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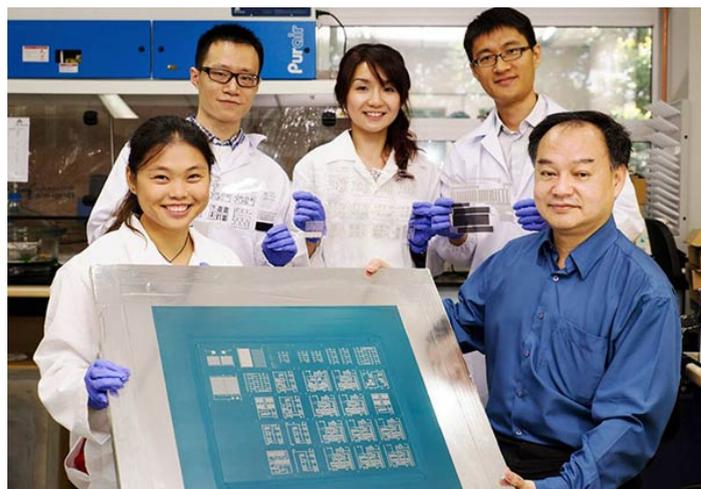
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## Flexible wearable electronic circuits printed using a T-shirt printer

BY MARK TYSON · NOVEMBER 17, 2014

Scientists at the Nanyang Technological University in Singapore (NTU) have managed to **print electronic circuits** onto flexible materials using a common-or-garden T-shirt printer. It is thought that, using the techniques tested by the scientists, cheap mass production of wearable disposable electronic circuits could be achieved.

Using the T-shirt printing equipment the scientists successfully printed transistors, capacitors and resistors onto materials such as paper, fabric, plastic and aluminium foil. Instead of ink the printer used printing materials containing silver nanoparticles, non/conductive plastics and carbon.



NTU Scientists

### Smart clothing, health healing monitoring, smart food packaging

By printing circuits using the aforementioned components it was even possible create printed 4bit D/A (digital to analogue converters) and RFID tags onto wearable component materials. *"This means we can have smarter products, such as a carton that*

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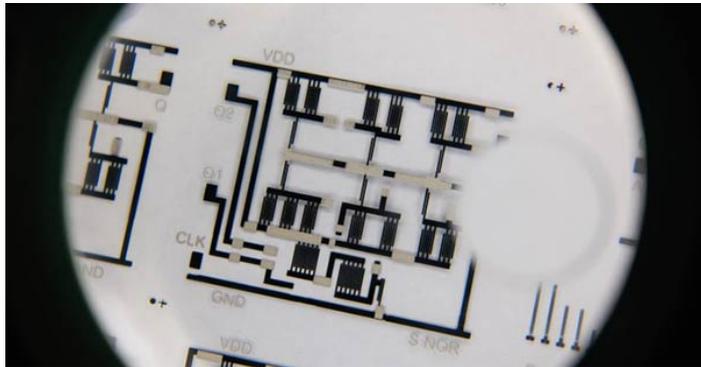
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tells you exactly when the milk expires, a bandage that prompts you when it is time for a redressing, and smart patches that can monitor life signals like your heart rate,” said NTU Associate Professor Joseph Chang.



Printed flexible electronic circuit close-up

### No toxic chemicals

These **printed wearable components** are made not to replace your smartphone or tablet but to provide them with information from wearable or packaging sensory information. The process is safe with human clothing or food packaging as the materials used in the process don't include toxic chemicals. *“Our innovative process is green, using non-corrosive chemicals. It can be printed on demand when needed within minutes. It is also scalable, as you can print large circuits on many types of materials and most importantly, it is low cost, as print technology has been available for decades,”* **said** Prof Chang.

Via [New Electronics](#)

Tags: Science wearable Wearables



#### Mark Tyson

Mark has worked for a number of years as a newshound on other technology news websites. He decided to write for Tech Assimilate thanks to this web site's open embracing vision of the fascinating world of personal technology. Mark has also worked in the printing and advertising industries for tens of years previously.

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