Digital Attenuator - 0.3 to 6000 MHz, 31.75 dB

USB, PARALLEL, I2C, SPI & UART Control Modes, SMA Connectors

Features

- Ideal for Automated Test Equipment (ATE) , WiMAX, LTE, WiFi, 3G/4G fading simulators, MIMO testing, engineering/production test lab environments
- Excellent solid-state repeatability and performance
- Uninterrupted RF when changing attenuation values
- Extremely fast attenuation switching and very fine attenuation step resolution

Description

API Weinschel's new 4205A Series of MMIC Digital Attenuators operate over the 0.3 to 6000 MHz frequency range and are available in a variety of attenuation ranges (up to 127.75 dB in 0.25 dB steps). These units can be controlled using parallel (TTL compatible), I2C, SPI, UART, or USB interfaces.

Specifications

Attenuation Range (non-parallel mode):	31.75 dB in 0.25 dB steps
Frequency Range:	0.3 to 6000 MHz
Nominal Impedance:	50 Ω input/output
Power Rating (max. for linear operation):	+23 dBm C.W., +28 dBm pulsed

Cell Configuration		
Model No.	**Attenuation Range/Step (dB)**	**Attenuation Cells (dB)**
4205A-31.5	0 - 31.75/0.25	0.25, 0.5, 1, 2, 4, 8, 16

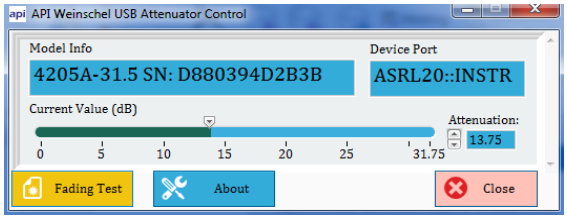
Insertion Loss (dB)		
Frequency Range (MHz)	**Typical**	**Maximum**
0.3 - 1000	1.5	1.9
1000 - 2200	2.1	2.5
2200 - 4000	2.8	3.3
4000 - 6000	3.8	4.2

VSWR		
Frequency Range (MHz)	**Typical**	**Maximum**
0.3 - 600	1.30:1	1.70:1
600 - 5000	1.25:1	1.50:1
5000 - 6000	1.25:1	1.50:1

Additional Specifications

Switching Speed	0.4 usec. max. (10%/90% RF)
Control Logic	PARALLEL, I2C, SPI, UART or USB
Operating Voltage	+3.3 to +15 VDC @ 25 mA
Temperature Range	0° C to +70° C
Connectors	SMA Female input/output
Control Connectors	The AUX control connector is an AMP-Latch 10-pin ribbon cable connector that mates with AMP P/N 746285-1 (supplied with each unit). The USB connector is a standard USB Mini-B.
Weight	83 g (2.92 oz.)
Test Data	Test data can be provided at an additional cost

Control Software Included



API Weinschel's LabView based USB Control Center Software (AUCS) can also be used in the operation of this series of digital attenuators. The AUCS will allow the user to setup, control, and perform test and measurements over a standard USB 2.0 communication interface. Additional information is available in the Operating & Installation Manual, IM-611.

 | weinschel.apitech.com | +1 (301) 846-9222 | weinschelsales@apitech.com

Digital Attenuator - 0.3 to 6000 MHz, 31.75 dB

USB, PARALLEL, I2C, SPI & UART Control Modes, SMA Connectors

Control Configuration

Units are supplied with both an AUX connector for operation in either a parallel (TTL compatible) mode or I2C, SPI, UART modes and a USB connector (Mini-B) for USB 2.0 operation. The main mode of operation is determined internally by the source of DC power to the unit.

USING AUX CONTROL: Each unit is supplied with a mating 10 pin connector (Amp 746285-1). Refer to the table below for mating connector pin/wiring details. There are four user-selectable digital interface AUX modes: PIO, I2C, SPI, and UART. In addition there are three AUX application modes (PIOSW, PULSE, and FADE) that allow the generation of RF patterns when operating standalone. The AUX mode selection is done via USB command (see SET AUX) and is stored in non-volatile memory (NVM) so that changes to the mode will be automatically applied at startup. Additional information is presented in the Operating & Installation Manual, IM-672.

USING USB CONFIGURATION: In USB mode the attenuator is controlled and powered via a standard USB 2.0 connection to a USB host. The 4205A-xx operates as a USB CDC device (USB VID=25EA, PID=106D), so it may be controlled via any software that can communicate to a standard virtual COM port. Programming is done via simple ASCII text-based message strings to control the device.

Complete Specifications

Parameter	Frequency Range	Condition	Min	Typ	Max.	Units
Operating Frequency	-	-	0.3	0.1-8000	6000	MHz
Nominal Impedance	0.3 - 6000 MHz	-	-	50	-	Ohms
Attenuation Range	0.3 - 6000 MHz	0.25 dB Steps	0	-	31.75	dB
Insertion Loss	0.3 - 1000 MHz	@ 0 dB	-	1.5	1.9	dB
	1000 - 2200 MHz		-	2.1	2.5	
	2200 - 4000 MHz		-	2.8	3.3	
	4000 - 6000 MHz		-	3.8	4.2	
VSWR	0.3 - 600 MHz	0 - 31.75 dB	-	1.3 : 1	1.7 : 1	-
	600 - 5000 MHz		-	1.25 : 1	1.5 : 1	
	5000 - 6000 MHz		-	1.25 : 1	1.5 : 1	
Attenuation accuracy [1]	0.3 - 600 MHz	0 - 7.75 dB	-	-0.0 / +0.2	-0.2 / +(0.2 + 2%)	dB
		8 - 31.75 dB	-	-0.0 / +0.4	-0.4 / +(0.2+ 2%)	
	600 - 3000 MHz	0 - 7.75 dB	-	± 0.1	-0.3 / + (0.15+3%)	
		8 - 31.75 dB	-	-0.0 / +0.4	-0.5 / + (0.15+2%)	
	3000 - 5000 MHz	0 - 7.75 dB	-	-0.1 / +0.2	-0.2 / +(0.25 + 4%)	
		8 - 31.75 dB	-	-0.0 / +0.5	-0.2 / +(0.35 + 3%)	
	5000 - 6000 MHz	0 - 7.75 dB	-	-0.0 / +0.3	-0.2 / +(0.25 + 5%)	
		8 - 31.75 dB	-	-0.0 / +0.5	-0.2 / +(0.50 + 3%)	
Monoticity	-	0.5 dB min step	0.3	-	6000	MHz
RF Input Power, CW	0.3 - 50 MHz	0 - 31.75 dB	-	-	Increase linearly with freq from 9 to 23	dBm
	50 - 6000 MHz		-	-	23	
RF Input Power, Pulsed	0.3 - 50 MHz	0 - 31.75 dB	-	-	Increase linearly with freq from 9 to 23	dBm
	50 - 6000 MHz		-	-	28	
Input IP3 [2]	@ 4000 MHz	0 - 31.75 dB	-	56	-	dBm
Switching time	0.3 - 6000 MHz	RF Trise/Tfall (10%/90%)	-	0.2	0.4	µsec.
		50% PIO CTRL to 90% RF	-	3	5	
Supply Voltage (VDC)	-	10 Pin Aux	+3.3	+5	+16	Volts
		USB	+4.4	+5	+5.25	
Digital input low Voltage	-	VDC= 3.3V to 4.5V	-0.3	-	+0.15	Volts
		VDC= 4.5V to 16V	-0.3	-	+0.8	
Digital input High Voltage	-	VDC= 3.3V to 4.5V	+2	-	+0.3	Volts
		VDC= 4.5V to 16V	+2	-	+5	
Supply Current	-			15	25	mA
Operating Temperature	0.3 - 6000 MHz	-	-20	-	+85	°C
Storage Temperature	-	-	-55		+125	°C

1. +x.x % is the percentage of the nominal attenuaton setting. For example the accuracy of 30 dB @ 2500 MHz is -0.5 / +(0.15 + 0.02 x 30) dB. This equates to -0.5/ +0.6 dB which means when setting the attenuator at 30 dB, the actual measured normalized value could be between 29.5 dB and 30.6 dB.
2. Measured with two tones at +18 dBm, 20 MHz spacing

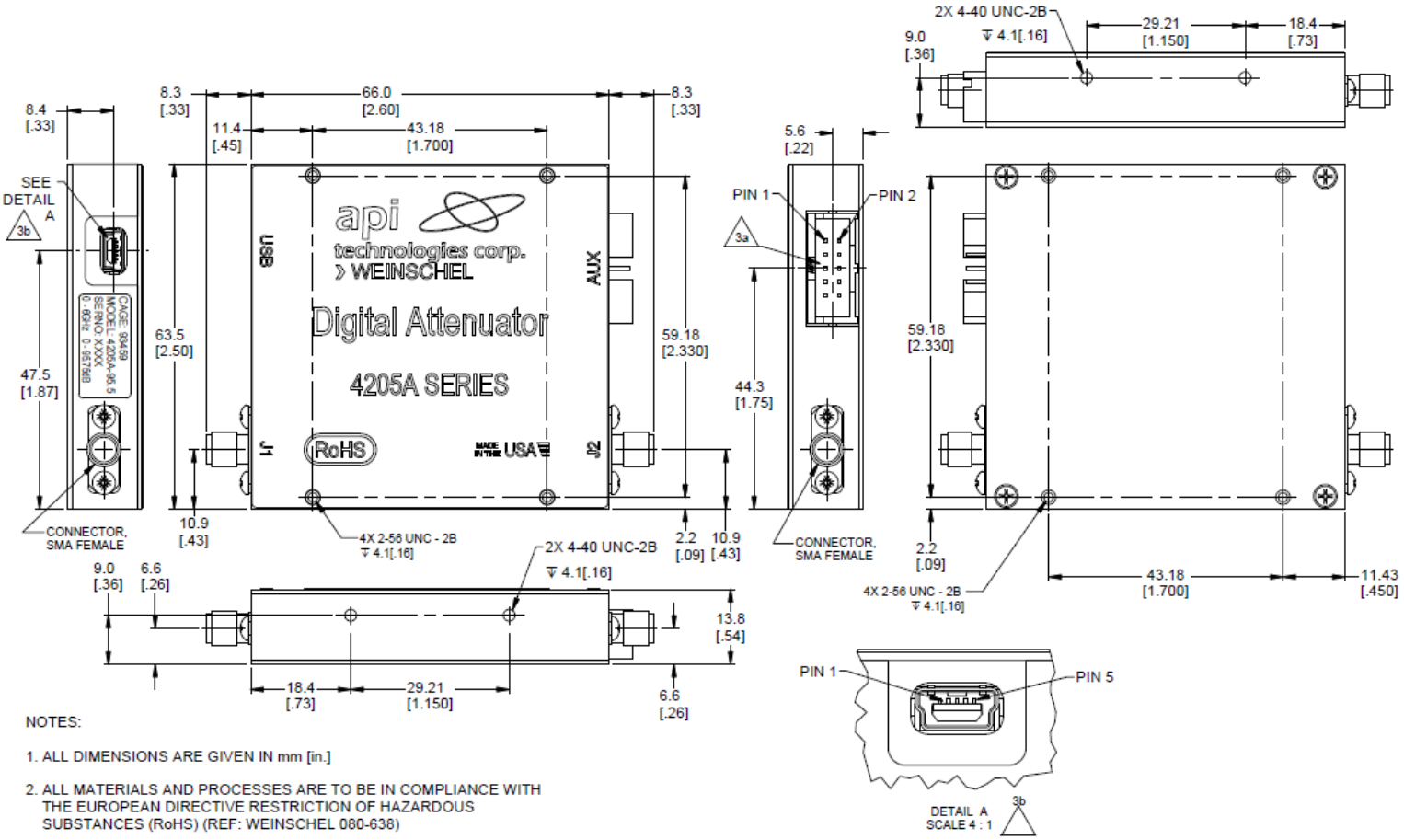
10 PIN Aux Control Connector:

PIN #	PIO [3]	I2C	SPI	UART
1	0.25 dB Digital Input	A0	NC	NC
2	0.5 dB Digital Input	A1	NC	NC
3	1 dB Digital Input	A2	NC	RXD
4	2 dB Digital Input	A3	NC	TXD
5	4 dB Digital Input	TRIG	SSN	NC
6	8 dB Digital Input	RESETN	SCLK	NC
7	16 dB Digital Input	SCL	SDI	NC
8	NC	SDA	NC	NC
9	Supply Voltage (VDC)			
10	Ground			

3. Parallel Input Mode:
   Digital input Low turns OFF desired attenuator bit
   Digital input High turns ON desired attenuator bit

Digital Attenuator - 0.3 to 6000 MHz, 31.75 dB

USB, PARALLEL, I2C, SPI & UART Control Modes, SMA Connectors



NOTES:

1. ALL DIMENSIONS ARE GIVEN IN mm [in.]
2. ALL MATERIALS AND PROCESSES ARE TO BE IN COMPLIANCE WITH THE EUROPEAN DIRECTIVE RESTRICTION OF HAZARDOUS SUBSTANCES (RoHS) (REF: WEINSCHEL 080-638)
3. CONTROL CONNECTORS:

a. AMP latch 10 pin ribbon cable connector mates with AMP P/N 746285-1 (supplied with each unit)

b. USB - Mini-B

 | weinschel.apitech.com | +1 (301) 846-9222 | weinschelsales@apitech.com