1. Description

- The M0050P is Dual Beam 4-way 0º splitter/combiner fabricated on GaAs IPD Cu-Pillar process. It operates over 17-22GHz, provides insertion loss of 1.5dB. This device is in a BGA package.



M0050P-PDS-F01

Figure 1. M0050P Package Outline

2. Applications

- Phased Array

3. Features[1]

- Frequency Range: 17-22GHz
- Insertion Loss: 1.5dB
- Isolation: 20dB
- Beam to Beam Isolation: 40dB
- Input/Output Return Loss: -14dB
- Input/Output Impedance: 50Ohm
- Package Size: 4.6 x 4.1 x 0.89mm

[1] EVB Test

4. Brief Typical Performance

Table 1. Brief Typical Performance

Parameter	17-22GHz	Units
Insertion Loss	1.5	dB
Isolation	20	dB
Beam to Beam Isolation	40	dB
Passband Ripple	±0.5	dB
Input Return Loss	-14	dB
Output Return Loss	-14	dB

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	Package Outline	5
9	Application Circuit	6
10	Recommended Solder Temperature Profile	7
11	Handling Precautions	7
12	Contact Information	8
13	Disclaimer	8

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.	17	-	22	GHz
Insertion Loss	IL	-	1.5	2	dB
Passband Ripple	△L	-	±0.5	-	dB
Isolation	ISO	-	20	-	dB
Beam to Beam Isolation	ISO-B	-	40	-	dB
Input Return Loss	RLin	-	-14	-12	dB
Output Return Loss	RLout	-	-14	-11	dB

7. Typical Performance Curve

■ Small-signal Characteristics Curve of L Beam

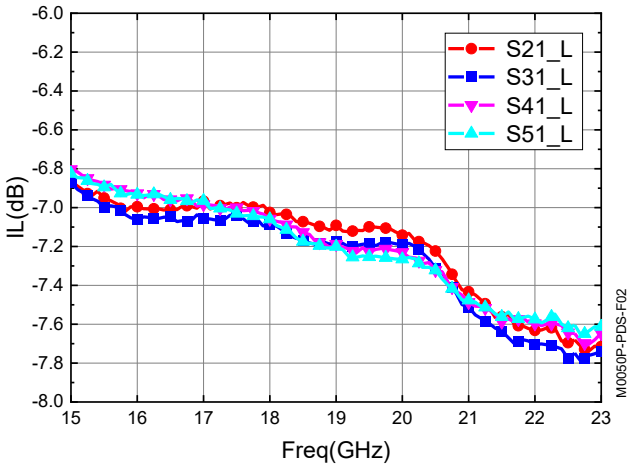


Figure 2. Insertion Loss Characteristics

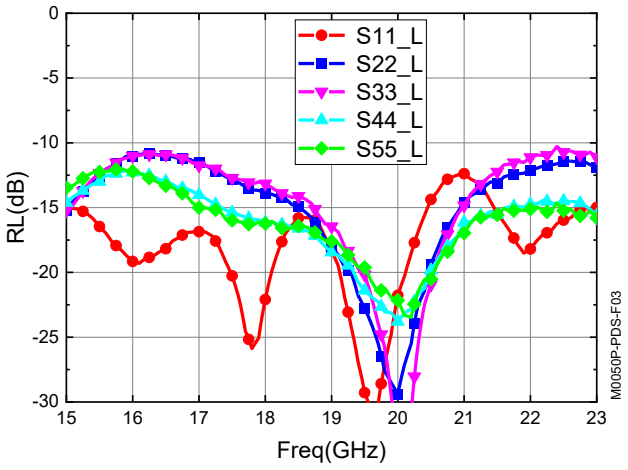


Figure 3. Input/Output Return Loss Characteristics

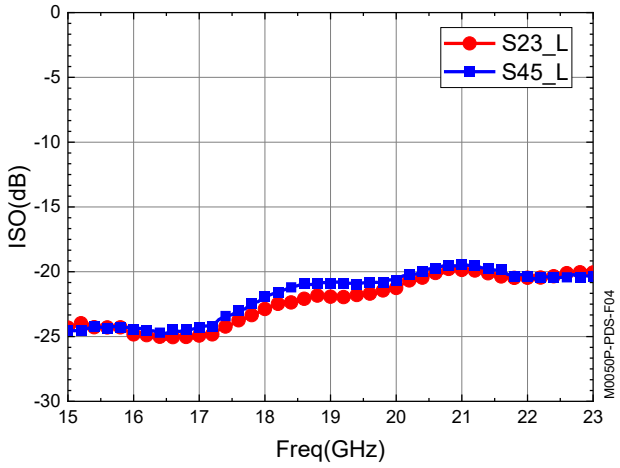


Figure 4. Isolation Characteristics

■ Small-signal Characteristics Curve of R Beam

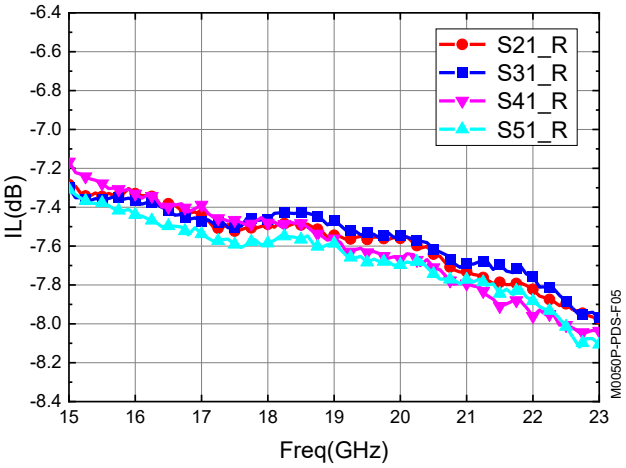


Figure 5. Insertion Loss Characteristics

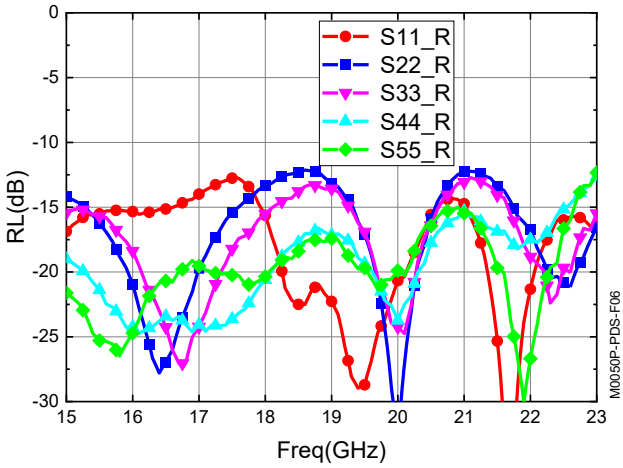


Figure 6. Input/Output Return Loss Characteristics

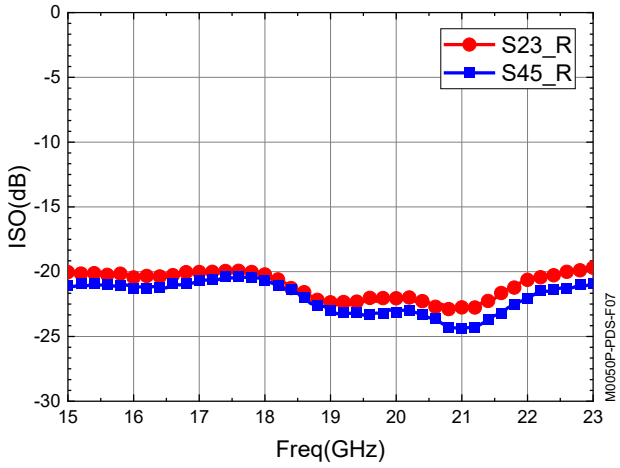


Figure 7. Isolation Characteristics

Small-signal Characteristics Curve of Beam to Beam

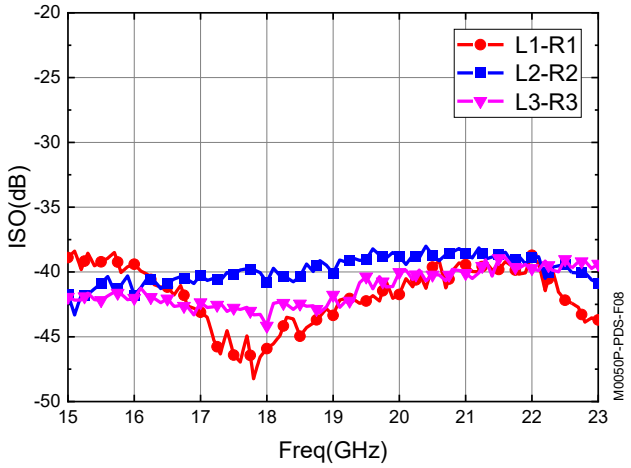


Figure 8. Beam to Beam Isolation Characteristics

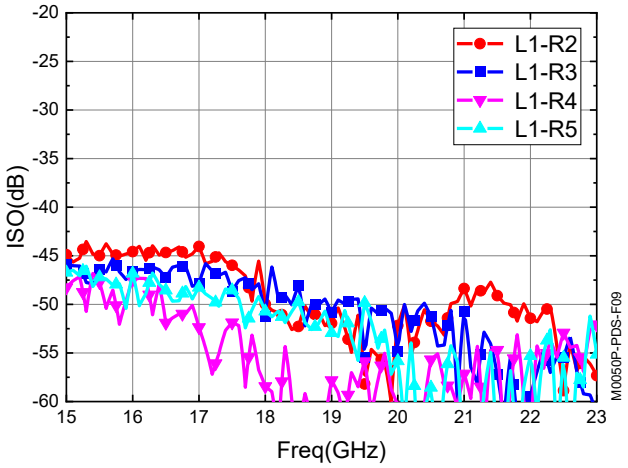


Figure 9. Beam to Beam Isolation Characteristics

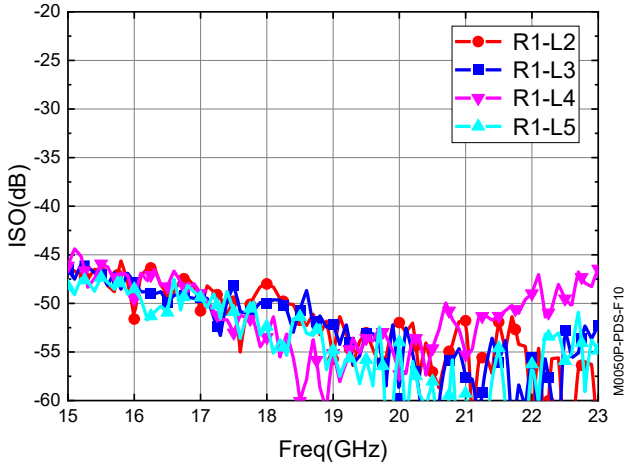


Figure 10. Beam to Beam Isolation Characteristics

8. Package Outline

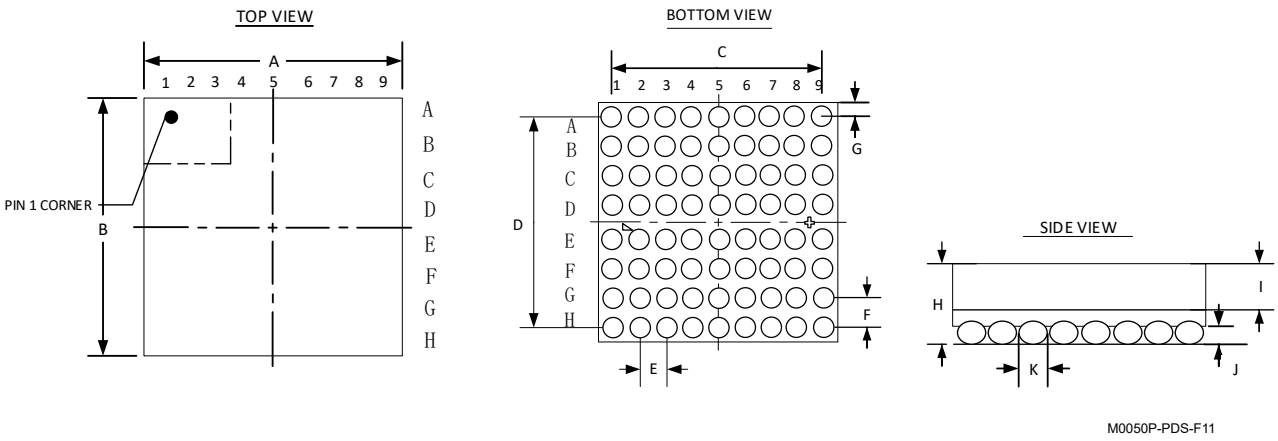


Figure 11. M0050P Outline Dimensions

Table 4. Package Outline Dimensions(mm)

A	B	C	D	E	F	G	H	I	J	K
4.6	4.1	4	4	0.5	0.5	0.3	0.89	0.45	0.23	0.3

Table 5. PIN Description

Pin	Symbol	Description
C9	L1	L Beam Input
A6	L2	L Beam Output1
A4	L3	L Beam Output2
H6	L4	L Beam Output3
H4	L5	L Beam Output4
F9	R1	R Beam Input
A8	R2	R Beam Output1
A2	R3	R Beam Output2
H8	R4	R Beam Output3
H2	R5	R Beam Output4
Other Ball	GND	GND

9. Application Circuit

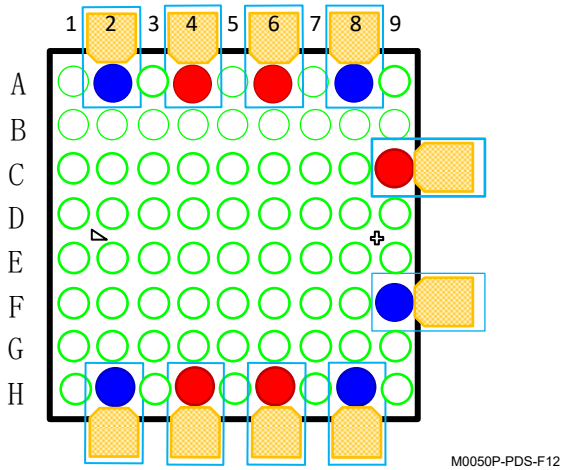


Figure 12. M0050P Application Circuit

10. Recommended Solder Temperature Profile

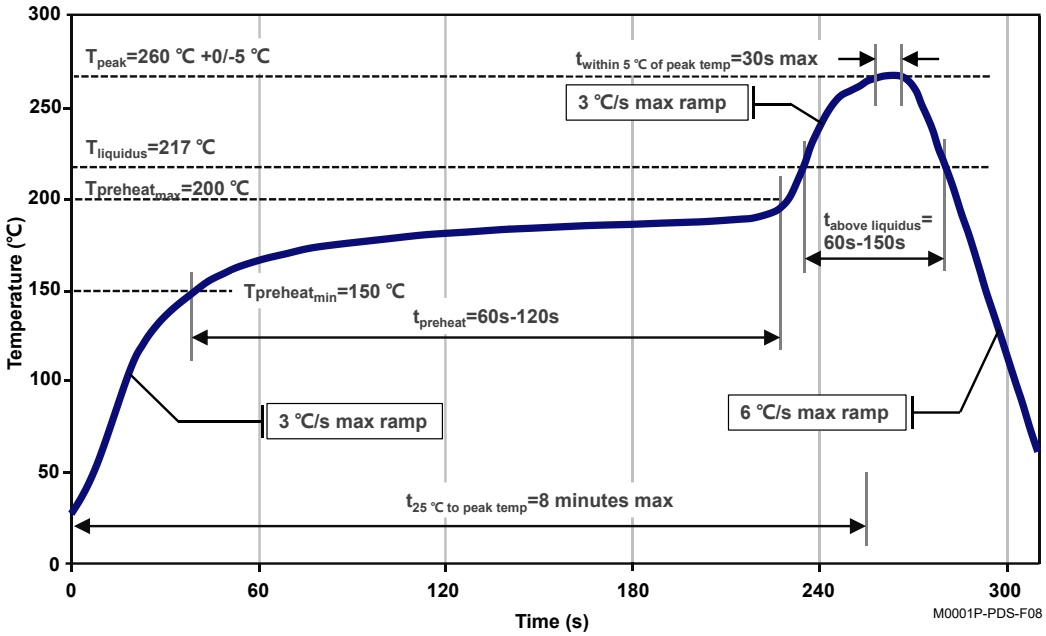


Figure 8. Recommended Solder Temperature Profile

11. Handling Precautions

- **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.



12. 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

13. Disclaimer

The information provided here is believed to be reliable at the time of publication. Raytron reserves the right to make changes to its products, specifications and product descriptions at any time without notice. Raytron assumes no responsibility for the use of this information and all such information should entirely be at the user's own risk. Raytron makes no warranty about the suitability of its products for specific purpose or application and disclaims all liability, including without limitation consequential and incidental damages. Raytron does not authorize or warrant any Raytron products for use in the life support devices or systems.

Raytron Microwave
Copyright @ Raytron Technology Co.,Ltd.