



RF MORECOM
COREA

5G (3.5GHz, 28GHz mmWave) RF Module Solution

Technology Innovation of RF Microwave Industry



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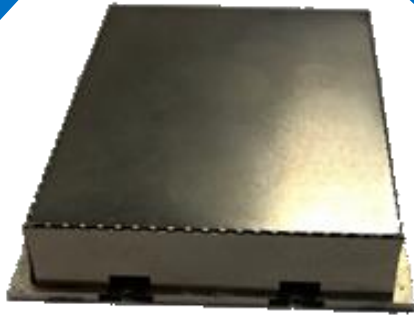
Divider / Coupler

7

DSP Module / Repeater

Ceramic waveguide filter

3.5GHz, 3.7GHz



<Ceramic Wave Filter>

PRODUCT STRONG POINTS

01

Same Performance as
Cavity Connectorized Filter

02

Ultra Compact Size

03

Sharp Rejection and lowest
Insertion loss

04

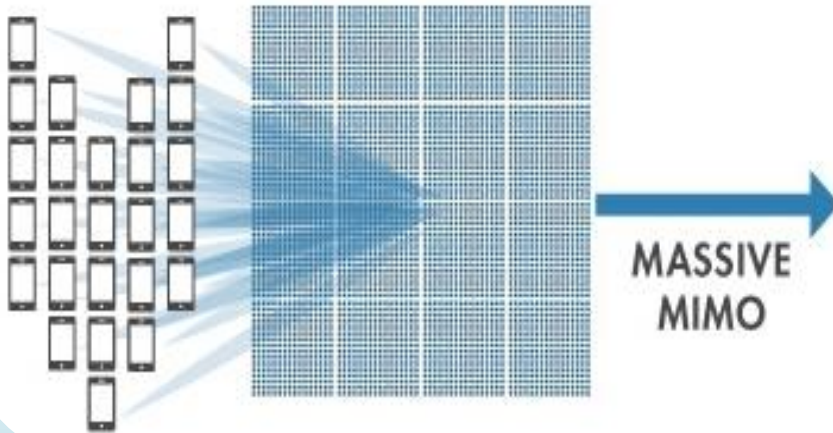
SMD type

05

Lower cost than Cavity

64x64 MASSIVE MIMO

Array antenna 3.5GHz



Products Application

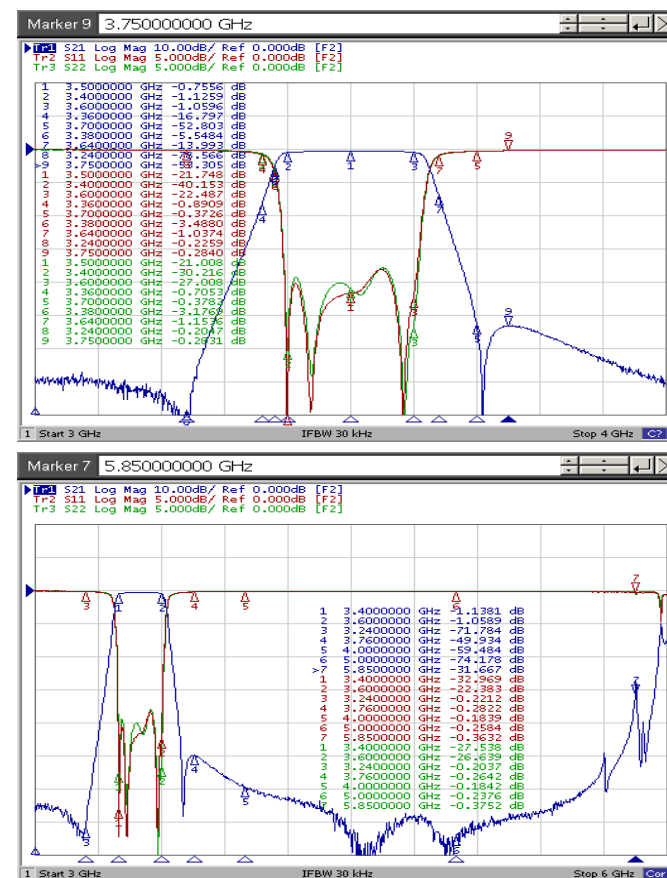
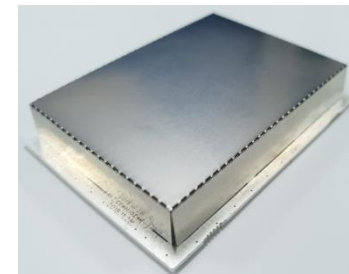
The Ceramic waveguide filter can use the 5G New Radio(NR) Massive MIMO base station. The Massive MIMO consist with 64 antennas (8x8) to dramatically improve wireless data speed and link reliability.

This technology is completely different from the traditional BTS architecture. Massive MIMO has hundreds of antenna elements and uses pre-coding technology to focus wireless energy on target mobile users to reduce radiant power. Focusing energy on certain users saves not only copy power, but also reduces interference with other users. This is particularly advantageous in the current cellular network, where interference is limited.

1-1. Ceramic waveguide filter 3.5GHz

1. Electrical Specifications

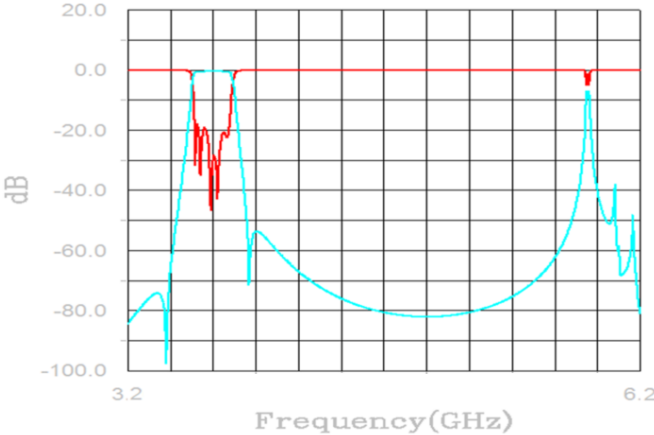
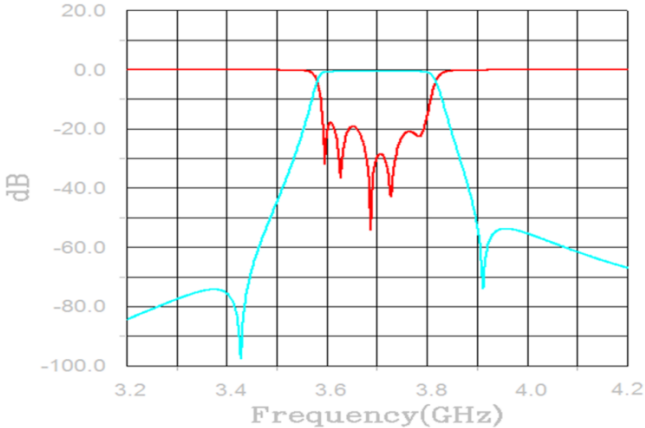
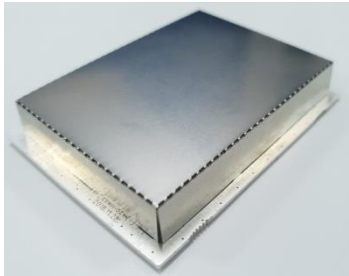
Descriptions		Specification
Center Frequency		3500MHz
Band Width		3400-3600MHz
Insertion loss		≤ 1.1 dB
Passband Ripple measured across 10MHz		≤ 0.5 dB
Return loss		≥ 15dB
Attenuation	DC - 2500 MHz	≥ 60 dB
	2500 - 2600 MHz	≥ 50 dB
	2600 - 3300 MHz	≥ 30 dB
	3300 - 3340 MHz	≥ 20 dB
	3340 - 3360 MHz	≥ 12 dB
	3640 - 3660 MHz	≥ 12 dB
	3660 - 3700 MHz	≥ 20 dB
	3700 - 4000 MHz	≥ 50 dB
	4000 - 5000 MHz	≥ 50 dB
	5000 - 5850 MHz	≥ 25 dB
Dimension(mm)		30 x 30 x 8 or 65 x 15 x 8
Power handling		10 watt
Temperature		-40 ~ 85 °C



1-2. Ceramic waveguide filter 3.7GHz

1. Electrical Specifications

Descriptions		Specification
Center Frequency		3700MHz
Band Width		3600-3800MHz
Insertion loss		≤ 1.1 dB
Passband Ripple measured across 10MHz		≤ 0.5 dB
Return loss		≥ 15dB
Attenuation	DC - 2700 MHz	≥ 60 dB
	2700 - 2800 MHz	≥ 50 dB
	2800 - 3500 MHz	≥ 30 dB
	3500 - 3540 MHz	≥ 20 dB
	3540 - 3560 MHz	≥ 12 dB
	3840 - 3860 MHz	≥ 12 dB
	3860 - 3900 MHz	≥ 20 dB
	3900 - 4200 MHz	≥ 50 dB
	4200 - 5800 MHz	≥ 40 dB
Dimension(mm)		30 x 30 x 8 or 65 x 15 x 8
Power handling		10 watt
Temperature		-40 ~ 85 °C

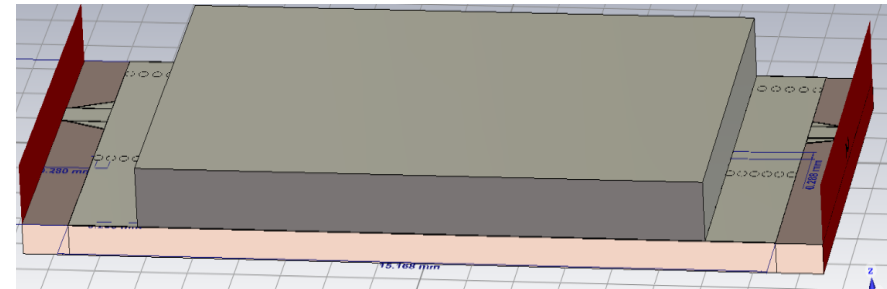


28GHz Substrate Integrated Waveguide filter

1. RMS500B2800 SIW filter

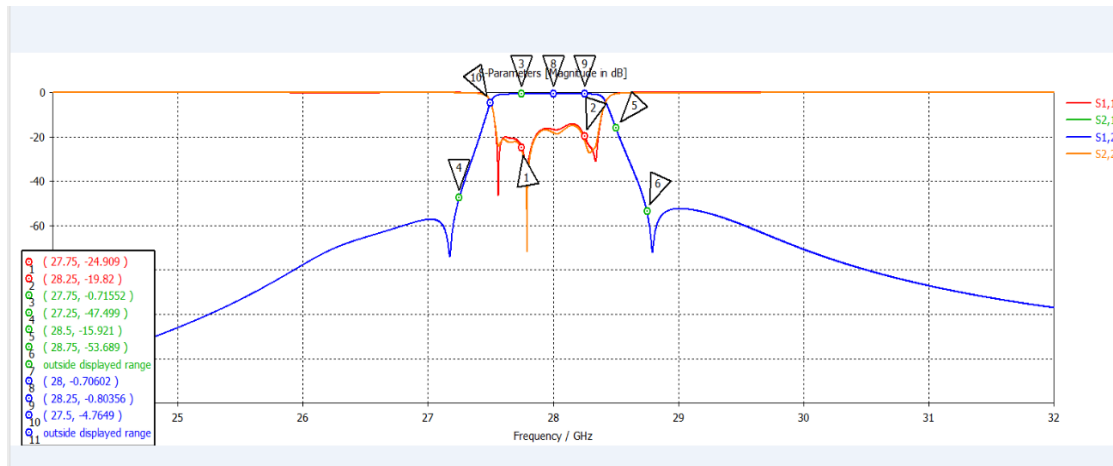
1. Electrical Specifications

Parameter	Specification
Frequency Range	27.75GHz~28.25GHz
Return Loss	15dB Min.
dB value over Frequency (27.25~28.75GHz)	40dB Min.@27.25GHz
	2.5dB Max.@27.5GHz
	1.5dB Max. @27.75GHz
	1.5dB Max.@28.25GHz
	2dB Max.@28.5GHz
	30dB Min.@28.75GHz



Size:29X13X6mm

2. Simulation data

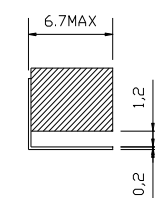
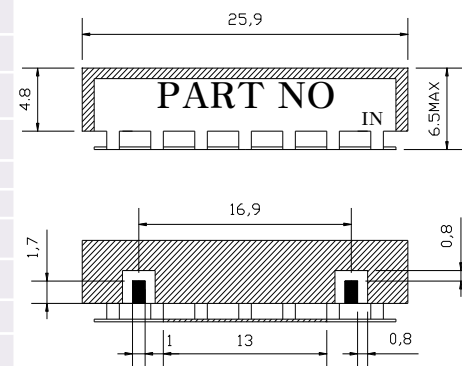


Monoblock Filter Type

1. RM150B3625S6.5R6NP

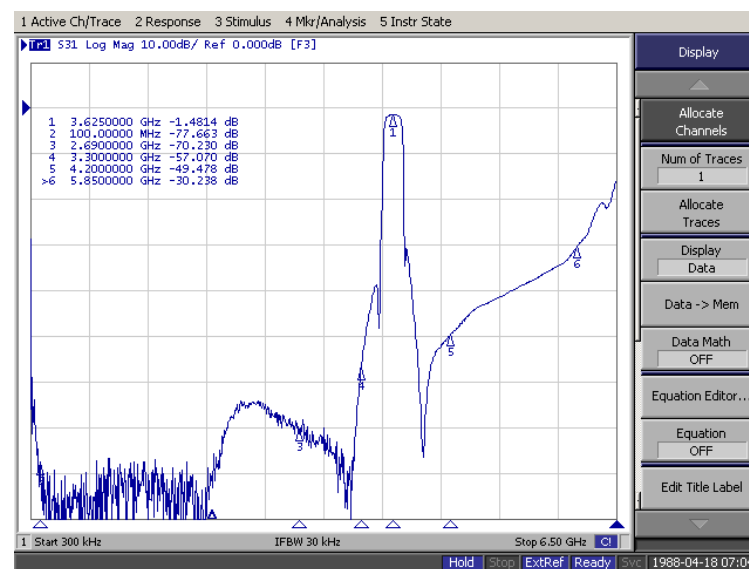
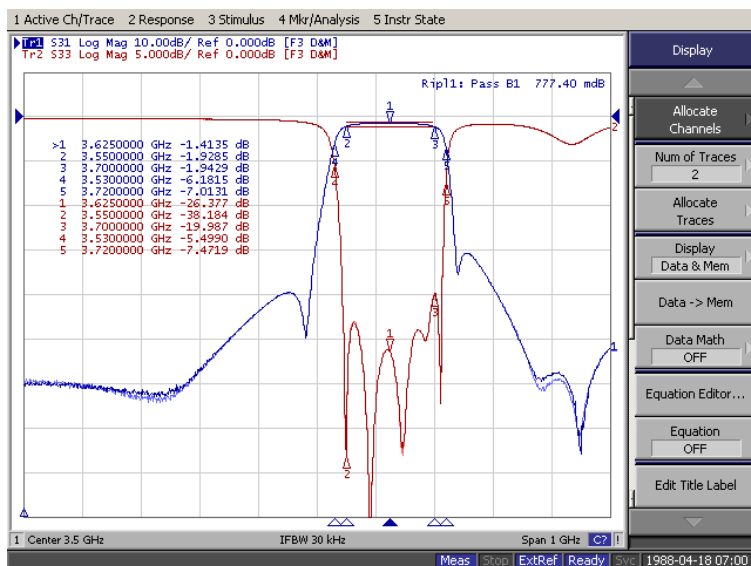
1. Electrical Specifications

Descriptions	Specification	Remark
Center frequencies	3625Mhz	
Band width	150Mhz (3550~3700)	
Insertion Loss	2.0 dB max.	
Ripple	1.0 dB max.	
V.S.W.R	2.0:1 dB max.	
Attenuation	@DC~2690 MHz	40 dB min.
	@2690~3300 MHz	25 dB min.
	@3300~3530 MHz	6 dB min.
	@3720~4200 MHz	6 dB min.
	@4200~5850 MHz	30 dB min.
Input Power	3W max	
In/Out Impedance	50 ohm	
Temperature range	-40~+85°C	
Size	25.9 x 6.5 x 6.7 mm	



■ IN / OUT TOLERANCE
UNLESS
SPECIFIED : +/-0.3 mm
▨ GROUND

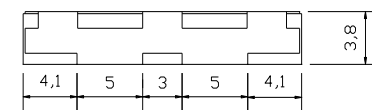
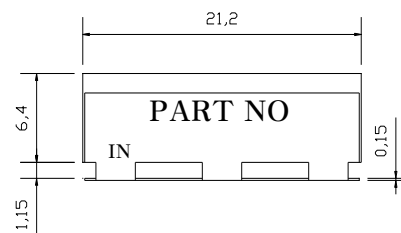
2. Plot Data



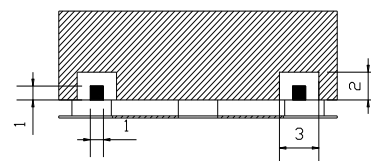
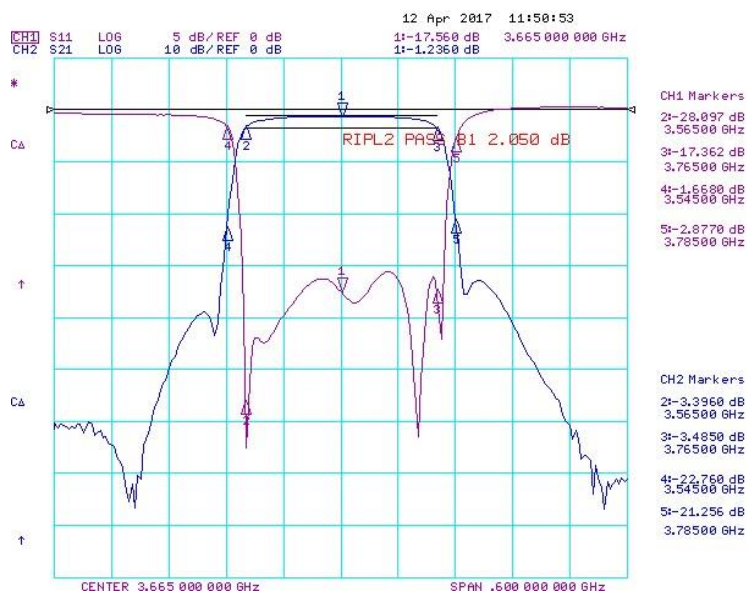
2. RM200B3500M48NP

1. Electrical Specifications

Descriptions	Specification	Remark
Center frequencies	3500MHz	
Band width	200MHz	
Insertion Loss	4.5 dB max.	
Ripple	2.0 dB max.	
Return Loss	13 dB max.	
Attenuation	@3380 MHz	18 dBc min.
	@3620 MHz	18 dBc min.
Input Power	3W max	
In/Out Impedance	50 ohm	
Temperature range	-40~+85°C	
Size	21.2 x 7.55 x 3.8 mm	



2. Plot Data



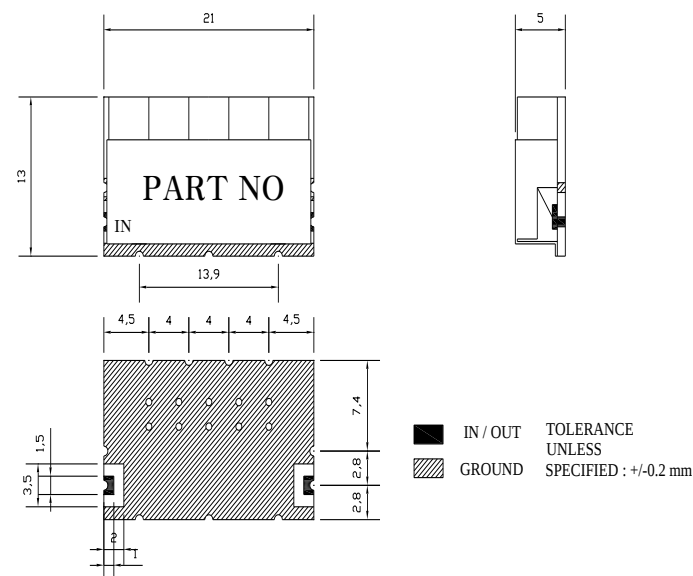
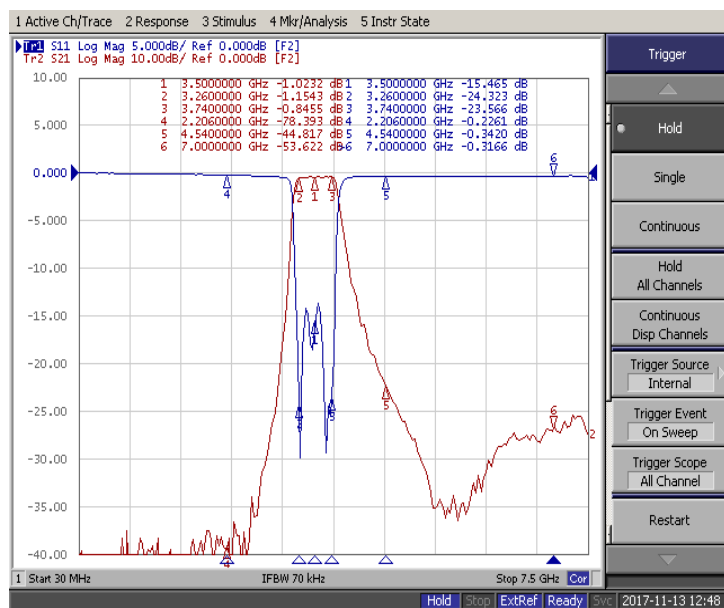
IN / OUT
GROUND
TOLERANCE
UNLESS
SPECIFIED : +/-0.3 mm

3. RM480B3500S45A

1. Electrical Specifications

Descriptions	Specification	Remark
Center frequencies	3500MHz	
Band width	480MHz	
Insertion Loss	3.0 dB max.	
Ripple	Over240MHz, 0.5 dB max. Over480MHz, 0.7 dB max.	
Return Loss	10 dB max.	
Attenuation	@DC~2206MHz	40 dBc min.
	@4540~7000 MHz	40 dBc min.
Input Power	3W max	
In/Out Impedance	50 ohm	
Temperature range	-40~+85°C	
Size	21 x 13 x 5 mm	

2. Plot Data



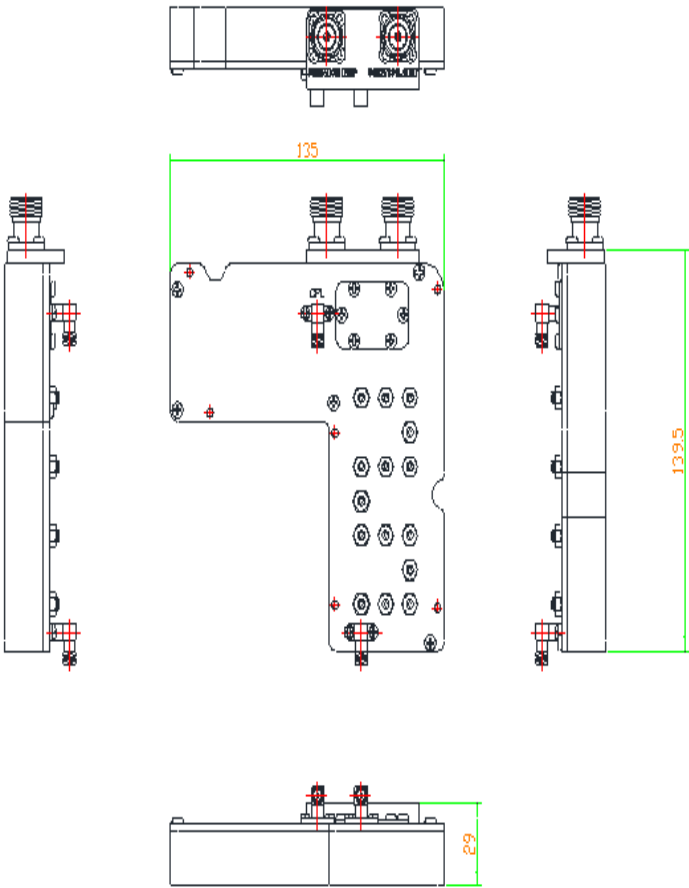
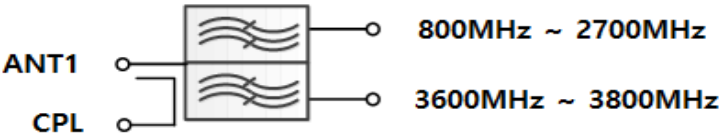
3.5GHz combined Cavity Filter

1. 3.5GHz combined Diplexer

1. Electrical Specifications

Descriptions		Specification	
Frequency Range		3600~ 3800MHz	800~2700MHz
Insertion Loss		1dB	1dB
Ripple		0.8dB	1dB
Return Loss		18 dB	18 dB
Coupling		30dB ±1.5dB	
Directivity		10dBc	
Attenuation	3400MHz ~ 5000MHz	-	≥30 dB
	100MHz ~ 3500MHz	50dB	-
	3500MHz ~ 3550MHz	35dB	-
	3850MHz ~ 6000MHz	35dB	-
	3577MHz	5dB(Room)	-
	3823MHz	5dB(Room)	-
	6500MHz ~ 8000MHz	≥30 dB	-
Absolute Delay		20nsec	20nsec
Input Power		AVG 5W	AVG 1W
In/Out Impedance		50Ω	
Temp. / Humidity.		- 30℃ ~ 70℃(0% ~ 90%)	
Vibration		1G 10 ~ 150Hz, 0.1 OCTAVES / MIN	
RoHS		RoHS apply	
Size		135 x 139.5 x 29 mm	

2. Block Diagram

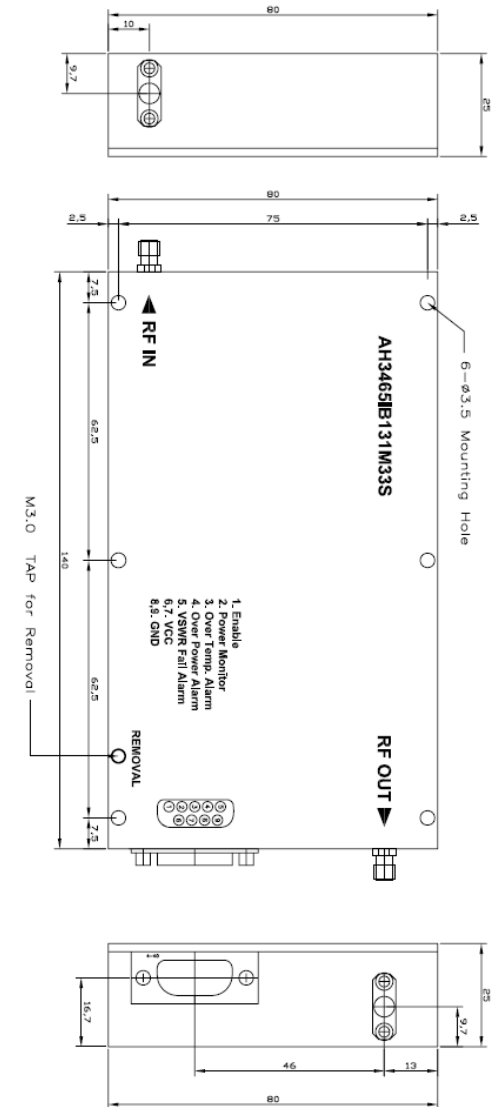


3.5Ghz HPA

1. RMAH3465IB131M33S

1. Electrical Specifications

Parameter	Specification	
Frequency Range	3400~3531MHz	3400~3420Mhz 3511~3531Mhz
Output Power	33dBm@Wimax 10Mhz 1FA or 2FA (PAPR 10dB@0.01%CCDF)	
Gain	40±1.0dB@Pout=33dBm	
Gain Flatness over Freq.	≤p-p 1.0dB over 20MHz BW	
Gain Variation over Temp.	≤± 1.0dB over -20°C ~ +60°C	
Input/Output VSWR	1.4:1	
Operation Voltage	27 ± 0.5VDC	
Current Consumption	Max. 1.5A @27VDC, Wimax 33dBm	
Standby current	Max. 0.3A	
ACLR(Wimax 10Mhz 1,2 FA)	-45dBc Min. @ Fc ± 5MHz, 30KHz RBW	

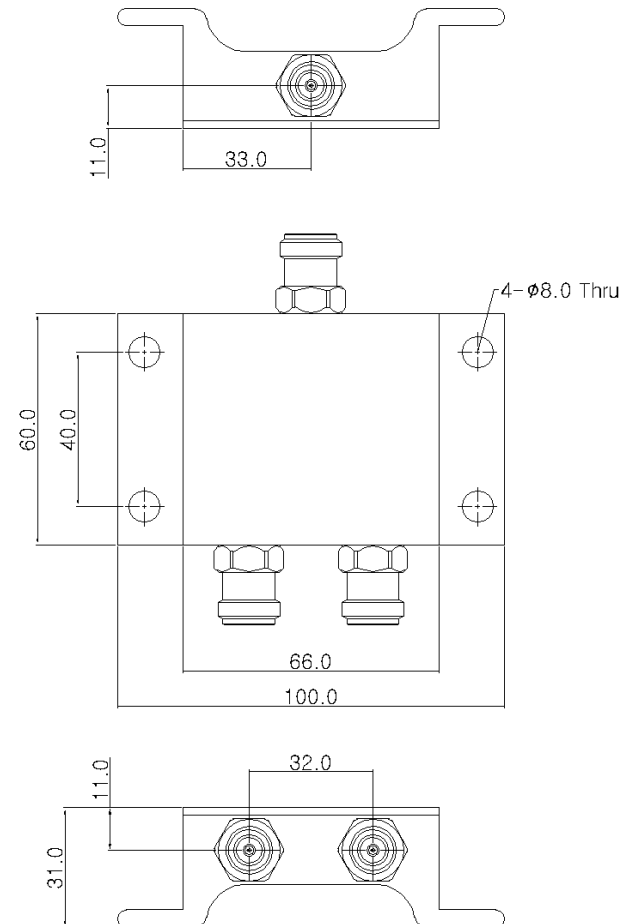


Divider/coupler (5G plus LTE plus 3G)

1. RFCPD2W11(2way divider)

1. Electrical Specifications

Parameter	Specification		Remark
Frequency Range	800~960MHz/1710~2170MHz/ 2300~2700MHz/3400~3900MHz		
Insertion Loss	P1(50%)	P2(50%)	
	3.6dB max.	3.6dB max.	
In/Out VSWR	1.2:1 max.		
Isolation	20dB min.		
PIMD	3 rd :-150dBc min. 5 th :-160dBc min.		40dBm@2tone
Input Power	150W max.		Forward
Impedance	50Ω		



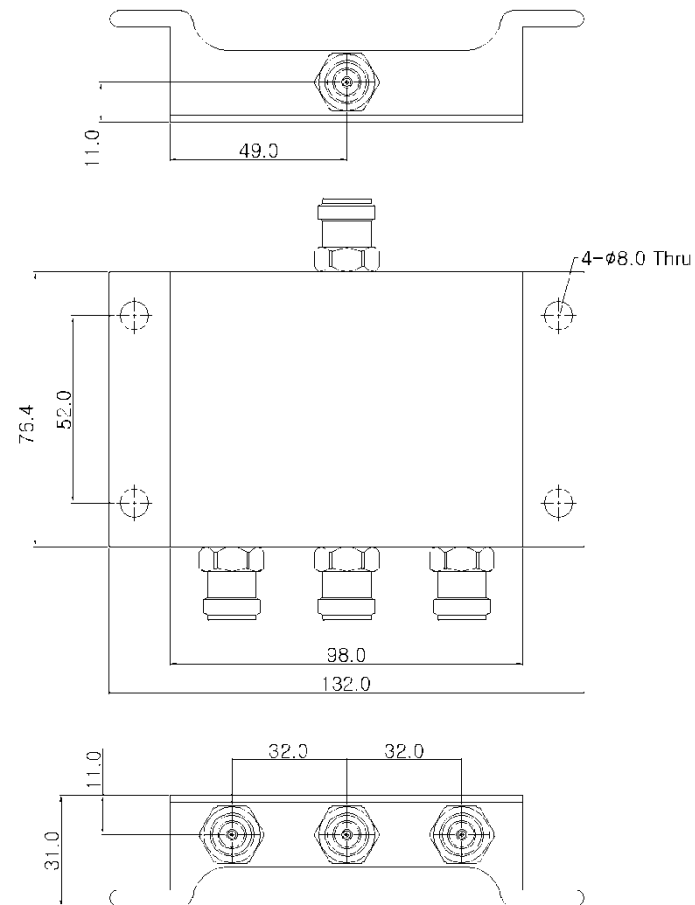
2. Mechanical Specification

Parameter	Specification	Remark
Dimension(WXDXH)	100.0X60.0X31.0(mm) /without connector	Refer to the drawing
In/Out Connector	N-female	
Finish	Chromate	
Weight	400g	

2. RFCPD3W111 (3way divider)

1. Electrical Specifications

Parameter	Specification			Remark
Frequency Range	800~960MHz/1710~2170MHz/ 2300~2700MHz/3400~3900MHz			
Insertion Loss	P1(33%)	P2(33%)	P3(33%)	
	6.0dB max.	6.0dB max.	6.0dB max.	
In/Out VSWR	1.2:1 max.			
Isolation	20dB min.			
PIMD	3 rd :-150dBc min. 5 th :-160dBc min.			40dBm@2tone
Input Power	150W max.			Forward
Impedance	50Ω			



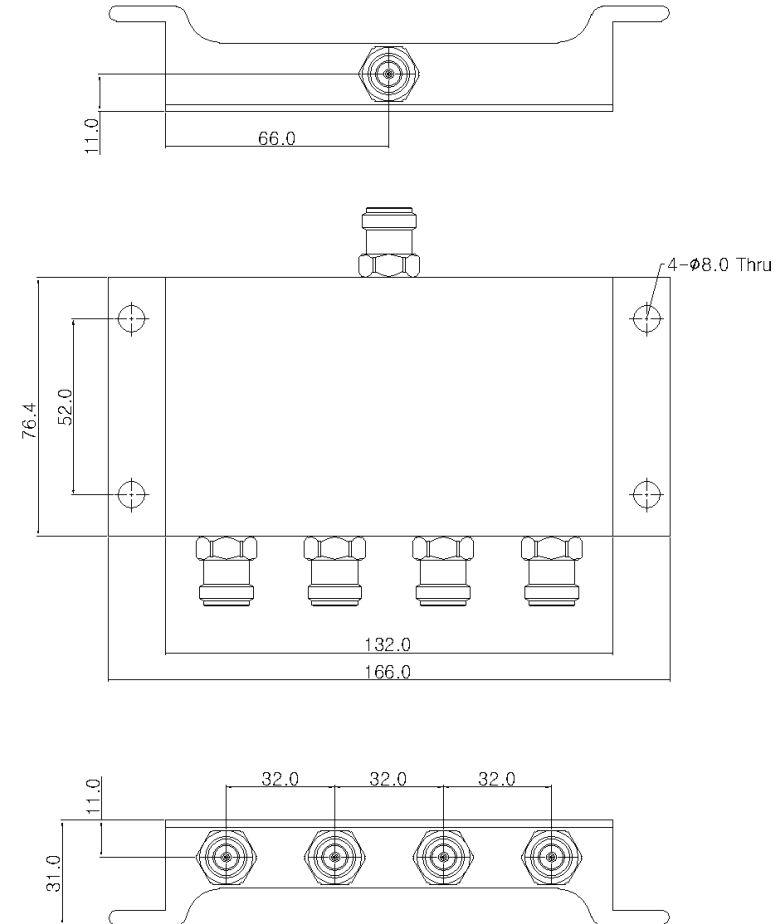
2. Mechanical Specifications

Parameter	Specification	Remark
Dimension(WXDXH)	132.0X76.0X31.0(mm) /without connector	Refer to the drawing
In/Out Connector	N-female	
Finish	Chromate	
Weight	590g	

3. RFCPD4W1111 (4way divider)

1. Electrical Specifications

Parameter	Specification				Remark
Frequency Range	800~960MHz/1710~2170MHz/ 2300~2700MHz/3400~3900MHz				
Insertion Loss	P1(25%)	P1(25%)	P1(25%)	P1(25%)	
	7.2dB max.	7.2dB max.	7.2dB max.	7.2dB max.	
In/Out VSWR	1.2:1 max.				
Isolation	20dB min.				
PIMD	3 rd :-150dBc min. 5 th :-160dBc min.				40dBm@2tone
Input Power	150W max.				Forward
Impedance	50Ω				



2. Mechanical Specifications

Parameter	Specification	Remark
Dimension(WXDXH)	166.0X76.4X31.0(mm) /without connector	Refer to the drawing
In/Out Connector	N-female	
Finish	Chromate	
Weight	790g	

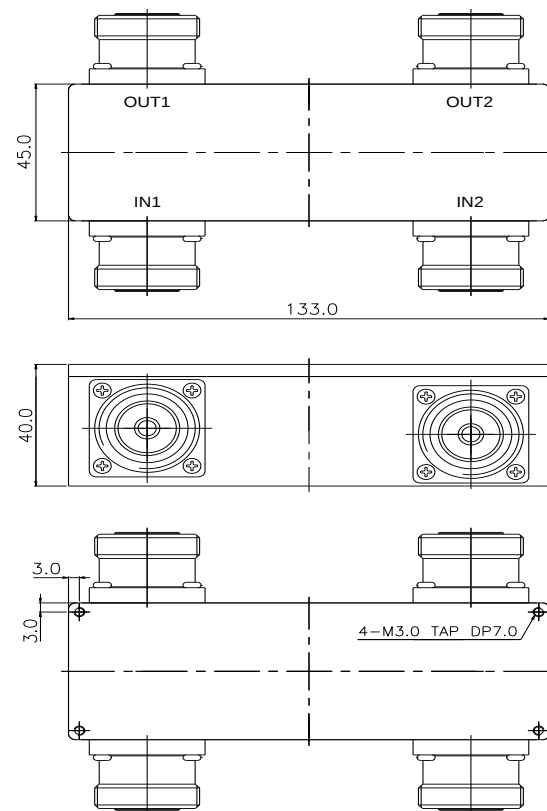
4.RMCHC2350M3100B(Hybrid Coupler)

1. Electrical Specifications

Parameter		Specification	
Pass band	Service	Frequency	Port
	5G	3.35~3.9Ghz	P1,P2->P3,P4 (ANT1,2)
	LTE	819~960, 1710~1870, 1885~2170, 2300~2700MHz	P1,P2->P3,P4(ANT 1,2)
Insertion Loss	3.8dB max		
Return Loss	18dB INPUT		
Isolation	22dB min.		
PIMD	-155dBc @43dBm(CW)X2Tone		
Max Input Power	Max.500W per port		
Impedance	50Ω		
Connector	N type		
Application	Temp:-30°C~+60°C, Humi: 95%		
Ingress Protection	IP67		

2. Mechanical Specifications

Parameter	Specification	Remark
Dimension(WXDXH)	166.0X76.4X31.0(mm) /without connector	Refer to the drawing
In/Out Connector	Din-female	
Finish	Gray Color Paint	
Weight	4.5Kg max.	



DSP Module & ICS digital repeater (5G plus LTE)

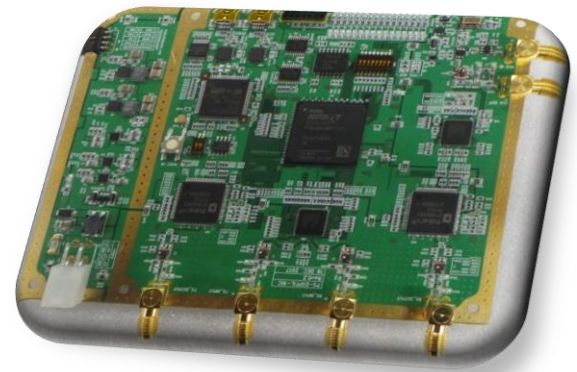
1. DSP 32 Channel module(PS-DSPFIL-32C)

1. DSP 32Channel module

- Intermediate operating equipment for 32channel
- 10Mhz reference clock
- LED display for active channel

2. Electrical Specifications

Parameter		Specification	Remark
Frequency Range	Down Link	ADC1 : 68.5~71.5 MHz	IF Center Frequency is 70MHz
		ADC2 : 68.5~71.5 MHz	
	Uplink	DAC1 : 68.5~71.5 MHz	
		DAC1 : 68.5~71.5 MHz	
Sampling Bandwidth		3 MHz (extend 10MHz)	IF Bandwidth
Sampling Clock		40 MSPS	Extend 65MSPS
Channel Bandwidth		12.5KHz~250KHz	Programmable
Channel Number		32 channels	Within IF Bandwidth
In-Band Ripple		≤ 1dB	Within IF Bandwidth
Group Delay		≤ 20usec	40taps
Digital Filter type		FIR Filter	Equiripple
Digital Filter Rejection	60dBc @fc±62.5KHz		12.5KHz Channel
	60dBc @fc±70KHz		25KHz Channel
	60dBc @fc±110KHz		100KHz Channel
Digital Filter Rejection depends on filter taps,			
ADC Input Power		-20dBm	Downlink/Uplink
DAC Output Power		-25dBm	Downlink/Uplink
ICS function (Interference Cancellation Range)		≥ I(Isolation)+15dB Cancellation Depth(30dB)	Option



5G(3.5GHz) Repeater(Digital ICS repeater solution)

1. 5G Repeater

- Low Power Consumption/Smallest size
- Remote control(SNMP/Wireless Modem)
- Donor and Service Antenna embedded.

2. Electrical Specifications

Descriptions	Specification	Remark
Frequency	3400~3600MHz 2300 MHz , 1800 MHz	
Sub and selection	200MHz BW programmable selection	1 to 5 channels(5 to 40MHz)
OUTPUT POWER	27dBm / 20dBm	
GAIN	20dBm 70dB $\pm$ 1dB // 65dB $\pm$ 1dB 27dBm 85dB $\pm$ 1dB // 80dB $\pm$ 1dB	
AGC/ALC level Control	30dB	
N.F	4.5dB	
EVM	2% Max	
Remote control	LTE modem and Smart phone App. control	
Current consumption	18W / 12W	
Size	158 X 174 X 45mm / 1.9Kg	

