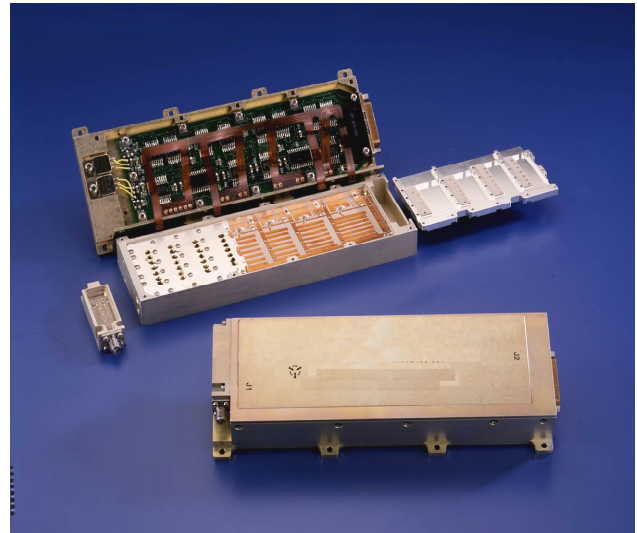


## FEATURES

- 2.0 to 6.0 GHz Coverage
- 16 Channels
- 250 MHz Channel Bandwidths
- Selectable video detection bandwidths
- Low False Alarm rate
- 50ns RF pulse width capability

## APPLICATIONS

- Coarse Frequency measurement
- Fast RF Activity Detection
- Fast Set on Receivers



## Product Description

The DG009-M1 Activity Detection Units (ADU) is a fast activity detection unit, which provides an indication of RF signal presence over the 2.0 to 6.0 GHz frequency range. The ADU consists of a power divider followed by two banks of 8 channel multiplexers, one on each arm of the power divider.

The outputs of the multiplexers are terminated in diode detectors followed by high-speed video comparators providing 16 TTL digital outputs indicating the RF channel with a valid signal.

Each channel of the ADU has a separately digitally programmable threshold of 32 levels over a 16 dB window. This is valid for each of the two selectable video bandwidths ( 10 MHz or 5MHz).

All input and output data is latched such that output data signals are present for a minimum period of time.

The ADU has been designed such that, when RF signals are present in the crossover regions of the multiplexers, only one of the two adjacent digital channels will trigger leading to clear unambiguous indication of input frequency.

The ADU has been designed for use in airborne transport environments of  $-20$  degC to  $+80$  degC and up to 50,000 feet altitude.

The ADU has a low false alarm rate, giving high system reliability and probability of detection when incorporated into typical Electronic Support Measures (ESM) suites.

<b>Technical Data</b>	<b>DG009-M1</b>
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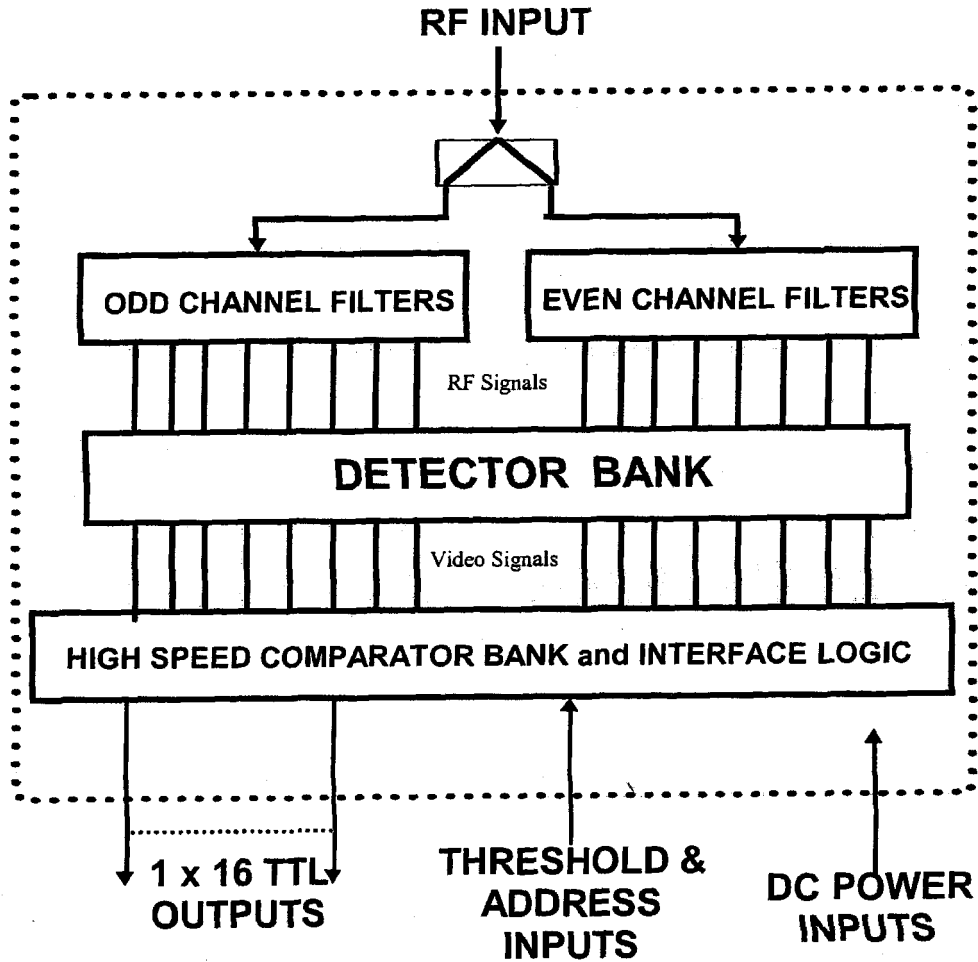
**Electrical Specification**

<u>Parameter</u>	<u>Specification Limit</u>
Operating Frequency Range	2.0-6.0 GHz
Number of Channels	16
Nominal Channel Bandwidth	250 MHz
Input VSWR (max)	1.9 : 1
Maximum Input Power	25.0 dBm
Input Power Range for Video BW of 10 MHz	10.0 to 16.0 dBm
Input Power Range for Video BW of 5 MHz	8.2 to 16.0 dBm
Signal to Harmonic Ratio	≥ -9.0 dBc
Noise Input Power Level	15.0 dBm
Selectable Video Bandwidth: Video BW WB Video BW NB	10 MHz 5 MHz
Probability of Detection, Centre Band (Unambiguous Zone)	> 0.99
Probability of Detection, Cross Over (ambiguity Zone)	> 0.93
False Alarm Rate (Far)	1 per second
Channel Centre Frequency (f <sub>0</sub> nominal)	
Channel 1	2.125 GHz
Channel 2	2.375 GHz
Channel 3	2.625 GHz
Channel 4	2.875 GHz
Channel 5	3.125 GHz
Channel 6	3.375 GHz
Channel 7	3.625 GHz
Channel 8	3.875 GHz
Channel 9	4.125 GHz
Channel 10	4.375 GHz
Channel 11	4.625 GHz
Channel 12	4.875 GHz
Channel 13	5.125 GHz
Channel 14	5.375 GHz
Channel 15	5.625 GHz
Channel 16	5.875 GHz
Unambiguous Channel Bandwidth (min)	220.0 MHz (f <sub>0</sub> ±110 MHz)
Cross Over Ambiguity Zone (max)	F <sub>cr</sub> ±15.0 MHz
Non-Activity Frequency Band	DC -1.97 GHz and 6.03-18.0 GHz
Throughput Time Delay (max) RF <sub>On</sub> (90% RF I/P to 50% TTL Output) Wide Band Video Band Width (10 MHz): For above +10.0 dBm input	50 ns

<b>Technical Data</b>	<b>DG009-M1</b>
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<u>Parameter</u>	<u>Specification Limit</u>
For above +9.0 dBm input Narrow Band Video Band Width (5 MHz):	60 ns
For above +8.2 dBm input	75 ns
For above +7.2 dBm input	95 ns
RF <sub>Off</sub> (max) (10% RF I <sub>p</sub> to 50% TTL Output)	
Wide Band Video Band Width (10 MHz)	80 ns
Narrow Band Video Band Width (5 MHz)	180 ns
Pulse Width Range	
Wide Band Video Band Width (10 MHz)	50 ns to CW
Narrow Band Video Band Width (5 MHz)	250 ns to CW
Recovery Time (max)	90 ns
Logic Output Characteristics	16 TTL Outputs
Output Circuit	Output Fanout Supports 5 TTL Loads (TTL-U.L) One Unit Load: I <sub>OL</sub> = 1.6 mA, I <sub>OH</sub> = 40 $\mu$ A
Output Truth Table	V <sub>OUT</sub> Low max "ON" = 0.5V V <sub>OUT</sub> High min "OFF" = 2.7V
Output Data Latching	Internal Latch
Internal Latch	Output Data 40 $\pm$ 5ns min
Threshold	Channel Address (A0-A3) Channel Threshold Data (D0-D4) Write Strobe (wr)
Threshold Range	Threshold Data LSB Low RF Input Signal Threshold Data MSB High RF Input Signal
Threshold Adjustment Controls	
Threshold Address	4 Bit TTL
Threshold Data	5 Bit TTL
Write Pulse	Complementary Input
Power Supply Voltage (V)	
+5.0 $\pm$ 5%	220 mA
+15.0 $\pm$ 5%	40 mA
-12.0 $\pm$ 5%	125 mA
Maximum Power Consumption	3.3 Watts
DC Voltages Ripple, Noise and Spikes	Up to 2% at Frequencies Up to 1 MHz
Weight	< 0.8 Kg
Operating Temperature Range	-20 $^{\circ}$ C to + 80 $^{\circ}$ C
Finish	Chemical Conversion Coating (yellow) per MIL-C-5541, Class 3
Marking	MIL-STD-1285 Method 1
Workmanship	MIL-HDBK-454 Guideline 9
Sealing	Hermetically Sealed (Design Goal) Moisture Sealed (minimum)

<b>Technical Data</b>	<b>DG009-M1</b>
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**Block Diagram**


<b>Technical Data</b>	<b>DG009-M1</b>
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**Connector Information**

Port Function Definition	
J1	SMA Female
J2	37 Pin
Pin Assignments for Connector J2	
1	Output CH-1
2	Output CH-2
3	Output CH-3
4	Output CH-4
5	Output CH-5
6	Output CH-6
7	Output CH-7
8	Output CH-8
9	Output CH-9
10	Output CH-10
11	Output CH-11
12	Output CH-12
13	Output CH-13
14	Output CH-14
15	Output CH-15
16	Output CH-16
17	Write Strobe
18	Spare
19	Video BW Select
20	Chan Threshold Bit-0
21	Chan Threshold Bit-1
22	Chan Threshold Bit-2
23	Chan Threshold Bit-3
24	Chan Threshold Bit-4
25	Channel Address 0
26	Channel Address 1
27	Channel Address 2
28	Channel Address 3
29	GND
30	+5V
31	+5V Return
32	-12V
33	-12V Return
34	+15V
35	+15V Return
36	Spare
37	Spare

**Outline Drawing**
