1. Description

- The M0301 is a 2-way 0° 2:3 unequal power splitter/combiner fabricated on GaAs IPD process. It operates over 10-19.5GHz and provides insertion loss of 0.9dB and excellent phase unbalance of 2.5°.

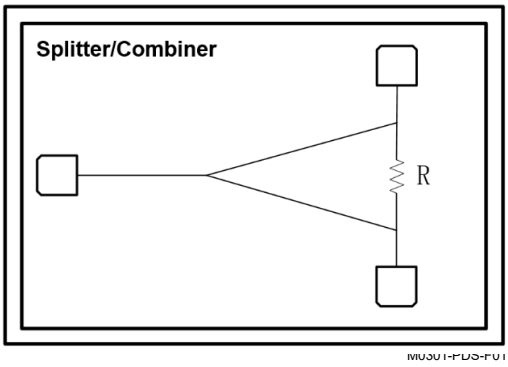


Figure 1. M0301 Functional Block Diagram

2. Applications

- Phased Array

3. Features[1]

- Frequency Range: 10-19.5GHz
- Insertion Loss: 0.9dB
- Isolation: 14dB
- Input/Output Return Loss: -15dB
- Power Split Ratio: 2:3
- Phase Unbalance: ±2.5°
- Input/Output Impedance: 50 Ohm
- Die Size: 1.25 x 1.15 x 0.10 mm

[1] On-wafer Test

4. Brief Typical Performance

Table 1. Brief Typical Performance

Parameter	10-19.5GHz	Units
Insertion Loss	0.9	dB
Isolation	14	dB
Input Return Loss	-15	dB
Output Return Loss	-15	dB
Phase Unbalance	±2.5	°

Test condition: CW Test

Table of Contents

No.	Contents	Page
1	Description	1
2	Applications	1
3	Features	1
4	Brief Typical Performance	1
5	Recommended Operating Conditions	3
6	RF Characteristics	3
7	Typical Performance Curve	3
8	Outline Dimensions	4
9	Assembly Information	5
10	Handling Precautions	5
11	Contact Information	6
12	Disclaimer	6

5. Recommended Operating Conditions

Table 2. Recommended Operating Conditions

Parameter	Min.	Typ.	Max.	Units
Operating Temperature Range	-55	25	125	°C

6. RF Characteristics (T_C = 25˚C)

Table 3. RF Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units
Frequency Range	Freq.	10	-	19.5	GHz
Insertion Loss	IL	-	0.9	-	dB
Passband Ripple	△L	-	±0.2	-	dB
Isolation	ISO	14	-	-	dB
Input Return Loss	RL_RFC	-	-15	-	dB
Output Return Loss	RL_RF1/RL_RF2	-	-15	-	dB
Phase Unbalance	Δφ	-2	-	3	°

Test condition: CW Test

7. Typical Performance Curve

■ Small-signal Characteristics Curve

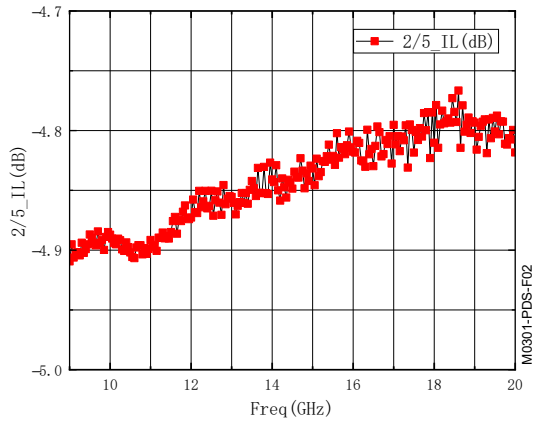


Figure 2. S21 Characteristics(2/5)

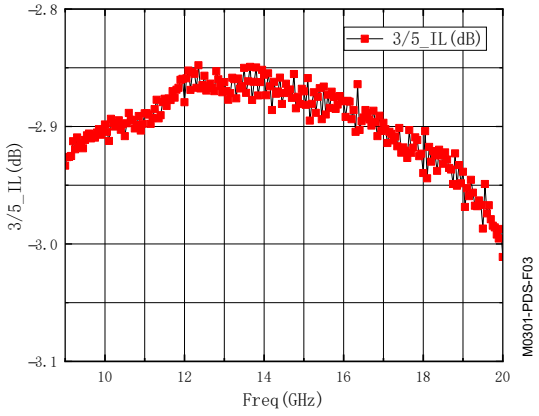


Figure 3. S21 Characteristics(3/5)

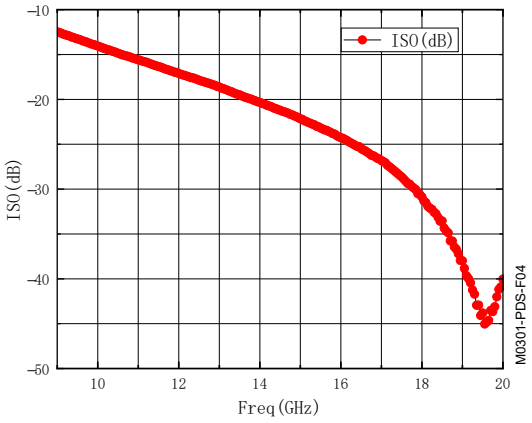


Figure 4. Isolation Characteristics

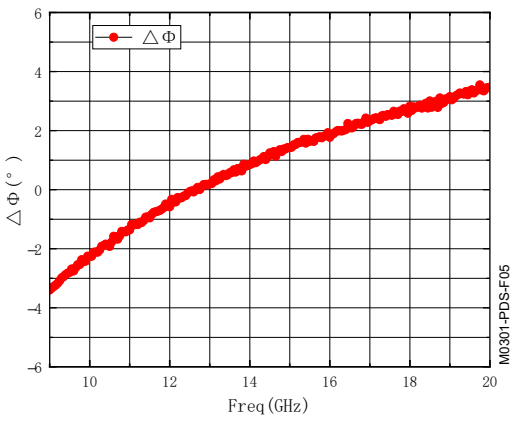


Figure 5. Phase Unbalance Characteristics

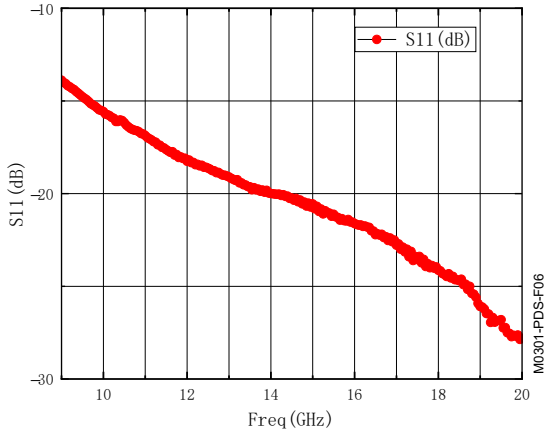


Figure 6. Input Return Loss Characteristics

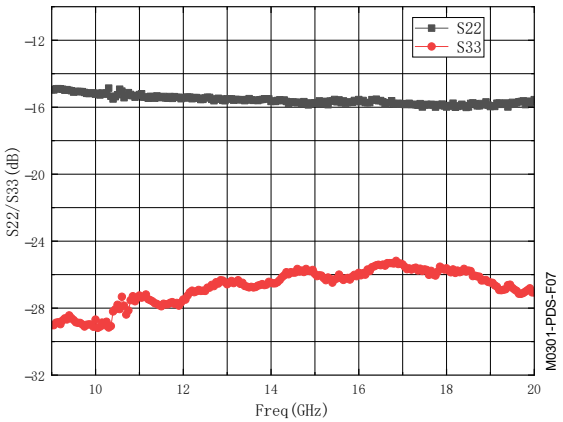
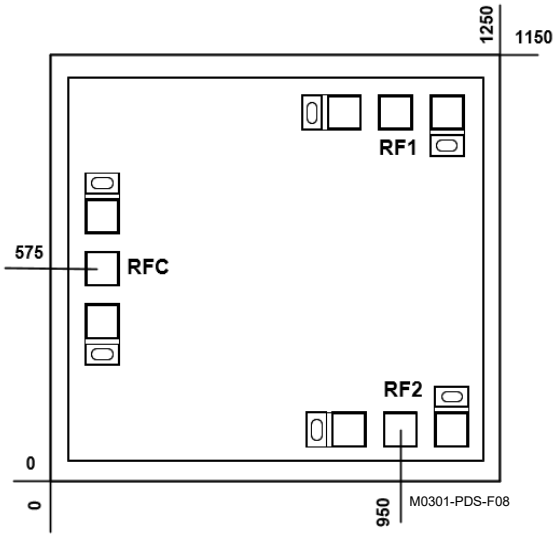


Figure 7. Output Return Loss Characteristics

8. Outline Dimensions



- Dimensions shown in micrometre

Figure 8. M0301 Outline Dimensions

Table 4. Pad Description

Pad	Symbol	Description	Remarks
1	RFC	RF Input	Common Port
2	RF1	RF Output 1	2/5 Splitter Port
3	RF2	RF Output 2	3/5 Splitter Port

9. Assembly Information

■ Assembly Diagram

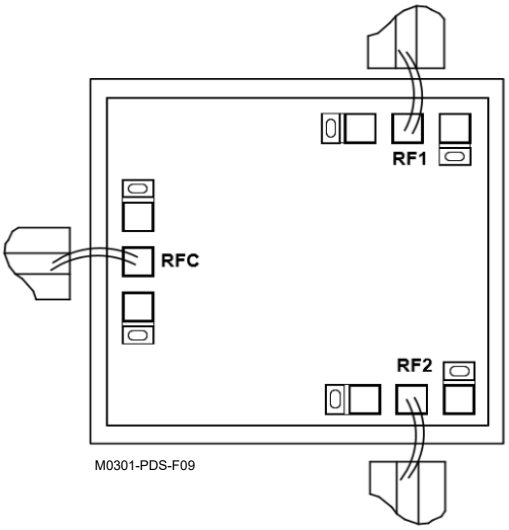


Figure 9. M0301 Assembly Diagram

- **Eutectic Die Attach:** It is best to use an 80% Au/20% Sn preform. Do not expose the chip to a temperature greater than 300°C for more than 30sec.
- **Wire Bonding:** RF bonds made with 1mil gold wire are recommended for the RF ports. Keep all bonds as short as possible, less than 0.35mm.

10. Handling Precautions

■ Storage

All bare dies ship in either Waffle or Gel Pak, which is an ESD protective container, and then sealed in an ESD protective bag. After opening the sealed ESD protective bag, all dies must be stored in a dry nitrogen environment.

■ Cleanliness

Handle the dies in a clean environment. Never use liquid cleaning systems to clean the dies.

■ ESD Caution

ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore proper ESD precautions should be taken to avoid performance degradation or loss of functionality.



11. Contact Information

For the latest specifications, additional product information, technical support and sales support, please contact:

- **Email:** RF.support@raytrontek.com
- **Web:** www.raytrontek.com

12. Disclaimer

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