

E0C37120

Multifunction Buffer IC

DESCRIPTION

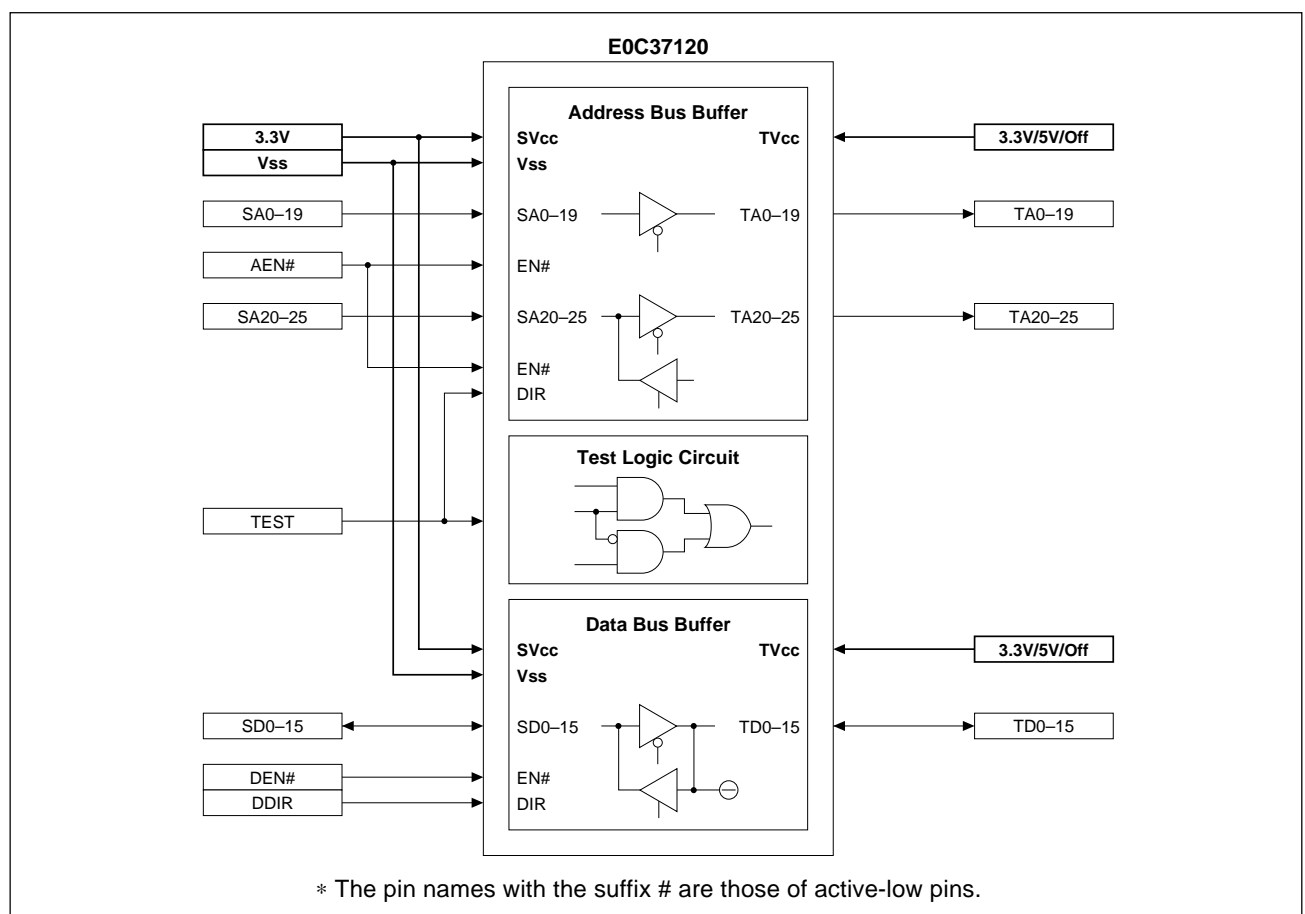
The E0C37120 is a multifunction buffer IC suitable for use as a PCMCIA interface buffer and 3.3V↔5V conversion level shifter. Because it enables a multi-chip buffer IC to be integrated into a single chip, this product helps you miniaturize your system.

The E0C37120 is designed to be particularly effective when it is used with the E0C37109 (MPU), SEIKO EPSON 32-bit single-chip RISC microcomputer. When used in this way, it provides superior characteristics as an interface buffer for PCMCIA cards capable of hot insertion/removal.

FEATURES

- Incorporates 26-bit mono-directional buffer
- Incorporates 16-bit bi-directional buffer
- Power supply on target side: 3.3V, 5V, power-off
- Incorporates 3.3V/ 5V level shifter
- High-speed 0.35- μ m CMOS process
- Compact package: QFP15-100pin

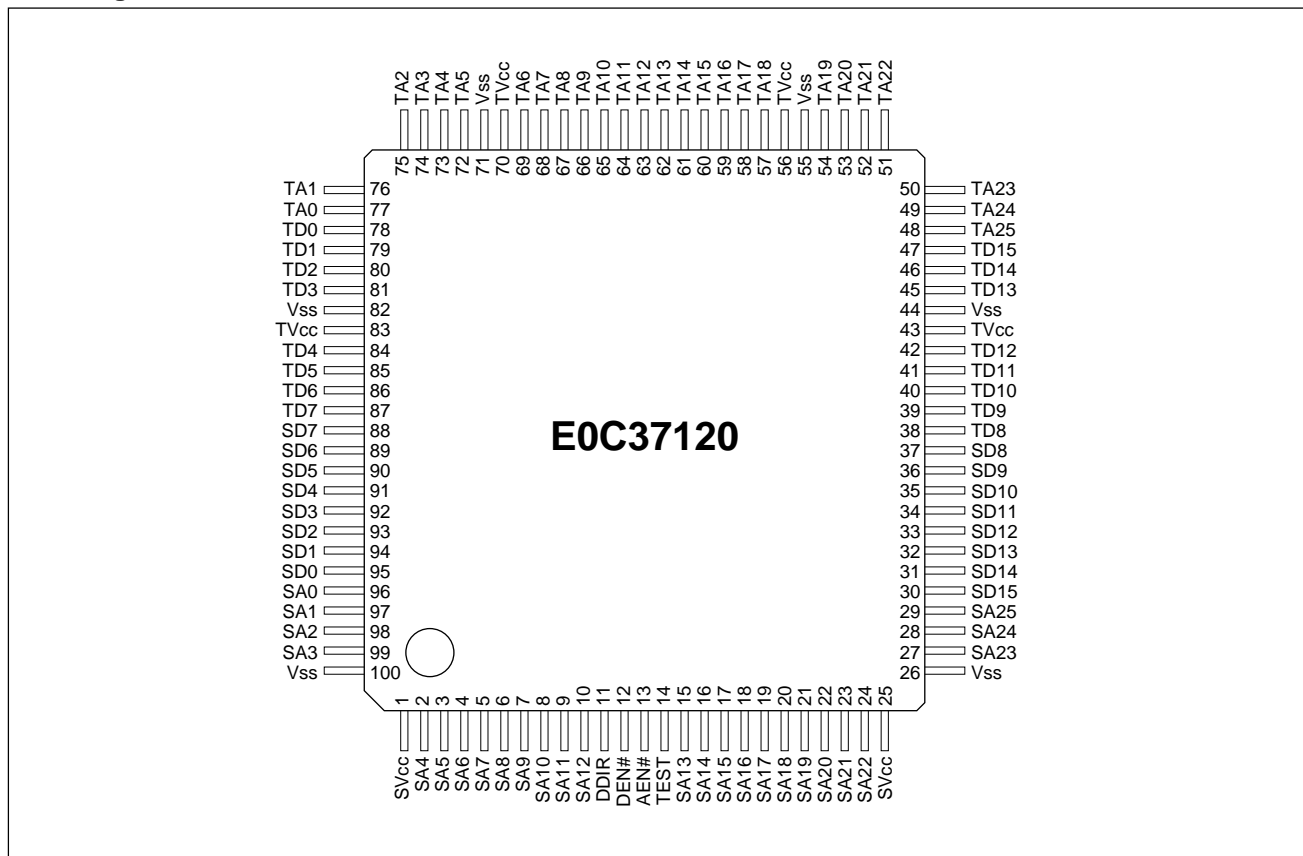
BLOCK DIAGRAM



E0C37120

■ PIN DESCRIPTION

● Pin Assignment



● Pin Function

Pin name	Description	Type	No. of pins	Power
SA0–19	Address bus signal on system side	I	20	SVcc
SA20–25	Address bus signal on system side When TEST = high, the pins SA20–25 function as test-signal output pins. When these pins are not used, connect them to Vss via a resistor of 10 kΩ or more.	I/O	6	SVcc
SD0–15	Data bus signal on system side When these pins are not used, connect them to Vss via a resistor of 10 kΩ or more.	I/O	16	SVcc
TA0–25	Address bus signal on target side	O	26	TVcc
TD0–15	Data bus signal on target side When these pins are not used, leave them unconnected.	I/O PD	16	TVcc
AEN#	Address bus buffer-enable signal	I	1	SVcc
TEST	Test signal Always connect this pin to Vss.	I	1	SVcc
DEN#	Data bus buffer-enable signal	I	1	SVcc
DDIR	Data bus buffer-direction signal When DDIR = high, this signal is driven in the direction SDxx ← TDxx. When DDIR = low, this signal is driven in the direction SDxx → TDxx.	I	1	SVcc
SVcc	Power supply on system side and for internal logic (3.3 V) Make sure power is fed to all the SVcc pins.	P	2	–
TVcc	Power supply for address bus buffer and data bus buffer on system side (3.3 V/5 V/Off) When turning the power off, set AEN# high to prevent static current consumption from increasing. Make sure power is fed to all the TVcc pins.	P	4	–
Vss	Ground Be sure to connect all the Vss pins to ground.	P	6	–

Note: Symbols representing the type of pins mean the following.

I: Input port, O: Output port, I/O: Bi-directional port, P: Power port, PD: with pull-down resistance

■ ELECTRICAL CHARACTERISTICS

● Absolute Maximum Ratings

(V_{SS}=0V)

Rating	Symbol	Value	Unit	Note
Supply voltage	SV _{CC}	-0.3 to 4.6	V	
	TV _{CC}	-0.3 to 6.0	V	
Input voltage	V _{pin}	-0.3 to SV _{CC} + 0.5 -0.3 to TV _{CC} + 0.5	V	
Output current/pin	I _{out}	±5	mA	
Total output current	ΣI _{out}	±30	mA	
Storage temperature	T _{stg}	-65 to 150	°C	

● Recommended Operating Conditions

(V_{SS}=0V)

Condition	Symbol	Min.	Typ.	Max.	Unit	Note
SV _{CC} supply voltage	SV _{CC}	3.0	3.3	3.6	V	
TV _{CC} supply voltage	TV _{CC}	3.0	–	5.5	V	*1
SV _{CC} pin voltage	V _{pin}	V _{SS}	–	SV _{CC}	V	
TV _{CC} pin voltage	V _{pin}	V _{SS}	–	TV _{CC}	V	
Operating temperature	T _a	-40	–	85	°C	

*1 Power Off (Hi-Z) input is allowed.

● DC Characteristics

(SV_{CC}=3.3V±0.3V, V_{SS}=0V, T_a=-40 to 85°C)

Characteristic	Symbol	Min.	Typ.	Max.	Unit	Note
High level output voltage (1) I _{OH} =-2mA	V _{OH1}	SV _{CC} - 0.4	–	–	V	*1
Low level output voltage (1) I _{OL} =2mA	V _{OL1}	–	–	0.4	V	*1
High level input voltage (1)	V _{IH1}	2.0	–	–	V	*2
Low level input voltage (1)	V _{IL1}	–	–	0.8	V	*2

*1 Pins SD0–SD15

*2 Pins SA0–SA25, SD0–SD15, AEN#, DEN#, DDIR

(TV_{CC}=3.3V±0.3V, V_{SS}=0V, T_a=-40 to 85°C)

Characteristic	Symbol	Min.	Typ.	Max.	Unit	Note
High level output voltage (2) I _{OH} =-2mA	V _{OH2}	TV _{CC} - 0.4	–	–	V	*1
Low level output voltage (2) I _{OL} =2mA	V _{OL2}	–	–	0.4	V	*1
High level input voltage (2)	V _{IH2}	2.0	–	–	V	*2
Low level input voltage (2)	V _{IL2}	–	–	0.8	V	*2
Pull-down resistance (1)	R _{PU1}	40	100	240	kΩ	*2

*1 Pins TA0–TA25, TD0–TD15

*2 Pins TD0–TD15

(TV_{CC}=5.0V±0.5V, V_{SS}=0V, T_a=-40 to 85°C)

Characteristic	Symbol	Min.	Typ.	Max.	Unit	Note
High level output voltage (3) I _{OH} =-3mA	V _{OH3}	TV _{CC} - 0.4	–	–	V	*1
Low level output voltage (3) I _{OL} =3mA	V _{OL3}	–	–	0.4	V	*1
High level input voltage (3)	V _{IH3}	3.5	–	–	V	*2
Low level input voltage (3)	V _{IL3}	–	–	1.0	V	*2
Pull-down resistance (2)	R _{PU2}	30	60	144	kΩ	*2

*1 Pins TA0–TA25, TD0–TD15

*2 Pins TD0–TD15

(SV_{CC}=3.3V±0.3V, TV_{CC}=5.0V±0.5V, V_{SS}=0V, T_a=-40 to 85°C)

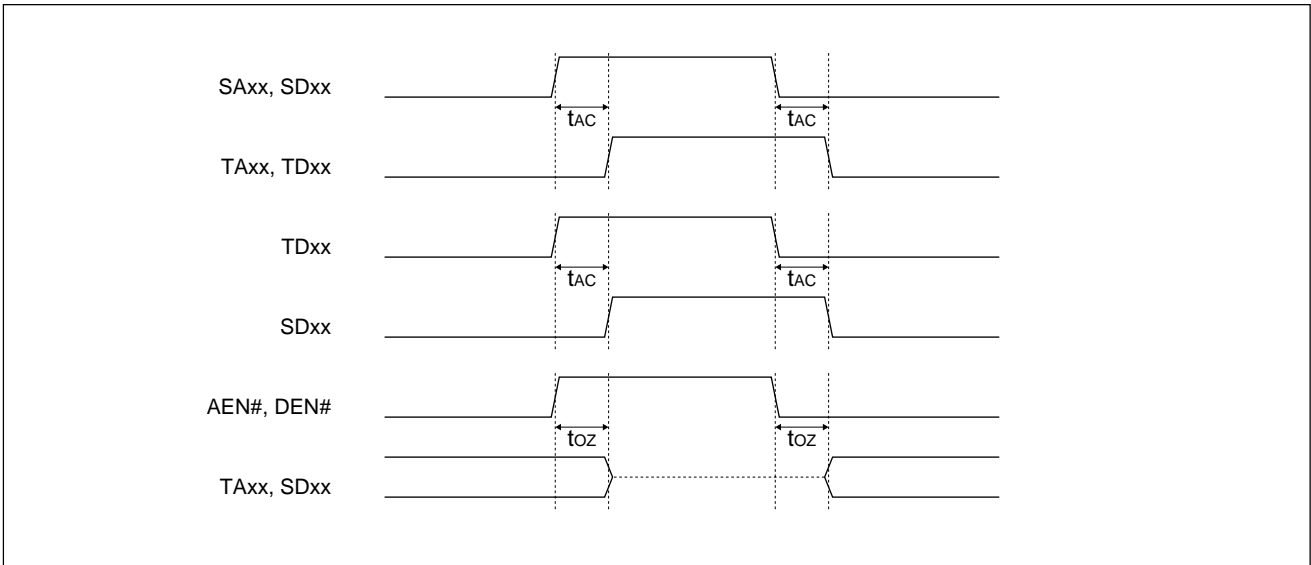
Characteristic	Symbol	Min.	Typ.	Max.	Unit	Note
Input leakage current	I _{LI}	-1	–	1	μA	
Output leakage current	I _{oZ}	-1	–	1	μA	
Pin capacitance	C _{IO}	–	–	10	pF	
f=1MHz, SV _{CC} =0V, TV _{CC} =0V						
Static current consumption	I _{CCS}	–	0.3	35	μA	

E0C37120

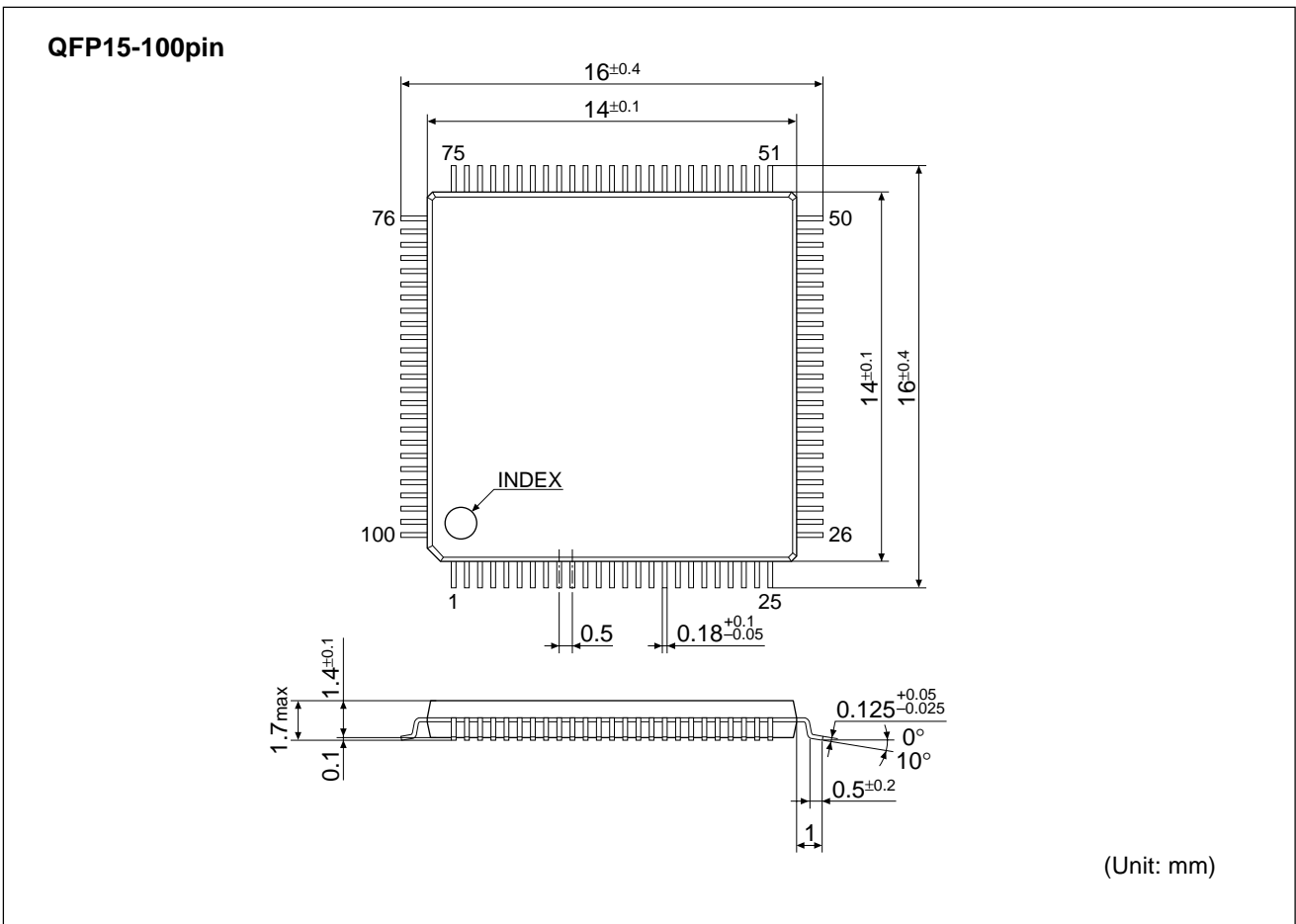
● AC Characteristics

(SV_{CC}=3.3V±0.3V, TV_{CC}=5.0V±0.5V, V_{SS}=0V, C_L=30pF, T_a=-40 to 85°C)

Characteristic	Symbol	Min.	Typ.	Max.	Unit	Note
Signal access time	t _{AC}	-	-	20	nS	
Output signal on/off time	toz	-	-	20	nS	

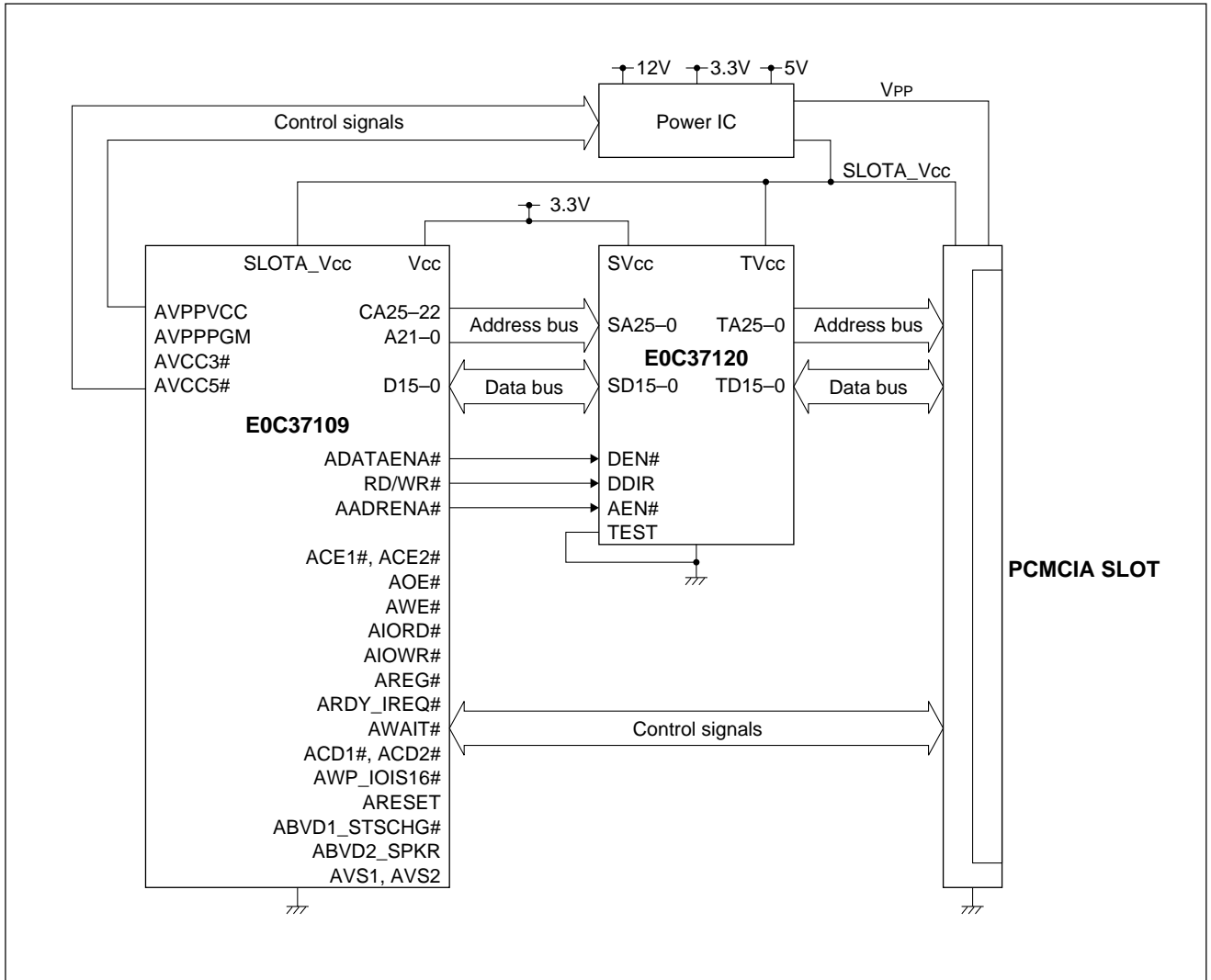


■ PACKAGE DIMENSIONS

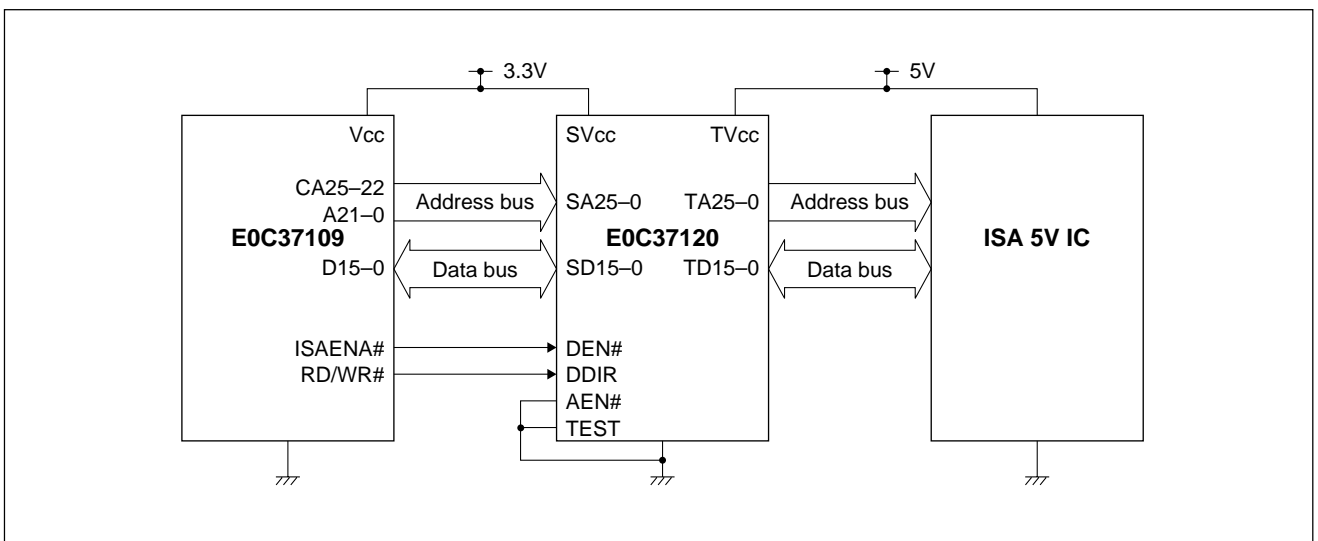


APPLICATION EXAMPLE

PCMCIA Buffer



Level Shifter Buffer



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SEIKO EPSON CORPORATION

ELECTRONIC DEVICES MARKETING DIVISION

IC Marketing & Engineering Group

ED International Marketing Department I (Europe & U.S.A.)

421-8, Hino, Hino-shi, Tokyo 191-8501, JAPAN
Phone : 042-587-5812 FAX : 042-587-5564

ED International Marketing Department II (Asia)

421-8, Hino, Hino-shi, Tokyo 191-8501, JAPAN
Phone : 042-587-5814 FAX : 042-587-5110

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