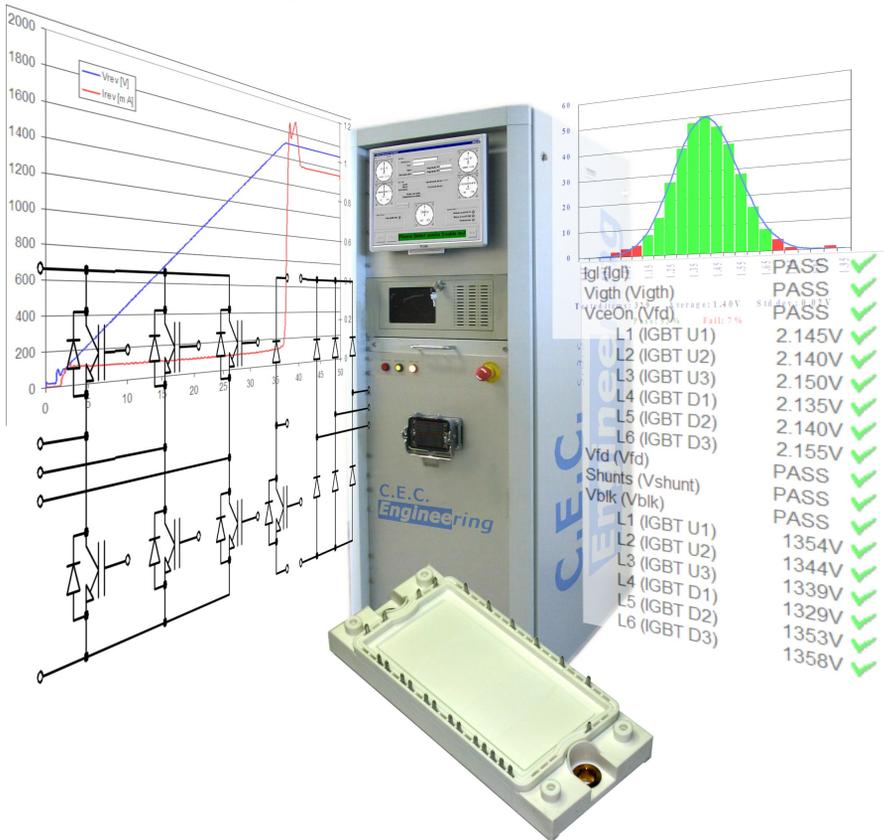# CEC Power Electronics Tester

Modular architecture for power semiconductors testing

- Discrete components or modules

- Reverse voltage up to 2500V @ 50mA

- Forward current up to 6000A @ 35V

- Gate parameters (iGBT, MOSFET, SCR…)

Igl (Igl)	PASS	✓
Vigth (Vigth)	PASS	✓
VceOn (Vfd)	PASS	✓
L1 (IGBT U1)	2.145V	✓
L2 (IGBT U2)	2.140V	✓
L3 (IGBT U3)	2.150V	✓
L4 (IGBT D1)	2.135V	✓
L5 (IGBT D2)	2.140V	✓
L6 (IGBT D3)	2.155V	✓
Vfd (Vfd)		
Shunts (Vshunt)	PASS	✓
Vblk (Vblk)	PASS	✓
L1 (IGBT U1)	PASS	✓
L2 (IGBT U2)	1354V	✓
L3 (IGBT U3)	1344V	✓
L4 (IGBT D1)	1339V	✓
L5 (IGBT D2)	1329V	✓
L6 (IGBT D3)	1353V	✓
	1358V	✓

What is it

A modular architecture for power semiconductors testing, discrete or modules

Who can need it

components manifacturers	end-of-line or intermediate production tests
components user and assemblers	class selection, incoming material quality check, final product test
laboratories	components characterization, stress tests

How to use it

Very easy to use, although complete and fully configurable; it requires no particular expertize, nor software writing.
Error safe: it cannot be damaged by improper programming.

Integrability

It can work as a stand-alone equipment, or together with an external automation, either in master or slave mode

Modularity

It can be equipped with the minimum required features: it can be small and specific, or complete an general purpose. It can be configured to test discrete components or modules. It can contact DUT manually or connected to an automation.

It runs usual static tests like

Reverse voltage:	blocking voltage, reverse leakage current, voltage class selection, surge test with reapplied reverse voltage
Forward bias:	forward voltage drop, temperature rise
Gate parameters:	trigger voltage and current (Igt, Vgt), latch current, hold current, insulated gate leakage current, insulated gate trigger voltage.

Custom tests can be implemented on request.
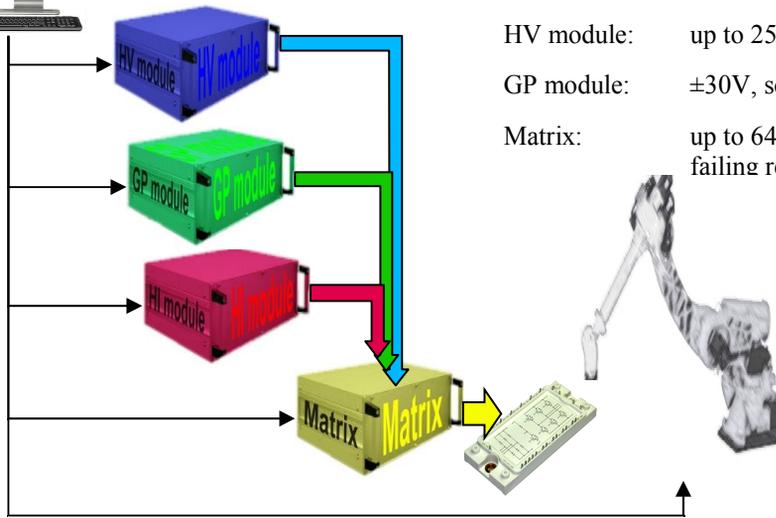
Electrical characteristics

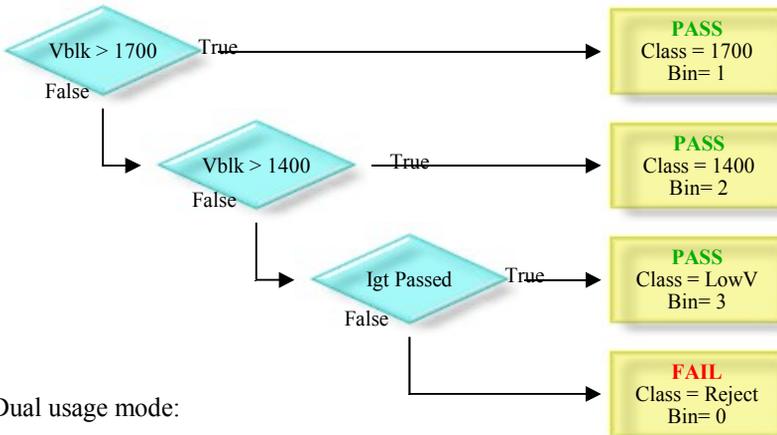|	
HI module:	100A, 1kA, … 6kA @ 35V
HV module:	up to 2500V, scales from 100μA to 50mA
GP module:	±30V, scales from 100nA to 1A
Matrix:	up to 64*3 points (Power + Gate + Sense) failing relay search tool

Synchronism between generation and measurement and between involved generators

Generation and measurement resolution: 12bit minimum

Ready for connection to contacting tools and automations.

TESTPROGRAM:
fully configurable and easy to define (no software writing is required)

The steps sequence is defined specifying the kind of test, its specific parameters, which junctions it must run on, where to jump if Pass, Fail, or depending on result value ranges. Parameters can be function of other tests results.

Different steps partial results can be used for class selection and binning.

It can loop on a test iterating some parameters (for characterization) or not (stress cycles).
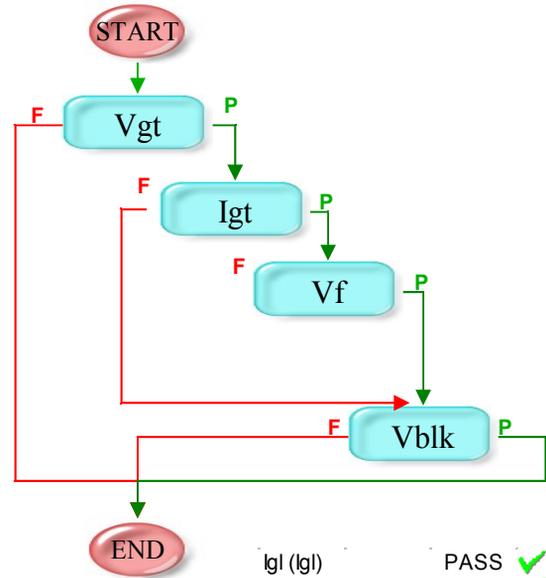
START

Vgt — F / P
Igt — F / P
Vf — F / P
Vblk — F / P

END

Vblk > 1700 — True → **PASS** Class = 1700 Bin= 1
False ↓
Vblk > 1400 — True → **PASS** Class = 1400 Bin= 2
False ↓
Igt Passed — True → **PASS** Class = LowV Bin= 3
False ↓
→ **FAIL** Class = Reject Bin= 0

Igl (Igl)		PASS ✓
Vigth (Vigth)		PASS ✓
VceOn (Vfd)		PASS ✓
L1	IGBT	2.145V ✓
L2	IGBT	2.140V ✓
	IGBT	2.150V ✓
	IGBT	2.135V ✓
	IGBT	2.140V ✓
	IGBT	2.155V ✓
		PASS ✓
(nt)		PASS ✓
		PASS ✓
	IGBT	1354V ✓
	IGBT	1344V ✓
	IGBT	1339V ✓
	IGBT	1329V ✓
	IGBT	1353V ✓
	IGBT	1358V ✓

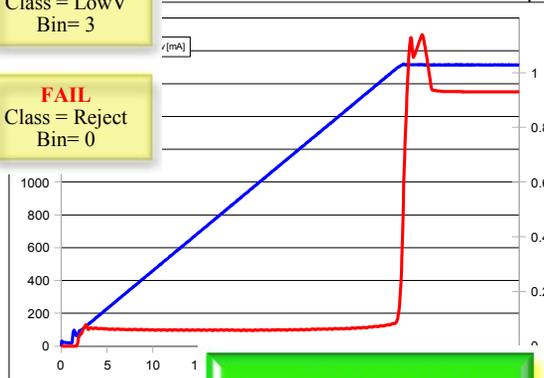Dual usage mode:

Simplyfied:	for production use, it needs no particular operators training: just recall the proper testprogram
Complete:	for testprogram definition and debugging, characterization, tests looping. It allows results and waveform sinspection.

PASS

Reports and statistics generation,
database and spreadsheets connection.