

GENERAL DESCRIPTION

The SGM4576 is a 6-bit, non-inverting, bidirectional voltage-level translator which features two independent configurable power-supply lines. The A and B ports track the V_{CCA} supply and V_{CCB} supply respectively. The supply voltage range is 1.65V to 5.5V for A ports and 2.3V to 5.5V for B ports. The device provides a bidirectional translation function between the different voltage nodes (including 1.8V, 2.5V, 3.3V and 5V).

The SGM4576 has an output enable (OE) function, which controls the inputs and outputs states. When OE goes low, all I/Os enter into the high-impedance state. It is beneficial for reducing quiescent current consumption. When V_{CCA} is powered, OE has an internal pull-down current source.

The SGM4576 is available in Green TQFN-2.6×1.8-16L package. It operates over an ambient temperature range of -40°C to +85°C.

FEATURES

- **Power Supply Voltage Ranges ($V_{CCA} \leq V_{CCB}$)**
 - ◆ **A Ports: 1.65V to 5.5V**
 - ◆ **B Ports: 2.3V to 5.5V**
- **Direction-Control Signal is Not Required**
- **Data Rates**
 - ◆ **Push-Pull: 24Mbps**
 - ◆ **Open-Drain: 2Mbps**
- **Support V_{CCA} or V_{CCB} Isolation**
 - ◆ **When V_{CCA} or V_{CCB} is Low, Device Enters Power-Down Mode**
- **No Specific Power Sequences Required for V_{CCA} and V_{CCB}**
- **Support Partial-Power-Down Function**
- **-40°C to +85°C Operating Temperature Range**
- **Available in Green TQFN-2.6×1.8-16L Package**

APPLICATIONS

Universal Asynchronous Receiver/Transmitter
I²C/SMBus Interfaces
General Purpose I/O (GPIO)

TYPICAL APPLICATION

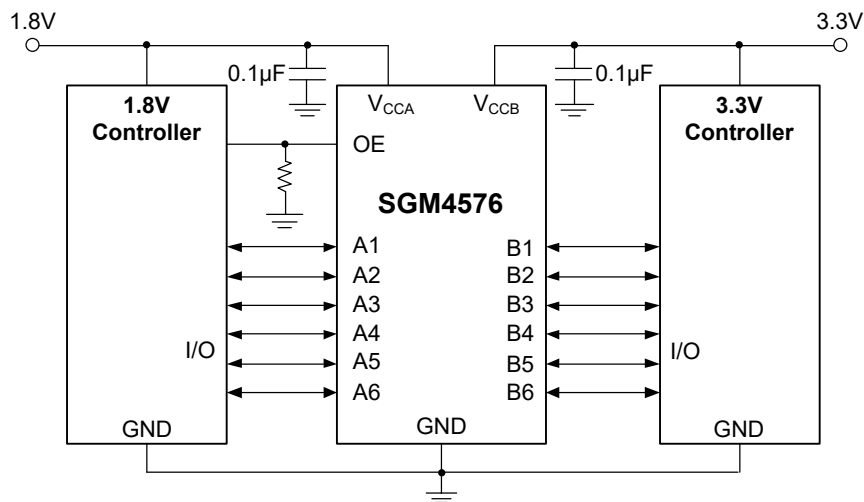


Figure 1. Typical Application Circuit

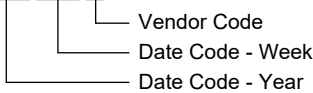
PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM4576	TQFN-2.6×1.8-16L	-40°C to +85°C	SGM4576YTQA16G/TR	4576 XXXXX	Tape and Reel, 3000

MARKING INFORMATION

NOTE: XXXXX = Date Code and Vendor Code.

XXXXX



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.

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.

DISCLAIMER

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

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.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage Range	
V_{CCA}	-0.3V to 6V
V_{CCB}	-0.3V to 6V
A Ports, B Ports, OE Input Voltage Range, V_I ⁽¹⁾	
.....	-0.3V to 6V
Output Voltage Range for the High-Impedance or Power-Off State, V_O ⁽¹⁾	
A Ports	-0.3V to 6V
B Ports	-0.3V to 6V
Output Voltage Range for the High or Low State, V_O ⁽¹⁾⁽²⁾	
A Ports	-0.3V to $V_{CCA} + 0.3V$
B Ports	-0.3V to $V_{CCB} + 0.3V$
Input Clamp Current, I_{IK} ($V_I < 0$)	-50mA
Output Clamp Current, I_{OK} ($V_O < 0$)	-25mA
Continuous Output Current, I_O	$\pm 50mA$
Continuous Current through V_{CCA} , V_{CCB} , or GND	$\pm 100mA$
Junction Temperature	+150°C
Storage Temperature Range	-65°C to +150°C
Lead Temperature (Soldering, 10s)	+260°C
ESD Susceptibility	
HBM	4000V
MM	300V
CDM	1000V

NOTES:

1. When the input and output current ratings are observed, the input and I/O negative voltage ratings may be exceeded.
2. V_{CCA} and V_{CCB} values are shown in the recommended operating conditions table.

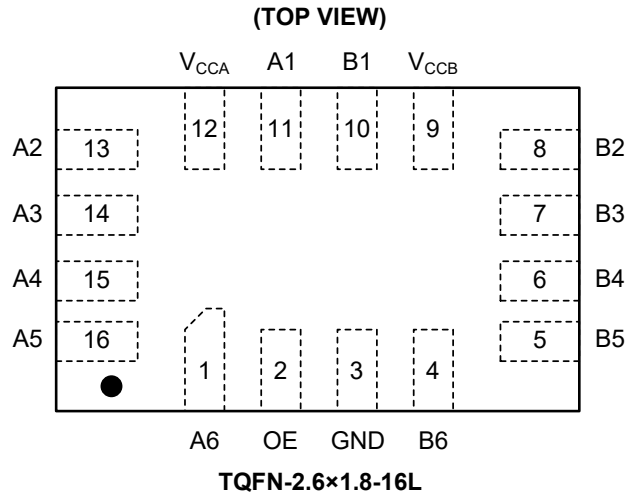
RECOMMENDED OPERATING CONDITIONS
(3, 4)

Supply Voltage Range ⁽⁵⁾	
V_{CCA}	1.65V to 5.5V
V_{CCB}	2.3V to 5.5V
High-Level Input Voltage, V_{IH}	
A Port I/Os ($V_{CCA} = 1.65V$, $V_{CCB} = 2.3V$ to 5.5V)	
.....	$V_{CCI} - 0.1V$ to V_{CCI}
A Port I/Os ($V_{CCA} = 1.95V$ to 5.5V, $V_{CCB} = 2.3V$ to 5.5V)	
.....	$V_{CCI} - 0.4V$ to V_{CCI}
B Port I/Os	$V_{CCI} - 0.4V$ to V_{CCI}
OE Input	$V_{CCA} \times 0.8V$ to 5.5V
Low-Level Input Voltage, V_{IL}	
A Port I/Os	0V to 0.15V
B Port I/Os	0V to 0.15V
OE Input	0V to $V_{CCA} \times 0.25V$
Operating Temperature Range	-40°C to +85°C

NOTES:

3. V_{CCI} is the supply voltage associated with the input ports.
4. V_{CCO} is the supply voltage associated with the output ports.
5. Ensure that $V_{CCA} \leq V_{CCB}$ and V_{CCA} must not exceed 5.5V.

PIN CONFIGURATION

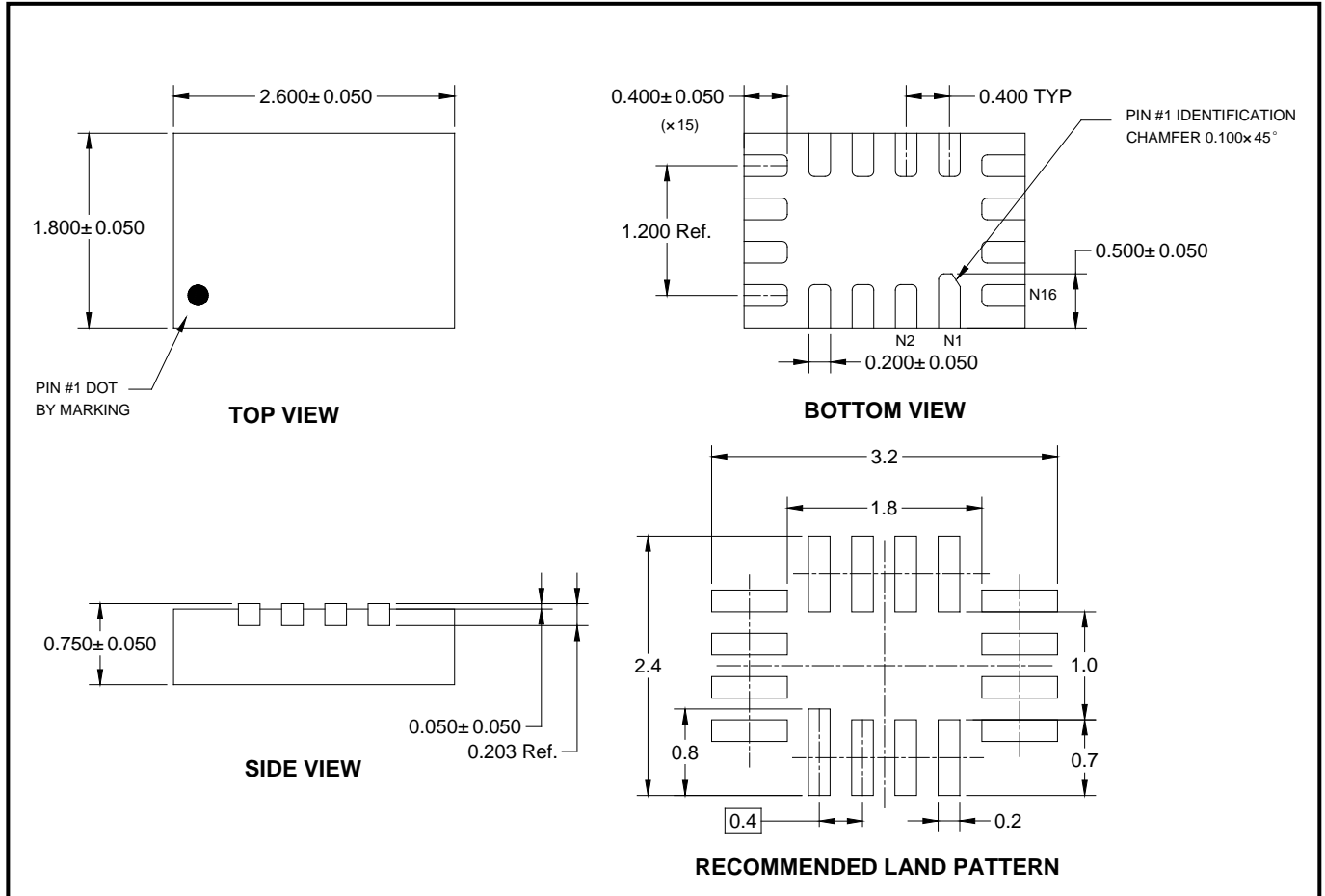


PIN DESCRIPTION

PIN	NAME	TYPE	FUNCTION
1	A6	I/O	Input/Output 6. It tracks the V_{CCA} supply.
2	OE	I	Output Enable Control Pin. Active high. When OE goes low, all outputs enter into the high-impedance state. It tracks the V_{CCA} supply.
3	GND	G	Ground.
4	B6	I/O	Input/Output 6. It tracks the V_{CCB} supply.
5	B5	I/O	Input/Output 5. It tracks the V_{CCB} supply.
6	B4	I/O	Input/Output 4. It tracks the V_{CCB} supply.
7	B3	I/O	Input/Output 3. It tracks the V_{CCB} supply.
8	B2	I/O	Input/Output 2. It tracks the V_{CCB} supply.
9	V_{CCB}	P	Supply Voltage on B Ports. It can be operated from 2.3V to 5.5V.
10	B1	I/O	Input/Output 1. It tracks the V_{CCB} supply.
11	A1	I/O	Input/Output 1. It tracks the V_{CCA} supply.
12	V_{CCA}	P	Supply Voltage on A Ports. It can be operated from 1.65V to 5.5V, and V_{CCA} is always $\leq V_{CCB}$.
13	A2	I/O	Input/Output 2. It tracks the V_{CCA} supply.
14	A3	I/O	Input/Output 3. It tracks the V_{CCA} supply.
15	A4	I/O	Input/Output 4. It tracks the V_{CCA} supply.
16	A5	I/O	Input/Output 5. It tracks the V_{CCA} supply.

PACKAGE OUTLINE DIMENSIONS

TQFN-2.6x1.8-16L



NOTES:

1. All linear dimensions are in millimeters.
2. This drawing is subject to change without notice.

PACKAGE INFORMATION

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
TQFN-2.6×1.8-16L	7"	9.0	2.01	2.81	0.93	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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