1. Description

- The M3523Q is low noise amplifier fabricated on GaAs p-HEMT MMIC process in a 3mm x 3mm QFN package. It operates over 6-18GHz and provides 21dB gain achieves 1.8dB noise figure. It can be biased from a single positive supply of 5V.



M3523Q-PDS-F01

Figure 1. M3523Q Functional Block Diagram

2. Applications

- Satellite Communication
- Radar Modules

3. Features

- Frequency: 6-18GHz
- Typical Gain: 21dB,
- Noise Figure: 1.8dB
- Input/Output Return Loss: -11dB
- Output P_{-1dB}: 17dBm
- Single Positive Supply: +5V (I_{DQ}=71mA)
- 50Ohm Matched Input/Output
- Package Size: 3.00 x 3.00 x 0.75mm

4. Brief Typical Performance

Table 1. Brief Typical Performance

Parameter	6-18GHz	Units
Small-Signal Gain	21	dB
Noise Figure	1.8	dB
Input Return Loss	-11	dB
Output Return Loss	-11	dB
Output P_{-1dB}	17	dBm

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5. Absolute Maximum Ratings

Table 2. Absolute Maximum Ratings

Parameter	Symbol	Rating	Units
Operating Voltage Range	V_D	0 ~ +6	V
Storage Temperature Range	T_{STG}	- 55 ~ 150	°C

6. Recommended Operating Conditions

Table 3. Recommended Operating Conditions

Parameter	Min.	Typ.	Max.	Units
Operating Temperature Range	-55	25	125	°C
Supply Voltage, V_D	-	5	-	V
Supply Current, I_{DQ}	-	71	-	mA

7. RF Characteristics (V_D=3V, T_C = 25˚C)

Table 4. RF Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units
Operating Frequency	Freq.	6	-	18	GHz
Small-Signal Gain	Gain	-	21	-	dB
Noise Figure	NF	-	1.8	-	dB
Input Return Loss	IN RL	-	-11	-	dB
Output Return Loss	OUT RL	-	-11	-	dB
Output Power for 1dB Compression	OP1dB	-	17	-	dBm
Supply Current	I_D	-	71	-	mA

• Typical performance at these conditions: Temp=25°C, V_D=5V, P_{IN}=-30dBm, 50Ohm system.

8. Typical Performance Curve

■ Small-signal Characteristics Curve

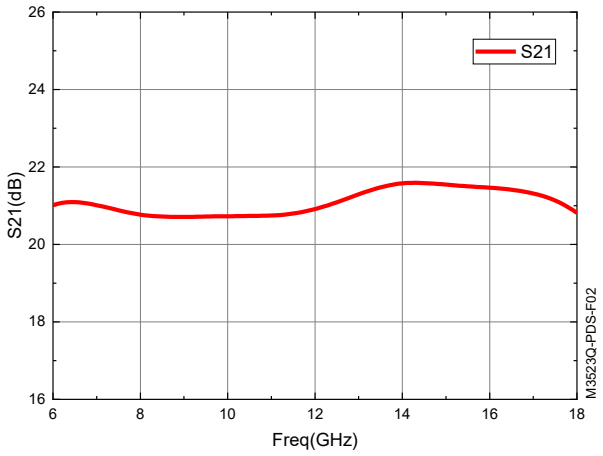


Figure 2. Small-signal Gain Characteristics

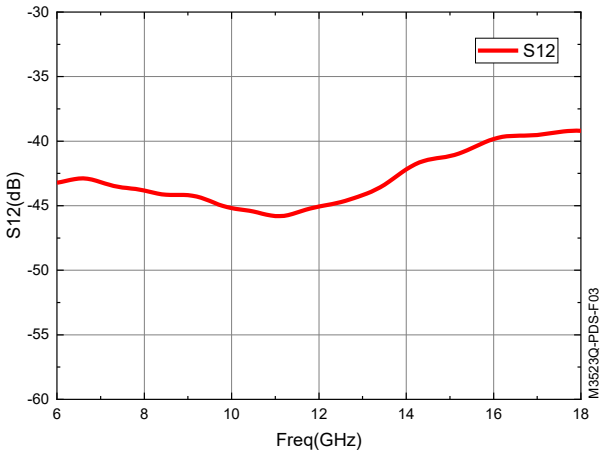


Figure 3. Reverse Isolation Characteristics

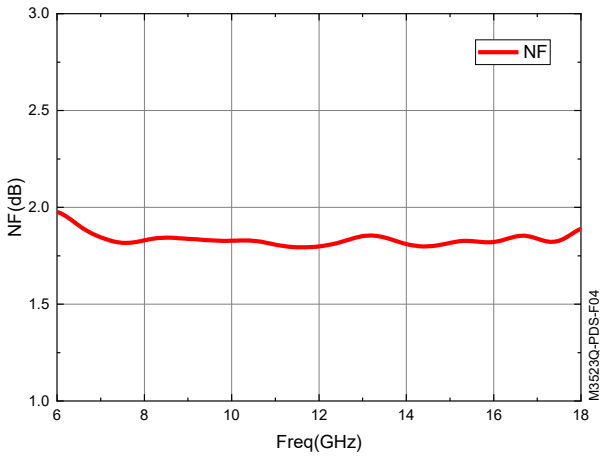


Figure 4. Noise Figure Characteristics

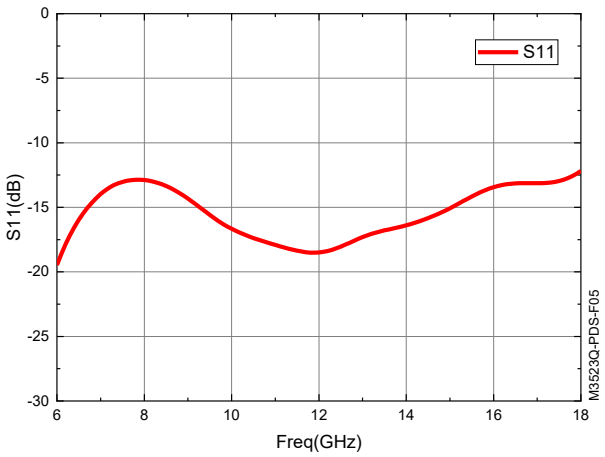


Figure 5. Input Return Loss Characteristics

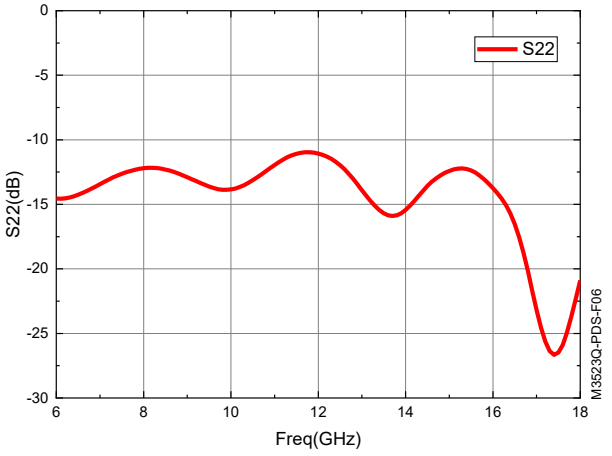


Figure 6. Output Return Loss Characteristics

■ Power Characteristics Curve

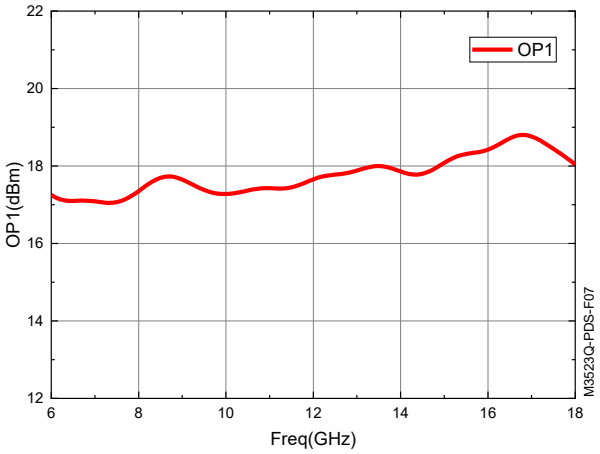


Figure 7. OP-1dB Characteristics

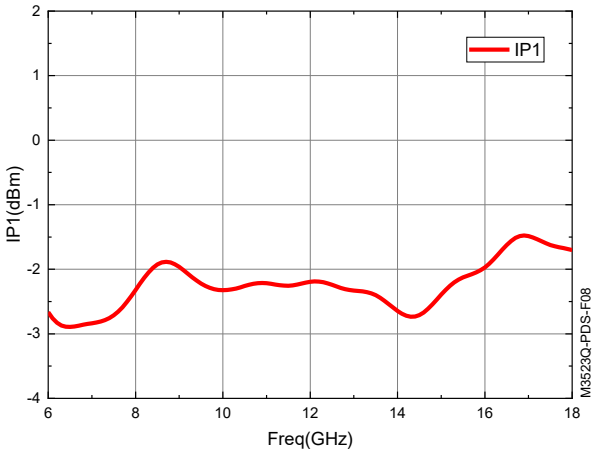
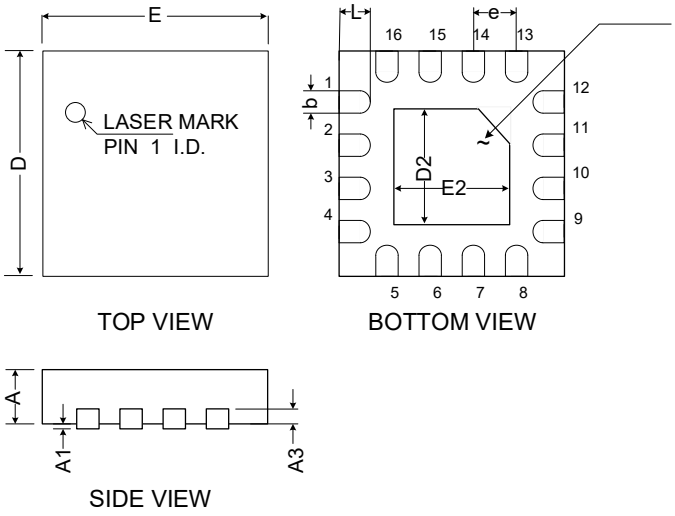


Figure 8. IP-1dB Characteristics

9. Package Outline



COMMON DIMENSIONS (MM)			
PKG.	WIVERY VERY THIN		
REF.	MIN.	NOM.	MAX.
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
A3	0.203 REF		
D	2.95	3.00	3.05
E	2.95	3.00	3.05
D2	1.60	1.65	1.70
E2	1.60	1.65	1.70
b	0.20	0.25	0.30
L	0.35	0.40	0.45
e	0.50 BSC		

M3523Q-PDS-F09

-
- Dimensions shown in millimetre

Figure 9. M3523Q Outline Dimensions

Table 5. PIN Description

Pin Number	Symbol	Description
3	RF_{IN}	RF Input. 50 ohm. DC blocking capacitor is not required.
10	RF_{OUT}	RF Output. 50 ohm. DC blocking capacitor is not required.
14	V_D	Supply Voltage. External bypass capacitors are required, refer to Figure 10.
4,9 & Paddle	GND	Package bottom must be connected to ground
1,2,5,67,8,11,12,13,15,16	N/C	Not used internally. Connected to ground on test board

10. Application Circuit

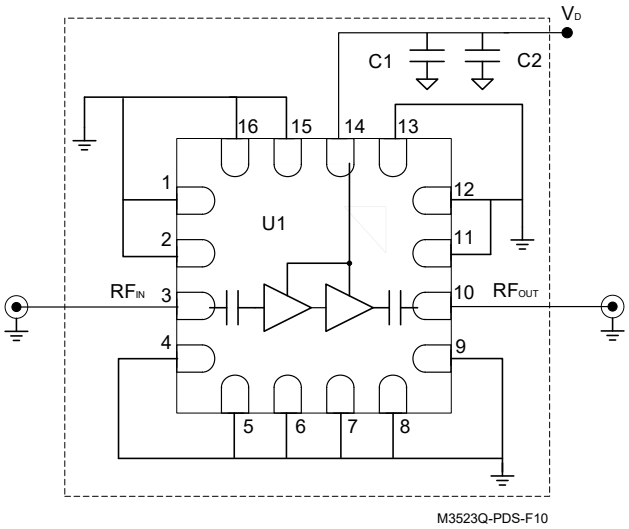


Figure 10. M3523Q Application Circuit

Table 6. Application Circuit

Component	Value	Description
U1	-	M3523Q
C1	0.01uF	Ceramic SMT capacitor
C2	0.1uF	Ceramic SMT capacitor

11. Recommended Solder Temperature Profile

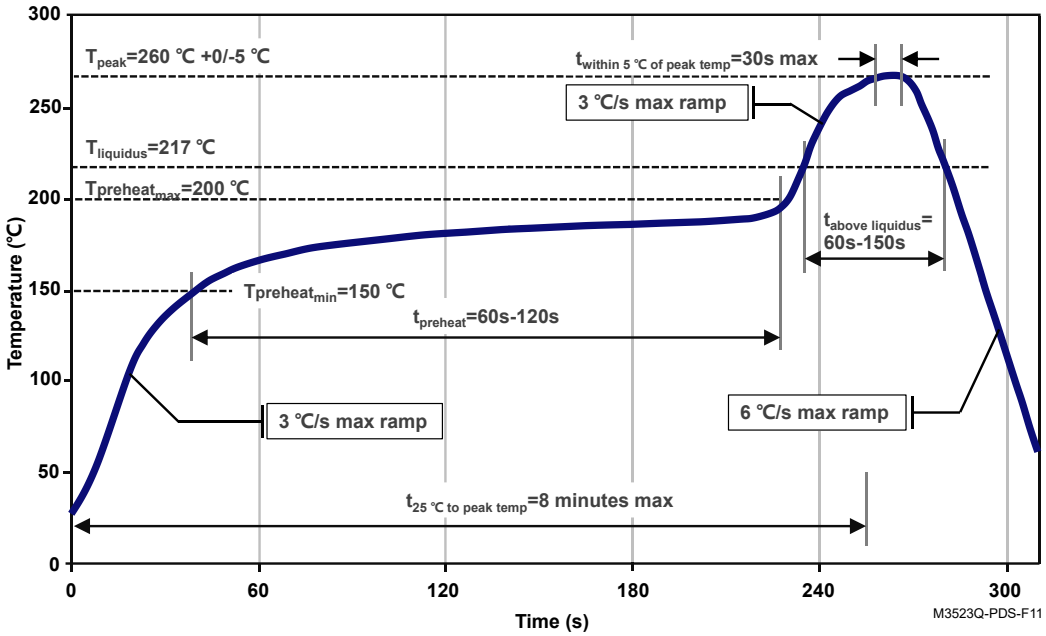


Figure 11. Recommended Solder Temperature Profile

12. 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.



13. 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

14. Disclaimer

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