

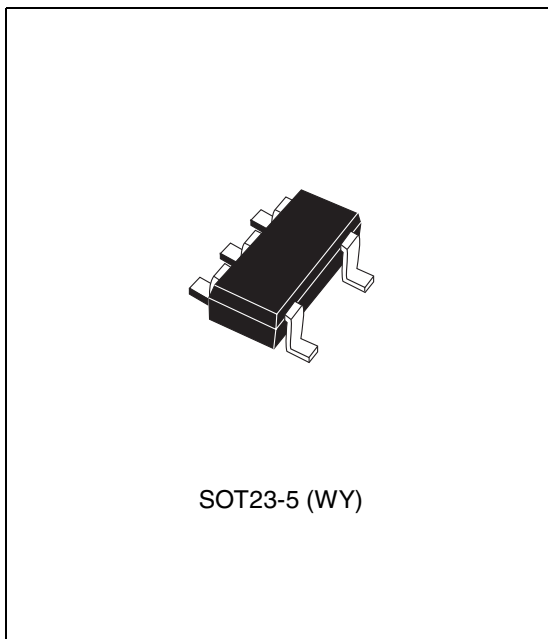


# STM6321/6322 STM6821/6822/6823/6824/6825

## 5-pin supervisor with watchdog timer and push-button reset

### Features

- Precision  $V_{CC}$  monitoring of 5, 3.3, 3, or 2.5 V power supplies
- $\overline{RST}$  outputs (active-low, push-pull or open drain)
- RST outputs (active-high, push-pull)
- Reset pulse width of 1.4 ms, 200 ms and 240 ms (typ)<sup>(a)</sup>
- Watchdog timeout period of 1.6 s (typ)<sup>(a)</sup>
- Manual reset input ( $\overline{MR}$ )
- Low supply current - 3  $\mu$ A (typ)
- Guaranteed  $\overline{RST}$  (RST) assertion down to  $V_{CC} = 1.0$  V
- Operating temperature: -40 to +85 °C (industrial grade)
- RoHS compliance  
Lead-free components are compliant with the RoHS directive



a. Other  $t_{rec}$  and watchdog timings are offered. Minimum order quantities may apply. Contact local sales office for availability.

Table 1. Device summary

Part number	Watchdog input	Manual reset input	Reset output		
			Active-low (push-pull)	Active-high (push-pull)	Active-low (open drain)
STM6321	✓			✓	✓
STM6322		✓		✓	✓
STM6821	✓	✓		✓	
STM6822	✓	✓			✓
STM6823	✓	✓	✓		
STM6824	✓		✓	✓	
STM6825		✓	✓	✓	

# Contents

<b>1</b>	<b>Description</b> .....	<b>5</b>
1.1	Pin descriptions .....	7
1.1.1	Active-low, push-pull reset output ( $\overline{RST}$ ) - 6823/6824/6825 .....	7
1.1.2	Active-low, open drain reset output ( $\overline{RST}$ ) - STM6321/6322/6822 .....	7
1.1.3	Push-button reset input ( $\overline{MR}$ ) .....	7
1.1.4	Watchdog input (WDI) .....	7
1.1.5	Active-high reset output (RST) .....	7
<b>2</b>	<b>Operation</b> .....	<b>10</b>
2.1	Reset output .....	10
2.2	Open drain $\overline{RST}$ output .....	10
2.3	Push-button reset input (STM6322/6821/6822/6823/6825) .....	11
2.4	Watchdog input (STM6321/6821/6822/6823/6824) .....	11
2.5	Applications information .....	11
2.5.1	Watchdog input current .....	11
2.5.2	Ensuring a valid reset output down to $V_{CC} = 0\text{ V}$ .....	11
2.6	Interfacing to microprocessors with bidirectional reset pins .....	12
<b>3</b>	<b>Typical operating characteristics</b> .....	<b>13</b>
<b>4</b>	<b>Maximum ratings</b> .....	<b>18</b>
<b>5</b>	<b>DC and AC parameters</b> .....	<b>19</b>
<b>6</b>	<b>Package mechanical data</b> .....	<b>20</b>
<b>7</b>	<b>Package mechanical data</b> .....	<b>23</b>
<b>8</b>	<b>Part numbering</b> .....	<b>26</b>
<b>9</b>	<b>Revision history</b> .....	<b>28</b>

## List of tables

Table 1.	Device summary . . . . .	1
Table 2.	Signal names . . . . .	5
Table 3.	Pin functions . . . . .	7
Table 4.	Absolute maximum ratings . . . . .	18
Table 5.	Operating and AC measurement conditions . . . . .	19
Table 6.	DC and AC characteristic . . . . .	20
Table 7.	SOT23-5 – 5-lead small outline transistor package mechanical data . . . . .	24
Table 8.	Carrier tape dimensions for SOT23-5 package . . . . .	25
Table 9.	Ordering information scheme . . . . .	26
Table 10.	Marking description . . . . .	27
Table 11.	Document revision history . . . . .	28

## List of figures

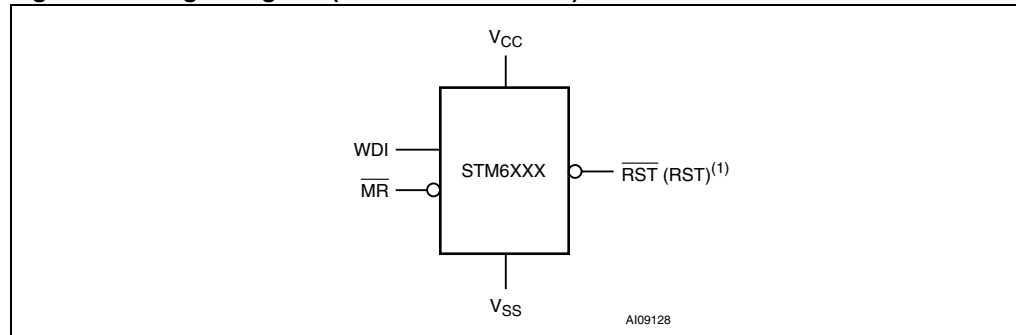
Figure 1.	Logic diagram (STM6821/6822/6823)	5
Figure 2.	Logic diagram (STM6321/6322/6824/6825)	5
Figure 3.	STM6822/6823 SOT23-5 connections	6
Figure 4.	STM6821 SOT23-5 connections	6
Figure 5.	STM6322/6825 SOT23-5 connections	6
Figure 6.	STM6321/6824 SOT23-5 connections	6
Figure 7.	Block diagram (STM6821/6822/6823)	8
Figure 8.	Block diagram (STM6321/6824)	8
Figure 9.	Block diagram (STM6322/6825)	8
Figure 10.	Hardware hookup	9
Figure 11.	STM6321/6322/6822 open drain $\overline{\text{RST}}$ output with multiple supplies	10
Figure 12.	Ensuring $\overline{\text{RST}}$ valid to $V_{\text{CC}} = 0$ , (active-low push-pull outputs)	12
Figure 13.	Ensuring $\overline{\text{RST}}$ valid to $V_{\text{CC}} = 0$ , (active-high, push-pull outputs)	12
Figure 14.	Interfacing to microprocessors with bidirectional reset I/O	12
Figure 15.	$V_{\text{CC}}$ -to-reset output delay vs. temperature	13
Figure 16.	Supply current vs. temperature	13
Figure 17.	$\overline{\text{MR}}$ -to-reset output delay vs. temperature	14
Figure 18.	Normalized power-up $t_{\text{rec}}$ vs. temperature	14
Figure 19.	Normalized reset threshold voltage vs. temperature	15
Figure 20.	Normalized power-up watchdog timeout period	15
Figure 21.	Voltage output low vs. $I_{\text{SINK}}$	16
Figure 22.	Voltage output high vs. $I_{\text{SOURCE}}$	16
Figure 23.	Maximum transient duration vs. reset threshold overdrive	17
Figure 24.	AC testing input/output waveforms	19
Figure 25.	$\overline{\text{MR}}$ timing waveform	19
Figure 26.	Watchdog timing	19
Figure 27.	SOT23-5 – 5-lead small outline transistor package mechanical drawing	24
Figure 28.	Carrier tape for SOT23-5 package	25

# 1 Description

The STM6xxx supervisors are self-contained devices which provide microprocessor supervisory functions. A precision voltage reference and comparator monitors the  $V_{CC}$  input for an out-of-tolerance condition. When an invalid  $V_{CC}$  condition occurs, the reset output ( $\overline{RST}$ ) is forced low (or high in the case of RST). These devices also offer a watchdog timer (except for STM6322/6825) and/or a push-button ( $\overline{MR}$ ) reset input.

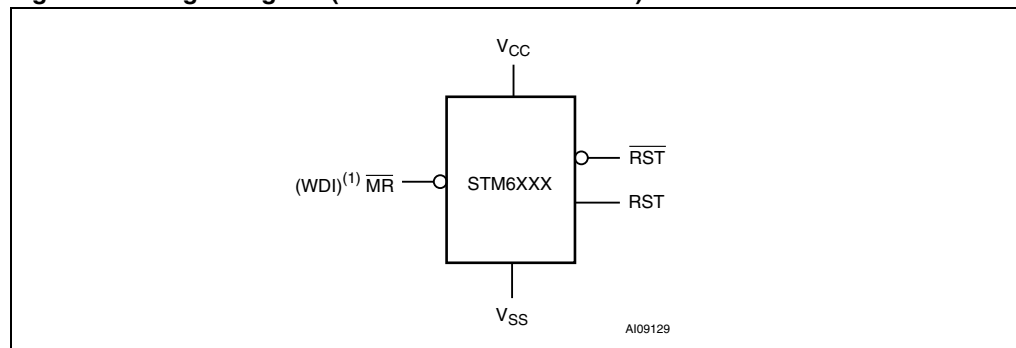
These devices are available in a standard 5-pin SOT23 package.

**Figure 1. Logic diagram (STM6821/6822/6823)**



1. For STM6821 only.

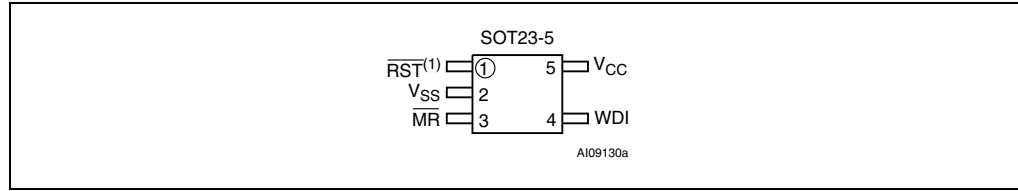
**Figure 2. Logic diagram (STM6321/6322/6824/6825)**



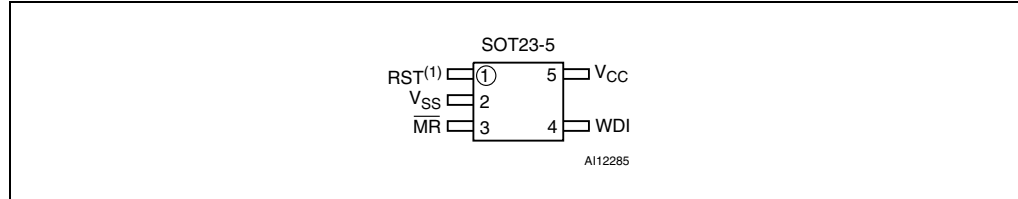
1. For STM6321/6824.

**Table 2. Signal names**

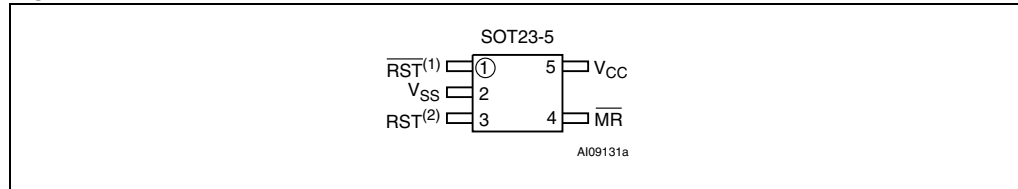
$\overline{MR}$	Push-button reset input
WDI	Watchdog input
$\overline{RST}$	Active-low reset output
RST	Active-high reset output
$V_{CC}$	Supply voltage
$V_{SS}$	Ground

**Figure 3. STM6822/6823 SOT23-5 connections**

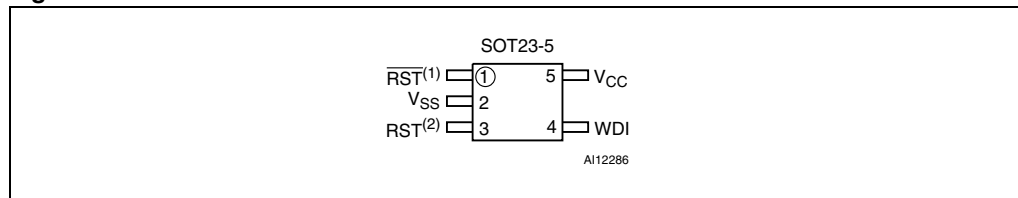
1. Open drain for STM6822.

**Figure 4. STM6821 SOT23-5 connections**

1. Push-pull only.

**Figure 5. STM6322/6825 SOT23-5 connections**

1. Open drain for STM6322.
2. Push-pull only.

**Figure 6. STM6321/6824 SOT23-5 connections**

1. Open drain for STM6321.
2. Push-pull only.

## 1.1 Pin descriptions

### 1.1.1 Active-low, push-pull reset output ( $\overline{\text{RST}}$ ) - 6823/6824/6825

Pulses low when triggered, and stays low whenever  $V_{\text{CC}}$  is below the reset threshold or when  $\overline{\text{MR}}$  is a logic low. It remains low for  $t_{\text{rec}}$  after either  $V_{\text{CC}}$  rises above the reset threshold, the watchdog triggers a reset, or  $\overline{\text{MR}}$  goes from low to high.

### 1.1.2 Active-low, open drain reset output ( $\overline{\text{RST}}$ ) - STM6321/6322/6822

Pulses low when triggered, and stays low whenever  $V_{\text{CC}}$  is below the reset threshold or when  $\overline{\text{MR}}$  is a logic low. It remains low for  $t_{\text{rec}}$  after either  $V_{\text{CC}}$  rises above the reset threshold, the watchdog triggers a reset, or  $\overline{\text{MR}}$  goes from low to high. Connect a pull-up resistor to supply voltage.

### 1.1.3 Push-button reset input ( $\overline{\text{MR}}$ )

A logic low on  $\overline{\text{MR}}$  asserts the reset output. Reset remains asserted as long as  $\overline{\text{MR}}$  is low and for  $t_{\text{rec}}$  after  $\overline{\text{MR}}$  returns high. This active-low input has an internal 52 k $\Omega$  pull-up. It can be driven from a TTL or CMOS logic line, or shorted to ground with a switch. Leave open if unused.

### 1.1.4 Watchdog input (WDI)

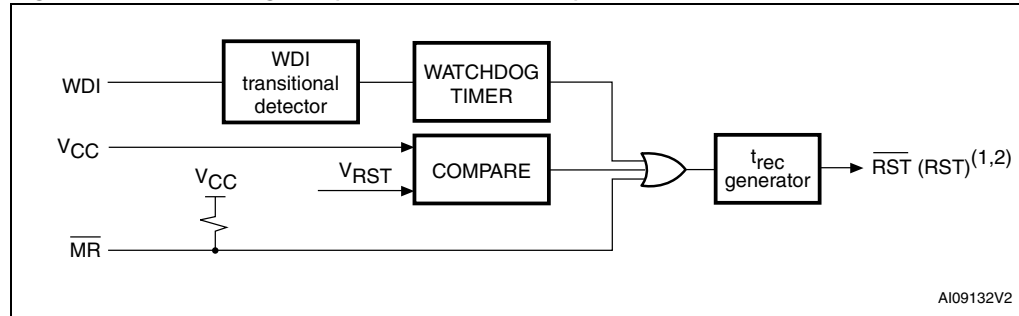
If WDI remains high or low for at least 1.6s, the internal watchdog timer expires and reset is asserted. The internal watchdog timer clears while reset is asserted or when WDI sees a rising or falling edge. The watchdog function **CAN** be disabled if WDI is left unconnected or is connected to a tri-state buffer output.

### 1.1.5 Active-high reset output (RST)

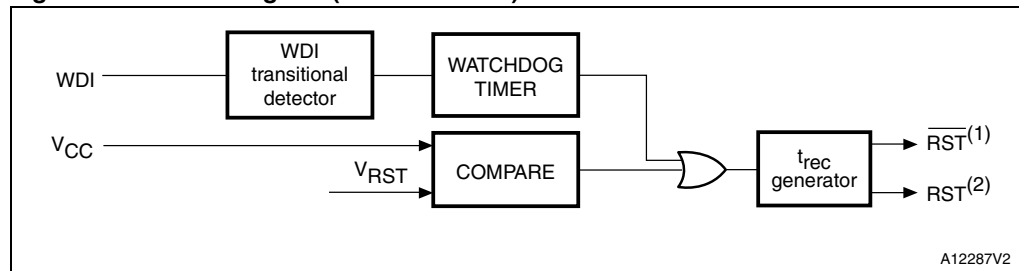
Active-high, push-pull reset output; inverse of  $\overline{\text{RST}}$ .

**Table 3. Pin functions**

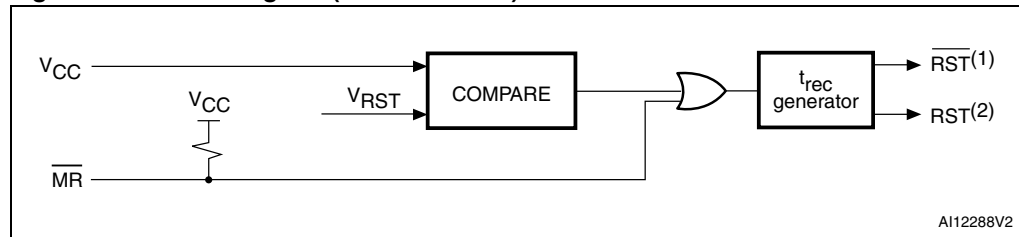
Pin				Name	Function
STM6822 STM6823	STM6821	STM6321 STM6824	STM6322 STM6825		
1	—	1	1	$\overline{\text{RST}}$	Active-low reset output
3	3	—	4	$\overline{\text{MR}}$	Push-button reset input
4	4	4	—	WDI	Watchdog Input
—	1	3	3	RST	Active-high reset output
5	5	5	5	$V_{\text{CC}}$	Supply voltage
2	2	2	2	$V_{\text{SS}}$	Ground

**Figure 7. Block diagram (STM6821/6822/6823)**

1. Push-pull for STM6823, open drain for STM6822.
2. Active-high (push-pull) for STM6821.

**Figure 8. Block diagram (STM6321/6824)**

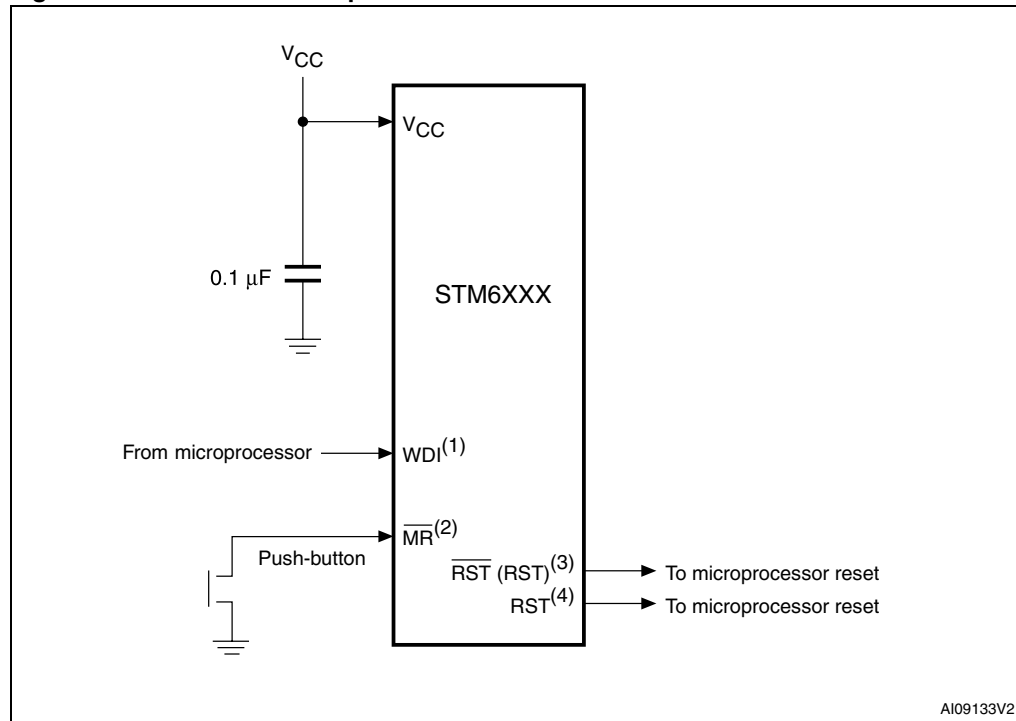
3. Active-low (open drain) for STM6321, active-low (push-pull) for STM6824.
4. Push-pull only.

**Figure 9. Block diagram (STM6322/6825)**

1. Active-low (open drain) for STM6322, active-low (push-pull) for STM6825.
2. Push-pull only.



Figure 10. Hardware hookup



1. For STM6321/6821/6822/6823/6824.
2. For STM6322/6821/6822/6823/6825.
3. For STM6821/ (RST output only).
4. For STM6321/6322/6824/6825 (both RST and  $\overline{\text{RST}}$  outputs).

## 2 Operation

### 2.1 Reset output

The STM6xxx supervisor asserts a reset signal to the MCU whenever  $V_{CC}$  goes below the reset threshold ( $V_{RST}$ ), a watchdog timeout occurs, or when the push-button reset input ( $\overline{MR}$ ) is taken low. Reset is guaranteed valid for  $V_{CC} < V_{RST}$  down to  $V_{CC} = 1\text{ V}$  for  $T_A = 0\text{ }^\circ\text{C}$  to  $85\text{ }^\circ\text{C}$ .

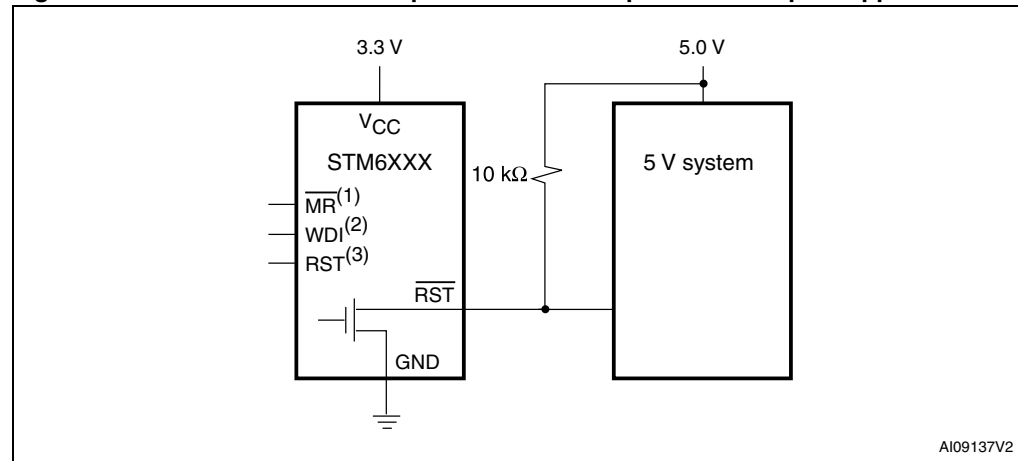
During power-up, once  $V_{CC}$  exceeds the reset threshold an internal timer keeps reset low for the reset timeout period,  $t_{rec}$ . After this interval reset is de-asserted.

Each time  $\overline{RST}$  is asserted, it stays low for at least the reset timeout period ( $t_{rec}$ ). Any time  $V_{CC}$  goes below the reset threshold the internal timer clears. The reset timer starts when  $V_{CC}$  returns above the reset threshold.

### 2.2 Open drain $\overline{RST}$ output

The STM6321/6322/6822 have an active-low, open drain reset output. This output structure will sink current when  $\overline{RST}$  is asserted. Connect a pull-up resistor from  $\overline{RST}$  to any supply voltage up to 6 V (see [Figure 11](#)). Select a resistor value large enough to register a logic low, and small enough to register a logic high while supplying all input current and leakage paths connected to the reset output line. A 10 k $\Omega$  pull-up resistor is sufficient in most applications.

**Figure 11. STM6321/6322/6822 open drain  $\overline{RST}$  output with multiple supplies**



1. STM6322/6822.
2. STM6321/6822.
3. STM6321/6322.

## 2.3 Push-button reset input (STM6322/6821/6822/6823/6825)

A logic low on  $\overline{MR}$  asserts reset. Reset remains asserted while  $\overline{MR}$  is low, and for  $t_{rec}$  (see [Figure 25 on page 19](#)) after it returns high. The  $\overline{MR}$  input has an internal 52 k $\Omega$  pull-up resistor, allowing it to be left open if not used. This input can be driven with TTL/CMOS-logic levels or with open drain/collector outputs. Connect a normally open momentary switch from  $\overline{MR}$  to GND to create a manual reset function; external debounce circuitry is not required. If  $\overline{MR}$  is driven from long cables or the device is used in a noisy environment, connect a 0.1  $\mu$ F capacitor from  $\overline{MR}$  to GND to provide additional noise immunity.  $\overline{MR}$  may float, or be tied to  $V_{CC}$  when not used.

## 2.4 Watchdog input (STM6321/6821/6822/6823/6824)

The watchdog timer can be used to detect an out-of-control MCU. If the MCU does not toggle the Watchdog Input (WDI) within  $t_{WD}$  (1.6 sec), the reset is asserted. The internal watchdog timer is cleared by either:

1. a reset pulse, or
2. by toggling WDI (high-to-low or low-to-high), which can detect pulses as short as 50 ns.

The timer remains cleared and does not count for as long as reset is asserted. As soon as reset is released, the timer starts counting.

*Note: The watchdog function may be disabled by floating WDI or tri-stating the driver connected to WDI. When tri-stated or disconnected, the maximum allowable leakage current is 10  $\mu$ A and the maximum allowable load capacitance is 200 pF.*

## 2.5 Applications information

### 2.5.1 Watchdog input current

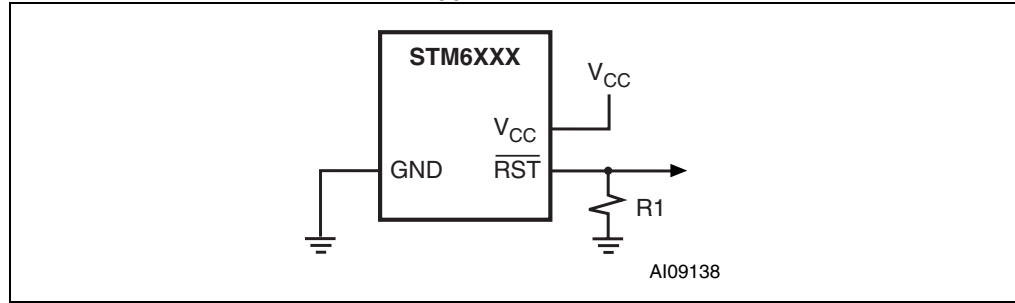
The WDI input is internally driven through a buffer and series resistor from the watchdog counter. For minimum watchdog input current (minimum overall power consumption), leave WDI low for the majority of the watchdog timeout period. When high, WDI can draw as much as 160  $\mu$ A. Pulsing WDI high at a low duty cycle will reduce the effect of the large input current. When WDI is left unconnected, the watchdog timer is serviced within the watchdog timeout period by a low-high-low pulse from the counter chain.

### 2.5.2 Ensuring a valid reset output down to $V_{CC} = 0$ V

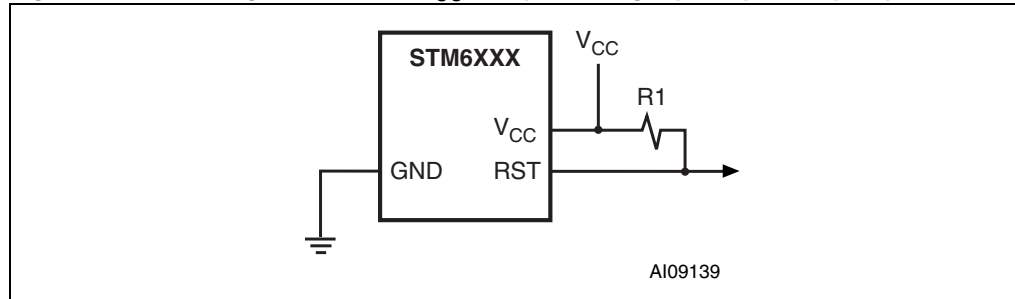
The STM6xxx supervisors are guaranteed to operate properly down to  $V_{CC} = 1$  V. In applications that require valid reset levels down to  $V_{CC} = 0$ , a pull-down resistor to active-low outputs (push/pull only, see [Figure 12 on page 12](#)) and a pull-up resistor to active-high outputs (push/pull only, see [Figure 13 on page 12](#)) will ensure that the reset line is valid while the reset output can no longer sink or source current. This scheme does not work with the open drain outputs of the STM6321/6322/6822.

The resistor value used is not critical, but it must be large enough not to load the reset output when  $V_{CC}$  is above the reset threshold. For most applications, 100 k $\Omega$  is adequate.

**Figure 12. Ensuring  $\overline{\text{RST}}$  valid to  $V_{\text{CC}} = 0$ , (active-low push-pull outputs)**



**Figure 13. Ensuring RST valid to  $V_{\text{CC}} = 0$ , (active-high, push-pull outputs)**

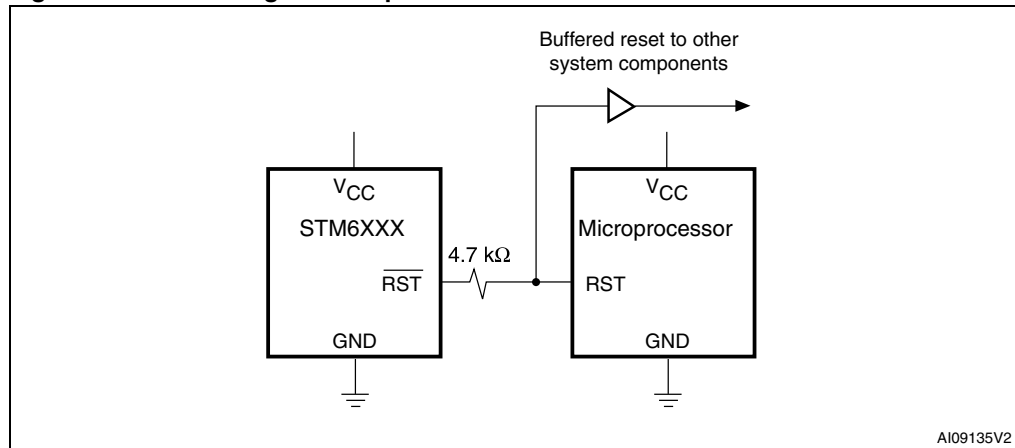


1. This configuration does not work on open drain outputs of the STM6321/6322/6822.

## 2.6 Interfacing to microprocessors with bidirectional reset pins

Microprocessors with bidirectional reset pins can contend with the STM6321 / 6322 / 6821 / 6822 / 6823 / 6824 / 6825 reset output. For example, if the reset output is driven high and the microprocessor wants to pull it low, signal contention will result. To prevent this from occurring, connect a 4.7 kΩ resistor between the reset output and the microprocessor's reset I/O as in [Figure 14](#).

**Figure 14. Interfacing to microprocessors with bidirectional reset I/O**



### 3 Typical operating characteristics

Figure 15.  $V_{CC}$ -to-reset output delay vs. temperature

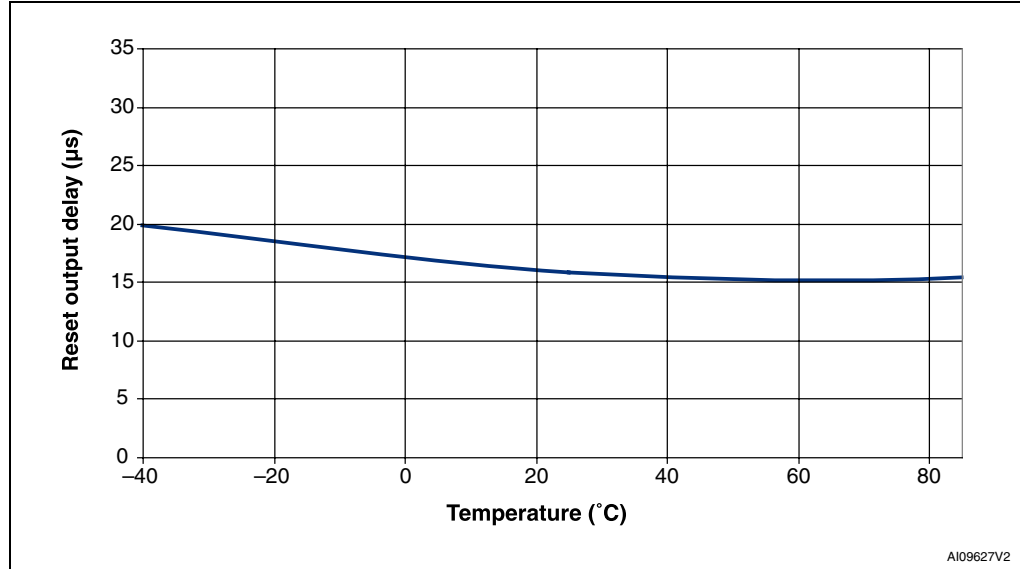


Figure 16. Supply current vs. temperature

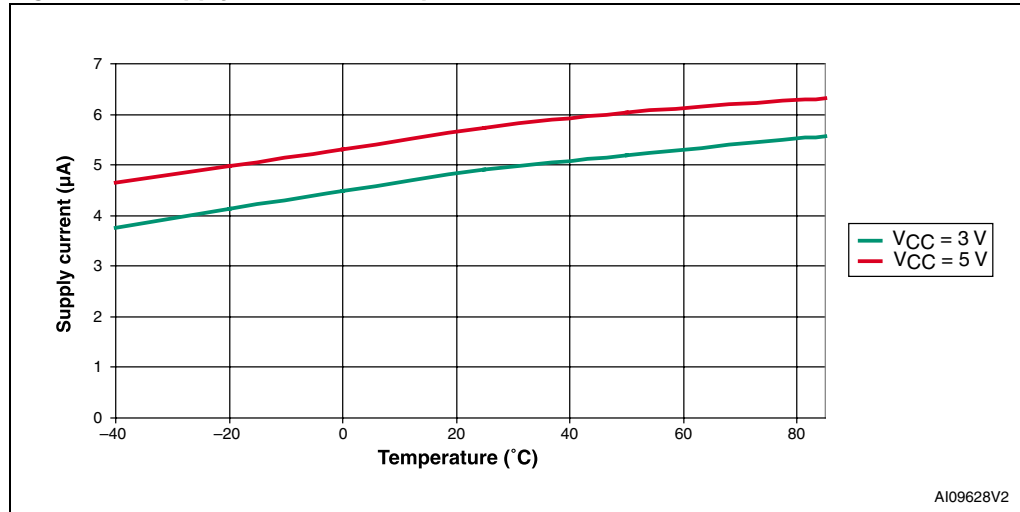


Figure 17.  $\overline{MR}$ -to-reset output delay vs. temperature

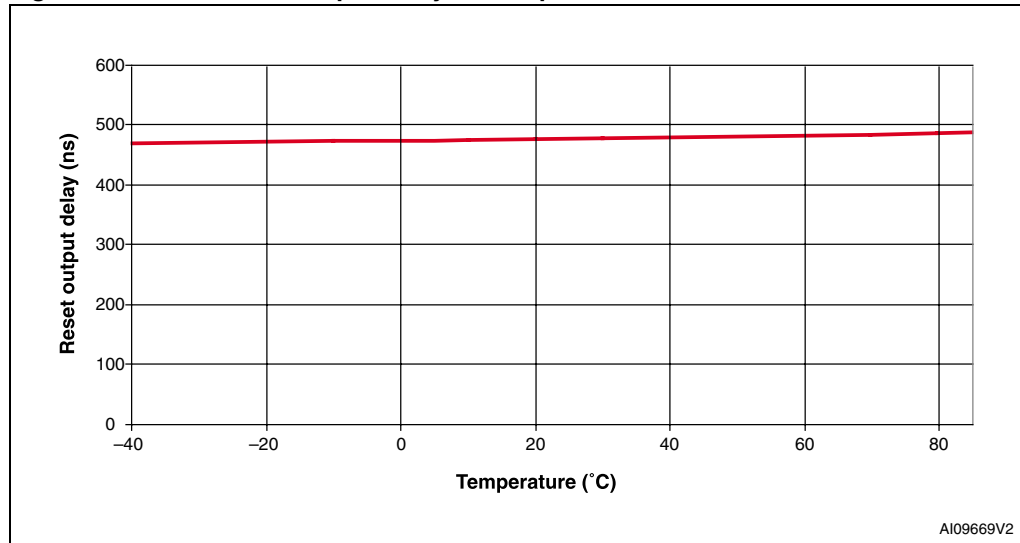


Figure 18. Normalized power-up  $t_{rec}$  vs. temperature

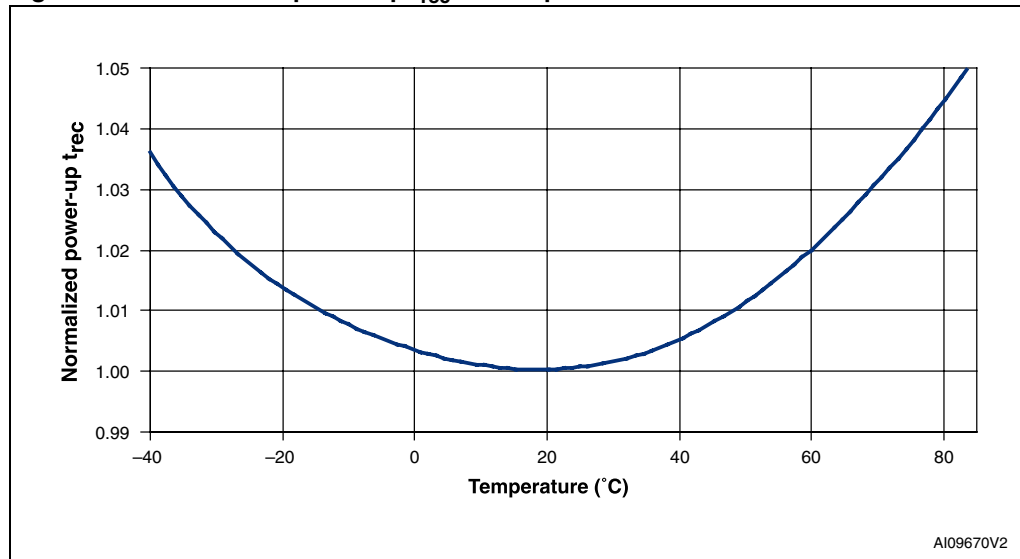


Figure 19. Normalized reset threshold voltage vs. temperature

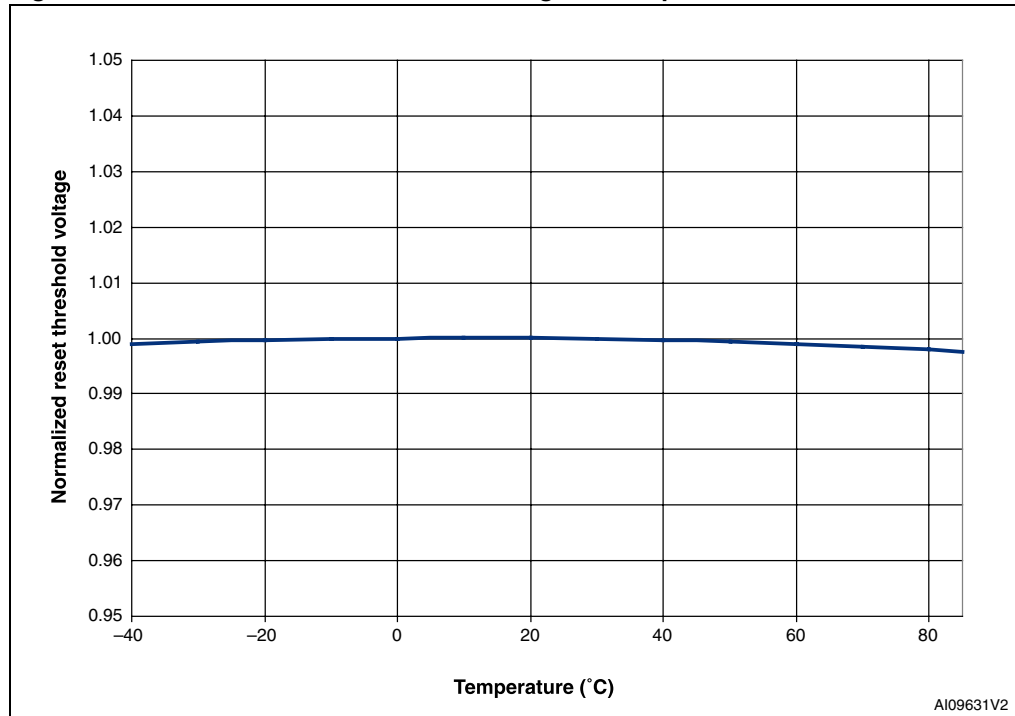


Figure 20. Normalized power-up watchdog timeout period

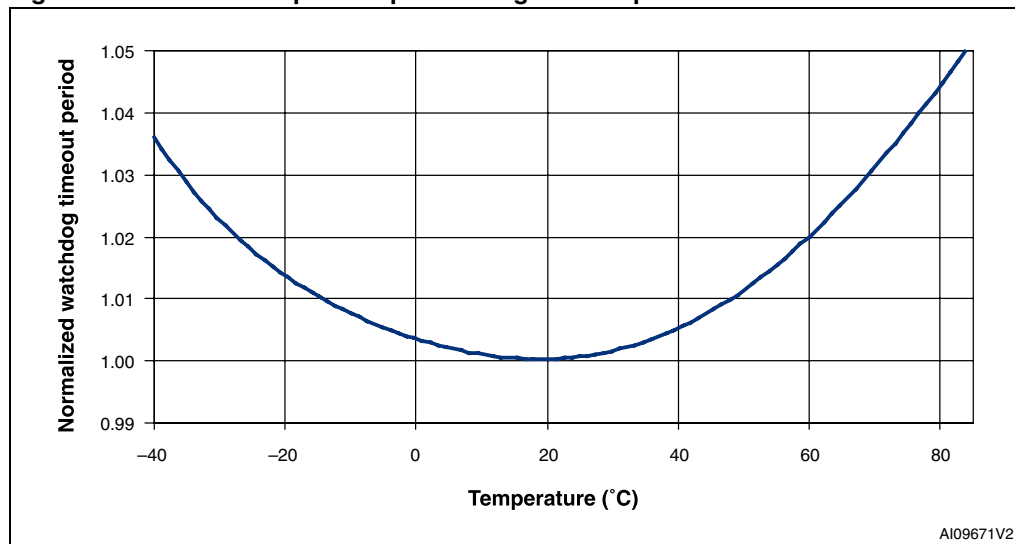


Figure 21. Voltage output low vs.  $I_{SINK}$

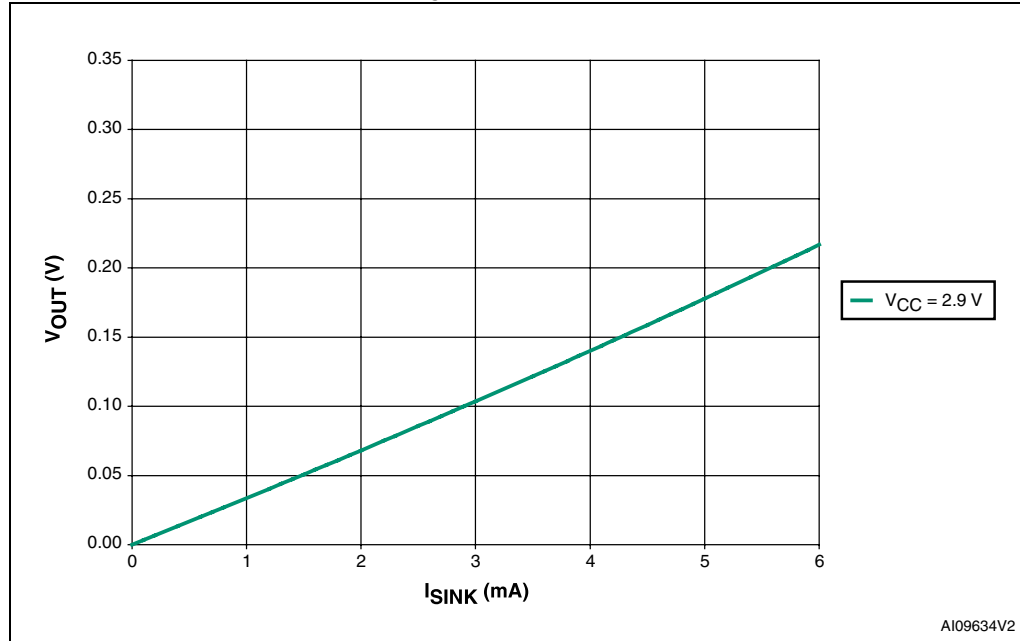


Figure 22. Voltage output high vs.  $I_{SOURCE}$

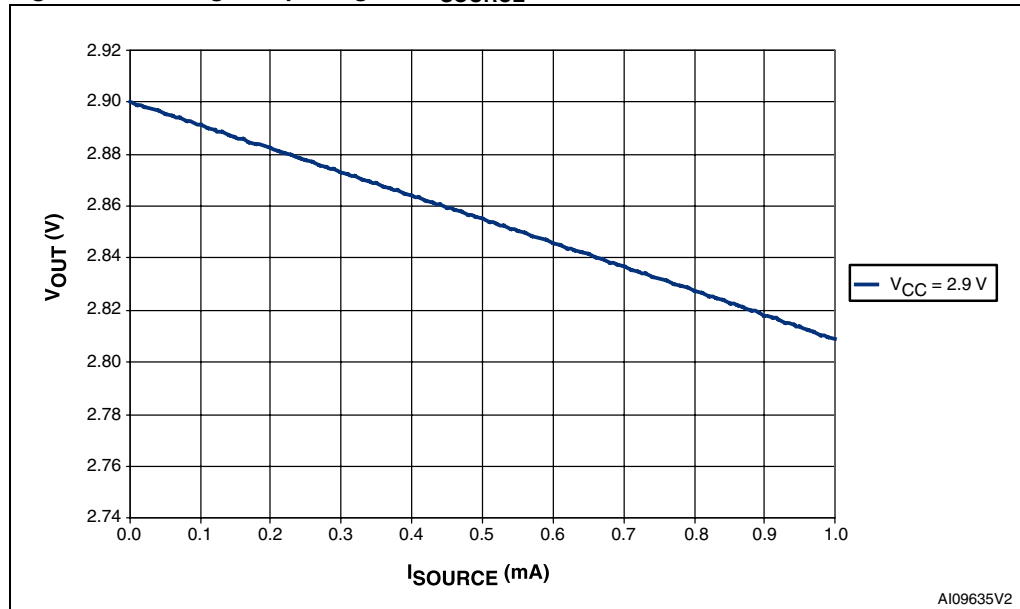
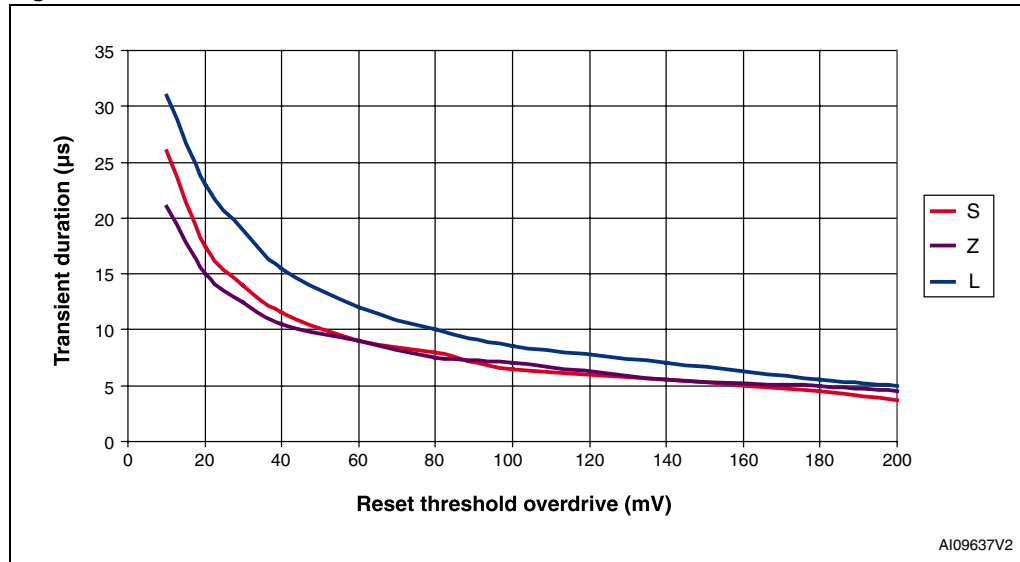




Figure 23. Maximum transient duration vs. reset threshold overdrive



## 4 Maximum ratings

Stressing the device above the rating listed in [Table 4](#) may cause permanent damage to the device. These are stress ratings only and operation of the device at these or any other conditions above those indicated in the operating sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability. Refer also to the STMicroelectronics™ SURE Program and other relevant quality documents.

**Table 4. Absolute maximum ratings**

Symbol	Parameter	Value	Unit
T <sub>STG</sub>	Storage temperature (V <sub>CC</sub> off)	-55 to 150	°C
T <sub>SLD</sub> <sup>(1)</sup>	Lead solder temperature for 10 seconds	260	°C
V <sub>IO</sub>	Input or output voltage	-0.3 to V <sub>CC</sub> + 0.3	V
V <sub>CC</sub>	Supply voltage	-0.3 to 7.0	V
I <sub>O</sub>	Output current	20	mA
P <sub>D</sub>	Power dissipation	320	mW

1. Reflow at peak temperature of 260 °C (total thermal budget not to exceed 245 °C for greater than 30 seconds).

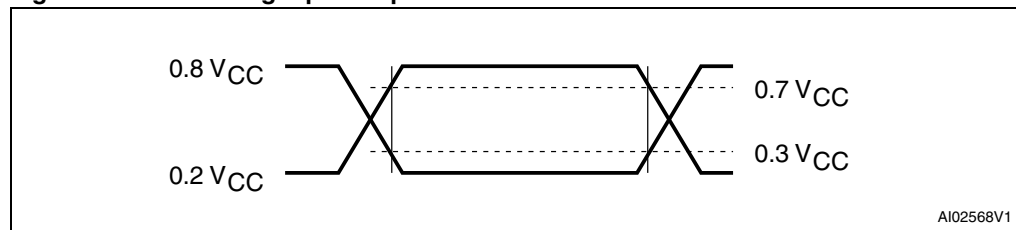
## 5 DC and AC parameters

This section summarizes the operating measurement conditions, and the DC and AC characteristics of the device. The parameters in the DC and AC characteristics tables that follow, are derived from tests performed under the measurement conditions summarized in [Table 5](#). Designers should check that the operating conditions in their circuit match the operating conditions when relying on the quoted parameters.

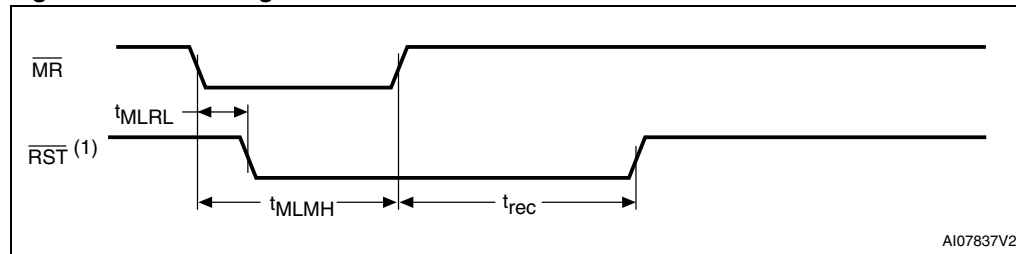
**Table 5. Operating and AC measurement conditions**

Parameter	STM6xxx	Unit
V <sub>CC</sub> supply voltage	1.0 to 5.5	V
Ambient operating temperature (T <sub>A</sub> )	-40 to 85	°C
Input rise and fall times	≤ 5	ns
Input pulse voltages	0.2 to 0.8 V <sub>CC</sub>	V
Input and output timing ref. voltages	0.3 to 0.7 V <sub>CC</sub>	V

**Figure 24. AC testing input/output waveforms**

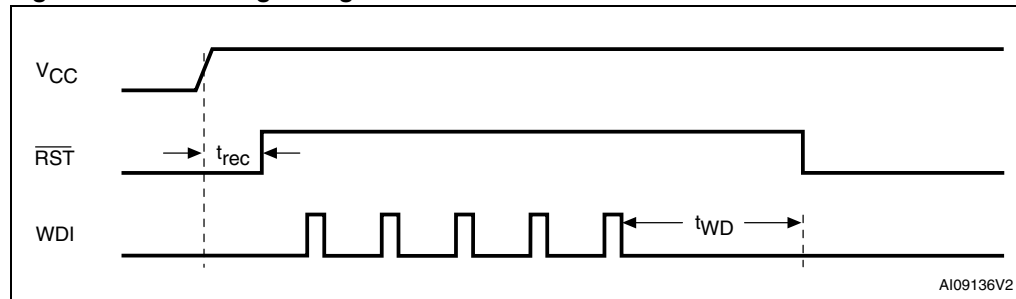


**Figure 25. MR timing waveform**



1. RST for STM6322/6821/6825.

**Figure 26. Watchdog timing**



## 6 Package mechanical data

Table 6. DC and AC characteristic

Sym	Alter-native	Description	Test condition <sup>(1)</sup>	Min	Typ	Max	Unit
V <sub>CC</sub>		Operating voltage		1.2 <sup>(2)</sup>		5.5	V
I <sub>CC</sub>		V <sub>CC</sub> supply current ( $\overline{MR}$ and WDI unconnected)	T/S/R/Z/Y (V <sub>CC</sub> < 3.6 V)		4	12	μA
			L/M (V <sub>CC</sub> < 5.5 V)		6	17	μA
		V <sub>CC</sub> supply current ( $\overline{MR}$ unconnected; STM6322/6825)	T/S/R/Z/Y (V <sub>CC</sub> < 3.6 V)		3	8	μA
			L/M (V <sub>CC</sub> < 5.5 V)		3	12	μA
I <sub>LI</sub>		Input leakage current	0 V = V <sub>IN</sub> = V <sub>CC</sub>	-1		+1	μA
		Input leakage current (WDI) <sup>(3)</sup>	WDI = V <sub>CC</sub> , time average		120	160	μA
			WDI = GND, time average	-20	-15		μA
I <sub>LO</sub>		Open drain reset output leakage current	V <sub>CC</sub> > V <sub>RST</sub> , Reset not asserted	-1		+1	μA
V <sub>IH</sub>		Input high voltage ( $\overline{MR}$ )	V <sub>RST</sub> > 4.0 V	2.0			V
			V <sub>RST</sub> < 4.0 V	0.7 V <sub>CC</sub>			V
V <sub>IH</sub>		Input high voltage (WDI) <sup>(4)</sup>	V <sub>RST</sub> (max) < V <sub>CC</sub> < 5.5 V	0.7 V <sub>CC</sub>			V
V <sub>IL</sub>		Input low voltage ( $\overline{MR}$ )	V <sub>RST</sub> > 4.0 V			0.8	V
			V <sub>RST</sub> < 4.0 V			0.3 V <sub>CC</sub>	V
V <sub>IL</sub>		Input low voltage (WDI) <sup>(4)</sup>	V <sub>RST</sub> (max) < V <sub>CC</sub> < 5.5 V			0.3 V <sub>CC</sub>	V
V <sub>OL</sub>		Output low voltage ( $\overline{RST}$ ; push-pull or open drain)	V <sub>CC</sub> ≥ 1.0 V, I <sub>SINK</sub> = 50 μA, Reset asserted			0.3	V
			V <sub>CC</sub> ≥ 1.2 V, I <sub>SINK</sub> = 100 μA, Reset asserted			0.3	V
			V <sub>CC</sub> ≥ 2.7 V, I <sub>SINK</sub> = 1.2 mA, Reset asserted			0.3	V
			V <sub>CC</sub> ≥ 4.5 V, I <sub>SINK</sub> = 3.2 mA, Reset asserted			0.4	V
		Output low voltage (RST; push-pull only)	V <sub>CC</sub> ≥ 2.7 V, I <sub>SINK</sub> = 1.2 mA, Reset not asserted			0.3	V
			V <sub>CC</sub> ≥ 4.5 V, I <sub>SINK</sub> = 3.2 mA, Reset not asserted			0.4	V

Table 6. DC and AC characteristic (continued)

Sym	Alter-native	Description	Test condition (1)	Min	Typ	Max	Unit	
$V_{OH}$		Output high voltage ( $\overline{RST}$ )	$V_{CC} \geq 2.7\text{ V}$ , $I_{SOURCE} = 500\ \mu\text{A}$ , Reset not asserted	$0.8 V_{CC}$			V	
			$V_{CC} \geq 4.5\text{ V}$ , $I_{SOURCE} = 800\ \mu\text{A}$ , Reset not asserted	$0.8 V_{CC}$			V	
		Output high voltage (RST)	$V_{CC} \geq 1.0\text{ V}$ , $I_{SOURCE} = 1\ \mu\text{A}$ , Reset asserted (0 °C to 85 °C)	$0.8 V_{CC}$			V	
			$V_{CC} \geq 1.5\text{ V}$ , $I_{SOURCE} = 100\ \mu\text{A}$ , Reset asserted	$0.8 V_{CC}$			V	
			$V_{CC} \geq 2.55\text{ V}$ , $I_{SOURCE} = 500\ \mu\text{A}$ , Reset asserted	$0.8 V_{CC}$			V	
			$V_{CC} \geq 4.25\text{ V}$ , $I_{SOURCE} = 800\ \mu\text{A}$ , Reset asserted	$0.8 V_{CC}$			V	
<b>Reset thresholds</b>								
$V_{RST}^{(5)}$		Reset threshold	STM6xxxL	25 °C	4.561	4.630	4.699	V
				-40 to 85 °C	4.514		4.746	V
			STM6xxxM	25 °C	4.314	4.390	4.446	V
				-40 to 85 °C	4.270		4.490	V
			STM6xxxT	25 °C	3.040	3.080	3.110	V
				-40 to 85 °C	3.000		3.150	V
			STM6xxxS	25 °C	2.890	2.930	2.960	V
				-40 to 85 °C	2.857		3.000	V
			STM6xxxR	25 °C	2.590	2.630	2.660	V
				-40 to 85 °C	2.564		2.696	V
			STM6xxxZ	25 °C	2.266	2.300	2.335	V
				-40 to 85 °C	2.243		2.358	V
			STM6xxxY	25 °C	1.970	2.000	2.030	V
				-40 to 85 °C	1.950		2.050	V
		Reset threshold hysteresis	L/M versions			10	mV	
			T/S/R/Z/Y versions			5	mV	
		$V_{CC}$ to $\overline{RST}$ delay ( $V_{RST} - V_{CC} = 100\text{ mV}$ , $V_{CC}$ falling at $1\text{ mV}/\mu\text{s}$ )			20		$\mu\text{s}$	
$t_{rec}^{(6)}$		Reset pulse width	A	1	1.4	2	ms	
			Blank	140	200	280	ms	
			J	240	360	480	ms	

Table 6. DC and AC characteristic (continued)

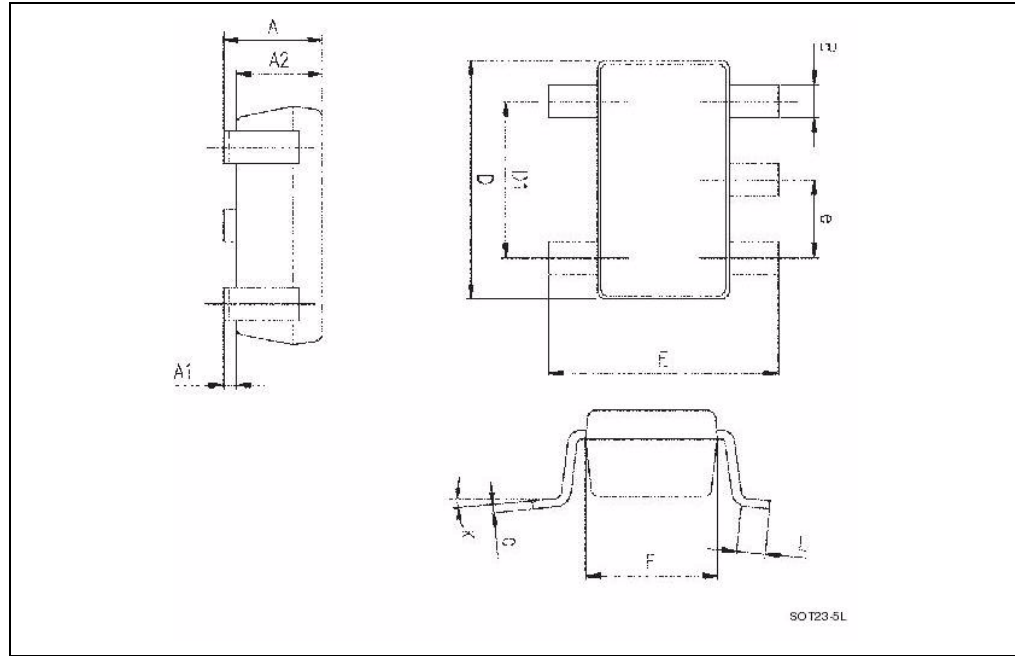
Sym	Alter-native	Description	Test condition <sup>(1)</sup>	Min	Typ	Max	Unit
		Reset threshold temperature coefficient			40		ppm/C
<b>Push-button reset input</b>							
t <sub>MLMH</sub>	t <sub>MR</sub>	$\overline{MR}$ pulse width		1			μs
t <sub>MLRL</sub>	t <sub>MRD</sub>	$\overline{MR}$ to $\overline{RST}$ output delay			500		ns
		$\overline{MR}$ glitch immunity			100		ns
		$\overline{MR}$ pull-up resistor		35	52	75	kΩ
<b>Watchdog timer</b>							
t <sub>WD</sub> <sup>(6)</sup>		Watchdog timeout period		1.12	1.60	2.24	s
		WDI pulse width <sup>(7)</sup>	V <sub>CC</sub> ≥ 3.0 V	50			ns

- Valid for ambient operating temperature: T<sub>A</sub> = -40 to 85 °C; V<sub>CC</sub> = 4.5 to 5.5 V for "L/M" versions; V<sub>CC</sub> = 2.7 to 3.6 V for "T/S/R" versions; and V<sub>CC</sub> = 1.2 to 2.75 V for "Z/Y" version (except where noted).
- V<sub>CC</sub> (min) = 1.0 V for T<sub>A</sub> = 0 to +85 °C.
- WDI input is designed to be driven by a three-state output device. To float WDI, the "high-impedance mode" of the output device must have a maximum leakage current of 10 μA and a maximum output capacitance of 200 pF. The output device must also be able to source and sink at least 200 μA when active.
- WDI is internally serviced within the watchdog period if WDI is left unconnected.
- The leakage current measured on the RST pin is tested with the reset asserted (output high impedance).
- Other t<sub>rec</sub> and watchdog timings are offered. Minimum order quantities may apply. Contact local sales office for availability.
- For V<sub>CC</sub> < 3.0 V, t<sub>WD</sub>(min) = 100 ns.

## 7 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK<sup>®</sup> packages, depending on their level of environmental compliance. ECOPACK<sup>®</sup> specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK<sup>®</sup> is an ST trademark.

Figure 27. SOT23-5 – 5-lead small outline transistor package mechanical drawing



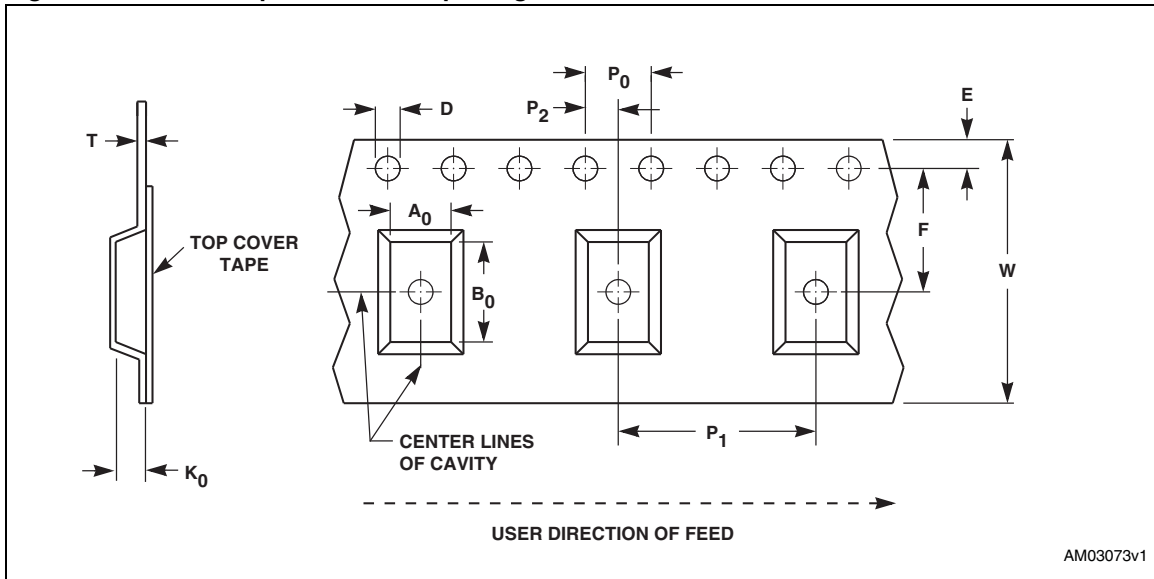
1. Drawing is not to scale.

Table 7. SOT23-5 – 5-lead small outline transistor package mechanical data

Symb	mm			inches		
	Typ	Min	Max	Typ	Min	Max
A	1.20	0.90	1.45	0.047	0.035	0.057
A1			0.15			0.006
A2	1.05	0.90	1.30	0.041	0.035	0.051
B	0.40	0.35	0.50	0.016	0.014	0.020
C	0.15	0.09	0.20	0.006	0.004	0.008
D	2.90	2.80	3.00	0.114	0.110	0.118
D1	1.90			0.075		
E	2.80	2.60	3.00	0.110	0.102	0.118
e	0.95			0.037		
F	1.60	1.50	1.75	0.063	0.059	0.069
K		0°	10°		0°	10°
L	0.35	0.10	0.60	0.014	0.004	0.024



Figure 28. Carrier tape for SOT23-5 package



AM03073v1

Table 8. Carrier tape dimensions for SOT23-5 package

Package	W	D	E	P <sub>0</sub>	P <sub>2</sub>	F	A <sub>0</sub>	B <sub>0</sub>	K <sub>0</sub>	P <sub>1</sub>	T	Unit	Bulk Qty
SOT23-5	8.00 +0.30 -0.10	1.50 +0.10/ -0.00	1.75 ±0.10	4.00 ±0.10	2.00 ±0.10	3.50 ±0.05	3.23 ±0.10	3.17 ±0.10	1.37 ±0.10	4.00 ±0.10	0.254 ±0.013	mm	3000

## 8 Part numbering

**Table 9. Ordering information scheme**

Example:	STM6xxx	L	WY	6	E
<b>Device type</b>	STM6xxx				
<b>Reset threshold voltage</b>					
L: $V_{RST} = 4.514$ to $4.746$ V					
M: $V_{RST} = 4.270$ to $4.490$ V					
T: $V_{RST} = 3.000$ to $3.150$ V					
S: $V_{RST} = 2.850$ to $3.000$ V					
R: $V_{RST} = 2.564$ to $2.696$ V					
Z: $V_{RST} = 2.243$ to $2.358$ V					
Y: $V_{RST} = 1.950$ to $2.050$ V					
<b>Reset pulse width<sup>(1)</sup></b>					
A: $t_{rec} = 1$ to $2$ ms					
Blank: $t_{rec} = 140$ to $280$ ms					
J: $t_{rec} = 240$ to $480$ ms					
<b>Package</b>					
WY = SOT23-5					
<b>Temperature range</b>					
6 = $-40$ to $85$ °C					
<b>Shipping method</b>					
E = ECOPACK <sup>®</sup> package, tubes					
F = ECOPACK <sup>®</sup> package, tape and reel					

1. Contact local sales office for availability. Other  $t_{rec}$  and watchdog timings are offered. Minimum order quantities may apply. Contact local sales office for availability.

For other options, or for more information on any aspect of this device, please contact the ST sales office nearest you.

Table 10. Marking description

Part number	Reset threshold (V)	Reset pulse width (ms)	Topside marking
STM6321LWY6F	4.630	200	5AUx
STM6321MAWY6F	4.390	1.4	5CRx
STM6321MWY6F	4.390	200	5AVx
STM6321TWY6F	3.080	200	5AWx
STM6321SWY6F	2.930	200	5AXx
STM6321RWY6F	2.630	200	5AYx
STM6322LWY6F	4.630	200	5BAx
STM6322MWY6F	4.390	200	5BBx
STM6322TWY6F	3.080	200	5BCx
STM6322SWY6F	2.930	200	5BDx
STM6322RWY6F	2.630	200	5BEx
STM6821LWY6F	4.630	200	5BGx
STM6821MWY6F	4.390	200	5BHx
STM6821TWY6F	3.080	200	5BJx
STM6821SWY6F	2.930	200	5BKx
STM6821RWY6F	2.630	200	5BLx
STM6822LWY6F	4.630	200	5BNx
STM6822MWY6F	4.390	200	5BPx
STM6822TWY6F	3.080	200	5BQx
STM6822SWY6F	2.930	200	5BRx
STM6822RWY6F	2.630	200	5BSx
STM6822ZWY6F	2.300	200	5BTx
STM6822YWY6F	2.000	200	5CTx
STM6823LWY6F	4.630	200	5BUx
STM6823MWY6F	4.390	200	5BVx
STM6823TJWY6F	3.080	280	5CMx
STM6823TWY6F	3.080	200	5BWx
STM6823SJWY6F	2.930	280	5CNx
STM6823SWY6F	2.930	200	5BXx
STM6823RJWY6F	2.630	280	5CPx
STM6823RWY6F	2.630	200	5BYx
STM6823ZWY6F	2.300	200	5BZx
STM6824LWY6F	4.630	200	5CAx
STM6824MWY6F	4.390	200	5CBx
STM6824TWY6F	3.080	200	5CCx
STM6824SWY6F	2.930	200	5CDx
STM6824RWY6F	2.630	200	5CEx
STM6825LWY6F	4.630	200	5CGx
STM6825MWY6F	4.390	200	5CHx
STM6825TWY6F	3.080	200	5CJx
STM6825SWY6F	2.930	200	5CKx
STM6825RWY6F	2.630	200	5CLx

Note: Where "x" = assembly work week (A to Z), such that "A" = WW01-02, "B" = WW03-04, and so forth.

## 9 Revision history

**Table 11. Document revision history**

Date	Revision	Changes
25-Aug-2004	1	First draft
15-Dec-2004	2	Update characteristics ( <a href="#">Figure 15</a> , <a href="#">16</a> , <a href="#">17</a> ; <a href="#">Table 6</a> , and <a href="#">9</a> )
10-Mar-2005	3	Document promoted to Datasheet status
17-Jun-2005	4	Package marking update ( <a href="#">Table 10</a> )
11-Apr-2006	5	Update characteristics, Lead-free text, availability ( <a href="#">Figure 3</a> , <a href="#">4</a> , <a href="#">5</a> , <a href="#">6</a> , <a href="#">7</a> , <a href="#">8</a> , and <a href="#">9</a> ; <a href="#">Table 1</a> , <a href="#">6</a> , <a href="#">9</a> , and <a href="#">10</a> )
11-Aug-2006	6	Update <a href="#">Description</a> , <a href="#">Table 9</a> , and <a href="#">10</a> .
25-May-2007	7	Formatting changes, updated <a href="#">Table 10</a> .
03-Jun-2008	8	Updated cover page; updated reset threshold values in <a href="#">Table 6</a> , <a href="#">9</a> , and <a href="#">10</a> ; addition of text to <a href="#">Section 6</a> ; updated <a href="#">Figure 27</a> and <a href="#">Table 6</a> and <a href="#">7</a> ; minor text changes.
09-Apr-2009	9	Updated <a href="#">Section 1.1.1</a> , <a href="#">Section 6</a> ; added tape and reel specifications <a href="#">Figure 28</a> , <a href="#">Table 8</a> .
06-Jan-2011	10	Document reformatted, Doc ID added, updated <a href="#">Table 10</a> , corrected typo in <a href="#">Features</a> , <a href="#">Section 1.1.4</a> , <a href="#">Section 2.1</a> , <a href="#">Section 2.3</a> , <a href="#">Section 4</a> , <a href="#">Table 4</a> , <a href="#">Table 6</a> , <a href="#">Table 9</a> , <a href="#">Figure 7</a> to <a href="#">Figure 11</a> , <a href="#">Figure 14</a> to <a href="#">Figure 26</a> .

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