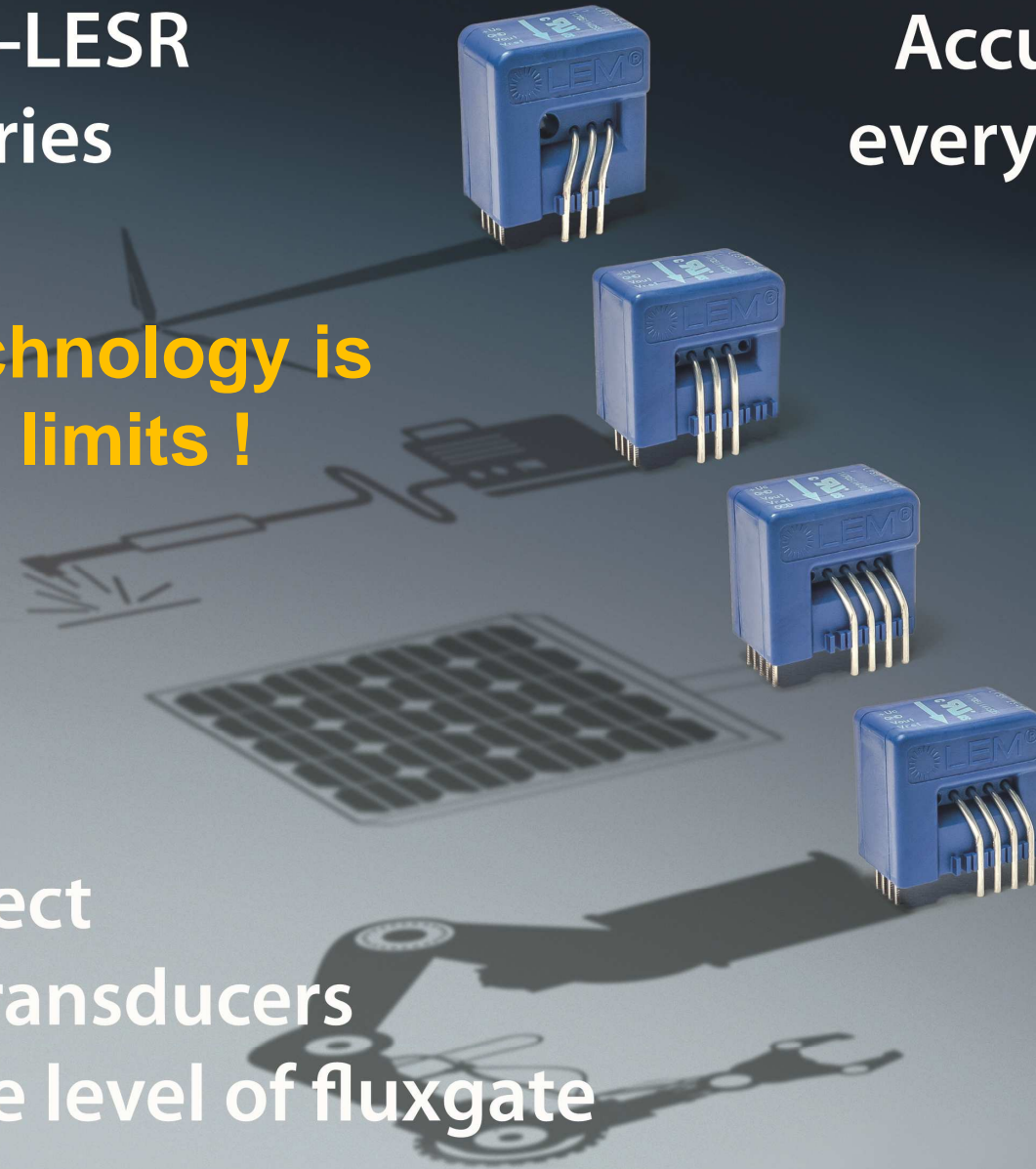


LXS-LXSR-LES-LESR LKSR-LPSR Series

Accurately
everywhere

Hall effect technology is
reaching new limits !

When Hall effect
closed-loop transducers
perform at the level of fluxgate



Fluxgate performance with Hall technology, brings the next level of cost competitiveness

LXS, LXSR, LES, LESR, LKSR, LPSR / Product description



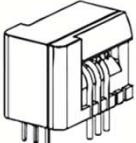
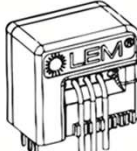
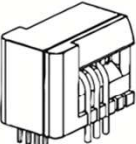

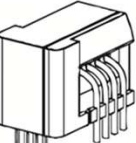



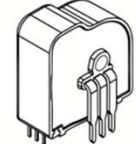

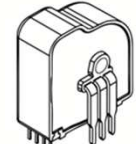
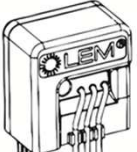
Features

- Based on LEM's patented high-performance Hall ASIC for closed loop transducers
- Multi-range 1.5 – 50A /PN Nominal
- Footprint compatible with former LEM Hall and Fluxgate families: LTS, LTSR, CAS, CASR, CKSR
- 22 models with various options: Reference, Footprint, Aperture and/or integrated primary conductor, OCD output (LPSR model)
- Down to 4 ppm/K offset drift

Key dates

- Sample kits: May 2017
- SOP: June 2017

Compatibility with existing LEM families

Old design	Old reference	New design	New reference	Secondary connection	Creepage Clearance (mm)	Temperature range
	CAS 6-NP		LES 6-NP	+5V GND V_{out}	dcl 7.7 dcp 7.7	-40 to 105°C
	CAS 15-NP		LES 15-NP			-40 to 105°C
	CAS 25-NP		LES 25-NP			-40 to 105°C
	CAS 50-NP		LES 50-NP			-40 to 105°C
	CASR 6-NP		LESR 6-NP	+5V GND V_{out} V_{ref}	dcl 7.55 dcp 7.55	-40 to 105°C
	CASR 15-NP		LESR 15-NP			-40 to 105°C
	CASR 25-NP		LESR 25-NP			-40 to 105°C
	CASR 50-NP		LESR 50-NP			-40 to 105°C
	CKSR 6-NP		LKSR 6-NP	+5V GND V_{out} V_{ref}	dcl 9.9 dcp 9.9	-40 to 105°C
	CKSR 15-NP		LKSR 15-NP			-40 to 105°C
	CKSR 25-NP		LKSR 25-NP			-40 to 105°C
	CKSR 50-NP		LKSR 50-NP			-40 to 105°C
	None		LPSR 6-NP	+5V GND V_{out} V_{ref} OCD	dcl 9.5 dcp 9.5	-40 to 105°C
	None		LPSR 15-NP			-40 to 105°C
	None		LPSR 25-NP			-40 to 105°C
	None		LPSR 50-NP			-40 to 105°C
	LTS 6-NP		LXS 6-NPS	+5V GND V_{out}	dcl 7.7 dcp 7.7	-40 to 85°C
	LTS 15-NP		LXS 15-NPS			-40 to 85°C
	LTS 25-NP		LXS 25-NPS			-40 to 85°C
	LTSR 6-NP		LXSR 6-NPS	+5V GND V_{out} V_{ref}	dcl 7.55 dcp 7.55	-40 to 85°C
	LTR 15-NP		LXSR 15-NPS			-40 to 85°C
	LTSR 25-NP		LXSR 25-NPS			-40 to 85°C

LES 6-NP, 15-NP, 25-NP, 50-NP

Product description

Features:

- $I_{PN} = 6, 15, 25, 50 A_{RMS}$
- Closed loop multi-range current transducer
- Voltage output
- Unipolar supply voltage
- Compact design for PCB mounting
- Very low offset drift
- CAS footprint compatible
- Operating temperature range -40 to +105°C

Same accuracy as CAS, pin-pin compatible

- CAS → LES
- CAS series will not be phased-out

Fluxgate performance with a Hall ASIC.

Datasheet available May 16th

Product name	Vcc (V)	Meas. Range (A)	Vout type	Package
LES 6-NP	5	±20	Fixed Vref	PCB mounted
LES 15-NP	5	±51	Fixed Vref	PCB mounted
LES 25-NP	5	±85	Fixed Vref	PCB mounted
LES 50-NP	5	±150	Fixed Vref	PCB mounted



LESR 6-NP, 15-NP, 25-NP, 50-NP

Product description

Features:

- $I_{PN} = 6, 15, 25, 50 A_{RMS}$
- Closed loop multi-range current transducer
- Voltage output
- Unipolar supply voltage
- Compact design for PCB mounting
- Very low offset drift
- Reference access OUT & IN (0.5 to 2.75 V)
- CASR footprint compatible
- Extended measuring range for unipolar measurement
- Operating temperature range -40 to +105°C

Same accuracy as CASR, pin-pin compatible

- CASR → **LESR**
- CASR series will not be phased-out

Fluxgate performance with a Hall ASIC.

Datasheet available May 16th

Product name	Vcc (V)	Meas. Range (A)	Vout type	Package
LESR 6-NP	5	±20	Fixed Vref	PCB mounted
LESR 15-NP	5	±51	Fixed Vref	PCB mounted
LESR 25-NP	5	±85	Fixed Vref	PCB mounted
LESR 50-NP	5	±150	Fixed Vref	PCB mounted



LKSR 6-NP, 15-NP, 25-NP, 50-NP

Product description

Features:

- $I_{PN} = 6, 15, 25, 50 A_{RMS}$
- Closed loop multi-range current transducer
- Voltage output
- Unipolar supply voltage
- Compact design for PCB mounting
- Very low offset drift
- Reference access OUT & IN (0.5 to 2.75 V)
- CKSR footprint compatible
- Extended measuring range for unipolar measurement
- Operating temperature range -40 to +105°C

Same accuracy as CKSR, pin-pin compatible

- CKSR → **LKSR**
- CKSR series will not be phased-out

Fluxgate performance with a Hall ASIC

Datasheet available May 16th

Product name	Vcc (V)	Meas. Range (A)	Vout type	Package
LKSR 6-NP	5	±20	Fixed Vref	PCB mounted
LKSR 15-NP	5	±51	Fixed Vref	PCB mounted
LKSR 25-NP	5	±85	Fixed Vref	PCB mounted
LKSR 50-NP	5	±150	Fixed Vref	PCB mounted



LPSR 6-NP, 15-NP, 25-NP, 50-NP

Product description

Features:

- $I_{PN} = 6, 15, 25, 50 A_{RMS}$
- Closed loop multi-range current transducer
- Voltage output
- Unipolar supply voltage
- Compact design for PCB mounting
- Very low offset drift
- Reference access OUT & IN (0.5 to 2.75 V)
- Extended measuring range for unipolar measurement
- OCD output, 5 secondary pins
- Operating temperature range -40 to +105°C

Same accuracy as CASR/CKSR fluxgate series

Fluxgate performance with a Hall ASIC.

Datasheet available May 16th

Product name	Vcc (V)	Meas. Range (A)	Vout type	Package
LPSR 6-NP	5	±20	Fixed Vref	PCB mounted
LPSR 15-NP	5	±51	Fixed Vref	PCB mounted
LPSR 25-NP	5	±85	Fixed Vref	PCB mounted
LPSR 50-NP	5	±150	Fixed Vref	PCB mounted



LXS 6-NPS, 15-NPS, 25-NPS

Product description

Features:

- $I_{PN} = 6, 15, 25 A_{RMS}$
- Closed loop multi-range current transducer
- Voltage output
- Unipolar supply voltage
- Compact design for PCB mounting
- Very low offset drift
- LTS footprint compatible
- With Aperture & Integrated primary conductor
- Operating temperature range -40 to +85°C

Replacement of LTS, pin-pin compatible, better accuracy in temperature (4 times better offset drifts)

- LTS → **LXS**

Fluxgate performance with a Hall ASIC.

Datasheet available May 16th

Product name	Vcc (V)	Meas. Range (A)	Vout type	Package
LXS 6-NPS	5	±20	Fixed Vref	PCB mounted/THT
LXS 15-NPS	5	±51	Fixed Vref	PCB mounted/THT
LXS 25-NPS	5	±85	Fixed Vref	PCB mounted/THT



LXSR 6-NPS, 15-NPS, 25-NPS

Product description

Features:

- $I_{PN} = 6, 15, 25 A_{RMS}$
- Closed loop multi-range current transducer
- Voltage output
- Unipolar supply voltage
- Compact design for PCB mounting
- Very low offset drift
- Reference access OUT & IN (0.5 to 2.75 V)
- LTSR footprint compatible
- With Aperture & Integrated primary conductor
- Extended measuring range for unipolar measurement
- Operating temperature range -40 to +85°C

Replacement of LTSR, pin-pin compatible, better accuracy in temperature (4 times better offset drifts)

- LTSR → LXSR

Fluxgate performance with a Hall ASIC.

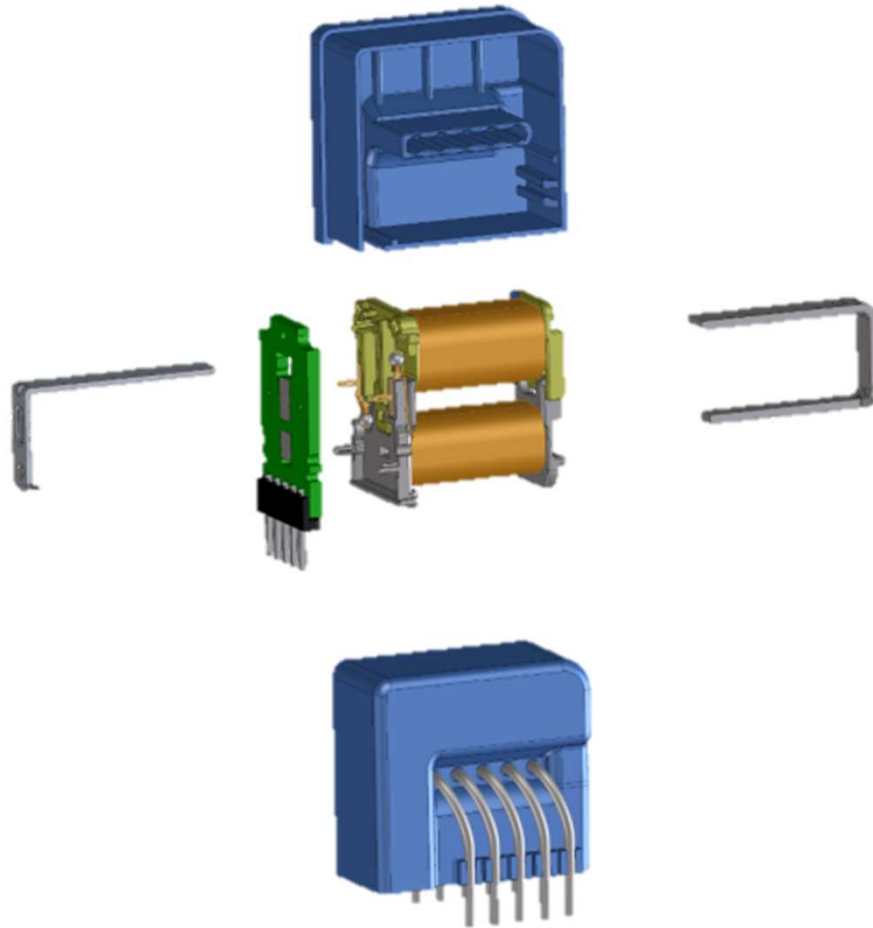
Datasheet available May 16th

Product name	Vcc (V)	Meas. Range (A)	Vout type	Package
LXSR 6-NPS	5	±20	Fixed Vref	PCB mounted/THT
LXSR 15-NPS	5	±51	Fixed Vref	PCB mounted/THT
LXSR 25-NPS	5	±85	Fixed Vref	PCB mounted/THT



LXS, LXSR, LES, LESR, LKSR, LPSR are designed-to-quality & -to-cost using the latest automotive techniques & manufacturing processes

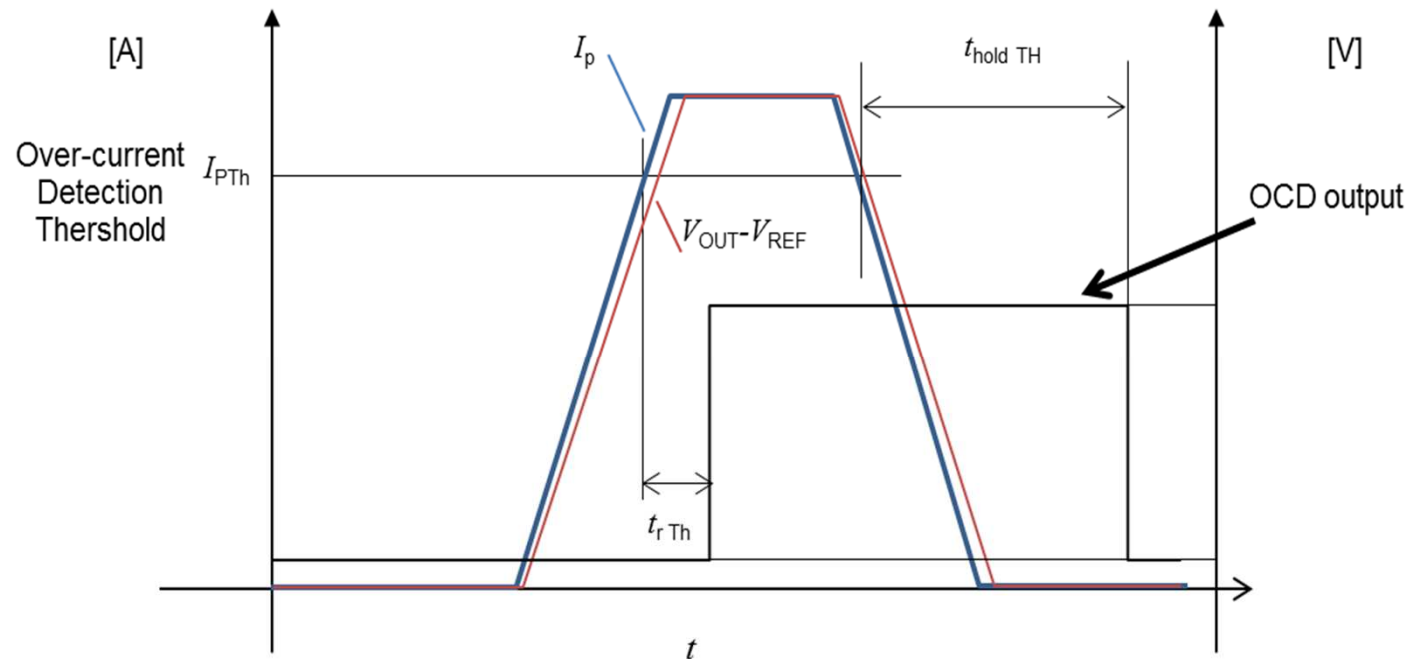
LXS, LXSR, LES, LESR, LKSR, LPSR's construction



- Industry 4.0 approach on the manufacturing line (communication)
- High traceability
- Two serial secondary coils to get best frequency performance
- Press-fit connections, no soldering
- Each transducer individually calibrated in temperature
- LEM patents

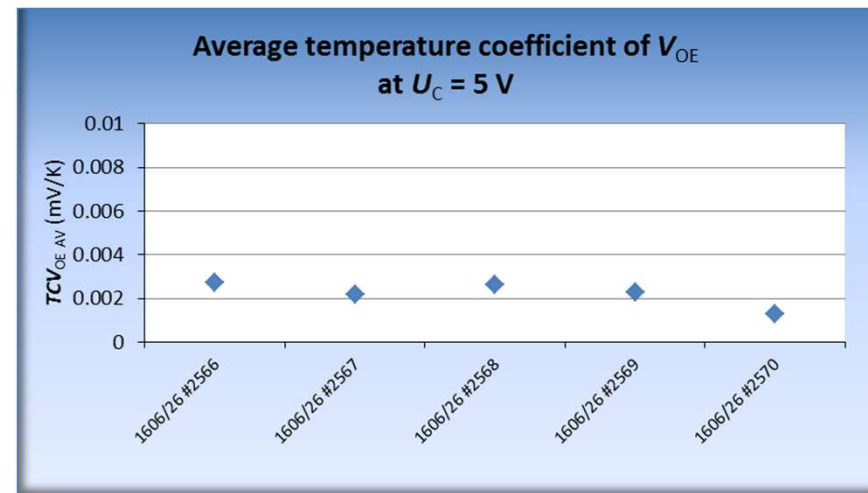
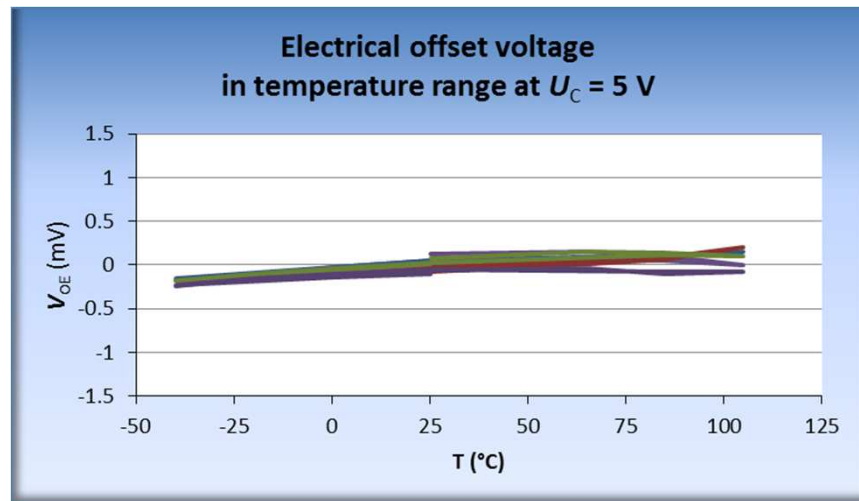
LPSR series: OCD trigger level can be set outside the measurement range

On LPSR only, the Over Current Detection can be set between $1.25x$ and $5x I_{PN}$. It is triggered by both positive and negative over-currents. The default value is $2.9x I_{PN}$.



Full characterization of the new transducer family has been carried out over all the extremes of operating conditions

The offset drift is calculated as is less than $4 \mu\text{V}/^\circ\text{C}$, equivalent to less than $1.6 \text{ ppm}/^\circ\text{C}$ for these transducers (the specification limit is $4 \text{ ppm}/^\circ\text{C}$). LKSR 25-NP



LXSR is pin-pin compatible with LTSR with higher-performance and LKSR pin-pin compatible with CKSR

Performance comparison: LTSR, CKSR and the new LKSR



	LTSR 25-NP Earlier Hall	CKSR 25-NP Fluxgate	LKSR 25-NP New Hall
Sensitivity error (%)	± 0.6	± 0.7	± 0.2
Temperature coefficient of sensitivity [ppm/°C]	± 50	± 40	± 40
Electrical offset voltage (mV)	25.0	1.4	1.0
Magnetic offset current (mA) after overload $10 \times I_{PN}$ (Referred to primary)	80	100	90
Reference Voltage V_{REF} @ $I_P=0$	2.475 - 2.525	2.495 - 2.505	2.485 - 2.515
Temperature coefficient of V_{REF} @ $I_P=0$ (ppm/°C of 2.5V)	± 100	± 50	± 100
Temperature coefficient of $V_{OUT} - V_{REF}$ @ $I_P=0$ (ppm/°C of 2.5 V)	± 37.5	± 4	± 4
Linearity (%)	± 0.1	± 0.1	± 0.1
Reaction time @ 10% of I_{PN} (ns)	100	300	300
Response time to 90% of I_{PN} step (ns)	400	300	400
Overall accuracy (% of I_{PN}) @ 25°C	0.7	1	0.8
Overall accuracy @ $T_A=85^\circ\text{C}$ (% of I_{PN})	1.9	1.35	1.0
Overall accuracy @ $T_A=105^\circ\text{C}$ (% of I_{PN})	NA	1.45	1.2

LXS, LXSR, LES, LESR, LKSR, LPSR: Various applications

Applications

Targeted applications:

- Robotics
- Servo motor drives
- AC output Solar inverters
- Variable speed drives, AC & DC sides inverters
- Uninterruptible & Switch-Mode Power Supplies
- Battery-supply installations
- Power supplies (welding)
- Air conditioning
- Home appliances
- Static converters for DC motor drives

