

# DA2CP20047 0.5 TO 20.0 GHz LOG VIDEO AMP ANALOG DETECTOR

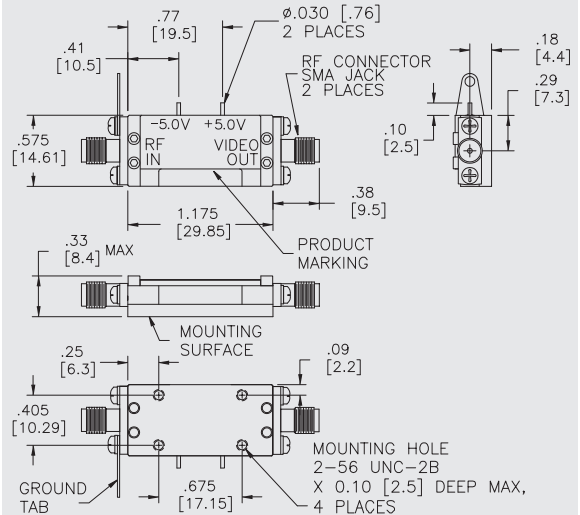
Typical Values @ +25 °C

<b>Wide Frequency Range</b> .....	<b>0.5 – 20 GHz</b>
<b>40 dB Power Range</b> .....	<b>-20 to +20 dBm</b>
<b>Provides a Compressed Transfer Response</b> .....	<b>Vo = 0 to 1.3 V</b>
<b>Temperature Stable Detection</b> .....	<b>+/- 1 dB</b>
<b>Small, Rugged, Hermetic Sealed Cougar Pak</b>	
<b>Wideband Power Monitor for Medium to High Power</b>	

## DA2CP20047

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### High Frequency CougarPak™ Package for Detectors



## SPECIFICATIONS\*

Parameter	Typical	Guaranteed	
		0 to 50 °C	-40 to +85°C
Frequency (Min.)	0.5 – 22.0 GHz	0.5 – 20.0 GHz	0.5 – 20.0 GHz
Input Power Range (Min.)	-25 to +20 dBm	-20 to +20 dBm	-20 to +20 dBm
VSWR (Max.)	1.6:1	2.0:1	2.0:1
Sensitivity, Vout (Min.) at 0 dBm	+0.70 V	+0.68 V	+0.65V
Temperature Stability (Max.)	± 0.4 dB	± 1.0 dB	± 1.5 dB
Power Flatness (Max.) (constant Vo) 0.5 -20 GHz 0.5 - 16 GHz	± 1.0 dB ±0.5 dB	±1.5 dB ±0.5 dB	±1.5 dB ±0.75 dB
Rise Time (Max.)‡	30 ms	40 ms	40 ms
Fall Time (Max.) ‡	90 ms	100 ms	100 ms
Supply Current (Max.)	± 1.5 mA	± 2.5 mA	± 2.5 mA
Output Offset Voltage, no RF	-0.2 V	0V to -0.3 V	0V to -0.3V

\* Measured in a 50 Ohm system at ±5.0 Vdc unless otherwise specified.  
‡ Total response time, Tr/Tf: 50% RF to 90 or 10% Video. 10k Ohm output load.

## MAXIMUM RATINGS

<b>DC Voltage</b> .....	<b>±10.0 V</b>
<b>Continuous RF Input Power</b> .....	<b>+23.0 dBm</b>
<b>Operating Case Temperature</b> .....	<b>-40 °C to +85 °C</b>
<b>Storage Temperature</b> .....	<b>-55 °C to +125 °C</b>
<b>Burn-In Temperature</b> .....	<b>+85 °C</b>
<b>Detector Thermal Resistance<sup>1</sup> (θjc)</b> .....	<b>+150 °C/Watt</b>
<b>Temperature Rise</b> .....	<b>&lt;1 °C</b>

<sup>1</sup> Thermal resistance is based on RF input power. Ratings based on +25 °C.

## APPLICATION NOTES

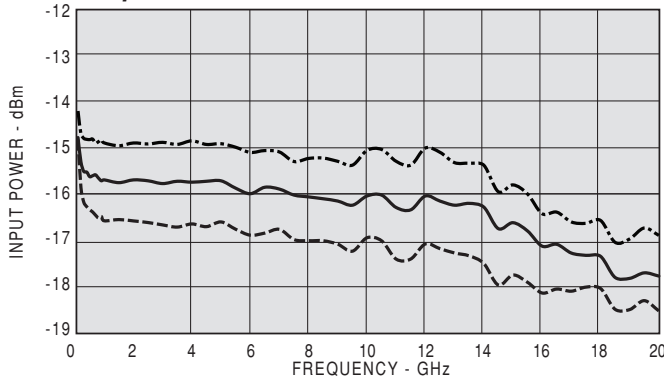
- ✦ Input is AC coupled
- ✦ Output voltage noise increases as RF signal is decreased (due to increasing video gain) and can be > 500mV with no RF
- ✦ Response time increases as RF signal is decreased (also due to increasing video gain)
- ✦ A logging amplifier follows this RF detector. Since the power range covers both the square law and linear regions of the detector, the transfer curve is not linear with Pin (dB). However, a smooth relationship exists which can be easily programmed and calibrated.

This detector is accurate for CW signals and will have a different output for signals containing harmonics or AM levels exceeding about -20 dBc.

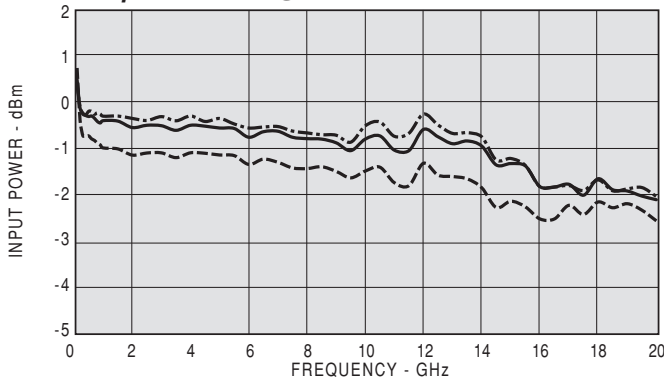
**TYPICAL PERFORMANCE**

KEY: +25 °C —  
+85 °C - - -  
-40 °C - - -

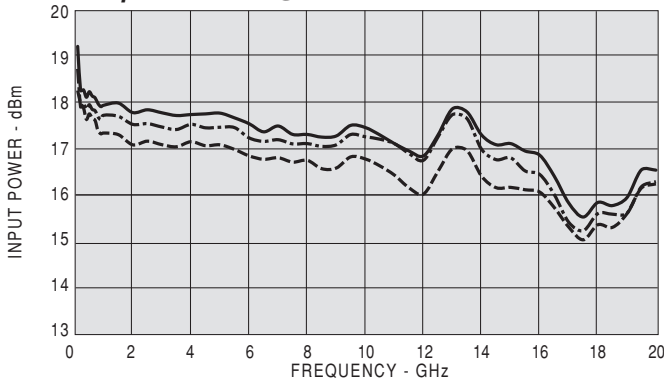
**Input Flatness @  $V_o = 0.2 V$**



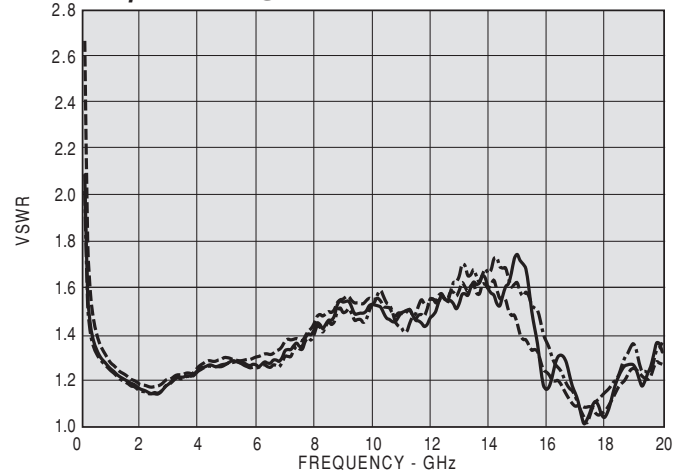
**Input Flatness @  $V_o = 0.7 V$**



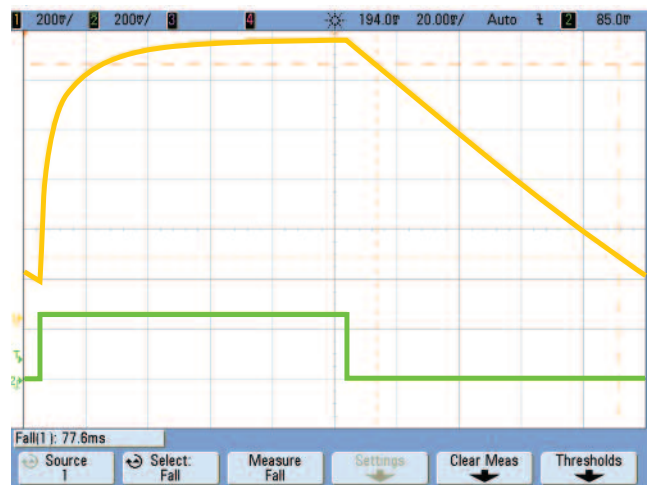
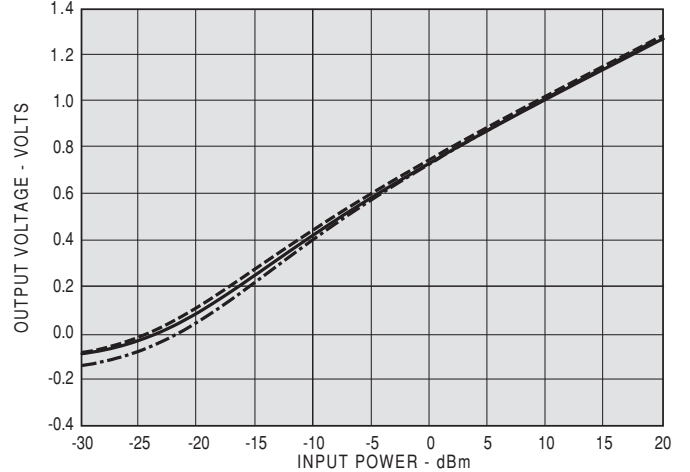
**Input Flatness @  $V_o = 1.2 V$**



**Input VSWR @  $P_{in} = 0 dBm$**



**Transfer Curve @ 8.0 GHz**



**Top Trace: Detector Response**  
**Bottom Trace: RF Input**  
**Time Base: 20 ms/div**