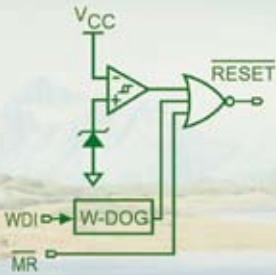


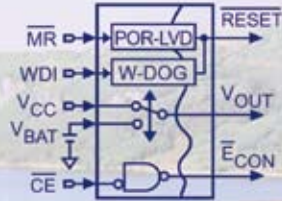
Microprocessor resets and supervisor ICs

Selection guide

Microprocessor resets and supervisors



Microprocessor supervisors with switchover



December 2005

Microprocessor reset ICs

- Monitor voltage, generate reset on power-on or low-voltage detect (POR/LVD)
- Optional manual reset input used for push-button reset
- 140ms minimum reset pulse width (t_{rec})
- -40 to 85°C

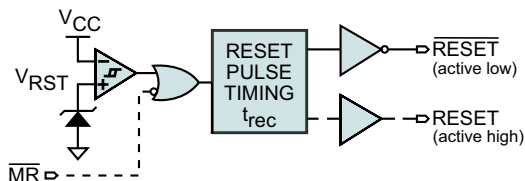
Part number	Package	Reset output			Manual reset input
		Active-low, push-pull	Active-low, open-drain	Active-high, push-pull	
STM809	SOT23-3	•			
STM810	SOT23-3			•	
STM811	SOT143-4	•			•
STM812	SOT143-4			•	•
STM1001	SOT23-3		•		



SOT23-3



SOT143-4



V_{RST}	Voltage letter
4.63V	STM8xxL xxxx
4.38V	STM8xxM xxxx
3.08V	STM8xxT xxxx
2.93V	STM8xxS xxxx
2.63V	STM8xxR xxxx

Part number	Package	Order suffix
STM809, SMT810, STM1001	SOT23-3	WX6F
STM811, SMT812	SOT143-4	W16F

Part number example:

- STM809 (SOT23-3), $V_{RST} = 3.08V$ (nom),
 → Part number: STM809TWX6F

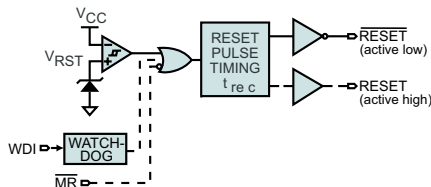
Reset+watchdog

- POR/LVD, push-button reset and watchdog
- SOT23-5 package
- 140ms minimum reset pulse width (t_{rec})
- -40 to 85°C

Part number	Watchdog input	Manual reset input	Reset outputs		
			Active-low, push-pull	Active-low, open-drain	Active-high, push-pull
STM6321	•			•	•
STM6322		•		•	•
STM6821	•	•			•
STM6822	•	•		•	
STM6823	•	•	•		
STM6824	•		•		•
STM6825		•	•		•



SOT23-5



V_{RST}	Voltage letter
4.63V	STM6xxxL WY6F
4.38V	STM6xxxM WY6F
3.08V	STM6xxxT WY6F
2.93V	STM6xxxS WY6F
2.63V	STM6xxxR WY6F
2.32V	STM6xxxZ WY6F

Part number example:

- STM6322 (SOT23-5), $V_{RST} = 2.63V$ (nom),
 → STM6322RWY6F



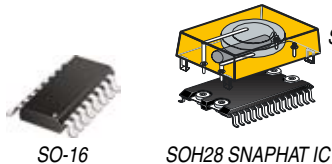
All devices listed here are Lead-free

Microprocessor supervisors with real-time clocks

Part number	RTC interface	V _{CC}	µP and system supervisory features					Package	Comments	
			Alarm	Watchdog	POR-LVD ¹	PFI-PFO ²	/Reset inputs			Battery monitor
M41T94	SPI	2.7 to 5.5V	•	•	•		2	•	SO-16 SOH28	400nA Ibat; THS Pin ³
M41ST84Y	400kHz I ² C	4.5 to 5.5V	•	•	•		1	•	SO-16	400nA Ibat
M41ST84W	I ² C	2.7 to 3.6V	•	•	•			•		

1. POR-LVD: power-on reset/low-voltage detect reset output
2. PFI-PFO: early power-fail warning (power-fail in/power-fail out)
3. THS pin: selects power-fail deselect threshold (2.65V or 4.40V for 3V or 5V operation)

- Feature rich serial RTCs with 44 bytes of NVRAM
- Automatic battery switchover
- SPI bus (M41T94) or I²C (M41ST84)
- Programmable squarewave generator
 - 1 to 32kHz
- Industrial temperature: -40 to 85°C
- Early power-fail warning (PFI/PFO: power-fail in/power-fail out)
- Push-button reset
- Packages: SO-16, SOH28

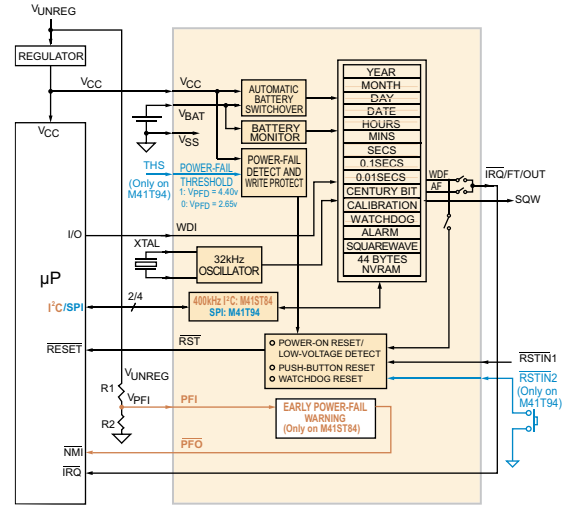


SNAPHAT[®] battery/crystal top

SO-16

SOH28 SNAPHAT IC

M41ST84/M41T94



All devices listed here are lead-free

TIMEKEEPER® supervisors

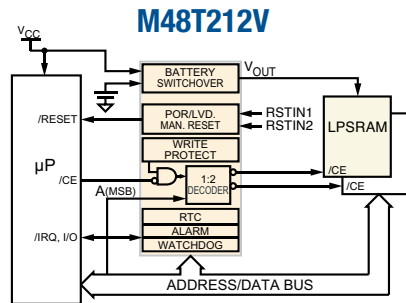
■ Microprocessor supervisors with switchover and real-time clocks

Part number	NVRAM	RTC interface	Package		V _{CC}	μP and system supervisory features						Squarewave out	32 KHz out	Chip enable outputs	-40 to 85°C	Comments
			SNAPHAT	Other		Alarm	Watchdog	POR-LVD ¹	PFI-PFO ²	/Reset inputs	Battery monitor					
M41ST95W	44B	SPI		SOX28	2.7 to 3.6V	•	•	•	•	2	•	•	•	1	•	400nA lbat
M41ST87Y	128B	400kHz I ² C		SOX28	4.5 to 5.5V	•	•	•	•	2	•	•	•	1	•	Tamper detect, RAM clear, unique
M41ST87W					2.7 to 3.6V	•	•	•	•	2	•	•	•	•	•	
M41ST85Y	44B	400kHz I ² C	SOH28	SOX28	4.5 to 5.5V	•	•	•	•	2	•	•	•	1	•	400nA lbat
M41ST85W					2.7 to 3.6V	•	•	•	•	2	•	•	•	•	•	
M48T212V		Parallel 8b	SOH44		3.0 to 3.6V	•	•	•	•	2	•	•	•	2		
M48T201V		Parallel 8b	SOH44		3.0 to 3.6V	•	•	•	•	2	•	•	•	1		
M48T201Y				4.5 to 5.5V	•	•	•	•	•	2	•	•	•	•	1	

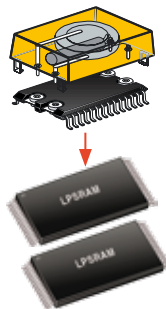
1. POR-LVD: power-on reset/low-voltage detect reset output
2. PFI-PFO: early power-fail warning (power-fail in/power-fail out)



■ SOX28 embedded crystal IC



■ TIMEKEEPER supervisors turn low-power SRAMs into TIMEKEEPER NVRAMs



All devices listed here are lead-free

Security supervisors

- Supervisors which detect intrusions protect sensitive data
- All include POR/LVD¹ and battery monitor

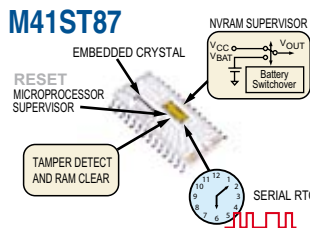
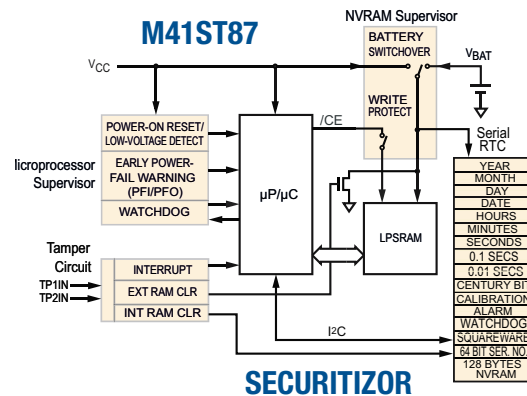
Part number	NVRAM	RTC interface	Package	V _{CC}	µP and system supervisory features										Comments								
					Tamper inputs	V _{00r} - battery Switchover output	Chip enable gate	Battery on	Alarm	Watchdog	Over/under voltage detect	PFL-PFO ²	Precision 1.237V reference output	/Reset inputs		Over/under temp. detect	Squarewave out	32 kHz out	Oscillator fail detect	-40 to 85°C			
M41T256	32KB	400kHz I ² C	SO44 SOH44	4.5 to 5.5V	1																		
M41ST87Y	128B	400kHz I ² C	SOX28	4.5 to 5.5V	2	•	•	•	•	2	•	•	•	•	•	•	•	•	•	•	•	RAM clear, unique serial no.	
M41ST87W				2.7 to 3.6V																			
STM1403			QFN16	2.2 to 3.6V	4	•	•			•	•	•	•	1								FIPS 140 level 3	
STM1404			QFN16	2.2 to 3.6V	4	•	•			•	•	•	•	1	•								FIPS 140 level 4

- POR-LVD: power-on reset/low-voltage detect reset output
- PFI-PFO: early power-fail warning (power-fail in/power-fail out)

Tamper detect/RAM clear functions

Configurable to do any or all of the following:

- Record time of tamper event
- Clear internal RAM (128 bytes)
- Clear external RAM
- Interrupt



- SOX28 embedded crystal IC



All devices listed here are lead-free

Microprocessor supervisors

- POR/LVD, push-button reset and watchdog
- Separate watchdog output
- Early power-fail warning (PFI/PFO: power-fail in/power-fail out)
- SO-8 and TSSOP8 packages
- -40 to 85°C

Part number	V_{RST} (nom) (V_{PFD})	Reset outputs		Manual reset input	PFI/PFO	Watchdog		Package
		Active-low, push-pull	Active-high, push-pull			Input	Output	
STM705	4.65V							SO-8, TSSOP8
STM706	4.40V	•		•	•	•	•	
STM706T, S, R	3.08V, 2.93V, 2.63V							SO-8, TSSOP8
STM707	4.65V							
STM708	4.40V	•	•	•	•			SO-8, TSSOP8
STM708T, S, R	3.08V, 2.93V, 2.63V							
STM813L	4.65V		•	•	•	•	•	SO-8, TSSOP8
STM706P	2.93V							

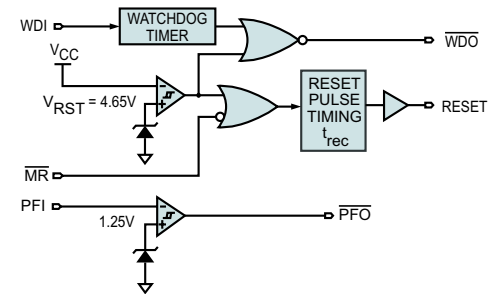


TSSOP8



SO-8

STM813L WATCHDOG



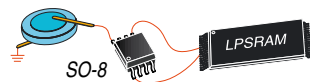
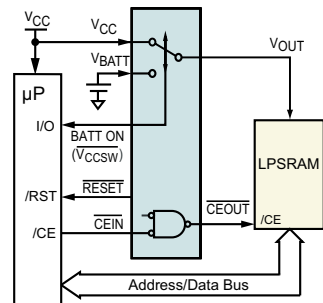
All devices listed here are Lead-free

Microprocessor supervisors with switchover (NVRAM supervisors)

- Supervisors with automatic battery switchover are used to turn low-power SRAMs into NVRAMs
- 40 to 85°C

Part number	V _{RST} (nom) (V _{PFD})	Reset output(s)	Manual reset input	PF/ PFO	Watch-dog	Chip enable gate	V _{CC} switch signal	Battery freshness seal	Battery monitor	Package
M40SZ100W	2.60V	Active-low, open drain	•	•		•			•	SO-16
M40Z111	4.35V, 4.60V					•				SOH28
M40Z300W	2.60V, 2.90V	Active-low, open drain				•			•	SO-16, SOH28
STM690A	4.65V									
STM692A	4.40V	Active-low, push-pull		•	•					SO-8, TSSOP8
STM690T, S, R	3.08V, 2.93V, 2.63V									
STM703	4.65V									
STM704	4.40V	Active-low, push-pull	•	•						SO-8, TSSOP8
STM704T, S, R	3.08V, 2.93V, 2.63V									
STM795T, S, R	3.08V, 2.93V, 2.63V	Active low, opendrain				•	•			SO-8, TSSOP8
STM802L, M	4.65V, 4.40V									
STM802T, S, R	3.08V, 2.93V, 2.63V	Active low, push-pull		•	•					SO-8, TSSOP8
STM804T, S, R	3.08V, 2.93V, 2.63V	Active-high, open drain		•	•					SO-8, TSSOP8
STM805L	4.65V	Active-high, push-pull		•	•					SO-8, TSSOP8
STM805T, S, R	3.08V, 2.93V, 2.63V	Active-high, open drain		•	•					SO-8, TSSOP8
STM806T, S, R	3.08V, 2.93V, 2.63V	Active-low, push-pull	•	•						SO-8, TSSOP8
STM817L, M	4.65V, 4.40V	Active-low, push-pull		•	•			•		SO-8, TSSOP8
STM818L, M	4.65V, 4.40V	Active-low, push-pull		•	•	•		•		SO-8, TSSOP8
STM819L, M	4.65V, 4.40V	Active-low, push-pull	•	•				•		SO-8, TSSOP8

STM795R/S/T



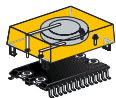
TSSOP8



SO-16



SO-8



SNAPHAT® battery top with SOH28 IC



All devices listed here are lead-free

Future developments

Voltage detectors

- Guaranteed assertion down to $V_{cc} = 1.0V$
- Low supply current $-0.9\mu A$ (typ)
- -40 to $85^{\circ}C$
- SOT23-3 package



SOT23-3

Part number	V_{RST}	Reset output	Comment
STM1061	3.4V, 3.1V, 2.9V, 2.8V, 2.7V, 2.6V, 2.3V, 2.2V, 1.7V, 1.6V (nominal)	Active-low, open drain	+/- 2%
STM1071	35 threshold steps from 1.6V to 5.0V, 100mV steps	Active-low, open drain	+/- 1.5%

Multiple voltage rail supervisors

- -40 to $85^{\circ}C$
- SOT23-5 and SOT23-6 packages



SOT23-5



SOT23-6

Part number	Monitored voltages			Manual Reset input (/MR)	/MR delay adjust pin (MRC)	Reset output (/RST)	Package
	Fixed- V_{CC1}	Fixed- V_{CC2}	Adjustable RSTIN ¹				
STM6717	V_{RST1}	V_{RST2}		•		Active-low, open drain	SOT23-5
STM6718	V_{RST1}	V_{RST2}		•		Active-low, push-pull	SOT23-5
STM6719	V_{RST1}	V_{RST2}	•	•		Active-low, open drain	SOT23-6
STM6720	V_{RST1}	V_{RST2}	•	•		Active-low, push-pull	SOT23-6
STM6777	V_{RST1}	V_{RST2}		•	•	Active-low, open drain	SOT23-6
STM6778	V_{RST1}	V_{RST2}		•	•	Active-low, push-pull	SOT23-6
STM6779	V_{RST1}		•	•	•	Active-low, open drain	SOT23-6
STM6780	V_{RST1}		•	•	•	Active-low, push-pull	SOT23-6

Available Reset threshold combinations	
V_{RST1} (nom)	V_{RST2} (nom)
4.625V	3.075V
4.375V	2.925V
3.075V	2.313V*, 1.665V*, 1.388V, 1.11V*, 0.925V, 0.833V
2.925V	2.188V*, 1.575V*, 1.313V, 1.05V*, 0.875V, 0.788V
2.188V	1.575V*, 1.313V, 1.05V, 0.875V, 0.788V
1.575V	1.313V, 1.05V, 0.875V, 0.788V

1. RSTIN is compared to a 0.63V threshold

* Standard stocking item

Microprocessor reset ICs

Part number	V_{RST}	Reset output
STM1810L,M		Active-low, push-pull
STM1811L,M	L=4.62V	Active-low, open drain with internal pull-up
STM1812L,M	M=4.37V	Active-high, push-pull
STM1813L,M		Active-low, open drain, Bi-directional with /MR detect
STM1815T,S,R	T=3.06V	Active-low, push-pull
STM1816T,S,R	S=2.88V	Active-low, open drain with internal pull-up
STM1817T,S,R		Active-high, push-pull
STM1818T,S,R	R=2.55V	Active-low, open drain, Bi-directional with /MR detect

- Low supply current $-4\mu A$ (typ)
- 100ms (min) reset pulse width
- Guaranteed assertion down to $V_{cc} = 1.0V$
- Fully compatible with DS181x and MXD181x
- -40 to $105^{\circ}C$
- SOT23-3 package



SOT23-3



All devices listed here are lead-free



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