

- Automotive** (OEM, Tier1 and others): Robert Bosch (DE+IN), Valeo, Conti
- Metrology** (NIM/National Institutes of Technology): PTB — VSL — METAS — Canada — Mexico — Argentina — Soutafrica — Australia — China/Beijeng
- Research** TU Munich — TU Dortmund — TU Magdeburg — FH Ulm — TU Stuttgart — TU Dresden — FH Chemnitz — PSI Schweiz — Australien — University of Harbin/ China — TU Erlangen — Fraunhofer (beam deflection)
- Special Projects** Siemens (Energy-Calibration — Lifetesting of power switches — QA of high energy turbines)



PFL2250... **the chameleon**
Universal — line simulation,
interrupts 2µsec — current
calibration e.g. 600Arms-
100 kHz-0,1%



CU-PA2014A

Applications

AERO	=	Aviation
AUTO	=	Automotive
BE-DV	=	Beam Deviation
CAL	=	Calibration
EMC	=	Electro Magnetic Compatibility
EN	=	Power Engineering
HV	=	High Voltage
MET	=	Metrology
N-MET	=	National Metrology Institution
NMR	=	Nuclear Magnetic Resonance
NS	=	New Standards
OEM	=	Original Equipment Manufacturer (like BMW / Daimler / Audi / Porsche)
P	=	Production
ACC	=	Particle Accelerator
QA	=	Quality Assurance
R&D	=	Research & Development
SA	=	Space Applications
Spin	=	Spectroscopy
TIER 1	=	Direct Supplier No. 1 (like Robert Bosch / Valeo / Continental)
U+R	=	University based Research

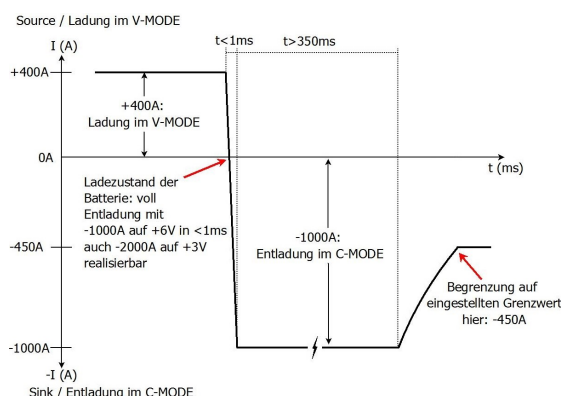
Countries

	AT = Austria
	AU = Australia
	BG = Bulgaria
	CA = Canada
	CH = Switzerland
	CL = Chile
	CN = China
	DE = Germany
	HU = Hungary
	FR = France
	IN = India
	NL = Netherlands
	RO = Romania
	TR = Turkey
	US = USA
	ZA = South Africa

Batterie testing with CU-PA2014A

Pulse: Dropping +6V /+400A to -1000A

Fall time: <1 ms — discharge: >350 ms



Reference list

Automotive: EMV, Calibration, HV-Tests Aero: Vibration	App	DE	Non DE	OEM TIER
EMC / Calibration	CAL / EMV	x	AT	X
QA-start puls e.g. ...1000A / μ sec	R&D	x		X
ECU testing - Valve	R&D-TIER1	x	FR	X
ECU testing	R&D-OEM	x		X
Quality-Assurance	R&D	x		
Automotive-Inductive Components	R&D-TIER		AT	X
Automotive tests $\cos\phi$ vs 0	QA		CH	
Cera-link Test @ 110Vrms / 60Arms / 100 kHz	R&D	x	AT	X
Automotive compliance LV124/148; VW80000 and customized	QA-TIER1		IN	X
QA of automotive capacitors up to 260 kHz	QA-TIER1	x		X
Life tests & QA, research; Hallsensors inline - calibration	QA-TIER1	x		X
EMV, Mil, Automotive as 1000 A / 170 kHz	MET		AT	
Life-testing: injection valves	QA-TIER1	x	US	X
Automotive: Magnetizing of sealing rings	P	x	RO TR BG	X
Aero R&D	AERO	x		



PA3035A+B
Automotive line-testing of 5-phase alternators

Controlled variable: V_{OUT} / C_{OUT}

Per phase: 36V_{pp} / 135A_{RMS},
AC-coupled, 20 Hz...3 kHz -3dB

5-phase rectifier

(for 5-phase generator)
AC-coupled

Potential Relations:

Amplifiers are galvanically insulated
between each other and Input / Output.

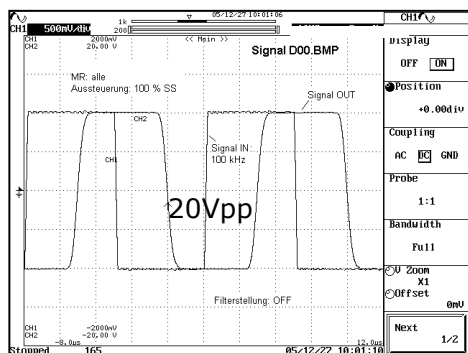
Amplifier <OFF>: at C_{OUT} -regulation:
 $C_{OUT} = 0A$! No-load voltage up to $>V_{max}$!

Reference list

Applikation	App	DE	Non DE	OEM TIER
Component Test	QA	x		X
Research & Education	R+E		CH	
High Voltage test and measurement				
High Voltage test and measurement	CAL	x	CH	
HV - circuit breakers tests	N-MET	x	AT	
Piezosupply onto 10.000 Volt	A-R&D	x		
Puplic Power Supply / Material research / Quality assurance				
Line simulation / Material research / Quality assurance	CAL, R&D	x	CH	
Inductances / Magnetic material	R&D	x	AT	
secret	QA		US	
Network simulation / EMC / Calibration	U+R	x		
Behaviour of electrical drives vs line conditions	R&D	x		
Simulation of a 3-phase high voltage transmission system — Northsea to southern Germany	EN-HV	x		
3-phases high precision power generators; 3x voltage; 3x current — for simuation and calibration of MW	EN-MET	x		
Simulation and research of national and international 4-phase public lines and 4-phase	EN-MET		AU	
Research on international public lines interrupts up to -45 kVA -100 kHz; 4-phases (R, S, T, N)	U+R	x		
Behaviour of electrical drives vs line conditions	R&D	x		
Education	U+R	x		



Filter OFF

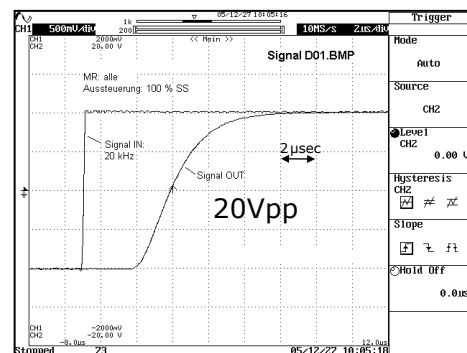


Isolation Amplifier T303-B

Rise time: 4µsec
10mV....3kV;
DC->300kHz
multi channel use



Filter 100 kHz

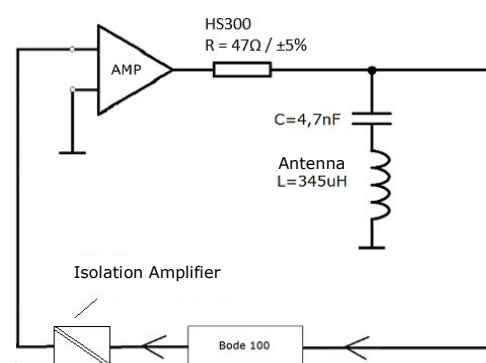
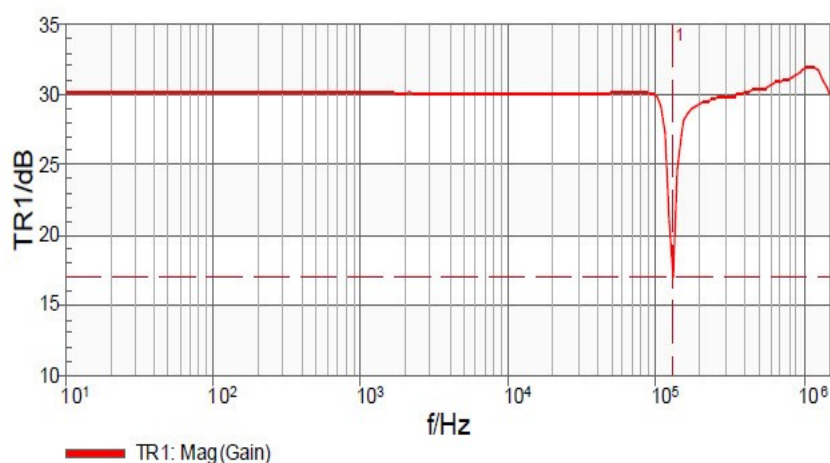


Reference list

Metrology	App	DE	Non DE	OEM TIER
Calibration laboratory 10A/DC -100 kHz -	MET	x		
QA-Calibration of powerstations	MET	x		
Inductances / Magnetic material	R&D-QA	x		
Calibration of high precision current sensors	MET	x		
Research at the forefront of technology	N-MET		CH ZA	
High power safety 0...360°	QA		CH	
Light calibration	MET	x		
Tomography QA	MET	x		
Research on high power (GWatt)	N-MET	x		
Metrology, Inductances / Magnetic materials	MET-R&D	x		
Research at the forefront of technology	N-MET		NL	
Metrology	MET		AT	

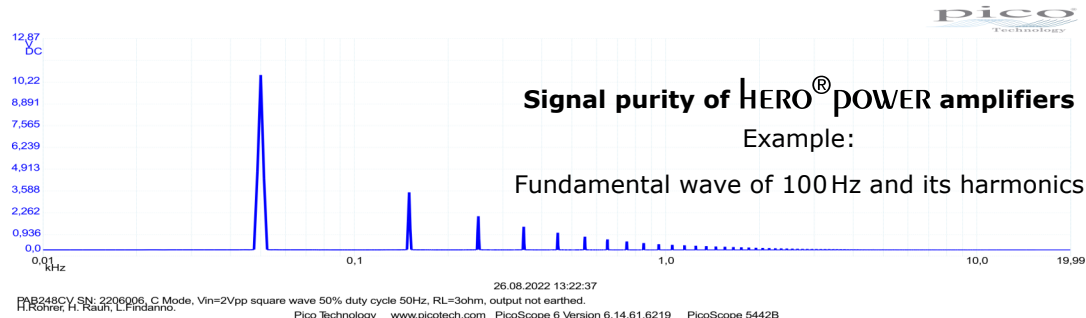


Resonance and amplitude purity of an automotive antenna



Reference list

Applikation	App	DE	Non DE	OEM TIER
Aerospace, Orbit and Submarine				
Calibration of Solarpanels for space	MET	x		
Quality-Assurance / research vibration	SA	x		
Submarine QA	SUB	x		
Piezos-Research on turbine blades	AERO	x		
Resonance-research on space vehicles	SA		US	
Degaussing magnetic free chambers	SA		CN	
Developping magnetic free chambers	SA		CH	
Degaussing	SA	x		
Multichanal piezosystem steering the ailerons into the neutral zone for reducing shocks	AERO		US	
Magnet related applications				
Deflection systems - Beam deviation	BE-DV	x		
Particle accelerator	R&D	x		
Accelerator Beam Guidance	PA-ACC	x		
Magnetic Resonance (NMR)	NMR	x		X
Magnetic Materials Qualification	QA	x	AT	
Calibration of precision high current flux zero transducers DC-MHz	MET	x	CH BG CN	
Special tasks				
Tests of MHz sensors	QA	x		
Resonance test for traction drives	CAL	x		
Anodizing / plasma ceramics	CAL	x		
Magnetic materials up to 1.4 MHz	CAL		ZA	
Beam deflection / magn. lenses	R&D	x		
Calibration & Control of chemical processes	QA	x		
Magnetic material / Inductors	QA	X		
High power measurement	MET	x		



PA5000W**DAkKS calibration of reference shunts for battery control**

- **Ranges: 20 mA to 500 A**
- **High accuracy: 10⁻⁵**
- additive BNC inputs (a DC-coupled and an AC-coupled)
- 3 switchable measuring ranges
- **R1: ±500 A / ±5 V;**
R2: ±500 A / ±10 V; R3: ±10 A / ±10 V
- Power dissipation: 5 kW continuous

PAB-315VA**DC...2 kHz ±850 A (40 Hz...2 kHz)****Basic physical research**

- exploring new physical characteristics
- e.g. magnetic field sensitive components
- 600Arms / 25Vrms AC coupled, high stability
- ±300A / ±30V DC coupled, high stable