GaAs monolithic microwave envelope detector

DC~20GHz

key indicator

- Frequency range: DC~20GHz
- Dynamic range: 30dB
- BCB protection
- Chip size: 1.25mm×1.25mm×0.1mm

typical application

- Radar and electronic countermeasures
- RF/Microwave Circuit
- Military and aerospace
- Test measurement
- Instrumentation

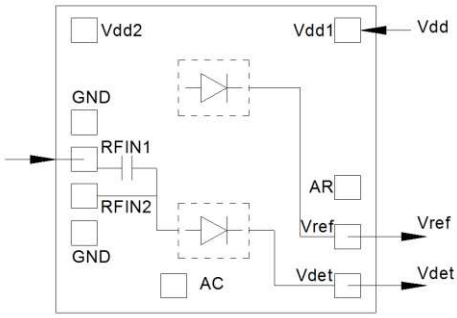
Product Introduction

AY9669 is a GaAs MMIC envelope detector chip that integrates internal matching detector diode (Vdet) and differential mode reference voltage (Vref).

The chip has a wide range of applications, accurate transmission power control and typical commercial communication systems.

The chip uses an on-chip metallization process to ensure good grounding, and the back of the chip is metallized, which is suitable for eutectic sintering or conductive adhesive bonding processes.

Functional block diagram



Electricity T_A=25℃,V_D=+5V,Z_0=50Ω）

parameter name	Parameter value			unit
	MIN	TYPE	MAX	
Frequency Range	DC	-	20	GHz
flatness	-	1	-	dB
Dynamic Range	-	30	-	dB
Input standing wave ratio	-	1.6	-	:1
Rising edge	-	50	-	ns
Falling edge	-	300	-	ns
Current	-	2.5	-	mA

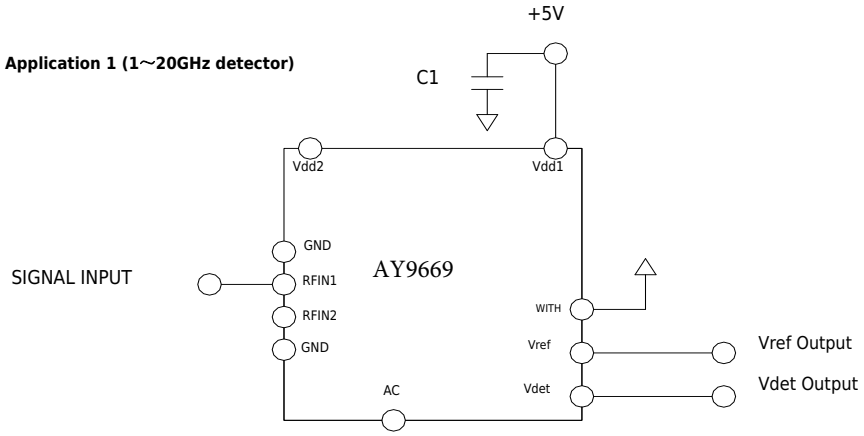
Absolute maximum rating

Maximum input RF power	+18dBm	Operating temperature	-55 ℃ ~ + 85 ℃
Voltage	+ 6V	Storage temperature	-65 ℃ ~ + 150 ℃

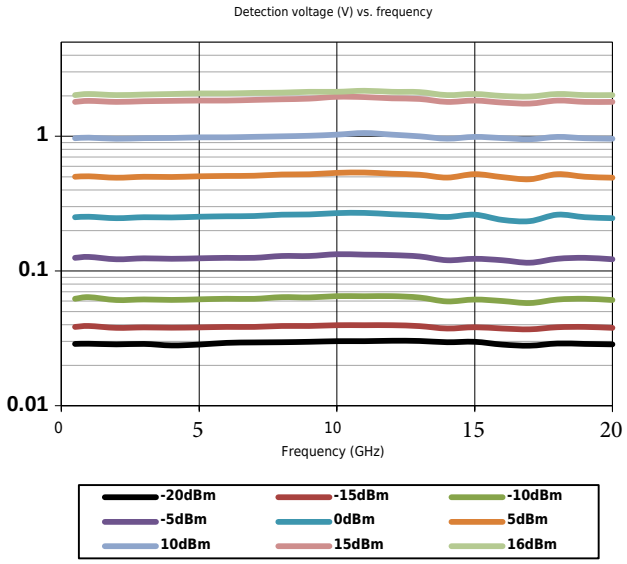
GaAs monolithic microwave envelope detector

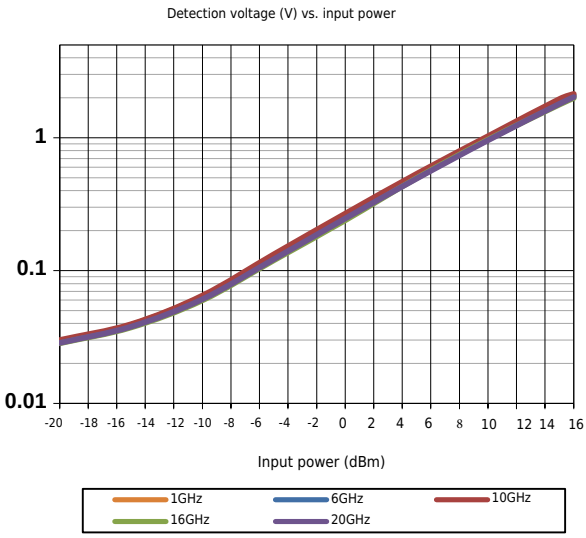
DC~20GHz

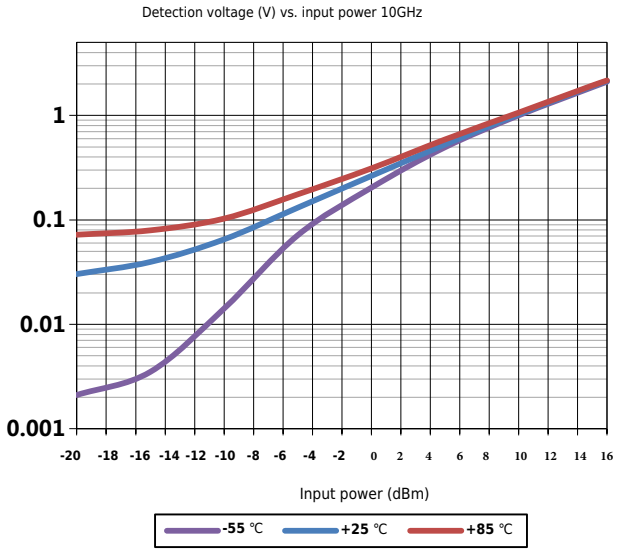
Application 1 (1~20GHz detector)

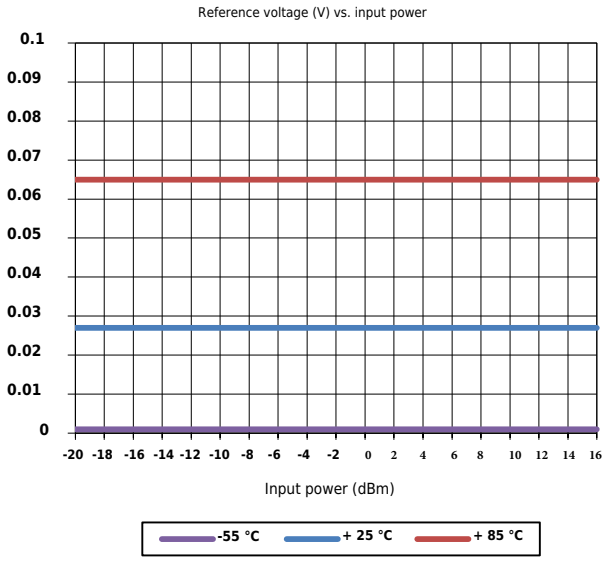


Application 1 typical test curve



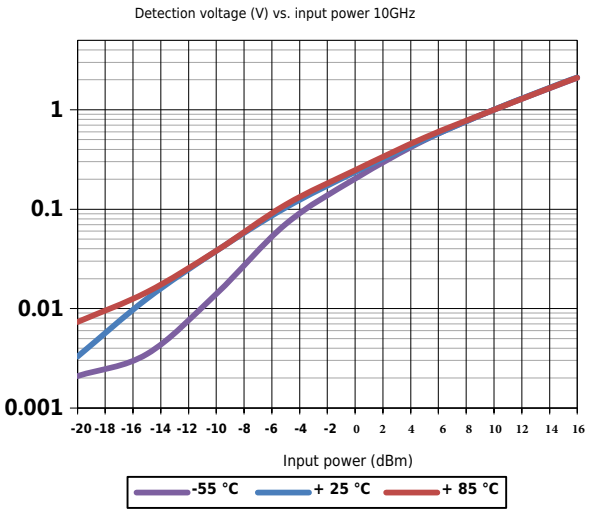


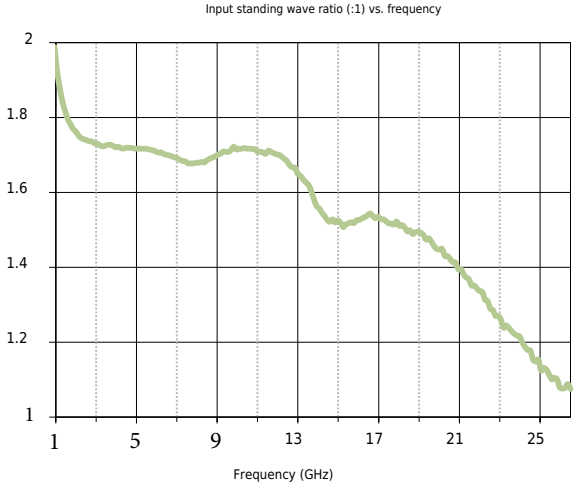




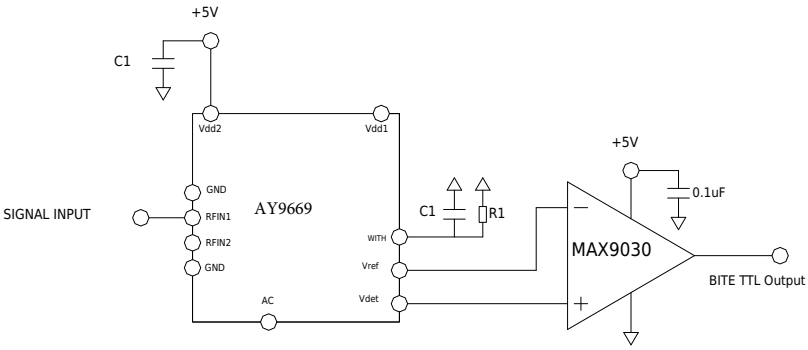
GaAs monolithic microwave envelope detector

DC~20GHz



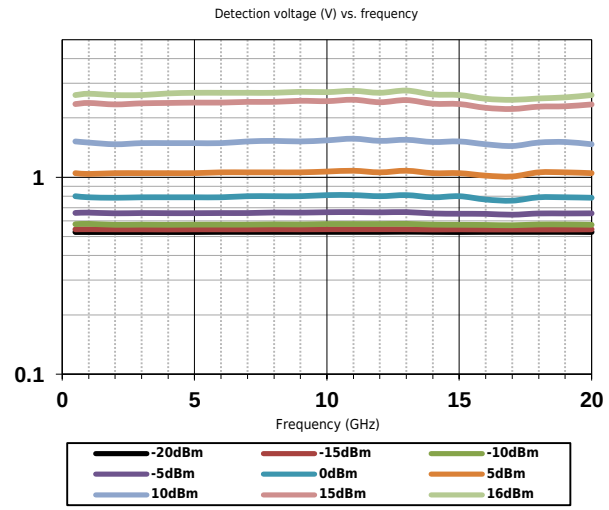


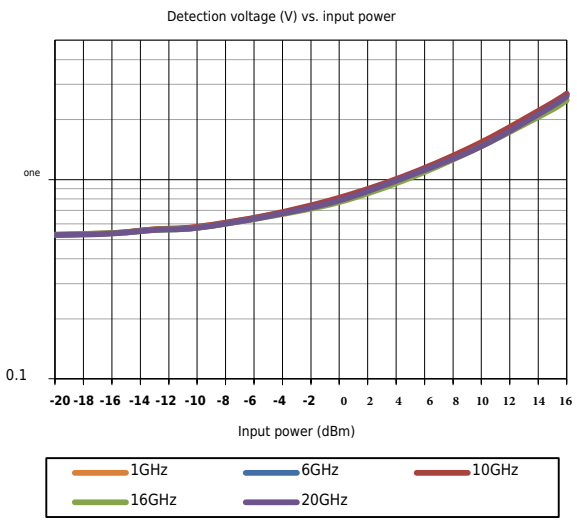
Shall with 2 (. 1 ~ 20GHz the BITE **)**



This circuit is used for system self-check, resistor R1 sets the threshold power, when the input signal is higher than the threshold power, the comparator MAX9030 outputs TTL high level. R1 setting range: 51Ohm~5.1KOhm.

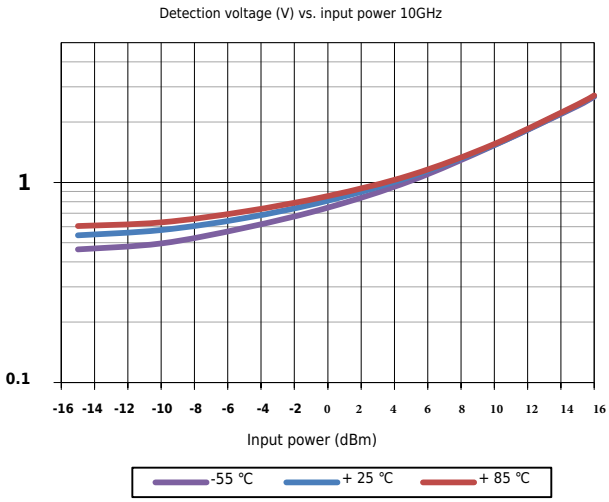
Application 2 typical test curve (R1=0Ohm **)**

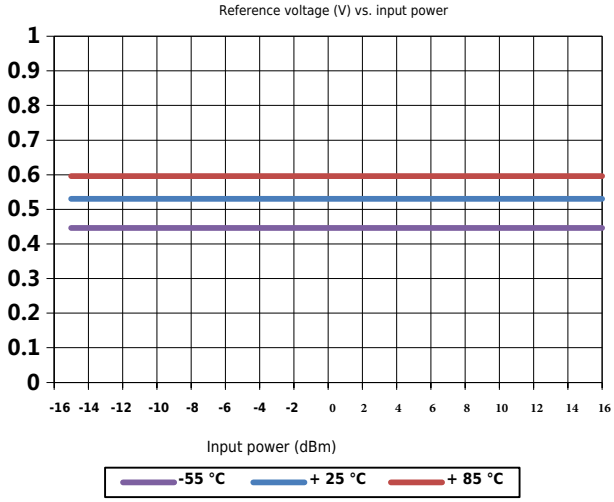


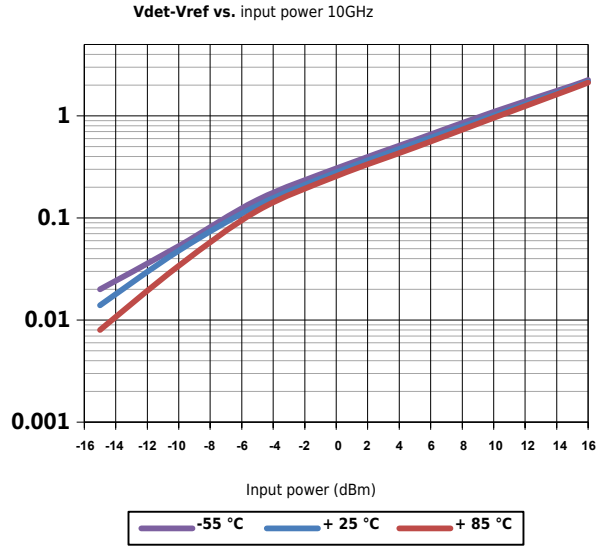


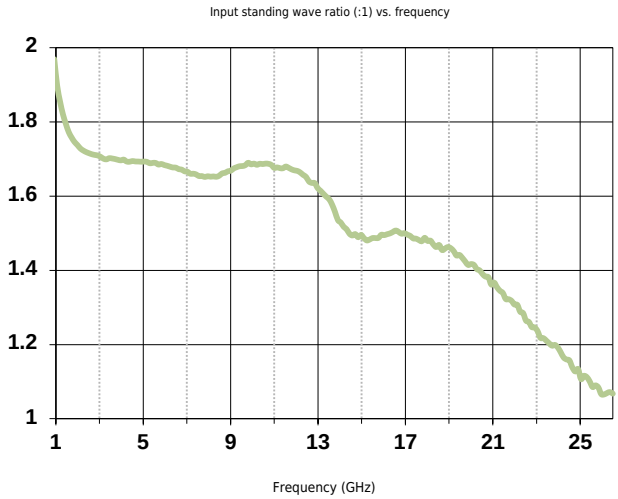
GaAs monolithic microwave envelope detector

DC~20GHz

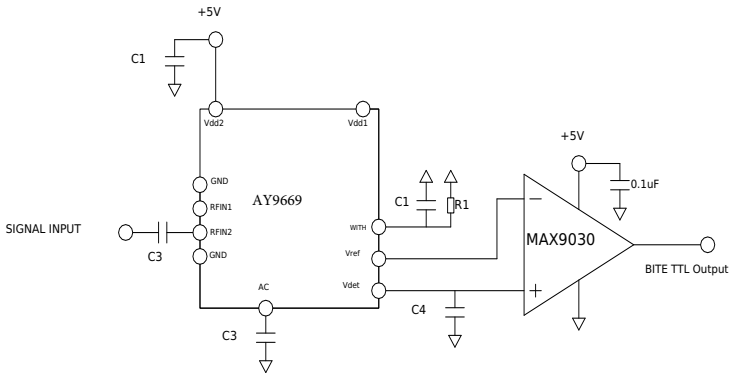








Shall with 3 (0.03 ~ 2GHz BITE)



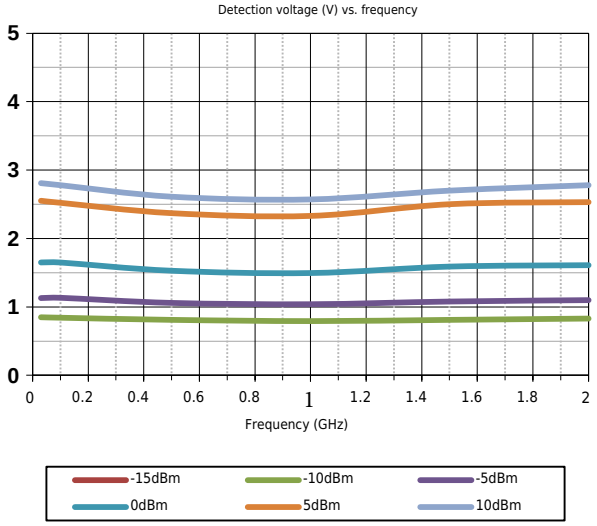
This circuit is used for system self-check, resistor R1 sets the threshold power, when the input signal is higher than the threshold power, the comparator MAX9030 outputs TTL high level. R1 setting range: 51Ohm~5.1KOhm.

GaAs monolithic microwave envelope detector

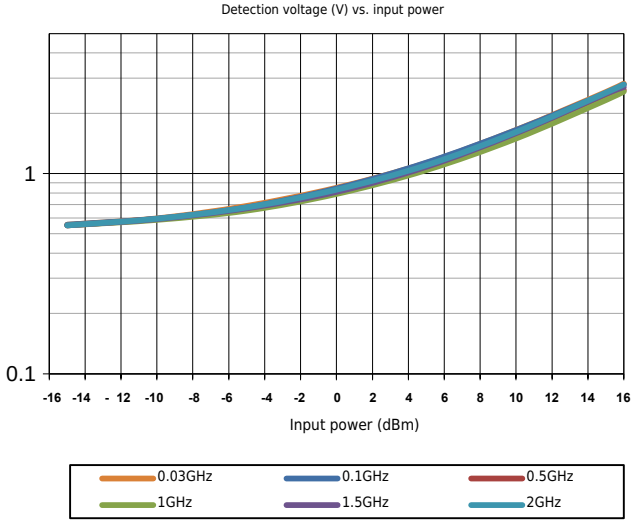
DC~20GHz

Application 3 typical test curve (R1=0Ohm)

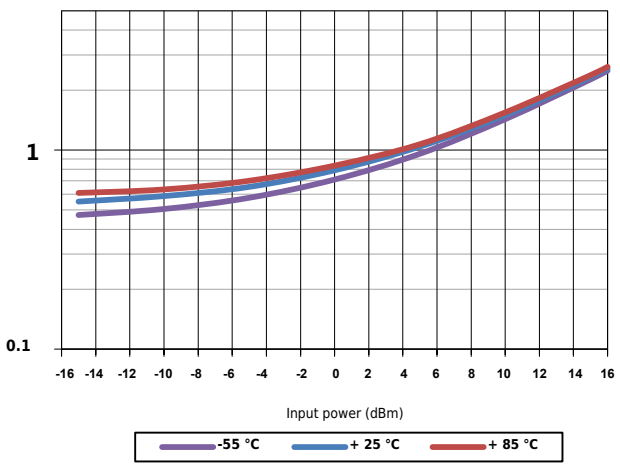
Detection voltage (V) vs. frequency



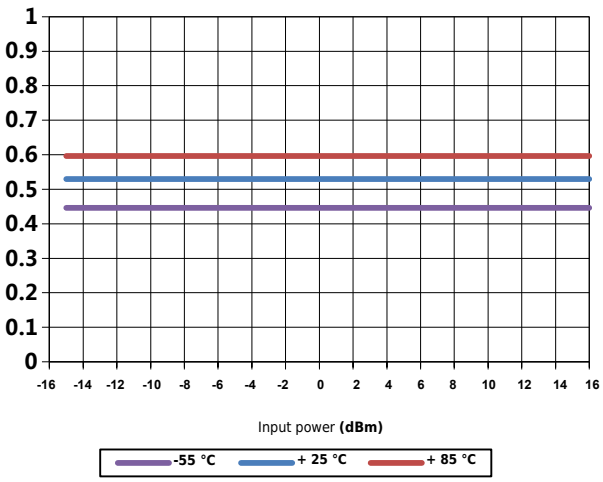
Detection voltage (V) vs. input power



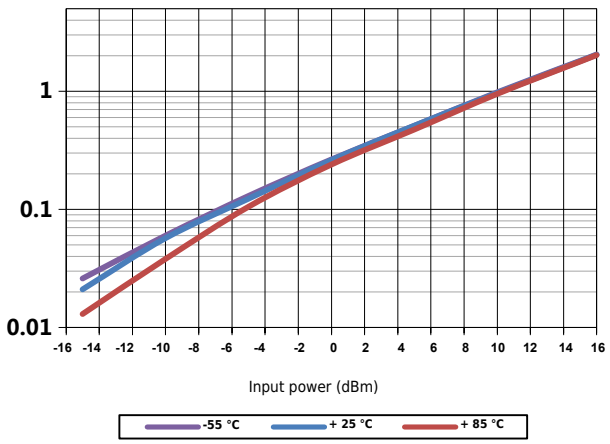
Detection voltage (V) vs. input power 1GHz



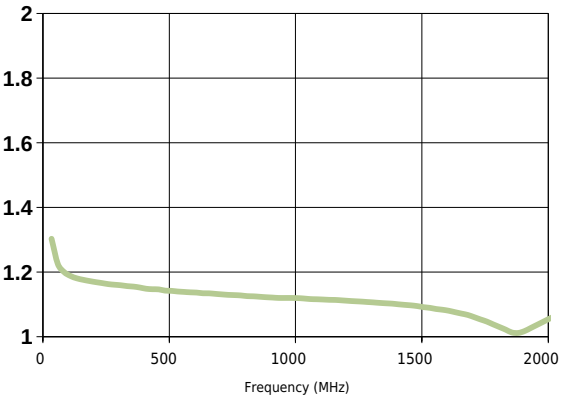
Reference voltage (V) vs. input power



Vdet-Vref vs. input power 1GHz



Input standing wave ratio (:1) vs. frequency



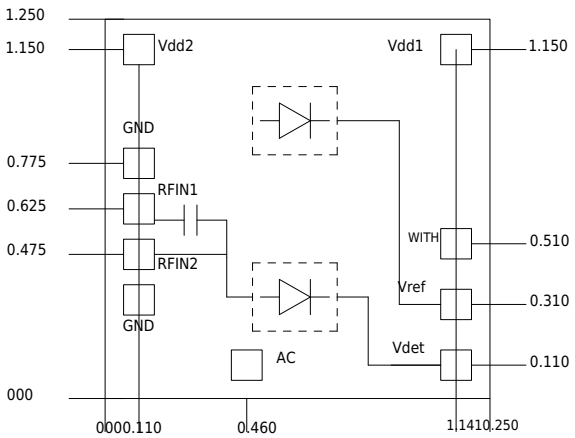
GaAs monolithic microwave envelope detector

DC~20GHz

Original list

serial number	Numerical value	model	manufacturer	Encapsulation
C1	330pF	116RM331M050TT	ATC	-
C2	10nF	GRM155R71H103KA88D	MURATA	0402
C3	1000pF	116RM102M050TT	ATC	-
C4	200pF	116RM201M050TT	ATC	-
R1	51Ohm~5.1KOhm		MURATA	0603

Dimensions (mm)



Chip thickness: 100μmChip size:
1.25×1.25×0.1mm±35μmPad: 100/100μm

Precautions

1. The chip is stored in a dry, nitrogen environment and used in an ultra-clean environment;
2. GaAs material is relatively brittle and cannot touch the surface of the chip, so you must be careful when using it;
3. The chip is sintered with conductive glue or alloy (the alloy temperature cannot exceed 300°C, and the time cannot exceed 30 seconds), so that it is fully grounded;
4. The gap between the microwave port of the chip and the substrate should not exceed 0.05mm. Use Φ25μm double gold wire for bonding. The recommended length of gold wire is 250～400μm; T
5. The chip is sensitive to static electricity, so pay attention to anti-static during storage and use..