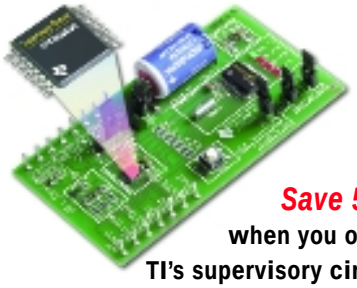
TEXAS INSTRUMENTS

THE WORLD LEADER IN DSP AND ANALOG



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See back cover for details.

1Q 2001 Issue 4

Sine On™

AN ANALOG AND MIXED-SIGNAL PRODUCT CATALOG

Supervisory Circuits

this issue:

Processor Supervisors

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➤ Processor supervisory circuits feature window-Watchdog

3 ➤ Battery-backup supervisors retain RAM
➤ Battery-backup supervisors for low-power processors

4 ➤ Dual and triple processor supervisors reduce part count
➤ Versatile processor supervisor in small SOT-23 package

5 ➤ Ultra-low power supervisors reduce power consumption
➤ Fully programmable supervisor with Watchdog

Power Supply Supervisors

6 ➤ Three-channel supervisor for switch-mode power supplies

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6 ➤ Supervisor with integrated delay and manual Reset in SC-70

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Resources

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10 ➤ Packaging

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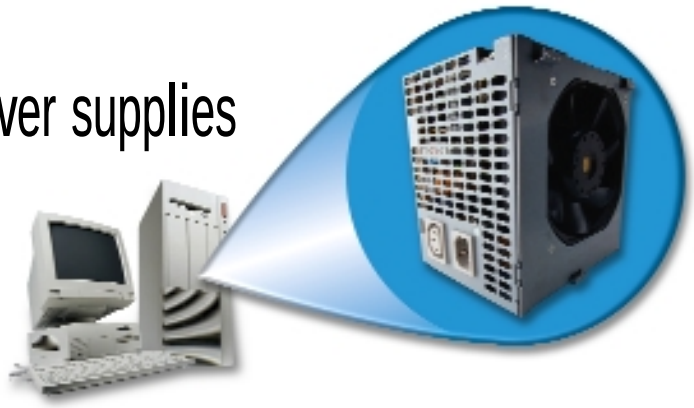
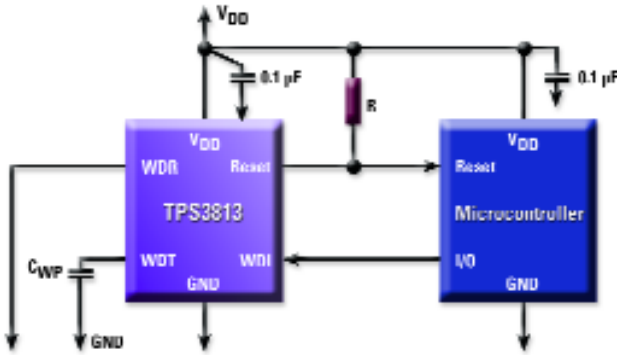
Supervisory circuits for
switch-mode power supplies
Page 6





Processor supervisor with programmable
window-Watchdog
Page 2

Evaluate
battery-backup
supervisors for low-power processors
Page 3

Read *Sine On* online at www.ti.com/sc/sineon

Processor Supervisors

Ultra-low voltage supervisors ideal for 1.2 V supplies

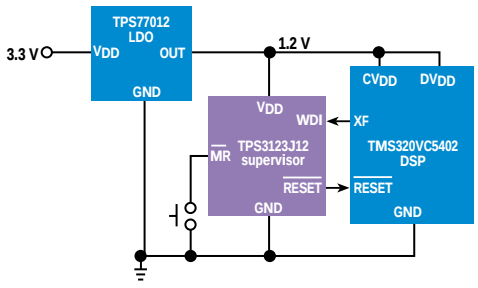
TPS312x

Get samples, datasheets and app reports at:
www.ti.com/sc/device/*partnumber*
Replace *partnumber* in URL with TPS3123xxx, TPS3124xxx, TPS3125xxx, TPS3126xxx or TPS3128xxx, where xxx is E12, J12, E15, G15, E18, or J18 (voltage options)

- Precision voltage monitoring of 1.2 V, 1.5 V or 1.8 V supports latest processor generations
- Ultra-low supply voltage of 0.75 V (min) for low-power operation
- Integrated delay time of 180 ms ensures stabilization of supply voltage
- Watchdog timer for monitoring processor activity
- Low supply current of 14 µA (typ) extends battery life
- Manual Reset input allows daisy-chaining of multiple devices or manual operation
- Packaging: SOT23-5 saves board space
- Suggested resale price starts at $0.80 each in quantities of 1,000

	Voltage options (V)	$\overline{\text{RESET}}$ output	RESET output	Watchdog	Manual Reset
TPS3123	1.2, 1.5, 1.8	Push/Pull		x	x
TPS3124	1.2, 1.5, 1.8	Push/Pull	Push/Pull	x	
TPS3125	1.2, 1.5, 1.8, 3	Push/Pull	Push/Pull		x
TPS3126	1.2, 1.5, 1.8	Open-drain	Open-drain		x
TPS3128	1.2, 1.5, 1.8	Open-drain		x	x

Supervision of an ultra-low voltage DSP



Applications include:

- Low-power processors and DSPs
- Portable/battery-powered equipment
- Wireless communication systems
- Intelligent instruments
- Notebook/desktop computers

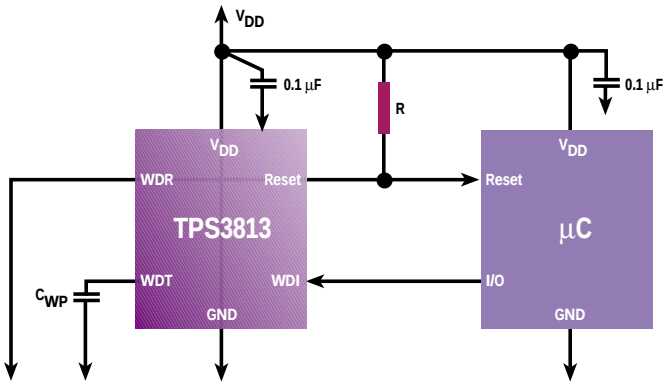
Processor supervisory circuits feature window-Watchdog

TPS381x

Get samples and datasheets at:
www.ti.com/sc/device/*partnumber*
Replace *partnumber* in URL with TPS3813xxx, where xxx is J25, L30, K33, or I50 (voltage options)

- Window-Watchdog with programmable delay and window ratio
- Precision voltage monitoring of 2.5 V, 3.0 V, 3.3 V or 5.0 V supports latest processor generations
- Power-on Reset generator with integrated delay time of 25 ms ensures stabilization of supply voltage
- Low supply current of 9 µA (typ) extends battery life
- Open-drain reset output
- Temperature range -40°C to +85°C
- Packaging: SOT23-6 saves board space
- Suggested resale price starts at $0.82 each in quantities of 1,000

Window-Watchdog prevents unwanted errors



Applications include:

- Applications using microcontrollers, microprocessors or DSPs
- Safety critical systems
- Automotive systems
- Heating systems
- Medical systems

For technical support and ordering literature, see page 11.

Processor Supervisors

Battery-backup supervisors retain RAM

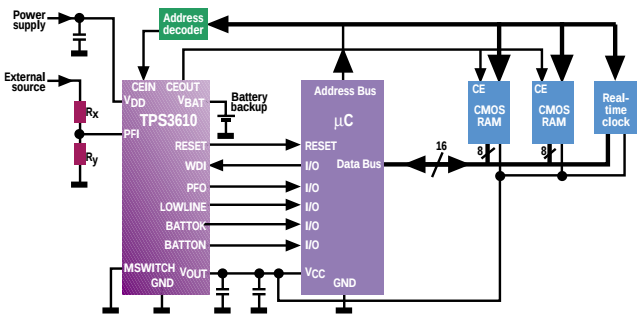
TPS361x

Get samples and datasheets at:
www.ti.com/sc/device/*partnumber*
Replace *partnumber* in URL with TPS3610U18, TPS3610T50, TPS3613-01 or TPS3617-50

- Backup-battery switching for adjustable, 1.8-V and 5-V systems
- Integrated gating of chip-enable signals
- Watchdog timer
- Battery freshness seal
- Voltage monitor for Power-Fail or low-battery monitoring
- Manual switchover
- Battery OK output
- Packaging: available in TSSOP-14, MSOP-8 or MSOP-10
- Suggested resale price in quantities of 1,000:
  TPS3610 price starts at $2.39 each
  TPS3613 price starts at $1.86 each
  TPS3617 price starts at $1.60 each

	Voltage options (V)	Chip-enable	Power-fail	Watchdog	Battery OK output	Lowline	Manual Reset	Manual switch
TPS3610	1.8, 5	x	x	x	x	x		x
TPS3613	Adj.	x					x	
TPS3617	5		x	x				

Battery-backup switching for RAM retention



Applications include:

- Portable/battery-powered equipment
- Fax machines
- Set-top boxes
- Point-of-sale equipment
- Mobile phones, palmtops, PDAs

Battery-backup supervisors for low-power processors

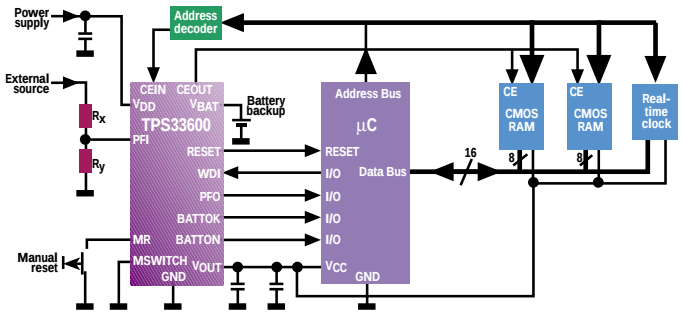
TPS360x

Get samples, datasheets and EVMs at:
www.ti.com/sc/device/*partnumber*
Replace *partnumber* in URL with TPS3600D20, TPS3600D33, TPS3600D50 or TPS3606-33

- Backup-battery switching for 2.0-V, 3.3-V and 5-V systems
- Integrated gating of chip-enable signals
- Watchdog timer
- Battery freshness seal
- Voltage monitor for Power-Fail or low-battery monitoring
- Manual Reset input and manual switchover
- Battery OK output
- Packaging: available in TSSOP-14 or MSOP-10
- Suggested resale price ranges from $1.86-$2.39 each in quantities of 1,000

	Voltage options (V)	Chip-enable	Power-fail	Watchdog	Battery OK output	Manual Reset	Manual switch
TPS3600	2.0, 3.3, 5	x	x	x	x	x	x
TPS3606	3.3		x	x		x	x

Battery-backup switching for low-power processors



Applications include:

- Low-power processors and DSPs
- Portable/battery-powered equipment
- Mobile phones, palmtops and PDAs
- Battery management

Processor Supervisors

Dual and triple processor supervisors reduce part count

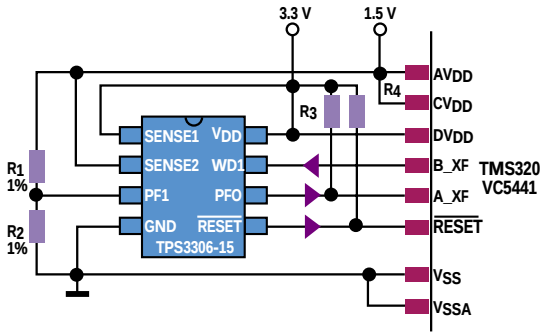
TPS330x

Get samples, datasheets and app reports at:
www.ti.com/sc/device/*partnumber*
Replace *partnumber* in URL with TPS3305-xx, TPS3307-xx, where xx is 18, 25 or 33 or replace *partnumber* with TPS3306-yy, where yy is 15, 18, 20, 25, or 33

- Integrated Watchdog timer monitors processor activity
- Integrated delay time of 100 ms and 200 ms ensures stabilization of supply voltage
- Low supply current of 15 µA (typ) extends battery life
- Precision voltage monitoring of fixed and adjustable input voltages to support latest generation of DSPs
- Manual Reset input allows daisy-chain of multiple devices
- Open-drain or push/pull Reset output stages
- Packaging: MSOP-8 reduces board space and allows compact designs
- Suggested resale price starts at $1.08 each in quantities of 1,000

	Voltage options (V)	$\overline{\text{RESET}}$ output	RESET output	Watchdog	Power-fail	Manual Reset
TPS3305	3.3/1.8, 3.3/2.5, 3.3/5	Push/Pull	Push/Pull	x		x
TPS3306	3.3/1.5, 3.3/1.8, 3.3/2, 3.3/2.5, 3.3/5	Open-drain		x	x	
TPS3307	3.3/1.8/Adj., 3.3/2.5/Adj., 3.3/5/Adj.	Push/Pull	Push/Pull			x

Supervision of a dual-voltage DSP



➤ Applications include:

- Multi-voltage DSPs and processors
- Portable/battery-powered equipment
- Embedded control systems
- Intelligent instruments

Versatile processor supervisor in small SOT-23 package

TPS382x

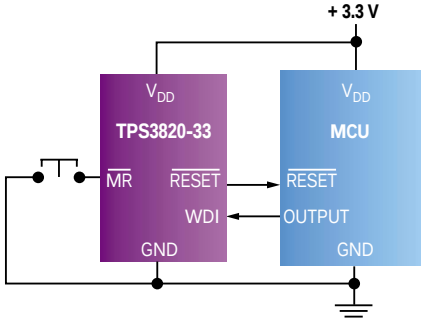
Get samples, datasheets and app reports at:
www.ti.com/sc/device/*partnumber*
Replace *partnumber* in URL with TPS3820, TPS3823, TPS3824, TPS3825 or TPS3828

- Integrated Watchdog timer for monitoring processor activity
- Integrated delay time of 200 ms or 25 ms ensures stabilization of supply voltage
- Low supply current of 15 µA (typ) extends battery life
- Precision voltage monitoring of 2.5 V, 3 V, 3.3 V and 5 V supports a broad range of industry-standard processor supply voltages
- Manual Reset input allows daisy-chain of multiple devices or manual operation
- Reset output available in active-low, active-high and open-drain for resetting different processor types
- Monitors a single supply voltage rail in DSP/microprocessor/microcontroller applications
- Packaging: 5-pin SOT-23 reduces board space and allows for smaller designs
- Suggested resale price in quantities of 1,000:
  TPS382x price starts at $0.73 each
  TPS3825 price starts at $0.67 each

Available options

	Voltage options (V)	$\overline{\text{RESET}}$ output	RESET output	Watchdog	Manual Reset
TPS3820	3.3, 5	Push/Pull		X	X
TPS3823	2.5, 3, 3.3, 5	Push/Pull		X	X
TPS3824	2.5, 3, 3.3, 5	Push/Pull	Push/Pull	X	
TPS3825	3.3, 5	Push/Pull	Push/Pull		X
TPS3828	3.3, 5	Open-drain		X	X

TPS382x typical application



For technical support and ordering literature, see page 11.

Processor Supervisors

Ultra-low power supervisors reduce power consumption

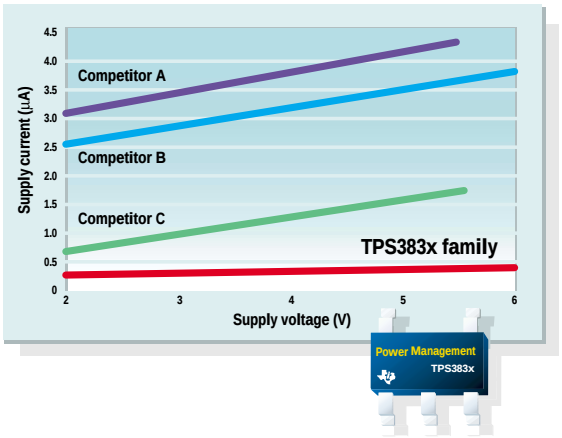
TPS383x

Get samples, datasheets and app reports at:
www.ti.com/sc/device/*partnumber*
Replace *partnumber* in URL with TPS3836-xxx, TPS3837-xxx, TPS3838-xxx, where xxx is E18, J25, L30 or K33

- ➤ Ultra-low supply current of 220 nA (typ) significantly reduces system power consumption
- ➤ Selectable delay time of 10 ms or 200 ms ensures stabilization of supply voltage
- ➤ Precision voltage monitoring of 1.8 V, 2.5 V, 3.0 V or 3.3 V supports latest processor generations
- ➤ Manual Reset input allows daisy-chaining of multiple devices or manual operation
- ➤ Open-drain or push/pull Reset output stages
- ➤ Packaging: SOT23-5 saves board space
- ➤ Suggested resale price starts at $0.93 each in quantities of 1,000

	Voltage options (V)	$\overline{\text{RESET}}$ output	RESET output	Manual Reset
TPS3836	1.8, 2.5, 3, 3.3	Push/Pull		x
TPS3837	1.8, 2.5, 3, 3.3		Push/Pull	x
TPS3838	1.8, 2.5, 3, 3.3	Open-drain		x

Supply current vs supply voltage



➤ Applications include:

- Low-power processors and DSPs
- Portable/battery-powered equipment
- Wireless communication systems
- Intelligent instruments

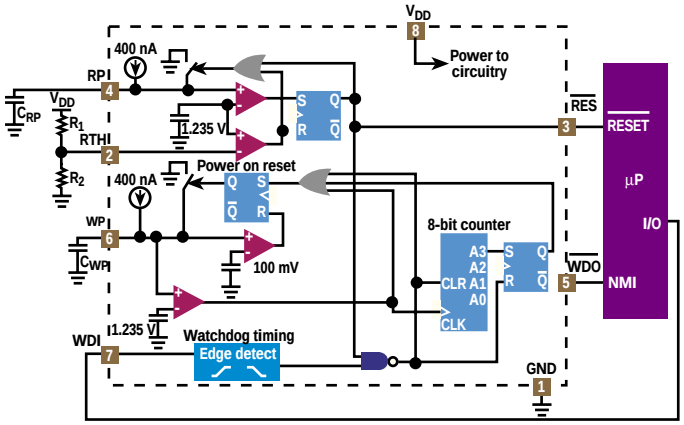
Fully programmable supervisor with Watchdog allows flexibility

UCC3946

Get samples and datasheet at:
www.ti.com/sc/device/UCC3946

- ➤ Watchdog supervisor with programmable timeout period
- ➤ Programmable Reset threshold
- ➤ Programmable Reset delay time
- ➤ Low supply current of 10 µA (typ) extends battery life
- ➤ Packaging: available in TSSOP-8, SO-8 or DIP-8
- ➤ Suggested resale price starts at $2.39 each in quantities of 1,000

UCC3946 features full programmability



➤ Applications include:

- Applications using low-voltage DSPs, microcontrollers or microprocessors
- Portable/battery-powered equipment
- Wireless communication systems
- Programmable controls
- Intelligent instruments
- Notebook/desktop computers
- Automotive systems

Power Supply Supervisors

Three-channel supervisor for switch-mode power supplies

TPS351x

Get samples and datasheets at:
www.ti.com/sc/device/*partnumber*
Replace *partnumber* in URL with TPS3510 or TPS3513

- Over- or under-voltage protection
- Over-current protection
- Maximum supply voltage of 15 V
- Integrated delay time of 300 ms
- Integrated 3-channel power supply supervisor for reduced component count and compact design
- Cost-effective monitoring and protection against power supply faults
- Over-voltage protection and lockout for 5 V, 3.3 V and 12 V
- UVLO for 5 V and 3.3 V
- Packaging: available in SO-8 and DIP-8 (TPS3510); SO-14 and DIP-14 (TPS3513)
- Suggested resale price in quantities of 1,000:
  TPS3510 price starts at $0.67 each
  TPS3513 price starts at $1.00 each

	Voltage options (V)	Power-Good	Fault protect output	Power supply control	Current sense
TPS3510	3.3/5/12	x	Open-drain	x	
TPS3513	3.3/5/12	x	Open-drain	x	x

TPS3510 ideal for switch-mode power supplies

Applications include:

- Switch-mode power supplies
- Desktop PCs
- Mixed-voltages power supply applications

Supply Voltage Supervisors

Supervisor with integrated delay and manual Reset in SC-70

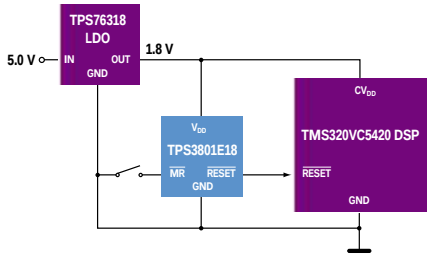
TPS380x

Get samples, datasheets and app reports at:
www.ti.com/sc/device/*partnumber*
Replace *partnumber* in URL with TPS3801xxx or TPS3809xxx, where xxx is E18, J25, L30, K33, I50, or -01

- Ultra-small SC-70 packaging (2.0 mm x 2.1 mm) for TPS3801 is half the size of a SOT-23 package
- Low supply current of 10 µA (typ) extends battery life
- Integrated delay time of 200 ms ensures stabilization of supply voltage
- Precision voltage monitoring of 1.8 V, 2.5 V, 3.0 V, 3.3 V, 5.0 V and adjustable supports broad range of industry standard processor supply voltages
- Manual Reset input allows daisy-chaining of multiple devices or manual operation
- Packaging: available in either the 5-pin SC-70 or the 3-pin SOT-23, which integrates basic supervisor functionality
- Suggested resale price in quantities of 1,000:
  TPS3801-xx price starts at $0.53 each
  TPS3809-xx price starts at $0.40 each

	Voltage options (V)	$\overline{\text{RESET}}$ output	Manual Reset
TPS3801	Adj., 1.8, 2.5, 3, 3.3, 5	Push/Pull	x
TPS3809	2.5, 3, 3.3, 5	Push/Pull	

TPS3801 saves board space



Applications include:

- Low-power microcontrollers, microprocessors or DSPs
- Portable/battery-powered equipment
- Space-critical designs
- DSP and microprocessor circuits
- Portable equipment
- Intelligent metering

For technical support and ordering literature, see page 11.

Supply Voltage Supervisors

Supervisor with programmable delay time provides flexibility

TLC77xx

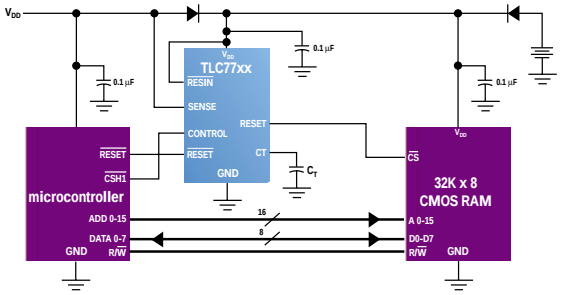
Get samples, datasheets and app reports at:
www.ti.com/sc/device/*partnumber*
Replace *partnumber* in URL with TLC7701, TLC7725, TLC7703 or TLC7705

- Power-down control support for static RAM with battery backup
- Programmable delay time for maximum application flexibility
- Precision voltage monitoring of 2.5 V, 3.0 V, 3.3 V, 5.0 V and adjustable version supports broad range of industry standard processor supply voltages
- Low supply current of 9 µA (typ) extends battery life
- Active-low and active-high push/pull outputs for resetting different processor types
- Packaging: available in SOIC and TSSOP
- Suggested resale price in quantities of 1,000:
  TLC77xxI price starts at $0.73 each
  TLC77xxQ price starts at $0.80 each

Available options

	Voltage options (V)	$\overline{\text{RESET}}$ output	RESET output
TLC77xx	Adj., 2.5, 3, 3.3, 5	Push/Pull	Push/Pull

Data retention during power down



➤ Applications include:

- Designs including RAM or other memory parts
- Battery-driven applications
- Embedded control systems
- Notebook/desktop computers
- Microcontroller or DSP designs
- Portable equipment
- Intelligent metering

Selected Application Reports

To access any of the following application reports, type the URL
www.ti.com/sc/psheets/abstracts/apps/*litnumber*.htm
and replace litnumber with the number in parentheses beside the title.

For a complete list of analog application reports, visit
www.ti.com/sc/docs/apps/analog/index.htm

- ***TPS383x ultra-low-power supervisors (slva091)***
  The trend of digital integrated circuits with extremely low current consumption requires an equivalent reduction of the power dissipation of analog circuits. This report describes an advanced supply voltage supervisor circuit that distinguishes itself by an extremely low supply current, and finds ideal applications in battery-operated systems.

- ***TPS330x supervising DSP and processor applications (slva056)***
  This application report describes the TPS3305 and TPS3307 supply voltage supervisor (SVS) families of devices, and gives a general introduction to the special features of the TPS330x. Typical applications that increase system reliability, such as supervising a dual-voltage DSP, are included.

- ***The TPS370x family application report (slva045)***
  This application report describes the TPS370x-xx supply voltage supervisor (SVS) family of devices, including a description of the circuit and a discussion of the differences between members of the TPS370x family. In addition, the report describes circuit features in detail and gives application examples.

- ***TPS382x microprocessor supervisory circuits with Watchdog function (slva039)***
  This application report introduces micropower supply voltage supervisors (SVS), discusses their benefits, and describes design methods and precautions for their use.

- ***TPS312x series supervisory circuits in ultra-low-voltage applications (slva077)***
  Voltage-monitoring circuits perform system initialization and monitor the supply voltage during operation. When combined with Watchdog circuits, they monitor the proper functioning of a device in safety-relevant circuits. This report describes the new TPS312x series of voltage-monitoring integrated circuits that have a low supply voltage of 1.2 V and a low current consumption.

- ***TPS3801/09 – smallest SVS for monitoring DSPs and processors (slva075)***
  This application report gives a general introduction to the TPS3801 and TPS3809 reset generators followed by an overview of the technical parameters and the special features of the TPS380x. Typical applications that increase system reliability are included. Layout considerations and design issues help in the system integration of the TPS3801 and TPS3809.

- ***TPS36xx – EVM user's guide (sluv045)***
  This user's guide describes the evaluation module (EVM) TPS3600D33 battery-backup supervisor SLV336 and is intended to assist in application development. The board contains a 3.6-V Lithium-Ion battery-backup source and a MSP430F1121 mixed-signal microcontroller from TI.

  Evaluate all modes of the device, as well as performance, using jumpers to adjust the logic pin voltage levels connected to the microcontroller.

Selection Guide for Supervisory Circuits

Device	# Supervisors	Package	Temperature Range*	V_{DD} (V) min	V_{DD} (V) max	V_{IT} (V) typ.	Tolerance (+/- %)	V_{hys} (mV) typ.	I_{DD} (µA) typ.	Time Delay (ms)	Manual Reset input/MR	Active-high Reset output	Power-fail PFI & PFO	Over-voltage detection	Over-current detection	Watchdog timer WDI	Backup-battery switchover	Cip-enable Gating	Reference output buffer	1ku price indication (US $)
Adjustable																				
TL7702A	1	SO-8, DIP-8	C, I	3.5	18	2.53	2	10	1.8 mA	Prog		x							x	0.36
TL7702B	1	SO-8, DIP-8	C, I, Q	3.6	18	2.53	2	10	1.8 mA	Prog		x							x	0.45
TLC7701	1	SO-8, DIP-8, TSSOP-8	I, Q	2	6	1.1	5	30	9	Prog		x								0.77
TPS3307-XX	3	SO-8, MSOP-8	I	2	6	1.25	2	15	15	200	x	x								1.18
TPS3613-01	1	MSOP-10	I	1.65	5.5	1.15	2	12	40	100	x	x					x	x		1.86
TPS3801-01	1	SC-70	I	1.6	6	1.14	2	30	9	200	x									0.56
UCC3946	1	SO-8, DIL-8, TSSOP-8	C	2	5.5	1.24	2	15	10	Prog						Prog				2.14
1.2 V																				
TPS3123J12	1	SOT-23	I	0.75	3.3	1.08	3	15	14	180	x					x				0.86
TPS3124J12	1	SOT-23	I	0.75	3.3	1.08	3	15	14	180		x				x				0.86
TPS3125J12	1	SOT-23	I	0.75	3.3	1.08	3	15	14	180	x	x								0.80
TPS3126E12	1	SOT-23	I	0.75	3.3	1.14	3	15	14	180	x	x								0.80
TPS3128E12	1	SOT-23	I	0.75	3.3	1.14	3	15	14	180	x					x				0.86
1.5 V																				
TPS3123G15	1	SOT-23	I	0.75	3.3	1.40	3	20	14	180	x					x				0.86
TPS3124G15	1	SOT-23	I	0.75	3.3	1.40	3	20	14	180		x				x				0.86
TPS3125G15	1	SOT-23	I	0.75	3.3	1.40	3	20	14	180	x	x								0.80
TPS3126E15	1	SOT-23	I	0.75	3.3	1.43	3	20	14	180	x	x								0.80
TPS3128E15	1	SOT-23	I	0.75	3.3	1.43	3	20	14	180	x					x				0.86
TPS3306-15	2	SO-8, MSOP-8	I	2.7	6	1.40	2	15	15	100			x	x		x				1.18
1.8 V																				
TPS3123J18	1	SOT-23	I	0.75	3.3	1.62	3	20	14	180	x					x				0.86
TPS3124J18	1	SOT-23	I	0.75	3.3	1.62	3	20	14	180		x				x				0.86
TPS3125J18	1	SOT-23	I	0.75	3.3	1.62	3	20	14	180	x	x								0.80
TPS3126E18	1	SOT-23	I	0.75	3.3	1.71	3	20	14	180	x	x								0.80
TPS3128E18	1	SOT-23	I	0.75	3.3	1.71	3	20	14	180	x					x				0.86
TPS3305-18	3	SO-8, MSOP-8	I	2.7	6	1.68	2	15	15	200	x	x				x				1.08
TPS3306-18	2	SO-8, MSOP-8	I	2.7	6	1.68	2	20	15	100			x	x		x				1.18
TPS3307-18	3	SO-8, MSOP-8	I	2	6	1.68	2	15	15	200	x	x								1.18
TPS3600D18	1	TSSOP-14	I	1.65	5.5	1.71	2	30	40	100	x		x			x	x	x		2.39
TPS3610U18	1	TSSOP-14	I	1.65	5.5	1.71	2	20	40	100			x			x	x	x		2.39
TPS3801E18	1	SC-70	I	1.6	6	1.71	2	30	9	200	x									0.56
TPS3836E18	1	SOT-23	I	1.6	6	1.71	2	30	0.25	10/200	x									0.93
TPS3837E18	1	SOT-23	I	1.6	6	1.71	2	30	0.25	10/200	x	x								0.93
TPS3838E18	1	SOT-23	I	1.6	6	1.71	2	30	0.25	10/200	x									0.93
2.0 V																				
TPS3306-20	2	SO-8, MSOP-8	I	2.7	6	1.86	2	20	15	100										1.18
2.5 V																				
TLC7725	1	SO-8, DIP-8, TSSOP-8	I, Q	2	6	2.25	3	70	9	Prog		x								0.73
TPS3305-25	2	SO-8, MSOP-8	I	2.7	6	2.25	2	20	15	200	x	x				x				1.08
TPS3306-25	2	SO-8, MSOP-8	I	2.7	6	2.25	2	20	15	100			x	x		x				1.18
TPS3307-25	3	SO-8, MSOP-8	I	2	6	2.25	2	20	15	200	x	x								1.18
TPS3600D25	1	TSSOP-14	I	1.65	5.5	2.25	2	30	40	100	x		x		x	x	x			2.39
TPS3707-25	1	SO-8, MSOP-8	I	2	6	2.25	2	40	20	200	x	x	x	x						0.88
TPS3801J25	1	SC-70	I	1.6	6	2.25	2	20	9	200	x									0.56
TPS3809J25	1	SOT-23	I	2	6	2.25	2	20	9	200										0.45
TPS3813J25	1	SOT-23	I	2	6	2.25	2	30	9	25						x				0.82
TPS3823-25	1	SOT-23	I	1.1	5.5	2.25	2	30	15	200	x					x				0.73
TPS3824-25	1	SOT-23	I	1.1	5.5	2.25	2	30	15	200		x				x				0.73
TPS3836J25	1	SOT-23	I	1.6	6	2.25	2	30	0.25	10/200	x									0.93
TPS3837J25	1	SOT-23	I	1.6	6	2.25	2	30	0.25	10/200	x	x								0.93
TPS3838J25	1	SOT-23	I	1.6	6	2.25	2	30	0.25	10/200	x									0.93
3.0 V																				
TLC7703	1	SO-8, DIP-8, TSSOP-8	I, Q	2	6	2.63	3	70	9	Prog		x								0.73
TPS3125L30	1	SOT-23	I	0.75	3.3	2.64	3	30	14	180	x	x								0.80
TPS3705-30	1	SO-8, MSOP-8	I	2.7	6	2.63	2	50	30	200	x		x	x		x				0.93
TPS3707-30	1	SO-8, MSOP-8	I	2	6	2.63	2	50	20	200	x	x	x	x						0.88
TPS3801L30	1	SC-70	I	1.6	6	2.63	2	30	9	200	x									0.56
TPS3809L30	1	SOT-23	I	2	6	2.63	2	30	9	200										0.45
TPS3813L30	1	SOT-23	I	2	6	2.64	2	35	9	25						x				0.82
TPS3823-30	1	SOT-23	I	2	5.5	2.63	2	30	15	200	x					x				0.73
TPS3824-30	1	SOT-23	I	2	5.5	2.63	2	30	15	200		x				x				0.73
TPS3836L30	1	SOT-23	I	1.6	6	2.64	2	40	0.25	10/200	x									0.93
TPS3837L30	1	SOT-23	I	1.6	6	2.64	2	40	0.25	10/200	x	x								0.93
TPS3838L30	1	SOT-23	I	1.6	6	2.64	2	40	0.25	10/200	x									0.93

*Temperature range: C = 0° C to 70° C, I = -40° C to 85° C, Q = -40° C to 125° C
Note: All devices feature an active-low reset output except TPS3837

For technical support and ordering literature, see page 11.

Selection Guide for Supervisory Circuits

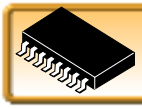
Device	# Supervisors	Package	Temperature Range*	V_{DD} (V) min	V_{DD} (V) max	Tolerance (+/- %)	V_{IT} (V) typ.	V_{hys} (mV) typ.	Time I_{DD} (µA) typ.	Delay (ms)	Manual Reset input/MR	Active-high Reset output	Power-fail PFI & PFO	Over-voltage detection	Over-current detection	Watchdog timer WDI	Backup-battery switchover	Cip-enable Gating	Reference output buffer	1ku price indication (US $)
3.3 V																				
TLC7733	1	SO-8, DIP-8, TSSOP-8	I, Q	2	6	2.93	2	70	9	Prog		x								0.73
TPS3305-xx	2	SO-8, MSOP-8	I	2.7	6	2.93	2	30	15	200	x	x				x				1.08
TPS3306-33	2	SO-8, MSOP-8	I	2.7	6	2.93	2	30	15	100			x	x		x				1.18
TPS3307-xx	3	SO-8, MSOP-8	I	2	6	2.93	2	30	15	200	x	x								1.18
TPS3510	3	SO-8, DIP-8	I	4	15	2.2	4	n/a	1 mA	300			x	3.3 V, 5 V, 12 V						0.67
TPS3513	3	SO-14, DIP-14	I	4.5	15	2.2	4	n/a	1 mA	300			x	3.3 V, 5 V, 12 V	3.3 V, 5 V, 12 V					1.00
TPS3600D33	1	TSSOP-14	I	1.65	5.5	2.93	2	40	40	100	x		x			x	x	x		2.39
TPS3606-33	1	MSOP-10	I	1.65	5.5	2.93	2	40	40	100	x		x			x	x			1.86
TPS3705-33	1	SO-8, MSOP-8	I	2	6	2.93	2	50	30	200	x		x	x		x				0.93
TPS3707-33	1	SO-8, MSOP-8	I	2	6	2.93	2	50	20	200	x	x	x	x						0.88
TPS3801K33	1	SC-70	I	1.6	6	2.93	2	40	9	200	x									0.56
TPS3809K33	1	SOT-23	I	2	6	2.93	2	40	9	200										0.45
TPS3813K33	1	SOT-23	I	2	6	2.93	2	40	9	25						x				0.82
TPS3820-33	1	SOT-23	I	1.1	5.5	2.93	2	30	15	25	x									0.73
TPS3823-33	1	SOT-23	I	2	5.5	2.93	2	30	15	200	x					x				0.73
TPS3824-33	1	SOT-23	I	2	5.5	2.93	2	30	15	200		x				x				0.73
TPS3825-33	1	SOT-23	I	1.1	5.5	2.93	2	30	15	200	x	x								0.67
TPS3828-33	1	SOT-23	I	1.1	5.5	2.93	2	30	15	200	x					x				0.73
TPS3836K33	1	SOT-23	I	1.6	6	2.93	2	40	0.25	10/200	x									0.93
TPS3837K33	1	SOT-23	I	1.6	6	2.93	2	40	0.25	10/200	x	x								0.93
TPS3838K33	1	SOT-23	I	1.6	6	2.93	2	40	0.25	10/200	x									0.93
5.0 V																				
TL7705A	1	SO-8, DIP-8	C, I	3.5	18	4.55	1	15	1.8 mA	Prog		x							x	0.33
TL7705B	1	SO-8, DIP-8	C, I, Q	3.6	18	4.55	1	30	1.8 mA	Prog		x							x	0.40
TL7757	1	SO-8, SOT-89, TO-266	C, I	1	7	4.55	2.5	50	1.4 mA	5 µs										0.27
TL7759	1	SO-8, DIP-8, SSOP-8	C	1	7	4.55	2.5	50	1.4 mA	5 µs		x								0.31
TL7770-5	2	SO-16, DIP-16	C	3.5	18	4.55	1	15	5 mA	Prog		x		Adjustable						0.73
TLC7705	1	SO-8, DIP-8, TSSOP-8	I, Q	2	6	4.55	2	70	9	Prog		x								0.73
TPS3305-xx	2	SO-8, MSOP-8	I	2.7	6	4.55	2	40	15	200	x	x				x				1.08
TPS3306-33	2	SO-8, MSOP-8	I	2.7	6	4.55	2	40	15	100			x	x		x				1.18
TPS3307-xx	3	SO-8, MSOP-8	I	2	6	4.55	2	40	15	200	x	x								1.18
TPS3510	3	SO-8, DIP-8	I	4	15	3.5	4	n/a	1 mA	300			x	3.3 V, 5 V, 12 V						0.67
TPS3513	3	SO-14, DIP-14	I	4.5	15	3.5	4	n/a	1 mA	300			x	3.3 V, 5 V, 12 V	3.3 V, 5 V, 12 V					1.00
TPS3600D50	1	TSSOP-14	I	1.65	5.5	4.55	2	60	40	100	x		x			x	x	x		2.39
TPS3610T50	1	TSSOP-14	I	1.65	5.5	4.55	2	60	40	100			x			x	x	x		2.39
TPS3617-50	1	MSOP-8	I	1.65	5.5	4.55	2	60	40	100			x			x	x			1.60
TPS3705-50	1	SO-8, MSOP-8	I	2	6	4.55	2	70	30	200	x		x	x		x				0.93
TPS3707-50	1	SO-8, MSOP-8	I	2	6	4.55	2	70	20	200	x	x	x	x		x				0.88
TPS3801I50	1	SC-70	I	2	6	4.55	2	50	9	200	x									0.56
TPS3809I50	1	SOT-23	I	2	6	4.55	2	50	9	200										0.45
TPS3813I50	1	SOT-23	I	2	6	4.55	2	60	9	25						x				0.82
TPS3820-50	1	SOT-23	I	1.1	5.5	4.55	2	30	15	25	x									0.73
TPS3823-50	1	SOT-23	I	2	5.5	4.55	2	30	15	200	x					x				0.73
TPS3824-50	1	SOT-23	I	2	5.5	4.55	2	30	15	200		x				x				0.73
TPS3825-50	1	SOT-23	I	1.1	5.5	4.55	2	30	15	200	x	x								0.67
TPS3828-50	1	SOT-23	I	1.1	5.5	4.55	2	30	1 mA	200	x					x				0.73
9 V																				
TL7709A	1	SO-8, DIP-8	C, I	3.5	18	7.6	1	20	1.8 mA	Prog		x							x	0.36
12 V																				
TL7712A	1	SO-8, DIP-8	C, I	3.5	18	10.8	2	35	1.8 mA	Prog		x							x	0.45
TPS3513	3	SO-14, DIP-14	I	4.5	15	9	4	n/a	1 mA	300			x	3.3 V, 5 V, 12 V	3.3 V, 5 V, 12 V					
15 V																				
TL7715A	1	SO-8, DIP-8	C, I	3.5	18	13.5	2	45	1.8 mA	Prog		x							x	0.45

*Temperature range: C = 0° C to 70° C, I = -40° C to 85° C, Q = -40° C to 125° C
Note: All devices feature an active-low reset output except TPS3837

Packaging

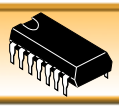
SO (D)*

Pin Count	8/14
Width	4.00
Length	5.00/8.75
Pitch	1.27
Height	1.75



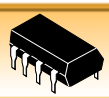
SO (DW)*

16
7.59
10.41
1.27
2.65



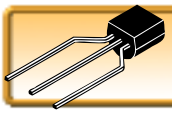
DIP (N)

14/16
6.60
19.69
2.54
5.08



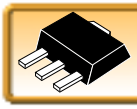
DIP (P)

Pin Count	8
Width	6.60
Length	10.60
Pitch	2.54
Height	5.08



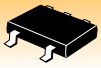
TO-226 (LP)*

3
3.43
18.04
1.40
4.19



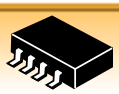
SOT-89 (PK)

3
4.60
4.25
1.50
1.60



SOT-23 (DBVR)**

Pin Count	3/5/6
Width	1.80
Length	3.10
Pitch	0.95
Height	1.30

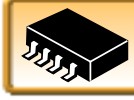


MSOP (DGN) (DGK) (DGS)*

8/10
3.05
3.05
0.65/0.5
1.07

SC-70 (SOT-323) (DCKR)**

5
1.35
2.20
0.65
1.0



TSSOP (PW)*

Pin Count	8/14
Width	4.50
Length	3.10/5.1
Pitch	0.65
Height	1.20

All linear dimensions are maximums specified in millimeters.

*These packages are also available in tape and reel, as well as tube, and can be ordered by adding "R" to the end of the device name.

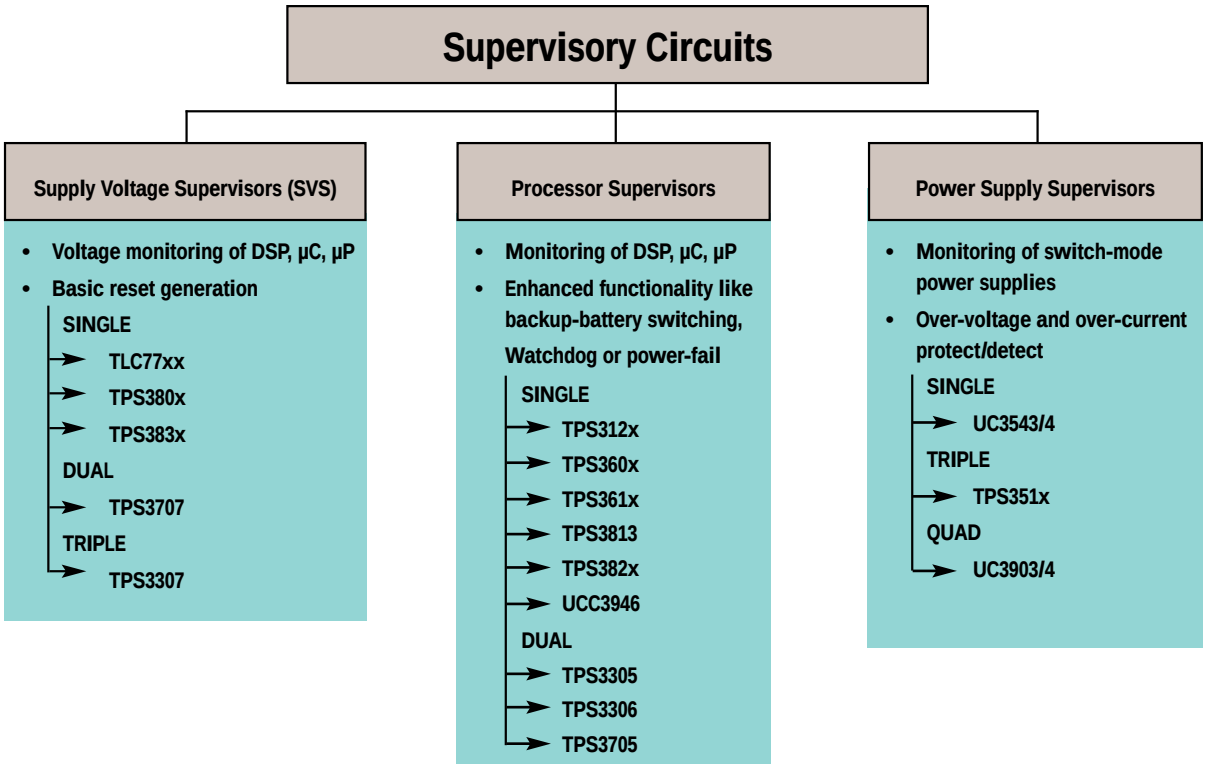
**Packages whose suffix includes "R" are only available in tape and reel.

Target applications

- Applications using DSPs, microcontrollers or microprocessors
- Wireless communication systems
- Portable/battery-powered equipment
- Industrial equipment
- Intelligent instruments
- Notebook/desktop computers
- Automotive systems
- Power supplies

For technical support and ordering literature, see page 11.

Supervisory Circuits Decision Tree



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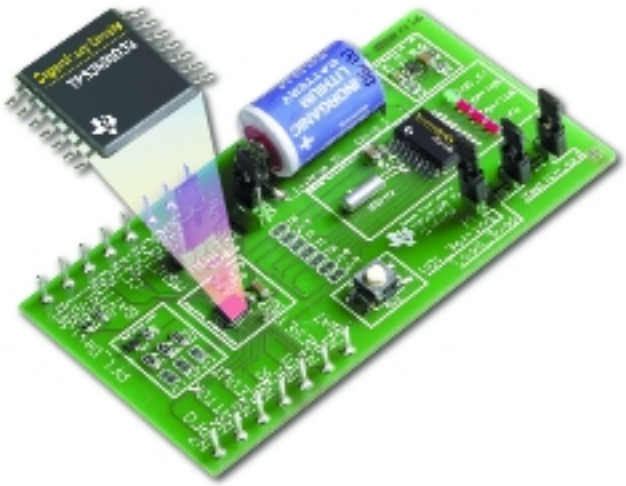

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