



# Z86250

## STARSIGHTDATABASEENGINE

### FEATURES

- |                         |                                 |                            |                           |
|-------------------------|---------------------------------|----------------------------|---------------------------|
| ■ <b>Part</b><br>Z86250 | ■ <b>Package</b><br>84-Pin PLCC | ■ <b>Speed (MHz)</b><br>24 | ■ Infrared Receiver Logic |
|-------------------------|---------------------------------|----------------------------|---------------------------|
- 4.3- to 5.5-Volt Operating Range
  - 0°C to +70°C Temperature Range
  - Low-Power Consumption
  - Segmented Base Registers
  - CRC-32 Encoding and Decoding Logic
  - Watch-Dog Timer (WDT) for Error Recovery
  - Serial I.M. and I<sup>2</sup>C Compatible Bus for External Communication
  - Test Multiplexer for Chip Debug

### GENERAL DESCRIPTION

Zilog's Z86250 StarSight Data Base Engine (DBE) is designed to process extracted data for the StarSight on-screen programming guide. The device is logically equivalent to the DBE1200 for StarSight applications.

The Z86250 provides a number of important peripheral functions, such as the IR Blaster to send command signals to the VCR, and low-power management to avoid loss of data.

For fast memory data manipulation, the Z86250 offers segmented base registers. The device also features PSRAM memory control and refresh logic.

The DBE is optimized to work with Zilog's Z89300 series of TV controller devices to provide a cost-effective solution for StarSight programming-guide data extraction and display.

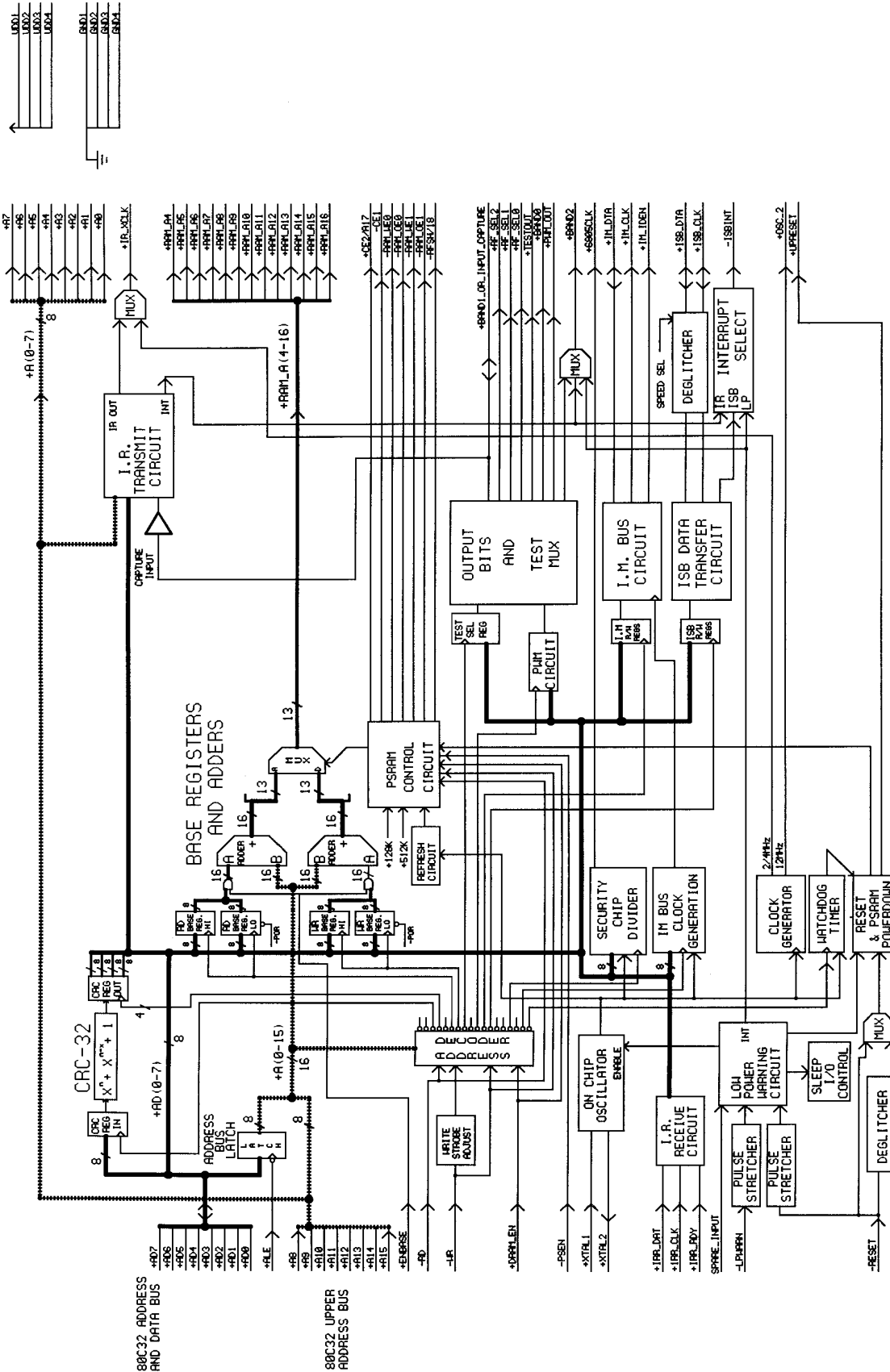
**Notes:**

All Signals with a preceding front slash, "/", are active Low, e.g.: B//W (WORD is active Low); /B/W (BYTE is active Low, only).

Power connections follow conventional descriptions below:

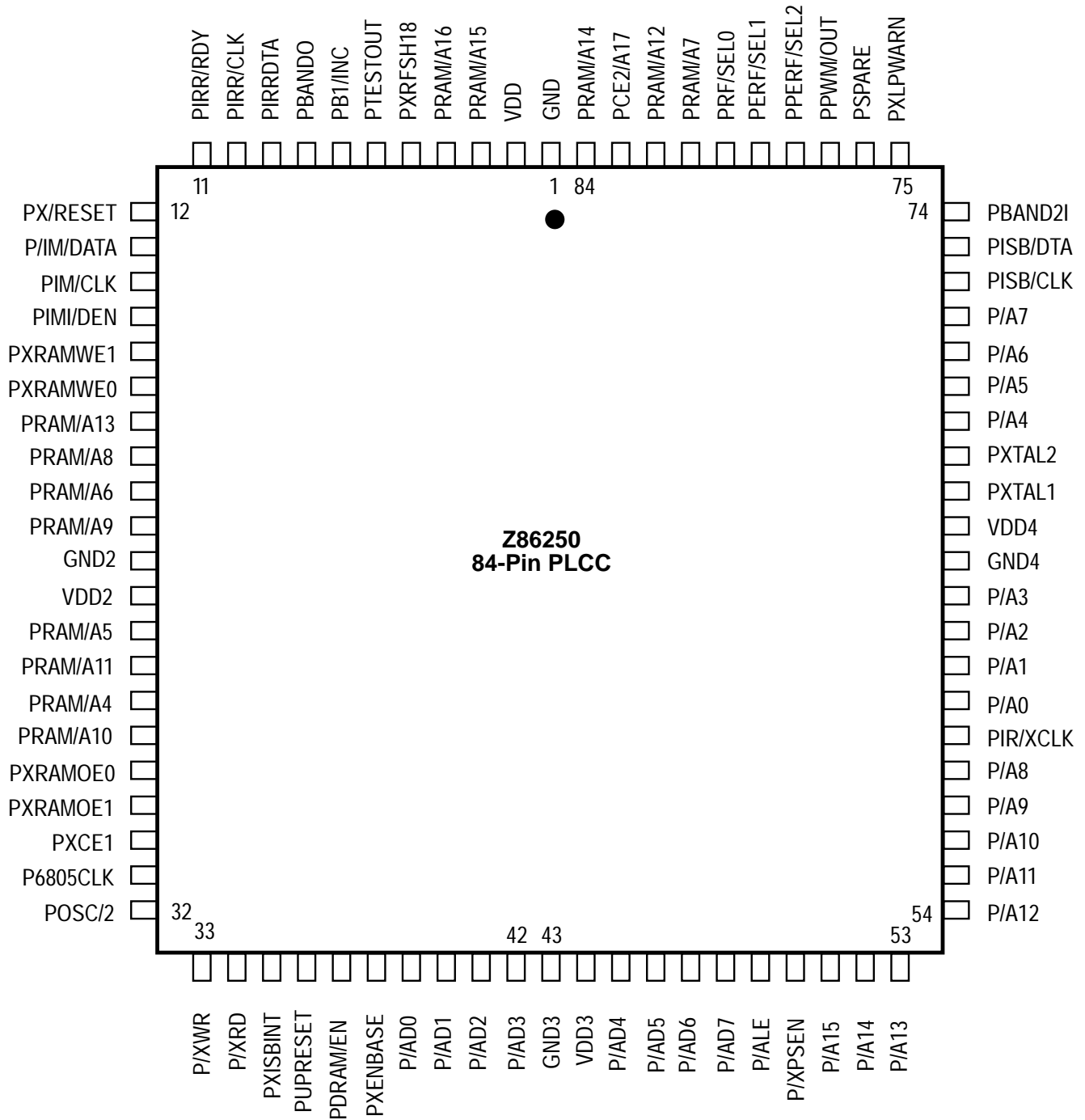
Connection	Circuit	Device
Power Ground	V <sub>CC</sub> GND	V <sub>DD</sub> V <sub>SS</sub>

GENERAL DESCRIPTION (Continued)



Database Engine Block Diagram

**PIN DESCRIPTION**



**Z86250 84-Pin PLCC  
Pin Assignments**

**PIN DESCRIPTION (Continued)**

PIN NO.	PIN NAME	PIN TYPE
1	GND1	POWER
2	VDD1	POWER
3	PRAM A15	Out LIVE
4	PRAM A16	Out LIVE
5	PXRFSH18	Oon
6	PTESTOUT	Out DEAD
7	PB1 IN C	I/O pushpull
8	PBAND0	Out DEAD,hc
9	PIRR DTA	IN S0
10	PIRR CLK	IN S0
11	PIRR RDY	IN S0
12	P XRESET	IN on always
13	P IM DTA	I/O opendrain
14	PIM CLK	Out DEAD
15	PIM IDEN	Out DEAD
16	PXRAMWE1	Out LIVE
17	PXRAMWE0	Out LIVE
18	PRAM A13	Out LIVE
19	PRAM A8	Out LIVE
20	PRAM A6	Out LIVE
21	PRAM A9	Out LIVE
22	GND2	POWER
23	VDD2	POWER
24	PRAM A5	Out LIVE
25	PRAM A11	Out LIVE
26	PRAM A4	Out LIVE
27	PRAM A10	Out LIVE
28	PXRAMOE0	Oon
29	PXRAMOE1	Out LIVE
30	PXCE1	Oon
31	P6805CLK	Out DEAD
32	POSC 2	Out OSC2
33	P XWR	IN S1
34	P XRD	IN S1
35	PXISBINT	Out INT
36	PUPRESET	Out DEAD
37	PDRAM EN	IN S0
38	PXENBASE	IN S0
39	P AD0	I/O data
40	P AD1	I/O data
41	P AD2	I/O data
42	P AD3	I/O data

PIN NO.	PIN NAME	PIN TYPE
43	GND3	POWER
44	VDD3	POWER
45	P AD4	I/O data
46	P AD5	I/O data
47	P AD6	I/O data
48	P AD7	I/O data
49	P ALE	IN S0
50	P XPSEN	IN S1
51	P A15	IN S0
52	P A14	IN S0
53	P A13	IN S0
54	P A12	IN S0
55	P A11	IN S0
56	P A10	IN S0
57	P A9	IN S0
58	P A8	IN S0
59	PIR XCLK	Out DEAD,hc
60	P A0	Out DEAD
61	P A1	Out DEAD
62	P A2	Out DEAD
63	P A3	Out DEAD
64	GND4	POWER
65	VDD4	POWER
66	PXTAL1	OSC INPUT
67	PXTAL2	OSC OUT
68	P A4	Out DEAD
69	P A5	Out DEAD
70	P A6	Out DEAD
71	P A7	Out DEAD
72	PISB CLK	I/O opendrain
73	PISB DTA	I/O opendrain
74	PBAND2I	Out INT
75	PXLPWARN	INon
76	PSPARE	INon
77	PPWM OUT	Out DEAD
78	PRF SEL2	Out DEAD
79	PRF SEL1	Out DEAD
80	PRF SEL0	Out DEAD
81	PRAM A7	Out LIVE
82	PRAM A12	Out LIVE
83	PCE2 A17	Oon
84	PRAM A14	Out LIVE

## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Min	Max	Units	Conditions
$V_{DD}$	Power Supply Voltage	-0.3	7	V	All pins with respect to GND
$T_A$	Operating Ambient Temp.	0	70	°C	
$T_S$	Storage Temperature	-65	150	°C	

Stress greater than those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only; operation of the device at any condition above those indicated in the operational sec-

tions of these specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

**DC CHARACTERISTICS**
 $T_A = 0^\circ\text{C to } +70^\circ\text{C}; V_{CC} = 4.3 \text{ V to } +5.5 \text{ V}$ 

Symbol	Parameter	Min	Max	Typical	Units	Conditions	Notes
$V_{IL}$	Input Voltage Low	0	$0.2 V_{DD}$	0.4	V	(except XTAL1)	
$V_{IH}$	Input Voltage High	$0.5 V_{DD}$	$V_{DD}$	3.6	V	(except XTAL1)	
$V_{OL1}$	Output Voltage Low		0.16	0.4	V	@ $I_{OH1}$	
$V_{OH1}$	Output Voltage High	$V_{DD} - 0.4$	4.75	$V_{DD}$	V	@ $I_{OH1}$	
$V_{OL2}$	Output Voltage Low		0.16	0.4	V	@ $I_{OH2}$	
$V_{OH2}$	Output Voltage High	$V_{DD} - 0.4$	4.75	$V_{DD}$	V	@ $I_{OH2}$	
$VX_{IL1}$	Input Voltage Low			$0.2 V_{DD}$	V	for XTAL1	
$VX_{IH1}$	Input Voltage High	$0.7 V_{DD}$			V	for XTAL1	
$VX_{OL2}$	Output Voltage Low		0.16	0.4	V	for XTAL2	@ 4.5 mA
$VX_{OH2}$	Output Voltage High	$V_{DD} - 0.4$	4.75	$V_{DD}$	V	for XTAL2	@ 3.7 mA
$I_{OL1}$	Output Current Low	2.5			mA		
$I_{OH1}$	Output Current High	1.5			mA		
$I_{OL2}$	Output Current Low	10			mA		
$I_{OH2}$	Output Current High	6			mA		
$V_{DD1}$	Operating Supply Voltage	4.3	5.0	5.5	V		
$V_{DD2}$	Sleep Supply Voltage	3.0		5.5	V		
$I_{DD1}$	Operating Supply Current			40	mA		
$I_{DD2}$	Operating Supply Current			10	$\mu\text{A}$		

**AC CHARACTERISTICS**
 $T_A = 0^\circ\text{C to } +70^\circ\text{C}; V_{DD} = 4.3 \text{ V to } +5.5 \text{ V}$ 

Symbol	Parameter	Min	Max	Typical	Units	Conditions	Notes
$f_{osc}$	Oscillator Frequency			24	MHz		
$V_{IN}$	Absolute Min/Max Input Voltage Range	-0.3	$V_{DD} + 0.3$		V		
$V_{OUT}$	Absolute Min/Max Output Voltage Range	-0.3	$V_{DD} + 0.3$		V		

**I/O READ ADDRESS REGISTER SUMMARY**

Read Address	Pg	Read Register Accessed	86250 Name
0400H	31	Read Test Multiplexer Register	XRD_MUX
0800H	5	I.R. Receive Data Register	XIRR_REG
0C00H	6	ISB Interrupt Status Register	XRD_STAT
1000H	12	I.M. Read Data Byte # 1	XRD_BYT1
1400H	12	I.M. Read Data Byte # 2	XRD_BYT2
1800H	6	I.M. Status and Chip I.D. Register	XSW_LO
1C00H	6	I.R. Receiver Status Register	XSW_HI
6000H	37	I.R. Blaster Status Register	XIRB_RD
6400H	38	Low Power Status Register	XLP_STAT
6800H	24	ISB Receive Data Register	XRRECREG
6C00H	29	ISB Status Register 2	XISB_ST2
7000H	16	CRC-32 Read Register 3	XRDCRC3
7400H	16	CRC-32 Read Register 2	XRDCRC2
7800H	17	CRC-32 Read Register 1	XRDCRC1
7C00H	17	CRC-32 Read Register 0	XRDCRC0
8000H	37	IRB T8 Control Register	
8001H	37	IRB T8 / T16 Common Control Reg	
8002H	37	IRB T16 Control Register	
8003H	37	Reserved	
8004H	37	IRB T8 Low Hold Register	
8005H	37	IRB T8 High Hold Register	
8006H	37	IRB T16 Low Hold Register	
8007H	37	IRB T16 High Hold Register	
8008H	37	IRB T16 Low Capture Register	
8009H	37	IRB T16 High Capture Register	
800AH	37	IRB T8 Low Capture Register	
800BH	37	IRB T8 High Capture Register	

The Page numbers refer to the schematic page where the register can be found.

**I/O Read Address Register Summary  
Table**

**I/O WRITE ADDRESS REGISTER SUMMARY**

Write Address	Pg	Write Register Accessed	86250 Name
80C32 PORT 1	X	Various Output Control BITS	
80C32 PORT 3	X	Various Control and I/O BITS	
0000H	3	Read_BASE_Register_LOW	XRBASELO
0400H	3	Read_BASE_Register_HIGH	XRBASEHI
0800H	3	Write_BASE_Register_LOW	XWBASELO
0C00H	3	Write_BASE_Register_HIGH	XWBASEHI
1000H	10	PWM_Control_Register_LOW	XPWM_LO
1400H	10	PWM_Control_Register_HI	XPWM_HI
2000H	12	I.M. BUS Address Register	XL_IM_AD
2400H	12	I.M. Write Data 1 Register	XL_IM_D1
2800H	12	I.M. Write Data 2 Register	XL_IM_D2
2C00H	12	I.M. BUS Start Transfer Register	XSTRT_IM
3000H	9	I.M. BUS Control Register	XIM_CTRL
3400H	39	Low Power Control Register	XLP_CTRL
3600H	39	Sleep Start Register	XWRSLEEP
3C00H	9	Security Chip Clock Freq Register	XCLK_REG
6000H	9	Output Control Register	XCNTRL_1
6400H	13	Refresh Watchdog Register	XWDOG_CS
6800H	18	CRC-32 Data Register	XWR_CRC
6C00H	29	ISB Control Register	XISBCTRL
7000H	24	ISB Transmit Data Register	XISBXMIT
7400H	31	RAM Sequence <i>and</i> 86250 Test Register	XWR_TEST
7800H	38	I.R. Blaster Control Register 1	XIRB_WR1
7C00H	38	I.R. Blaster Control Register 2	XIRB_WR2
8000H	37	IRB T8 Control Register	
8001H	37	IRB T8 / T16 Common Control Reg	
8002H	37	IRB T16 Control Register	
8004H	37	IRB T8 Low Hold Register	
8005H	37	IRB T8 High Hold Register	
8006H	37	IRB T16 Low Hold Register	
8007H	37	IRB T16 High Hold Register	

**I/O Write Address Register Summary  
Table**



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