

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LG ELECTRONICS, INC.

Petitioner,

v.

CONSTELLATION DESIGNS, LLC

Patent Owner.

Case IPR2023-00319
U.S. Patent 10,693,700

PETITIONER'S REPLY TO PATENT OWNER RESPONSE

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II.	The '700 Patent does not describe “each of the plurality of different non-uniform multidimensional symbol constellations is capable of providing a greater parallel decoding capacity at a specific SNR than the other symbol constellations in the plurality of multidimensional symbol constellations at the same SNR”.....	2
	A. The '700 patent provides no description of optimizing a multidimensional symbol constellation (e.g., QAM constellation) that is created from a one-dimensional symbol constellation (e.g., PAM).....	5
	B. The '700 patent fails to disclose that an optimized PAM used to form a QAM yields an optimized QAM.	11
	C. Patent Owner only points to evidence of 1D constellations being optimized, which is not enough to support claims 5, 15, and 25	14
	D. There is no comparison of parallel decoding capacity between different non-uniform multidimensional symbol constellations	19
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EXHIBITS

LGE1001	U.S. Patent No. 10,693,700
LGE1002	Prosecution History for U.S. Patent No. 10,693,700
LGE1003	Expert Declaration of Dr. Bertrand Hochwald
LGE1004	RESERVED
LGE1005	RESERVED
LGE1006	RESERVED
LGE1007	RESERVED
LGE1008	Ulrich Reimers et al., <i>DVB The Family of International Standards for Digital Video Broadcasting</i> , Second Edition, 2005 (“Ulrich”)
LGE1009	RESERVED
LGE1010	U.S. Provisional application No. 60/933,319 (“’319 Provisional”)
LGE1011	Declaration of June Munford (ATSC322)
LGE1012	Second Stipulation by Petitioner, LGE, <i>Constellation Designs, LLC v. LG Electronics, Inc. et al</i> , Case No. 2:21-cv-00448 (E.D. Tex.)
LGE1013	RESERVED
LGE1014	De Gaudenzi et al., <i>Turbo-coded APSK modulations design for satellite broadband communications</i> , Int. J. Satell. Commun. Network. 2006; 24:261–281, Published online 19 May 2006 in Wiley InterScience (“DeGaudenzi”)

LGE1015	U.S. Patent No. 7,978,777
LGE1016	RESERVED
LGE1017	RESERVED
LGE1018	Memorandum, Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation (USPTO June 21, 2022) (“Interim Procedure”)
LGE1019	Docket Control Order, <i>Constellation Designs, LLC v. LG Electronics, Inc. et al</i> , Case No. 2:21-cv-00448 (E.D. Tex.)
LGE1020	Complaint, <i>Constellation Designs, LLC v. LG Electronics, Inc. et al</i> , Case No. 2:21-cv-00448 (E.D. Tex.)
LGE1021	RESERVED
LGE1022	ATSC Recommended Practice: Guidelines for the Physical Layer Protocol, Document no. A/327:2018
LGE1023	ATSC 3.0 Standard: Physical Layer Protocol, Document no. A/322:2018
LGE1024	Loghin, et al., <i>Non-Uniform Constellations for ATSC 3.0</i> , IEEE Transactions on Broadcasting, Vol 62, No. 1, March 2016. (“Loghin”)
LGE1025	G. Ungerboeck, Channel Coding with Multilevel/Phase Signals, IEEE Trans. Inform. Theory, Vol. IT-28, No. 1, Jan. 1982, pp. 55-67 (“Ungerboeck”)
LGE1026	Declaration of June Munford (ATSC327)
LGE1027	Declaration of June Munford (DG)
LGE1028	Declaration of June Munford (Loghin)

- LGE1029 Second Declaration of Dr. Bertrand Hochwald
- LGE1030 Muela, Manuel Fuentes, *Non-Uniform Constellations for Next-Generation Digital Terrestrial Broadcast Systems*,
Departamento de Comunicaciones Universitat Politècnica de
València, June 2017 (“Fuentes”)
- LGE1031 Proakis, John G. *Digital Communications*, Fourth Edition, 2000
 (“Proakis”)

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