

SGM853 Low Power Reset Timer with Two Voltage Detector Functions

GENERAL DESCRIPTION

The SGM853 is a reset timer with dual voltage detector featuring low power and small solution size for applications requiring a highly integrated solution.

As a reset timer, the SGM853 has an input (RESET pin) and a fixed delay push-pull 1× output (RESET_OUT pin). It generates a low-level reset signal for 500ms (TYP) if the input has a low-level voltage for 8s (TYP). Then the reset signal returns to high for subsequent loads reset.

The SGM853 also has two voltage detector functions with 4 inputs and 2 outputs including a push-pull 1× output and a push-pull 2× output. The 2× output provides greater source and sink current. On the one side, the ALL PG output pin indicates whether the 3 input pins (SUS PG, VCC PG and AUX PG) are in a high-level voltage at the same time. If the above 3 input pins are high at the same time, the ALL PG output pin is set to high, and vice versa. On the other side, the PROCHOT_OUT output pin generates a fixed 12ms delay time and indicates whether the PROCHOT input pin is in a high-level voltage. If PROCHOT rises to high-level voltage, PROCHOT_OUT rises after a fixed 12ms delay time, and PROCHOT OUT falls immediately when PROCHOT falls.

The SGM853 operates over a junction temperature range of -40°C to +125°C. It is available in a Green UTQFN-1.6×1.6-12AL package.

FEATURES

- Low Power Consumption
- Output Options:
 - 2 Outputs: Push-Pull 1×
 - 1 Output: Push-Pull 2×
- Available in a Green UTQFN-1.6×1.6-12AL Package

APPLICATIONS

Smart Phones Tablet PCs Servers Workstations Storage Systems Networking/Telecommunication Equipment



SGM853

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM853	UTQFN-1.6×1.6-12AL	-40°C to +125°C	SGM853XUSH12G/TR	00A XXX	Tape and Reel, 3000

MARKING INFORMATION

NOTE: XXX = Date Code and Trace Code.

Y X	Y Y— X X	Serial Number
Γ		Trace Code
		Date Code - Year

Green (RoHS & HSF): SG Micro Corp defines "Green" to mean Pb-Free (RoHS compatible) and free of halogen substances. If you have additional comments or questions, please contact your SGMICRO representative directly.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage on VDD Relative to GND0.5V to 7	7V
DC Input VoltageGND - 0.5V to V_{DD} + 0.5	5V
Current at Input Pin1mA to 1m	۱A
Maximum Average or DC Current	
Push-Pull 1×	۱A
Push-Pull 2×40m	۱A
nput leakage (Absolute Value)1000r	۱A
Maximum Average or DC Current90m	۱A
Package Thermal Resistance	
UTQFN-1.6×1.6-12AL, θ _{JA} 133°C/	W
Junction Temperature+150	°C
Storage Temperature Range	°C
Lead Temperature (Soldering, 10s)+260	°C
ESD Susceptibility	
HBM4000)V
CDM	V

RECOMMENDED OPERATING CONDITIONS

Operating Junction Temperature Range......-40°C to +125°C

OVERSTRESS CAUTION

Stresses beyond those listed in Absolute Maximum Ratings may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect reliability. Functional operation of the device at any conditions beyond those indicated in the Recommended Operating Conditions section is not implied.

ESD SENSITIVITY CAUTION

This integrated circuit can be damaged if ESD protections are not considered carefully. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because even small parametric changes could cause the device not to meet the published specifications.

DISCLAIMER

SG Micro Corp reserves the right to make any change in circuit design, or specifications without prior notice.



PIN CONFIGURATION



PIN DESCRIPTION

PIN	NAME	TYPE	FUNCTION
1	VDD	Р	Supply Voltage.
2	PROCHOT	I	Active High Digital Input with Schmitt Trigger. This pin can not be left floating.
3	RESET	I	Digital Input with Schmitt Trigger. The reset delay time of 8s. This pin can not be left floating.
4	SUS_PG	I	Digital Input with Schmitt Trigger. It has an internal 1.25M Ω pull-down resistor.
5, 11	NC	—	Leave it floating or connect it to GND.
6	VCC_PG	I	Digital Input with Schmitt Trigger. It has an internal 1.25M Ω pull-down resistor.
7	GND	G	Ground.
8	ALL_PG	0	Push-Pull 1× Output.
9	RESET_OUT	0	Push-Pull 1× Output.
10	AUX_PG	I	Digital Input with Schmitt Trigger. It has an internal 1.25M Ω pull-down resistor.
12	PROCHOT_OUT	0	Active High Push-Pull 2× Output.

NOTE: I: Input, O: Output, G: Ground, P: Power.



ELECTRICAL CHARACTERISTICS

(T_J = -40°C to +125°C, typical values are at T_J = +25°C, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS	
Supply Voltage	V _{DD}			1.7	3.3	5.5	V	
Capacitor Value at VDD	C _{VDD}				0.1		μF	
Input Capacitance	C _{IN}				4		pF	
Quiescent Current	Ι _Q	Static inputs and floating	ng outputs		0.3	0.9	μA	
Active Current	I _A	Static outputs, keep R		0.8	1.6	μA		
Maximal Voltage Applied to Any Pin in High-Impedance State	Vout					V _{DD}	V	
Maximum Average or DC Current	han	T _J = +85°C				66	mA	
through VDD Pin (Per chip side)	JUDA	T _J = +110°C				65	mA	
Maximum Average or DC Current	loup	T _J = +85°C				34	mA	
through GND Pin (Per chip side)	·GND	T _J = +110°C	T _J = +110°C			31	mA	
		V _{DD} = 1.8V		1.04		V _{DD}		
High-Level Input Voltage	V _{IH}	V _{DD} = 3.3V		1.85		V _{DD}	V	
		V _{DD} = 5.0V		2.94		V _{DD}		
		V _{DD} = 1.8V		0		0.62		
Low-Level Input Voltage	VIL	V _{DD} = 3.3V		0		1.42	V	
		V _{DD} = 5.0V		0		1.95		
		Push-pull 1×, open-drain PMOS 1×	I _{OH} = 100μA, V _{DD} = 1.8V	1.60	1.79		- V	
	V _{он}		I _{OH} = 3mA, V _{DD} = 3.3V	2.71	3.12			
High Lovel Output Voltage			I_{OH} = 5mA, V_{DD} = 5.0V	4.21	4.77			
		Push-pull 2×, open-drain PMOS 2×	I_{OH} = 100µA, V_{DD} = 1.8V	1.61	1.79			
			I _{OH} = 3mA, V _{DD} = 3.3V	2.84	3.21			
			I_{OH} = 5mA, V_{DD} = 5.0V	4.34	4.89			
		Push-pull 1×	I_{OL} = 100µA, V_{DD} = 1.8V		0.006	0.01	-	
			$I_{OL} = 3mA, V_{DD} = 3.3V$		0.13	0.18		
Low Lovel Output Veltage			$I_{OL} = 5mA, V_{DD} = 5.0V$		0.20	0.26		
Low-Level Output Voltage	VOL		I_{OL} = 100µA, V_{DD} = 1.8V		0.003	0.01	v	
		Push-pull 2×	$I_{OL} = 3mA, V_{DD} = 3.3V$		0.07	0.1		
			$I_{OL} = 5mA, V_{DD} = 5.0V$		0.1	0.14		
		Push-pull 1x	$V_{OH} = V_{DD} - 0.2V,$ $V_{DD} = 1.8V$	0.9	1.58			
		open-drain PMOS 1×	$V_{OH} = 2.4V, V_{DD} = 3.3V$	7.3	11.96			
High-Level Output Current	Іон		$V_{OH} = 2.4V, V_{DD} = 5.0V$	19.2	26.83		mA	
	-01	Push-pull 2×.	$V_{OH} = V_{DD} - 0.2V,$ $V_{DD} = 1.8V$	1.67	3.07			
		open-drain PMOS 2×	V _{OH} = 2.4V, V _{DD} = 3.3V	13.95	23.43		-	
			$V_{OH} = 2.4V, V_{DD} = 5.0V$	36.50	52.24			
			V _{OL} = 0.15V, V _{DD} = 1.8V	1.49	2.3			
		Push-pull 1×	V _{OL} = 0.4V, V _{DD} = 3.3V	5.93	8.64			
Low-Level Output Current	lo		V _{OL} = 0.4V, V _{DD} = 5.0V	7	9.79		mA	
	.UL		V _{OL} = 0.15V, V _{DD} = 1.8V	2.9	4.49			
		Push-pull 2×	$V_{OL} = 0.4 V, V_{DD} = 3.3 V$	10.7	16.84		-	
			V_{OL} = 0.4V, V_{DD} = 5.0V	12.76	19.09			



ELECTRICAL CHARACTERISTICS (Continued)

(T_J = -40°C to +125°C, typical values are at T_J = +25°C, unless otherwise noted.)

PARAMETER SYMBOL		CONDITIONS	MIN	ТҮР	MAX	UNITS	
Internal Pull-Down Resistance	R _{PULL_DOWN} SUS_PG, VCC_PG and AUX_PG Pins		967	1248	1524	kΩ	
Delay1 Time	t _{DLY1}	T _J = +25℃	7.68	8	8.36	s	
		$T_{J} = -40^{\circ}C \text{ to } +125^{\circ}C$	7.49	8	8.89		
Delay2 Time	t _{DLY2}	T」 = +25℃	475.94	500	526.02	ms	
		$T_{J} = -40^{\circ}C \text{ to } +125^{\circ}C$	460.09	500	561.94		
Delay? Time	t _{DLY3}	T _J = +25℃	11.59	12	12.8	ms	
Delays Time		T _J = -40°C to +125°C	11.25	12	13.66		
Startup Time t _{SU}		From V_{DD} rising past 1.35V		0.05		ms	
Power-On Threshold V _{PON}		V_{DD} level required to start up the chip	1.223	1.283	1.343	V	
Power-Off Threshold V _F		V_{DD} level required to switch off the chip	0.73	0.91	1.089	V	



TYPICAL PERFORMANCE CHARACTERISTICS











FUNCTIONAL BLOCK DIAGRAM



Figure 1. SGM853 Block Diagram



SGM853

APPLICATION INFORMATION

The SGM853 is both a reset timer and a dual voltage detector that features low power and small solution size for applications requiring a highly integrated solution.

Reset Timer

A reset event occurs and forces the reset input (RESET pin) in a low-level input voltage for at least 8s. The RESET_OUT generates a low-level reset signal for 500ms to shut down the subsequent loads or PMIC. Then the reset signal returns to a high-level voltage until the input pin is in the next low-level state for more than 8s.

If the RESET is released and returns to high-level voltage within 8s, the counter resets and the RESET_OUT remains high.

Detector 1: ALL_PG

The ALL_PG output pin monitors 3 input pins at the same time: SUS_PG, VCC_PG and AUX_PG pins. If the application scenario requires voltage detection on up to 3 power rails, connect the power rail to the above three input pins respectively.

Detector 2: PROCHOT and PROCHOT_OUT

The PROCHOT_OUT pin is used to monitor PROCHOT input pin. If the PROCHOT input rises to a high-level voltage, the PROCHOT_OUT rises after a fixed delay time of 12ms, and PROCHOT_OUT falls immediately when PROCHOT in low-level voltage. If PROCHOT keeps in high-level voltage within 12ms, the PROCHOT_OUT remains low.

REVISION HISTORY

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

JULY 2024 – REV.A to REV.A.1	Page		
Updated Tape and Reel Information	10		
Changes from Original (OCTOBER 2022) to REV.A	Page		
Changed from product preview to production data	All		



TAPE AND REEL INFORMATION

REEL DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
UTQFN-1.6×1.6-12AL	7″	9.0	1.80	1.80	0.69	4.0	4.0	2.0	8.0	Q1

CARTON BOX DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF CARTON BOX

Reel Type	Length (mm)	Width (mm)	Height (mm)	Pizza/Carton	
7" (Option)	368	227	224	8	
7"	442	410	224	18	

