

Systems category: Cost Effective pulsed SMU

- ✓ Compact and efficient design
- ✓ Embedded power supplies
- ✓ Cost effective pulsed DC supply and measurement solution
- ✓ Synchronization capabilities for multiple instrument measurements
- ✓ Driven by IVCAD and IQSTAR Software

MAIN FEATURES

- Reliable pulse units with long lasting performances (thermal, SOA and DUT breakdown protections)
- Pulse or DC operation with pulse width down to 1 μ s from the generator and for measurements
- Internal and external synchronization
- Extended stop conditions and built-in protection
- Direct hardware programmability (SCPI commands)
- Embedded measurement units providing wide bandwidth and high accuracy for simultaneous current and voltage measurements
- Embedded fast short-circuit current breaker, performing the protection of the external pulse unit as well as external components such as Bias Tees
- Remote control through LAN or USB
- Compatible with IVCAD and IQSTAR Software's



SYSTEM DESCRIPTION

The AM3100 is a standalone Pulsed IV system for Pulse Load Pull and general-purpose test pulsed applications. AM3100 PIV systems are used to bias transistors or circuits in pulsed conditions to avoid self-heating and ensure quasi-isothermal conditions during the measurements.



Pulsed DC and RF Load Pull bench architecture

Power amplifiers are often driven by pulsed RF signal combined with continuous or pulsed DC bias conditions. This brings some complexity to the bench configuration. Indeed, even when continuous DC voltages supplies are used, the pulsed RF signal magnitude will drive the transistor consumption in pulsed mode also, if the PA operates in saturated area.

In order to measure the peak current to evaluate the peak efficiency, there is a need for synchronized pulsed IV and pulsed RF measurements.

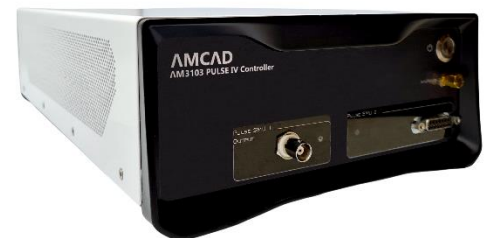
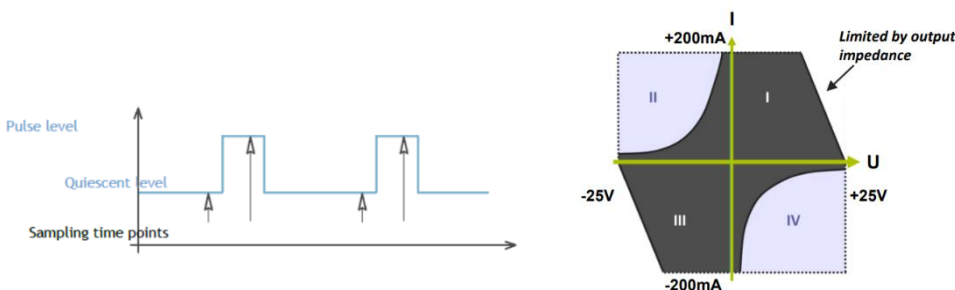
In term of measurement speed and system integration, the AM3100 PIV system will replace advantageously complex measurement architectures made of DC multimeters or external oscilloscope combined with external DC supplies.

SYSTEM SPECIFICATIONS

AM3111 Pulse SMU +/-25V +/-0.2A

Embedded inside the AM3103 Main controller, the Gate Pulse SMU presents the following characteristics:

- 4-quadrant DC or Pulse voltage source.
- Down to 1 μ s pulse width, 20ns time resolution.
- Simultaneous voltage and current sampling.
- Pulse and Quiescent level sampling time points can be chosen automatically by the source or manually by the user.
- 1 voltage range: ± 25 V
- 2 current ranges: ± 5 mA and ± 200 mA
- No transient when powering on/off or switching on/off
- Output on isolated BNC connector
- Operating range: DC: yellow area, Pulse: yellow + blue areas

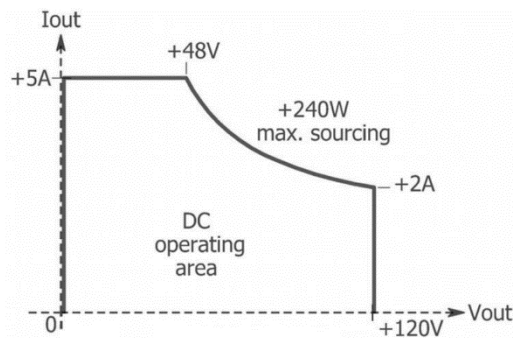


Parameters	Conditions/Comments	Min	Max
Voltage programming range		-25V	25V
Output current	Guaranteed: source stops if +/-260mA is exceeded	-200mA	200mA
Output power	Source, DC		3W
	Sink, DC		0.5W
Pulse	Width	1 μ s	10s
	Frequency	0.1Hz	200kHz
	Duty cycle	0%	100%
Temperature	Ambient temperature in front of the chassis rear openings	10°C	30°C

AM3121 Pulse SMU +120V +30A

The AM3121 Pulse SMU is a power probe dedicated to bias the transistor drain (Positive voltages). Optimized for high power pulsed measurements applications (120V, 30A), this probe head embed a current breaker and can be used either for Load Pull applications or general-purpose pulsed SMU. The Strig signal performs overall synchronization of start, stop, and emergency stop. Using either constant level or pulsed mode, the Ptrig signal performs overall synchronization of the power pulse, the measurement sampling time and the transient mask.

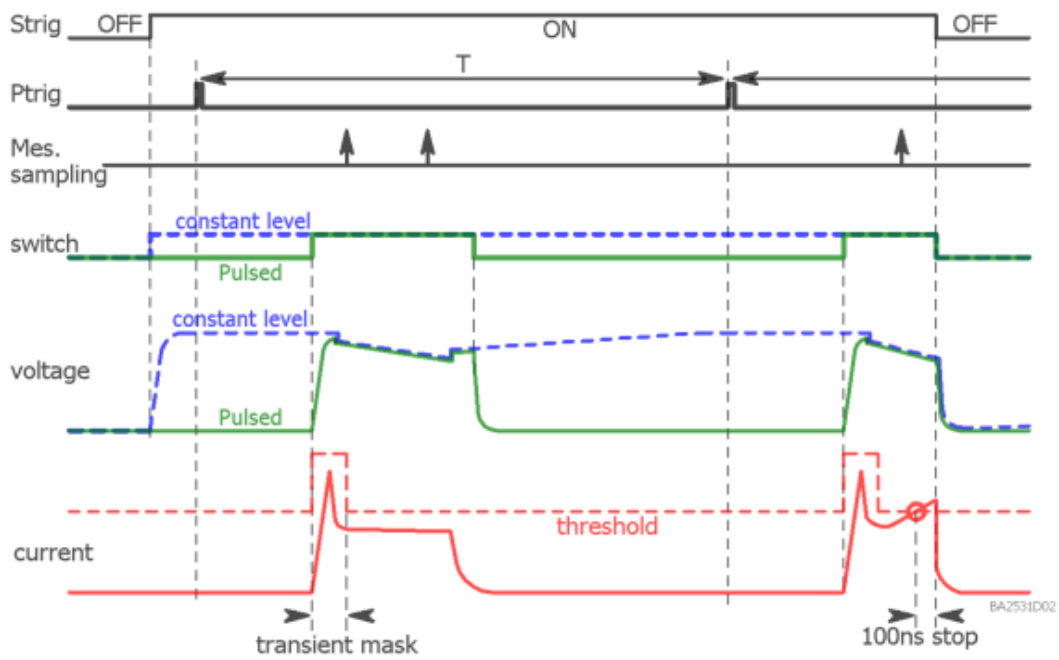
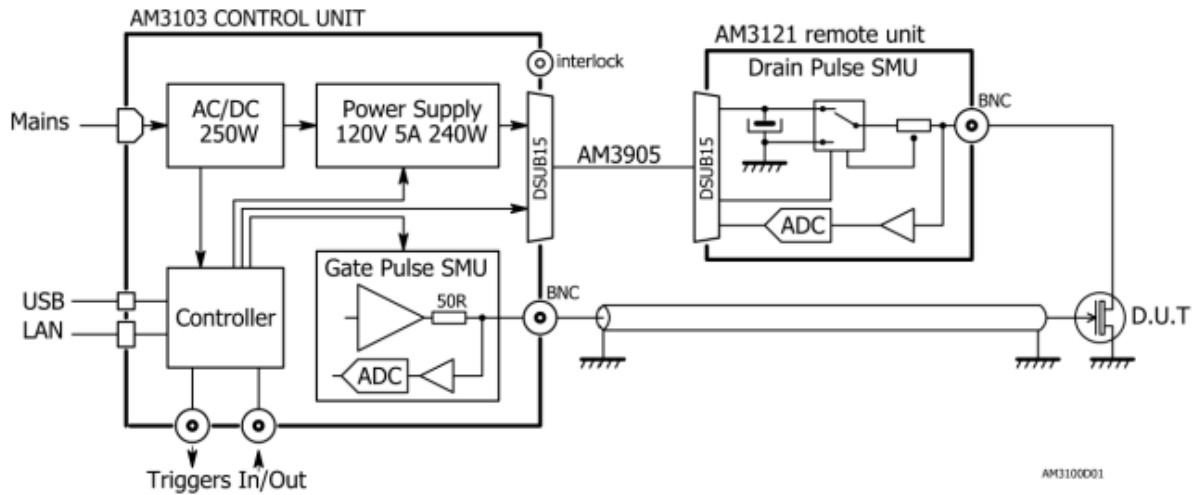
- Isolated DC voltage source
- Fast toggling current and power limitation
- 2-quadrant, source & sink operating area
- 18-bit voltage programming, no missing code
- Safe charging and discharging of any load capacitor
- Programmable voltage slope
- No transient when powering on/off



Parameters	Conditions/Comments	Min.	Typ.	Max.
Voltage programming range		0		+120V
Current compliance range	Programmable maximum sourcing current limit	+250mA		5A
Source output power	DC or transient operation, fast toggling limitation		240W	
Operating temperature	Ambient temperature, 80% RH non-condensing	+15°C		+30°C
Earth isolation	Between power gnd and earth	220kΩ & 300nF		

SYSTEM SPECIFICATIONS

System Schematic and measurements specifications



AM3111 Measurement specifications

Parameters	Conditions/Comments	25V range	200mA range	5mA range
ADC resolution	16-bit	0.9mV	7μA	170nA
Noise		+/-2mV	+/-30μA	+/-5μA
Settling time	To 95% To ADC resolution	0.5μs 2μs	0.5μs 2μs	1μs 4μs
Absolute accuracy	Offset + % of reading, 2-year	7.5mV + 0.1%	100μA + 0.2%	10μA + 0.2%

AM3121 Measurement specifications

Parameters	Conditions/Comments	Voltage	Current
Measurement range		-5V / 125V	-1A / 33A
ADC resolution	16 bits	2.1mV	550μA
Settling time	To 95% To ADC resolution	0.5μs 2μs	0.5μs 2μs
Noise		+/-15mV	+/-2mA
Absolute accuracy	Offset + gain	20mV + 0.1%	20mA + 0.3%

AM3100 Pulse Timing definition

Parameters	Conditions/Comments	Spec.	Min.	Max.
Time jitter	Ptrigger to any output			+/-2.5ns
Minimum time delay from Ptrigger	Fixed delay from Ptrigger to any output	200ns	190ns	210ns
Time delay calibration error	Parameter inside each pulse	+/-10ns		
Time resolution	Delay and duration counting	20ns		
Internal Ptrigger range	Period (timer resolution 1μs) Frequency		5μs 200kHz	10s 0.1Hz

Warranty

Any AMCAD product comes with a two-year parts and labour warranty, when returned to our workshops. A phone support service is also available for the same period. At the end of the initial two-year period, a further contract can be subscribed, including:

- A preventive functional check and calibration of the modules (on site or in our workshop)
- A further two-year warranty period

Quality Regulations & Environment

The PIV System and all modules are compliant to the applicable European directive and hold the CE mark.

- ISO/CEI 17025 compliant calibration for any DC source or measurement module, calibration certificate provided.
- Serial number based life cycle management
- All products are 100% tested (test reports on demand)
- AMCAD only uses RoHS compliant components and does not use substances banned by the COSHH regulation.
- AMCAD complies with the relevant national regulations related to the safety and health of its employees against hazardous substances.
- The protection degree of the PIV system is IP20 according to CEI 60529.



AMCAD Engineering
Advanced Modeling for Computer-Aided Design

PIV SYSTEM – AM3100_BROCHURE_REV1

All Rights Reserved

Specifications are subject to change without notice