IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

DIVERSIFIED OBSERVATION LLC	)
	)
Plaintiff,	)
	) Civil Action No. _____
v.	)
	) **JURY TRIAL DEMANDED**
OKI DATA AMERICAS, INC.	)
	)
Defendant.	)
_____	)

COMPLAINT

For its Complaint, Plaintiff Diversified Observation LLC ("Plaintiff" or "Diversified Observation"), by and through the undersigned counsel, alleges as to the activities of Defendant Oki Data Americas, Inc. ("Oki") as follows:

THE PARTIES

1. Diversified Observation is a Texas company with a place of business located at 5068 W. Plano Pkwy, Suite 300, Plano, Texas 75093.

2. Defendant Oki Data Americas, Inc. is a Delaware corporation with a place of business located at 2000 Bishops Gate Boulevard, Mt. Laurel, New Jersey 08054.

JURISDICTION AND VENUE

3. This action arises under the Patent Act, 35 U.S.C. §1 *et seq.*

4. Subject matter jurisdiction is proper in this Court under 28 U.S.C. §§1331 and 1338.

5. Oki has purposefully availed itself of the rights and benefits of Delaware law by engaging in systematic and continuous contacts with the state of Delaware, including by selling printers and other electronic products in Delaware, directly or through affiliates, and by continuously and systematically placing goods into the stream of commerce for distribution

throughout Delaware. Oki also derives substantial revenue from the sale of those products in Delaware. Oki also regularly conducts and solicits business within the State of Delaware.

6. Oki alleged patent infringement and conceded personal jurisdiction and venue in *Ricoh Company, Ltd et al v. Oki Data Americas, Inc. et al*, C.A. No. 09-694-SLR (D. Del. Feb. 22, 2010), D.I. 14 at p. 2-3 ("Defendants admit that this Court has personal jurisdiction [and that Oki is] incorporat[ed] in Delaware.").

7. Venue is proper in this district pursuant to § 1400(b) because Oki is incorporated in Delaware.

THE PATENTS-IN-SUIT

8. On January 5, 1999, the United States Patent and Trademark Office ("USPTO") duly and lawfully issued United States Patent No. 5,857,133 (the "'133 Patent"), entitled "Information Reading Apparatus Having a Contact Image Sensor." A true and correct copy of the '133 Patent is attached hereto as Exhibit A.

9. On July 2, 2002, the USPTO duly and lawfully issued United States Patent No. 6,414,461 (the "'461 Patent"), entitled "Scanner that Controls Stepping Motor Torque." A true and correct copy of the '461 Patent is attached hereto as Exhibit B.

10. On February 18, 2003, the USPTO duly and lawfully issued United States Patent No. 6,522,432 (the "'432 Patent"), entitled "Image Scanner with Automatic Signal Compensation." A true and correct copy of the '432 Patent is attached hereto as Exhibit C.

11. Diversified Observation is the assignee and owner of the right, title and interest in and to the '133, '461, and '432 patents, including the right to assert all causes of action arising under said patents and the right to any remedies for infringement of them.

COUNT I – INFRINGEMENT OF UNITED STATES PATENT NO. 5,857,133

12. Diversified Observation repeats and realleges the allegations of the previous paragraphs as if fully set forth herein.

13. Without license or authorization and in violation of 35 U.S.C. § 271(a), Oki has infringed Claim 1 of the ’133 patent by making, using, importing, offering for sale, or selling image information reading apparatuses, including, but not limited to Oki’s multifunction printer MB472 (“Oki MB472”).

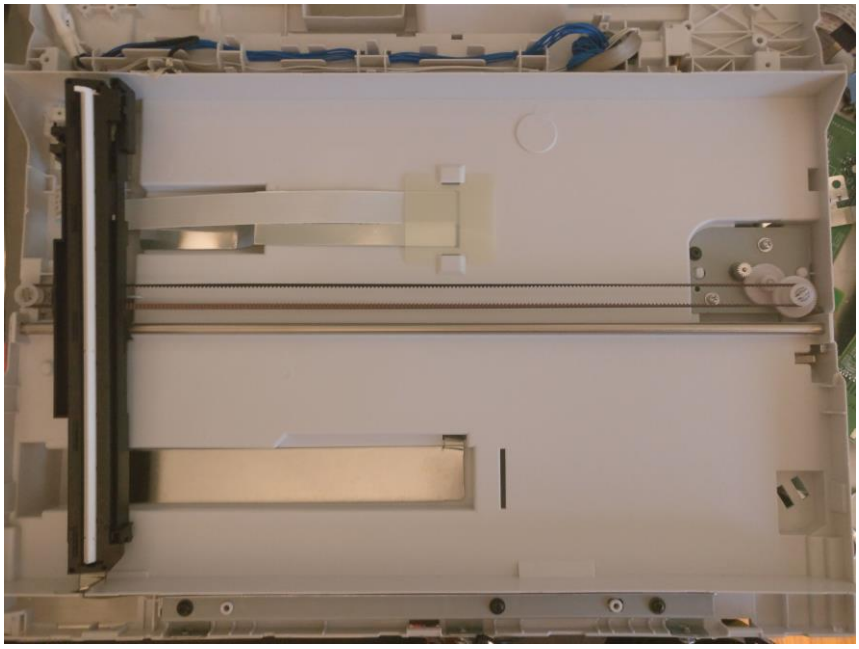
14. Claim 1 of the ’133 Patent reads:

> 1. An image information reading apparatus having a housing comprising:
>
> a sheet table on top of said housing for supporting a document sheet;
>
> a contact image sensor module carried by a carriage disposed beneath the bottom surface side of said sheet table, said contact image sensor having a plurality of slide-blocks attached onto the top surface of said contact image sensor module;
>
> single guiding means crossed over the bottom center of said carriage for guiding said carriage along said sheet table, said single guiding means mounted on a pair of supports at opposite ends for holding and supporting said guiding means in a manner that said contact image sensor module can contact the bottom surface side of said sheet table tightly with said plurality of slide-blocks interposed therebetween; and
>
> driving means located at one side of said single guiding means for reciprocally moving said carriage along said sheet table from a first direction to a second direction.

Exh. A at 5:2-22 (this notation in referring to a patent means at column 5, lines 2-22).

15. More specifically, the Oki MB472 is an information reading apparatus having a housing, a sheet table, a contact image sensor carried by a carriage with a plurality of slide blocks,

a single guiding means for the carriage and a driving means for moving the carriage along the sheet table, as shown in the following images of the Oki MB472:



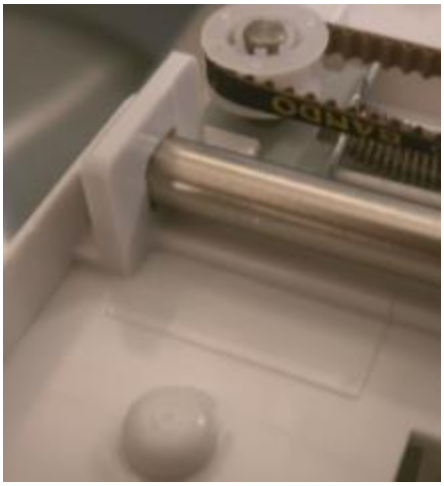
16. The Oki MB472 includes a sheet table on top of the housing for supporting a document sheet:

17. The Oki MB472 includes a contact image sensor module carried by a carriage beneath the bottom surface of the sheet table:

18. The contact image sensor module has a plurality of slide blocks attached onto its top surface (red rectangle added for clarity):

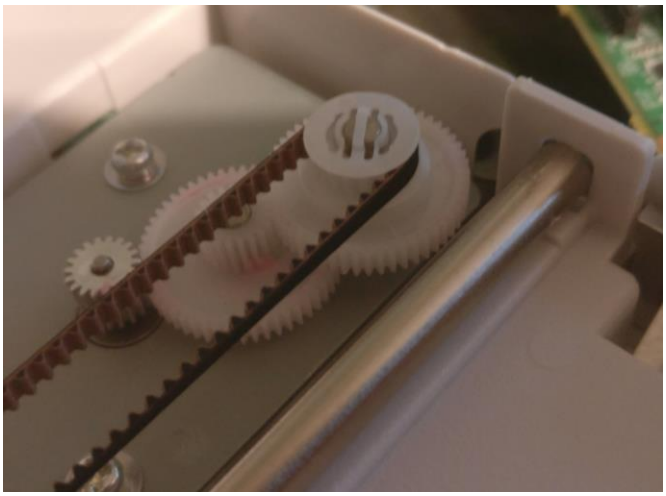
19. The Oki MB472 includes a single guiding means crossed over the bottom center of the carriage for guiding the carriage along the sheet table (red rectangle added for clarity):

20. The guiding means is mounted on a pair of supports at opposite ends for holding the guiding means:

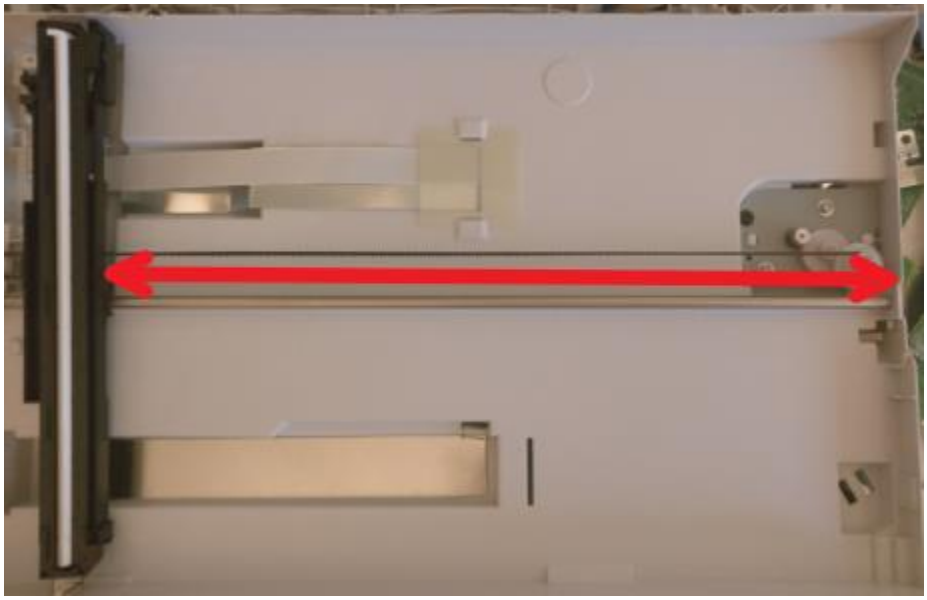


21. The supports hold the contact image sensor module in a manner that the contact image sensor module can contact the bottom surface side of the sheet table tightly with the pluralrity of slide blocks interposed therebetween:

22. The Oki MB472 includes a driving means located at one side of the single guiding means:



23. The guiding means of the Oki MB472 reciprocally moves the carriage along the sheet table from a first direction to a second direction (as shown by the added red arrow):



24. As shown above, every element of Claim 1 of the ’133 Patent is found in the Oki MB472.

25. Diversified Observation is entitled to recover from Oki the damages sustained by Diversified Observation as a result of Oki's infringement of the ’133 patent in an amount subject to proof at trial, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. §284.

COUNT II – INFRINGEMENT OF UNITED STATES NO. 6,414,461

26. Diversified Observation repeats and realleges the allegations of the previous paragraphs as if fully set forth herein.

27. Without license or authorization and in violation of 35 U.S.C. §271(a), Oki has infringed and continues to infringe at least Claim 1 of the '461 patent by making, using, importing, offering for sale, or selling scanners, including, but not limited to, the Oki MB472.

28. Claim 1 of the '461 Patent reads:

> 1. A scanner comprising: a housing having a transparent platform, a document to be scanned being placed on the transparent platform; a scanning module movably installed inside the housing for scanning the document; a driving module installed inside the housing for driving the scanning module, the driving module comprising:
>
> a stepping motor for driving the scanning module forward and backward so that the scanning module scans the document; and
>
> a motor driving circuit for controlling the stepping motor according to a driving signal; and
>
> a control circuit for controlling the operations of the scanner, the control circuit comprising a memory, the memory storing a torque table and a driving program, the torque table recording a plurality of torque values, each of the torque values corresponding a predetermined condition when the stepping motor produces the corresponding torque, and the driving program chooses one of the torque values according to the predetermined condition, the motor driving circuit receiving the corresponding driving signal according to the torque value chosen by the driving

program and controlling the stepping motor so that the stepping motor generates a torque according to the driving signal;

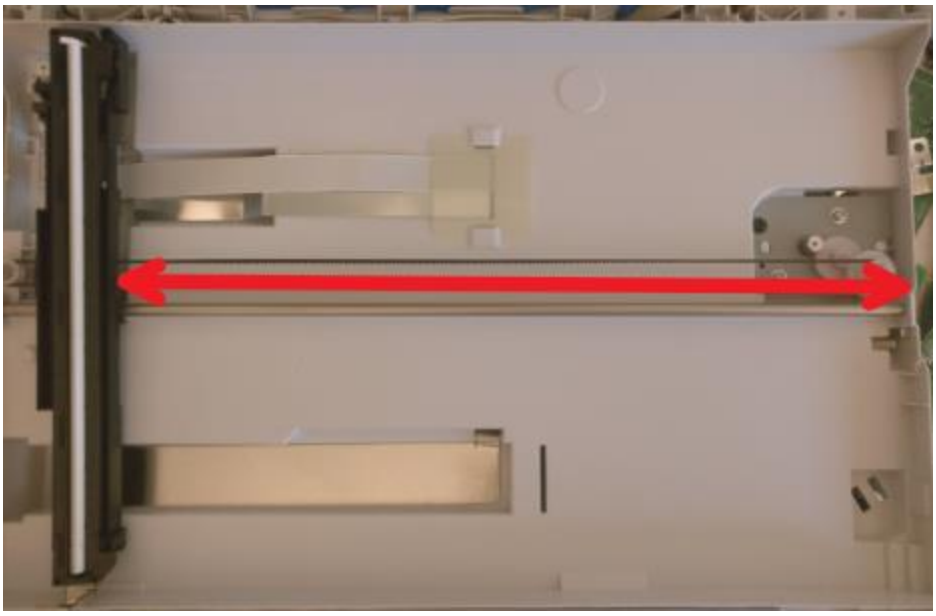
wherein the control circuit controls the stepping motor to generate different torque so that the scanning module scans the document at different speeds.

Exh. C at 4:58 to 5:18.

29. The Oki MB472 includes a scanner comprising a housing, a scanning module, a driving module, a stepping motor, a motor driving circuit for controlling the stepping motor and a control circuit for controlling the operations of the scanner, as shown in these images:

30. The Oki MB472 includes a housing having a transparent platform, a document to be scanned may be placed on the transparent platform:

31. The Oki MB472 includes a scanning module moveably installed inside the housing for scanning the document (as shown by the added red arrow):



32. It includes a driving module installed inside the housing for driving the scanning module:

33. The driving module of the Oki MB472 includes a stepping motor for driving the scanning module forward and backward (see added red arrow) so that the scanning module scans the document:

Minebea

ST35B-96

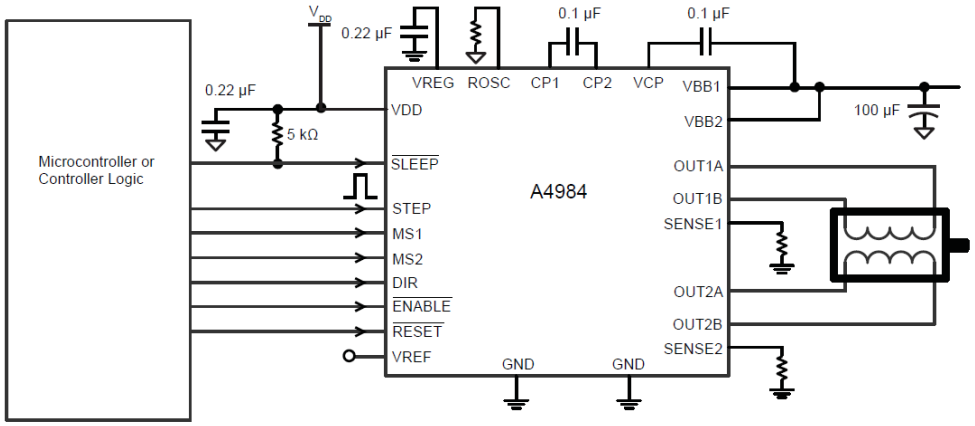
3.75°

See http://www.nmbtc.com/content/pdfs/st35b-96.pdf (last accessed Oct. 1, 2017).

34. The driving module of the Oki MB472 includes a motor driving circuit (e.g., Texas Instruments DRV8812) for controlling the stepping motor according to a driving signal:

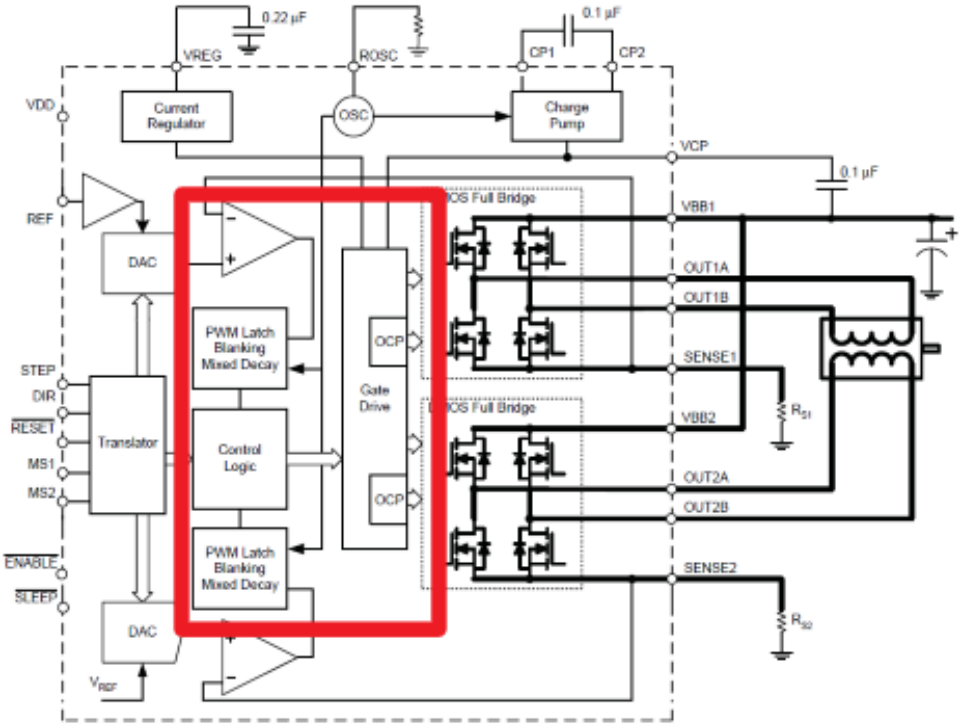
See http://html.alldatasheet.com/html-pdf/338779/ALLEGRO/A4984SLPTR-T/299/1/A4984SLPTR-T.html ("Alldatasheet") (last accessed Oct. 1, 2017).

Typical Application Diagram



Id.

35. The Oki MB472 includes a control circuit for controlling the operations of the scanner:



See Alldatasheet (red rectangle added for clarity).

36. The control circuit includes a memory (e.g., control logic). The memory stores a torque table and a driving program:

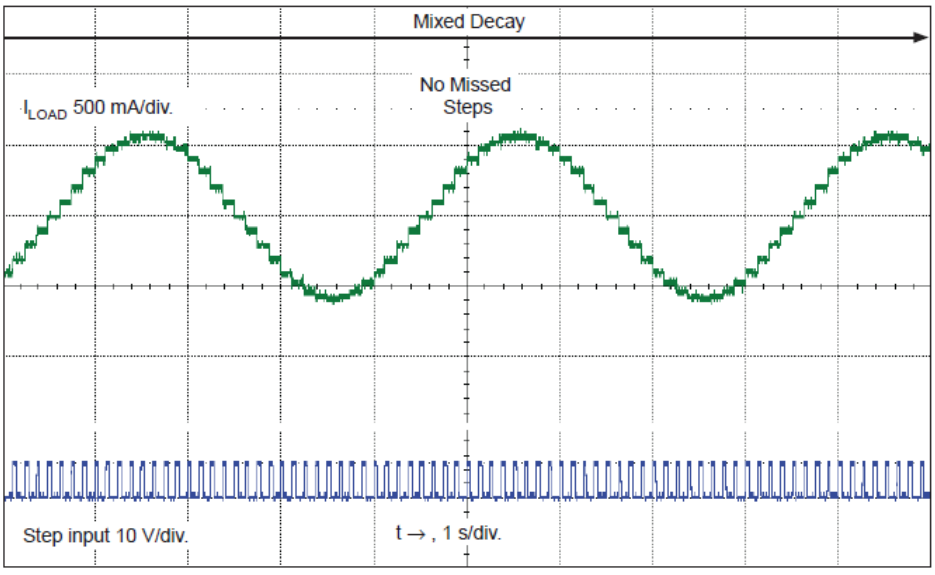


Figure 3. Continuous stepping using automatically-selected mixed stepping (ROSC pin grounded)

See Alldatasheet.

37. The torque table includes a plurality of torque values, each of the torque values corresponds to a predetermined condition when the stepping motor produces the corresponding torque, and the driving program chooses one of the torque values according to the predetermined condition:

Table 2. Step Sequencing Settings

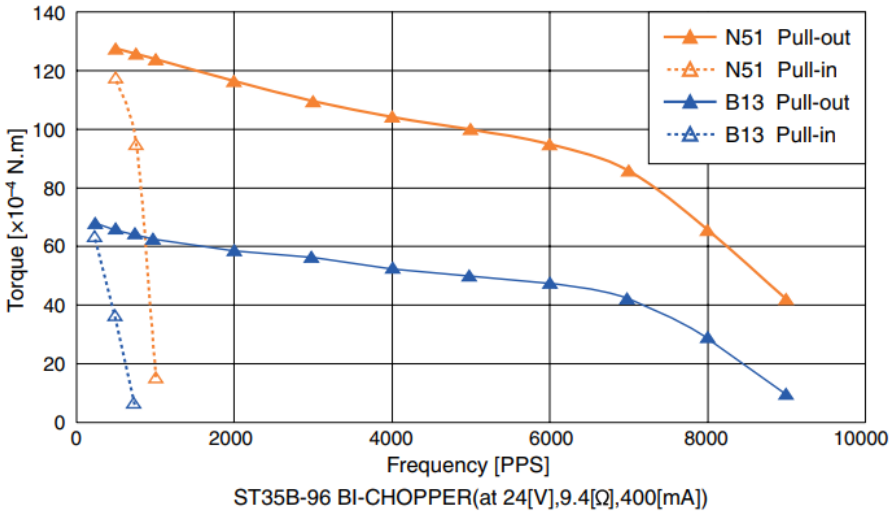
Home microstep position at Step Angle 45°; DIR = H

Full Step #	Half Step #	1/4 Step #	1/8 Step #	Phase 1 Current [% $I_{trip Max}$] (%)	Phase 2 Current [% $I_{trip Max}$] (%)	Step Angle (°)	Full Step #	Half Step #	1/4 Step #	1/8 Step #	Phase 1 Current [% $I_{trip Max}$] (%)	Phase 2 Current [% $I_{trip Max}$] (%)	Step Angle (°)
	1	1	2	100.00	0.00	0.0		5	9	17	–100.00	0.00	180.0
				99.52	9.80	5.6					–99.52	–9.80	185.6
			2	98.08	19.51	11.3				18	–98.08	–19.51	191.3
				95.69	29.03	16.9					–95.69	–29.03	196.9
		2	3	92.39	38.27	22.5			10	19	–92.39	–38.27	202.5
				88.19	47.14	28.1					–88.19	–47.14	208.1
			4	83.15	55.56	33.8				20	–83.15	–55.56	213.8
				77.30	63.44	39.4					–77.30	–63.44	219.4
1	2	3	5	70.71	70.71	45.0	3	6	11	21	–70.71	–70.71	225.0
				63.44	77.30	50.6					–63.44	–77.30	230.6
			6	55.56	83.15	56.3				22	–55.56	–83.15	236.3
				47.14	88.19	61.9					–47.14	–88.19	241.9
		4	7	38.27	92.39	67.5			12	23	–38.27	–92.39	247.5
				29.03	95.69	73.1					–29.03	–95.69	253.1
			8	19.51	98.08	78.8				24	–19.51	–98.08	258.8
				9.80	99.52	84.4					–9.80	–99.52	264.4
	3	5	9	0.00	100.00	90.0		7	13	25	0.00	–100.00	270.0
				–9.80	99.52	95.6					9.80	–99.52	275.6
			10	–19.51	98.08	101.3				26	19.51	–98.08	281.3
				–29.03	95.69	106.9					29.03	–95.69	286.9
		6	11	–38.27	92.39	112.5			14	27	38.27	–92.39	292.5
				–47.14	88.19	118.1					47.14	–88.19	298.1
			12	–55.56	83.15	123.8				28	55.56	–83.15	303.8
				–63.44	77.30	129.4					63.44	–77.30	309.4
2	4	7	13	–70.71	70.71	135.0	4	8	15	29	70.71	–70.71	315.0
				–77.30	63.44	140.6					77.30	–63.44	320.6
			14	–83.15	55.56	146.3				30	83.15	–55.56	326.3
				–88.19	47.14	151.9					88.19	–47.14	331.9
		8	15	–92.39	38.27	157.5			16	31	92.39	–38.27	337.5
				–95.69	29.03	163.1					95.69	–29.03	343.1
			16	–98.08	19.51	168.8				32	98.08	–19.51	348.8
				–99.52	9.80	174.4					99.52	–9.80	354.4

See Alldatasheet.

38. The motor driving circuit receives the corresponding driving signal according to the torque value chosen by the driving program and controls the stepping motor so that the stepping motor generates a torque according to the driving signal:

Torque/Speed Characteristics



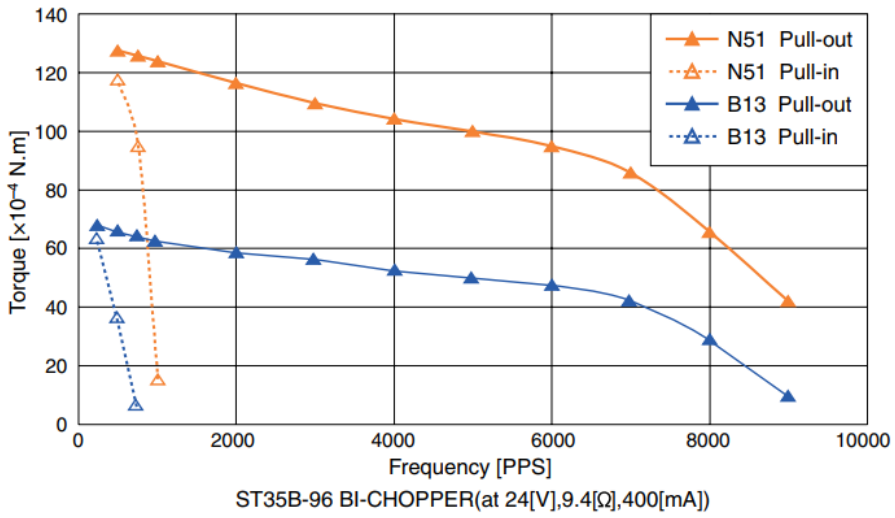
See http://www.nmbtc.com/content/pdfs/st35b-96.pdf (last accessed Oct. 1, 2017).

39. The control circuit of the Oki MB472 controls the stepping motor to generate different torque so that the scanning module is capable of scanning the document at different speeds. As an example, the control circuit modifies the torque output of the stepping motor so that the scanning module scans the document more slowly for color documents and faster for black and white documents:

Scanner	
Scan Type	Color CIS
Document Input	50-sheet Duplex Reversing Automatic Document Feeder (RADF); Single-sheet flatbed scanner
Scan Speed	As fast as 2 sec./page Black & White; as fast as 6 sec./page Color[4]
Scan Resolution	600 dpi
Scan-to	Folder (CIFS/FTP/HTTP), E-mail (with LDAP support), USB memory, PDF, Secure PDF, High compression-PDF, S-TIFF/M-TIFF (RAW/G3/G4 Compressed), JPEG, XPS, Scan to computer (with Actkey)

See http://www.oki.com/us/printing/images/19711_MB472w_MFP_SS-LR_pages_tcm75-167860.pdf (last accessed Oct. 1, 2017).

Torque/Speed Characteristics



See http://www.nmbtc.com/content/pdfs/st35b-96.pdf (last accessed Oct. 1, 2017).

40. As shown above, the Oki MB472 includes every element recited by Claim 1 of the '461 Patent.

41. Diversified Observation is entitled to recover from Oki the damages sustained by Diversified Observation as a result of Oki's infringement of the '461 patent in an amount subject

to proof at trial, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

COUNT III – INFRINGEMENT OF UNITED STATES NO. 6,522,432

42. Diversified Observation repeats and realleges the allegations of the previous paragraphs as if fully set forth herein.

43. Without license or authorization and in violation of 35 U.S.C. § 271(a), Oki has infringed and continues to infringe at least Claim 1 of the ’432 patent by making, using, importing, offering for sale, and/or selling an image scanner for scanning a document, including, but not limited to, Oki MB472.

44. Claim 1 of the ’432 Patent reads:

> 1. An image scanner for scanning a document comprising:
>
> (1) a test region;
>
> (2) a light source for illuminating the document and the test region;
>
> (3) optical means for conveying the light reflected from the document and the test region;
>
> (4) a line image sensor for receiving the light from the optical means and generating an image signal corresponding to the light reflected from the document and a brightness signal corresponding to the light reflected from the test region; the line image sensor comprising an array of (red, green, blue)(R,G,B) sensing elements for converting the light received from the optical means into an array of corresponding (R,G,B) signals wherein both the image signal and the brightness signals generated by the line image sensor are formed by an array of (R,G,B) signals; and

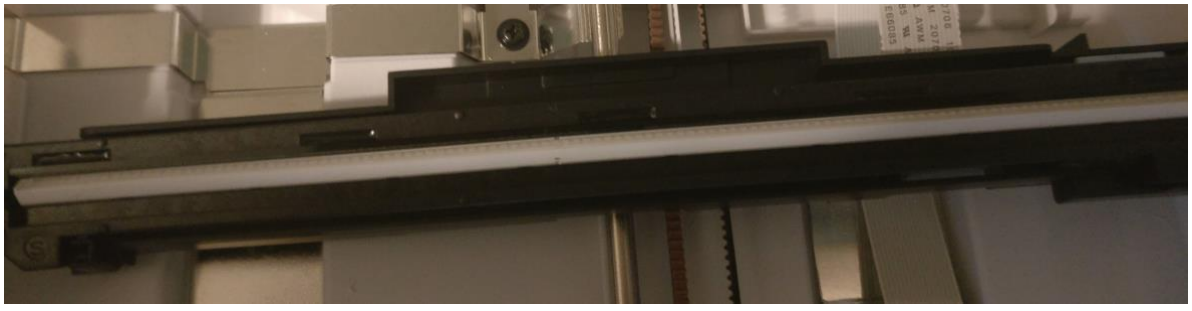
(5) a signal compensation circuit for amplifying the image signal according to the brightness signal to compensate the instability of the light source; the signal compensation circuit comprising an A/D converter for digitizing the (R,G,B) signals of the image signal and the brightness signal, and a digital processor for adjusting the digitized (R,G,B) signals of the image signal according to the digitized (R,G,B) signals of the brightness signal.

Exh. C at 5:12-38.

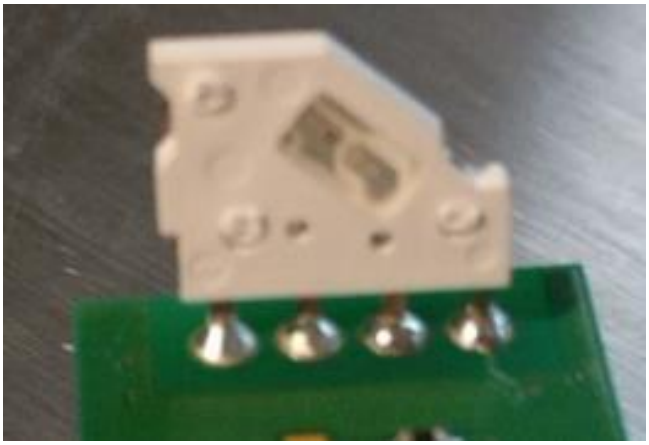
45. Specifically, the Oki MB472 includes an image scanner for scanning a document:

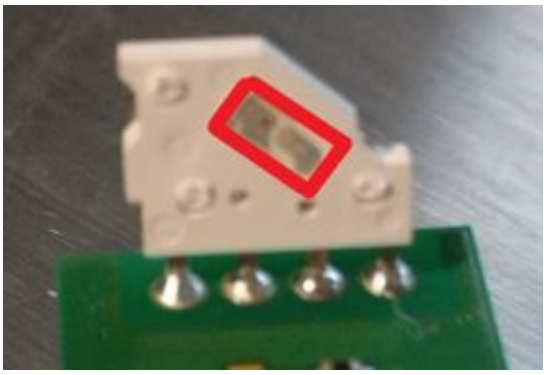
46. The Oki MB472 flatbed scanner module includes a test region:

47. The Oki MB472 includes a light source for illuminating the document and the test region. The Oki MB472 also includes a contact image sensor ("CIS") that includes a light source for illuminating the document to be scanned and the test region:



48. The light source of the OKI Data MB472 CIS module includes an RGB LED (red rectangle added for clarity):

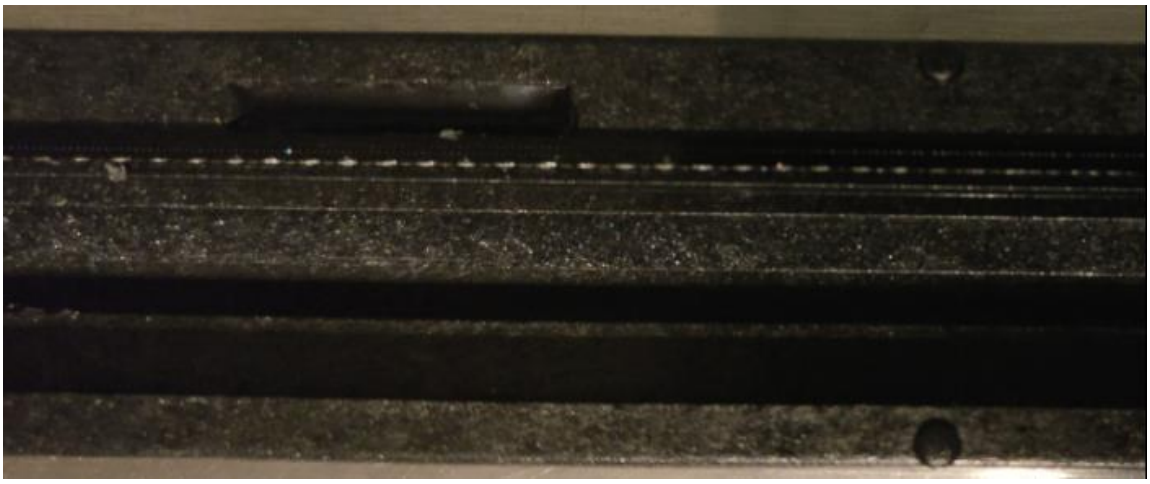




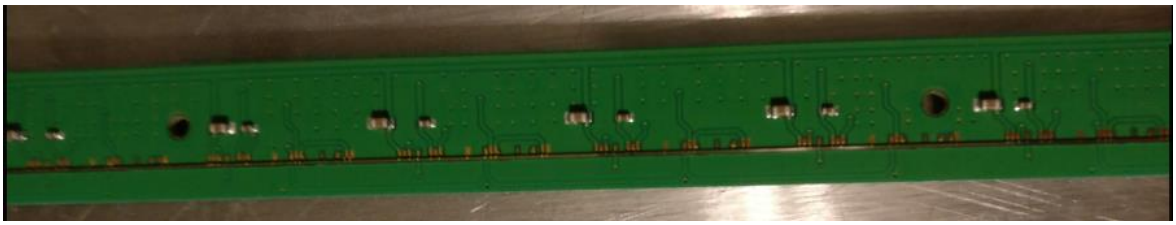
49. The CIS module includes a rod lens that directs light generated by the LEDs to the document and the test region:

50. The rod lens can be removed from the housing:

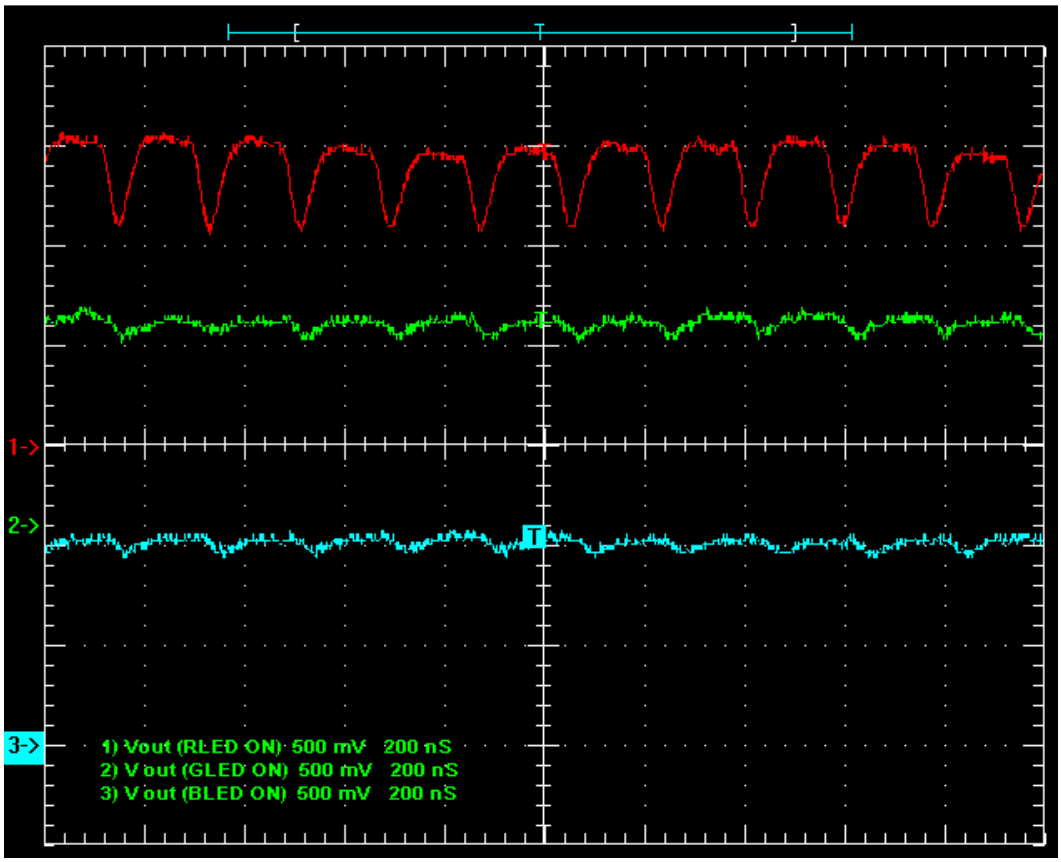
51. The Oki MB472 includes an optical means for conveying the light reflected from the document and the test region. The housing of the CIS module includes a light guide:



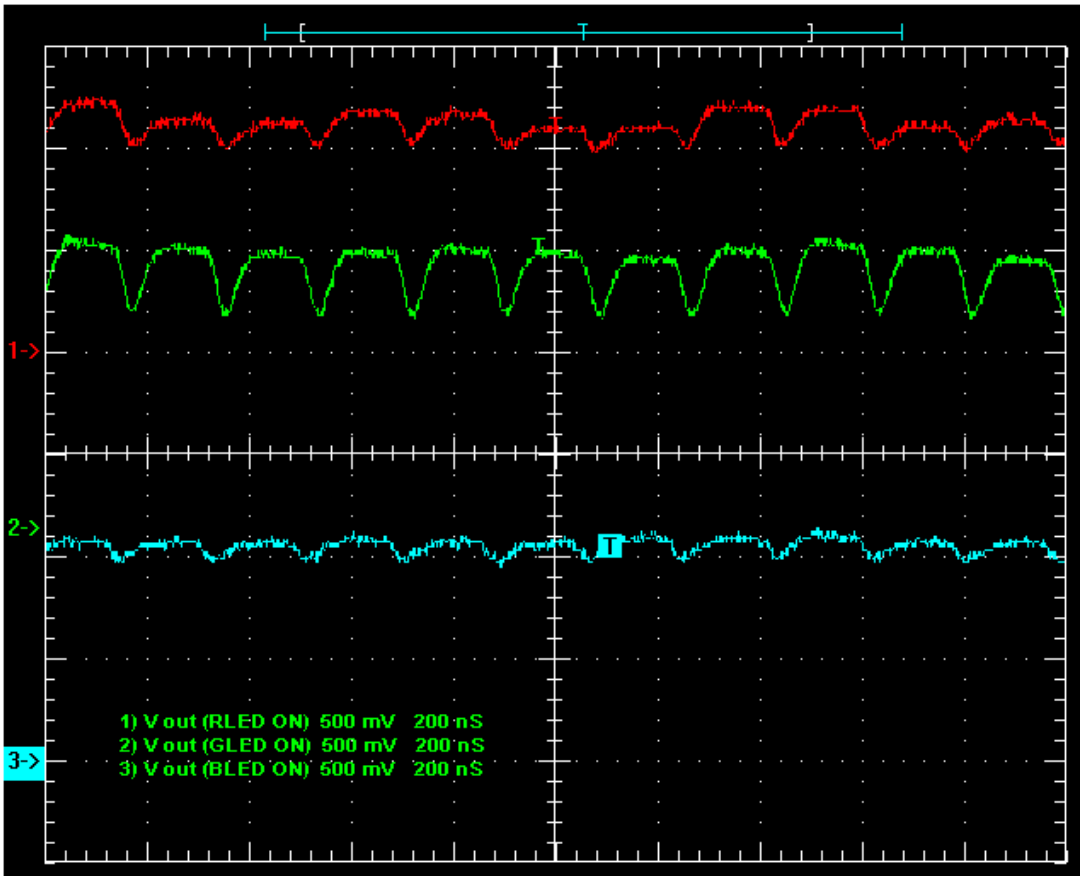
52. The Oki MB472 includes a line image sensor for receiving light from the optical means and generating an image signal:



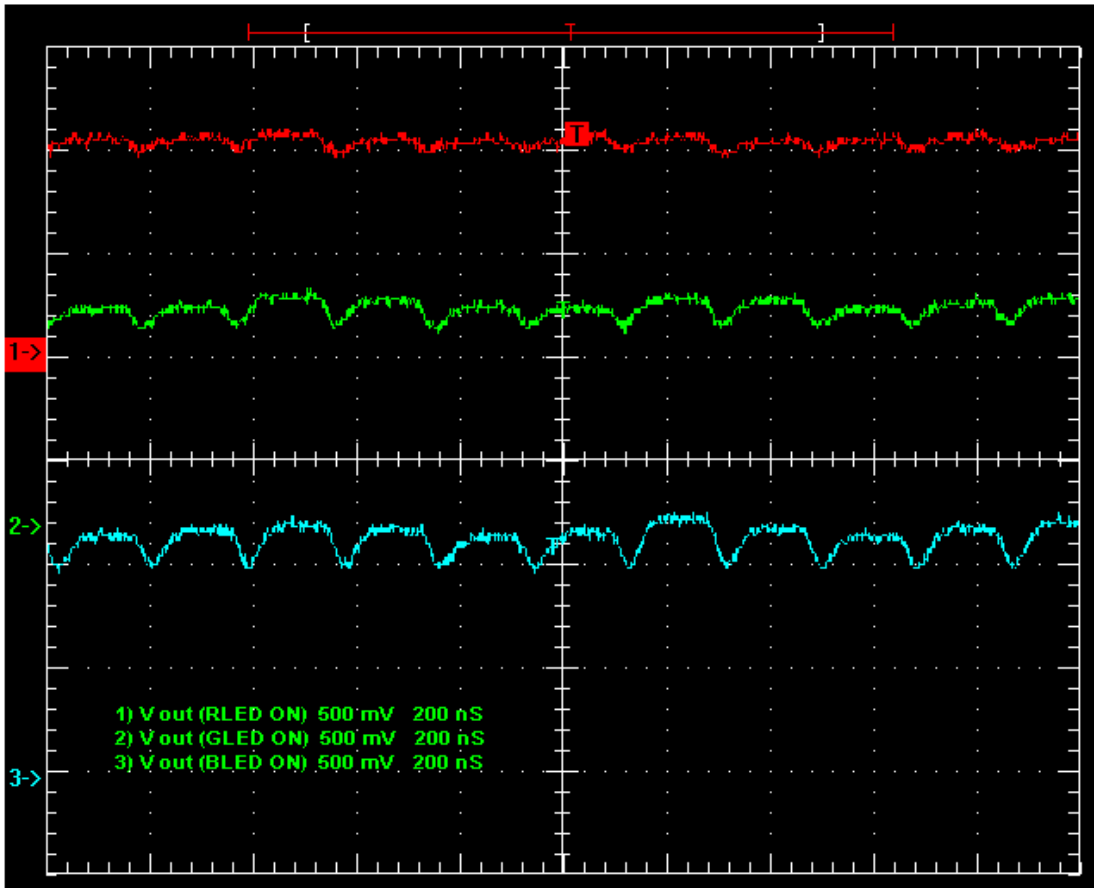
53. The image signal generated by the line image sensor corresponds to the light reflected from the document and the test region. A CIS module output from scanning a Red test pattern at the document region appears as follows:



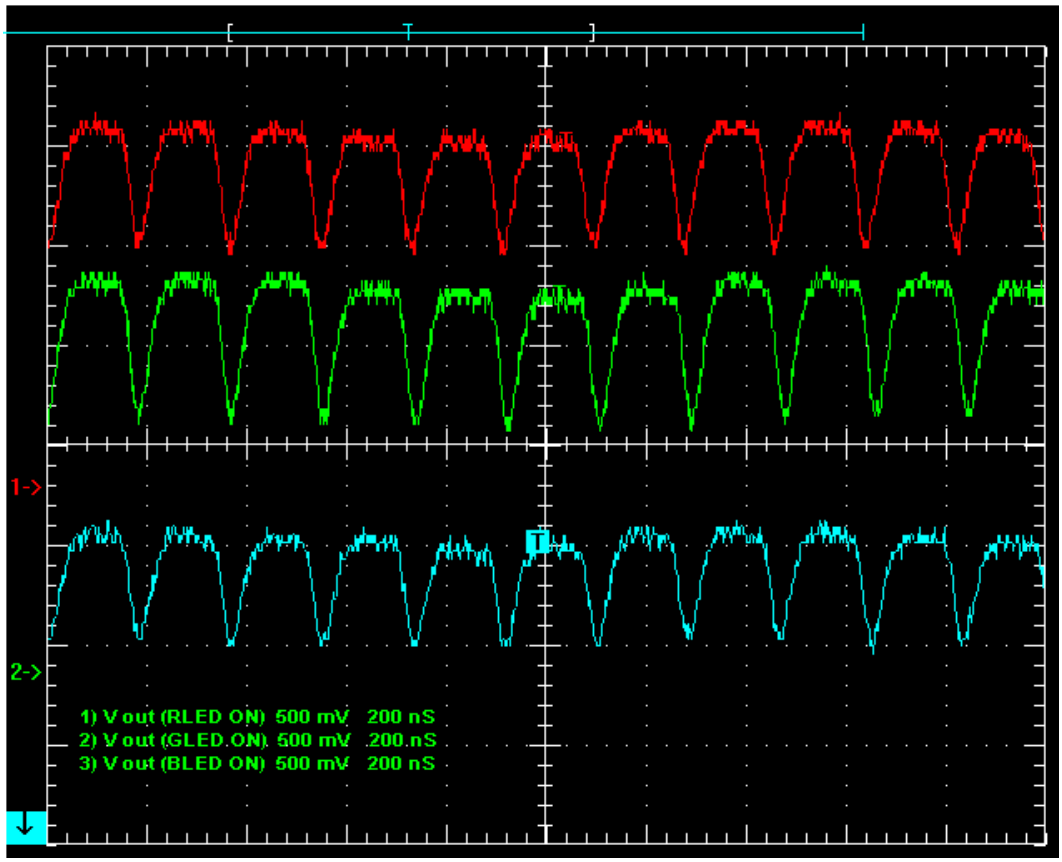
54. A CIS module output from scanning a Green test pattern at the document region appears below:



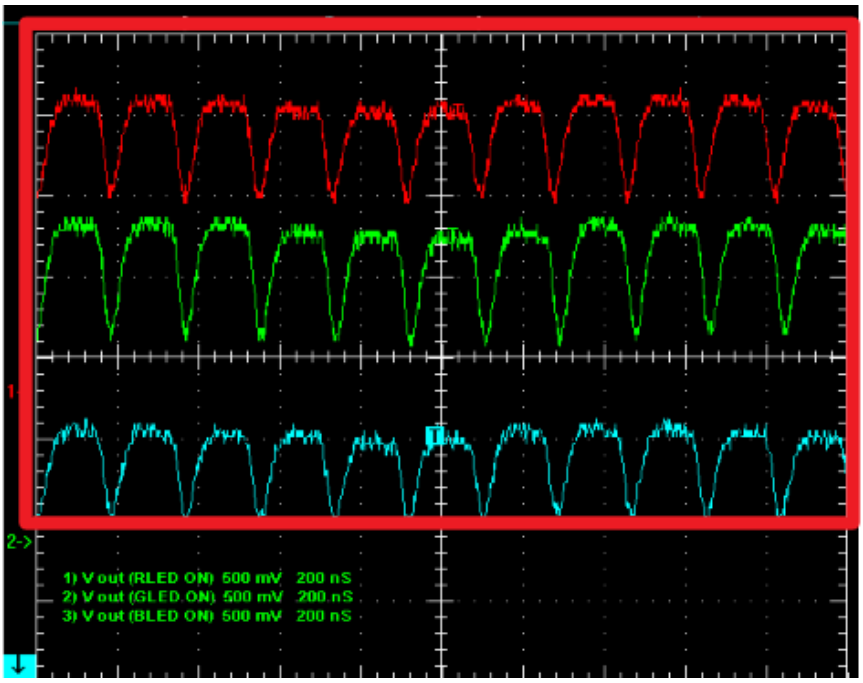
55. A CIS module output from scanning a Blue test pattern at the document region appears below:



56. A CIS module output from scanning the test region appears below:



57. The line image sensor of the CIS module comprises an array of (red, green, blue) (R, G, B) sensing elements for converting the light received from the optical means into an array of corresponding (R, G, B) signals. The measured CIS module output illustrated below shows the RGB signals (red rectangle added for clarity):



58. Both the image signal and the brightness signals generated by the line image sensor are formed by an array of RGB signals. As shown above, the image and brightness signals generated by the line image sensor of the Oki MB472 include isolatable signals from the RGB signal array.

59. The Oki MB472 includes a signal compensation circuit for amplifying the image signals according to the brightness signal to compensate the instability of the light source:

60. The Texas Instruments VSP5610 16-Bit, 4-Channel, CCD/CMOS Sensor Analog Front-End with Timing Generator chip is an analog to digital converter that is operable to adjust the offset level of an analog input signal and includes a programmable gain to support pixel level inflection (e.g., light source instability) caused by luminance:

DESCRIPTION

The VSP5610/11/12 are high-speed, high-performance, 16-bit analog-to-digital-converters (ADCs) that have four independent sampling circuit channels for multi-output charge-coupled device (CCD) and complementary metal oxide semiconductor (CMOS) line sensors. Pixel data from the sensor are sampled by the sample/hold (SH) or correlated double sampler (CDS) circuit, and are then converted to digital data by an ADC. Data output is selectable in low-voltage differential signaling (LVDS) or CMOS modes.

The VSP5610/11/12 include a programmable gain to support the pixel level inflection caused by luminance. The integrated digital-to-analog-converter (DAC) can be used to adjust the offset level for the analog input signal. Furthermore, the timing generator (TG) is integrated in these devices for the control of sensor operation.

See http://www.ti.com/product/VSP5610 (last accessed Oct. 1, 2017).

61. The signal compensation circuit includes a A/D (i.e., analog to digital) converter (i.e., ADC) for digitizing the RGB signals of the image signal and the brightness signal:

FUNCTIONAL BLOCK DIAGRAM

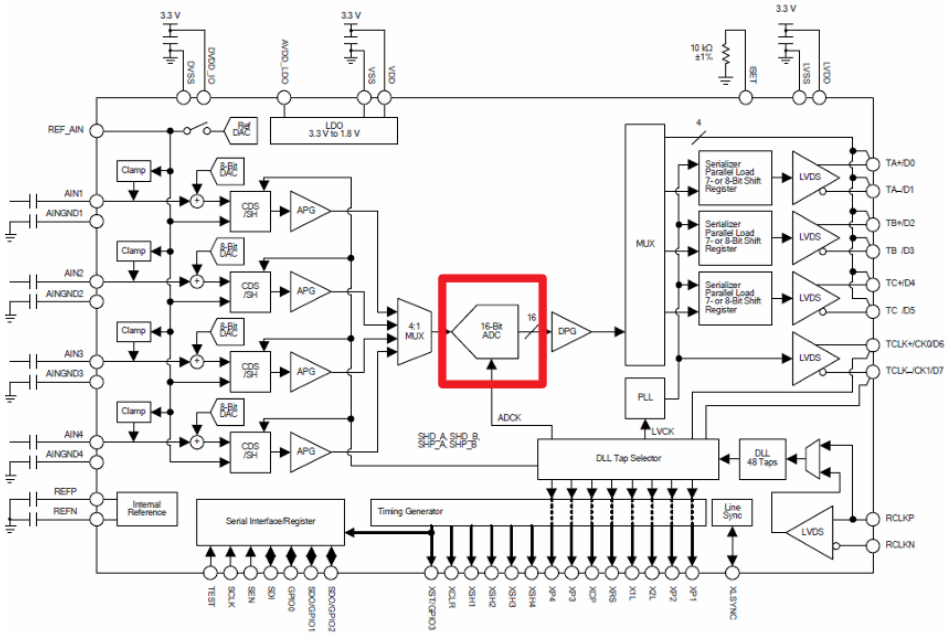


Figure 3. VSP5610/11/12 Block Diagram

Id. (red rectangle added for clarity)

62. The signal compensation circuit includes a digital processor for adjusting the digitized RGB signals of the image signal according to the digitized RGB signals of the brightness signal:

FUNCTIONAL BLOCK DIAGRAM

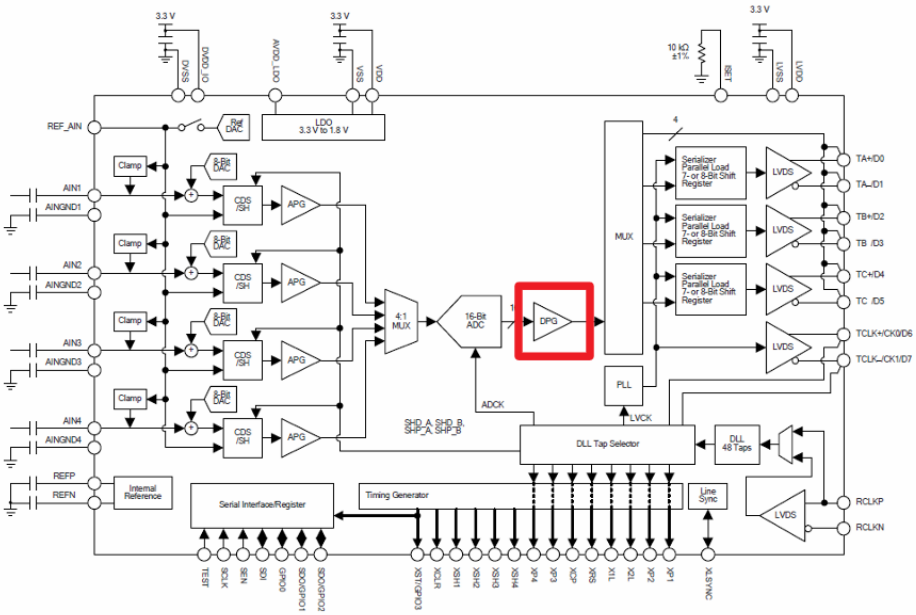


Figure 3. VSP5610/11/12 Block Diagram

Id. (red rectangle added for clarity)

63. The Digital Programmable Gain unit is operable to modify the brightness and image signals generated by the CIS module.

DIGITAL PROGRAMMABLE GAIN (DPG)

The VSP5610/11/12 provide a maximum digital gain of 2 V/V. The total gain is fixed by the combination of CDS/SH analog gain (APG) and digital gain (DPG). DPG is controlled by an 8-bit internal register (DPG_x) that can set the gain from 1 V/V to 2 V/V, as defined by Equation 2. This register is included in each of the four channels, so the gain of each channel can be set independently.

Figure 14 shows the relationship between the digital gain and register code. Note that the default value is 1 V/V.

$$\text{DPG (V/V)} = \frac{1}{256} \times \text{Code} + 1 \qquad \text{(Code = 0 LSB to 255 LSB)} \qquad (2)$$

Id. at p. 26 (blue font in original).

64. Thus, the Oki MB472 includes every element of Claim 1 of the ’432 Patent.

65. Diversified Observation is entitled to recover from Oki the damages sustained by Diversified Observation as a result of Oki's infringement of the ’432 patent in an amount subject to proof at trial, which, by law, cannot be less than a reasonable royalty, together with interest and costs as fixed by this Court under 35 U.S.C. §284.

JURY DEMAND

Diversified Observation hereby demands a trial by jury on all issues so triable.

PRAYER FOR RELIEF

WHEREFORE, Diversified Observation requests that this Court enter judgment against Oki as follows:

A. An adjudication that Oki has infringed the ’133, ’461, and ’432 patents;

B. An award of damages to be paid by Oki adequate to compensate Diversified Observation for Oki's past infringement of the ’133 patent, including interest, costs, expenses and an accounting of all infringing acts including, but not limited to, those acts not presented at trial;

C. An award of damages to be paid by Oki adequate to compensate Diversified Observation for Oki’s past infringement of the ’461 and ’432 patents and any continuing or future infringement through the date such judgment is entered, including interest, costs, expenses and an accounting of all infringing acts including, but not limited to, those acts not presented at trial;

D. A declaration that this case is exceptional under 35 U.S.C. § 285, and an award of Diversified Observation's reasonable attorneys' fees; and

E. An award to Diversified Observation of such further relief at law or in equity as the Court deems just and proper.

Dated: October 7, 2017

STAMOULIS & WEINBLATT LLC

/s/ Stamatios Stamoulis

Stamatios Stamoulis #4606
Richard C. Weinblatt #5080
Two Fox Point Centre
6 Denny Road, Suite 307
Wilmington, DE 19809
Telephone: (302) 999-1540
stamoulis@swdelaw.com
weinblatt@swdelaw.com

Jeffrey G. Toler (Pro Hac Vice motion to be filed)
Craig S. Jepson (Pro Hac Vice motion to be filed)
Benjamin R. Johnson (Pro Hac Vice motion to be filed)
TOLER LAW GROUP, PC
8500 Bluffstone Cove
Suite A201
Austin, TX 78759
Telephone: (512) 327-5515
jtoler@tlgiplaw.com
cjepson@tlgiplaw.com
bjohnson@tlgiplaw.com

Attorneys for Plaintiff
Diversified Observation LLC