



Signal conditioning

LMV82x series

TSV85x series

LMV3 series

LMX3 series



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Sensors, MCUs and ST op-amps

- ST is #1 in MEMS sensors
- ST's STM32 family is a top-selling ARM Cortex-M MCU series
- Leader in industry-standard op-amps, ST is enlarging its portfolio towards higher performance amplifiers focusing on low power, high precision and tiny packages

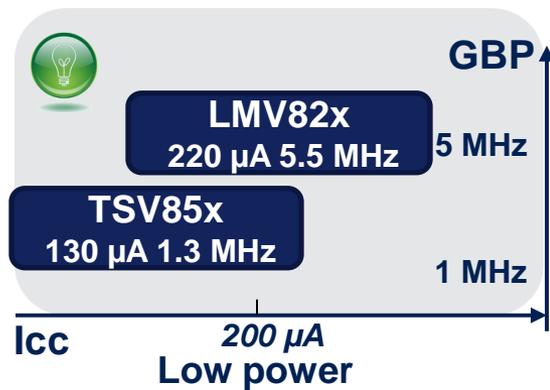
ST op-amps enhance the signal chain



ST op-amps provide the perfect fit between our sensors and microcontrollers

LMV82x-TSV85x series: low-power op-amps

4



Same small packages and same pin-out, for a drop-in solution with better performances

- Wider operating range from 2.3 V to 5.5 V
- Lower offset with $V_{IO} = 800 \mu V$
- Lower power, shutdown pin
- Higher ESD protection 4 kV
- Automotive grade availability in 2012
- All on our space-saving DFN8 2x2 mm (for dual op-amps)



The benefits of using LMV82x and TSV85x

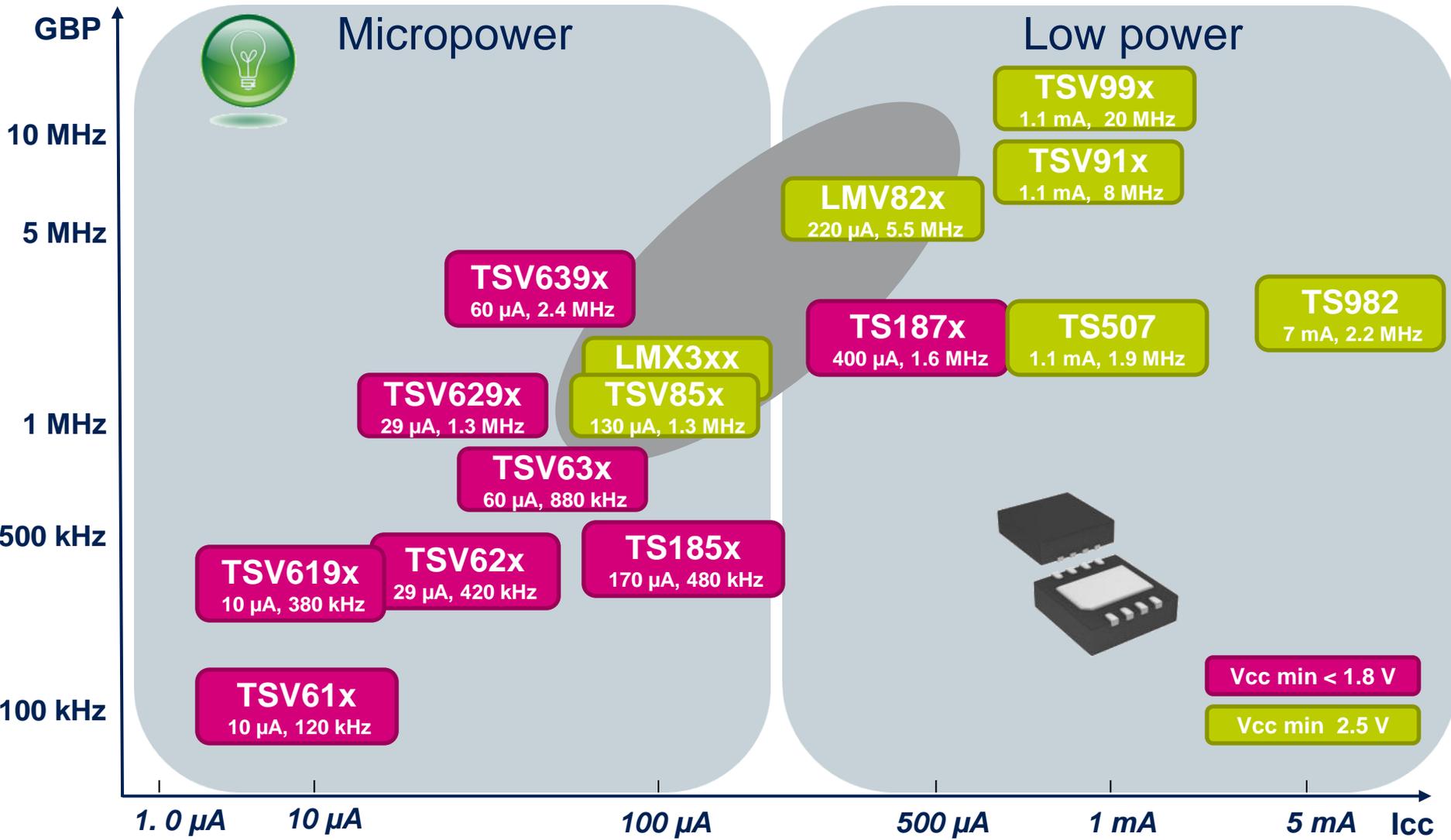
- The families consist of various versions
 - With or without standby function for power saving
 - Enhanced input offset voltage for higher accuracy (A-version)
- Get better performance at no extra design cost

	Without shutdown		With shutdown	
	Standard V_{IO}	Enhanced V_{IO}	Standard V_{IO}	Enhanced V_{IO}
Single	TSV851	TSV851A	TSV850	TSV850A
Dual	TSV852	TSV852A	TSV853	TSV853A
Quad	TSV854	TSV854A	TSV855	TSV855A

The benefits of using LMV82x and TSV85x

- The LMV82x and TSV85x are two new low-power op-amp families that upgrade ST's general-purpose range of standard op-amps for a variety of applications in the industrial, medical and convergence segments
- The LMV82x family is a drop-in replacement for the existing competitors LMV82x family with some superior features, including:
 - Lower input offset voltage
 - Lower operating voltage
 - Lower power consumption/shutdown option
 - Higher ESD immunity 4 kV
- The TSV85x family outperforms the classic LMV321 family and is a drop-in replacement for the standard LMX321 family from competitors

ST op-amp portfolio: low-voltage (max 6 V)



Drop-in solution for LMV821, LMV822, LMV824

Parameter	ST offering	Competition
	LMV82x	LMV82x
Temperature range (°C)	-40 to +125	-40 to +125
V_{OS} max (μV)	4000/800	5500
I_q typical (μA)	220	300
I_q max (μA)	500	500
GBWP (kHz)	5500	5500
Operating voltage range (V)	2.5 to 5.5	2.7 to 5.5
Rail-to-rail	Out	Out
Unity gain stable	Yes	Yes
Shutdown pin	Yes (option)	No
Package	SC70-5, SOT-23-5, DFN , Mini SO, SO, TSSOP	SC70-5, SOT-23-5, Mini SO, SO, TSSOP
Comments	Standby and precision versions available	

LMV321L and LMV321/358/324

Drop-in solution for LMV321, LMV358, LMV324

Parameter	ST offering		Competition
	LMV321L	LMV321	LMV321
Temperature range (°C)	-40 to +125	-40 to +125	-40 to +85
V_{OS} max (μV)	7000	6000	7000
# per package	1	1	1
I_q typical (μA)	130	160	130
I_q max (μA)	350	250	350
GBWP (kHz)	1000	1000	1000
Operating voltage range (V)	2.7 to 5.5	2.7 to 6	2.7 to 5.5
Rail-to-rail	Out	In/out	Out
Unity gain stable	Yes	Yes	Yes
Shutdown pin	No	No	No
Package	SC70-5, SOT-23-5	SC70-5, SOT-23-5	SC70-5, SOT-23-5
Comments	Low-cost version for high volume drop-in to NS & TI	Higher performance	

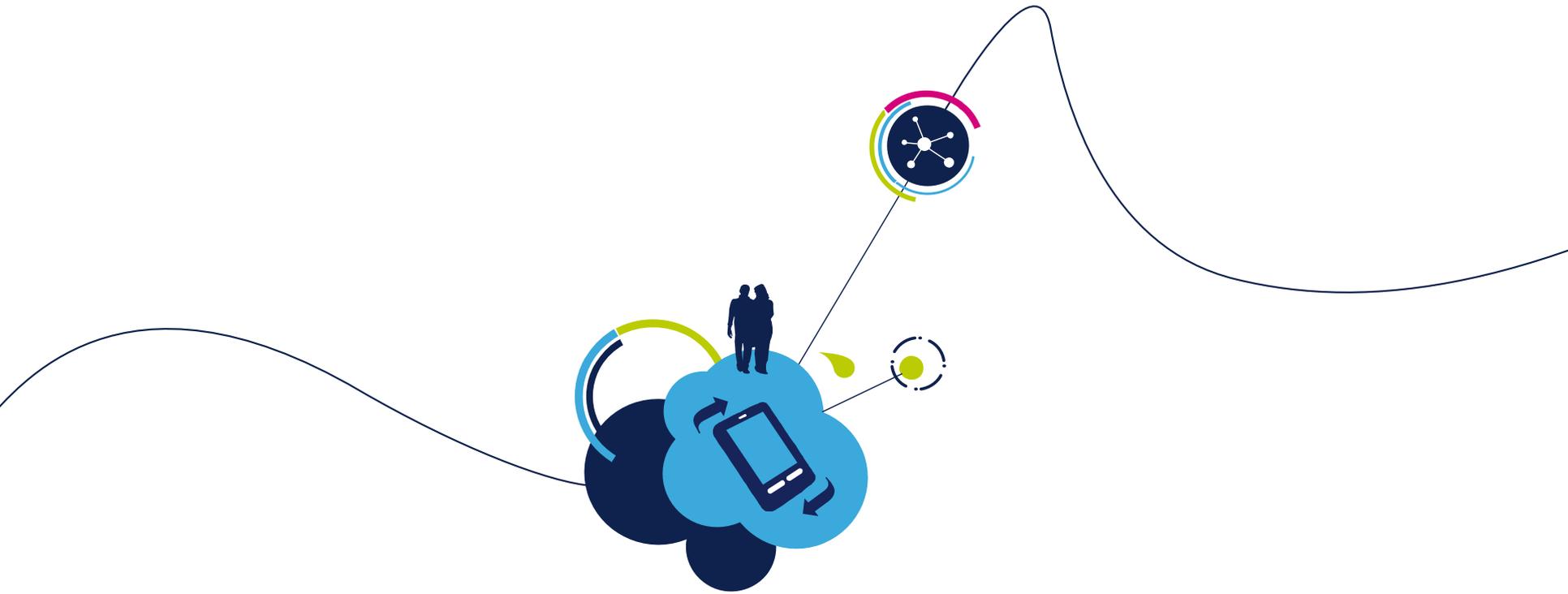
TSV85x and LMX321/358/324

Drop-in solution for LMX321 - LMX358 - LMX324

Parameter	ST offering		Competition
	TSV851	LMX321	LMX321
Temperature range (°C)	-40 to +125	-40 to +125	-40 to +125
V _{OS} max (µV)	4000/800	4000	6000
# per package	1	1	1
I _q typical (µA)	130	130	105
I _q max (µA)	180	180	170
GBWP (kHz)	1300	1300	1300
Operating voltage range (V)	2.3 to 5.5	2.3 to 5.5	2.3 to 7
Rail-to-rail	Out	Out	Out
Unity gain stable	Yes	Yes	Yes
Shutdown pin	Yes	No	No
Package	SC70-5, SOT-23-5	SC70-5, SOT-23-5	SC70-5, SOT-23-5
Comments	Standby and precision & DFN versions available	See TSV85x for more options	



- The LMV82x and the TSV85x are industry-standard op-amps
- They are aligned on existing families from our competitors, but with some enhancements
- The combination of low power, low voltage, low cost and tiny package makes them especially suitable for portable equipment
- Other typical applications
 - Active filtering
 - PLCs
 - Telecom (such as cordless phones and wireless infrastructures)
 - Consumer (such as set-top boxes)



And more....

Standard versus automotive flow

Automotive grade parts are emphasized by the letter Y



	Front-end			EWS					Assembly	Final test		
	Automotive flow	Control Process electrical test (T84)	Visual inspection	Electrical test	PAT	GPAT	SBL	SYL	Specific auto flow	Electrical test	Hot test	JVT
Standard products	No ✗	Sampling screening	Sampling	Yes ✓	No ✗	No ✗	No ✗	No ✗	No ✗	Yes ✓	No ✗	No ✗
AG qualified products (Y)	Yes ✓	100% wafer screening	100% of wafers	Yes ✓	Yes ✓	Yes ✓	Yes ✓	Yes ✓	Yes ✓	Yes ✓	Yes ✓	Yes ✓

Automotive sample kit

Part number	Package	Description
LM2001PPT	TSSOP8	Low power dual voltage comparator: 400 µA/1.3 µs
TS391PMLT	SOT23-5	Low power single voltage comparator: 200 µA/1.3 µs
TSC1014MLT		
TSC1018MLT	SOT23-5	High side current sense amplifier: input 2.8 to 30 V - load dump
TSC101CMLT		
TSC1021PPT	TSSOP8	High-side current sense amplifier plus signal conditioning amplifier: input 2.8 to 30 V - load dump, reversed battery
TSC1031PPT	TSSOP8	High-voltage, high-side current sense amplifier: input 2.9 to 70 V or ± 2.5 to 65 V load dump, reversed battery
MC33079YDT	SO-14	Low noise quad operational amplifier
TS5070YLT	SOT23-5	High precision rail-to-rail operational amplifier: input offset voltage 100 µV max
TS912A1DT	SO8	Rail-to-rail CMOS dual operational amplifier
TS362A1PPT	TSSOP8	Rail-to-rail high output current dual operational amplifier
TS9912A1YST	Micro508	Dual rail-to-rail input/output 6 MHz operational amplifiers
TS9902A1YST	Micro508	Rail-to-rail input/output 20 MHz OIP operational amplifiers

Operational amplifiers and comparators



STMicroelectronics

Automotive sample kit



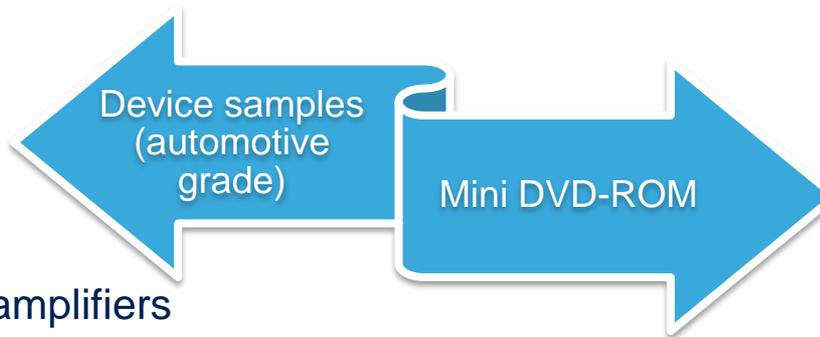
Scan this QR-code to visit our website.
www.st.com/stdlinear

Operational amplifiers and comparators - Automotive sample kit



outside

inside



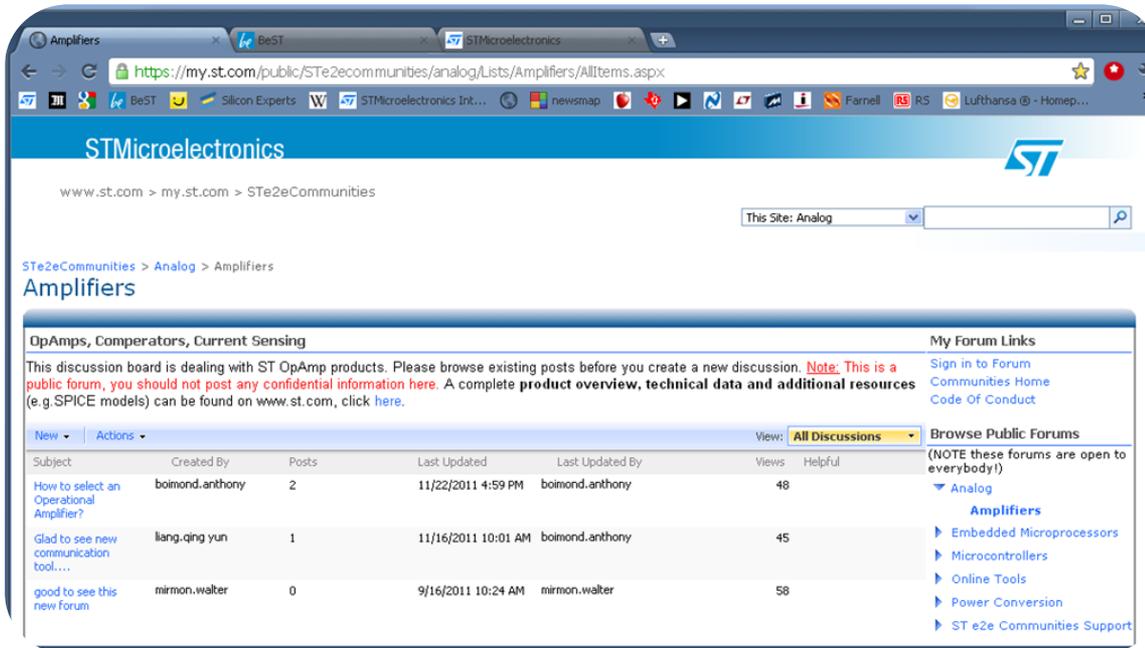
- Comparators
- Operational amplifiers
- High-side current sense amplifiers

- Datasheets
- Macro models
- Application notes

ST op-amp apps on Android market



ST op-amps – op-amp forum



The screenshot shows a web browser window displaying the STMicroelectronics forum page. The URL is <https://my.st.com/public/STe2ecomunities/analog/Lists/Amplifiers/AllItems.aspx>. The page title is "Amplifiers" and it is part of the "STMicroelectronics" website. The forum content includes a header with "OpAmps, Comparators, Current Sensing" and a "My Forum Links" section. A table lists forum posts with columns for Subject, Created By, Posts, Last Updated, Last Updated By, Views, and Helpful. The posts are:

Subject	Created By	Posts	Last Updated	Last Updated By	Views	Helpful
How to select an Operational Amplifier?	boimond.anthony	2	11/22/2011 4:59 PM	boimond.anthony	48	
Glad to see new communication tool...	lang.qing yun	1	11/16/2011 10:01 AM	boimond.anthony	45	
good to see this new forum	mirmon.walter	0	9/16/2011 10:24 AM	mirmon.walter	58	

- The op-amps forum was recently created as part of the e2e initiative (engineers to engineers) launched by ST.
- This forum is a useful place to find or request information about op-amps.



Click on the following link to reach the forum:

<https://my.st.com/public/STe2ecomunities/analog/Lists/Amplifiers/AllItems.aspx>

Sign in to post a message

HiRel and standard product portfolio

		ST's differentiation	Key products
Comparator	Standard	Broad portfolio of general-purpose products Automotive quality	LM2901, LM2903 LM393, LM339
	Low power	From low to micropower High performance Battery friendly	LMV331, TS331 TS86x
	High speed	Excellent speed/power ratio Low voltage	TS3021, TS3011
Operational amplifier	Standard	Broad portfolio of general-purpose products Automotive quality, tiny packages	LM358, LM324, LM290x, LMV3x, LMV82x
	Low power	From low to micropower Extend battery life High accuracy and reliability	TSV6x, TSV85x
	Precision	$V_{io} < 100 \mu V$ (max.) Low noise	TSV7x, TSZ1x
	Current sensing	Wide supply-voltage range Highly rugged Low current consumption	TSC101, TSC102, TSC103
Battery monitoring		Easy-to-build and smallest gas gauge solution extended battery life	STC3100, STC3105

**Reliable
delivery with
high quality
level**

**ST's op-amps
and
comparators
are the glue
between
analog and
digital**

**ST's portfolio:
high-
performance
analog and
high-volume
capability**

**First choice
when it
comes to
performance:
check out our
new product
families**