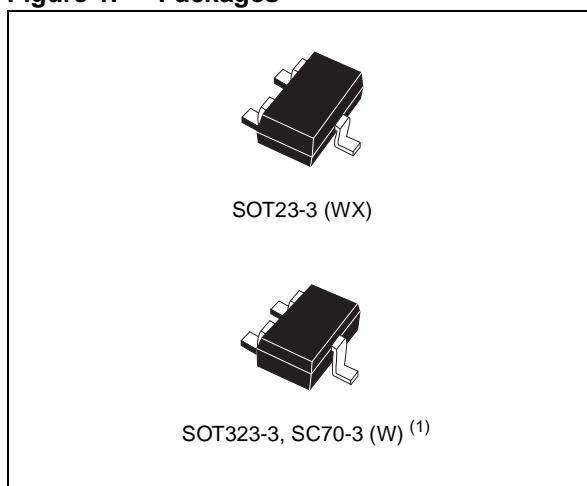


Low Power Voltage Detector

Features

- Factory-trimmed Voltage Thresholds in 0.1V Increments from 1.6 to 5.5V
- $\pm 2\%$ Voltage Threshold Accuracy
- Operating Voltage 0.7 to 6.0V
- Open Drain Output
- Low Supply Current of 0.9 μ A (typ)
- Guaranteed $\overline{\text{OUT}}$ Assertion Down to $V_{\text{CC}} = 0.7\text{V}$
- Power Supply Transient Immunity
- Available in SOT23-3 and SOT323-3 (SC70-3) packages
- Operating Temperature -40 to 85°C .

Figure 1. Packages



1. Contact local sales office for availability.

1 Summary Description

The STM1061 low power voltage detector provides monitoring of battery, power-supply, and regulated system voltages. A precision voltage reference and comparator monitors the V_{CC} input and compares it with a specified voltage threshold condition. When V_{CC} falls below a specified trip point threshold, the output (\overline{OUT}) is forced low and remains asserted as long as the V_{CC} input remains below $V_{TH-} + \text{hysteresis}$ (V_{HYST}). The STM1061 device is guaranteed to output the correct logic state for V_{CC} down to 0.7V. They are also designed to ignore fast transients on V_{CC} .

This small, low power device is ideal for portable applications and is available in space-saving SOT23-3 and SOT323-3 (SC70-3) packages.

Figure 2. Logic Diagram

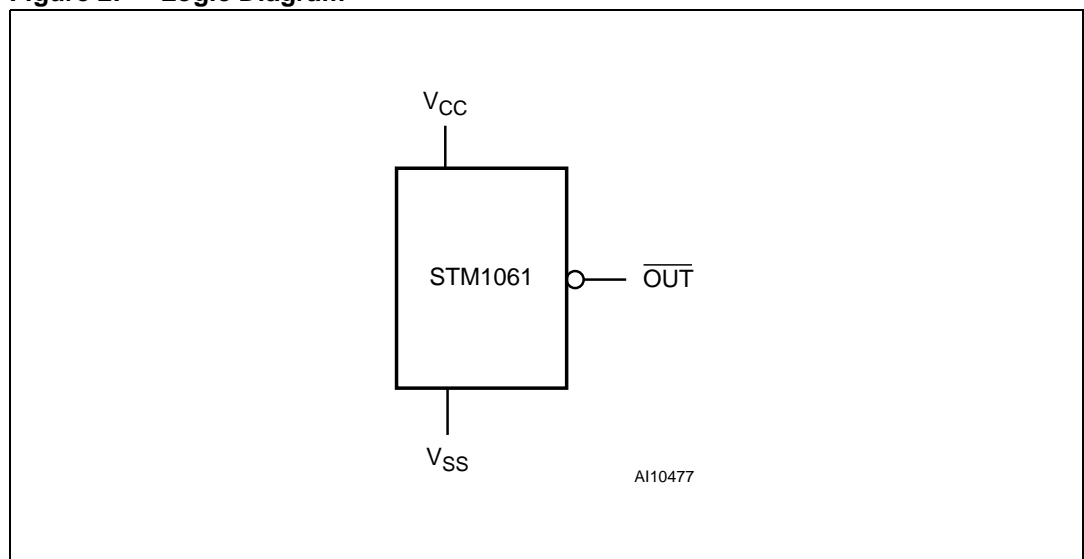
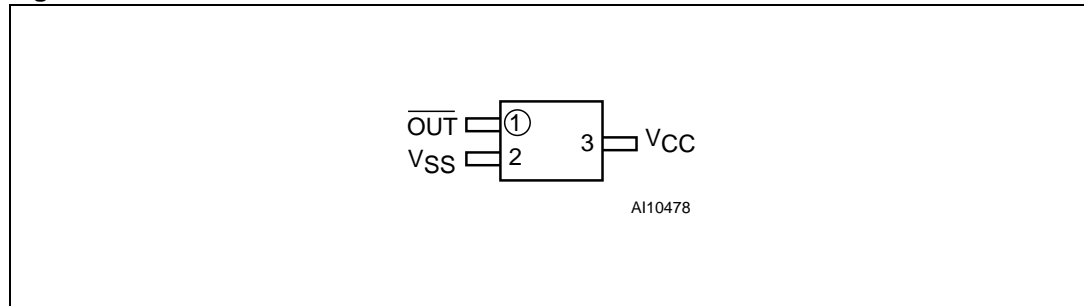


Table 1. Signal Names

OUT	Open Drain Active-Low Output
V_{CC}	Supply Voltage
V_{SS}	Ground

Figure 3. SOT23-3 Connections



5 Maximum Rating

Stressing the device above the rating listed in the [Table 3: Absolute Maximum Ratings](#) 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 3. Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
T_{STG}	Storage Temperature (V_{CC} Off, V_{BAT} 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

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

6 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

Sym	Parameter	STM1061	Unit
V_{CC}	Supply Voltage	0.7 to 6.0	V
T_A	Ambient Operating Temperature	-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 15. AC Testing Input/Output Waveforms

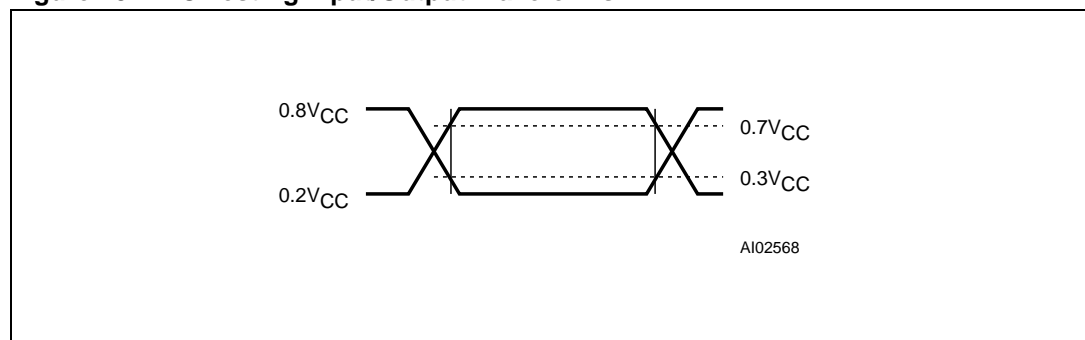


Table 5. DC and AC Characteristics

Sym.	Description	Test Condition ⁽¹⁾	Min	Typ	Max	Unit
V _{CC}	Operating Voltage		0.7		6.0	V
I _{CC}	V _{CC} Supply Current	V _{CC} = 3.0V, No Load		0.9	3.0	μA
		V _{CC} = 5.5V, No Load		1.1	3.6	μA
I _{OUT}	Output Current, N-channel (V _{DS} = 0.5V), Reset asserted	V _{CC} = 1.0V	1.0	1.7		mA
		V _{CC} = 2.0V	3.0	14		mA
		V _{CC} = 3.0V	5.0	22		mA
		V _{CC} = 4.0V	6.0	26		mA
		V _{CC} = 5.0V	7.0	30		mA
Voltage Thresholds						
V _{TH-}	Detect Voltage ⁽²⁾ (see Table 9 on page 21 for detailed listing)		V _{TH-} - 2%	V _{TH-}	V _{TH-} + 2%	V
V _{TH+}	Release Voltage			V _{TH-} + V _{HYST}		V
V _{HYST}	Threshold Hysteresis		0.02V _{TH-}	0.05V _{TH-}	0.08V _{TH-}	V
t _{PD}	V _{CC} to $\overline{\text{OUT}}$ Detect Delay	V _{CC} falling from (V _{TH-} + 100mV) to (V _{TH-} - 100mV) at 10mV/μs		25		μs
t _{PR}	V _{CC} to $\overline{\text{OUT}}$ Release Delay	V _{CC} rising from (V _{TH+} - 100mV) to (V _{TH+} + 100mV) at 10mV/μs		30	200	μs
	Threshold Temperature Coefficient			±100		ppm/°C

1. Valid for Ambient Operating Temperature: T_A = 25°C.

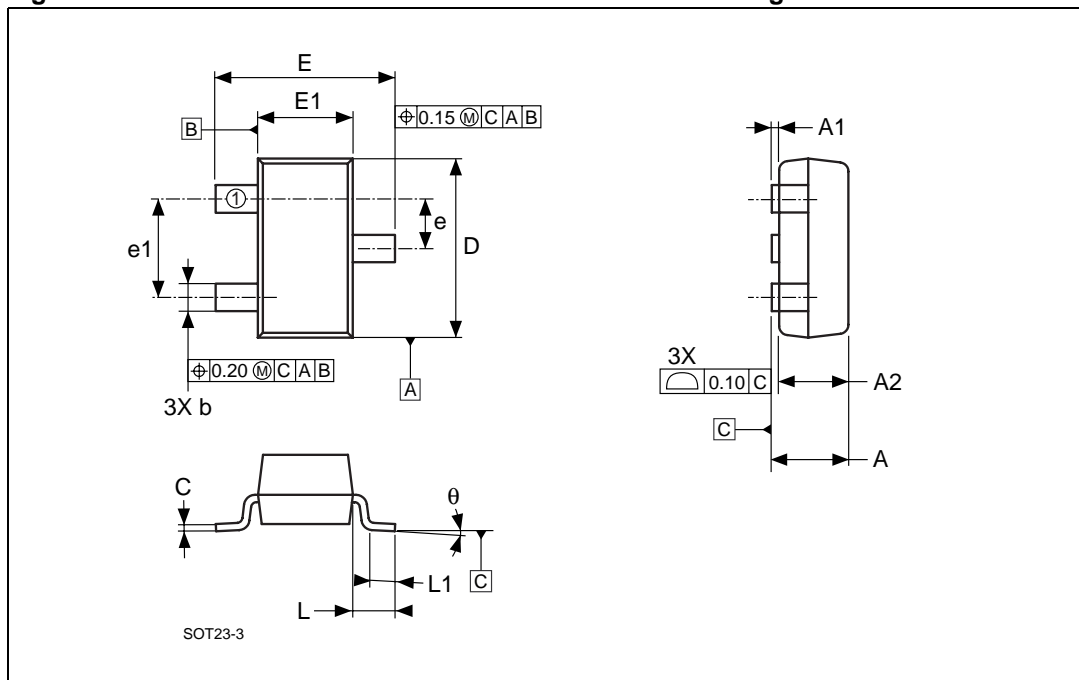
2. Other V_{TH-} threshold are offered. Minimum order quantities may apply. Contact local sales office for availability.

7 Package Mechanical

In order to meet environmental requirements, ST offers these devices in ECOPACK[®] packages. These packages have a Lead-free second level interconnect. The category of second Level Interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97.

The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

Figure 17. SOT23-3 – 3-lead Small Outline Transistor Package Outline



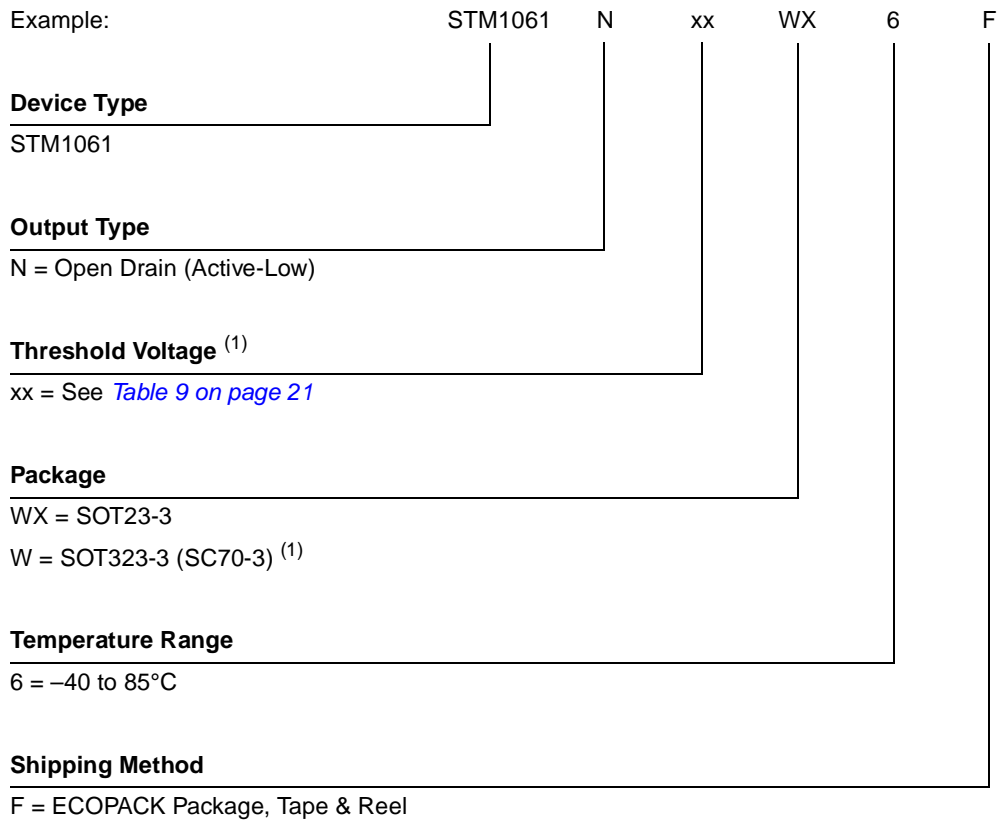
1. Drawing is not to scale.

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
Q		0°	8°		0°	8°
N		3			3	

8 Part Numbering

Table 8. Ordering Information Scheme



1. Other thresholds voltage options 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 9. Factory-Trimmed Thresholds with Marking Description

Suffix	Threshold Voltage V_{TH-} (V) at $T_A = 25^\circ\text{C}$ ⁽¹⁾			Topside Marking
	Min (-2%)	Typ	Max (+2%)	
16	1.568	1.600	1.632	16Nx
17	1.666	1.700	1.734	17Nx
19	1.862	1.900	1.938	19Nx
21	2.058	2.100	2.142	21Nx
22	2.156	2.200	2.244	22Nx
23	2.254	2.300	2.346	23Nx
25	2.450	2.500	2.550	25Nx
26	2.548	2.600	2.652	26Nx
27	2.646	2.700	2.754	27Nx
28	2.744	2.800	2.856	28Nx
29	2.842	2.900	2.958	29Nx
30	2.940	3.000	3.060	30Nx
31	3.038	3.100	3.162	31Nx
34	3.332	3.400	3.468	34Nx
38	3.724	3.800	3.876	38Nx

1. Other V_{TH-} thresholds are offered. Minimum order quantities may apply. Contact local sales office for availability.