



SGM4573

Open-Drain, Dual-Supply Translating Transceiver with Auto Direction Sensing

GENERAL DESCRIPTION

The SGM4573 is a 4-bit, dual-supply translating transceiver. The auto direction sensing function allows a bidirectional voltage level translation for the device. The An and Bn are 4-bit input-output ports and OE is an output enable input. V_{CCA} and V_{CCB} are two supply pins that accept the voltage from 1.65V to 3.6V and 2.3V to 5.5V respectively. This makes the translation among voltage nodes of 1.8V, 2.5V, 3.3V and 5V available. OE and An pins track the V_{CCA} supply and Bn pins track the V_{CCB} supply. When OE pin is held low, the outputs enter a high-impedance state.

FEATURES

- V_{CCA} Supply Voltage Range: 1.65V to 3.6V
- V_{CCB} Supply Voltage Range: 2.3V to 5.5V
- Inputs Accept Voltages up to 5.5V
- Max Data Rates:
 - ♦ Push-Pull: 24Mbps
 - ♦ Open-Drain: 2Mbps
- Support Partial Power-Down Mode
- -40°C to +125°C Operating Temperature Range
- Available in Green TSSOP-14 and TQFN-3.5×3.5-14AL Packages

APPLICATIONS

Computers
Mobile Phones

FUNCTION TABLE

SUPPLY VOLTAGE		CONTROL INPUT	INPUT/OUTPUT	
$V_{CCA}^{(1)}$	V_{CCB}	OE	An	Bn
1.65V to 3.6V	2.3V to 5.5V	L	Z	Z
1.65V to 3.6V	2.3V to 5.5V	H	Input or Output	Output or Input
GND ⁽²⁾	GND ⁽²⁾	X	Z	Z

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

NOTES:

1. $V_{CCA} \leq V_{CCB}$ and $V_{CCA} \leq 3.6V$.
2. The device enters power-down mode when either V_{CCA} or V_{CCB} is at GND.

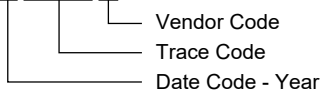
PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM4573	TSSOP-14	-40°C to +125°C	SGM4573XTS14G/TR	4573 XTS14 XXXXX	Tape and Reel, 4000
	TQFN-3.5x3.5-14AL	-40°C to +125°C	SGM4573XTSZ14G/TR	SGM4573 XTSZ14 XXXXX	Tape and Reel, 4000

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 ⁽¹⁾

Supply Voltage Range, V_{CCA}	-0.5V to 6.5V
Supply Voltage Range, V_{CCB}	-0.5V to 6.5V
Input Voltage Range, V_I ⁽²⁾	-0.5V to 6.5V
Output Voltage Range, V_O ⁽²⁾	
Active Mode, A or B Ports.....	-0.5V to $V_{CCO} + 0.5V$
Power-Down Mode or 3-State Mode	
A Ports.....	-0.5V to 4.6V
B Ports.....	-0.5V to 6.5V
Input Clamp Current, I_{IK} ($V_I < 0V$).....	-50mA
Output Clamp Current, I_{OK} ($V_O < 0V$).....	-50mA
Output Current, I_O	
High-State.....	-50mA
Low-State.....	50mA
Supply Current, I_{CCA} or I_{CCB}	100mA
Ground Current, I_{GND}	-100mA
Junction Temperature ⁽³⁾	+150°C
Storage Temperature Range.....	-65°C to +150°C
Lead Temperature (Soldering, 10s).....	+260°C
ESD Susceptibility	
HBM.....	6000V
CDM.....	1000V

RECOMMENDED OPERATING CONDITIONS

Supply Voltage Range, V_{CCA}	1.65V to 3.6V
Supply Voltage Range, V_{CCB}	2.3V to 5.5V
Input Transition Rise or Fall Rate, $\Delta t/\Delta V$	
A or B Ports, Push-Pull Driving	
$V_{CCA} = 1.65V$ to 3.6V, $V_{CCB} = 2.3V$ to 5.5V.....	10ns/V (MAX)
OE Input	
$V_{CCA} = 1.65V$ to 3.6V, $V_{CCB} = 2.3V$ to 5.5V.....	10ns/V (MAX)
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 minimum input voltage ratings and output voltage ratings may be exceeded if the input and output 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.

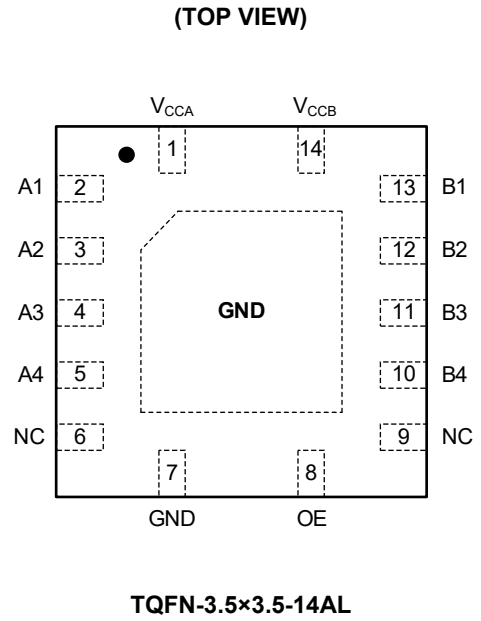
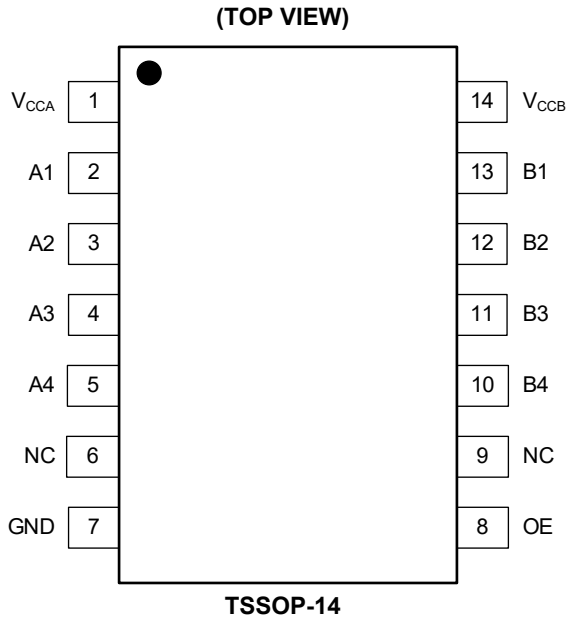
ESD SENSITIVITY CAUTION

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

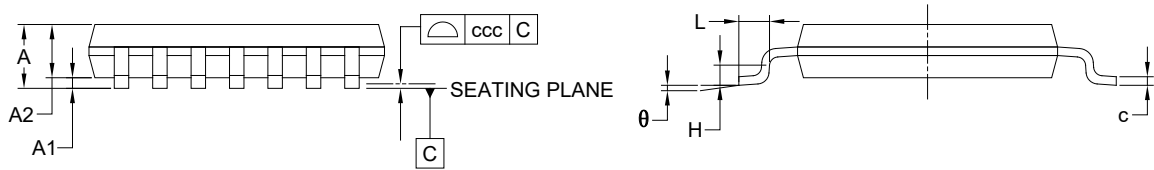
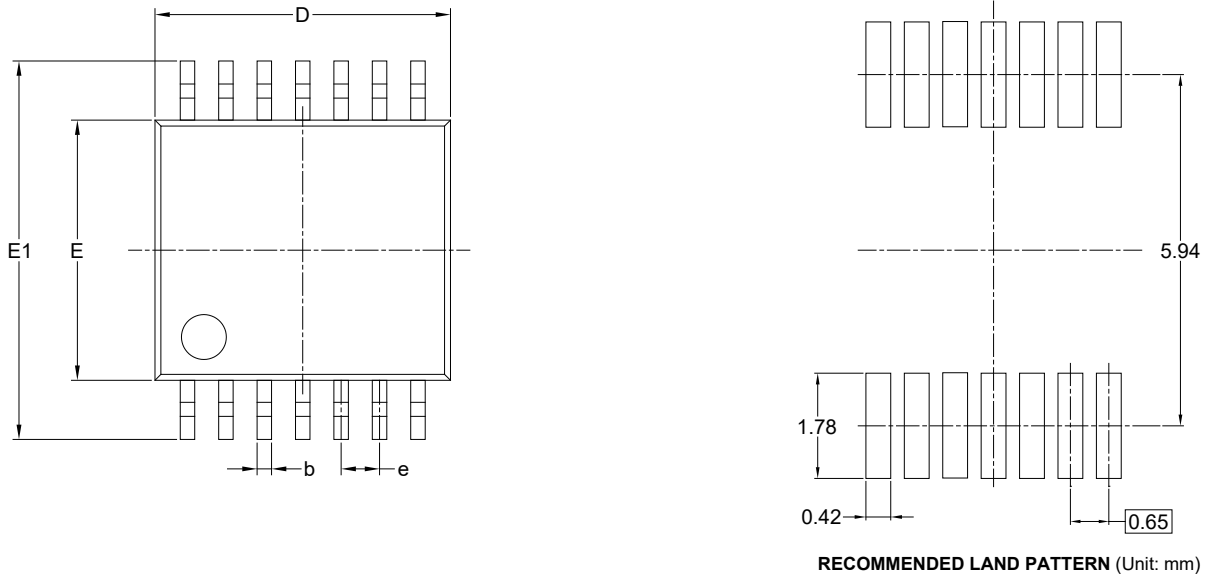


PIN DESCRIPTION

PIN	NAME	FUNCTION
1	V _{CCA}	Supply Voltage on A Ports.
2, 3, 4, 5	A1, A2, A3, A4	Data Inputs/Outputs. They track the V _{CCA} supply.
6, 9	NC	No Connection.
7	GND	Ground.
8	OE	Output Enable Input (Active-High). It tracks the V _{CCA} supply.
10, 11, 12, 13	B4, B3, B2, B1	Data Inputs/Outputs. They track the V _{CCB} supply.
14	V _{CCB}	Supply Voltage on B Ports.
Exposed Pad	GND	Connect it to GND internally. This pad is not an electrical connection point. TQFN-3.5x3.5-14AL package only.

PACKAGE OUTLINE DIMENSIONS

TSSOP-14



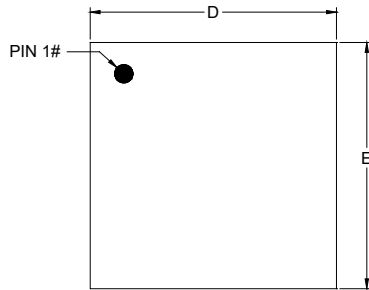
Symbol	Dimensions In Millimeters		
	MIN	MOD	MAX
A	-	-	1.200
A1	0.050	-	0.150
A2	0.800	-	1.050
b	0.190	-	0.300
c	0.090	-	0.200
D	4.860	-	5.100
E	4.300	-	4.500
E1	6.200	-	6.600
e	0.650 BSC		
L	0.450	-	0.750
H	0.250 TYP		
θ	0°	-	8°
ccc	0.100		

NOTES:

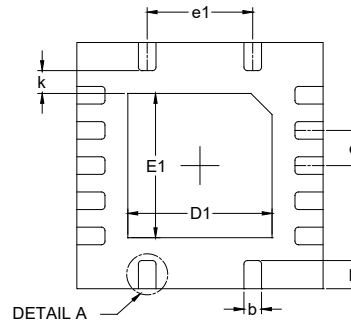
1. This drawing is subject to change without notice.
2. The dimensions do not include mold flashes, protrusions or gate burrs.
3. Reference JEDEC MO-153.

PACKAGE OUTLINE DIMENSIONS

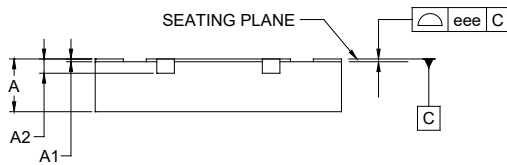
TQFN-3.5×3.5-14AL



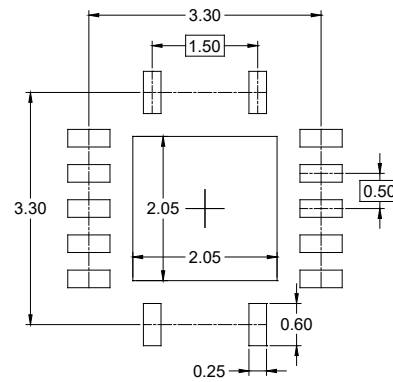
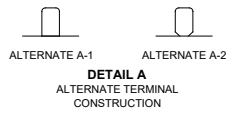
TOP VIEW



BOTTOM VIEW



SIDE VIEW



RECOMMENDED LAND PATTERN (Unit: mm)

Symbol	Dimensions in Millimeters		
	MIN	MOD	MAX
A	0.700	-	0.800
A1	0.000	-	0.050
A2	0.203 REF		
b	0.200	-	0.300
D	3.400	-	3.600
E	3.400	-	3.600
D1	1.950	-	2.150
E1	1.950	-	2.150
e	0.500 BSC		
e1	1.500 BSC		
k	0.200 MIN		
L	0.300	-	0.500
eee	0.080		

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
TSSOP-14	13"	12.4	6.80	5.40	1.50	4.0	8.0	2.0	12.0	Q1
TQFN-3.5×3.5-14AL	13"	12.4	3.80	3.80	1.10	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