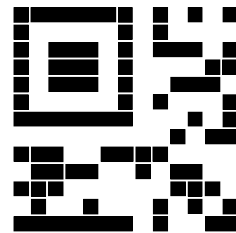


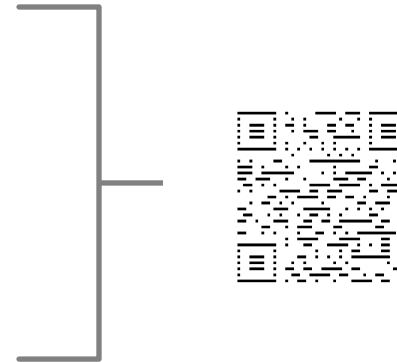
New Work Item Proposal
Micro QR Code
Inclusion to ISO/IEC 18004 QR Code



14 – 15 May, 2003
SC31 Plenary
ISO/IEC SC31 National Body of Japan

Review of QR Code

- Standardized by AIM (1997) then ISO/IEC (2000)
- Adopted by major industry such as AIAG, JAMA, JTA, JEITA, etc. and government
- Pursuing easy reading
- Equipped with all features of other 2Ds
 - ◆ High data capacity
 - ◆ High density storage
 - ◆ High-speed reading
 - ◆ Omni-directional reading
 - ◆ Error correction
- Kanji is supported as a default character set.





QR Code - National Standard

■ Japan

- Japanese Industrial Standard JIS X 0510

■ People's Republic of China

- Chinese National Standard GB/T 18284

■ Republic of Korea

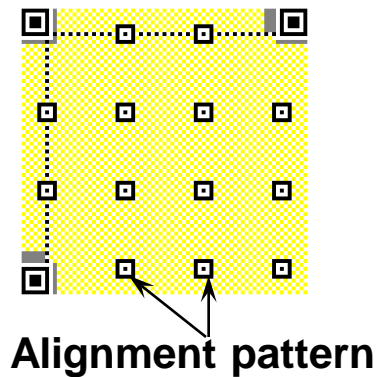
- Korean National Standard KSXISOIEC 18004

■ Socialist Republic of Viet Nam

- Vietnamese National Standard (under standardization process)

QR Code Features

- High capacity and reduced space encoding
 - ◆ Up to 7,089 characters (numeric)
 - ◆ 300 characters (numeric) in 5mm square (0.1mm module)
- High-speed and omni-directional reading
- High resistant to damage
 - ◆ Up to 30% of codewords can be recovered.
- Distortion corrected capability
 - ◆ Alignment pattern enables correction of local distortion.
- Efficient encoding of Kanji/Kana
 - ◆ 20% fewer bits (13 bits) are used to encode Kanji as a default character set.



Benefits of Easy (High-Speed) Reading

**Easy reading
(High-speed reading)**

Fixed reader

**Read high-speed
moving objects**

**Maximize the
performance of
conveyors**

Hand-held reader

**Achieve high
response and
instant reading**

**Provide high
operability**

QR Code Major Applications



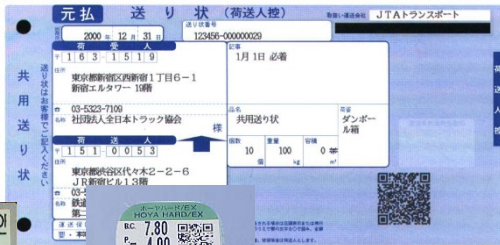
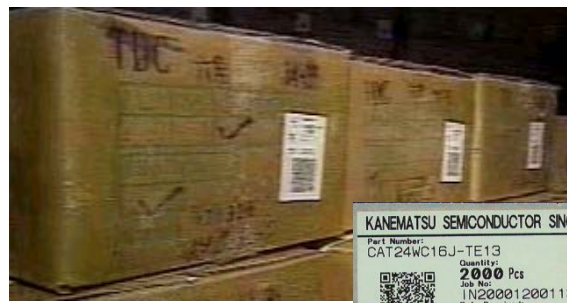
**JAMA Label/Kanban
(Japan & USA)**



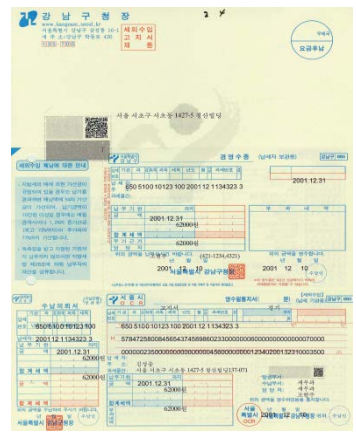
**Part Label
(UK)**



**Livestock Ear/Tail Tag
(Australia)**



**Product Package Label
(Japan)**



**Soul City Tax Form
(Korea)**



QR Code Implementation – JAMA Members

■ DAIHATSU MOTOR CO., LTD.

- After market parts deliver card & label

■ FUJI HEAVY INDUSTRIES, LTD.

- Parts label (Glove box, etc.)

■ HINO MOTORS, LTD.

- Assembly line control

■ HONDA MOTOR CO., LTD.

- Assembly line control

■ ISUZU MOTORS LIMITED

- JAMA standard slips

■ KAWASAKI HEAVY INDUSTRIES, LTD.

- JAMA standard slips

■ MAZDA MOTOR CORPORATION

- Assembly line control

■ MITSUBISHI MOTORS CORPORATION

- Production data control

■ NISSAN DIESEL MOTOR CO., LTD.

- JAMA standard slips

■ NISSAN MOTOR CO., LTD.

- General material control, etc.

■ SUZUKI MOTOR CORPORATION

- JAMA standard slips

■ TOYOTA MOTOR CORPORATION

- JAMA standard slips, Parts label, etc.

■ YAMAHA MOTOR CO., LTD.

- Direct parts marking

-
-
-



QR Code Implementation – JEITA Members

■ CANON INC.

- Shipping control for printer

■ DENSO CORPORATION

- Manufacturing process control for EL display glass

■ FUJITSU LIMITED

- Manufacturing process control for hard disk

■ HITACHI, LTD.

- Manufacturing process control for personal computer

■ MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD. (Panasonic)

- Shipping/receiving control for equipment parts

■ MITSUBISHI ELECTRIC CORPORATION

- Manufacturing process control for products

■ SANYO ELECTRIC CO., LTD.

- Receiving control for battery

■ SEIKO EPSON CORPORATION

- Manufacturing process control for printer head

■ SHARP CORPORATION

- Manufacturing process control for MD devices

■ SONY CORPORATION

- Manufacturing process control for video camera

■ T D K CORPORATION

- Shipping control for electronics parts

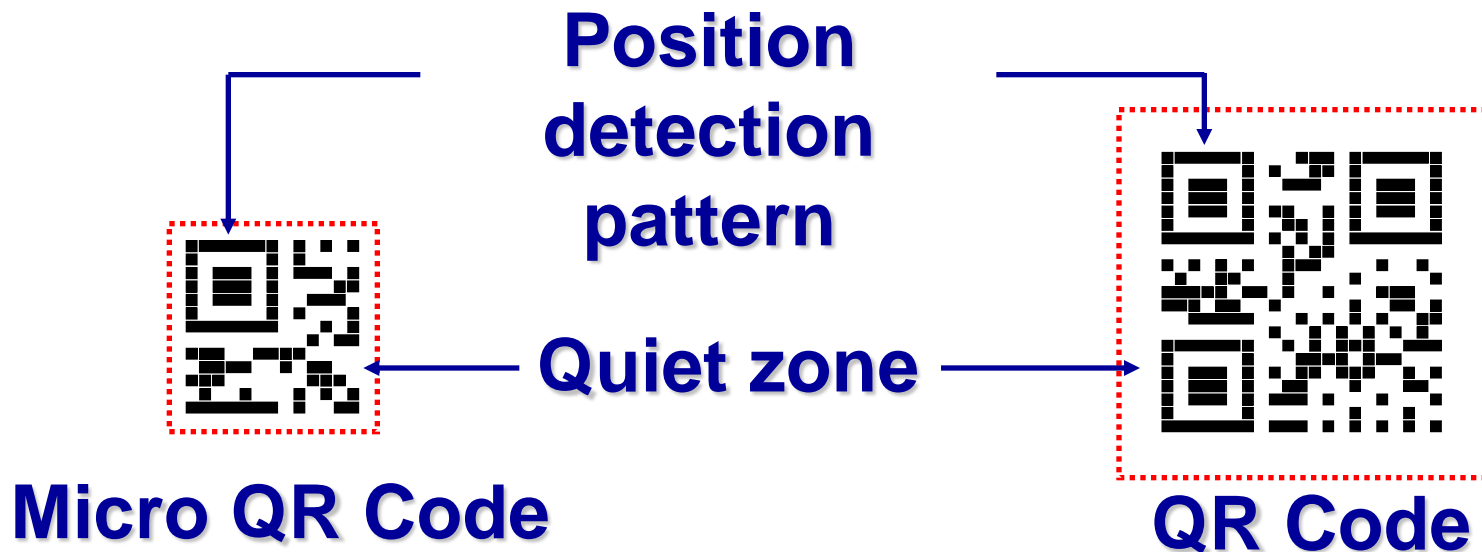
■ TOSHIBA CORPORATION

- Manufacturing process control for personal computer

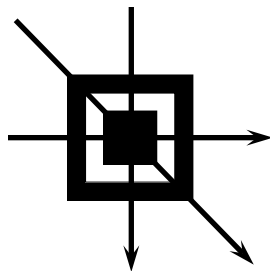
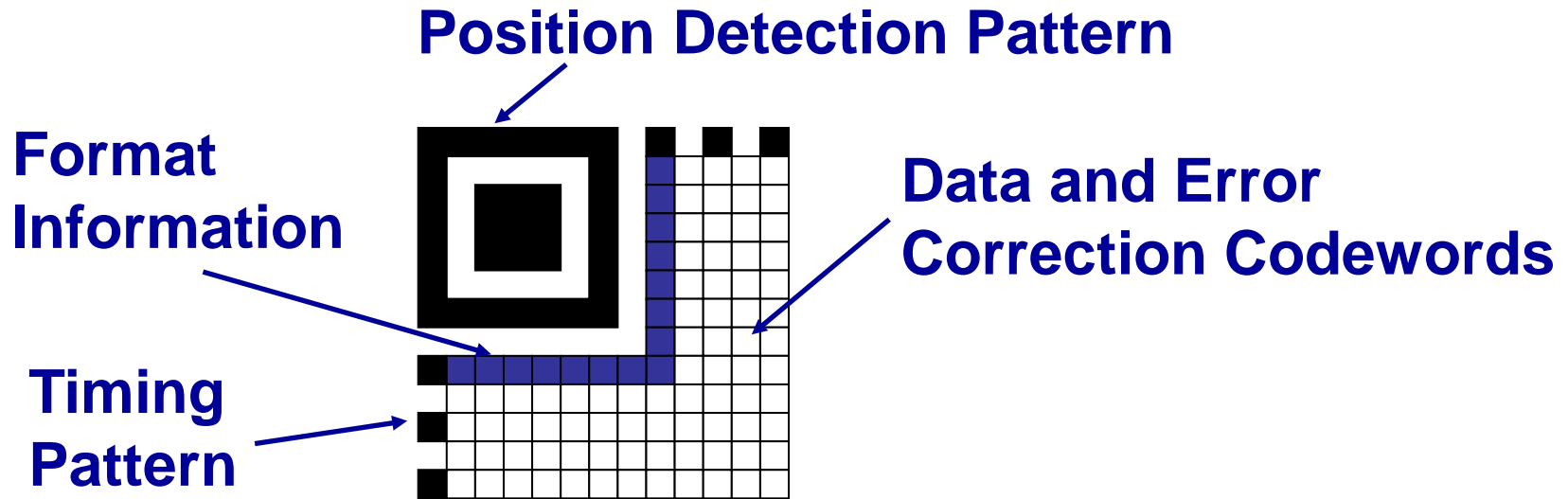


What is Micro QR Code?

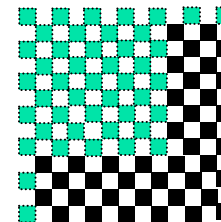
- Only with one PDP to achieve more efficient data encoding and smaller size
- Maintain the most beneficial feature of QR Code; “Easy reading”
- Suitable for small data/space applications



Micro QR Code Structure



B:W:B:W:B = 1:1:3:1:1



Apply masking

Stable high speed reading without effect of background

Data Capacity of All Micro QR Code

Version	Modules per side	Error detection/correction	Data capacity			
			Numeric	Alpha-numeric	8-bit byte	Kanji
M1	11	Error detection only	5	-	-	-
M2	13	Level L (7% corrected)	10	6	-	-
		Level M (15% corrected)	8	5	-	-
M3	15	Level L (7% corrected)	23	14	9	6
		Level M (15% corrected)	18	11	7	4
M4	17	Level L (7% corrected)	35	21	15	9
		Level M (15% corrected)	30	18	13	8
		Level Q (25% corrected)	21	13	9	5



QR Code Family

■ QR Code Model 2

- ◆ Standard version
- ◆ Added alignment patterns to correct more distortion
- ◆ Increased data capacity; Up to 7,089 characters (numeric)
- ◆ Wide range of applications, such as high volume data processing and high-speed reading

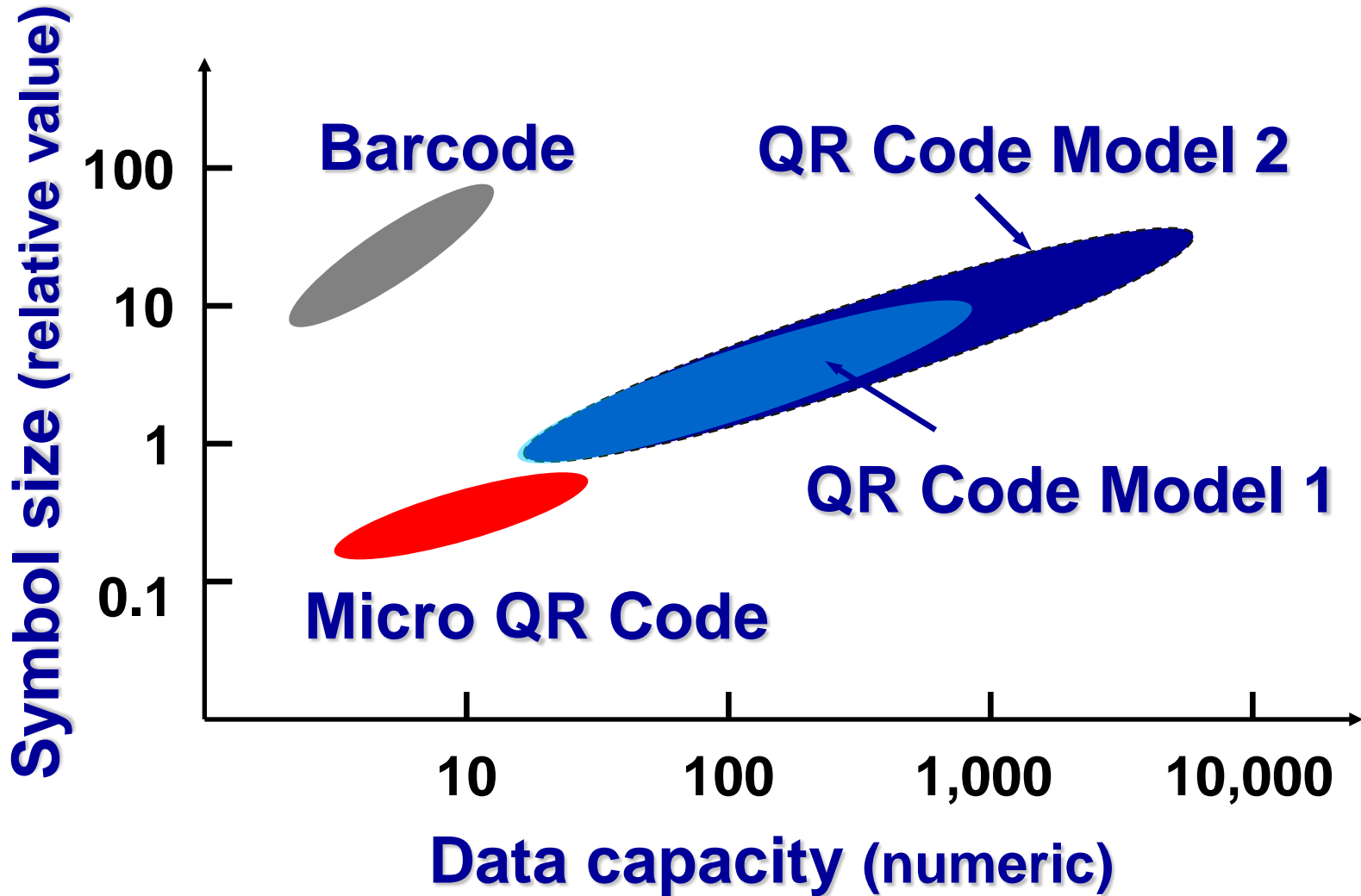
■ QR Code Model 1

- ◆ Original version
- ◆ Data capacity; Up to 1,167 characters (numeric)

■ Micro QR Code

- ◆ Small QR Code with one position detection pattern
- ◆ Suitable for small data and limited space applications¹²

Comparison of QR Code Data Capacity





Micro QR Code Applications

■ Ultra small label

Labels/tags attached to small parts, jewelry etc. where space for a barcode is not available.

■ Small item marking

Direct marking on electronic parts, medical supplies, etc.

■ Data entry sheet

Catalogue, inspection sheet, etc. where many symbols are printed as data entry media.

Micro QR Code Application

1. Price tag used in jewelry shop

- Item management and sales data entry



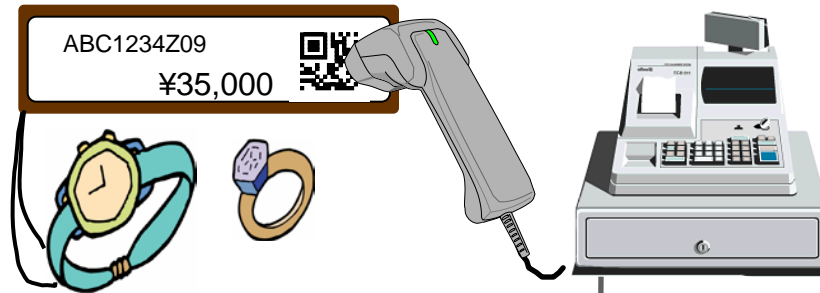
Price Tag

System Configuration

(Price tag used in jewelry shop)

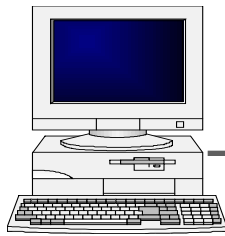
Shop

Sales/inventory data collection



Office

Sales/inventory management

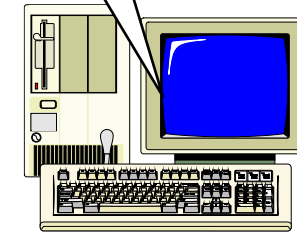


Sales/inventory /client data

Head office

Sales/inventory/client management

Shop	Sale date	Product name
.....
.....
.....



Manufacturers

- Establish sales system for small jewel and watches
- Improve sales/inventory management

2. Paperback Book Control

Inventory control/replenishment in book stores



- Country code: 1 digit
- Publisher/title code: 8 digits
- Category code: 4 digits
- Price: Up to 5 digits

Micro QR Code is printed on book cover

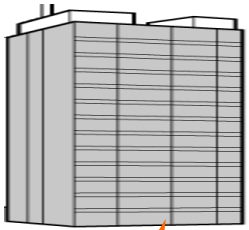
ISBN4-12345-123-3 C1011 ¥1200E

国別記号 出版者(社)記号 書名記号 分類コード 本体価格

System Configuration (Paperback book control)

Book store

Center



**Order
out-of-
stock
books**

**Download data
of books**

Read Micro QR Code

- Inventory control is significantly improved
- One salesperson can visit more book stores

3. Book Label

■ Book stock control at university library

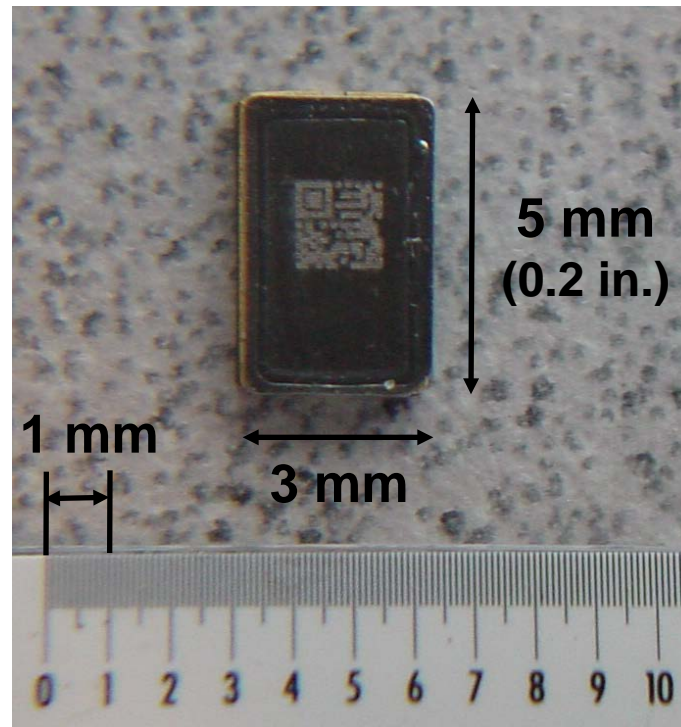


Version: M4
Data: 2000N00902210

Book Label

5. Marking on Electronics Parts

- Assembly instruction and part tracking in manufacturing process



Direct marking on micro sensor

6. Manufacturing Process Control

■ Automatic assembling and manufacturing data control

Micro QR Code attachment

Issue label

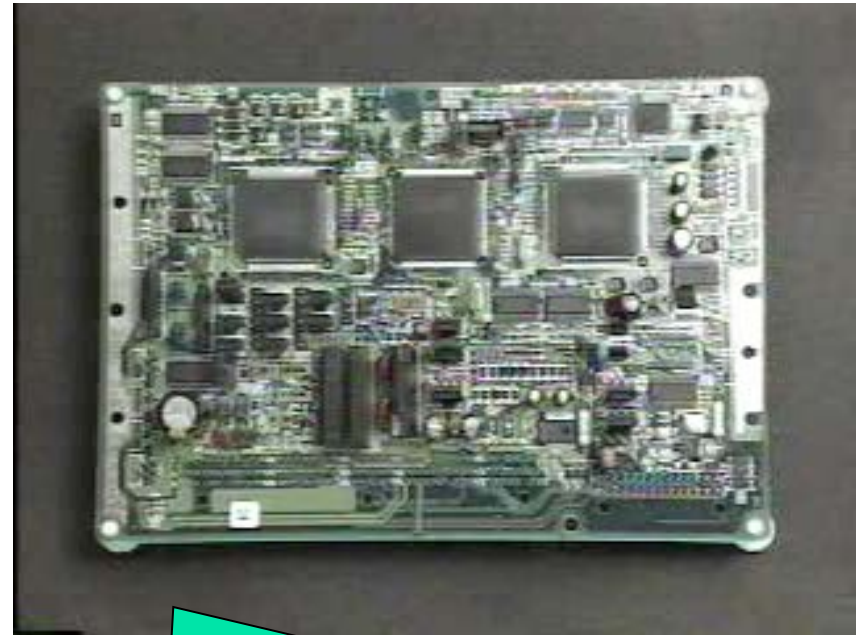
Attach label

Read Micro QR Code

Automatic set-up

- Change line width
- Provide assembled parts info

Assembling process



Symbol size: Approx. 5mm square
Data (26 digits): Product/Serial No,
PCB data, Date

- Automatic set-up system without host PC is realized.
- Manufacturing data is automatically managed.

Reference – Support QR Code

■ Reading devices

Major scanner manufactures provide 2D scanners which read QR Code as well as other ISO/IEC 2D symbologies.



Scanner



Pen type



Camera type



Handy terminal



Fixed type

■ Printing devices (printers, software, etc.)

Major bar code printing/marketing device manufactures provide devices which generate QR Code



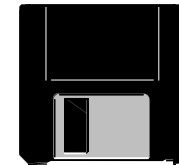
Label printer



Page printer



Marking equipment



PC software

Add Micro QR Code to ISO/IEC

**Excelling features in
QR Code Family
(Technical needs)**

**Users need ISO/IEC
Standard of Micro QR
(Business needs)**

- **Add Micro QR Code to ISO/IEC**
- **Promote 2D market**

**Global product
support for QR Code
family**

**Appropriate reference
standard exists
(ISO/IEC 18004 QR Code)**



***Thank you very much
for your kind attention !!***

