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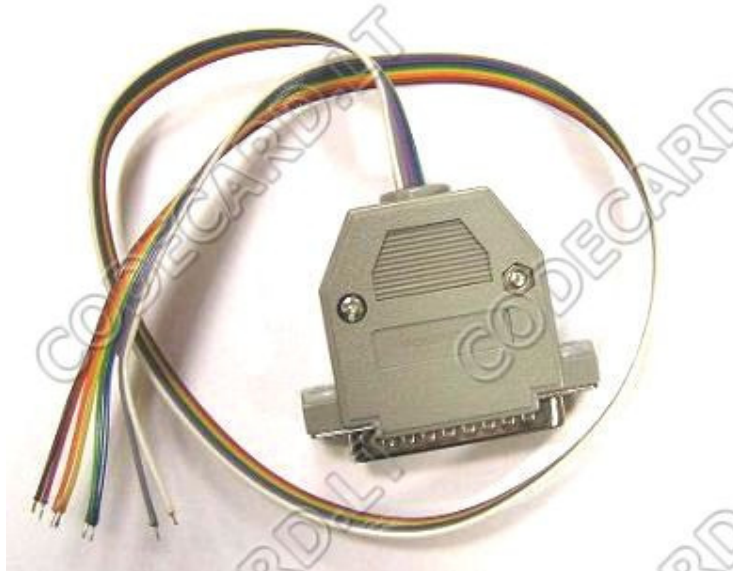
S4.4 CarProg Motorola HC11 Programmer manual

For Motorola MPU MC68HC11 series programming use A10 cable.

You can recognize Motorola (Freescale) MPU by maskset:

This MPU maskset is 4C11W.
- First digit "4" is mask series number, in practice can be 0, 1, 2, 3, 4 or 5, but for programming is not important.

- Second 4 symbols is always letter + digit + digit + letter: this is processor maskset or encrypted processor type. All processor marking can by custom made, like "FORD S2234234" or SC2323454 but always you can find maskset on Motorola or Freescale processors.

Before programming always select right processor type according maskset.

How to connect CarProg programmer:
For HC11 programming use A10 cable 7 color wires:

YELOW – communication signal from MPU;
GREEN – communication signal to MPU;
BLUE – Reset signal to MPU;
ORANGE – MODB signal to MPU, low level;
BROWN – GND (ground);
RED – switched +5V;
VIOLET - switched +12V;

Troubleshooting:

CarProg ERROR messages:
- **Communication error** - no communication between CarProg and Motorola processor - check MPU type, try to select quartz frequency manually.
- **Check processor MODA and MODB pins**: in programming mode these pins must be low level (or connected to GND or VSS). In most cases MODB is connected to VDD – **pull-up MODB from board.**

MC68HC11 processor security bit in many case is ON (especially in car radios), and when you try to read MPU internal memory first time, MPU will clear security bit itself. But if security bit was ON, after first try to read HC11, processor internal EEPROM will by lost. **Don't try to read HC11 MPU if you not sure that you have file for EEPROM recovery.**

To understand better onboard MPU programming problems, you can use table with right programming signals and voltages, described in table.

If you can't read or write MPU with CarProg, check:
- did you was select right MPU type;
- did quartz resonator Q is the same in circuit board and in CarProg options;
- did all programming signals have right form and voltage;

	Yellow TXD From MPU	Green RXD To MPU	Orange LOW MODB	Blue RESET
All HC11 MPU	Impulse 3.3-5V +5 V	Impulse 3.3-5V +5 V	0 V 0 V	RESET +5 V

If all conditions are OK, ask support@codecard.lt

1. MC68HC11A0, MC68HC11A1, MC68HC11A8

- **Check processor MODA and MODB pins**: in programming mode these pins must be low level (or connected to GND or VSS). In most cases MODB is connected to VDD – **pull-up MODB from board. MODA connect to VSS.** If processor is 11A1, 11A8, 11E1 in 52PLCC package – just short pins 1+2+3.

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```
PA7/PAI/OC1    1          48    V_DD          ←(red)
PA6/OC2/OC1    2          47    PD5/SS
PA5/OC3/OC1    3          46    PD4/SCK
PA4/OC4/OC1    4          45    PD3/MOSI
PA3/OC5/OC1    5          44    PD2/MISO
PA2/IC1        6          43    PD1/TxD       ←(yellow)
PA1/IC2        7          42    PD0/RxD       ←(green)
PA0/IC3        8          41    IRQ
PB7/A15        9          40    XIRQ
PB6/A14       10          39    RESET         ←(blue)
PB5/A13       11          38    PC7/A7/D7
PB4/A12       12          37    PC6/A6/D6
PB3/A11       13          36    PC5/A5/D5
PB2/A10       14          35    PC4/A4/D4
PB1/A9        15          34    PC3/A3/D3
PB0/A8        16          33    PC2/A2/D2
PE0/AN0       17          32    PC1/A1/D1
PE1/AN1       18          31    PC0/A0/D0
PE2/AN2       19          30    XTAL
PE3/AN3       20          29    EXTAL
V_RL          21          28    STRB/ R/W
V_RH          22          27    E
V_SS          23          26    STRA/AS       (brown arrow →)
MODB          24          25    MODA/LIR      (orange arrow →)
```

MPU	Mask Set
MC68HC11A0	B84T
MC68HC11A1	C11W
	A38P
	A49N
	B46E
	B95T
	B96D

MPU	Mask Set
MC68HC11A8	B65H

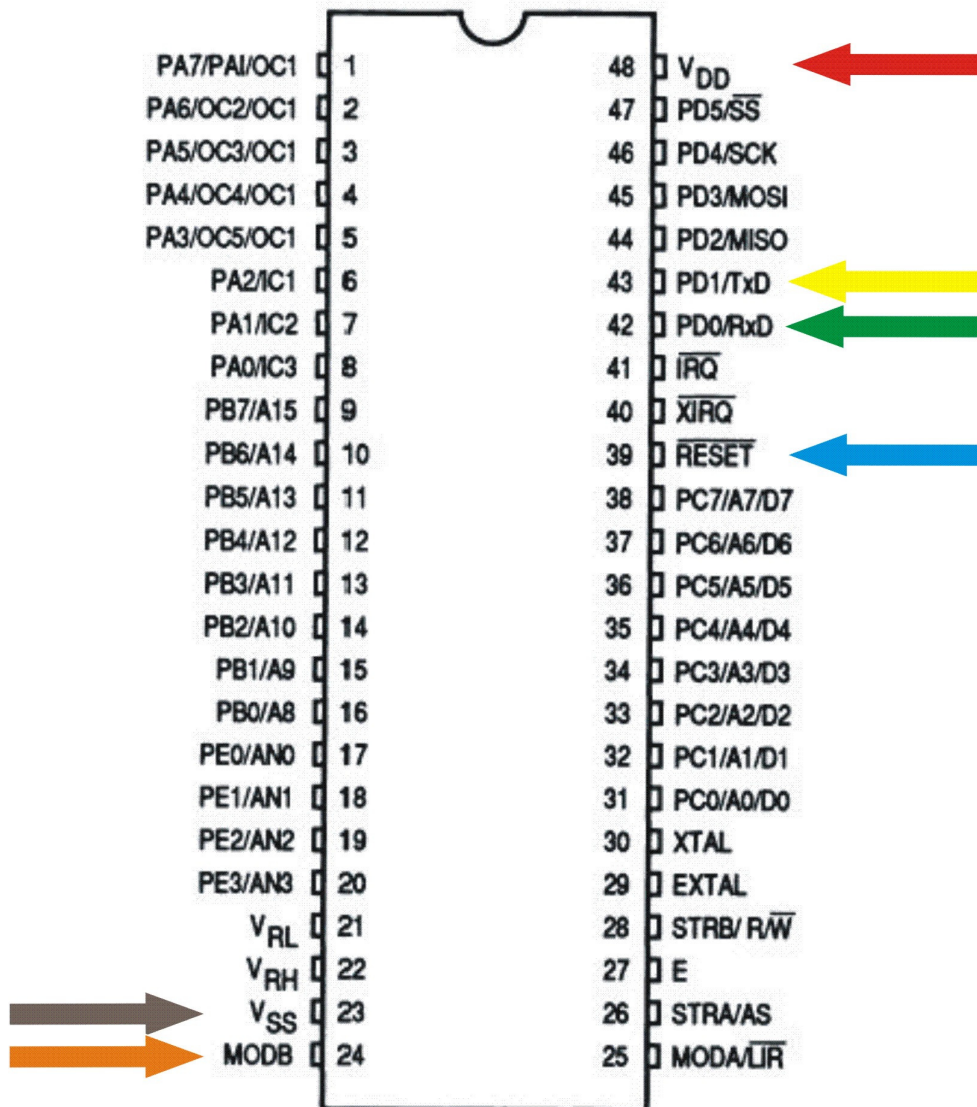## 2. MC68HC11E9, MC68HC711E9, MC68HC11E20

Check processor MODA and MODB pins: in programming mode these pins must be low level (or connected to GND or VSS). In most cases MODB is connected to VDD – **pull-up MODB from board.**
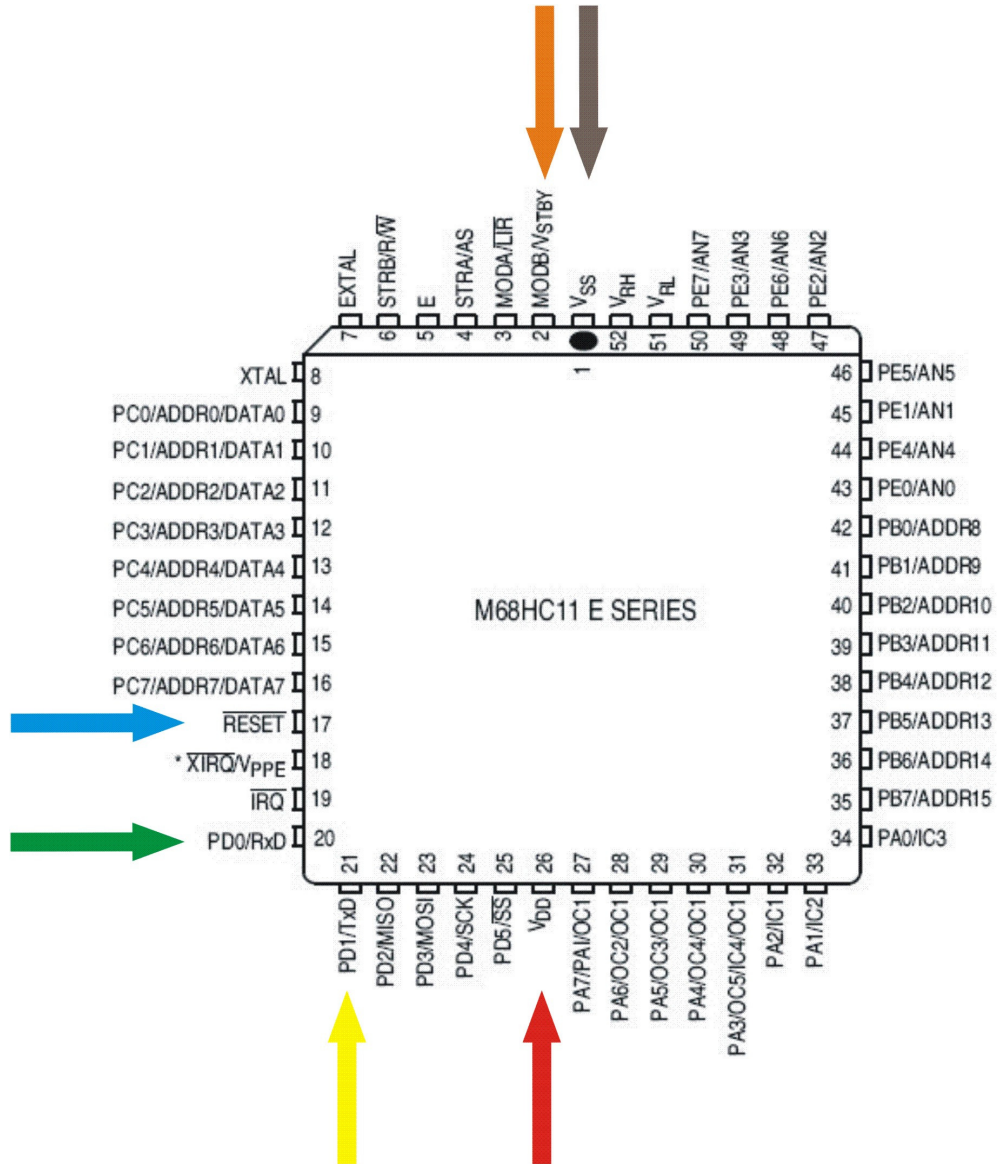
MPU	Mask Set
MC68HC11E1	C91F
	B60R
MC68HC11E9	C83W
	C96K
	D35E
	D82R
	F96J
	C96N
MC68HC11E20	E22B

MC68HC711E9   E82K
                H89E
                K82H
                E50W
                H50W
                K81H
MC68HC711E20   D43R
                G59F
                H19S

M68HC11 E SERIES

Left pins (top to bottom):
1 PA0/IC3
2 NC
3 NC
4 NC
5 PB7/ADDR15
6 PB6/ADDR14
7 PB5/ADDR13
8 PB4/ADDR12
9 PB3/ADDR11
10 PB2/ADDR10
11 PB1/ADDR9
12 PB0/ADDR8
13 PE0/AN0
14 PE4/AN4
15 PE1/AN1
16 PE5/AN5

Top pins (left to right):
64 PA1/IC2
63 PA2/IC1
62 PA3/OC5/IC4/OC1
61 NC
60 NC
59 PA4/OC4/OC1
58 PA5/OC3/OC1
57 PA6/OC2/OC1
56 PA7/PAI/OC1
55 VDD
54 PD5/SS
53 PD4/SCK
52 PD3/MOSI
51 PD2/MISO
50 PD1/TxD
49 VSS

Right pins (top to bottom):
48 NC
47 PD0/RxD
46 IRQ
45 XIRQ/VPPE*
44 NC
43 RESET
42 PC7/ADDR7/DATA7
41 PC6/ADDR6/DATA6
40 PC5/ADDR5/DATA5
39 PC4/ADDR4/DATA4
38 PC3/ADDR3/DATA3
37 PC2/ADDR2/DATA2
36 PC1/ADDR1/DATA1
35 NC
34 PC0/ADDR0/DATA0
33 XTAL

Bottom pins (left to right):
17 PE2/AN2
18 PE6/AN6
19 PE3/AN3
20 PE7/AN7
21 VRL
22 VRH
23 VSS
24 VSS
25 MODB/VSTBY
26 NC
27 MODA/LIR
28 STRA/AS
29 E
30 STRB/R/W
31 EXTAL
32 NC

M68HC11 E SERIES

Pin	Left		Right	Pin
1	V_{SS}		EV_{SS}	56
2	MODB/V_{STBY}		V_{RH}	55
3	MODA/$\overline{LIR}$		V_{RL}	54
4	STRA/AS		PE7/AN7	53
5	E		PE3/AN3	52
6	STRB/R$\overline{W}$		PE6/AN6	51
7	EXTAL		PE2/AN2	50
8	XTAL		PE5/AN5	49
9	PC0/ADDR0/DATA0		PE1/AN1	48
10	PC1/ADDR1/DATA1		PE4/AN4	47
11	PC2/ADDR2/DATA2		PE0/AN0	46
12	PC3/ADDR3/DATA3		PB0/ADDR8	45
13	PC4/ADDR4/DATA4		PB1/ADDR9	44
14	PC5/ADDR5/DATA5		PB2/ADDR10	43
15	PC6/ADDR6/DATA6		PB3/ADDR11	42
16	PC7/ADDR7/DATA7		PB4/ADDR12	41
17	$\overline{RESET}$		PB5/ADDR13	40
18	* $\overline{XIRQ}$/V_{PPE}		PB6/ADDR14	39
19	$\overline{IRQ}$		PB7/ADDR15	38
20	PD0/RxD		PA0/IC3	37
21	EV_{SS}		PA1/IC2	36
22	PD1/TxD		PA2/IC1	35
23	PD2/MISO		PA3/OC5/IC4/OC1	34
24	PD3/MOSI		PA4/OC4/OC1	33
25	PD4/SCK		PA5/OC3/OC1	32
26	PD5/$\overline{SS}$		PA6/OC2/OC1	31
27	V_{DD}		PA7/PAI/OC1	30
28	V_{SS}		EV_{DD}	29

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3. MC68HC11EA9, MC68HC711EA9   **!!! mask D47J, 1D46J can be secured and will be erased while reading !!!**
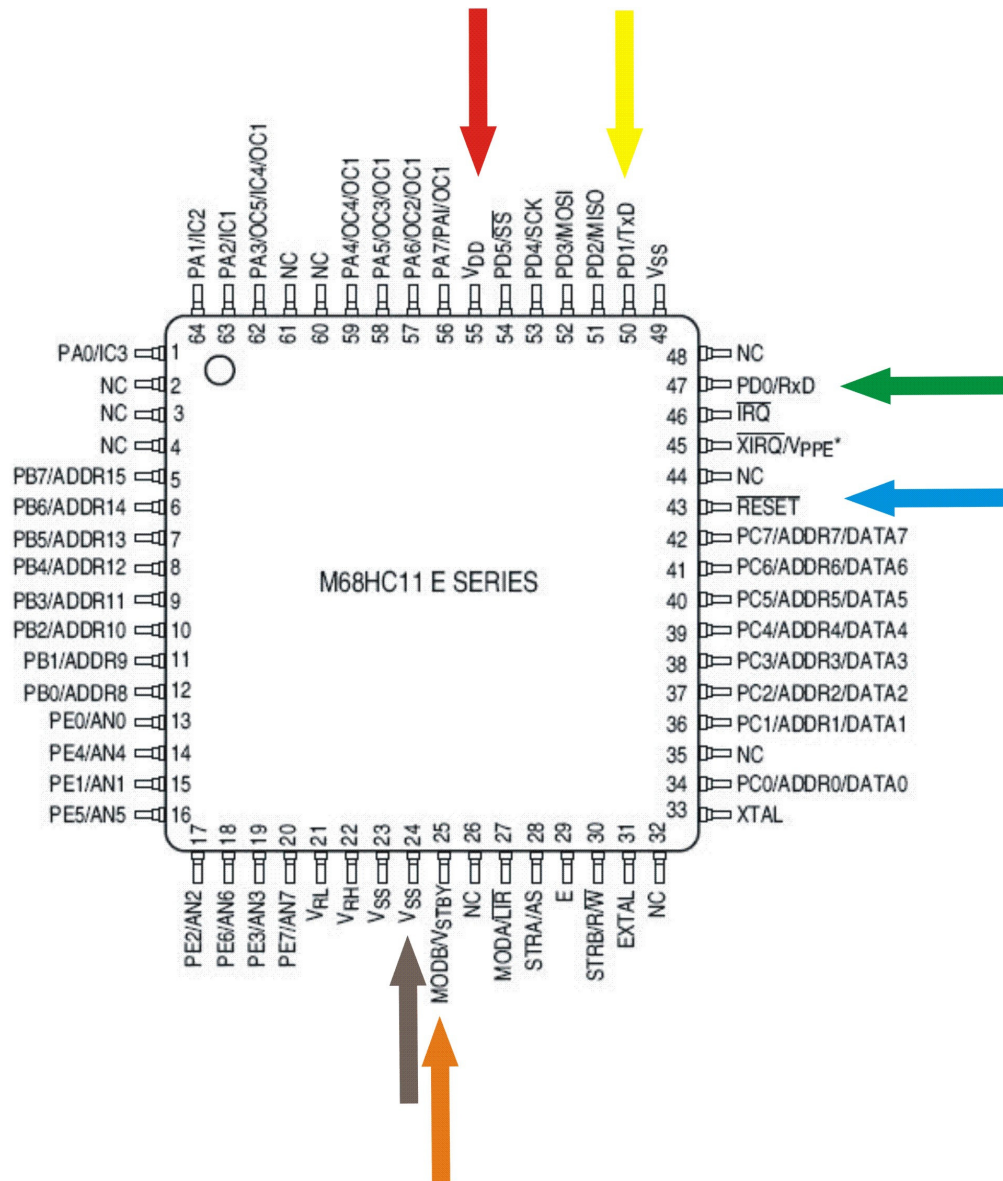**Check processor MODA and MODB pins**: in programming mode these pins must be low level (or connected to GND or VSS). In most cases MODB is connected to VDD – **pull-up MODB from board.**
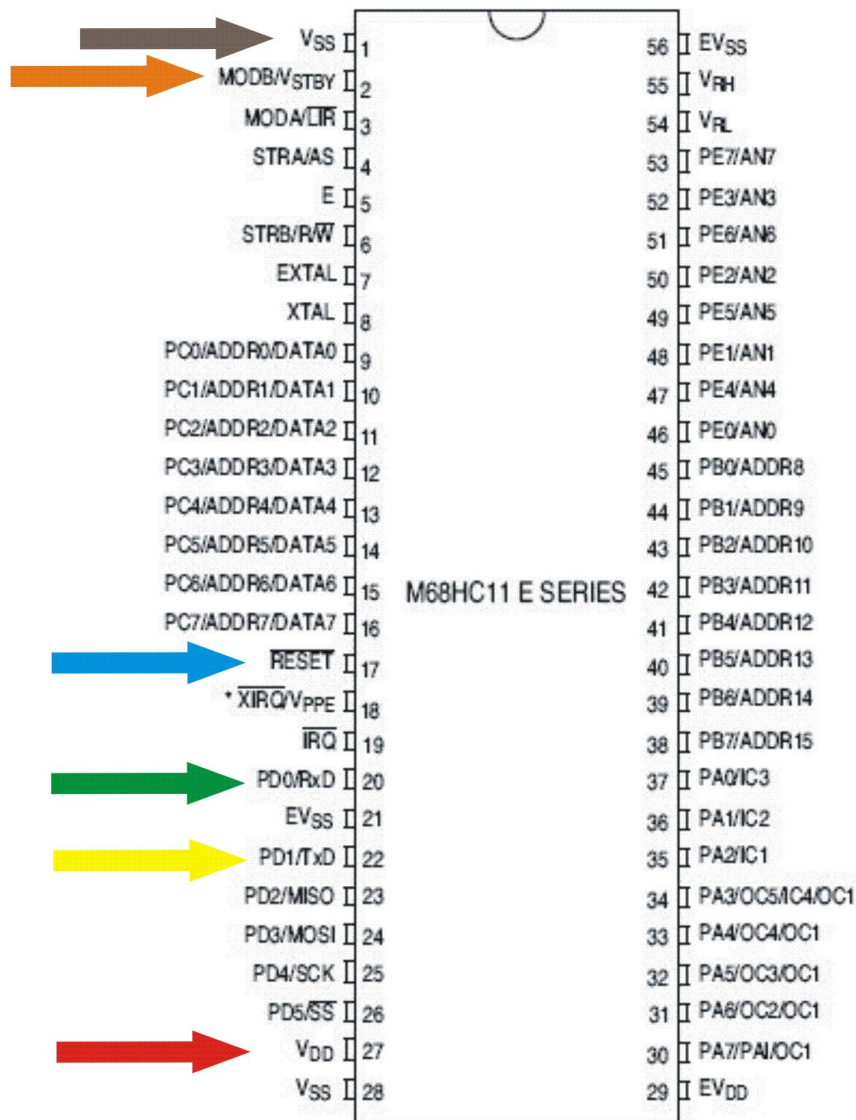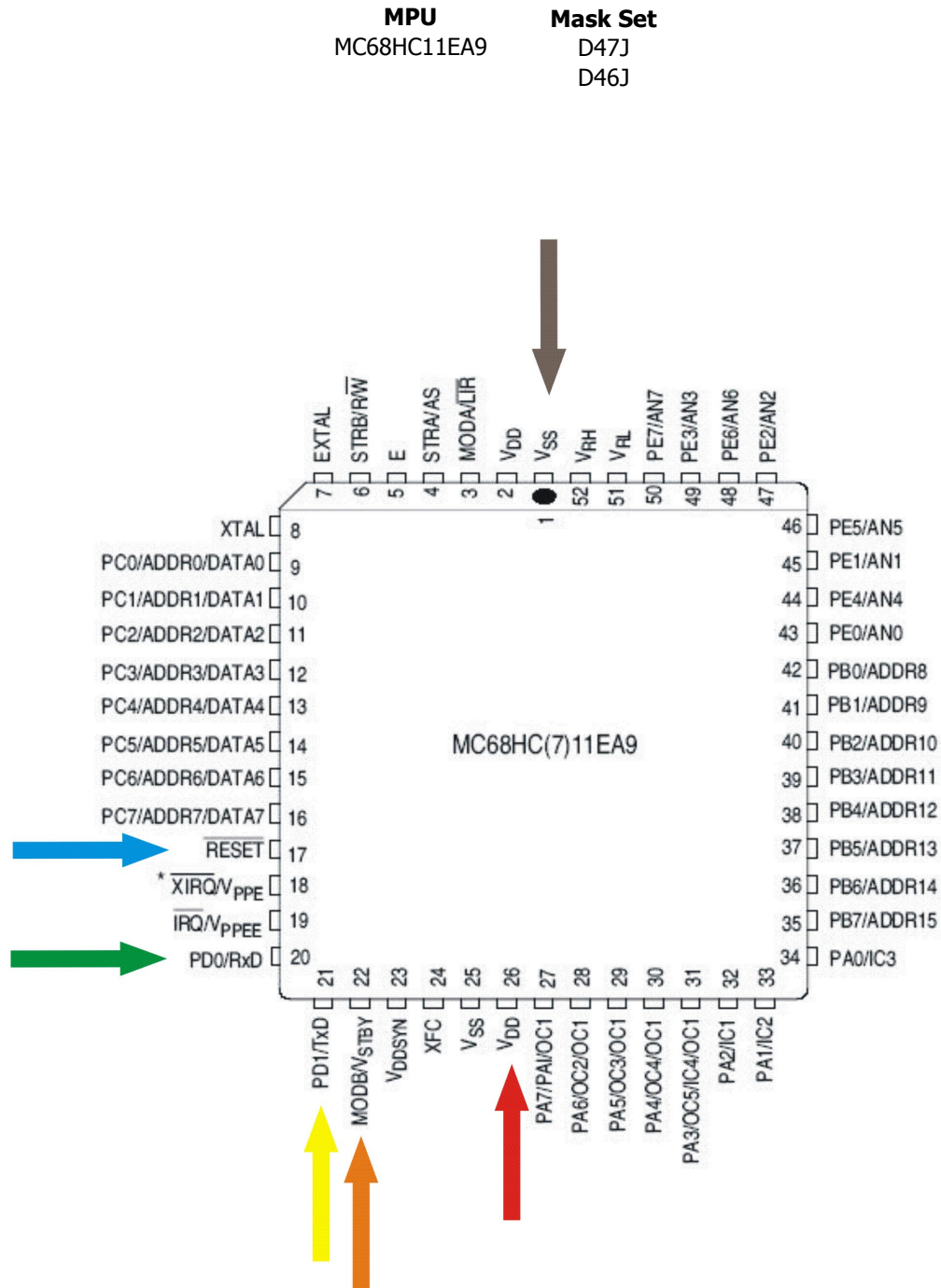
MPU	Mask Set
MC68HC11EA9	D47J
	D46J

4. MC68HC11F1, MC68HC711F1

- **Check processor MODA and MODB pins**: in programming mode these pins must be low level (or connected to GND or VSS). In most cases MODB is connected to VDD – **pull-up MODB from board. MODA connect to VSS.** If processor is 11A1, 11A8, 11E1 in 52PLCC package – just short pins 1+2+3.

MPU
MC68HC11A8

Mask Set
B77M
C15J
C94R
E61H
E87J
F37E
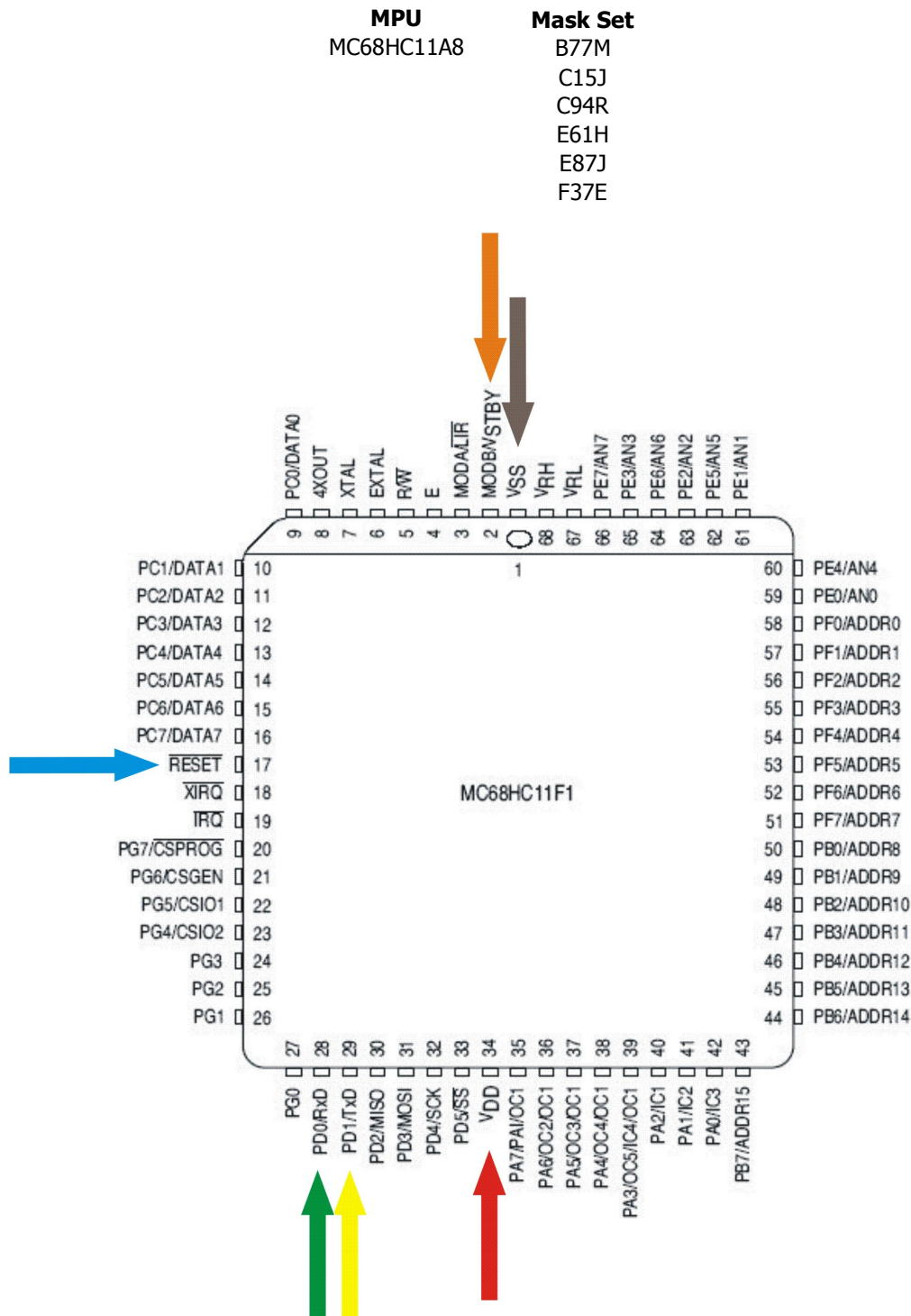

MC68HC11F1

5. MC68HC11K4, MC68HC711K4

Check processor MODA and MODB pins: in programming mode these pins must be low level (or connected to GND or VSS). In most cases MODB is connected to VDD – **pull-up MODB from board.**
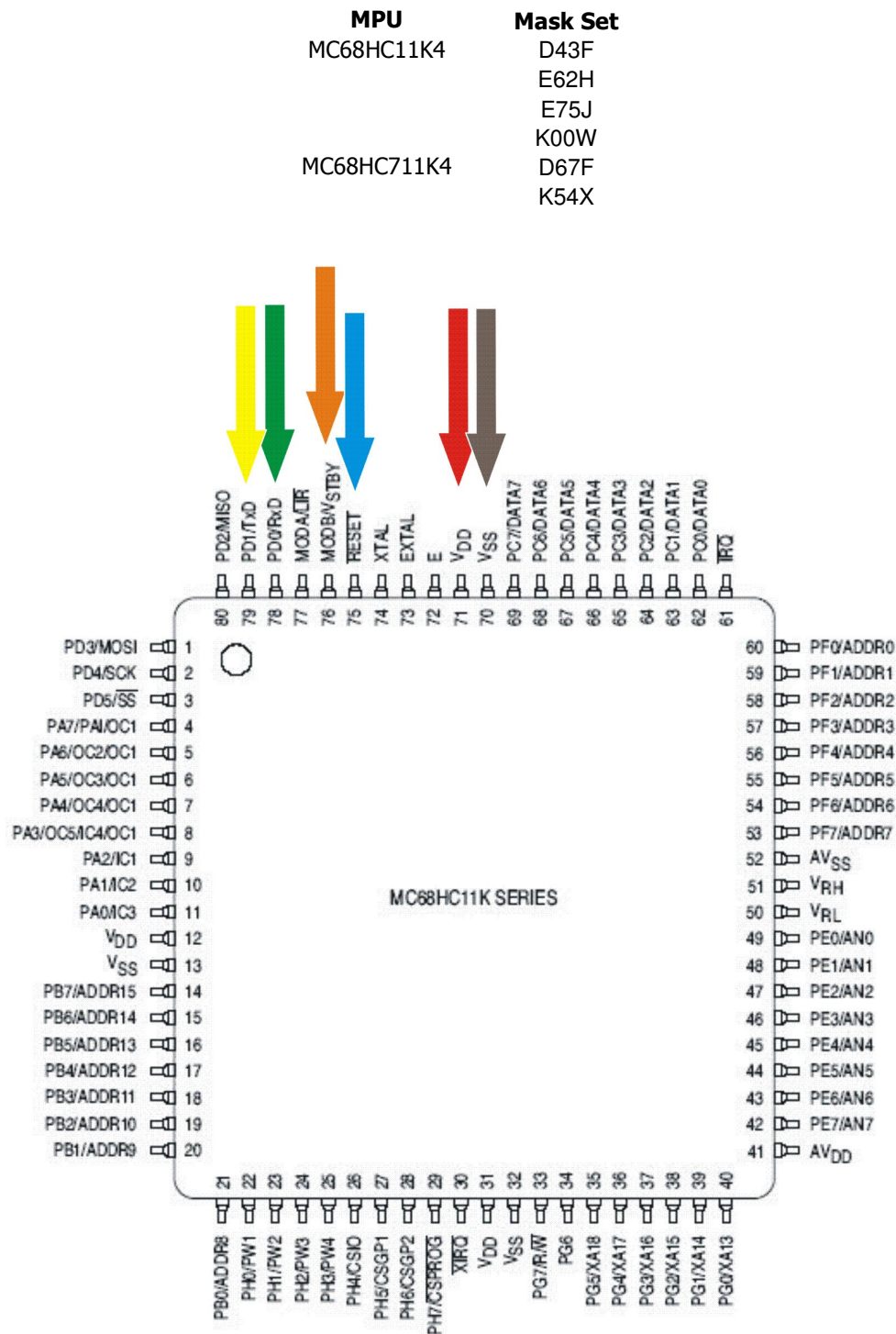
MPU	Mask Set
MC68HC11K4	D43F
	E62H
	E75J
	K00W
MC68HC711K4	D67F
	K54X

MC68HC11K SERIES

Left side pins:
- 12 PH0/PW1
- 13 PH1/PW2
- 14 PH2/PW3
- 15 PH3/PW4
- 16 PH4/CSIO
- 17 PH5/CSGP1
- 18 PH6/CSGP2
- 19 PH7/CSPROG
- 20 TEST16[1]
- 21 $\overline{XIRQ}/V_{PPE}$[2]
- 22 TEST15[1]
- 23 V_{DD}
- 24 V_{SS}
- 25 TEST14[1]
- 26 PG7/R/$\overline{W}$
- 27 PG6
- 28 PG5/XA18
- 29 PG4/XA17
- 30 PG3/XA16
- 31 PG2/XA15
- 32 PG1/XA14

Top pins:
- 11 PB0/ADDR8
- 10 PB1/ADDR9
- 9 PB2/ADDR10
- 8 PB3/ADDR11
- 7 PB4/ADDR12
- 6 PB5/ADDR13
- 5 PB6/ADDR14
- 4 PB7/ADDR15
- 3 V_{SS}
- 2 V_{DD}
- 1 PA0/IC3
- 84 PA1/IC2
- 83 PA2/IC1
- 82 PA3/OC5/IC4/OC1
- 81 PA4/OC4/OC1
- 80 PA5/OC3/OC1
- 79 PA6/OC2/OC1
- 78 PA7/PAI/OC1
- 77 PD5/$\overline{SS}$
- 76 PD4/SCK
- 75 PD3/MOSI

Right side pins:
- 74 PD2/MISO
- 73 PD1/TxD
- 72 PD0/RxD
- 71 MODA/$\overline{LIR}$
- 70 MODB/V_{STBY}
- 69 RESET
- 68 XTAL
- 67 EXTAL
- 66 XOUT
- 65 E
- 64 V_{DD}
- 63 V_{SS}
- 62 PC7/DATA7
- 61 PC6/DATA6
- 60 PC5/DATA5
- 59 PC4/DATA4
- 58 PC3/DATA3
- 57 PC2/DATA2
- 56 PC1/DATA1
- 55 PC0/DATA0
- 54 $\overline{IRQ}$

Bottom pins:
- 33 PG0/XA13
- 34 AV$_{DD}$
- 35 PE7/AN7
- 36 PE6/AN6
- 37 PE5/AN5
- 38 PE4/AN4
- 39 PE3/AN3
- 40 PE2/AN2
- 41 PE1/AN1
- 42 PE0/AN0
- 43 V_{RL}
- 44 V_{RH}
- 45 AV$_{SS}$
- 46 PF7/ADDR7
- 47 PF6/ADDR6
- 48 PF5/ADDR5
- 49 PF4/ADDR4
- 50 PF3/ADDR3
- 51 PF2/ADDR2
- 52 PF1/ADDR1
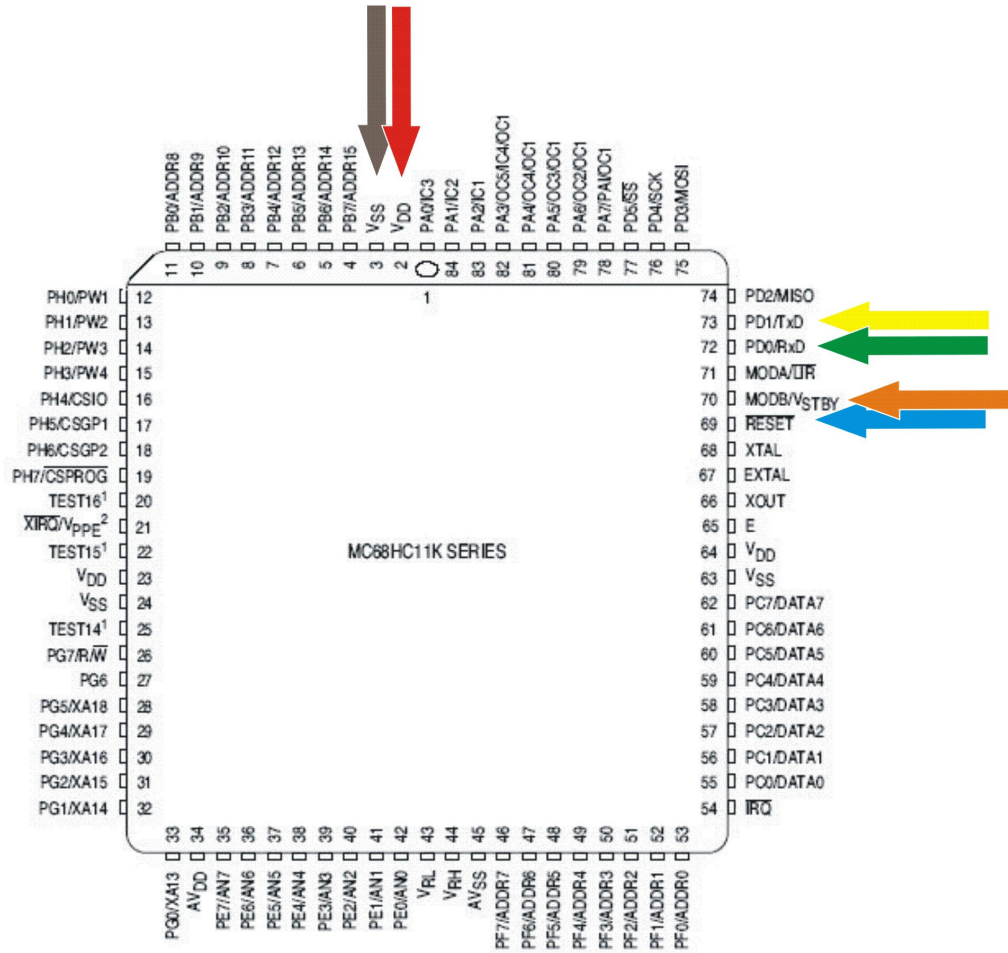- 53 PF0/ADDR0

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6. MC68HC11KA4, MC68HC711KA4

Check processor MODA and MODB pins: in programming mode these pins must be low level (or connected to GND or VSS). In most cases MODB is connected to VDD – **pull-up MODB from board.**
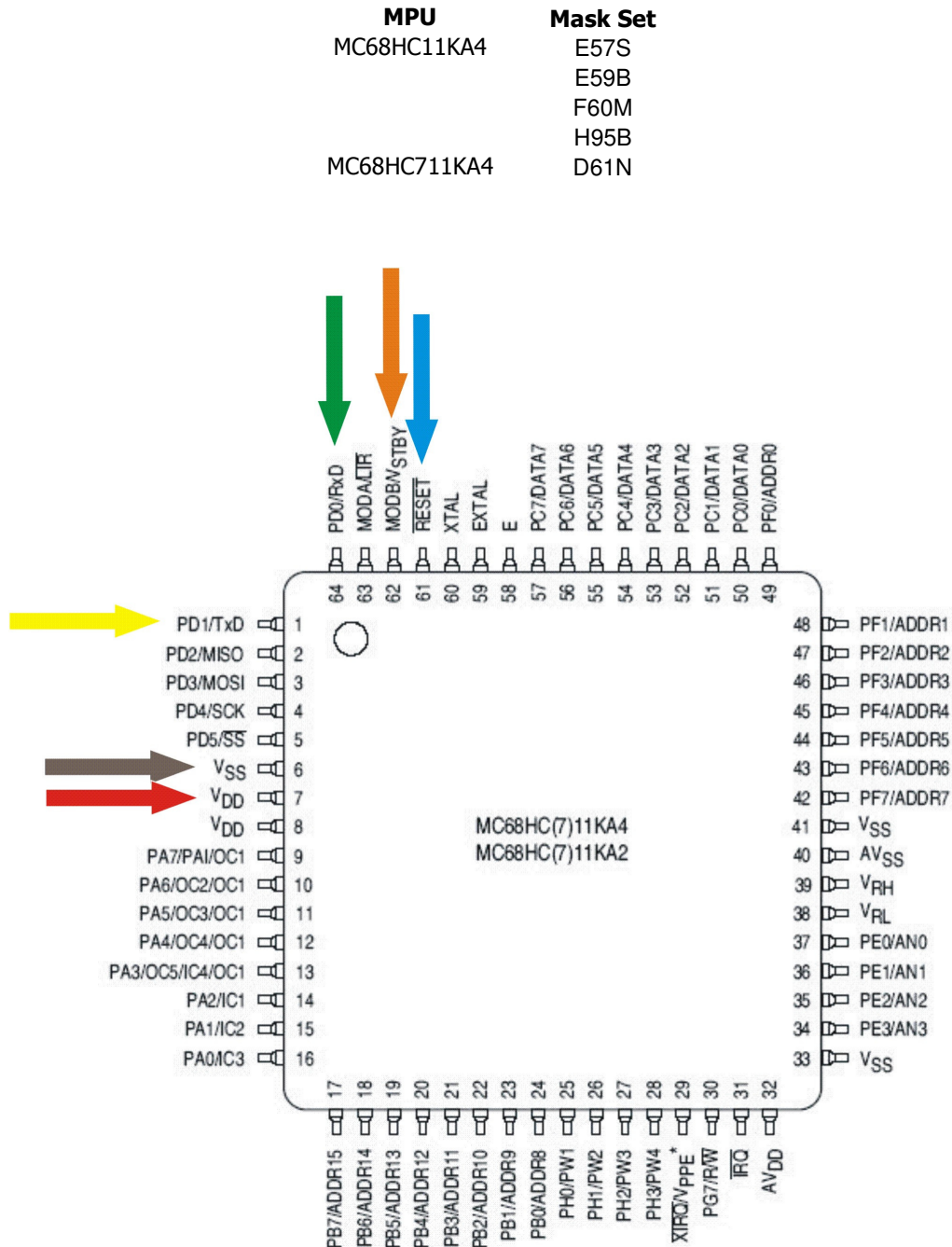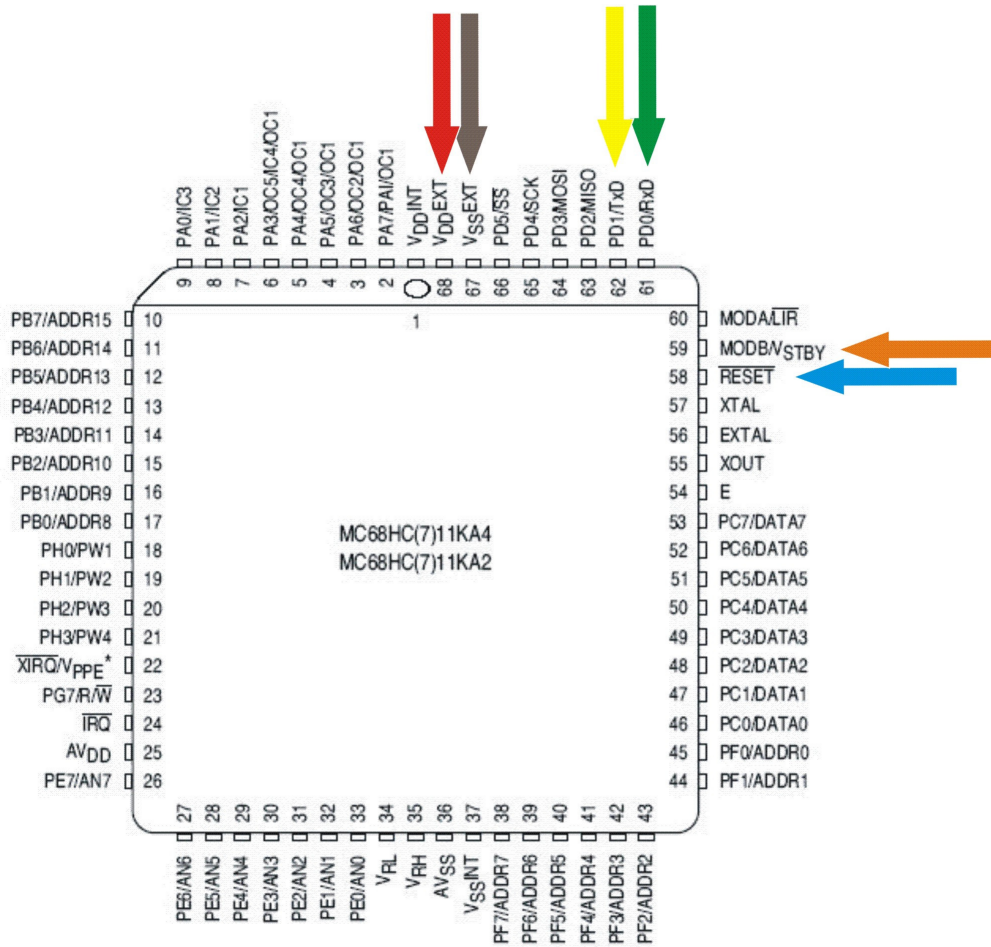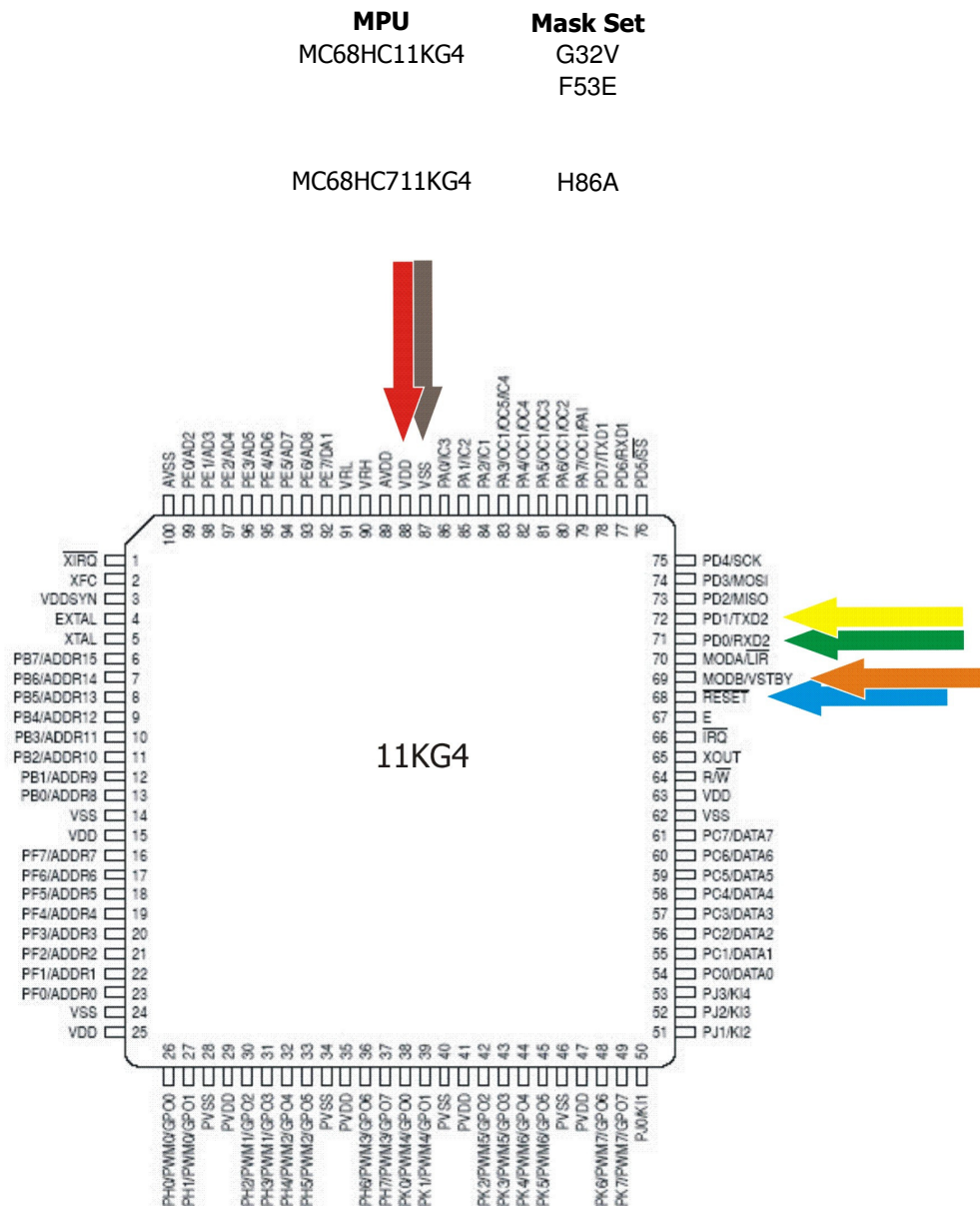
MPU	Mask Set
MC68HC11KA4	E57S
	E59B
	F60M
	H95B
MC68HC711KA4	D61N

MC68HC(7)11KA4
MC68HC(7)11KA2

Left side pins:
- PB7/ADDR15 — 10
- PB6/ADDR14 — 11
- PB5/ADDR13 — 12
- PB4/ADDR12 — 13
- PB3/ADDR11 — 14
- PB2/ADDR10 — 15
- PB1/ADDR9 — 16
- PB0/ADDR8 — 17
- PH0/PW1 — 18
- PH1/PW2 — 19
- PH2/PW3 — 20
- PH3/PW4 — 21
- XIRQ/V$_{PPE}$* — 22
- PG7/R/W̄ — 23
- ĪRQ — 24
- AV$_{DD}$ — 25
- PE7/AN7 — 26

Right side pins:
- 60 — MODA/L̄ĪR̄
- 59 — MODB/V$_{STBY}$
- 58 — R̄ĒSĒT̄
- 57 — XTAL
- 56 — EXTAL
- 55 — XOUT
- 54 — E
- 53 — PC7/DATA7
- 52 — PC6/DATA6
- 51 — PC5/DATA5
- 50 — PC4/DATA4
- 49 — PC3/DATA3
- 48 — PC2/DATA2
- 47 — PC1/DATA1
- 46 — PC0/DATA0
- 45 — PF0/ADDR0
- 44 — PF1/ADDR1

Top pins:
- PA0/IC3 — 9
- PA1/IC2 — 8
- PA2/IC1 — 7
- PA3/OC5/IC4/OC1 — 6
- PA4/OC4/OC1 — 5
- PA5/OC3/OC1 — 4
- PA6/OC2/OC1 — 3
- PA7/PAI/OC1 — 2
- V$_{DD}$INT — 68
- V$_{DD}$EXT — 68
- V$_{SS}$EXT — 67
- PD5/S̄S̄ — 66
- PD4/SCK — 65
- PD3/MOSI — 64
- PD2/MISO — 63
- PD1/TxD — 62
- PD0/RxD — 61

Bottom pins:
- PE6/AN6 — 27
- PE5/AN5 — 28
- PE4/AN4 — 29
- PE3/AN3 — 30
- PE2/AN2 — 31
- PE1/AN1 — 32
- PE0/AN0 — 33
- V$_{RL}$ — 34
- V$_{RH}$ — 35
- AV$_{SS}$ — 36
- V$_{SS}$INT — 37
- PF7/ADDR7 — 38
- PF6/ADDR6 — 39
- PF5/ADDR5 — 40
- PF4/ADDR4 — 41
- PF3/ADDR3 — 42
- PF2/ADDR2 — 43

7. MC68HC11KG4, MC68HC711KG4

Check processor MODA and MODB pins: in programming mode these pins must be low level (or connected to GND or VSS). In most cases MODB is connected to VDD – **pull-up MODB from board.**
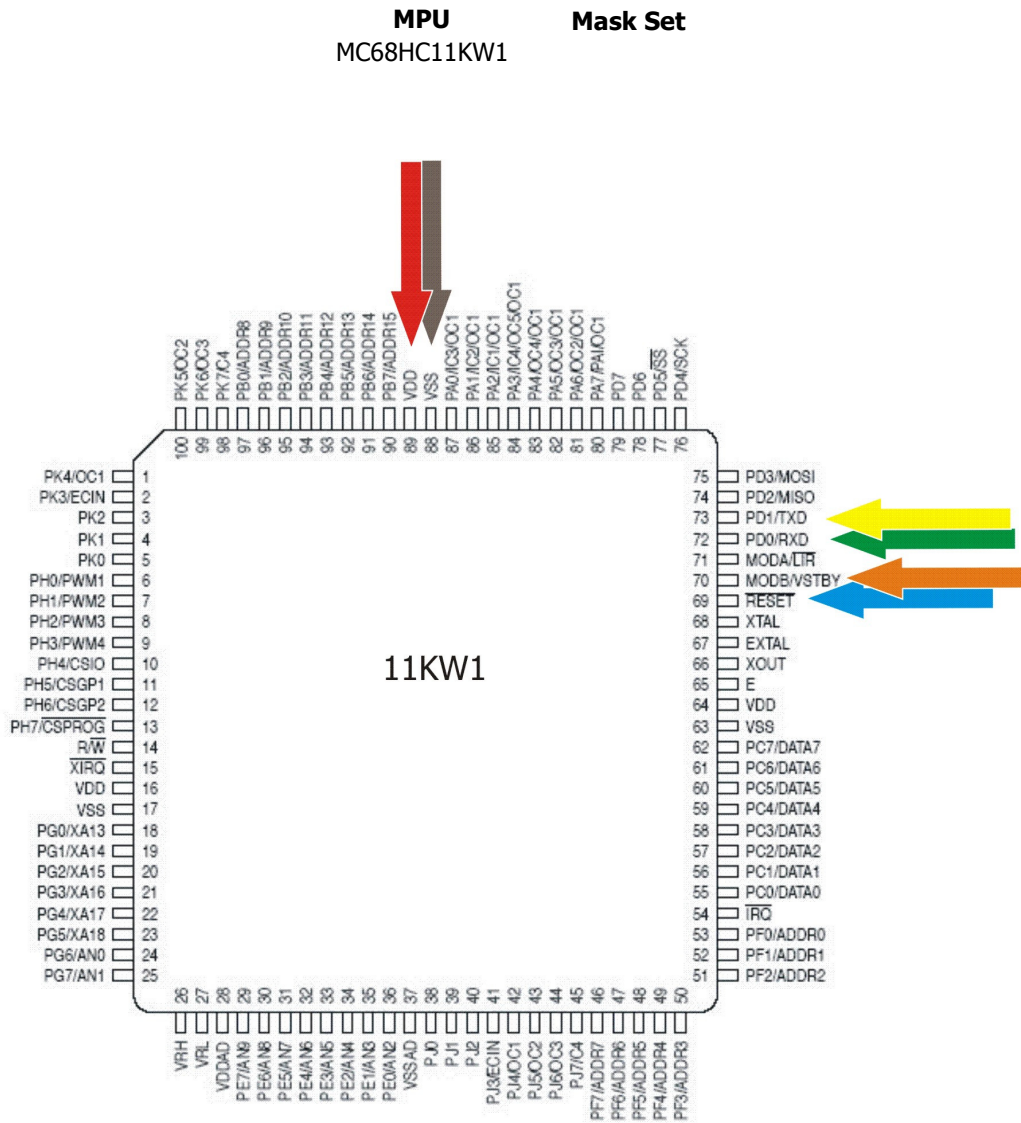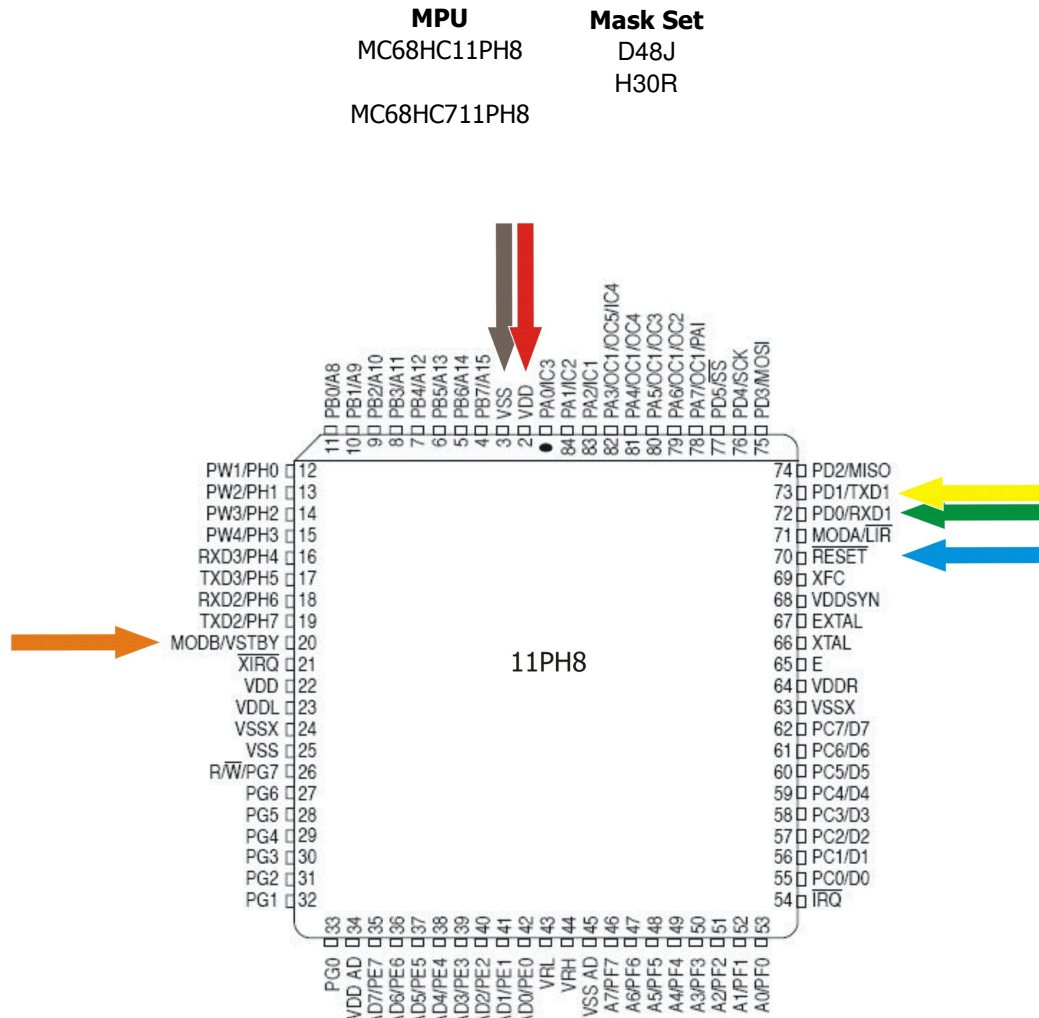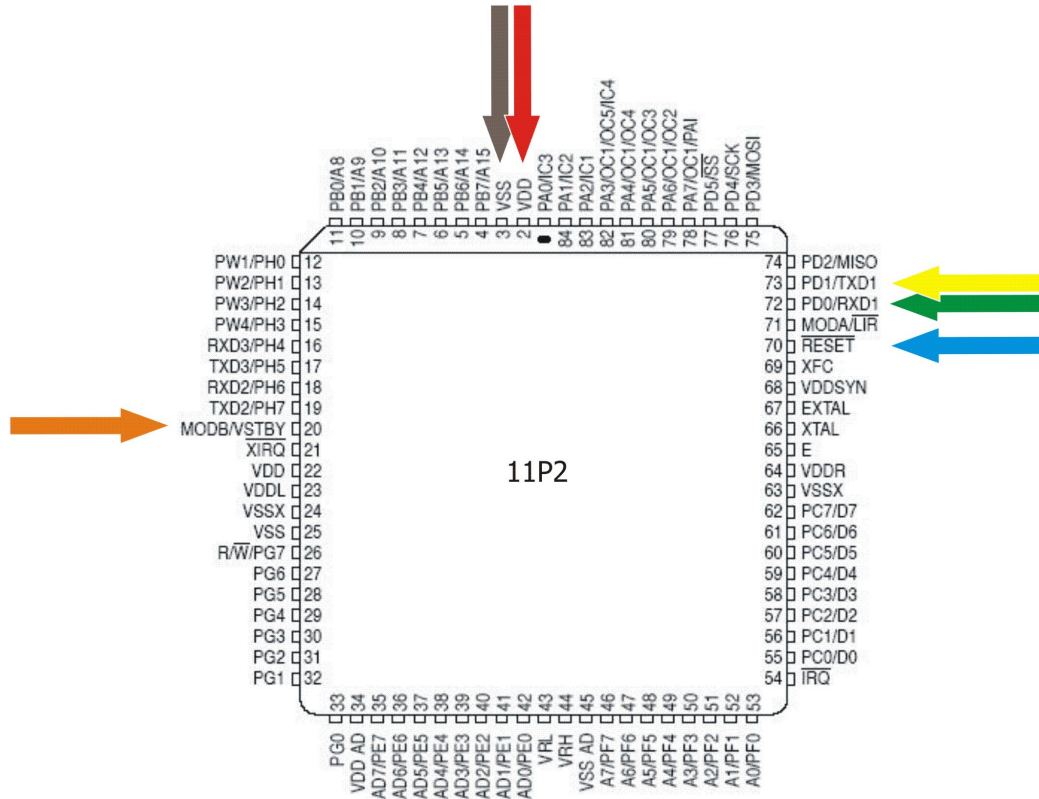
MPU	Mask Set
MC68HC11KG4	G32V
	F53E
MC68HC711KG4	H86A

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8. MC68HC11KW1

MPU	**Mask Set**
MC68HC11KW1	

11KW1

9. MC68HC11PH8, MC68HC711PH8

MPU	Mask Set
MC68HC11PH8	D48J
	H30R
MC68HC711PH8	

10. MC68HC11P2, MC68HC711P2

MPU	Mask Set
MC68HC11P2	D48J
	H30R
MC68HC711P2	D99H
	E53M

11P2

11P2