: 2.OCT.2019 16:19:52

Diagram 15b: Pre scan 30 – 1000 MHz, Symbolic name: BL_{100}, EIRP Vertical polarization



Date: 2.OCT.2019 16:15:43

Diagram 16a: Pre scan 1 – 18 GHz, Symbolic name: BL_{100}, EIRP Horizontal polarization

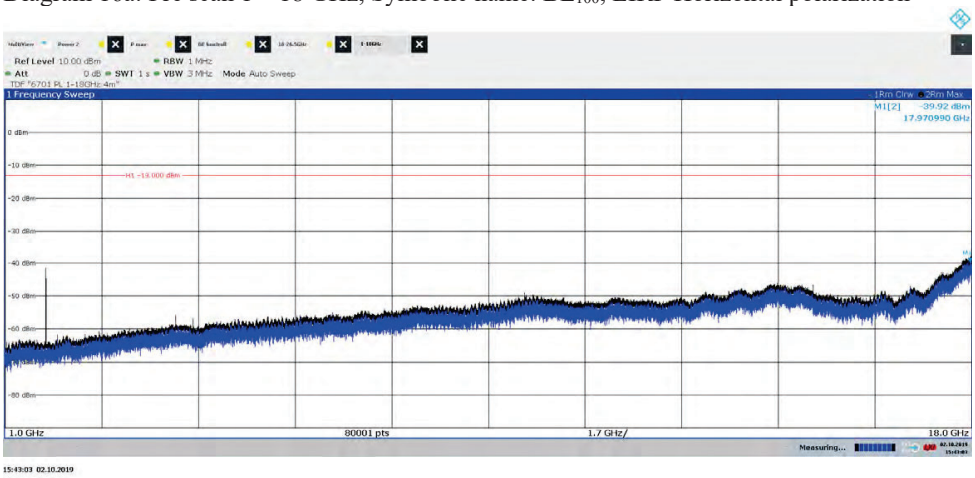


Diagram 16b: Pre scan 1 – 18 GHz, Symbolic name: BL_{100}, EIRP Vertical polarization

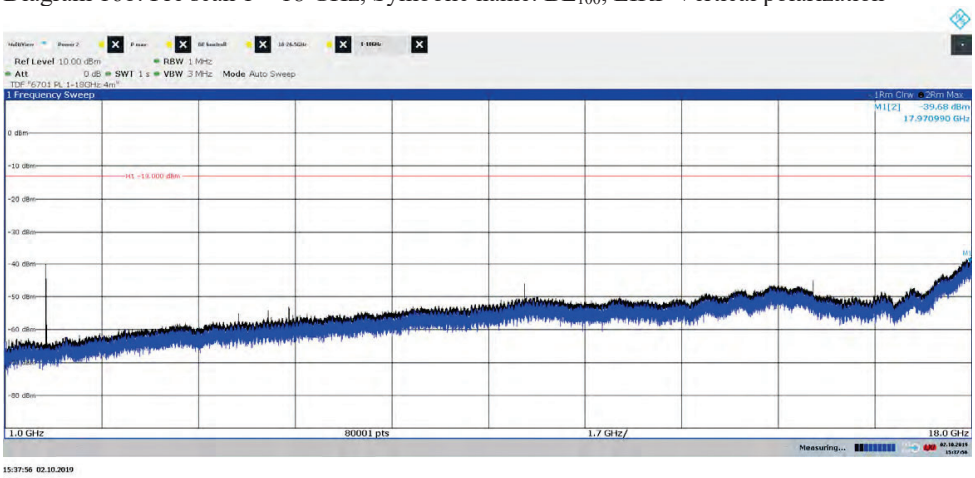


Diagram 17a: Pre scan 18 – 26.5 GHz, Symbolic name: BL_{100}, EIRP Horizontal polarization
See diagram 17c for TRP result

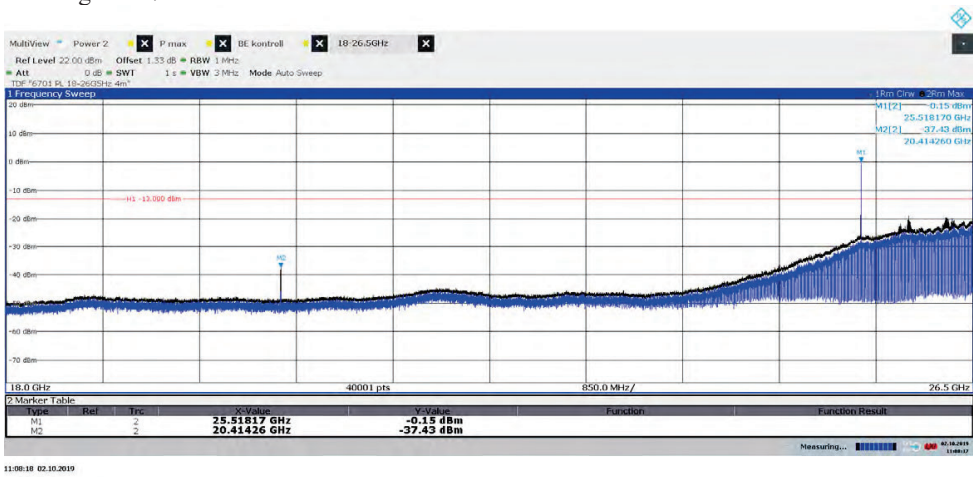


Diagram 17b: Pre scan 18 – 26.5 GHz, Symbolic name: BL_{100}, EIRP Vertical polarization
See diagram 17c for TRP result

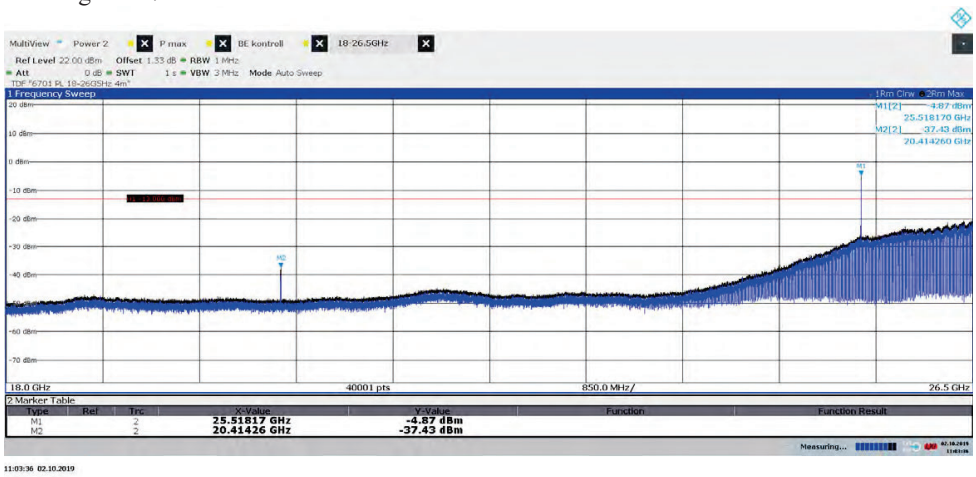


Diagram 17c: Two cut TRP 25.47 – 25.57 GHz 5x LO, Symbolic name: BL_{100}

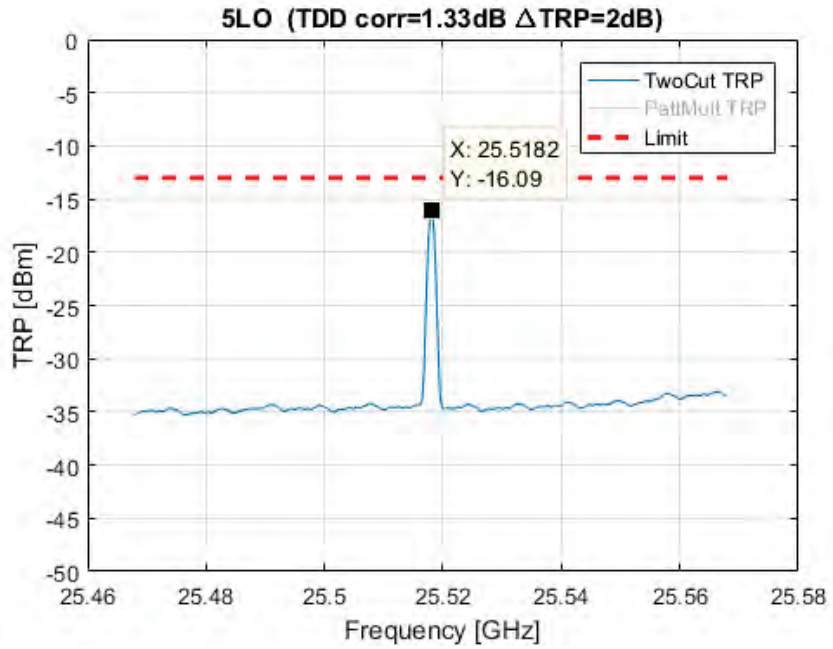


Diagram 18a: Pre scan 26.5 – 30.0 GHz, Symbolic name: BL_{100}, EIRP Horizontal polarization
See diagram 18e for TRP result

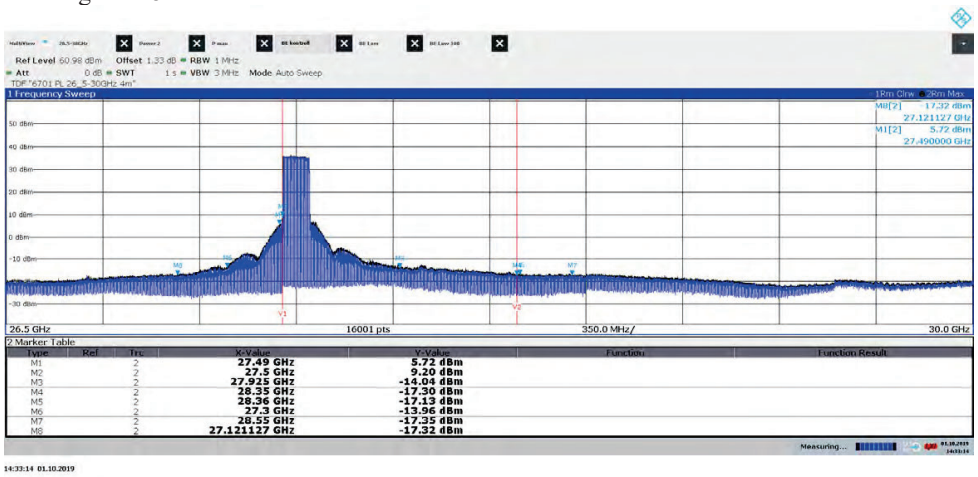


Diagram 18b: Pre scan 26.5 – 30.0 GHz, Symbolic name: BL_{100}, EIRP Vertical polarization
See diagram 18e for TRP result

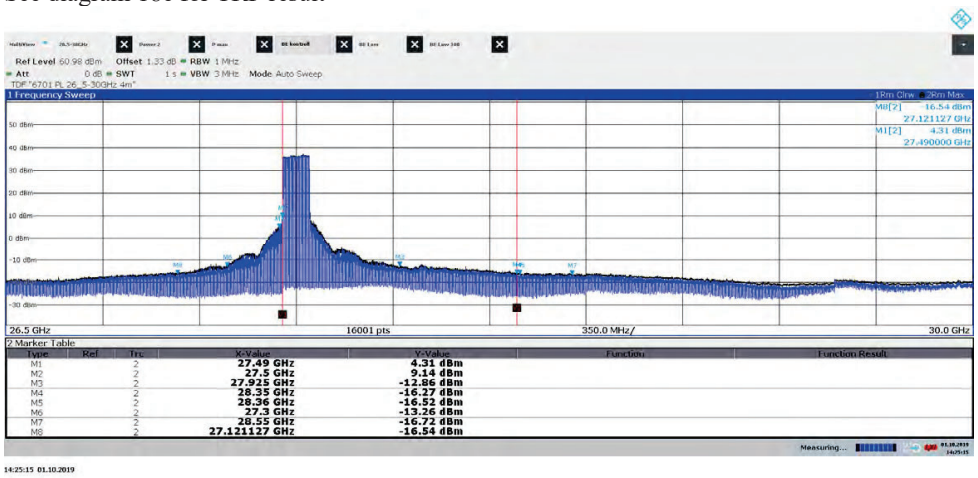


Diagram 18c: Pre scan 27.00 – 27.51 GHz, Symbolic name: BL_{100}, EIRP Horizontal polarization
See diagram 18e for TRP result

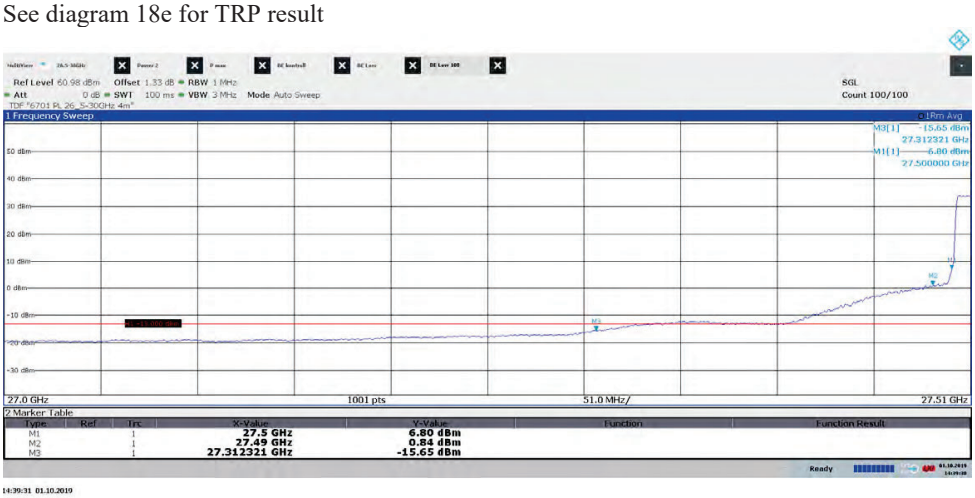


Diagram 18d: Pre scan 27.00 – 27.51 GHz, Symbolic name: BL_{100}, EIRP Vertical polarization
See diagram 18e for TRP result

Power EIRP for 27.5GHz Hor/ Ver [dBm]	Power EIRP for 27.49 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 27.5 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 27.49 GHz (Limit -13 dBm) [dBm]/ Verdict
6.80/ 6.76	0.84/ 0.67	28.17/ 28.30	-18.44/ Pass	-24.47/ Pass

EX-1019
Ericsson Inc. and Verizon Wireless v. Procomm International PTE Ltd.
000071

Diagram 18e: Pattern multiplication TRP 27.3 – 27.5 GHz, Symbolic name: BL_{100}

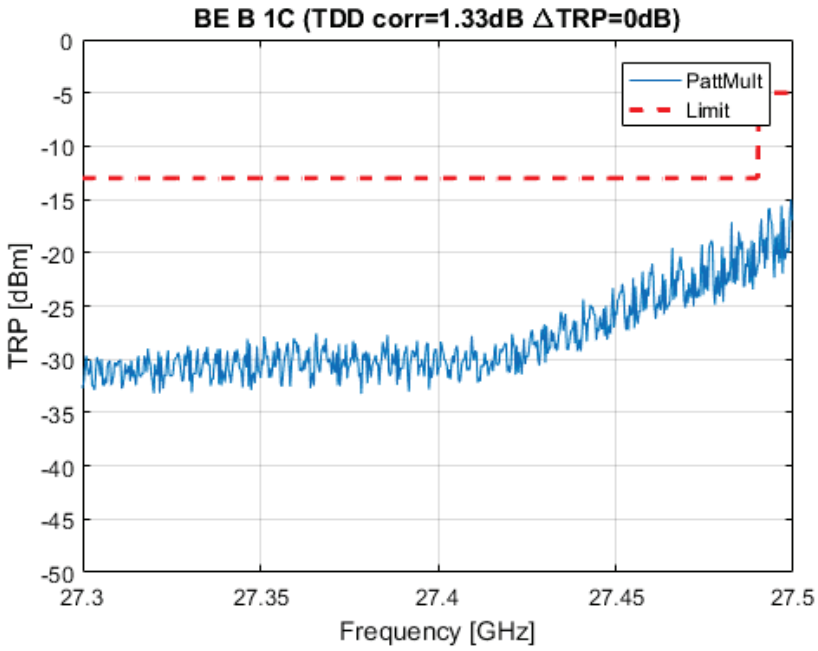


Diagram 19a: Pre scan 27 – 27.5 GHz, Symbolic name: $BL3_{100}$, EIRP Horizontal polarization
See diagram 19c for TRP result

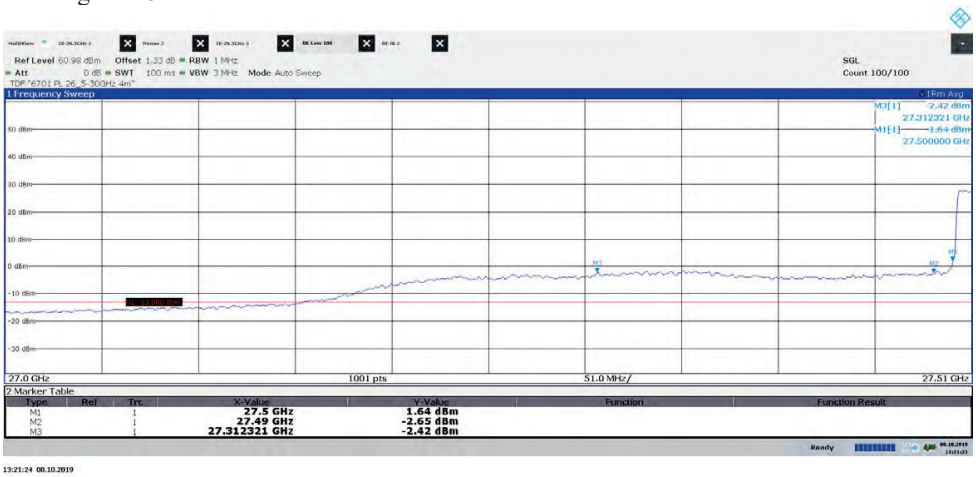


Diagram 19b: Pre scan 27 – 27.5 GHz, Symbolic name: $BL3_{100}$, EIRP Vertical polarization
See diagram 19c for TRP result

Power EIRP for 27.5 GHz Hor/ Ver [dBm]	Power EIRP for 27.49 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 27.5 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 27.49 GHz (Limit -13 dBm) [dBm]/ Verdict
1.64/ 1.98	-2.65/ -2.22	28.17/ 28.3	-23.41/ Pass	-27.66/ Pass

Diagram 19c: Pattern multiplication TRP 27.0 – 27.5 GHz, Symbolic name: $BL3_{100}$

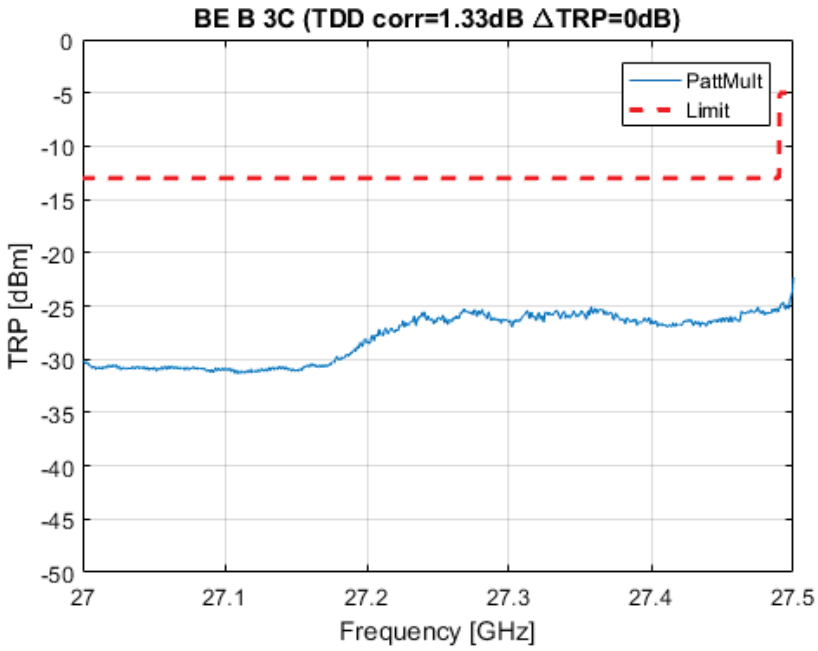


Diagram 20a: Pre scan 27.625 – 28.225 GHz, Symbolic name: TL_{100}, EIRP Horizontal polarization

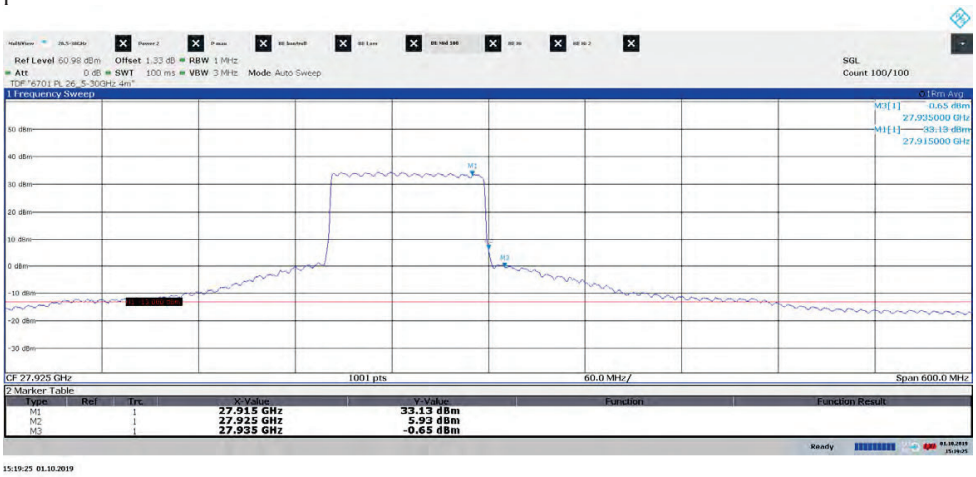
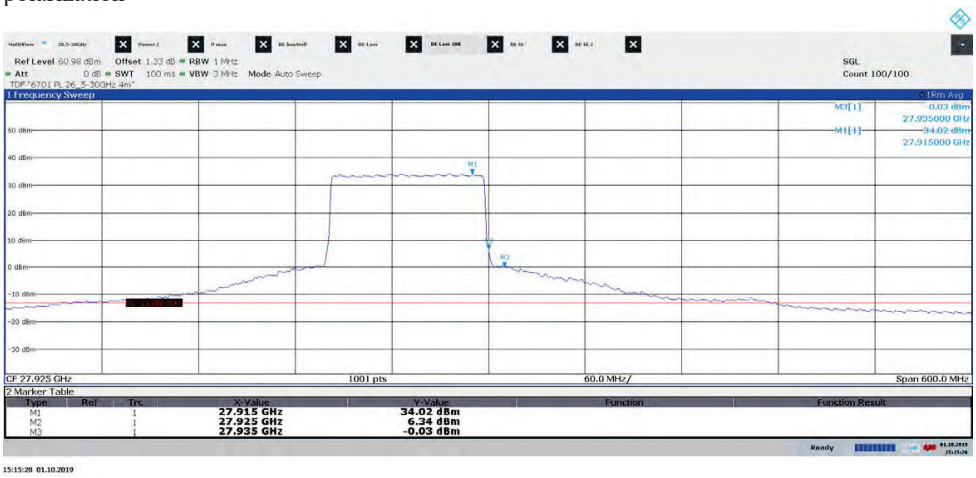


Diagram 20b: Pre scan 27.625 – 28.225 GHz, Symbolic name: TL_{100}, EIRP Vertical polarization



Power EIRP for 27.925 GHz Hor/ Ver [dBm]	Power EIRP for 27.935 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 27.925 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 27.935 GHz (Limit -13 dBm) [dBm]/ Verdict
5.93/ 6.34	-0.65/ -0.03	28.9/ 29	-19.80/ Pass	-26.27/ Pass

Diagram 21a: Pre scan 27.625 – 28.225 GHz, Symbolic name: BH_{100}, EIRP Horizontal polarization

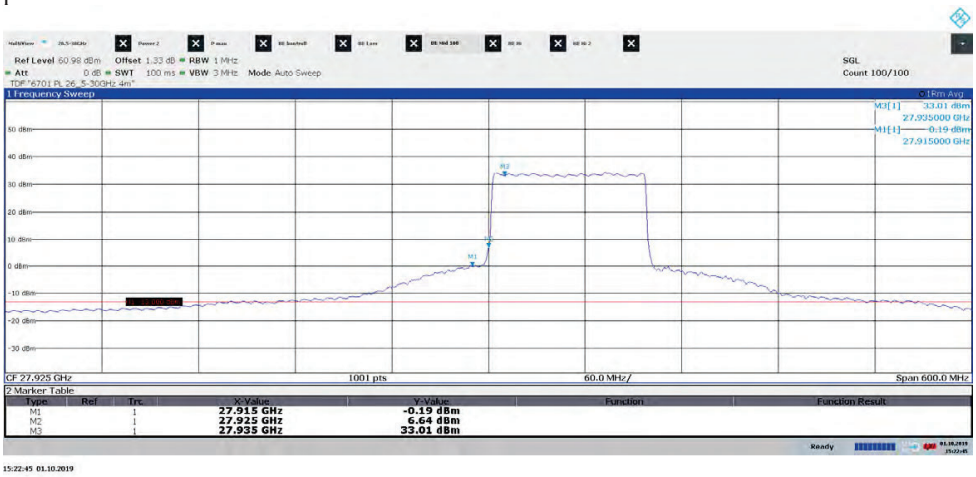


Diagram 21b: Pre scan 27.625 – 28.225 GHz, Symbolic name: BH_{100}, EIRP Vertical polarization

Power EIRP for 27.925 GHz Hor/ Ver [dBm]	Power EIRP for 27.915 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 27.925 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 27.915 GHz (Limit -13 dBm) [dBm]/ Verdict
6.64/ 6.39	-0.19/ -0.54	28.9/ 29	-19.42/ Pass	-26.30/ Pass

Diagram 22a: Pre scan 26.5 – 30.0 GHz, Symbolic name: TH_{100}, EIRP Horizontal polarization
See diagram 22e for TRP result

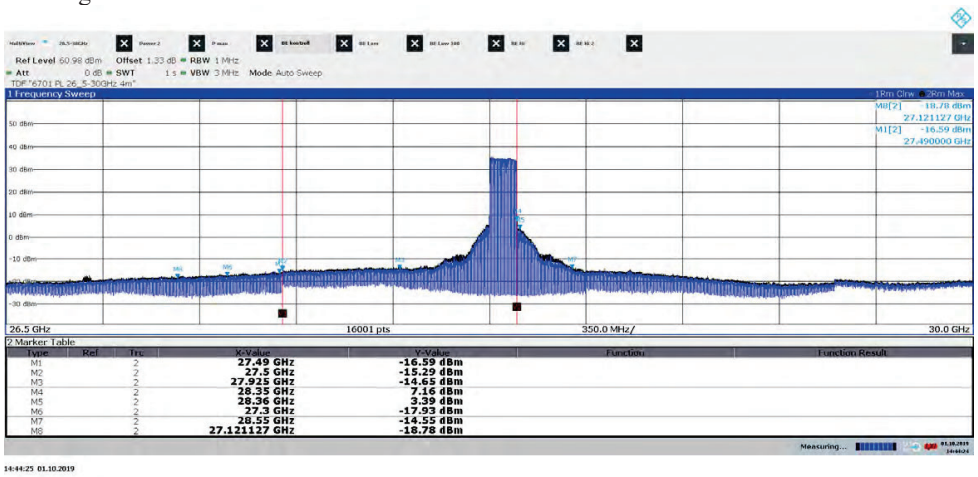


Diagram 22b: Pre scan 26.5 – 30.0 GHz, Symbolic name: TH_{100}, EIRP Vertical polarization
See diagram 22e for TRP result

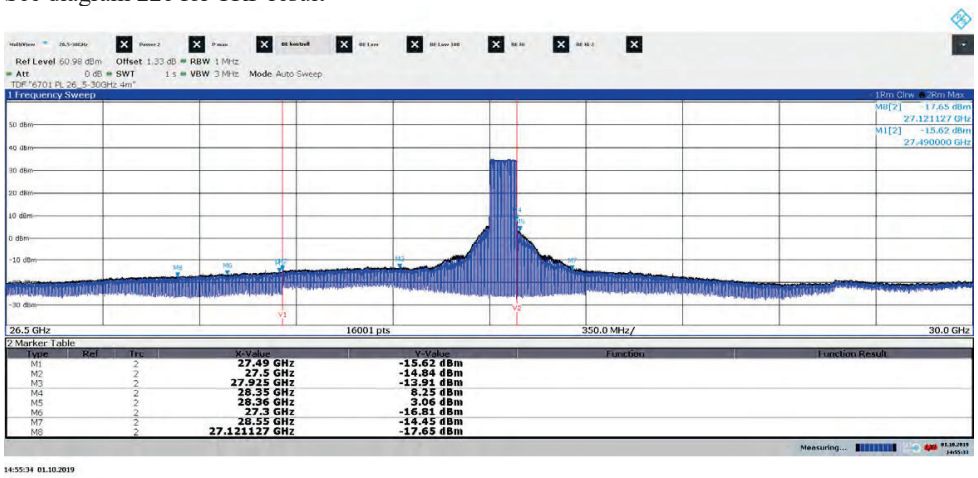


Diagram 22c: Pre scan 28.34 – 28.85 GHz, Symbolic name: TH_{100}, EIRP Horizontal polarization
See diagram 22e for TRP result

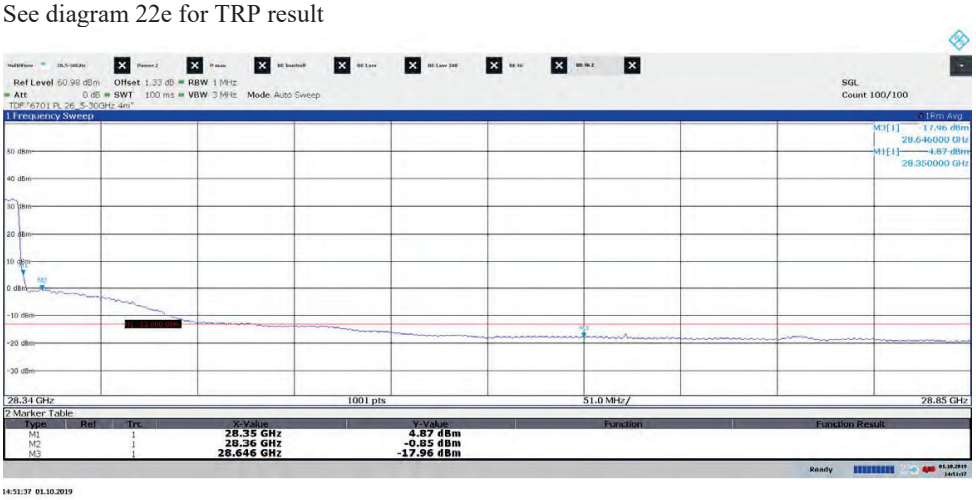


Diagram 22d: Pre scan 28.34 – 28.85 GHz, Symbolic name: TH_{100}, EIRP Vertical polarization
See diagram 22e for TRP result

Power EIRP for 28.35 GHz Hor/ Ver [dBm]	Power EIRP for 28.36 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 28.35 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 28.36 GHz (Limit -13 dBm) [dBm]/ Verdict
4.87/ 5.01	-0.85/ -1.77	28.91/ 29.11	-21.06/ Pass	-27.26/ Pass

Diagram 22e: Pattern multiplication TRP 28.35 – 28.55 GHz, Symbolic name: TH_{100}

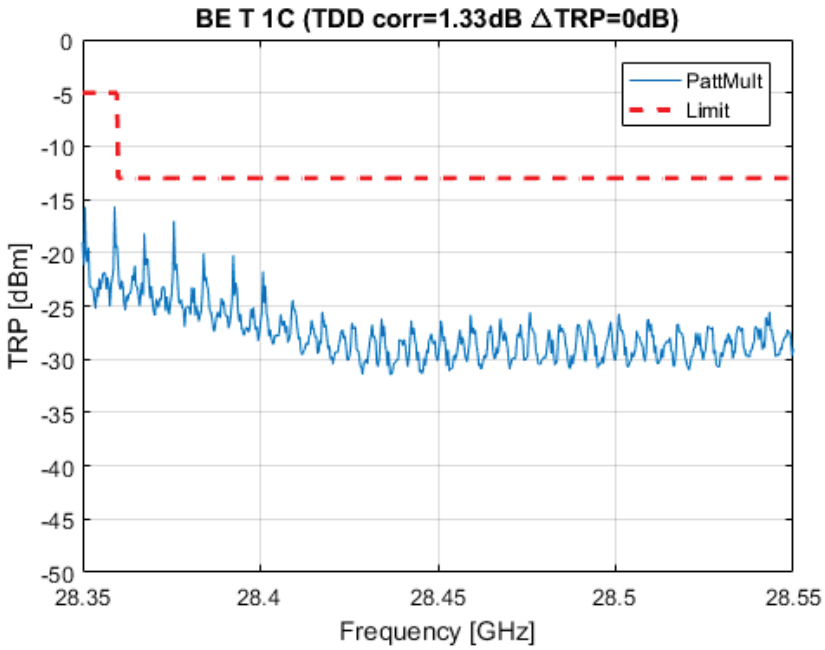


Diagram 23a: Pre scan 28.34 – 28.85 GHz, Symbolic name: $TH3_{100}$, EIRP Horizontal polarization
See diagram 23c for TRP result

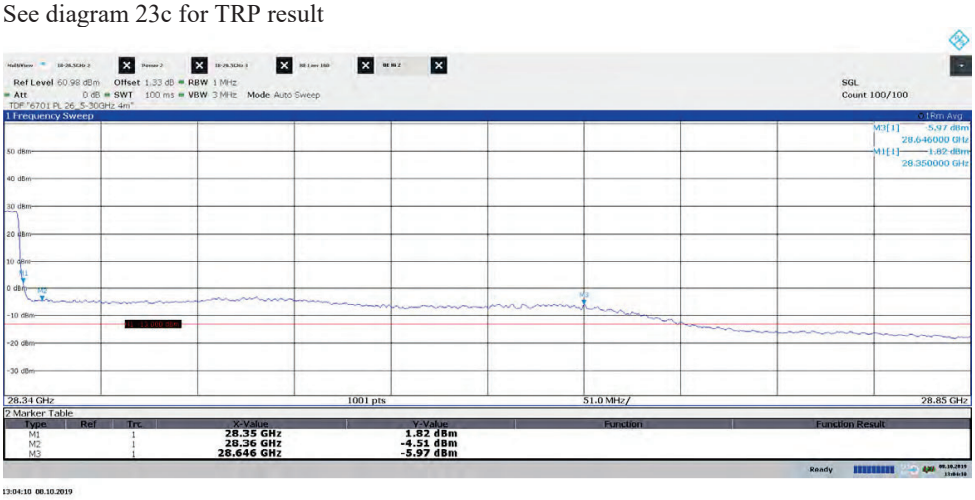


Diagram 23b: Pre scan 28.34 – 28.85 GHz, Symbolic name: $TH3_{100}$, EIRP Vertical polarization
See diagram 23c for TRP result

Power EIRP for 28.35 GHz Hor/ Ver [dBm]	Power EIRP for 28.36 GHz Hor/ Ver [dBm]	Antenna Gain Hor/ Ver [dBi]	Total conducted power/BW for 28.35 GHz (Limit -5 dBm) [dBm]/ Verdict	Total conducted power/BW for 28.36 GHz (Limit -13 dBm) [dBm]/ Verdict
1.82/ 1.24	-4.51/ -3.17	28.91/ 29.11	-24.45/ Pass	-29.80/ Pass

Diagram 23c: Pattern multiplication TRP 28.35 – 28.85 GHz, Symbolic name: $TH3_{100}$

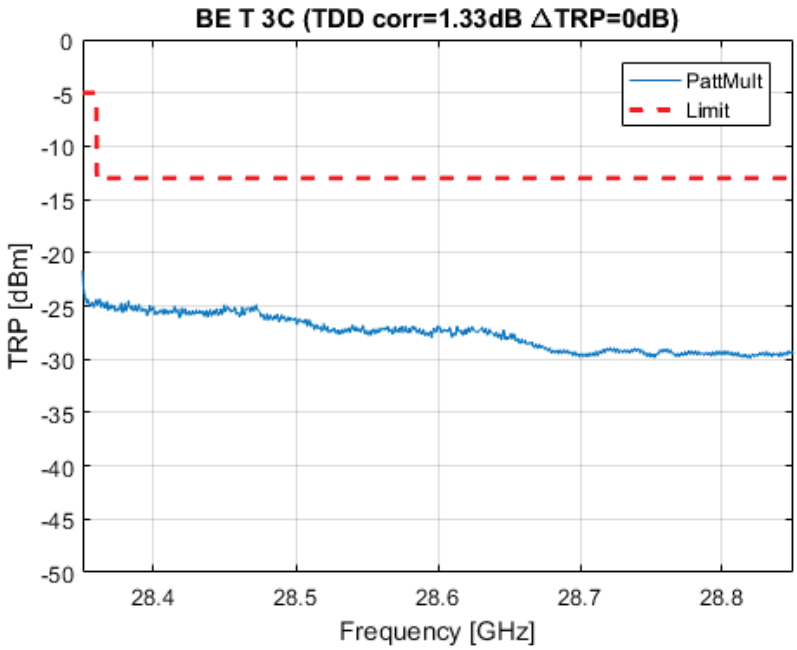


Diagram 24a: Pre scan 30 – 40 GHz, Symbolic name: BL_{100}, EIRP Horizontal polarization
See diagram 24c for TRP result

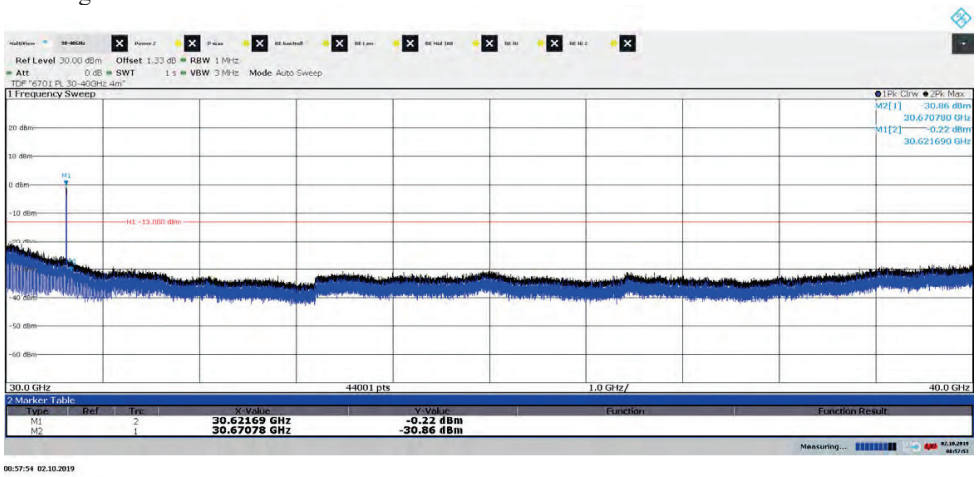


Diagram 24b: Pre scan 30 – 40 GHz, Symbolic name: BL_{100}, EIRP Vertical polarization
See diagram 10c for TRP result

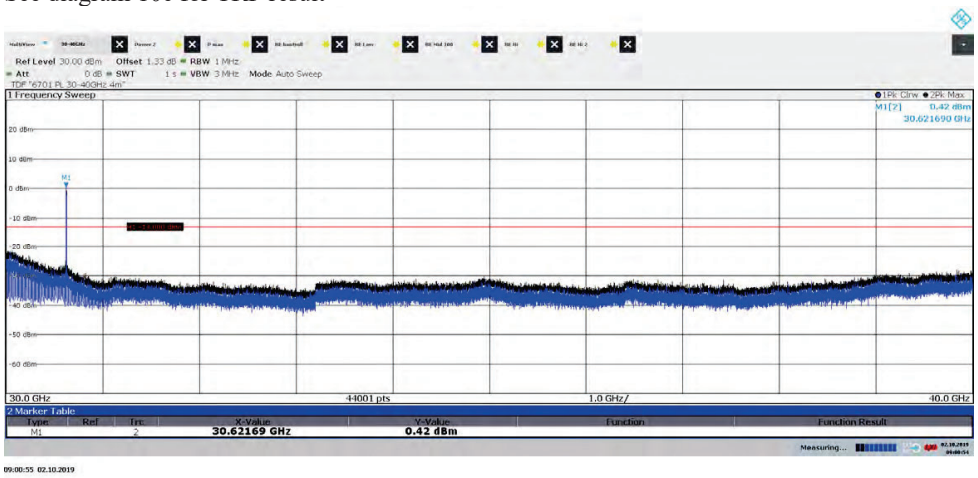


Diagram 24c: Two cut TRP 30.57 – 30.67 GHz 6x LO, Symbolic name: BL_{100}

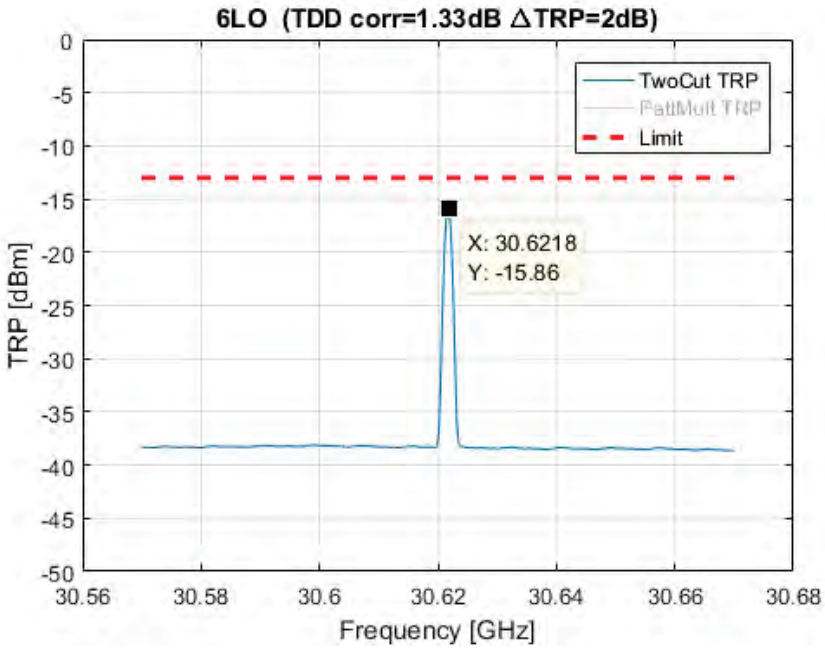


Diagram 25a: Pre scan 40 – 60 GHz, Symbolic name: BL_{100}, EIRP Horizontal polarization

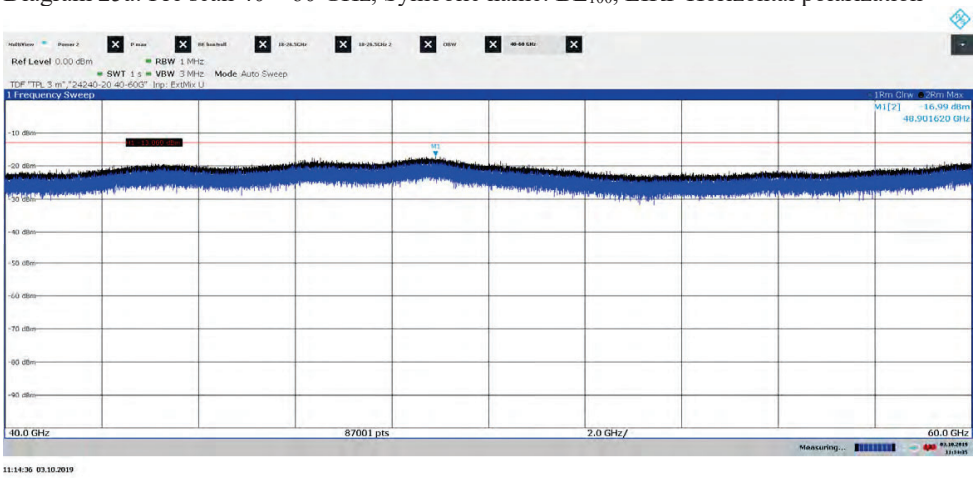


Diagram 25b: Pre scan 40 – 60 GHz, Symbolic name: BL_{100}, EIRP Vertical polarization

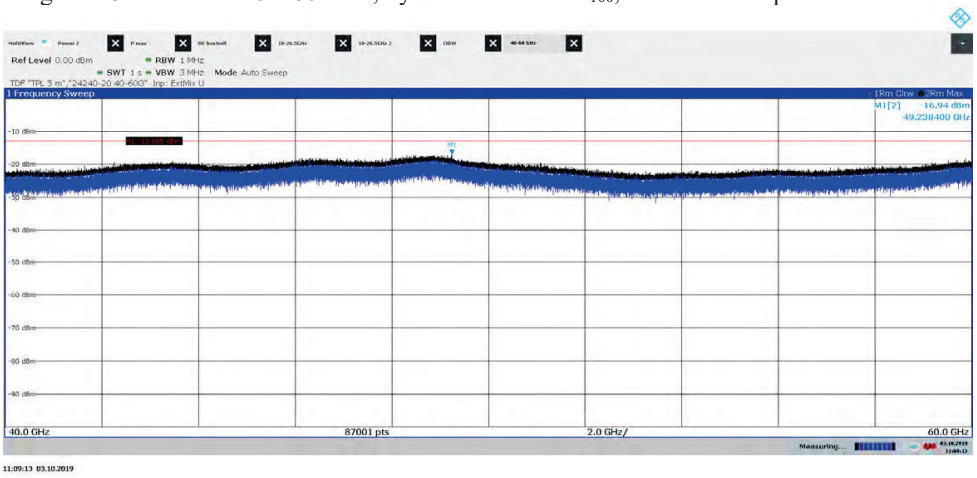


Diagram 26a: Pre scan 60 – 80 GHz, Symbolic name: BL_{100}, EIRP Horizontal polarization

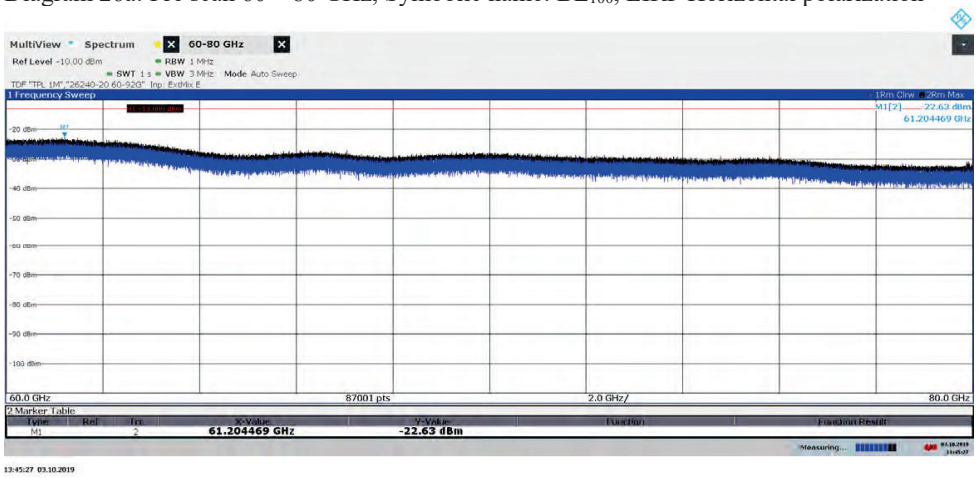


Diagram 27b: Pre scan 60 – 80 GHz, Symbolic name: BL_{100}, EIRP Vertical polarization

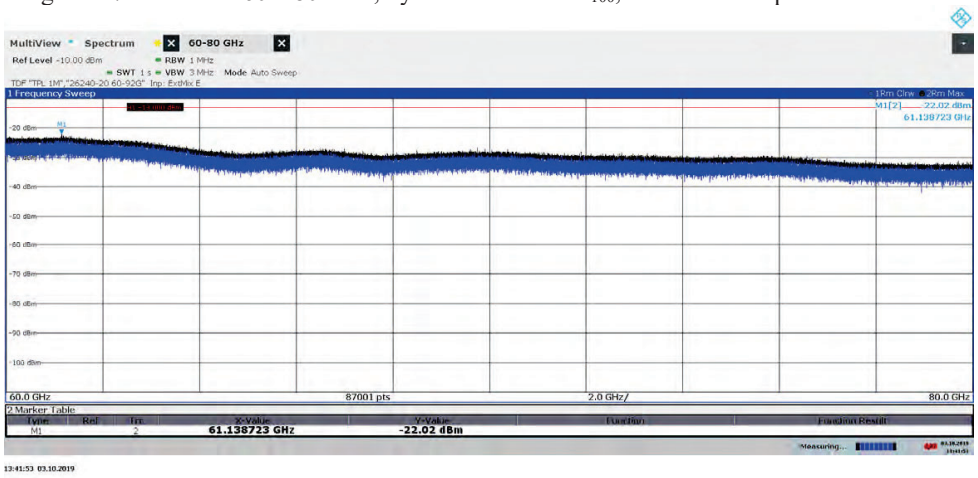


Diagram 28a: Pre scan 80 – 100 GHz, Symbolic name: BL_{100}, EIRP Horizontal polarization

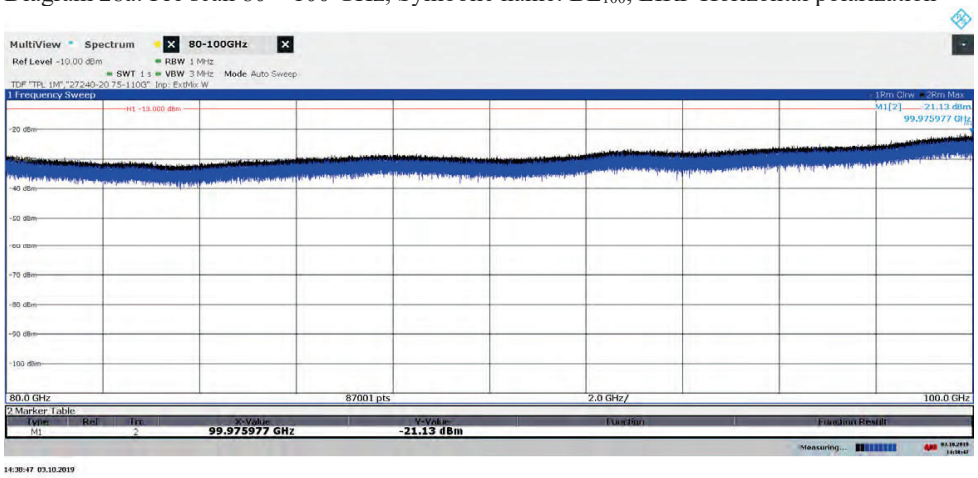
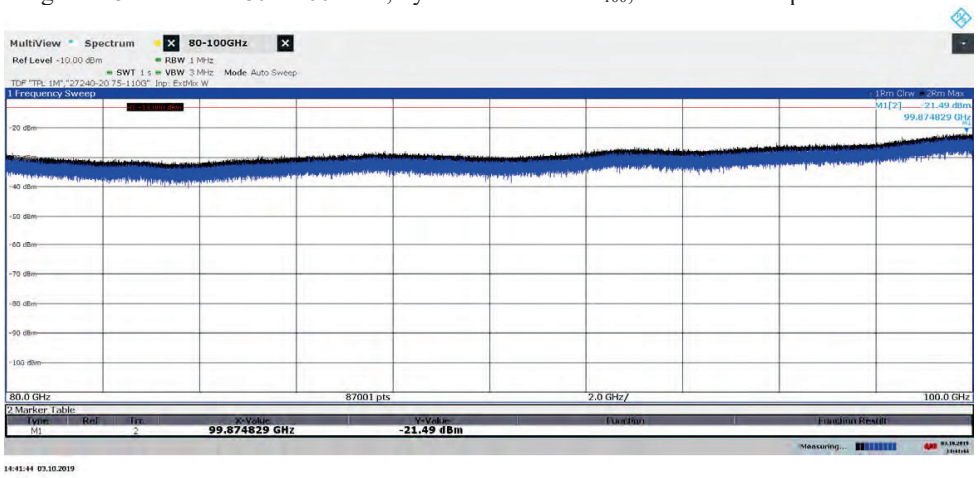


Diagram 28b: Pre scan 80 – 100 GHz, Symbolic name: BL_{100}, EIRP Vertical polarization



Frequency stability measurements according to 47 CFR §2.1055

Date	Temperature (test equipment)	Humidity (test equipment)
2022-07-11	23 °C ± 3 °C	46 % ± 5 %
2022-07-12	22 °C ± 3 °C	49 % ± 5 %
2022-07-13	23 °C ± 3 °C	48 % ± 5 %

Test set-up and procedure

The measurements were made per definition in ANSI C63.26, 5.6.

A temperature chamber with a RF transparent door was used and a measurement antenna was aligned outside the temperature chamber. The option NR 5G downlink measurements K144 in the spectrum analyser was used to demodulate the signal and report the frequency error.

Measurement equipment	RISE number
R&S FSW 43	902 073
RF Cable	BX50236
EMCO Horn Antenna 3116	503 279
Temperature Chamber	503 360
Testo 635, temperature and humidity meter	504 203
Multimeter Fluke 87	502 190

Results

Nominal transmitter frequency was 27550.08 MHz (BL_{100}) with a bandwidth of 100 MHz.

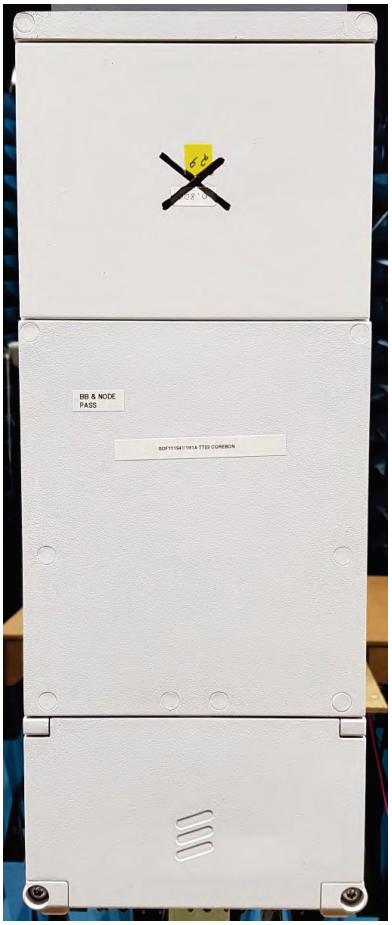
Test conditions		Frequency error (Hz)
Supply voltage AC (V)	Temp. (°C)	
102	+20	+80
138	+20	+78
120	+20	+89
120	+30	-77
120	+40	+68
120	+50	-59
120	+10	+88
120	0	+55
120	-10	-66
120	-20	-77
120	-30	+46
Maximum freq. error (Hz)		89
Measurement uncertainty		$< \pm 1 \times 10^{-7}$

Remark

The frequency stability performance is sufficient to ensure that the fundamental emission stays within the authorized frequency band.

Photos of test object

Front side



Rear side

Test object label KRK 101 01/1:

EX-1019
Ericsson Inc. and Verizon Wireless v. Procomm International PTE Ltd.
000089

Bottom side:

Top side

Left side

Right side

EXHIBIT 41

FCC ID: TA8AKRK10101

SM 6701 B261, KRK 101 01/1, R1C

Front side

Rear side

Test object label KRK 101 01/1:

Exhibit 3 External photos Date 2019-10-10 Page 2(2)

FCC ID: TA8AKRK10101

Bottom side:

Top side

Left side

Right side

EXHIBIT 42

ERICSSON

Prepared (also subject responsible if other)		No.		
ERAWALA				
Approved	Checked	Date	Rev	Reference
BNEPBAJD		2019-10-10	B	

Federal Communications Commission
Authorization & Evaluation Division
7435 Oakland Mills Road
Columbia, Maryland 21046
Attention: Equipment Authorization Branch

Subject: Certification for FCC ID: TA8AKRK10101

To Whom It May Concern:

Ericsson AB requests a Grant of Certification (Type Acceptance) for the above-mentioned FCC Identifier.

The Street Macro radio (SM 6701 B261) operates in the Upper Microwave Flexible Use Service (27.5 GHz – 28.35 GHz) as per 47 CFR Part 30.

This TDD radio uses NR Radio Access Technology for 5G (3GPP) and is designed for use in 5G cellular system.

The Radio is, through Advanced Antenna System technology (AAS), capable of beam forming/steering in azimuth/elevation. It supports 2 beams.

It supports channel bandwidth up to 100 MHz/carrier.
The radio unit supports intra band carrier aggregation, up to 400 MHz aggregated bandwidth.

The radio supports modulation types QPSK, 16QAM, and 64QAM.

The radio can be used in RBS system configured for 3GPP 2x2 MIMO/Spatial multiplexing and beam-forming technologies.

This radio will always require a license for transmission.

The Exhibit 8 user manuals submitted with this application is generic and may cover multiple products.

This application is only valid for the model specified in the Exhibit 12 circuit description.

Ericsson AB accept by this request the agreement set out in the document “IP SPCR 125 Annex A2 Agreements on Post-market surveillance for radio equipment certified for the US market.

Ericsson AB requests confidentiality under CFR 0.459 according to attached letter. We further certify that the applicant nor any party to the application is subject to a denial of Federal benefits, that includes FCC benefits, pursuant to section 5301 of the Anti-Drug abuse Act of 1988, 21 U.S.C. Section 862.

ERICSSON

Prepared (also subject responsible if other)		No.		
ERAWALA				
Approved	Checked	Date	Rev	Reference
BNEPBAJD		2019-10-10	B	

If additional information is needed, please contact me on the below listed number.

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