

GENERAL DESCRIPTION

The SGM4568 is an 8-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 1.2V to 5.5V for A ports and 1.65V to 5.5V for B ports. The device provides a bidirectional translation function between the different voltage nodes (including 1.2V, 1.5V, 1.8V, 2.5V, 3.3V and 5V).

The SGM4568 has an output enable (OE) function, which controls the outputs states. When OE goes low, all outputs enter into the high-impedance state. The OE should be connected to GND via a pull-down resistor, and the minimum resistor value is depended on the current source capability of the driver.

The SGM4568 features the OE input circuit which is referenced to V_{CCA} .

The SGM4568 is available in Green TSSOP-20 and TQFN-3×3-20L packages. It operates over an ambient temperature range of -40°C to +85°C.

FEATURES

- **Power Supply Voltage Range ($V_{CCA} \leq V_{CCB}$)**
 - A Ports: 1.2V to 5.5V
 - B Ports: 1.65V to 5.5V
- **Support V_{CCA} or V_{CCB} Isolation**
 - When V_{CCA} or V_{CCB} is Low, Device Enters Power-Down Mode
- **OE Input Circuit Referenced to V_{CCA}**
- **Support Partial-Power-Down Function**
- **Support Push-Pull Output**
- **Low Power Consumption**
- **-40°C to +85°C Operating Temperature Range**
- **Available in Green TSSOP-20 and TQFN-3×3-20L Packages**

APPLICATIONS

Universal Asynchronous Receiver/Transmitter
General Purpose I/O (GPIO)
Smart Phones
Portable Equipment

TYPICAL APPLICATION

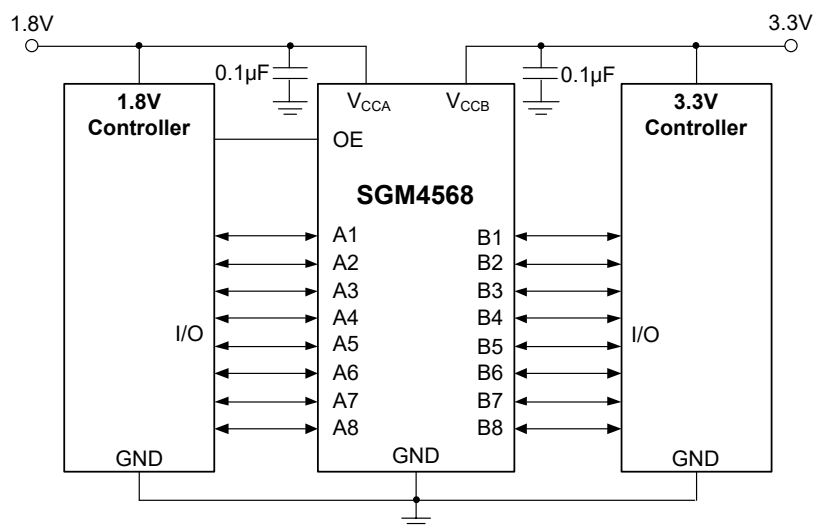


Figure 1. Typical Application Circuit

PACKAGE/ORDERING INFORMATION

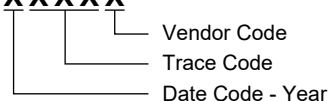
MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM4568	TSSOP-20	-40°C to +85°C	SGM4568YTS20G/TR	SGM4568YTS20 XXXXX	Tape and Reel, 4000
	TQFN-3×3-20L	-40°C to +85°C	SGM4568YTQG20G/TR	SGM 4568QG XXXXX	Tape and Reel, 4000

MARKING INFORMATION

TSSOP-20

XXXXX = Date Code, Trace Code and Vendor Code.

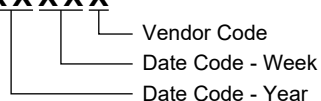
XXXXX



TQFN-3×3-20L

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 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.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage Range

V_{CCA} -0.3V to 6V

V_{CCB} -0.3V to 6V

Input Voltage Range, V_I

A Ports -0.3V to 6V

B Ports -0.3V to 6V

Output Voltage Range for the High-Impedance or Power-Off State, V_O

A Ports -0.3V to 6V

B Ports -0.3V to 6V

Output Voltage Range for the High or Low State, V_O ⁽¹⁾

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 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

NOTE:

1. V_{CCA} and V_{CCB} values are shown in the recommended operating conditions table.

RECOMMENDED OPERATING CONDITIONS (2, 3)

Supply Voltage Range

V_{CCA} 1.2V to 5.5V

V_{CCB} 1.65V to 5.5V

High-Level Input Voltage, V_{IH}

Data Inputs $V_{CCI} \times 0.85$ ⁽⁴⁾ to V_{CCI}

OE Input $V_{CCA} \times 0.85$ to 5.5V

Low-Level Input Voltage, V_{IL}

Data Inputs 0V to $V_{CCI} \times 0.2$ ⁽⁴⁾

OE Input 0V to $V_{CCA} \times 0.2$

Output Voltage Range for the High-Impedance or Power-Off State, V_O

A Ports 0V to 5.5V

B Ports 0V to 5.5V

Input Transition Rise or Fall Rate, $\Delta t/\Delta V$

A Port Inputs 40ns/V (MAX)

B Port Inputs 40ns/V (MAX)

Operating Temperature Range

..... -40°C to +85°C

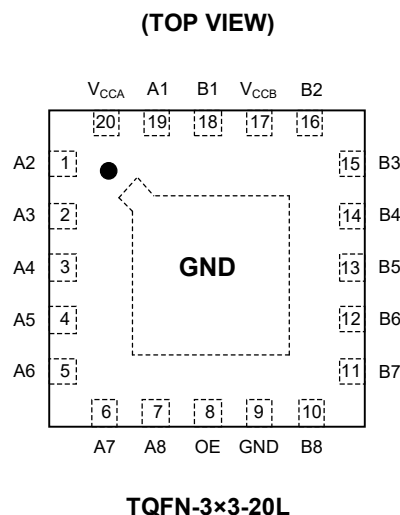
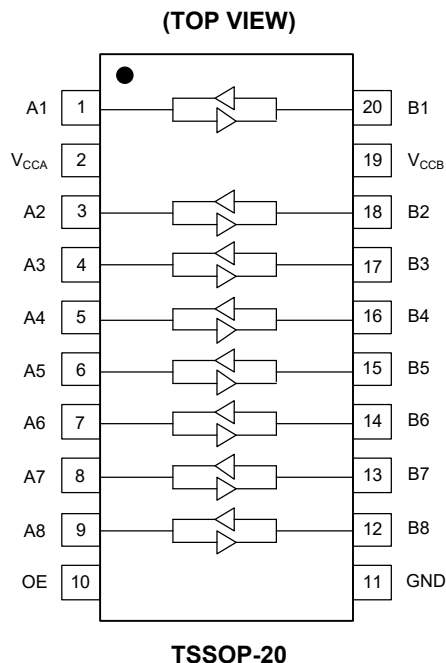
NOTES:

2. Ensure that the A side and B side of the unused data I/O pairs remain the same state, that is., both at V_{CCI} or both at GND.

3. Ensure that $V_{CCA} \leq V_{CCB}$ and V_{CCA} must not exceed 5.5V.

4. V_{CCI} is the supply voltage associated with the input ports.

PIN CONFIGURATIONS

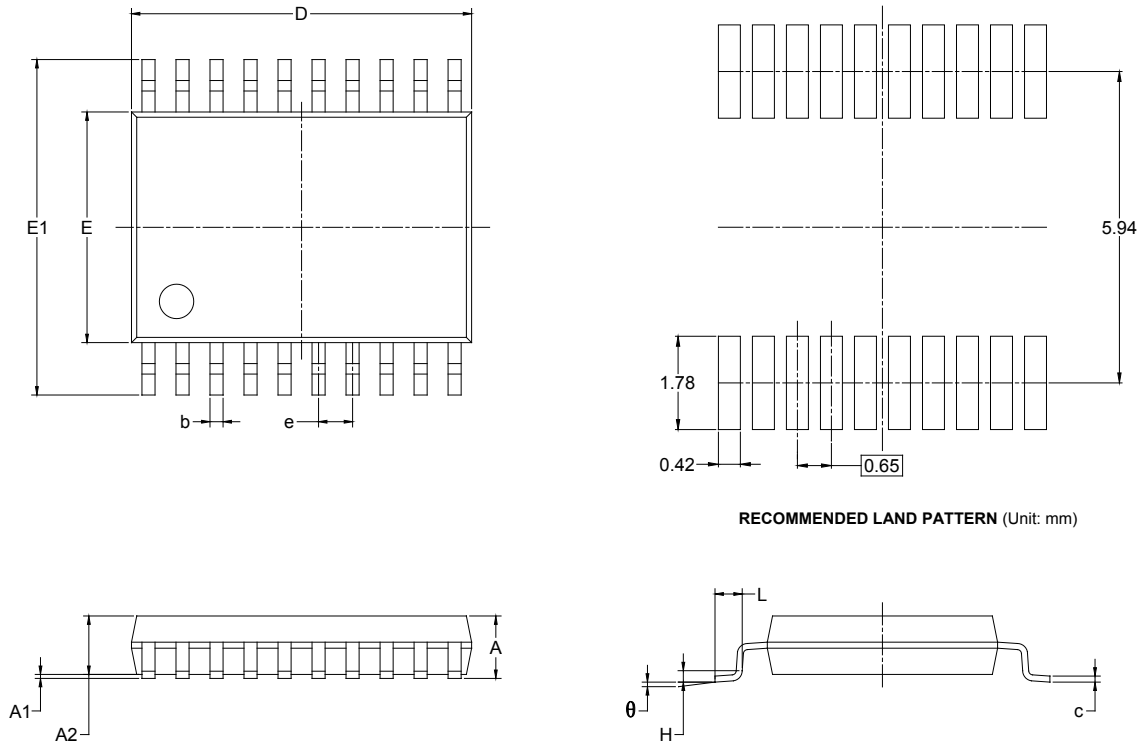


PIN DESCRIPTION

PIN		NAME	FUNCTION
TSSOP-20	TQFN-3x3-20L		
1	19	A1	Input/Output 1. It tracks the V_{CCA} supply.
2	20	V_{CCA}	Supply Voltage on A Ports. It can be operated from 1.2V to 5.5V, and V_{CCA} is always $\leq V_{CCB}$.
3	1	A2	Input/Output 2. It tracks the V_{CCA} supply.
4	2	A3	Input/Output 3. It tracks the V_{CCA} supply.
5	3	A4	Input/Output 4. It tracks the V_{CCA} supply.
6	4	A5	Input/Output 5. It tracks the V_{CCA} supply.
7	5	A6	Input/Output 6. It tracks the V_{CCA} supply.
8	6	A7	Input/Output 7. It tracks the V_{CCA} supply.
9	7	A8	Input/Output 8. It tracks the V_{CCA} supply.
10	8	OE	Output Enable Control Pin. Active high. When OE goes low, all outputs enter into the high-impedance state. It tracks the V_{CCA} supply.
11	9	GND	Ground.
12	10	B8	Input/Output 8. It tracks the V_{CCB} supply.
13	11	B7	Input/Output 7. It tracks the V_{CCB} supply.
14	12	B6	Input/Output 6. It tracks the V_{CCB} supply.
15	13	B5	Input/Output 5. It tracks the V_{CCB} supply.
16	14	B4	Input/Output 4. It tracks the V_{CCB} supply.
17	15	B3	Input/Output 3. It tracks the V_{CCB} supply.
18	16	B2	Input/Output 2. It tracks the V_{CCB} supply.
19	17	V_{CCB}	Supply Voltage on B Ports. It can be operated from 1.65V to 5.5V.
20	18	B1	Input/Output 1. It tracks the V_{CCB} supply.
—	Exposed Pad	GND	Exposed pad should be soldered to PCB board and connected to GND or left floating.

PACKAGE OUTLINE DIMENSIONS

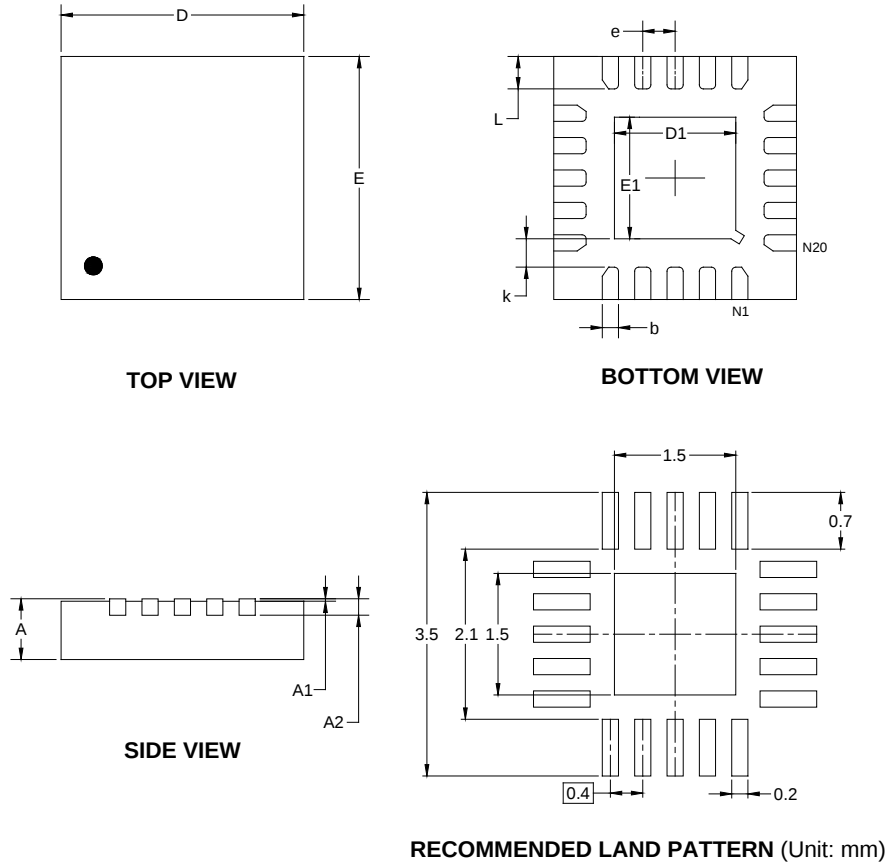
TSSOP-20



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A		1.100		0.043
A1	0.050	0.150	0.002	0.006
A2	0.800	1.000	0.031	0.039
b	0.190	0.300	0.007	0.012
c	0.090	0.200	0.004	0.008
D	6.400	6.600	0.252	0.259
E	4.300	4.500	0.169	0.177
E1	6.250	6.550	0.246	0.258
e	0.650 BSC		0.026 BSC	
L	0.500	0.700	0.02	0.028
H	0.25 TYP		0.01 TYP	
θ	1°	7°	1°	7°

PACKAGE OUTLINE DIMENSIONS

TQFN-3×3-20L

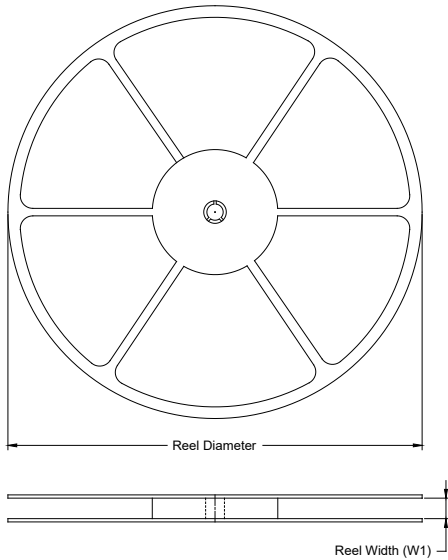


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A2	0.203 REF		0.008 REF	
D	2.924	3.076	0.115	0.121
D1	1.400	1.600	0.055	0.063
E	2.924	3.076	0.115	0.121
E1	1.400	1.600	0.055	0.063
k	0.200 MIN		0.008 MIN	
b	0.150	0.250	0.006	0.010
e	0.400 TYP		0.016 TYP	
L	0.324	0.476	0.013	0.019

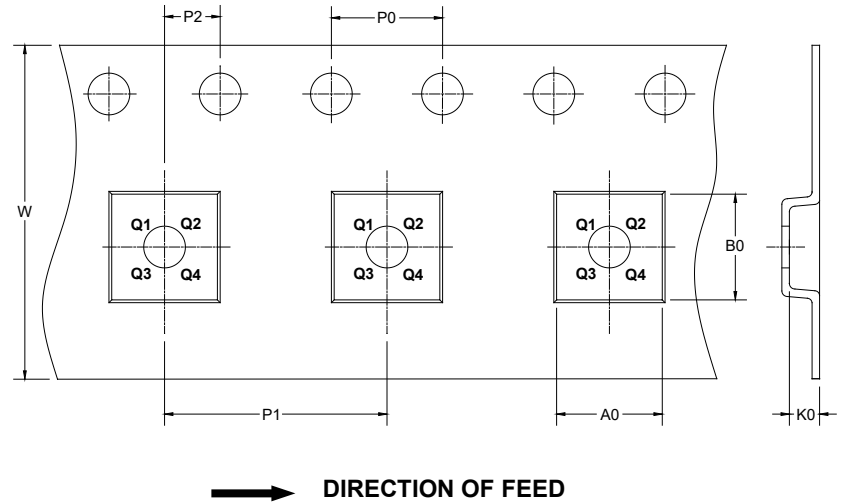
NOTE: This drawing is subject to change without notice.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



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

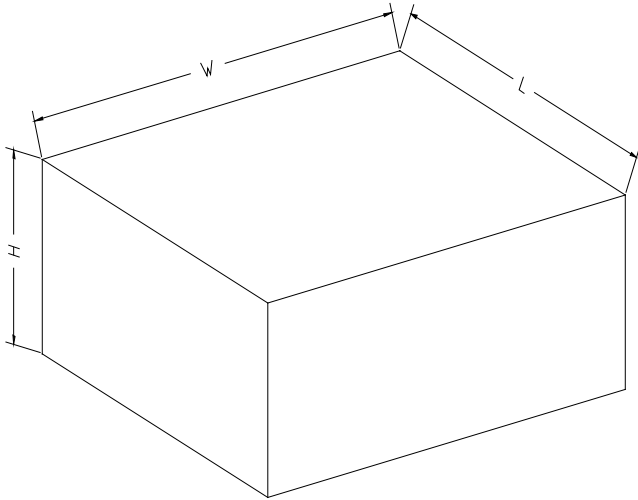
KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant	Assembly House
TSSOP-20	13"	12.4	6.80	6.85	1.70	4.0	8.0	2.0	12.0	Q1	JCET-D8
TSSOP-20	13"	16.4	6.80	6.90	1.50	4.0	8.0	2.0	16.0	Q1	HTTS
TQFN-3×3-20L	13"	12.4	3.30	3.30	1.10	4.0	8.0	2.0	12.0	Q1	JCET-D8

DD0001

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
13"	386	280	370	5

DD0002