

### GENERAL DESCRIPTION

The SGM7SZ245S is an octal bus transceiver with 3-state outputs, which can accept supply voltage range from 1.8V to 5.5V. The device is mainly used for asynchronous communication between data buses. The control function can minimize external timing requirements to the greatest extent possible.

The An and Bn are 8-bit data input-output ports. DIR is the direction control input and  $\overline{OE}$  is the output enable input. When DIR is set high, it allows transmission from An to Bn. When DIR is set low, it allows transmission from Bn to An.  $\overline{OE}$  can be used to make the outputs disabled so that the buses are effectively isolated.

The SGM7SZ245S is available in Green TSSOP-20, TQFN-3×3-20L and TQFN-5.5×3.5-24L packages. It operates over an ambient temperature range of -40°C to +125°C.

### FUNCTION TABLE

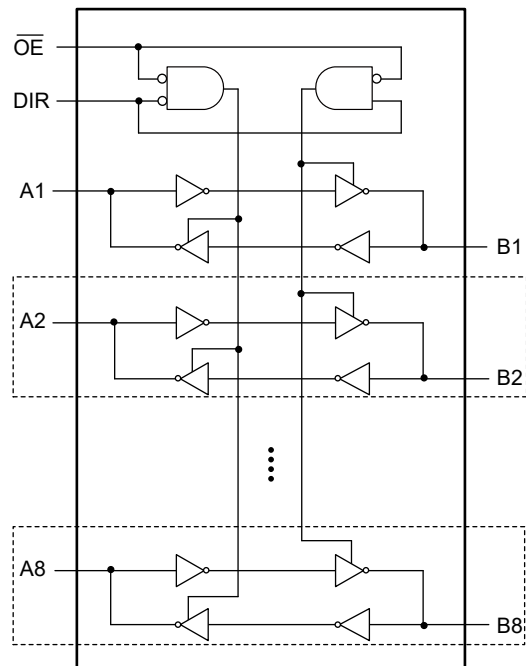
| CONTROL INPUT   |     | INPUT/OUTPUT |         |
|-----------------|-----|--------------|---------|
| $\overline{OE}$ | DIR | An           | Bn      |
| L               | L   | An = Bn      | Inputs  |
| L               | H   | Inputs       | Bn = An |
| H               | X   | Z            | Z       |

H = High Voltage Level  
 L = Low Voltage Level  
 Z = High-Impedance State  
 X = Don't Care

### FEATURES

- **Wide Supply Voltage Range: 1.8V to 5.5V**
- **Input and Output Interface Capability to 5.5V System Environment**
- **+7.8mA/-7.8mA Output Current at  $V_{CC} = 5.0V$**
- **3-State Outputs Drive Bus Lines Directly**
- **-40°C to +125°C Operating Temperature Range**
- **Available in Green TSSOP-20, TQFN-3×3-20L and TQFN-5.5×3.5-24L Packages**

### LOGIC DIAGRAM



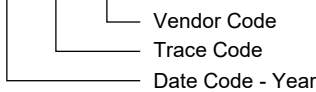
**PACKAGE/ORDERING INFORMATION**

| MODEL      | PACKAGE DESCRIPTION | SPECIFIED TEMPERATURE RANGE | ORDERING NUMBER      | PACKAGE MARKING             | PACKING OPTION      |
|------------|---------------------|-----------------------------|----------------------|-----------------------------|---------------------|
| SGM7SZ245S | TSSOP-20            | -40°C to +125°C             | SGM7SZ245SXTS20G/TR  | SGM06NXTS20<br>XXXXX        | Tape and Reel, 4000 |
|            | TQFN-3×3-20L        | -40°C to +125°C             | SGM7SZ245SXTQG20G/TR | SGM<br>06OQG<br>XXXXX       | Tape and Reel, 4000 |
|            | TQFN-5.5×3.5-24L    | -40°C to +125°C             | SGM7SZ245SXTQQ24G/TR | SGM7SZ245S<br>XTQQ<br>XXXXX | Tape and Reel, 3000 |

**MARKING INFORMATION**

NOTE: XXXXX = Date Code, Trace 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.

**ABSOLUTE MAXIMUM RATINGS <sup>(1)</sup>**

|   |                                      |
|---|--------------------------------------|
| Supply Voltage Range, $V_{CC}$ .....                              | -0.3V to 6.0V                        |
| Input Voltage, $V_I$ <sup>(2)</sup> .....                         | -0.3V to 6.0V                        |
| Output Voltage, $V_O$ <sup>(2)</sup> .....                        |                                      |
| High-State or Low-State .....                                     | -0.3V to MIN(6.0V, $V_{CC} + 0.3V$ ) |
| 3-State Mode .....  | -0.3V to 6.0V                        |
| Input Clamp Current, $I_{IK}$ ( $V_I < 0V$ ) .....                | -20mA                                |
| Output Clamp Current, $I_{OK}$ ( $V_O < 0V$ ) .....               | -20mA                                |
| Continuous Output Current, $I_O$ ( $V_O = 0V$ to $V_{CC}$ ) ..... | ±40mA                                |
| Continuous Current through $V_{CC}$ or GND .....                  | ±70mA                                |
| Junction Temperature <sup>(3)</sup> .....                         | +150°C                               |
| Storage Temperature Range .....                                   | -65°C to +150°C                      |
| Lead Temperature (Soldering, 10s) .....                           | +260°C                               |
| ESD Susceptibility  |                                      |
| HBM .....   | 2000V                                |
| CDM .....   | 1000V                                |

**RECOMMENDED OPERATING CONDITIONS**

|                                      |                 |
|--------------------------------------|-----------------|
| Supply Voltage Range, $V_{CC}$ ..... | 1.8V to 5.5V    |
| Input Voltage Range, $V_I$ .....     | 0V to 5.5V      |
| Output Voltage, $V_O$                |                 |
| High-State or Low-State .....        | 0V to $V_{CC}$  |
| 3-State Mode .....                   | 0V to 5.5V      |
| Operating Temperature Range .....    | -40°C to +125°C |

**OVERSTRESS CAUTION**

1. 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.
2. The input and output negative voltage ratings may be exceeded if the input and output clamp current ratings are observed.
3. The performance capability of a high-performance integrated circuit in conjunction with its thermal environment can create junction temperatures which are detrimental to reliability.

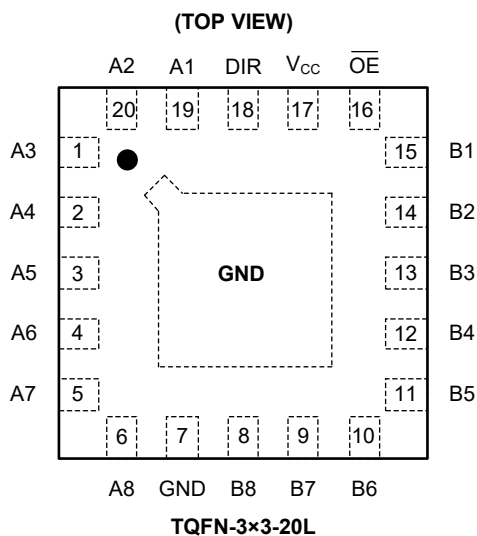
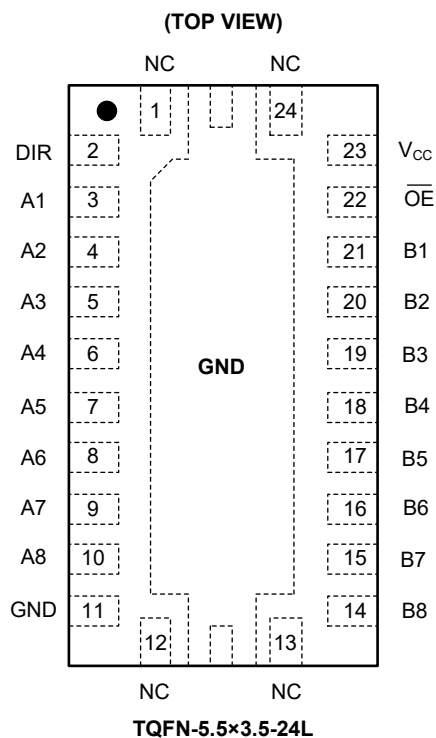
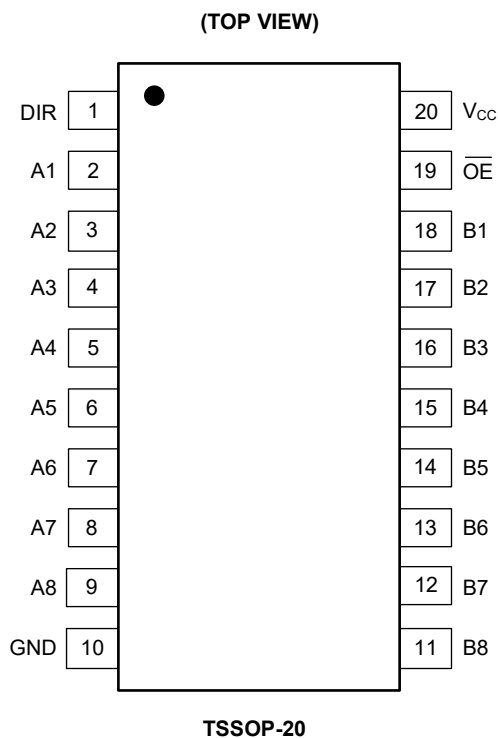
**ESD SENSITIVITY CAUTION**

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 CONFIGURATIONS

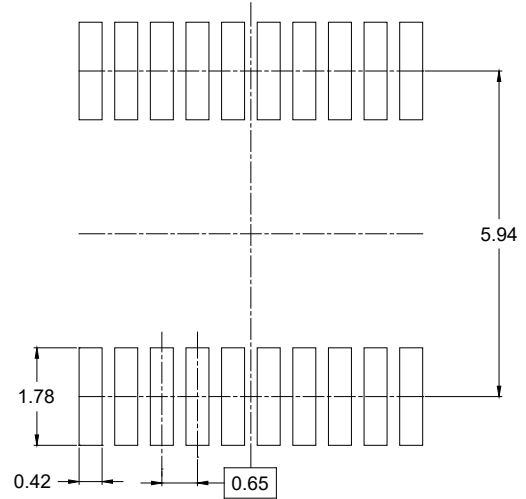
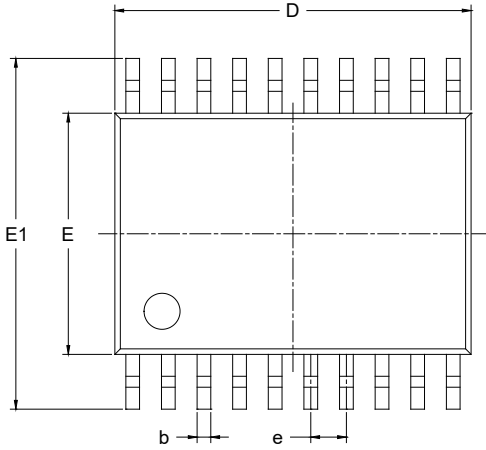


## PIN DESCRIPTION

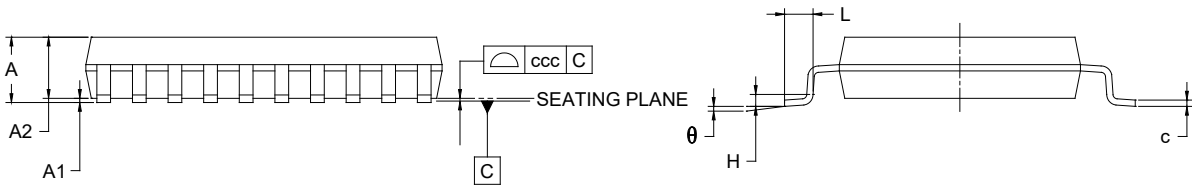
| PIN            |                |                  | NAME            | FUNCTION  |
|----------------|----------------|------------------|-----------------|---|
| TSSOP-20       | TQFN-3×3-20L   | TQFN-5.5×3.5-24L |                 |   |
| 1              | 18             | 2                | DIR             | Direction Control Input.  |
| 2, 3, 4, 5     | 19, 20, 1, 2   | 3, 4, 5, 6       | A1, A2, A3, A4  | Data Inputs/Outputs.  |
| 6, 7, 8, 9     | 3, 4, 5, 6     | 7, 8, 9, 10      | A5, A6, A7, A8  | Data Inputs/Outputs.  |
| 10             | 7              | 11               | GND             | Ground.   |
| 11, 12, 13, 14 | 8, 9, 10, 11   | 14, 15, 16, 17   | B8, B7, B6, B5  | Data Inputs/Outputs.  |
| 15, 16, 17, 18 | 12, 13, 14, 15 | 18, 19, 20, 21   | B4, B3, B2, B1  | Data Inputs/Outputs.  |
| 19             | 16             | 22               | $\overline{OE}$ | Output Enable Input (Active Low).   |
| 20             | 17             | 23               | V <sub>CC</sub> | Supply Voltage. 1.8V ≤ V <sub>CC</sub> ≤ 5.5V                                 |
| –              | –              | 1, 12, 13, 24    | NC              | No Connection.  |
| –              | Exposed Pad    | Exposed Pad      | GND             | Connect it to GND internally. This pad is not an electrical connection point. |

PACKAGE OUTLINE DIMENSIONS

TSSOP-20



RECOMMENDED LAND PATTERN (Unit: mm)



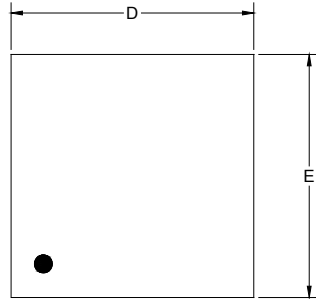
| Symbol | Dimensions In Millimeters |     |       |
|--------|---------------------------|-----|-------|
|        | MIN                       | MOD | MAX   |
| A      | -                         | -   | 1.200 |
| A1     | 0.050                     | -   | 0.150 |
| A2     | 0.800                     | -   | 1.050 |
| b      | 0.190                     | -   | 0.300 |
| c      | 0.090                     | -   | 0.200 |
| D      | 6.400                     | -   | 6.600 |
| E      | 4.300                     | -   | 4.500 |
| E1     | 6.200                     | -   | 6.600 |
| e      | 0.650 BSC                 |     |       |
| L      | 0.450                     | -   | 0.750 |
| H      | 0.250 TYP                 |     |       |
| θ      | 0°                        | -   | 8°    |
| ccc    | 0.100                     |     |       |

NOTES:

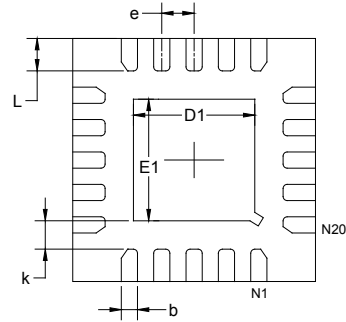
1. Body dimensions do not include mode flash or protrusion.
2. This drawing is subject to change without notice.
3. Reference JEDEC MO-153.

PACKAGE OUTLINE DIMENSIONS

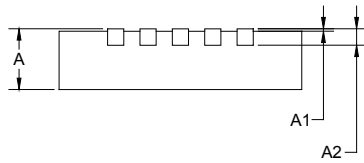
TQFN-3×3-20L



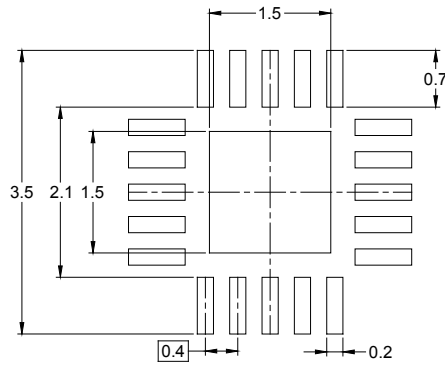
TOP VIEW



BOTTOM VIEW



SIDE VIEW

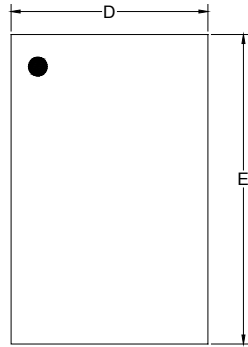


RECOMMENDED LAND PATTERN (Unit: mm)

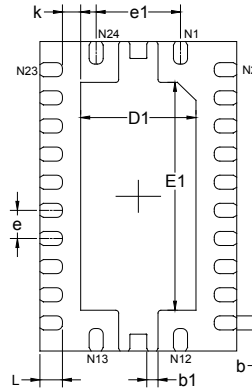
| Symbol | Dimensions<br>In Millimeters |       | Dimensions<br>In Inches |       |
|--------|------------------------------|-------|-------------------------|-------|
|        | MIN                          | MAX   | MIN                     | MAX   |
| A      | 0.700                        | 0.800 | 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 |

PACKAGE OUTLINE DIMENSIONS

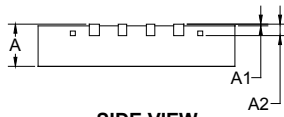
TQFN-5.5×3.5-24L



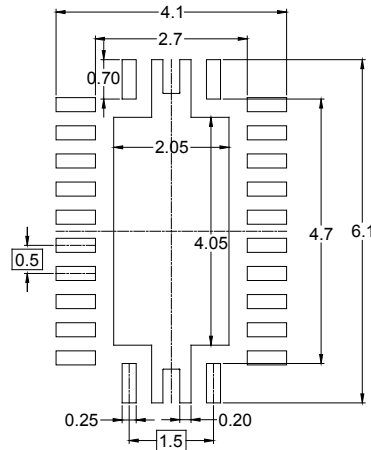
TOP VIEW



BOTTOM VIEW



SIDE VIEW



RECOMMENDED LAND PATTERN (Unit: mm)

| Symbol | Dimensions<br>In Millimeters |       | Dimensions<br>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      | 3.400                        | 3.600 | 0.134                   | 0.142 |
| D1     | 1.950                        | 2.150 | 0.077                   | 0.085 |
| E      | 5.400                        | 5.600 | 0.213                   | 0.220 |
| E1     | 3.950                        | 4.150 | 0.156                   | 0.163 |
| k      | 0.325 REF                    |       | 0.013 REF               |       |
| b      | 0.200                        | 0.300 | 0.008                   | 0.012 |
| b1     | 0.150                        | 0.250 | 0.006                   | 0.010 |
| L      | 0.300                        | 0.500 | 0.012                   | 0.020 |
| e      | 0.500 BSC                    |       | 0.020 BSC               |       |
| e1     | 1.500 BSC                    |       | 0.059 BSC               |       |

## 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 |
|------------------|---------------|--------------------|---------|---------|---------|---------|---------|---------|--------|---------------|
| TSSOP-20         | 13"           | 16.4               | 6.80    | 6.90    | 1.50    | 4.0     | 8.0     | 2.0     | 16.0   | Q1            |
| TQFN-3×3-20L     | 13"           | 12.4               | 3.30    | 3.30    | 1.10    | 4.0     | 8.0     | 2.0     | 12.0   | Q2            |
| TQFN-5.5×3.5-24L | 13"           | 12.4               | 3.80    | 5.80    | 1.00    | 4.0     | 8.0     | 2.0     | 12.0   | Q1            |

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