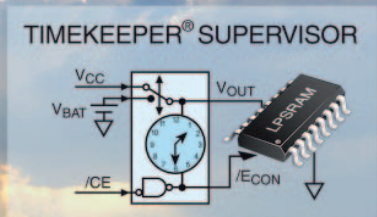
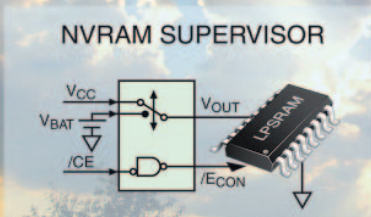
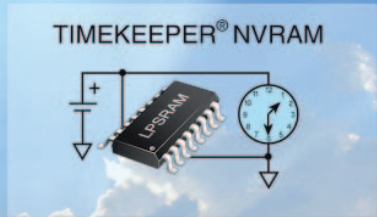
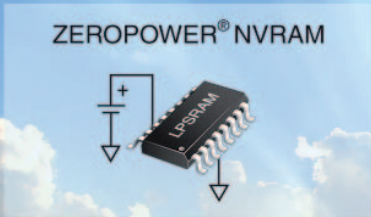


Non-volatile RAMs

Selection guide



September 2007

ZEROPOWER[®] NVRAMs

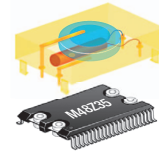
- Battery backed SRAM
- 16 Mbit to 16 Kbit

Density	Part number	V _{CC} [V]	Battery check	Package			Comments
				SNAPHAT [®]	DIP	Other	
16 Mb (2 Mx8)	M48Z2M1Y	5.0			36		
	M48Z2M1V	3.3					
4 Mb (512 Kx8)	M48Z512AY	5.0			32		
1 Mb (128 Kx8)	M48Z129V	3.3	■		32		Reset output
	M48Z128Y	5.0			32		
256 Kb (32 Kx8)	M48Z35AV	3.3	■	SOH28	28		
	M48Z35	5.0		SOH28	28		
	M48Z32V	3.3				SO-44	Low-profile package
64 Kb (8 Kx8)	M48Z58	5.0		SOH28	28		
	M48Z18	5.0			28		Z18: 5 V+/-10 %
	M48Z08	5.0			28		Z08: 5 V+10/-5 %
16 Kb (2 Kx8)	M48Z12	5.0			24		Z12: 5 V+/-10 %
	M48Z02	5.0			24		Z02: 5 V+10/-5 %

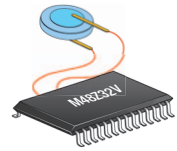
High density surface mount

For high density (1 Mb and above) surface mount ZEROPOWER NVRAM solutions, ST offers NVRAM supervisors for non-volatizing low-power SRAMs. Users can mix and match these devices to implement a variety of configurations. Refer to the SUPERVISOR tables for more information.

ZEROPOWER example solutions



3.3 V or 5 V, 32 Kx8 SNAPHAT solution with ST's M48Z35



Low profile 3.3 V, 32 Kx8 solution with ST's M48Z32V

TIMEKEEPER® NVRAMS

- Battery backed SRAM with real-time clocks
- 32 Mbit to 1 Kbit

Density	Part number	V _{CC} [V]	Clock (1)	µP and System Supervisory Features				-40° to +85° C	Package			Comments
				Alarm	Watchdog	POR-LVD output (2)	Battery monitor		SNAPHAT	DIP	Other	
32 Mb (1 Mx32)	M440T1MV	3.3	16B	■	■		■				PBGA-168	
4 Mb (512 Kx8)	M48T512Y	5.0	8B							32		
	M48T251Y	5.0	Ph							32		Phantom clock interface
1 Mb (128 Kx8)	M48T248Y	5.0	Ph							32		Phantom clock interface
	M48T129V	3.3	16B	■	■	■	■			32		
	M48T129Y	5.0										
	M48T128Y	5.0										
256 Kb (32 Kx8)	M48T37V	3.3	16B	■	■	■	■	■	SOH44			
	M48T37Y	5.0										
	M48T35AV	3.3	8B					■	SOH28	28		
	M48T35	5.0	8B					■	SOH28	28		
64 Kb (8 Kx8)	M48T59	5.0	16B	■	■	■	■		SOH28	28		
	M48T58	5.0	8B						SOH28	28		
	M48T18	5.0	8B						(3)	28		5 V+/-10 %; Power-fail interrupt
	M48T08	5.0	8B							28		5 V+10/-5 %; Power-fail interrupt
	M48T08Y	5.0	8B						SOH28			Replaces M48T18-100MH1
16 Kb (2 Kx8)	M48T12	5.0	8B							24		5 V+/-10 %
	M48T02	5.0	8B							24		5 V+10/-5 %
1 Kb (128 x8)	M48T86	5.0	16B	■	■	■	■		SOH28	24		Multiplexed bus; Squarewave output

1.16B: Parallel access real-time clock with 16 registers for time, date, alarm and watchdog

8B: Parallel access real-time clock with 8 registers for time and date. No alarm, no watchdog

Ph: Phantom (serial) interface to the real-time clock over bit 0 of the data bus

2. POR-LVD: Power-on reset/low-voltage detect

3. M48T18-100MH1 (SNAPHAT package) replaced by M48T08Y-10MH1

NVRAM supervisors

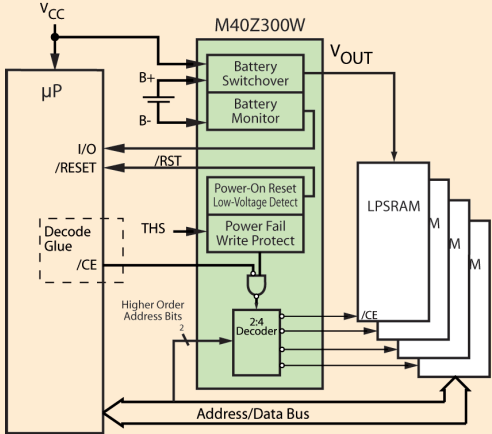
Microprocessor supervisors with switchover

■ Turn low-power SRAMs into NVRAMs

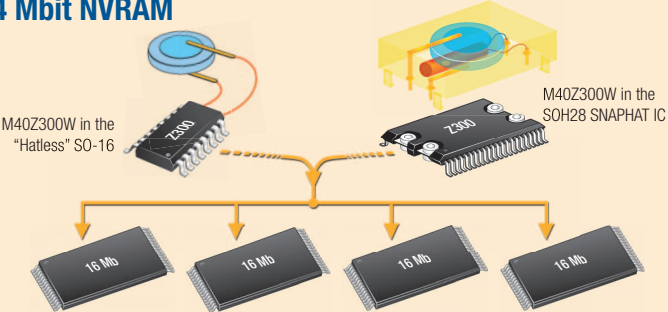
Root p/n	V _{RST} (V _{PFD}) [V]	Reset output	Manual reset input	PFI/ PFO (1)	Watch-dog	Chip enable gate	Battery freshness seal	Package	Comment
M40SZ100W	2.60	Active low, open drain	■	■		■		SO-16	Battery monitor
M40Z111	4.35, 4.60	n/a				■		SOH28	
M40Z300W	2.60, 2.90	Active low, open drain				4		SO-16, SOH28	Battery monitor
STM690A	4.65	Active low, push-pull		■	■			SO-8	
STM690R,S,T	2.63, 2.93, 3.08						SO-8, TSSOP8		
STM692A	4.40						SO-8		
STM703	4.65	Active low, push-pull		■				SO-8	
STM704	4.40		■				SO-8, TSSOP8		
STM704R,S,T	2.63, 2.93, 3.08						SO-8		
STM795R,S,T	2.63, 2.93, 3.08	Active low, open drain				■		SO-8	V _{cc} switch signal
STM802L,M	4.65, 4.40	Active low, push-pull		■	■			SO-8, TSSOP8	2 % PFI Threshold
STM802R,S,T	2.63, 2.93, 3.08								
STM804R,S,T	2.63, 2.93, 3.08	Active high, open drain		■	■			SO-8, TSSOP8	2 % PFI Threshold
STM805L	4.65	Active high, push-pull		■	■			SO-8	
STM805R,S,T	2.63, 2.93, 3.08	Active high, open drain		■	■			SO-8, TSSOP8	
STM806R,S,T	2.63, 2.93, 3.08	Active low, push-pull	■	■				SO-8, TSSOP8	2 % PFI Threshold
STM817L,M	4.65, 4.40	Active low, push-pull		■	■		■	SO-8, TSSOP8	
STM818L,M							■		
STM819L,M			■				■		

1. PFI-PFO: Early power-fail warning (power-fail in/power-fail out)

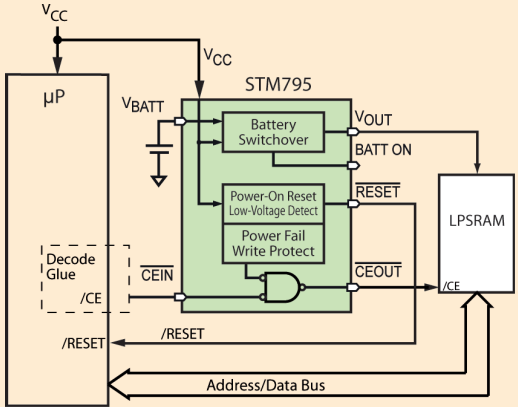
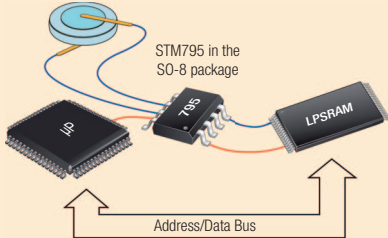
Surface mount NVRAM solutions



64 Mbit NVRAM



4 Mbit NVRAM



TIMEKEEPER[®] supervisors

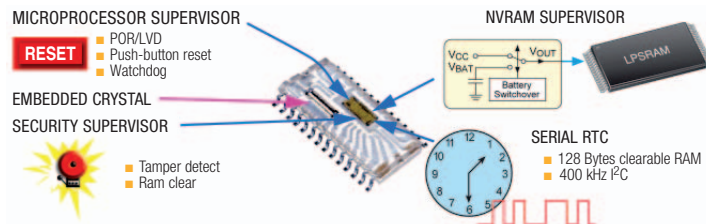
■ Turn low-power SRAMs into TIMEKEEPER NVRAMs

Part number	RTC bus	#Chip selects	V _{CC} [V]	μP and system supervisory features						Square-wave output	Chip enable gate	V _{OUT}	-40° to +85° C	Package		Comment
				Alarm	Watch-dog	POR-LVD Output (1)	PFI-PFO (2)	/Reset inputs	Battery monitor					Hatless	SNAPHAT	
M41ST95W	SPI	1	2.7-3.6	■	■	■	■	2	■	■	■	■	SOX28		32 KHz out	
M41ST87Y	400 kHz I ² C	1	4.5-5.5	■	■	■	2	2	■	■	■	■	SOX28		Tamper detect; RAM clear; Unique serial No.; 32 KHz out	
M41ST87W			2.7-3.6													
M41ST85W	400 kHz I ² C	1	2.7-3.6	■	■	■	■	2	■	■	■	■	SOX28	SOH28		
M41T315V	Phantom	1	3.0-3.6					1						SOH28		
M48T201V	8 b	1	3.0-3.6	■	■	■		2	■	■	■	■			SOH28	
M48T201Y			4.5-5.5													
M48T212V	8 b	2	3.0-3.6	■	■	■		2	■	■	■	■		SOH28		

1. POR-LVD: power-on reset / low-voltage detect.

2. PFI-PFO: Early power-fail warning (power-fail in / power-fail out).

Solutions with TIMEKEEPER SUPERVISORS

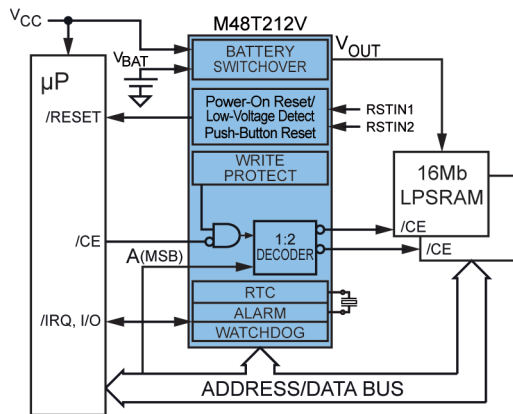


M41ST87 SECURITIZOR

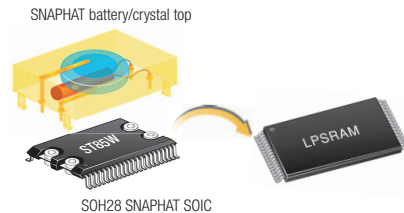
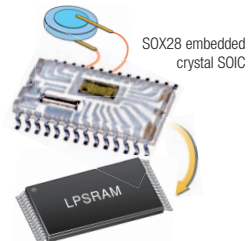
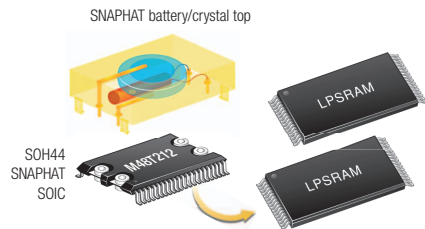
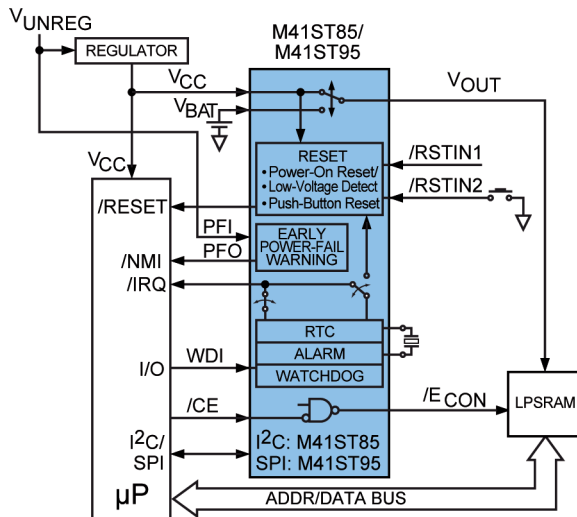
3/3.3 V or 5 V, 1 Mb -16 Mb
for secure applications

3.3 V, 32 Mbit solution using the M48T212V and two 16-Mbit LPSRAMs

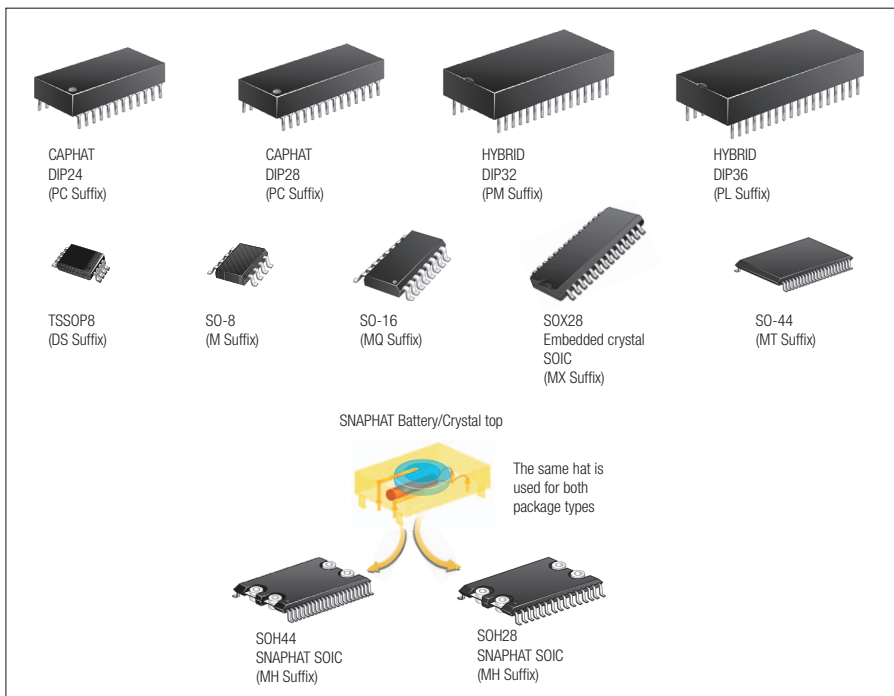
- Parallel access RTC with alarm and watchdog
- Power-on reset/low-voltage detect with push-button reset inputs



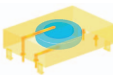
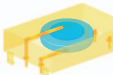
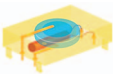
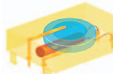
3.3 V, 1-16 Mb solution with the M41ST85/M41ST95



NVRAM package options



SNAPHAT battery/crystal tops

	48 mAh	120 mAh -40° to +85° C
ZEROPOWER and SUPERVISOR (no crystal)	 M4Z28-BR00SH1	 M4Z32-BR00SH1
TIMEKEEPER and TIMEKEEPER SUPERVISOR (includes crystal)	 M4T28-BR12SH1	 M4T32-BR12SH1/6



© STMicroelectronics - September 2007 - Printed in Italy - All rights reserved

The STMicroelectronics corporate logo is a registered trademark of the STMicroelectronics group of companies. TIMEKEEPER, ZEROPOWER and SNAPHAT are STMicroelectronics trademarks. All other names are the property of their respective owners.

For selected STMicroelectronics sales offices fax:

China +86 21 34054689; France +33 1 55489569; Germany +49 89 4605454; Italy +39 02 8250449; Japan +81 3 57838216; Singapore +65 6481 5124; Sweden +46 8 58774411; Switzerland +41 22 9292900; United Kingdom and Eire +44 1628 890391; USA +1 781 861 2678

Full product information at www.st.com

Order code: SGNVRAMS0907

