INELIGIBILITY CONTENTIONS: APPENDIX B

DEFENDANTS' INVALIDITY CONTENTIONS FOR U.S. PATENT NO. 9,483,722
APPENDIX B: SUBJECT-MATTER INELIGIBILITY[1]

As demonstrated in the claim charts below, claims 1–14 (the "Asserted Claims") of U.S. Patent No. 9,483,722 ("the '722 patent") are invalid under 35 U.S.C. § 101. Defendants provide these Subject-Matter Ineligibility Contentions in light of Defendants' current understanding of the Asserted Claims and Plaintiff's apparent construction of those claims, as reflected in their Infringement Contentions. Defendants' contentions may reflect alternative positions as to claim construction and scope, and do not represent any admissions or agreement by Defendants as to the construction, meaning, scope, definiteness, function, structure, written description support for, or enablement of any claim contained herein. Defendants' contentions herein are not, and should in no way be seen as, any admission that Defendants' accused technology meets any limitations of the claims. Defendants incorporate by reference Exhibits B1–B5 and Exhibit B, as if fully set forth herein.

Claims of the '722 patent, including the Asserted Claims, are not directed to patent-eligible subject matter because they are directed to one or more abstract ideas and fail to recite any additional features that transform the abstract idea(s) into an inventive concept.

[1] Because the'965and '053 patents have identical specifications and the claims of those patents are directed to the same abstract ideas with similar conventional components, Defendants incorporate the other appendices into this document, as if fully set forth herein.

U.S. Patent No. 9,483,722: Ineligibility Chart A[2]

Pursuant to Judge Gilstrap's Standing Order Regarding Subject Matter Eligibility Contentions, Samsung provides the following chart identifying each exception to eligibility (e.g., abstract idea, law of nature, and natural phenomenon) to which each Challenged Claim is directed and the factual and legal basis therefor.

Asserted Claims	Factual and Legal Basis for Invalidity Under 35 U.S.C. § 101
Claims 1-14 of the '722 patent.	The Asserted Claims of the '722 patent are directed to an abstract idea and/or natural phenomenon/law. For example, the claim language and specification indicate that the Asserted Claims are directed to patent-ineligible concepts generally relating to receiving and transmitting information. *See, e.g.*, '722 patent, cl. 1 ("one active circuit . . . amplif[ies] a signal received from the antenna" and "includes a transmit circuit"), cls. 2–14, Fig. 15, 15:28–33 ("[C]ircuits include an amplifier . . . [that] amplified the voltage received at the antenna."), 15:39–50, 16:57–17:5 ("Active transmit driver circuit . . . may include circuits to actively transmit a signal."); *see also ChargePoint, Inc. v. SemaConnect, Inc.*, 920 F.3d 759, 767 (Fed. Cir. 2019) ("While '[t]he § 101 inquiry must focus on the language of the Asserted Claims themselves,' the specification may nonetheless be useful in illuminating whether the claims are 'directed to' the identified abstract idea." (alteration in original) (citation omitted)). Courts have found similar claims directed to receiving and/or transmitting signals (and even with additional processing steps not specified in the claims here) to be directed to a patent-ineligible abstract idea. *See, e.g., Blue Spike, LLC v. Google, Inc.,* No. 14-cv-01650-YGR, 2015 WL 5260506 (N.D. Cal. Sept. 8, 2015) at *6 (finding patent-ineligible claims reciting (1) receiving and inputting a reference signal to a processor; (2) receiving and inputting a query signal to the processor; and (3) comparing the query signal to the reference signal), aff'd 669 F. App'x 575 (Fed. Cir. 2016); *Va. Innovation Scis. Inc. v. Amazon.com, Inc.,* 227 F. Supp. 3d 582, 595, 604 (E.D. Va. 2021) (finding patent-ineligible claims reciting (1) receiving a video signal and (2) converting the video signal to a display format), aff'd sub nom. *Va. Innovation Scis.,. Inc. v. HTC Corp.,* 718 F. App'x 988 (Fed. Cir. 2018); *Morales v. Square, Inc.,* 75 F. Supp. 3d 716, 722–23 (W.D. Tex. 2014) (finding patent-

[2] Pursuant to the Court's Standing Order Regarding Subject Matter Eligibility Contentions, Paragraph (a)(2)(A), Defendants incorporate by reference Ineligibility Chart Bof the Invalidity Contentions into this chart, as if fully set forth herein.

Asserted Claims	Factual and Legal Basis for Invalidity Under 35 U.S.C. § 101
	ineligible claims reciting (1) receiving a signal and (2) combining the signal with a unique identifier). Courts have similarly found claims directed to receiving and processing data to be directed to an abstract idea. *See, e.g., Yu v. Apple,* 1 F.4th 1040, 1045 (Fed. Cir. 2021) (finding circuitry claims for receiving and processing image data are directed to an abstract idea); *3d Eye Surveillance, LLC v. United States,* 140 Fed. Cl. 39, 56 (2018) (finding claims that recite receiving and processing image data are directed to an abstract idea); *Elec. Power Grp., LLC v. Alstom S.A.,* 830 F.3d 1350, 1356 (Fed. Cir. 2016) (finding claims for receiving and processing power grid data are directed to an abstract idea); *Digitech Image Techs., LLC v. Elecs. for Imaging, Inc.,* 758 F.3d 1344, 1351 (Fed. Cir. 2014) (finding claims for processing image data are directed to an abstract idea); *Trinity Info Media, LLC v. Covalent, Inc.*, 72 F.4th 1355, 1359, 1361-63 (Fed. Cir. 2023) (finding claims for poll-based networking system directed to abstract idea where claims recited two "receiving" steps and additional "providing," "displaying," and "comparing" steps); *Hawk Tech. Sys., LLC v. Castle Retail, LLC*, 60 F.4th 1349, 1357-58 (Fed. Cir. 2023) (finding claims directed to abstract idea where claims include "receiving, displaying, converting, storing, and transmitting digital video"). At best, the Asserted Claims relate to the abstract idea of amplifying a signal from an antenna, providing it to a smartcard controller, and driving the antenna with a signal from the smartcard controller. But again, receiving a signal and transmitting a signal is abstract. *See, e.g.*, *Va. Innovation Scis. Inc. v. Amazon.com, Inc.,* 227 F. Supp. 3d at 604 (finding patent-ineligible claims directed to (1) converting a received video signal to a display format signal and (2) driving a display terminal with the display format signal); *Morales,* 75 F. Supp. 3d at 722–23 (finding patent-ineligible claims directed to (1) combining a received signal with a unique identifier and (2) communicating the signal from a response unit). The claimed circuitry configuration in the Asserted Claims does not transform the abstract idea into patent-eligible matter. The Asserted Claims recite generic signal processing components to achieve a generic result . As the Federal Circuit has explained, a claim directed to an abstract idea is not patent eligible where "generic hardware limitations [of the claims] merely serve as conduit for the abstract idea." *Yu,* 1 F.4th at 1045 (citation omitted). Here, the Asserted Claims recite generic signal processing components to obtain the generic result of (1) amplifying a received signal and (2)

Asserted Claims	Factual and Legal Basis for Invalidity Under 35 U.S.C. § 101
	driving an antenna to transmit a signal. The claimed "controller," "antenna," "amplifier," "load modulation," and "driver circuit" are generic signal processing components used to process a signal in a generic, conventional manner. Any further limitations that merely recite the generic processes executed by these components, *e.g.,* "the amplifier is coupled to amplify a signal," do not render them any less generic. *See* '722 patent, cls. 1, 5, 11; *Smart Sys. Innovations, LLC v. Chicago Transit Auth.,* 873 F.3d 1364, 1371 (Fed. Cir. 2017) ("We . . . look to whether the claims . . . focus on a specific means or method that improves the relevant technology or are instead directed to a result or effect that itself is the abstract idea and merely invoke generic processes and machinery."). Moreover, the fact that the device claims specify a "smartcard controller" that receives the received data or that provides the transmitted data is of no moment. The claims do not specify that the smartcard controller does anything with the data it receives or provides, and they provide no details of how to implement the smartcard controller; the smartcard controller is nothing more than a generic component. *See* '722 patent, cls. 1-14. Indeed, courts have repeatedly rejected such result-focused claims as patent-ineligible. *Two-Way Media*, 874 F.3d at 1337 ("We look to whether the claims in the patent focus on a specific means or method, or are instead directed to a result or effect that itself is the abstract idea and merely invokes generic processes and machinery."); *Yu*, 1 F.4th at 1042–43 (holding claims that are "directed to a result or effect that itself is the abstract idea and merely invoke[s] generic processes and machinery" are patent ineligible). *See, e.g., Affinity Labs of Texas, LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1269 (Fed. Cir. 2016) ("The purely functional nature of the claim confirms that it is directed to an abstract idea, not to a concrete embodiment of that idea."); *Elec. Power*, 830 F.3d at 1356 ("Indeed, the essentially result-focused, functional character of claim language has been a frequent feature of claims held ineligible under § 101, especially in the area of using generic computer and network technology to carry out economic transactions."). Without more, purporting to process a received signal and transmit a signal with generic signal reception and transmission components is within the realm of abstract ideas. *See, e.g., Elec. Power Grp., LLC v. Alstom S.A.,* 830 F.3d 1350, 1356 (Fed. Cir. 2016) (finding claims for receiving and processing power grid data are directed to an abstract idea); *Digitech Image Techs., LLC v. Elecs. for Imaging, Inc.,* 758 F.3d 1344, 1351 (Fed. Cir. 2014) (finding that collecting, processing, and

Asserted Claims	Factual and Legal Basis for Invalidity Under 35 U.S.C. § 101
	displaying data is an abstract idea). As such, the '722 patent claims amount to no more than the abstract idea of processing a received signal and driving an antenna with an output signal using conventional components operating according to their well-understood, intended manner. *See Yu,* 1 F.4th at 1043. Nor does limiting the abstract idea of receiving and/or transmitting signals to a mobile device and/or smartcard environment render the Asserted Claims patent-eligible. Courts have explained on numerous occasions that limiting an abstract idea to a particular technological environment does not render the claims any less abstract. *Affinity Labs*, 838 F.3d at 1259 ("The Supreme Court and this court have repeatedly made clear that merely limiting the field of use of the abstract idea to a particular existing technological environment does not render the claims any less abstract."). *See, e.g., ChargePoint, Inc. v. SemaConnect, Inc.*, 920 F.3d 759, 770 (Fed. Cir. 2019) (noting that "whether a device is 'a tangible system' . . . is not dispositive" because "[r]esolving the § 101 inquiry based on such an argument would make the determination of patent eligibility 'depend simply on the draftsman's art" (internal quotation marks omitted)); *In re TLI Commc'ns LLC Pat. Litig.,* 823 F.3d 607, 612 (Fed. Cir. 2016) ("[A] relevant inquiry at step one is to ask whether the claims are directed to an improvement to computer functionality versus being directed to an abstract idea. . . . [T]he claims here are not directed to a specific improvement to computer functionality. Rather, they are directed to the use of conventional or generic technology in a nascent but well-known environment, without any claim that the invention reflects an inventive solution to any problem presented by combining the two."). Although the Asserted Claims recite a "smartcard controller," neither the Asserted Claims nor the '722 patent specification provide a functional distinction between the claimed smartcard controller and a generic controller. *See* '722 patent, cls. 1–14. At best, the '722 patent specification indicates a smartcard controller may be a controller "capable of implementing both ISO 7816 and ISO 14445 standards for contact/contactless requirements." '722 patent, 8:56–9:6. But the '722 patent does not purport to relate the controller's compatibility with known contactless communication standards with any purported improvement. Nor does the specification recite anything but a generic mobile device that comprises the smartcard controller. And to be sure, courts have reiterated that implementing generic, conventional components in a mobile device and/or smartcard environment do not save claims from being abstract. *See, e.g., Samsung Elecs. Co. v. Blaze Mobile, Inc.,* 673 F. Supp. 3d 1066, 1076–78 (N.D.

Asserted Claims	Factual and Legal Basis for Invalidity Under 35 U.S.C. § 101
	Cal. 2023) (holding claims directed to "facilitating secure transactions" but in an "NFC-enabled" environment deployed with "smartcard internals and application platforms" are still directed to an abstract idea); *Universal Secure Registry LLC v. Apple, Inc.,* 10 F. 4th 1342, 1352–53 (Fed. Cir. 2021) (holding claims directed to "authenticat[ing] a user's identity" but in a "smart card" environment are still directed to an abstract idea); *In re TLI Commc'ns*, 823 F.3d at 613 ("[A]lthough the claims limit the abstract idea to a particular environment—a mobile telephone system—that does not make the claims any less abstract for the step 1 analysis."). Nor does limiting the abstract idea to a conventional RFID environment make the Asserted Claims non-abstract. For example, the independent claims recite that the conventional "smartcard controller" includes "load modulation circuitry for half duplex communication" by "creating at least one frequency sideband about a carrier frequency of an interrogating radio frequency (RF) field," that the "antenna" is "tuned to operate at 13.56 MHz," and/or that a transmit circuit forms a signal that "mimics the at least one frequency sideband" to drive the antenna. *See* '722 patent, cls. 1, 5, 11. But these additional details merely describe how a conventional RFID environment operates and thus does not make the Asserted Claims patent-eligible. '722 patent, 5:29–32 ("In various embodiments of the present invention, the RFID functionality . . . is accessed by mobile computing device."), 8:48–9:6 (explaining "smartcard controller 330 is compatible with passive RFID tag readers in NFC applications" and may be "capable of implementing" known RFID standards such "ISO 7816 and ISO 14443 standards for contact/contactless requirements"); *Automated Tracking Sols., LLC v. Coca-Cola Co.,* 223 F. Supp. 3d 1278, 1289–90 (N.D. Ga. 2016) (holding that claims reciting "RFID 'transponder,' 'reader,' and antenna'" merely recite "conventional or generic" components "in a nascent environment" and the RFID environment, therefore, "does not make the claims any less abstract"), aff'd, 723 F. App'x 989 (Fed. Cir. 2018); *Affinity Labs*, 838 F.3d at 1259 ("The Supreme Court and this court have repeatedly made clear that merely limiting the field of use of the abstract idea to a particular existing technological environment does not render the claims any less abstract."). The failure of the Asserted Claims to provide any meaningful bounds on the ineligible concept is particularly problematic in this case because of the danger of preemption. *Athena Diagnostics, Inc. v. Mayo Collaborative Servs., LLC*, 915 F.3d 743, 752 (Fed. Cir. 2019) ("Preemption is sufficient to

Asserted Claims	Factual and Legal Basis for Invalidity Under 35 U.S.C. § 101
	render a claim ineligible under § 101, but it is not necessary."). Because the Asserted Claims are drafted to cover a result, they would preempt any modification, alternative, or improvement on what the named inventors allegedly contributed to the art. Independent claims 1, 5, and 11 are substantially similar and directed to the same abstract idea. Claim 5 recites a "transmit circuit," and claims 1 and 11 recite a more specific "active transmit driver circuit." '722 patent, cls. 1, 5, 11. But these transmit circuit components are well-known, generic components that form or drive signals for transmission. *See* '722 patent, 16:63–65 (explaining active driver circuits merely "actively transmit a signal"), 18:1–4 (noting that "the term 'driver'" as used in the specification may refer to "any . . . method driving output data" to a transmit antenna). The '722 dependent claims do not recite any additional features that transform the abstract idea into patent-eligible matter. For example, dependent claims 2, 6, and 12 each recite the additional limitation "wherein the antenna comprises an inductive element too small to draw enough power sufficient to operate the smartcard controller from an interrogating radio frequency (RF) field." This limitation does little more than attempt to capture, in the claims, a well-known problem identified in the specification, rather than a technological solution that makes the abstract idea non-abstract. *See* '722 patent, 2:18–20 ("[T]he size of antennas are proving to be a barrier to further miniaturization of passive RFID tags."). Dependent claims 3, 7, and 13 recite "the smartcard controller is coupled to be powered by the mobile device." As the '722 patent supports, powering signal processing components with a local power source is a generic implementation of RFID signal processing. *See* '722 patent, 1:13–21 ("Active tags are characterized by a local power source such as a battery. . . . Active tags are typically used to transmit over long distances."). Dependent claims 4, 10, and 14 require that the mobile device "comprises a mobile phone." A mobile phone is a generic embodiment of a mobile device and the integration of RFID functionality into mobile phones was contemplated prior to the '722 patent. *See* '722 patent, 1:63–2:5 (describing prior art mobile phone and "Example mobile applications includ[ing] . . . ticketing and mobile payments."). Furthermore, limiting the abstract idea to a mobile phone and/or smartcard environment does not render the otherwise abstract claims patent-eligible. *See, e.g.*, *In re TLI*

Asserted Claims	Factual and Legal Basis for Invalidity Under 35 U.S.C. § 101
	Commc'ns, 823 F.3d at 613 ("[A]lthough the claims limit the abstract idea to a particular environment—a mobile telephone system—that does not make the claims any less abstract for the step 1 analysis."). Further, dependent claim 8 recites "the transmit circuit comprises a load modulation circuit." The '722 patent admits that load modulation circuits "are generally well-known" generic components for embedding data into a carrier RF signal. *See* '722 patent, 15:67–16:3 (recognizing "Load modulation driver circuits are generally well known"). Finally, dependent claim 9 recites "the transmit circuit comprises an active transmit driver." As discussed in relation to representative claim 5, active transmission and driver circuit components are well-known, generic circuit components for forming and driving signals for transmission. *See* '722 patent, 16:63–65, 18:1–4. At step two of the *Alice* inquiry—the search for an inventive concept—none of the additional elements of the Asserted Claims, considered individually or as an ordered combination, supplies an inventive concept that is significantly more than the patent ineligible concept itself. To supply an inventive concept, the additional features "must be more than 'well-understood, routine, conventional activity.'" *Affinity Labs*, 838 F.3d at 1262 (quoting *Mayo Collaborative Servs. v. Prometheus Lab'ys, Inc.*, 566 U.S. 66, 79 (2012)); *Mayo*, 566 U.S. at 82 (2012) ("simply appending conventional steps, specified at a high level of generality, to laws of nature, natural phenomena, and abstract ideas cannot make those laws, phenomena, and ideas patentable"). Here, the Asserted Claims simply append well-understood, routine, and conventional signal processing means to the patent ineligible concept, so they do not pass muster under *Alice* step 2. *See* '722 patent: Ineligibility Chart B. Moreover, additional limitations that are themselves abstract cannot save a patent from being found ineligible. The Asserted Claims are directed to the same abstract idea, and they further do not add an inventive concept. As discussed above, the Asserted Claims do not recite inventive features, but rather recite additional generic, conventional components and techniques that are used to perform the abstract idea of receiving and transmitting information in a particular technological environment. *Affinity Labs of Texas, LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1259 (Fed. Cir. 2016). Given this significant overlap, and the lack of any distinguishing features that impact whether the claims are

Asserted Claims	Factual and Legal Basis for Invalidity Under 35 U.S.C. § 101
	abstract or have an inventive concept, any of the asserted claims is representative of all other asserted claims. *See also* Ineligibility Chart A for the ’965 and ’053 patents (Appendices A, C).

2(A). DESCRIPTION OF THE INDUSTRY, AT THE RELEVANT TIME, IN WHICH THE ASSERTED CLAIMS ARE ALLEGED TO BE WELL UNDERSTOOD, ROUTINE, AND CONVENTIONAL, AND THE FACTUAL AND LEGAL BASIS THEREFOR

2(B). DESCRIPTION OF HOW EACH ELEMENT OF EACH CHALLENGED CLAIM WAS WELL-UNDERSTOOD, ROUTINE, AND CONVENTIONAL IN THE RELEVANT INDUSTRY AT THE RELEVANT TIME, AND THE FACTUAL AND LEGAL BASIS THEREFOR

U.S. Patent No. 9,483,722: Ineligibility Chart B[3]

Pursuant to Judge Gilstrap's Standing Order Regarding Subject Matter Eligibility Contentions, Samsung provides the following description of the industry, at the relevant time, in which the Asserted Claims are alleged to be well understood, routine, and conventional, and the factual and legal basis therefor; and a description of how each element of each Challenged Claim, both individually and in combination with the other elements of that claim, was well understood, routine, and conventional, in the relevant industry at the relevant time, and the legal and factual basis therefor.[4]

A. Description of the Industry

As of August 8, 2008, the claimed priority date, circuitry effectuating smartcard functionality, like the type recited in the Asserted Claims, were far from new. The '722 patent itself identifies a number of prior art smartcard implementations, including smartcards implementing RFID, that deploy smartcard controllers and antennas. *See, e.g.,* '965 patent, 2:20–21 ("Fig. 14 shows a prior art smartcard controller and antenna in combination."), Fig. 14, 2:39–41 ("Examples of smartcard controllers are the 'SmartMX' controllers sold by NXP Semiconductors."), 1:33–37 ("One example of a loop antenna is shown in U.S. Pat. No. 6,568,600, issued to Carpier et al. on May 27, 2003 (the '600 patent). The device described in the '600 patent is recognizable as a 'credit card sized' passive RFID card (more specifically, a card that conforms to ISO 7816 size requirements)."), 1:50–60 (discussing "Antenna design"

[3] Pursuant to the Court's Standing Order Regarding Subject Matter Eligibility Contentions, Paragraph (a)(2)(A), Defendants incorporate by reference Ineligibility Chart Aof the Invalidity Contentions into this chart, as if fully set forth herein.

[4] Samsungnotes that under Supreme Court and Federal Circuit precedent, the Court need not, and should not, consider whether each and every element of each Challenged Claim was well understood, routine, and conventional. Rather, the only elements which should be considered under Alice step 2 are the elements that fall outside the scope of the abstract idea. *See Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 221-224 (2014); *BSG Tech LLC*, 899 F.3d at 1290 ("It has been clear since *Alice* that a claimed invention's use of the ineligible concept to which it is directed cannot supply the inventive concept that renders the invention 'significantly more' than that ineligible concept."); see *also Supercell Oy v. GREE, Inc.*, PGR2018-00029, Paper 45 at 21-22 (explaining that the Federal Circuit has instructed that "the inquiry under Alice step two is to determine whether claim limitations *other than the steps for executing the formulated concept* are 'well-understood, routine, and conventional.'"), at 44 ("In *Alice*, the Supreme Court did not go through how each claim limitation was 'well-understood, routine, conventional.' Instead, the Supreme Court took only those additional elements not accounted for by the abstract idea . . .. The Federal Circuit has since confirmed this approach." (citations omitted)).

described in "Microchip Technology, Inc. application note entitled 'Antenna Circuit Design for RFID Applications' by Youbok Lee, Ph.D, published in 2003").[5]

Moreover, the '722 patent explains that RFID functionality was "seeing widespread use in many applications," including integration into mobile devices. '965 patent, 1:61–64 ("Passive tags are seeing widespread use in many applications. For example, mobile device manufacturers are embedding passive RFID tags in mobile devices for NFC applications."). *See, e.g,* '965 patent, 1:64–2:3 ("U.S. Pat. No. 7,333,062 issued to Leizerovich et al. on Feb. 19, 2008 (the '062 patent) shows a mobile phone with an integrated loop antenna for an NFC device."), 2:4–16 ("There have been attempts to implement passive tags in smaller mobile devices" including "a secure digital (SD) memory card manufactured by Wireless Dynamics, Inc. of Calgary, Alberta Canada" and "U.S. Patent Application Publication No.: US 2006/0124755 show[ing] a memory card having a passive tag.").

Other prior art confirms the claimed smartcard circuitry components and integrating them into a mobile device were well-known. *See, e.g.*, U.S. Patent Pub. No. 2009/0040022 at ¶¶ 28, 91; U.S. Patent Pub. No. 2010/0112941 at ¶ 6. For example, smartcard controllers coupled to an antenna for receiving and transmitting signals were well-known. *See, e.g.,* U.S. Patent Pub. No. 2009/0040022 at ¶¶ 11, 91; Dachs, C., *NFC — the intuitive contactless technology becomes reality*, 122 E & I ELEKTROTECHNIK UND INFORMATIONSTECHNIK 466, 468; U.S. Patent Pub. No. 2008/0245851 at ¶ 12. Employing load modulation circuitry and/or active transmission circuitry to transmitting signals from a controller was well-known. *See, e.g.,* U.S. Patent Pub. No. 2009/0040022 at ¶ 65; U.S. Patent Pub. No. 2010/0112941 at ¶ 53. Moreover, amplifying a signal received from the antenna and provided to a controller was well-known. *See, e.g.,* U.S. Patent Pub. No. 2008/0093454 at ¶¶ 5, 80, Fig. 31; U.S. Patent Pub. No. 2009/0040022 at ¶¶ 109–10.

Because RFID was in use for years before the claimed priority date, there were many well-understood, routine, and conventional features of RFID circuitry, including those effectuating smartcard functionality. The next section provides additional details on how the elements of the claim were well understood, routine, and conventional.

B. Description of How Each Element was Well Understood, Routine, and Conventional

Samsung incorporates by reference its Invalidity Contentions, served simultaneously with these contentions, as further evidence of "how each element of each Challenged Claim, both individually and in combination with other elements of the claim, was well understood, routine, and conventional." Specifically, Samsung incorporates by reference the cover pleading to its P.R. 3-3 Invalidity

[5] The '965, '722, and '053 patents share a common specification. For the sake of simplicity, this Appendix citesto the '965 patent when referring to the common specification unless otherwise noted.

Contentions, including its invalidity charts set forth in Exhibits B1-B5 and Exhibit B, which contain further evidence of how each element of the Asserted Claims was well understood, routine, and conventional. Samsung also incorporates by reference the prior art communication systems and other prior art identified in the '722 patent, the prosecution history of the '722 patent, and related patents and their prosecution histories. Samsung further incorporates by reference expert reports that will be provided according to the schedule provided by the Court's Docket Control Order. Below, Samsung provides additional bases showing how the elements of the Asserted Claims were well understood, routine, and conventional or otherwise not inventive.

U.S. Patent No. 9,483,722 Claim 1	**Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time**
1[pre] A mobile device comprising:[6]	To the extent the preamble is limiting, a mobile phone was well understood, routine, and conventional. The '722 patent explains that mobile devices and integrating RFID applications, such as smartcard functionality, into mobile devices was well-understood, routine, and conventional. *See, e.g.,* '965 patent, 4:41–48 ("[A] mobile computing device 110 may be a personal digital assistant (PDA), a smartphone, a mobile phone, a handheld computer, a desktop computer, or any other device capable of operating as described herein."), 1:62–2:3 ("[M]obile device manufacturers are embedding passive RFID tags into mobile devices for NFC applications."). The '722 patent specification admits RFID functionality implementing smartcards was well-known. '965 patent, 2:20–41 (describing "a prior art smartcard controller and antenna in combination" that is "inductively coupled to another device . . . in the presence of an interrogating RF field"), 1:61–62 (noting RFID tags' "widespread use in many applications"), 8:44–46 ("Smartcard controller 330 . . . includ[es] RFID functionality."). *See also id.* at 1:13–14. It was further well-known to integrate such functionality into mobile devices, such as mobile telephones. '965 patent, 1:61–62 ("Passive tags are seeing widespread use in many applications."). The '722 patent specification even admits and describes "attempts" to implement RFID tags in mobile devices. '965 patent at 2:4–5, 1:62–2:3 (describing a prior art "mobile phone with an integrated loop antenna for an NFC device" disclosed in U.S. Pat. No. 7,333,062 as an example of "mobile device manufacturers . . . embedding passive RFID tags into mobile devices for NFC applications"), 2:6–14 (describing a

[6] Defendants do not take a position on whether the preambles are limiting. Claim elements have been numbered for convenience, and the numbering should not be understood to contend that an element is or is not part of the preamble of a claim. Defendants reserve the right to propose their constructions, if applicable, in accordance with the Court's schedule.

U.S. Patent No. 9,483,722 Claim 1	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
	prior art "RFID tag implementation in a secure digital (SD) memory card manufactured by Wireless Dynamics, Inc. of Calgary, Alberta Canada. Card 1300" and another prior art "memory card having a passive tag" disclosed in U.S. Patent Pub. No.: US 2006/0124755). The prosecution history of the '722 patent further demonstrates the abstract nature of claim 1. For example, during prosecution of the '722 patent, the claims were only allowed after adding the limitation of a smartcard controller "includes load modulation circuitry for half duplex communication by creating at least one frequency sideband about a carrier frequency of an interrogating radio frequency (RF) field" and the active transmit circuit "in operation forms a signal that mimics the at least one frequency sideband and wherein the signal drives the antenna." '722 File History Applicant Response dated 8/29/2016 at 2. Indeed, in the first Office Action, the Examiner found that most of the claimed elements were disclosed in a single prior art reference. '722 File History Non-Final Rejection dated 12/2/2015 at 4–5 ("Kowalski [U.S. Pat. No. 8,260,199] discloses a mobile phone comprising a smartcard controller (311); an antenna (AC3); and at least one active circuit (LCT2b) coupled between the smartcard controller and the antenna, wherein the at least one active circuit is coupled to be powered by the mobile device."). The prosecution history of the related patents further demonstrates that this claim was well-known, routine, and conventional. For example, during prosecution of the related U.S. Pat. No. 9,489,608 (the "'608 patent") and U.S. Pat. No 9,117,152 (the "'152 patent"), each Examiner noted that a mobile device comprising a smartcard controller, an antenna, and transmit circuits "coupled between the smartcard controller and the antenna" were known in the art. '608 File History Non-Final Rejection dated 12/2/2015 at 4–7 ("Kowalski [U.S. 8,260,199] discloses a mobile phone comprising a smartcard controller (311); an antenna (AC3); and at least one active circuit (LCT2b) coupled between the smartcard controller and the antenna, wherein the at least one active circuit is coupled to be powered by the mobile device."); '152 File History Non-Final Rejection dated 11/20/2014 at 2–3 ("Fox [U.S. 5,943,624] discloses mobile device comprising: a smartcard controller (42); an antenna (18); and performance enhancement circuits coupled between the smartcard controller and the antenna.").

U.S. Patent No. 9,483,722 Claim 1	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
	At best, the claim simply represents a narrowing of the abstract idea to a particular mobile environment, which is not patent-eligible. *See, e.g.*, *BSG Tech.*, 899 F.3d at 1287; *In re TLI Commc'ns*, 823 F.3d at 611, 614 ("In other words, the telephone unit simply provides the environment in which the abstract idea of classifying and storing digital images in an organized manner is carried out."); *Affinity Labs*, 838 F.3d at 1258–59; *buySAFE, Inc. v. Google, Inc.*, 765 F.3d 1350, 1355 (Fed. Cir. 2014). In this regard, the mobile phone works as expected, and only has the add-on functionality of the smartcard, and this does not add an inventive concept. *In re TLI Commc'ns LLC Pat. Litig.*, 823 F.3d at 614. Extrinsic evidence also shows that the recited components and processes were generic and conventional at the time. *See* Invalidity Contentions. *See also* Exhibits B1-B5 and Exhibit B at Element 1[pre]. In view of the above, this element merely recites conventional functionality that is incidental to the abstract idea of receiving and transmitting information in a mobile and/or smartcard environment. *See Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 716 (Fed. Cir. 2014) ("insignificant 'pre-solution activity'" is "not sufficient to transform an otherwise patent-ineligible abstract idea into patent-eligible subject matter"); *Parker,* 437 U.S. at 591 ("The notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance.").
1[a] a smartcard controller that includes load modulation circuitry for half duplex communication by creating at least one frequency sideband about a carrier frequency of an interrogating radio frequency (RF) field;	The intrinsic record, including the specification of the '722 patent, establishes that this element was well-understood, routine, and conventional. *See, e.g.*, '965 patent, 2:20–41 (describing "a prior art smartcard controller" and providing other "Examples of smartcard controllers" in the prior art); '722 patent. 15:64–16:5. This claim element merely recites a generic component, used in a conventional way. For example, the '722 specification provides prior art examples of smartcard controllers without describing any distinctions over the examples, which means a smartcard controller was generic and known at the time. *See*, '965 patent, 8:53–56 ("The 'SmartMX' family of controllers available from NXP Semiconductors N.V. of The Netherlands are examples of

U.S. Patent No. 9,483,722 Claim 1	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
	suitable dual interface smartcard controllers."), 8:44–61 (explaining "smartcard controller 330 is compatible with passive RFID tag readers in NFC applications" and may be "capable of implementing" known RFID standards such "ISO 7816 and ISO 14443 standards for contact/contactless requirements"), 2:20–41. The '722 specification further explains that load modulation circuitry is "generally well-known" and a conventional means for embedding transmit data into an RF carrier signal. '722 patent, 15:67–16:3. *See* '722 patent, 2:21–42 ("Fig. 14 shows a prior art smartcard controller and antenna in combination" including "load modulation driver circuit 1410 [that] modulates an impedance seen by the device presenting the interrogating RF field."). It was well-understood that load modulation circuitry embeds data into the sidebands of a carrier signal. *See id.* Moreover, the '722 patent describes prior art active tags "transmit information . . . on an RF carrier frequency of choice using a locally generated RF carrier." '722 patent, 1:15–17. The reader device, which provides an interrogating signal, expects a response in the form of its own "signal reflected back" modulated with the response data. '722 patent, 1:22–27. As such, generating an RF carrier at the same carrier frequency as the interrogating signal is a known, conventional way of implementing active transmission. Likewise, load modulating data into a frequency sideband about the interrogating signal's carrier frequency is a known, conventional way of embedding data into a locally generated carrier. '722 patent, 1:15–17 (explaining active transmission entails "broadcasting on an RF carrier frequency of choice"). The prosecution history of the '722 patent further indicates this limitation was well-understood, routine and conventional. For example, during prosecution of the '722 patent, the Examiner found that the prior art "discloses . . . a smartcard controller." '722 File History, Non-Final Rejection dated 12/2/2015 at 4–5 ("Kowalski [U.S. Pat. No. 8,260,199] discloses . . . a smartcard controller (311)."). The prosecution history of related patents demonstrates that the limitation was well-understood, routine, and conventional. For example, during prosecution of the related '965, '608 and '152

U.S. Patent No. 9,483,722 Claim 1	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
	patents, each Examiner found that the prior art "discloses a mobile phone comprising a smartcard controller." '608 File History Non-Final Rejection dated 12/2/2015 at 4–7 ("Kowalski [U.S. Pat. No. 8,260,199] discloses a mobile phone comprising a smartcard controller (311)."); '152 File History Non-Final Rejection dated 11/20/2014 at 2–3 ("Fox [U.S. 5,943,624] discloses mobile device comprising: a smartcard controller (42)"); '965 File History, Response dated 5/18/2015 at 6 (same).*See also* '965 File History, Non-Final Rejection dated 11/19/2014 at 2, Response dated 5/18/2015 at 7–8. And during prosecution of related U.S. Patent No. 8,451,122 (the "'122 patent"), the Examiner similarly found that the prior art "discloses an electronic transaction device comprising a smart card controller." '122 File History Non-Final Rejection dated 1/29/2013 at 2–4 ("Pitroda [U.S. 6,705,520] discloses an electronic transaction device comprising a smart card controller.") At best, the element simply represents a narrowing of the abstract idea to a particular environment, which is not patent-eligible. *SAP Am.,* 898 F.3d at 1169 (dependent claims merely represent "further narrowing of what are still" abstract ideas); *BSG Tech.*, 899 F.3d at 1287; *In re TLI Commc'ns*, 823 F.3d at 611; *Affinity Labs*, 838 F.3d at 1258–59; *buySAFE, Inc.*, 765 F.3d at 1355.Thus, implementing the abstract idea in a smartcard environment does not render the claims patent-eligible.*See, e.g., Samsung Elecs.,* 673 F. Supp. at 1076–78 (holding claims directed to the abstract idea of "facilitating secure transactions" are not rendered any less abstract when recited in an "NFC-enabled" environment deployed with "smartcard internals and application platforms"). In view of the above, this element merely recites conventional functionality that is incidental to the abstract idea of receiving and transmitting information in a mobile and/or smartcard environment. *See Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 716 (Fed. Cir. 2014) ("insignificant 'pre-solution activity'" is "not sufficient to transform an otherwise patent-ineligible abstract idea into patent-eligible subject matter"); *Parker,* 437 U.S. at 591 ("The notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance.").

U.S. Patent No. 9,483,722 Claim 1	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
	See also 1[pre] above; Exhibits B1-B5 and Exhibit B at Element 1[a].
1[b] an antenna tuned to operate at 13.56 MHz; and	The intrinsic record, including the specification of the '722 patent, establishes that this element was well-understood, routine, and conventional.For example, the '722 specification states that prior art antenna circuits are "typically tuned to create a resonant circuit at the frequency of interest (e.g., 13.56 MHz)." '965 patent at 2:20–41. The specification further provides examples of prior art antenna tuned to operate at 13.56 MHz. *See, e.g.*, '965 patent, 1:50–60 (describing prior art "RFID tag antenna" designed "to operate at 13.56 MHz" disclosed in Lee, Y., (2003) Antenna Circuit Design for RFID Applications, Microchip Technology Inc., Microchip AN 710c), 1:62–2:3 (describing a prior art "integrated loop antenna for an NFC device" "implement[ed] . . . at 13.56 MHz" disclosed in U.S. Pat. No. 7,333,062), 8:53–57 (describing prior art "smartcard controllers" that "provide RFID functionality at 13.56 MHz"). The prosecution history of the '722 patent further indicates that an antenna tuned to 13.56 MHz was a well-understood, routine and conventional way of implementing an RFID antenna circuit. For example, during prosecution of the '722 patent, the Examiner found that the prior art discloses "the antenna is tuned to operate at 13.56 MHz." '722 File History, Non-Final Rejection dated 12/2/2015 at 5–6 ("Kowalski [U.S. Pat. No. 8,260,199] discloses the antenna is tuned to operate at 13.56 MHz."). The prosecution history of the related patents further demonstrates that this limitation was well-understood, routine, and conventional. For example, during prosecution of the related '608 patent, the Examiner found that the prior art discloses "the antenna is tuned to operate at 13.56 MHz." '608 File History Non-Final Rejection dated 12/2/2015 at 4–7 ("Kowalski [U.S. 8,260,199] discloses the antenna is tuned to operate at 13.56 MHz."). During prosecution of the related '965 and '152 patents, the Examiner characterized 13.56MHz as "the conventional ISO standard" resonant frequency and found that "it would have been obvious to utilize the standard operating frequency [in smartcard devices] so that other smartcard reader may conveniently communicate at

U.S. Patent No. 9,483,722 Claim 1	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
	the same conventional frequency." '965 File History, Non-Final Rejection dated 11/19/2014 at 3; '152 File History Non-Final Rejection dated 11/20/2014 at 2–3. *See also* 1[pre] above; Exhibits B1-B5 and Exhibit B at Element 1[b]. In view of the above, this element merely recites conventional functionality that is incidental to the abstract idea of receiving and transmitting information in a mobile and/or smartcard environment. *See Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 716 (Fed. Cir. 2014) ("insignificant 'pre-solution activity'" is "not sufficient to transform an otherwise patent-ineligible abstract idea into patent-eligible subject matter"); *Parker,* 437 U.S. at 591 ("The notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance.").
1[c] at least one active circuit coupled between the smartcard controller and the antenna, wherein the at least one active circuit includes an amplifier coupled to be powered by the mobile device, and wherein the amplifier is coupled to amplify a signal received from the antenna and to provide an amplified signal to the smartcard controller, and.	The intrinsic record, including the specification of the '722 patent, establishes that this element was well-understood, routine, and conventional.For example, the background discussion in the '722 specification explains that active tags, which are "characterized by a local power source" and can thus implement active transmission over "locally generated RF carrier" signals, were known in the art. '965 patent, 1:14–18.Thus, the "active" characteristic of the claimed circuit is provided by a well-understood, routine, and conventional way of powering a circuit—with a local power source. '965 patent, 1:14–18 ("Active tags are characterized by a local power source."). Similarly, active circuits were well known. '965 patent, 1:14–18 ("Active tags . . . generally transmit information . . . using a locally generated RF carrier."). *See* Element 1[a] (discussing active transmission). Moreover, the additional elements this claim elements recites are generic components used in a conventional way. For example, the '722 specification describes an amplifier performing only generic amplifying functions. *See, e.g.,* '965 patent, 15:6–15 ("Amplifier 1510 amplifies the voltage received at antenna 1542, and the amplified voltage is provided to the smartcard controller."). The language presumes that the reader will understand without further technical detail because driving a circuit component was well-understood, routine, and conventional. *See generally*

U.S. Patent No. 9,483,722 Claim 1	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
	id. Courts have held that such generic descriptions are not inventive. *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 715–16 (Fed. Cir. 2014) (holding the claims insufficient to supply an inventive concept because they did not "do significantly more than simply describe [the] abstract method," but rather are simply "conventional steps, specified at a high level of generality"). The '722 patent specification further provides the host mobile device's "battery" is a local power source and the RFID card comprising the amplifier is powered by the host device. '965 patent, 6:21–41, 15:16–27, 16:32–46.The amplifer thus "make[s] use of power available on the RFID card" through conventional coupling, *e.g.*, the RFID card's "electrical contacts . . . part of a host interface that communicates with [the host device]." '965 patent, 5:11–12. This coupling enables powering the amplifier in a conventional manner, *e.g.,* by "Cycling power" "between the hosting computer device . . . to the RFID card." '965 patent, 16:44–46, 14:15–24. The prosecution history of the '722 patent further indicates that this element recites well-understood, routine and conventional components.During prosecution, the Examiner found that the prior art discloses "at least one active circuit . . . coupled between the smartcard controller and the antenna," "wherein the amplifier is coupled to be powered by the mobile device," and the amplifier "amplif[ies] the received signal to provide an amplified signal to the smartcard controller." '722 File History, Non-Final Rejection dated 12/2/2015 at 4–5 ("Kowalski [U.S. Pat. No. 8,260,199] discloses . . . at least one active circuit (LCT2b) coupled between the smartcard controller and the antenna."). '722 File History, Non-Final Rejection dated 12/2/2015 at 5 ("Kowalski [U.S. Pat. No. 8,260,199] discloses . . . the amplifier is coupled to be powered by the mobile device."). '722 File History, Final Rejection dated 4/29/2016 at 2–3 ("Park et al. (US 2005/0224589) discloses . . . an amplifier to amplify the received signal to provide an amplified signal to the smartcard controller."). The Examiner even noted, "It would have been obvious . . . to amplify the received signal so that the received data may be enhanced for better [reception]." '722 File History, Final Rejection dated 4/29/2016 at 2. The prosecution history of the related patents further indicates that this limitation was well-understood, routine, and conventional. For example, during prosecution of the related '608 patent,

U.S. Patent No. 9,483,722 Claim 1	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
	the Examiner found that the prior art discloses "an amplifier" and "at least one active circuit . . . coupled between the smartcard controller and the antenna." '608 File History Non-Final Rejection dated 12/2/2015 at 4–7 ("Kowalski [U.S. 8,260,199] discloses . . . at least one active circuit (LCT2b) coupled between the smartcard controller and the antenna."). Similarly, during prosecution of the related '122 patent, the Examiner similarly found that the prior art discloses "an amplifier" and "the transmit circuit includes an active transmit driver circuit." '122 File History Non-Final Rejection dated 1/29/2013 at 2–4 ("Staufer [U.S. 6,606,025] discloses the transmit circuit includes an active transmit driver circuit."). And during prosecution of the'965, '608, and '152 patents, each Examiner found that the prior art discloses "the amplifier is coupled to be powered by the mobile device." '608 File History Non-Final Rejection dated 12/2/2015 at 4–7 ("Kowalski [U.S. 8,260,199] discloses . . . the amplifier is coupled to be powered by the mobile device."); '152 File History Non-Final Rejection dated 11/20/2014 at 2–3 ("Fox [U.S. 5,943,624] discloses the amplifier is coupled to be powered by the mobile device (battery, 54) (Fig. 4)."); '965 File History, Non-Final Rejection dated 11/19/2014 at 3 (same). At best, the element simply represents a narrowing of the abstract idea to a particular environment, which fails to provide an inventive concept and is thus not patent-eligible. *SAP Am.,* 898 F.3d at 1169 (dependent claims merely represent "further narrowing of what are still" abstract ideas); *BSG Tech.*, 899 F.3d at 1287; *In re TLI Commc'ns*, 823 F.3d at 611; *Affinity Labs*, 838 F.3d at 1258–59; *buySAFE, Inc.*, 765 F.3d at 1355.Therefore, implementing the abstract idea in a mobile and/or smartcard environment cannot, in itself, render the claims patent-eligible. *See, e.g., Samsung Elecs.,* 673 F. Supp. at 1076–78 (holding claims directed to the abstract idea of "facilitating secure transactions" are not rendered any less abstract when recited in an "NFC-enabled" environment deployed with "smartcard internals and application platforms"); *In re TLI Commc'ns*, 823 F.3d at 613 ("[A]lthough the claims limit the abstract idea to a particular environment—a mobile telephone system—that does not make the claims any less abstract for the step 1 analysis."). In view of the above, this element merely recites conventional functionality that is incidental to the abstract idea of receiving and transmitting information in a mobile and/or smartcard environment. *See Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 716 (Fed. Cir. 2014) ("insignificant 'pre-

U.S. Patent No. 9,483,722 Claim 1	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
	solution activity'" is "not sufficient to transform an otherwise patent-ineligible abstract idea into patent-eligible subject matter"); *Parker,* 437 U.S. at 591 ("The notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance."). *See also* 1[pre] above; Exhibits B1-B5 and Exhibit B at Element 1[pre], 1[a], 1[b], and 1[c].
1[d] the at least one active circuit further includes a transmit circuit coupled between the smartcard controller and the antenna that in operation forms a signal that mimics the at least one frequency sideband and wherein the signal drives the antenna.	The intrinsic record, including the specification of the '722 patent, establishes that this element was well-understood, routine, and conventional. *See* Element 1[c] (discussing an active transmit circuit coupled between the smartcard controller and the antenna) and Element 1[a] (discussing mimicking an interrogating signal in active transmission). In addition to a generic active transmit circuit, this limitation recites driving circuit components. Driving circuit components, such as an antenna, is a generic, well-known, and conventional way of implementing integrated circuits. The '722 specification does not describe how a driver circuit operates nor purports to disclose any inventive aspect of a driver. *See generally*, '965 patent. Rather, the '722 specification provides that a "driver" may implement "any . . . method of driving the transmit output data." '965 patent, 17:40–44. Indeed, any discussion of a driver component is provided in non-specific and non-limiting language. *See, e.g.*, '965 patent, 17:41–44 ("[T]he term 'driver' as used herein refers to an active transmit driver or a load modulation driver or any other method of driving the transmit output data."), 7:13–15 (identifying generic components of host interface circuitry include "drivers, receivers, terminations, and the like"). The language presumes that the reader will understand without further technical detail because driving a circuit component was well-understood, routine, and conventional. *See generally id.* Courts have held that such generic descriptions are not inventive. *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 715–16 (Fed. Cir. 2014) (holding the claims insufficient to supply an inventive concept because they did not "do significantly more than simply describe [the] abstract method," but rather are simply "conventional steps, specified at a high level of generality").

U.S. Patent No. 9,483,722 Claim 1	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
	In view of the above, this element merely recites conventional functionality that is incidental to the abstract idea of receiving and transmitting information in a mobile and/or smartcard environment. *See Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 716 (Fed. Cir. 2014) ("insignificant 'pre-solution activity'" is "not sufficient to transform an otherwise patent-ineligible abstract idea into patent-eligible subject matter"); *Parker,* 437 U.S. at 591 ("The notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance."). *See also* Exhibits B1-B5 and Exhibit B at Claim 8.

U.S. Patent No. 9,483,722 Claim 2	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
2. The mobile device of claim 1 wherein the antenna comprises an inductive element too small to draw enough power sufficient to operate the smartcard controller from the interrogating radio frequency (RF) field.	The intrinsic record, including the specification of the '722 patent, establishes that this element was well-understood, routine, and conventional.The background discussion in the '722 specification characterizes the size of an RFID's inductive loop antenna as a well-known "barrier" to miniaturization of RFID tags. '965 patent, 2:6–19, 2:4–6 ("[A]ttempts to implement passive tags in smaller mobile devices . . . have met with limited success due in part to the size of the loop antenna.").Namely, the '722 patent explains that passive tags "derive the energy needed to power the tag from an interrogating RF field." '965 patent, 1:21–27. "Below a certain antenna size, the power supply voltage may never reach the critical value, and the tag may never power up." '965 patent, 1:41–49. *See also* '965 patent, 14:55–65 ("As the antenna shrinks in size, the RFID card needs to be closer to the device producing the interrogating RF field in order to produce a large enough voltage to overcome the bridge rectifier diode drops, thereby reducing the maximum usable distance."), 1:45–49 ("As the antenna size is reduced, it takes longer for the power supply voltage to reach the critical value, and the tag operation may not meet response time specifications. Below a certain antenna size, the power supply voltage may never reach the critical value, and the tag may never power up.").Thus, this claim attempts to claim a technological problem that even the '722 patent admits was well-known and already addressed in the prior art. '965 patent, 2:4–6 ("There have been attempts to implement passive tags in smaller mobile devices."). The '722 patent even provides an example prior art discussion of "determin[ing] size requirements for a passive RFID tag antenna to operate at 13.56 MHz." '965 patent, 1:50–60. *See also*, '965 patent, 2:6–19 (describing prior art implementations of RFID tags in mobile devices and identifying "significantly oversized" antennae and having to "access a loop antenna on a different device" as practical barriers). The prosecution history of the '722 patent also indicates the limitation was well-understood, routine, and conventional. For example, during prosecution of the '722 patent, the Examiner found that the prior art discloses "the antenna comprises an inductive element too small to draw enough power sufficient to operate the smartcard controller from an interrogating radio frequency (RF) field." '722 File History, Non-Final Rejection dated 12/2/2015 at 5–6 ("Kowalski [U.S. Pat. No. 8,260,199] discloses the antenna comprises an inductive element too small to draw enough power sufficient to operate the smartcard controller from an interrogating radio frequency (RF) field (the

U.S. Patent No. 9,483,722 Claim 2	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
	inductive coupling of the antennas are maximize after bringing them together; thus, they are small by themselves).”). The prosecution history of related patents demonstrates that the limitation was well-understood, routine, and conventional. For example, during prosecution of the related ’608 patent, the Examiner found that the prior art discloses an “antenna comprises an inductive element too small to draw enough power sufficient to operate the smartcard controller from an interrogating radio frequency (RF) field,” further explaining that “the inductive coupling of the antennas are maximize after bringing them together; thus, they are small by themselves.” ; ’608 File History Non-Final Rejection dated 12/2/2015 at 4–7 (“Kowalski [U.S. Pat. No. 8,260,199] discloses the antenna comprises an inductive element too small to draw enough power sufficient to operate the smartcard controller from an interrogating radio frequency (RF) field.”). Moreover, reciting that the antenna includes “an inductive element too small to draw enough power sufficient to operate the smartcard controller from an interrogating radio frequency (RF) field,” without explaining how the antenna operates based on this structure, is the recitation of an abstract idea itself, and thus, does not add an inventive concept. *See, e.g., Internet Pats. Corp. v. Active Network, Inc.,* 790 F.3d 1343, 1345, 1348 (Fed. Cir. 2015) (finding claims directed to “maintaining [a user interface in a state determined by a user] . . . without loss of said state” while the user activates other interface functionalities are patent-ineligible because “The mechanism for maintaining the state is not described” in the claims). *See also* claim 1 above; Exhibits B1-B5 and Exhibit B at Claim 2. In view of the above, this element merely recites conventional functionality that is incidental to the abstract idea of receiving and transmitting information in a mobile and/or smartcard environment. *See Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 716 (Fed. Cir. 2014) (“insignificant ‘pre-solution activity’” is “not sufficient to transform an otherwise patent-ineligible abstract idea into patent-eligible subject matter”); *Parker,* 437 U.S. at 591 (“The notion that post-solution activity, no

U.S. Patent No. 9,483,722 Claim 2	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
	matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance.”).

U.S. Patent No. 9,483,722 Claim 3	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
3. The mobile device of claim 1 wherein the smartcard controller is coupled to be powered by the mobile device.	The intrinsic record, including the specification of the '722 patent, establishes that this element was well-understood, routine, and conventional. *See, e.g.*, '965 patent, 1:14–15 (explaining that prior art active RFID tags are powered "by a local power source").This claim element merely recites generic components used in a conventional way. *See* Element 1[a] (discussing the claimed "smartcard controller").For example, the '722 patent specification provides the host mobile device's "battery" is a local power source. '965 patent, 6:21–41. The battery is coupled, in conventional way, *e.g.*, "through [a] host interface," to the smartcard controller to power the controller. '965 patent, 9:7–10, Fig. 3A, 8:62–63, 13:41–52. The prosecution history of the '722 patent also demonstrates the limitation was well-understood, routine, and conventional. For example, during prosecution of the '722 patent, the Examiner found that the prior art discloses "the smartcard controller is coupled to be powered by the mobile device." '722 File History, Non-Final Rejection dated 12/2/2015 at 5–6 ("Kowalski [U.S. Pat. No. 8,260,199] discloses the smartcard controller is coupled to be powered by the mobile device."). The prosecution history of the related patents further demonstrates that this limitation was well-understood, routine, and conventional. For example, during prosecution of the related '965, '608, and '152 patents, each Examiner found that the prior art "discloses the smartcard controller is coupled to be powered by the mobile device." '152 File History Non-Final Rejection dated 11/20/2014 at 2–3 ("Fox [U.S. 5,943,624] discloses the smartcard controller is coupled to be powered by the mobile device (54) (Fig. 4)."); '965 File History, Non-Final Rejection dated 11/19/2014 at 2 (same); '608 File History Non-Final Rejection dated 12/2/2015 at 4–7 ("Kowalski [U.S. Pat. No. 8,260,199] discloses the smartcard controller is coupled to be powered by the mobile device."). At best, the element simply represents a narrowing of the abstract idea to a particular environment, which fails to provide an inventive concept and is thus not patent-eligible. *SAP Am.,* 898 F.3d at 1169 (dependent claims merely represent "further narrowing of what are still" abstract ideas); *BSG Tech.*, 899 F.3d at 1287; *In re TLI Commc'ns*, 823 F.3d at 611; *Affinity Labs*, 838 F.3d at 1258–59; *buySAFE, Inc.*, 765 F.3d at 1355. Thus, implementing the abstract idea in a mobile and/or

U.S. Patent No. 9,483,722 Claim 3	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
	smartcard environment cannot, in itself, render the claims patent-eligible. *See, e.g., Samsung Elecs.,* 673 F. Supp. at 1076–78 (holding claims directed to the abstract idea of "facilitating secure transactions" are not rendered patent eligible when recited in an "NFC-enabled" environment deployed with "smartcard internals and application platforms"). In view of the above, this element merely recites conventional functionality that is incidental to the abstract idea of receiving and transmitting information in a mobile and/or smartcard environment. *See Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 716 (Fed. Cir. 2014) ("insignificant 'pre-solution activity'" is "not sufficient to transform an otherwise patent-ineligible abstract idea into patent-eligible subject matter"); *Parker,* 437 U.S. at 591 ("The notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance."). *See also* claim 1 above; Exhibits B1-B5 and Exhibit B at Claim 3.

U.S. Patent No. 9,483,722 Claim 4	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
4. The mobile device of claim 1 wherein the mobile device comprises a mobile phone.	The intrinsic record, including the specification of the '722 patent, establishes that this element was well-understood, routine, and conventional. *See, e.g.*, '965 patent, 1:62–2:3 (describing a prior art "mobile phone" implemented as "an NFC device" disclosed in U.S. Pat. No. 7,333,062). This claim element merely recites implementing the abstract idea in a particular environment, which fails to provide an inventive concept and is thus not patent-eligible. *See SAP Am.,* 898 F.3d at 1169 (dependent claims merely represent "further narrowing of what are still" abstract ideas); *BSG Tech.*, 899 F.3d at 1287; *In re TLI Commc'ns*, 823 F.3d at 611; *Affinity Labs*, 838 F.3d at 1258–59; *buySAFE, Inc.*, 765 F.3d at 1355. Indeed, the '722 patent identifies "a mobile phone" as just one of *several* suggested computing environments in which an RFID card may be implemented. '965 patent, 4:41-48 (also listing "a personal digital assistant (PDA), a smartphone," "a handheld computer, a desktop computer, or any other device" as host devices).The description of the claimed mobile phone environment as interchangeable with other well-known, conventional mobile devices underscores that the limitation fails to provide an inventive concept.Therefore, implementing the abstract idea in a mobile phone communicating with its smartcard cannot, in itself, render the claims patent-eligible.*See, e.g.*, *In re TLI Commc'ns*, 823 F.3d at 613 ("[A]lthough the claims limit the abstract idea to a particular environment—a mobile telephone system—that does not make the claims any less abstract for the step 1 analysis."). The prosecution history of the '722 patent also demonstrates the limitation was well-understood, routine, and conventional. For example, during prosecution of the '722 patent, the Examiner found that the prior art "discloses the mobile device comprises a mobile phone." '722 File History, Non-Final Rejection dated 12/2/2015, at 5–76 ("Kowalski [U.S. Pat. No. 8,260,199] discloses the mobile device comprises a mobile phone."). The prosecution history of related patents demonstrates that the limitation was well-understood, routine, and conventional. For example, during prosecution of the related '965 patent, the Applicant admitted that the prior art discloses a mobile phone. '965 File History, Response dated 5/18/2015 at 6.*See also* '965 File History, Non-Final Rejection dated 11/19/2014 at 2. During prosecution of the related '608, and '152 patents, each Examiner found that the prior art "discloses

U.S. Patent No. 9,483,722 Claim 4	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
	the mobile device comprises a mobile phone." '608 File History Non-Final Rejection dated 12/2/2015 at 4–7 ("Kowalski [U.S. Pat. No. 8,260,199] discloses the mobile device comprises a mobile phone."); '152 File History Non-Final Rejection dated 11/20/2014 at 2–3 ("Fox [U.S. 5,943,624] discloses the mobile device comprises a mobile phone (10)."). During prosecution of the related '122 patent, the Examiner further explained "it would have been obvious that mobile phones are used for verbal communication as well as contactless communication . . .. Thus, utilizing a mobile phone to provide contactless communication is not new but rather well-known in the art." '122 File History Non-Final Rejection dated 1/29/2013 at 2–4. In view of the above, this element merely recites conventional functionality that is incidental to the abstract idea of receiving and transmitting information in a mobile and/or smartcard environment. *See Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 716 (Fed. Cir. 2014) ("insignificant 'pre-solution activity'" is "not sufficient to transform an otherwise patent-ineligible abstract idea into patent-eligible subject matter"); *Parker,* 437 U.S. at 591 ("The notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance."). *See also* claim 1 above; Exhibits B1-B5 and Exhibit B at Claim 4.

U.S. Patent No. 9,483,722 Claim 5	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
5 [pre] A mobile device comprising:	To the extent the preamble is limiting, a mobile device was well understood, routine, and conventional. *See* Element 1[pre] above. *See also* Exhibits B1-B5 and Exhibit B at Element 5[pre].
5 [a] a smartcard controller that includes load modulation circuitry for half duplex communication by creating at least one frequency sideband about a carrier frequency of an interrogating radio frequency (RF) field;	The intrinsic record, including the specification of the '722 patent, establishes that this element was well-understood, routine, and conventional. *See* Element 1[a] above. *See also* Exhibits B1-B5 and Exhibit B at Element 5[a].
5 [b] an antenna tuned to operate at 13.56 MHz;	The intrinsic record, including the specification of the '722 patent, establishes that this element was well-understood, routine, and conventional. *See* Element 1[b] above. *See also* Exhibits B1-B5 and Exhibit B at Element 5[b].
5 [c] an amplifier coupled between the smartcard controller and the antenna, wherein the amplifier is coupled to be powered by the mobile device, and wherein the amplifier is coupled to amplify a signal received from the antenna and to provide an	The intrinsic record, including the specification of the '722 patent, establishes that this element was well-understood, routine, and conventional. *See* Element 1[c] above. *See also* Exhibits B1-B5 and Exhibit B at Element 5[c].

U.S. Patent No. 9,483,722 Claim 5	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
amplified signal to the smartcard controller; and	
5 [d] a transmit circuit coupled between the smartcard controller and the antenna that in operation forms a signal that mimics the at least one frequency sideband and wherein the signal drives the antenna.	The intrinsic record, including the specification of the '722 patent, establishes that this element was well-understood, routine, and conventional. *See* Elements 1[c]–1[d] above. *See also* Exhibits B1-B5 and Exhibit B at Element 5[d].

U.S. Patent No. 9,483,722 Claim 6	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
6. The mobile device of claim 5 wherein the antenna comprises an inductive element too small to draw enough power sufficient to operate the smartcard controller from the interrogating radio frequency (RF) field.	The intrinsic record, including the specification of the '722 patent, establishes that this element was well-understood, routine, and conventional. *See* Claim 2 above. *See also* claim 5 above; Exhibits B1-B5 and Exhibit B at Claim 6.

U.S. Patent No. 9,483,722 Claim 7	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
7. The mobile device of claim 5 wherein the smartcard controller is coupled to be powered by the mobile device.	The intrinsic record, including the specification of the '722 patent, establishes that this element was well-understood, routine, and conventional. *See* Claim 3 above. *See also* claim 5 above; Exhibits B1-B5 and Exhibit B at Claim 7.

U.S. Patent No. 9,483,722 Claim 8	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
8. The mobile device of claim 5 wherein the transmit circuit comprises a load modulation circuit.	The intrinsic record, including the specification of the '722 patent, establishes that this element was well-understood, routine, and conventional.For example, the background discussion in the '722 specification describes "a prior art smartcard controller and antenna" coupled to a "load modulation driver circuit 1410." '965 patent at 2:20–41. The specification further explains load modulation was "generally well known" and used in prior art RFID tags "to transmit response codes by . . . modulating the signal reflected back to the reader antenna." '965 patent at 1:21–28, 15:40–48 ("Load modulation driver circuits are generally well known."). The prosecution history of the '722 patent further indicates this limitation was well-understood, routine, and conventional. For example, during prosecution of the '722 patent, the Examiner found that the prior art "discloses . . . load modulation circuit (RFM) coupled between the smartcard controller and the antenna." '722 File History, Non-Final Rejection dated 12/2/2015 at 5 ("Kowalski [U.S. Pat. No. 8,260,199] discloses the load modulation circuit (RFM) coupled between the smartcard controller and the antenna."). Here, the claimed transmit circuit comprising the load modulation circuit is likewise coupled between the smartcard controller and the antenna. The prosecution history of the related patents further demonstrates that load modulation circuits were well-understood, routine, and conventional. For example, during prosecution of the related '122 patent, the Examiner found that the prior art discloses "the transmit circuit includes a load modulation driver circuit." '122 File History Non-Final Rejection dated 1/29/2013 at 2–4 ("Staufer [U.S. 6,606,025] discloses the transmit circuit includes a load modulation driver circuit."). And during prosecution of the related '965 patent, the Examiner found that the prior art disclosed "performance enhancement circuits coupled between the smartcard controller and the antenna, wherein the performance enhancement circuits include an amplifier (134) and a load modulation circuit (142)." '965 File History, Non-Final Rejection dated 11/19/2014 at 2–3 ("Fox [U.S. 5,943,624] discloses the load modulation circuit."). Indeed, the Applicant agreed with the Examiner that the prior art discloses at least an amplifier and modulation. '965 File History, Response dated 5/18/2015 at 6.

U.S. Patent No. 9,483,722 Claim 8	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
	In view of the above, this element merely recites conventional functionality that is incidental to the abstract idea of receiving and transmitting information in a mobile and/or smartcard environment. *See Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 716 (Fed. Cir. 2014) ("insignificant 'pre-solution activity'" is "not sufficient to transform an otherwise patent-ineligible abstract idea into patent-eligible subject matter"); *Parker,* 437 U.S. at 591 ("The notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance."). *See also* claim 5 above; Exhibits B1-B5 and Exhibit B at Claim 8.

U.S. Patent No. 9,483,722 Claim 9	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
9. The mobile device of claim 5 wherein the transmit circuit comprises an active transmit driver.	The intrinsic record, including the specification of the '722 patent, establishes that this element was well-understood, routine, and conventional. This claim element merely recites generic components. *See* Element 1[d] (discussing an "active circuit . . . includ[ing] a transmit circuit" that "drives" circuit components). The '722 specification does not illuminate any functional distinction between a "transmit circuit," claimed here, and an "active circuit . . . includ[ing] a transmit circuit," recited in Element 1[d]. In any case, circuits that form transmit signals and drive neighboring components to transmit those signals were well-known, routine, and conventional. *See* Elements 1[c]–1[d]. The prosecution history of the related patents further indicates that an active transmit driver was well-understood, routine, and conventional. For example, during prosecution of the related '122 patent, the Examiner found that the prior art "discloses the transmit circuit includes an active transmit driver circuit." '122 File History Non-Final Rejection dated 1/29/2013 at 2–4 ("Staufer [U.S. 6,606,025] discloses the transmit circuit includes an active transmit driver circuit."). And during prosecution of the related '965 patent, the Examiner found that the prior art discloses "the transmit driver circuit." '965 File History, Non-Final Rejection dated 11/19/2014 at 2–3. In view of the above, this element merely recites conventional functionality that is incidental to the purported claimed advance of receiving and transmitting information in a mobile and/or smartcard environment. *See Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 716 (Fed. Cir. 2014) ("insignificant 'pre-solution activity'" is "not sufficient to transform an otherwise patent-ineligible abstract idea into patent-eligible subject matter"); *Parker,* 437 U.S. at 591 ("The notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance."). *See also* [1d] and claim 5 above; Exhibits B1-B5 and Exhibit B at Claim 9.

U.S. Patent No. 9,483,722 Claim 10	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
10. The mobile device of claim 5 wherein the mobile device comprises a mobile phone.	The intrinsic record, including the specification of the '722 patent, establishes that this element was well-understood, routine, and conventional. *See* Claim 4 above. *See also* claim 5 above; Exhibits B1-B5 and Exhibit B at Claim 10.

U.S. Patent No. 9,483,722 Claim 11	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
11 [pre] A mobile device comprising:	To the extent the preamble is limiting, a mobile device was well understood, routine, and conventional. *See* Element 1[pre] above. *See also* Exhibits B1-B5 and Exhibit B at Element 11[pre].
11 [a] a smartcard controller that includes load modulation circuitry for half duplex communication by creating at least one frequency sideband about a carrier frequency of an interrogating radio frequency (RF) field;	The intrinsic record, including the specification of the '722 patent, establishes that this element was well-understood, routine, and conventional. *See* Element 1[a] above. *See also* Exhibits B1-B5 and Exhibit B at Element 11[a].
11 [b] an antenna tuned to operate at 13.56 MHz;	The intrinsic record, including the specification of the '722 patent, establishes that this element was well-understood, routine, and conventional. *See* Element 1[b] above. *See also* Exhibits B1-B5 and Exhibit B at Element 11[b].
11 [c] an amplifier coupled to be powered by the mobile device, wherein the amplifier is coupled to amplify a signal received from the antenna and to provide an amplified signal to the smartcard controller; and	The intrinsic record, including the specification of the '722 patent, establishes that this element was well-understood, routine, and conventional. *See* Element 1[c] above. *See also* Exhibits B1-B5 and Exhibit B at Element 11[c].
11 [d] an active transmit driver circuit coupled between the smartcard controller and the	The intrinsic record, including the specification of the '722 patent, establishes that this element was well-understood, routine, and conventional. *See* Claim 9 (discussing the claimed "active transmit

U.S. Patent No. 9,483,722 Claim 11	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
antenna, wherein the active transmit driver circuit is coupled to be powered by the mobile device.	driver") and Elements 5[d], 1[c] (discussing the "active . . . transmit circuit coupled between the smartcard controller and the antenna"). In addition to coupling a generic, conventional active transmit driver in a conventional way—between a controller and antenna components—this claim element recites the active transmit driver is coupled to be powered by the mobile device. Coupling an active transmit driver circuit to its host device power source is a well-understood, conventional way to power the circuit. For example, the '722 patent specification provides the host mobile device's "battery" is a local power source and the RFID card comprising the purported performance enhancement circuits is powered by the host device. '965 patent, 6:21–41, 15:16–27, 16:32–46.The active transmit driver circuit can thus "make use of power available on the RFID card" through conventional coupling, *e.g.*, the RFID card's "electrical contacts . . . part of a host interface that communicates with [the host device]." '965 patent, 5:11–12. This coupling enables powering the RFID card in a conventional manner, *e.g.,* by "Cycling power" "between the hosting computer device . . . to the RFID card." '965 patent, 16:44–46, 14:15–24. The prosecution history of the '722 patent further indicates a mobile device powering an active transmit driver circuit as claimed was well-understood, routine, and conventional. During prosecution, the Examiner found that the prior art discloses an active circuit "coupled between the smartcard controller and antenna, wherein . . . the active circuit is coupled to be powered by the mobile device." '722 File History, Non-Final Rejection dated 12/2/2015 at 4–5 ("Kowalski [U.S. Pat. No. 8,260,199] discloses . . . at least one active circuit (LCT2b) coupled between the smartcard controller and the antenna, wherein the at least one active circuit is coupled to be powered by the mobile device."). The prosecution history of related patents demonstrates that the limitation was well-understood, routine, and conventional. For example, during prosecution of the related '608 patent, the Examiner found that the prior art discloses "at least one active circuit is coupled to be powered by the mobile device." '608 File History Non-Final Rejection dated 12/2/2015 at 4–7 ("Kowalski [U.S. 8,260,199] discloses the at least one active circuit is coupled to be powered by the mobile

U.S. Patent No. 9,483,722 Claim 11	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
	device."). During prosecution of the '152 patent, the Examiner similarly found that the prior art "discloses the transmit drive circuit is coupled to be powered by the mobile device." '152 File History Non-Final Rejection dated 11/20/2014 at 2–3 ("Fox [U.S. 5,943,624] discloses the transmit driver circuit is coupled to be powered by the mobile device (battery, 54).") In view of the above, this element merely recites conventional functionality that is incidental to the purported claimed advance of receiving and transmitting information in a mobile and/or smartcard environment. *See Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 716 (Fed. Cir. 2014) ("insignificant 'pre-solution activity'" is "not sufficient to transform an otherwise patent-ineligible abstract idea into patent-eligible subject matter"); *Parker,* 437 U.S. at 591 ("The notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance."). *See also* [1c], 1[d] and claim 9 above; Exhibits B1-B5 and Exhibit B at Element 11[d].

U.S. Patent No. 9,483,722 Claim 12	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
12. The mobile device of claim 11 wherein the antenna comprises an inductive element too small to draw enough power sufficient to operate the smartcard controller from the interrogating radio frequency (RF) field.	The intrinsic record, including the specification of the '722 patent, establishes that this element was well-understood, routine, and conventional. *See* Claim 2 above. *See also* claim 11 above; Exhibits B1-B5 and Exhibit B at Claim 12.

U.S. Patent No. 9,483,722 Claim 13	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
13. The mobile device of claim 11 wherein the smartcard controller is coupled to be powered by the mobile device.	The intrinsic record, including the specification of the '722 patent, establishes that this element was well-understood, routine, and conventional. *See* Claim 3 above. *See also* claim 11 above; Exhibits B1-B5 and Exhibit B at Claim 13.

U.S. Patent No. 9,483,722 Claim 14	Factual and Legal Basis for How Each Element of Each Challenged Claim Was Well-Understood, Routine, and Conventional in the Relevant Industry at the Relevant Time
14. The mobile device of claim 11 wherein the mobile device comprises a mobile phone.	The intrinsic record, including the specification of the '722 patent, establishes that this element was well-understood, routine, and conventional. *See* Claim 4 above. *See also* claim 11 above; Exhibits B1-B5 and Exhibit B at Claim 14.