Z86250
STARSIGHT DATABASE ENGINE

FEATURES

Part	Package	Speed (MHz)
Z86250	84-Pin PLCC	24

- 4.3- to 5.5-Volt Operating Range
- 0°C to +70°C Temperature Range
- Low-Power Consumption
- Segmented Base Registers
- Infrared Receiver Logic
- CRC-32 Encoding and Decoding Logic
- Watch-Dog Timer (WDT) for Error Recovery
- Serial I.M. and I²C 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.

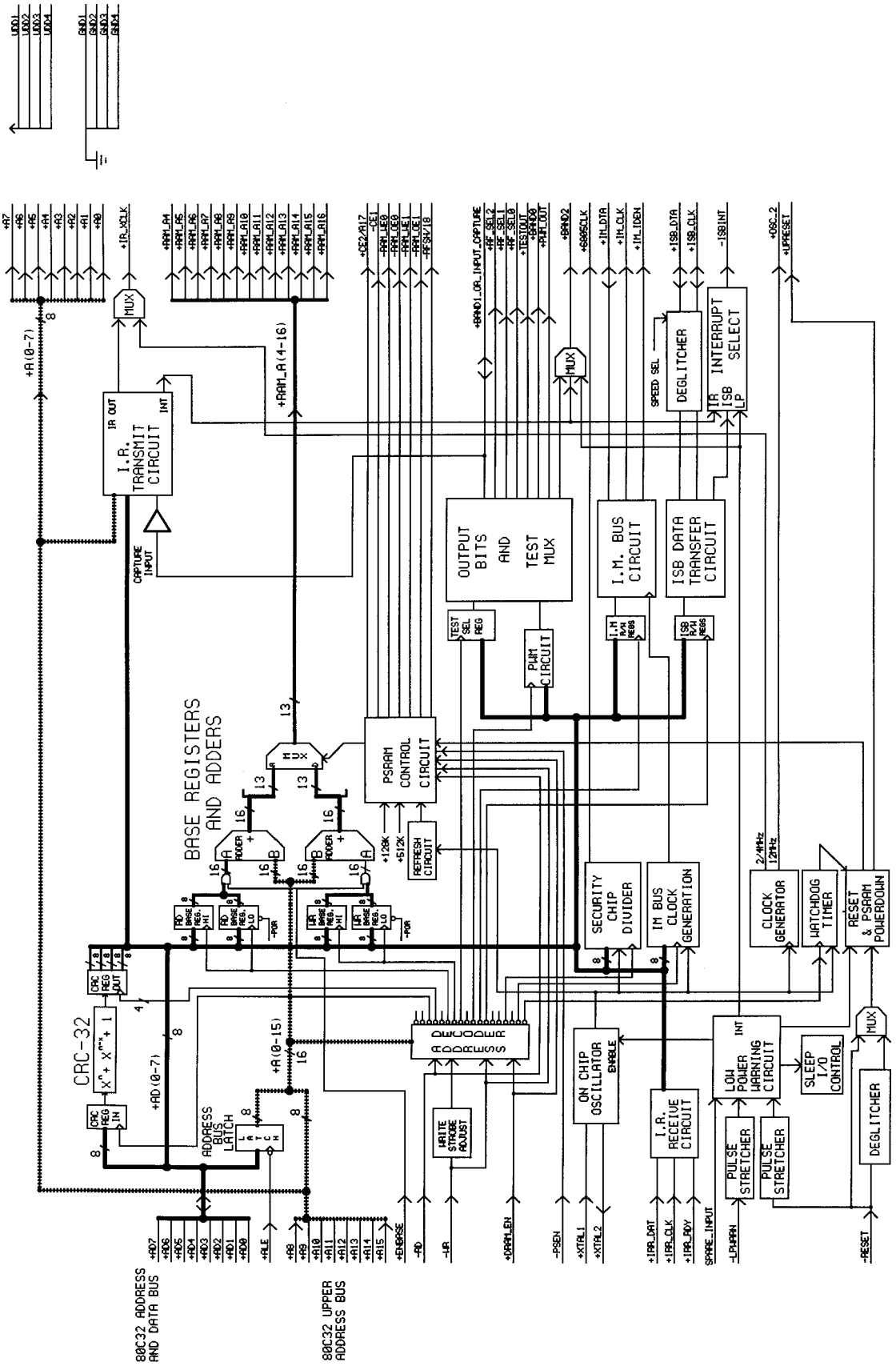
The DBE is optimized to work with Zilog's Z89300 series of TV controller devices to provide a cost-effective solution for StarSight programming-guide data extraction and display.

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:

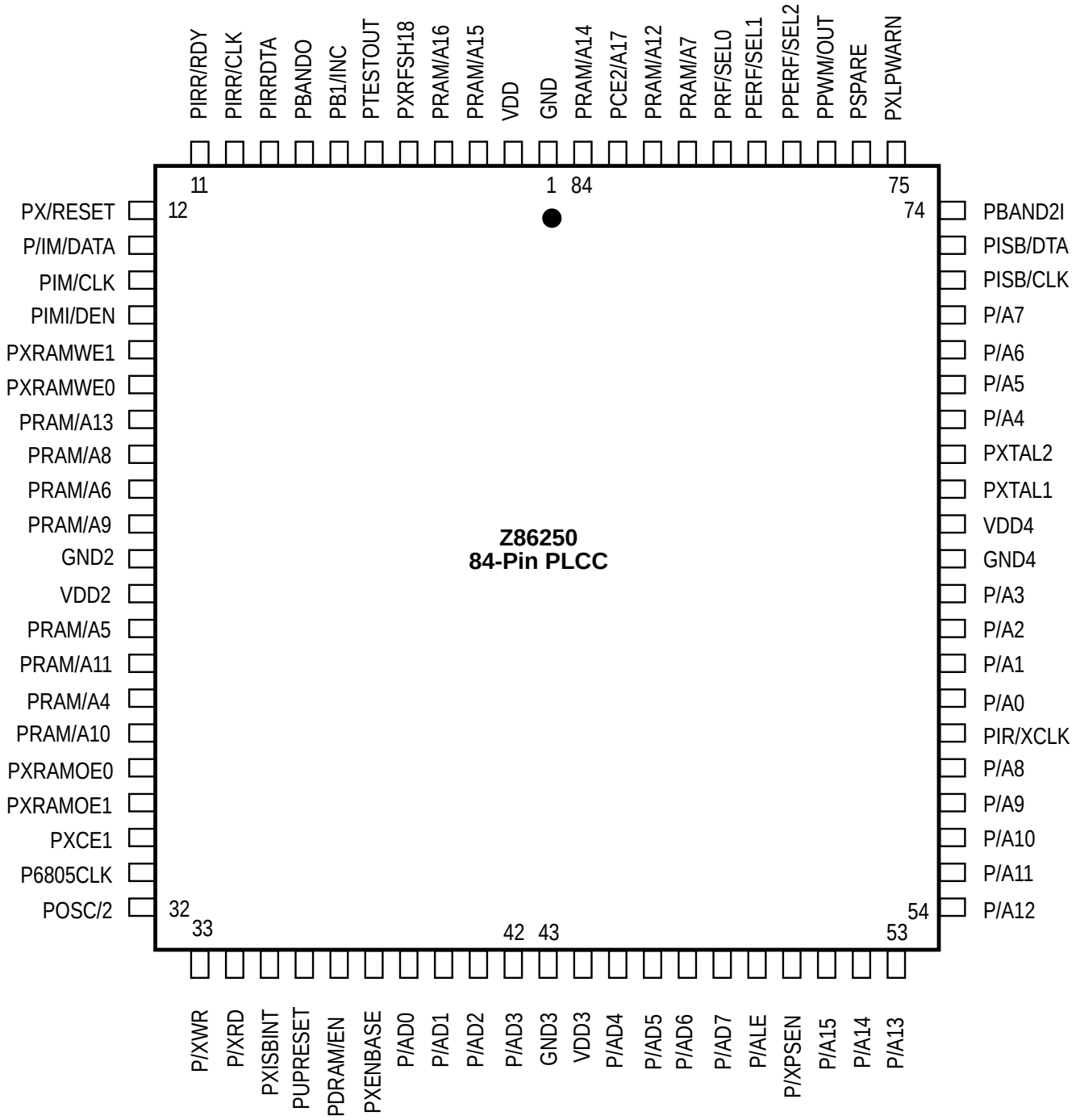
Connection	Circuit	Device
Power	V_{CC}	V_{DD}
Ground	GND	V_{SS}

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

Z86250 Pinouts

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

DC CHARACTERISTICS

T_A = 0°C to + 70°C; V_{CC} = 4.3 V to + 5.5 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_{OL1}	Output Current High	1.5			mA		
I_{OL2}	Output Current Low	10			mA		
I_{OL2}	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	µA		

AC CHARACTERISTICS

T_A = 0°C to + 70°C; V_{DD} = 4.3 V to + 5.5 V

Symbol	Parameter	Min	Max	Typical	Units	Conditions	Notes
fosc	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 *and* 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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