

# **Debug Kit phyCORE-ST10F168/269**

## **Application Note**

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## Application Note

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## 1 The Debug Kit phyCORE-ST10F168/ST10F269

### 1.1 debugCORE-ST10F168/ST10F269 Overview

The debugCORE-ST10F168/ST10F269 is a special debugging version Single Board Computer (SBC) module which is 100% function-compatible with the phyCORE-ST10F168/ST10F269. As opposed to the phyCORE-ST10F168/ST10F269, which was developed for use in OEM applications, the debugCORE-ST10F168/ST10F269 is used for simple and efficient error detection and debugging using a hardware emulator. To support its debugging function, the debugCORE-ST10F168/ST10F269 provides all required connectors for emulator connectivity and is equipped with LEDs for displaying the operating state.

Since the debugCORE is 100% function-compatible with the phyCORE-ST10F168/ST10F269, it can easily be inserted directly into the application in place of the phyCORE-ST10F168/ST10F269 for the purpose of hardware debugging (*see Figure 1*).

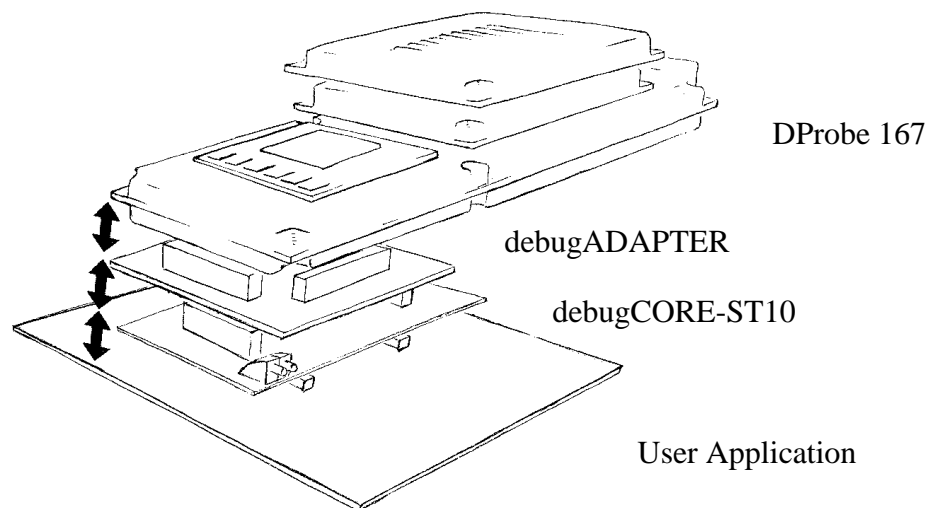


Figure 1: Using the debugCORE in User Applications

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**Caution:**

The debugCORE-ST10F168/ST10F269 differs from the phyCORE-ST10F168/ST10F269 in its physical dimensions. In order to enable insertion of the debugCORE-ST10F168/ST10F269 in place of the phyCORE-Modul, it is important to take the profile of the components surrounding the phyCORE-connector into consideration. Maximum component profiles are given in *Figure 2*.

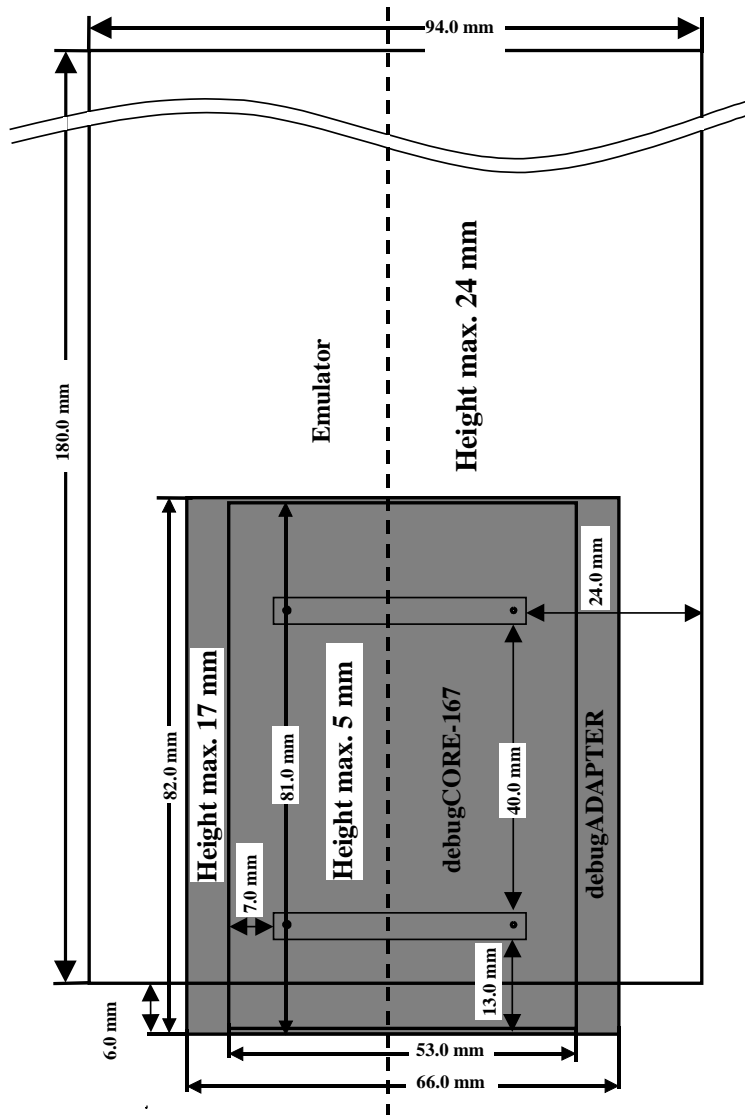


Figure 2: Component Profile Limitations for Insertion of the debugCORE-ST10F168/ST10F269

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## 1.2 Components of the debugCORE-ST10F168/ST10F269

As described previously, the debugCORE-ST10F168/ST10F269 represents a superset and expansion of the phyCORE-ST10F168/ST10F269. The following components have been added for simple debugging:

- two 80-pole SMD-connectors (X2), through which all necessary controller signals extend, and to which the debugADAPTER-167 is attached
- a reset button (S1)
- pin header row (X3) with silk-screened designator for easy access to voltage levels and
- two LEDs (D3, D4) for status display

The following figure shows the positions of the additional components.

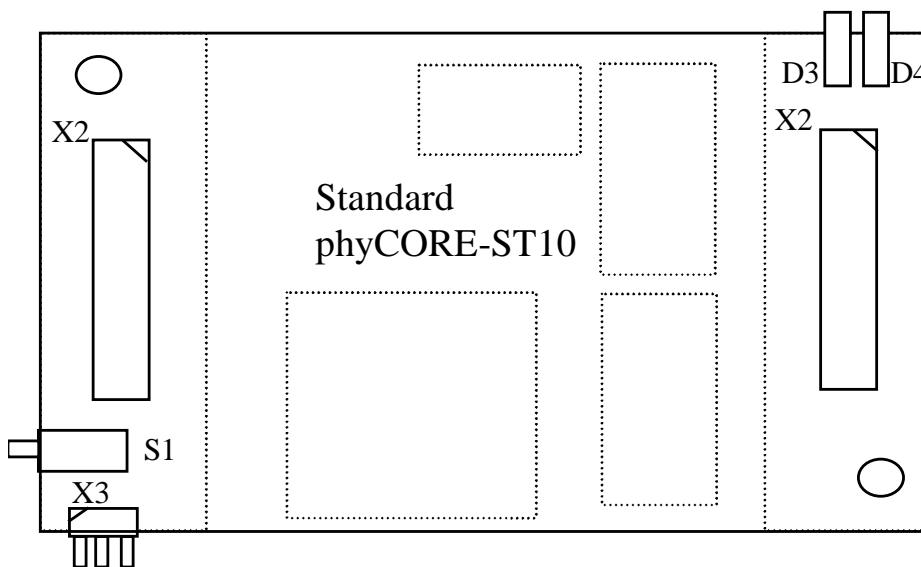


Figure 3: Positions of the Additional Components on the debugCORE-ST10F168/ST10F269

### **1.2.1 SMD Connector X2**

The SMD connector X2 is used to connect the debugAdapter to the debugCORE-ST10F168/ST10F269. The connector consists of two 80-pin SMD connector headers that are protected against reverse polarity due to their arrangement.

### **1.2.2 Pin Header Row X3**

The pin header row X3 provides a simple method of accessing the supply voltage of the debugCORE-ST10F168/ST10F269 and its reset signal for the purpose of measurement.

The following table shows the pin layout.

<b>Pin</b>	<b>Signal</b>
1	VCC
2	GND
3	/RESET

### **1.2.3 LEDs D3 and D4**

Two LEDs D3 and D4 are provided for status display of the debugCORE-ST10F168/ST10F269. LED D3 shows whether the controller is in Adapt Mode or not, in other words, whether an emulation is in progress. LED D4 shows whether the EINIT (end of initialization) instruction was carried out.

### **1.3 debugADAPTER-167**

The debugADAPTER-167 is required to allow easy connection of the debugCORE-ST10F168/ST10F269 to an Emulator. The debugADAPTER-167 is inserted into the SMD socket at X2 on the debugCORE. The debugADAPTER-167 features a Quad Connector which enables direct connection of an Emulator without any additional expansion.

#### **1.3.1 The Quad Connector**

The quad connector is the safest and most reliable method of connecting the debug hardware to a Hitex or NOHAU Emulator. The interface contains all ST10F168/ST10F269 processor signals and power pins. In addition, the quad connector is also the most inexpensive emulator interface solution available on the market.

Quad Connector X2 A

Pin	Signal	Signal	Pin
1	NC	NC	2
3	P6.0	P6.1	4
5	P6.2	P6.3	6
7	P6.4	/HLD-P	8
9	P6.6	P6.7	10
11	P8.0	P8.1	12
13	P8.2	P8.3	14
15	P8.4	P8.5	16
17	P8.6	P8.7	18
19	VCC	GND	20
21	P7.0	P7.1	22
23	P7.2	P7.3	24
25	P7.4	P7.5	26
27	P7.6	P7.7	28
29	P5.0	P5.1	30
31	P5.2	P5.3	32
33	P5.4	P5.5	34
35	P5.6	P5.7	36
37	P5.8	P5.9	38
39	NC	NC	40

Quad Connector X2 B

Pin	Signal	Signal	Pin
41	NC	NC	42
43	VREF	VGND	44
45	P5.10	P5.11	46
47	P5.12	P5.13	48
49	P5.14	P5.15	50
51	GND	VCC	52
53	P2.0	P2.1	54
55	P2.2	P2.3	56
57	P2.4	P2.5	58
59	P2.6	P2.7	60
61	GND	VCC	62
63	P2.8	P2.9	64
65	P2.10	P2.11	66
67	P2.12	P2.13	68
69	P2.14	P2.15	70
71	P3.0	P3.1	72
73	P3.2	P3.3	74
75	P3.4	P3.5	76
77	GND	VCC	78
79	NC	NC	80

Quad Connector X2 C

Pin	Signal	Signal	Pin
81	NC	NC	82
83	P3.6	P3.7	84
85	P3.8	P3.9	86
87	P3.10	P3.11	88
89	/WRH	P3.13	90
91	P3.15	VCC	92
93	GND	VPP	94
95	A16	A17	96
97	A18	A19	98
99	A20	A21	100
101	A22	A23	102
103	VCC	GND	104
105	/RD-P	/WRL	106
107	/RDY-P	ALE	108
109	/EA	D0	110
111	D1	D2	112
113	D3	D4	114
115	D5	D6	116
117	D7	D8	118
119	NC	NC	120

Quad Connector X2 D

Pin	Signal	Signal	Pin
121	NC	NC	122
123	VCC	GND	124
125	D9	D10	126
127	D11	D12	128
129	D13	D14	130
131	D15	A0	132
133	A1	A2	134
135	A3	A4	136
137	A5	A6	138
139	A7	VCC	140
141	GND	A8	142
143	A9	A10	144
145	A11	A12	146
147	A13	A14	148
149	A15	VCC	150
151	XTO	XTI	152
153	GND	/RES-P	154
155	/RESO-P	/NMI-P	156
157	GND	VCC	158
159	NC	NC	160

Table 1: Connector Layout of the of the Quad Connector (X6)

## **1.4 Physical Dimensions**

Due to the required expansion header, the debugCORE's physical dimensions are greater than those of its phyCORE-base module. This must be taken into consideration, especially upon insertion into the target application.

### **Dimensions:**

debugCORE-ST10F168/ST10F269	80 x 53 mm
debugAdapter-167	81 x 66 mm

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**How would you improve this manual?**

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**Did you find any mistakes in this manual?** page

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