

## **REMANUFACTURING INDUSTRY**

### **Clones for Microcontrollers & Chips**

(Report developed by PowerVip Management)

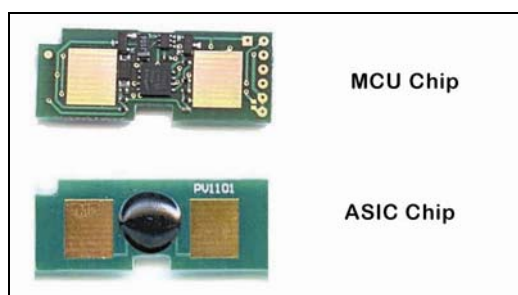
Many efforts have been done by ETIRA, by local Remanufacturers Associations and in general by the entire Remanufacturing Industry about clone cartridges and its consequences.

In this report, PowerVip would like to inform you about **CLONES IN CHIPS TECHNOLOGIES**. Please note that we don't refer to clone cartridges, but to the chip itself

### **TECHNOLOGIES UNDERSTANDING**

Concerning Chips for printer cartridges, either you have an **ASIC chip** or an **MCU one**.

- **ASIC:** Application Specific Integrated Circuit. It means that an integrated circuit is custom designed, being not a general purpose IC, but dedicated to an specific function. Create an ASIC chips requires a big start up investment. So, it could be performed for big volumes, for example some HP printers.
- **MCU:** Microcontroller Unit: it is bought from open market, for example, Texas Instruments, Microchip, etc. and then it is programmed. It is a general purpose IC. It can be programmed for printer cartridges, telecommunications, energy metering devices, etc. For non massive products, such as chips for Samsung, Lexmark, Epson, Radiofrequency HP, etc., it is more convenient to use this MCU arrangement. The initial investment is the engineering, assembling and programming, but not creating the chip itself.
- Look at the picture. It is the same printer chip (HP1320) with the two different technologies



**IMPORTANT NOTE!!** If you even see a chip with a big black dot (it seems to be an ASIC one), the chip could be an MCU solution with just a plastic coverage.

### **CHEAP MARKET PRICES**

When PowerVip noticed about such cheap prices on the market from Asian competitors, it decided to tested lots of MCU chips. The million dollar question was: were these companies doing something better?

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Página 1 de 2



Finally, PowerVip has discovered that the MCU is not original and that these companies haven't achieved more efficiency or haven't got lower rates by buying large quantities. The real fact is that **THE MCU IS A CLONE** according with its features (time response, speed, power consumption, etc.).

For example, for Lexmark, Epson, Radiofrequency HP chips, PowerVip uses the MCU 12F683, from Microchip company. Retail prices for this MCU are USD 1,08 for a minimum of 3.300 pieces. Find attached a link where you can see this <http://www.digikey.com/product-search/en/integrated-circuits-ics/embedded-microcontrollers/2556109?k=pic%20683&ColumnSort=1000011&fid=0>.

To this cost of around USD 1,00, it must be added the PCB (Printed Circuit Board) manufacturing, passive components (resistors, capacitors, etc), PCB assembling, programming, quality control, guarantee and technical support. If all this is taken under consideration, it can be concluded that PowerVip chips, **WHICH USE ORIGINAL MCUS**, are not at all expensive.

### WHAT TO DO THEN?

Everyone certainly must look after its business and decides who its chip supplier is. But what about Intellectual Properties Rights? Is this something to put really in practice? Or is it something written with the hand and erased with the elbow?

If everybody knows and recognizes that there are clone cartridges, **IT IS NOW TIME TO REVEAL THAT THERE ARE ALSO CLONES MCUS.**

PowerVip is one of the few companies worldwide that could find out this, because it is a real chip manufacturer and not a trader.

PowerVip, founded in year 2.000, is a competitive company, able to compete with Asian companies when the rules are equal and the competition is fair. In this sense, it shall never use clone MCUs.

Hope that this explanation is understood and shared. For any question, do not doubt to contact us at [europa@powervip.es](mailto:europa@powervip.es).

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Página 2 de 2