

Precision Amplitude Control for Analog Video

National Semiconductor
RD-162
Signal Path Applications
January 2008



1.0 Design Description

This circuit is intended to provide automatic, precision amplitude control for video signals at the input to a video distribution amplifier board. It is meant to compensate for level impairments to the video signal so that the distributed outputs will be nominal.

2.0 Features

- .037 dB/LSB of granularity in amplitude adjustment.
- Adjustment range : -6dB to +3.5dB (0.5 to 1.5)
- Suitable for CVBS, S-Video, SD and ED Video formats.
- Excellent delay and amplitude variation specifications.
(For Detailed Electrical Specifications see LMH6505)

3.0 Schematic

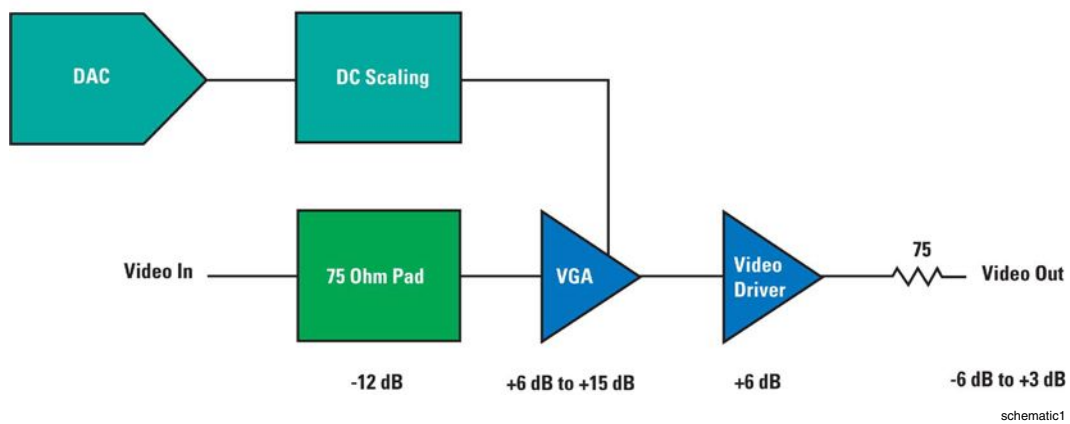
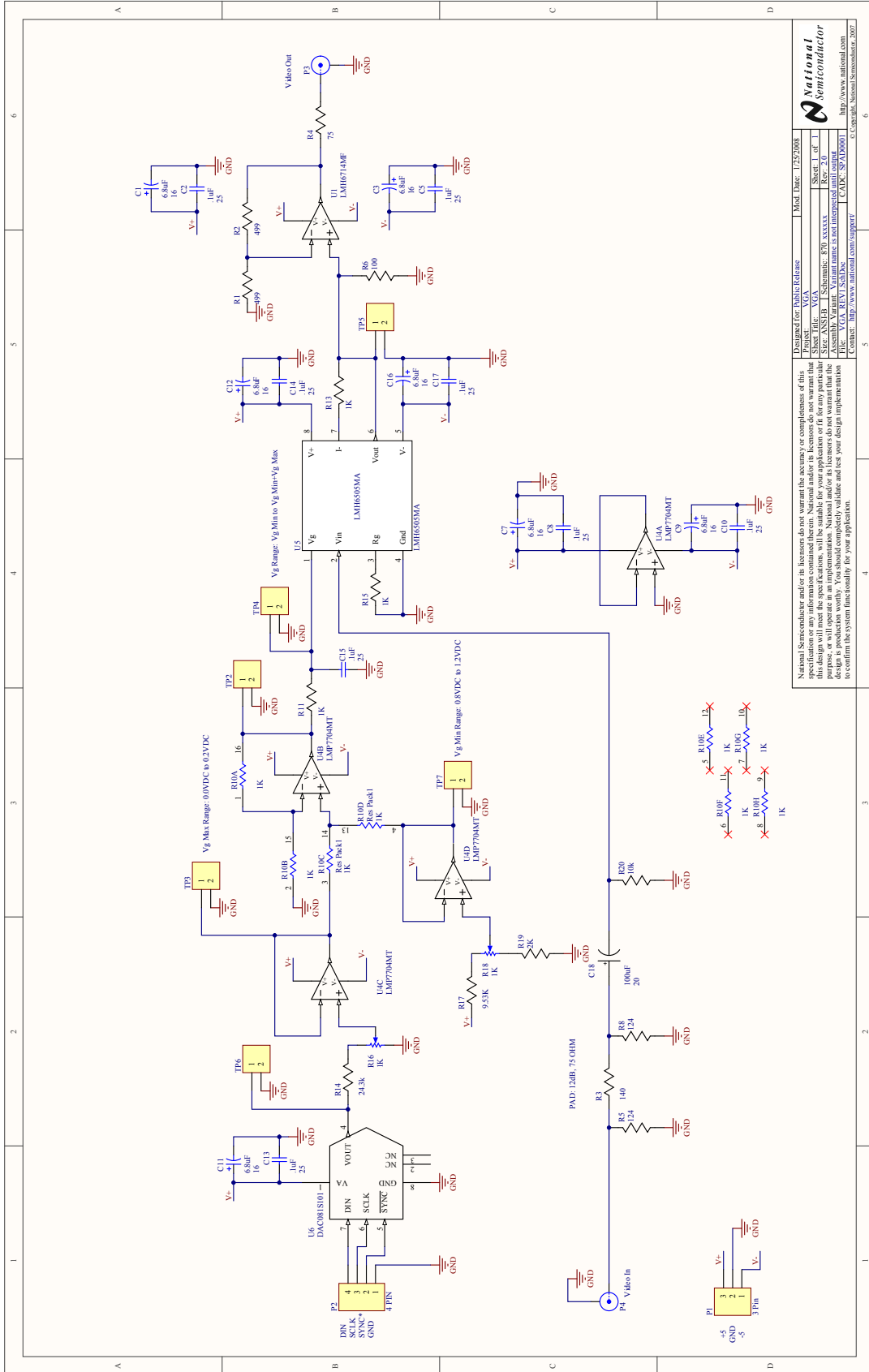


FIGURE 1. VGA Block Diagram



Intended for Public Release | Mod. Date: 1/25/2008

Project: VGA
 Sheet: 1 of 1
 Title: VGA Schematic: RD-162
 Assembly: Vg Min, Vg Max, Vg Min+Vg Max
 File: VGA_REV1.SchDoc | CAD#: SP100001
 Contact: http://www.national.com/support | © Copyright National Semiconductor, 2007

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FIGURE 2. VGA Schematic

schematic8

4.0 Bill of Materials

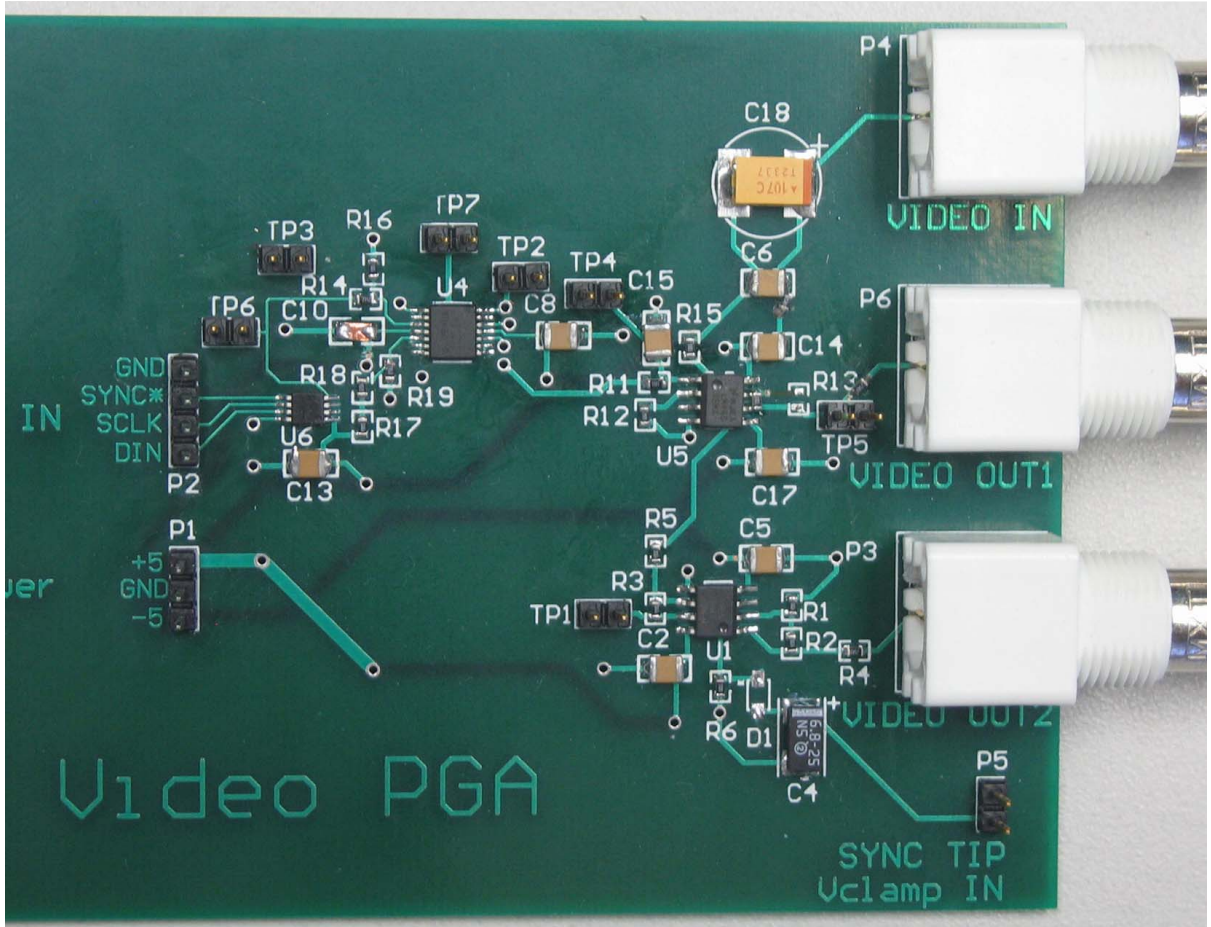
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Description	Designator	Footprint	QTY	Distributor	DistributorPartNumber	Vendor	VendorPartNumber	Value
Tantalum SMT Capacitor	C1, C3, C7, C8, C11, C12, C16	TANT-C	7	DigiKey	595D156X0016B2T-ND	Vishay	595D156X0016B2T	6.8uF
Tantalum SMT	C2, C5, C8, C10, C13, C14, C15, C17	0603	8	DigiKey	399-1168-2-ND	Kemet	C0805C104K3RAC1U	1uF
Header, 3-Pin	P1	TANT-C	1	DigiKey	594D107X0020D2T-ND	Vishay	594D107X0020D2T	100uF
Header, 4-Pin	P2	HDR1X3	1	DigiKey	WM6-403-ND	Molex	22-28-40-30	3 Pin
BNC Elbow Connector	P3, P4	HDR1X4	1	DigiKey	WM6-404-ND	Molex	22-28-40-40	4 Pin
Resistor, SMD, 0603, 140 OHM	R1, R2	BNC_RA_CON	2	Newark	32M0733	Molex	73100-0069	75 OHM BNC
Resistor, SMD, 0603	R3	0603	1	DigiKey	P499HCT-ND	Panasonic	ERJ-3EKF4990V	499
Resistor, SMD, 0603	R4	0603	1	DigiKey	P750HCT-ND	Panasonic	ERJ-3EKF750V	75
Resistor, SMD, 0603	R5, R8	0603	2	DigiKey	P124HCT-ND	Panasonic	ERJ-3EKF1240V	124
Resistor, SMD, 0603	R6	0603	1	DigiKey	P100HCT-ND	Panasonic	ERJ-3EKF1000V	100
Resistor Network	R10	SOIC16	1	DigiKey	766-163-R1KP-ND	CTS	766163102GP	1K
Resistor, SMD, 0603	R11, R13, R15	0603	3	DigiKey	P100KHCT-ND	Panasonic	ERJ-3EKF11001V	1K
Resistor, SMD, 0603	R14	0603	1	DigiKey	P243KHCT-ND	Panasonic	ERJ-3EKF2432V	24.3k
Potentiometer	R16, R18	VR5	2	DigiKey	490-3007-ND	Murata	PV374102C01B00	1K
Resistor, SMD, 0603	R17	0603	1	DigiKey	P953KHCT-ND	Panasonic	ERJ-3EKF9531V	9.53K
Resistor, SMD, 0603	R19	0603	1	DigiKey	P200KHCT-ND	Panasonic	ERJ-3EKF12001V	2K
Resistor, SMD, 0603	R20	0603	1	DigiKey	P100KHCT-ND	Panasonic	ERJ-3EKF1002V	10k
Header, 2-Pin	TP2, TP3, TP4, TP5, TP6, TP7	HDR1X2	6	DigiKey	WM6502-ND	Molex	22-28-40-23	2 Pin
Single Wideband Video Op Amp	U1	MF05A	1	DigiKey	LMH6714MF-ND	National Semiconductor	LMH6714MF	
Precision, CMOS Input, RRIO,	U4	MTC14	1	DigiKey	LMP7704MT-ND	National Semiconductor	LMP7704MT	
Wide Supply Range Amplifiers	U5	SO-8	1	DigiKey	LMH6505MA-ND	National Semiconductor	LMH6505MA	
Wideband, Low Power, Linear-in-dB, Variable Gain Amplifier	U6	MSOP-8	1	DigiKey	DAC081S101C1MM-ND	National Semiconductor	DAC081S101C1MM	

bom1

FIGURE 3. VGA_REV_1

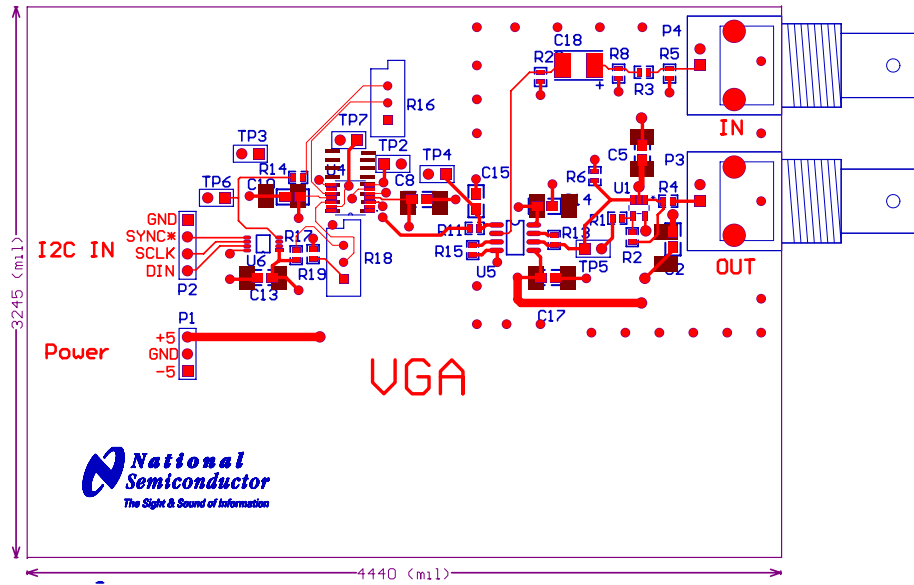
5.0 Board Photos



boardphoto

FIGURE 4. VGA Board Photo

6.0 Layouts



layout

FIGURE 5. VGA Top

Notes

Notes

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