HMC-C052

SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SDLVA), 1 - 20 GHz

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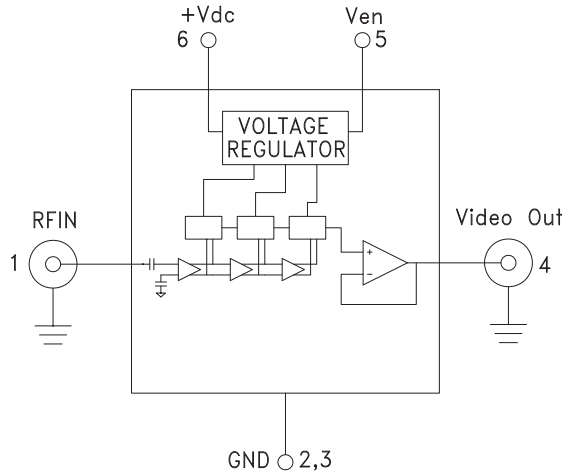
Typical Applications

The HMC613LC4B is ideal for:

- EW, ELINT & IFM Receivers
- DF Radar Systems
- ECM Systems
- Broadband Test & Measurement
- Power Measurement & Control Circuits
- Military & Space Applications

Functional Diagram



Features

1 to 20 GHz Operation

High Logging Range: 59 dB

Output Frequency Flatness: ±2 dB

Internal Voltage Regulation

Power Down Mode

Fast Rise/Fall Times: 2/7 ns

Hermetically Sealed Module

Single Positive Supply: +7V to +16V

-55 to +85° C Operating Temperature

General Description

The HMC-C052 is a Successive Detection Log Video Amplifier (SDLVA) which operates from 1 to 20 GHz. The HMC-C052 provides a logging range of 59 dB.

This product comes standard with two female SMA field replaceable connectors but can also be used with blind mate SMP connectors or as a drop-in module. The package size measures 0.89 x 0.85 x 0.23" (22.6 x 21.6 x 5.84 mm) making it ideal for environmentally robust applications where space is limited.

The HMC-C052 has an integrated voltage regulator that allows the SDLVA to operate from +7 to +16V without appreciable change in performance. An enable pin provides the ability to power down the SDLVA for power conscious system designs.

Electrical Specifications, T_A = +25C Vdc = +12V

Parameter	Conditions	Typ.	Units
Input Frequency Range [1]		1 - 20	GHz
Frequency Flatness	Pin= -30 dBm	±2	dB
Log Linearity	Pin= -50 dBm to +0 dBm	±1	dBm
Log Linearity over Temperature	-55 to +85° C, Pin= -30dBm	±1	dB
Minimum Logging Range	to ±3 dB error	-54	dBm
Maximum Logging Range	to ±3 dB error	+5	dBm
Input Return Loss		9	dB
Log Video Minimum Output Voltage		0.9	V
Log Video Maximum Output Voltage		1.5	V

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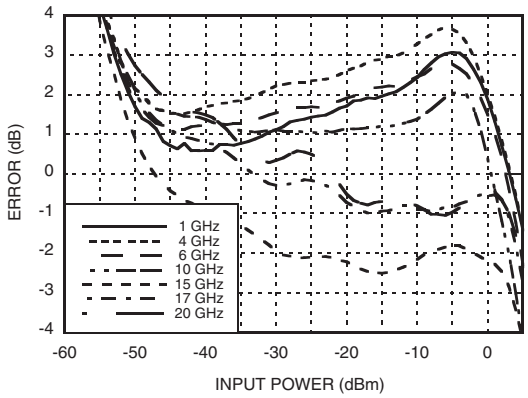
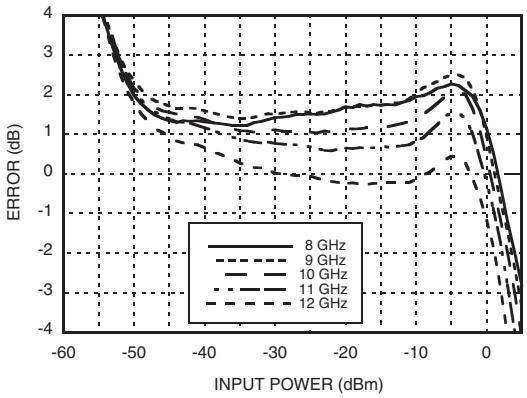
Electrical Specifications, (continued)

Parameter	Conditions	Typ.	Units
Log Video Output Rise Time	Pin = -20 dBm, 10% to 90%	2	ns
Log Video Output Fall Time	Pin = -20 dBm, 90% to 10%	7	ns
Ven Voltage		3.3	V
Vdc Voltage Range	7 - 16	12	V
Log Video Recovery Time	-50 dBm to 0 dBm	21	ns
Log Video Output Slope		14	mV/dB
Log Video Output Slope Variation over Temperature	@ 10 GHz	5	µV/dB°C
Log Video Propagation Delay		3	ns
Supply Current (Idc)		86	mA

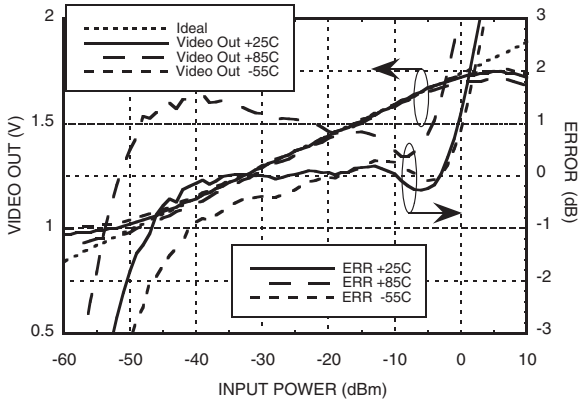
Error Flatness vs. Input Power Over Frequency



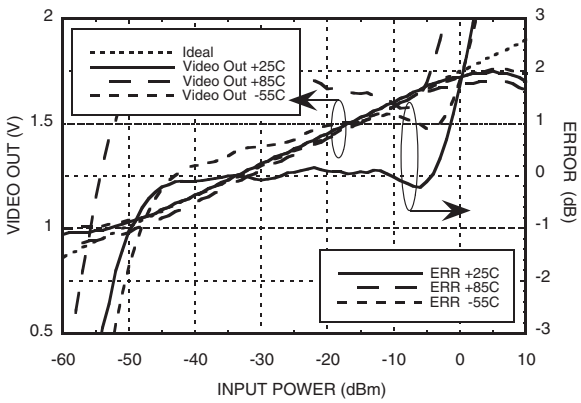
X-Band Error Flatness vs. Input Power Over Frequency



VIDEO OUT & Error vs. Input Power, Fin= 1 GHz



VIDEO OUT & Error vs. Input Power, Fin= 4 GHz



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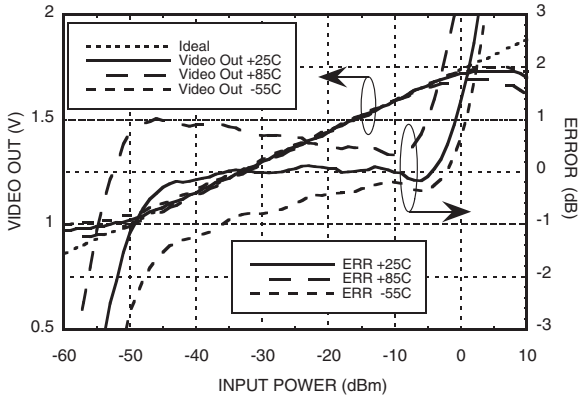
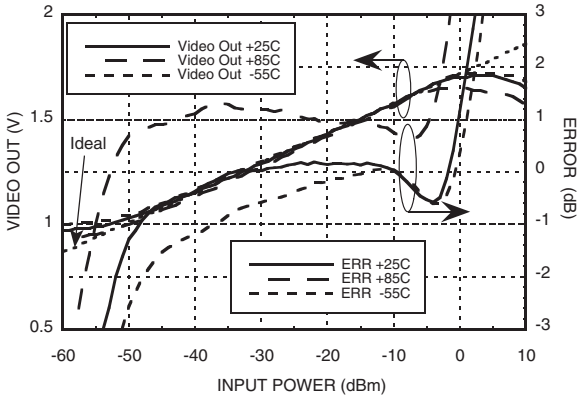
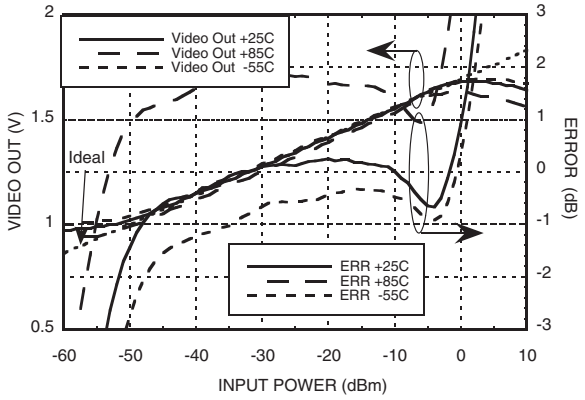
VIDEO OUT & Error vs. Input Power, Fin= 6 GHz



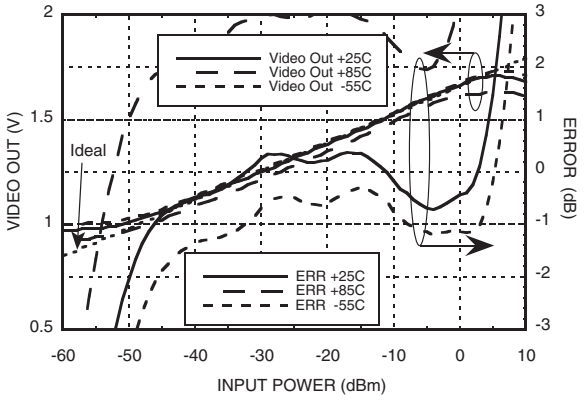
VIDEO OUT & Error vs. Input Power, Fin= 10 GHz



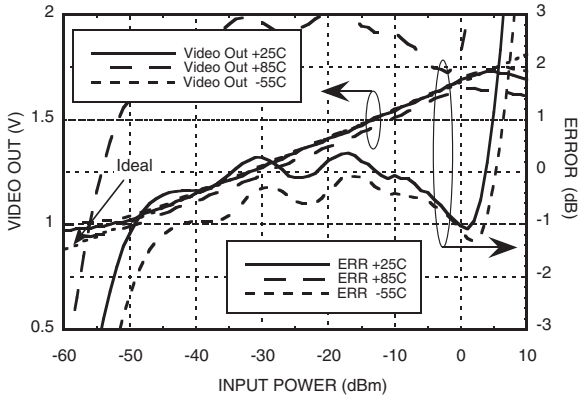
VIDEO OUT vs. Error vs. Input Power, Fin = 12 GHz



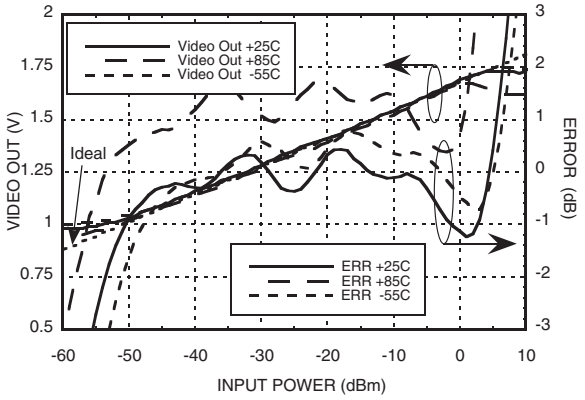
VIDEO OUT & Error vs. Input Power, Fin= 15 GHz



VIDEO OUT & Error vs. Input Power, Fin= 17 GHz



VIDEO OUT & Error vs. Input Power, Fin= 20 GHz



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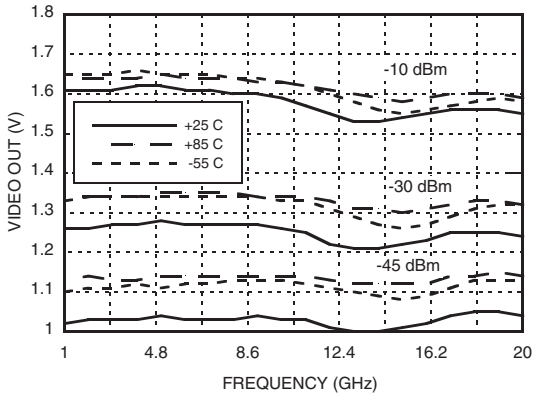
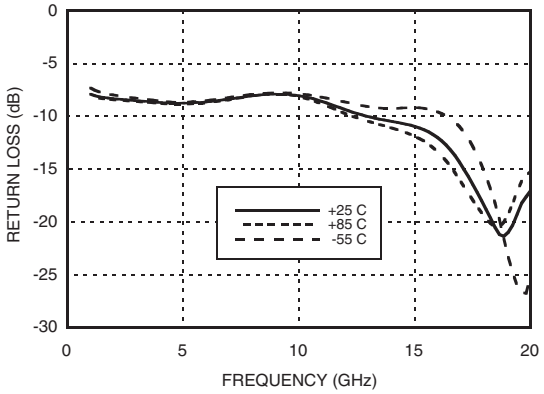
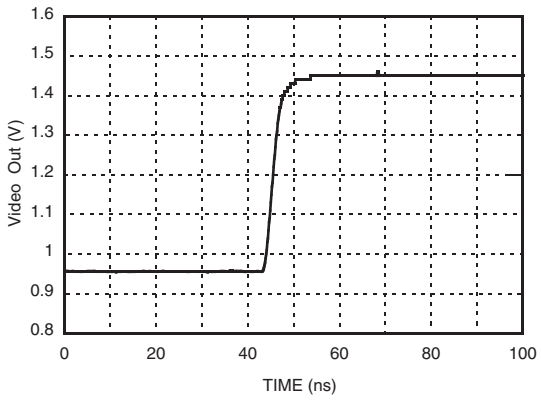
VIDEO OUT vs. Frequency Over Input Power & Temperature



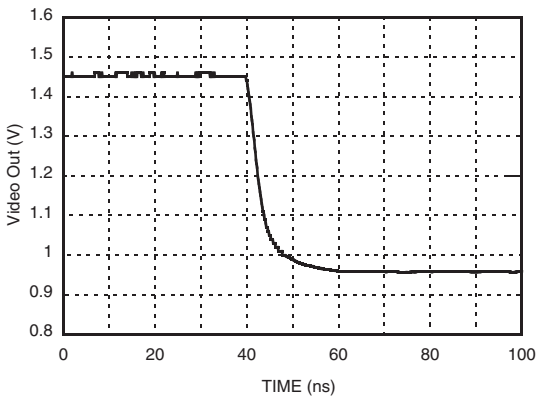
Input Return Loss vs. Frequency



Rise Time @ 10 GHz @ -20 dBm



Fall Time @ 10 GHz @ -20 dBm



Absolute Maximum Ratings

Icc	100 mA
Input Signal Amplitude	12 dBm
Junction Temperature	125 °C
Continuous Pdiss (T=85 °C) Derate 40 mW/°C above 85 °C	1.6 W
Thermal Resistance (R_{th}) (junction to package bottom)	25 °C/W
Ven Max	3.6V
Vdc Max	+16V
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

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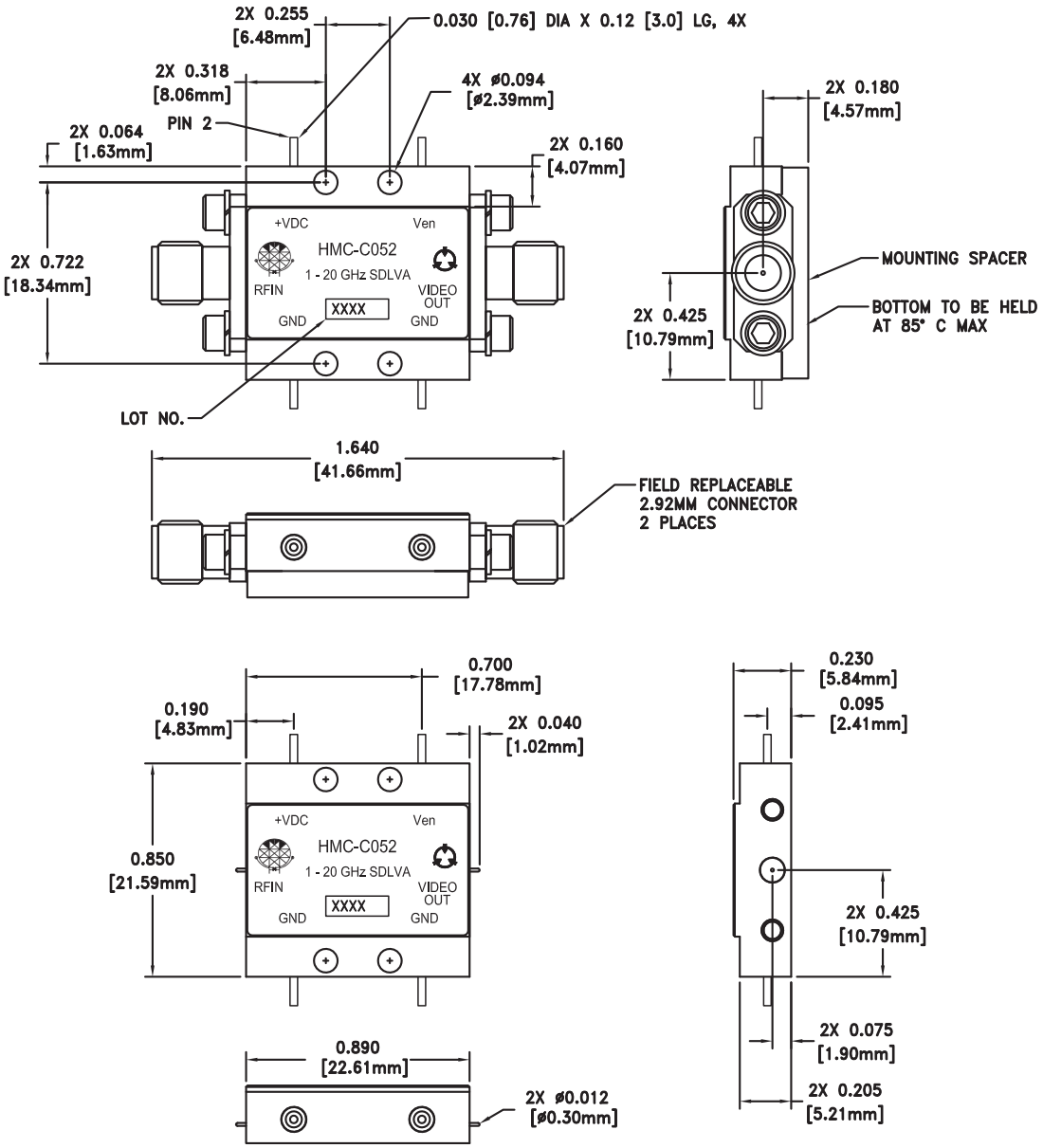
Outline Drawing



Package Information

Package Type	C-10
Package Weight [1]	16.7 gms [2]
Spacer Weight	3.3 gms [2]

[1] Includes the connectors

[2] ±1 gms Tolerance

NOTES:

1. PACKAGE, LEADS, COVER MATERIAL: KOVAR™
2. BRACKET MATERIAL: ALUMINUM
3. PLATING: ELECTROLYTIC GOLD 50 MICROINCHES MIN., OVER ELECTROLYTIC NICKEL 75 MICROINCHES MIN.
4. ALL DIMENSIONS ARE IN INCHES [MILLIMETERS].
5. TOLERANCES ±.005 [0.13] UNLESS OTHERWISE SPECIFIED.
6. FIELD REPLACEABLE SMA CONNECTORS. TENSOLITE 5602 - 5CCSF OR EQUIVALENT.

⚠7 TO MOUNT MODULE TO SYSTEM PLATFORM REPLACE 0 -80 HARDWARE WITH DESIRED MOUNTING SCREWS.

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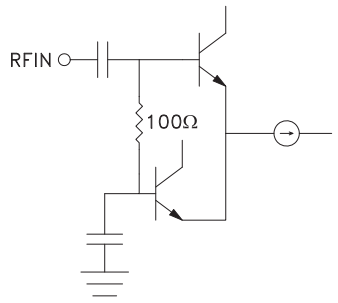
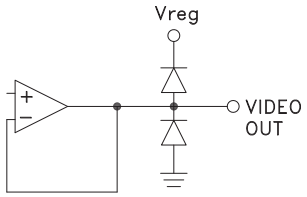
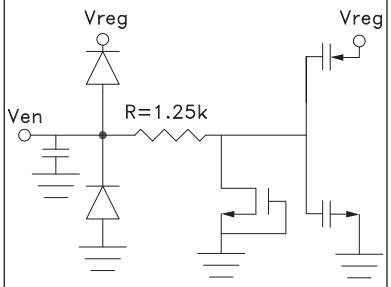
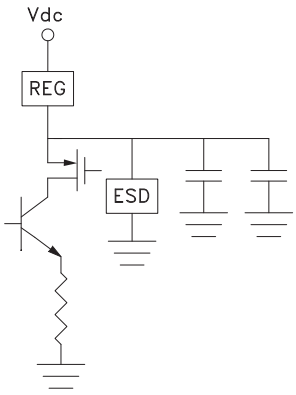
Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1	RFIN	RF Input pin.	
2, 3	GND	These pins must be connected to a high quality RF/DC ground.	
4	VIDEO OUT	Video Out is a voltage that is proportional to the log of the Input Power.	
5	Ven	To enable the SDLVA, +3.3V must be applied to Ven. Ven must be set to 0V before voltage is applied to Vdc to prevent a latch up condition. Total supply current will be reduced to less than 3mA when Ven is set to 0V.	
6	Vdc	Bias Supply pin.	

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