

GENERAL DESCRIPTION

The SGM821 is an ultra-low power and programmable watchdog timer designed for system wake-up in duty-cycled and battery-powered applications.

The SGM821 with programmable interrupt timer consumes only 35nA (TYP) system current. Accordingly, the system can be placed in sleeping mode, consuming less power, and only returning to active mode when the device is interrupted. The SGM821 is ideal for wireless sensor applications or other applications with smaller batteries compared to the μC that typically costs micro-amps of total system current. The watchdog timer of the SGM821 can be programmed by an external resistor of 500 Ω to 180k Ω . And it provides a corresponding time interval from 100ms to 8200s (TYP).

The SGM821 is available in Green SOT-23-6 and TDFN-2 \times 2-6AL packages. It operates over a junction temperature range of -40 $^{\circ}\text{C}$ to +105 $^{\circ}\text{C}$.

FEATURES

- **Supply Voltage Range:** 1.8V to 5.5V
- **Low Current Consumption:** 35nA (TYP)
- **Programmable Watchdog Time:** 100ms to 8200s (TYP)
- **Manual Reset Input**
- **Available in Green SOT-23-6 and TDFN-2 \times 2-6AL Packages**

APPLICATIONS

- Low Power Systems
- IoT
- Tamper Detectors
- Smart Home Controllers
- Wireless Sensors

TYPICAL APPLICATION

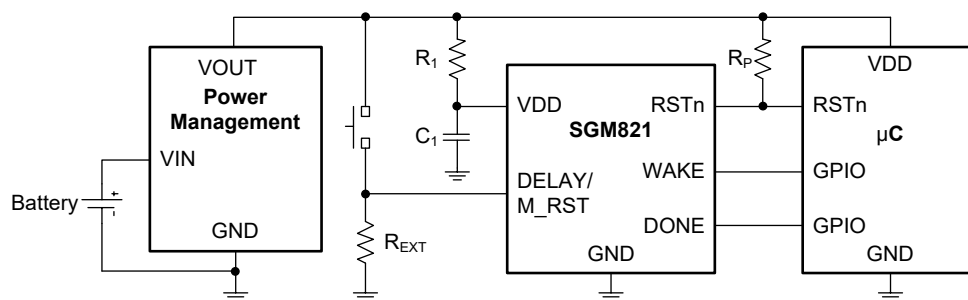


Figure 1. Simplified Application Schematic

SGM821

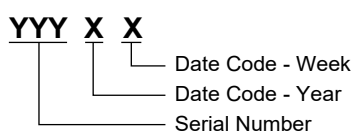
PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM821	SOT-23-6	-40°C to +105°C	SGM821GN6G/TR	RCEXX	Tape and Reel,3000
	TDFN-2x2-6AL	-40°C to +105°C	SGM821GTDI6G/TR	RCF XXXX	Tape and Reel,3000

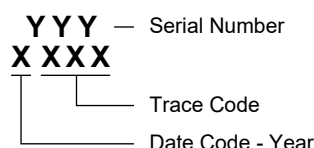
MARKING INFORMATION

NOTE: XX = Date Code. XXXX = Date Code and Trace Code.

SOT-23-6



TDFN-2x2-6AL



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, V_{CC}	-0.3V to 6V
Input Voltage at Any Pin ⁽¹⁾	-0.3V to $V_{CC} + 0.3V$
Package Thermal Resistance	
SOT-23-6, θ_{JA}	215°C/W
TDFN-2x2-6AL, θ_{JA}	106°C/W
Junction Temperature.....	+150°C
Storage Temperature Range	-65°C to +150°C
Lead Temperature (Soldering, 10s).....	+260°C
ESD Susceptibility	
HBM.....	4000V
CDM	1000V

RECOMMENDED OPERATING CONDITIONS

Supply Voltage, V_{CC}	1.8V to 5.5V
Operating Junction Temperature Range.....	-40°C to +105°C

NOTE:

1. The voltage between any two pins is not allowed to be greater than 6V.

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.

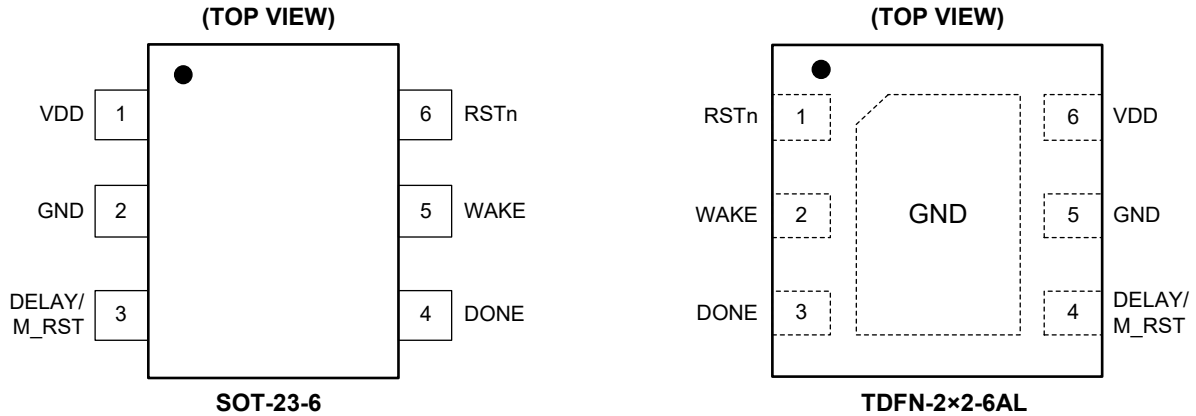
ESD SENSITIVITY CAUTION

This integrated circuit can be damaged by ESD if you don't pay attention to ESD protection. 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 very small parametric changes could cause the device not to meet its published specifications.

DISCLAIMER

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

PIN CONFIGURATION



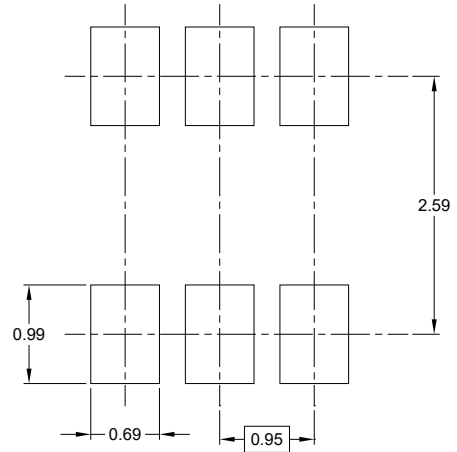
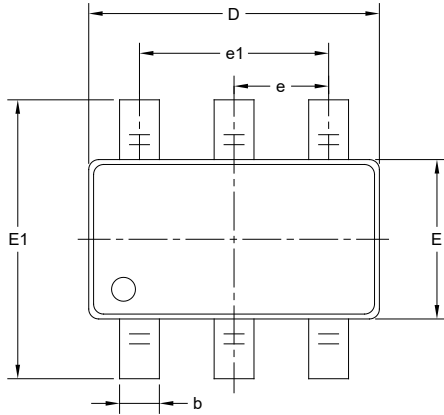
PIN DESCRIPTION

PIN		NAME	TYPE	FUNCTION
SOT-23-6	TDFN-2x2-6AL			
1	6	VDD	P	Supply Voltage Pin.
2	5	GND	G	Ground.
3	4	DELAY/ M_RST	I	One-Time External Resistance Detection and Manual Reset Pin. Resistor connected between this pin and GND is used to set the watchdog timer. The allowable external resistance ranges from 500Ω to 180kΩ. This pin is also used as an input manual reset pin, and pulling this pin up to VDD will issue an RSTn signal.
4	3	DONE	I	Logic Watchdog Input Pin. Digital signal sent by the external system, indicating that the WAKE signal is received. This pin is not allowed to be floating.
5	2	WAKE	O	Watchdog output (Push-Pull) Pin. A pulse signal is sent at the end of the programming time interval to wake up the external system.
6	1	RSTn	O	Reset Output (Open-Drain Output) Pin. Digital signal to RESET the external system. A pull-up resistor is required.
—	Exposed Pad	GND	—	Connect the thermal pad to a large-area ground plane. The exposed pad is internally connected to GND.

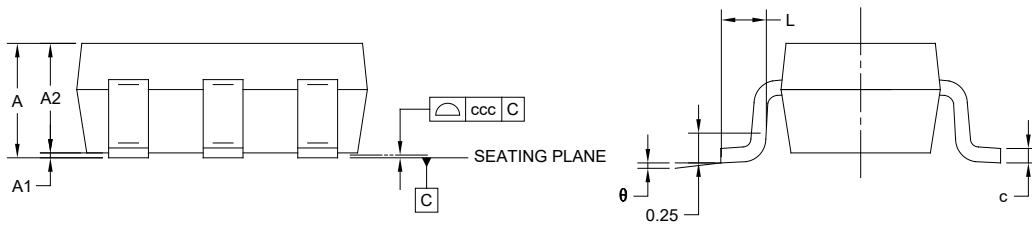
NOTE: I = Input, O = Output, G = Ground, P = Power.

PACKAGE OUTLINE DIMENSIONS

SOT-23-6



RECOMMENDED LAND PATTERN (Unit: mm)



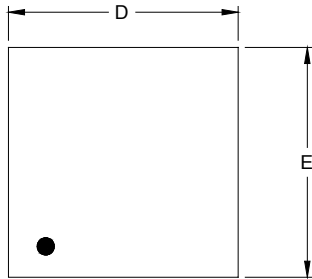
Symbol	Dimensions In Millimeters		
	MIN	MOD	MAX
A	-	-	1.450
A1	0.000	-	0.150
A2	0.900	-	1.300
b	0.300	-	0.500
c	0.080	-	0.220
D	2.750	-	3.050
E	1.450	-	1.750
E1	2.600	-	3.000
e	0.950 BSC		
e1	1.900 BSC		
L	0.300	-	0.600
θ	0°	-	8°
ccc	0.100		

NOTES:

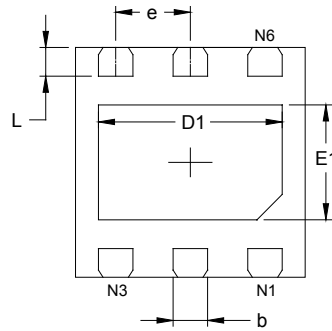
1. This drawing is subject to change without notice.
2. The dimensions do not include mold flashes, protrusions or gate burrs.
3. Reference JEDEC MO-178.

PACKAGE OUTLINE DIMENSIONS

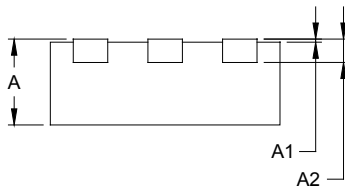
TDFN-2x2-6AL



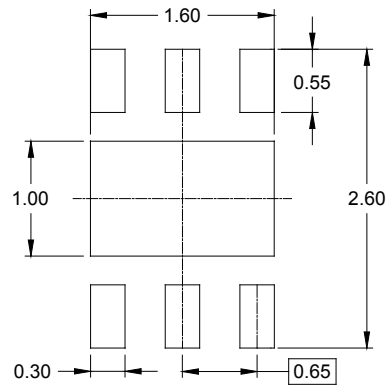
TOP VIEW



BOTTOM VIEW



SIDE VIEW



RECOMMENDED LAND PATTERN (Unit: mm)

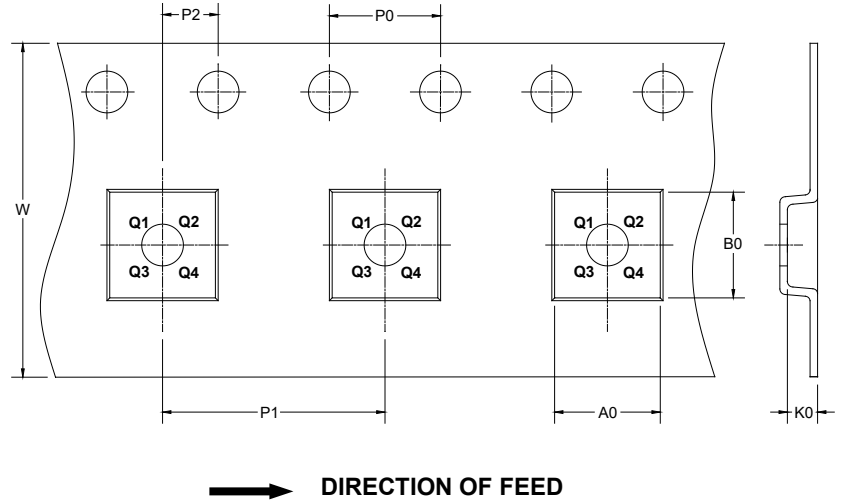
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A2	0.203 REF		0.008 REF	
D	1.900	2.100	0.075	0.083
D1	1.500	1.700	0.059	0.067
E	1.900	2.100	0.075	0.083
E1	0.900	1.100	0.035	0.043
b	0.250	0.350	0.010	0.014
e	0.650 BSC		0.026 BSC	
L	0.174	0.326	0.007	0.013

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE 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
SOT-23-6	7"	9.5	3.17	3.23	1.37	4.0	4.0	2.0	8.0	Q3
TDFN-2×2-6AL	7"	9.5	2.30	2.30	1.10	4.0	4.0	2.0	8.0	Q1

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PACKAGE INFORMATION

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

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