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www.sunon.com

SUNON®

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Thermal Solution
5G Telecom Networking

Server/Switch/Router/WIFI 6 Router/5G Small Cell

*All products are RoHS compliant.

ABOUT SUNON

Over 41 years, SUNON has specialized in various types of thermal solutions related to motors, fans, and ventilators for a wide range of applications. We offer optimal thermal solutions and prompt responses to clients' needs, with customer service and technical support networks all around the world.



5G ERA

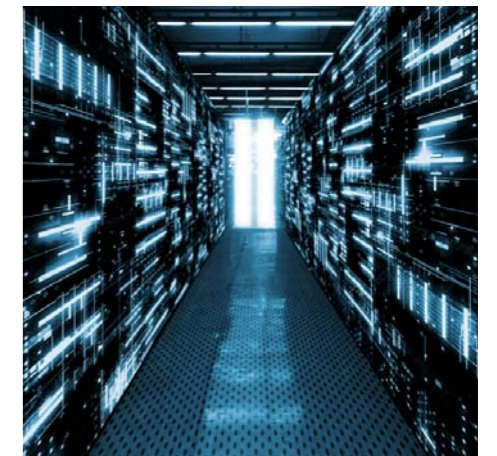
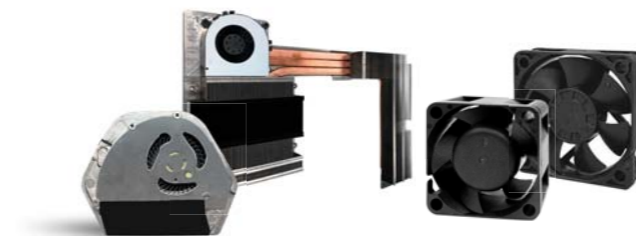
Smart Life
High-speed Connections

Global corporations have invested time and effort in building 5G infrastructure and networks. The best 5G operating performance is determined by a seamless integration of ultra-high speed, ultra-low latency and high capacity. SUNON can design suitable thermal modules to meet 5G thermal needs and offer an optimal and efficient thermal solution in the limited spaces of 5G infrastructure's internal structures.

Networking

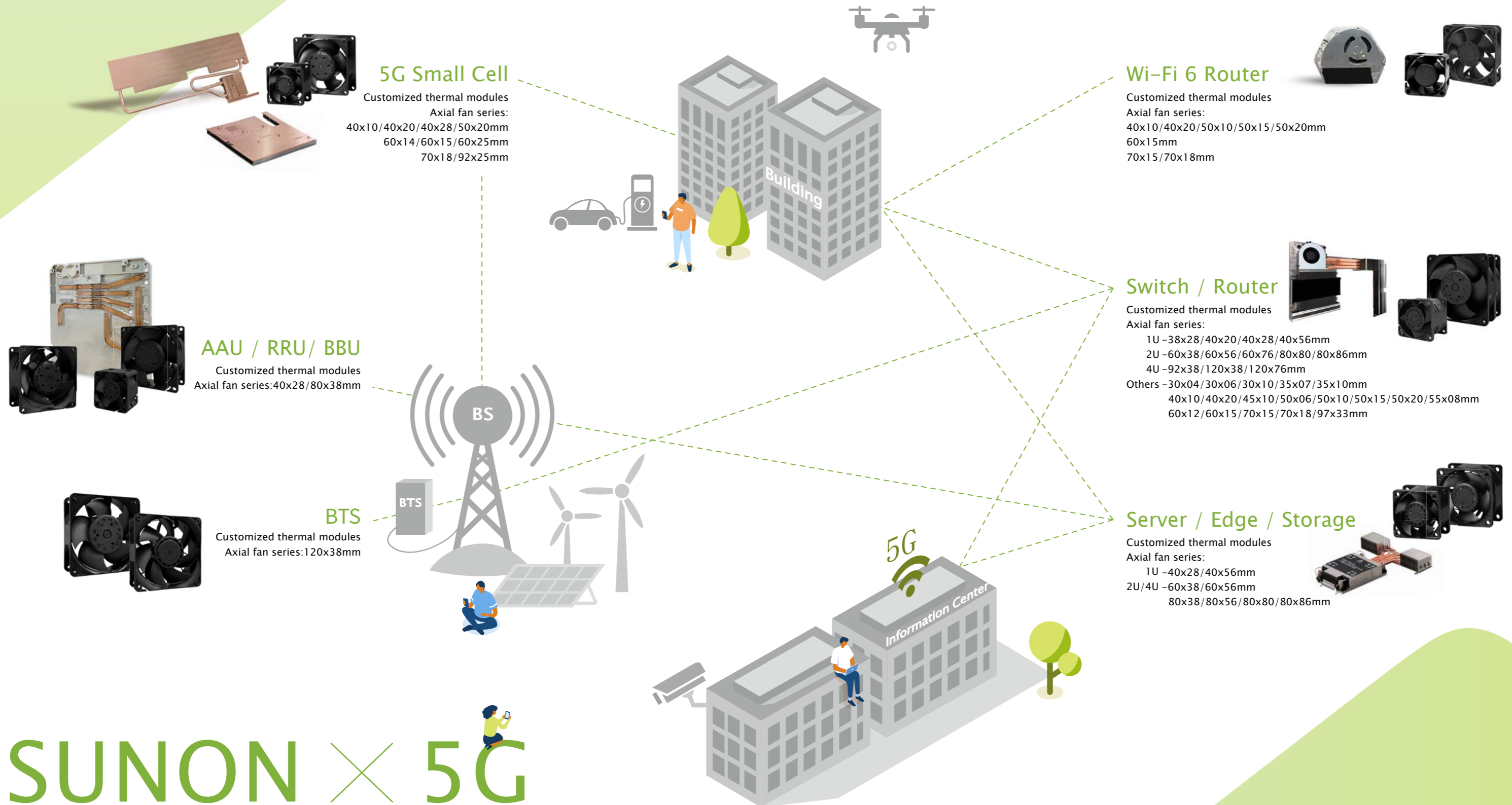


Base Stations



SUNON × 5G

Facing 5G Era fast development, SUNON with solid technical support skills can design a variety of higher performance thermal products In response to the growing 5G industry, so that we offer the best thermal solution for various 5G applications.



5G Small Cell

Customized thermal modules
Axial fan series:
40x10/40x20/40x28/50x20mm
60x14/60x15/60x25mm
70x18/92x25mm

Wi-Fi 6 Router

Customized thermal modules
Axial fan series:
40x10/40x20/50x10/50x15/50x20mm
60x15mm
70x15/70x18mm

AAU / RRU / BBU

Customized thermal modules
Axial fan series:40x28/80x38mm

Switch / Router

Customized thermal modules
Axial fan series:
1U -38x28/40x20/40x28/40x56mm
2U -60x38/60x56/60x76/80x80/80x86mm
4U -92x38/120x38/120x76mm
Others -30x04/30x06/30x10/35x07/35x10mm
40x10/40x20/45x10/50x06/50x10/50x15/50x20/55x08mm
60x12/60x15/70x15/70x18/97x33mm

BTS

Customized thermal modules
Axial fan series:120x38mm

Server / Edge / Storage

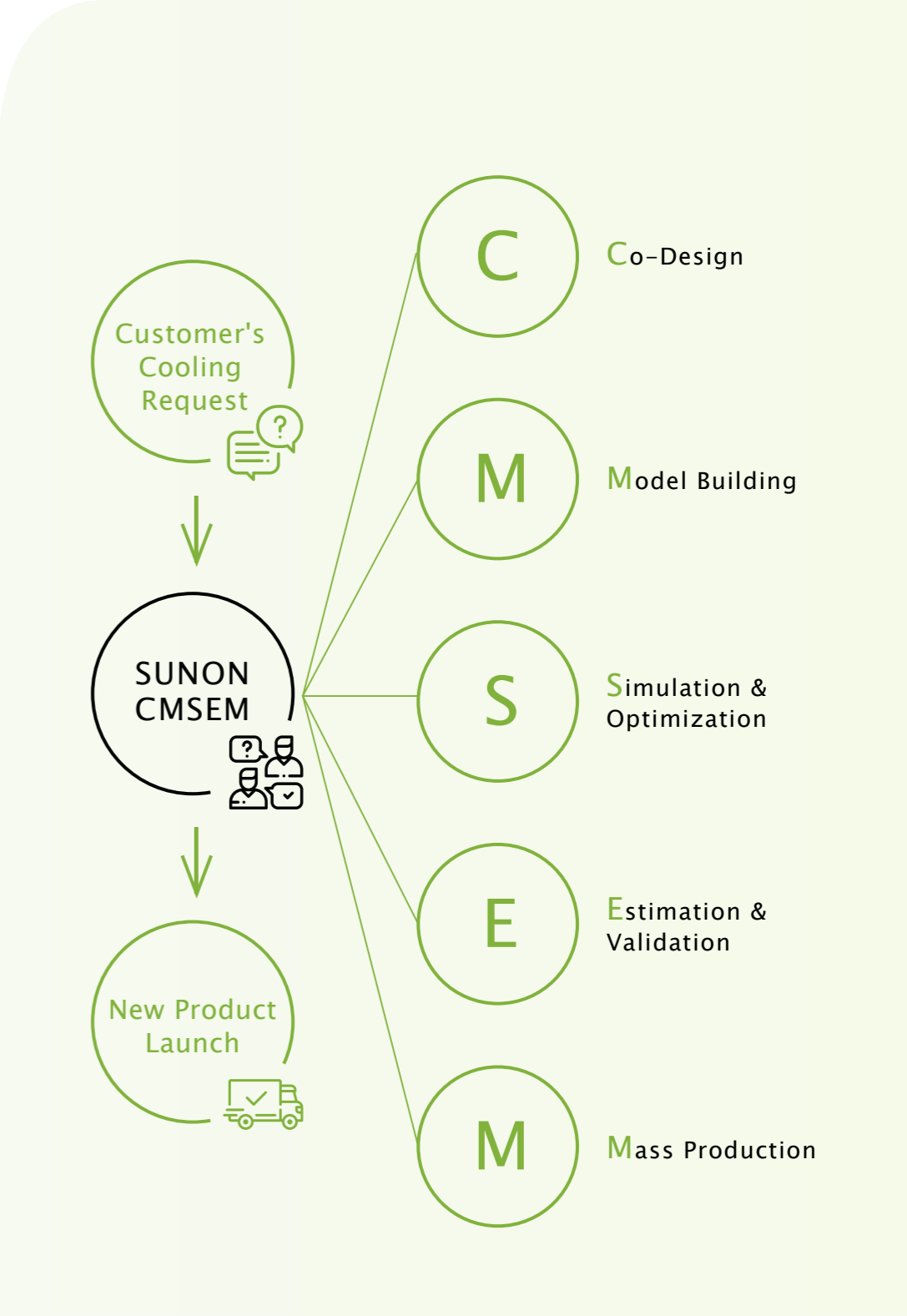
Customized thermal modules
Axial fan series:
1U -40x28/40x56mm
2U/4U -60x38/60x56mm
80x38/80x56/80x80/80x86mm

SUNON Optimal Cooling Solution

Product Info	Cooling Fans	Cooling Modules				
		Air Cooling	Liquid Cooling	Passive Cooling		
	DC Fan & Blower EC Fan AC Fan & Blower	Fan Cooling Module	Cold Plates	Heat Sink (HS)	Heat Pipe (HP)	Vapor Chamber (VC)
		Custom Design	Integral Pipelining Embedded	Extrusion Die Casting Skived Fin Stacked Fin	Custom Design	Custom Design
Features	<ul style="list-style-type: none"> • High fan efficiency • Low noise • Energy saving • Long life 	<ul style="list-style-type: none"> • The most efficient heat dissipation solution 	<ul style="list-style-type: none"> • Compact design • Large power carrier • Effective space utilization 	<ul style="list-style-type: none"> • High reliability • Economic thermal solution 	<ul style="list-style-type: none"> • Various pipe design • Flexible configuration 	<ul style="list-style-type: none"> • Better isothermal system • High Qmax

SUNON Comprehensive Thermal Solution and Technical Support Service

SUNON is an original cooling product manufacturer. We are 100% research-based, designing and manufacturing a variety of fans, vapor chambers and heat pipes and more, We can configure both active and passive cooling components to provide our clients a full range of cooling solutions through the use of scientific simulation and equipment. SUNON aims to give excellent service in thermal solutions, satisfying clients' thermal requirements for any function, sizes, and budget.



WHAT WE DO

CMSEM One-Stop Thermal Solution Service

SUNON provides a set of CMSEM services, designing thermal solutions from scratch. We work together with our clients to design the best thermal modules for their individual needs. Then, we create a model to simulate and optimize each module's thermal performance, which is passed through various estimation and mass-production phrases. Through collaboration, the highest quality of service, and a timesaving process of solving heat problems, SUNON provides our clients with optimal thermal solutions.



5G Networking Applications

Living a 5G smart lifestyle is secured by high-performance data processing and transmission within networking systems, however, when those systems operate in a poorly ventilated environment, serious lag between applications can occur. SUNON efficiently addresses heat dissipation problems by providing thermal solutions, by which data and information are processed without any disruption at ultralow latency and ultrahigh speed.



SUNON is 100% designing and manufacturing a variety of fans and cooling modules that are based on each client's thermal needs, suitable for outdoor base stations to indoor networking applications such as server and router. We can solve most of heat problems for the entire 5G applications to enhance the internet connection.

Server Storage Edge



Switch Router



Wi-Fi 6 Router



5G Small Cell



Fan & Cooling Module

- Adopting cutting-edge thermal technologies such as AntiVib motor- and power-saving circuits ensures thermal effectiveness.
- Maximizes server system operation performance.



- Fan tray solution and various cooling components are suitable for switch and router use
- Increases the capacity of data transmission.



- The best air cooling solution with high performance.
- Space utilization and maximal thermal effectiveness.



- High effective fan solution and a variety of configurations available.
- Customized designs such as IP protection for different thermal needs.



System View

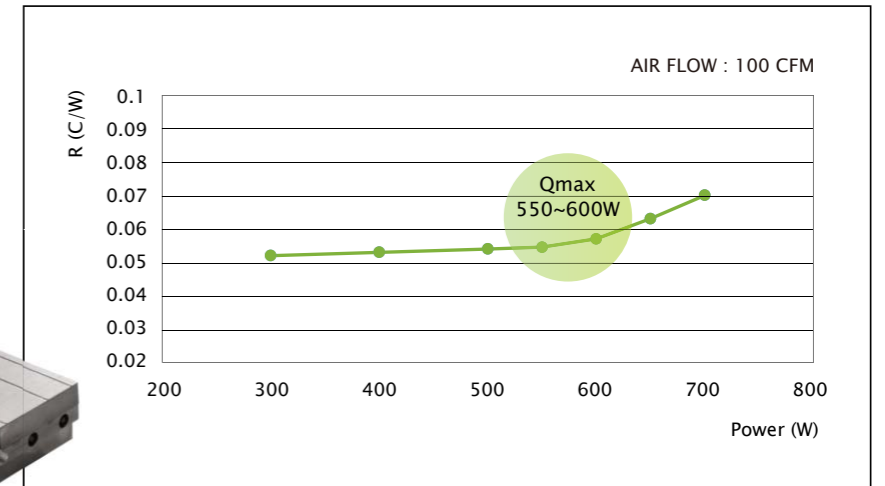
Thermal Solution

5G Networking Applications Cooling Modules

We customize a full range of cooling solutions to offer the best thermal solutions, meeting clients' goals and needs for any function, sizes, and budget.

High Power Heat Pipe Solution

- > Higher level thermal conductivity : 92~100w TDP.
- > Excellent thermal equilibrium, 80% plus increase in thermal effectiveness.
- > Can be configured with other components for high powered applications to reduce thermal resistance.



For Intel CPU Coolers and Edge and Storage

> SUNON introduces and develops the latest thermal specification for Intel server CPU coolers and various custom-design cooling modules, to fully satisfy networking applications' thermal needs.



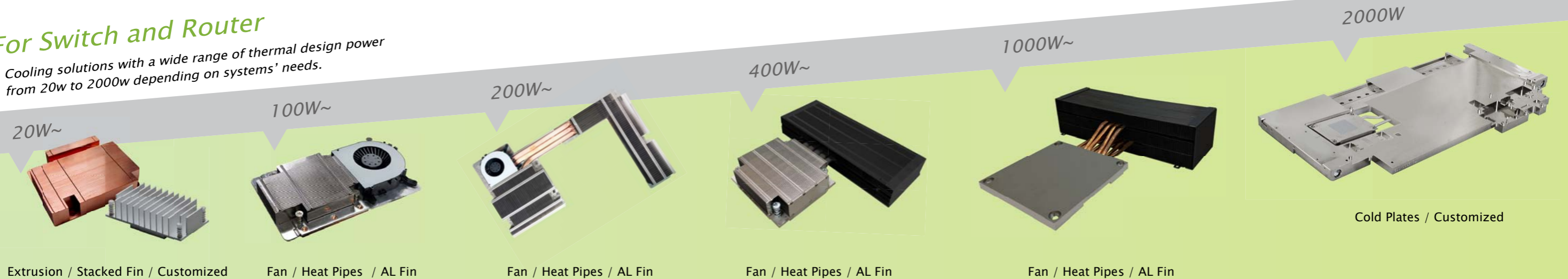
For Wifi 6 Router

> Customized air cooling configuration design: ADC and AL and fan die-casting techniques, and space utilization offering average 20w TDP.



For Switch and Router

> Cooling solutions with a wide range of thermal design power from 20w to 2000w depending on systems' needs.



20W~
Extrusion / Stacked Fin / Customized

100W~
Fan / Heat Pipes / AL Fin

200W~
Fan / Heat Pipes / AL Fin

400W~
Fan / Heat Pipes / AL Fin

1000W~
Fan / Heat Pipes / AL Fin

2000W
Cold Plates / Customized

Thermal Solution 5G Networking Applications Cooling Modules



5G Small Cell

Type	size (mm)	Model	Bearing	Rated Voltage (V)	Power Current (mA)	Power (W)	Speed (RPM)	Air Flow (CFM)	Static Pressure (Inch-H ₂ O)	Noise (dB(A))	Frame Type
Fan	40x40x10	MF40101V1-1Q140	Vapo	12	45	0.54	7,000	8.0	0.19	27.3	Rib
	40x40x10	MF40101V2-1Q030	Vapo	12	30	0.36	5,800	7.0	0.12	20.6	Rib
	40x40x20	MF40201VX-1Q09	Vapo	12	82	1.02	9,500	10.7	0.40	33.8	Rib
	50x50x20	MF50201V1-1Q03	Vapo	12	110	1.32	6,500	19.0	0.29	35.8	Rib
	60x60x15	EF60151BX-Q01	2 Ball	12	100	1.20	5,400	21.7	0.17	35.9	Flange
	60x60x15	MF60151V1-1Q02	Vapo	12	105	1.26	4,700	26.4	0.18	34.2	Rib
	60x60x25	EF60251BX-Q09	2 Ball	12	150	1.86	6,000	27.8	0.35	40.5	Flange
Blower	92x92x25	GF92251B2-000	2 Ball	12	300	3.60	4,200	70.0	0.30	45.0	Flange
	60x60x14	MF60120V1-C23	Vapo	5	330	1.65	4,400	8.0	0.59	41.2	
	60x60x15	MF60151VX-1B00	Vapo	12	130	1.56	4,500	6.2	0.71	37.7	
	70x71.3x18	EF70181B1-C01	2 Ball	12	29	3.48	5,000	12.1	0.78	44.0	

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Server/Storage/Edge

Type	System	size (mm)	Model	Bearing	Rated Voltage (V)	Power Current (mA)	Power (W)	Speed (RPM)	Air Flow (CFM)	Static Pressure (Inch-H ₂ O)	Noise (dB(A))	Frame Type
Fan	1U	40x40x28	PF40281BX-D43	2 Ball	12	900	10.80	22,000	31.3	2.81	62.0	Flange
		40x40x28	PF40281BX-D08	2 Ball	12	1150	13.80	23,000	31.6	3.25	62.0	Rib
		40x40x28	VF40281BX-Q22	2 Ball	12	1750	21.00	26,000	36.3	4.38	63.0	Flange
		40x40x28	VF40281BX-Q73	2 Ball	12	2100	25.20	27,000	37.3	4.58	63.4	Rib
		40x40x28	XF40281BX-Q01	2 Ball	12	1650	19.80	36,000	31.0	6.80	68.7	Rib
		40x40x28	XF40281BX-Q03	2 Ball	12	2650	31.80	33,000	38.6	5.83	70.1	Rib
		40x40x28	XG40281BX-1Q01	2 Ball	12	2500	30.00	34,000	40.0	6.39	68.9	Flange
		40x40x56	PF40561BX-QA1	2 Ball	12	1900	22.80	23,300 (in) 20,300 (out)	34.8	4.31	69.4	Flange
		40x40x56	VG40561BX-D01	2 Ball	12	1270	15.24	25,500 (in) 22,300 (out)	25.0	6.19	65.0	Flange
		40x40x56	XF40561BX-Q02	2 Ball	12	2500	30.00	30,000 (in) 27,200 (out)	33.6	7.60	69.5	Flange
		40x40x56	XG40561BX-1Q25	2 Ball	12	3200	38.40	33,200 (in) 27,200 (out)	38.7	9.25	78.6	Flange
		40x40x56	XG40561BX-1Q33	2 Ball	12	3000	36.00	29,800 (in) 27,900 (out)	41.0	8.60	72.6	Flange
	60x60x38	PF60381BX-D07	2 Ball	12	2500	30.00	16,500	75.2	3.28	67.6	Flange	
	60x60x38	VF60381BX-0000	2 Ball	12	1900	22.80	22,800	67.8	4.84	64.1	Flange	
	60x60x38	VF60381BX-Q09	2 Ball	12	2750	33.00	20,800	77.0	4.84	72.6	Flange	
	60x60x38	XF60381BX-1000	2 Ball	12	3100	37.20	26,200	71.8	7.10	67.6	Flange	
	60x60x56	PF60561BX-000	2 Ball	12	2500	30.00	15,300 (in) 14,300 (out)	72.9	3.44	71.7	Flange	
	60x60x56	VF60561BX-Q09	2 Ball	12	2700	32.40	17,400 (in) 14,100 (out)	66.4	5.46	72.9	Flange	
60x60x56	VG60561BX-1Q02	2 Ball	12	4200	50.40	20,700 (in) 17,400 (out)	75.7	7.46	77.4	Flange		
60x60x56	VG60561BX-Q14	2 Ball	12	4200	50.40	21,600 (in) 20,800 (out)	69.9	10.42	78.6	Flange		
60x60x56	VG60561BX-1Q01	2 Ball	12	5200	62.40	21,300 (in) 18,400 (out)	80.9	8.68	78.2	Flange		
60x60x56	XG60561BX-1Q01	2 Ball	12	5300	63.60	24,000 (in) 23,000 (out)	85.8	10.26	80.0	Flange		
80x80x38	PF80381BX-000	2 Ball	12	4000	48.00	14,000	141.9	3.20	72.1	Flange		
80x80x38	VF80381B1-1Q04	2 Ball	12	3000	36.00	10,800	125.2	1.84	60.6	Flange		
80x80x38	VF80381BX-Q39	2 Ball	12	4200	50.40	17,000	132.4	5.88	73.1	Flange		
80x80x56	VF80561BX-Q01	2 Ball	12	2200	26.40	12,700 (in) 10,900 (out)	94.8	3.57	70.8	Flange		
80x80x56	VG80561BX-Q09	2 Ball	12	5000	60.00	17,000 (in) 14,500 (out)	127.0	6.59	75.5	Flange		
80x80x56	VF80561BX-Q07	2 Ball	12	2100	25.20	13,500 (in) 11,300 (out)	103.8	5.09	71.1	Flange		
80x80x56	VG80561BX-Q14	2 Ball	12	4000	48.00	17,000 (in) 14,500 (out)	130.4	8.41	77.3	Flange		
80x80x80	PF80801BX-000	2 Ball	12	6800	81.60	15,600 (in) 14,100 (out)	151.5	5.44	80.4	Flange		
80x80x80	VF80801BX-Q10	2 Ball	12	9400	112.80	15,400 (in) 13,600 (out)	168.6	6.90	84.1	Flange		
80x80x80	VG80801BX-1Q01	2 Ball	12	10700	128.40	16,500 (in) 13,500 (out)	203.7	7.44	83.0	Flange		
80x80x86	VG80861BX-Q07	2 Ball	12	7500	90.00	15,700 (in) 14,600 (out)	161.7	7.15	81.1	Flange		
80x80x86	VF80864BX-Q06	2 Ball	54	1850	99.90	16,500 (in) 15,700 (out)	166.3	7.22	81.9	Flange		
	2U/4U											

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Thermal Solution

5G Networking Applications

Cooling Modules



Wi-Fi 6 Router

Type	size (mm)	Model	Bearing	Rated Voltage (V)	Power Current (mA)	Power (W)	Speed (RPM)	Air Flow (CFM)	Static Pressure (Inch-H2O)	Noise (dB(A))	Frame Type	
Fan	30x30x06	MF30060V1-1D03	Vapo	5	112	0.56	9,100	4.9	0.17	23.6	Rib	
	30x30x10	MF30100V2-1000	Vapo	5	80	0.40	9,500	4.7	0.17	21.0	Rib	
	35x35x10	MF35100V2-1D02	Vapo	5	60	0.30	6,300	4.5	0.10	17.2	Rib	
	40x40x10	EF40101BX-1Q07	2 Ball	12	85	1.02	9,000	10.0	0.27	33.7	Rib	
	40x40x10	EF40101B1-1Q17	2 Ball	12	60	0.72	7,000	8.0	0.19	27.3	Rib	
	40x40x10	MF40101V2-1Q03	Vapo	12	30	0.44	5,800	7.0	0.12	20.6	Rib	
	40x40x10	MF40100V2-1D05	Vapo	5	42	0.21	5,000	4.9	0.09	19.6	Rib	
	40x40x10	HA40101V4-1D07	Vapo	12	22	0.27	3,800	3.9	0.05	10.5	Rib	
	40x40x20	EF40201BX-1Q05	2 Ball	12	110	1.32	9,000	10.9	0.40	32.3	Rib	
	40x40x20	EF40201BX-1Q03	2 Ball	12	70	0.84	8,200	9.3	0.30	27.9	Rib	
	50x50x15	MF50151V1-1Q01	Vapo	12	65	0.78	6,100	17.0	0.23	33.0	Rib	
	50x50x15	EF50151B3-Q01	2 Ball	12	36	0.48	3,700	9.6	0.09	19.5	Rib	
	50x50x15	HA50151V4-1Q05	Vapo	12	18	0.22	3,200	7.7	0.07	15.4	Rib	
	50x50x20	MF50201V1-1Q03	Vapo	12	110	1.32	6,500	19.0	0.29	35.8	Rib	
	60x60x15	EF60151BX-Q01	2 Ball	12	100	1.20	5,400	21.7	0.17	35.9	Flange	
	60x60x15	MF60151V1-1Q02	Vapo	12	105	1.26	4,700	26.4	0.18	34.2	Flange	
	70x70x15	MF70151V1-1Q01	Vapo	12	70	1.16	3,300	24.0	0.11	31.4	Flange	
	Blower	30x30x04	EG30040S1-C07	Sleeve	5	450	2.25	11,200	0.5	0.33	27.0	
		35x35x07	EF35070S1-C01	Sleeve	5	127	0.64	7,000	1.1	0.30	25.5	
		45x45x10	MG45100V1-C06	Vapo	5	270	1.35	8,500	4.1	0.62	41.4	
65.5x65x05		EG50040S1-CG8	Sleeve	5	275	1.38	4,300	3.6	0.53	35.8		
52.1x45.5x6.8		EF50060S1-C19	Sleeve	5	450	2.25	5,700	2.6	0.49	33.6		
55x55x08		EG60070S1-C24	Sleeve	5	320	1.60	6,000	4.4	0.88	37.2		
52.2x53.5x10.4		EF50101B2-C02	2 Ball	12	75	0.90	4,600	4.1	0.44	28.9		
60x60x12		MF60121V1-C01	Vapo	12	170	2.04	4,000	5.4	0.52	28.5		
60x60x15		MF60151VX-1B00	Vapo	12	130	1.56	4,500	6.2	0.71	37.3		
70x71.3x18		EF70181B1-C08	2 Ball	12	375	4.50	5,000	14.7	0.81	43.5		

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Switch/Router

Type	System	size (mm)	Model	Bearing	Rated Voltage (V)	Power Current (mA)	Power (W)	Speed (RPM)	Air Flow (CFM)	Static Pressure (Inch-H2O)	Noise (dB(A))	Frame Type
Fan	1U	38x38x28	PF38281BX-Q12	2 Ball	12	820	9.84	25,000	26.0	3.19	62.7	Rib
		38x38x28	VF38281BX-000	2 Ball	12	870	10.44	27,000	24.2	3.56	61.6	Rib
		40x40x20	EF40201BX-1Q03	2 Ball	12	60	0.72	8,200	9.3	0.30	27.9	Rib
		40x40x20	EF40201BX-1Q05	2 Ball	12	78	0.85	9,000	11.0	0.39	32.1	Rib
		40x40x20	EF40201BX-1Q12	2 Ball	12	255	3.06	15,000	17.9	0.90	46.3	Rib
		40x40x20	PF40201BX-1Q02	2 Ball	12	480	5.90	19,000	22.3	1.57	49.0	Rib
		40x40x28	PF40281B1-000	2 Ball	12	510	6.12	17,600	24.9	1.95	56.0	Flange
		40x40x28	PF40281BX-D30	2 Ball	12	1150	13.80	23,000	31.6	3.25	62.0	Rib
		40x40x28	VF40281BX-Q73	2 Ball	12	2100	25.20	27,000	37.3	4.58	63.4	Rib
		40x40x28	VF40284BX-1Q01	2 Ball	48	470	22.56	27,000	38.8	4.56	64.8	Rib
	40x40x56	PF40561BX-Q10	2 Ball	12	2000	24.00	23,300 (in) 20,300 (out)	34.8	4.31	71.4	Flange	
	40x40x56	XF40561BX-Q15	2 Ball	12	2500	30.00	30,000 (in) 27,000 (out)	33.3	7.84	71.6	Flange	
	40x40x56	XG40561BX-1Q31	2 Ball	12	3100	37.20	30,000 (in) 27,500 (out)	40.1	9.40	75.4	Flange	
	60x60x38	VF60381BX-000	2 Ball	12	1900	22.80	22,800	67.8	4.84	64.1	Flange	
	60x60x38	VF60384BX-1000	2 Ball	48	460	22.08	22,800	67.8	4.84	64.1	Flange	
	60x60x56	VG60561BX-Q17	2 Ball	12	4600	55.20	19,200 (in) 19,200 (out)	80.5	6.43	80.2	Flange	
	60x60x76	PF60761BX-000	2 Ball	12	2800	22.60	18,200 (in) 14,700 (out)	73.2	3.96	68.6	Flange	
	80x80x80	PF80804BX-Q03	2 Ball	48	1300	62.40	13,500 (in) 11,000 (out)	145.2	5.13	76.0	Flange	
	80x80x86	VF80861BX-Q03	2 Ball	12	6900	82.80	14,500 (in) 14,300 (out)	151.0	7.56	81.7	Flange	
	4U	92x92x38	PF92384BX-Q07	2 Ball	48	1200	57.60	13,500	192.5	3.37	72.3	Flange
120x120x38		PFC0384BX-Q08	2 Ball	48	1350	64.80	6,600	266.5	1.93	68.9	Flange	
120x120x38		XGC0381BX-Q02	2 Ball	12	4700	56.40	9,000	207.0	2.86	73.0	Flange	
120x120x76		XGC0764BX-Q10	2 Ball	50	3900	195.00	12,400 (in) 13,600 (out)	358.2	10.66	84.6	Flange	
Blower		97x97x33	PF97331B1-C18	2 Ball	12	1300	15.60	5,400	44.2	3.39	58.0	

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Thermal Solution

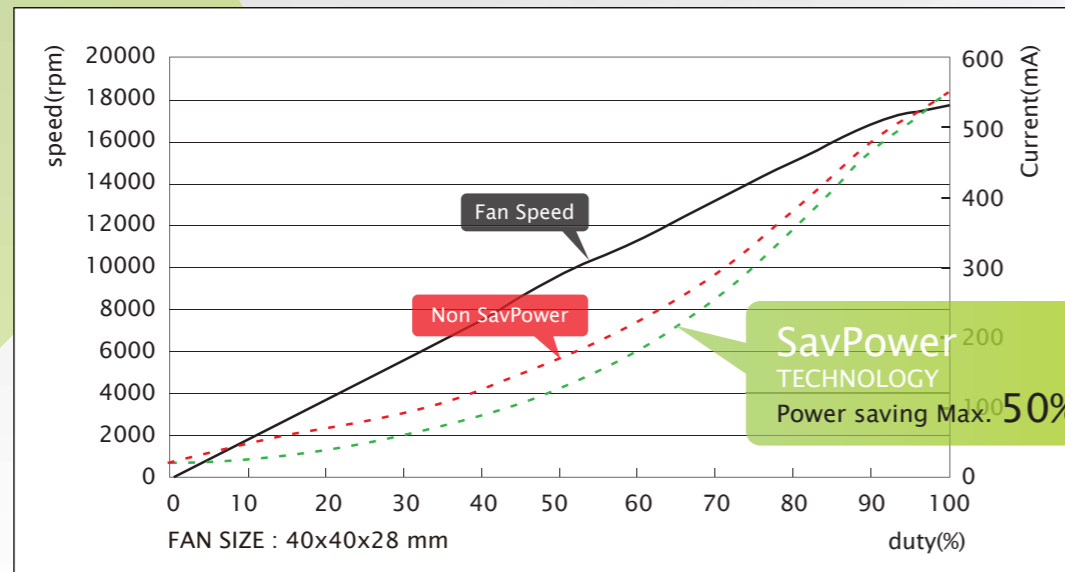
5G Networking Applications

Cooling Modules

In combination with power-saving and smart technologies, SUNON offers the best 5G fan solution with high thermal effectiveness and low vibration and less noise for 5G application.

More Power-saving

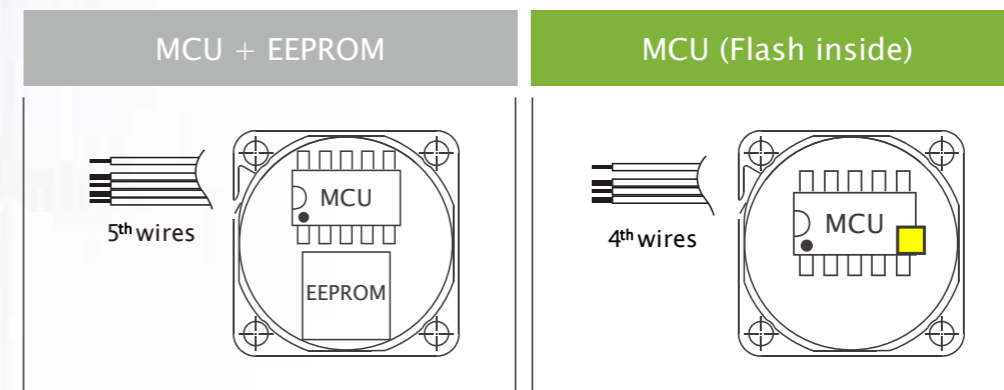
- > By using SUNON's power saving circuit optimization technique, the fan motor's conversion efficiency reduces energy consumption when the fan speed decreases.
- > Compared to other PWM fans, the power-saving fan series is an efficient cooling component to use, saving max 50% power.



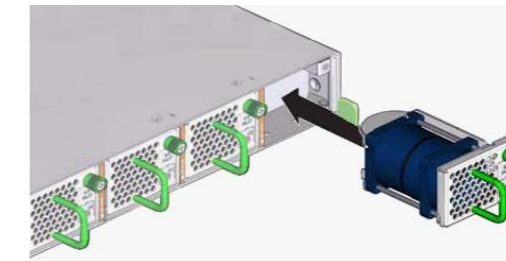
Intelligence

- > EEPROM or MCU increase fan service life.
- > Adopting an anti-reverse-rotation braking design, fans are guaranteed not to rotate in reverse while operating under high back pressure, so that the fans sustain their thermal effectiveness.
- > By using smart technology, the needs for high thermal effectiveness of high-speed transmission of data by 5G applications are met and 24-hour operating IOT system is secure.

Record Output



Hot Swap Braking Function



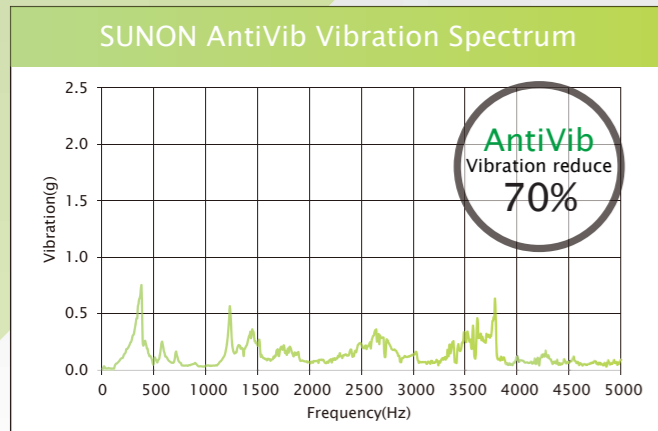
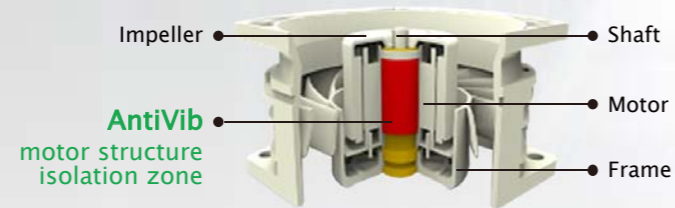
Thermal Solution 5G Networking Applications Cooling Modules

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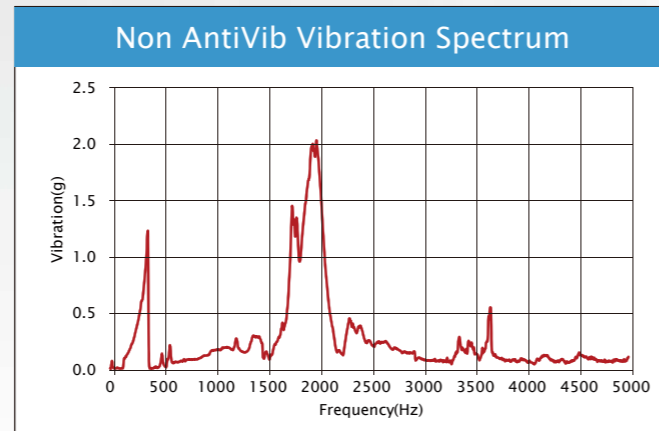
Low Vibration

AntiVib motor structure:

- > Effectively lowers the vibration level while the fan is rotating quickly.
- > Widely applied in fans with over 20,000RPM, it has an up to a 70% reduction in the vibration level that sustains a steady thermal function without interruption.



FAN SIZE : 60x60x38 mm



Less Noise

- > The sources of the noises by mini fans are from blade passing, pole passing, and broadband noise.
- > With a great deal of experience in noise cancellation, we advance our own geometric design of fan blades to improve pressure distribution of air inlet and outlet, so that the fan noise can be reduced at specific bandwidths, (i.e. between 4,000Hz and 20,000Hz with a 6.7B(A) reduction in the noise).

