

CCS CCSEB Evaluation Board with different CCS Charge Controllers

The CCSEB Evaluation Board (or the CCSB2 Kit) can be assembled with different CCS Charge controllers. The CCS Charge Controllers CCS9310B2, CCS9505, CCS9606, CCS9620 and CCS96205 work with the CCS charge principle.

In comparison to the CCS9310B2 the controllers CCS9505, CCS9606, CCS9620 and CCS96205 offer some Special Functions, e.g. Charge Mode Selection (MT settings, Charge speed), DC-Pin, Serial Data Out, etc.

Because of that, the CCS Charge Controllers are not exactly pin compatible. The differences and pin configurations are listed in the following table 1.

1) Table 1 Pin-Configurations

Pin	CCS9310B2	CCS9505	CCS9606	CCS9620	CCS96205
1	Buzzer	Buzzer	Buzzer	Buzzer	Buzzer
2	Watch	Watch	Watch	Watch	Watch
3	F.U.	F.U.	F.U.	F.U.	F.U.
4	RST	RST	RST	RST	RST
5	GND	GND	GND	GND	GND
6	F.U.	MT1	MT1	MT1	MT1
7	F.U.	MT2	MT2	MT2	MT2
8	F.U.	BE	MT3	BE	BE
9	F.U.	LE	MT4	LE	LE
10	F.U.	TxD	TxD	TxD	TxD
11	F.U.	Out3	Out3	F.U.	F.U.
12	F.U.	Out4	Out4	E/A	E/A
13	LED	LED	LED	LED	LED
14	VDD	VDD	VDD	VDD	VDD
15	CLKOUT	CLKOUT	CLKOUT	CLKOUT	CLKOUT
16	OSC	OSC	OSC	OSC	OSC
17	INTOUT	INTOUT	INTOUT	INTOUT	INTOUT
18	INTIN	INTIN	INTIN	INTIN	INTIN

F.U. Factory Used, Do not connect F.U. Pins

2) Special Functions

2.1) Pin Description

Pin 6, 7, 8, 9, 10, 11, 12 are used for additional functions compared with the CCS9310B2.

Pin 6, 7, 8, 9 are Input-Pins, Pin 10, 11, 12 are Output-Pins.

Pin 6, 7, 8, 9 are needed for the charging function and must be connected!!!!

CCS9505, CCS9606:

Pin 11 Out 3: Status Output

Pin 12 Out 4: Status Output

Table 2: Additional Status Output

Pin 12	Pin 11	
Status 4	Status 3	definition
0	0	standby (no battery)
0	1	charging process
1	0	battery defective
1	1	charge OK (battery full)

0 ... low 1 ... high

CCS9505, CCS9620, CCS96205

Pin 6 MT1: Charge Mode (Charge Speed)

Pin 7 MT2: Charge Mode (Charge Speed)

Table 3: MT settings

MT 2	MT 1	cycle time	charge current	typ.	charge time *	typ. *
Pin 7	Pin 6	sec	C _A	C _A	h	h
0	0	15	1/2 - 2	1	0.5 - 2	1
0	1	30	1/4 - 1	1/2	1 - 4	2
1	0	45	1/6 - 2/3	1/3	1.5 - 6	3
1	1	60	1/8 - 1/2	1/4	2 - 8	4

0 ... low ... 1 high

*max. time for a fullcharge of an empty battery!

Pin 8 BE: Buzzer Enable a) to VDD Buzzer sound
b) to GND no Buzzer sound

Pin 9 LE: Charge Enable a) to VDD, charge process like CCS9310B2
b) to GND, charge process stops. When LE is connected to VDD again, the battery is treated as a new, just connected battery.

CCS9606

Pin 6 MT1: Charge Mode (Charge Speed)

Pin 7 MT2: Charge Mode (Charge Speed)

Pin 8 MT3: Charge Mode (Charge Speed)

Pin 9 MT4: Charge Mode (Charge Speed)

Table 4: MT settings

Mode	MT4	MT3	MT2	MT1	cycle time	charge current	typ.	charge time *	typ.*
	Pin9	Pin8	Pin7	Pin6	sec	C _A	C _A	h	h
fast	0	0	0	0	15	1/2 - 2	1	0.5 - 2	1
	0	0	0	1	30	1/4 - 1	1/2	1 - 4	2
	0	0	1	0	45	1/6 - 2/3	1/3	1.5 - 6	3
	0	0	1	1	60	1/8 - 1/2	1/4	2 - 8	4
	0	1	1	1	120	1/16 - 1/4	1/8	4 - 16	8
slow	1	1	1	1	240	1/32 - 1/8	1/16	8 - 32	16

0...low 1...high

*max. time for a fullcharge of an empty battery!

CCS9505, CCS9606, CCS9620, CCS96205

Pin 10 TxD: Serial Data Out for graphical presentation of the charging curve via BTI-Adapter

CCS9620, CCS96205

Pin 12 E/A: Charge ON/OFF DC-Pin for DC-Power-Supply

Comments: Our aim is to help you best in the design of superior chargers with CCS-technology. This Application Note was carefully composed. However, according to the wide range of solutions not all aspects and possibilities can be covered by this publication. Furthermore errors cannot be completely excluded and we do not provide any responsibility for the given applications. Therefore we welcome your response comments and suggestions for further improving our CCS-Application Notes. **Thank you!**

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