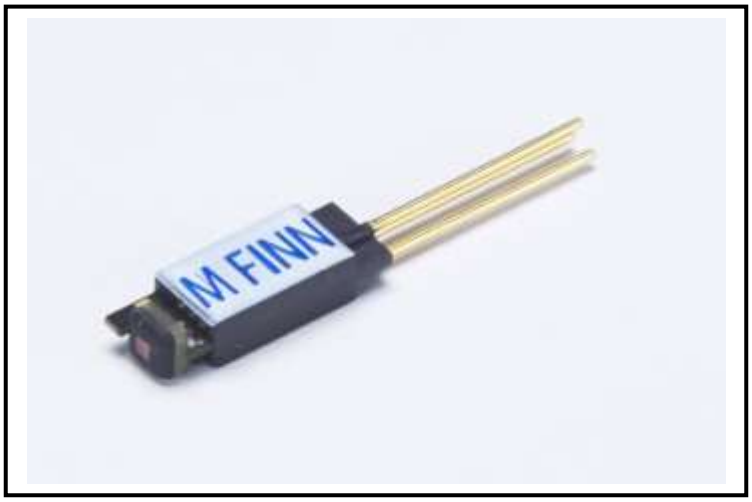
Mega FINN™
Specification Manual



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In future publications, FTE may make changes to specifications and product descriptions at any time, without notice.

Contact FTE or your distributor to obtain the latest specifications prior to placing your product order.

U. S. Patent Nos: 6,490,037; 7,023,554; 7,227,639 and 7,265,822. Additional patents pending.

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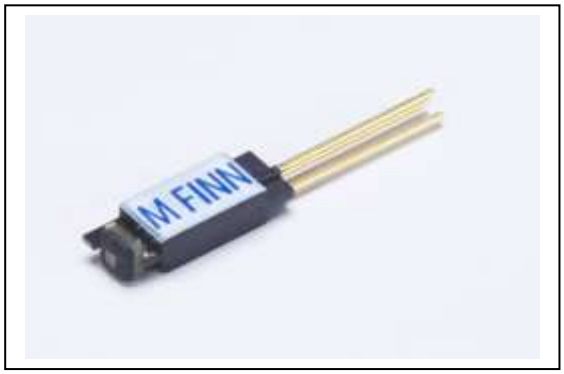
FINN TEST ELECTRONICS

1. Part Numbers and Descriptions

TCMega200SL



TCMega200

Part Number	Description
TCMega200SL	Mega FINN™ with Sleeve
TCMega200	Mega FINN™ sensor

2. Principal of Operation

The Mega FINN™ combines the form factor of the Ultra FINN™ with a new operating program that allows for greater speed and stability, to accommodate the need for even faster test measurements and additional types of light sources such as pulsing LEDs. The Mega FINN™ incorporates a light-to-Frequency converter sensor with a microprocessor designed to take precise measurements from the sensor. The Mega FINN™ calculates the color and intensity of the light being tested, converting it to an easy to read signal for comparing LEDs and other light sources.

3. Method of Operation

The small, slim packaging of the MegaFINN™ allows for easy installation directly in front or on top of the LED on a printed circuit board. During test, the light source (LED) is activated and the MegaFINN™ outputs a Frequency in kHz that quantifies the LED's color. The same signal quantifies the brightness of the LED with its pulse-width (average DC voltage). The Mega FINN™ provides customers with the flexibility to test light sources using anything from simple stand alone meters to fully integrated and automated equipment.

4. Applications

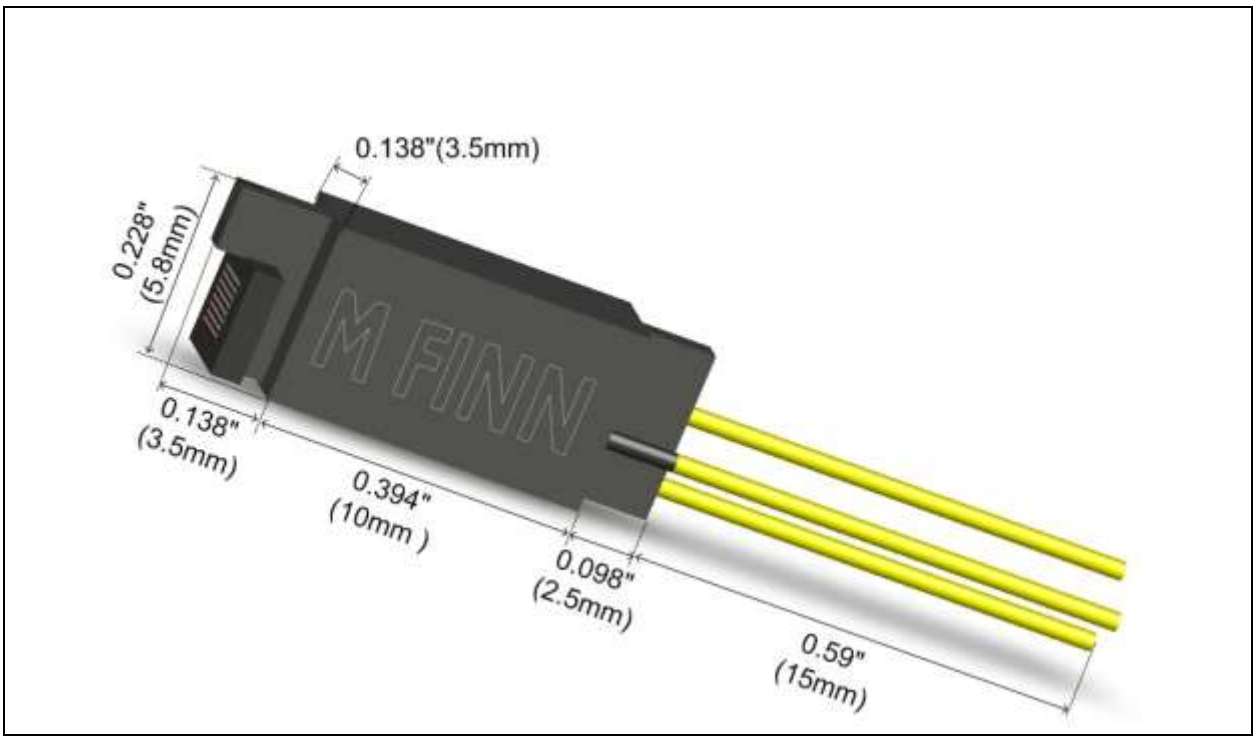
- When test requirements call for the absolute fastest test time possible
- When quality control demands reliable, unerring accuracy and when clear cut measurements are vital
- For Pulsing, Bright to very dim LEDs – visible light from Ultraviolet to near infrared
- Functional and In-circuit test environments, on any test platform

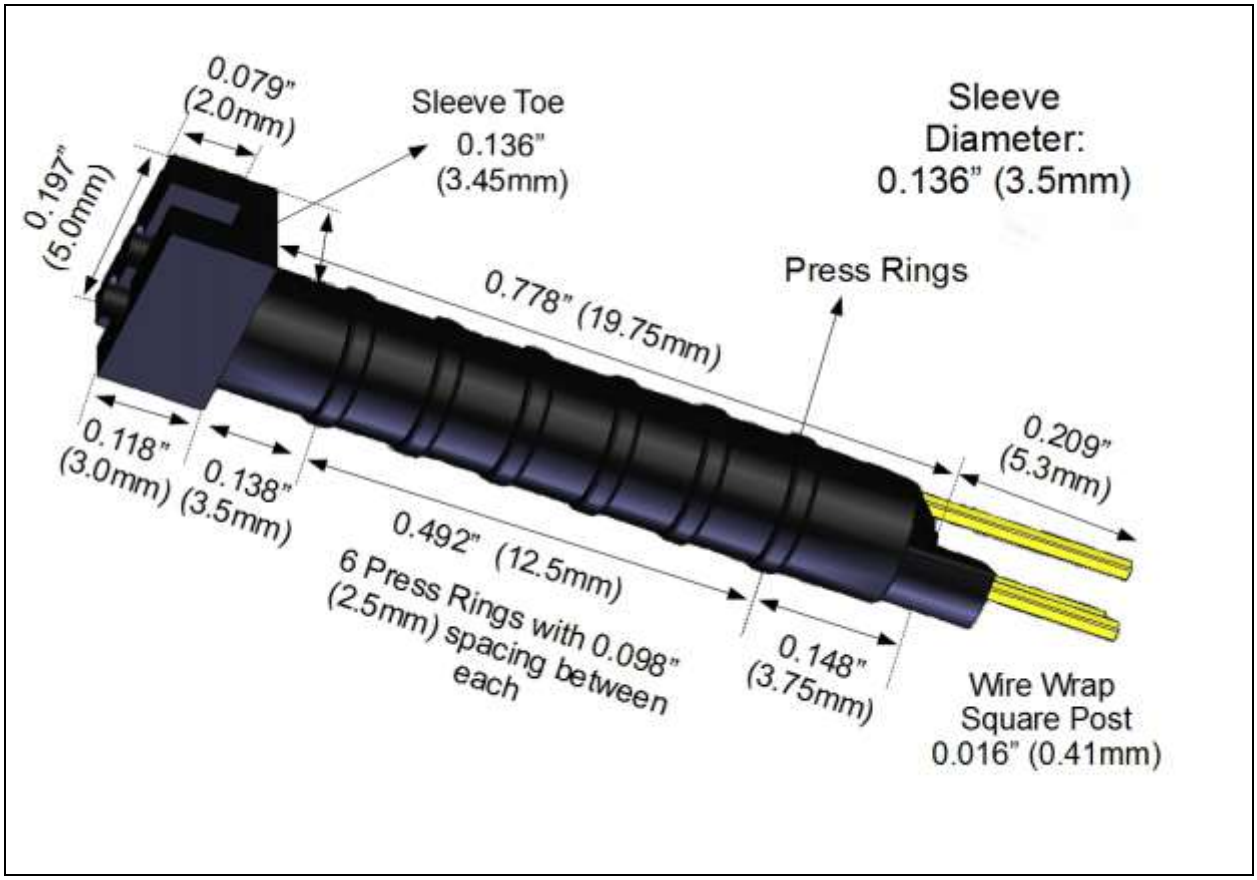
5. Features

- High accuracy of +/- 0.3% and average resolution of 0.1nm across the visible spectrum
- Fast response time – typically less than 3 milliseconds for average to bright LEDs
- Works with any Pulse Width Modulation LED pulsing at 50Hz or greater. Worst case response time for PWM LEDs is ~80ms
- So fast it will output ON and OFF results when an LED is blinking slower than 30Hz
- Shut off time to dark output is 16ms
- Intelligent Triggering feature will start a fresh sample when an LED turn on is detected giving this sensor the fastest response time possible
- Built in InfraRed filter to attenuate non-visible light
- Built in Diffuser to assist with reading non-diffused LEDs
- Operating voltage of 5.0Vdc, current is typically 17mA
- Color identification determined by the frequency output and intensity indicated by the DC average of the same output (patented feature)
- Eliminates most user implementation problems and reduces ambient light errors
- Improved sleeve utilizes more durable wire-wrap terminations for easier installation, 30 gauge wire is recommended

6. Properties

6.1. Dimensions





6.2. Power Source

The Mega FINN™ requires 5.0 volts DC. Current is typically 17 mA.

6.3. Pins

Three pins are: Output (signal), Ground, and Power
Pins are spaced 70 mil apart
Sleeve uses standard 16 mil square posts for wire wrapping, 30 gauge wire is recommended.
Smaller gauge or thicker wire may cause undue stress on the wire wrap posts.

6.4. Sensor

Light- to- frequency converter sensor comprised of an 8 x 8 array of photodiodes, 16 photo-diodes each of blue, green and red filters and 16 photo-diodes of clear, with no filter.

6.5. Controller

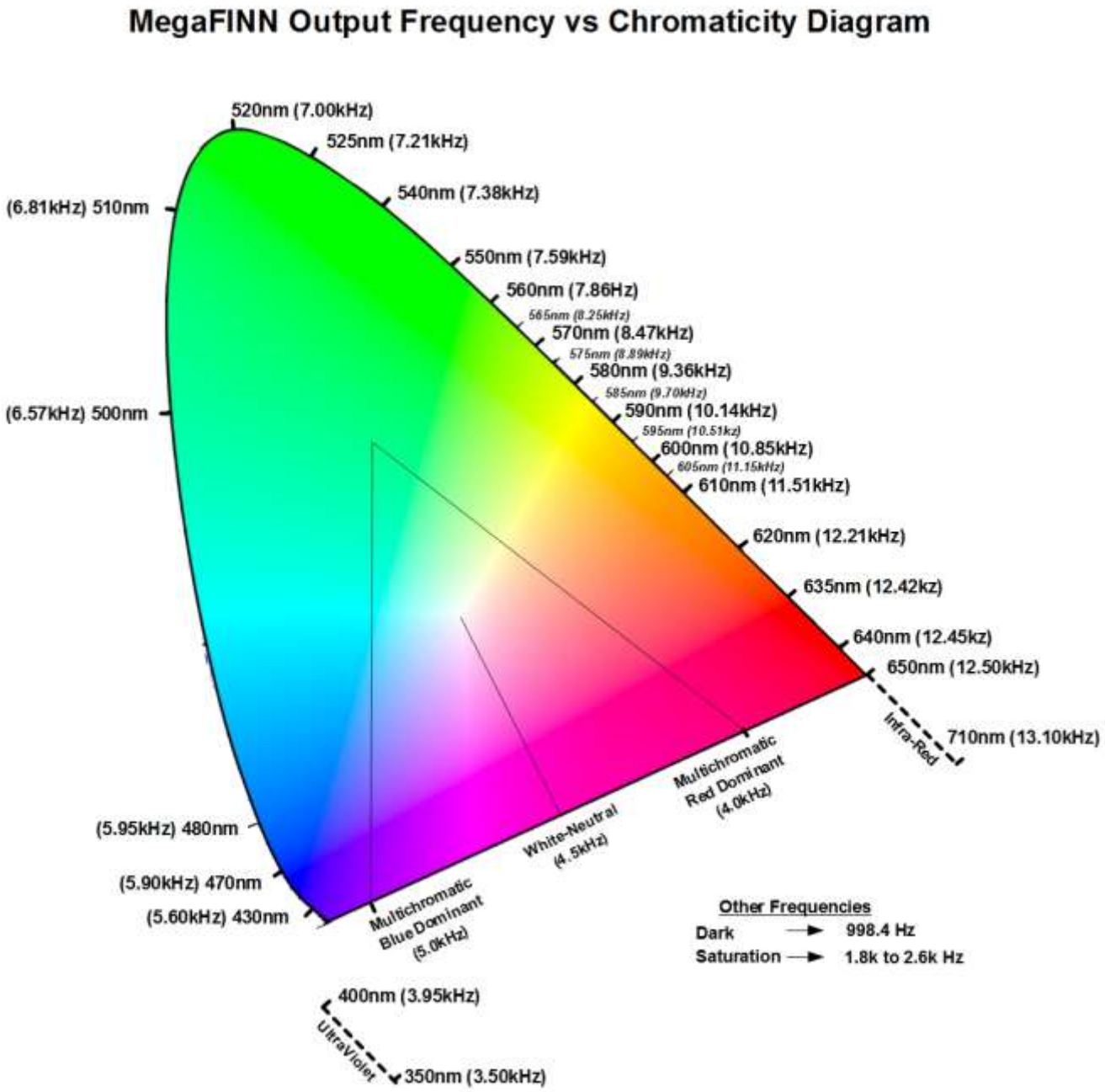
The micro controller, in combination with the precision MHz high frequency clock source, allows for extremely fast and accurate sampling of the light source under test.

7. Typical Measurements

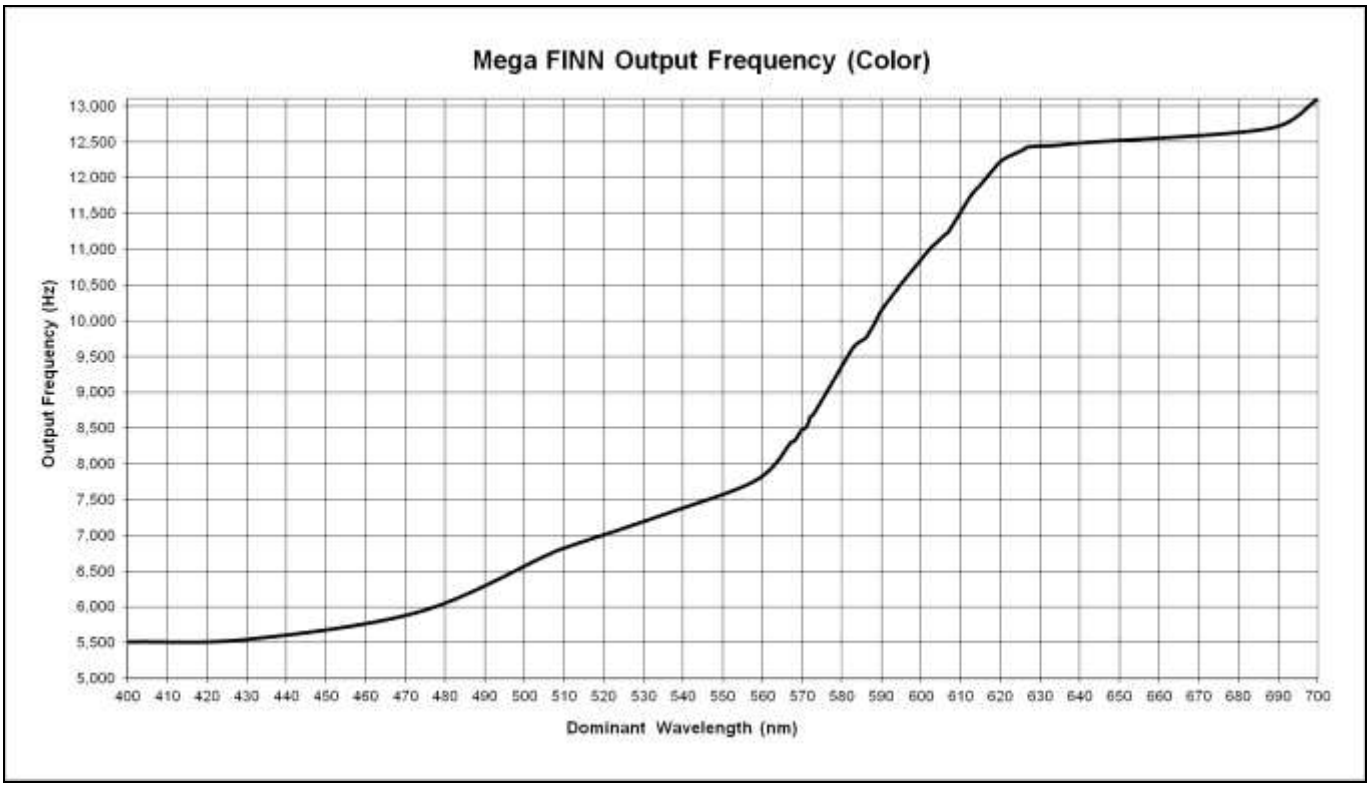
7.1. Color

Typical Measurements		
Color	**nm**	**kHz**
Red	635	12.42
Amber	608	11.25
Yellow	585	9.70
Green	565	8.25
Pure Green	525	7.21
Blue	470	5.90
Other Measurements		
Infrared	Up to 700	12.5 - 13.1
Ultraviolet	Down to 400	3.5 - 3.95
Fluorescent	multiple	4.2
White (red dominant)	multiple	4.0 - 4.35
White (blue dominant)	multiple	4.4 - 5.0
Saturation	n/a	1.8 to 2.6
Dark	n/a	0.998

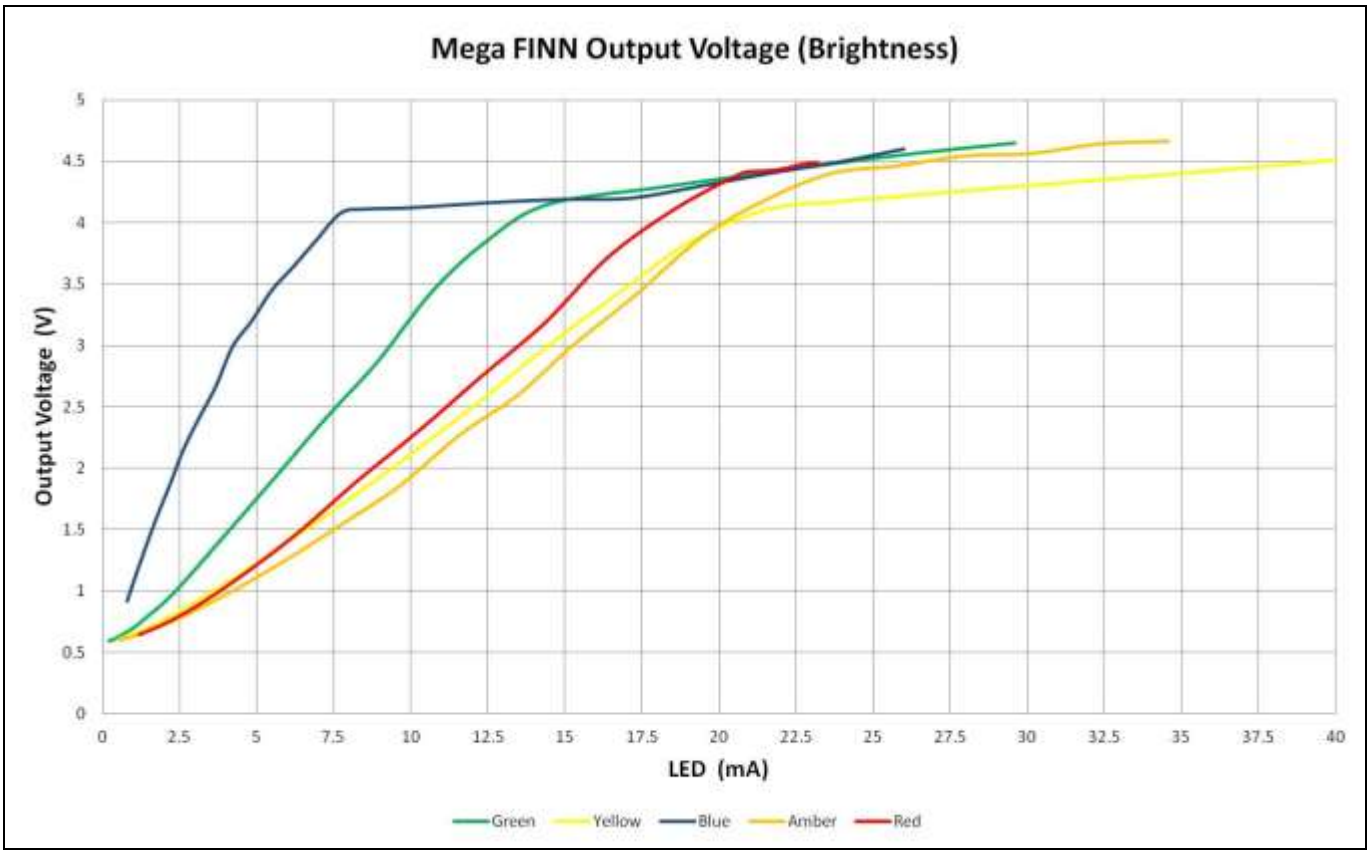
7.2. Output Frequency vs Chromaticity



7.3. Output Frequency Graph



7.4. Output Voltage Graph



8. Mega FINN™ Timing

Mega FINN™ response is typically less than 3 milliseconds. The response time will decrease for brighter LEDs and will increase for dimmer LEDs.

9. Fixturing Instructions

The Mega FINN™ sleeve is easy to insert into most materials used in fixturing today.

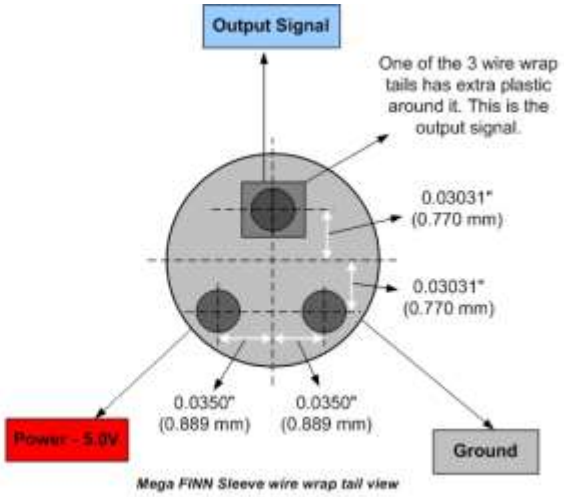
9.1. Installation Instructions

How to identify the Power, Ground and Signal Pins:

1) Identify the wire wrap tail that has the extra plastic; this is the **Output** Signal.

2) Move clockwise to the next wire wrap tail; this is the **Ground**.

3) Move clockwise again to the next wire wrap tail; this is the **Power** (5.0V).



Mega FINN Sleeve wire wrap tail view

Drilling Instructions:

The center of the hole for the sleeve should align with the center of the LED.

Drill Hole	0.1417" (3.6 mm)	-0.002" / +0.0005" (-0.051mm / + 0.012mm)
Sleeve Press Rings	0.145" (3.683 mm)	-0.002" / +0.002" (-0.051mm / + 0.051mm)
Sleeve Diameter	0.136" (3.454 mm)	-0.002" / +0.002" (-0.051mm / + 0.051mm)

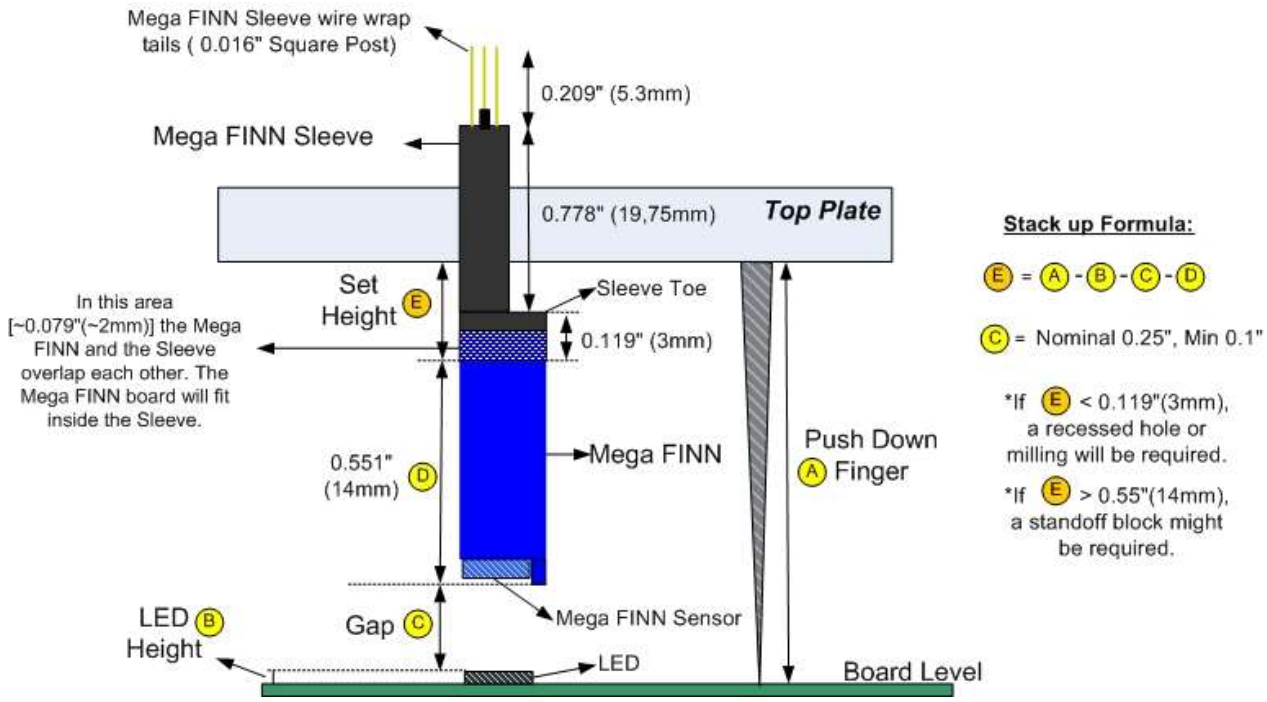
Wire Wrapping Instructions:

-The 3 wire wrap tails are 0.016" (0.406mm) square posts.
-The posts are spaced at 0.070" (1.78mm) apart.
-We recommend using 30 gauge wire.

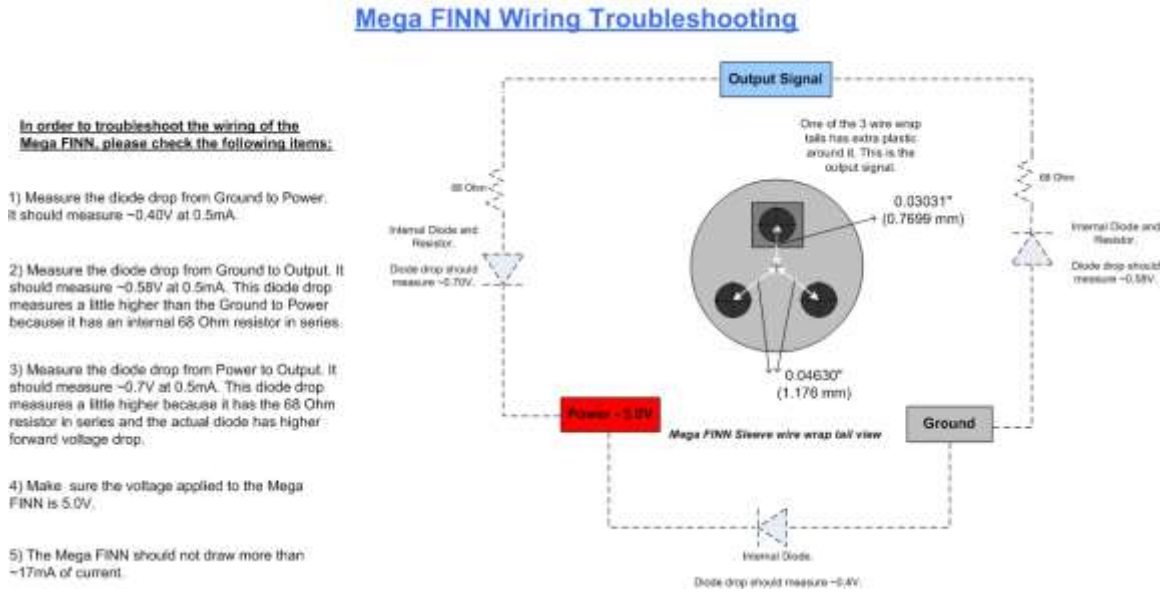
Sockets:

If the Mega FINN Sleeve cannot be used then individual sockets can be used.
The Mega FINN pins will fit in IDI Part# R-0-WW.016.

9.2. Stack Up Measurements for Mega FINN™



9.3. Troubleshooting Wiring



10. Sources of Error

10.1. Wiring

Special care should be paid to the wiring instructions. Improper wiring will result in over-heating and damage to the part. If miss-wiring has occurred, immediate replacement of the damaged part is recommended.

10.2. Ambient light and adjacent LED's

Light from sources other than the device being tested should be prevented from reaching the sensor surface while making measurements. Ambient light entering the sensor's active area will be used to calculate the color and intensity. Typically the ambient light is many orders of magnitude less than the LED and ambient light will have little effect. If the ambient light is significant and non-uniform then the Megan FINN™ uses a sampling algorithm to average out the non-uniform light resulting in longer sampling times.

When the LED being measured is shut off then the ambient light becomes the only light source and the sensor will output the ambient light reading.

A simple method to eliminate the ambient light is to use a shroud or heat shrink tubing.

10.3. Distance

The further away the sensor is from the LED, the lower the voltage response of the sensor. If the LED is dim (20mcd or less), the sensor face should be around 0.10" to 0.15" from the LED. LED's that have medium brightness (20-100mcd) can be placed at a greater distance 0.15" to 0.25". Very bright LED's (100-200mcd) should placed at 0.25" or greater for best results. If using light pipes or light conduit, this distance should be measured from the LED lens to the front face of the light pipe with a small gap between the sensor and other end of the conduit.

10.4. Vdd other than 5V

The MegaFINN™ will not turn on if the supply voltage is lower than 4.70Vdc. Make sure the supply voltage at the MegaFINN™ wire wrap tail is greater than 4.70Vdc but no more than 5.50V.

10.5. Saturation

If the output frequency is between 1.8 kHz and to 2.6 kHz the sensor is in saturation. Reduce the intensity of the LED if possible. Another way to get out of saturation is to move the sensor further from the LED or switch to a smaller diameter light conduit.

11. Absolute Maximum Ratings

Over operating free-air temperature range (unless otherwise noted)†

Supply voltage, VDD (see Note 1)	6 V
Operating free-air temperature range, TA	0C to 70C
Storage temperature range	–25C to 85C
Maximum current or output	±40 mA

† Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTE 1: All voltage values are with respect to GND lead.

12. Recommended Operating Conditions

	Min	Nom	Max	Unit
Supply voltage, VDD	2.7	5.0	5.5	V
Operating free-air temperature range, TA	0	25	70	Celsius
Supply current	-	17	40 (Note1)	mA

Note1: Additional loads on output pin not included

13. Product Return Policy

All products are inspected and fully tested prior to leaving the FINN Test Electronics facility. If it is believed that a product was shipped damaged, the damaged parts must be shipped back to FINN Test Electronics for evaluation. Once received and evaluated, FINN Test Electronics will replace the item in an even part for part exchange only.

Any discrepancies in your order must be reported immediately. FINN Test Electronics offers a **thirty (30) day** return/exchange policy on products that have been mis-ordered. The thirty day time limit is determined from the date of purchase. **Damaged, used or altered goods will not be accepted for credit or exchange.**

Please contact FINN Test Electronics for an **RMA number** before returning any product to FINN Test Electronics. Returns sent without an RMA number will not be accepted. Please see our *Warranty and Return Policy* document for a full explanation of our warranty and the appropriate return procedures.

14. Patent Numbers

U.S. Patent Nos. 6,490,037 - 7,023,554 - 7,227,639 - 7,265,822
Additional patents pending

15. Ordering Information

FINN™ parts may be ordered directly by calling 224-662-0383 or by emailing to FINNsales@FINNTest.com. Customers located outside of the US who would prefer to place an order locally may contact one of the FINN™ distributors listed below.

15.1. Distributors:

France – Cotelec - www.cotelec.fr

Switzerland – SQC AG **-** www.sqc.ch

Germany – FIXTEST GmbH **-** www.fixtest.de

Japan - Newly Tsuchiyama Co., Ltd. - www.newly-t.com

Distributor phone numbers and addresses can be accessed by clicking on the *distributor link* located on the products page at www.FINNTestElectronics.com.

16. Technical Support

Our product engineers are available to assist you with choosing the correct FINN™ product to fit your specific needs as well as to answer any technical questions you may have regarding installation and/or implementation.

Please contact us at:

Email: FINNSales@FINNTest.com

Phone: 224-662-0383

17. Revision History and Control

17.1. Rev A - January 2016

- Initial release