

Evaluation Board For PLL Frequency Synthesizer

EVAL-ADF411XEB1

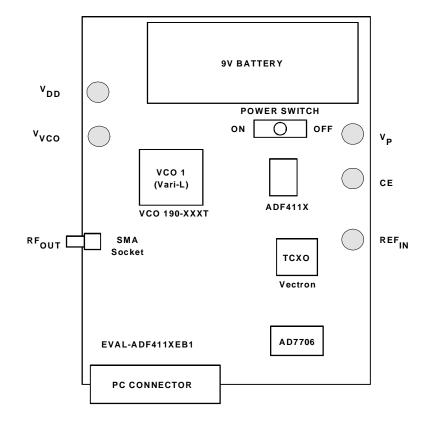
FEATURES

- General Purpose PLL Evaluation Board excluding Synthesizer, VCO, Loop Filter for generating generic PLL standards.
- Compatible with ADF4110 and ADF4116 synthesizer families.
- Accompanying Software allows complete control of synthesizer functions from PC
- Battery Operated: Choice of 3V or 5V supplies

GENERAL DESCRIPTION

This board is designed to allow the user to evaluate the performance of the ADF411X Frequency Synthesizer for PLL's (Phase Locked Loops). The block diagram of the board is shown below. It contains the footprint for a ADF411X synthesizer, a pc connector, SMA connector for the reference input, power supplies and RF output. There is also a footprint for a loop filter and a VCO on board. A cable is included with the board to connect to a pc printer port.

The package also contains windows software to allow easy programming of the synthesizer.



BLOCK DIAGRAM

REV.PrB 04/00

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One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106, U.S.A. Tel: 781-329-4700 Fax: 781-326-8703

Hardware Description

The evaluation board comes with a cable for connecting to the printer port of a PC. The silk screen and cable diagram for the evaluation board are shown below. The board schematic is shown on pages 3 and 4.

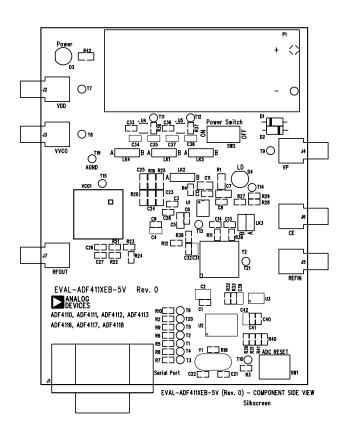


Figure 1. Evaluation Board Silkscreen

The board is powered from a single 9V battery. The power supply ciruitry allows the user to choose either 3V or 5V for the ADF4113 V_{DD} and V_P , and for the VCO supply. The default settings are 3V for the ADF411X V_{DD} and 5V for the ADF411X V_P and for the VCO supply. It is very important to note that the ADF4113 V_{DD} should never exceed the ADF411X V_P . This can damage the device.

All components necessary for LO generation are catered for on-board. The TCXO connector provides the necessary Reference Input. The PLL is made up of the ADF411X, passive loop filter and the VCO 190-XXXT from Vari-L. The output is available at RFOUT through a standard SMA connector. If the user wishes they may use their own power supplies and reference input. In this case, they need to insert SMA connectors to as shown on the silkscreen and block diagram.

The AD7706 A/D converter is used to monitor the power supply voltage and current consumption of the ADF411X. This helps the user pick the optimum synthesizer settings for power consumption and also provides an alert if the battery

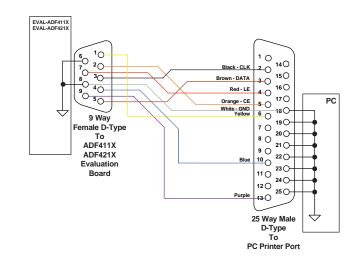


Figure 2. PC Cable Diagram

voltage is too low to sustain the required 3V or 5V for the board supply.

Loop component values shown in the circuit diagram are for 900MHz RF output, 5mA CP current, VCO190-902T, 200kHz channel spacing and 20kHz loop bandwidth.

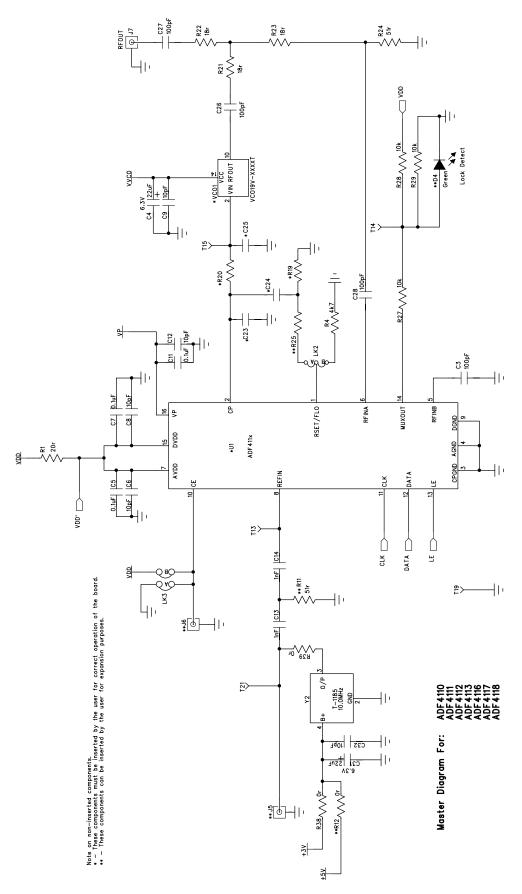


Figure 3. Evaluation Board Circuit Diagram (Page 1)

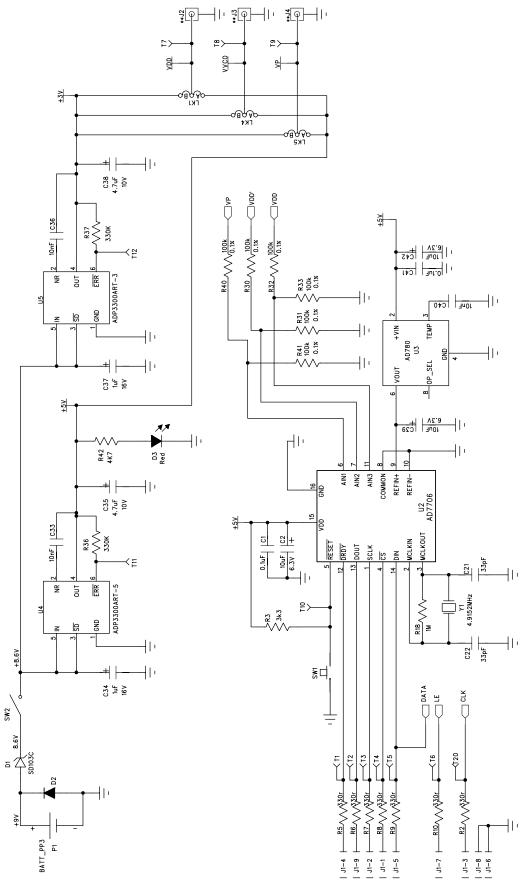


Figure 4. Evaluation Board Circuit Diagram (Page 2)

Software Description

The software comes on a CD. If the user double clicks on "setup.exe", then the install wizard installs the software. Follow the on-screen directions. The software will be installed in a default directory called "C:/Program Files/ADF4XXX/ADF4XXX_rev0". To run the software, simply double-click on "adf4XXX_rev0.exe".

Before the main software screen appears, the Device window appears, which will ask the user to choose which device is being evaluated. Choose the device being evaluated and click OK.

The Main Interface window will now appear. (See Figure 5)

Click on Choose Port, and the Port Connector window will appear. Choose the port that the cable is connected to on the PC and click OK. (Normally LPT1)

Click on Reference Frequency, and the Reference Frequency window will appear. Enter the reference frequency being used and click OK. Click on RF VCO Output Frequency, and the Output Frequency window will appear. Enter the output frequency and PFD reference frequency, and click OK. Click On Prescaler, and the Prescaler window will appear. Grab the pointer, and choose the desired prescaler value. Click OK. Click on Charge Pump Current Setting 2 or Charge Pump Current Setting 1 and the Current Setting window

will appear. Grab the pointer to set the Charge Pump Current Setting. Click OK. Click on the RF PD Polarity button to set the RF PD

Click on the RF PD Polarity button to set the RF PD Polarity bit.

The data is now set up, and other features can now be examined by the user.

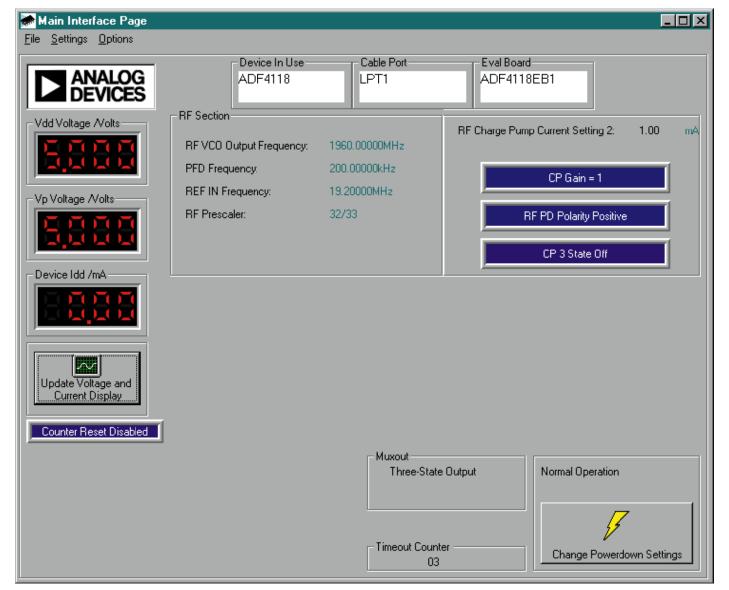


Figure 5. Software Front Panel

Qty	Reference Designator	Description	Manufacturer	PCB DECAL	VALUE
	114	De Net Jacob			
<u>1</u> 1	U1 U2	Do Not Inser AD7706BR	ADI ADI	TSSOP-16 SO16WB	AD7706BR
1	U3	AD780AR	ADI	SO8NB	AD780AR
1	U4	ADP3300ART-5	ADI	SOT23-6	ADP3300ART-5
1	U5	ADP3300ART-3	ADI	SOT23-6	ADP3300ART-3
1	VCO1	Do Not Inser	Vari-L	30123-0	ADF 3300ART-3
1	Y1	4.9152MHz Crystal	Vectron International	HC49 low profile	VXA1-1011
1	Y2	10 MHz TCXO	Vectron International		T-1185
1	D1	SD103C Schottky Diode	General Semiconductor	DO35	SD103C
1	D2	IN4001	General Genneonauctor	D035	FEC 365-117
1	D3	Red Low Power LED	Vishay	LED	FEC 657-130
1	D4	Green Low Power LED (Do Not Insert)		LED	FEC 657-141
	54	Green Low Power LLD (Do Not Insert)	Visitay		1 20 037-141
2	C1 C41	0.1uF Multi Layer Ceramic Capacitor	Murata	Case 0603	FEC 499-675
1	C2	10uF 6.3V Tantalum Capacitor	AVX	CAP\TAJ B	FEC 197-014
4	C3 C26 C27 C28	100pF Multi Layer Ceramic Capacitor	Murata	Case 0603	FEC 499-122
2	C4 C31	22uF 6.3V Tantalum Capacitor	AVX	CAP\TAJ A	FEC 197-038
3	C5 C7 C11	0.1uF Multi Layer Ceramic Capacitor	Murata	Case 0805	FEC 317-627
5	C6 C8 C9 C12 C32	10pF Multi Layer Ceramic Capacito	Murata	Case 0603	FEC 499-110
2	C13 C14	1nF Multi Layer Ceramic Capacito	Murata	Case 0603	FEC 317-202
2	C13 C14 C21 C22	33pF Multi Layer Ceramic Capacitor		Case 0603	FEC 317-202 FEC 498-555
	C21 C22		Murata	Case 0603	FEC 490-000
1	C23	Do Not Inser			
1		Do Not Inser		Case 0805	
1	C25	Do Not Inser	Murata	Case 0805	EEC 400 440
3	C33 C36 C40	10nF Multi Layer Ceramic Capacito	Murata	Case 0603	FEC 499-146
2	C34 C37	1uF 16V Tantalum Capacitor	AVX		FEC 498-701
2	C35 C38	4.7uF 10V Tantalum Capacitor	AVX		FEC 498-658
2	C39 C42	10uF 6.3V Tantalum Capacitor	AVX	CAP\TAJ_A	FEC 197-014
	D 4			0 0005	FF0 774 400
1	R1	20r 5% Resistor (Surface Mount)	Multicomp	Case 0805	FEC 771-132
7	R2 R5 R6 R7 R8 R9 R10	330r 1% Resistor (Surface Mount)	Multicomp	Case 0603	FEC 911-143
1	R3	3k3 1% Resistor (Surface Mount)	Multicomp	Case 0603	FEC 911-290
1	R4	4k7 1% Resistor (Surface Mount)	Multicomp	Case 0603	FEC 911-318
1	R11	Do Not Inser	• •	Case 0603	
1	R18	1M 1% Resistor (Surface Mount)	Multicomp	Case 0603	FEC 911-598
1	R19	Do Not Inser		Case 0805	
1	R20	Do Not Inser		Case 0805	550.044.004
1 1 3	R20 R21 R22 R23	Do Not Inser 18r 1% Resistor (Surface Mount)	Multicomp	Case 0805 Case 0603	FEC 911-021
1	R20 R21 R22 R23 R24	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount)	Multicomp Multicomp	Case 0805 Case 0603 Case 0603	FEC 911-021
1 1	R20 R21 R22 R23 R24 R25	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser	Multicomp	Case 0805 Case 0603 Case 0603 Case 0805	
1 1 3	R20 R21 R22 R23 R24 R25 R27 R28 R29	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount)	Multicomp Multicomp	Case 0805 Case 0603 Case 0603 Case 0805 Case 0603	FEC 911-355
1 1 3 6	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount)	Multicomp Multicomp Meggitt	Case 0805 Case 0603 Case 0603 Case 0805 Case 0603 Case 0603	FEC 911-355 FEC 911-471
1 1 3 6 2	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount)	Multicomp Multicomp Meggitt Multicomp	Case 0805 Case 0603 Case 0603 Case 0805 Case 0603 Case 0603 Case 0603	FEC 911-355 FEC 911-471 FEC 911-537
1 1 3 6 2 2	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount	Multicomp Multicomp Meggitt Multicomp Multicomp	Case 0805 Case 0603 Case 0603 Case 0805 Case 0603 Case 0603 Case 0603 Case 0603	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227
1 3 6 2 2 1	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R12	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert	Multicomp Multicomp Meggitt Multicomp Multicomp Multicomp	Case 0805 Case 0603 Case 0805 Case 0805 Case 0603	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 772-227
1 1 3 6 2 2	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount	Multicomp Multicomp Meggitt Multicomp Multicomp	Case 0805 Case 0603 Case 0603 Case 0805 Case 0603 Case 0603 Case 0603 Case 0603	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227
1 3 6 2 2 1 1	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R12 R42	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount)	Multicomp Multicomp Meggitt Multicomp Multicomp Multicomp Multicomp	Case 0805 Case 0603 Case 0603 Case 0805 Case 0603 Case 0603	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 772-227 FEC 911-938
1 3 6 2 2 1 1 1	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R12 R42 SW 1	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount) Push Button Switch	Multicomp Meggitt Multicomp Multicomp Multicomp Multicomp Omron	Case 0805 Case 0603 Case 0805 Case 0603 Case 0805 SW\PB-SMALL	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 772-227 FEC 911-938 FEC 176-986
1 3 6 2 2 1 1	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R12 R42	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount)	Multicomp Multicomp Meggitt Multicomp Multicomp Multicomp Multicomp	Case 0805 Case 0603 Case 0603 Case 0805 Case 0603 Case 0603	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 772-227 FEC 911-938
1 3 6 2 2 1 1 1	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R12 R42 SW1 SW2	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount) Push Button Switch SPDT Switch - (Washable)	Multicomp Meggitt Multicomp Multicomp Multicomp Multicomp Multicomp Omron Apem	Case 0805 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0805 SW\PB-SMALL SW_SIP-3P	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 911-938 FEC 176-986 FEC 150-559
1 3 6 2 2 1 1 1	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R12 R42 SW 1	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount) Push Button Switch	Multicomp Meggitt Multicomp Multicomp Multicomp Multicomp Omron	Case 0805 Case 0603 Case 0805 Case 0603 Case 0805 SW\PB-SMALL	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 772-227 FEC 911-938 FEC 176-986
1 3 6 2 2 1 1 1 1 1 1 8	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R12 SW1 SW2 T1-15 T19-21	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount) Push Button Switch SPDT Switch - (Washable) Red Testpoint	Multicomp Meggitt Multicomp Multicomp Multicomp Multicomp Multicomp Omron Apem W Hughes	Case 0805 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0805 SW\PB-SMALL SW_SIP-3P TESTPOINT	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 772-227 FEC 911-938 FEC 176-986 FEC 150-559 FEC 240-345
1 3 6 2 2 1 1 1 1 1 1 1 8	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R42 SW1 SW2 J1	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount) Push Button Switch SPDT Switch - (Washable) Red Testpoint 9 PIN D-TYPE MALE (HORIZ)	Multicomp Meggitt Multicomp Multicomp Multicomp Multicomp Multicomp Omron Apem	Case 0805 Case 0603 Case 0805 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0805 SW\PB-SMALL SW_SIP-3P TESTPOINT DCON9M	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 911-938 FEC 176-986 FEC 150-559
1 3 6 2 2 1 1 1 1 1 1 1 8 1 5	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R12 R42 SW1 SW2 J1 J2 J3 J4 J5 J6	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount) Push Button Switch SPDT Switch - (Washable) Red Testpoint 9 PIN D-TYPE MALE (HORIZ) Do Not Inser	Multicomp Meggitt Multicomp Multicomp Multicomp Multicomp Multicomp Omron Apem W Hughes McMurdo	Case 0805 Case 0603 Case 0805 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0805 SW\PB-SMALL SW_SIP-3P TESTPOINT DCON9M SMA	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 772-227 FEC 911-938 FEC 176-986 FEC 150-559 FEC 150-559 FEC 240-345 FEC 150-750
1 3 6 2 2 1 1 1 1 1 1 1 8	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R42 SW1 SW2 J1	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount) Push Button Switch SPDT Switch - (Washable) Red Testpoint 9 PIN D-TYPE MALE (HORIZ)	Multicomp Meggitt Multicomp Multicomp Multicomp Multicomp Multicomp Omron Apem W Hughes	Case 0805 Case 0603 Case 0805 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0805 SW\PB-SMALL SW_SIP-3P TESTPOINT DCON9M	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 772-227 FEC 911-938 FEC 176-986 FEC 150-559 FEC 240-345
1 3 6 2 2 1 1 1 1 1 8 1 5 1	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R12 R42 SW1 SW2 J1 J2 J3 J4 J5 J6 J7	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount) Push Button Switch SPDT Switch - (Washable) Red Testpoint 9 PIN D-TYPE MALE (HORIZ) Do Not Inser GOLD 50Ω SMA SOCKET	Multicomp Meggitt Multicomp Multicomp Multicomp Multicomp Multicomp Omron Apem W Hughes McMurdo Pasternack	Case 0805 Case 0603 Case 0805 SW\PB-SMALL SW_SIP-3P TESTPOINT DCON9M SMA	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 772-227 FEC 911-938 FEC 176-986 FEC 150-559 FEC 150-559 FEC 150-750 PE4118
1 1 3 6 2 2 1 1 1 1 1 1 5 1 4	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R12 R42 SW1 SW2 J1 J2 J3 J4 J5 J6 J7 LK1 LK2 LK4 LK5	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount) Push Button Switch SPDT Switch - (Washable) Red Testpoint 9 PIN D-TYPE MALE (HORIZ) Do Not Inser GOLD 50Ω SMA SOCKET 3 pin header	Multicomp Meggitt Multicomp Multicomp Multicomp Multicomp Omron Apem W Hughes W Hughes McMurdo Pasternack Harwin	Case 0805 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0805 SW\PB-SMALL SW_SIP-3P TESTPOINT DCON9M SMA SMA SIP-3P	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 772-227 FEC 911-938 FEC 176-986 FEC 150-559 FEC 150-750 PE4118 FEC 512-047
1 3 6 2 2 1 1 1 1 1 1 8 1 5 1 1 4 1	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R12 R42 SW1 SW2 J1 J2 J3 J4 J5 J6 J7 LK1 LK2 LK4 LK5 LK3	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount) Push Button Switch SPDT Switch - (Washable) Red Testpoint 9 PIN D-TYPE MALE (HORIZ) Do Not Inser GOLD 50Ω SMA SOCKET 3 pin header 2 pin header	Multicomp Meggitt Multicomp Multicomp Multicomp Multicomp Omron Apem W Hughes W Hughes McMurdo Pasternack Harwin Harwin	Case 0805 Case 0603 Case 0805 SW\PB-SMALL SW_SIP-3P TESTPOINT DCON9M SMA	FEC 911-355 FEC 911-471 FEC 911-637 FEC 772-227 FEC 772-227 FEC 911-938 FEC 176-986 FEC 150-559 FEC 150-559 FEC 150-750 PE4118 PE4118 FEC 512-047 FEC 512-047
1 1 3 6 2 2 1 1 1 1 1 1 5 1 4	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R12 R42 SW1 SW2 J1 J2 J3 J4 J5 J6 J7 LK1 LK2 LK4 LK5	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount) Push Button Switch SPDT Switch - (Washable) Red Testpoint 9 PIN D-TYPE MALE (HORIZ) Do Not Inser GOLD 50Ω SMA SOCKET 3 pin header	Multicomp Meggitt Multicomp Multicomp Multicomp Multicomp Omron Apem W Hughes W Hughes McMurdo Pasternack Harwin	Case 0805 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0805 SW\PB-SMALL SW_SIP-3P TESTPOINT DCON9M SMA SMA SIP-3P	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 772-227 FEC 911-938 FEC 176-986 FEC 150-559 FEC 150-750 PE4118 FEC 512-047
1 3 6 2 2 1 1 1 1 1 5 1 4 1 5	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R12 SW1 SW2 T1-15 T19-21 J1 J2 J3 J4 J5 J6 J7 LK1 LK2 LK4 LK5 LK3 LK1-5	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount) Push Button Switch SPDT Switch - (Washable) Red Testpoint 9 PIN D-TYPE MALE (HORIZ) Do Not Inser GOLD 500 SMA SOCKET 3 pin header 2 pin header 2 pin header Shorting Shunt	Multicomp Meggitt Multicomp Multicomp Multicomp Multicomp Omron Apem W Hughes McMurdo Pasternack Harwin Harwin Harwin	Case 0805 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0805 SW\PB-SMALL SW_SIP-3P TESTPOINT DCON9M SMA SMA SIP-3P SIP-2P	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 772-227 FEC 911-938 FEC 176-986 FEC 150-559 FEC 150-559 FEC 150-750 PE4118 FEC 512-047 FEC 512-047 FEC 512-047 FEC 150-410
1 3 6 2 2 1 1 1 1 1 1 8 1 5 1 1 4 1	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R12 R42 SW1 SW2 I1-15 T19-21 J1 J2 J3 J4 J5 J6 J7 LK1 LK2 LK4 LK5 LK3 LK1-5 P1	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount) Push Button Switch SPDT Switch - (Washable) Red Testpoint 9 PIN D-TYPE MALE (HORIZ) Do Not Inser GOLD 50Ω SMA SOCKET 3 pin header 2 pin header 2 pin header Shorting Shunt Pair PCB snap-on battery connector	Multicomp Meggitt Multicomp Multicomp Multicomp Multicomp Omron Apem W Hughes McMurdo Pasternack Harwin Harwin Harwin Keystone	Case 0805 Case 0603 Case 0805 SW\PB-SMALL SW_SIP-3P TESTPOINT DCON9M SMA SIP-3P	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 772-227 FEC 911-938 FEC 176-986 FEC 150-559 FEC 150-559 FEC 150-750 PE4118 FEC 512-047 FEC 512-047 FEC 512-035 FEC 150-410 FEC 723-988
1 3 6 2 2 1 1 1 1 1 1 5 1 1 5 5	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R12 SW1 SW2 T1-15 T19-21 J1 J2 J3 J4 J5 J6 J7 LK1 LK2 LK4 LK5 LK3 LK1-5	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount) Push Button Switch SPDT Switch - (Washable) Red Testpoint 9 PIN D-TYPE MALE (HORIZ) Do Not Inser GOLD 500 SMA SOCKET 3 pin header 2 pin header 2 pin header Shorting Shunt	Multicomp Meggitt Multicomp Multicomp Multicomp Multicomp Omron Apem W Hughes McMurdo Pasternack Harwin Harwin Harwin	Case 0805 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0805 SW\PB-SMALL SW_SIP-3P TESTPOINT DCON9M SMA SMA SIP-3P SIP-2P	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 772-227 FEC 911-938 FEC 176-986 FEC 150-559 FEC 150-559 FEC 150-750 PE4118 FEC 512-047 FEC 512-047 FEC 512-047 FEC 150-410
1 1 3 6 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R12 R42 SW1 SW2 J1 J2 J3 J4 J5 J6 J7 LK1 LK2 LK4 LK5 LK3 P1 P1	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount) Push Button Switch SPDT Switch - (Washable) Red Testpoint 9 PIN D-TYPE MALE (HORIZ) Do Not Inser GOLD 50Ω SMA SOCKET 3 pin header 2 pin header 2 pin header Shorting Shunt Pair PCB snap-on battery connector 9V PP3 Battery	Multicomp Multicomp Meggitt Multicomp Multicomp Multicomp Multicomp Multicomp Omron Apem Omron Apem W Hughes McMurdo Pasternack Harwin Harwin Harwin Keystone Duracell	Case 0805 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0805 SW\PB-SMALL SW_SIP-3P TESTPOINT DCON9M SMA SMA SIP-3P SIP-2P	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 772-227 FEC 911-938 FEC 176-986 FEC 150-559 FEC 150-750 PE4118 FEC 512-047 FEC 512-047 FEC 150-410 FEC 908-526
1 3 6 2 2 1 1 1 1 1 1 5 1 4 1 5 2 2	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R12 R42 SW1 SW2 I1-15 T19-21 J1 J2 J3 J4 J5 J6 J7 LK1 LK2 LK4 LK5 LK3 LK1-5 P1	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount) Push Button Switch SPDT Switch - (Washable) Red Testpoint 9 PIN D-TYPE MALE (HORIZ) Do Not Inser GOLD 50Ω SMA SOCKET 3 pin header 2 pin header 2 pin header Shorting Shunt Pair PCB snap-on battery connector	Multicomp Meggitt Multicomp Multicomp Multicomp Multicomp Omron Apem W Hughes McMurdo Pasternack Harwin Harwin Harwin Keystone	Case 0805 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0805 SW\PB-SMALL SW_SIP-3P TESTPOINT DCON9M SMA SMA SIP-3P SIP-2P	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 772-227 FEC 911-938 FEC 176-986 FEC 150-559 FEC 150-559 FEC 150-750 PE4118 FEC 512-047 FEC 512-047 FEC 512-035 FEC 150-410 FEC 723-988
1 1 3 6 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R12 R42 SW1 SW2 J1 J2 J3 J4 J5 J6 J7 LK1 LK2 LK4 LK5 LK3 P1 P1	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount) Push Button Switch SPDT Switch - (Washable) Red Testpoint 9 PIN D-TYPE MALE (HORIZ) Do Not Inser GOLD 50Ω SMA SOCKET 3 pin header 2 pin header 2 pin header 2 pin header Shorting Shunt Pair PCB snap-on battery connector 9V PP3 Battery Rubber Stick-On Feet	Multicomp Multicomp Meggitt Multicomp Multicomp Multicomp Multicomp Multicomp Omron Apem Omron Apem W Hughes McMurdo Pasternack Harwin Harwin Harwin Keystone Duracell	Case 0805 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0805 SW\PB-SMALL SW_SIP-3P TESTPOINT DCON9M SMA SMA SIP-3P SIP-2P	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 772-227 FEC 911-938 FEC 176-986 FEC 150-559 FEC 150-750 PE4118 FEC 512-047 FEC 512-047 FEC 150-410 FEC 908-526
1 1 3 6 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R12 R42 SW1 SW2 J1 J2 J3 J4 J5 J6 J7 LK1 LK2 LK4 LK5 LK3 P1 P1	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount) Push Button Switch SPDT Switch - (Washable) Red Testpoint 9 PIN D-TYPE MALE (HORIZ) Do Not Inser GOLD 50Ω SMA SOCKET 3 pin header 2 pin header 2 pin header Shorting Shunt Pair PCB snap-on battery connector 9V PP3 Battery	Multicomp Multicomp Meggitt Multicomp Multicomp Multicomp Multicomp Multicomp Omron Apem Omron Apem W Hughes McMurdo Pasternack Harwin Harwin Harwin Keystone Duracell	Case 0805 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0805 SW\PB-SMALL SW_SIP-3P TESTPOINT DCON9M SMA SMA SIP-3P SIP-2P	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 772-227 FEC 911-938 FEC 176-986 FEC 150-559 FEC 150-750 PE4118 FEC 512-047 FEC 512-047 FEC 150-410 FEC 908-526
1 1 3 6 2 1 1 1 1 1 1 1 1 5 1 1 4 1 5 1 4 1 5 1 4 1 5 1 4 1 5 1 4 1 5 1 4 1 5 1 1 1 1 1 1 1 1 1 1 1 1 1	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R12 R42 SW1 SW2 T1-15 T19-21 J1 J2 J3 J4 J5 J6 J7 LK1 LK2 LK4 LK5 LK3 LK1-5 P1 P1 Each Corner EVAL-ADF411XEB1	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount) Push Button Switch SPDT Switch - (Washable) Red Testpoint 9 PIN D-TYPE MALE (HORIZ) Do Not Inser GOLD 50Ω SMA SOCKET 3 pin header 2 pin header 2 pin header 2 pin header Shorting Shunt Pair PCB snap-on battery connector 9V PP3 Battery Rubber Stick-On Feet	Multicomp Multicomp Meggitt Multicomp Multicomp Multicomp Omron Apem W Hughes McMurdo Pasternack Harwin Harwin Harwin Harwin UKeystone Duracell 3M	Case 0805 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0805 SW\PB-SMALL SW_SIP-3P TESTPOINT DCON9M SMA SMA SIP-3P SIP-2P	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 772-227 FEC 911-938 FEC 176-986 FEC 150-559 FEC 150-750 PE4118 FEC 512-047 FEC 512-047 FEC 150-410 FEC 908-526
1 1 3 6 2 1 1 1 1 1 1 1 5 1 1 4 1 5 2 1 4 1 5 1 4 1 5 1 4 1 5 1 4 1 5 1 1 1 1 1 1 1 1 1 1 1 1 1	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R12 R42 SW1 SW2 J1 J2 J3 J4 J5 J6 J7 LK1 LK2 LK4 LK5 LK3 LK1-5 P1 P1 Each Corner	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount) Push Button Switch SPDT Switch - (Washable) Red Testpoint 9 PIN D-TYPE MALE (HORIZ) Do Not Inser GOLD 50Ω SMA SOCKET 3 pin header 2 pin header 2 pin header 2 pin header Shorting Shunt Pair PCB snap-on battery connector 9V PP3 Battery Rubber Stick-On Feet	Multicomp Multicomp Meggitt Multicomp Multicomp Multicomp Omron Apem W Hughes McMurdo Pasternack Harwin Harwin Harwin Harwin UKeystone Duracell 3M	Case 0805 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0805 SW\PB-SMALL SW_SIP-3P TESTPOINT DCON9M SMA SMA SIP-3P SIP-2P	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 772-227 FEC 911-938 FEC 176-986 FEC 150-559 FEC 150-750 PE4118 FEC 512-047 FEC 512-047 FEC 150-410 FEC 908-526
1 1 3 6 2 1 1 1 1 1 1 1 5 1 1 4 1 5 2 1 4 4 4	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R12 R42 SW1 SW2 T1-15 T19-21 J1 J2 J3 J4 J5 J6 J7 LK1 LK2 LK4 LK5 LK3 LK1-5 P1 P1 Each Corner EVAL-ADF411XEB1	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount) Push Button Switch SPDT Switch - (Washable) Red Testpoint 9 PIN D-TYPE MALE (HORIZ) Do Not Inser GOLD 50Ω SMA SOCKET 3 pin header 2 pin header 2 pin header 2 pin header Shorting Shunt Pair PCB snap-on battery connector 9V PP3 Battery Rubber Stick-On Feet	Multicomp Multicomp Meggitt Multicomp Multicomp Multicomp Omron Apem W Hughes McMurdo Pasternack Harwin Harwin Harwin Harwin UKeystone Duracell 3M	Case 0805 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0805 SW\PB-SMALL SW_SIP-3P TESTPOINT DCON9M SMA SMA SIP-3P SIP-2P	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 772-227 FEC 911-938 FEC 176-986 FEC 150-559 FEC 150-750 PE4118 FEC 512-047 FEC 512-047 FEC 150-410 FEC 908-526
1 1 3 6 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1	R20 R21 R22 R23 R24 R25 R27 R28 R29 R30 R31 R32 R33 R40 R41 R36 R37 R38 R39 R12 R42 SW1 SW2 T1-15 T19-21 J1 J2 J3 J4 J5 J6 J7 LK1 LK2 LK4 LK5 LK3 LK1-5 P1 P1 Each Corner EVAL-ADF411XEB1	Do Not Inser 18r 1% Resistor (Surface Mount) 51r 1% Resistor (Surface Mount) Do Not Inser 10k 1% Resistor (Surface Mount) 100k 0.1% Resistor (Surface Mount) 330K 1% Resistor (Surface Mount) 0r 1% Resistor (Surface Mount) 0r 1% Resistor - Do Not Insert 4k7 1% Resistor (Surface Mount) Push Button Switch SPDT Switch - (Washable) Red Testpoint 9 PIN D-TYPE MALE (HORIZ) Do Not Inser GOLD 50Ω SMA SOCKET 3 pin header 2 pin header 2 pin header Shorting Shunt Pair PCB snap-on battery connector 9V PP3 Battery Rubber Stick-On Feet PCB	Multicomp Multicomp Meggitt Multicomp Multicomp Multicomp Omron Apem W Hughes McMurdo Pasternack Harwin Harwin Harwin Harwin UKeystone Duracell 3M	Case 0805 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0603 Case 0805 SW\PB-SMALL SW_SIP-3P TESTPOINT DCON9M SMA SMA SIP-3P SIP-2P	FEC 911-355 FEC 911-471 FEC 911-537 FEC 772-227 FEC 772-227 FEC 911-938 FEC 176-986 FEC 150-559 FEC 150-559 FEC 150-559 FEC 150-750 PE4118 FEC 512-047 FEC 512-035 FEC 150-410 FEC 723-988 FEC 908-526

Table 1. Bill of Materials for the EVAL-ADF411XEB1