SGM4572-11Q

Automotive 2-Bit Fixed Direction Voltage-Level Translator with Schmitt-Trigger Inputs and 3-State Outputs

GENERAL DESCRIPTION

The SGM4572-11Q is a 2-bit, non-inverting fixed direction voltage-level translator with two configurable power supply lines. The A and B ports track the V_{CCA} supply and V_{CCB} supply respectively. The supply voltage range is from 1.1V to 5.5V for both A and B ports.

The SGM4572-11Q has an output enable (OE) function, which controls the inputs and outputs states. It refers to the minimum values of V_{CCA} and V_{CCB}. The fixed direction feature allows data to transmit from A ports to B ports or B ports to A ports when OE goes high. When OE goes low, all I/Os enter into the high-impedance state.

The SGM4572-11Q is AEC-Q100 qualified (Automotive Electronics Council (AEC) standard Q100 Grade 1) and it is suitable for automotive applications.

The SGM4572-11Q is available in a Green VSSOP-8 package and is rated over the -40℃ to +125℃ temperature range.

APPLICATIONS

Automotive Applications
Battery Powered Equipment
Industrial Equipment
Medical Equipment
Telecom Equipment

TYPICAL APPLICATION

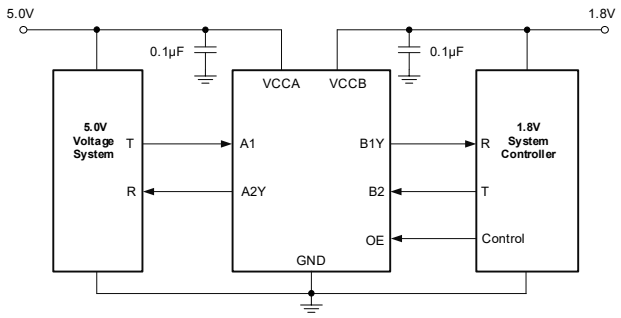


Figure 1. Typical Application Circuit

FEATURES

- **AEC-Q100 Qualified for Automotive Applications**
  Device Temperature Grade 1
  T_A = -40℃ to +125℃
- **V_{CCA} Supply Voltage Range: 1.1V to 5.5V**
- **V_{CCB} Supply Voltage Range: 1.1V to 5.5V**
- **Inputs Accept Voltages Higher than the Supply Voltage and up to 5.5V**
- **Up to 200Mbps (TYP) Supporting for 3.3V to 5.0V**
- **Low Power Consumption**
  - **1.4μA (TYP) at +25℃**
- **Slow and Noisy Inputs are Allowed by Schmitt-Trigger Inputs**
- **Integrated Static Pull-Down Resistors for Inputs Help the Channels Avoid Floating**
- **Outputs are Disabled when V_{CC} ≤ 100mV or Floating**
- **I_{OFF} Allows Operation in Partial-Power-Down Mode**
- **OE with V_{CC_MIN} Circuitry Allows for Control from Either A or B Port**
- **-40℃ to +125℃ Operating Temperature Range**
- **Available in a Green VSSOP-8 Package**

FUNCTION TABLE

CONTROL INPUT	PORTS		OPERATION
OE	INPUTS	OUTPUTS	
H	L	L	Unidirectional, non-inverting
H	H	H	Unidirectional, non-inverting
L	*X*	Z	Isolation

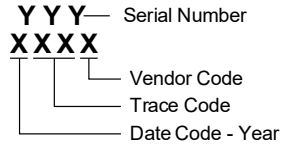
H = High Voltage Level
L = Low Voltage Level
Z = High-Impedance State
X = Don't Care.

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM4572-11Q	VSSOP-8	-40℃ to +125℃	SGM4572-11QVS8G/TR	1TT XXXX	Tape and Reel, 3000

MARKING INFORMATION

NOTE: XXXX = Date Code, Trace Code and Vendor Code.



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 A, V_{CCA} ..... -0.5V to 6.5V
Supply Voltage B, V_{CCB} ..... -0.5V to 6.5V
Input Voltage, V_I (1)
A1, B2 Ports ..... -0.5V to 6.5V
OE ..... -0.5V to 6.5V
Output Voltage, V_O (1) (2)
3-State Mode ..... -0.5V to 6.5V
Active Mode ..... -0.5V to V_{CCO} + 0.5V
Input Clamp Current, I_{IK}, V_{IN} < 0V ..... -20mA
Output Clamp Current, I_{OK}, V_{OUT} < 0V ..... -20mA
Continuous Output Current, I_O ..... ±25mA
Continuous Current through V_{CC} or GND, I_O ..... ±100mA
Package Thermal Resistance
VSSOP-8, θ_{JA} ..... 215.3℃/W
VSSOP-8 θ_{JB} ..... 147.7℃/W
VSSOP-8, θ_{JC} ..... 68.6℃/W
Junction Temperature (3) ..... +150℃
Storage Temperature Range ..... -65℃ to +150℃
Lead Temperature (Soldering, 10s) ..... +260℃
ESD Susceptibility (4) (5)
HBM ..... ±7000V
CDM ..... ±1000V

NOTES:
1. The input and output voltage ratings may be exceeded if the input and output clamp current ratings are observed.
2. V_{CCO} is the supply voltage associated with the data output port.
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.
4. For human body model (HBM), all pins comply with AEC-Q100-002 specification.
5. For charged device model (CDM), all pins comply with AEC-Q100-011 specification.

RECOMMENDED OPERATING CONDITIONS

Supply Voltage A, V_{CCA} ..... 1.1V to 5.5V
Supply Voltage B, V_{CCB} ..... 1.1V to 5.5V
Input Voltage, V_I ..... 0V to 5.5V
Output Voltage, V_O
Active Mode ..... 0V to V_{CCO}
3-State Mode ..... 0V to 5.5V
Operating Ambient Temperature Range ..... -40℃ to +125℃

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.

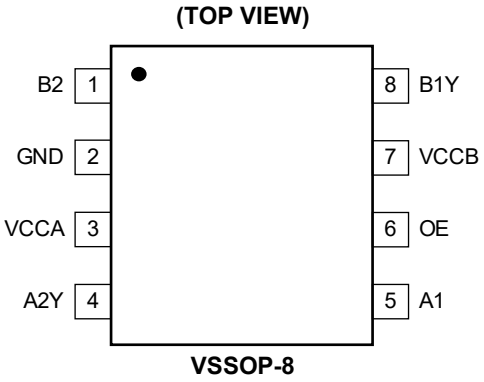
ESD SENSITIVITY CAUTION

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	FUNCTION
1	B2	Input B2. It tracks the V_{CCB} supply.
2	GND	Ground.
3	VCCA	Supply Voltage on A Port. 1.1V ≤ V_{CCA} ≤ 5.5V.
4	A2Y	Output A2. It tracks the V_{CCA} supply.
5	A1	Input A1. It tracks the V_{CCA} supply.
6	OE	Output Enable Pin (Active-High).
7	VCCB	Supply Voltage on B Port. 1.1V ≤ V_{CCB} ≤ 5.5V.
8	B1Y	Output B1. It tracks the V_{CCB} supply.

FUNCTIONAL BLOCK DIAGRAM

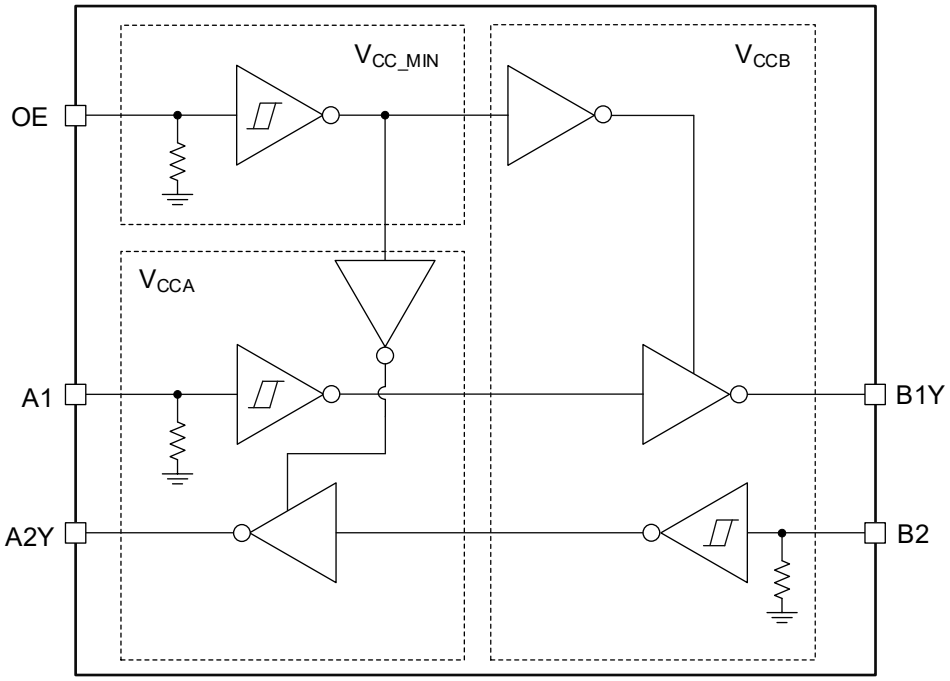
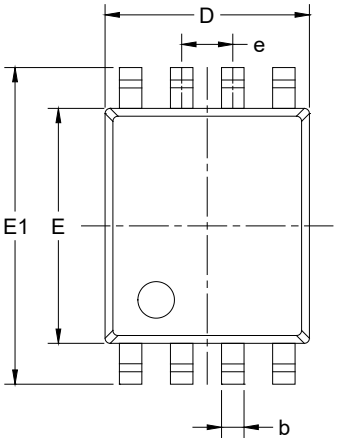
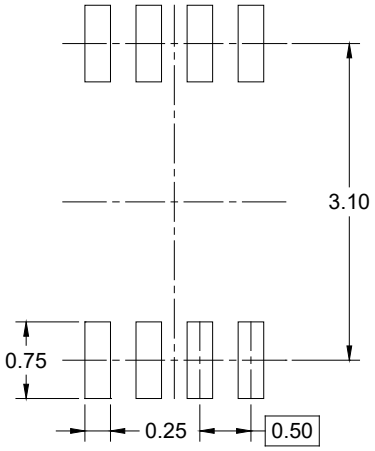


Figure 2. Block Diagram

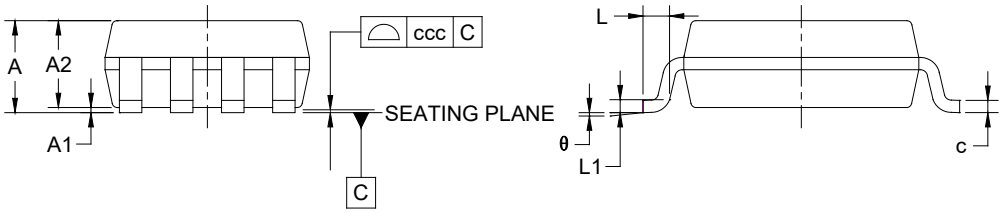
PACKAGE OUTLINE DIMENSIONS

VSSOP-8





RECOMMENDED LAND PATTERN (Unit: mm)

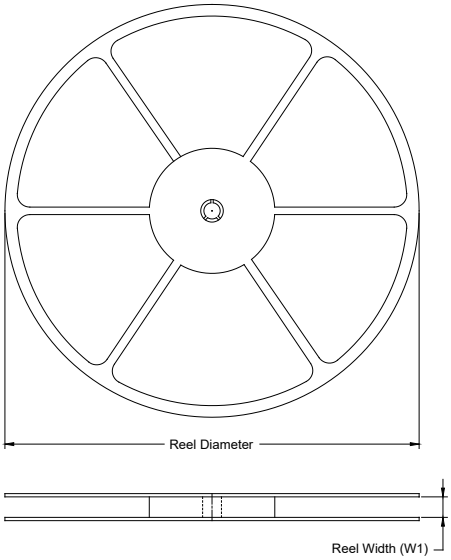


Symbol	Dimensions In Millimeters		
	MIN	NOM	MAX
A	-	-	1.000
A1	0.000	-	0.150
A2	0.600		0.850
b	0.170	-	0.270
c	0.080		0.230
D	1.900	-	2.100
E	2.200	-	2.400
E1	3.000	-	3.200
e	0.500 BSC		
L	0.150	-	0.400
L1	0.120 BSC		
θ	0°	-	8°
ccc	0.100		

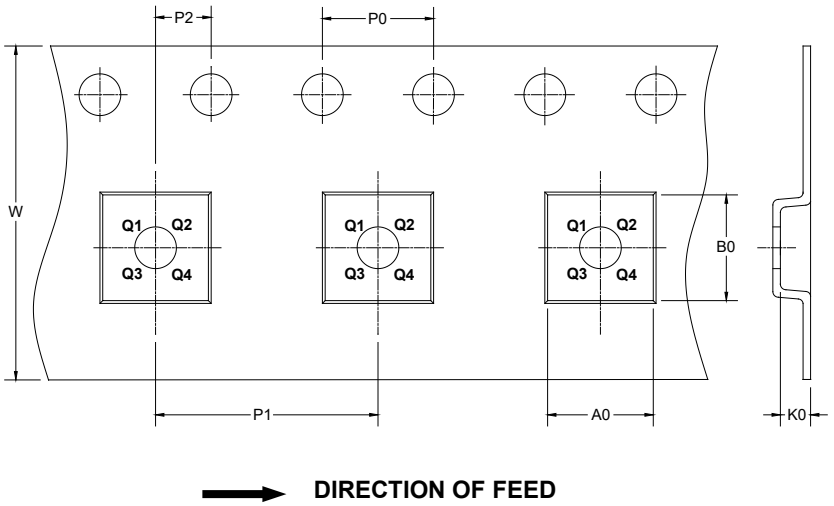
NOTES:
1. This drawing is subject to change without notice.
2. The dimensions do not include mold flashes, protrusions or gate burrs.
3. Reference JEDEC MO-187 CA.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



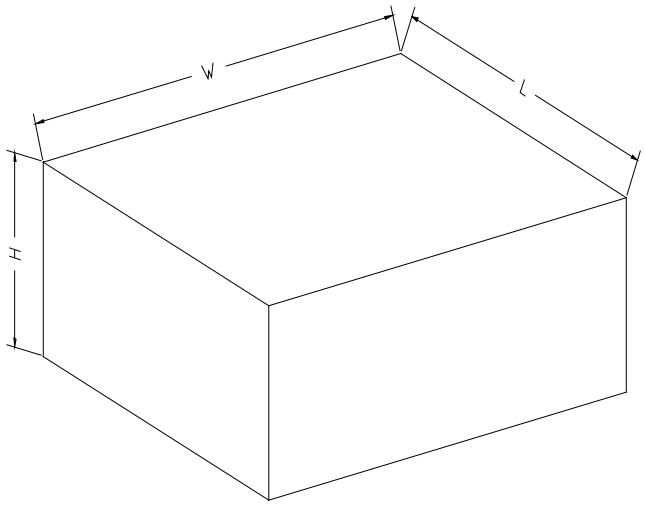
NOTE: The picture is only for reference. Please make the object as the standard.

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
VSSOP-8	7"	9.5	2.25	3.35	1.05	4.0	4.0	2.0	8.0	Q3

DD0001

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

DD0002