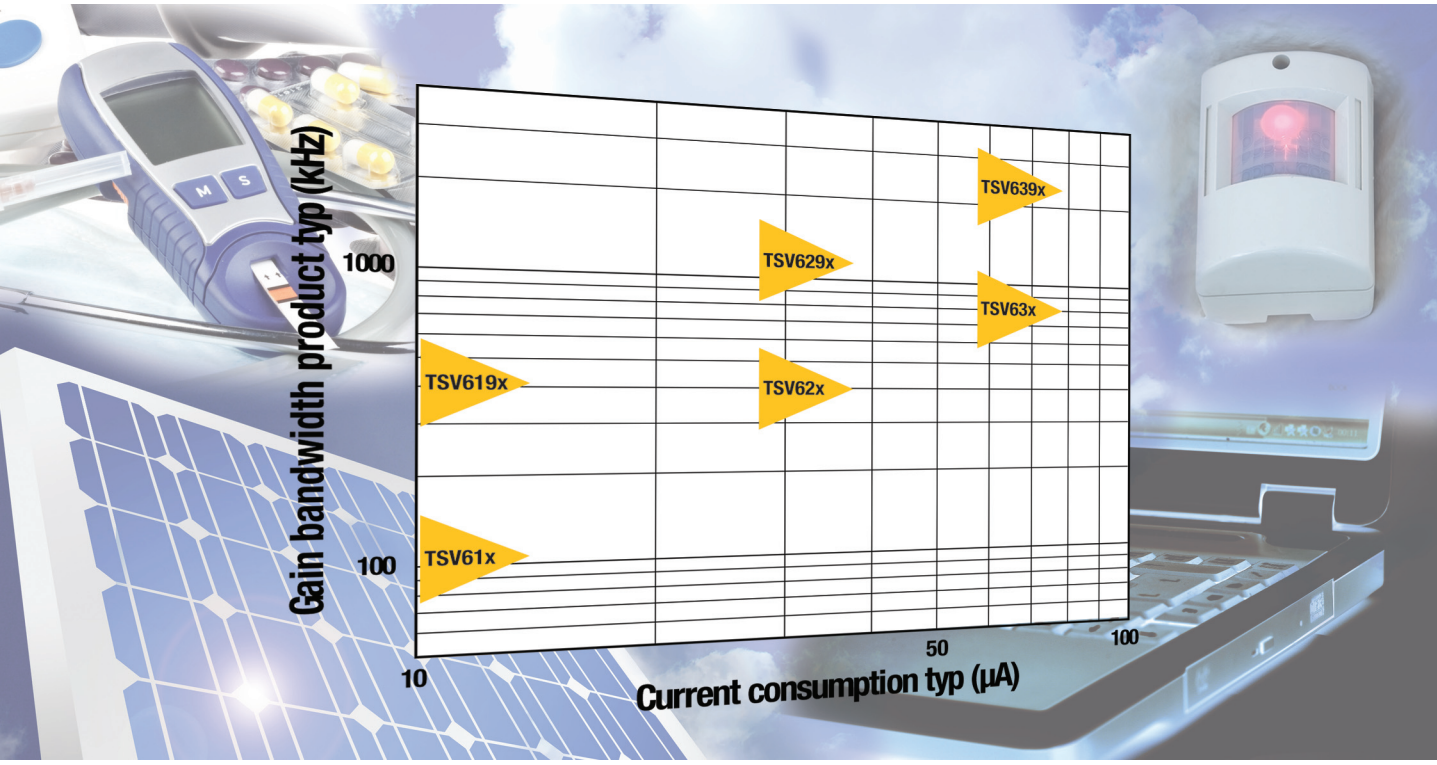
New micropower op-amps
Zero trade-offs

TSV6x family delivers the best power-to-speed ratio



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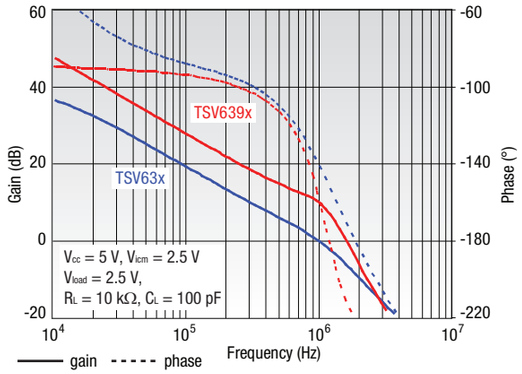
Enlarged TSV6x family for extended battery life and high accuracy at low voltage

STMicroelectronics has recently introduced three new micropower op-amp families for power saving in low-voltage applications. The TSV619x, TSV629x and TSV639x, based on previous TSV6x families, further reduce power consumption for handheld, battery-supplied applications.
They offer an outstanding merit factor. For the same consumption as the TSV6x, they offer a gain-bandwidth product increased by a factor of 3 and have twice the slew rate value. They are intended for non-inverting (G ≥ +4) or inverting (G ≤ -3) gain configurations for stability reasons.
They keep the same advantages as the TSV6x families: precision, low supply voltage, low input currents, as well as tiny packages.

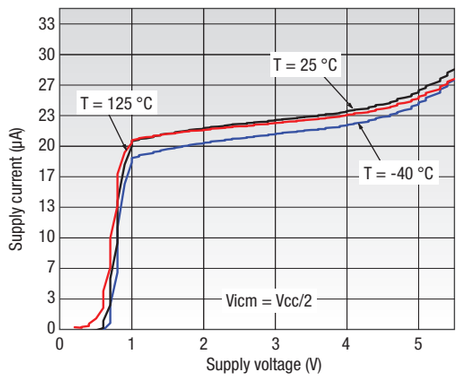
Key features and benefits

Features	Benefits
Ultra low supply voltage: 5.5 V down to 1.5 V	Ideal for battery-powered devices, extends battery life
Large offer - 6 ranges of power/speed: From 10 µA/450 kHz up to 60 µA/2.4 MHz	High merit factor extends battery-life
Standby current: 5 nA typ	Significantly reduces consumption when not in use, thus extends battery life
Very low input offset voltage: Down to 500 µV max	Good precision for small signal conditioning
Low input bias current: 1 pA typ	Ideal for high impedance sensors
Tiny packages: SC70-5/6, SOT23-5/6/8, MSO8/10	Board space saving
High ESD tolerance (≥4 kV HBM) High EMI rejection ratio	Design robustness, high reliability

TSV6xx and TSV6x9x: two complementary families to better fit application needs



TSV62x: very stable supply current versus supply voltage and temperature



Typical applications

- Battery-powered devices
- Signal conditioning, filtering
- Medical handheld devices
- Smoke detectors
- Low-side current sensing
- Photodiode pre-amplification

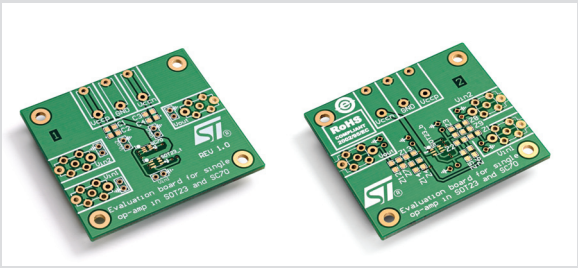
TSV6xx device summary

Part number	Number of operators	Supply voltage		Input offset voltage	Input bias current	Supply current per operator	GBP	Slew rate	Stability gain	Equivalent input noise voltage	Rail-rail I/O	Standby
		min. (V)	max. (V)	max. (mV)	max. (nA)	max. (µA)	typ. (MHz)	typ. (V/µs)		typ. 1 kHz (nV/√Hz)		
TSV611/2	1,2	1.5	5.5	4/0.8	0.01	15	0.12	0.034	≥1	156	Y/Y	No
TSV620/3/5	1,2,4	1.5	5.5	4/0.8	0.01	36	0.42	0.14	≥1	70	Y/Y	Yes
TSV621/2/4	1,2,4	1.5	5.5	4/0.8	0.01	36	0.42	0.14	≥1	70	Y/Y	No
TSV6191/2	1,2	1.5	5.5	4/0.8	0.01	15	0.45	0.07	≥10	156	Y/Y	No
TSV630/3/5	1,2,4	1.5	5.5	3/0.5/0.8	0.01	69	0.88	0.34	≥1	65	Y/Y	Yes
TSV631/2/4	1,2,4	1.5	5.5	3/0.5/0.8	0.01	69	0.88	0.34	≥1	65	Y/Y	No
TSV6290/3/5	1,2,4	1.5	5.5	4/0.8	0.01	36	1.3	0.35	≥4	70	Y/Y	Yes
TSV6291/2/4	1,2,4	1.5	5.5	4/0.8	0.01	36	1.3	0.35	≥4	70	Y/Y	No
TSV6390/3/5	1,2,4	1.5	5.5	3/0.5/0.8	0.01	69	2.5	0.7	≥4	65	Y/Y	Yes
TSV6391/2/4	1,2,4	1.5	5.5	3/0.5/0.8	0.01	69	2.5	0.7	≥4	65	Y/Y	No

Other rail-to-rail products

Part number	Number of operators	Supply voltage		Input offset voltage	Input bias current	Supply current per operator	GBP	Slew rate	Stability gain	Equivalent input noise voltage	Rail-rail I/O
		min. (V)	max. (V)	max. (mV)	max. (nA)	max. (µA)	typ. (MHz)	typ. (V/µs)		typ. 1 kHz (nV/√Hz)	
TS941/2/4	1,2,4	2.5	10	10/5/2	0.15	1.85	0.01	0.0045	≥1	-	N/Y
TS931/2/4	1,2,4	2.7	10	10/5/2	0.15	33	0.1	0.05	≥1	76	N/Y
LMV321/358/324	1,2,4	2.7	6	3	50	200	1	0.35	≥1	40	Y/Y
TS912/4	2,4	2.7	16	10/5/2	0.15	350	1	0.8/0.6	≥1	30	Y/Y
TSV321/358/324	1,2,4	2.5	6	3/1	130	835	1.4	0.6	≥1	27	Y/Y
TS507	1	2.7	5.5	0.1	70	1150	1.9	0.6	≥1	12	Y/Y
TS982	2	2.5	5.5	5	500	7200	2.2	0.7	≥1	17	Y/Y
TS9511	1	2.7	12	0.8	70	1000	3	1	≥1	25	Y/Y
TS951/2/4	1,2,4	2.7	12	6	100	1300	3	1	≥1	25	Y/Y
TS9222/4	2,4	2.7	12	0.5	55	1200	4	1.3	≥1	9	Y/Y
TS921/2/4	1,2,4	2.7	12	3/0.9	100	1500	4	1.3	≥1	9	Y/Y
TSV911/2/4	1,2,4	2.5	5.5	4.5/1.5	0.01	1100	8	4.5	≥1	27	Y/Y
TS461/2/4	1,2,4	2.7	10	5	750	2800	12	4	≥1	4	N/Y
TS971/2/4	1,2,4	2.7	10	5	750	2800	12	4	≥1	4	N/Y
TSV991/2/4	1	2.5	5.5	4.5/1.5	0.01	1100	20	10	≥3	27	Y/Y

Evaluation board for single op-amp

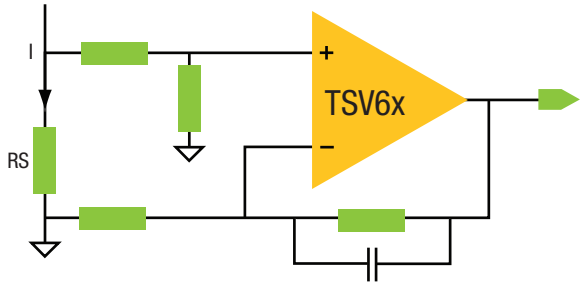


- Designed for multiple configurations
- SOT23-5/6 and SC70-5/6 compatible

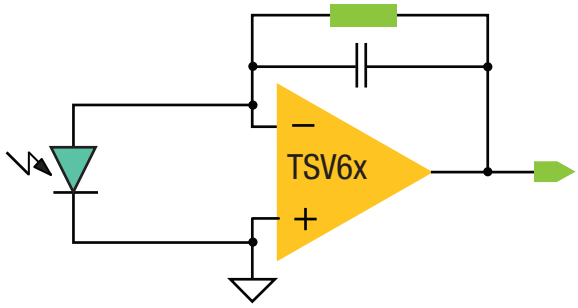
order code: STEVAL-CCA022V1

Typical application diagrams

Low side current sensing



Photodiode amplification



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