

**UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF TEXAS
DALLAS DIVISION**

RANGING OPTICS LLC,

Plaintiff

v.

**GOOD SPORTSMAN MARKETING,
L.L.C.,**

Defendants

Case No. 3:21-cv-1405

JURY TRIAL DEMANDED

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Ranging Optics LLC (“Ranging Optics” or “Plaintiff”) hereby asserts the following claims for patent infringement against Defendants Good Sportsman Marketing, L.L.C. (“GSM” or “Defendant”), and alleges as follows:

SUMMARY

1. Ranging Optics owns United States Patent Nos. 6,512,574 (“the ‘574 patent”) and 7,443,927 (“the ‘927 patent”) (collectively, the “Asserted Patents”).
2. Defendant has infringed and continues to infringe at least one or more claims of each of Ranging Optic’s Asserted Patents at least by making, using, selling, and/or offering to sell a number of its laser range finder products including, *inter alia*, the Halo Optics XL600 Laser Rangefinder (collectively, the “Accused Product”).
3. By this action, Ranging Optics seeks to obtain compensation for the harm Ranging Optics has suffered as a result of Defendants’ infringement of the Asserted Patents.

NATURE OF THE ACTION

4. This is a civil action for patent infringement arising under the patent laws of the United States, 35 U.S.C. § 1 *et seq.*

5. Defendants have infringed and continue to infringe at least one or more claims of each of Ranging Optic's Asserted Patents at least by making, using, selling, and/or offering to sell its products and services in the United States, including in this District.

6. Ranging Optics is the legal owner by assignment of the Asserted Patents, which were duly and legally issued by the United States Patent and Trademark Office ("USPTO"). Ranging Optics seeks monetary damages for Defendants' infringement of the Asserted Patents.

THE PARTIES

7. Plaintiff Ranging Optics LLC is a Texas limited liability company with its principal place of business at 17330 Preston Road Ste 200, Dallas, TX 75252. Ranging Optics is the owner of intellectual property rights at issue in this action.

8. Upon information and belief, GSM is a limited liability company organized and existing under the laws of Texas, with a principal place of business at 5250 Frye Road, Irving, Texas 75061.

9. On information and belief, GSM owns and directs or controls the Halo Optics brand. It was recently announced that GSM purchased WGI Innovation and the Halo Optics brands from Pure Fishing Inc, <https://www.prnewswire.com/news-releases/gridiron-capital-backed-gsm-outdoors-acquires-plano-synergys-hunting-and-archery-brands-from-pure-fishing-301272710.html>. GSM's website lists Halo Optics as one of its brands, <https://www.gsmoutdoors.com/>.

10. On information and belief, Defendant directly and/or indirectly develop, design,

manufacture, distribute, market, offer to sell and/or sell infringing products and services in the United States, including in the Northern District of Texas, and otherwise direct infringing activities to this District in connection with its products and services.

JURISDICTION AND VENUE

11. As this is a civil action for patent infringement arising under the patent laws of the United States, 35 U.S.C. § 1 *et seq.*, this Court has subject matter jurisdiction over the matters asserted herein under 28 U.S.C. §§ 1331 and 1338(a).

12. This Court has personal jurisdiction over Defendant because, on information and belief, GSM and Halo Optics, conducts regular and substantial business in Texas, including operating and directing its business through the GSM headquarters location in Irving, Texas. GSM has committed acts within this state that give rise to this suit, including importing, making, using, offering to sell, and selling infringing products such as those identified in this Complaint. At a minimum, GSM places products, including infringing products such as the one identified in this Complaint, into the stream of commerce knowing and intending that such products will be used, sold, or offered for sale within this state. Exercising personal jurisdiction over GSM is appropriate and reasonable under the circumstances.

13. Venue is proper in this District under the provisions of 28 U.S.C. §§ 1391 and 1400(b) at least because a substantial part of the events or omissions giving rise to the claims occurred in this District, and because Defendants have committed acts of infringement in this District. Furthermore, Defendants have a regular and established place of business in the District, including through the GSM headquarters located at 5250 Frye Road, Irving, Texas 75061.

The '574 Patent

14. U.S. Patent No. 6,512,574 (“the ‘574 Patent”) is titled “Light Receiving Circuit of

Laser Range Finder,” and was issued on January 28, 2003. A true and correct copy of the ‘574 Patent is attached as Exhibit A.

15. The ‘574 Patent was filed on February 12, 2001 as U.S. Patent Application No. 09/780,364.

16. Ranging Optics is the owner of all rights, title, and interest in and to the ‘574 Patent, with the full and exclusive right to bring suit to enforce the ‘574 Patent, including the right to recover for past infringement.

17. The ‘574 Patent is valid and enforceable under United States Patent Laws.

18. The ‘574 Patent disclosed, among other things, “a light receiving circuit of a laser range finder comprising a photo-sensitive element, a conversion resistance amplifying loop, and main amplification loop, and a one short circuit.” Ex. A at Abstract.

19. The ‘574 Patent recognized various shortcomings of existing range finder device. As one example, traditional laser range funders employed a pulse type of the laser transmitter to transmit short laser pulses of about 20 nanoseconds onto a target. *Id.* at 1:12-15. “The reflected laser signal from the target is received by employing a low noise high sensitivity laser received to evaluate the distance” using a mathematical formula which includes calculating the time delay. *Id.* at 1:15-20. However, noise may interfere with the calculation of the time delay and noise increases as the distance measured increases. To overcome the problems in the prior art, the ‘574 Patent discloses “a light receiving receiver with a bias stabilized main amplifier followed by a one-shot circuit to get a digital output signal with fixed pulse width.” *Id.* at 1:42-45. This novel apparatus provides a function of maximum sensitivity for the laser receiving circuit, therefore increasing the ranging distance of the laser range finger.

20. Defendant has had actual constructive notice of the ‘574 Patent no later than

October 21, 2020 when Plaintiff informed Halo Optics of the '574 Patent. Defendant's infringement of the '574 Patent was willful and deliberate, entitling Plaintiff to enhanced damages.

The '927 Patent

21. U.S. Patent No. 7,443,927 ("the '927 Patent") is titled "Signal Detector," and was issued on October 28, 2008. A true and correct copy of the '927 Patent is attached as Exhibit B.

22. The '927 Patent was filed on June 12, 2007 as U.S. Patent Application No. 11/761,439.

23. Ranging Optics is the owner of all rights, title, and interest in and to the '927 Patent, with the full and exclusive right to bring suit to enforce the '927 Patent, including the right to recover for past infringement.

24. The '927 Patent is valid and enforceable under United States Patent Laws.

25. The '927 Patent discloses, among other things, "a signal detector compris[ing] a signal translator, a data signal detector, a clock signal detector and an inputting control circuit for detecting abnormal clock and data signals." Ex. B at Abstract.

26. The '927 Patent recognized various shortcomings of existing types of "[signal] detectors in the market for various uses, such as fire warning, anti-theft, quantity surveying and so on..." *Id.* at 1:16-18. These signal detection devices detect conditions such as temperature, pressure or light and send out a warning signal. *Id.* at 1:18-20. However, once a clock signal is interrupted during a transmission, the whole course of transmission is interrupted as well without any warning. *Id.* at 1:21-25. These interruptions cause delays in time and transmission, thereby wasting valuable resources. *Id.* at 1:26-27. Furthermore, if a short circuit or some other factor causes the system, to continuously output a series of data signals, the abnormal data transmission may cause the transmission facility as well as the laser to become overly exhausted or break down.

Id. at :28-32.

27. The '927 provided a solution to this problem by among other things, providing a novel signal detector comprising a signal translator, a data signal detector and an inputting control circuit. *Id.* at 1:38-40. The signal translator converts differential data signals into a single data signal and the data signal detector outputs a data detecting signal according to the signal data signal. *Id.* at 1:4-43. The '927 Patent further utilized an interrupting control circuit which receives the data detecting signal and outputs a shutdown signal when the single data signal is at a high voltage level over a predefined ratio. *Id.* at 1:43-46.

28. Defendant has had actual constructive notice of the '927 Patent no later than October 21, 2020 when Plaintiff informed Halo Optics of the '927 Patent. Defendant's infringement of the '927 Patent was and continues to be willful and deliberate, entitling Plaintiff to enhanced damages.

COUNT I: INFRINGEMENT OF U.S. PATENT NO. 6,512,574

29. Ranging Optics incorporates by reference and re-alleges paragraphs 16-21 of this Complaint as if fully set forth herein.

30. Defendants have infringed, either literally or under the doctrine of equivalents, the '574 Patent in violation of 35 U.S.C. § 271 *et seq.*, directly and/or indirectly, by making, using, offering for sale, or selling in the United States, and/or importing into the United States without authority or license the Accused Product.

31. As just one non-limiting example, set forth below (with claim language in bold and italics) is exemplary evidence of infringement of Claim 7 of the '574 Patent in connection with the Accused Product. This description is based on publicly available information. Ranging Optics reserves the right to modify this description, including, for example, on the basis of information

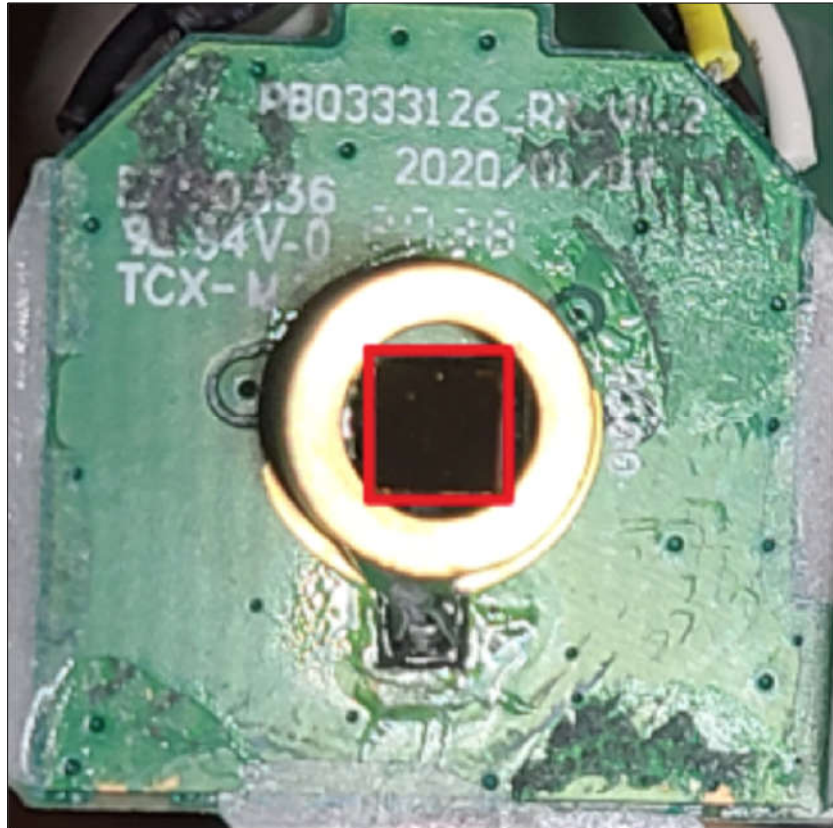
about the Accused Product that it obtains during discovery.

32. **7(a).** *A light receiving circuit of a laser range finder, said light receiving circuit comprising*—Defendants made, used, sold, and/or offered to sell a device or system that is covered by the apparatus in accordance with Claim 7.

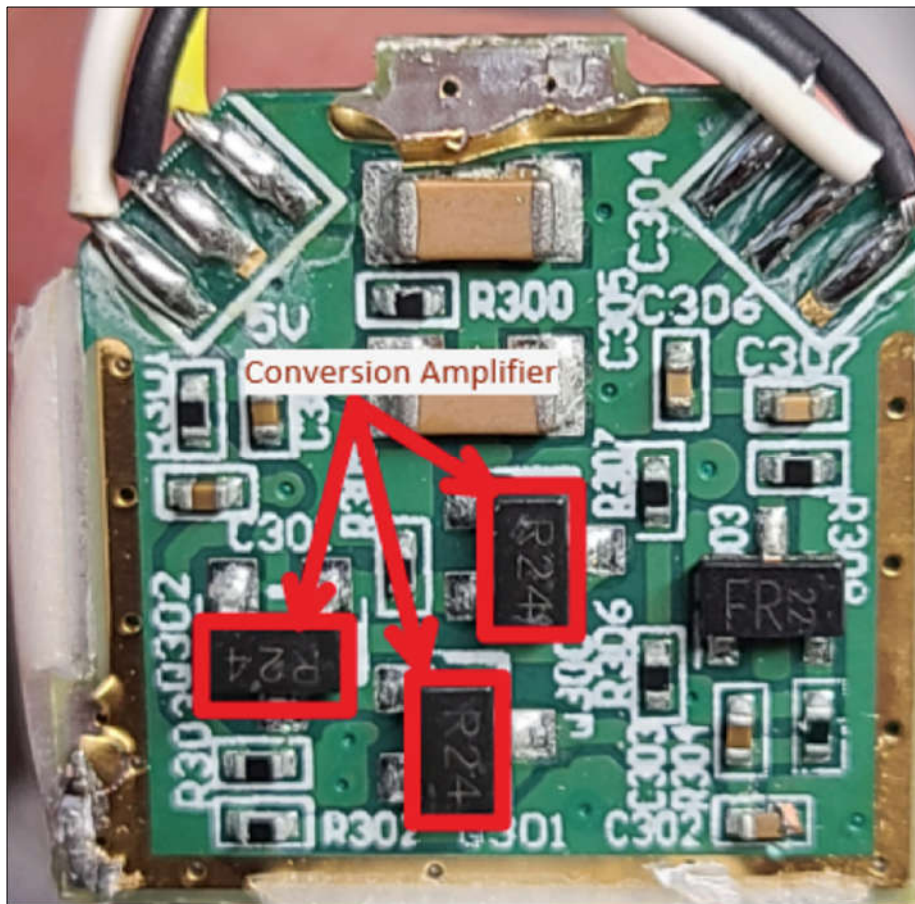
For instance, the Halo Optics XL600 Laser Rangefinder houses a light receiving circuit.



7(b): *a photosensitive element for converting a light signal into a current signal;*—Defendants made, used, sold, and/or offered to sell a device or system that includes a photosensitive element (APD – Avalanche Photodiode).

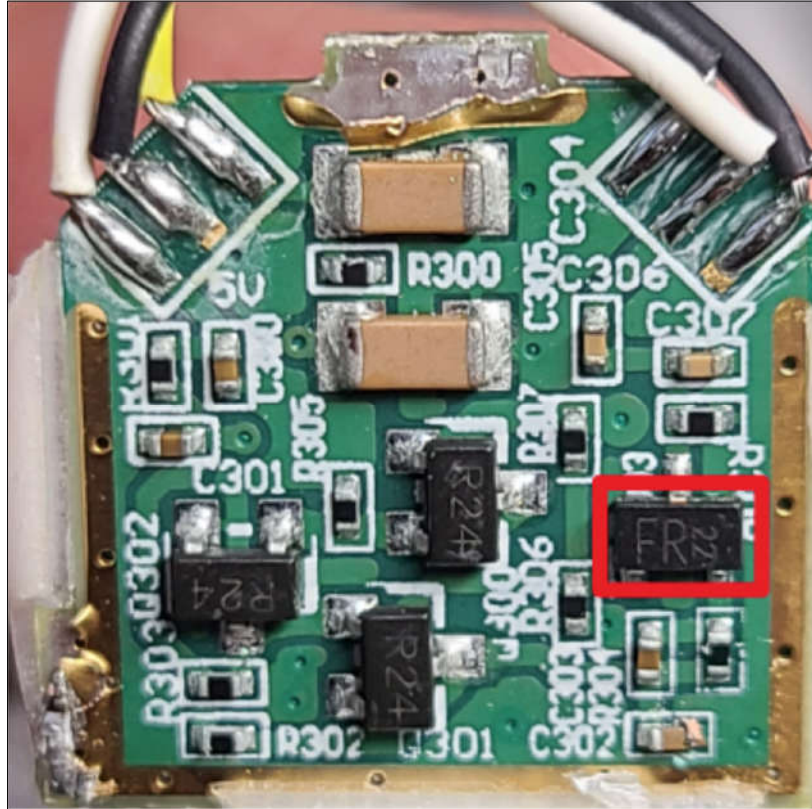


7(c): a conversion amplifier connected with said photosensitive element for converting the current signal outputted from the photosensitive element into a voltage signal;— Defendants made, used, sold, and/or offered to sell a device or system that includes transistors that convert the current signal into a voltage signal.



R24 Transistor

7(d): a main amplifier connected with the conversion amplifier for amplifying the output voltage signal from the conversion amplifier;— Defendants made, used, sold, and/or offered to sell a device or system that includes a main amplifier connected to the conversion amplifier.



ROHM 2SA2029 / 2SA1774EB / 2SA1774
2SA1576UB / 2SA1576U3 / 2SA1037AK
General purpose Transistor (-50V, -150mA) Datasheet

| Parameter | Value |
|------------------|--------|
| V _{CEO} | -50V |
| I _c | -150mA |

●Features
 1)Excellent h_{FE} linearity.
 2)Complements the 2SC5658/2SC4617EB/
 2SC4617/2SC4081UB/2SC4081U3/2SC2412K

●Application
 GENERAL PURPOSE SMALL SIGNAL
 AMPLIFIER

●Outline


| | |
|------------------------------------|---------------------------------------|
| SOT-723 2SA2029 (VMT3) | SOT-416FL 2SA1774EB (EMT3F) |
| SOT-416 2SA1774 (EMT3) | SOT-323FL 2SA1576UB (UMT3F) |
| SOT-323 2SA1576U3 (UMT3) | SOT-346 2SA1037AK (SMT3) |

<https://fscdn.rohm.com/en/products/databook/datasheet/discrete/transistor/bipolar/2sa1576u3t106r-e.pdf>

7(e): a one-shot circuit connected with the main amplifier for shaping the output voltage

signal from the main amplifier into a digital signal by which the range-finding computation is attained by the laser range finder;— Defendants made, used, sold, and/or offered to sell a device or system that includes a one-shot circuit which includes a comparator. The comparator utilizes the voltage signal from the main amplifier to generate a digital signal (e.g. compares the incoming voltage signal with a stable input signal to generate a digital output).



| | |
|--|---|
|  TEXAS INSTRUMENTS | ADC08060 |
| www.ti.com | SNAS120H – OCTOBER 2000 – REVISED MARCH 2013 |
| ADC08060 8-Bit, 20 MSPS to 60 MSPS, 1.3 mW/MSPS A/D Converter with Internal Sample-and-Hold | |
| Check for Samples: ADC08060 | |
| <p>FEATURES</p> <ul style="list-style-type: none"> • Single-Ended Input • Internal Sample-and-Hold Function • Low Voltage (Single +3V) Operation • Small Package • Power-Down Feature <p>KEY SPECIFICATION</p> <ul style="list-style-type: none"> • Resolution: 8 bits • Maximum Sampling Frequency: 60 MSPS (min) • DNL: 0.4 LSB(typ) • ENOB 7.5bits (typ) at $f_{IN} = 25$ MHz • THD: -60 dB (typ) • Power Consumption <ul style="list-style-type: none"> – Operating: 1.3 mW/MSPS (typ) – Power Down Mode: 1 mW (typ) <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Digital Imaging Systems • Communication Systems • Portable Instrumentation • Viterbi Decoders • Set-Top Boxes | <p>DESCRIPTION</p> <p>The ADC08060 is a low-power, 8-bit, monolithic analog-to-digital converter with an on-chip track-and-hold circuit. Optimized for low cost, low power, small size and ease of use, this product operates at conversion rates of 20 MSPS to 70 MSPS with outstanding dynamic performance over its full operating range while consuming just 1.3 mW per MHz of clock frequency. That's just 78 mW of power at 60 MSPS. Raising the PD pin puts the ADC08060 into a Power Down mode where it consumes just 1 mW.</p> <p>The unique architecture achieves 7.5 Effective Bits with 25 MHz input frequency. The excellent DC and AC characteristics of this device, together with its low power consumption and single +3V supply operation, make it ideally suited for many imaging and communications applications, including use in portable equipment. Furthermore, the ADC08060 is resistant to latch-up and the outputs are short-circuit proof. The top and bottom of the ADC08060's reference ladder are available for connections, enabling a wide range of input possibilities. The digital outputs are TTL/CMOS compatible with a separate output power supply pin to support interfacing with 3V or 2.5V logic. The output coding is straight binary and the digital inputs (CLK and PD) are TTL/CMOS compatible.</p> <p>The ADC08060 is offered in a 24-lead TSSOP package and is specified over the industrial temperature range of -40°C to +85°C.</p> |

<https://www.ti.com/lit/ds/symlink/adc08060.pdf>

FUNCTIONAL DESCRIPTION

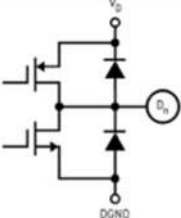
The ADC08060 uses a new, unique architecture that achieves over 7.4 effective bits at input frequencies up to 30 MHz.

The analog input signal that is within the voltage range set by V_{RT} and V_{RB} is digitized to eight bits. Output format is straight binary. Input voltages below V_{RB} will cause the output word to consist of all zeroes. Input voltages above V_{RB} will cause the output word to consist of all ones.

Incorporating a switched capacitor bandgap, the ADC08060 exhibits a power consumption that is proportional to frequency, limiting power consumption to what is needed at the clock rate that is used. This and its excellent performance over a wide range of clock frequencies makes it an ideal choice as a single ADC for many 8-bit needs.

Data is acquired at the falling edge of the clock and the digital equivalent of that data is available at the digital outputs 2.5 clock cycles plus t_{OD} later. The ADC08060 will convert as long as the clock signal is present. The output coding is straight binary.

The device is in the active state when the Power Down pin (PD) is low. When the PD pin is high, the device is in the power down mode, where the output pins hold the last conversion before the PD pin went high and the device consumes just 1 mW.

| | | | |
|--|--------------|---|---|
| <p>13 thru 16 and 19 thru 22</p> | <p>D0-D7</p> |  | <p>Conversion data digital Output pins. D0 is the LSB, D7 is the MSB. Valid data is output just after the rising edge of the CLK input.</p> |
|--|--------------|---|---|

<https://www.ti.com/lit/ds/symlink/adc08060.pdf>

The digital signal is then sent to the logic chip (e.g. Gowin GW1NZ), which performs the range finding computation.



3.2 Configurable Function Unit

The configurable function unit and the configurable logic unit are two basic units for FPGA core of GOWINSEMI. As shown in Figure 3-2, each unit consists of four configurable logic sections and its configurable routing unit. Each of the three configurable logic sections contains two 4-input LUTs and two registers, and the other one only contains two 4-input LUTs.

Configurable logical sections in CLU cannot be configured as SRAM, but as basic logic, ALU, and ROM. The configurable logic sections in the CFU can be configured as basic logic, ALU, SRAM, and ROM depending on the applications. This section takes CFU as an example to introduce CFU and CLU.

3.2.1 CLU

The CLU supports three operation modes: Basic logic mode, ALU mode, and ROM mode.

- Basic Logic Mode

Each LUT can be configured as one four-input LUT. Higher input number of LUT can be formed by combining the LUT4 together.

- Each CLS can form one five-input LUT5.
- Two CLSs can form one six-input LUT6.
- Four CLSs can form one seven-input LUT7.
- Eight CLSs (two CLUs) can form one eight-input LUT8.

- ALU Mode

When combined with carry chain logic, the LUT can be configured as the ALU mode to implement the following functions.

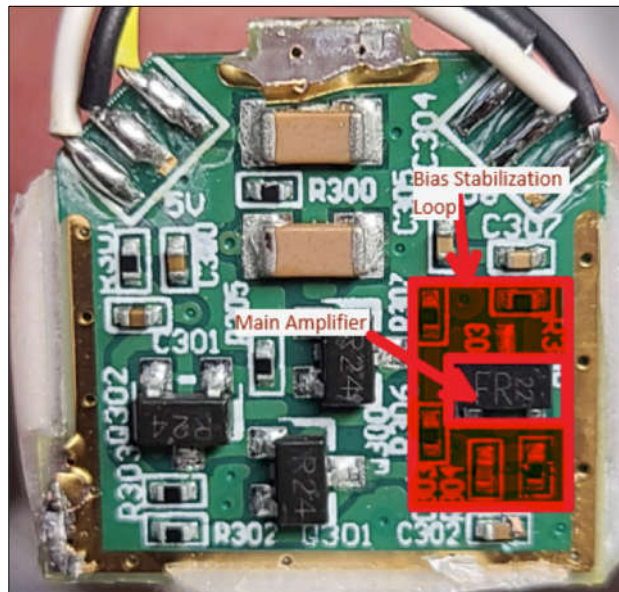
- Adder and subtractor
- Up/down counter
- Comparator, including greater-than, less-than, and not-equal-to
- MULT

- Memory mode

In this mode, a 16 x 4 S-SRAM or ROM can be constructed by using

https://www.gowisemi.com/upload/database_doc/401/document/6054519b2930b.pdf

7(f): *wherein said main amplifier is a bias stabilized amplifier.*— Defendants made, used, sold, and/or offered to sell a device or system that includes the main amplifier as a bias stabilized amplifier (e.g. The main amplifier is connected to a plurality of capacitors and resistors, which bias-stabilize the input current.)



33. Ranging Optics is in compliance with any applicable marking and/or notice provisions of 35 U.S.C. § 287 with respect to the '574 Patent.

34. Ranging Optics is entitled to recover from Defendants all damages that Ranging Optics has sustained as a result of Defendants' infringement of the '574 Patent, including, without limitation, a reasonable royalty.

COUNT II: INFRINGEMENT OF U.S. PATENT NO. 7,443,927

35. Ranging Optics incorporates by reference and re-alleges paragraphs 22-28 of this Complaint as if fully set forth herein.

36. Defendants have infringed and are infringing, either literally or under the doctrine of equivalents, the '927 Patent in violation of 35 U.S.C. § 271 et seq., directly and/or indirectly, by making, using, offering for sale, or selling in the United States, and/or importing into the United States without authority or license the Accused Product.

37. As just one non-limiting example, set forth below (with claim language in bold and italics) is exemplary evidence of infringement of Claim 1 of the '927 Patent in connection with the Accused Product. This description is based on publicly available information. Ranging Optics reserves the right to modify this description, including, for example, on the basis of information about the Accused Product that it obtains during discovery.

38. ***1(a): A signal detector, comprising:***—Defendants make, use, sell, and/or offer to sell a signal detector (e.g. the Accused Product detects an incoming light signal)






1(b): a signal translator converting differential data signals into a single data signal:—

Defendants make, use, sell, and/or offer to sell a device or system that includes a signal translator (e.g. ADC08060 A/D converter) operable to convert differential data signals into a signal data signal.




ADC08060

www.ti.com SNAS120H – OCTOBER 2000 – REVISED MARCH 2013

ADC08060 8-Bit, 20 MSPS to 60 MSPS, 1.3 mW/MSPS A/D Converter with Internal Sample-and-Hold

Check for Samples: [ADC08060](#)

FEATURES

- Single-Ended Input
- Internal Sample-and-Hold Function
- Low Voltage (Single +3V) Operation
- Small Package
- Power-Down Feature

KEY SPECIFICATION

- Resolution: 8 bits
- Maximum Sampling Frequency: 60 MSPS (min)
- DNL: 0.4 LSB(typ)
- ENOB 7.5bits (typ) at $f_{IN} = 25$ MHz
- THD: -60 dB (typ)
- Power Consumption
 - Operating: 1.3 mW/MSPS (typ)
 - Power Down Mode: 1 mW (typ)

APPLICATIONS

- Digital Imaging Systems
- Communication Systems
- Portable Instrumentation
- Viterbi Decoders
- Set-Top Boxes

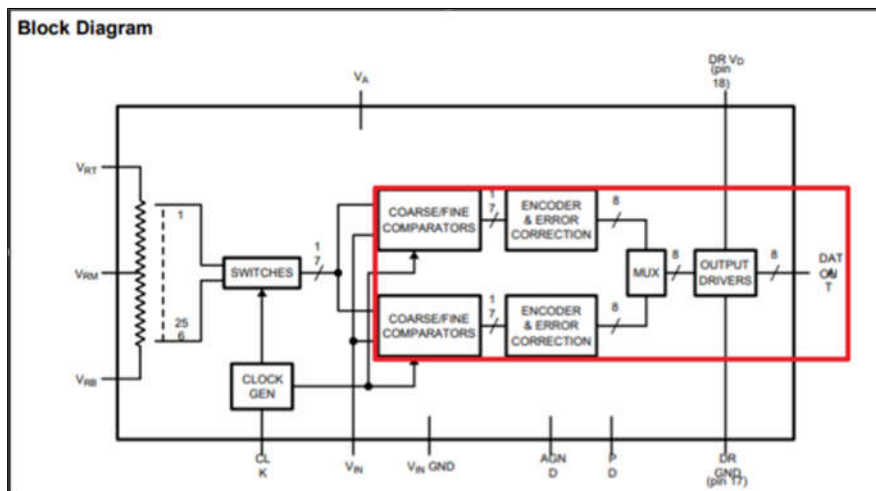
DESCRIPTION

The ADC08060 is a low-power, 8-bit, monolithic analog-to-digital converter with an on-chip track-and-hold circuit. Optimized for low cost, low power, small size and ease of use, this product operates at conversion rates of 20 MSPS to 70 MSPS with outstanding dynamic performance over its full operating range while consuming just 1.3 mW per MHz of clock frequency. That's just 76 mW of power at 60 MSPS. Raising the PD pin puts the ADC08060 into a Power Down mode where it consumes just 1 mW.

The unique architecture achieves 7.5 Effective Bits with 25 MHz input frequency. The excellent DC and AC characteristics of this device, together with its low power consumption and single +3V supply operation, make it ideally suited for many imaging and communications applications, including use in portable equipment. Furthermore, the ADC08060 is resistant to latch-up and the outputs are short-circuit proof. The top and bottom of the ADC08060's reference ladder are available for connections, enabling a wide range of input possibilities. The digital outputs are TTL/CMOS compatible with a separate output power supply pin to support interfacing with 3V or 2.5V logic. The output coding is straight binary and the digital inputs (CLK and PD) are TTL/CMOS compatible.

The ADC08060 is offered in a 24-lead TSSOP package and is specified over the industrial temperature range of -40°C to +85°C.

<https://www.ti.com/lit/ds/symlink/adc08060.pdf>



1(c): a data signal detector outputting a data detecting signal according to the single data signal; and:— Defendants make, use, sell, and/or offer to sell a device or system that includes a data signal detector operable to output a data detecting signal (e.g. Gowin GW1NZ) according to the single data signal (e.g. The comparator output).



3.3.3 I/O Logic Modes

The I/O Logic in the GW1NZ series of FPGA products supports several modes. In each operation, the I/O can be configured as output, input, and INOUT or tristate output (output signal with tristate control).

The GW1NZ-1 pins IOR6 (A,B,C....J) do not support IO logic.

For further information about I/O logic modes, please refer to [UG289_Gowin Programmable IO \(GPIO\) User Guide](#).

https://www.gowinsemi.com/upload/database_doc/401/document/6054519b2930b.pdf

3.2 GPIO Banking

The generic attributes of GPIO are:

- All banks support emulated LVDS differential output using external resistance;
- All banks support pull up, pull down, and bus-keeper settings;
- Each bank supports one kind of pin voltage;
- Each bank supports one reference voltage signal, whether it is from an external pin or from the internal reference voltage generator.

This manual takes GW1N and GW2A series of devices as examples to introduce the GPIO banking of Gowin FPGA products. For other series devices, please refer to the corresponding product datasheet.

<http://cdn.gowinsemi.com.cn/UG289E.pdf>

39. Ranging Optics is in compliance with any applicable marking and/or notice provisions of 35 U.S.C. § 287 with respect to the '927 Patent.

40. Ranging Optics is entitled to recover from Defendants all damages that Ranging Optics has sustained as a result of Defendants' infringement of the '927 Patent, including, without limitation, a reasonable royalty.

PRAYER FOR RELIEF

WHEREFORE, Ranging Optics respectfully requests:

A. That Judgment be entered that Defendants have infringed at least one or more claims of the Asserted Patents, directly and/or indirectly, literally and/or under the doctrine of equivalents;

B. An award of damages sufficient to compensate Ranging Optics for Defendants' infringement under 35 U.S.C. § 284;

C. That the case be found exceptional under 35 U.S.C. § 285 and that Ranging Optics be awarded its reasonable attorneys' fees;

D. Costs and expenses in this action;

E. An award of prejudgment and post-judgment interest; and

F. Such other and further relief as the Court may deem just and proper.

DEMAND FOR JURY TRIAL

Pursuant to Rule 38(b) of the Federal Rules of Civil Procedure, Ranging Optics respectfully demands a trial by jury on all issues triable by jury.

Dated: June 16, 2021

Respectfully submitted,

/s/ Hao Ni

Hao Ni

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