

DKN Research Newsletter

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Detection Devices for Novel Coronavirus, Part II

In the previous newsletter, I wrote about the possibility of using our electronics advancements to create detection devices for Novel Coronavirus. I received many comments and ideas for these new medical devices. Several commented on current electronic projects intended to develop detection and diagnosis equipment.

The idea is to create a wearable electronic sensor that attaches to your body. The substrate requirements are different from those used in traditional materials (polyimide films or PET films). Device substrates have to be flexible and elastic to remain attached during body movements; urethane and silicone rubber could be an option. Larger sized devices will require a permeable substrate to address moisture from sweating. One option for this basic material is to use adhesive bandages along with an appropriate coating material or glue.

The printed circuit boards copper foil (standard conductor material) is not suitable for a wearable device because of its poor elasticity. Using meander patterns as conductors can improve the copper foil circuits' elasticity, but it is not enough for general use. One alternative for wiring electronic devices is screen-printable conductive ink. The elasticity from the conductive ink can increase by adding a rubber component for the binder matrix.

Multiple electrode patterns used in sensor modules are needed to continuously detect temperature, oxygen levels, perspiration and more. The sensors can't detect coronavirus, but the data sent to wireless devices and picked up by an Artificial Intelligence chip can be analyzed. The results can trigger an early detection alarm if the user has symptoms associated with the coronavirus. The primary feature of this diagnosis system is a continuous monitoring of your health and vitals during the infection. The AI devices learn as more data is analyzed, and accuracy will be improved.

The hardware will not require any unique creation for use as the module and its cost can be less than \$100 once volume production is scaled. Printable & Flexible Electronics will play a key role in building the devices. The sensor parts should be disposable, because they are attached on human skin. The necessity for early detection is essential, and this device could fill that need. Once operational, it can detect and monitor all your health for almost anything with a quick update and download. I can see every major retailer offering this product for sale.

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Headlines of the week

(Please contact haverhill@dknresearch.com for further information and news.)

1. TSMC (Major semiconductor manufacturer in Taiwan) 5/12

Has optimistic forecast for the market trend in 2021. AMD, one of the major customers has been taking over the market share from Intel.

2. Sony (Major electronics company in Japan) 5/13

Has made a good performance with imaging devices for the fiscal year ending March 2020. Revenue: 1.7 trillion yens, 22% increase from previous year.

3. Renesas (Major semiconductor manufacturer in Japan) 5/15

Has decided to terminate the business of laser diodes, photo diodes and photo detectors. The revenue was much smaller than the forecast they planned.

4. Sony (Major electronics company in Japan) 5/18

Has unveiled a new image sensor “Intelligent Vision Sensor” with AI functions. It does not need additional processor and memories in the chip.

5. JEITA (Electronic industry association in Japan) 5/18

Indicates that connectors are key components for the car electronics in the roadmap published in 2019.

6. Tokyo University (Japan) 5/19

Has succeeded to process sub-micron scale using femto second laser with wave length of 10 to 100 nanometers.

7. Unitree Robotics (Robotics Venture in China) 5/20

Has commercialized a new dog-shape robot with four legs. Retail cost is about ten thousand dollars for one unit. It has a high mobility.

8. Samsung Electronics (Major electronics company in Japan) 5/21

Plans to develop ultra high resolution image sensors with 600 million pixels competing Sony's devices.

9. TDK (Device manufacturer in Japan) 5/22

Has started the volume production of SMT common mode filter for Ethernet of automobile use.

10. Share Medical (Medical device manufacturers in Japan) 5/22

Has agreed to co-develop a wireless digital stethoscope for non-touch diagnosis of Novel Coronavirus cases. The small device can be attached on the traditional stethoscope.

11. Shibaura Institute of Technology (Technical college in Japan) 5/22

Has developed a new spherical speaker introducing dielectric elastomer actuator. It emits high tones up to 16kHz for all directions.

12. Fuji Keizai (Market research firm in Japan) 5/22

Has estimated the market of capacitance type touch panel screen 1.87 trillion yens in 2019. It forecasted 1.71 trillion yens in 2024. There will be remarkable shift from glass base to flexible.

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