

2-Bit Bidirectional Voltage-Level Translator with Auto Direction Sensing

GENERAL DESCRIPTION

The SGM4556YXET is a 2-bit, non-inverting, bidirectional voltage-level translator which features two independent configurable power-supply lines. The A and B ports track the $V_{\rm CCA}$ supply and $V_{\rm CCB}$ supply respectively. The supply voltage range is 1.2V to 5.0V for A ports and 1.65V to 5.5V for B ports. The device provides a bidirectional translation function among the different voltage nodes (including 1.2V, 1.5V, 1.8V, 2.5V, 3.3V and 5V).

The SGM4556YXET has an output enable (OE) function, which controls the outputs states. When OE goes low, all outputs enter into the high-impedance state. When Vcca is powered, OE has an internal pull-down current source. 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 SGM4556YXET is available in a Green XTDFN-1.35×1-8L package. It operates over an ambient temperature range of -40°C to +85°C.

FEATURES

- Power Supply Voltage Ranges (V_{CCA} ≤ V_{CCB})
 - + A Ports: 1.2V to 5.0V
 - 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 a Green XTDFN-1.35×1-8L Package

APPLICATIONS

Universal Asynchronous Receiver/Transmitter (UART) General Purpose I/O (GPIO)

TYPICAL APPLICATION

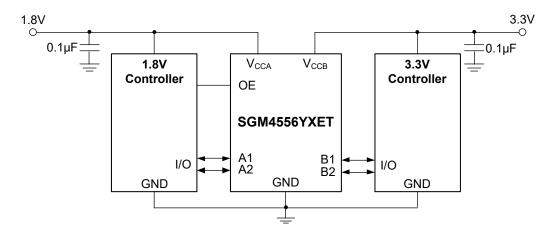


Figure 1. Typical Application Circuit

PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION	
SGM4556YXET	XTDFN-1.35×1-8L	-40°C to +85°C	SGM4556YXET8G/TR	2UX	Tape and Reel, 5000	

MARKING INFORMATION

NOTE: X = Date Code.

YY X

Date Code - Quarter

Serial Number

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 Range	
V _{CCA}	0.3V to 6V
V _{CCB}	0.3V to 6V
Input Voltage Range, V _I ⁽¹⁾	0.3V to 6V
Output Voltage Range for the High-Im	pedance or Power-Off
State, V _O ⁽¹⁾	
A Ports	0.3V to 6V
B Ports	0.3V to 6V
Output Voltage Range for the High or L	ow State, V _O ^{(1) (2)}
A Ports	
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)	50mA
Continuous Output Current, Io	
Continuous Current through V_{CCA} , V_{CCB}	, or GND±100mA
Package Thermal Resistance	
XTDFN-1.35×1-8L, θ _{JA}	188.2°C/W
XTDFN-1.35×1-8L, θ _{JB}	104°C/W
XTDFN-1.35×1-8L, θ _{JC}	95.9°C/W
Junction Temperature	+150°C
Storage Temperature Range	65°C to +150°C
Lead Temperature (Soldering, 10s)	+260°C
ESD Susceptibility	
HBM	4000V
MM	400V
CDM	1000V

NOTES:

 When the input and output current ratings are observed, the input and I/O negative voltage ratings may be exceeded.
 V_{CCA} and V_{CCB} values are shown in the recommended operating conditions in Electrical Characteristics section.

RECOMMENDED OPERATING CONDITIONS

Operating Temperature Range-40°C to +85°C

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.

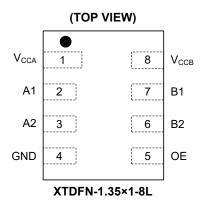
ESD SENSITIVITY CAUTION

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.

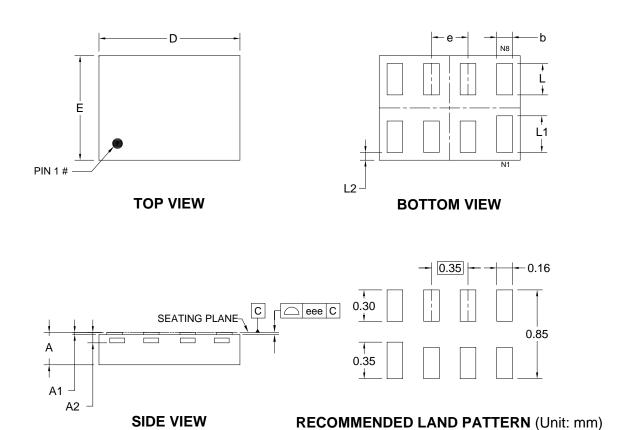
PIN CONFIGURATION



PIN DESCRIPTION

PIN	NAME	FUNCTION							
1	V_{CCA}	Supply Voltage on A Ports. It can be operated from 1.2V to 5.0V, and V _{CCA} is always ≤ V _{CCB} .							
2	A1	Channel 1 Input/Output A. It tracks the V _{CCA} supply.							
3	A2	Channel 2 Input/Output A. It tracks the V _{CCA} supply.							
4	GND	Ground.							
5	OE	Output Enable Control Pin. Active high. When OE goes low, all outputs enter into the high-impedance state. It tracks the $V_{\rm CCA}$ supply.							
6	B2	Channel 2 Input/Output B. It tracks the V _{CCB} supply.							
7	B1	Channel 1 Input/Output B. It tracks the V _{CCB} supply.							
8	V _{CCB}	Supply Voltage on B Ports. It can be operated from 1.65V to 5.5V.							

PACKAGE OUTLINE DIMENSIONS XTDFN-1.35×1-8L



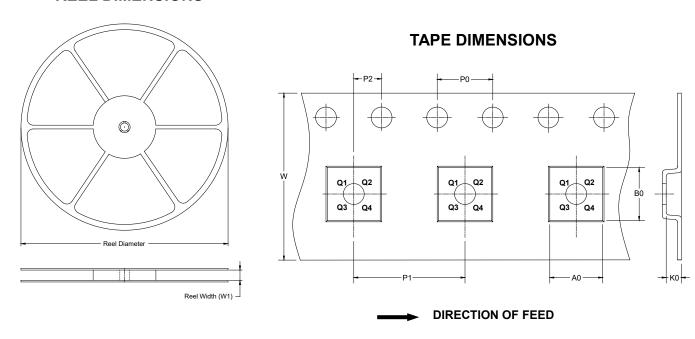
Symbol	Dimensions In Millimeters					
Symbol	MIN	MOD	MAX			
Α	-	0.310	0.330			
A1	0.000	-	0.050			
A2		0.100 REF				
D	1.250	1.350	1.450			
E	0.900	1.000	1.100			
b	0.110	0.160	0.210			
е		0.350 BSC	350 BSC			
L	0.250	0.300	0.350			
L1	0.300	0.300 0.350				
L2	0.075 REF					
eee	-					

NOTE: This drawing is subject to change without notice.



TAPE AND REEL INFORMATION

REEL DIMENSIONS

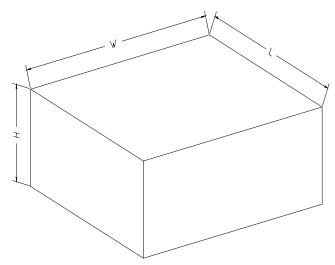


NOTE: The picture is only for reference. Please make the object as the standard.

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
XTDFN-1.35×1-8L	7"	9.5	1.21	1.51	0.39	4.0	4.0	2.0	8.0	Q1

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