

Mitsubishi Electric Corporation

Power Semiconductor Device Works
Marketing Planning Dept.

Lead Free on Power Semiconductor Devices (※)

Dear Sirs

Mitsubishi Semiconductor Device Group is progressing "Lead Free". Power Semiconductor Device Works made plan of how to eliminate lead included in our products considering where lead is applied and quality assurance level required to a product. We will progress "Lead Free" by product type and step by step.

Outline of our plan is as follows.

(1)Product Category

We divided our power modules into three categories, consumer use, industrial use and high reliability use and we progress

"Lead Free" by category.

(2) "Lead Free" for outer lead

We have been trying to change to lead free solder of Sn/Cu type for solder plating or dipping. We have already studied

available technology for mass production and already started to provide lead free sample of a specified product for consumer

use from July in 2002. And after qualification and approval of the sample in our customers we started mass production from

September in 2003. We are gradually applying above solder of Sn/Cu type to the other product for consumer use.

As for products for industrial use and high reliability use we will progress "Lead Free" with same solder step by step.

(3) "Lead Free" for inner package

We are studying to change to Sn/Ag/Cu type considering better packaging structure with lead free solder and reliability level

demand to power modules. We will progress "Lead Free" for consumer use at first, then for industrial use and for high

reliability use step by step. Because we feel "Lead Free" of inner package is very higher hurdle than outer lead from technical

point of view.

Our present target to develop available technology of "Lead Free" is by around April in 2004 for consumer use and by 1st half

year of 2005 for industrial use. And for high reliability use we need much more time to realize "Lead Free" due to further higher

hurdle.

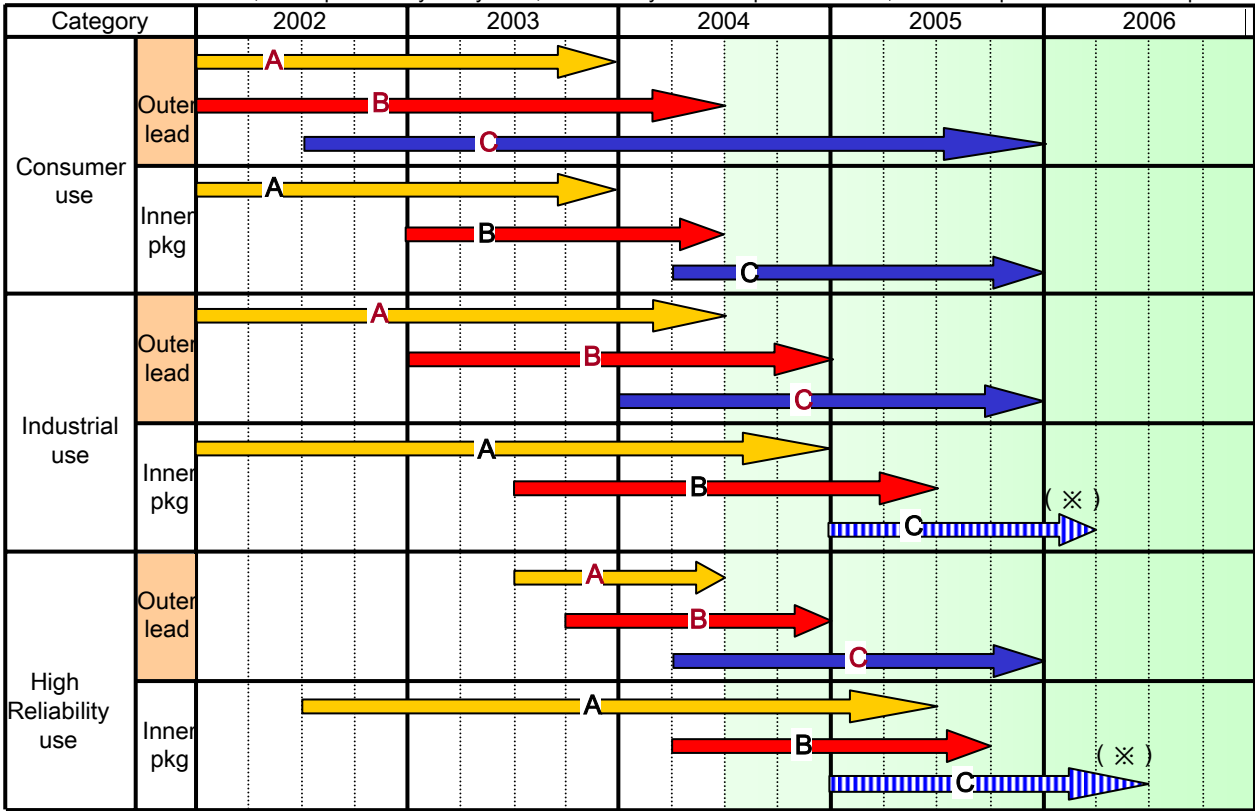
We show summary of our plan in the table below.

(※) ... The products of IC packaging like a transistor array etc. are out of the plan mentioned above.

Best Regards

Schedule on Lead Free (CY)

→ A : preliminary study
 → B : study for mass production
 → C : sample release & mass pro. start



※ to be decided after discussion with customer