



# **COMPACT INDIGO SYSTEM**

## **EVALUATION BOARD**

### **SK-88F332-02**

---

**USERS GUIDE**





## Revision History

Date	Version	Comments
27.09.2009	V0.10	MKa, First Release
03.11.2009	V0.11	MKa Adjusted Value of R21, added default values of Indigo Modepins
08.04.2010	V1.00	Adapted document to second revision of the board

This document contains 27 pages.

## Warranty and Disclaimer

To the maximum extent permitted by applicable law, Fujitsu Microelectronics Europe GmbH restricts its warranties and its liability for the **COMPACT INDIGO SYSTEM** Board and all its deliverables (eg. software include or header files, application examples, target boards, evaluation boards, engineering samples of IC's, display etc.), its performance and any consequential damages, on the use of the Product in accordance with (i) the terms of the License Agreement and the Sale and Purchase Agreement under which agreements the Product has been delivered, (ii) the technical descriptions and (iii) all accompanying written materials. In addition, to the maximum extent permitted by applicable law, Fujitsu Microelectronics Europe GmbH disclaims all warranties and liabilities for the performance of the Product and any consequential damages in cases of unauthorised decompiling and/or reverse engineering and/or disassembling.

**Note: The COMPACT INDIGO SYSTEM Board and all its deliverables are intended and must only be used in an evaluation laboratory environment.**

1. Fujitsu Microelectronics Europe GmbH warrants that the Product will perform substantially in accordance with the accompanying written materials for a period of 90 days from the date of receipt by the customer. Concerning the hardware components of the Product, Fujitsu Microelectronics Europe GmbH warrants that the Product will be free from defects in material and workmanship under use and service as specified in the accompanying written materials for a duration of 1 year from the date of receipt by the customer.
2. Should a Product turn out to be defect, Fujitsu Microelectronics Europe GmbH's entire liability and the customer's exclusive remedy shall be, at Fujitsu Microelectronics Europe GmbH's sole discretion, either return of the purchase price and the license fee, or replacement of the Product or parts thereof, if the Product is returned to Fujitsu Microelectronics Europe GmbH in original packing and without further defects resulting from the customer's use or the transport. However, this warranty is excluded if the defect has resulted from an accident not attributable to Fujitsu Microelectronics Europe GmbH, or abuse or misapplication attributable to the customer or any other third party not relating to Fujitsu Microelectronics Europe GmbH.
3. To the maximum extent permitted by applicable law Fujitsu Microelectronics Europe GmbH disclaims all other warranties, whether expressed or implied, in particular, but not limited to, warranties of merchantability and fitness for a particular purpose for which the Product is not designated.
4. To the maximum extent permitted by applicable law, Fujitsu Microelectronics Europe GmbH's and its supplier's liability are restricted to intention and gross negligence.

### **NO LIABILITY FOR CONSEQUENTIAL DAMAGES**

**To the maximum extent permitted by applicable law, in no event shall Fujitsu Microelectronics Europe GmbH and its suppliers be liable for any damages whatsoever (including but without limitation, consequential and/or indirect damages for personal injury, assets of substantial value, loss of profits, interruption of business operation, loss of information, or any other monetary or pecuniary loss) arising from the use of the Product.**

Should one of the above stipulations be or become invalid and/or unenforceable, the remaining stipulations shall stay in full effect

# 1 Contents

<b>REVISION HISTORY</b> .....	<b>3</b>
<b>WARRANTY AND DISCLAIMER</b> .....	<b>4</b>
<b>1 CONTENTS</b> .....	<b>5</b>
<b>2 OVERVIEW</b> .....	<b>7</b>
2.1 Introduction .....	7
2.2 Features.....	7
2.3 General description.....	8
<b>3 USE CASES OF THE COMPACT INDIGO SYSTEM</b> .....	<b>9</b>
3.1 MB91467S and Compact Indigo System .....	9
3.2 Jade-D and Compact Indigo System .....	9
3.3 Congactec PCIe Card and Compact Indigo System.....	9
<b>4 INSTALLATION</b> .....	<b>10</b>
<b>5 JUMPERS AND SWITCHES</b> .....	<b>11</b>
5.1 Jumper Overview.....	11
5.2 Power Modes for Compact Indigo System.....	12
5.3 3.3V or 5V Power supply for MCU and Indigo Steppermotors and 5V Supply region (JP1).....	13
5.4 Operating Modes for MB88F332 'Indigo'.....	14
5.5 Indigo PWMs for Display Backlight dimming .....	15
5.6 Operating-Mode for MB96F356 (S2).....	15
5.7 Necessary changes if MB96F356 SPI is used for programming the Indigo.....	15
5.8 APIX Connector .....	16
5.9 Display .....	16
<b>6 USE OF ADDITIONAL PARTS/FEATURES ON THE COMPACT INDIGO BOARD</b> .....	<b>17</b>
6.1 Use of the EEPROM.....	17
6.2 TSHARC Touch Controller .....	17
6.3 External Flash.....	17
6.4 MB96F350 Controller .....	17
6.5 Speaker.....	18
<b>7 DEFAULT ENABLED FEATURES OF THE COMPACT INDIGO SYSTEM</b> .....	<b>19</b>
7.1 Touch display via UART .....	19
7.2 LEDs and Buttons via GPIOs .....	19
7.3 Backlight dimming via VPWM or PWM .....	19
7.4 7" Display mounted and configured display parameter .....	19
<b>8 PROGRAMMING INDIGO</b> .....	<b>20</b>
8.1 Aardvark.....	20
<b>9 PROGRAMMING THE MCU</b> .....	<b>21</b>

9.1 VIA USB -> RS232 TTL Cable .....	21
<b>10 CONNECTORS .....</b>	<b>22</b>
10.1 Power connector (X7) .....	22
10.2 Aardvark connector (X2).....	22
<b>11 RELATED PRODUCTS .....</b>	<b>23</b>
11.1 MB91F467S.....	23
11.2 Jade-D 23	
11.3 Congatec PCIe Card .....	23
<b>12 INFORMATION ON THE INTERNET .....</b>	<b>24</b>
<b>13 CHINA ROHS REGULATION .....</b>	<b>25</b>
<b>14 RECYCLING .....</b>	<b>27</b>

## 2 Overview

### 2.1 Introduction

The 'Compact Indigo System', SK-88F332-02 is a multifunctional evaluation board for the Fujitsu Indigo MB88F332 GDC and 16-Bit Flash microcontroller MB96F356 Series.

It can be used as a remote display board for the MB91F467SA, Jade-D (MB86R02) and Congatec APIX PCI Express card. The connection to the devices is via an APIX™ link. The intention is to use the full function set of Indigo via the APIX link.

Furthermore, the board can also be used as a receiver of APIX camera signals. The pre-mounted MB96F350 could setup the indigo via the SPI Host Interface.

### 2.2 Features

- ▶ Power options:
  - ▶ Power over APIX possible
  - ▶ Auxiliary power possible (if RJ45 is mounted)
  - ▶ External power source via plug possible
- ▶ RJ45 or Rosenberger HSD Connector (assembly option)
- ▶ Access to the TSHARC Touch Controller via Indigo UART possible
- ▶ Key matrix decoding possible
- ▶ All resources of Indigo and MB96F356 available for evaluation
- ▶ All pins routed to pin headers
- ▶ 4 MHz main-crystal, 32 kHz subclock-crystal for MB96F356 assembly option
- ▶ Programming of Indigo via Host Interface using Aardvark ([www.totalphase.com](http://www.totalphase.com)) and GDC Flasher/GDC Studio or MB96F350
- ▶ Display options e.g 7" (resolution 800x480) or 5.7" (resolution 640x480) possible
- ▶ 4 user push buttons connected to Indigo GPIO
- ▶ 4 user LED connected to Indigo GPIO
- ▶ Reset button, Reset LED, Power OK LED
- ▶ In-circuit programming for MB96F350 possible

**This board must only be used for test applications  
in an evaluation laboratory environment.**

### **2.3 General description**

The operating mode of the Indigo MB88F332 can be selected by DIP-switches S1 and S8, whereas the operating mode of the MB96F350 (U2) can be selected via switch S2.



## **3 Use cases of the Compact Indigo System**

### **3.1 MB91467S and Compact Indigo System**

- APIX link is used for high-speed data connection
- Internal Graphics Engine: only sprite based
- All peripherals of Indigo can be used
- Software Remote Handler Light SW-ARH-DRV-LT-91460-E01 Is highly recommended to shorten development time and save software costs
- GDC Designer could be used for prototyping and graphic code generation

### **3.2 Jade-D and Compact Indigo System**

- Jade-D Arm based graphic SoC with two integrated APIX channels
- Up to 1Gbit APIX Pixel Link for rendered pictures could be used
- In addition, all the features of Indigo sprite engine could be used
- All the peripherals of Indigo could be used too
- Remote Handler Light Software should be used

### **3.3 Congactec PCIe Card and Compact Indigo System**

- PC picture on display
- Some peripherals could be used (UART->Touch, GPIOs->LEDs, buttons)
- Comprehensive driver for Indigo peripherals under development

## 4 Installation

Please remove the board carefully from the shipping box.

Check first if there is any damage before powering on the evaluation board and check carefully that the display is not broken.

**Please change the jumper settings and power sources for your use case! You can find additional information about this in the chapter “How to power the Compact Indigo System”.**

After switching the power on, the display backlight and LED D20 should be lit. If the LED D20 is not on, switch off the power supply and check the jumper settings again.

By default, the evaluation board supplied with a MB96F350 microcontroller, programmed with test software and a pre-flashed Indigo.

In-circuit programming allows the user to program his own application into the flash memory. Guidance for programming Indigo's flash memory and the MB96F350 is described in chapter 5.

**Do not use programming adapters other than the Aardvark adapter (from [TOTALPHASE Inc.](#)) for Indigo and the TTTL-232R USB - TTL Level Serial Converter2.54TL (from [FTDI](#)) for MB96F356 only!**

## 5 Jumpers and Switches

This chapter describes the jumpers and switches which can be modified on the evaluation board. The default settings are indicated by a grey background. All jumpers and switches are named directly on the board, so it is very easy to set the jumpers according to the features.

### 5.1 Jumper Overview

Jumper	Description / Function	Type	Default
JP1	Power 5V (default) or 3.3V for MCU and Indigo	Jumper 4	3-4
JP3	No power external power from X7 default	Jumper 2	open
JP5	12 V power insertion from SDIN_P	Jumper 2	closed
JP6	12 V power insertion from SDIN_N	Jumper 2	closed
JP7	GND insertion from SDOUT_P	Jumper 2	closed
JP8	GND insertion from SDOUT_N	Jumper 2	closed
JP9	Aux Power 12V	Jumper 2	open
JP10	Aux Power GND	Jumper 2	open
JP11	Used if EEPROM is assembled	Jumper 2	open
JP12	Used if EEPROM is assembled	Jumper 2	open
JP13	Connect Shield of Cable to GND	Jumper 2	closed
X12/1	Aardvark or MCU to HostIF connection (DI)	Jumper 3	2-3
X12/2	Aardvark or MCU to HostIF connection (DO)	Jumper 3	2-3
X14/1	Aardvark or MCU to HostIF connection (SCK)	Jumper 3	2-3
X12/2	Aardvark or MCU to HostIF connection (XCS)	Jumper 3	2-3
X8	PWM11 or VPWM3 for backlight dimming	PinHeader	1-3

## 5.2 Power Modes for Compact Indigo System

### 5.2.1 Power via APIX

Jumper	Description / Function	Type	Default
JP3	external power from X7	Jumper 2	open
JP5	12 V power insertion from SDIN_P	Jumper 2	closed
JP6	12 V power insertion from SDIN_N	Jumper 2	closed
JP7	GND insertion from SDOUT_P	Jumper 2	closed
JP8	GND insertion from SDOUT_N	Jumper 2	closed
JP9	Aux Power 12V	Jumper 2	open
JP10	Aux Power GND	Jumper 2	open

### 5.2.2 Power via an auxiliary source

**This is only an option if the RJ45 connector is used!**

Jumper	Description / Function	Type	Default
JP3	external power from X7	Jumper 2	open
JP5	12 V power insertion from SDIN_P	Jumper 2	open
JP6	12 V power insertion from SDIN_N	Jumper 2	open
JP7	GND insertion from SDOUT_P	Jumper 2	open
JP8	GND insertion from SDOUT_N	Jumper 2	open
JP9	Aux Power 12V	Jumper 2	closed
JP10	Aux Power GND	Jumper 2	closed

### 5.2.3 Power via an external source (X7)

Jumper	Description / Function	Type	Default
JP3	external power from X7	Jumper 2	closed
JP5	12 V power insertion from SDIN_P	Jumper 2	open
JP6	12 V power insertion from SDIN_N	Jumper 2	open
JP7	GND insertion from SDOUT_P	Jumper 2	open
JP8	GND insertion from SDOUT_N	Jumper 2	open
JP9	Aux Power 12V	Jumper 2	open
JP10	Aux Power GND	Jumper 2	open

### 5.2.4 Compact Indigo System is power source for external device

**Make sure that X7 is connected to a power source 12V DC!**

#### 5.2.4.1 Power to external device provided by power over APIX

Jumper	Description / Function	Type	Default
JP3	external power from X7	Jumper 2	closed
JP5	12 V power insertion from SDIN_P	Jumper 2	closed
JP6	12 V power insertion from SDIN_N	Jumper 2	closed
JP7	GND insertion from SDOUT_P	Jumper 2	closed
JP8	GND insertion from SDOUT_N	Jumper 2	closed
JP9	Aux Power 12V	Jumper 2	open
JP10	Aux Power GND	Jumper 2	open

#### 5.2.4.2 Power to external device via auxiliary power

**This is only an option if RJ45 Connector is used!**

Jumper	Description / Function	Type	Default
JP3	external power from X7	Jumper 2 pole	closed
JP5	12 V power insertion from SDIN_P	Jumper 2 pole	open
JP6	12 V power insertion from SDIN_N	Jumper 2 pole	open
JP7	GND insertion from SDOUT_P	Jumper 2 pole	open
JP8	GND insertion from SDOUT_N	Jumper 2 pole	open
JP9	Aux Power 12V	Jumper 2 pole	closed
JP10	Aux Power GND	Jumper 2 pole	closed

### 5.3 3.3V or 5V Power supply for MCU and Indigo Steppermotors and 5V Supply region (JP1)

If JP1 is connected to 2-3 the MCU and the Indigo (steppermotors and 5V Supply Region (Indigo Pin 13, 19, 25, 31, 37, 43, 1, 51, 53, 62, 85, 94, 104, 179, 189, 207)) are supplied with 5V.

Jumper	Description / Function	Type	Setting
JP1	5V Power for MCU and parts of Indigo	Jumper 3 pole	2-3
JP1	3.3V Power for MCU and parts of Indigo	Jumper 3 pole	3-4

If JP1 is connected to 3-4 the MCU and the Indigo (steppermotors and 5V Supply Region (Indigo Pin 13, 19, 25, 31, 37, 43, 1, 51, 53, 62, 85, 94, 104, 179, 189, 207)) are supplied with 3.3V.

## 5.4 Operating Modes for MB88F332 'Indigo'

DIP switches S1/1 to S1/3 and S8 are used for the configuration of the APIX interface. S8/1 to S8/8 are used to set the operating mode of the MB88F332 'Indigo'.

Make sure that the mode pin settings correspond to the configuration/operation mode of the whole application and APIX setup.

For detailed information, please check the Hardware Manual of the MB88F332 'Indigo'.

Default/recommended settings are marked with a gray background.



[\(Indigo Hardware Manual Version 1.1\)](#)

DIP switch	Setting	Logical value
S1/1 (APIX_CNFG[2])	ON (closed)	1 (high)
	OFF (open)	0 (low)
S1/2 (APIX_CNFG[1])	ON (closed)	1 (high)
	OFF (open)	0 (low)
S1/3 (APIX_CNFG[0])	ON (closed)	1 (high)
	OFF (open)	0 (low)
S1/4	not connected (OFF)	

DIP switch	Setting	Logical value
S8/1 (MST)	ON (closed)	0 (low)
	OFF (open)	1 (high)
S8/2 (XTST)	ON (closed)	0 (low)
	OFF (open)	1 (high)
S8/3 (XSM)	ON (closed)	0 (low)
	OFF (open)	1 (high)
S8/4 (PLL_MODE)	ON (closed)	0 (low)
	OFF (open)	1 (high)
S8/5 (RSTB_MODE[1])	ON (closed)	0 (low)
	OFF (open)	1 (high)
S8/6 (RSTB_MODE[0])	ON (closed)	0 (low)
	OFF (open)	1 (high)
S8/7 (PLL_MODE)	ON (closed)	0 (low)
	OFF (open)	1 (high)
S8/8 (TESTSEL2)	ON (closed)	0 (low)
	OFF (open)	1 (high)

## 5.5 Indigo PWMs for Display Backlight dimming

Two options are available for dimming the display backlight:

### 5.5.1 VPWM3

Jumper	Value
X8	1-3

### 5.5.2 PWM\_11

Jumper	Value
X8	3-4

## 5.6 Operating-Mode for MB96F356 (S2)

The S2 switch is used to set the operating mode of the microcontroller (MB96F356).

Ensure that the mode pin settings correspond to the operation mode of the application.

For more detailed information, please check the Hardware Manual of the microcontroller.

DIP switch	Setting	Logical value
S2 (MD0)	RUN-MODE	1 (high)
	PGM-MODE	0 (low)

## 5.7 Necessary changes if MB96F356 SPI is used for programming the Indigo

If the MB96F355 is used for programming the Indigo MB88F332 via the Host Interface, the following changes have to be made:

Jumper	Value
X12/1	1-2
X12/2	1-2
X14/1	1-2
X14/2	1-2

**Aardvark is then deactivated.**

## 5.8 APIX Connector

The standard connector is an RJ45, but if the RJ45 is not mounted, a Rosenberger HSD (D4S20F-40MA5-?) (? Stands for the coding of the connector) connector could be mounted.

For pin out details please check the [Inova Specification](#).

## 5.9 Display

A 7" touch display is mounted on the board by default but the following displays could also be mounted without changing the connector:

(Please be aware that the internal parameters of the Indigo then have to be adjusted)

Possible Displays:

Ordering Number		Resolution
G-ET0350G0DH6	3.5"	320x240
G-ET0430G0DH6	4.3"	480x272
G-ET0500G0DH6	5.0"	800x480
G-ET0570G0DH6	5.7"	320x240
G-ET0570G0DHU	5.7"	640x480
G-ET0700G0DH6	7.0"	800x480

The versions mentioned above have touch functionality, but they are also available without touch functionality.

The alternative displays can be ordered at [Glyn](#).



## 6 Use of additional parts/features on the Compact Indigo Board

### 6.1 Use of the EEPROM

To use the EEPROM on the Compact Indigo System, you have to assemble the following parts:

Device	Description
U5	93LC46C
R79	4k7
C108	100nF
R84	1k
R78	0R

### 6.2 TSHARC Touch Controller

The TSHARC Touch Controller is connected to the UART of the Indigo. A Windows driver can be downloaded from the following link:

[TSCARC Driver Page](#)

### 6.3 External Flash

If you want to use the external flash device, you have to assemble following parts:

Device	Description
U9	MP45PE10-VMN6
R11	10k
C119	100nF
R120	10uF

### 6.4 MB96F350 Controller

#### 6.4.1 Communication between MB96F350 and Indigo

##### 6.4.1.1 UART Communication

The default path is the UART 2 of MCU (Pin 9, Pin 10) connected to Indigo UART (Pin190, Pin 191). If you don't want to use this connection you must remove the following parts:

Device	Description
R32	0R
R33	0R
R34	0R

### 6.4.1.2 I2C Communication

You can use Indigo-MCU communication via I2C. If you would like to use this, please assemble the following parts.

Device	Description
R96	0R
R97	0R

## 6.5 Speaker

A speaker could be used together with the Compact Indigo System. Please connect a speaker to:

Device	Description
X9 Pin1	SG_SGA
X9 Pin2	SG_SGO

## 7 Default enabled features of the Compact Indigo System

### 7.1 Touch display via UART

The touch display is connected to a TSHARC touch controller. This device communicates via UART/SPI1 of Indigo (DI Pin 93; DO Pin 97). The pin multiplexing in Indigo is configured such that SPI1 is in UART function mode.

### 7.2 LEDs and Buttons via GPIOs

The connections of LEDs and GPIOs are as follows: The pin multiplexing and data direction register in Indigo is configured in accordance with this function.

GPIO	LED
GPIO_0	DS1
GPIO_1	DS2
GPIO_2	DS3
GPIO_3	DS4

The connections of BUTTONs and GPIOs are as follows. The pin multiplexing and data direction register in Indigo is configured in accordance with this function.

GPIO	Button
GPIO_8/PWM_O[0]	SW3
GPIO_9/PWM_O[1]	SW4
GPIO_10/PWM_O[2]	SW5
GPIO_11/PWM_O[3]	SW6

### 7.3 Backlight dimming via VPWM or PWM

The backlight can be dimmed via VPWM\_3 or PWM\_11. The default is VPWM\_3 (jumper on X8 1-3). Please bear in mind that VPWM\_3 is only operative if the pixel clock is active and the pin multiplexing in Indigo has been configured appropriately for this function. This function only works correctly if the host can control the registers in Indigo.

### 7.4 7" Display mounted and configured display parameter

The parameters for the 7" display are flashed to Indigo. If you want to change the display, please use the Host Interface to adjust the parameters.

## 8 Programming Indigo

### 8.1 Aardvark

A level shifter as described in "[INDIGO HOST INTERFACE LEVEL SHIFTER FOR 5V](#)" is already mounted on the Compact Indigo System. If you use the board only in the 3.3V domain, this level shifter is not necessary but is mounted because it is also possible to use the 5V domain.

#### 8.1.1 Flash a sequence with GDC flasher

GDC Flasher is a free tool for loading GDC Studio format files into the flash memory of MB88F332 'Indigo'. You will find more information and documentation [here](#).

#### 8.1.2 Use Aardvark for debugging the Indigo chip with the help of GDC Studio

A description of how to use [GDC Studio](#) for debugging the Indigo is available [here](#).

## 9 Programming the MCU

### 9.1 VIA USB -> RS232 TTL Cable

For programming the MCU please use X6 and following cable form FTDI:

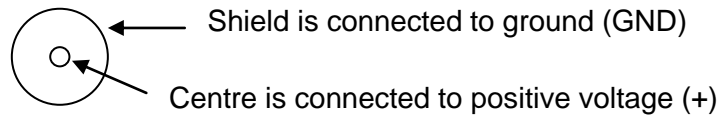
[http://www.ftdichip.com/Documents/DataSheets/Modules/DS\\_TTL232R.pdf](http://www.ftdichip.com/Documents/DataSheets/Modules/DS_TTL232R.pdf)

## 10 Connectors

### 10.1 Power connector (X7)

The following figure shows the power connection jack X12. This connector is used to connect an external, unregulated DC power supply voltage (9-12 V DC) to the evaluation board.

Connector X7:



If you are using external power, please make sure that you have jumpered your board according to chapter “5.2 Power Modes for Compact Indigo System”

### 10.2 Aardvark connector (X2)

You can use X2 to connect the Aardvark. Please make sure that Pin1 is connected to the red marked side of the Aardvark cable

## **11 Related Products**

### **11.1 MB91F467S**

[MB91F467SAPMC Resources](#)

### **11.2 Jade-D**

[Jade-D Resources](#)

### **11.3 Congatec PCIe Card**

[Congatec PCIe Card](#)

## 12 Information on the Internet

Information about FUJITSU MICROELECTRONICS Products can be found on the following Internet pages:

Microcontrollers (8-, 16- and 32bit), Graphics Controllers  
Datasheets and Hardware Manuals, Support Tools (Hard- and Software)

<http://mcu.emea.fujitsu.com>

Linear Products: Power Management, A/D and D/A Converters

<http://www.fujitsu.com/emea/services/microelectronics/linears/>

Media Products: SAW filters, acoustic resonators and VCOs

<http://www.fujitsu.com/emea/services/microelectronics/saw/>

For more information about FUJITSU MICROELECTRONICS

<http://www.fujitsu.com/emea/services/microelectronics/>

China RoHS regulation <http://www.fujitsu.com/emea/services/microelectronics/>



## 13 China RoHS regulation

### Evaluation Board 评估板

### Emulation Board 仿真板

根据SJ/T11364-2006

《电子信息产品污染控制标识要求》特提供如下有关污染控制方面的信息。

The following product pollution control information is provided according to SJ/T11364-2006 *Marking for Control of Pollution caused by Electronic Information Products*.

#### 1. 电子信息产品污染控制标志说明 Explanation of Pollution Control Label



该标志表明本产品含有超过中国标准SJ/T11363-2006

《电子信息产品中有毒有害物质的限量要求》中限量的有毒有害物质。标志中的数字为本产品的环保使用期，表明本产品在正常使用的条件下，有毒有害物质不会发生外泄或突变，用户使用本产品不会对环境造成严重污染或对其人身、财产造成严重损害的期限，单位为年。

为保证所声明的环保使用期限，应按产品手册中所规定的环境条件和方法进行正常使用，并严格遵守产品维修手册中规定的定期维修和保养要求。

产品中的消耗件和某些零部件可能有其单独的环保使用期限标志，并且其环保使用期限有可能比整个产品本身的环保使用期限短。应到期按产品维修程序更换那些消耗件和零部件，以保证所声明的整个产品的环保使用期限。

本产品在使用寿命结束时不可作为普通生活垃圾处理，应被单独收集妥善处理。

请注意：环保使用期限50年的指定不是与产品的耐久力，使用期限或任何担保要求等同的。

This symbol to be added to all EIO sold to China, indicates the product contains hazardous materials in excess of the limits established by the Chinese standard SJ/T11363-2006 *Requirements for Concentration Limits for Certain Hazardous Substances in Electronic Information Products*. The number in the symbol is the Environment-friendly Use Period (EFUP), which indicates the period, starting from the manufacturing date, during which the toxic or hazardous substances or elements contained in electronic information products will not leak or mutate under normal operating conditions so that the use of such electronic information products will not result in any severe environmental pollution, any bodily injury or damage to any assets, the unit of the period is "Year".

In order to maintain the declared EFUP, the product shall be operated normally according to the instructions and environmental conditions as defined in the product manual, and periodic maintenance schedules specified in Product Maintenance Procedures shall be followed strictly.

Consumables or certain parts may have their own label with an EFUP value less than the product. Periodic replacement of those consumables or parts to maintain the declared EFUP shall be done in accordance with the Product Maintenance Procedures.

This product must not be disposed of as unsorted municipal waste, and must be collected separately and handled properly after decommissioning.

Please note: The designation of 10 years EFUP is not to be equated with the durability, use-duration or any warranty-claims of the product.

产品中有毒有害物质或元素的名称及含量

Table of hazardous substances name and concentration

<b>部件名称</b> Component Name	<b>有毒有害物质或元素</b> Hazardous substances name					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr (VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
Error! Reference source not found.	x	o	o	o	o	o

**O:** 表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T11363-2006 标准规定的限量要求以下

**X:** 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006 标准规定的限量要求

- 此表所列数据为发布时所能获得的最佳信息
- 由于缺少经济上或技术上合理可行的替代物质或方案，此医疗设备运用以上一些有毒有害物质来实现设备的预期临床功能，或给人员或环境提供更好的保护效果。

O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.

X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006.

- Data listed in the table represents best information available at the time of publication

## 14 Recycling

### **Gültig für EU-Länder:**

Gemäß der Europäischen WEEE-Richtlinie und deren Umsetzung in landesspezifische Gesetze nehmen wir dieses Gerät wieder zurück.

Zur Entsorgung schicken Sie das Gerät bitte an die folgende Adresse:

Fujitsu Microelectronics Europe GmbH  
Warehouse/Disposal  
Monzastraße 4a  
63225 Langen

### **Valid for European Union Countries:**

According to the European WEEE-Directive and its implementation into national laws we take this device back.

For disposal please send the device to the following address:

Fujitsu Microelectronics Europe GmbH  
Warehouse/Disposal  
Monzastraße 4a  
63225 Langen