1. Description

- The M5305 is an 80W ($IP_{-0.3dB}$) wideband SPDT switch MMIC with gallium nitride (GaN) high electron mobility transistor (HEMT) from Infiwave. The M5305 operates from 2 to 6GHz with a -28V or -40V control voltage.

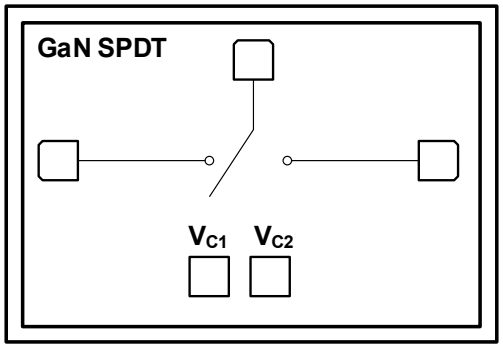


Figure 1. M5305 Functional Block Diagram

2. Applications

- TX/RX Modules

3. Features[1]

- Operating Frequency: 2-6GHz
- Insertion Loss: 1.1dB
- Isolation: 45dB
- Input/Output Return Loss: -12dB
- Input Power ($IP_{-0.3dB}$): 49dBm (80W)
- Control Voltage: 0/-28V or 0/-40V
- Die Size: 3.6 x 2.4 x 0.08mm

[1] On-wafer Test

4. Brief Typical Performance

Table 1. Brief Typical Performance

Parameter	2-6GHz	Units
Insertion Loss	1.1	dB
Isolation	45	dB
Input / Output Return Loss	-12	dB
Input Power for 0.3dB Compression	49	dBm

- Test condition: Input signal Pulsed, Pulse width = 50μs, Duty cycle = 5%

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5. Recommended Operating Conditions

Table 2. Recommended Operating Conditions

Parameter	Min.	Typ.	Max.	Units
Operating Temperature Range	-55	25	125	°C
Control Voltage, V_C	-	0/-28	0/-40	V

6. RF Characteristics (T_C = 25°C)

Table 3. RF Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units
Operating Frequency	Freq.	2	-	6	GHz
Insertion Loss	IL	-	1.1	-	dB
Isolation	ISO	-	45	-	dB
Input/Output Return Loss	RL	-	-12	-	dB
Input Power for 0.3dB Compression	$IP_{-0.3dB}$	-	49	-	dBm

• Test condition: Input signal Pulsed, Pulse width = 50μs, Duty cycle = 5%

7. Typical Performance Curve

■ Small-signal Characteristics Curve（25°C）

- **V_{CTL}=-28V, On-wafer test**

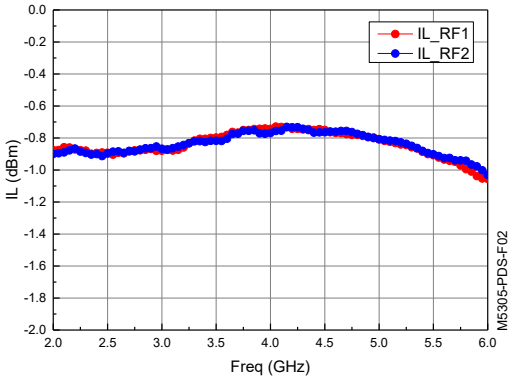


Figure 2. Insertion Loss Characteristics

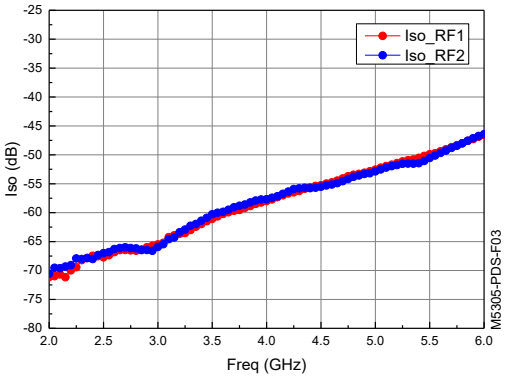


Figure 3. Isolation Characteristics

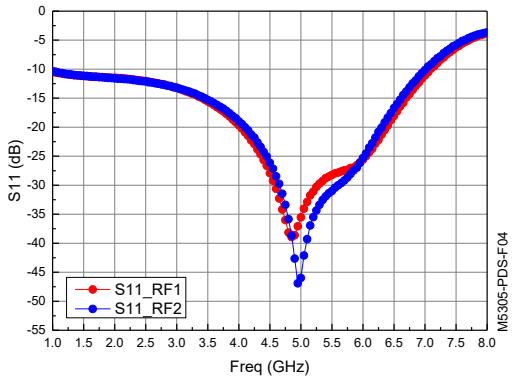


Figure 4. Input Return Loss Characteristics

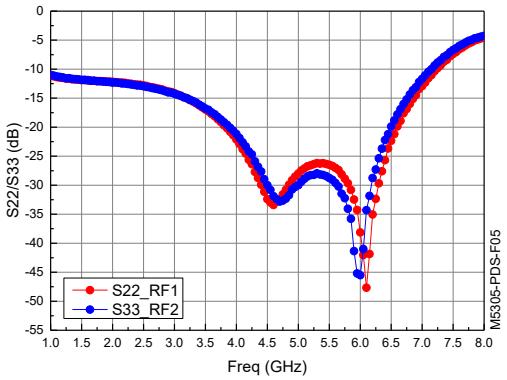
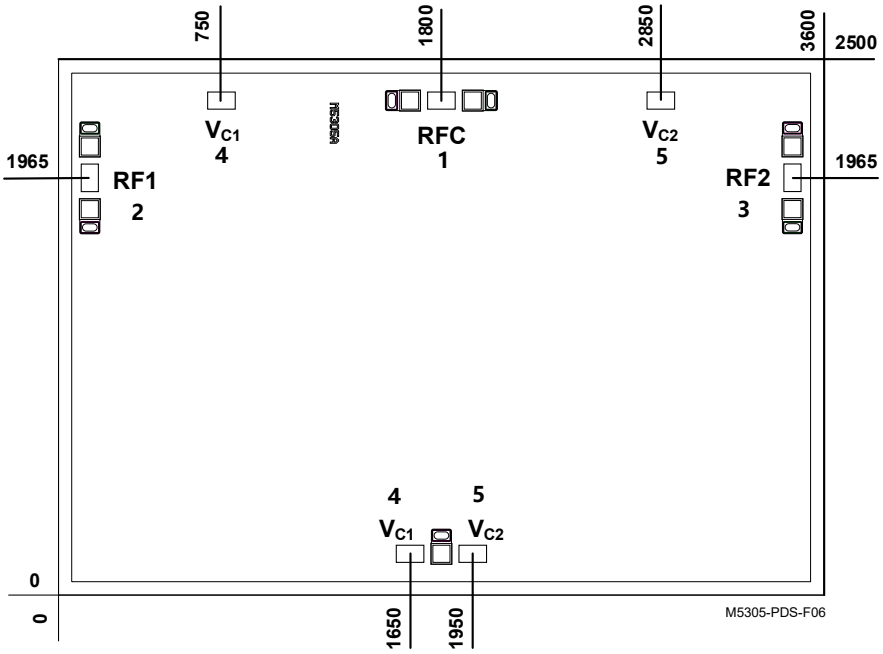


Figure 5. Output Return Loss Characteristics

8. Outline Dimensions



• Dimensions shown in micrometre

Figure 6. M5305 Outline Dimensions

Table 4. Pad Description

Pad	Symbol	Description
1	RFC	RF Input
2,3	RF1/RF2	RF Output 1 / RF Output 2
4,5	V_{C1}/V_{C2}	Control Voltage

Table 5. Truth Table

V_{C1}	V_{C2}	RFC to RF1	RFC to RF2
-28V/-40V	0V	ON	OFF
0V	-28V/-40V	OFF	ON

9. Assembly Information

■ Assembly Diagram

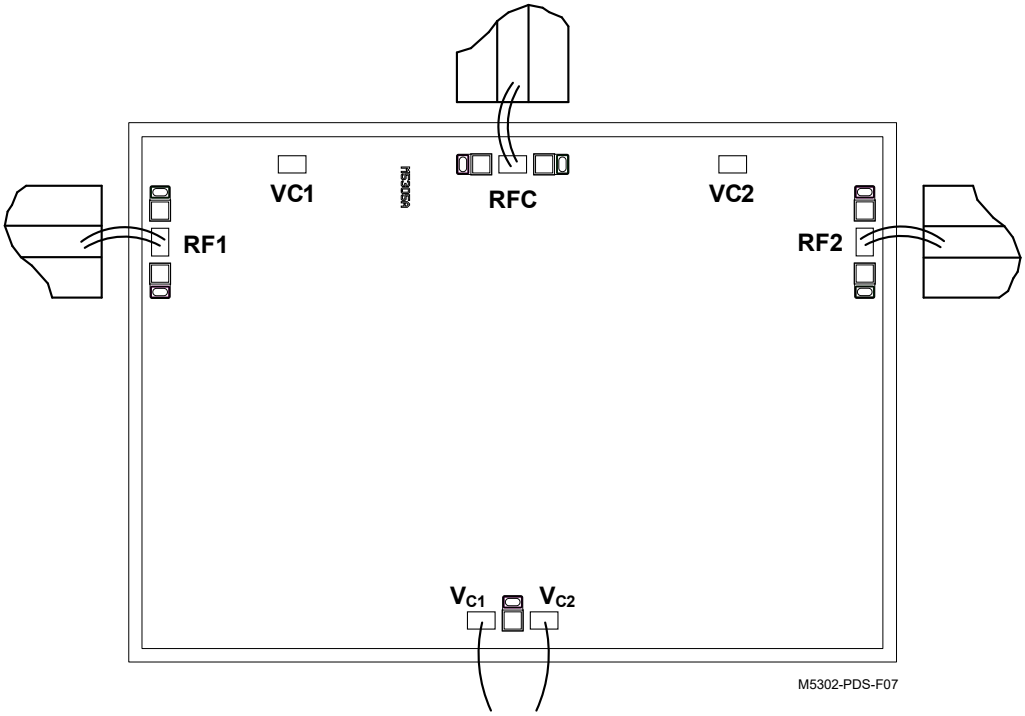


Figure 7. M5305 Assembly Diagram

- **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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