DAXA-ED5 Specification

802.11a/n/ac 5GHz 4x4 Wave 2 PCIe mini card, QCA9980

Overview:

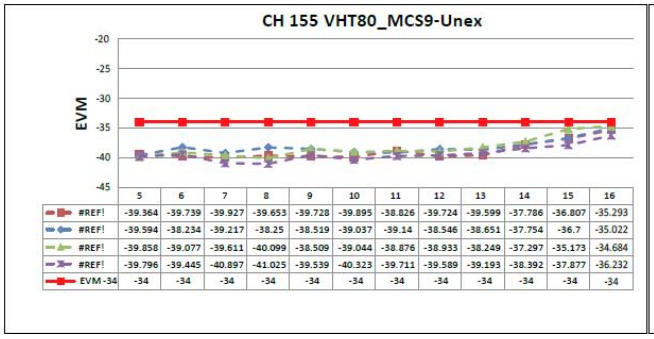
DAXA-ED5 is an 802.11a/n/ac 5GHz single band 4x4 MU-MIMO Wave 2 PCI-e mini card module which is designed to optimize the way Wi-Fi® devices are served in crowded carrier and enterprise environment. Features MU-MIMO, 256-QAM modulation, and explicit and implicit beamforming, DAXA-ED5 greatly improves Wi-Fi® performance for the growing number of connected devices in home, offices, and public hotspots.

Optimized spectrum usage with revolutionary Wave 2 MU-MIMO, DAXA-ED5 delivers up to 1.73Gbps wireless data rate and offers two to three times more network capacity to meet carrier and enterprise requirements for next generation performance and agility to support more connected devices.

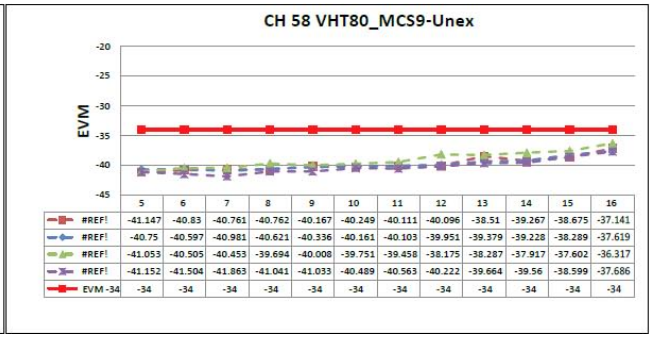
Key Features:

- External FEM used to extreme performance.
- Triples network and device performance and efficiency for the growing number of connected devices in crowded environment.
- Dynamically adapt to changes in channel conditions, device movement and application requirement to maximize throughput and device performance in complex multi-user networks.
- 73.7 (W) x 50.8 (L) mm wide size module with same mounting screw hole location of standard full size PCIe mini card to solid and firmly mount onto main board.
- Four U.FL antenna connectors enable design flexibility to utilize different transmit/receive chains to communicate with different users.
- Optical quality inspection and individual power calibration ensure high performance and stable quality.
- REACH and RoHS compliance ensure a high level protection of human health and the environment from risks that can be posed by chemicals.

Tx Power Capability

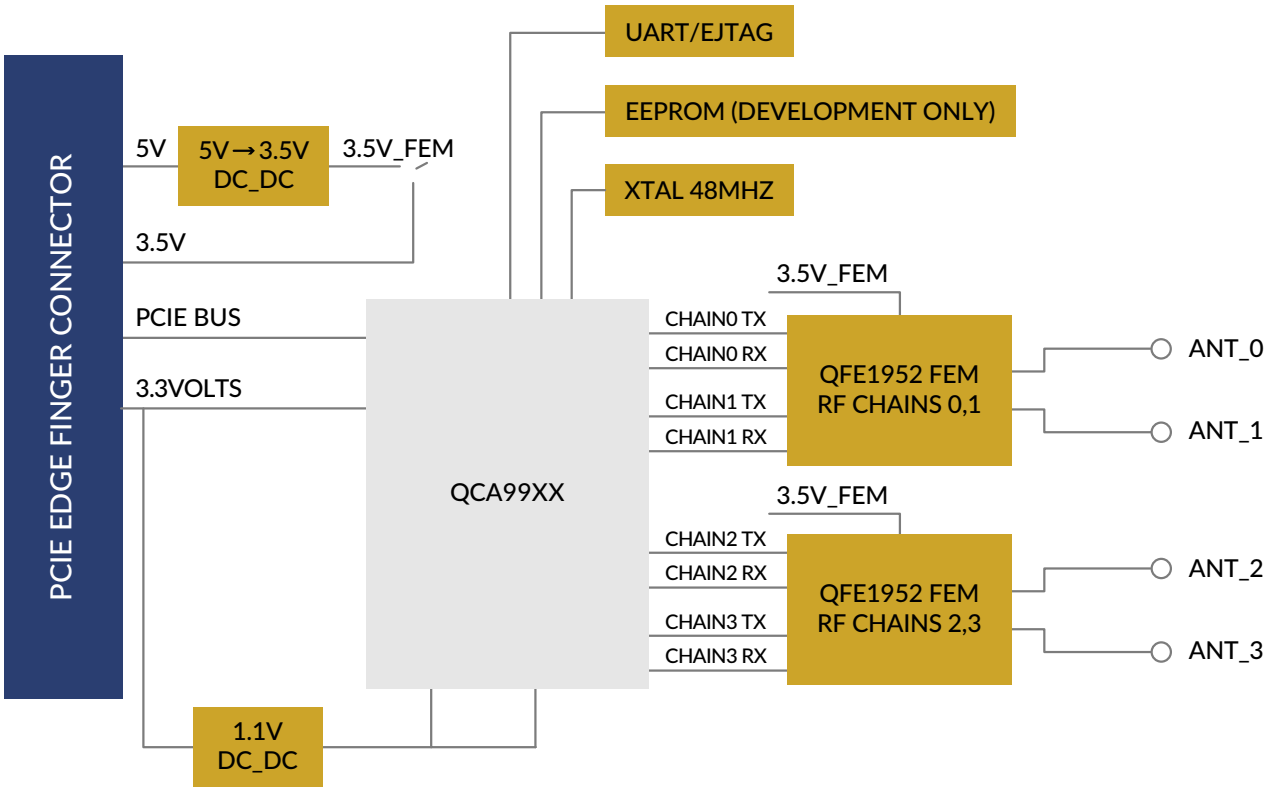


	5	6	7	8	9	10	11	12	13	14	15	16
#REF!	-39.364	-39.739	-39.927	-39.653	-39.728	-39.895	-38.826	-39.724	-39.599	-37.786	-36.807	-35.293
#REF!	-39.594	-38.234	-39.217	-38.25	-38.519	-39.037	-39.14	-38.546	-38.651	-37.754	-36.7	-35.022
#REF!	-39.858	-39.077	-39.611	-40.099	-38.509	-39.044	-38.876	-38.933	-38.249	-37.297	-35.173	-34.684
#REF!	-39.796	-39.445	-40.897	-41.025	-39.539	-40.323	-39.711	-39.589	-39.193	-38.392	-37.877	-36.232
EVM -34	-34	-34	-34	-34	-34	-34	-34	-34	-34	-34	-34	-34

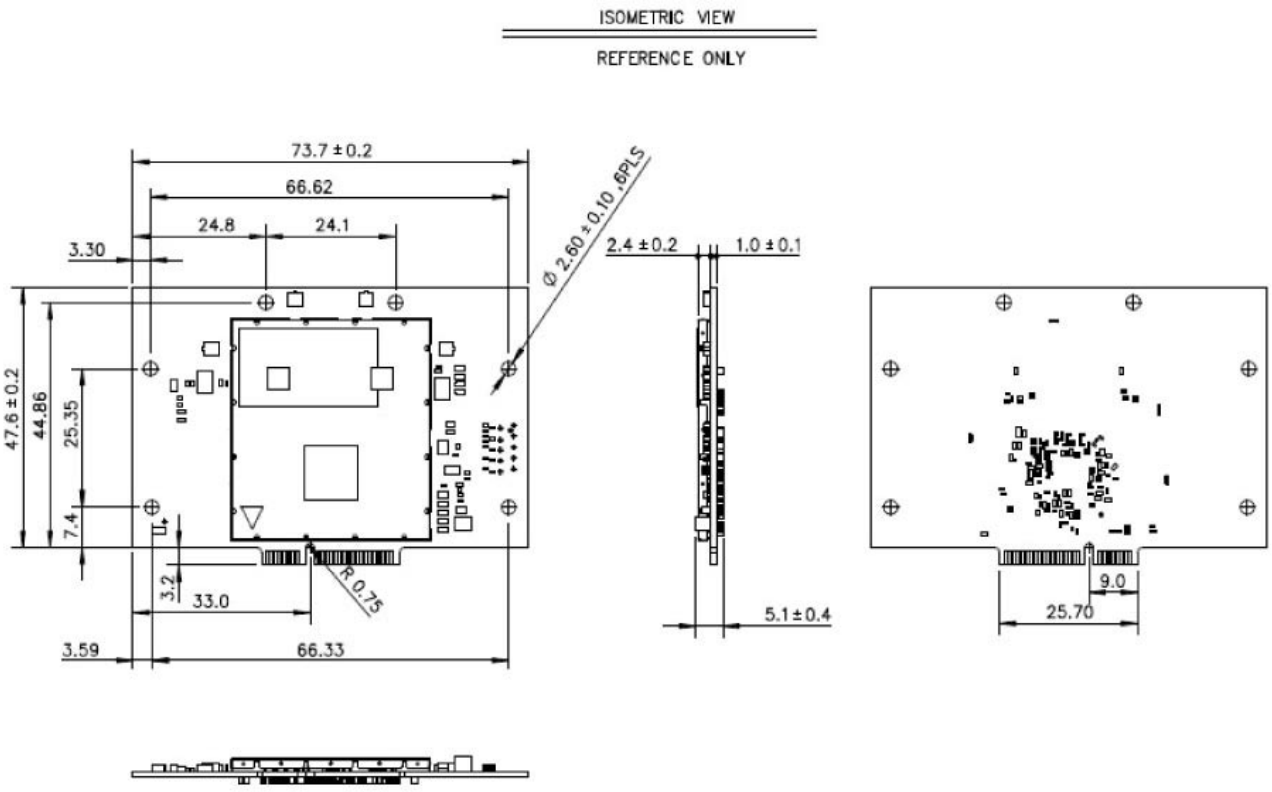


	5	6	7	8	9	10	11	12	13	14	15	16
#REF!	-41.147	-40.83	-40.761	-40.762	-40.167	-40.249	-40.111	-40.096	-38.51	-39.267	-38.675	-37.141
#REF!	-40.75	-40.597	-40.981	-40.621	-40.336	-40.161	-40.103	-39.951	-39.379	-39.228	-38.289	-37.619
#REF!	-41.053	-40.505	-40.453	-39.694	-40.008	-39.751	-39.458	-38.175	-38.287	-37.917	-37.602	-36.317
#REF!	-41.152	-41.504	-41.863	-41.041	-41.033	-40.489	-40.563	-40.222	-39.664	-39.56	-38.599	-37.686
EVM -34	-34	-34	-34	-34	-34	-34	-34	-34	-34	-34	-34	-34

Block Diagram



Mechanical Outline



Specifications:

Main Chipset	QCA9980
Tx/Rx	4T4R
Standard Conformance	802.11a, 802.11n and 802.11ac
Frequency Range	» USA: » 5.15 – 5.35GHz » 5.47 – 5.725GHz » 5.725 – 5.85GHz » Europe: » 5.15 – 5.35GHz » 5.47 – 5.725GHz » Japan: » 5.15 – 5.35GHz » 5.47 – 5.725GHz » China: » 5.725 – 5.85GHz
Interface	miniPCI-Express 2.0
Operating Channels	» USA/Canada: 12 non-overlapping channels » Major Europe Countries: 19 non-overlapping channels » Japan: 19 non-overlapping channels » China: 5 non-overlapping channels

Operation Voltage

» 3.3VDC power supply

» 3.5V or 5V power for FEM (5V is provided by default, 3.5V shall be provided by project request)

Power Consumption (typical level, with ± 50mA tolerance)

SGC_CUS5_Condition	3.3V for main IC Avg.	5V to 3.5V for FEM Avg.	Watt	Unit
11g Cont. Tx@ 6M, 4TX, 18dBm/each chain	595	1220	8.0635	mA
11g Cont. Tx@ 54M, 4TX, 15dBm/each chain	525	850	5.9825	
11ac Cont. Tx@ VH20_MCS0, 4TX, 17dBm/ each chain	575	1050	7.1475	
11ac Cont. Tx@ VH40_MCS0, 4TX, 17dBm/ each chain	610	1110	7.563	
11ac Cont. Tx@ VH80_MCS0, 4TX, 17dBm/ each chain	650	1100	7.645	
11ac Cont. Tx@ VH20_MCS0, 4TX, 14dBm/ each chain	570	920	6.481	
11ac Cont. Tx@ VH40_MCS0, 4TX, 13dBm/ each chain	580	830	6.064	
11ac Cont. Tx@ VH80_MCS0, 4TX, 13dBm/ each chain	610	830	6.163	
Standby	235	40	0.9755	

Output Power (typical power level (dBm) with ± 2dB tolerance)

a/n/ac (Power Per Chain)

		Channel		
		CH36~48	CH52~64	CH100~165
20MHz BW	6Mbps	18	18	18
	9Mbps	18	18	18
	12Mbps	18	18	18
	18Mbps	18	18	18
	24Mbps	18	18	18
	36Mbps	17	17	17
	48Mbps	16	16	16
	54Mbps	15	15	15
	HT20MCS0	18	18	18
	HT20MCS1	18	18	18
	HT20MCS2	18	18	18
	HT20MCS3	18	18	18
	HT20MCS4	18	18	18
	HT20MCS5	17	17	17
	HT20MCS6	16	16	16
	HT20MCS7	15	15	15
40MHz BW	HT40MCS0	17	17	17
	HT40MCS1	17	17	17
	HT40MCS2	17	17	17
	HT40MCS3	17	17	17
	HT40MCS4	17	17	17
	HT40MCS5	17	17	17
	HT40MCS6	16	16	16
	HT40MCS7	15	15	15

VHT	MCS0	17	17	17
20/40/80MHz BW	MCS1	17	17	17
	MCS2	17	17	17
	MCS3	17	17	17
	MCS4	17	17	17
	MCS5	16	16	16
	MCS6	16	16	16
	MCS7	15	15	15
	MCS8	14	14	14
	MCS9	13	13	13

Receiver Sensitivity (typical sensitivity level per chain with +4/-2dB tolerance)

a/n/ac (All Chain Combined)

		Channel		
		CH36~48	CH52~64	CH100~165
20MHz BW	6Mbps	-90	-90	-90
	54Mbps	-73	-73	-73
	HT20MCS0	-90	-90	-90
	HT20MCS7	-70	-70	-70
	VHT20MCS0	-89	-89	-89
	VHT20MCS8	-65	-65	-65
40MHz BW	HT40MCS0	-88	-88	-88
	HT40MCS7	-68	-68	-68
	VHT40MCS0	-87	-87	-87
	VHT40MCS9	-63	-63	-63
80MHz BW	VHT80MCS0	-86	-86	-86
	VHT80MCS9	-60	-60	-59

Antenna Connector

four U.FL ultra-miniature coaxial antenna connectors

Dimension

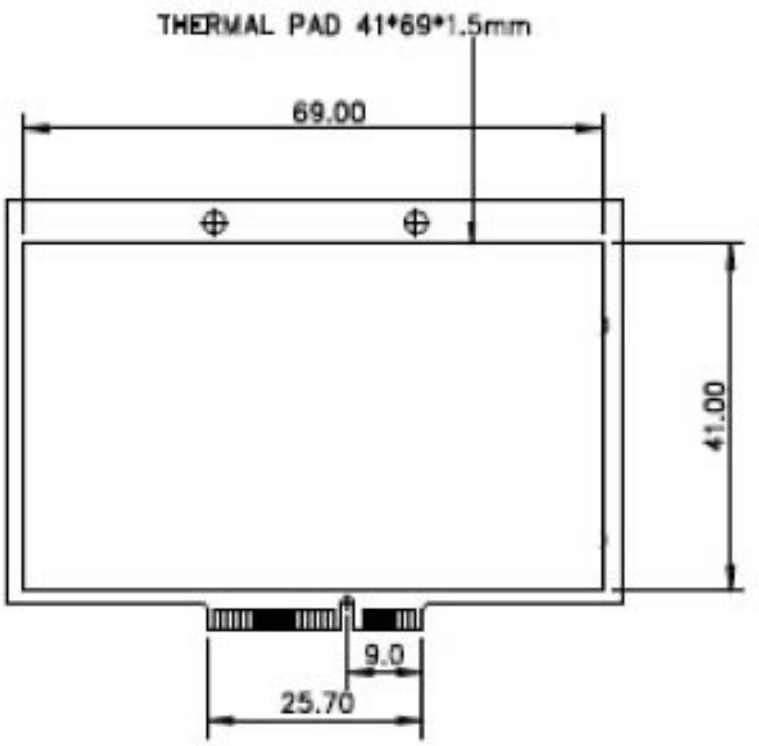
73.7 (W) x 50.8(L) mm wide size

Operation Temperature Range	-10°C ~ +50°C (ambient)
Storage Temperature Range	-20°C ~ +80°C
Operating Humidity	15% ~ 95%, non-condensing
Storage Humidity	max. 95%, non-condensing
Human Health & Environment-Friendly Compliance	REACH and RoHS

Application Note:

Strongly recommend to add thermal pad to back-side of DAXA-ED5 to secure stable performance.

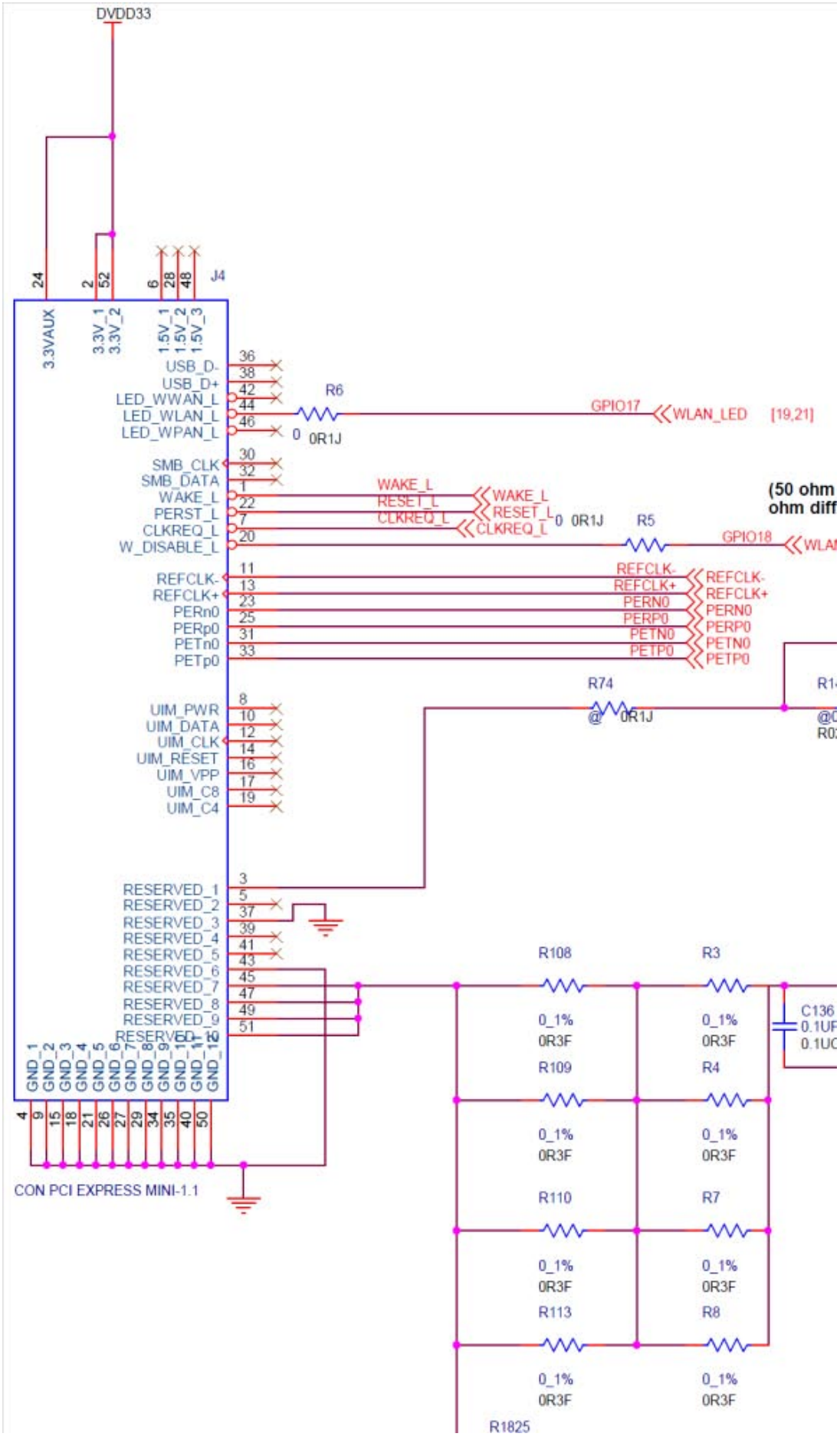
Thermal Pad: 41mm x 69mm x 1.5T PK605



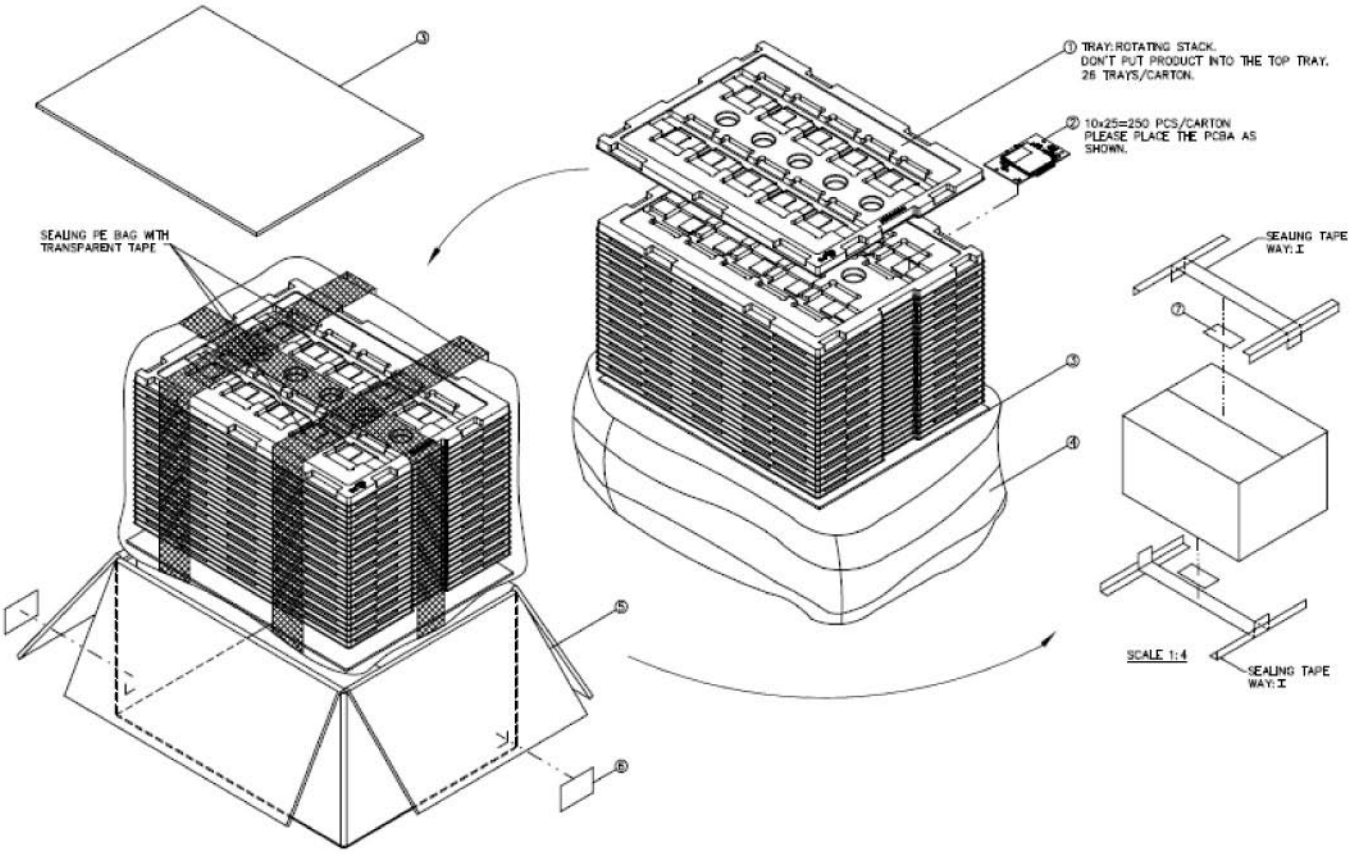
Pin Define:

Pin No.	Name	Direction	Description
4,9,15,18,21,26,27,29, 34,35,40,50	GND	---	Ground
43	RESERVED	---	Ground
37	RESERVED	---	Ground
39,41	RESERVED	---	No connection
49,51	RESERVED	I	External 5V Power Supply for FEM (3.5V by project request)
3	RESERVED	I/O	Reserved for QCA GPIO(CHP_PWD_L)
47	RESERVED	I/O	External 5V Power Supply for FEM (3.5V by project request)
45	RESERVED	I/O	External 5V Power Supply for FEM (3.5V by project request)
5	RESERVED	I/O	No connection
8,10,12,14,16,17,19,	NC	---	No connection
33	PETp0	Analog input signal	Differential receive
31	PETn0	Analog input signal	Differential receive
25	PERP0	Analog output signal	Differential trnasmit
23	PERN0	Analog output signal	Differential trnasmit
13	REFCLK+	Analog input signal	Differential reference clock (100MHz)
11	REFCLK-	Analog input signal	Differential reference clock (100MHz)
20	WLAN_DISABLE_L	I/O	Reserved for QCA
7	CLKREQ_L	A digital output signal	Reference clock request, open drain

Pin No.	Name	Direction	Description
22	PERST_L	Input siganls with	PCI Express reset with weak pull down
1	WAKE_L	A digital output signal	Reserved for 3.3V or WAKE2_L (Request)
32	SMB_DATA	---	No connection
30	SMB_CLK	---	No connection
46	LED_WPAN_L	O	No connection
44	LED_WLAN_L	O	Reserved for QCA GPIO(LED_WLAN_L)
42	LED_WWAN_L	---	No connection
38	USB_D+	I/O	USB_D+
36	USB_D-	I/O	USB_D-
6,28,48	1.5V	---	No connection
2,52	3.3V	---	3.3V
24	3.3VAUX	---	3.3V


DVDD33
J4
3.3VAUX
3.3V_1
3.3V_2
1.5V_1
1.5V_2
1.5V_3
USB_D-
USB_D+
LED_WWAN_L
LED_WLAN_L
LED_WPAN_L
R6
0 0R1J
GPIO17
WLAN_LED
[19,21]
SMB_CLK
SMB_DATA
WAKE_L
PERST_L
CLKREQ_L
W_DISABLE_L
RESET_L
0 0R1J
R5
GPIO18
(50 ohm
ohm diff
REFCLK-
REFCLK+
PERn0
PERp0
PETn0
PETp0
PERN0
PERP0
PETN0
PETP0
R74
@ 0R1J
UIM_PWR
UIM_DATA
UIM_CLK
UIM_RESET
UIM_VPP
UIM_C8
UIM_C4
RESERVED_1
RESERVED_2
RESERVED_3
RESERVED_4
RESERVED_5
RESERVED_6
RESERVED_7
RESERVED_8
RESERVED_9
GND_1
GND_2
GND_3
GND_4
GND_5
GND_6
GND_7
GND_8
GND_9
GND_10
GND_11
GND_12
CON PCI EXPRESS MINI-1.1
R108
R3
R109
R4
R110
R7
R113
R8
0_1%
0R3F
C136
0.1UF
R1825

Packing:


③
① TRAY: ROTATING STACK.
DON'T PUT PRODUCT INTO THE TOP TRAY.
26 TRAYS/CARTON.
② 10×25=250 PCS/CARTON
PLEASE PLACE THE PCBA AS
SHOWN.
SEALING PE BAG WITH
TRANSPARENT TAPE
SEALING TAPE
WAY: I
⑦
③
④
⑤
⑥
SCALE 1:4
SEALING TAPE
WAY: I

Ordering Information:

DAXA-ED5	802.11a/n/ac 5GHz 4x4 Wave 2 PCIe mini card, QCA9980

Wireless radio modules are ESD sensitive, especially the components such as RF switch and the power amplifier. To avoid damage by electrostatic discharge, the following installation procedure is recommended:

» Touch your hands and the bag or tray containing the radio module to a ground point on the host board (for example one of the mounting holes).

» Install the radio module in the corresponding socket of host board.

» Install the pigtail cable in the cutout of the enclosure. This will ground the pigtail to the enclosure.

» Touch the I-PEX connector of the pigtail to the mounting hole (discharge), then plug onto the radio module.

» Use external lightning protection for outdoor applications.

» Make sure all antennas are being connected with the radio module (don't leave I-PEX connector open) before powering on the host device.