1. Description

- The MA006Q is a limiter fabricated using GaAs MMIC process in a 4mm x 4mm QFN package. The device operates from 5 to 12GHz, with an insertion loss of less than 1.2dB, and power handling capability of 51dBm (126W, test condition: 100us, 25%), a flat leakage of 14dBm. No input or output DC-blocking capacitors are integrated on-chip.



MA006Q-PDS-F01

Figure 1. MA006Q Functional Block Diagram

2. Applications

- TX/RX Modules

3. Features

- Operating Frequency: 5-12GHz
- Insertion Loss: -1.2 dB
- Input/Output Return Loss: -12dB / -13dB
- Power Handling Capability: 51dBm (126W, Pulse width = 100us, Duty cycle = 25%)
- Flat Leakage: 14dBm
- Die Size: 4.0 x 4.0 x 0.85mm

4. Brief Typical Performance

Table 1. Brief Typical Performance

Parameter	5-12GHz	Units
Insertion Loss	-1.2	dB
Input Return Loss	-12	dB
Output Return Loss	-13	dB
Power Handing Capability	51	dBm
Flat Leakage at P_{IN}>20dBm	14	dBm

- Test condition: Input signal pulsed, Pulse width = 100us, Duty cycle = 25%

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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
Operating Frequency	5	-	12	GHz
Maximum Input Power	-	-	51	dBm

6. RF Characteristics (T_C = 25˚C)

Table 3. RF Characteristics[1]

Parameter	Symbol	Min.	Typ.	Max.	Units
Operating Frequency	Freq	5	-	12	GHz
Insertion Loss @ 12GHz	IL	-	-1.2	-	dB
Input Return Loss	RLin	-	-12	-	dB
Output Return Loss	RLout	-	-13	-	dB
Power Handing Capability	Pc	-	51	-	dBm
Flat Leakage	FL	-	14	-	dBm

[1]. Test condition: Input signal pulsed, Pulse width = 100us, Duty cycle = 25%

7. Typical Performance Curve

■ Small-signal Characteristics Curve

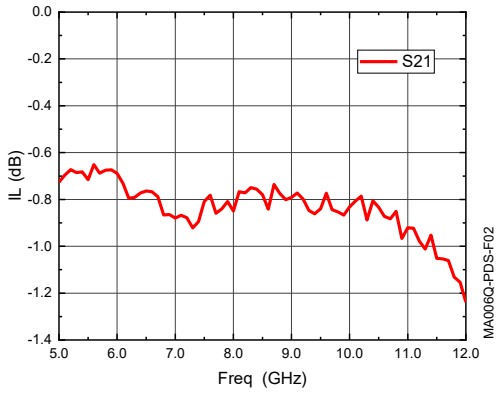


Figure 2. Insertion Loss Characteristics

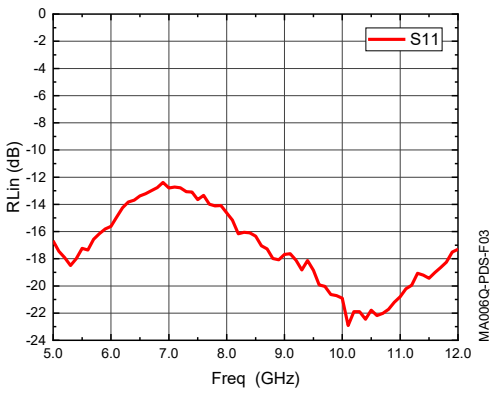


Figure 3. Input Return Loss Characteristics

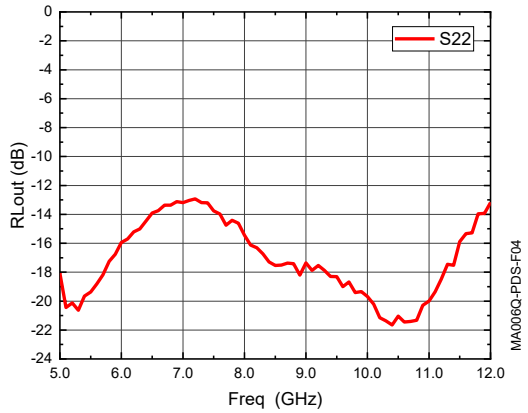


Figure 4. Output Return Loss Characteristics

■ Power Characteristics

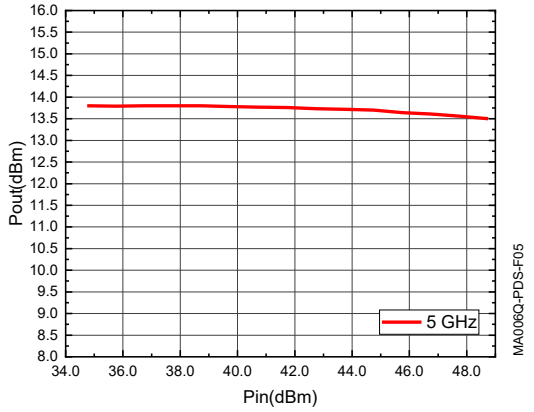
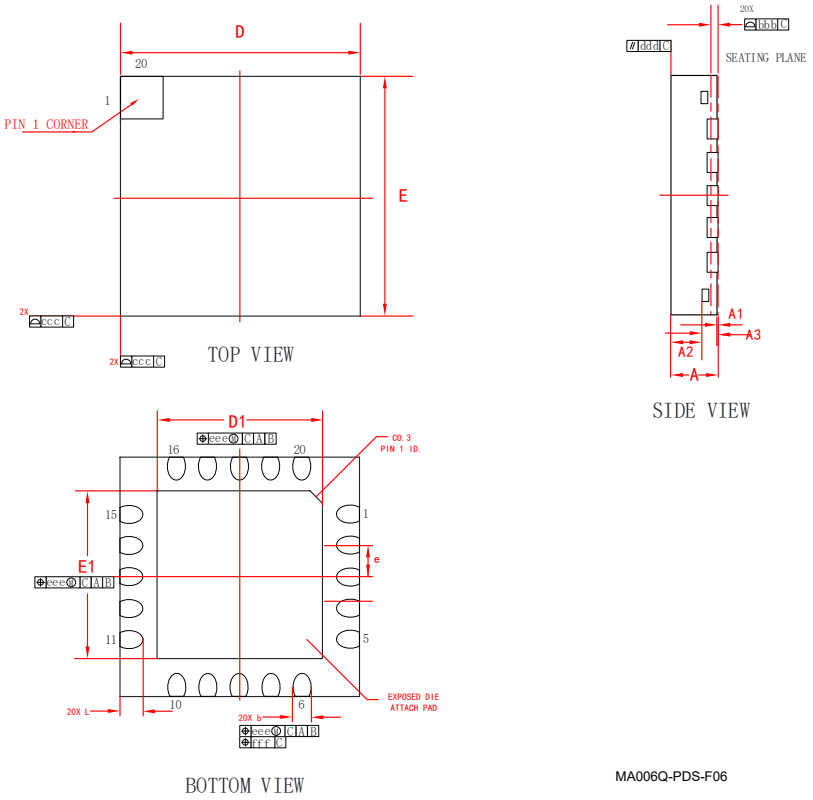


Figure 5. Flat Leakage Characteristics

8. Package Outline



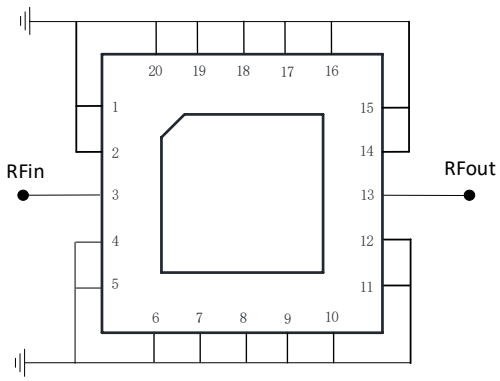
- Dimensions shown in micrometre

Figure 6. MA006Q Outline Dimensions

Table 4. Package Outline Dimensions (mm)

DESCRIPTION	SYMBOL	MILLIMETER		
		MIN.	NOM.	MAX.
TOTAL THICKNESS	A	0.80	0.85	0.9
STAND OFF	A1	0	0.035	0.050
MOLD THICKNESS	A2	-	0.65	0.67
MATERIAL THICKNESS	A3	-	0.203	-
PACKAGE SIZE	D	3.90	4.00	4.10
	E	3.90	4.00	4.10
EP SIZE	D1	2.75	2.8	2.85
	E1	2.75	2.8	2.85
LEAD LENGTH	L	0.25	0.3	0.35
LEAD PITCH	e		0.5	
LEAD WIDTH	b	0.25	0.30	0.35
LEAD POSITION OFFSET	aaa		0.10	
LEAD COPLANARITY	bbb		0.08	
PACKAGE EDGE PROFILE	ccc		0.10	
MOLD FLATNESS	ddd		0.10	
EP POSITION OFFSET	eee		0.10	
	fff		0.05	

9. Application Circuit



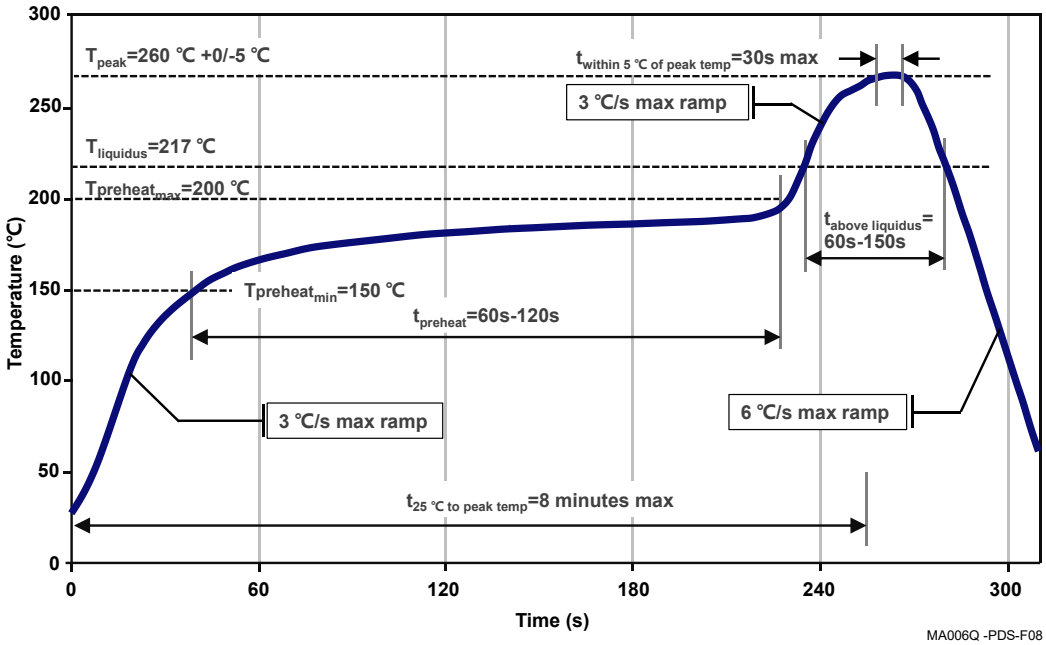
MA006Q-PDS-F07

Figure 7. MA006Q Application Circuit

Table 5. Pin Description

Pin	Symbol	Description
3	RFin	RF Input
13	RFout	RF Output
1,2,4,5,6,7,8,9,10,11,12,14,15,16,17,18,19,20	GND	RF Ground Pin

10. Recommended Solder Temperature Profile



MA006Q -PDS-F08

Figure 8. Recommended Solder Temperature Profile

11. 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.



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

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