



SGM8T245S

8-Bit Dual-Supply Bus Transceiver with Configurable Voltage Translation and 3-State Outputs

GENERAL DESCRIPTION

The SGM8T245S is an 8-bit bus transceiver with configurable voltage translation and 3-state outputs. The An and Bn are 8-bit data input and output ports, DIR is the direction control input and \overline{OE} is an output enable input. V_{CCA} and V_{CCB} are dual-supply pins. The supply voltage of V_{CCA} and V_{CCB} can range from 1.2V to 5.5V, making the device suitable for bidirectional translating among any of the 1.2V, 1.5V, 1.8V, 2.5V, 3.3V and 5.5V voltage nodes. The An, DIR and \overline{OE} pins are referenced to V_{CCA} , and Bn pins are referenced to V_{CCB} .

The direction control (DIR) input determines the direction of the data flow. The DIR (active high) enables data from An ports to Bn ports. The DIR (active low) enables data from Bn ports to An ports. When the output enable (\overline{OE}) input is high, both An and Bn ports are disabled, so the buses are effectively isolated.

This device is highly suitable for partial power-down applications using power-off leakage current (I_{OFF}) circuit. When the device is powered down, the current backflow will be prevented from passing through the device.

FUNCTION TABLE

CONTROL INPUTS		INPUT/OUTPUT	
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

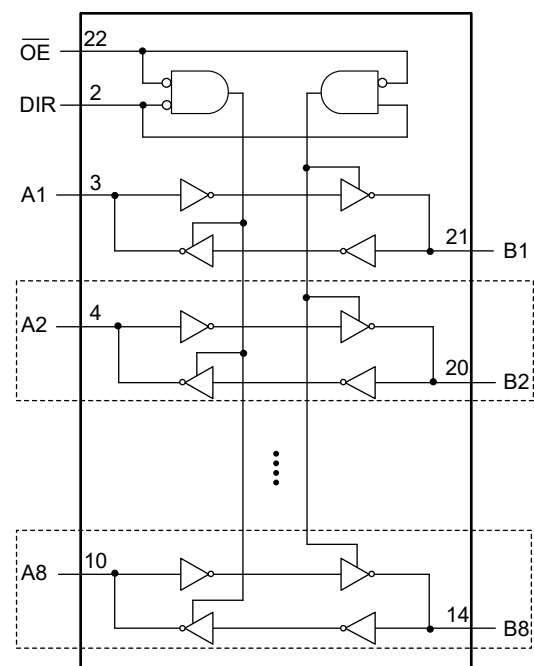
FEATURES

- V_{CCA} Supply Voltage Range: 1.2V to 5.5V
- V_{CCB} Supply Voltage Range: 1.2V to 5.5V
- Inputs Accept Voltages up to 6V
- +20mA/-20mA Output Current
- Outputs in High-Impedance State when V_{CCA} or $V_{CCB} = 0V$
- -40°C to +125°C Operating Temperature Range
- Available in Green TSSOP-24 and TQFN-5.5×3.5-24L Packages

APPLICATIONS

- Personal Electronic
- Industrial Equipment
- Enterprise Infrastructure
- Telecom Equipment

LOGIC DIAGRAM



8-Bit Dual-Supply Bus Transceiver with Configurable Voltage Translation and 3-State Outputs

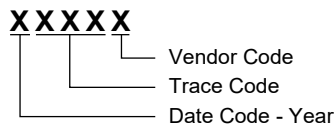
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PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM8T245S	TSSOP-24	-40°C to +125°C	SGM8T245SXTS24G/TR	SGM8T245S XTS24 XXXXX	Tape and Reel, 4000
	TQFN-5.5×3.5-24L	-40°C to +125°C	SGM8T245SXTQQ24G/TR	SGM8T245S XTQQ XXXXX	Tape and Reel, 3000

MARKING INFORMATION

NOTE: XXXXX = 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 ⁽¹⁾

Supply Voltage Range, V_{CCA}	-0.3V to 6.0V
Supply Voltage Range, V_{CCB}	-0.3V to 6.0V
Input Voltage Range, V_I ⁽²⁾	-0.3V to 6.0V
Output Voltage Range, V_O ⁽²⁾	
3-State Mode	-0.3V to 6.0V
High-State or Low-State	
A Ports	-0.3V to MIN(6.0V, $V_{CCA} + 0.3V$)
B Ports	-0.3V to MIN(6.0V, $V_{CCB} + 0.3V$)
Input Clamp Current, I_{IK} ($V_I < 0V$)	-70mA
Output Clamp Current, I_{OK} ($V_O < 0V$)	-70mA
Continuous Output Current, I_O	±70mA
Continuous Output Current (V_{CCA} , V_{CCB} or GND).....	±100mA
Junction Temperature ⁽³⁾	+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_{CCA}	1.2V to 5.5V
Supply Voltage Range, V_{CCB}	1.2V to 5.5V
Input Voltage Range, V_I	0V to 5.5V
Output Voltage Range, V_O	
3-State Mode	0V to 5.5V
High-State or Low-State	
A Ports	0V to V_{CCA}
B Ports	0V to V_{CCB}
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 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.

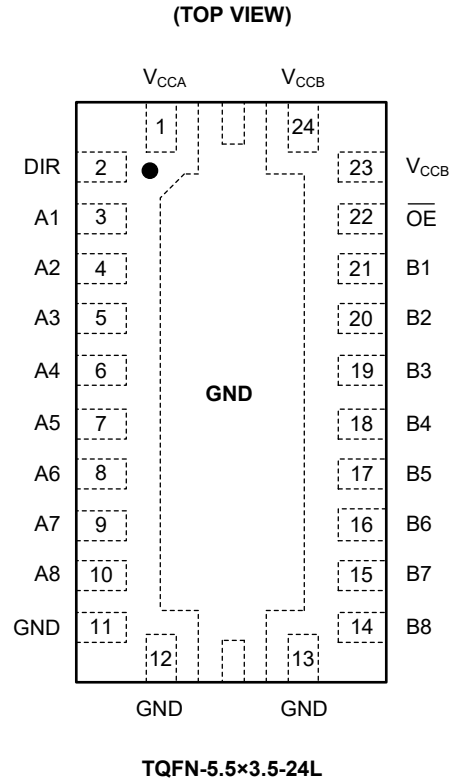
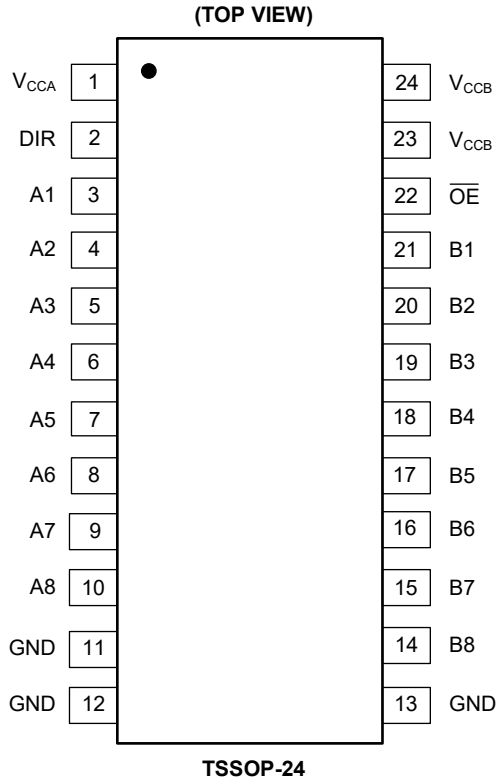
DISCLAIMER

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

8-Bit Dual-Supply Bus Transceiver with Configurable Voltage Translation and 3-State Outputs

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PIN CONFIGURATIONS



PIN DESCRIPTION

PIN	NAME	FUNCTION
1	V_{CCA}	Supply Voltage V_{CCA} . The A_n , DIR and \overline{OE} signals are referenced to V_{CCA} .
2	DIR	Direction Control Input.
3, 4, 5, 6, 7, 8, 9, 10	A1, A2, A3, A4, A5, A6, A7, A8	Data Inputs/Outputs.
11, 12, 13	GND	Ground.
14, 15, 16, 17, 18, 19, 20, 21	B8, B7, B6, B5, B4, B3, B2, B1	Data Inputs/Outputs.
22	\overline{OE}	Output Enable Input (Active Low).
23, 24	V_{CCB}	Supply Voltage V_{CCB} . The B_n signals are referenced to V_{CCB} .
Exposed Pad	GND	Connect it to GND internally. This pad is not an electrical connection point. TQFN-5.5x3.5-24L package only.

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ELECTRICAL CHARACTERISTICS

(Full = -40°C to +125°C, all typical values are measured at T_A = +25°C. V_{CCI} is the supply voltage associated with the data input ports. V_{CCO} is the supply voltage associated with the data output ports, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	TEMP	MIN	TYP	MAX	UNITS	
High-Level Input Voltage	V _{IH}	Data inputs	V _{CCI} = 1.2V to 1.4V	Full	0.85 × V _{CCI}		V	
			V _{CCI} = 1.4V to 2.3V	Full	0.75 × V _{CCI}			
			V _{CCI} = 2.3V to 3.3V	Full	1.75			
			V _{CCI} = 3.3V to 5.0V	Full	2.20			
		DIR, \overline{OE} inputs	V _{CCI} = 1.2V to 1.4V	Full	0.85 × V _{CCA}			
			V _{CCI} = 1.4V to 2.3V	Full	0.75 × V _{CCA}			
			V _{CCI} = 2.3V to 3.3V	Full	1.75			
			V _{CCI} = 3.3V to 5.0V	Full	2.20			
Low-Level Input Voltage	V _{IL}	Data inputs	V _{CCI} = 1.2V to 1.4V	Full		0.10 × V _{CCI}	V	
			V _{CCI} = 1.4V to 2.3V	Full		0.15 × V _{CCI}		
			V _{CCI} = 2.3V to 3.3V	Full		0.50		
			V _{CCI} = 3.3V to 5.0V	Full		0.65		
		DIR, \overline{OE} inputs	V _{CCI} = 1.2V to 1.4V	Full		0.10 × V _{CCA}		
			V _{CCI} = 1.4V to 2.3V	Full		0.15 × V _{CCA}		
			V _{CCI} = 2.3V to 3.3V	Full		0.50		
			V _{CCI} = 3.3V to 5.0V	Full		0.65		
High-Level Output Voltage	V _{OH}	V _I = V _{IH}	I _{OH} = -100μA, V _{CCA} = V _{CCB} = 1.2V to 5.0V	Full	V _{CC} - 0.05	V _{CC} - 0.005	V	
			I _{OH} = -1mA, V _{CCA} = V _{CCB} = 1.2V	Full	1.1	1.18		
			I _{OH} = -5mA, V _{CCA} = V _{CCB} = 1.4V	Full	1.2	1.32		
			I _{OH} = -16mA, V _{CCA} = V _{CCB} = 1.65V	Full	1.1	1.44		
			I _{OH} = -20mA, V _{CCA} = V _{CCB} = 2.3V	Full	1.9	2.13		
			I _{OH} = -20mA, V _{CCA} = V _{CCB} = 5.0V	Full	4.7	4.89		
Low-Level Output Voltage	V _{OL}	V _I = V _{IL}	I _{OL} = 100μA, V _{CCA} = V _{CCB} = 1.2V to 5.0V	Full		0.005	V	
			I _{OL} = 1mA, V _{CCA} = V _{CCB} = 1.2V	Full		0.02		0.1
			I _{OL} = 5mA, V _{CCA} = V _{CCB} = 1.4V	Full		0.07		0.2
			I _{OL} = 16mA, V _{CCA} = V _{CCB} = 1.65V	Full		0.19		0.4
			I _{OL} = 20mA, V _{CCA} = V _{CCB} = 2.3V	Full		0.18		0.4
			I _{OL} = 20mA, V _{CCA} = V _{CCB} = 5.0V	Full		0.14		0.3
Input Leakage Current	I _I	Control inputs, V _{CCA} = 1.2V to 5.5V, V _{CCB} = 1.2V to 5.5V, V _I = V _{CCA} or GND	Full		±0.01	±2	μA	
Power-Off Leakage Current	I _{OFF}	A port, V _{CCA} = 0V, V _{CCB} = 1.2V to 5.5V, V _I or V _O = 0V to 5.5V	Full		±0.01	±10	μA	
		B port, V _{CCB} = 0V, V _{CCA} = 1.2V to 5.5V, V _I or V _O = 0V to 5.5V	Full		±0.01	±10		
Off-State Output Current ⁽¹⁾	I _{OZ}	A or B port, V _{CCA} = V _{CCB} = 5.5V, V _O = 0V or V _{CCO}	Full		±0.01	±10	μA	
		A port, V _{CCA} = 5.5V, V _{CCB} = 0V, V _O = 0V or V _{CCO}	Full		±0.01	±10		
		B port, V _{CCA} = 0V, V _{CCB} = 5.5V, V _O = 0V or V _{CCO}	Full		±0.01	±10		
Supply Current	I _{CCA}	V _{CCA} = 1.2V to 5.5V, V _{CCB} = 1.2V to 5.5V, V _I = V _{CCI} or GND, I _O = 0A	Full		10	15	μA	
	I _{CCB}		Full		20	28		
	I _{CCA} + I _{CCB}		Full		30	43		
Input Capacitance	C _I	Control inputs, V _{CCA} = V _{CCB} = 3.3V, V _I = 3.3V or GND	+25°C		4.5		pF	
Input/Output Capacitance	C _{IO}	A or B ports, V _{CCA} = V _{CCB} = 3.3V, V _O = 3.3V or GND	+25°C		7		pF	

NOTE: 1. For I/O ports, the parameter I_{OZ} includes the input leakage current.

8-Bit Dual-Supply Bus Transceiver with SGM8T245S Configurable Voltage Translation and 3-State Outputs

DYNAMIC CHARACTERISTICS

(See Figure 1 for test circuit. See Figure 2 and Figure 3 for waveforms. Full = -40°C to +125°C, all typical values are measured at T_A = +25°C, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	V _{CCB}									UNITS
			1.2V			1.5V			1.8V			
			MIN ⁽¹⁾	TYP	MAX ⁽¹⁾	MIN ⁽¹⁾	TYP	MAX ⁽¹⁾	MIN ⁽¹⁾	TYP	MAX ⁽¹⁾	
V_{CCA} = 1.2V												
Propagation Delay	t _{PLH}	An to Bn		68			43			36		ns
	t _{PHL}			92			43			28		
	t _{PLH}	Bn to An		70			59			55		ns
	t _{PHL}			97			92			90		
Enable Time	t _{PZH}	OE to An		102			102			102		ns
	t _{PZL}			128			128			128		
	t _{PZH}	OE to Bn		97			64			54		ns
	t _{PZL}			125			70			56		
Disable Time	t _{PHZ}	OE to An		44			44			44		ns
	t _{PLZ}			38			38			38		
	t _{PHZ}	OE to Bn		80			50			51		ns
	t _{PLZ}			79			56			54		
V_{CCA} = 1.5V												
Propagation Delay	t _{PLH}	An to Bn		53		2	29	74	2	22	49	ns
	t _{PHL}			86		2	37	80	2	24	52	
	t _{PLH}	Bn to An		43		2	30	74	1	26	63	ns
	t _{PHL}			43		2	38	80	1	36	71	
Enable Time	t _{PZH}	OE to An		43		2	43	96	2	43	96	ns
	t _{PZL}			48		2	48	110	2	48	110	
	t _{PZH}	OE to Bn		75		2	45	98	2	33	71	ns
	t _{PZL}			99		2	39	110	2	35	76	
Disable Time	t _{PHZ}	OE to An		20		2	20	43	5	20	43	ns
	t _{PLZ}			17		2	17	32	2	17	32	
	t _{PHZ}	OE to Bn		62		10	36	75	10	29	62	ns
	t _{PLZ}			60		10	34	61	5	27	49	
V_{CCA} = 1.8V												
Propagation Delay	t _{PLH}	An to Bn		50		2	24	63	2	17	39	ns
	t _{PHL}			84		1	35	71	2	22	43	
	t _{PLH}	Bn to An		35		0.1	28	60	2	18	39	ns
	t _{PHL}			31		5	24	52	2	23	43	
Enable Time	t _{PZH}	OE to An		27		2	27	58	2	27	58	ns
	t _{PZL}			29		2	29	62	2	29	62	
	t _{PZH}	OE to Bn		70		2	36	85	2	27	58	ns
	t _{PZL}			98		2	42	97	2	29	64	
Disable Time	t _{PHZ}	OE to An		14		2	14	30	2	14	30	ns
	t _{PLZ}			11		2	11	22	2	11	22	
	t _{PHZ}	OE to Bn		56		10	29	64	5	23	52	ns
	t _{PLZ}			53		5	28	52	5	21	42	

8-Bit Dual-Supply Bus Transceiver with SGM8T245S Configurable Voltage Translation and 3-State Outputs

DYNAMIC CHARACTERISTICS (continued)

(See Figure 1 for test circuit. See Figure 2 and Figure 3 for waveforms. Full = -40°C to +125°C, all typical values are measured at T_A = +25°C, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	V _{CCB}									UNITS
			1.2V			1.5V			1.8V			
			MIN ⁽¹⁾	TYP	MAX ⁽¹⁾	MIN ⁽¹⁾	TYP	MAX ⁽¹⁾	MIN ⁽¹⁾	TYP	MAX ⁽¹⁾	
V_{CCA} = 2.5V												
Propagation Delay	t _{PLH}	An to Bn		42		1	22	60	1	14	35	ns
	t _{PHL}			81		1	33	68	2	19	41	
	t _{PLH}	Bn to An		31		1	16	36	0.1	13	25	ns
	t _{PHL}			21		1	15	34	0.1	17	31	
Enable Time	t _{PZH}	OE to An		15		1	15	28	2	15	28	ns
	t _{PZL}			15		1	15	28	2	15	28	
	t _{PZH}	OE to Bn		65		2	31	76	2	22	49	ns
	t _{PZL}			87		1	37	90	2	24	54	
Disable Time	t _{PHZ}	OE to An		8		1	8	24	1	8	24	ns
	t _{PLZ}			6		1	6	14	1	6	14	
	t _{PHZ}	OE to Bn		52		10	25	58	2	18	40	ns
	t _{PLZ}			49		5	23	44	2	16	32	
V_{CCA} = 3.3V												
Propagation Delay	t _{PLH}	An to Bn		46		0.1	21	58	1	13	34	ns
	t _{PHL}			80		0.1	32	68	2	19	40	
	t _{PLH}	Bn to An		27		1	15	32	1	11	22	ns
	t _{PHL}			19		0.1	13	23	1	11	20	
Enable Time	t _{PZH}	OE to An		10		1	10	20	1	10	20	ns
	t _{PZL}			10		1	10	18	1	10	18	
	t _{PZH}	OE to Bn		64		2	30	74	2	20	44	ns
	t _{PZL}			86		2	36	85	2	22	50	
Disable Time	t _{PHZ}	OE to An		8		1	8	19	1	8	19	ns
	t _{PLZ}			6		1	6	12	1	6	12	
	t _{PHZ}	OE to Bn		50		10	24	52	2	17	40	ns
	t _{PLZ}			47		5	22	40	2	15	30	
V_{CCA} = 5.0V												
Propagation Delay	t _{PLH}	An to Bn		46		0.1	20	58	1	13	33	ns
	t _{PHL}			80		1	34	68	2	21	40	
	t _{PLH}	Bn to An		27		1	14	31	1	9	20	ns
	t _{PHL}			19		1	11	20	1	9	16	
Enable Time	t _{PZH}	OE to An		9		1	9	14	1	9	14	ns
	t _{PZL}			8		1	8	13	1	8	13	
	t _{PZH}	OE to Bn		62		2	30	75	2	20	43	ns
	t _{PZL}			91		1	35	81	2	22	48	
Disable Time	t _{PHZ}	OE to An		7		1	7	17	1	7	17	ns
	t _{PLZ}			5		0.1	5	10	0.1	5	10	
	t _{PHZ}	OE to Bn		50		10	23	50	2	16	40	ns
	t _{PLZ}			47		5	21	40	2	14	28	

8-Bit Dual-Supply Bus Transceiver with SGM8T245S Configurable Voltage Translation and 3-State Outputs

DYNAMIC CHARACTERISTICS (continued)

(See Figure 1 for test circuit. See Figure 2 and Figure 3 for waveforms. Full = -40°C to +125°C, all typical values are measured at T_A = +25°C, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	V _{CCB}									UNITS
			2.5V			3.3V			5.0V			
			MIN ⁽¹⁾	TYP	MAX ⁽¹⁾	MIN ⁽¹⁾	TYP	MAX ⁽¹⁾	MIN ⁽¹⁾	TYP	MAX ⁽¹⁾	
V_{CCA} = 1.2V												
Propagation Delay	t _{PLH}	An to Bn		31			30			30		ns
	t _{PHL}			22			20			19		
	t _{PLH}	Bn to An		52			51			51		ns
	t _{PHL}			89			88			90		
Enable Time	t _{PZH}	OE to An		102			102			102		ns
	t _{PZL}			128			128			128		
	t _{PZH}	OE to Bn		49			48			49		ns
	t _{PZL}			49			47			48		
Disable Time	t _{PHZ}	OE to An		44			44			44		ns
	t _{PLZ}			38			38			38		
	t _{PHZ}	OE to Bn		47			46			47		ns
	t _{PLZ}			46			46			46		
V_{CCA} = 1.5V												
Propagation Delay	t _{PLH}	An to Bn	1	17	36	1	15	32	1	14	31	ns
	t _{PHL}		1	15	34	0.1	13	23	0.1	11	20	
	t _{PLH}	Bn to An	1	23	60	0.1	22	58	0.1	21	58	ns
	t _{PHL}		1	34	68	1	33	68	0.1	35	68	
Enable Time	t _{PZH}	OE to An	2	43	96	2	43	96	2	43	96	ns
	t _{PZL}		2	48	110	2	48	110	2	48	110	
	t _{PZH}	OE to Bn	2	26	53	2	24	46	2	23	43	ns
	t _{PZL}		2	27	54	2	24	46	2	23	43	
Disable Time	t _{PHZ}	OE to An	5	20	43	5	20	43	2	20	43	ns
	t _{PLZ}		2	17	32	2	17	32	2	17	32	
	t _{PHZ}	OE to Bn	5	24	52	5	23	50	5	23	48	ns
	t _{PLZ}		5	22	40	2	22	39	2	23	38	
V_{CCA} = 1.8V												
Propagation Delay	t _{PLH}	An to Bn	1	12	24	0.1	10	22	0.1	9	20	ns
	t _{PHL}		1	14	24	0.1	11	20	0.1	9	18	
	t _{PLH}	Bn to An	1	15	35	1	14	34	1	13	33	ns
	t _{PHL}		2	20	41	2	19	40	2	21	40	
Enable Time	t _{PZH}	OE to An	2	27	58	2	27	58	2	27	58	ns
	t _{PZL}		2	29	62	2	29	62	2	29	62	
	t _{PZH}	OE to Bn	2	20	38	2	18	32	2	17	28	ns
	t _{PZL}		2	20	39	2	17	32	2	16	27	
Disable Time	t _{PHZ}	OE to An	2	14	30	2	14	30	2	14	30	ns
	t _{PLZ}		2	11	22	2	11	22	2	11	22	
	t _{PHZ}	OE to Bn	2	17	42	2	16	40	5	16	38	ns
	t _{PLZ}		2	16	33	2	15	32	2	14	26	

8-Bit Dual-Supply Bus Transceiver with SGM8T245S Configurable Voltage Translation and 3-State Outputs

DYNAMIC CHARACTERISTICS (continued)

(See Figure 1 for test circuit. See Figure 2 and Figure 3 for waveforms. Full = -40°C to +125°C, all typical values are measured at T_A = +25°C, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	V _{CCB}									UNITS
			2.5V			3.3V			5.0V			
			MIN ⁽¹⁾	TYP	MAX ⁽¹⁾	MIN ⁽¹⁾	TYP	MAX ⁽¹⁾	MIN ⁽¹⁾	TYP	MAX ⁽¹⁾	
V_{CCA} = 2.5V												
Propagation Delay	t _{PLH}	An to Bn	1	9	21	0.1	7	16	1	6	13	ns
	t _{PHL}		1	11	22	0.1	8	16	1	6	13	
	t _{PLH}	Bn to An	1	9	21	1	8	20	1	8	19	ns
	t _{PHL}		1	11	22	1	10	22	1	12	21	
Enable Time	t _{PZH}	OE to An	1	15	28	1	15	28	1	15	28	ns
	t _{PZL}		1	15	28	1	15	28	1	15	28	
	t _{PZH}	OE to Bn	2	15	30	1	13	22	1	11	20	ns
	t _{PZL}		2	15	30	1	12	22	2	11	18	
Disable Time	t _{PHZ}	OE to An	1	8	24	1	8	24	1	8	24	ns
	t _{PLZ}		1	6	14	1	6	14	1	6	14	
	t _{PHZ}	OE to Bn	2	13	32	2	35	44	1	12	25	ns
	t _{PLZ}		2	11	24	1	10	22	2	10	20	
V_{CCA} = 3.3V												
Propagation Delay	t _{PLH}	An to Bn	1	8	20	0.1	9	18	0.1	5	12	ns
	t _{PHL}		1	10	22	0.1	9	19	0.1	5	10	
	t _{PLH}	Bn to An	1	7	16	1	7	14	0.1	6	14	ns
	t _{PHL}		1	8	15	1	7	16	1	9	15	
Enable Time	t _{PZH}	OE to An	1	10	20	1	10	20	1	10	20	ns
	t _{PZL}		1	10	18	1	10	18	1	10	18	
	t _{PZH}	OE to Bn	2	13	26	1	11	21	1	9	15	ns
	t _{PZL}		2	13	26	1	10	19	1	8	16	
Disable Time	t _{PHZ}	OE to An	1	8	19	1	8	19	1	8	19	ns
	t _{PLZ}		1	6	12	1	6	12	1	6	12	
	t _{PHZ}	OE to Bn	1	11	27	1	10	25	1	9	22	ns
	t _{PLZ}		1	10	20	1	10	18	2	8	16	

8-Bit Dual-Supply Bus Transceiver with SGM8T245S Configurable Voltage Translation and 3-State Outputs

DYNAMIC CHARACTERISTICS (continued)

(See Figure 1 for test circuit. See Figure 2 and Figure 3 for waveforms. Full = -40°C to +125°C, all typical values are measured at T_A = +25°C, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	V _{CCB}									UNITS
			2.5V			3.3V			5.0V			
			MIN ⁽¹⁾	TYP	MAX ⁽¹⁾	MIN ⁽¹⁾	TYP	MAX ⁽¹⁾	MIN ⁽¹⁾	TYP	MAX ⁽¹⁾	
V_{CCA} = 5.0V												
Propagation Delay	t _{PLH}	An to Bn	1	8	19	0.1	6	18	0.1	5	10	ns
	t _{PHL}		1	12	22	1	9	16	0.1	8	12	
	t _{PLH}	Bn to An	1	6	13	0.1	5	12	0.1	5	11	ns
	t _{PHL}		1	6	11	0.1	5	10	0.1	8	12	
Enable Time	t _{PZH}	OE to An	1	9	14	1	9	14	1	9	14	ns
	t _{PZL}		1	8	13	1	8	13	1	8	13	
	t _{PZH}	OE to Bn	1	14	24	1	11	18	1	10	14	ns
	t _{PZL}		1	14	24	1	11	17	1	9	13	
Disable Time	t _{PHZ}	OE to An	1	7	17	1	7	17	1	7	17	ns
	t _{PLZ}		0.1	5	10	0.1	5	10	0.1	5	10	
	t _{PHZ}	OE to Bn	2	10	30	1	9	25	1	8	22	ns
	t _{PLZ}		2	9	18	1	7	15	1	10	14	

NOTE:

1. Specified by design and characterization, not production tested.

TYPICAL POWER DISSIPATION CAPACITANCE

(T_A = +25°C, V_{CCA} = V_{CCB}, unless otherwise noted.)

PARAMETER	SYMBOL	CONDITIONS	V _{CCA} = V _{CCB}						UNITS
			1.2V	1.5V	1.8V	2.5V	3.3V	5.0V	
Power Dissipation Capacitance ⁽¹⁾⁽²⁾	C _{PD}	A ports: (direction An to Bn)	0.6	1.1	1.1	1.1	1.1	1.1	pF
		A ports: (direction Bn to An)	6	17	17	17	17	17	
		B ports: (direction An to Bn)	6	17	17	17	17	17	
		B ports: (direction Bn to An)	0.6	1.1	1.1	1.1	1.1	1.1	

NOTES:

1. C_{PD} is used to determine the dynamic power dissipation (P_D in μW).

$$P_D = C_{PD} \times V_{CC}^2 \times f_i \times N + \Sigma(C_L \times V_{CC}^2 \times f_o)$$

where:

f_i = Input frequency in MHz.

f_o = Output frequency in MHz.

C_L = Output load capacitance in pF.

V_{CC} = Supply voltage in Volts.

N = Number of inputs switching.

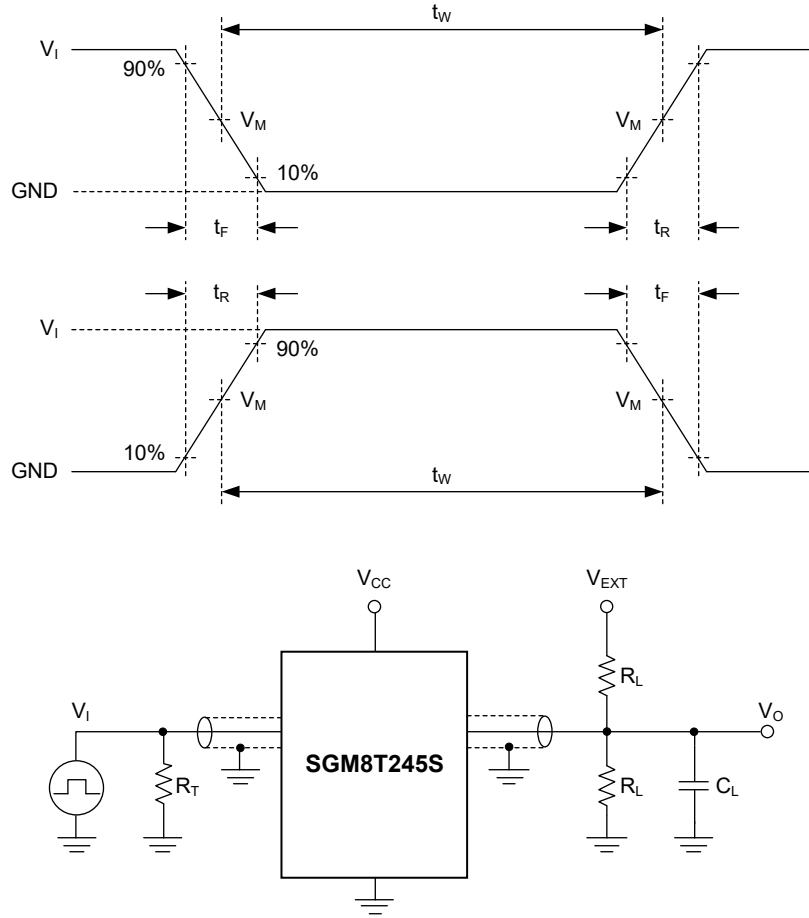
Σ(C_L × V_{CC}² × f_o) = Sum of the outputs.

2. Per transceiver, f_i = 10MHz, t_R = t_F = 1ns, C_L = 0pF.

8-Bit Dual-Supply Bus Transceiver with Configurable Voltage Translation and 3-State Outputs

SGM8T245S

TEST CIRCUIT



Test conditions are given in Table 1.

Definitions for test circuit:

R_L : Load resistance.

C_L : Load capacitance (includes jig and probe).

R_T : Termination resistance (equals to output impedance Z_O of the pulse generator).

V_{EXT} : External voltage is used to measure switching time.

Figure 1. Test Circuit for Measuring Switching Times

Table 1. Test Conditions

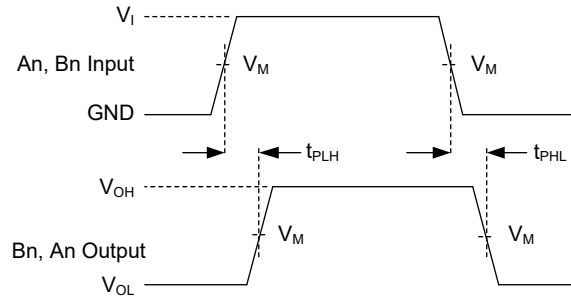
SUPPLY VOLTAGE	INPUT		LOAD		V_{EXT}		
	V_{CC1}	$\Delta t/\Delta V$	C_L	R_L	t_{PLH}, t_{PHL}	t_{PZH}, t_{PHZ}	$t_{PZL}, t_{PLZ}^{(2)}$
1.2V to 5.5V	V_{CC1}	$\leq 1.0\text{ns/V}$	15pF	2k Ω	Open	GND	$2 \times V_{CC0}$

NOTES:

1. V_{CC1} is the supply voltage associated with the data input ports.
2. V_{CC0} is the supply voltage associated with the data output ports.

SGM8T245S 8-Bit Dual-Supply Bus Transceiver with Configurable Voltage Translation and 3-State Outputs

WAVEFORMS

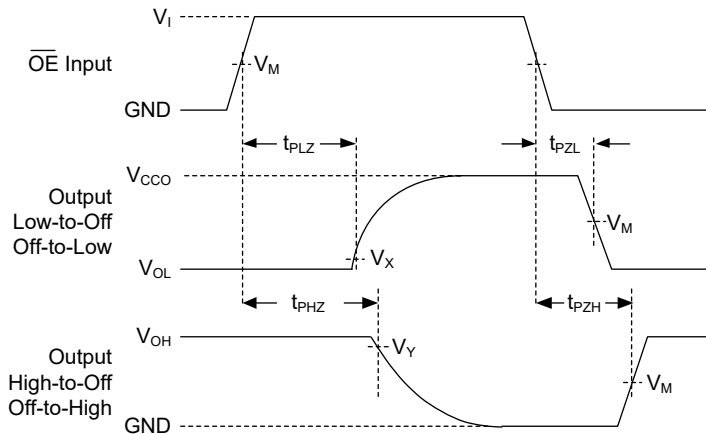


Test conditions are given in Table 1.

Measurement points are given in Table 2.

Logic levels: V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.

Figure 2. Input (An, Bn) to Output (Bn, An) Propagation Delay Times



Test conditions are given in Table 1.

Measurement points are given in Table 2.

Logic levels: V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.

Figure 3. Enable and Disable Times

Table 2. Measurement Points

SUPPLY VOLTAGE	INPUT ⁽¹⁾		OUTPUT		
	V_{CCI}	V_M ⁽²⁾	V_M ⁽³⁾	V_X	V_Y
1.2V	V_{CCI}	$0.5 \times V_{CCI}$	$0.5 \times V_{CCO}$	$V_{OL} + 0.1V$	$V_{OH} - 0.1V$
$1.5V \pm 0.1V$	V_{CCI}	$0.5 \times V_{CCI}$	$0.5 \times V_{CCO}$	$V_{OL} + 0.1V$	$V_{OH} - 0.1V$
$1.8V \pm 0.15V$	V_{CCI}	$0.5 \times V_{CCI}$	$0.5 \times V_{CCO}$	$V_{OL} + 0.15V$	$V_{OH} - 0.15V$
$2.5V \pm 0.2V$	V_{CCI}	$0.5 \times V_{CCI}$	$0.5 \times V_{CCO}$	$V_{OL} + 0.15V$	$V_{OH} - 0.15V$
$3.3V \pm 0.3V$	V_{CCI}	$0.5 \times V_{CCI}$	$0.5 \times V_{CCO}$	$V_{OL} + 0.3V$	$V_{OH} - 0.3V$
$5.0V \pm 0.5V$	V_{CCI}	$0.5 \times V_{CCI}$	$0.5 \times V_{CCO}$	$V_{OL} + 0.5V$	$V_{OH} - 0.5V$

NOTES:

- V_{CCI} is the supply voltage associated with the data input ports.
- The measurement points should be V_{IH} or V_{IL} when $\Delta t/\Delta V > 1.0ns/V$.
- V_{CCO} is the supply voltage associated with the data output ports.

SGM8T245S 8-Bit Dual-Supply Bus Transceiver with Configurable Voltage Translation and 3-State Outputs

REVISION HISTORY

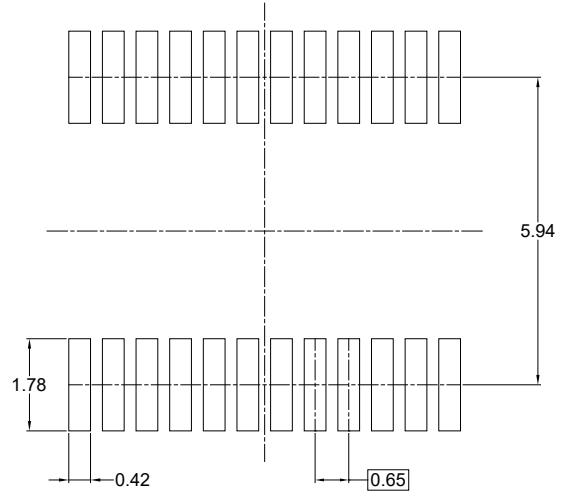
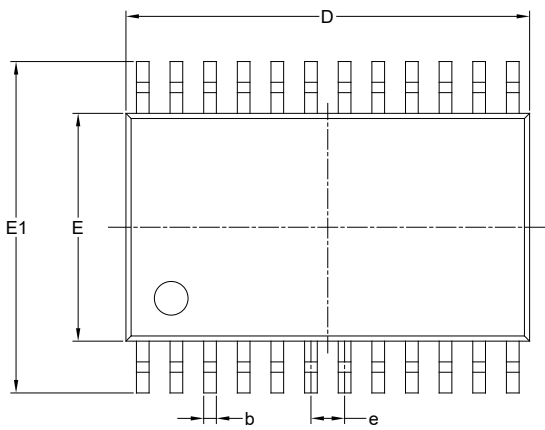
NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

JANUARY 2024 – REV.A to REV.A.1	Page
Updated Function Table and I_{OFF} and I_{OZ} conditions in ELECTRICAL CHARACTERISTICS section.....	1, 4
Updated MIN and MAX values related to 1.2V supply voltage in DYNAMIC CHARACTERISTICS section	5, 6, 7

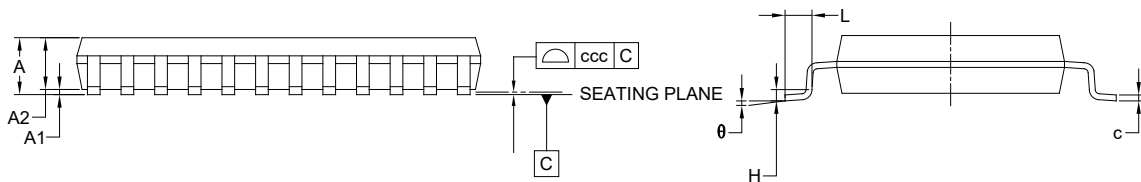
Changes from Original (JULY 2023) to REV.A	Page
Changed from product preview to production data.....	All

PACKAGE OUTLINE DIMENSIONS

TSSOP-24



RECOMMENDED LAND PATTERN (Unit: mm)



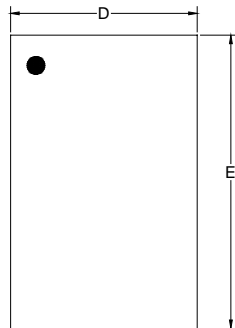
Symbol	Dimensions In Millimeters		
	MIN	MOD	MAX
A	-	-	1.200
A1	0.050	-	0.150
A2	0.800	-	1.050
b	0.190	-	0.300
c	0.090	-	0.200
D	7.700	-	7.900
E	4.300	-	4.500
E1	6.200	-	6.600
e	0.650 BSC		
L	0.450	-	0.750
H	0.250 TYP		
theta	0°	-	8°
ccc	0.100		

NOTES:

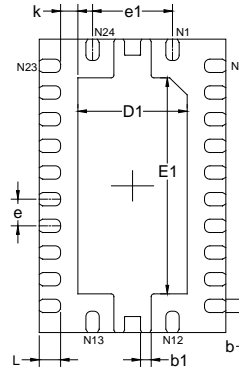
1. This drawing is subject to change without notice.
2. The dimensions do not include mold flashes, protrusions or gate burrs.
3. Reference JEDEC MO-153.

PACKAGE OUTLINE DIMENSIONS

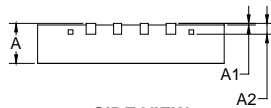
TQFN-5.5x3.5-24L



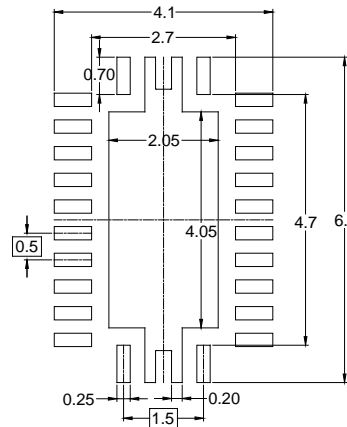
TOP VIEW



BOTTOM VIEW



SIDE VIEW



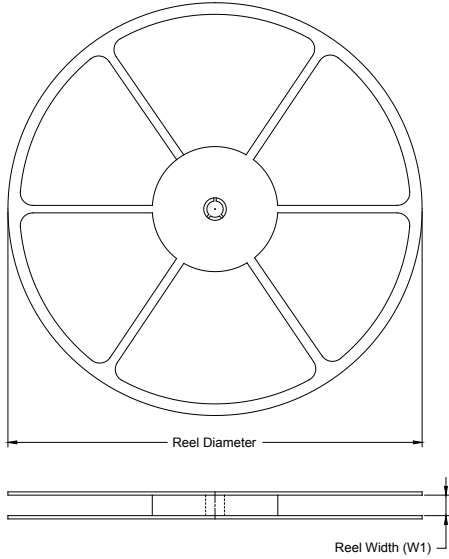
RECOMMENDED LAND PATTERN (Unit: mm)

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	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	

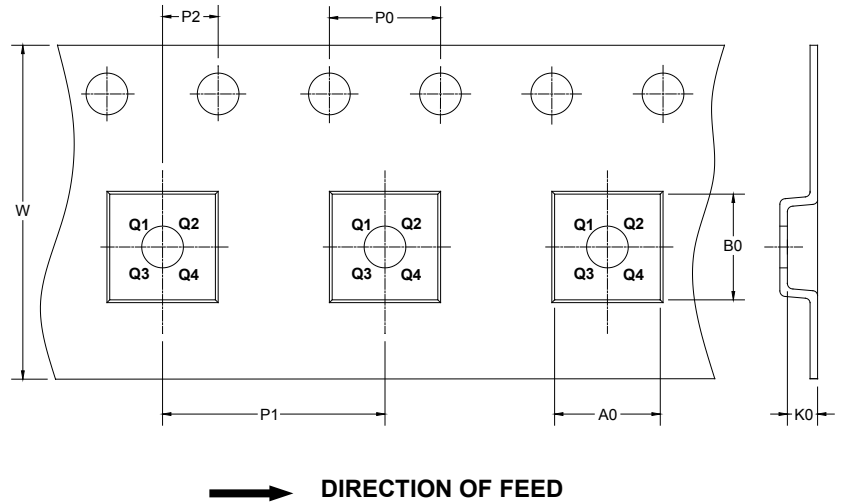
NOTE: This drawing is subject to change without notice.

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-24	13"	16.4	6.80	8.30	1.60	4.0	8.0	2.0	16.0	Q1
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

单击下面可查看定价，库存，交付和生命周期等信息

[>>SGMICRO\(圣邦微电子\)](#)