



# FMC-to-QSE Adapter Card User Guide

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**FMC-QSE-DC-UG-v1.0**  
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**[www.efinixinc.com](http://www.efinixinc.com)**

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# Introduction

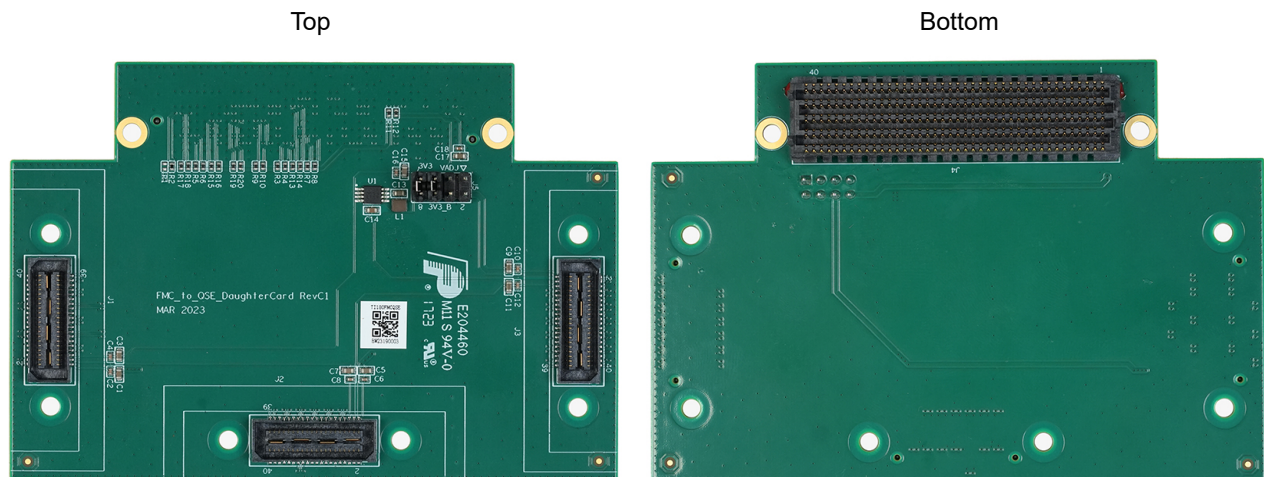
The FMC-to-QSE Adapter Card (part number: EFX\_GPIO\_FL\_DC\_C) adds three additional multi-purpose QSE connectors to the supported development board. The adapter card connects to the development board using the FPGA mezzanine card (FMC) with low pin-count connector (LPC). You can use the QSE connectors to attach:

- HDMI Connector Daughter Card
- Ethernet Connector Daughter Card
- MIPI and LVDS Expansion Daughter Card



**Learn more:** Refer to the [FMC-to-QSE Adapter Card Schematics and BOM](#) for the part details and schematics.

Figure 1: FMC-to-QSE Adapter Card



**Warning:** The board can be damaged without proper anti-static handling.

## Supported Development Boards

You can use with:

- Titanium Ti180 M484 Development Board
- Titanium Ti180 J484 Development Board

## Features

- Three QSE multi-purpose connector extension for development boards
- Power supplied from the development board; no external power required

## What's in the Box?

The FMC-to-QSE Adapter Card includes:

- FMC-to-QSE Adapter Card
- 2 standoffs
- 2 screws
- 2 nuts

## Headers

*Table 1: FMC-to-QSE Adapter Card Headers*

Reference Designator	Description
J1	40-pin multi-purpose high-speed QSE connector for GPIO
J2	40-pin multi-purpose high-speed QSE connector for GPIO
J3	40-pin multi-purpose high-speed QSE connector for GPIO
J4	FMC connector
J5	8-pin header for selecting power source

## Headers J1, J2, and J3 (QSE Connectors)

J1, J2, and J3 are multi-purpose high-speed QSE interface connectors.

*Table 2: J1, J2, and J3 Pin Assignments*

Pin Number	Signal Name		
	J1	J2	J3
1	3V3_B	3V3_B	3V3_B
2	QSE1_P02	QSE2_P02	QSE3_P02
3	5V_B	5V_B	5V_B
4	QSE1_P04	QSE2_P04	QSE3_P04
5	GND	GND	GND
6	GND	GND	GND
7	QSE1_P07	QSE2_P07	QSE3_P07
8	QSE1_P08	QSE2_P08	QSE3_P08
9	QSE1_P09	QSE2_P09	QSE3_P09
10	QSE1_P10	QSE2_P10	QSE3_P10
11	GND	GND	GND
12	GND	GND	GND
13	QSE1_P13	QSE2_P13	QSE3_P13

Pin Number	Signal Name		
	J1	J2	J3
14	QSE1_P14	QSE2_P14	QSE3_P14
15	QSE1_P15	QSE2_P15	QSE3_P15
16	QSE1_P16	QSE2_P16	QSE3_P16
17	GND	GND	GND
18	GND	GND	GND
19	QSE1_P19	QSE2_P19	QSE3_P19
20	QSE1_P20	QSE2_P20	QSE3_P20
21	QSE1_P21	QSE2_P21	QSE3_P21
22	QSE1_P22	QSE2_P22	QSE3_P22
23	GND	GND	GND
24	GND	GND	GND
25	QSE1_P25	QSE2_P25	QSE3_P25
26	QSE1_P26	QSE2_P26	QSE3_P26
27	QSE1_P27	QSE2_P27	QSE3_P27
28	QSE1_P28	QSE2_P28	QSE3_P28
29	GND	GND	GND
30	GND	GND	GND
31	QSE1_P31	QSE2_P31	QSE3_P31
32	QSE1_P32	QSE2_P32	QSE3_P32
33	QSE1_P33	QSE2_P33	QSE3_P33
34	QSE1_P34	QSE2_P34	QSE3_P34
35	GND	GND	GND
36	GND	GND	GND
37	QSE1_P37	QSE2_P37	QSE3_P37
38	QSE1_P38	QSE2_P38	QSE3_P38
39	QSE1_P39	QSE2_P39	QSE3_P39
40	QSE1_P40	QSE2_P40	QSE3_P40

## Header J4 (FMC)

J4 is a 400-pin FMC LPC interface connector for connecting the FMC-to-QSE Adapter Card to the development board.

*Table 3: J4-1 Pin Assignments*

Pin Number	Signal Name	Pin Number	Signal Name
A1	GND	B1	N.C.
A2	N.C.	B2	GND
A3	N.C.	B3	GND
A4	GND	B4	N.C.
A5	GND	B5	N.C.
A6	N.C.	B6	GND
A7	N.C.	B7	GND
A8	GND	B8	N.C.
A9	GND	B9	N.C.
A10	N.C.	B10	GND
A11	N.C.	B11	GND
A12	GND	B12	N.C.
A13	GND	B13	N.C.
A14	N.C.	B14	GND
A15	N.C.	B15	GND
A16	GND	B16	N.C.
A17	GND	B17	N.C.
A18	N.C.	B18	GND
A19	N.C.	B19	GND
A20	GND	B20	N.C.
A21	GND	B21	N.C.
A22	N.C.	B22	GND
A23	N.C.	B23	GND
A24	GND	B24	N.C.
A25	GND	B25	N.C.
A26	N.C.	B26	GND
A27	N.C.	B27	GND
A28	GND	B28	N.C.
A29	GND	B29	N.C.
A30	N.C.	B30	GND
A31	N.C.	B31	GND
A32	GND	B32	N.C.

Pin Number	Signal Name	Pin Number	Signal Name
A33	GND	B33	N.C.
A34	N.C.	B34	GND
A35	N.C.	B35	GND
A36	GND	B36	N.C.
A37	GND	B37	N.C.
A38	N.C.	B38	GND
A39	N.C.	B39	GND
A40	GND	B40	N.C.

Table 4: J4-2 Pin Assignments

Pin Number	Signal Name	Pin Number	Signal Name
C1	GND	D1	GND
C2	N.C.	D2	GND
C3	N.C.	D3	GND
C4	GND	D4	N.C.
C5	GND	D5	N.C.
C6	N.C.	D6	GND
C7	N.C.	D7	GND
C8	GND	D8	QSE2_P26
C9	GND	D9	QSE2_P28
C10	QSE1_P20	D10	GND
C11	QSE1_P22	D11	QSE2_P02
C12	GND	D12	QSE2_P04
C13	GND	D13	GND
C14	QSE1_P19	D14	QSE2_P08
C15	QSE1_P21	D15	QSE2_P10
C16	GND	D16	GND
C17	GND	D17	QSE2_P38
C18	QSE1_P13	D18	QSE2_P40
C19	QSE1_P15	D19	GND
C20	GND	D20	QSE2_P31
C21	GND	D21	QSE2_P33
C22	QSE3_P07	D22	GND
C23	QSE3_P09	D23	QSE2_P13
C24	GND	D24	QSE2_P15
C25	GND	D25	GND
C26	QSE3_P13	D26	QSE3_P19
C27	QSE3_P15	D27	QSE3_P21

Pin Number	Signal Name	Pin Number	Signal Name
C28	GND	D28	GND
C29	GND	D29	N.C.
C30	QSE2_P37	D30	N.C.
C31	QSE2_P39	D31	N.C.
C32	GND	D32	GND
C33	GND	D33	N.C.
C34	N.C.	D34	N.C.
C35	N.C.	D35	N.C.
C36	GND	D36	3V3
C37	N.C.	D37	GND
C38	GND	D38	3V3
C39	3V3	D39	GND
C40	GND	D40	3V3



Table 5: J4-3 Pin Assignments

Pin Number	Signal Name	Pin Number	Signal Name
E1	GND	F1	N.C.
E2	QSE3_P37	F2	GND
E3	QSE3_P39	F3	GND
E4	GND	F4	N.C.
E5	GND	F5	N.C.
E6	QSE3_P32	F6	GND
E7	QSE3_P34	F7	N.C.
E8	GND	F8	N.C.
E9	QSE3_P38	F9	GND
E10	QSE3_P40	F10	N.C.
E11	GND	F11	N.C.
E12	QSE2_P32	F12	GND
E13	QSE2_P34	F13	N.C.
E14	GND	F14	N.C.
E15	N.C.	F15	GND
E16	N.C.	F16	N.C.
E17	GND	F17	N.C.
E18	N.C.	F18	GND
E19	N.C.	F19	N.C.
E20	GND	F20	N.C.
E21	N.C.	F21	GND
E22	N.C.	F22	N.C.
E23	GND	F23	N.C.
E24	N.C.	F24	GND
E25	N.C.	F25	N.C.
E26	GND	F26	N.C.
E27	N.C.	F27	GND
E28	N.C.	F28	N.C.
E29	GND	F29	N.C.
E30	N.C.	F30	GND
E31	N.C.	F31	N.C.
E32	GND	F32	N.C.
E33	N.C.	F33	GND
E34	N.C.	F34	N.C.
E35	GND	F35	N.C.
E36	N.C.	F36	GND
E37	N.C.	F37	N.C.

Pin Number	Signal Name	Pin Number	Signal Name
E38	GND	F38	GND
E39	VADJ	F39	GND
E40	GND	F40	VADJ

*Table 6: J4-4 Pin Assignments*

Pin Number	Signal Name	Pin Number	Signal Name
G1	GND	H1	N.C.
G2	QSE1_P14	H2	GND
G3	QSE1_P16	H3	GND
G4	GND	H4	QSE1_P37
G5	GND	H5	QSE1_P39
G6	QSE1_P31	H6	GND
G7	QSE1_P33	H7	QSE1_P26
G8	GND	H8	QSE1_P28
G9	QSE2_P14	H9	GND
G10	QSE2_P16	H10	QSE1_P02
G11	GND	H11	QSE1_P04
G12	QSE1_P08	H12	GND
G13	QSE1_P10	H13	QSE2_P20
G14	GND	H14	QSE2_P22
G15	QSE1_P07	H15	GND
G16	QSE1_P09	H16	QSE1_P32
G17	GND	H17	QSE1_P34
G18	QSE1_P25	H18	GND
G19	QSE1_P27	H19	QSE1_P38
G20	GND	H20	QSE1_P40
G21	N.C.	H21	GND
G22	N.C.	H22	QSE2_P25
G23	GND	H23	QSE2_P27
G24	QSE3_P31	H24	GND
G25	QSE3_P33	H25	QSE2_P19
G26	GND	H26	QSE2_P21
G27	QSE2_P07	H27	GND
G28	QSE2_P09	H28	QSE3_P25
G29	GND	H29	QSE3_P27
G30	N.C.	H30	GND
G31	N.C.	H31	QSE3_P26
G32	GND	H32	QSE3_P28

Pin Number	Signal Name	Pin Number	Signal Name
G33	QSE3_P20	H33	GND
G34	QSE3_P22	H34	QSE3_P14
G35	GND	H35	QSE3_P16
G36	QSE3_P08	H36	GND
G37	QSE3_P10	H37	QSE3_P02
G38	GND	H38	QSE3_P04
G39	VADJ	H39	GND
G40	GND	H40	VADJ

*Table 7: J4-5 Pin Assignments*

Pin Number	Signal Name	Pin Number	Signal Name
J1	GND	K1	N.C.
J2	N.C.	K2	GND
J3	N.C.	K3	GND
J4	GND	K4	N.C.
J5	GND	K5	N.C.
J6	N.C.	K6	GND
J7	N.C.	K7	N.C.
J8	GND	K8	N.C.
J9	N.C.	K9	GND
J10	N.C.	K10	N.C.
J11	GND	K11	N.C.
J12	N.C.	K12	GND
J13	N.C.	K13	N.C.
J14	GND	K14	N.C.
J15	N.C.	K15	GND
J16	N.C.	K16	N.C.
J17	GND	K17	N.C.
J18	N.C.	K18	GND
J19	N.C.	K19	N.C.
J20	GND	K20	N.C.
J21	N.C.	K21	GND
J22	N.C.	K22	N.C.
J23	GND	K23	N.C.
J24	N.C.	K24	GND
J25	N.C.	K25	N.C.
J26	GND	K26	N.C.
J27	N.C.	K27	GND

<b>Pin Number</b>	<b>Signal Name</b>	<b>Pin Number</b>	<b>Signal Name</b>
J28	N.C.	K28	N.C.
J29	GND	K29	N.C.
J30	N.C.	K30	GND
J31	N.C.	K31	N.C.
J32	GND	K32	N.C.
J33	N.C.	K33	GND
J34	N.C.	K34	N.C.
J35	GND	K35	N.C.
J36	N.C.	K36	GND
J37	N.C.	K37	N.C.
J38	GND	K38	N.C.
J39	N.C.	K39	GND
J40	GND	K40	N.C.

## Header J5 (Power Source Selector)

J5 is a 8-pin header used to select the power supply for the FMC-to-QSE Adapter Card.

*Table 8: J5 Pin Assignment*

Jumper	Description
Connect Pins 1 and 2 Connect Pins 3 and 4	Use VADJ supply from the development board
Connect Pins 5 and 6 Connect Pins 7 and 8	Use 3.3 V supply from the development board (default)

## Installing Standoffs

Before using the board, attach the standoffs with the screws (M3 size) provided in the kit.



**Warning:** You can damage the board if you over tighten the screws. Tighten all screws to a torque between  $4 \pm 0.5$  kgf/cm and  $5 \pm 0.5$  kgf/cm.

## Revision History

*Table 9: Revision History*

Date	Version	Description
July 2023	1.0	Initial release.