

UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

RANGING OPTICS LLC,

Plaintiff

v.

BASS PRO GROUP, LLC;
CABELA'S LLC., and CABELA'S
WHOLESALE L.L.C.

Defendant

Case No. 6:20-cv-01103

JURY TRIAL DEMANDED

AMENDED COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Ranging Optics LLC (“Ranging Optics” or “Plaintiff”) hereby asserts the following claims for patent infringement against Defendants Bass Pro Group, LLC; Cabela’s LLC, and Cabela’s Wholesale L.L.C. (collectively “Defendants” or “Cabela’s”), and alleges as follows:

SUMMARY

1. Ranging Optics owns United States Patent Nos. 6,512,574 and 7,443,927 (the “Asserted Patents”).
2. Defendants infringe the Asserted Patents by implementing, without authorization, Ranging Optic’s proprietary technologies in a number of its laser range finder products including, *inter alia*, Defendants’ Intensity 1600 Rangefinder (“Accused Products”).

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 continues to infringe at least one or more claims of each of Ranging Optics'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. Bass Pro Group, LLC is a Delaware limited liability company. On information and belief, Bass Pro Group, LLC may be served via its registered agent for service of process: The Corporation Trust Company, 1209 Orange St., Wilmington, DE 19801

9. Cabela's LLC is a Delaware limited liability company. On information and

belief, Cabela's, LLC may be served via its registered agent for service of process: The Corporation Trust Company, 1209 Orange St., Wilmington, DE 19801

10. Cabela's Wholesale, L.L.C. is a Delaware limited liability company. On information and belief, Cabela's, LLC may be served via its registered agent for service of process: The Corporation Trust Company, 1209 Orange St., Wilmington, DE 19801

11. On information and belief, Defendants directly and/or indirectly develops, designs, manufactures, distributes, markets, offers to sell and/or sells infringing products and services in the United States, including in the Western District of Texas, and otherwise directs infringing activities to this District in connection with its products and services.

JURISDICTION AND VENUE

12. 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).

13. In particular, Defendants have committed and continues to commit acts of infringement in violation of 35 U.S.C. § 271, and has made, used, marketed, distributed, offered for sale, sold, and/or imported infringing products in the State of Texas, including in this District, and engaged in infringing conduct within and directed at or from this District. For example, Defendants have purposefully and voluntarily placed the Accused Products into the stream of commerce with the expectation that the Accused Products will be used in this District. The Accused Products have been and continue to be distributed to and used in this District. Defendants' acts cause and have caused injury to Ranging Optics, including within this District.

14. 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 located at 2700 Marketplace Dr, Waco, TX 76711.

The '574 Patent

15. 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 PX-574.

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

17. 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.

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

19. The ‘574 Patent discloses, 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.” PX-574 at Abstract.

20. 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 finder.

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 PX-927.

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.” PX-927 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 cause 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.

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

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

29. Defendants have infringed and are infringing, 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 Products.

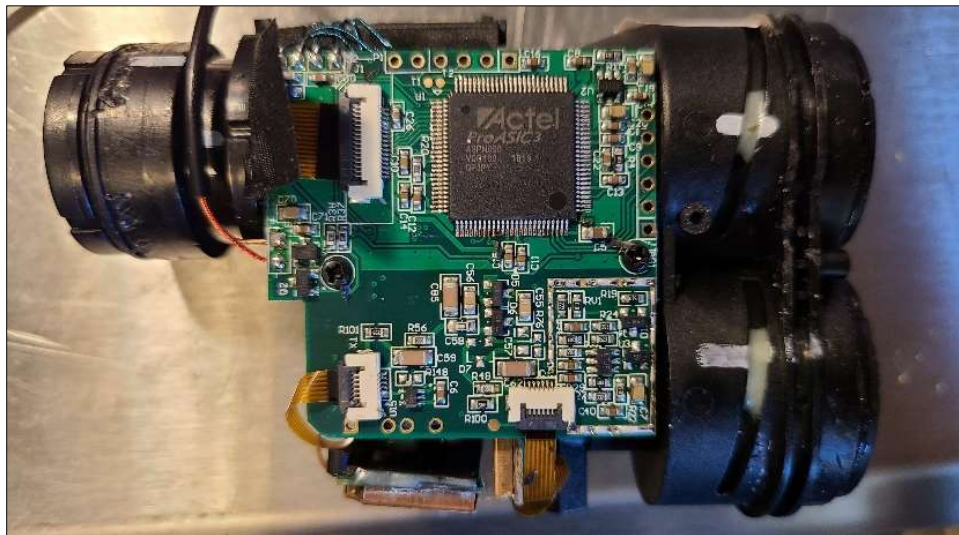
30. As just one non-limiting example, set forth below (with claim language in bold and italics) is exemplary evidence of infringement of Claim 7 of the '574 Patent in connection with the Accused Products. This description is based on publicly available information. Ranging Optics reserves the right to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

31. ***7(a). A light receiving circuit of a laser range finder, said light receiving circuit comprising:***—Defendants make, use, sell, and/or offer to sell a device or system that is covered by the apparatus in accordance with Claim 7.

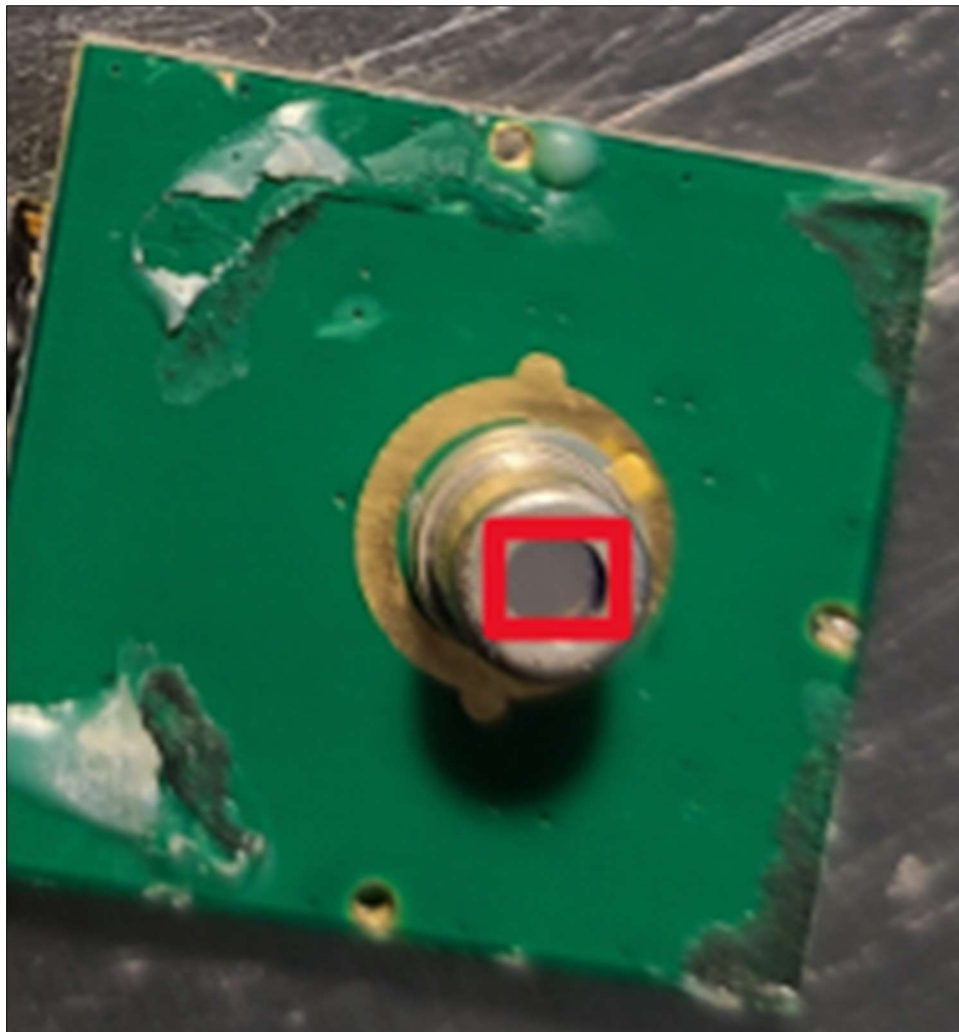
For instance, the Intensity 1600 Rangefinder houses a light receiving circuit.



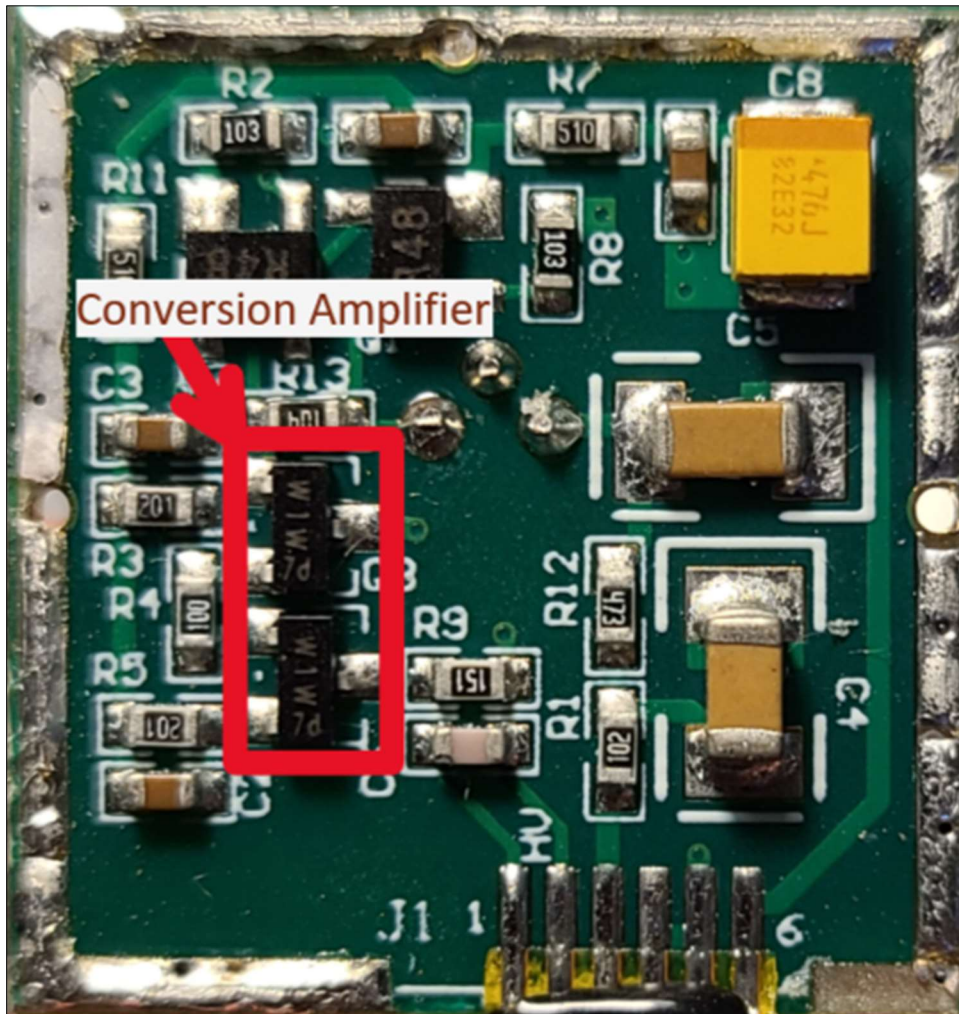
<https://www.cabelas.com/shop/en/cabelas-intensity-1600-rangefinder>



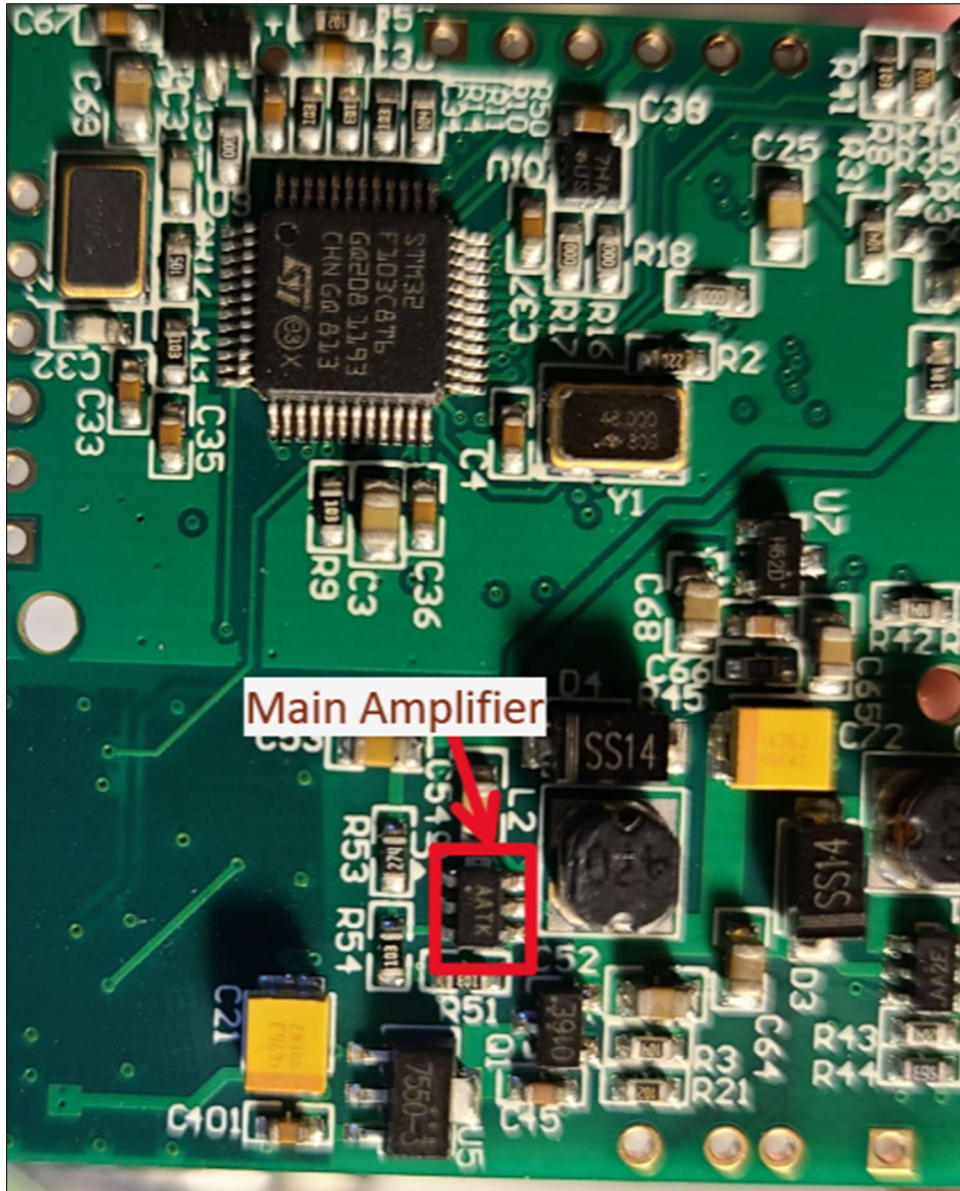
7(b): a photosensitive element for converting a light signal into a current signal;—Defendants make, use, sell, and/or offer to sell a device or system that includes a photosensitive element (APD – Avalanche Photodiode).



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 make, use, sell, and/or offer to sell a device or system that includes transistors that convert the current signal into a voltage signal.



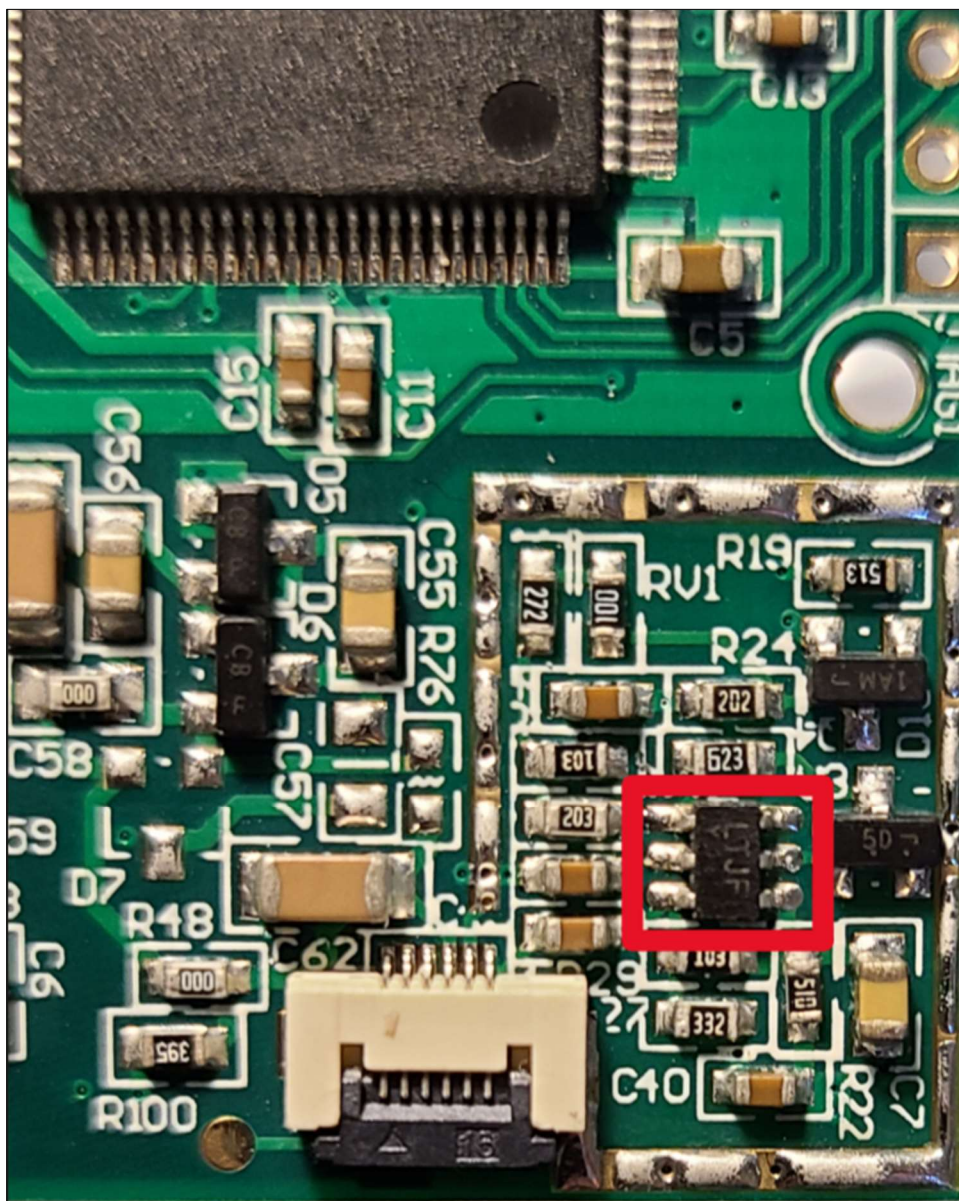
7(d): a main amplifier connected with the conversion amplifier for amplifying the output voltage signal from the conversion amplifier;— Defendants make, use, sell, and/or offer to sell a device or system that includes a main amplifier connected to the conversion amplifier.



The Main Amplifier (Max5026EUT Chip) amplifies the input voltage of an incoming signal.

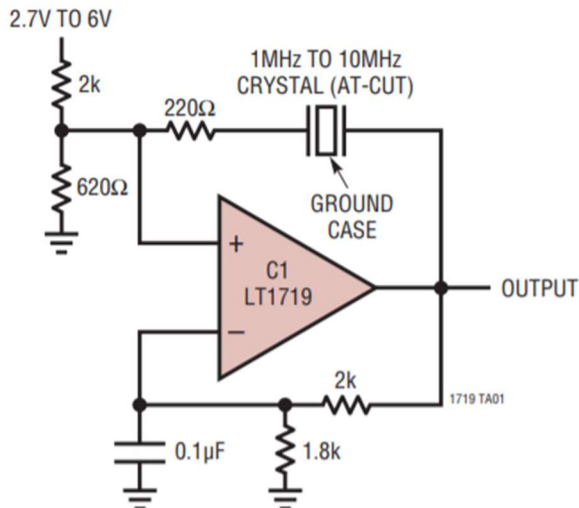
7(e): a one-shot circuit connected with the main amplifier for shaping the output voltage signal from the main amplifier into a digital signal by which the range-finding computation is attained by the laser range finder;— Defendants make, use, sell, and/or offer to sell a device or system that includes 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).



TYPICAL APPLICATION

2.7V to 6V Crystal Oscillator with TTL/CMOS Output



LT1719

APPLICATIONS INFORMATION

Circuit Description

The block diagram of the LT1719 is shown in Figure 7. The circuit topology consists of a differential input stage, a gain stage with hysteresis and a complementary common-emitter output stage. All of the internal signal paths utilize low voltage swings for high speed at low power.

The input stage topology maximizes the input dynamic range available without requiring the power, complexity and die area of two complete input stages such as are found in rail-to-rail input comparators. With a single 2.7V supply, the LT1719 still has a respectable 1.6V of input common mode range. The differential input voltage range is rail-to-rail, without the large input currents found in competing devices. The input stage also features phase reversal protection to prevent false outputs when the inputs are driven below the -100mV common mode voltage limit.

The internal hysteresis is implemented by positive, nonlinear feedback around a second gain stage. Until this point, the signal path has been entirely differential. The signal path is then split into two drive signals for the upper and

lower output transistors. The output transistors are connected common emitter for rail-to-rail output operation. The Schottky clamps limit the output voltages at about 300mV from the rail, not quite the 50mV or 15mV of Linear Technology's rail-to-rail amplifiers and other products. But the output of a comparator is digital, and this output stage can drive TTL or CMOS directly. It can also drive ECL, as described earlier, or analog loads as demonstrated in the applications to follow.

The bias conditions and signal swings in the output stage are designed to turn their respective output transistors off faster than on. This helps minimize the surge of current from $+V_S/V^+$ to ground that occurs at transitions, to minimize the frequency-dependent increase in power consumption. The frequency dependence of the supply current is shown in the Typical Performance Characteristics.

Speed Limits

The LT1719 comparator is intended for high speed applications, where it is important to understand a few limitations. These limitations can roughly be divided into

LT1719

TYPICAL APPLICATION

High Performance Sine Wave to Square Wave Converter

Propagation delay of comparators is typically specified for a 100mV step with some fraction of that for overdrive. But in many signal processing applications, such as in communications, the goal is to convert a sine wave, such as a carrier, to a square wave for use as a timing clock. The desired behavior is for the output timing to be dependent on the input timing only. No phase shift should occur as a function of the input amplitude, which would result in AM to FM conversion.

The circuit of Figure 9a is a simple LT1719S8-based sine wave to square wave converter. The $\pm 5V$ supplies on the input allow very large swing inputs, while the 3V logic supply keeps the output swing small to minimize cross talk. Figure 9b shows the time delay vs input amplitude with a 10MHz sine wave. The LT1719 delay changes just 0.65ns over the 26dB amplitude range; 2.33° at 10MHz. The delay is particularly flat yielding excellent AM rejection

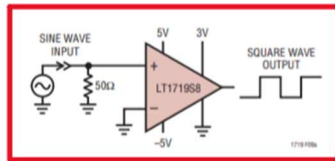


Figure 9a. LT1719-Based Sine Wave to Square Wave Converter

from 0dBm to 15dBm. If a 2:1 transformer is used to drive the input differentially, this exceptionally flat zone spans -5dBm to 10dBm, a common range for RF signal levels.

Similar delay performance is achieved with input frequencies as high as 50MHz. There is, however, some additional encroachment into the central flat zone by both the small amplitude and large amplitude variations.

With small input signals, the hysteresis and dispersion make the LT1719 act like a comparator with a 12mV hysteresis span. In other words, a 12mV_{p-p} sine wave at 10MHz will barely toggle the LT1719, with 90° of phase lag or 25ns additional delay.

Above 5V_{p-p} at 10MHz, the LT1719 delay starts to decrease due to internal capacitive feed-forward in the input stage. Unlike some comparators, the LT1719 will not falsely anticipate a change in input polarity, but the feed-forward is enough to make a transition propagate through the LT1719 faster once the input polarity does change.

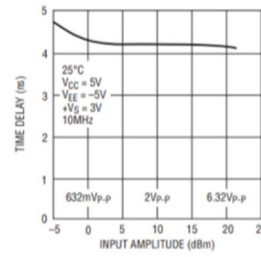
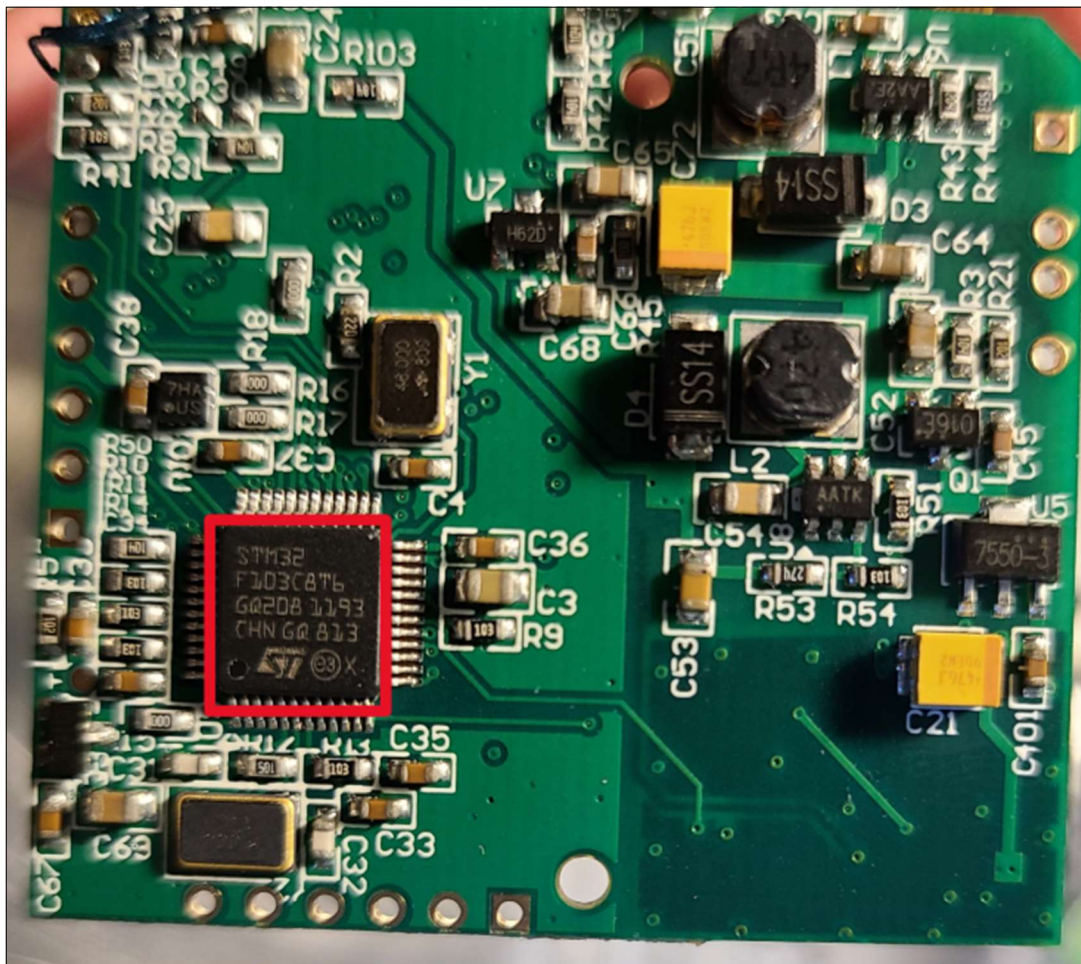



Figure 9b. Time Delay vs Sine Wave Input Amplitude

<https://www.analog.com/media/en/technical-documentation/data-sheets/1719fa.pdf>

The digital signal is then sent to the logic chip (e.g. STM32F103C8T6) which performs the range finding computation.





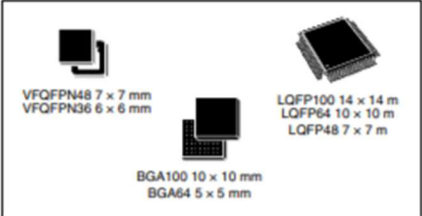
STM32F103x8

STM32F103xB

Medium-density performance line ARM-based 32-bit MCU with 64 or 128 KB Flash, USB, CAN, 7 timers, 2 ADCs, 9 communication interfaces

Features

- ARM 32-bit Cortex™-M3 CPU Core
 - 72 MHz maximum frequency, 1.25 DMIPS/MHz (Dhrystone 2.1) performance at 0 wait state memory access
 - Single-cycle multiplication and hardware division
- Memories
 - 64 or 128 Kbytes of Flash memory
 - 20 Kbytes of SRAM
- Clock, reset and supply management
 - 2.0 to 3.6 V application supply and I/Os
 - POR, PDR, and programmable voltage detector (PVD)
 - 4-to-16 MHz crystal oscillator
 - Internal 8 MHz factory-trimmed RC
 - Internal 40 kHz RC
 - PLL for CPU clock
 - 32 kHz oscillator for RTC with calibration
- Low power
 - Sleep, Stop and Standby modes
 - V_{BAT} supply for RTC and backup registers
- 2 x 12-bit, 1 μs A/D converters (up to 16 channels)
 - Conversion range: 0 to 3.6 V
 - Dual-sample and hold capability
 - Temperature sensor
- DMA
 - 7-channel DMA controller
 - Peripherals supported: timers, ADC, SPIs, I²Cs and USARTs
- Up to 80 fast I/O ports
 - 26/37/51/80 I/Os, all mappable on 16 external interrupt vectors and almost all 5 V-tolerant



- Debug mode
 - Serial wire debug (SWD) & JTAG interfaces
- 7 timers
 - Three 16-bit timers, each with up to 4 IC/OC/PWM or pulse counter and quadrature (incremental) encoder input
 - 16-bit, motor control PWM timer with dead-time generation and emergency stop
 - 2 watchdog timers (Independent and Window)
 - SysTick timer 24-bit downcounter
- Up to 9 communication interfaces
 - Up to 2 x I²C interfaces (SMBus/PMBus)
 - Up to 3 USARTs (ISO 7816 interface, LIN, IrDA capability, modem control)
 - Up to 2 SPIs (18 Mbit/s)
 - CAN interface (2.0B Active)
 - USB 2.0 full-speed interface
- CRC calculation unit, 96-bit unique ID
- Packages are ECOPACK®

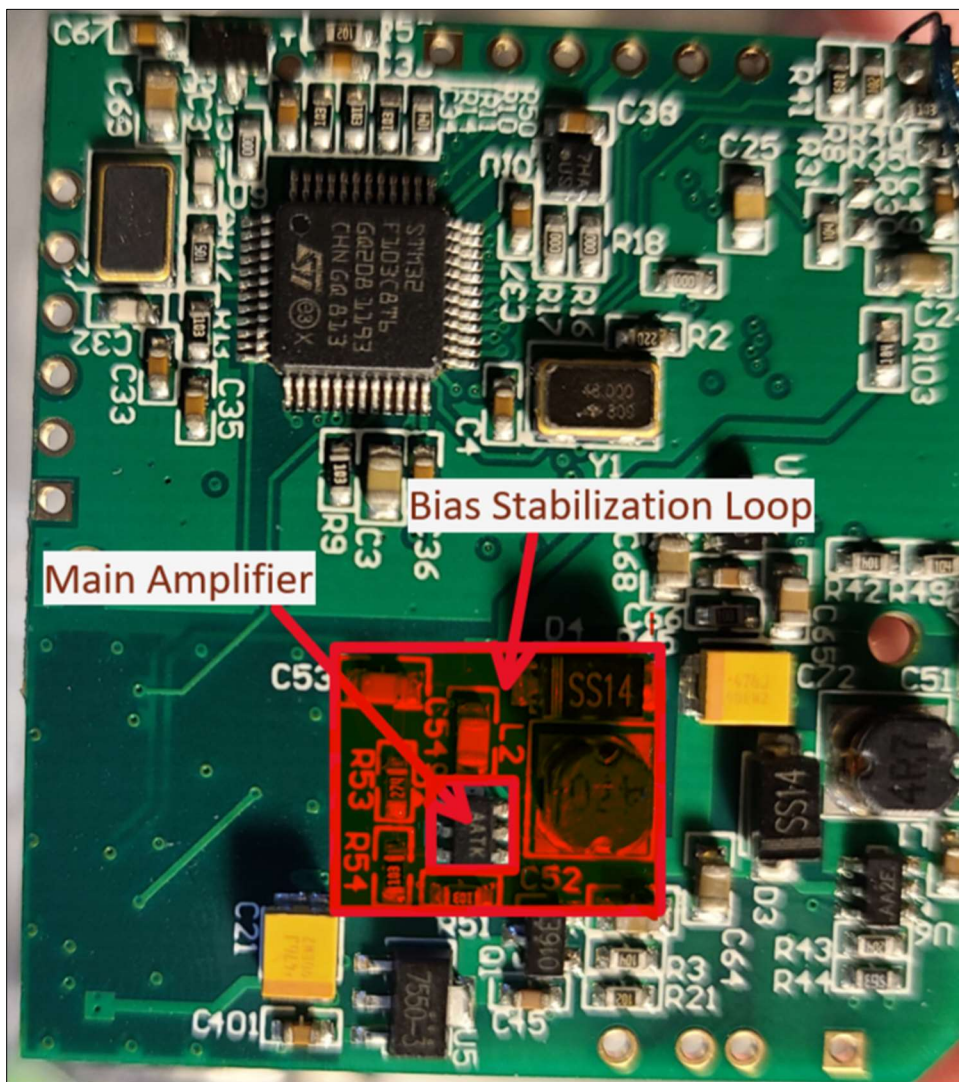
Table 1. Device summary

Reference	Part number
STM32F103x8	STM32F103C8, STM32F103R8 STM32F103V8, STM32F103T8
STM32F103xB	STM32F103RB, STM32F103VB, STM32F103CB, STM32F103TB

7(f): wherein said main amplifier is a bias stabilized amplifier..—

Defendants make, use, sell, and/or offer 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.)



19-2239, Rev 2, 3/09

EVALUATION KIT AVAILABLE

MAXIM

500kHz, 36V Output, SOT23, PWM Step-Up DC-DC Converters

MAX5025-MAX5028

General Description

The MAX5025-MAX5028 constant-frequency, pulse-width modulating (PWM), low-noise boost converters are intended for low-voltage systems that often need a locally generated high voltage. These devices are capable of generating low-noise, high output voltages required for varactor diode biasing in TV tuners, set-top boxes, and PCI cable modems. The MAX5025-MAX5028 operate from as low as 3V and switch at 500kHz.

The constant-frequency, current-mode PWM architecture provides for low output noise that is easy to filter. A 40V lateral DMOS device is used as the internal power switch, making the devices ideal for boost converters up to 36V. The MAX5025/MAX5026 adjustable versions require the use of external feedback resistors to set the output voltage. The MAX5027/MAX5028 offer a fixed 30V output. These devices are available in a small, 6-pin SOT23 package.

Applications

- TV Tuner Power Supply
- Low-Noise Varactor Diode Biasing
- Set-Top Box Tuner Power Supply
- PCI Cable Modem
- Voice-Over-Cable
- LCD Power Supply
- Avalanche Photodiode Biasing

Features

- ◆ Input Voltage Range:
3V to 11V (MAX5026/MAX5028)
4.5V to 11V (MAX5025/MAX5027)
- ◆ Wide Output Voltage Range: V_{CC} to 36V
- ◆ Output Power: 120mW (max)
- ◆ User-Adjustable Output Voltage with MAX5025/MAX5026 Using External Feedback Resistors
- ◆ Fixed 30V Output Voltage: MAX5027/MAX5028
- ◆ Internal 1.3Ω (typ), 40V Switch
- ◆ Constant PWM Frequency Provides Easy Filtering in Low-Noise Applications
- ◆ 500kHz (typ) Switching Frequency
- ◆ $1\mu A$ (max) Shutdown Current
- ◆ Small, 6-Pin SOT23 Package

Ordering Information

PART	TEMP RANGE	PIN-PACKAGE
MAX5025EUT-T	-40°C to +85°C	6 SOT23-6
MAX5026EUT-T	-40°C to +85°C	6 SOT23-6
MAX5027EUT-T	-40°C to +85°C	6 SOT23-6
MAX5028EUT-T	-40°C to +85°C	6 SOT23-6

32. 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.

33. 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

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

35. Defendant has infringed and is 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.

36. 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 Products. 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 Products that it obtains during discovery.

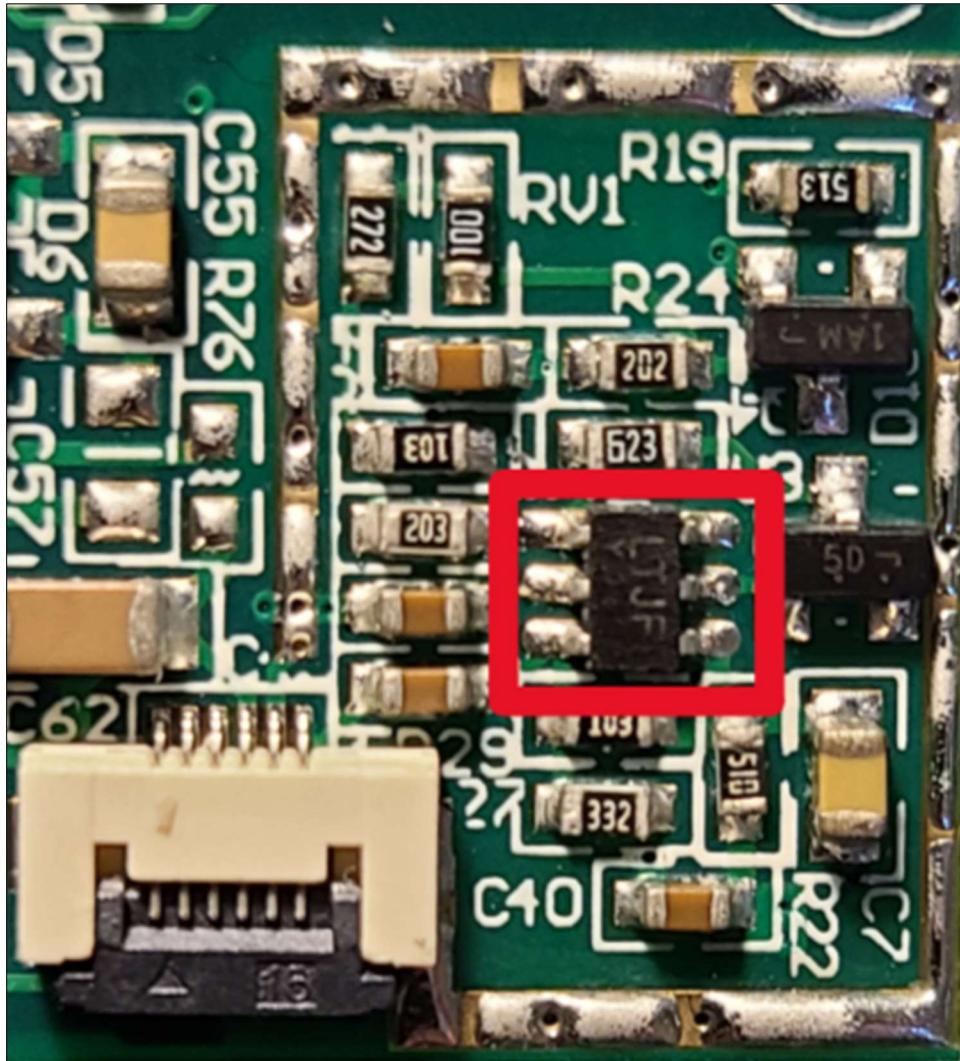
37. ***1(a): A signal detector, comprising:***—Defendants make, use, sell, and/or offer to sell a signal detector (e.g. the Accused Products detects an incoming light signal)




<https://www.cabelas.com/shop/en/cabelas-intensity-1600-rangefinder>



1(b): receiving data at a data communication system operating on a node at an edge of a network 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. comparator) operable to convert differential data signals into a signal data signal.





LT1719

4.5ns Single/Dual Supply 3V/5V Comparator with Rail-to-Rail Output

FEATURES

- UltraFast: 4.5ns at 20mV Overdrive
7ns at 5mV Overdrive
- Low Power: 4.2mA at 3V
- Separate Input and Output Power Supplies (SO-8 Only)
- Output Optimized for 3V and 5V Supplies
- TTL/CMOS Compatible Rail-to-Rail Output
- Low Power Shutdown Mode: 0.1 μ A
- Low Profile (1mm) SOT-23 (ThinSOT™) Package

APPLICATIONS

- High Speed Differential Line Receiver
- Crystal Oscillator Circuits
- Level Translators
- Threshold Detectors/Discriminators
- Zero-Crossing Detectors
- High Speed Sampling Circuits
- Delay Lines

DESCRIPTION

The LT[®]1719 is an UltraFast™ comparator optimized for low voltage operation. The input voltage range extends from 100mV below V_{FF} to 1.2V below V_{CC} . Internal hysteresis makes the LT1719 easy to use even with slow moving input signals. The rail-to-rail outputs directly interface to TTL and CMOS. Alternatively the symmetric output drive can be harnessed for analog applications or for easy translation to other single supply logic levels. A shutdown control allows for reduced power consumption and extended battery life in portable applications.

The LT1719 is available in the SO-8 and 6-lead SOT-23 package. The SO-8 package has separate supplies which allow flexible operation, accommodating separate analog input ranges and output logic levels.

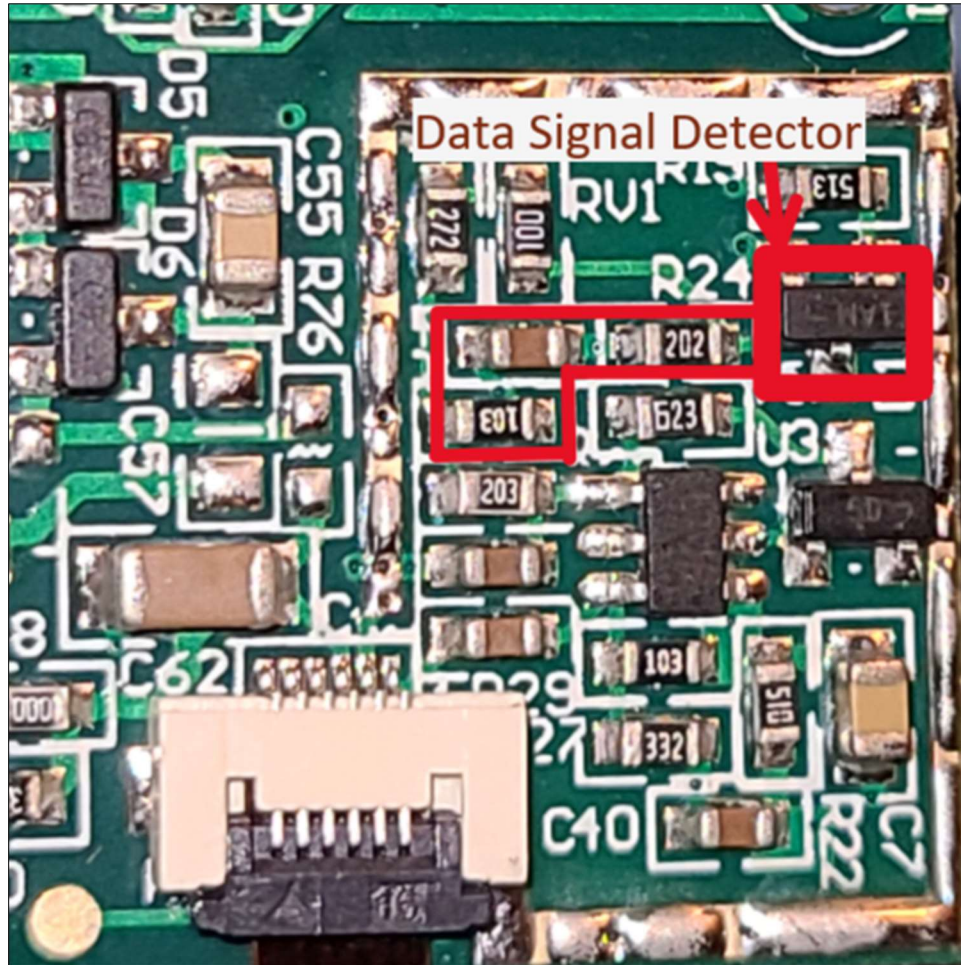
For a dual/quad comparator with similar performance, see the LT1720/LT1721.

LT[®], LT, LTC, LTM, Linear Technology and the Linear logo are registered trademarks of Linear Technology Corporation. UltraFast is a trademark of Linear Technology Corporation. All other trademarks are the property of their respective owners.

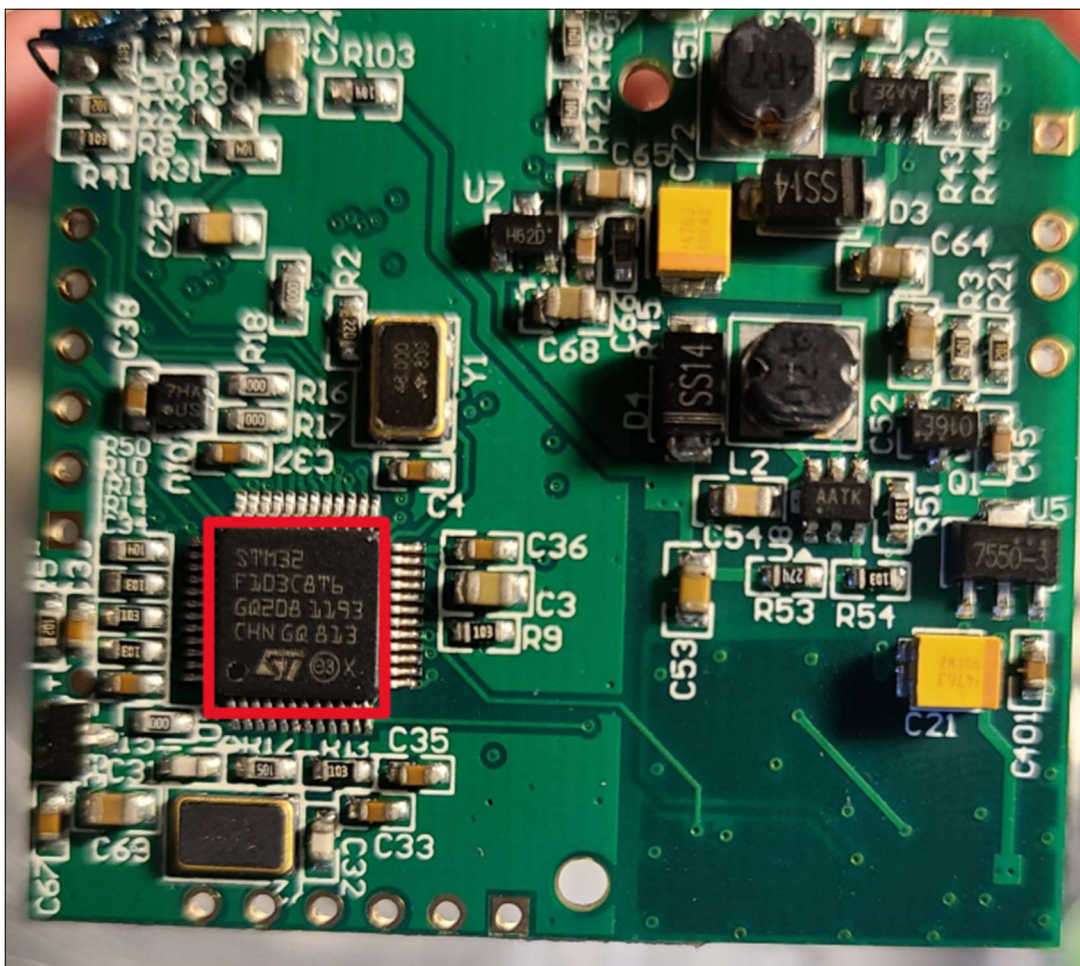


<https://datasheets.maximintegrated.com/en/ds/MAX5025-MAX5028.pdf>

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. A bipolar transistor which outputs a high voltage signal) according to the single data signal (e.g. The comparator output).



1(d): an interrupting control circuit receiving the data detecting signal and outputting a shutdown signal when the single data signal is at high voltage level over a predefined ratio:— Defendants make, use, sell, and/or offer to sell a device or system that includes an interrupting control circuit (e.g. STM32F103C8T6) for receiving the data detecting signal and outputting a shutdown signal according to the voltage of the data detecting signal.



The STM32F103C8T6 contains an Interrupt service routine which outputs a shutdown signal when the input voltage the single data signal is at a high voltage over a predefined ratio. (Take Out?)

2.3.5 Nested vectored interrupt controller (NVIC)

The STM32F103xx performance line embeds a nested vectored interrupt controller able to handle up to 43 maskable interrupt channels (not including the 16 interrupt lines of Cortex™-M3) and 16 priority levels.

- Closely coupled NVIC gives low-latency interrupt processing
- Interrupt entry vector table address passed directly to the core
- Closely coupled NVIC core interface
- Allows early processing of interrupts
- Processing of *late arriving* higher priority interrupts
- Support for tail-chaining
- Processor state automatically saved
- Interrupt entry restored on interrupt exit with no instruction overhead

14/99

Doc ID 13587 Rev 13



STM32F103x8, STM32F103xB

Description

This hardware block provides flexible interrupt management features with minimal interrupt latency.

2.3.6 External interrupt/event controller (EXTI)

The external interrupt/event controller consists of 19 edge detector lines used to generate interrupt/event requests. Each line can be independently configured to select the trigger event (rising edge, falling edge, both) and can be masked independently. A pending register maintains the status of the interrupt requests. The EXTI can detect an external line with a pulse width shorter than the Internal APB2 clock period. Up to 80 GPIOs can be connected to the 16 external interrupt lines.

2.3.22 ADC (analog-to-digital converter)

Two 12-bit analog-to-digital converters are embedded into STM32F103xx performance line devices and each ADC shares up to 16 external channels, performing conversions in single-shot or scan modes. In scan mode, automatic conversion is performed on a selected group of analog inputs.

Additional logic functions embedded in the ADC interface allow:

- Simultaneous sample and hold
- Interleaved sample and hold
- Single shunt

The ADC can be served by the DMA controller.

An analog watchdog feature allows very precise monitoring of the converted voltage of one, some or all selected channels. An interrupt is generated when the converted voltage is outside the programmed thresholds.

The events generated by the general-purpose timers (TIMx) and the advanced-control timer (TIM1) can be internally connected to the ADC start trigger, injection trigger, and DMA trigger respectively, to allow the application to synchronize A/D conversion and timers.

38. 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.

39. 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 Defendant has 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: March 3, 2021

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