



STM809, STM810 STM811, STM812

Reset Circuit

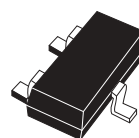
FEATURES SUMMARY

- PRECISION MONITORING OF 3V, 3.3V, and 5V SUPPLY VOLTAGES
- TWO OUTPUT CONFIGURATIONS
 - Push-pull $\overline{\text{RST}}$ Output (STM809/811)
 - Push-pull RST Output (STM810/812)
- 140ms RESET PULSE WIDTH (MIN)
- LOW SUPPLY CURRENT - 6 μ A (TYP)
- GUARANTEED $\overline{\text{RST}}$ /RST ASSERTION DOWN TO $V_{\text{CC}} = 1.0\text{V}$
- OPERATING TEMPERATURE:
–40°C to 85°C (Industrial Grade)
- LEAD-FREE, SMALL SOT23 and SOT143 PACKAGE

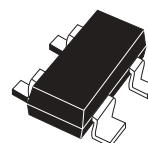
Table 1. Device Options

	Active-Low RESET	Active-High RESET	Manual RESET Input	Package
STM809	✓			SOT23-3
STM810		✓		SOT23-3
STM811	✓		✓	SOT143-4
STM812		✓	✓	SOT143-4

Figure 1. Packages



SOT23-3 (WX)



SOT143-4 (W1)

MAXIMUM RATING

Stressing the device above the rating listed in the Absolute Maximum Ratings table 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 im-

plied. 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 3. Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
T_{STG}	Storage Temperature (V_{CC} Off)	-55 to 150	°C
$T_{SLD}^{(1)}$	Lead Solder Temperature for 10 seconds	260	°C
V_{IO}	Input or Output Voltage	-0.3 to $V_{CC} + 0.3$	V
V_{CC}	Supply Voltage	-0.3 to 7.0	V
I_O	Output Current	20	mA
P_D	Power Dissipation	320	mW

Note: 1. Reflow at peak temperature of 255°C to 260°C for < 30 seconds (total thermal budget not to exceed 180°C for between 90 to 150 seconds).

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 4.](#), Operating and AC Measurement Conditions. Designers should check that the operating conditions in their circuit match the operating conditions when relying on the quoted parameters.

Table 4. Operating and AC Measurement Conditions

Parameter	STM809/810/811/812	Unit
V _{CC} Supply Voltage	1.0 to 5.5	V
Ambient Operating Temperature (T _A)	–40 to 85	°C
Input Rise and Fall Times	≤ 5	ns
Input Pulse Voltages	0.2 to 0.8V _{CC}	V
Input and Output Timing Ref. Voltages	0.3 to 0.7V _{CC}	V

Figure 14. AC Testing Input/Output Waveforms

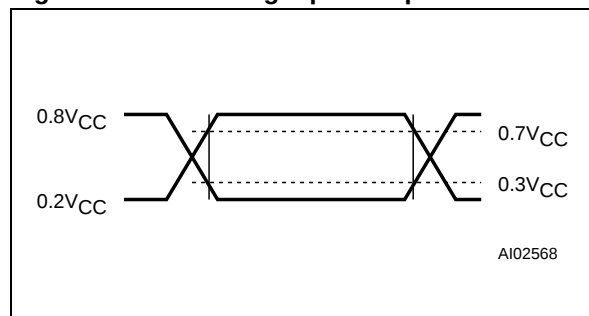
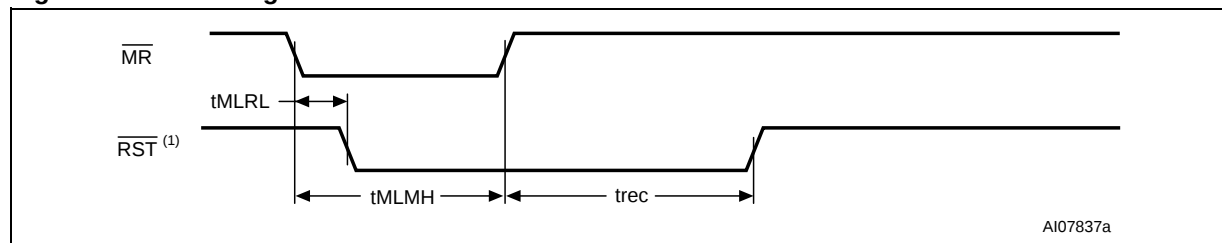


Figure 15. $\overline{\text{MR}}$ Timing Waveform



Note: 1. RST for STM810/812

Table 5. DC and AC Characteristics

Sym	Alter- native	Description	Test Condition ⁽¹⁾	Min	Typ	Max	Unit	
V _{CC}		Operating Voltage	T _A = −40 to +85°C	1.2		5.5	V	
			T _A = 0 to +70°C	1.0		5.5	V	
I _{CC}		V _{CC} Supply Current	V _{CC} < 3.6V		5.5	10	μA	
			V _{CC} < 5.5V		7	15	μA	
V _{IH}		$\overline{\text{MR}}$ Input High Voltage	V _{CC} > V _{RST} (max), STM8XXL/M	2.2			V	
			V _{CC} > V _{RST} (max), STM8XXR/S/T	0.7V _{CC}			V	
V _{IL}		$\overline{\text{MR}}$ Input Low Voltage	V _{CC} > V _{RST} (max), STM8XXL/M			0.8	V	
			V _{CC} > V _{RST} (max), STM8XXR/S/T			0.25V _{CC}	V	
V _{OL}		$\overline{\text{RST}}$ Output Low Voltage (Active High ⁽²⁾ or Low)	STM8XXR/S/T only, I _{OL} = 1.2mA V _{CC} = V _{RST} (min)			0.3	V	
			STM8XXL/M only, I _{OL} = 3.2mA V _{CC} = V _{RST} (min)			0.4	V	
V _{OL}		$\overline{\text{RST}}$ Output Low Voltage	I _{OL} = 50μA; V _{CC} > 1.0V			0.3	V	
V _{OH}		$\overline{\text{RST}}$ Output High Voltage	STM8XXR/S/T only, I _{OH} = 500μA	0.8V _{CC}			V	
			STM8XXL/M only, I _{OH} = 800μA	0.8V _{CC}			V	
		RST Output High Voltage	I _{OH} = 150μA, 1.8V < V _{CC} < V _{RST} (min)	0.8V _{CC}			V	
RESET Thresholds								
V _{RST}		Reset Threshold	STM8XXL	25°C	4.56	4.63	4.70	V
				−40 to 85°C	4.50		4.75	V
			STM8XXM	25°C	4.31	4.38	4.45	V
				−40 to 85°C	4.25		4.50	V
			STM8XXT	25°C	3.04	3.08	3.11	V
				−40 to 85°C	3.00		3.15	V
			STM8XXS	25°C	2.89	2.93	2.96	V
				−40 to 85°C	2.85		3.00	V
			STM8XXR	25°C	2.59	2.63	2.66	V
				−40 to 85°C	2.55		2.70	V
		V _{RST} Temperature Coefficient	V _{CC} = 3.3V			45	ppm/ C	
		V _{CC} to $\overline{\text{RST}}$ Delay	V _{CC} = V _{RST} to (V _{RST} − 100mV)	STM8XXL/M		40	μs	
				STM8XXR/S/T		20	μs	
Push-Button RESET Input								
t _{MLMH}	t _{MR}	$\overline{\text{MR}}$ Pulse Width		10			μs	
t _{MLRL}	t _{MRD}	$\overline{\text{MR}}$ to $\overline{\text{RST}}$ Output Delay ⁽³⁾			0.5		μs	
		$\overline{\text{MR}}$ Glitch Immunity ⁽⁴⁾			100		ns	
		$\overline{\text{MR}}$ Pull-up Resistance		10	20	30	kΩ	
	t _{rec}	$\overline{\text{RST}}$ Pulse Width		140	210	280	ms	

Note: 1. Valid for Ambient Operating Temperature: T_A = -40 to 85°C; V_{CC} = 1.2V to 5.5V (except where noted).

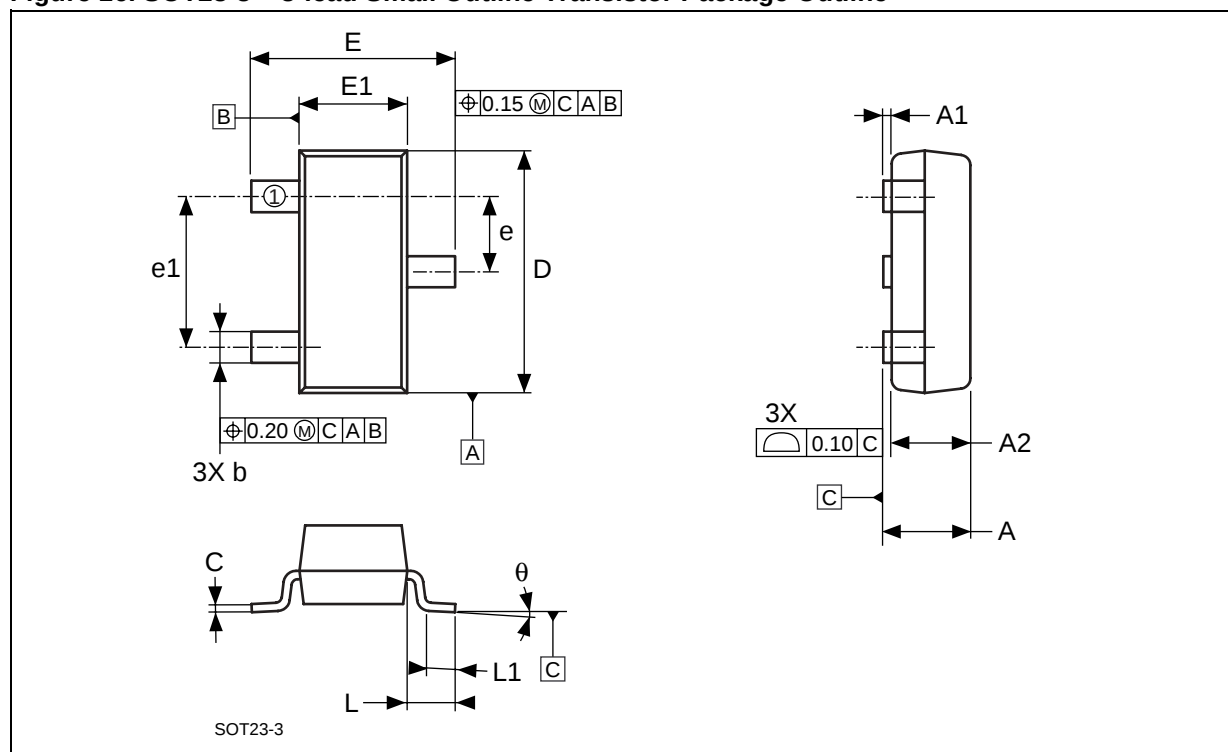
2. For Active High (RST); V_{CC} = V_{RST} (max)

3. RST output for STM810/812

4. "Glitches" of 100ns or less typically will not generate a RESET pulse.

PACKAGE MECHANICAL

Figure 16. SOT23-3 – 3-lead Small Outline Transistor Package Outline



Note: Drawing is not to scale.

Table 6. SOT23-3 – 3-lead Small Outline Transistor Package Mechanical Data

Symbol	mm			inches		
	Typ	Min	Max	Typ	Min	Max
A		0.89	1.12		0.035	0.044
A1		0.01	0.10		0.001	0.004
A2		0.88	1.02		0.035	0.042
b		0.30	0.50		0.012	0.020
C		0.08	0.20		0.003	0.008
D		2.80	3.04		0.110	0.120
E		2.10	2.64		0.083	0.104
E1		1.20	1.40		0.047	0.055
e		0.89	1.03		0.035	0.041
e1		1.78	2.05		0.070	0.081
L	0.54			0.021		
L1		0.40	0.60		0.016	0.024
θ		0°	8°		0°	8°
N	3			3		

PART NUMBERING

Table 8. Ordering Information Scheme

Example:	STM8XX	L	WX	6	F
Device Type	STM8XX	L	WX	6	F
STM8XX					
Reset Threshold Voltage					
L = $V_{RST} = 4.50V$ to $4.75V$					
M = $V_{RST} = 4.25V$ to $4.50V$					
T = $V_{RST} = 3.00V$ to $3.15V$					
S = $V_{RST} = 2.85V$ to $3.00V$					
R = $V_{RST} = 2.55V$ to $2.70V$					
Package	WX = SOT23-3 (STM809, STM810) W1 = SOT143-4 (STM811, STM812)	L	WX	6	F
WX = SOT23-3 (STM809, STM810)					
W1 = SOT143-4 (STM811, STM812)					
Temperature Range	6 = -40 to $85^{\circ}C$	L	WX	6	F
6 = -40 to $85^{\circ}C$					
Shipping Method	F = Pb-Free Package (ECO ² PACK [®]), Tape & Reel	L	WX	6	F
F = Pb-Free Package (ECO ² PACK [®]), Tape & Reel					

For a list of available options (e.g., Speed, Package) or for further information on any aspect of this device, please contact the ST Sales Office nearest to you.

Table 9. Marking Description

Part Number	Reset Threshold	Output	Topside Marking
STM809L	4.63V	Push-Pull $\overline{\text{RST}}$	8AAx
STM809M	4.38V	Push-Pull $\overline{\text{RST}}$	8ABx
STM809T	3.08V	Push-Pull $\overline{\text{RST}}$	8ACx
STM809S	2.93V	Push-Pull $\overline{\text{RST}}$	8ADx
STM809R	2.63V	Push-Pull $\overline{\text{RST}}$	8AEx
STM810L	4.63V	Push-Pull RST	8AFx
STM810M	4.38V	Push-Pull RST	8AGx
STM810T	3.08V	Push-Pull RST	8AHx
STM810S	2.93V	Push-Pull RST	8AJx
STM810R	2.63V	Push-Pull RST	8AKx
STM811L	4.63V	Push-Pull $\overline{\text{RST}}$	8ALx
STM811M	4.38V	Push-Pull $\overline{\text{RST}}$	8AMx
STM811T	3.08V	Push-Pull $\overline{\text{RST}}$	8ANx
STM811S	2.93V	Push-Pull $\overline{\text{RST}}$	8APx
STM811R	2.63V	Push-Pull $\overline{\text{RST}}$	8AQx
STM812L	4.63V	Push-Pull RST	8ARx
STM812M	4.38V	Push-Pull RST	8ASx
STM812T	3.08V	Push-Pull RST	8ATx
STM812S	2.93V	Push-Pull RST	8AUx
STM812R	2.63V	Push-Pull RST	8AVx