Weinschel CORPORATION

MODELS 3230, 3231, 3230T & 3231T
RF Programmable Attenuators

dc to 1.2 GHz
1 Watt

NEW

Ideal for Wireless/Cellular Applications.

Features

- **Cost Effective design for Wireless/Cellular Applications**
- **Available in 6 or 8 Cell Configurations:**
  90 dB/10 dB steps
  63.75 dB/0.25 dB steps
  63 dB/1 dB steps
- **Optional TTL or SmartStep Interface**
- **Custom Configurations including bus controlled attenuator subsystems**

Specifications

NOMINAL IMPEDANCE: 50 Ω
FREQUENCY RANGE: dc to 1.2 GHz:

MAXIMUM SWR:

Frequency Range (GHz)	SWR
dc - 1.0	1.30
1.0 - 1.2	1.45

CELL CONFIGURATIONS:

Model Number	NO. Cells	Attenuation Range/Steps (dB)	Cell Increments (dB)
3230-63 3230T-63	6	63/1	1, 2, 4, 8, 16, 32
3230-90 3230T-90	6	90/10	10, 10, 10, 20, 20, 20
3231-63.75 3231T-63.75	8	63.75/0.25	0.25, 0.5, 1, 2, 4, 8, 16, 32

INCREMENTAL ATTENUATION ACCURACY:

Frequency Range (GHz)	Accuracy
dc - 1.0	± 0.2 dB or 2.0%
1.0 - 1.2	± 0.3 dB or 2.0%

MAXIMUM CHARACTERISTIC ZERO LOSS (dB):

Frequency Range (GHz)	3230-63 3230-90	3231-63.75
dc - 0.5	1.75	1.75
0.5 - 1.0	3.25	4.10
1.0 - 1.2	4.25	4.90

RATED SWITCH LIFE: 5 million operations per cell (typ)
SWITCHING TIME: 8 msec. maximum @ nominal rated voltage.
CYCLING RATE: 5 Hz maximum
OPERATING VOLTAGE: +11 V to +16 V
+12 V to +17 V (TTL opt -1)
OPERATING CURRENT: 16 mA maximum per cell
TEMPERATURE RANGE (Operating): -40 to +70°C
POWER RATING: 1 watt average, 50 watts peak (5 msec pulse width; 1% duty cycle)
CONNECTORS: SMA female connectors per MIL-STD-348 interface dimensions - mate nondestructively with MIL-C-39012 connectors.

CONTROL TERMINALS: 0.040 inch. (1 mm) diameter solderable leads
CONSTRUCTION:
Housing: Aluminum
Connectors: Stainless steel body and beryllium copper contacts.
WEIGHT:
3230 125 g (4.5 oz)
3231 155 g (4.9 oz)
3230T 219 g (5.9 oz)
3231T 189 g (5.5 oz)

ACCESSORIES

SmartStep Interface: The Model 8210A SmartStep Interface provides a flexible, low cost solution for the operation of programmable step attenuators and other electromechanical devices under computer control. Designed to interface to Weinschel's new line of SmartStep programmable attenuators, the 8210A represents a new concept in device control applications for bench test and subsystem designs. The 8210A provides a high-level interface from various industry standard communications interfaces, including IEEE-488 and RS232/RS422/RS485, to the SmartStep's serial Driver Interface Bus.

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CONTROL CONFIGURATION:

Standard Unit: One terminal is connected to case ground and the remaining terminals are provided for activation of individual cells. Attenuation is fail-safe to "0" setting in the absence of a control voltage. Application of a voltage (+) to a particular cell causes it to switch to the attenuate position.

Units with TTL Option: Units with this options are supplied with a very low profile connectorized TTL interface board mounted directly to the control terminals. This TTL interface option is available with a 10 pin ribbon cable connector and is supplied with a mating connector. Refer to Physical Dimensions for mating connector pin/wiring details. Two wires are specified for supply voltage and ground. The remaining wires will accept TTL control signals to activate or de-activate a particular attenuation cell. A TTL high will energize a cell to the high attenuation state, whereas a TTL low will maintain a cell in its zero attenuation state.

To order 3230 Series Attenuators with this option add -1 to basic model number for ribbon cable connector. Example: Model 3230-90 with a TTL interface would be 3230-90-1.

Note: Control is non-latching and requires a continuous control signal for the period of time in which attenuation is required.

TTL DRIVER SPECIFICATIONS:

INTERFACE CONNECTOR: Option -1: 10 pin .025 square post header on .1 center. Mates with Amp connector 746285-1 or equivalent.

INPUT VOLTAGE: V_{IN} High= +2.0V minimum
+5.0V typical
Vcc maximum
V_{IN} Low = 0 minimum
0.8 maximum

INPUT CURRENT: I_{IN} (V_{IN}=2.4 V) = 55 µA
I_{IN} (V_{IN}=3.85 V) = 280 µA

SUPPLY CURRENT: I_{CC}=25 µA maximum per cell

SUPPLY VOLTAGE: V_{CC}=+12.0 to +15 V

TEMPERATURE RANGE (Operating): -40 to +70 °C

Units with SmartStep driver Circuitry (Figure 1): The SmartStep attenuators feature an internal microcontroller-based driver that provides a TTL-level digital interface for control of the attenuator relays. This card simplifies operation and interfacing requirements, while at the same time providing for greatly enhanced flexability over past designs. User-selectable modes of operation include both parallel and serial I^2C bus. The parallel mode provides a simple, one-bit per relay on/off control with internal pullups for use primarily in single attenuator applications. This mode allows the attenuator to be controlled via a variety of methods, such as a TTL-level digital output port, or mechanical toggle switches. The I^2C mode provides a two-wire serial bus structure and protocol for connecting a number of devices to a single host control interface, suitable for use in larger system and sub-system applications. The SmartStep contains non-volatile configuration memory that is used to hold a

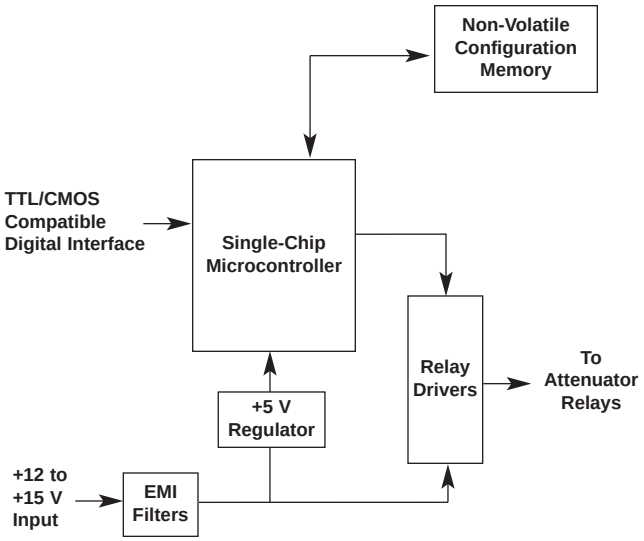

Figure 1. SmartStep Driver Circuitry

wide variety of attenuator and driver-dependant parameters, including serial number, attenuator cell dB values, relay configurations, and switching requirements, which are all accessable via the I^2C interface.

SmartStep Driver Interface Specifications:

Input Supply Voltage:	+12.0 to +15.0V
Control Signals:	TTL/CMOS compatible
Interface Modes:	parallel/ I^2C serial

DC Characteristics (at 25°C):

Digital Interface:

Parameter		Specification
VI_L	Low Level input:	-0.5 min, 0.8V max
V_{IH}	High Level input:	2.0 min, 5.25V max
I_{PU}	Pullup Current	50 µA min, 400 µA max

Power Supply:

V_{IN}	Supply Voltage:	+12.0 to +15.0V
I_{IN}	Supply current:	25 mA
I_{CELL}	Supply Current:	150 mA (per cell, switching)

TEMPERATURE: -20° to +70°C operating
-55° to +85°C nonoperating

INTERFACE CONNECTOR: 14 pin .025 square post header on .1 center, mates with Amp connector 746285-2 or equivalent (one mating connector included with each unit).

MODEL NUMBER DESCRIPTION:

Example:

3230* - XX - X

- 3230* — Basic Model Number
- XX — Attenuation Value (dB)
- X — TTL Option (Add -1) Example: 3230-63-1

* Add T to Basic Model Number when ordering SmartStep Control Circuitry.

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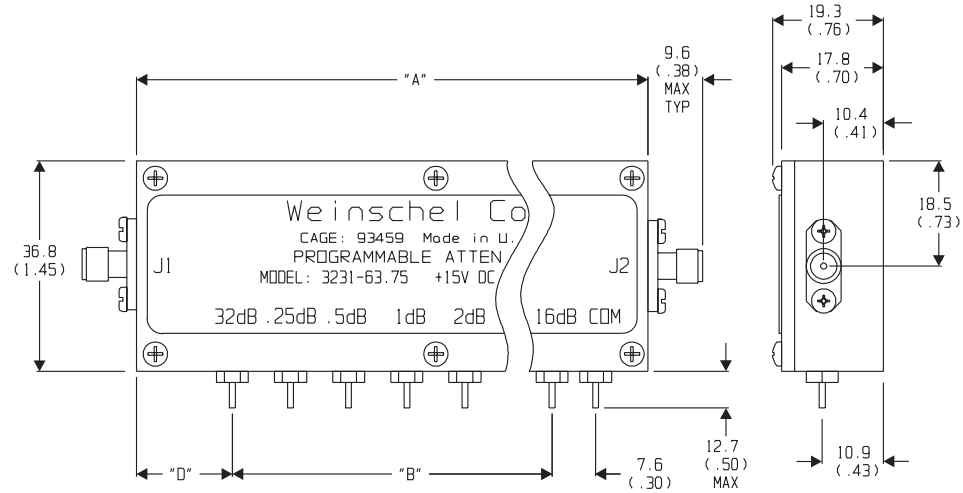
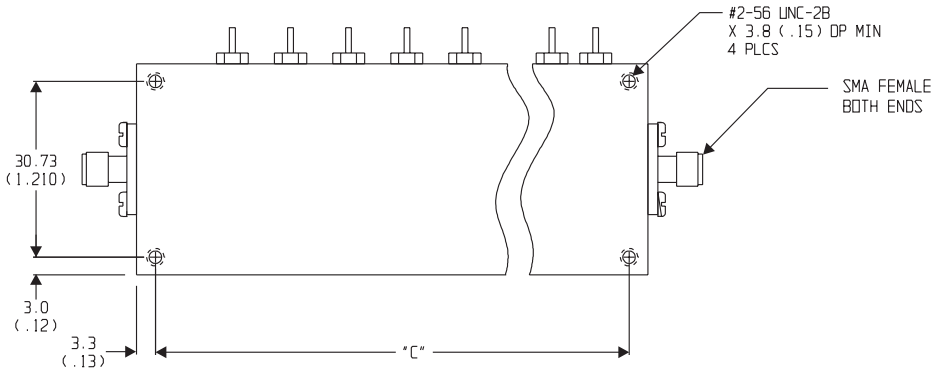
PHYSICAL DIMENSIONS:

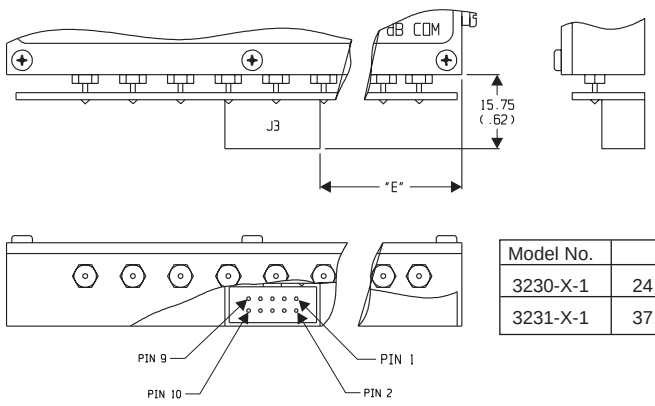
Model 3230 & 3231:





Model No.	No. Cells	A	B	C	D
3230-X	6	85.6 (3.37)	5 EQ SPCS @ 10.16 (.40) = 50.80 (2.00)	78.99 (3.11)	17.3 (0.68)
3231-X	8	104.6 (4.12)	7 EQ SPCS @ 10.16 (.40) = 71.12 (2.80)	98.04 (3.860)	16.8 (0.66)

Model 3230 & 3231 w/TTL Option -1:



Model No.	E
3230-X-1	24.6 (0.97)
3231-X-1	37.8 (1.48)

Control Connector J3 Pin Locations:

TTL Conn PIN No. (J3)	3230-63-1 dB (Cell)	3230-90-1 dB (Cell)	3231-63.75-1 dB (Cell)
1	NC	NC	32
2	NC	NC	0.25
3	32	20	0.5
4	1	10	1
5	2	10	2
6	4	20	4
7	8	10	8
8	16	20	16
9	COM	COM	COM
10	+Vcc	+Vcc	+Vcc

NC = Not Connected

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

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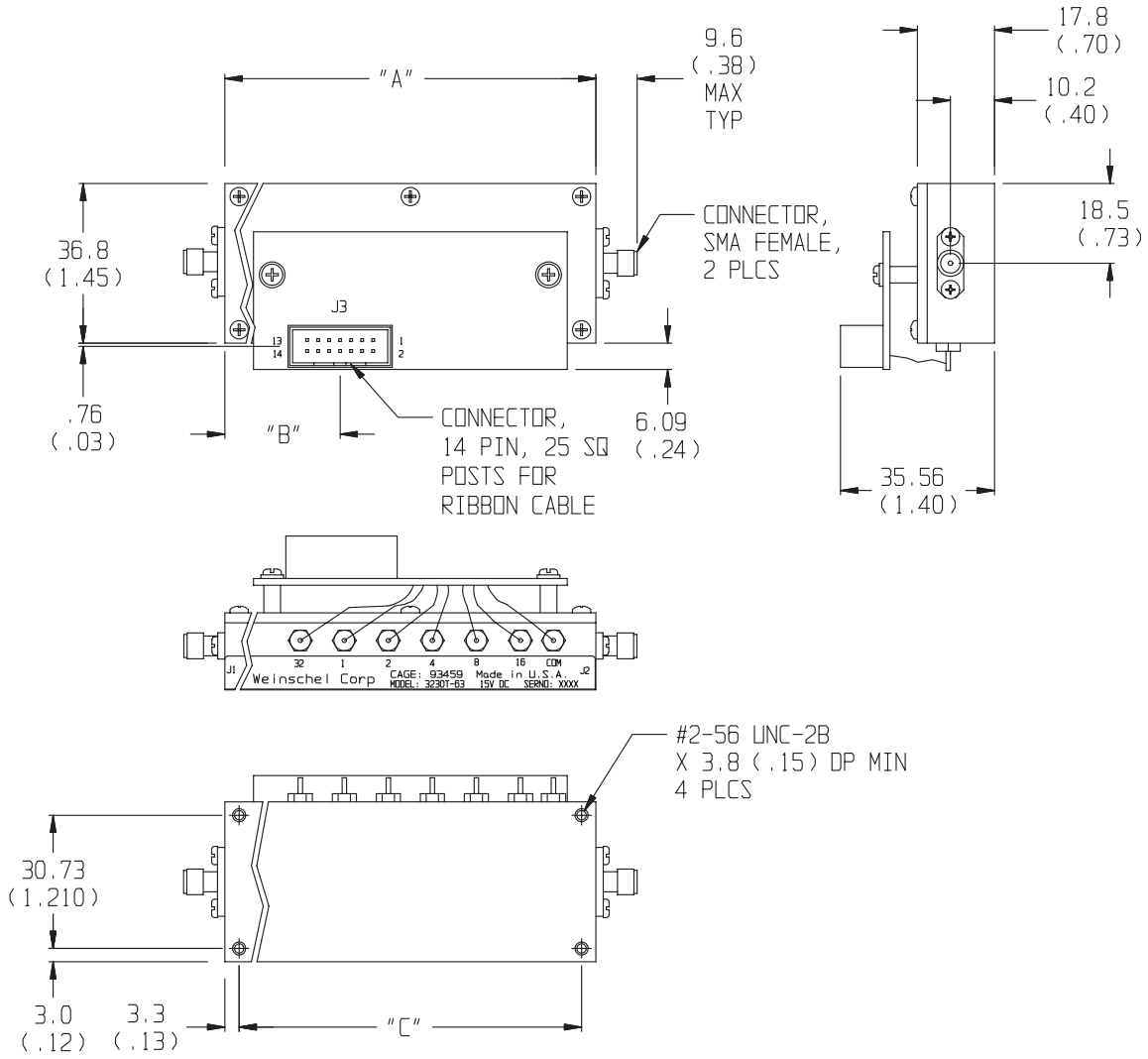
PHYSICAL DIMENSIONS:

Model 3230T & 3231T:



Model No.	No. Cells	A	B	C
3230T-X	6	85.6 (3.37)	24.0 (0.98)	78.99 (3.11)
3231T-X	8	104.6 (4.12)	34.8 (1.37)	98.04 (3.86)

NOTE: All dimensions are given in mm (inches) and are maximum, unless otherwise specified.

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