Global Intellectual Strategies®

Panasonic Corporation

Wireless Patent Offering

July 23, 2014

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1. Opportunity – Sale of Patent Portfolio

GIS (Global Intellectual Strategies) is pleased to offer the sale of this patent portfolio. The portfolio is owned by Panasonic Corporation and the patented technology pertains to cellular wireless products.

The sale of the portfolio is offered exclusively by GIS. GIS is offering these assets for sale and is not pursuing licensing or enforcement of the portfolio.

This Executive Summary ("Executive Summary" or the "Document") has been prepared by GIS solely for informational purposes and is subject to a Disclaimer & Notice that can be found in attached Exhibit B.

2. History of Portfolio

The portfolio relates to 4G (LTE), 3G, and 2G wireless communications including HSDPA (High-Speed Downlink Packet Access), ROHC (Robust Header Compression), GPRS (General Packet Radio Service), and ARQ (Automatic Repeat Query) found in virtually all cellular devices on the market today.

As part of Panasonic's patent divestiture program, GIS was asked by Panasonic to review a specific subset of Panasonic's full portfolio of patents and select from this subset patents that are suitable for sale to interested parties. GIS has selected a number of patents which are highlighted below. The selection process involved selecting patents, in part on the basis of potential for commercial use in the industry, ease in detecting use, and the technological advancements and advantages set forth by the inventions.

3. The Patent Portfolio

This portfolio consists of 115 patents from 25 families (see Exhibit A). The portfolio contains 29 US patents, 14 Japanese patents, 12 German patents, 8 Korean patents, 6 Chinese patents and others from Denmark, Finland, France, India, Italy, Spain, Turkey, and the UK. The portfolio applies to the general area of cellular wireless communications and is centered on the following technologies:

- Spreading codes in support of CDMA (2G and 3G) cellular systems.
- Uplink Status flag (USF) used in GPRS/EGPRS cellular systems.
- Dynamic slots allocation in GPRS/EGPRS cellular systems.
- Hybrid-ARQ constellation rearrangement in HSDPA (3G) cellular systems.

The patents in this portfolio are declared as standards essential with the standards bodies and may be subject to FRAND licensing terms.

Panasonic and GIS performed technical evaluations to identify the promising patents in the portfolio and selected certain exemplary patents for which EoU (Evidence-of-Use) documents were produced by GIS.

The patents in the portfolio deal with cellular data transmission used for 2G (CDMA), 3G, and 4G (LTE) communications. The following patent families were identified to be of particular interest.

- Family 1: US Patent No. 6,661,783 pertains to 3GPP standards TS 25.201, TS 25.211, TS 25.213 used in all user equipment and base stations that support CDMA.
- Family 22: US Patent Nos. 6,952,413, 7,046,656, and 7,058,041 pertain to 3GPP standards TS 44.060 and TS.002 used in all user equipment and base stations that support GPRS/EGPRS.
- Family 23: US Patent No. 7,020,105 pertains to 3GPP standards TS 05.02, TS 44.060, and TS 45.002 used in all user equipment that support GPRS/EGPRS.
- Family 24: US Patent No. 7,154,961 and 7,567,622 pertains to ETSI standards TS 25.201 and TS 25.308 as used in all user equipment and base stations that support HSDPA channel.

4. Value of Portfolio

The portfolio being offered includes patents that pertain to technologies required by cellular communications systems including handsets and base stations.

Due to practical commercial requirements for backwards compatibility with 2G and 3G systems, patents in this portfolio have a very broad applicability across most presently deployed systems and are expected to apply to the future systems as well. In particular, GPRS packet data transmission from the 2G systems is supported on 3G and 4G devices and network equipment.

Eleven exemplary EoU documents have been produced, to demonstrate the portfolio's applicability to a wide range of products:

- 1 EoU document (Family 1) with claims documented on the selection of spreading codes used in DPDCH and DPCCH to transmit user data, pilot and power control information in handsets and base stations supporting CDMA transmission.
- 6 EoU documents (Family 22) with a claim documented on the uplink status flags (USF) found in PDCH fields used in GPRS/EGPRS compliant handsets and networks. USF allows the dynamic allocation of uplink slots for transmission by a handset.
- 2 EoU documents (Family 23) with claims documented on adjacent cell measurements conducted by GPRS/ EGPRS compliant handsets. The multi-slot reception capability of the handset is leveraged by the network to improve the handset adjacent cell measurement. These measurements facilitate cell selection and handovers.
- 2 EoU documents (Family 24) with claims documented on the Hybrid-ARQ retransmission protocols used in 3GPP networks supporting HSDPA channels, where the transmitter performs constellation re-arrangement between retransmission in order to improve performance.

The EoU Documents will be made available to those interested buyers who sign a NDA (Non-Disclosure Agreement) with GIS.

There are a number of features of this portfolio that make it particularly compelling. These characteristics include:

- Large number of patents in key jurisdictions. There are 115 patents in the portfolio with good coverage in the key jurisdictions; the US, Germany, France, Japan, Korea, and China. There are three or four charted families in each of these jurisdictions meaning that this portfolio could stand on its own for a licensing program for monetization or defensive purposes.
- Backwards compatibility. Cellular handsets and base stations, even when supporting the latest standards must remain backwards compatible with the older 3G and 2G standards for situations with non-optimal network coverage. Newer feature phones feature 3G but not 4G/LTE meaning that this technology is very relevant with wider market coverage than 4G/LTE technology.
- Evidence of Use based on standards. Evidence of use may be shown for a whole class of products by referring to the relevant standards. In some cases field testing can also be used to strengthen the evidence for specific products.
- Portfolio remaining life. The portfolio is still rather young with approximately 10 years of life left on most patent families.

5. Portfolio Encumbrances

Panasonic has identified a list ("white list") of the top cellular companies and identified which companies that are not licensed to the portfolio being offered. The white list will be made available to those interested buyers who sign a NDA & CIA (Common Interest Agreement) with GIS. This white list is not exhaustive. Other companies of interest may be licensed under one or more of the patents being offered. If a potential buyer wants to know whether a specific company is licensed, it should notify GIS. GIS will inquire with Panasonic and report the response to the interested company.

6. Summary of Exemplary Patent Analyses

GIS has conducted an EoU analysis for a number of patents and produced EoU documents on corresponding standards specifications for the following groups and patents:

Family	Technology/Sub-portfolio	Patents	Foreign Equivalents	Estimated Expiry year	Exemplary EoU documents
1	CDMA transmission apparatus	US 6,661,783	KR, JP	2019	3GPP UMTS Spec.
22	Extended dynamic resource allocation in packet data transfer	US 6,952,413 US 7,046,656 US 7,058,041 EP 1489869 EP 1489871 EP 1489872	JP, ES, IT, FR, GB, DE, IN, KR	2024	3GPP GPRS spec
23	Dynamic resource allocation in packet data transfer	US 7,020,105 EP 1465449	JP, GB, FR, DE, FI, DK, TR, ES, IT, IN, KR	2024	3GPP GPRS spec
24	Constellation rearrangement for ARQ transmit diversity schemes	US 7,154,961 US 7,567,622	JP, CN, KR, DE, GB, FR	2022	3GPP HSPA and LTE spec

Table 1 - Summary of Exemplary EoU documents

7. Cellular Market

Cellular communications has become ubiquitous in our modern world with the major products being cellular phones, tablets and cellular modems. Cellular modems are also being integrated into automobiles as mandated by the European Union eCall initiative. In addition, M2M (Machine to Machine) applications also exist, though on a minor scale. Though interested buyers are responsible for their own market evaluation GIS has supplied high level market revenue and unit shipment data below in order to aid them.

7.1 Revenues

Traditionally the cell phone market has been divided between *smartphones* and *feature phones*, feature phones being the traditional phones without data access. Today the line between feature phones and low end smartphones is blurring and this trend will likely continue. The tablet market is also divided into products that include cellular networking and those that omit it.

Table 2 shows unit shipments of cellular Smartphones, and tablets (see *Figure 9*). As feature phones that do include 2G, 3G, and LTE data features are omitted the addressable market would actually exceed the numbers shown. The data on tablets assumes that 12% of tablets sold are cellular-capable as reported by NPD (http://www.connected-intelligence.com/our-research/connect/mobile-connectivity-report).

Product Type	2014	2015	2016	2017	2018
Smartphones	680	775	875	925	1050
Cellular-capable Tablets	33	42	48	58	76

Table 2 - Units sold world-wide (Millions). 2018 data is extrapolated from the 2017 data using the 2012-2017 CAGR rates.

In order to convert unit sales into annual revenue the following estimated average unit prices were used:

- Smartphones: $350
- Tablets: $300

Estimated revenue data for cellular base stations is presented in the following table.

Product Type	2014	2015	2016	2017	2018
Smartphones	$238,000	$271,250	$306250	$323,750	$367,500
Tablets	$9,900	$12,600	$14,400	$17,280	$22,680
Cellular Base Stations	$33,095	$33,847	$32,684	$28,924	$30,000
Relevant worldwide revenue	$280,995	$317,697	$353,334	$369,954	$420,180

Table 3 - Worldwide revenues (USD Millions)

7.2 Geographic Distribution of Sales Revenue

Product Type	NA	EMEA	Asia/Pacific	CALA	Comment
Smartphones	21%	35%	36%	8%	See Figure 11 below
Tablets	36%	34%	28%	2%	See Figure 13 below
Cellular Base Stations	13%	25%	54%	8%	From Infonetics
Exemplary Patent Jurisdictions					
Family 1	US		JP, KR		
Family 22	US	DE, ES, FR, GB, IT	IN, KR, JP		
Family 23	US	DE, DK, ES, FI, FR, GB, IT	IN, JP, KR		
Family 24	US	DE, FR, GB	CN, JP, KR		

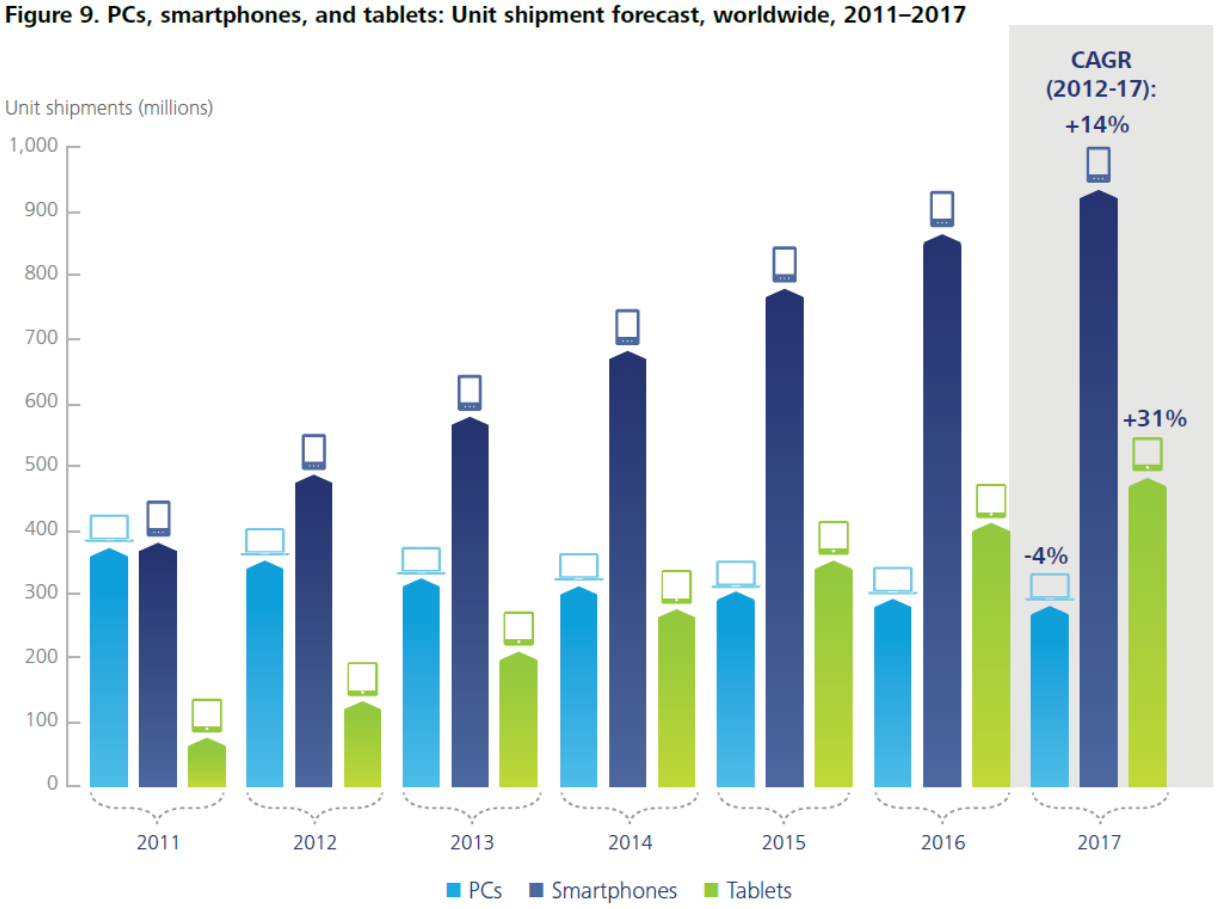
8. Information from Sources (Market Information)

The primary source of market data on the cellular phone market is the *Open Mobile 2012* study from Deloitte TMT that may be downloaded from http://dupress.com/articles/rising-tide-exploring-pathways-to-growth-in-the-mobile-semiconductor-industry/

Excerpts from the report are reproduced below.

Figure 9 shows worldwide smartphone sales rising to 925 million units by 2017 with a CAGR of 14%. Total tablet sales, including cellular capable models, show a more modest growth to 58 million units by 2017 with a CAGR of 31%.

Figure 9. PCs, smartphones, and tablets: Unit shipment forecast, worldwide, 2011–2017



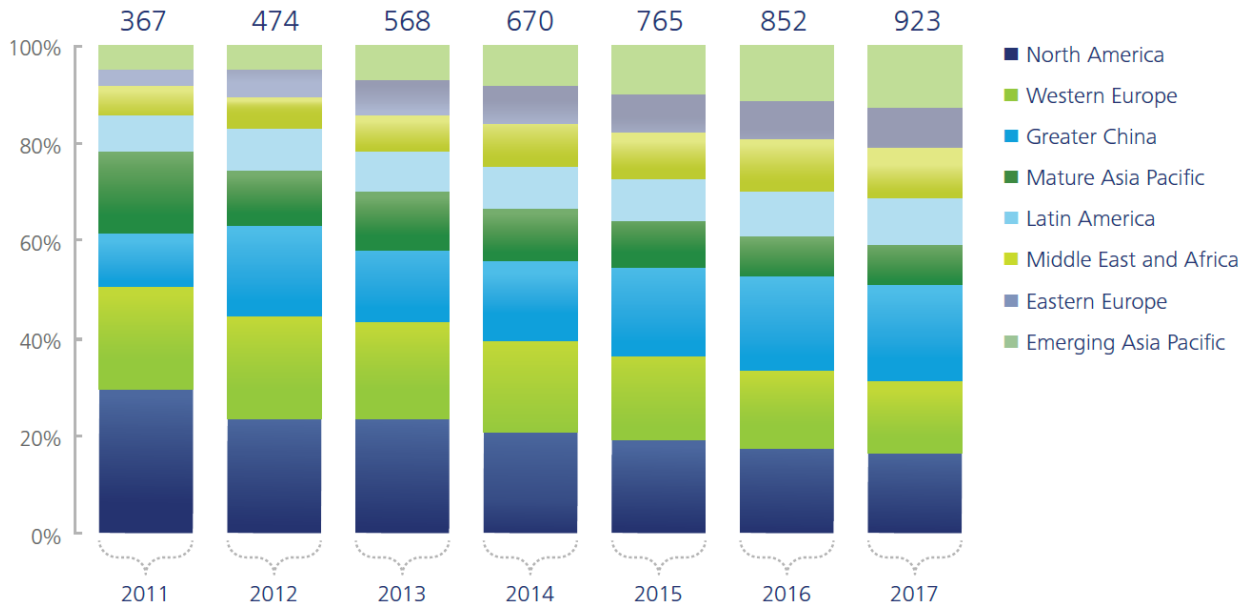
Source: Carolina Milanesi and Ranjit Atwal, *Forecast: Desk-based PCs, notebooks, ultramobiles and tablets, worldwide, 2010–2017, 1Q13 update*, Gartner, March 20, 2013; Annette Zimmermann et. al., *Forecast: Mobile phones, worldwide, 2011–2017, 1Q13 update*, Gartner, March 22, 2013; Deloitte analysis.

Note: "Smartphone" represents only the premium communication device category covered by Gartner, and excludes utility and basic communication device categories.

Graphic: Deloitte University Press | DUPress.com

Figure 11 shows the regional distribution of smartphone sales from 2011-2017 as a percentage of total worldwide unit shipments. The graph shows a significant increase in Western Europe and Latin America with a corresponding decrease in North America.

Figure 11. Smartphone unit shipments (millions): % share by region, worldwide, 2011–2017



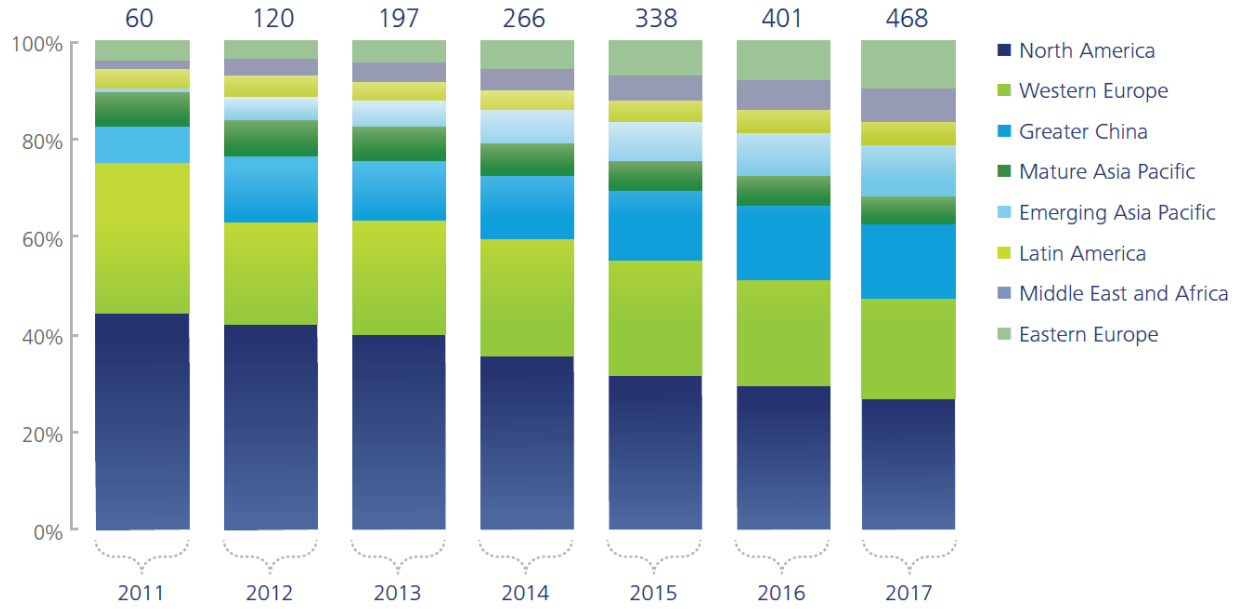
Source: Annette Zimmermann et. al., *Forecast: Mobile phones, worldwide, 2011–2017, 1Q13 update,* Gartner, March 22, 2013; Deloitte analysis.

Note: North America includes the United States and Canada. Greater China includes China, Taiwan, and Hong Kong. Mature Asia-Pacific includes Australia, New Zealand, Japan, South Korea, and Singapore. Emerging Asia-Pacific mainly includes India, Indonesia, Malaysia, and Thailand.

Graphic: Deloitte University Press | DUPress.com

Figure 13 shows the regional distribution of tablet sales from 2011-2017 as a percentage of total worldwide unit shipments. The graph shows a significant increase in Western Europe, China, and the emerging Asia Pacific regions with a corresponding decrease in North America.

Figure 13. Tablet shipment forecast (in millions): % share by region, worldwide, 2011–2017



Source: Carolina Milanesi and Ranjit Atwal, *Forecast: Desk-based PCs, notebooks, ultramobiles and tablets, worldwide, 2010–2017, 1Q13 update,* Gartner, March 20, 2013; Deloitte analysis.

Note: North America includes the United States and Canada. Greater China includes China, Taiwan, and Hong Kong. Mature Asia Pacific includes Australia, New Zealand, Japan, South Korea, and Singapore. Emerging Asia Pacific mainly includes India, Indonesia, Malaysia, and Thailand.

Graphic: Deloitte University Press | DUPress.com

9. Process Considerations

Given below is a listing of the process steps to be followed:

1. After having reviewed the Seller's package, the buyers interested in pursuing acquisition of the portfolio will need to complete and execute the NDA & CIA document, and return the document to GIS.
2. Once GIS has received the executed NDA & CIA, GIS will provide access to confidential documentation. This confidential information will include Exemplary EoU documents and the white list of top companies that have not been licensed. Prospective buyers may make inquiries to GIS regarding the EoU documents and other technical questions. Prospective buyers may also submit company names for Panasonic to determine whether they have been licensed and make other inquiries.
3. After having reviewed this information, the buyers who intend to place an offer will submit the Offer Form to GIS who will forward it to Panasonic.
4. Prospective buyers may submit signed offers by **September 19th, 2014** and negotiations may ensue as offers are received. Panasonic will then decide which offer(s) to accept. Once offer(s) is/are deemed acceptable the selected buyer(s) will then sign the Patent Assignment Agreement and the transaction will proceed to closing.

The owner of the portfolio reserves the right to sell at any time if an offer deemed acceptable is received.

Thank you for your interest in this offering. For additional information, please contact GIS using the information below:

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10. About GIS

GIS is an Intellectual Property consulting company that applies knowledge of patents and technical excellence to assists clients in maximizing the value of their Intellectual Property.

GIS was founded in August 2000 and operates in Ottawa, Canada. GIS is a team of patent professionals, including a patent attorney, and engineers that provide patent and technical analysis in support of patent licensing & litigation, patent sale & acquisition, patent portfolio valuation and management services backed by in-house technical reverse engineering expertise. Our technical expertise is focused in the fields of electronic systems, semiconductors, audio/video, software, and communications.

11. Exhibit A - Patent List

The table below lists all US patent assets. All patent family members are included in the sale.

Family	Patent Number	Title	Estimate Expiry Date
1	6661783	CDMA transmission apparatus	3/9/2019
2	7369621	Radio communication base station device, radio communication mobile station device, and radio communication method	7/3/2023
3	7502593	Radio communication system	4/26/2024
4	6721367	Base station apparatus and radio communication method	11/5/2019
5	6597292	Wireless transmission apparatus and control system	9/28/2019
6	6577686	Receiver	10/12/2019
7	6577715	Modem apparatus, communication control apparatus, communication terminal apparatus, and communication control method	3/10/2020
8	6700921	Spread-spectrum communication apparatus	1/7/2020
9	6604218	Data encoding apparatus and data decoding apparatus	1/10/2020
10	6684086	Radio base station device and radio communication method	12/16/2020
11	6785230	Audio transmission apparatus	5/23/2020
12	6768460	Diversity wireless device and wireless terminal unit	3/28/2021
13	6687343	Internet communication control apparatus and communication terminal calling method	8/1/2022
14	6677905	Antenna device and mobile communications apparatus including the device	2/13/2022
15	8145128	Wireless reception apparatus, wireless transmission apparatus, wireless communication system, wireless reception method, wireless transmission method, and wireless communication method	4/14/2025
16	7529567	Radio telephone apparatus and method for controlling amount of electric current consumption thereof	9/19/2026
17	7797011	Communication method and communication equipment in the PoC service	2/17/2027
18	8195175	Method for verifications and fast QoS establishment	12/28/2025
19	7593516	Electronic apparatus	12/5/2027
20	7848459	Radio receiving apparatus and radio receiving method	4/10/2026
21	8331395	Communication apparatus, communication system, and communication control method	11/14/2028
22	6952413	Extended dynamic resource allocation in packet data transfer	2/27/2024
	7046656		
	7058041		
23	7020105	Dynamic resource allocation in packet data transfer	2/27/2024
24	7154961	Constellation rearrangement for ARQ transmit diversity schemes	10/18/2022
	7567622		
	8325845		
25	7123618	Data transmitting apparatus and data receiving apparatus	6/18/2021

12. Exhibit B – Disclaimer & Notice

This Executive Summary ("Executive Summary" or the "Document") has been prepared by GIS (Global Intellectual Strategies") solely for informational purposes from publicly available information and from materials supplied to GIS by Panasonic Corporation ("Company"). The Executive Summary relates to the possible sale of intellectual property assets owned or controlled by the Company. This Document is being furnished through GIS as the Company's strategic advisor, solely for use by prospective purchasers in considering an acquisition of the Patent Portfolios ("Patent Portfolios").

This Memorandum has been prepared to assist interested parties in making their own evaluations of the Patent Portfolios and does not purport to contain all of the information that a prospective purchaser may desire. In all cases, interested parties should conduct their own investigation and analysis of the Patent Portfolios and the data set forth in this Document.

GIS has not independently verified the accuracy and completeness of any of the information provided by the Company and contained in this Memorandum. GIS is not acting in any legal capacity in this transaction or any other dealing with any parties. Neither GIS, the Company or its subsidiaries, nor their respective affiliates, directors, officers, employees, representatives or agents makes any representation or warranty as to the accuracy or completeness of this Memorandum, or any supplemental information furnished in connection herewith, and none of the foregoing shall have any liability for any representations (express or implied) contained in, or for any omissions from, this Memorandum, any supplemental information furnished in connection herewith or any other written or oral communication transmitted to the recipient in the course of the recipient's evaluation of the Patent Portfolios.

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