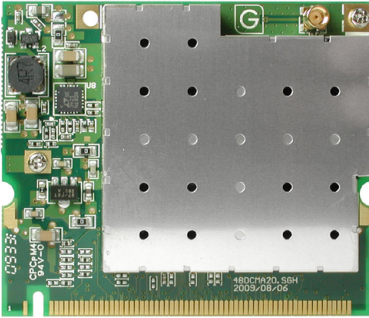




5.9GHz DSRC wireless mini-PCI, AR5414A-B2B



Model: DCMA-86P2



DCMA-86P2 is the first 5.86 – 5.92GHz industrial-grade high power wireless mini-PCI designed specifically to support communications for vehicle-to- vehicle (V2V) or vehicle-to-roadside (V2R) applications using 5.9GHz DSRC protocol.

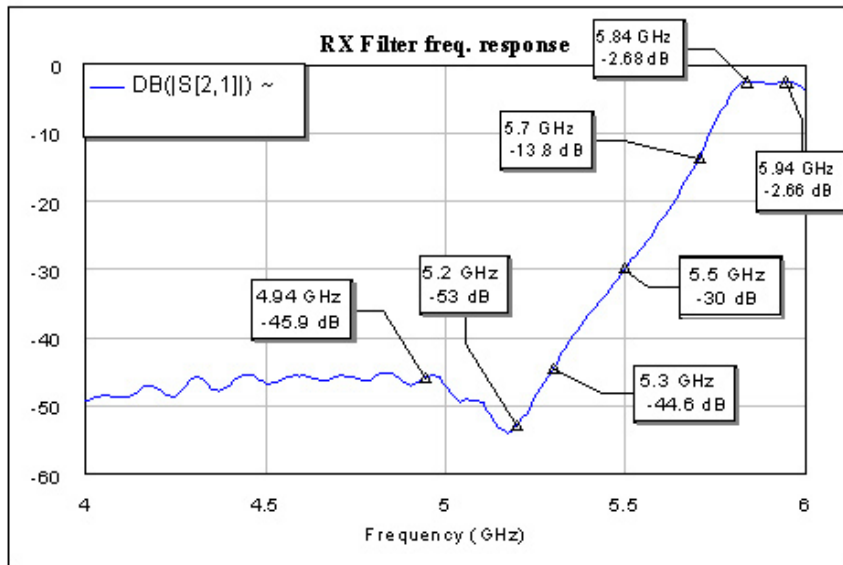
Unique combination of dedicated temperature compensated crystal oscillator (TCXO) for OSC source, industrial-grade wireless chipset and components, and more than 7 years Atheros chipset / RF design experience enables DCMA-86P2 to support 1). less than ± 10 ppm transmitted center frequency tolerance, 2). less than 10dBm antenna input power and 23dBm EIRP over temperature range $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$ and 3). type I and type II receiver's alternate adjacent channel rejection, which almost comply with ASTM E2213 requirement.

Key Features:

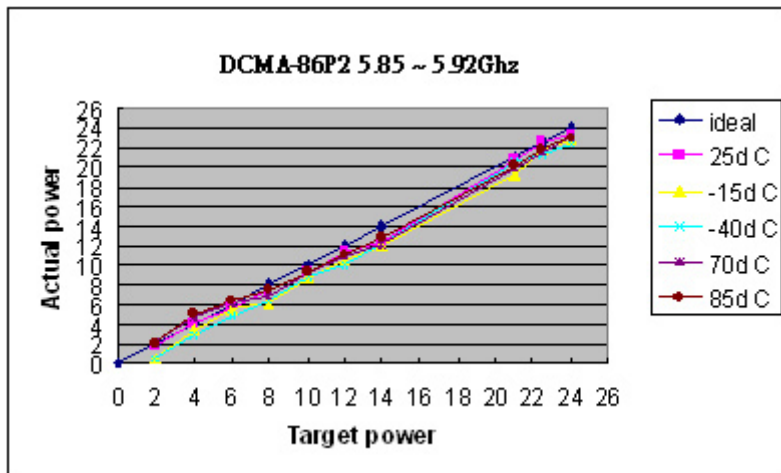
- Dedicated temperature compensated crystal oscillator (TCXO) used to ensure less than ± 10 ppm transmitted center frequency deviation over wide $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$ temperature range.
- Real industrial-grade chipset and components with unique design / production calibration know-how enable power control accuracy from 2.5dBm \sim 24dBm over wide $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$ temperature range.
- Dedicated high rejection Rx filter operates in 5.86-5.92 GHz frequencies used to meet ASTM E2213.03 Clause 8.10.2. type I adjacent/alternate adjacent and type II alternate adjacent channel rejection requirement.
- RF ESD and Surge protection up to 14KV ensures highest level of performance and reliability in the harshest outdoor vehicular deployments.
- Average power up to 251mW (24dBm) meets DRSC Class C output requirement and provides superior wifi coverage.
- Dual power supply plus heat sink design makes critical components temperature cooler by up to 10°C , significantly reduces components aging caused by thermal to ensure long-term performance reliability.
- PA fine-tuning gains balance of linearity and power consumption with enough margins while maintaining adequate Tx power to ensure no major performance degradation over time.
- Same EVM on both light and heavy loading maintain lower packet error to increase channel efficiency.
- Less than 50mV output ripple design ensures high performance while remaining conscious of power efficiency.
- Max. 7dB sensitivity improvement at 5.92GHz/13.5Mbps/5MHz BW than Atheros MB62 reference design.
- Mini-PCI Type IIIA form factor with screw hole is ideal for solid mounting onto motherboard to against vibration.
- One DIP type MMCX RF connector enables robust assembly and lower loss for external antenna.
- RoHS compliance meets environment-friendly requirement.
- Flexible power supply design to easily change from 3.3Vdc (default) to 3.3Vdc+5Vdc by only one on-board resistor shift to meet power budget requirement of different platforms.

Why DCMA-86P2 is first and only wireless mini-PCI for V2V and V2R applications using 5.9GHz DSRC protocol?

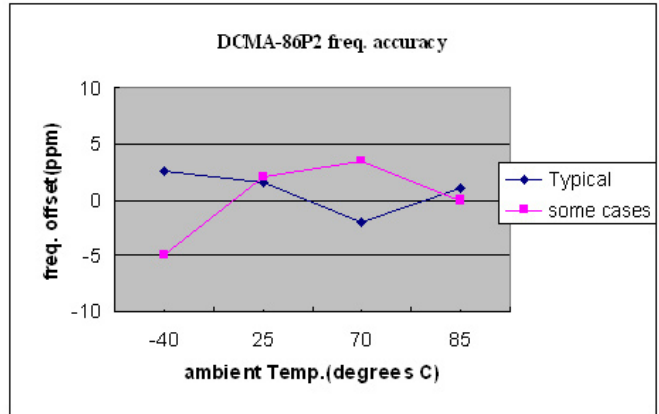
1. Frequency response and alternate adjacent channel rejection in 5.86 ~ 5.92GHz:



2. Power control accuracy from 2.5dBm ~ 24dBm over wide -40°C ~ +85°C temperature range.

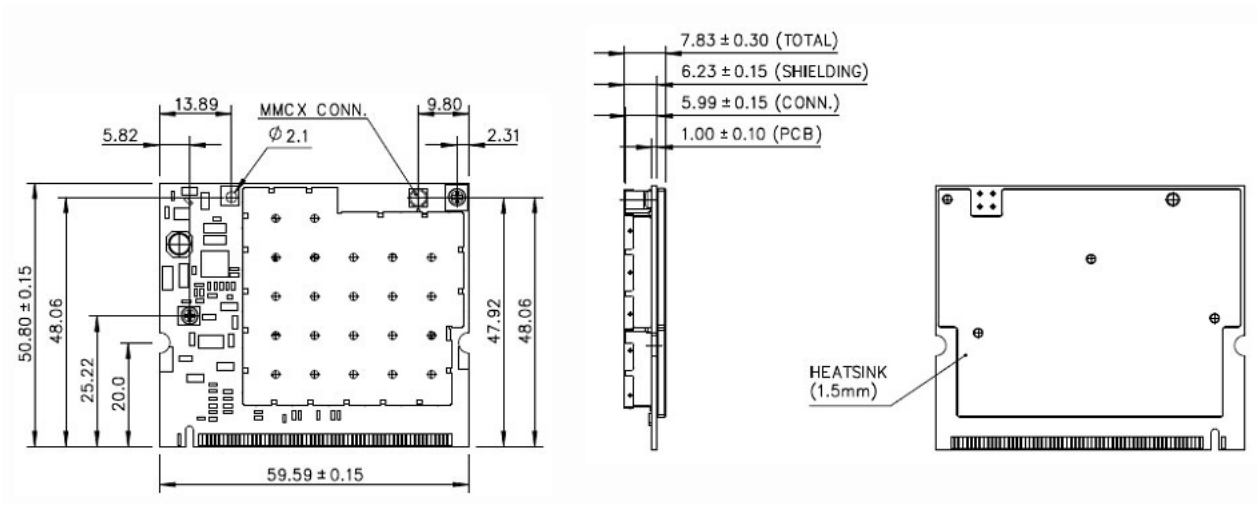


3. less than ± 10 ppm transmitted center frequency tolerance in $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$ temperature rang.



4. Max. 7dB sensitivity improvement at 5.92GHz/13.5Mbps/5MHz BW than Atheros MB62 reference design.

Mechanical Outline



Specifications:			
Chipset	Atheros AR5414A-B2B		
Frequency Range	5.86 ~ 5.92GHz		
Channel Bandwidth	40MHz, 20MHz, 10MHz, and 5MHz		
Frequency Tolerance	transmitted center frequency tolerance \pm 10ppm max.		
Interface	32-bit mini-PCI Type IIIA		
Operation Voltage	3.3 \pm 5% VDC		
Modulation Technique	OFDM with BPSK, QPSK, 16-QAM, and 64-QAM		
Data Rate	<ul style="list-style-type: none"> ▪ 20MHz BW: 6, 9, 12, 18, 24, 36, 48, 54Mbps ▪ 10MHz BW: 3, 4.5, 6, 9, 12, 18, 24, 27Mbps ▪ 5MHz BW: 1.5, 2.75, 3, 4.5, 6, 9, 12, 13.5Mbps 		
Transmit Power		5860MHz Ave./Peak	5920MHz Ave./Peak
	1.5/3/6Mbps	24/29dBm	24/29dBm
	2.75/4.5/9Mbps	24/29dBm	24/29dBm
	3/6/12Mbps	24/29dBm	24/29dBm
	4.5/9/18Mbps	24/29dBm	24/29dBm
	6/12/24Mbps	24/29dBm	24/29dBm
	9/18/36Mbps	23/28dBm	23/28dBm
	12/24/48Mbps	20.5/25.5dBm	20.5/25.5dBm
	13.5/27/54Mbps	19/24dBm	18.5/23.5dBm
	<p>Remark: The default transmit power setting of DCMA-86P2 is as above. If ASTM E2213-03 Clause 8.9.1.10 Class-C power mask conformance required, please make sure to change the power setting of DCMA-86P2 to be lower than 20dBm.</p>		

Specifications:

Sensitivity (tolerance ± 2 dB)

20MHz BW	Min.(-40°C)	Typical(+25°C)	Max.(+85°C)
6Mbps	-94.5dBm	-93dBm	-91.5dBm
9Mbps	-94.5dBm	-93dBm	-91.5dBm
12Mbps	-92.5dBm	-91dBm	-89.5dBm
18Mbps	-90.5dBm	-89dBm	-87.5dBm
24Mbps	-87.5dBm	-86dBm	-84.5dBm
36Mbps	-83.5dBm	-82dBm	-80.5dBm
48Mbps	-78.5dBm	-77dBm	-75.5dBm
54Mbps	-76.5dBm	-75dBm	-73.5dBm

10MHz BW	Min.(-40°C)	Typical(+25°C)	Max.(+85°C)
3Mbps	-98dBm	-96dBm	-94.5dBm
4.5Mbps	-98dBm	-96dBm	-94.5dBm
6Mbps	-97dBm	-95dBm	-93.5dBm
9Mbps	-94dBm	-92dBm	-90.5dBm
12Mbps	-91dBm	-89dBm	-87.5dBm
18Mbps	-87dBm	-85dBm	-83.5dBm
24Mbps	-82dBm	-80dBm	-78.5dBm
27Mbps	-81dBm	-79dBm	-77.5dBm

5MHz BW	Min.(-40°C)	Typical(+25°C)	Max.(+85°C)
1.5Mbps	-101dBm	-99dBm	-97.5dBm
2.75Mbps	-101dBm	-99dBm	-97.5dBm
3Mbps	-100dBm	-98dBm	-96.5dBm
4.5Mbps	-98dBm	-96dBm	-94.5dBm
6Mbps	-94dBm	-92dBm	-90.5dBm
9Mbps	-91dBm	-89dBm	-87.5dBm
12Mbps	-86dBm	-84dBm	-82.5dBm
13.5Mbps	-84dBm	-82dBm	-80.5dBm

Power Consumption

3.3V power supply only:

	-40°C	25°C	85°C
Cont. Tx @ 24dBm 6M	1.15A	1.4A	1.45A
Cont. Tx @ 21dBm 6M	0.93A	1.15A	1.16A
Cont. Tx @ 15dBm 6M	0.83A	0.87A	0.93A
Cont. Tx @ 5dBm 6M	0.7A	0.75A	0.8A
Chariot @ 24dBm 6M	1.05A	1.4A	1.26A
Cont. Rx	0.7A	0.26A	0.27A
Idle	0.28A	0.3A	0.3A

3.3+5V power supply @ 25°C:

	3.3V	5.0V
Cont. Tx @ 25dBm 6M	0.68A	0.44A
Cont. Tx @ 21dBm 54M	0.61A	0.31A

Antenna

one DIP MMCX RF connector for robust antenna assembly

Dimension

59.6 mm(L) x 50.8mm(W) x 7.5mm(H)

Operation Temperature Range

-40°C ~ +85°C

Specifications:	
Storage Temperature Range	-45°C ~ +90°C
Operating Humidity	10% ~ 95%, non-condensing
Storage Humidity	max. 95%, non-condensing
Environment-Friendly Compliance	RoHS

Ordering Information:	
DCMA-86P2	5.9GHz DSRC wireless mini-PCI, AR5414A-B2B
ESD Cable	UL 1007 18AWG, length 19cm, for ground end to enclosure point tied to earth ground.



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