HM1232 POWER SUPPLY CONTROL CHIP WITH BUILT-IN WATCHDOG TIMER

J O 3454 is designed to monitor power supply within the system of reset signal generation for microprocessors. It is used in monitor systems for controlling various processes and entities.

Packaged in 8-pin plastic DIP/SOP.

Features:

- Rated supply voltage   5.0 B
- Accurate 5% or 10% microprocessor power supply monitoring
- Programming of watchdog timer overflow time
- Generation of reset signals at power on for correct microprocessor start

The chip contains reference voltage source, analog comparator, Watchdog timer, circuit for monitoring power supply deviation accuracy.
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Functions:

- Reset signal generation after power failure/ error
- Reset signal generation from external "RESET" pushbutton
- Reset signal generation from watchdog timer

Tamb from -10 to + 70 °C

$\overline{\text{PBRST}}$ 01	08 Ucc
TD 02	07 $\overline{\text{ST}}$
TOL 03	06 $\overline{\text{RST}}$
GND 04	05 RST
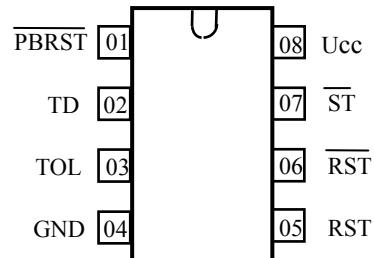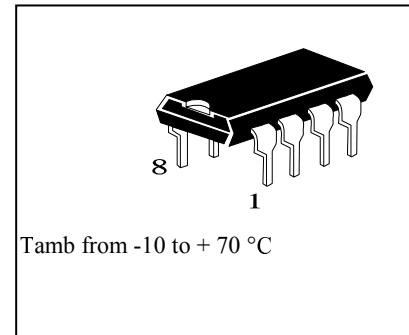
Fig 1 – PIN ASSIGNMENT

Operating temperature range: from - 10 to + 70°C

Table 1 – Recommended operating conditions

Symbol	Parameter	Typical		Units
		Min	Max	
V_{CC}	Supply voltage	4.5	5.5	V
V_{IH}	Input voltage, high level	2.0	V_{CC}+0.3	V
V_{IL}	Input voltage, low level	-0.3	0.8	V
T_A	Operating temperature range	-10	+70	°C

Table 2 – Absolute maximum ratings

Symbol	Parameter	Typical		Units
		Min	Max	
V_{CC}	Supply voltage	-	7.0	V
V_{IH}	Input voltage, high level	-	7.0	V
V_{IL}	Input voltage, low level	-1.0	-	V
T_{stg}	Storage temperature	-60	+125	°C

Table 3 DC electrical characteristics (T_{Amb} = - 10° to + 70℃)

Symbol	Parameter	Test conditions	Typical		Units
			min	max	
I_{LIL1}	Input leakage current, low level, ST, TOL	V_{CC}=5 V±10%, V_{IL}=0 V	-	-1	µA
I_{LIL2}	Input leakage current, low level, TD	V_{CC}=5 V±10%, V_{IL}=0 V	-	-300	µA
I_{LIL3}	Input leakage current, low level, PBRST	V_{CC}=5 V±10%, V_{IL}=0 V	-	-1000	µA
I_{LIH1}	Input leakage current, high level, ST, TOL	V_{CC}=5 V±10%, V_{IH}=V_{CC}	-	1	µA
I_{LIH2}	Input leakage current, high level, TD	V_{CC}=5 V±10%, V_{IH}=V_{CC}	-	300	µA
I_{OH}	Output current, high level, RST	V_{CC}=5 V±10%, V_{OH}=2.4 V	-8	-	µA
I_{OL}	Output current, low level, RST, RST	V_{CC}=5 V±10%, V_{OL}=0.4 V	8	-	mA
V_{OH}	Output voltage, high level, RST	V_{CC}=5 V±10%, I_{OH}= -500 µA	V_{CC}-0.5	-	V
V_{OH1}	Output voltage, high level,- RST	V_{CC}=2 V, I_{OH}= -500 µA	V_{CC}-0.5	-	V
V_{OL}	Output voltage, low level, RST	V_{CC}=2 V, I_{OL}=1 mA	-	0.4	V
I_{CC}	Operating current	V_{CC}=5 V±10%	-	2	mA

Table 3 (cont)

Symbol	Parameter	Test conditions	Typical		Units
			min	max	
V_{CCTP1}	V_{CC} trip point	TOL = GND	4.5	4.74	V
V_{CCTP2}	V_{CC} trip point	TOL = V_{CC}	4.25	4.49	V

Table 4 – AC electrical characteristics (Tamb = from - 10 to + 70 °C)

Symbol	Parameter	Test conditions	Typical		Units
			min	max	
t_{TD1}	Watchdog timer overflow time	V_{CC}=5.0 V±10% t_{ST}≥20 ns TD = GND	62.5	250	ms
t_{TD2}		TD disconnected	250	1000	ms
t_{TD3}		TD = V_{CC}	500	2000	ms
t_{PDLY}	PBRST stable low to RST and $\overline{RST}$	V_{CC}=5.0 V±10% t_{PB}≥20 ms	-	20	ms
t_{RST}	Reset active time	V_{CC}=5.0 V±10% t_{PB}≥20 ms	250	1000	ms
t_{RPD}	Vcc fail detect to RST and $\overline{RST}$	V_{CC}=from 5.0 to 4.0 V t_F≥10 µs	-	175	µs
t_{RPU}	Vcc detect to RST and RST transition	V_{CC}= from 5.0 to 4.0 V t_R≥1 µs	250	1000	ms

$\overline{\text{PBRST}}$

t_{PB}

t_{PDLY}

V_{IH}

V_{IL}

$\overline{\text{RST}}$

t_{RST}

RST

$t_{PB} \geq 20$ мс $t_{PDLY} \leq 20$ мс   250 мс $\leq t_{RST} \leq 1000$ мс
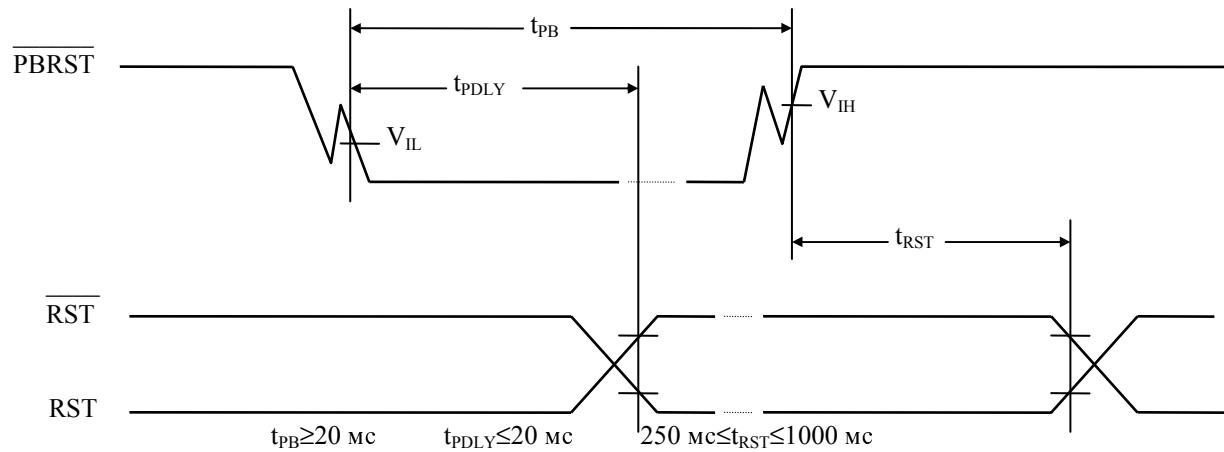
Fig. 2 – Timing diagram of forming reset signal from external PBRST control button

Invalid strob   Valid strob   Indeterminate strob

$\overline{\text{ST}}$

t_{ST}

MIN

$t_{TD1} - t_{TD3}$

MAX

RST

$t_{ST} \geq 20$ нс   62.5 мс $\leq t_{TD1} \leq 250$ мс   250 мс $\leq t_{TD2} \leq 1000$ мс   500 мс $\leq t_{TD3} \leq 2000$ мс
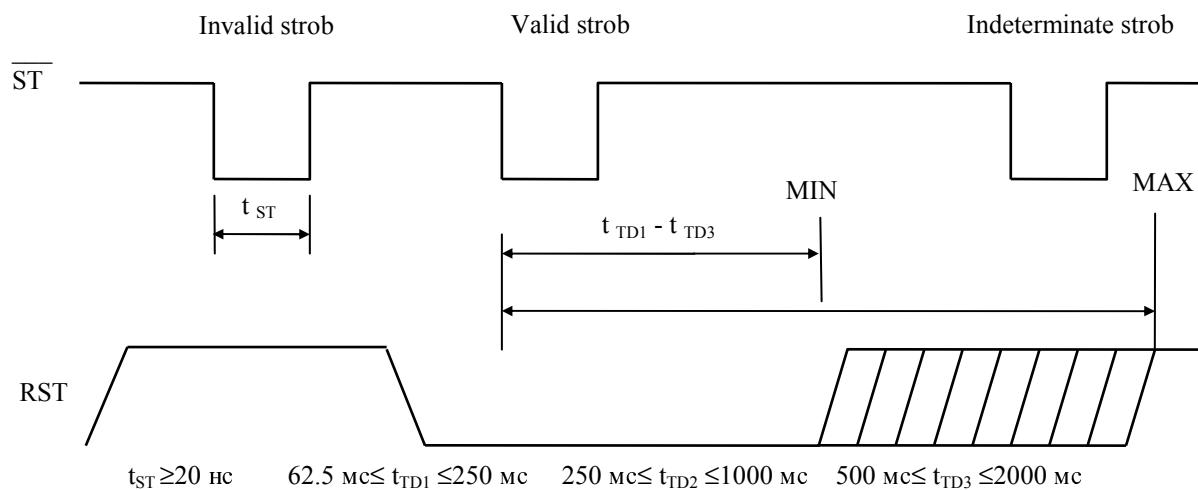
Fig. 3 – Timing diagram : Strobe input
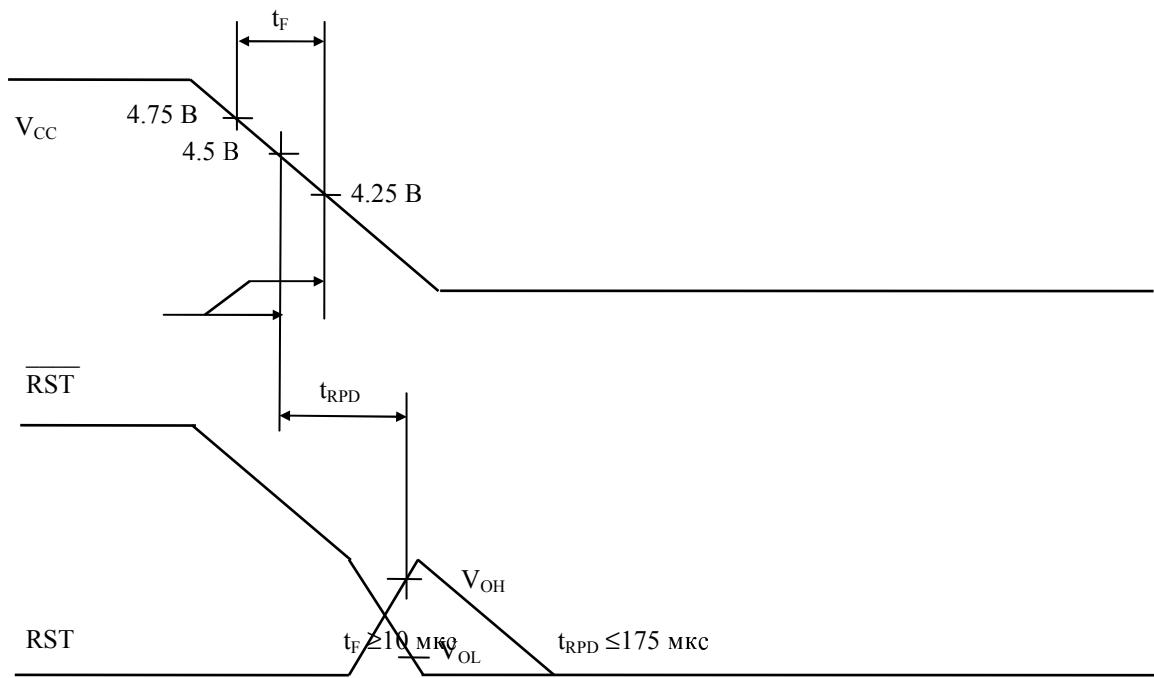
Fig. 4 – Timing diagram: power error / down to V_{CCTP}
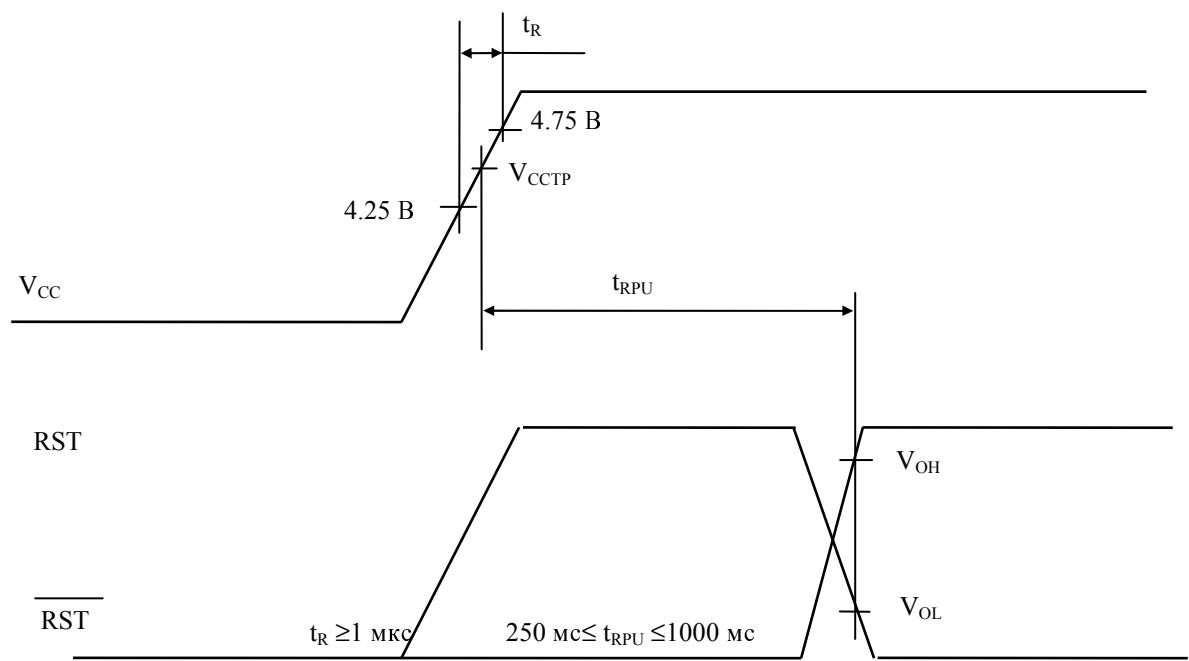
Fig. 5 – Timing diagram: Power-Up/ Stable
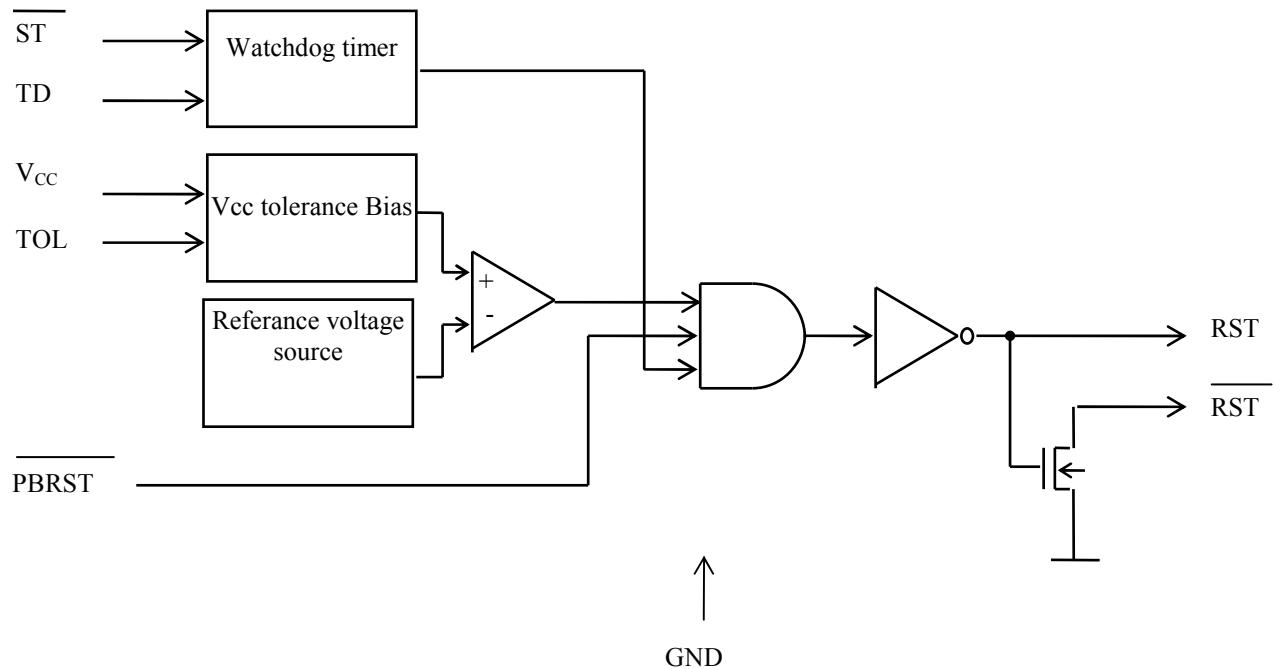
Fig.6 Block diagram

Table 5 – Pin description

| Pin	Symbol	Description
01	$\overline{\text{PBRST}}$	Pushbutton reset input
02	TD	Time Delay Set
03	TOL	Selects 5% or 10% V_{CC} Detect
04	GND	Ground
05	RST	Reset output (Active High)
06	$\overline{\text{RST}}$	Reset output (Active Low, open drain)
07	$\overline{\text{ST}}$	Strobe Input
08	V_{CC}	Supply output from voltage source
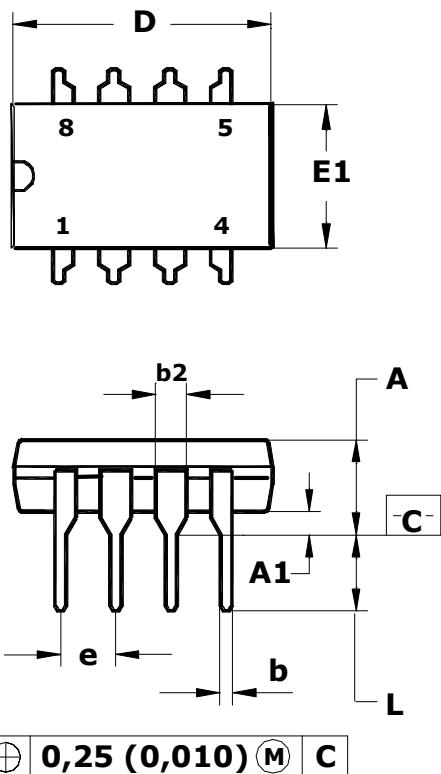
Note: D, E1 Dimensions do not include flash wich shall not be more than 0.25 (0.010) per one side

	D	E1	A	b	b2	e	α	L	E	c	A1
Mm											
min	9.02	6.07	—	0.36	1.14		0°	2.93	7.62	0.20	0.38
max	10.16	7.11	5.33	0.56	1.78	2.54	15°	3.81	8.26	0.36	—
Inch											
min	0.355	0.240	—	0.014	0.045		0°	0.115	0.300	0.008	0.015
max	0.400	0.280	0.210	0.022	0.070	0.1	15°	0.150	0.325	0.014	—

Table 7 – Package overall dimensions

SOP8 PACKAGE OUTLINE DIMENSIONS
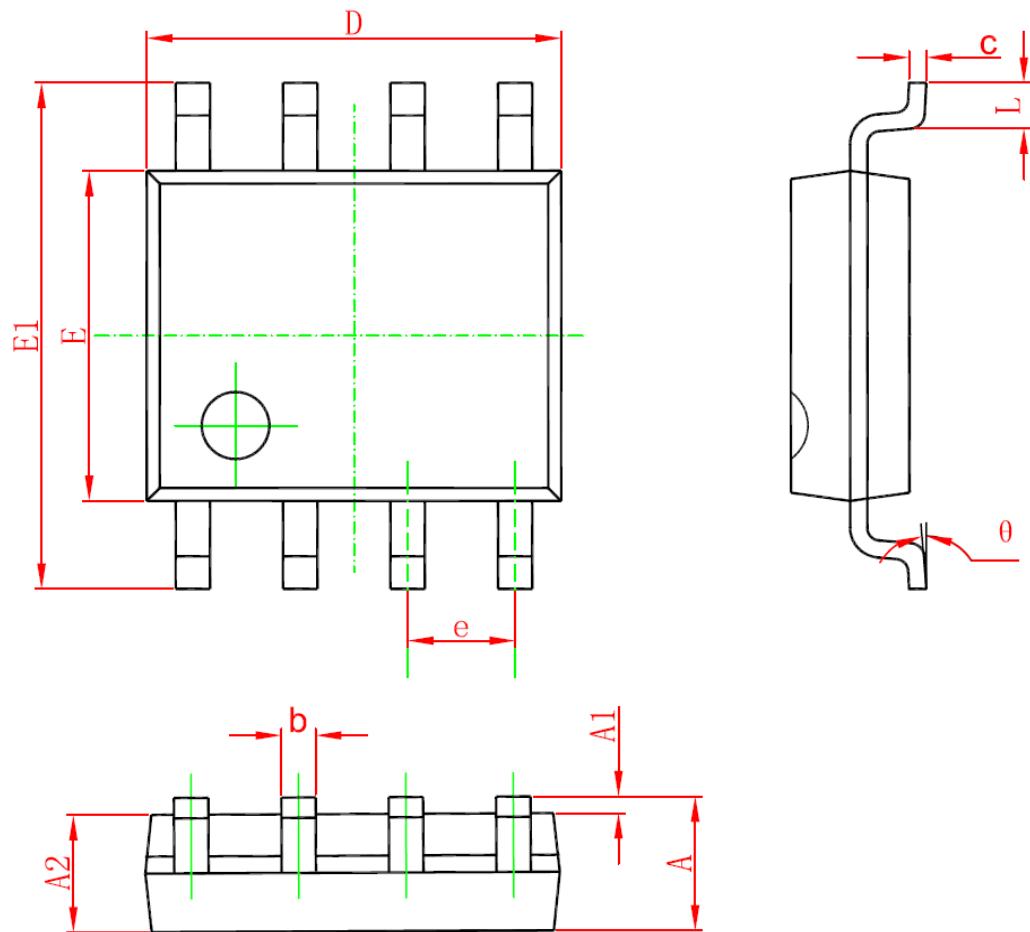
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°