FUJITSU

FUJITSU FLASH USB Programmer

Specifications

FUJITSU FLASH
USB Programmer
Specifications
Version 1.09 11 Sep 2012
Software version number: V01L17
©2010 FUJITSU SEMICONDUCTOR LIMITED Printed in Japan

1. Circuit diagrams utilizing Fujitsu products are included as a mean of illustrating typical semiconductor applications. Complete information sufficient for construction proposes is not necessarily given.

1. The information contained in this document has been carefully checked and is believed to be reliable. However, Fujitsu assumes no responsibility for inaccuracies.

1. The information contained in this document does not convey any license under the copy right, patent right to trademarks claimed and owned by Fujitsu.

1. Fujitsu reserved the right to change products or specifications without notice.

1. No part of this publication may be copied or reproduced in any form or by any means, or transferred to any third party without prior written consent of Fujitsu.

1. The products described in this document are not intended for use in equipment requiring high reliability, such as marine relays and medical life-support systems. For such applications, contact your Fujitsu sales representative.

7. If the products and technologies described in this document are controlled by the Foreign Exchange and Foreign Trade Control Act established in Japan, their export is subject to prior approval based on the said act.

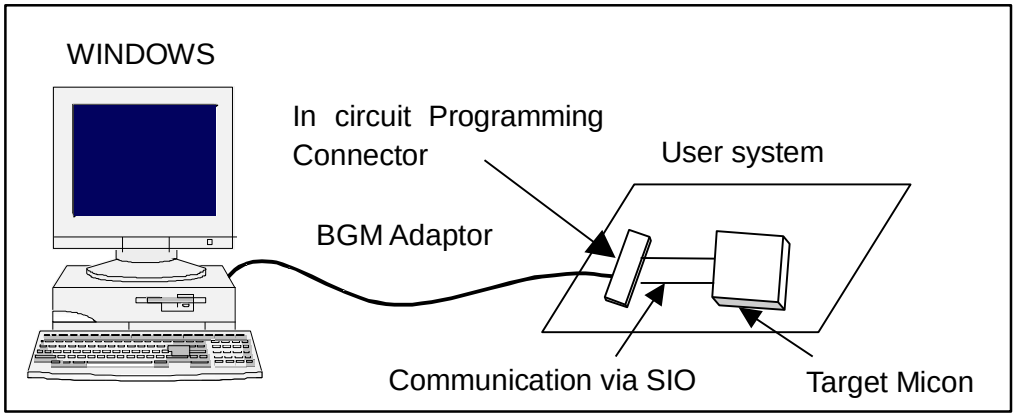
Ver	date	page	contents
1.00	2008/6/30	---	New
1.01	2008/7/8	P2,P19,P20 P59,P66,P67 P78	add MB95F116M,MB95F166,MB91F312A
1.02	2008/09/12	P2,P7,P8,P9 P10,P11,P12 P13,P14,P15 P16,P17,P18 P20,P43,P46 P74,P75	8FX Suffix change Caution change add MB90F335,MB90F912,MB90F997,MB91F224
1.03	2008/12/18	P5	MB89F202RA connection chart
1.04	2009/1/28		Suffix change MB90F884/A -> MB90F884/A/B/C MB90F883/A -> MB90F883/A/B Correction of registration MB91F249/S
1.05	2009/5/27		add MB90F362E/ES/TE/TES add MB90F883C add IntelHex format add Checksum function change FLASH area display
1.06	2009/6/26	Section 2,3	add MB91F492
1.07	2010/8/2	Section 2,3	add MB90F337,MB91F486,MB91F625,MB91F627, MB91F635A,MB91F637A,MB91F639A,MB91F644A, MB91F647A,MB91F668,MB91F669
1.08	2011/9/14		Windows 7 support
1.09	2012/9/11	Section 7	Windows 7 support bug fix

Contents

1. CONFIGURATION DIAGRAM 1
2. COMPATIBLE MICROCONTROLLERS 2
3. EXAMPLE OF CONNECTION FOR ON-BOARD REPROGRAMMING BY PROGRAMMER 3
3-1. 8L/8FX:EXAMPLE OF CONNECTION FOR ON-BOARD REPROGRAMMING BY PROGRAMMER 4
3-1-1. Setting for MB89F202RA 5
3-1-2. Setting for MB89F499 6
3-1-3. Setting for MB95F108B 7
3-1-4. Setting for MB95F108AM 8
3-1-5. Setting for MB95F116MA 9
3-1-6. Setting for MB95F118B 10
3-1-7. Setting for MB95F118M 11
3-1-8. Setting for MB95F128 12
3-1-9. Setting for MB95F128MB 13
3-1-10. Setting for MB95F136MB 14
3-1-11. Setting for MB95F146 15
3-1-12. Setting for MB95F156M 16
3-1-13. Setting for MB95F166 17
3-1-14. Setting for MB95F168MA 18
3-2. 16LX:EXAMPLE OF CONNECTION FOR ON-BOARD REPROGRAMMING BY PROGRAMMER 19
3-2-1. Setting for MB90F334/335/337 20
3-2-2. Setting for MB90F342/E/CE/ES/CES /F347 /F349 21
3-2-3. Setting for MB90F351E/ES/TE/TES /F352E/ES/TE/TES 22
3-2-4. Setting for MB90F362E/ES/TE/TES 23
3-2-5. Setting for MB90F387 24
3-2-6. Setting for MB90F394H 25
3-2-7. Setting for MB90MF408 26
3-2-8. Setting for MB90F428G 27
3-2-9. Setting for MB90F438L 28
3-2-10. Setting for MB90F462 29
3-2-11. Setting for MB90F482 30
3-2-12. Setting for MB90F488/B /F489B 31
3-2-13. Setting for MB90F497G /498G 32
3-2-14. Setting for MB90F543G /F548G /F548GL 33
3-2-15. Setting for MB90F583C 34
3-2-16. Setting for MB90F598G 35
3-2-17. Setting for MB90F803/N 36
3-2-18. Setting for MB90F804 /F809 37
3-2-19. Setting for MB90F822 /F823 38

3-2-20. Setting for MB90F867 39
3-2-21. Setting for MB90F882 /F883/A/B/C /F884/A/B/C 40
3-2-22. Setting for MB90F946A/F947A/F949A 41
3-2-23. Setting for MB90F952 42
3-2-24. Setting for MB90F983 43
3-2-25. Setting for MB90F997/912 44
3-3. FR:EXAMPLE OF CONNECTION FOR ON-BOARD REPROGRAMMING BY PROGRAMMER 45
3-3-1. Setting for MB91F211 /F213 46
3-3-2. Setting for MB91F223 /F224 47
3-3-3. Setting for MB91F249/S 48
3-3-4. Setting for MB91F312A 49
3-3-5. Setting for MB91F318R /FV319A /FV319R 50
3-3-6. Setting for MB91F345 51
3-3-7. Setting for MB91F353A /F355A /F356B 52
3-3-8. Setting for MB91F467RA 53
3-3-9. Setting for MB91F475 /F478 /F479 54
3-3-10. Setting for MB91F482 /F486 /F487 /F492 55
3-3-11. Setting for MB91F610 56
3-3-12. Setting for MB91F625 /F627 57
3-3-13. Setting for MB91F637 /F639 /F635A /F637A /F639A 58
3-3-14. Setting for MB91F644/ F647/ F644A/ F647A 59
3-3-15. Setting for MB91F662 60
3-3-16. Setting for MB91F668/F669 61
3-4. 16FX:EXAMPLE OF CONNECTION FOR ON-BOARD REPROGRAMMING BY PROGRAMMER 62
3-4-1. Setting for MB96F348C/H/T 63
3-5. BGM adaptor circuit chart 64
4. INSTALLATION AND EXECUTION OF SOFTWARE 65
5. PROGRAMMER FUNCTIONS 66
5-1. Downloading 68
5-2. Erasing and Programming 69
5-3. Motorola-S format decoder specification 72
5-4. Intel-Hex format decoder specification 73
5-5. Special specification 75
6. SECURITY FUNCTION 76
7. STATUS OF OPERATION CHECK 77
8. OTHERS 78
9. CAUTIONS 80

1. CONFIGURATION DIAGRAM



Using USB cable connected to the personal computer (Windows PC), flash memory data in the microcontroller mounted in the user system can be reprogrammed. Note that the user system must have a BGM Adopter for communication with the microcontroller SIO.

2. COMPATIBLE MICROCONTROLLERS

8L/8FX
MB89F202RA, MB89F499
MB95F108B/AM, MB95F116MA, MB95F118B/M, MB95F128/MB, MB95F136MB,
MB95F146, MB95F156M, MB95F166, MB95F168MA

16LX
MB90F334, MB90F335, MB90F337, MB90F342E/CE/ES/CES, MB90F347, MB90F349,
MB90F351E/ES/TE/TES, MB90F352E/ES/TE/TES, MB90F362E/ES/TE/TES,
MB90F387, MB90F394H,
MB90MF408, MB90F428G, MB90F438L, MB90F462, MB90F482, MB90F488/B
MB90F489B, MB90F497G, MB90F498G, MB90F543G, MB90F548/G/GL
MB90F583C, MB90F598G,
MB90F803/N, MB90F804, MB91F809, MB90F822, MB90F823, MB90F867,
MB90F882, MB90F883/A/B/C, MB90F884/A/B/C,
MB90F912, MB90F946A, MB90F947A, MB90F949A, MB90F952, MB90F983, MB90F997

FR
MB91F211, MB91F213, MB91F223, MB91F224, MB91F249/S, MB91F312A, MB91F318R,
MB91FV319A, MB91FV319R, MB91F345, MB91F353, MB91F355, MB91F356B,
MB91F467RA, MB91F475, MB91F478, MB91F479,
MB91F482, MB91F486, MB91F487, MB91F492,
MB91F610,MB91F625,MB91F627,MB91F637,MB91F639,MB91F635A,MB91F637A,
MB91F639A,MB91F644, MB91F647,MB91F644A, MB91F647A,
MB91F662, MB91F668, MB91F669

16FX
MB96F348C/H/T

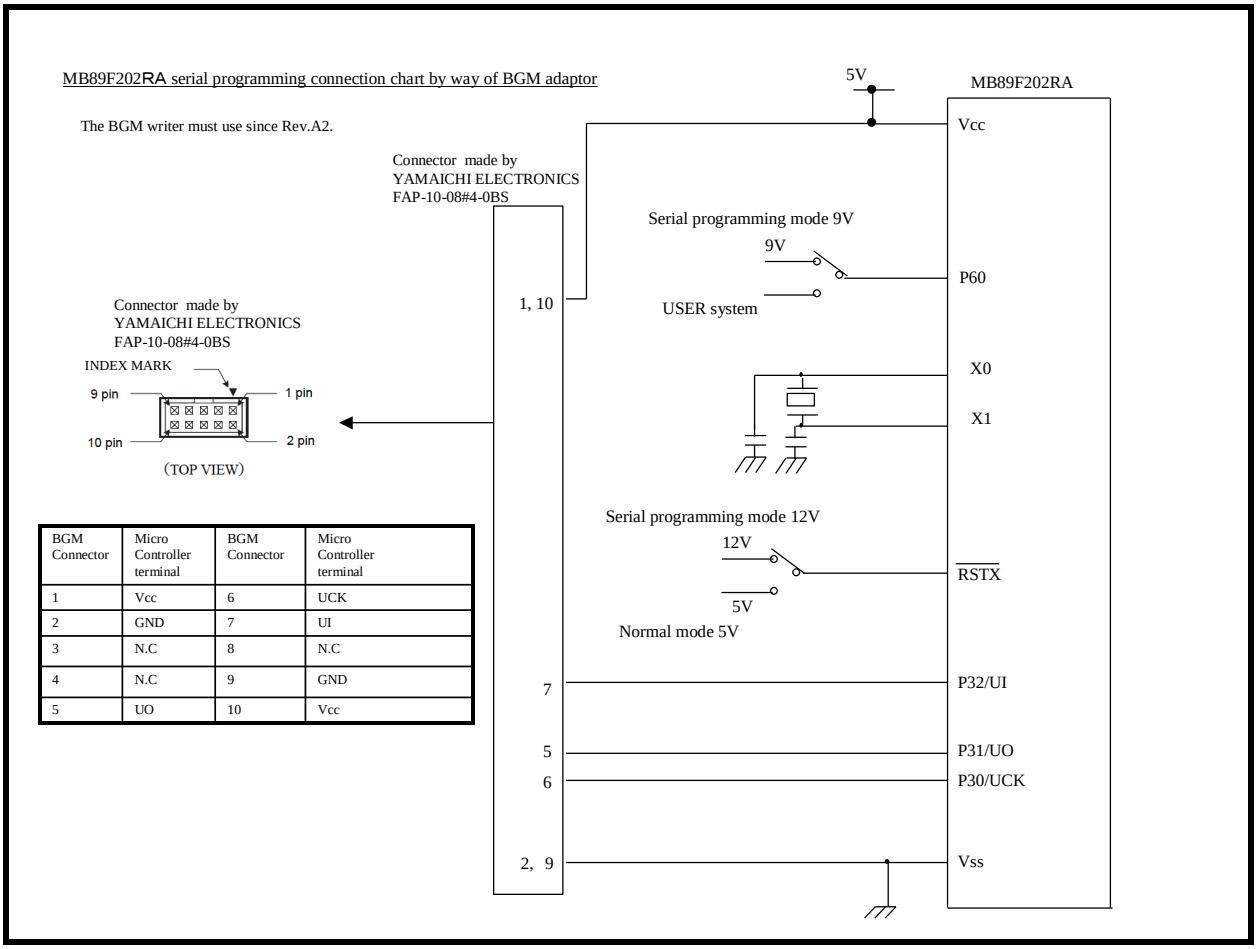
3. EXAMPLE OF CONNECTION FOR ON-BOARD REPROGRAMMING BY PROGRAMMER

This chapter explains a pin setup which must be set up for every kind series.

3-1. 8L/8FX:EXAMPLE OF CONNECTION FOR ON-BOARD REPROGRAMMING BY PROGRAMMER

This chapter explains a pin setup which must be set up for every kind series.

3-1-1. Setting for MB89F202RA



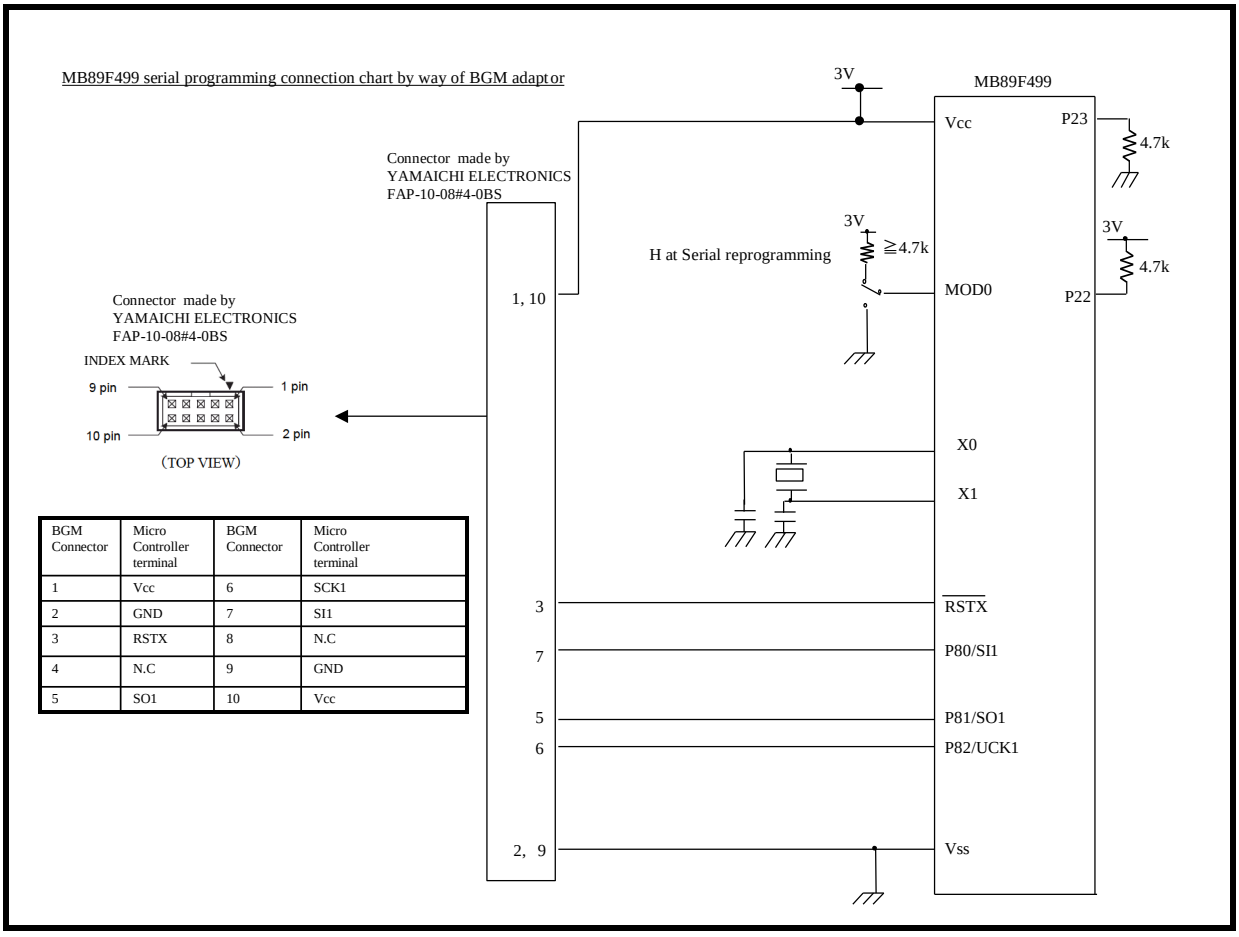
BGM Connector	Micro Controller terminal	BGM Connector	Micro Controller terminal
1	Vcc	6	UCK
2	GND	7	UI
3	N.C	8	N.C
4	N.C	9	GND
5	UO	10	Vcc

P60 and P32 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High(12V)" level after setting P60 and P32 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming, control is shifted to the user circuit side as for P60 and P32 pins. Then RSTX pin set from "Low" to "High(5V)" level executes user program.

3-1-2. Setting for MB89F499



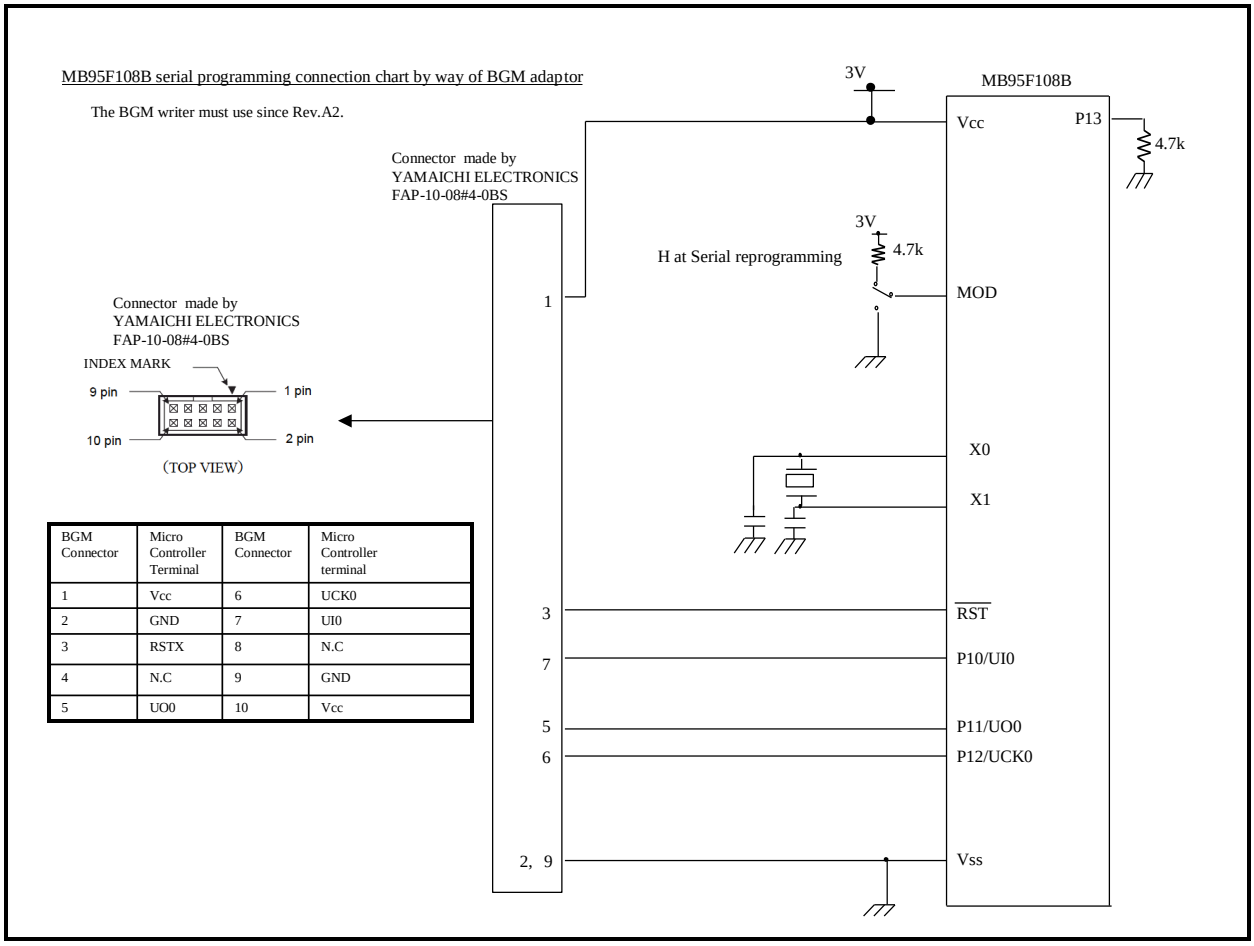
BGM Connector	Micro Controller terminal	BGM Connector	Micro Controller terminal
1	Vcc	6	SCK1
2	GND	7	SI1
3	RSTX	8	N.C
4	N.C	9	GND
5	SO1	10	Vcc

The MOD0 pin and P22,P23 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD0 pin and P22,P23 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming, control is shifted to the normally-used mode as for MOD0 pin and to the user circuit side as for P22 and P23 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-1-3. Setting for MB95F108B



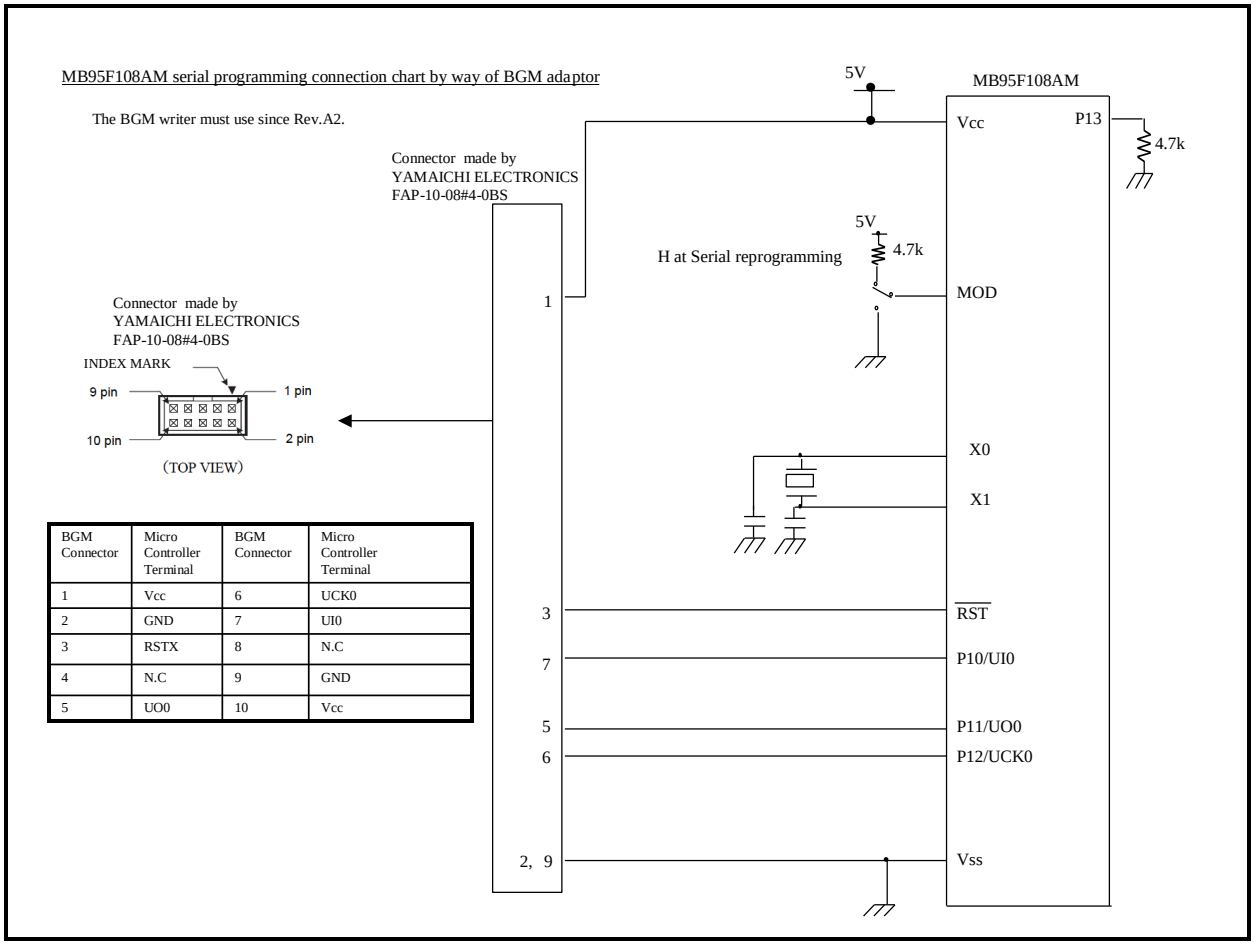
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD pin and P13 pin cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD pin and P13 pin, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD pin and to the user circuit side as for P13 pin.Then RSTX pin set from "Low"to "High"Level executes user program.

3-1-4. Setting for MB95F108AM



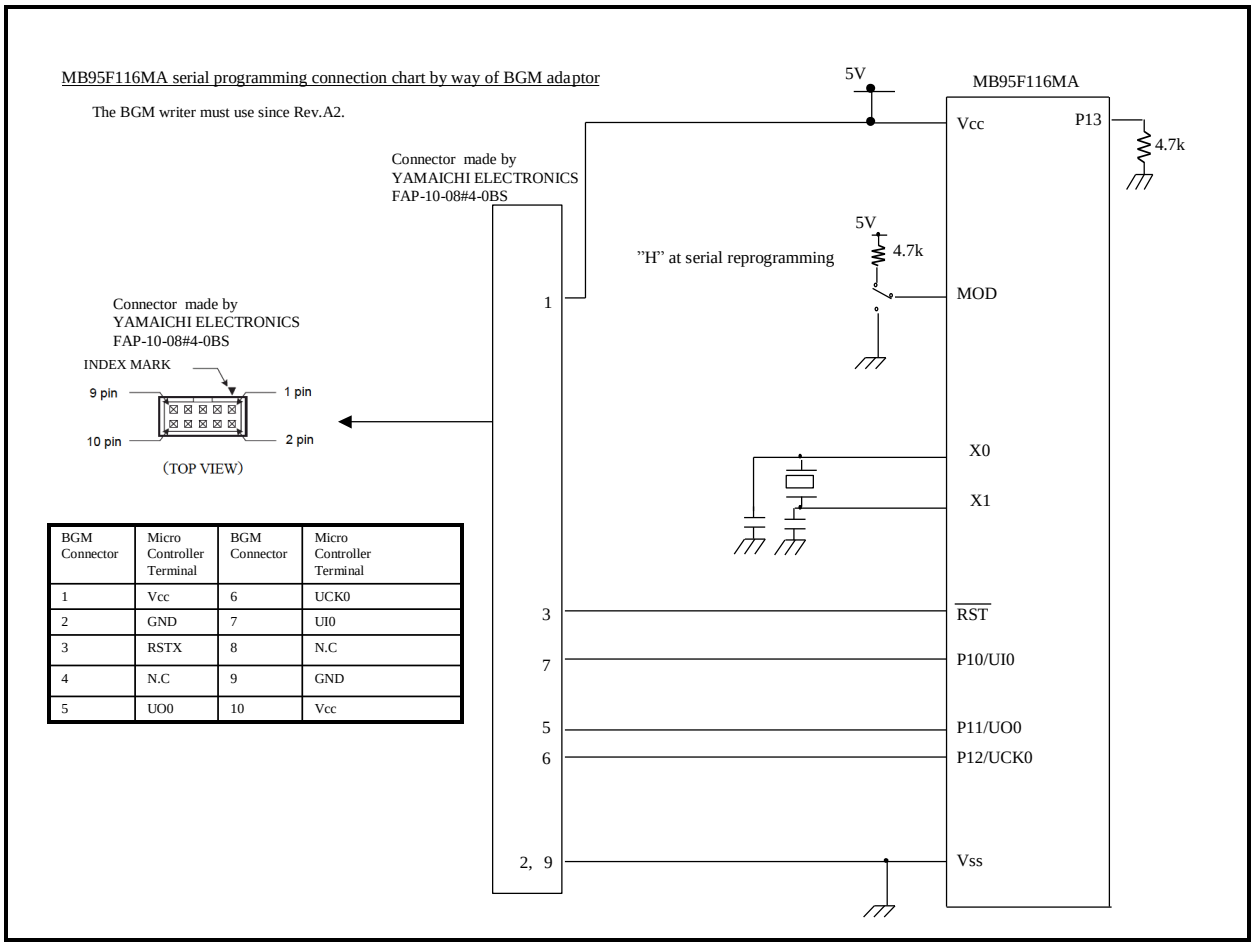
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD pin and P13 pin cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD pin and P13 pin, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD pins and to the user circuit side as for P13 pin.Then RSTX pin set from "Low"to "High"Level executes user program.

3-1-5. Setting for MB95F116MA



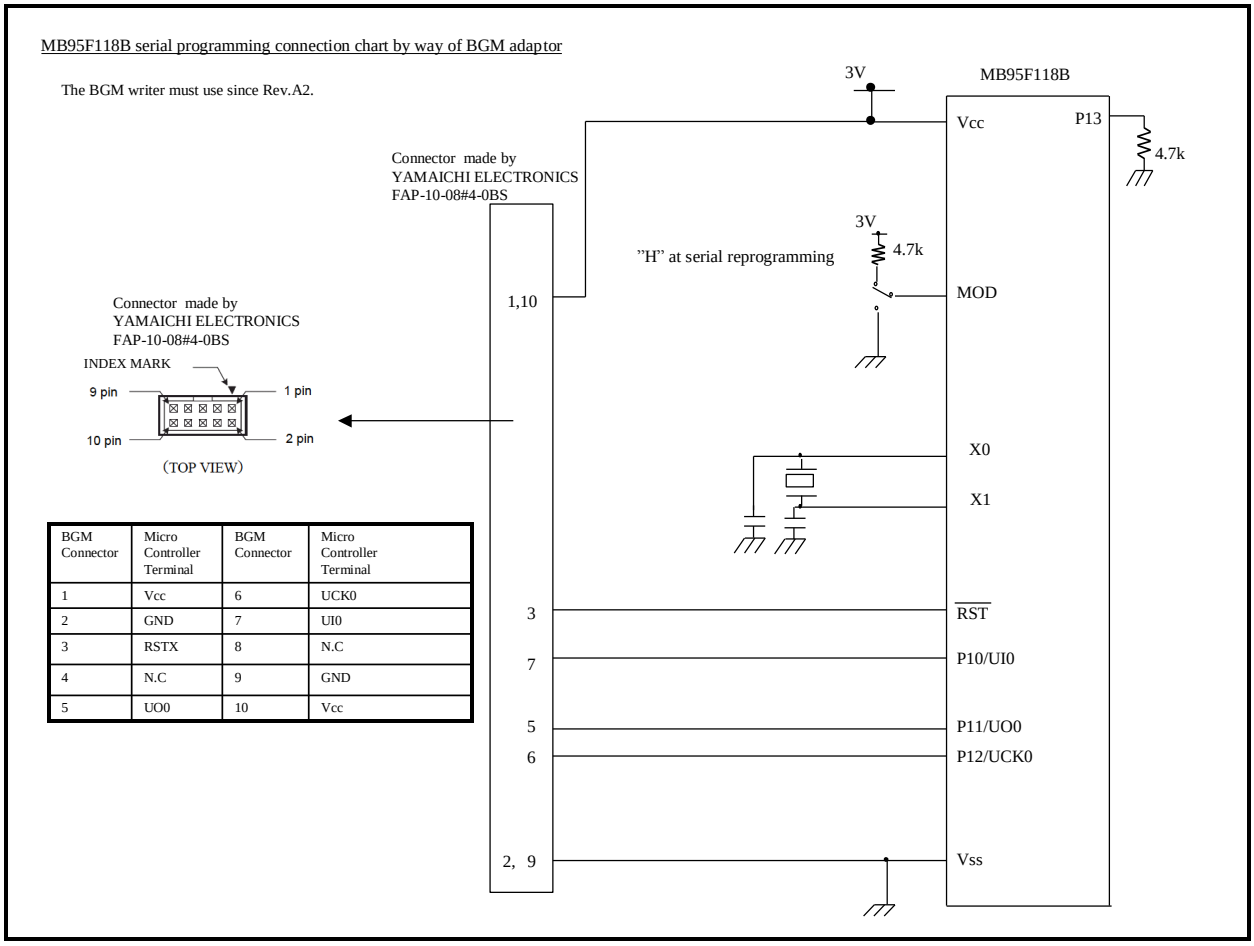
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD pin and P13 pin cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD pin and P13 pin, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD pins and to the user circuit side as for P13 pin.Then RSTX pin set from "Low"to "High"Level executes user program.

3-1-6. Setting for MB95F118B



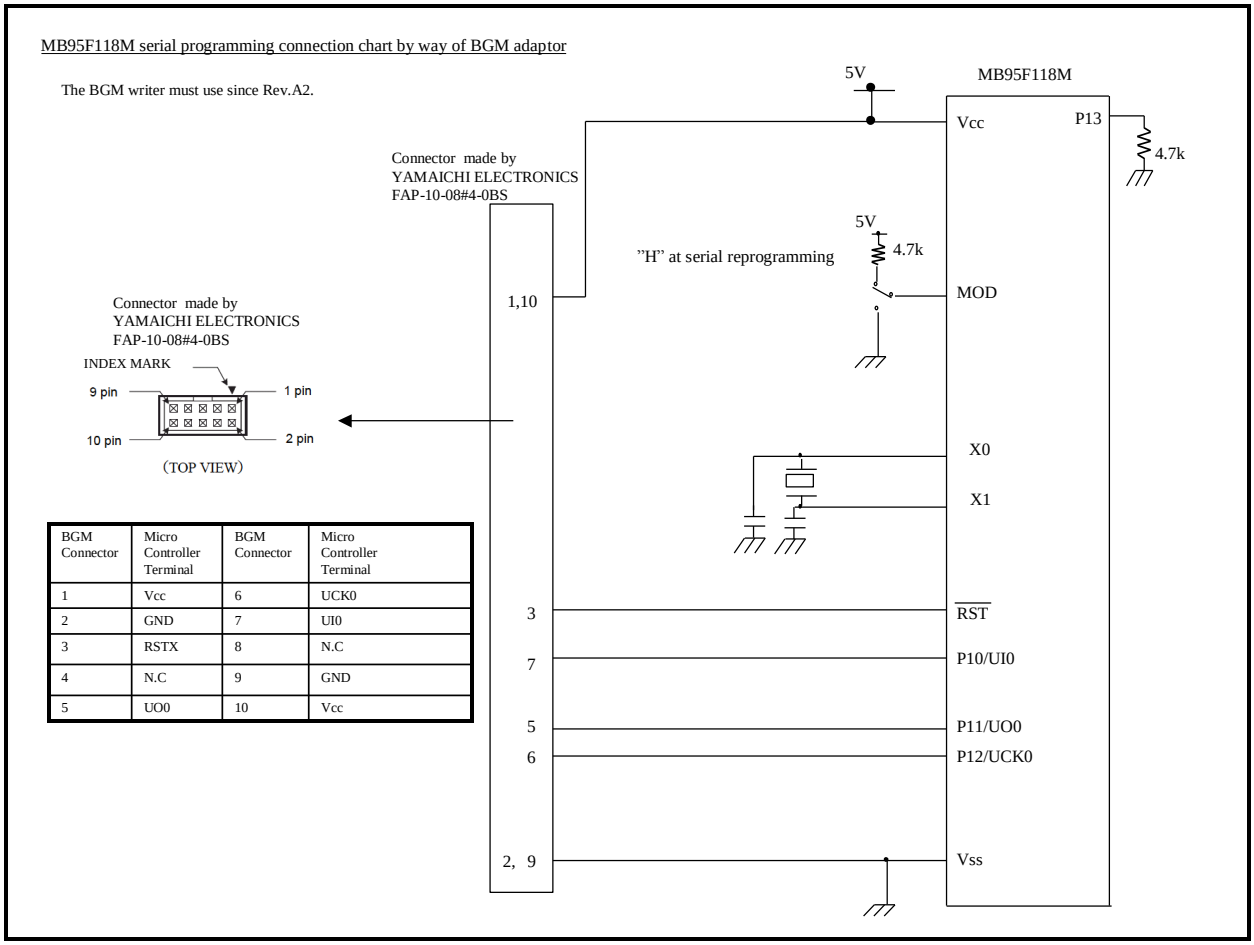
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD pin and P13 pin cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD pin and P13 pin, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD pins and to the user circuit side as for P13 pin.Then RSTX pin set from "Low"to "High"Level executes user program.

3-1-7. Setting for MB95F118M



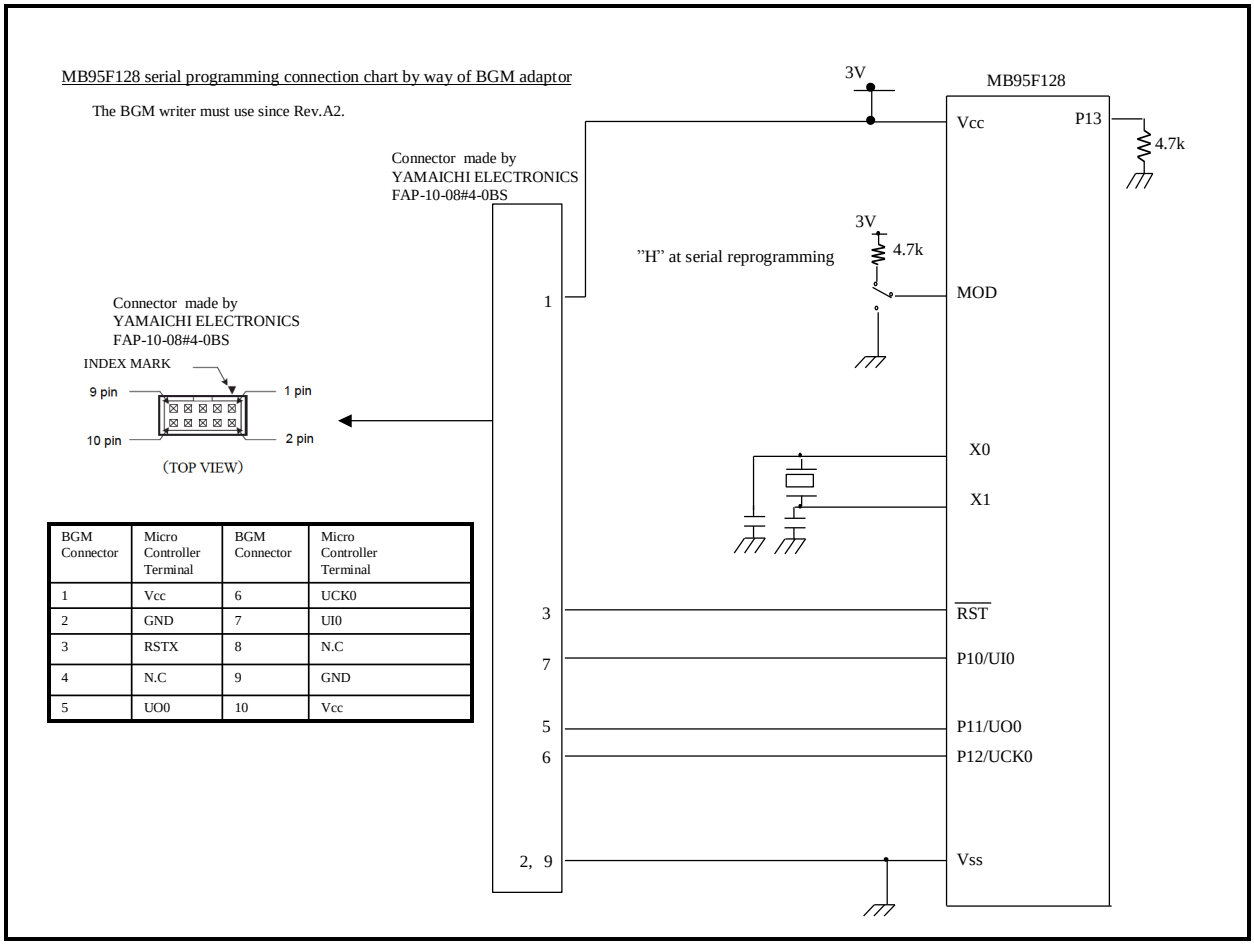
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD pin and P13 pin cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD pin and P13 pin, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD pins and to the user circuit side as for P13 pin.Then RSTX pin set from "Low"to "High"Level executes user program.

3-1-8. Setting for MB95F128



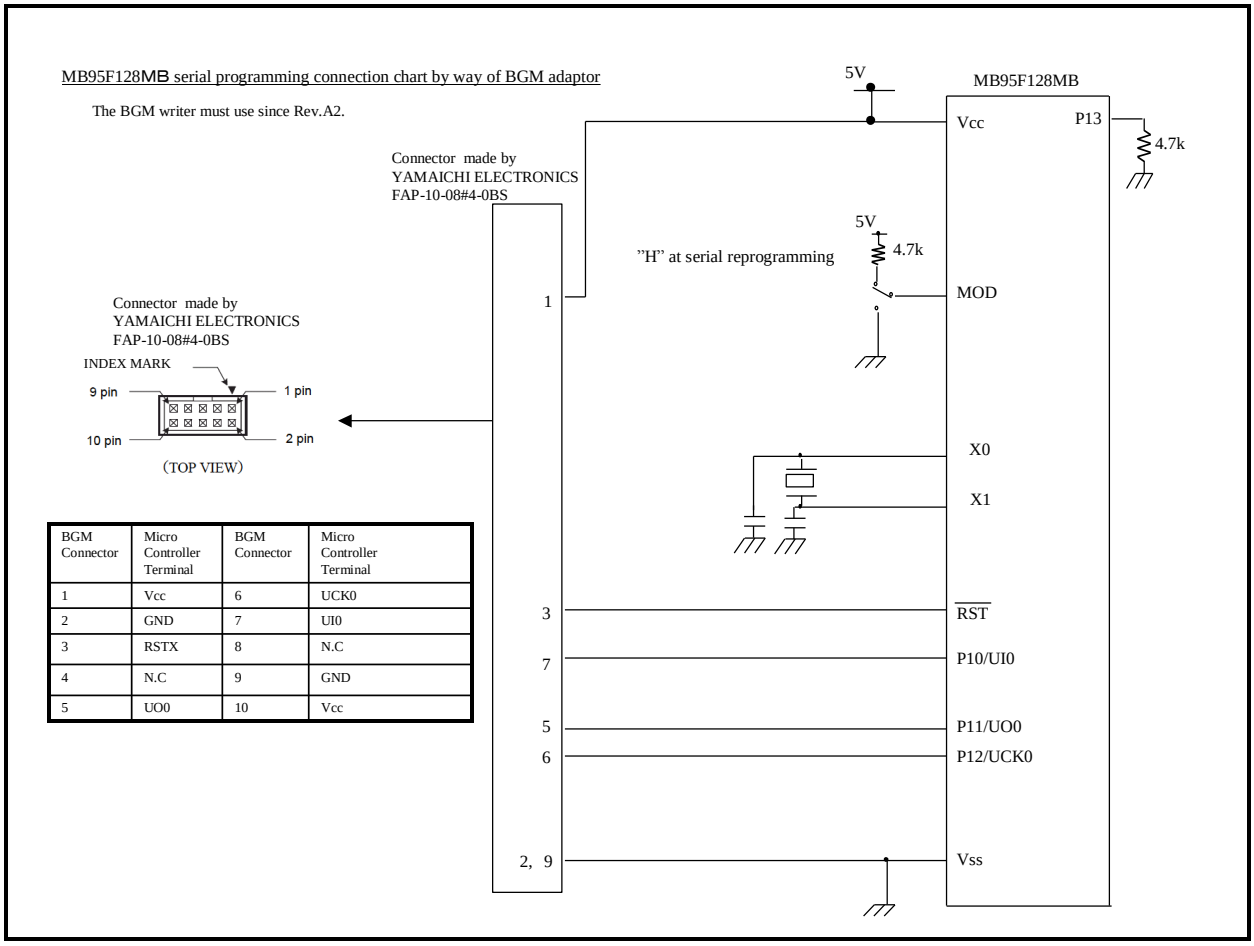
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD pin and P13 pin cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD pin and P13 pin, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD pins and to the user circuit side as for P13 pin.Then RSTX pin set from "Low"to "High"Level executes user program.

3-1-9. Setting for MB95F128MB



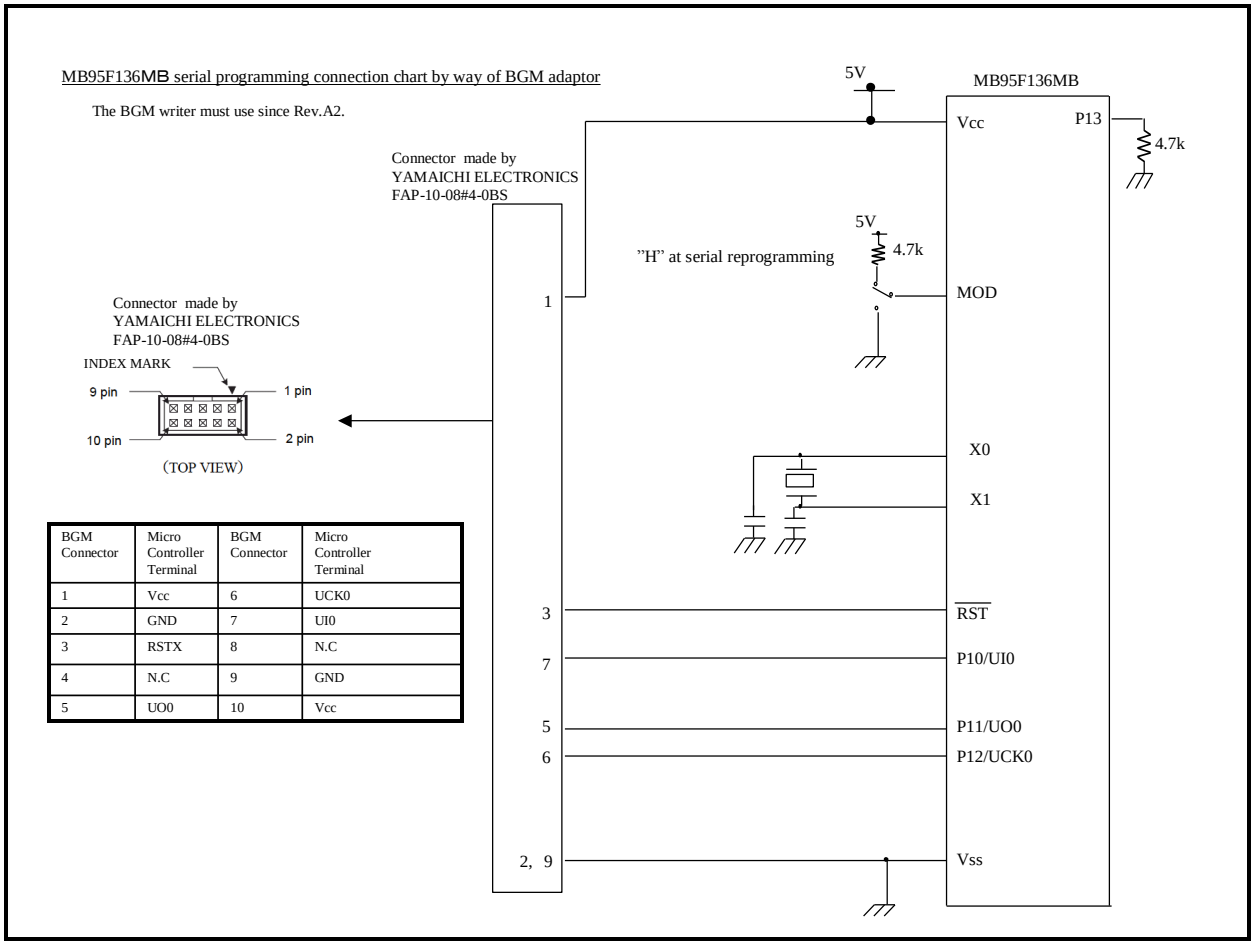
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD pin and P13 pin cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD pin and P13 pin, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD pins and to the user circuit side as for P13 pin.Then RSTX pin set from "Low"to "High"Level executes user program.

3-1-10. Setting for MB95F136MB



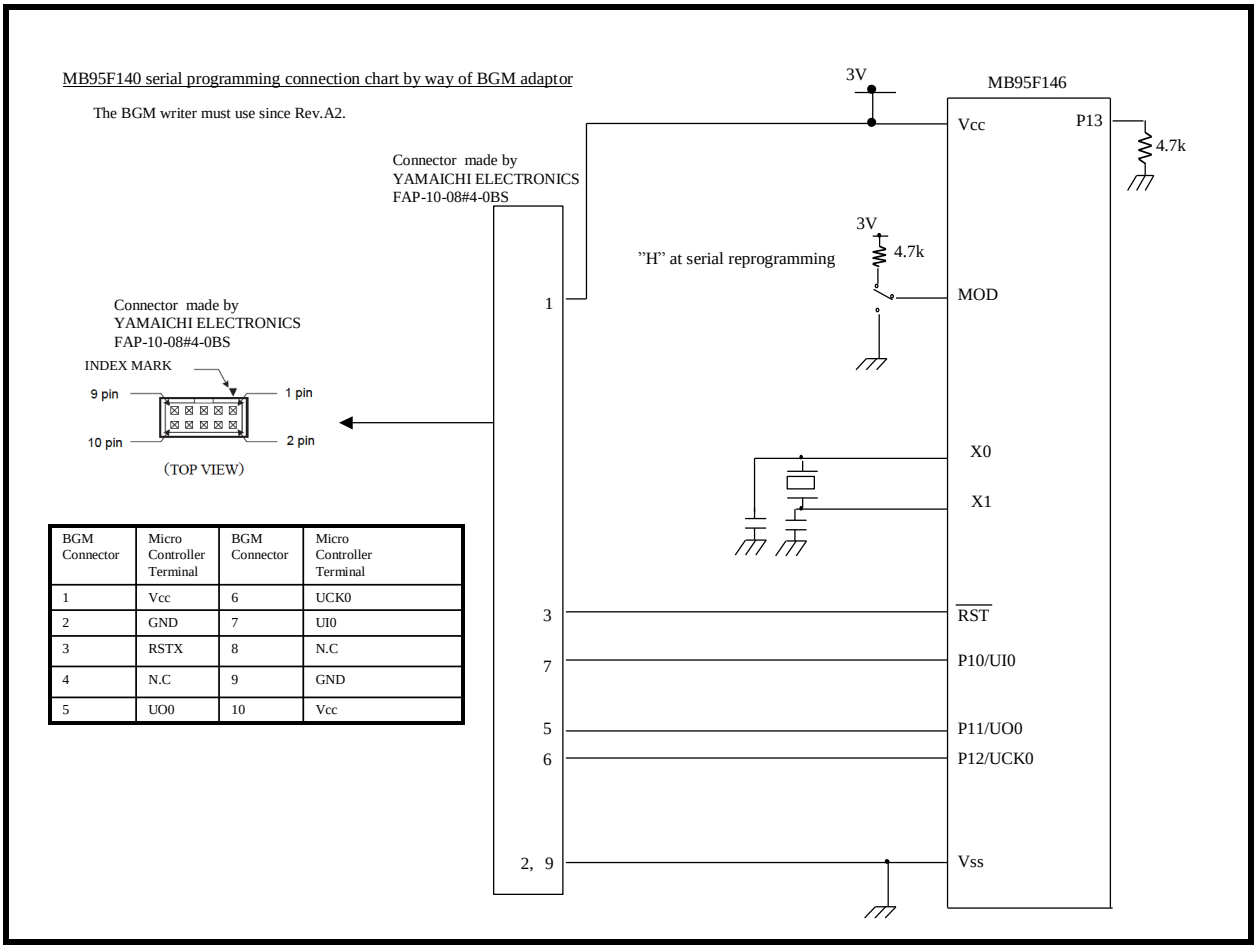
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD pin and P13 pin cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD pin and P13 pin, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD pins and to the user circuit side as for P13 pin.Then RSTX pin set from "Low"to "High"Level executes user program.

3-1-11. Setting for MB95F146



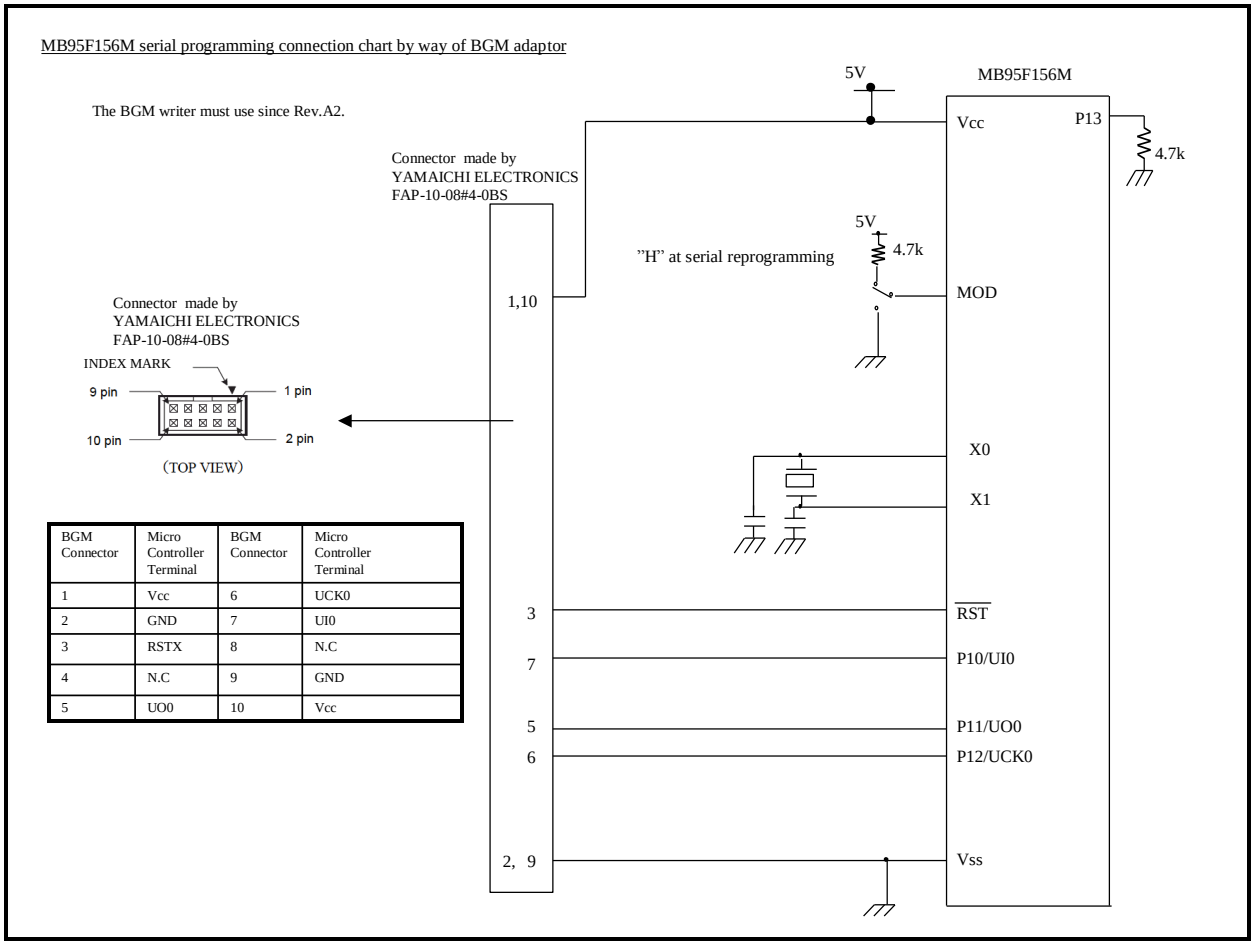
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD pin and P13 pin cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD pin and P13 pin, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD pins and to the user circuit side as for P13 pin.Then RSTX pin set from "Low"to "High"Level executes user program.

3-1-12. Setting for MB95F156M



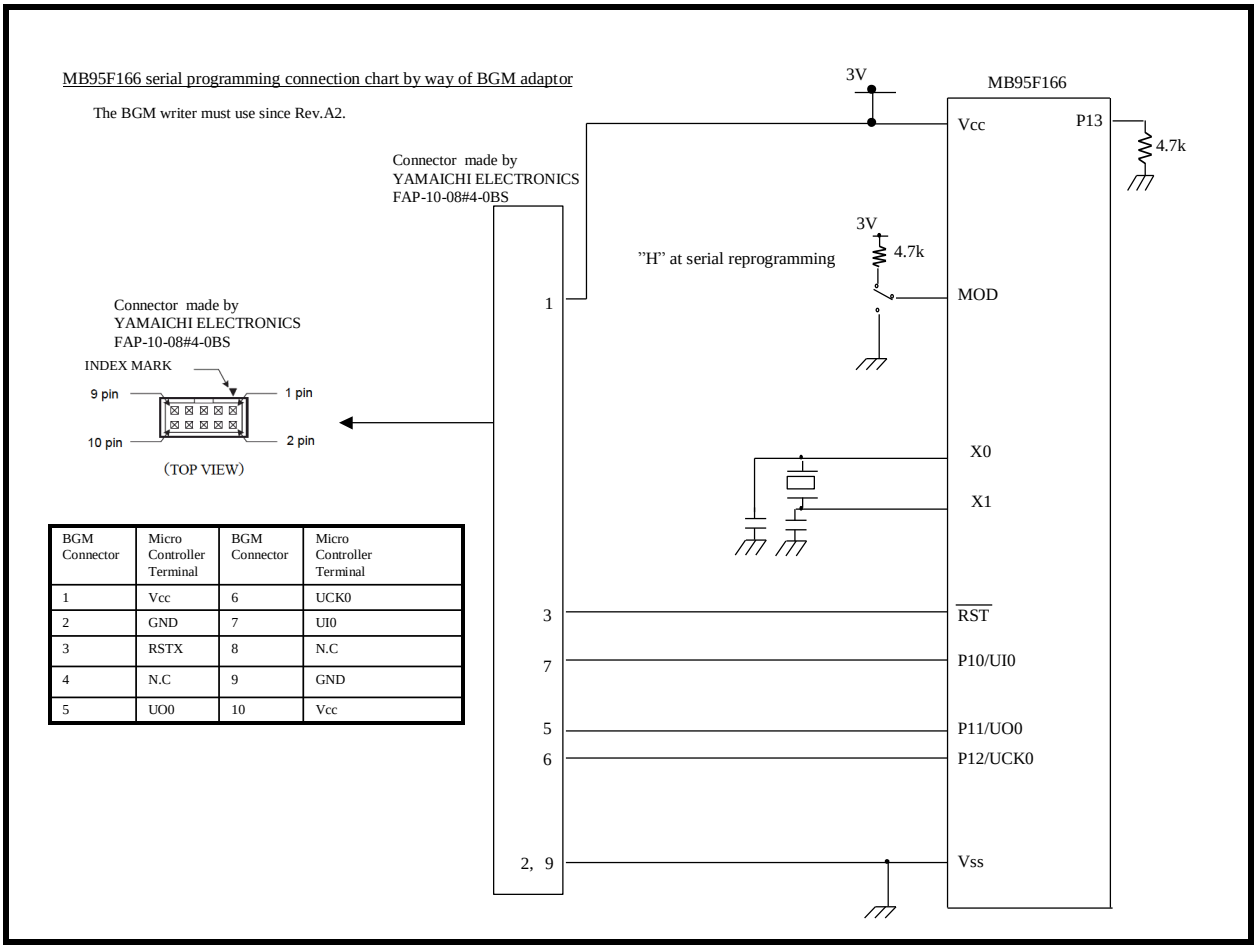
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD pin and P13 pin cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD pin and P13 pin, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD pins and to the user circuit side as for P13 pin.Then RSTX pin set from "Low"to "High"Level executes user program.

3-1-13. Setting for MB95F166



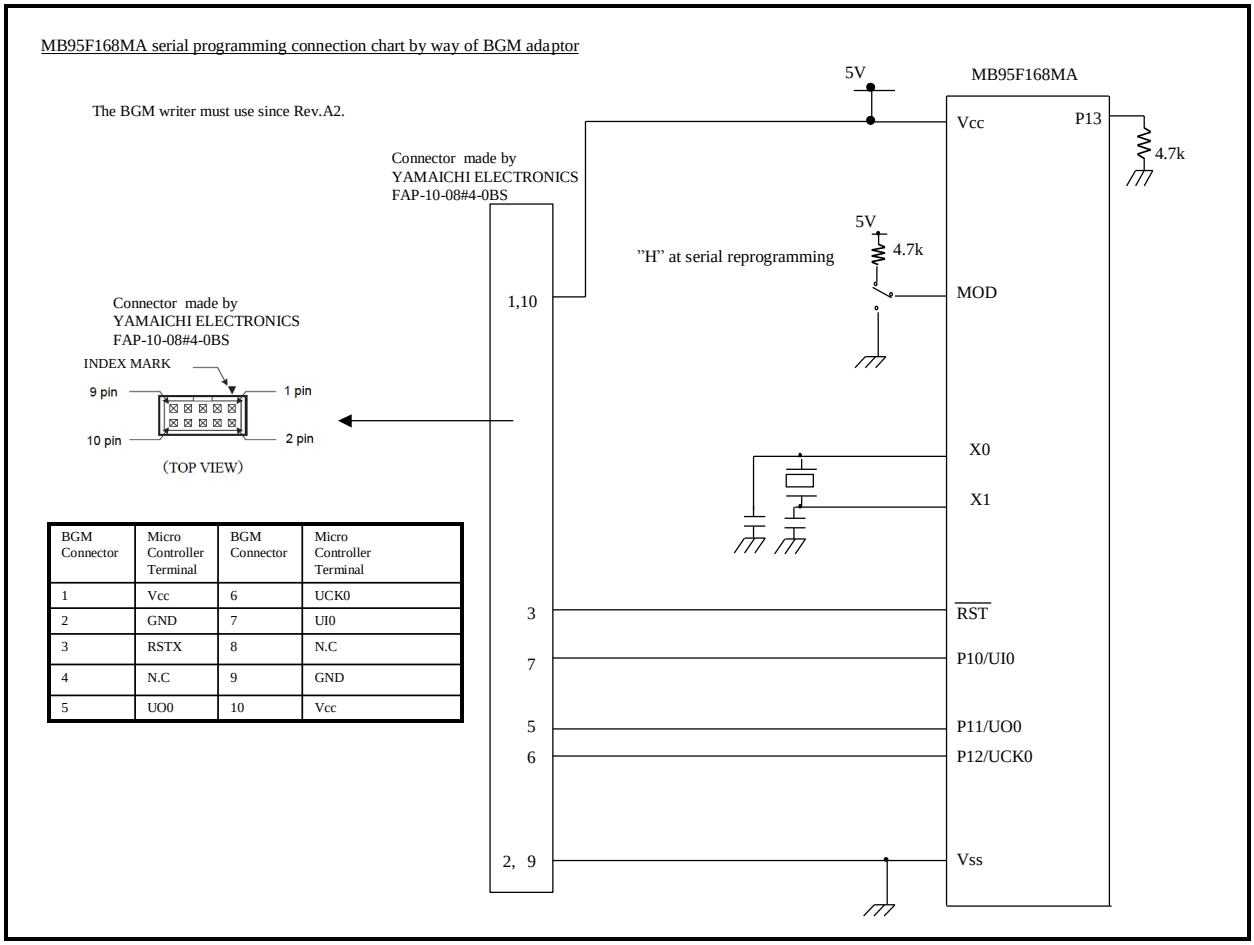
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD pin and P13 pin cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD pin and P13 pin, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD pins and to the user circuit side as for P13 pin.Then RSTX pin set from "Low"to "High"Level executes user program.

3-1-14. Setting for MB95F168MA



BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD pin and P13 pin cannot be controlled by the PC and should be set in the user system.

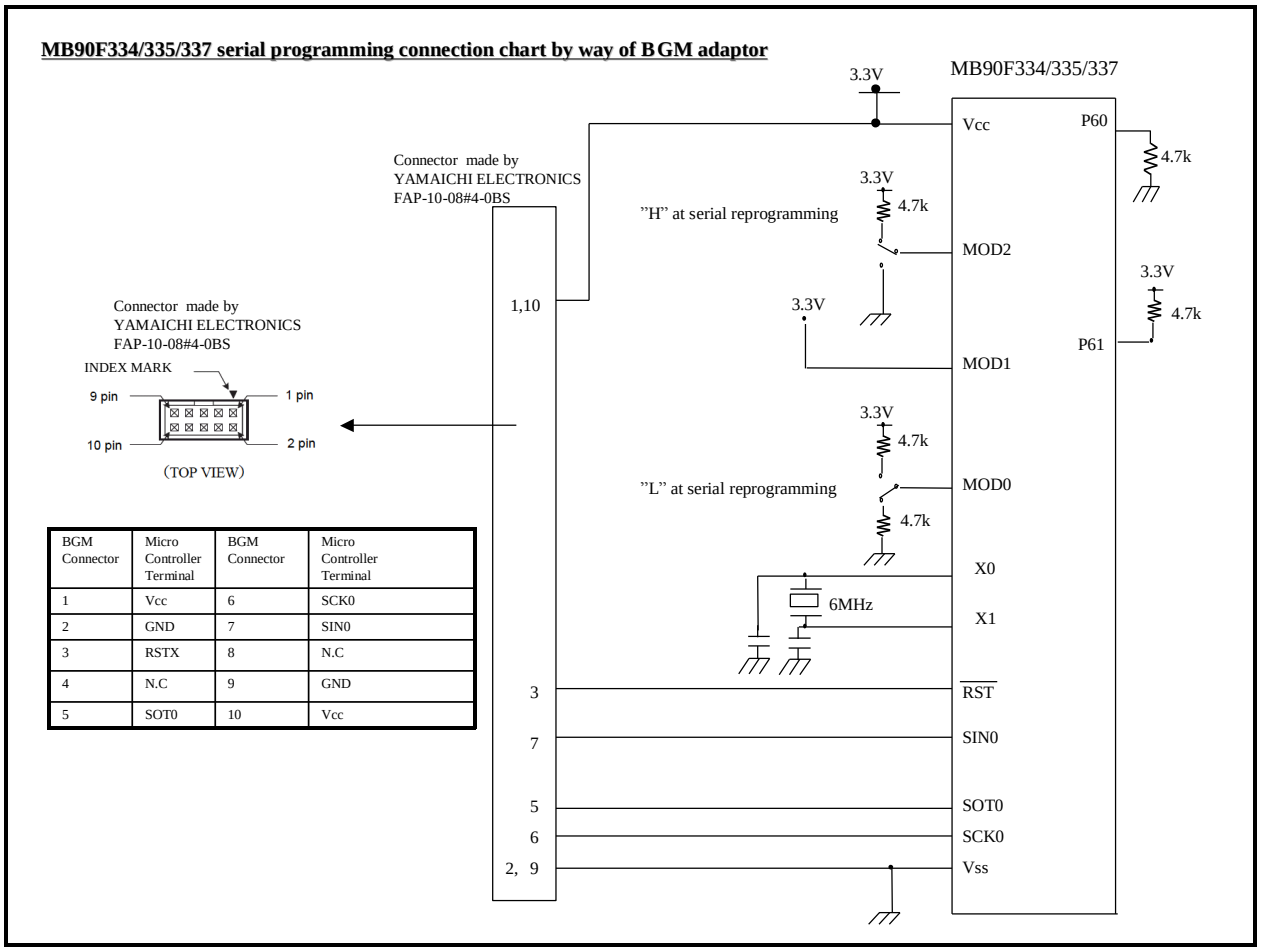
When the RSTX pin is set from "Low" to "High" level after setting MOD pin and P13 pin, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD pins and to the user circuit side as for P13 pin.Then RSTX pin set from "Low"to "High"Level executes user program.

3-2. 16LX:EXAMPLE OF CONNECTION FOR ON-BOARD REPROGRAMMING BY PROGRAMMER

This chapter explains a pin setup which must be set up for every kind series.

3-2-1. Setting for MB90F334/335/337



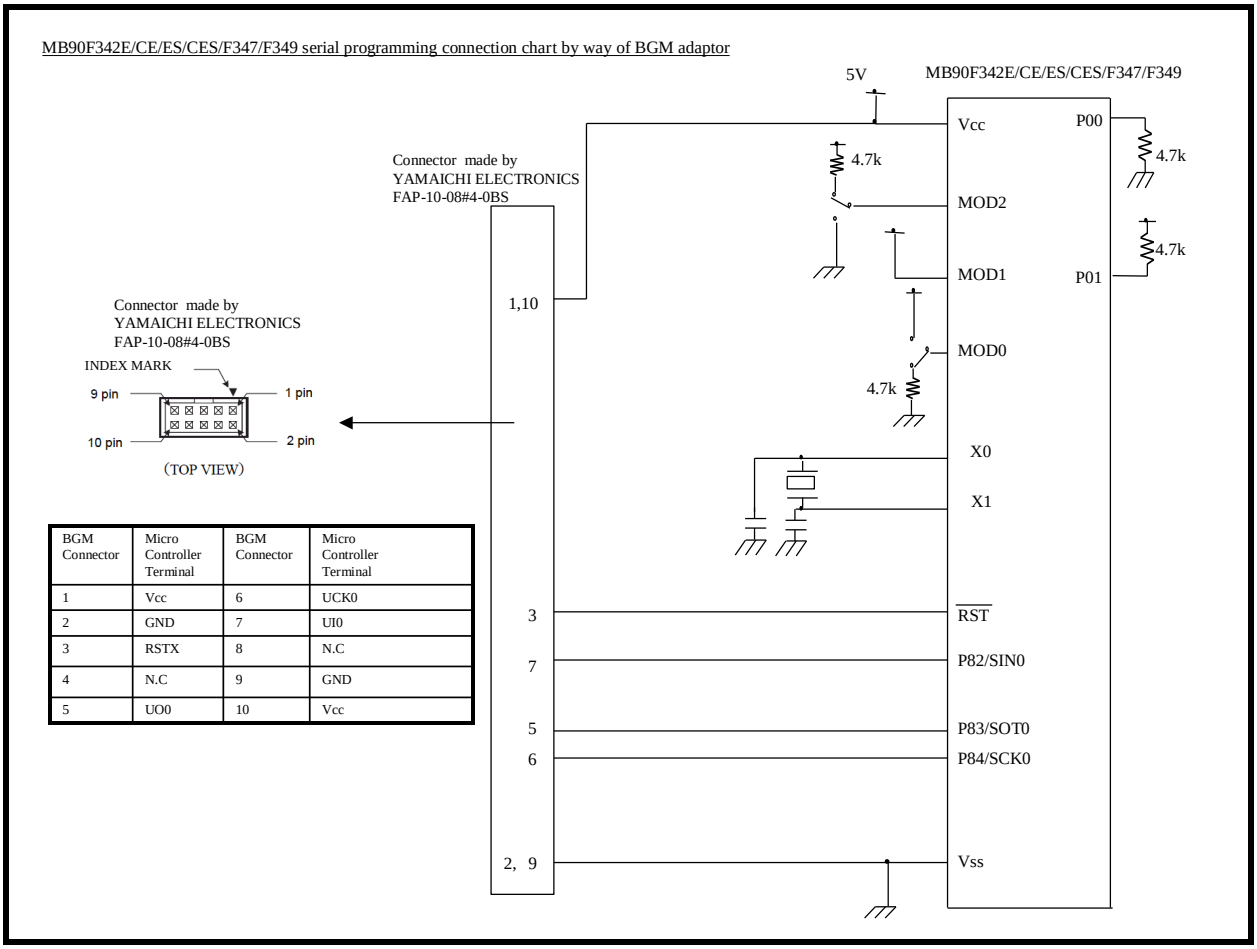
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SCK0
2	GND	7	SIN0
3	RSTX	8	N.C
4	N.C	9	GND
5	SOT0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P60,P61 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P60,P61 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P60,P61 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-2-2. Setting for MB90F342/E/CE/ES/CES /F347 /F349



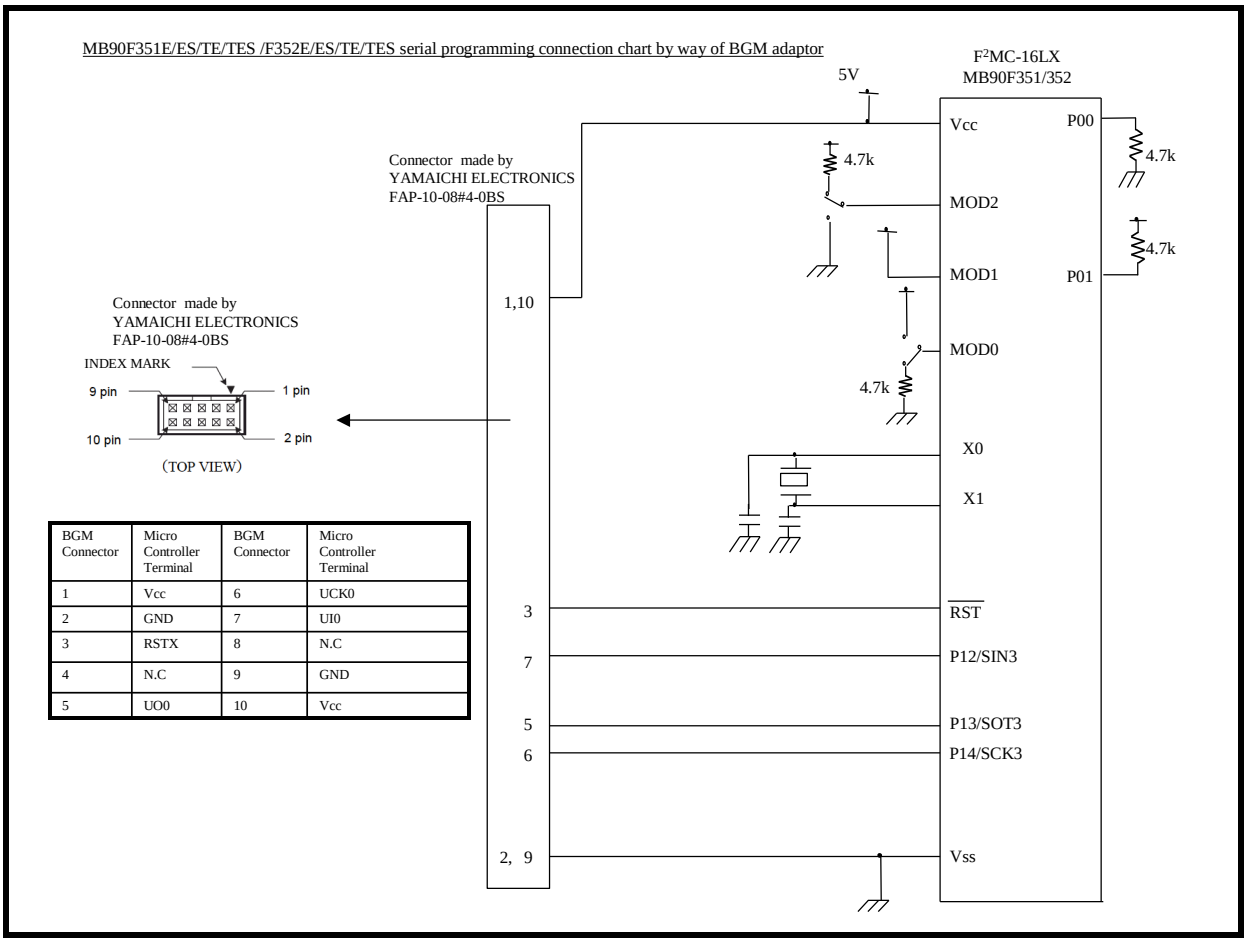
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P00,P01 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P00,P01 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P00,P01 pins. Then RSTX pin set from "Low" to "High" Level executes user program.

3-2-3. Setting for MB90F351E/ES/TE/TES /F352E/ES/TE/TES



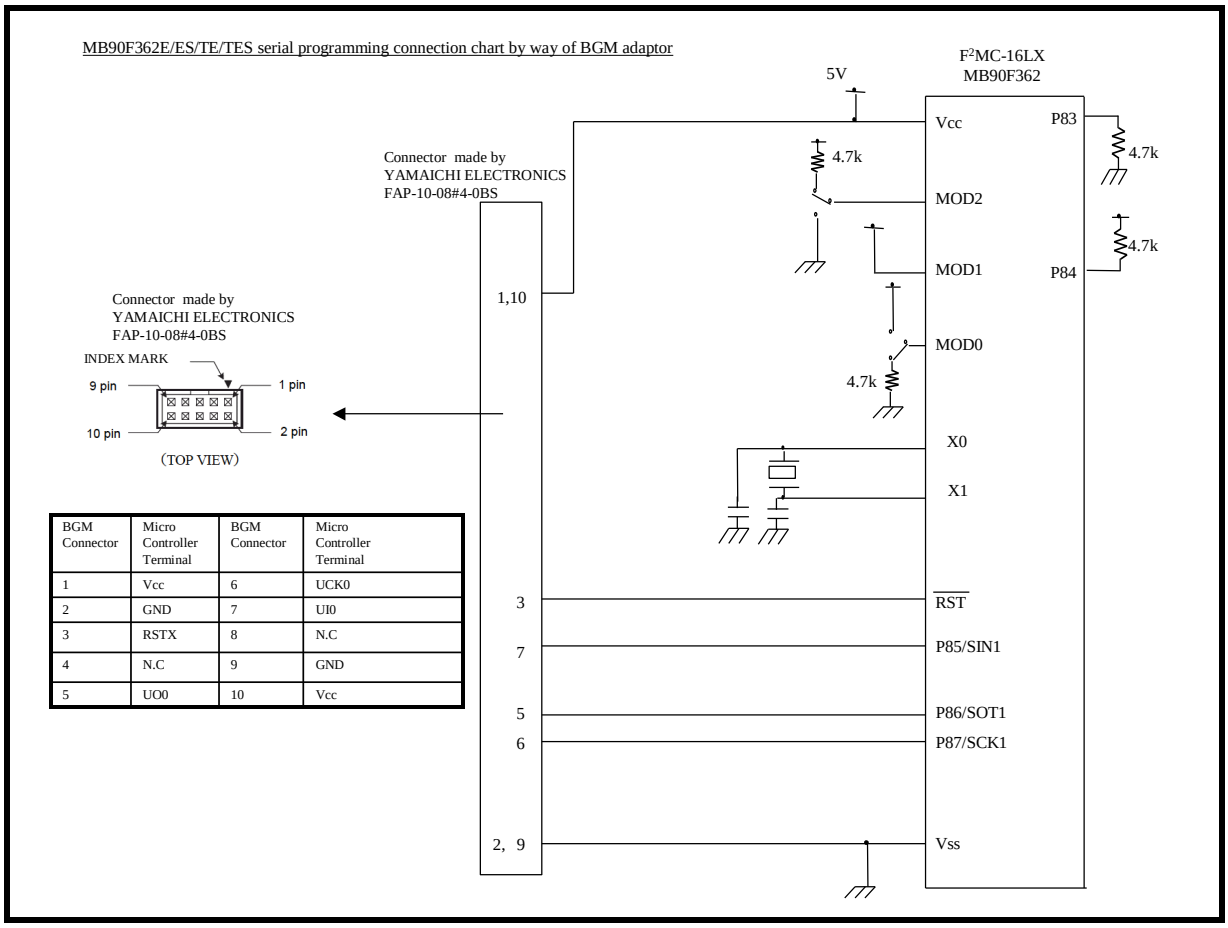
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P00,P01 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P00,P01 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P00,P01 pins. Then RSTX pin set from "Low" to "High" Level executes user program.

3-2-4. Setting for MB90F362E/ES/TE/TES



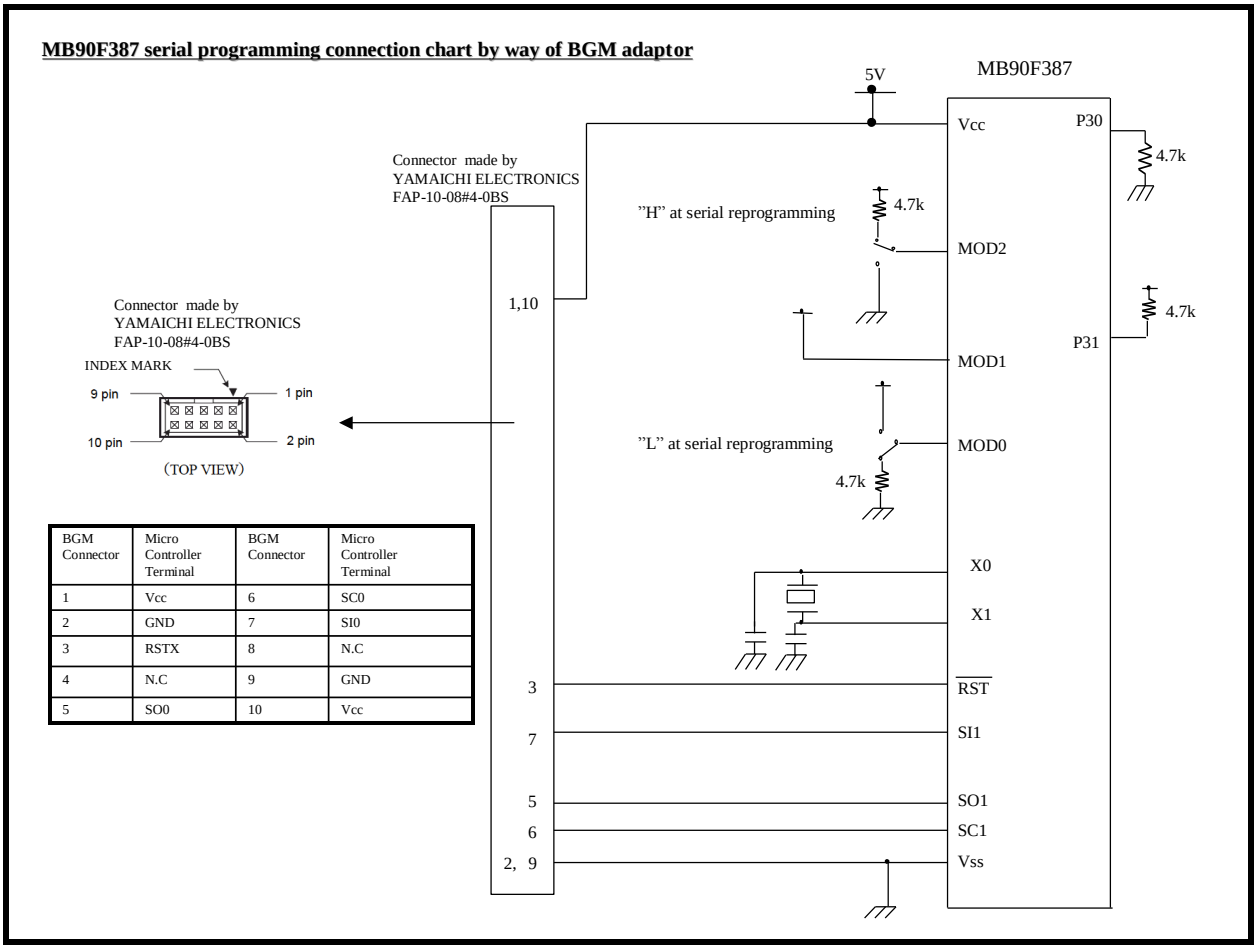
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P83,P84 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P83,P84 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P83,P84 pins. Then RSTX pin set from "Low" to "High" Level executes user program.

3-2-5. Setting for MB90F387



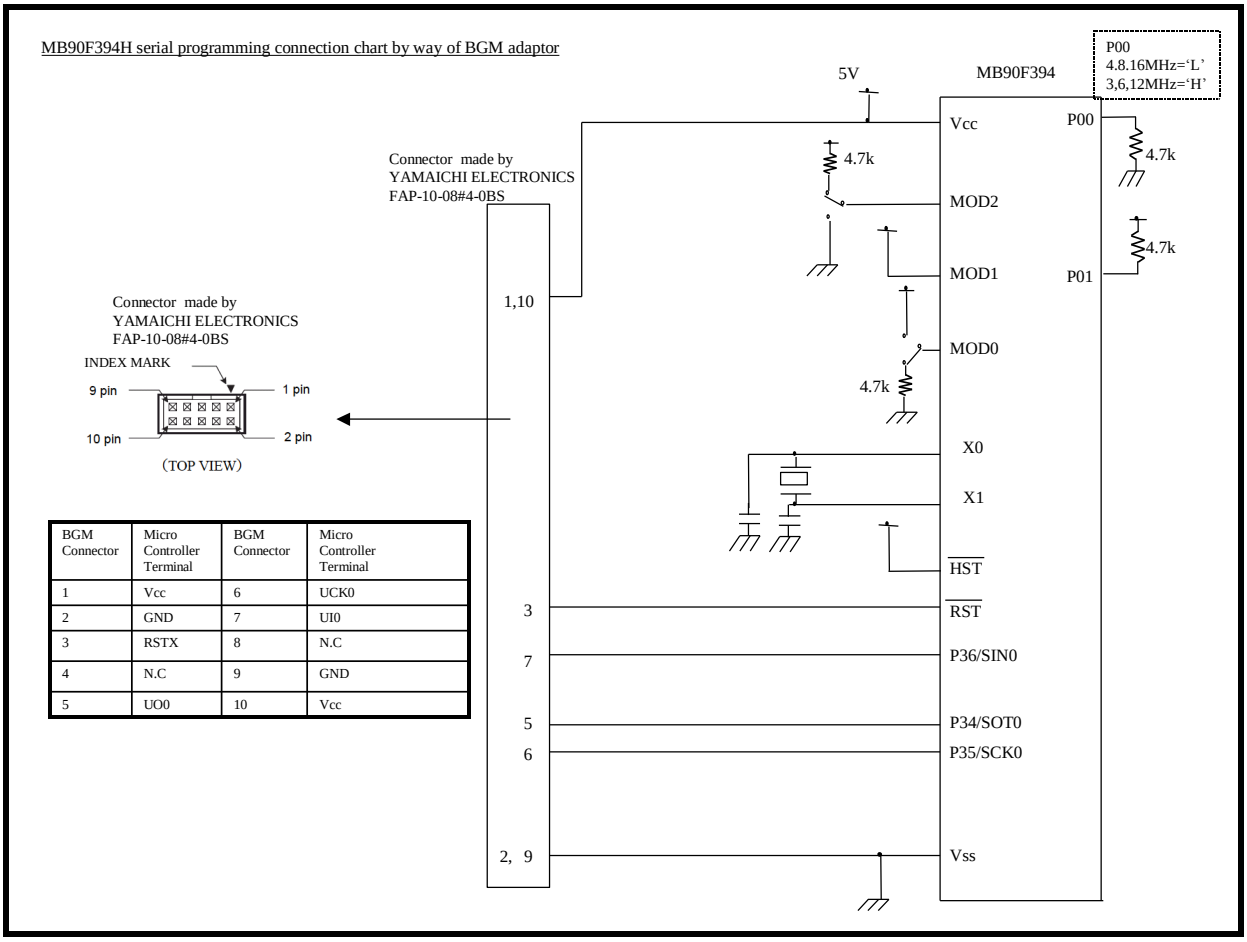
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SC0
2	GND	7	SI0
3	RSTX	8	N.C
4	N.C	9	GND
5	SO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P30,P31 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P30,P31 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P30,P31 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-2-6. Setting for MB90F394H



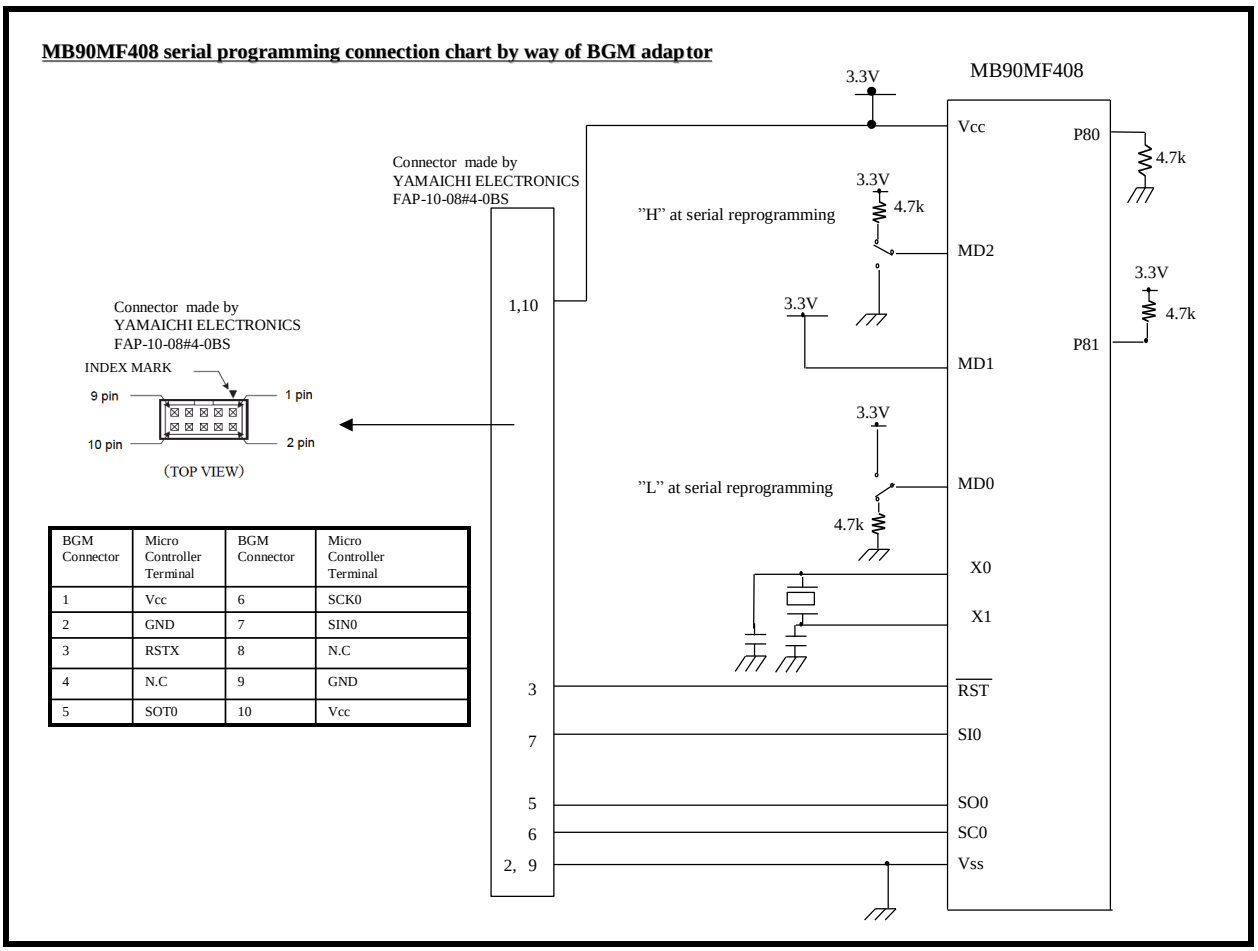
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P00,P01 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P00,P01 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P00,P01 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-2-7. Setting for MB90MF408



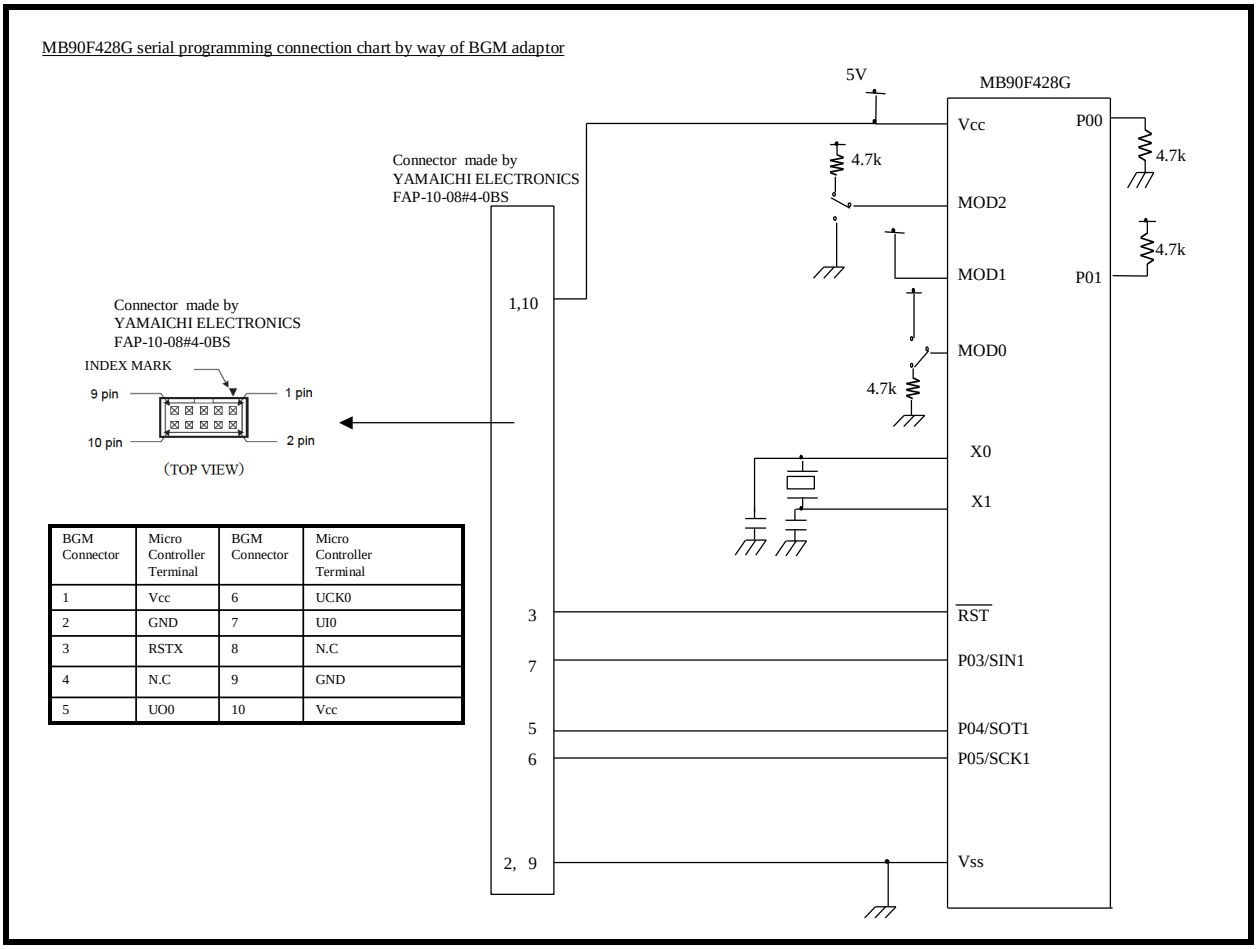
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SCK0
2	GND	7	SIN0
3	RSTX	8	N.C
4	N.C	9	GND
5	SOT0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P80,P81 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P00,P01 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P00,P01 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-2-8. Setting for MB90F428G



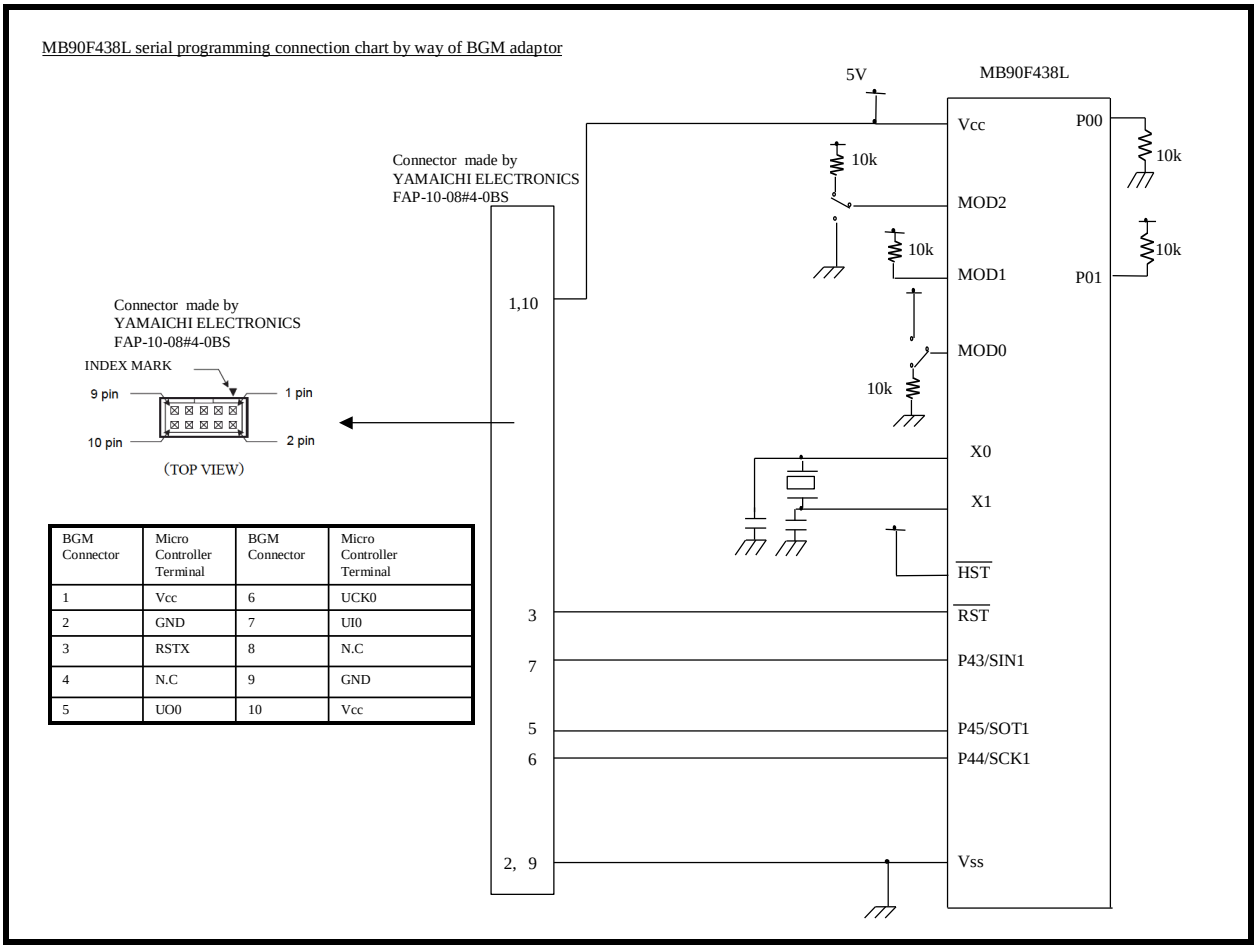
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P00,P01 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P00,P01 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P00,P01 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-2-9. Setting for MB90F438L



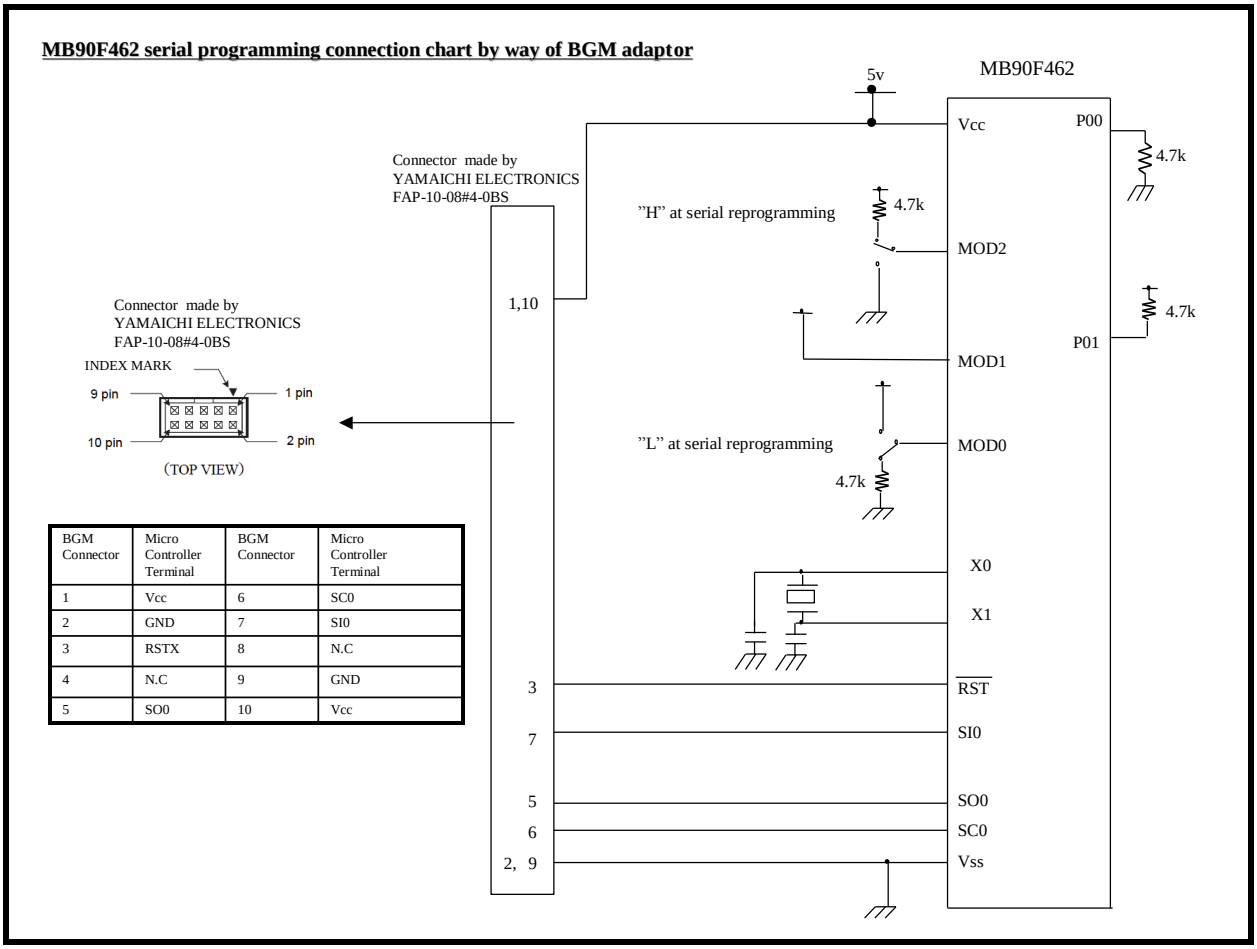
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P00,P01 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P00,P01 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P00,P01 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-2-10. Setting for MB90F462



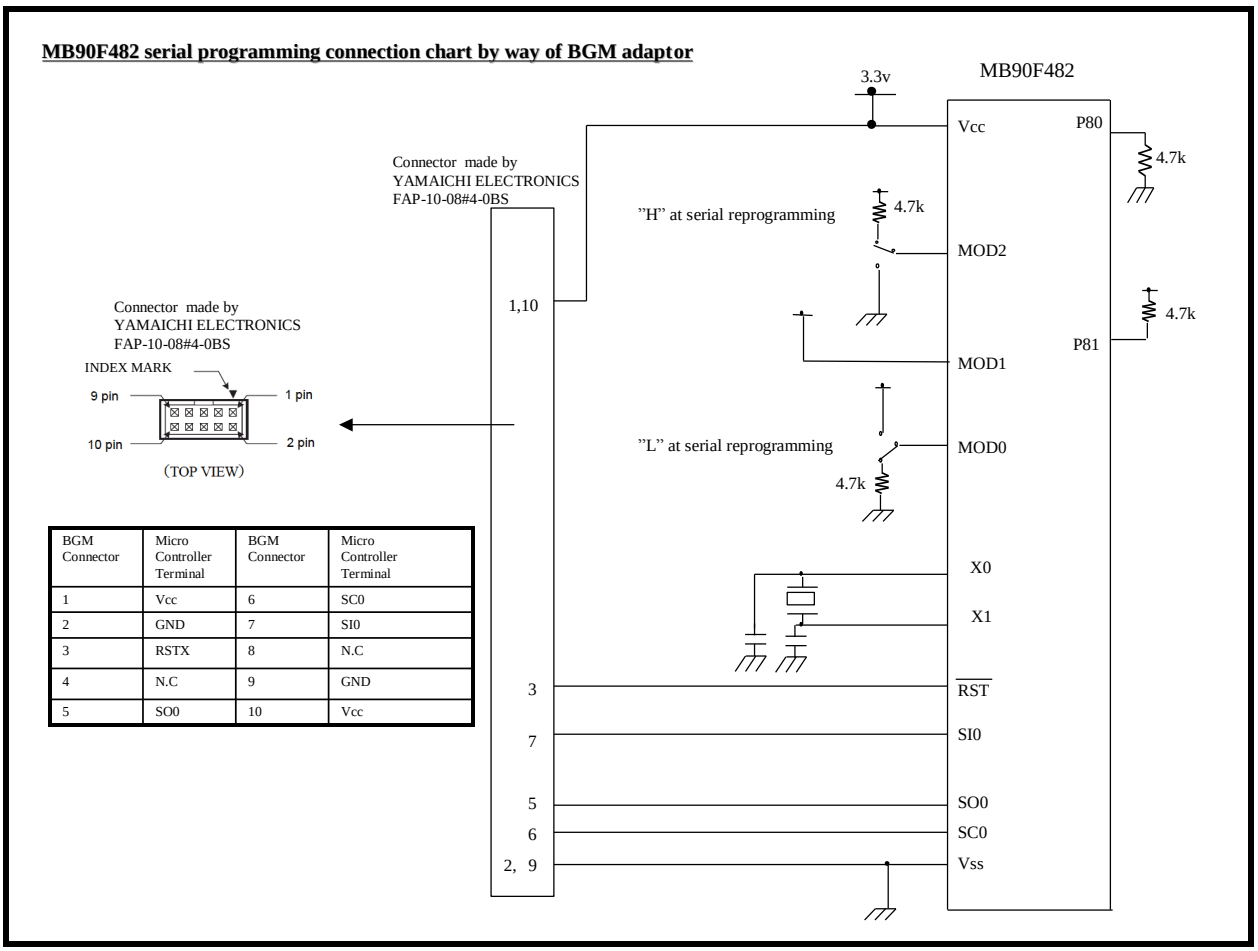
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SC0
2	GND	7	SI0
3	RSTX	8	N.C
4	N.C	9	GND
5	SO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P00,P01 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P00,P01 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P00,P01 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-2-11. Setting for MB90F482



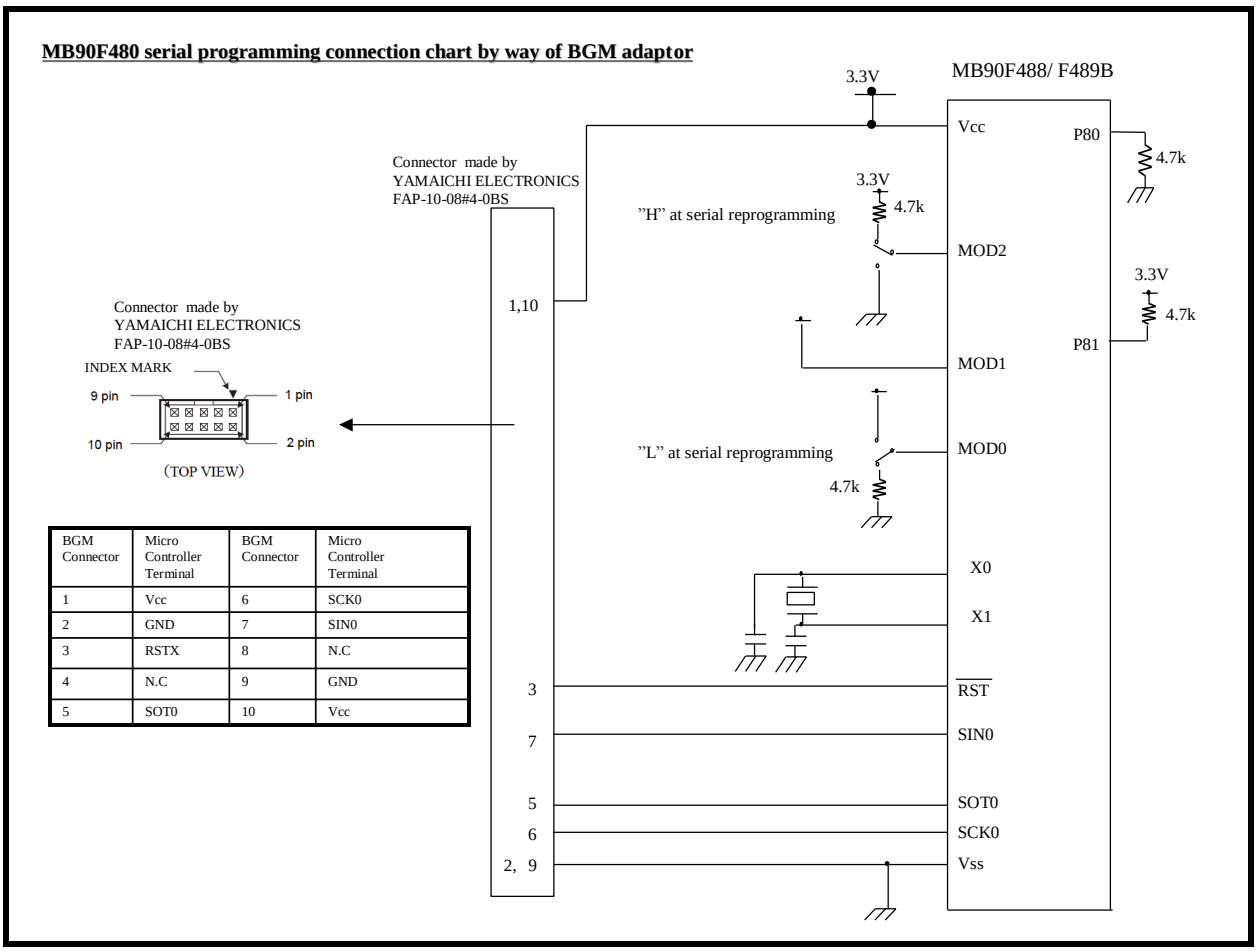
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SC0
2	GND	7	SI0
3	RSTX	8	N.C
4	N.C	9	GND
5	SO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P80,P81 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P80,P81 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P80,P81 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-2-12. Setting for MB90F488/B /F489B



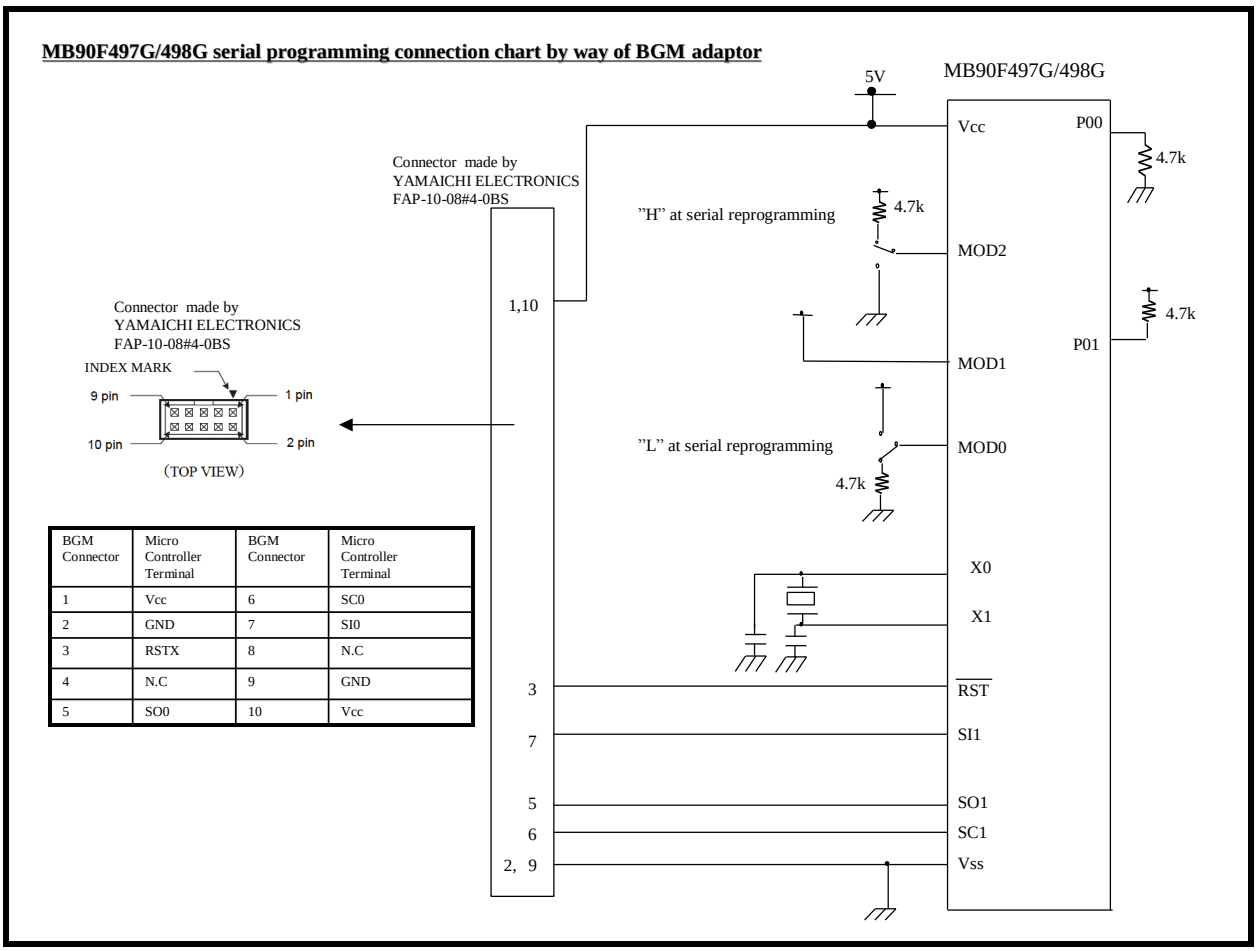
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SCK0
2	GND	7	SIN0
3	RSTX	8	N.C
4	N.C	9	GND
5	SOT0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P80,P81 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P80,P81 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P80,P81 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-2-13. Setting for MB90F497G /498G



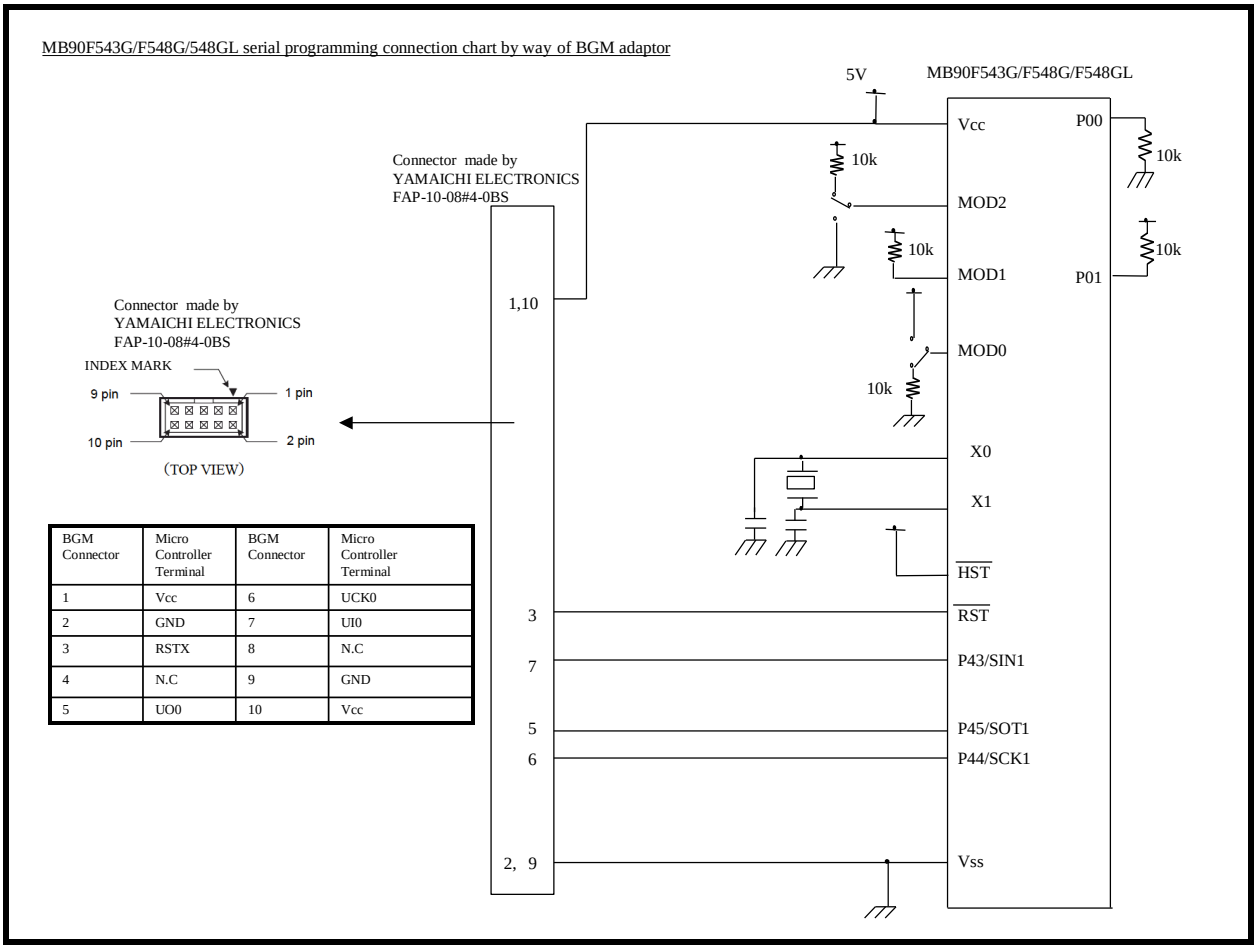
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SC0
2	GND	7	SI0
3	RSTX	8	N.C
4	N.C	9	GND
5	SO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P00,P01 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P00,P01 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P00,P01 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-2-14. Setting for MB90F543G /F548G /F548GL



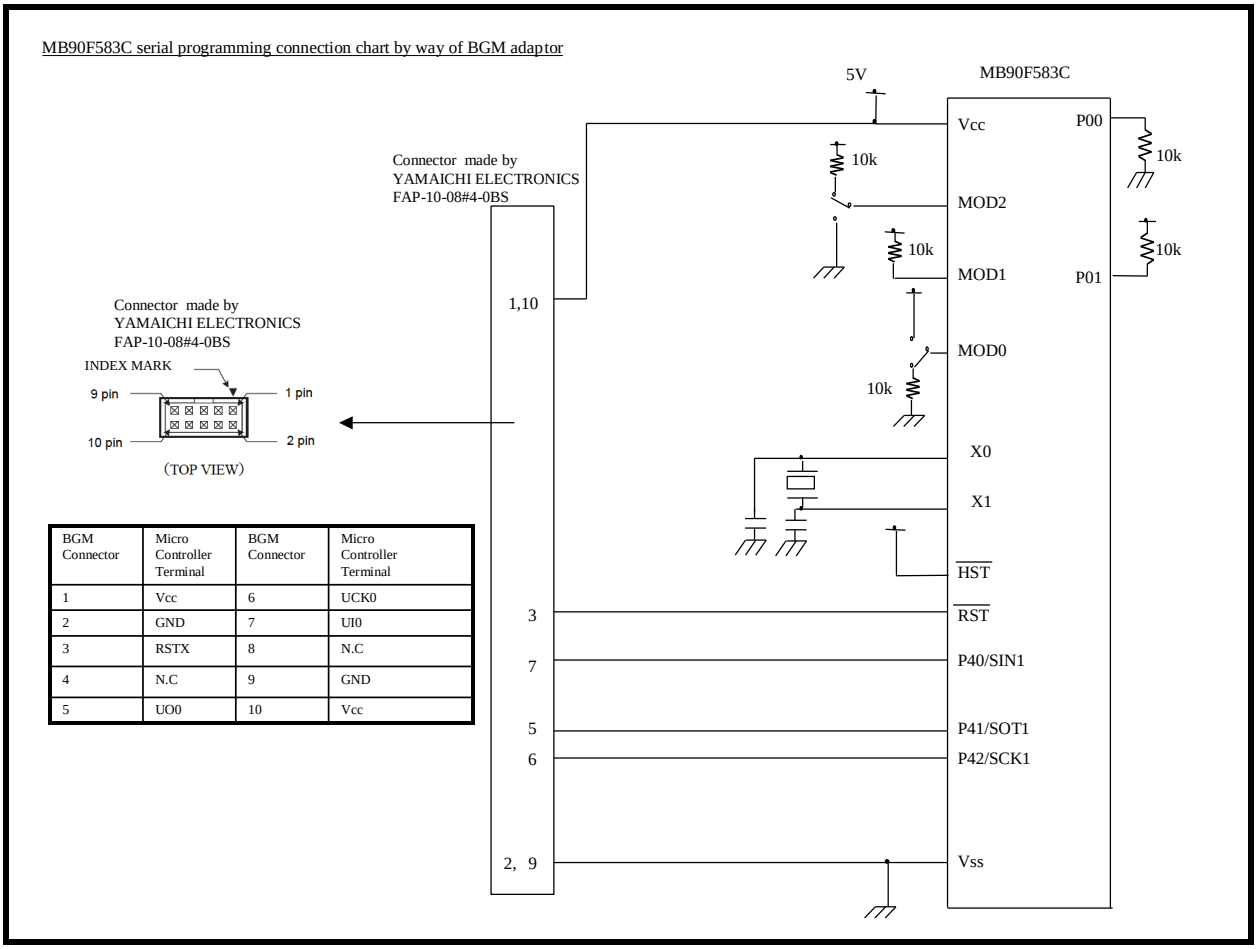
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P00,P01 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P00,P01 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P00,P01 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-2-15. Setting for MB90F583C



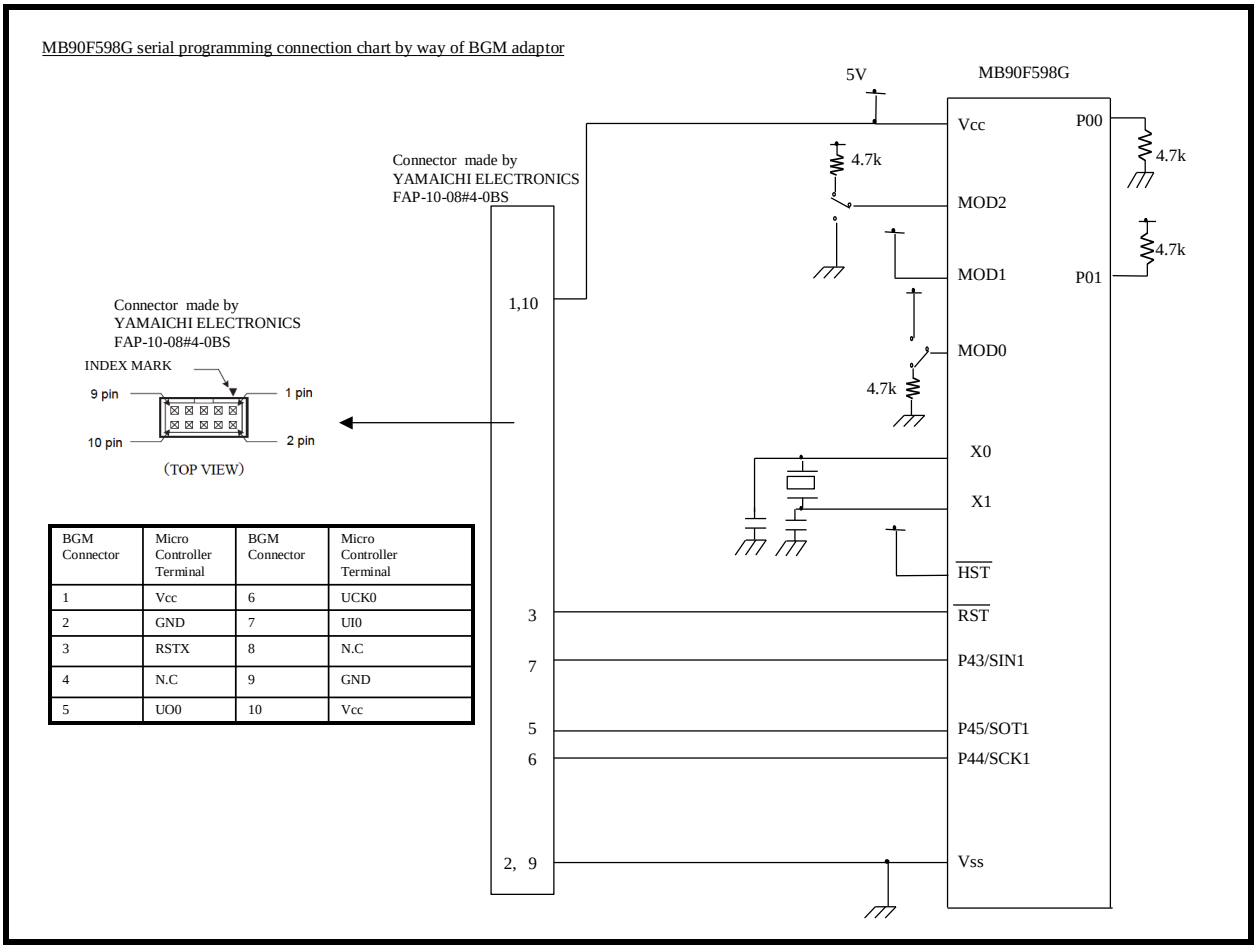
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P00,P01 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P00,P01 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P00,P01 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-2-16. Setting for MB90F598G



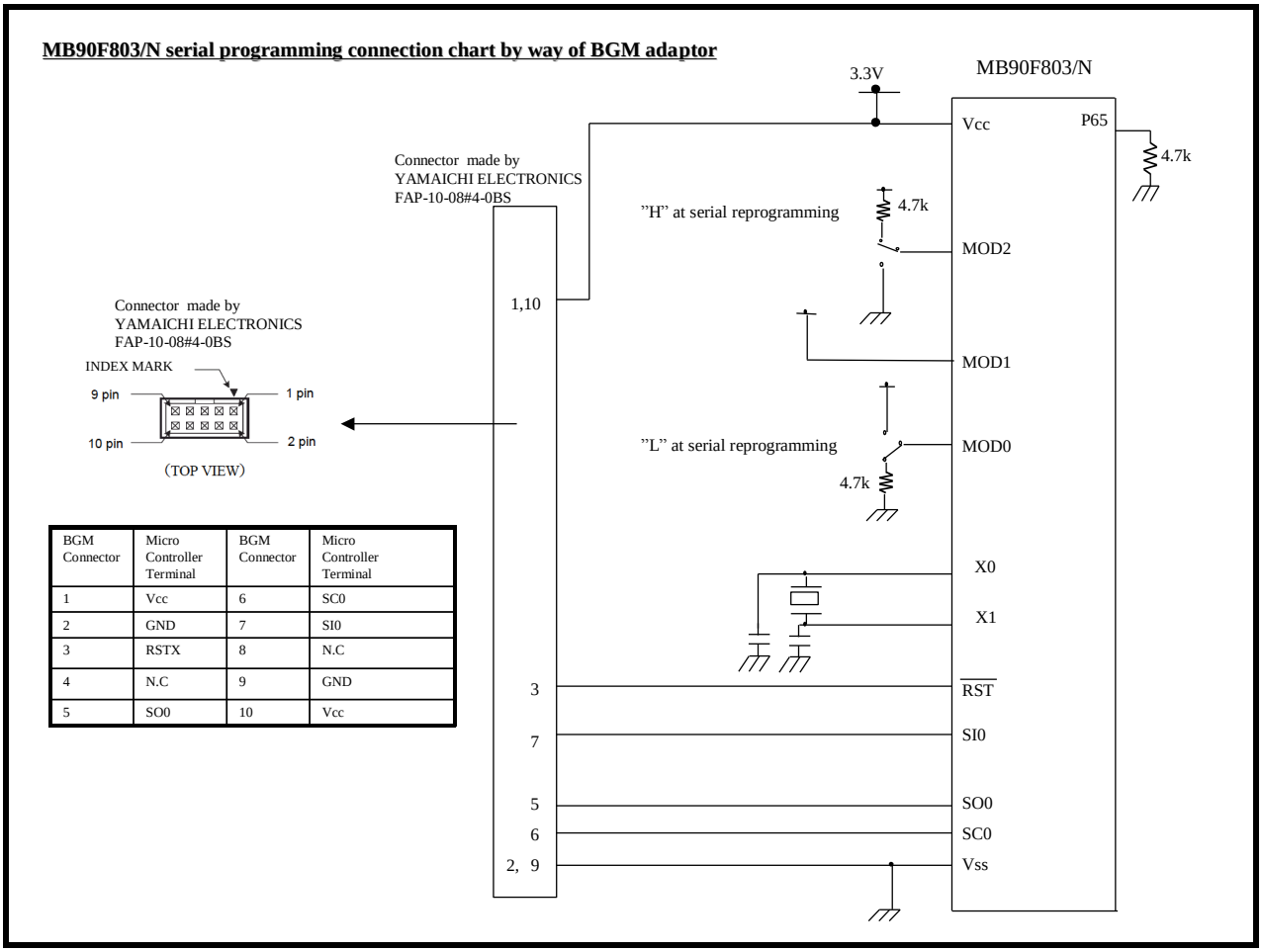
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P00,P01 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P00,P01 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P00,P01 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-2-17. Setting for MB90F803/N



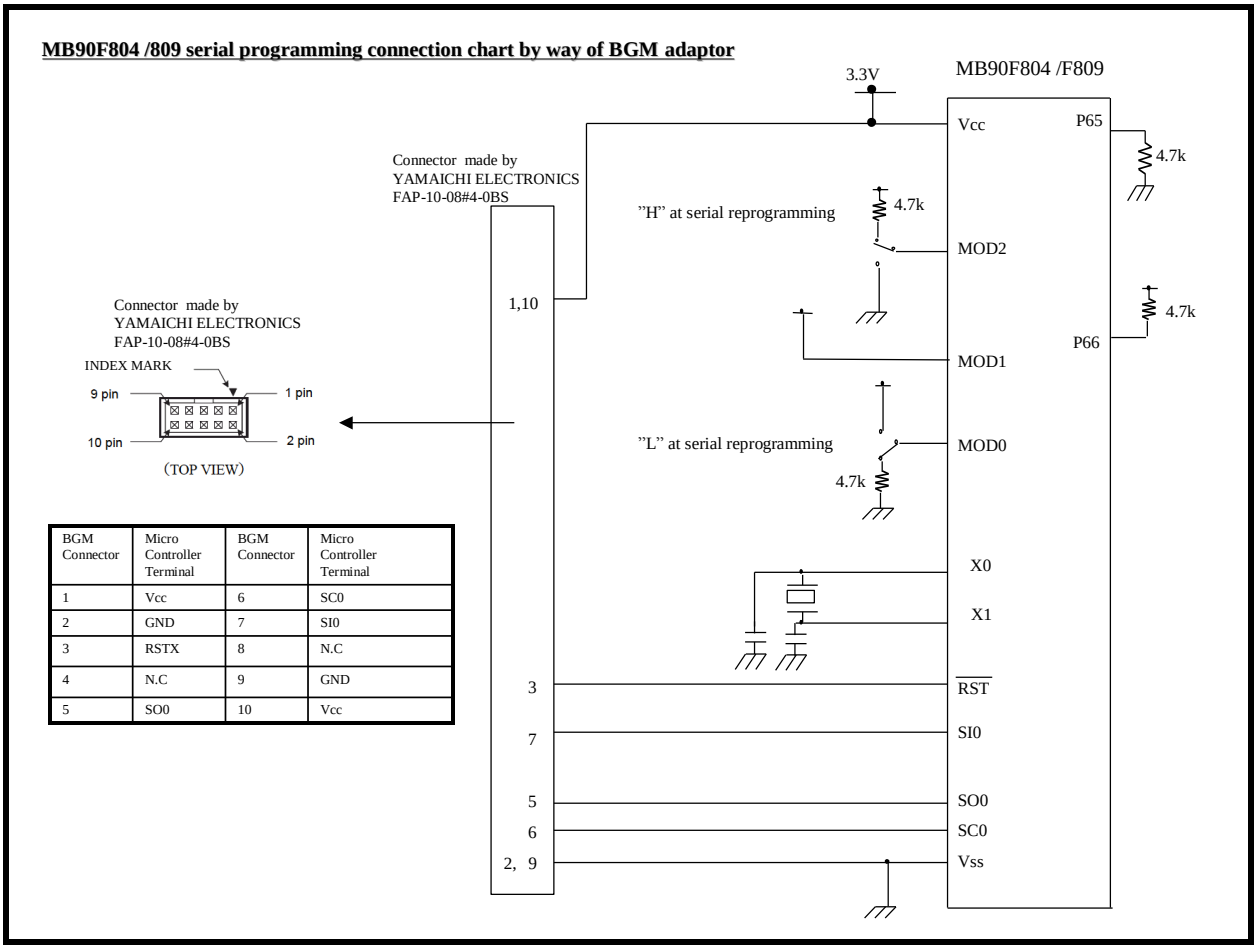
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SC0
2	GND	7	SI0
3	RSTX	8	N.C
4	N.C	9	GND
5	SO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P65 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P65 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P65 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-2-18. Setting for MB90F804 /F809

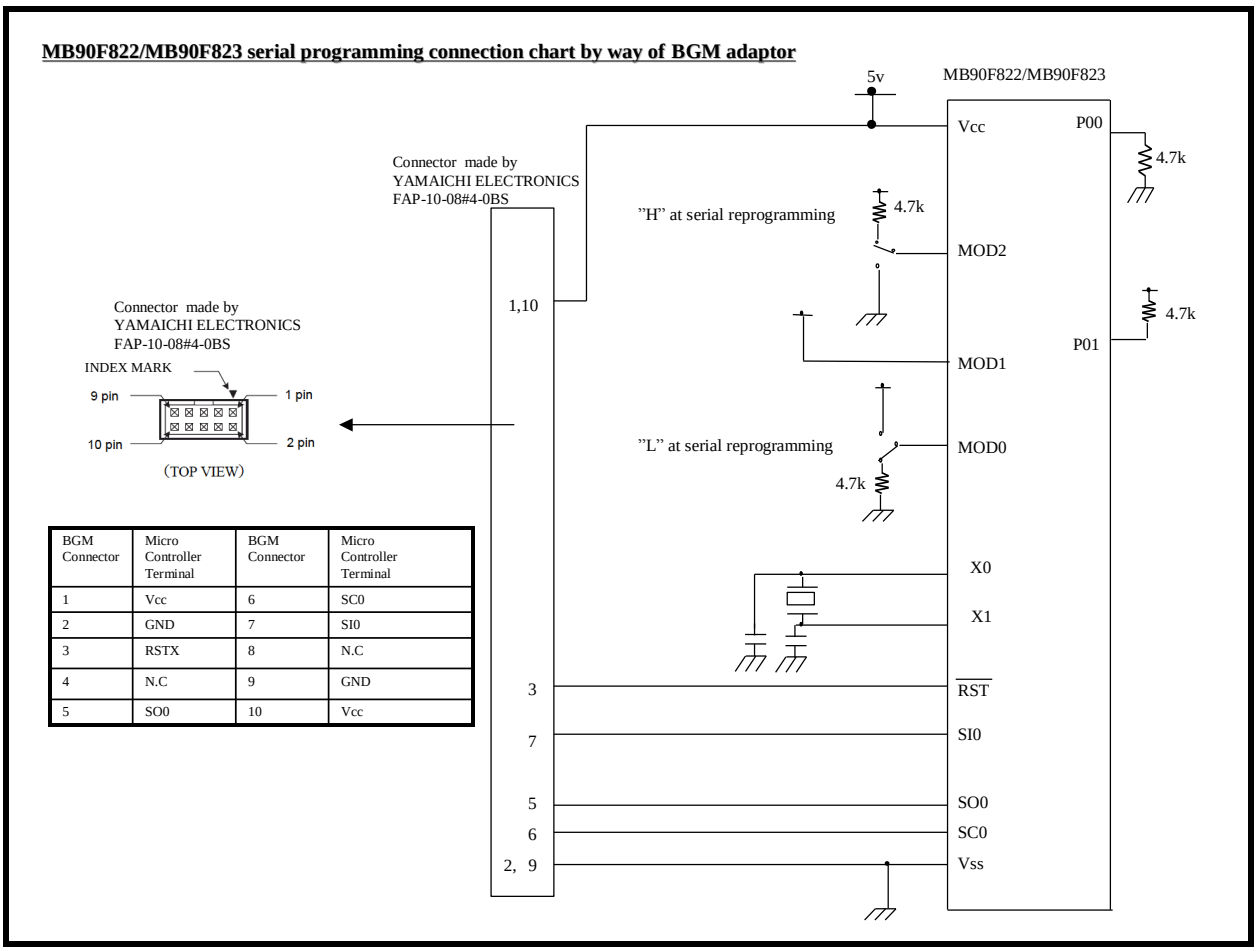


The MOD2,MOD1 and MOD0 pins and P65,P66 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P65,P66 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P65,P66 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-2-19. Setting for MB90F822 /F823



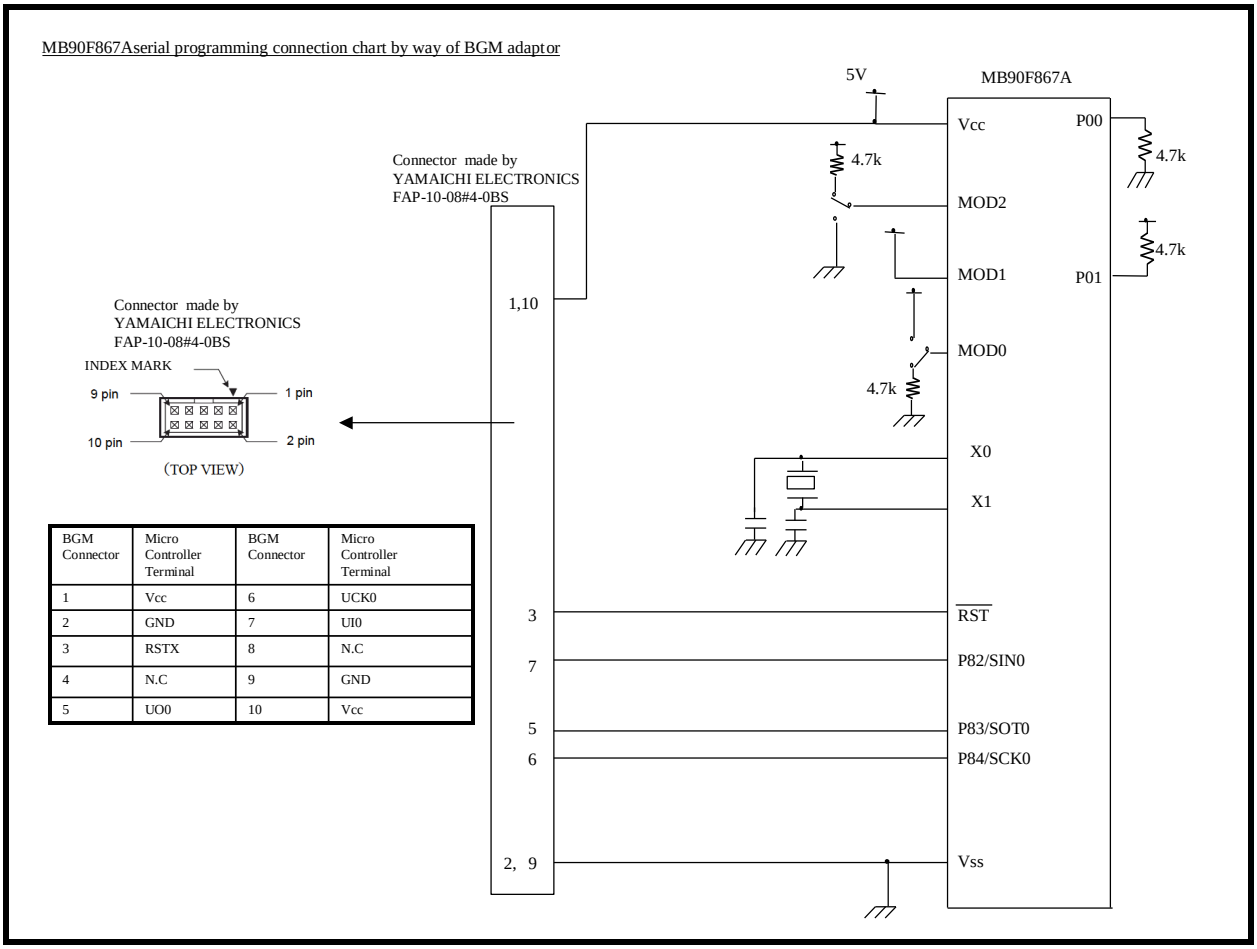
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SC0
2	GND	7	SI0
3	RSTX	8	N.C
4	N.C	9	GND
5	SO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P00,P01 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P00,P01 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P00,P01 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-2-20. Setting for MB90F867



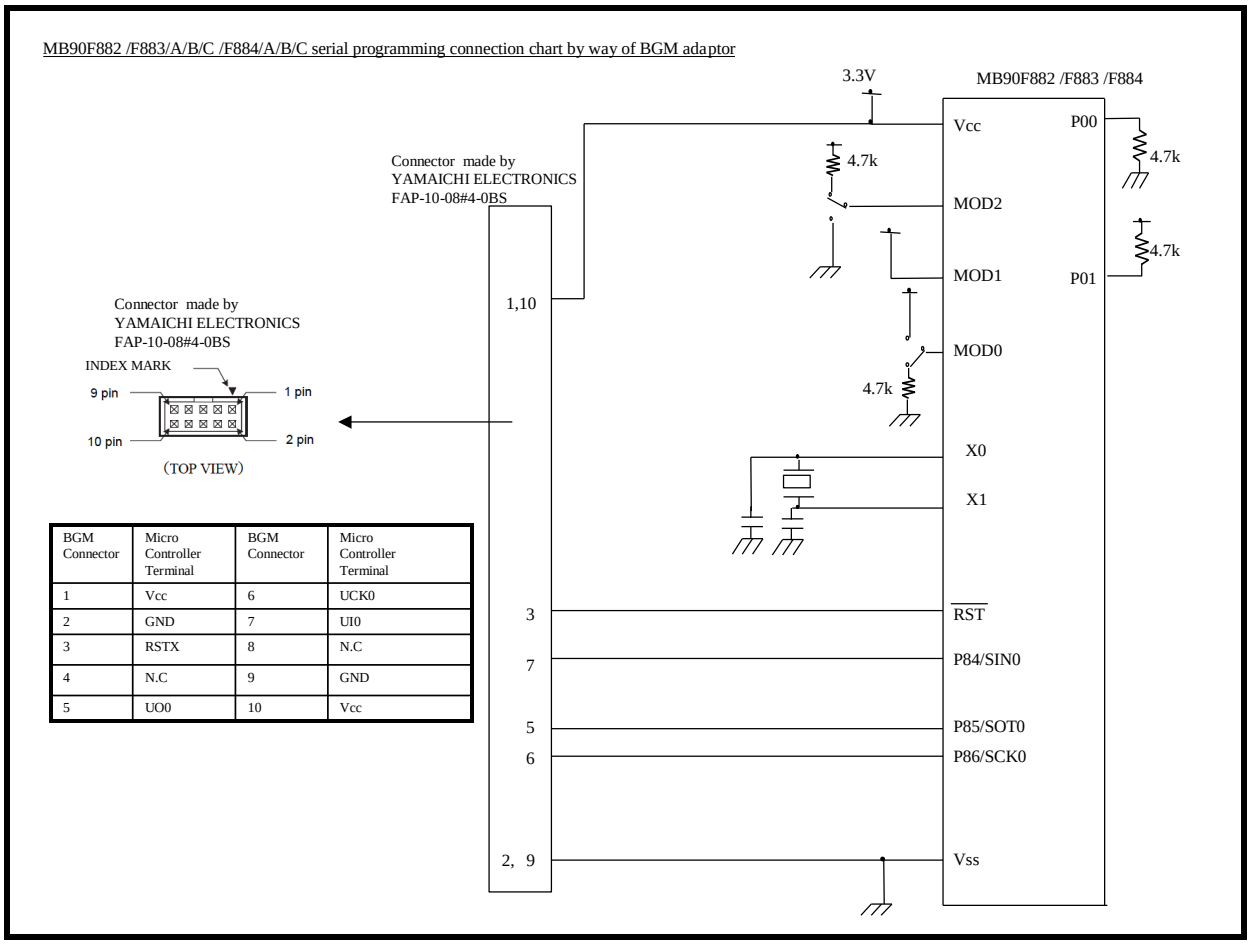
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P00,P01 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P00,P01 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P00,P01 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-2-21. Setting for MB90F882 /F883/A/B/C /F884/A/B/C



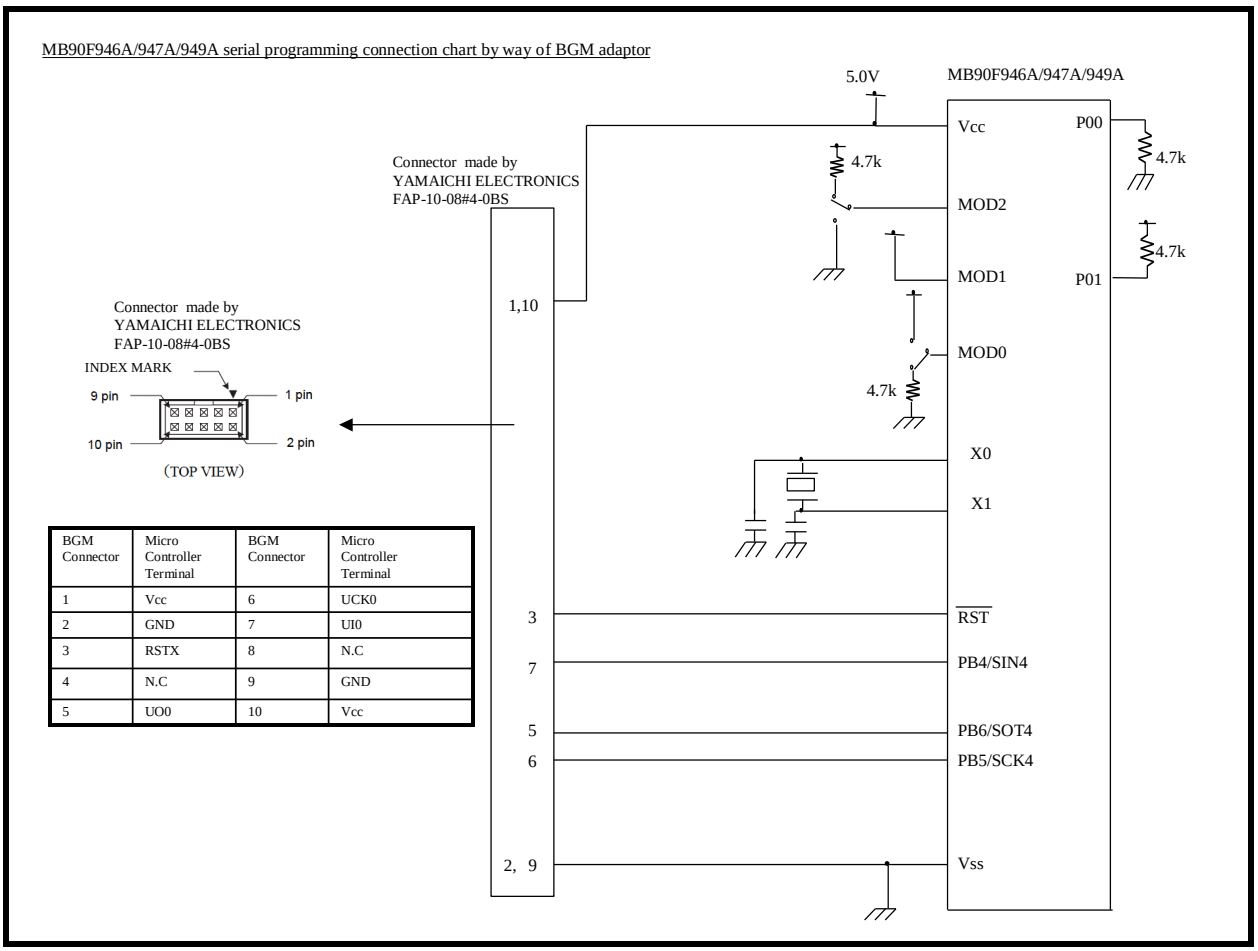
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD2, MOD1 and MOD0 pins and P00, P01 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2, MOD1 and MOD0 pins and P00, P01 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming, control is shifted to the normally-used mode as for MOD2, MOD1 and MOD0 pins and to the user circuit side as for P00,P01 pins. Then RSTX pin set from "Low" to "High" Level executes user program.

3-2-22. Setting for MB90F946A/F947A/F949A



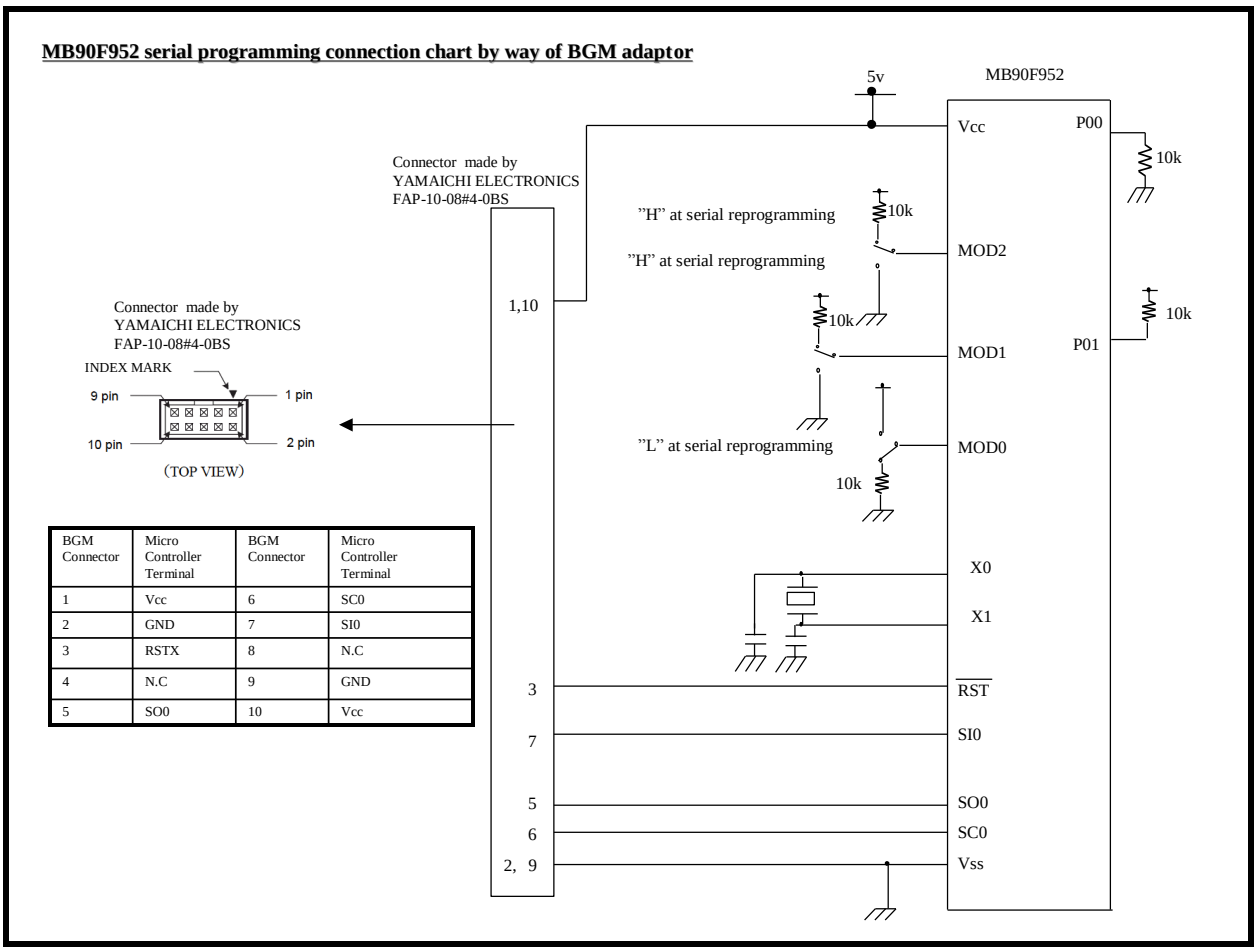
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P00,P01 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P00,P01 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming, control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P00,P01 pins. Then RSTX pin set from "Low" to "High" Level executes user program.

3-2-23. Setting for MB90F952



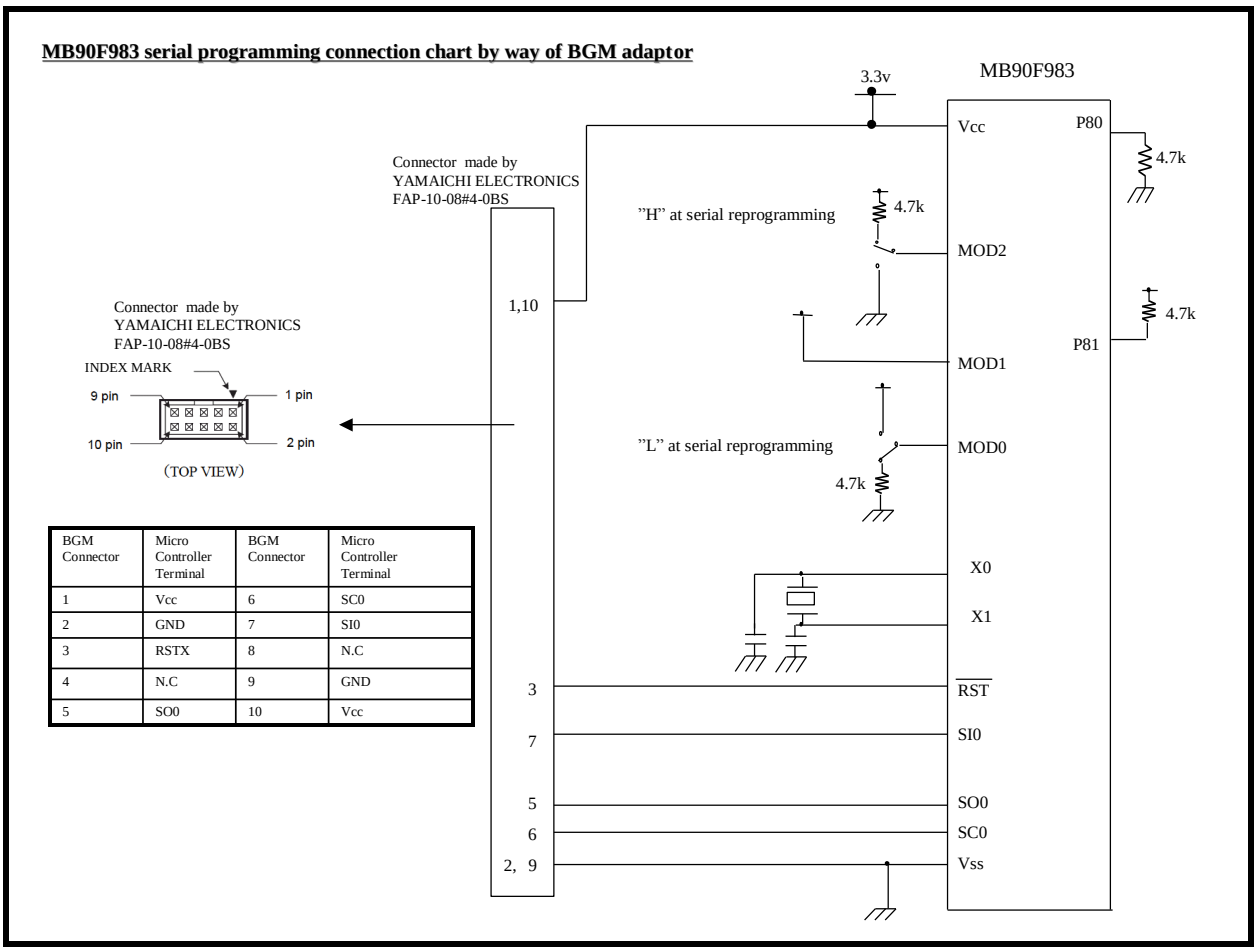
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SC0
2	GND	7	SI0
3	RSTX	8	N.C
4	N.C	9	GND
5	SO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P00,P01 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P00,P01 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P00,P01 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-2-24. Setting for MB90F983



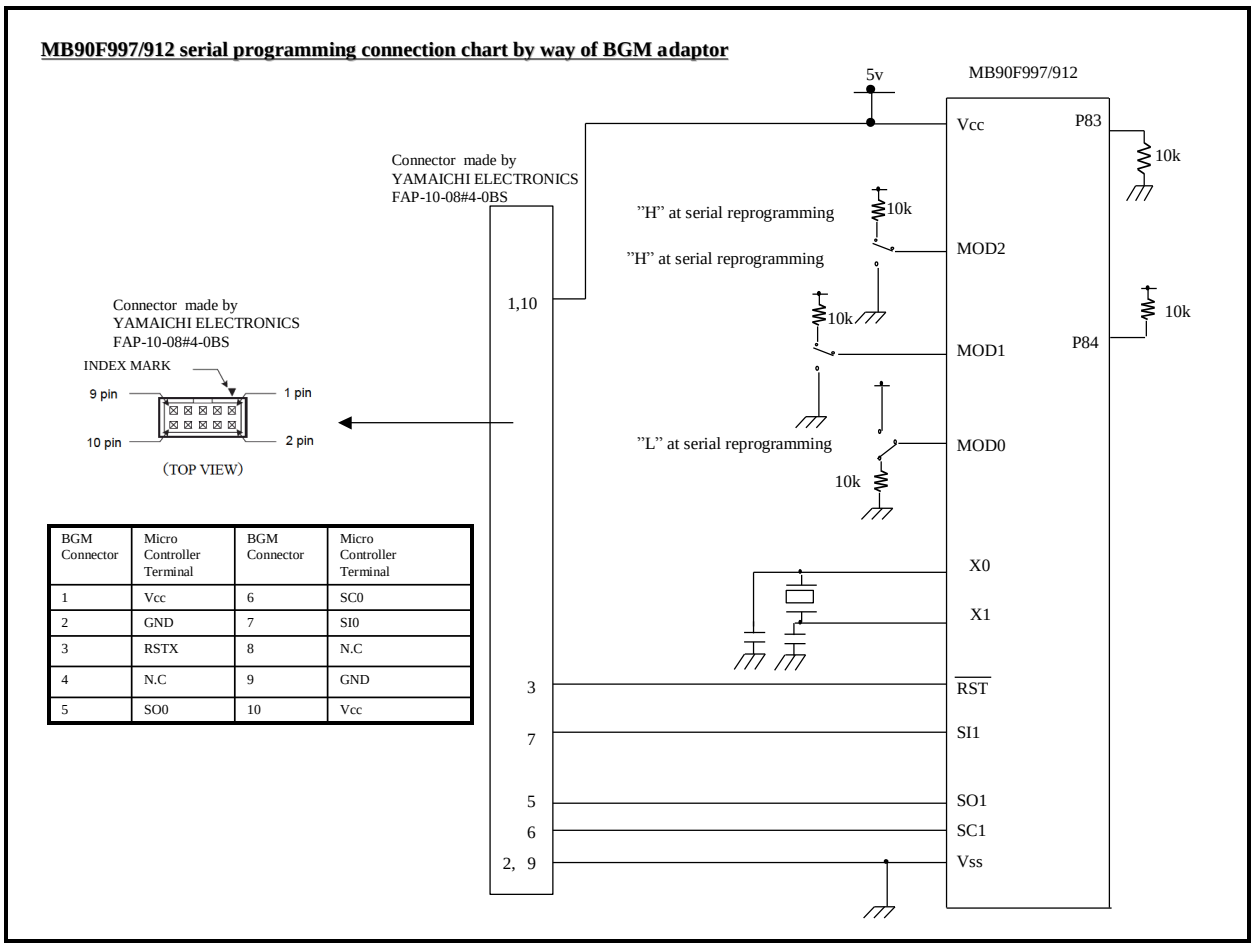
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SC0
2	GND	7	SI0
3	RSTX	8	N.C
4	N.C	9	GND
5	SO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P80,P81 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P80,P81 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P80,P81 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-2-25. Setting for MB90F997/912



BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SC0
2	GND	7	SI0
3	RSTX	8	N.C
4	N.C	9	GND
5	SO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P83,P84 pins cannot be controlled by the PC and should be set in the user system.

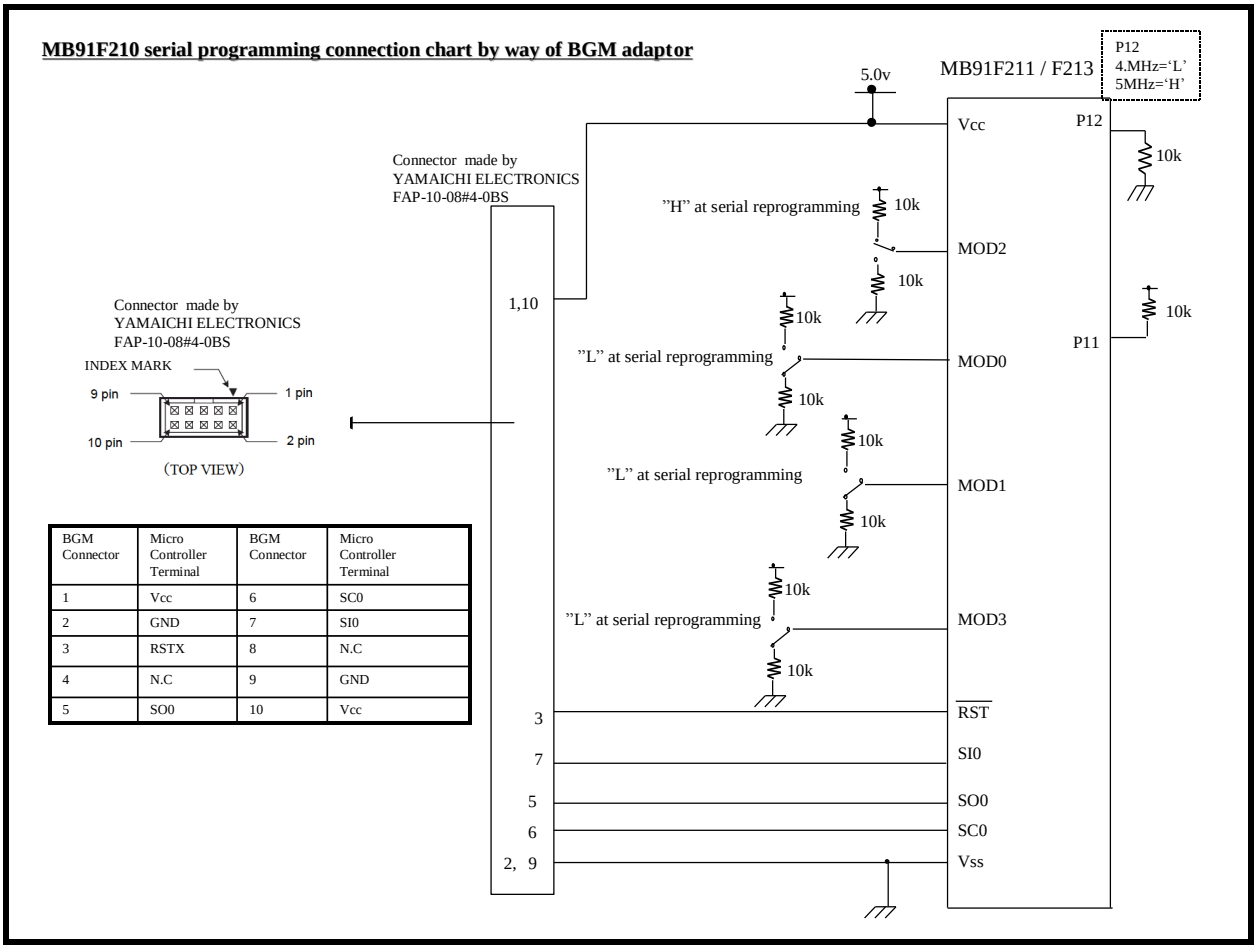
When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P83,P84 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P83,P84 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-3. FR:EXAMPLE OF CONNECTION FOR ON-BOARD REPROGRAMMING BY PROGRAMMER

This chapter explains a pin setup which must be set up for every kind series.

3-3-1. Setting for MB91F211 /F213



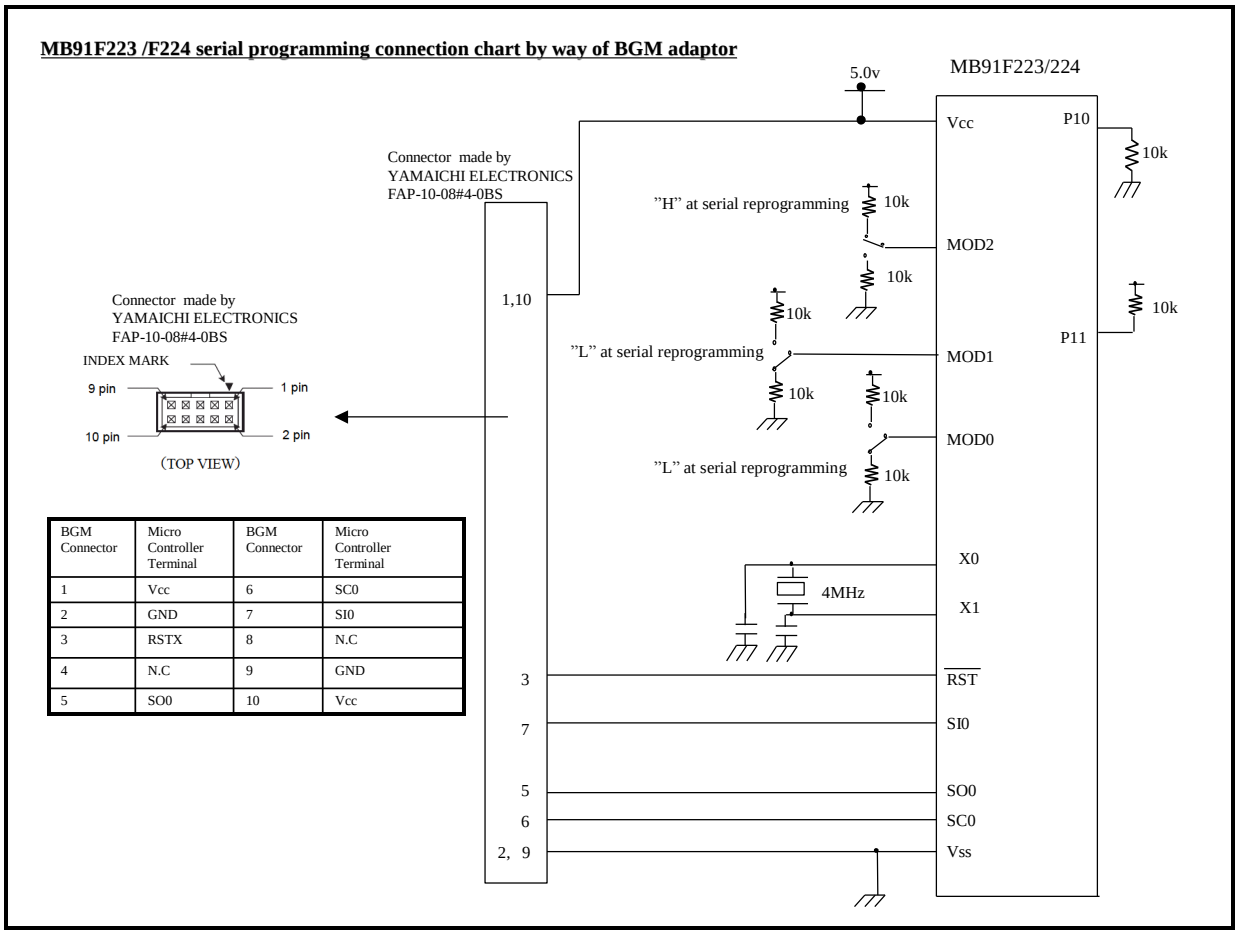
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SC0
2	GND	7	SI0
3	RSTX	8	N.C
4	N.C	9	GND
5	SO0	10	Vcc

The MOD3,MOD2,MOD1 and MOD0 pins and P11,P12 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD3,MOD2,MOD1 and MOD0 pins and P11,P12 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD3,MOD2,MOD1 and MOD0 pins and to the user circuit side as for P11,P12 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-3-2. Setting for MB91F223 /F224



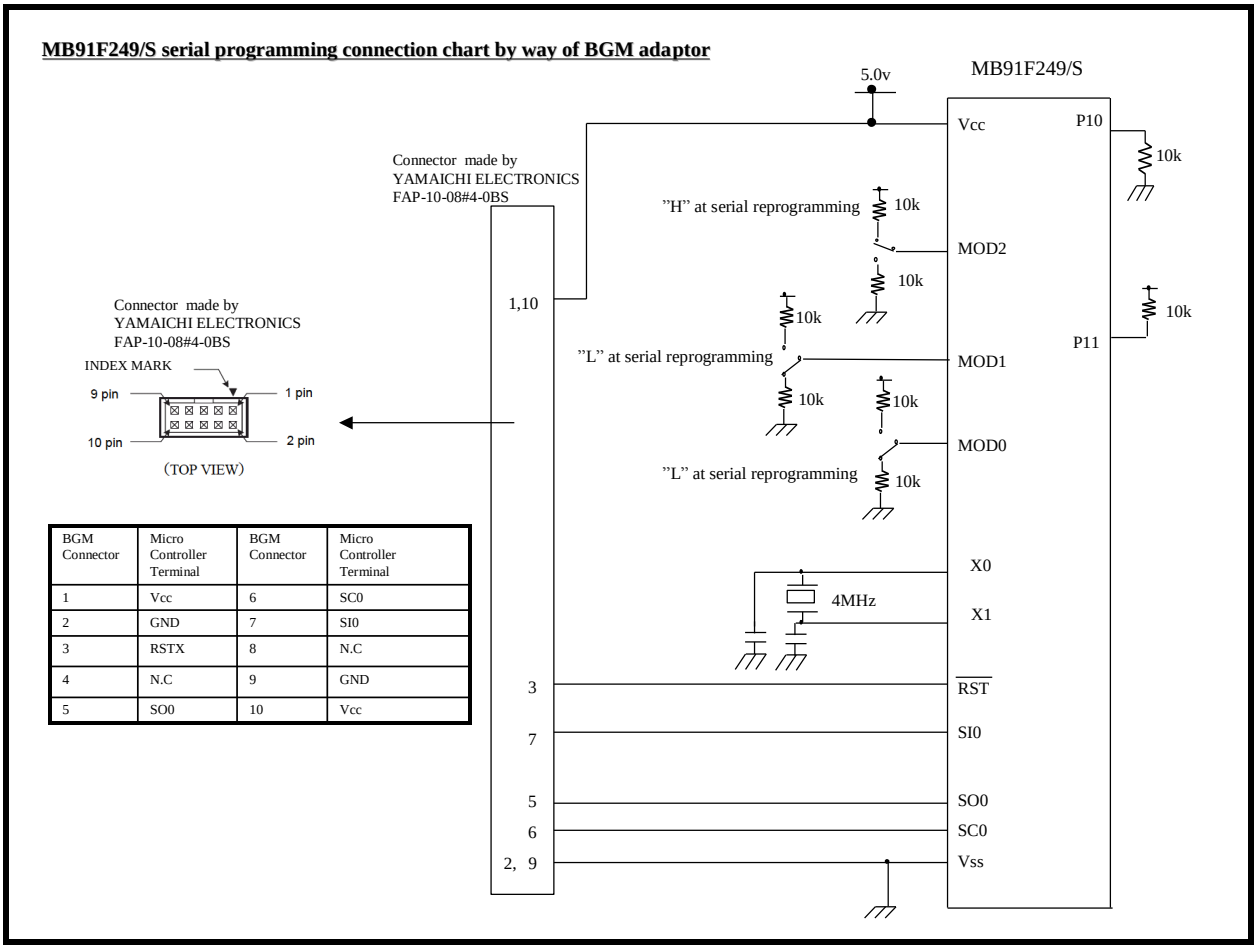
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SC0
2	GND	7	SI0
3	RSTX	8	N.C
4	N.C	9	GND
5	SO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P10,P11 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P10,P11 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P10,P11 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-3-3. Setting for MB91F249/S



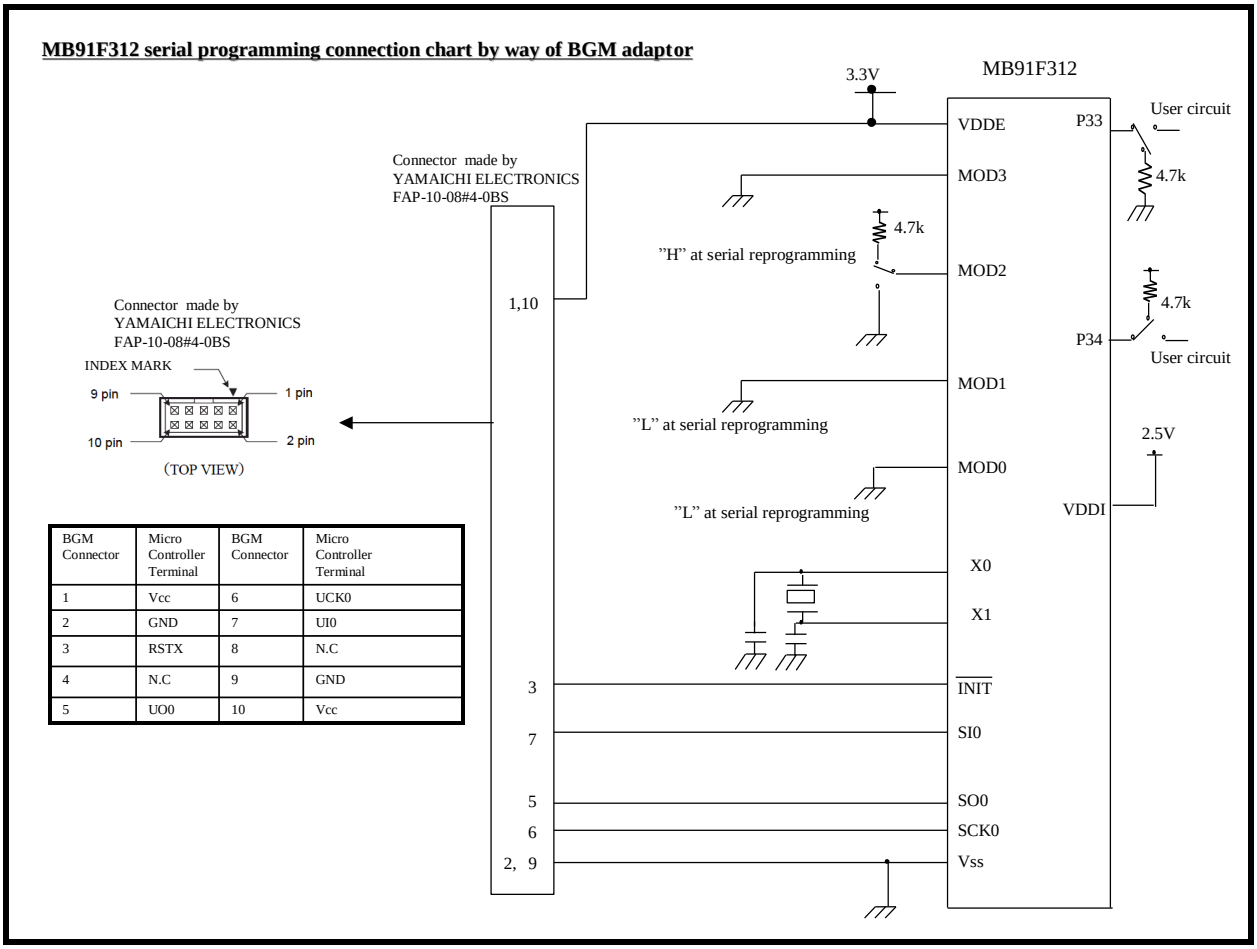
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SC0
2	GND	7	SI0
3	RSTX	8	N.C
4	N.C	9	GND
5	SO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P10,P11 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P10,P11 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P10,P11 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-3-4. Setting for MB91F312A



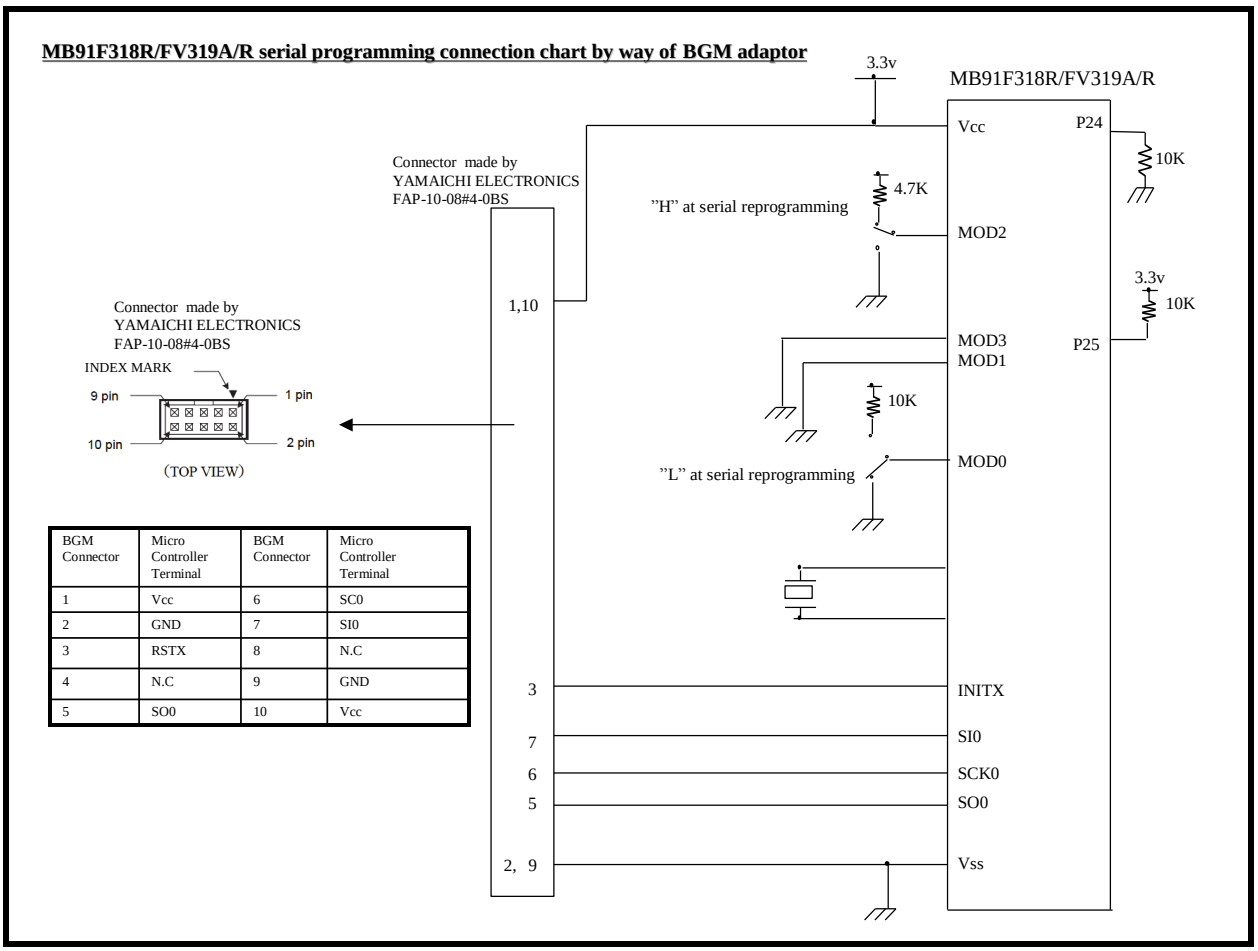
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	UCK0
2	GND	7	UI0
3	RSTX	8	N.C
4	N.C	9	GND
5	UO0	10	Vcc

The MOD3,MOD2,MOD1 and MOD0 pins and P53,P54 pins cannot be controlled by the PC and should be set in the user system.

When the INITX pin is set from "Low" to "High" level after setting MOD3,MOD2,MOD1 and MOD0 pins and P53,P54 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD3,MOD2,MOD1 and MOD0 pins and to the user circuit side as for P53,P54 pins.Then RSTX pin set from "Low" to "High" Level executes user program.

3-3-5. Setting for MB91F318R /FV319A /FV319R



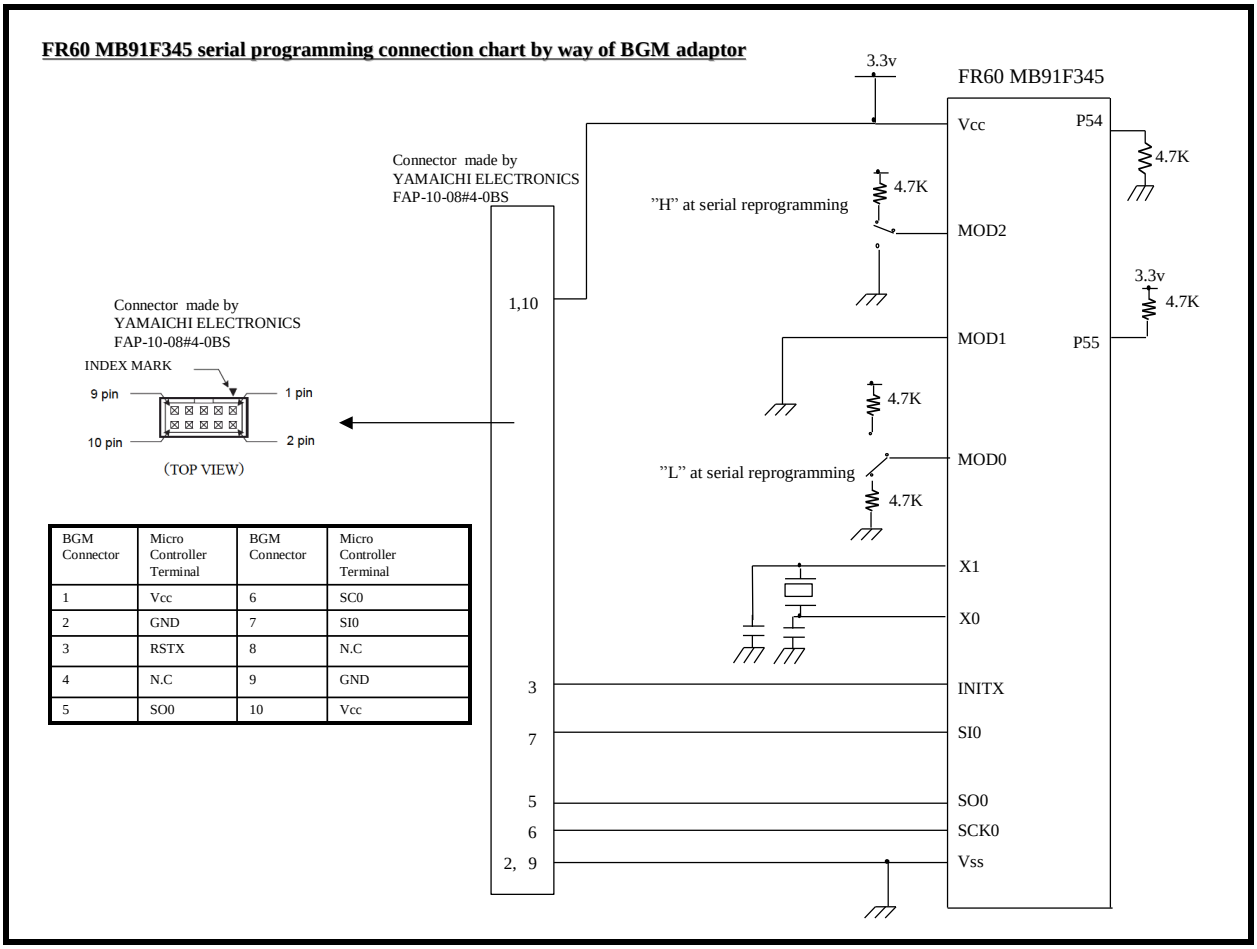
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SC0
2	GND	7	SI0
3	RSTX	8	N.C
4	N.C	9	GND
5	SO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P24,P25 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P24,P25 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P24,P25 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-3-6. Setting for MB91F345



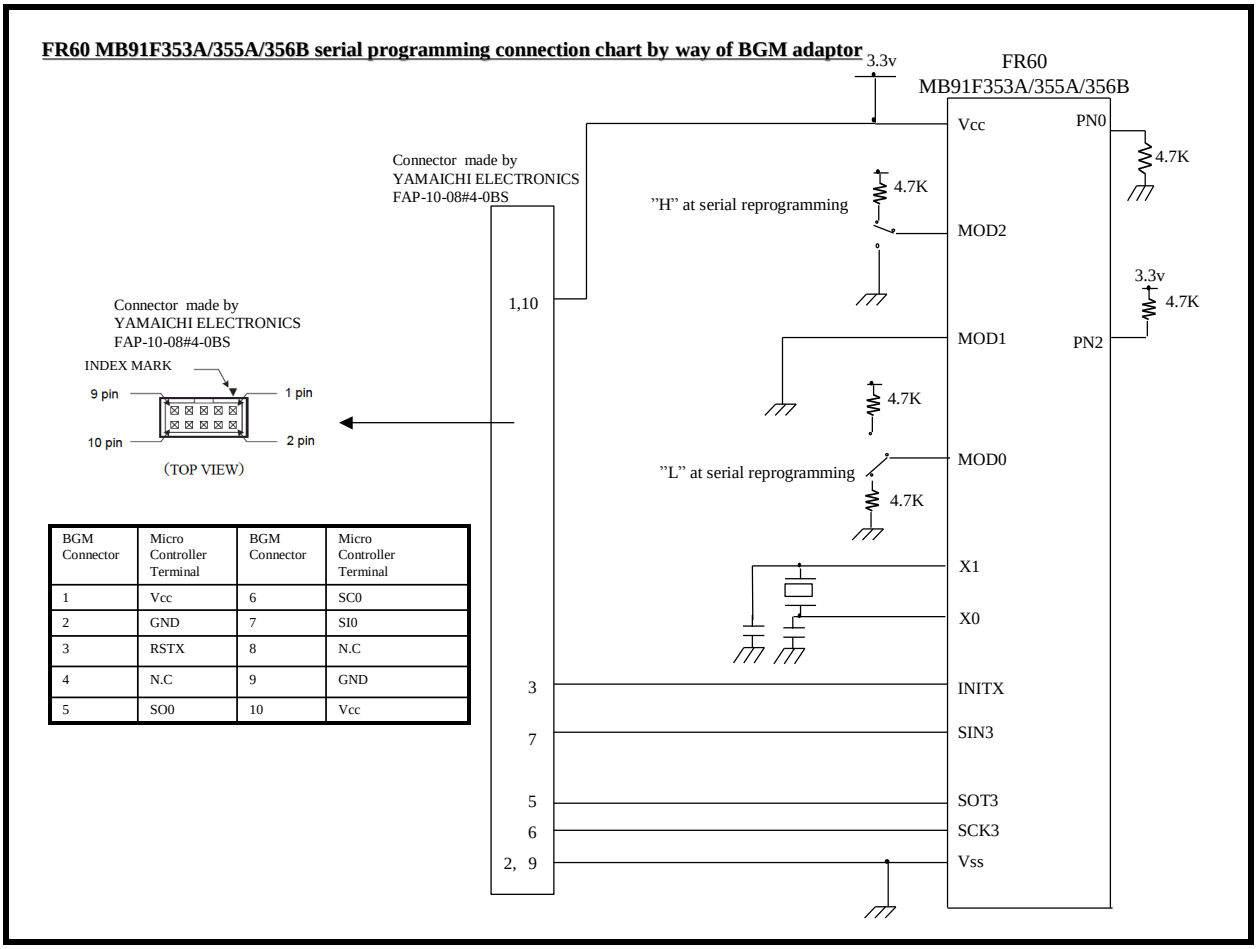
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SC0
2	GND	7	SI0
3	RSTX	8	N.C
4	N.C	9	GND
5	SO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P54,P55 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P54,P55 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P54,P55 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-3-7. Setting for MB91F353A /F355A /F356B



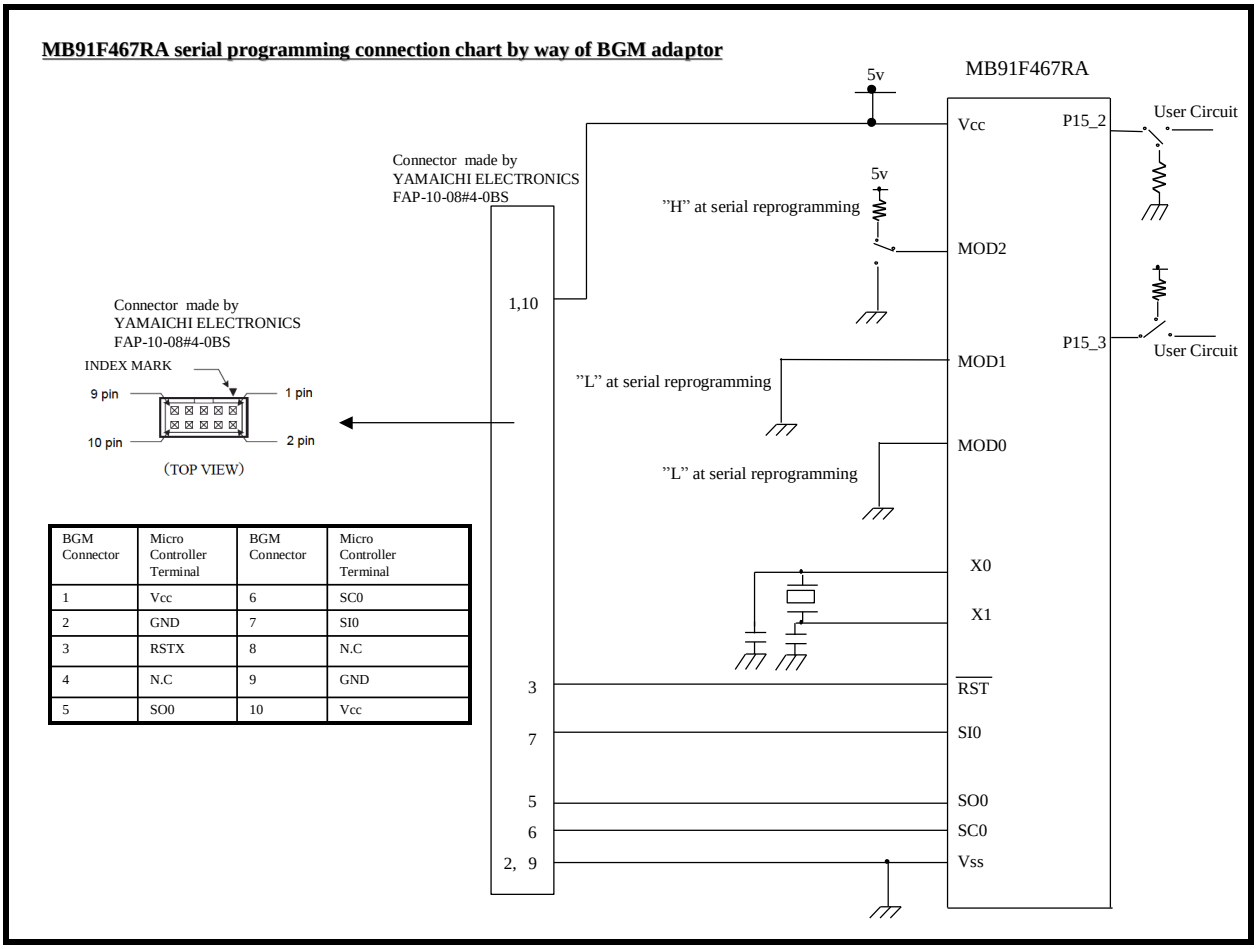
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SC0
2	GND	7	SI0
3	RSTX	8	N.C
4	N.C	9	GND
5	SO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and PN0,PN2 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and PN0,PN2 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for PN0,PN2 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-3-8. Setting for MB91F467RA



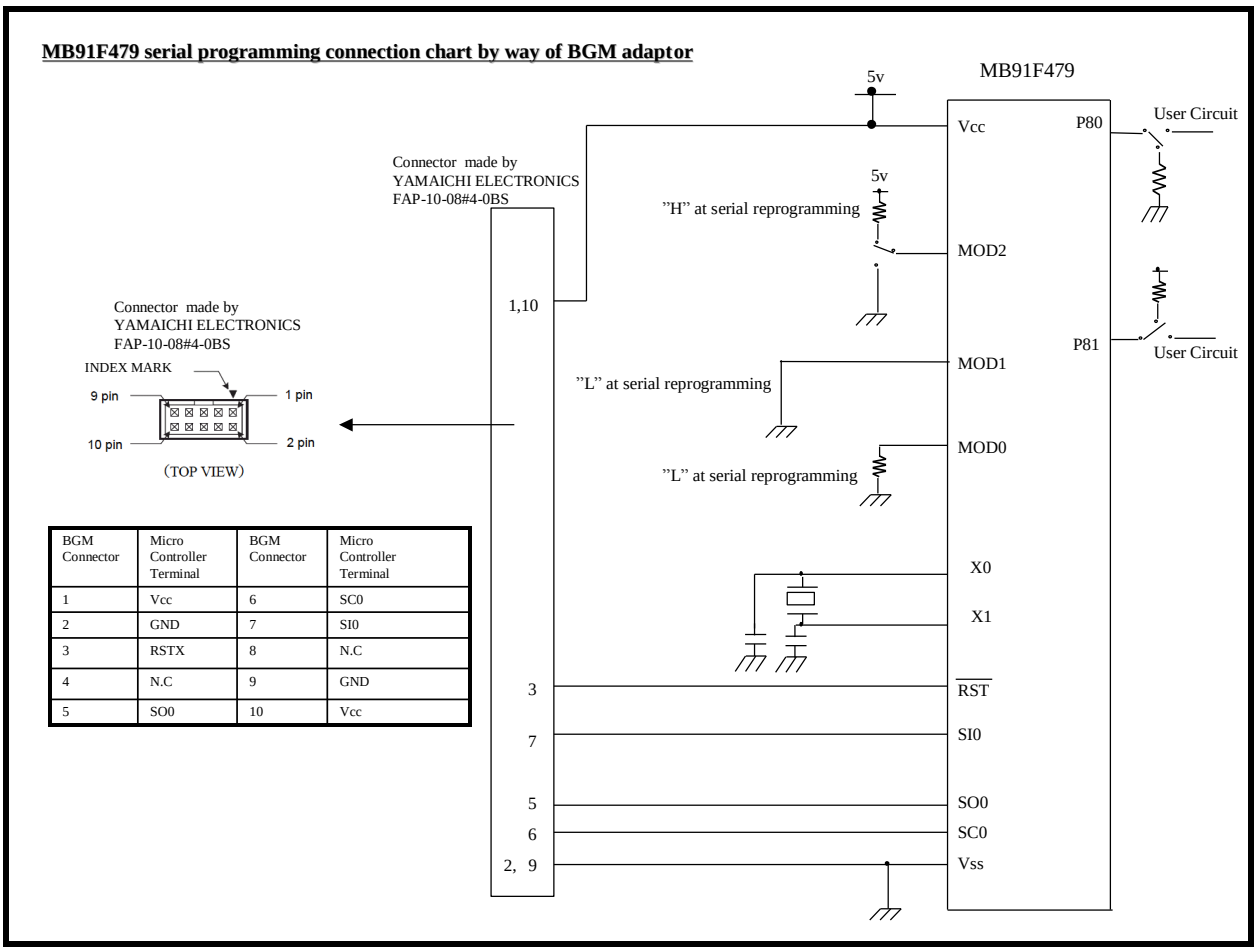
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SC0
2	GND	7	SI0
3	RSTX	8	N.C
4	N.C	9	GND
5	SO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P15_2,P15_3 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P80,P81 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P81,P80 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-3-9. Setting for MB91F475 /F478 /F479



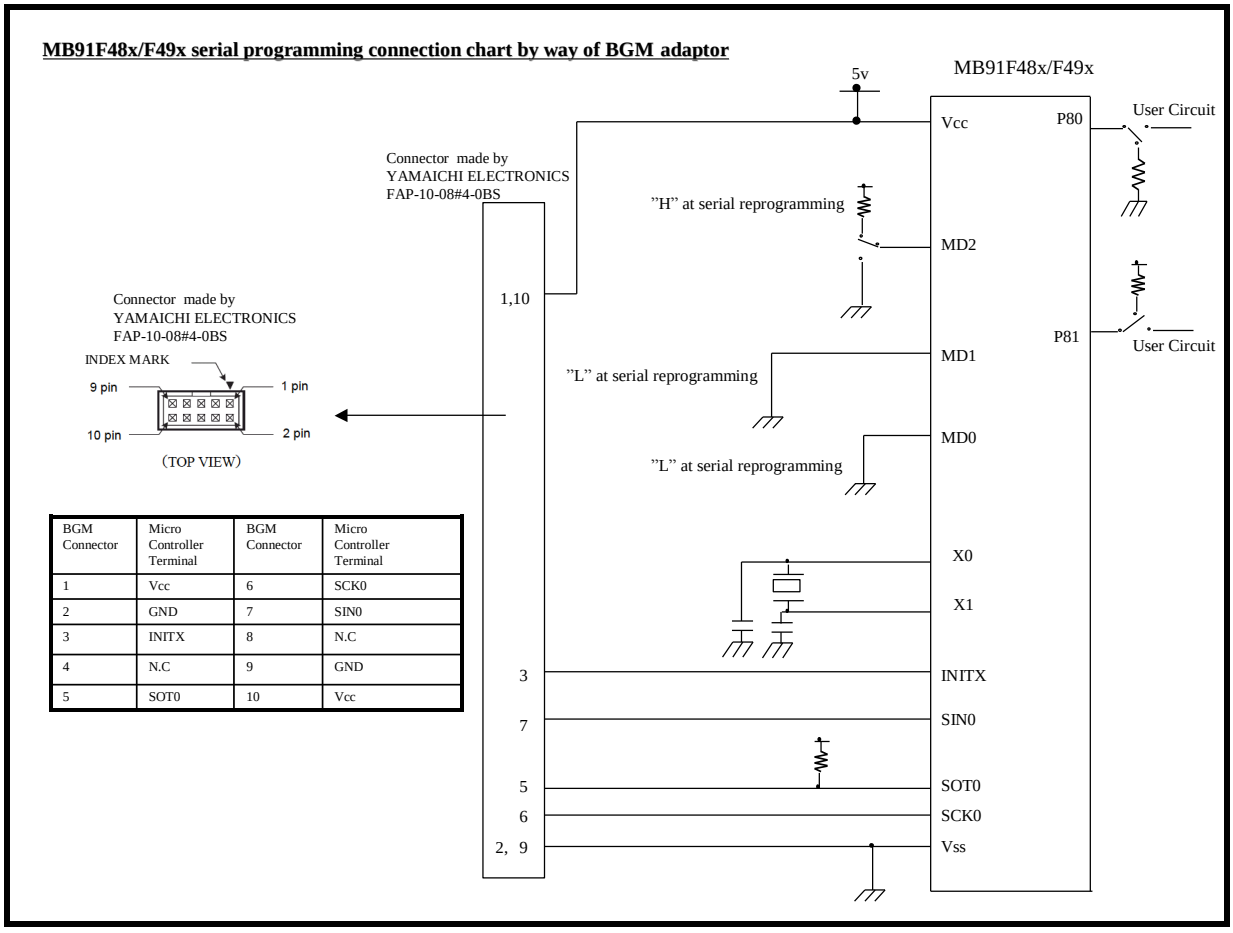
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SC0
2	GND	7	SI0
3	RSTX	8	N.C
4	N.C	9	GND
5	SO0	10	Vcc

The MOD2,MOD1 and MOD0 pins and P80,P81 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins and P80,P81 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins and to the user circuit side as for P81,P80 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-3-10. Setting for MB91F482 /F486 /F487 /F492



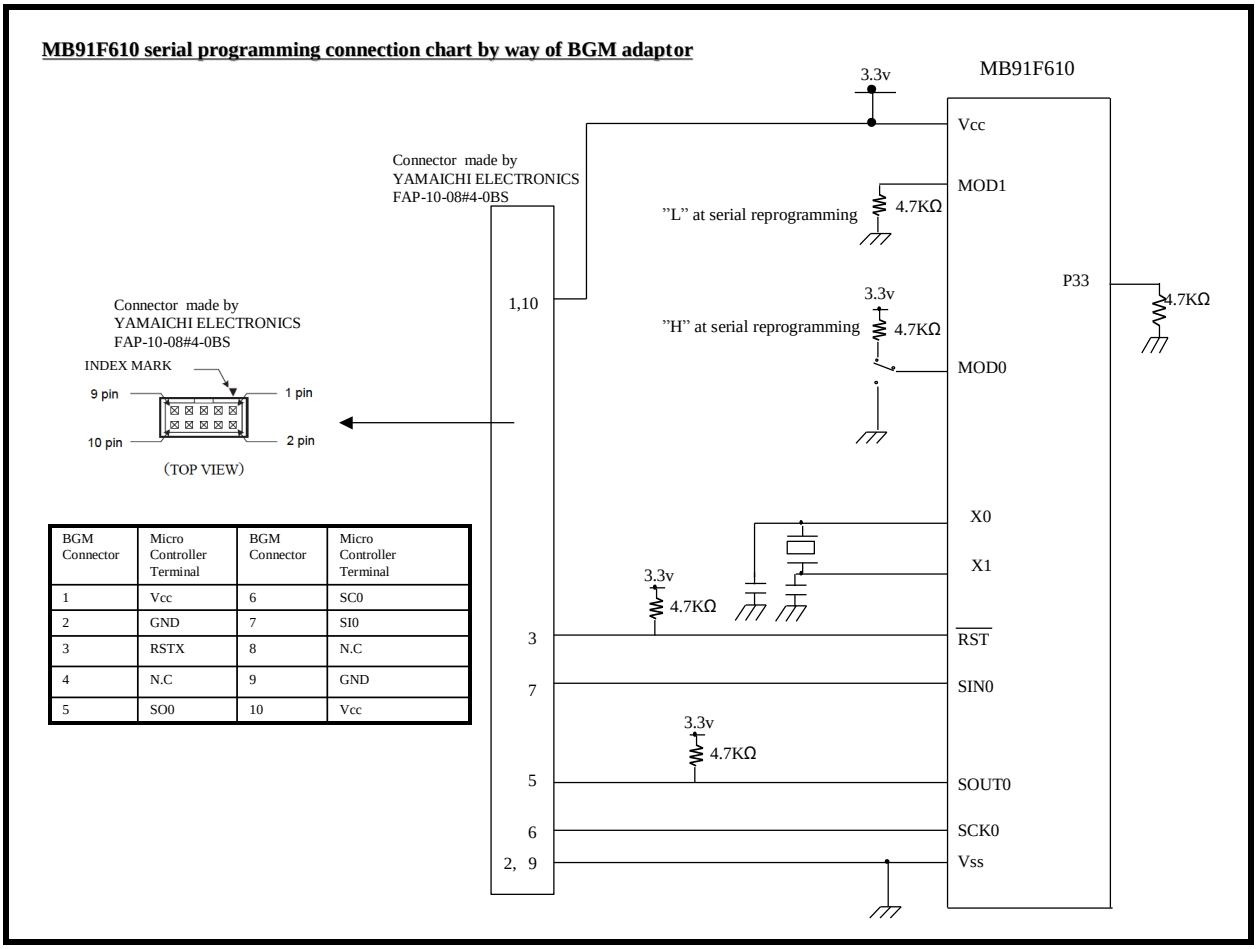
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SCK0
2	GND	7	SIN0
3	INITX	8	N.C
4	N.C	9	GND
5	SOT0	10	Vcc

The MD2,MD1 and MD0 pins and P80,P81 pins cannot be controlled by the PC and should be set in the user system.

When the INITX pin is set from "Low" to "High" level after setting MD2,MD1 and MD0 pins and P80,P81 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MD2,MD1 and MD0 pins and to the user circuit side as for P81,P80 pins.Then INITX pin set from "Low" to "High" level executes user program.

3-3-11. Setting for MB91F610

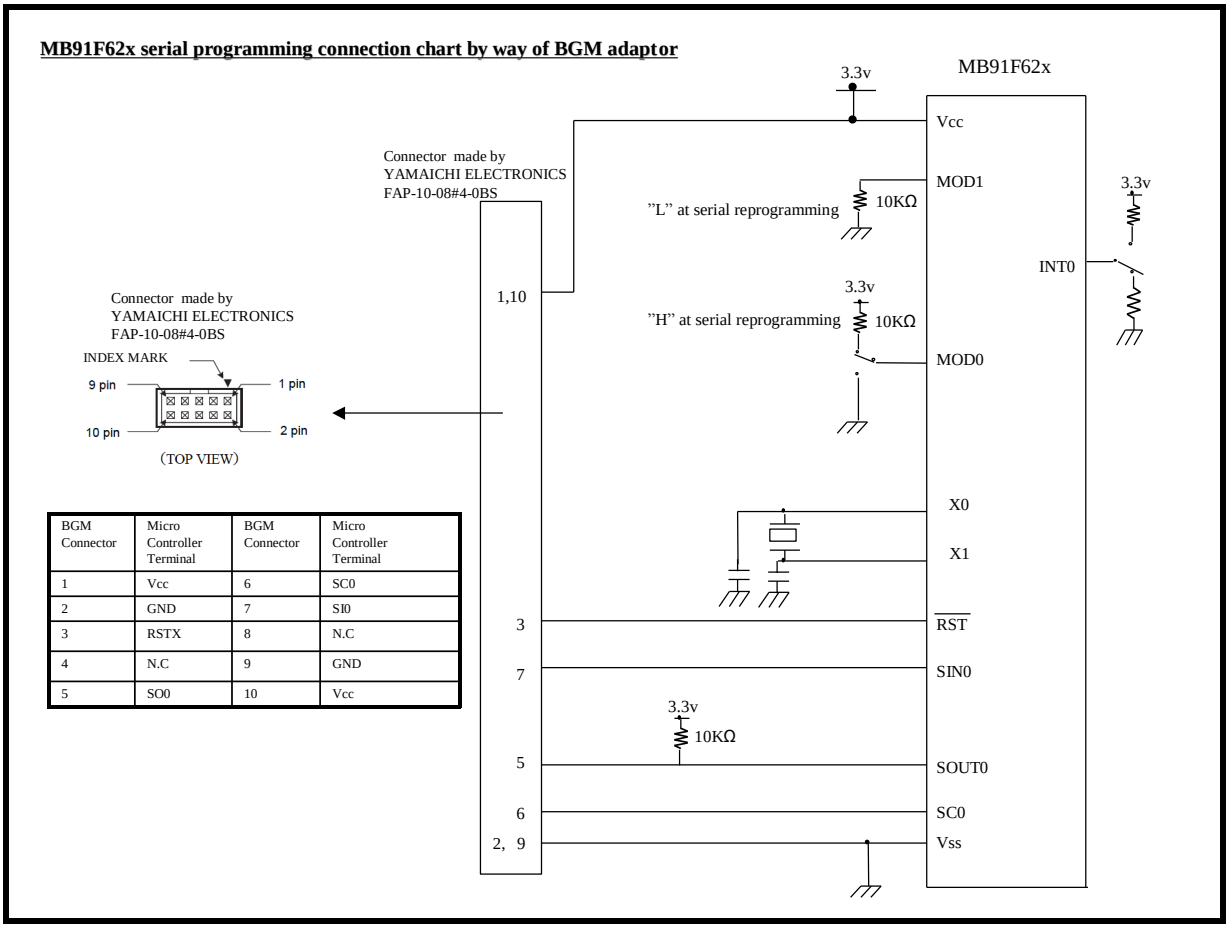


The MOD1 and MOD0 pins and P33,SOUT0 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD1 and MOD0 pins and P33,SOUT0 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD1 and MOD0 pins and to the user circuit side as for P33,SOUT0 pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-3-12. Setting for MB91F625 /F627



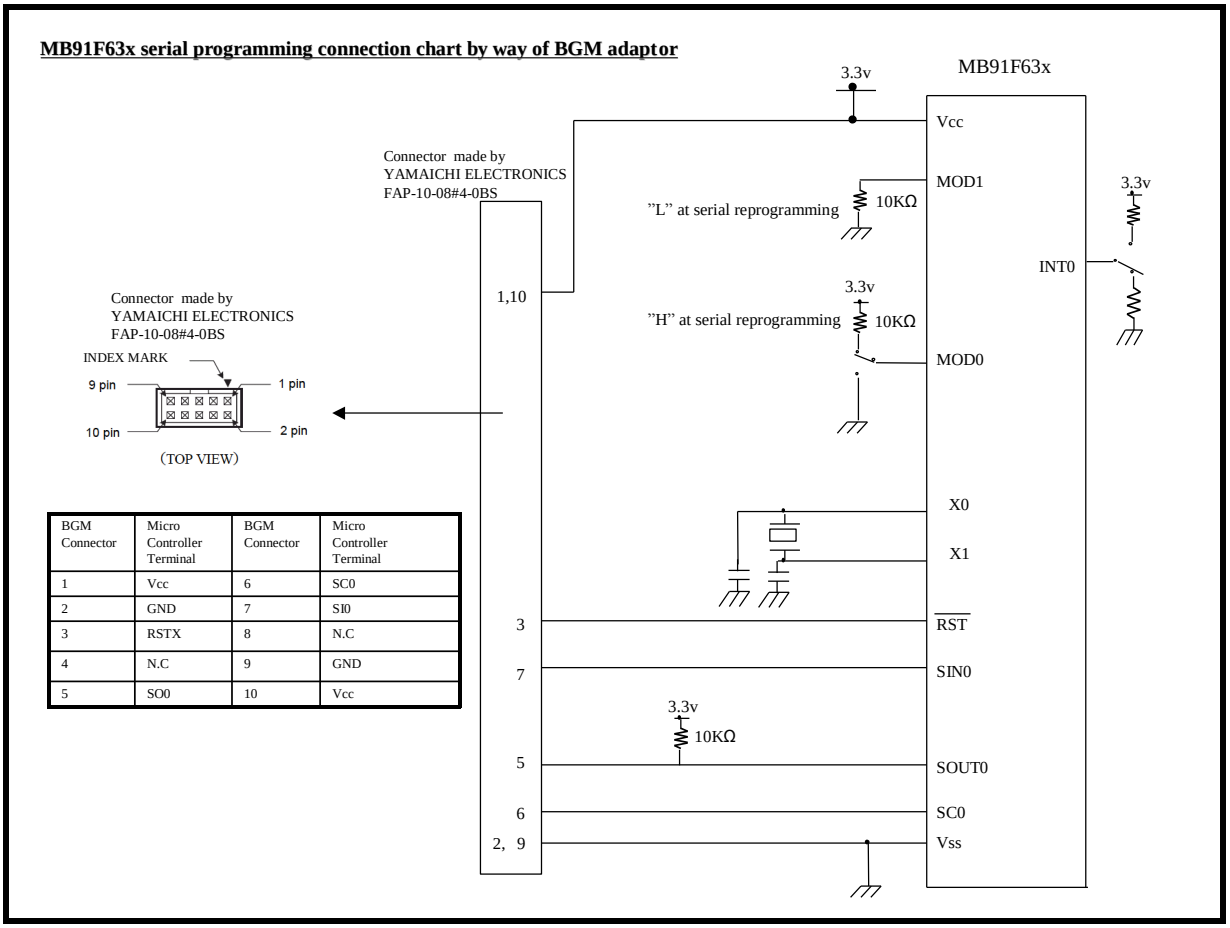
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SC0
2	GND	7	SI0
3	RSTX	8	N.C
4	N.C	9	GND
5	SO0	10	Vcc

The MOD1 and MOD0 pins and INT0,SOUT0 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD1 and MOD0 pins and INT0,SOUT0 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD1 and MOD0 pins and to the user circuit side as for INT0,SOUT0pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-3-13. Setting for MB91F637 /F639 /F635A /F637A /F639A



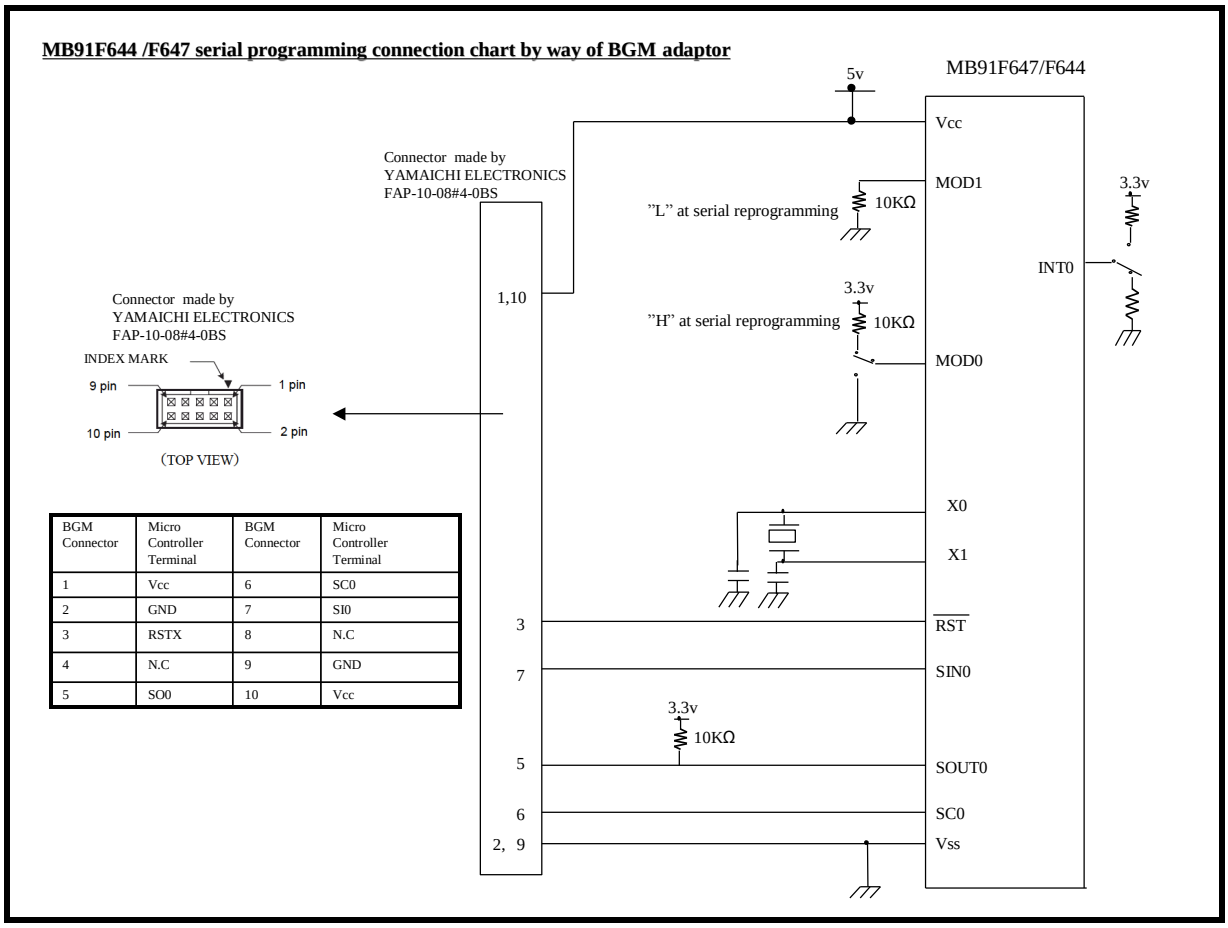
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SC0
2	GND	7	SI0
3	RSTX	8	N.C
4	N.C	9	GND
5	SO0	10	Vcc

The MOD1 and MOD0 pins and INT0,SOUT0 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD1 and MOD0 pins and INT0,SOUT0 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD1 and MOD0 pins and to the user circuit side as for INT0,SOUT0pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-3-14. Setting for MB91F644/ F647/ F644A/ F647A



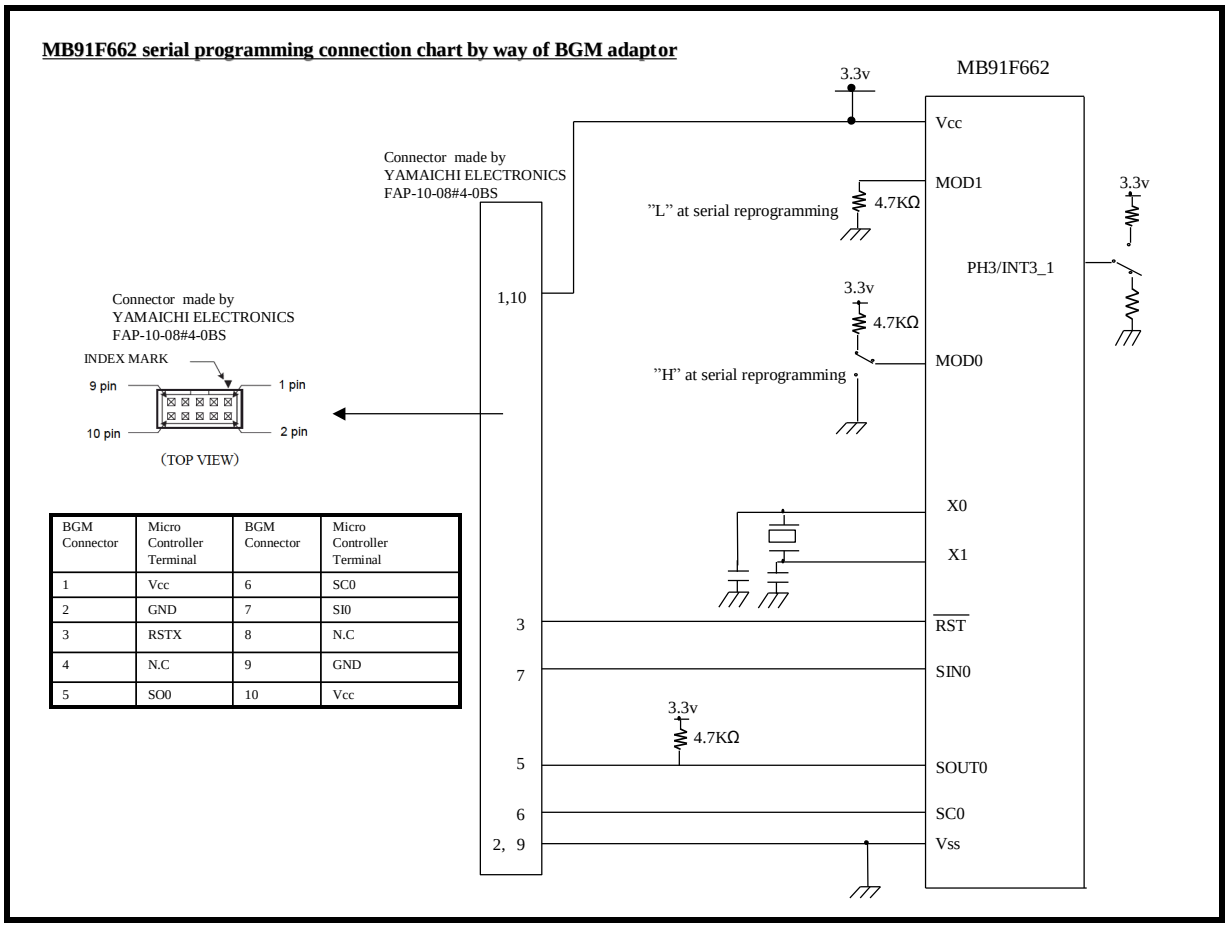
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SC0
2	GND	7	SI0
3	RSTX	8	N.C
4	N.C	9	GND
5	SO0	10	Vcc

The MOD1 and MOD0 pins and INT0,SOUT0 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD1 and MOD0 pins and INT0,SOUT0 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD1 and MOD0 pins and to the user circuit side as for INT0,SOUT0pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-3-15. Setting for MB91F662



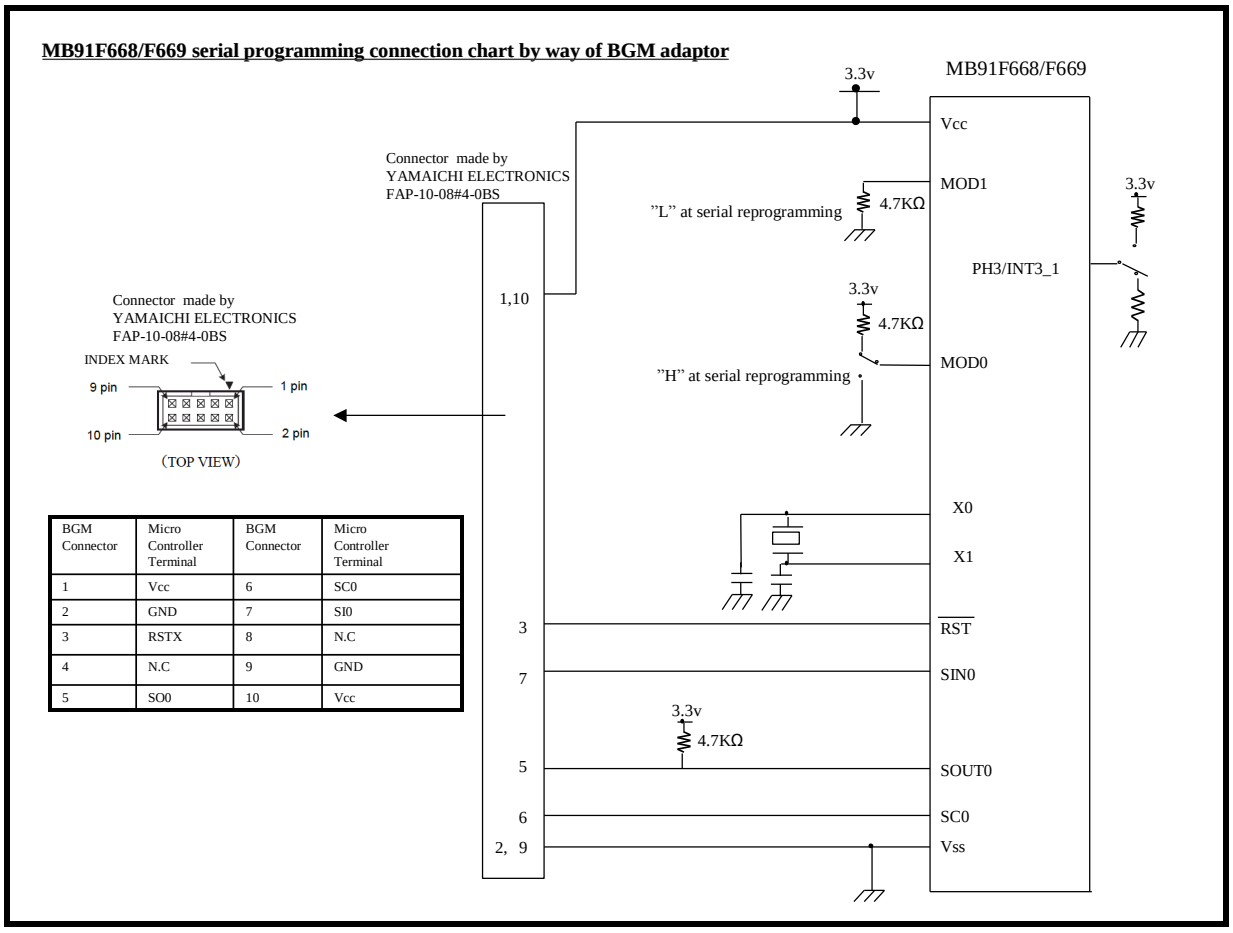
BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SC0
2	GND	7	SI0
3	RSTX	8	N.C
4	N.C	9	GND
5	SO0	10	Vcc

The MOD1 and MOD0 pins and PH3,SOUT0 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD1 and MOD0 pins and PH3,SOUT0 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD1 and MOD0 pins and to the user circuit side as for PH3,SOUT0pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-3-16. Setting for MB91F668/F669



BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SC0
2	GND	7	SI0
3	RSTX	8	N.C
4	N.C	9	GND
5	SO0	10	Vcc

The MOD1 and MOD0 pins and PH3,SOUT0 pins cannot be controlled by the PC and should be set in the user system.

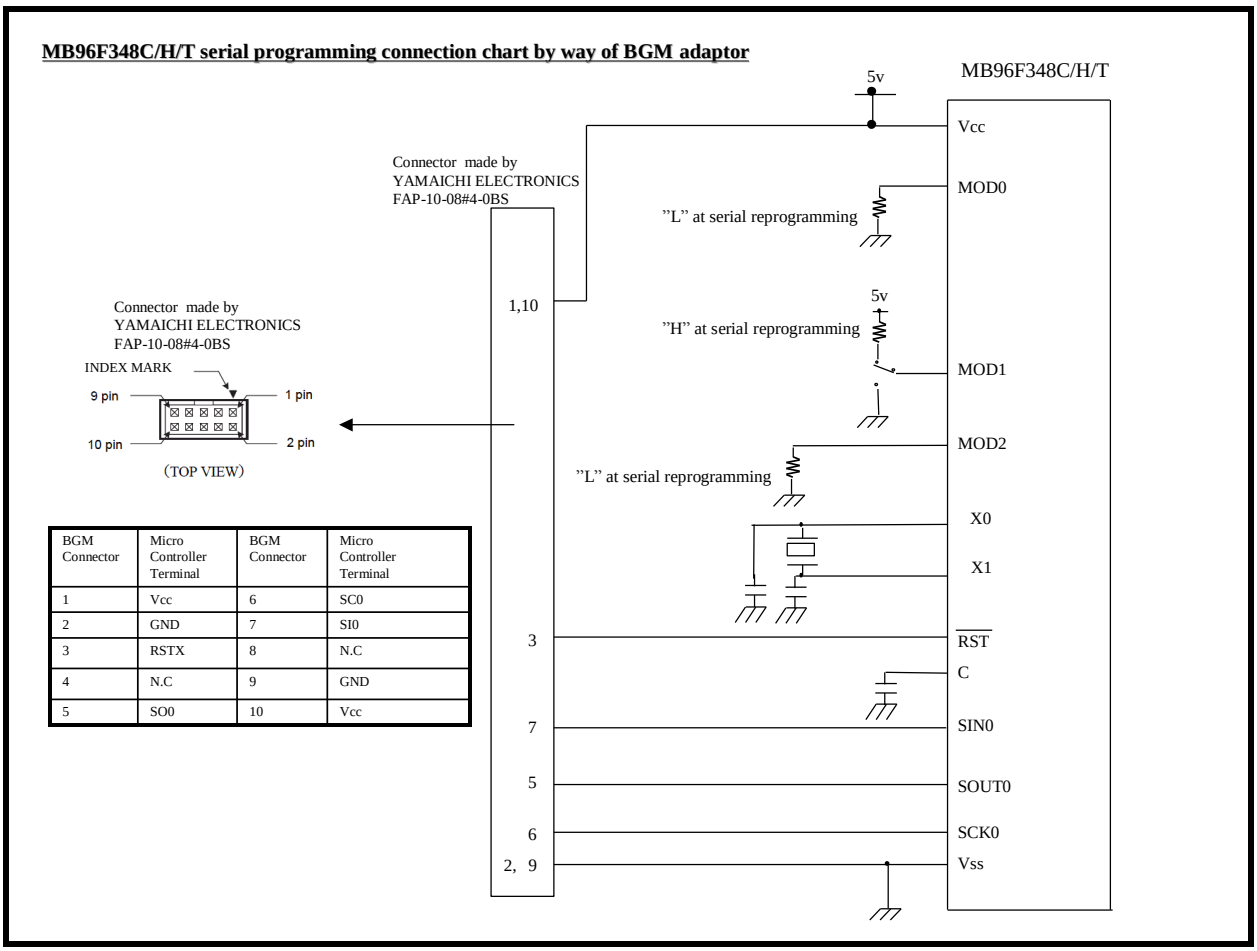
When the RSTX pin is set from "Low" to "High" level after setting MOD1 and MOD0 pins and PH3,SOUT0 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD1 and MOD0 pins and to the user circuit side as for PH3,SOUT0pins.Then RSTX pin set from "Low"to "High"Level executes user program.

3-4. 16FX:EXAMPLE OF CONNECTION FOR ON-BOARD REPROGRAMMING BY PROGRAMMER

This chapter explains a pin setup which must be set up for every kind series.

3-4-1. Setting for MB96F348C/H/T



BGM Connector	Micro Controller Terminal	BGM Connector	Micro Controller Terminal
1	Vcc	6	SC0
2	GND	7	SI0
3	RSTX	8	N.C
4	N.C	9	GND
5	SO0	10	Vcc

The MOD2,MOD1 and MOD0 pins cannot be controlled by the PC and should be set in the user system.

When the RSTX pin is set from "Low" to "High" level after setting MOD2,MOD1 and MOD0 pins, the microcontroller enters the serial reprogramming mode, enabling serial reprogramming from the PC.

After the reprogramming,control is shifted to the normally-used mode as for MOD2,MOD1 and MOD0 pins.Then RSTX pin set from "Low" to "High"Level executes user program.

3-5. BGM adaptor circuit chart

There is BGM adaptor circuit chart "MB2146-09_Circuit_RevA2.pdf" in the folder that installs FUJITSU USB PROGRAMMER and refer, please.

4. INSTALLATION AND EXECUTION OF SOFTWARE

If the old software version is installed, uninstall it first before installation.

Starting the installer to operate as instructed will complete the installation. Note that the install might not be performed when a directory in a deep nest is specified as the install directory.

After installation, click the Windows ***Start*** button ***=> Program => FUJITSU USB PROGRAMMER => USB PROGRAMMER*** to start the programmer software.

[USB Driver]

The OS will check the directory where the USB driver is located when the power to the PC and BGM ADAPTOR is turned ON while the USB cable is connected.

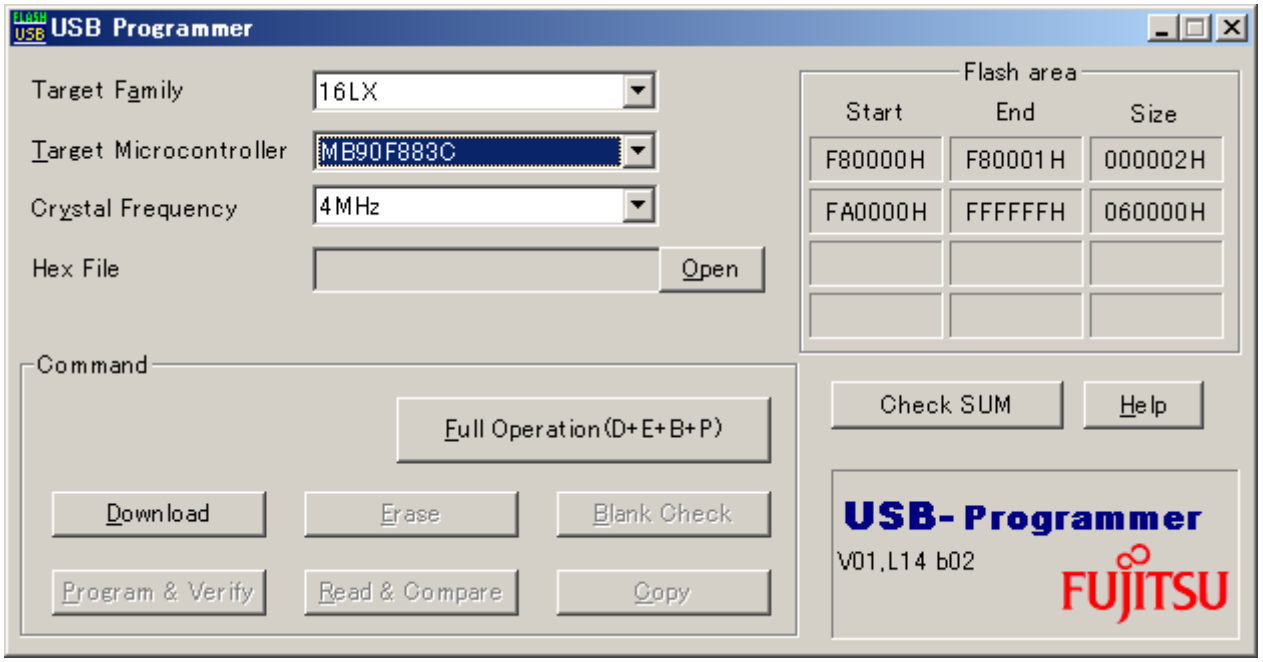
Specify ¥Drivers directory.

5. PROGRAMMER FUNCTIONS

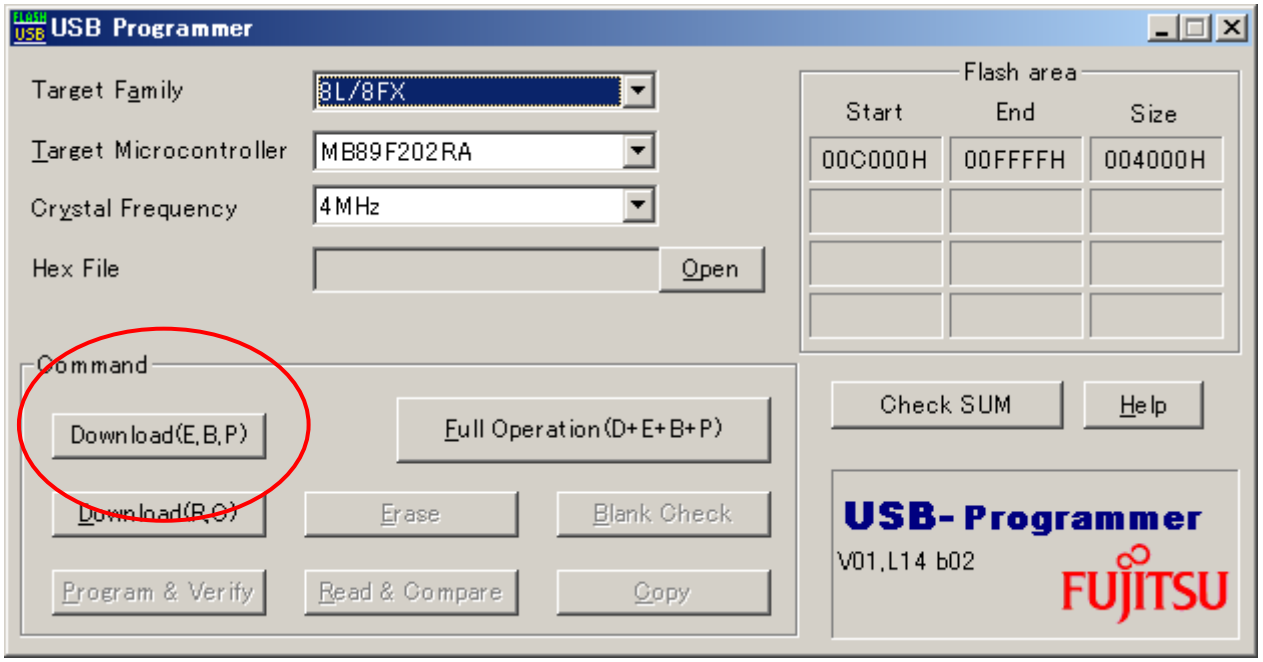
This programmer automatically performs erasing, programming, reading, verifying, blank checking and a set of commands for flash memory at one time.

- Main dialog box

  Programmer software is started to open the dialog box as shown below.



It selects Target Microcontoroller excluding MB89F202RA



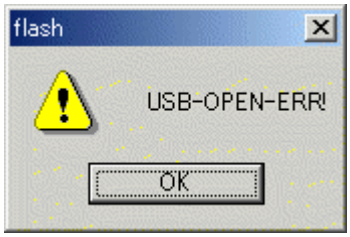
Selected MB89F202RA

- Overview of operating procedure

First, complete setting of the user system (microcontroller board) that data is programmed to (see ***Chapter 3***). In starting or when setting has been changed, it is necessary to perform downloading (described later).

After downloading terminates normally, perform procedures such as Erase and Programming.

[If the following error dialogs are displayed]



[Explanation of an error dialog]

BGM ADAPTOR is not connected correctly.
Or power supply is not carried out, it is displayed on a target board.

[Check]

Please check connection.

5-1. Downloading

This section describes the operating procedure for downloading and the operating state of the program.

(a) Specify the type of microcontroller family used in the user system in ***Target Family*** of the main dialog box.

Please look at ***Chapter 2*** about the selectable families.

(b) Specify the type of microcontroller used in the user system in ***Target Microcontroller*** of the main dialog box.

Please look at ***Chapter 2*** about the selectable types.

(c) Specify the frequency of the crystal oscillator input to the microcontroller in ***Crystal Frequency*** of the main dialog box.

(d) Execution of downloading

Click the ***[Download]*** button.

The window displayed as following "Downloading" opens.



When the download processing ends normally, each button of [Erase] [Blank Check] [Program & Verify] [Read & Compare] [Copy] of the main dialog becomes active.

[About Download of MB89F202RA]

It was not possible to settle in one Download file by the convenience of the capacity of RAM.

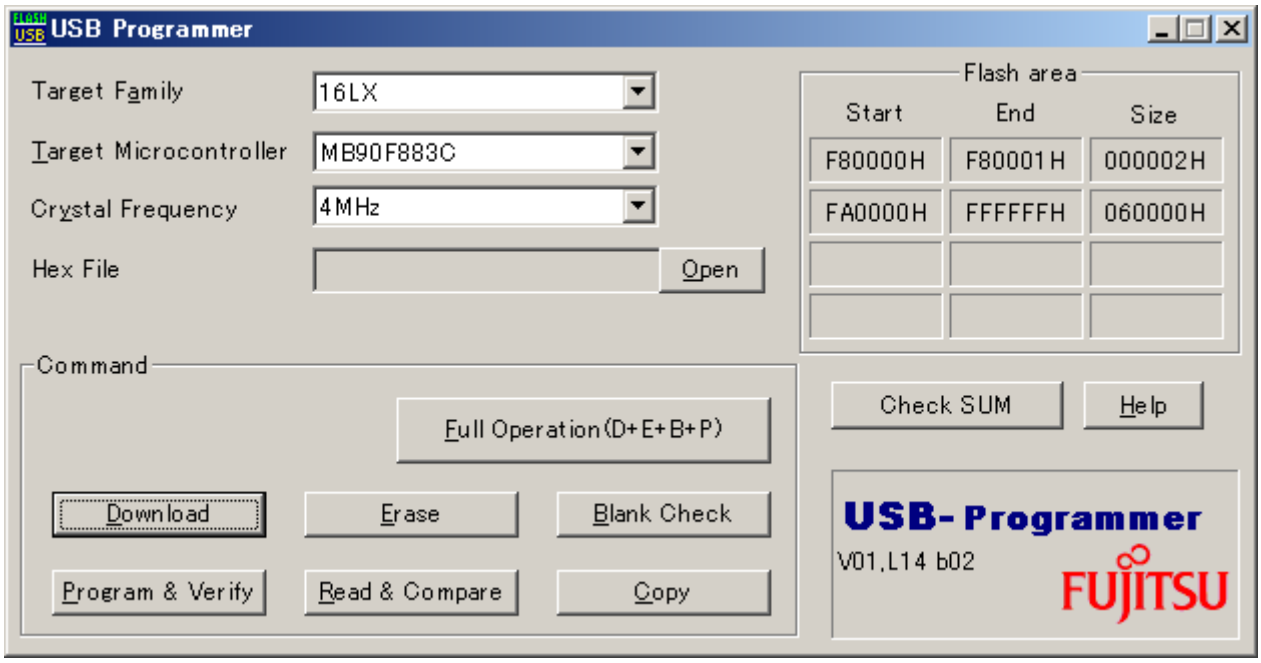
Then, the function is divided into two, and the function has been achieved by doing either in Download. Each function is as follows.

[Download(E,B,P)] :Erase,Blank Check,Program&Verify

[Download(R,C)] :Read&Compare,Copy

5-2. Erasing and Programming

This section explains how to specify ***Hex File*** and the processing and operation performed when the ***[Erase]***, ***[Blank Check]***, ***[Program & Verify]***, ***[Read & Compare]***, ***[Copy]*** and ***[Full Operation (D+E+B+P)]*** buttons are clicked.



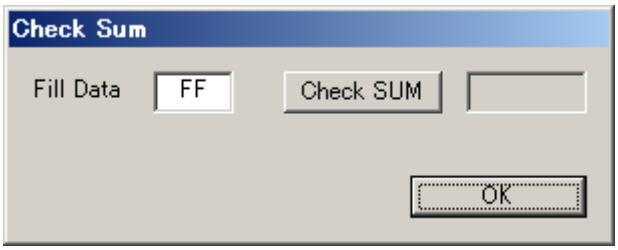
(a) ***Hex File***: Select the file to be programmed to flash memory

Specify the Motorola-S format file or Intel-HEX format file to be programmed to flash memory in the microcontroller. Drag and drop the file directly from Explorer or click the ***[Open]*** button to open the file select window.

Hex File must be specified to execute ***[Program & Verify]***, ***[Read & Compare]*** and ***[Full Operation (D+E+B+P)]***. There is no problem because the decipherment is done every time at the head of these processing as for the file specified for here even if the specification of the file is changed immediately before processing.

After ***Hex File*** is specified, checksum to ROM image after the file shown in ***Hex File*** is decoding done can be calculated.

The dialog box to calculate checksum when a lower right ***[Check SUM]*** button is pushed opens.



The range of the calculation of checksum is limited to the Flash area shown in the upper right of the main dialog. When the area has divided into plural block, the empty area between blocks is not added, and the total of each block is calculated.

The calculation method is simple addition of every one byte, and the result shows the last 4 digits (It is not a complement representation) by the hexadecimal number.

ROM value in the Flash area not shown in Hex File is calculated assuming that it is a value indicated by Fill Data at the left of the dialog. When starting, FF is set here. Please specify it by two hexadecimal number digits when changing.

[Notes concerning checksum]

This function doesn't calculate the checksum of ROM image written in the FLASH memory in the microcontroller chip. When Hex File is not specified, and the error is detected at the decipherment of Hex File, nothing is displayed.

The SUM value calculated here is not peculiar against Hex File. When another microcontroller is selected, same Hex File might reach another value.

The value specified with Fill Data is not written at the time of writing. This value is used only for the calculation of checksum.

(b) ***Erase***: Erase all flash memory areas

All flash memory must be in the blank state (0xff) when programming a new program to it. By pushing this button, a chip erase command is published to FLASH and elimination is performed.

In addition, a blank check does not perform this command.

(c) ***Blank Check***: Check that all flash memory areas are blank

This button is clicked to check that all flash memory is in the blank state (0xff).

(d) ***Program & Verify***: Program data to flash memory

This button is clicked to program the Motorola-S or Intel-HEX format file specified in ***Hex File*** to flash memory in the microcontroller concurrently with verification.

(e) ***Read & Compare***: Compare ***Hex File*** with data in flash memory in microcontroller

This button is clicked to compare data in the Motorola-S or Intel-HEX format file specified in ***Hex File*** with data in flash memory in the microcontroller.

(f) ***Copy***: Save data in flash memory in microcontroller to file

This button is clicked to read data from flash memory integrated into the microcontroller and save it as an Motorola-S or Intel-HEX format file.

The output file format can be changed **by right-clicking** in the Copy button. The button name changes by ***[Copy]*** and ***[Copy_i]*** whenever right-clicking. The state of ***[Copy]*** shows Motorola-S format, and the state of ***[Copy_i]*** shows Intel-HEX format.

Processing begins when the button is **left-clicked**, the folder is specified preservation ahead, the file name is input, and the ***[Save]*** button is pushed when the form is selected.

(g) ***Full Operation (D+E+B+P)***: Automatic programming

Operation to ***[Download]*** to ***[Program & Verify]*** is performed by package.

In the case of a blank chip, processing is performed in order of ***[Download]***, ***[Blankcheck]***, and ***[Program & Verify]***. When it is not a blank chip, processing is performed in order of ***[Download]***, ***[Blankcheck]***, ***[Erase]***, ***[Blankcheck]***, and ***[Program & Verify]***.

5-3. Motorola-S format decoder specification

Before programming, Motorola-S format Decoder of programmer changes Motorola S format data into binary data, according to the following specification.

(a) The decoder does not error when overlap of addresses occurs.

The decoder does not error about overlap of address. If user writes a data on an address which was already written another data before, former data is overwritten by new data.

(b) Available address

If user writes a data beyond an address range of FLASH memory, programming results in an error. But if an address range of whole FLASH memory does not continue, decoder does not give an error and programming procedure goes on. For example, user can program a FLASH memory which starts an address H'F90000 and ends an address H'FFFFFF and does not have memory function between H'FC0000-H'FCFFFF even if user tries to program on such eclipse address range.

(c) About the error detected by the decoder.

The error detected by the decoder is the following (1)-(4). When these errors are detected, processing is interrupted by the decoder. Then the line number and the cause of the error are displayed in the dialog window.

(1) file error

The start of the line is not "S".

(2) S-format error

The start of the line is not "S0","S1","S2","S3","S4","S5","S6","S7","S8" and "S9".

(3) decode error

- There are character except "0123456789ABCDEF".("S" is excluded. See (1) and (2).) And, the small letter "abcdef" cannot be used.
- The LENGTH data is different from the length of an actual data row.
- The SUM data is different.

(4) address error

There is data besides the FLASH area. (See b.Available address)

(d) Other detail

The decoder skips a line. even if the line is contained only new-line code NL and programming goes on.

A line beginning with "S0","S5","S7","S8" and "S9" is ignored and decoder skips such lines in S format file without error.

5-4. Intel-Hex format decoder specification

Before programming, Intel-Hex decoder of programmer changes Intel-Hex format data into binary data, according to the following specification.

(a) The decoder does not error when overlap of addresses occurs.

The decoder does not error about overlap of address. If user writes a data on an address which was already written another data before, former data is overwritten by new data.

(b) Available address

If user writes a data beyond an address range of FLASH memory, programming results in an error. But if an address range of whole FLASH memory does not continue, decoder does not give an error and programming procedure goes on. For example, user can program a FLASH memory which starts an address H'F90000 and ends an address H'FFFFFF and does not have memory function between H'FC0000-H'FCFFFF even if user tries to program on such eclipse address range.

(c) About the error detected by the decoder.

The error detected by the decoder is the following (1)-(4). When these errors are detected, processing is interrupted by the decoder. Then the line number and the cause of the error are displayed in the dialog window.

(1) file error

The start of the line is not ":".

(2) decode error

There are character except "0123456789ABCDEF".(":" is excluded. See (1).) And, the small letter "abcdef" cannot be used.

The record type is not 00, 01, 02, 03, 04, and 05.

The length of the data string that turns out by the number of data is different from the length of an actual data string.

The SUM data is different.

(3) record error

When not is in number 0 of data at 01 records.

When not is in number 2 of data at 02 records.

When not is in number 4 of data at 03 records.

When not is in number 2 of data at 04 records.

When not is in number 4 of data at 05 records.

(4) address error

There is data besides the FLASH area. (See b.Available address)

(d) Other detail

The decoder skips a line. even if the line is contained only new-line code NL.

The decipherment processing ends when end record (01) is processed. It is invalid no matter what it is written after this record.

The record from 01 to 05 is not used to process the offset address value. Moreover, the error judgment to it is not done.

5-5. Special specification

(1) for MB91FV319A

for 0x80000 – 0x17FFFF writing, choose [MB91FV319A : PROG] in ***Target Microcontroller.***

for 0x180000 – 0x1FFFFF writing, choose [MB91FV319A : FONT] in ***Target Microcontroller.***

(2) for MB91FV319R

for 0x80000 – 0x17FFFF writing, choose [MB91FV319R : PROG] in ***Target Microcontroller.***

for 0x180000 – 0x1FFFFF writing, choose [MB91FV319R : FONT] in ***Target Microcontroller.***

(3) for MB91F610

for 0x80000 – 0xFFFFF writing, choose [MB91F610 : PROG] in ***Target Microcontroller.***

for 0x400000 – 0x5FFFFF writing, choose [MB91F610 : FONT] in ***Target Microcontroller.***

6. SECURITY FUNCTION

The access to the flash memory is limited when the protection code "01H" is written at a specific address of the flash memory, and the kind in which the flash security function is provided cannot read/be written in the flash memory from which external terminal.

The lock of the function cannot be released until the chip is erased when the flash memory is protected once. Please refer to the hardware manual for details.

After all flash memory area is erased, it is necessary to input reset to the microcomputer again to write it in the flash memory.

7. STATUS OF OPERATION CHECK

Specifications for PC used for operation check

PC: FMV 6450TX2
CPU: Pentium 450 MHz
OS: Japanese and English version of Windows 2000 SP3, Windows XP SP2
Memory: 192 MB

PC: Dell Optiplex 320
CPU: Pentium(R) D 3.00GHZ
OS: Japanese and English version of Windows 7 Professional 32 bit, Japanese version of Windows 7 Home Premium 32bit
Memory: 1.00GB

PC: FUJITSU ESPRIMO_D751
CPU: Intel(R) Core™i5-2500 CPU 3.30GHz
OS: Japanese version of Windows 7 Professional 32 bit
Memory: 4.00GB

PC: TOSHIBA Satellite K47 280E/HD
CPU: Intel(R) Core™i7 CPU 2.80GHz
OS: Japanese version of Windows 7 Enterprise 32 bit
Memory: 2.00GB

8. OTHERS

(A) Troubleshooting

CASE1: If the response from this program is lost

・Please re-start a target.

・Please once remove BGM adapter from PC.

・Please re-start program.

CASE2: Buttons does not become effective.

・Please push "Download" button and download a program.

CASE3: Error occurs by download.

・Please check connection and a setup of hardware.

・Please also refer to the error message list.

CASE4: It cannot write in to FLASH.

・If data is written in FLASH, it cannot write in normally.

・Please perform writing after Erase Command.

・Please also refer to the error message list.

CASE5: NG occurs by Read & Compare

・The writing to FLASH may not be performed normally.

・Please Download Command and Erase Command.

・Please also refer to the error message list.

(B) about error messages

Many error messages are displayed owing to the setting mistake of hardware and software.
the case where an error is outputted in addition even if it checks these in detail, please tell the person in charge of software acquisition origin a detailed condition.

USB-OPEN-ERROR!

Cause: BGM adapter is not connected correctly or power supply supply is not carried out at a target board.
Action: Please check connection.

DownLoad NG!

Cause: The response of download processing is unusual.
Action: Please check connection and a setup of hardware.

Target No Response. RCV-DATA:0xFF

Cause: It cannot communicate with a microcontroller
Action: Please check connection and a setup of hardware.

No.007 Unable to open Download file

Cause: **m_flash.xxx** not found
Action: Please reinstall this software.

No.011　Communication error

Cause: The unusual command response was received.

Action: Please reperform by improving connection and a setup of hardware.

No.017　File access error

Cause: Access of a **m_flash.xxx** file went wrong.

Action: Return the folder and file configurations to the installation defaults.

No.018　Erase error *1

Cause: The response at the time of erase processing is unusual. There is the possibility that a chip is poor.

Action: Please improve a setup of hardware or exchange chips.

No.101　Please set "hex file"

Cause: "Hex file" not set

Action: Set "hex file" in the dialog box.

9. CAUTIONS

The PC programming software has the possibility of receiving the influence by the communications cable, the outside environment, and the PC.

Therefore, please evaluate it enough when you use the software.

Please use programming systems of programmer venders when you write two or more devices at the same time.

Please don't use the USB HUB between PC and MCU.

The specifications of the product are subject to change without notice.