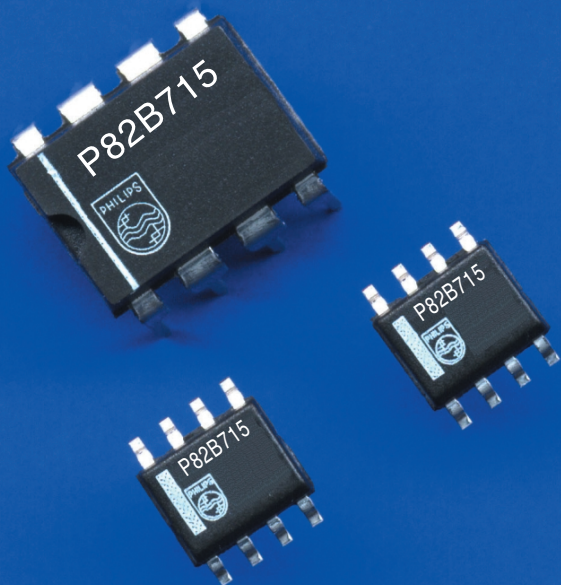


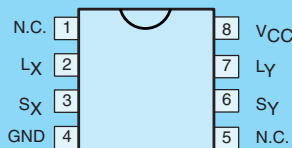
# P82B715

## I<sup>2</sup>C Bus Extender Chip



### Pin Configurations

8-Pin Dual In-Line or SO  
82B715



### Pinning

PIN	SYMBOL	FUNCTION
1	N.C.	
2	L <sub>X</sub>	Buffered Bus, LDA or LCL
3	S <sub>X</sub>	I <sup>2</sup> C Bus, SDA or SCL
4	GND	Negative Supply
5	N.C.	
6	S <sub>Y</sub>	I <sup>2</sup> C Bus, SCL or SDA
7	L <sub>Y</sub>	Buffered Bus, LCL or LDA
8	V <sub>CC</sub>	Positive Supply

### Order Information

Package	Container	Pkg. Drawing	12NC	Part Number
SO 8	Tube	SOT96-1	935154770112	P82B715TD
	T & R	SOT96-1	935154770118	P82B715TD
DIP 8	Tube	SOT97-1	935154220112	P82B715PN

### Description

The 82B715 is an analog bipolar integrated circuit intended for application in I<sup>2</sup>C bus systems.

While retaining all the operating modes and features of the I<sup>2</sup>C system it permits extension of the practical separation distance between components on the I<sup>2</sup>C bus by buffering both the data (SDA) and the clock (SCL) lines.

The I<sup>2</sup>C bus capacitance limit of 400pF restricts practical communication distances to a few meters. Using one 82B715 at each end of longer cables reduces the cable loading capacitance on the I<sup>2</sup>C bus by a factor of 10 times and may allow the use of low cost general purpose wiring to extend bus lengths.

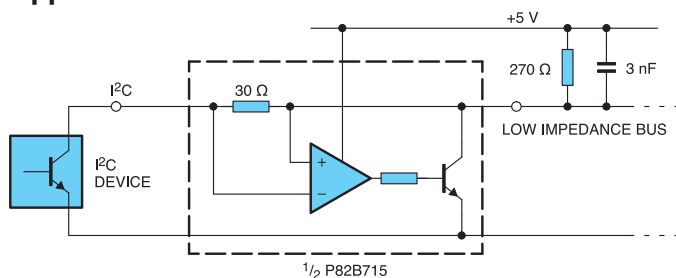
### P82B715 Features

- Dual, bi-directional, unity voltage gain buffering
- Wide supply voltage range
- I<sup>2</sup>C compatible
- 10X impedance transformation
- Logic signal levels may include V<sub>CC</sub> and ground
- Available in SO and DIL 8-pin packages
- Manufactured in rugged bipolar process

### P82B715 Operating Characteristics

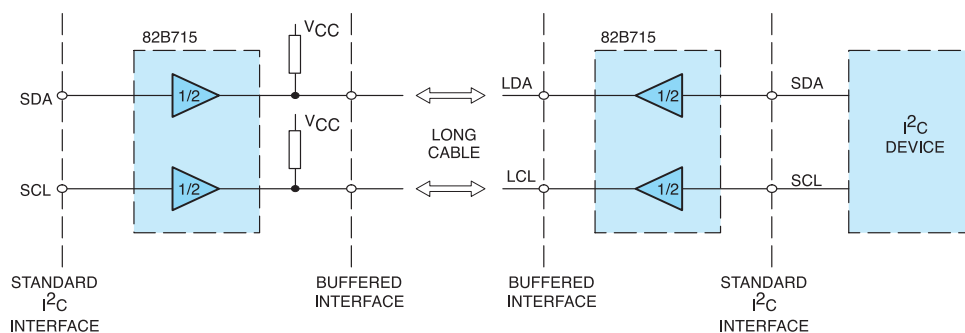
- 3 V to 12.5 V operating range
- -40 to 85 °C operating temperature range
- 0 to 100 kHz clock frequency

### Application

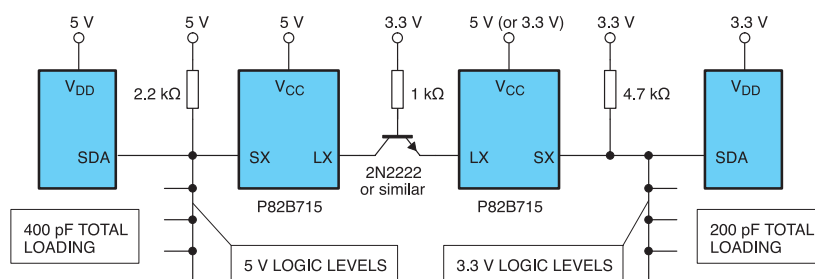


The P82B715 uses unidirectional analog amplification to increase the current sinking capability of standard I<sup>2</sup>C chips by a factor 10. Its 30 mA static sink capability on the low impedance bus allows up to 4000 pF bus capacitance.

The P82B715 reduces the operating impedance of cables linking standard I<sup>2</sup>C chips by a factor up to 10 times. In this example the cabling could be twisted telephone pairs and the impedance around 180 ohms.



Logic level shifting with P82B715 requires external components but its impedance transforming action allows a single low cost transistor to be used.



## Philips I<sup>2</sup>C Buffers, Extenders and Hubs

Application	PCA9515	PCA9516	P82B96	P82B715
Data sheet supply voltage range $V_{CC}$	3.0 - 3.6 V	3.0 - 3.6 V	2 - 15 V	4.5 - 12 V
Nominal logic levels supported (range)	$V_{CC}$ to 5.5 V	$V_{CC}$ to 5.5 V	$V_{CC}$ to 15V	Equal/less than $V_{CC}$
Allows I <sup>2</sup> C bus logic level shifting (range)	3.0 - 5.5 V	3.0 - 5.5 V	2 - 15 V	no level shifts
Allows interconnecting I <sup>2</sup> C buses, each 400pF	yes, 2	yes, 5	yes, 2+	no
On-chip bus sink current capability	I <sup>2</sup> C	I <sup>2</sup> C	10x I <sup>2</sup> C	10x I <sup>2</sup> C
Drives lower impedance "I <sup>2</sup> C like" buses	no	no	yes	yes
Max. (multimaster) bus capacitance supported	800 pF	2000 pF	unlimited	3000 pF approx
Allows inter-working of I <sup>2</sup> C and SMBus	yes	yes	yes	no
Designed operating I <sup>2</sup> C clock speed	400 kHz	400 kHz	100 kHz	100 kHz
Typ. propagation delay (excluding contention)	100 nsec	120 nsec	300 nsec	400 nsec
(Multimaster) system configuration	repeater	hub/star	multi-drop bus	multi-drop bus
Splits I <sup>2</sup> C to Tx/Rx allowing opto-isolation	no	no	yes	no
Releases all I/O if $V_{CC}$ supply fails	yes	yes	yes	no
I/Os can be pulled above chip's $V_{CC}$ level	yes, to 5.5 V	yes, to 5.5 V	yes, to 15 V	no
Logic "buffer enable" input(s)	yes	yes, 4	no	no
Supply current (typ)	2 mA	7 mA	1 mA	16 mA
Packages	TSSOP/SO8	TSSOP/SO16	DIL/SO8	DIL/SO8

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