AST 2000 LINEAR IC TESTER OVERVIEW

The AST 2000 is well-suited for testing op amps, comparators, voltage regulators, voltage references and power supplies. Its hardware and software are architected to support true parallel testing. This approach provides vast reductions in test times, further lowering cost of equipment ownership.

1. Physical Description

This section describes the AST 2000 tester and the location of their major component parts. As can be seen in Figure 1.1, the physical dimensions of the tester are 600mm(width)×1560mm(height)×600mm(depth). It consists of the following primary hardware blocks:

- Power supply.
- Tester CPU with an interface board.
- Test instrument cards assembly with backplane.
- DUT card with I/O cable.

1.1 Power supply

The AST 2000 tester power subsystem supply ±5V, +7.5V, ±18V, ±27V, and ±48V. The supply connects to the backplane through power cables.

1.2 Tester CPU with interface board

The tester is controlled through an Industrial Computer (Pentium level) with an interface card. The interface card plugs into a PC ISA BUS. The standard configuration includes a color display and keyboard.

1.3 Test instrument card assembly with backplane

There are two 13-slot card cages that contain all the standard and optional instrument cards which can be plugs into the backplane. Minimum instrument configuration requires IFC (slot 0), one DVI, one PDA and one DCC (No slot constrains). Table 1.1 lists the instrument cards available for the tester.

Table 1.1 Instrument cards

Item	Instrument	Description
IFC	Interface Card	Provides bus drive and isolation.
DVI	Dual Voltage/Current Source	Two-channel, ±40V/±400mA V/I source, provides four-quadrant Kelvin force/measure operation.
PVM	Precision Voltage Meter	Highly precision voltage meter.

MVS	Multi Voltage Source	Sixteen-channel ±20V/±50mA Kelvin Voltage source.
TMU	Time Measurement Unit	Four-channel, provide a wide range of interval and frequency measurement functions for both analog and digital devices.
CBIT	DUT-card Control-Bit	Provides 128-channel control signals for delay, and source for DUT-card application.
PVI-10	Power Voltage/Current Source to 10A	Two-channel, ±40V/±10A (pulse) V/I source, provides four-quadrant Kelvin force/measure operation.
PVI-30	Power Voltage/Current Source to 30A	±50V/±30A (pulse) V/I source, provides four-quadrant Kelvin force/measure operation.
ACS	AC System	Includes two AC sources and one AC meter that provide a maximum frequency of 100K Hz and maximum level of ±10V volts peak to peak.
PMU	Precision Measurement Unit	20 bit resolution, ±10V

1.4 DUT card with I/O cable

The DUT card is a flexible card used to create custom circuitry for various DUT applications. Proprietary cable design ensures I/O signal integrity during system operation.

2 Specifications of the instrument cards

2.1 DVI

The dual V/I Source is two-channel, four-quadrant Kelvin voltage/current source/sink to the DUT.

Voltage Forcing

Ranges ±45V，±20V，±10V，±5V，±2V，±1V

Resolution 12Bit

Accuracy ±0.25%（FS）

Voltage Measuring

Ranges ±45V，±20V，±10V，±5V，±2V，±1V

Resolution 16Bit

Accuracy ±0.1%（FS）

Current Forcing

Ranges ±400mA，±40mA，±4mA，±400uA，±40uA，±4uA

Resolution	12Bit
Accuracy	±0.25%（FS）

Current Measuring

Ranges	±400mA，±40mA，±4mA，±400uA，±40uA，±4uA
Resolution	16Bit
Accuracy	±0.1%（FS）

Voltage Clamps

Range	Same as Voltage Forcing Ranges above
Resolution	12 Bit

Current Clamps

Range	Same as Current Forcing Ranges above
Resolution	12 Bit

2.2 PVM

The Precision Voltage Meter can be used to measure voltage of system and DUT.

Input Range	±10V Max
Input Impedance	10GΩ Min
Measurement resolution	16 Bit
Measurement accuracy	
100mV range	0.05％ FS
200mV range	0.05％ FS
500mV range	0.05％ FS
1V range	0.05％ FS
2V range	0.05％ FS
5V range	0.05％ FS
10V range	0.05％ FS
Sampling rate	100ksps Max
On-board Sampling RAM	32K ×16-bit
Filter	50kHz

2.3 MVS

The Multi Voltage Source includes sixteen-channel voltage-only sources for providing

reference voltages to devices.

Voltage range	±20V
Resolution	12Bit
Accuracy	±0.25％ FS
Current available	±50mA
Current Clamps	±50mA

2.4 TMU

The fore-channel Time Measurement Unit Provides the capability to measure the time interval between tow signal-shot events or to measure the period of high frequency AC signals.

Measurement Modes

Interval measurement	Start, measure interval, stop
Frequency Measurement	Start, measure interval, stop after N events, 1=<N<255

Interval measurement

Input Voltage Range	±15V max
Input Impedance	1GΩ Min
Time Measurement Resolution	
4us range	1nS
40uS range	10nS
Measurement accuracy	
4us range	1% (FS)+10nS
40uS range	0.1% (FS)+50nS

Frequency Measurement

Measurement accuracy	0.001%（Standard Clock 10M Hz）

2.5 PVI-10

The Power V/I provides four-quadrant force/measure operation up to 45V and 10A (pulse).

Voltage Forcing

Ranges	±45V，±20V，±10V，±5V，±2V，±1V
Resolution	12Bit
Accuracy	±0.25%（FS）

Voltage Measuring

Ranges	±45V，±20V，±10V，±5V，±2V，±1V
Resolution	16Bit
Accuracy	±0.1%（FS）

Current Forcing

Ranges	±10A(pulse)，±1A，±100mA，±10mA, ±1mA, ±100uA
Resolution	12Bit
Accuracy	±0.25%（FS）

Current Measuring

Ranges	±10A(pulse)，±1A，±100mA，±10mA, ±1mA, ±100uA
Resolution	16Bit
Accuracy	±0.1%（FS）

Voltage Clamps

Range	Same as Voltage Forcing Ranges above
Resolution	12 Bit

Current Clamps

Range	Same as Current Forcing Ranges above
Resolution	12 Bit

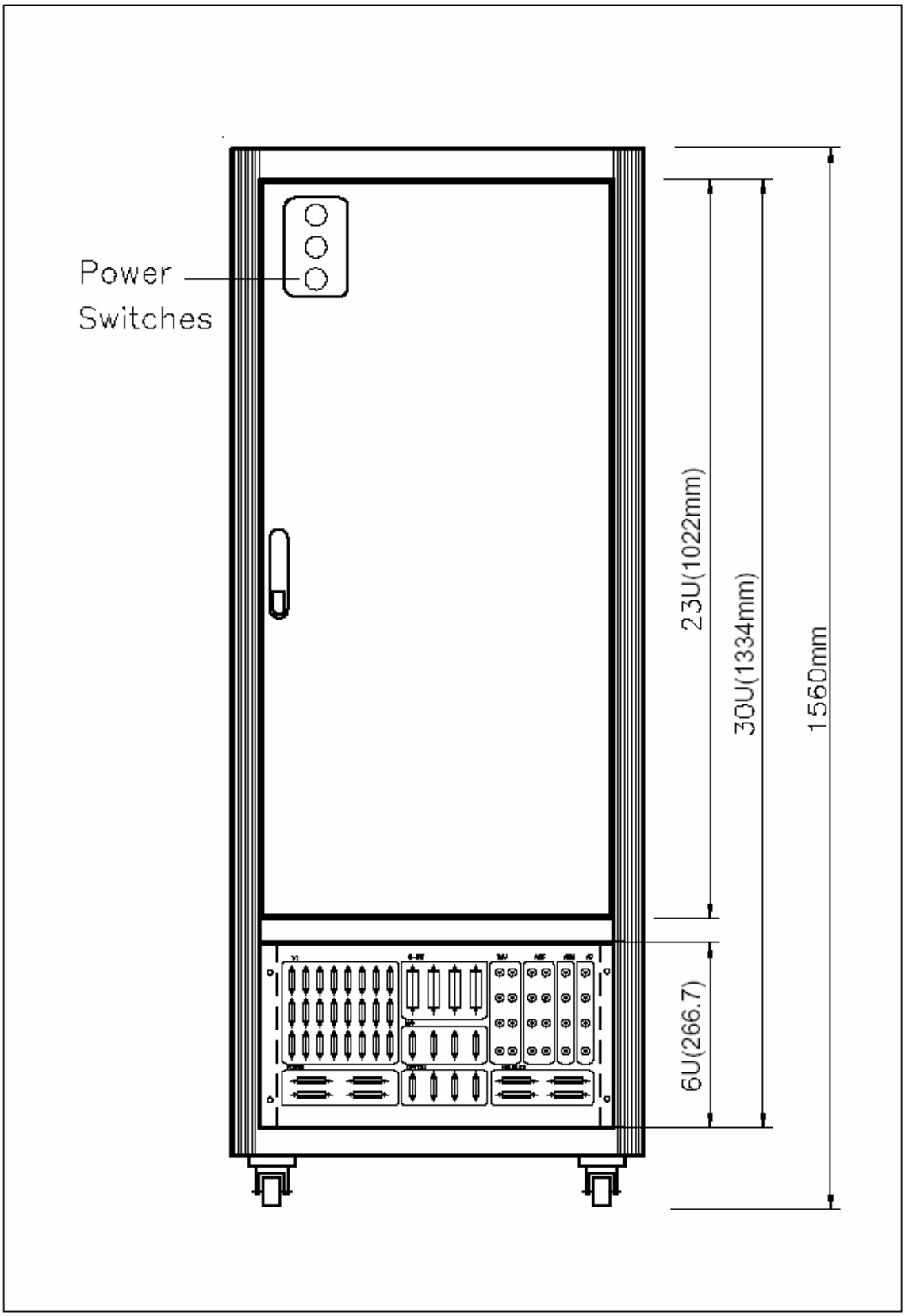
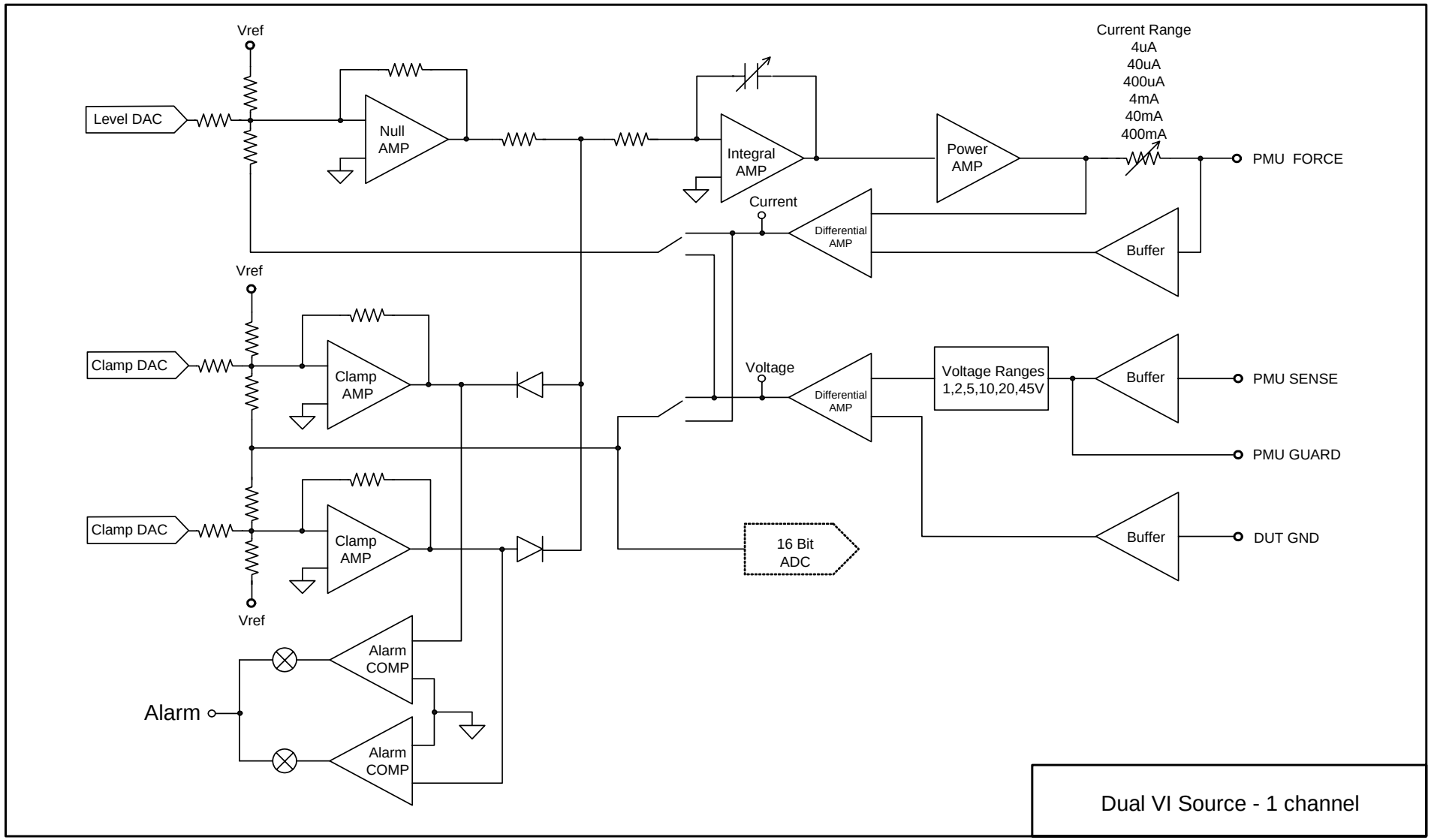
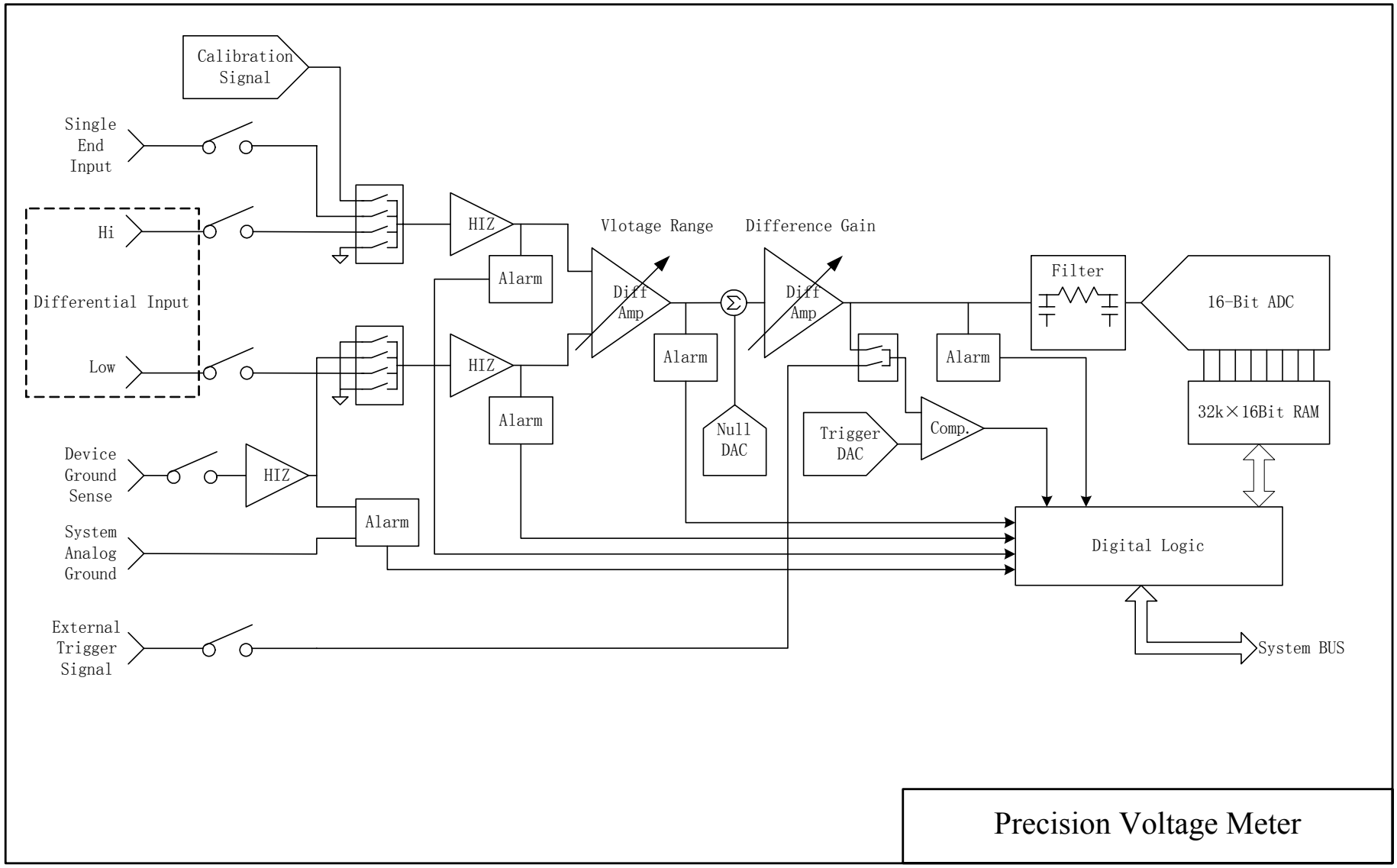
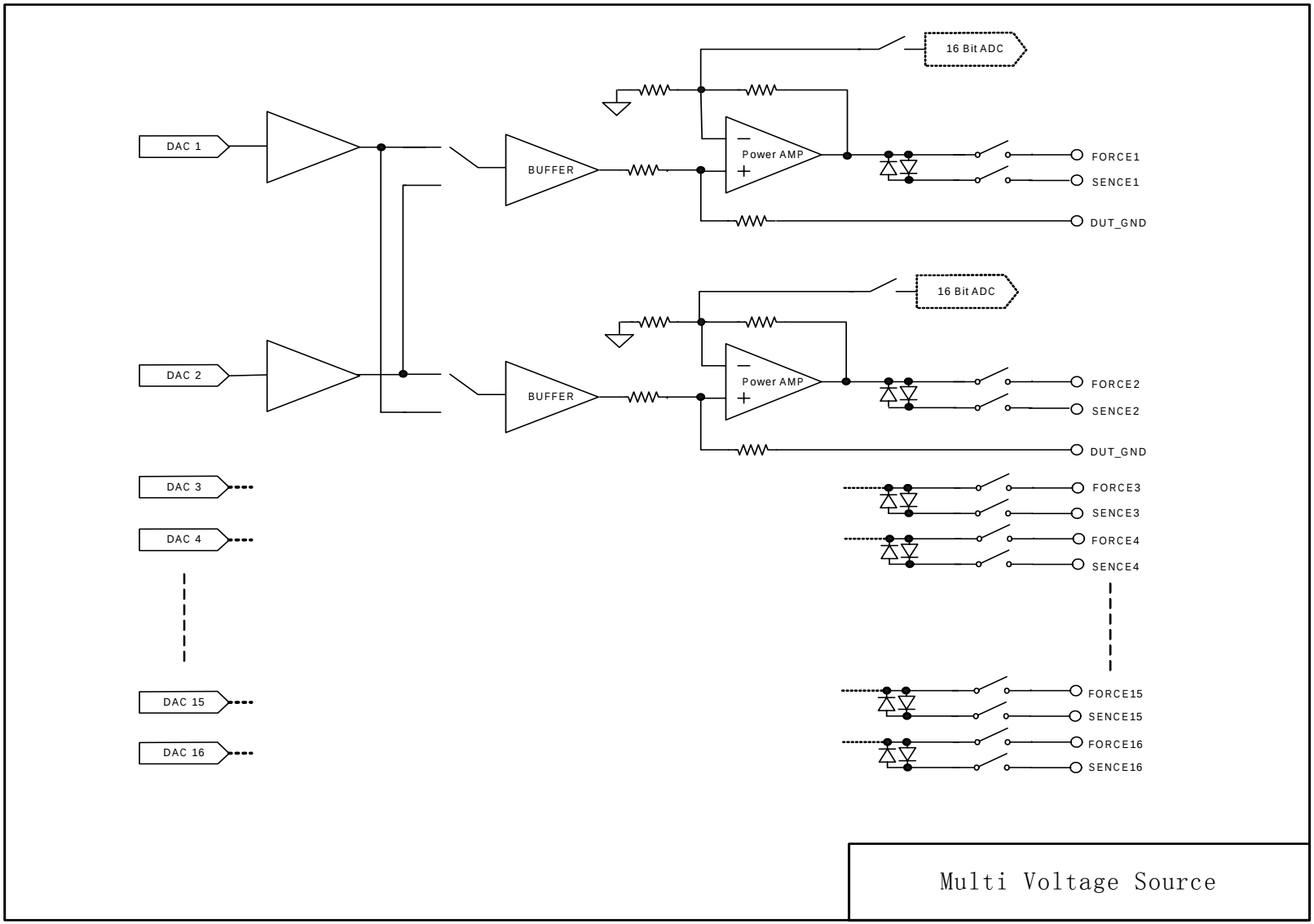


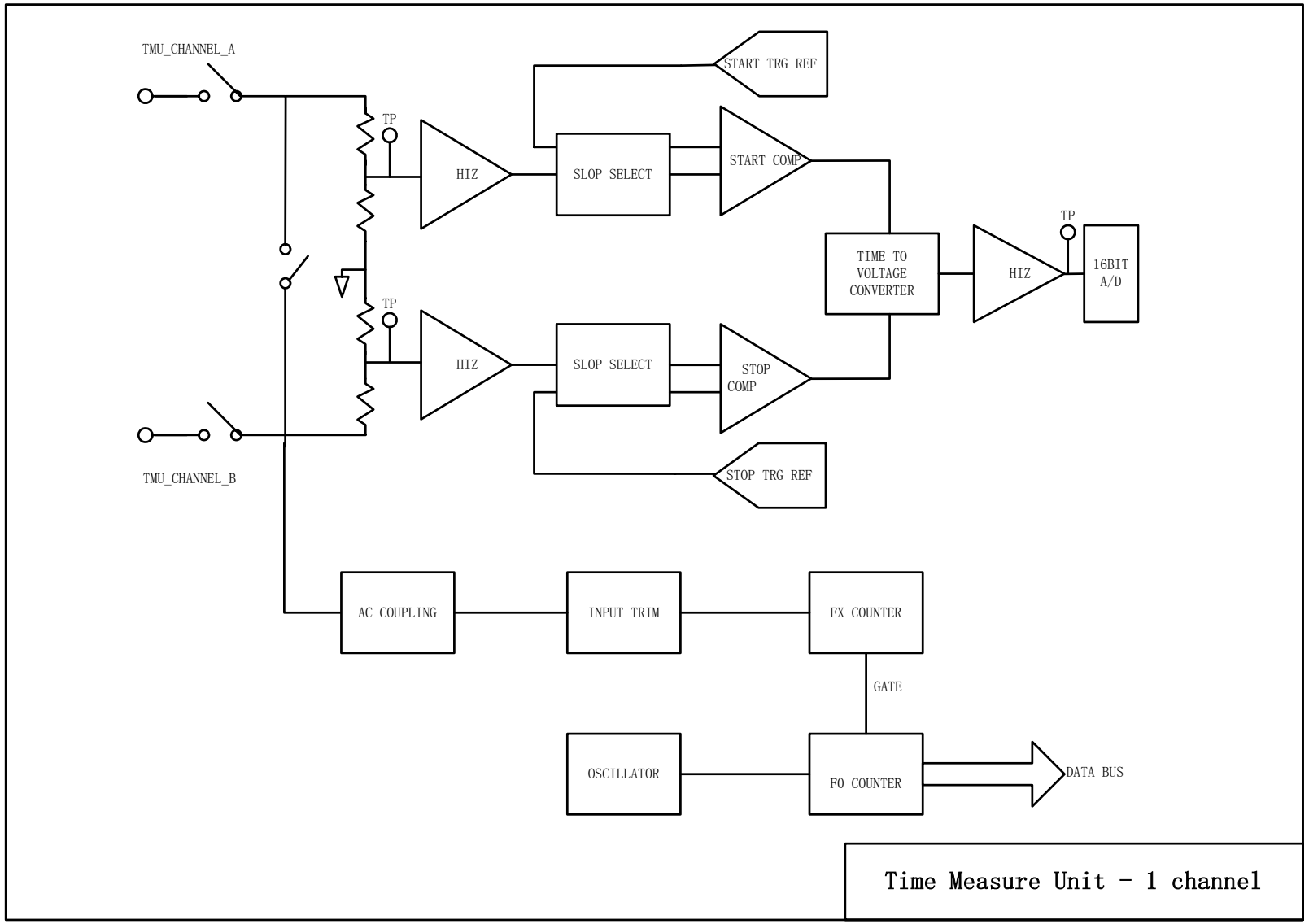
Figure 1.1 AST 2000 Linear IC Tester

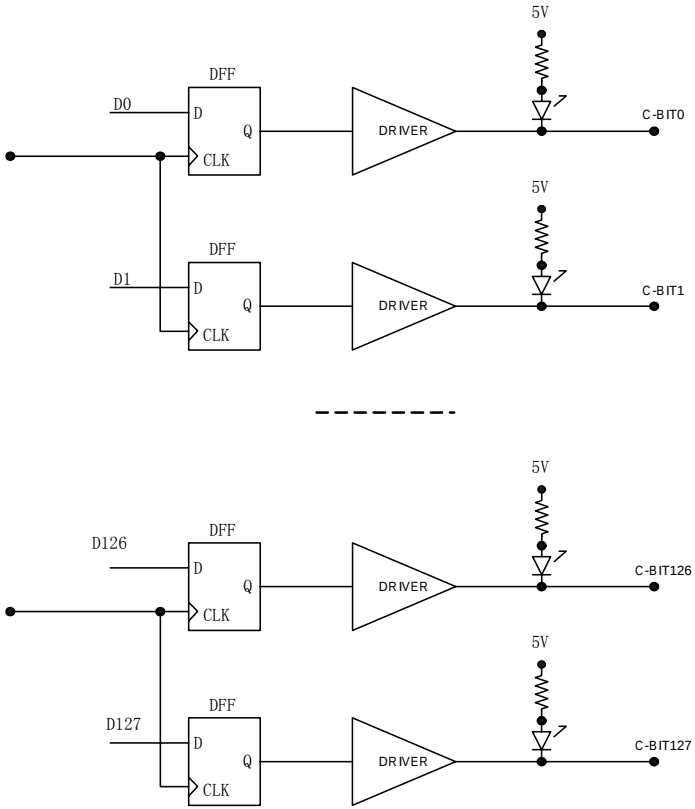

Vref
Level DAC
Null AMP
Integral AMP
Power AMP
Current Range
4uA
40uA
400uA
4mA
40mA
400mA
PMU FORCE
Current
Differential AMP
Buffer
Vref
Clamp DAC
Clamp AMP
Voltage
Differential AMP
Voltage Ranges 1,2,5,10,20,45V
Buffer
PMU SENSE
PMU GUARD
Clamp DAC
Clamp AMP
16 Bit ADC
Buffer
DUT GND
Vref
Alarm COMP
Alarm
Alarm COMP
Dual VI Source - 1 channel


Calibration Signal
Single End Input
Hi
Differential Input
Low
Device Ground Sense
System Analog Ground
External Trigger Signal
HIZ
HIZ
HIZ
Alarm
Alarm
Alarm
Alarm
Alarm
Vlotage Range
Difference Gain
Diff Amp
Diff Amp
Null DAC
Trigger DAC
Comp.
Filter
16-Bit ADC
32k×16Bit RAM
Digital Logic
System BUS
Precision Voltage Meter

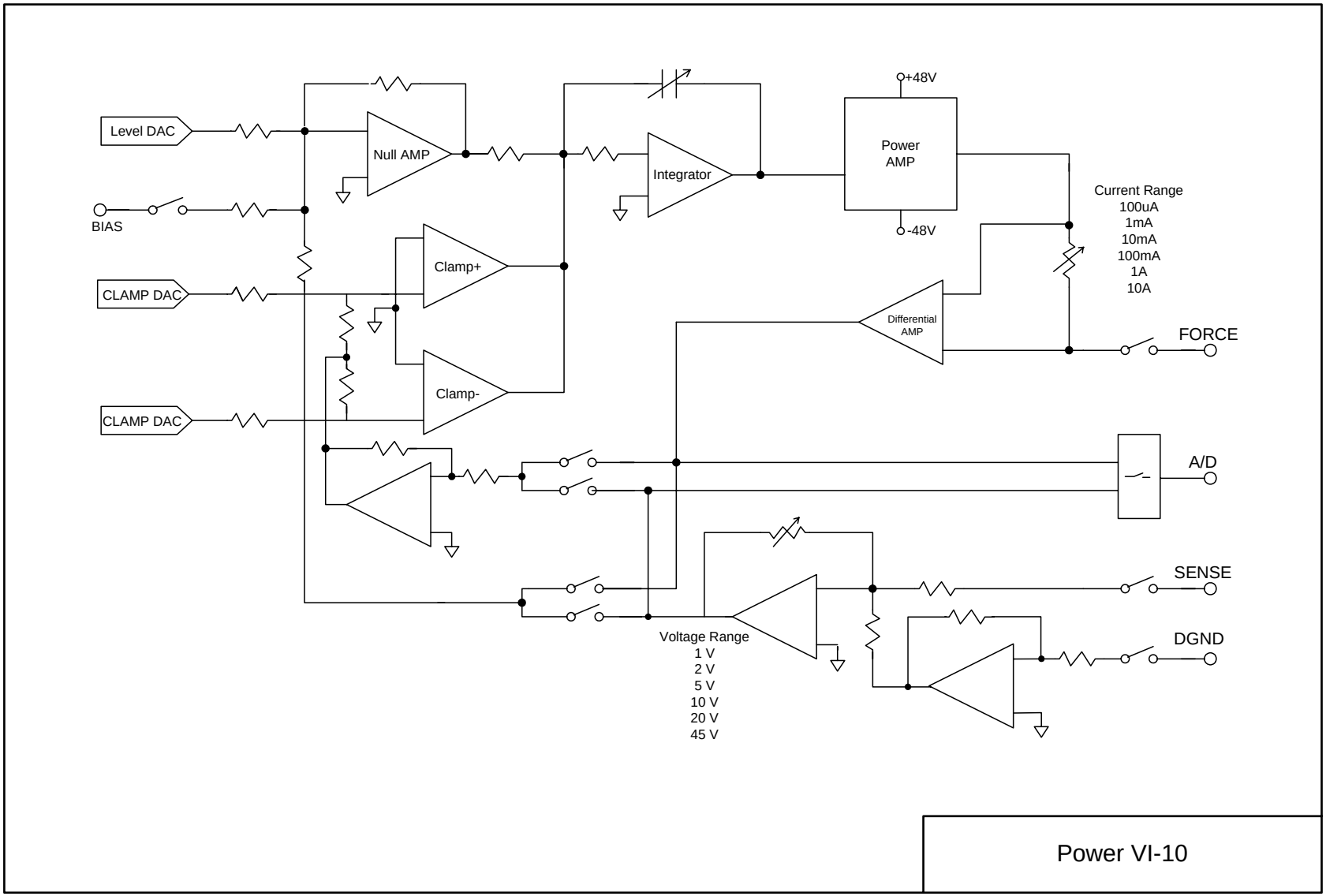


Multi Voltage Source


TMU_CHANNEL_A
TMU_CHANNEL_B
TP
TP
HIZ
HIZ
START TRG REF
SLOP SELECT
START COMP
SLOP SELECT
STOP COMP
STOP TRG REF
TIME TO VOLTAGE CONVERTER
HIZ
TP
16BIT A/D
AC COUPLING
INPUT TRIM
FX COUNTER
GATE
OSCILLATOR
FO COUNTER
DATA BUS
Time Measure Unit - 1 channel


5V
DFF
D0
D
Q
CLK
DRIVER
C-BIT0
5V
DFF
D1
D
Q
CLK
DRIVER
C-BIT1
5V
D126
DFF
D
Q
CLK
DRIVER
C-BIT126
5V
D127
DFF
D
Q
CLK
DRIVER
C-BIT127

Control Bit


Level DAC
BIAS
CLAMP DAC
CLAMP DAC
Null AMP
Integrator
Clamp+
Clamp-
+48V
Power
AMP
-48V
Current Range
100uA
1mA
10mA
100mA
1A
10A
Differential
AMP
FORCE
A/D
SENSE
DGND
Voltage Range
1 V
2 V
5 V
10 V
20 V
45 V
Power VI-10