

HIGH SPEED 4K × 8 CMOS PROM/RPROM

KEY FEATURES

- **Ultra-Fast Access Time**
— 35 ns
- **Low Power Consumption**
- **Fast Programming**
- **Pin Compatible with AM27S43 and N82S321 Bipolar PROMs**
- **Immune to Latch-Up**
— Up to 200 mA
- **Available in 300 Mil Dip**

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GENERAL DESCRIPTION

The WS57C43B is an extremely HIGH PERFORMANCE 32K UV Erasable Electrically Re-Programmable Read Only Memory. It is manufactured in an advanced CMOS technology which allows it to operate at Bipolar PROM speeds while consuming only 25% of the power required by its Bipolar counterparts.

A further advantage of the WS57C43B over Bipolar PROM devices is the fact that it utilizes a proven EPROM technology. This allows the entire memory array to be tested for switching characteristics and functionality after assembly. Unlike devices which cannot be erased, every WS57C43B is 100% tested with worst case test patterns both before and after assembly.

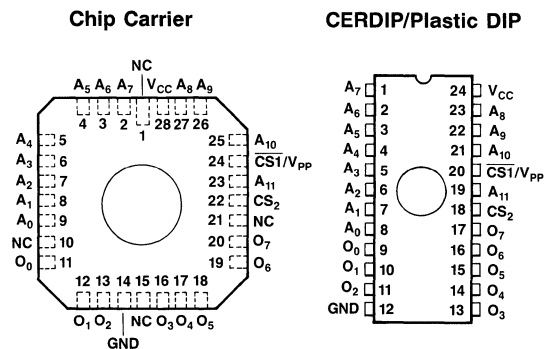
The WS57C43B is configured in the standard Bipolar PROM pinout which provides an easy upgrade path for systems which are currently using Bipolar PROMs. It also uses the same programming algorithm as its predecessor the WS57C43.

MODE SELECTION

MODE \ PINS	CS1/ V _{PP}	CS2	V _{CC}	OUTPUTS
Read	V _{IL}	V _{IH}	V _{CC}	D _{OUT}
Output Disable	V _{IH}	X	V _{CC}	High Z
Output Disable	X	V _{IL}	V _{CC}	High Z
Program	V _{PP}	X	V _{CC}	D _{IN}
Program Verify	V _{IL}	V _{IH}	V _{CC}	D _{OUT}

PIN CONFIGURATION

TOP VIEW



PRODUCT SELECTION GUIDE

PARAMETER	WS57C43B-35	WS57C43B-45	WS57C43B-55	WS57C43B-70
Address Access Time (Max)	35 ns	45 ns	55 ns	70 ns
Output Enable Time (Max)	20 ns	25 ns	25 ns	25 ns

ABSOLUTE MAXIMUM RATINGS*

Storage Temperature -65°C to +150°C
 Voltage on Any Pin with
 Respect to Ground -0.6V to +7V
 V_{PP} with Respect to Ground -0.6V to +14V
 ESD Protection > 2000V

*Notice: Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods of time may affect device reliability.

OPERATING RANGE

RANGE	TEMPERATURE	V _{CC}
Comm'l	0° to +70°C	+5V ± 5%
Industrial	-40° to +85°C	+5V ± 10%
Military	-55° to +125°C	+5V ± 10%

DC READ CHARACTERISTICS Over Operating Range. (See Above)

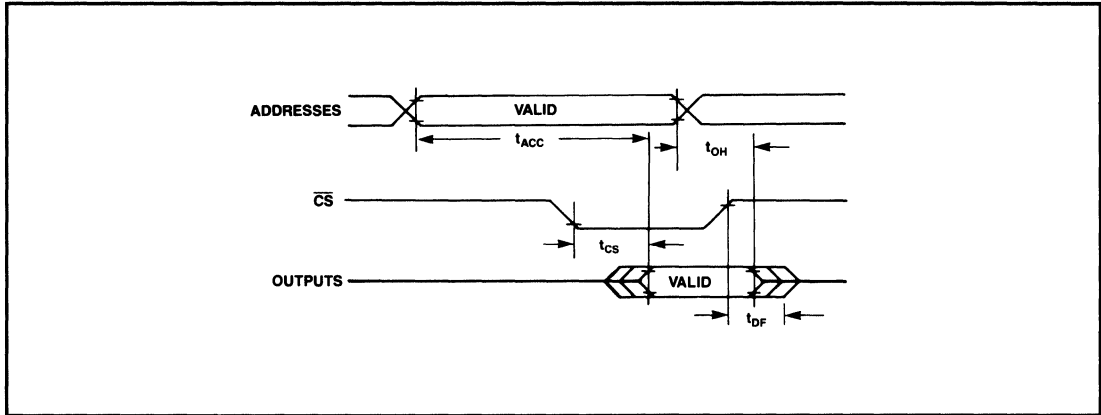
SYMBOL	PARAMETER	TEST CONDITIONS	MIN	MAX	UNITS
V _{OL}	Output Low Voltage	I _{OL} = 16 mA		0.4	V
V _{OH}	Output High Voltage	I _{OH} = -4 mA	2.4		
I _{CC1}	V _{CC} Active Current (CMOS)	Notes 1 and 3	Comm'l	30	mA
			Military	35	
I _{CC2}	V _{CC} Active Current (TTL)	Notes 2 and 3	Comm'l	40	
			Military	40	
I _{LI}	Input Load Current	V _{IN} = 5.5V or Gnd	-10	10	µA
I _{LO}	Output Leakage Current	V _{OUT} = 5.5V or Gnd	-10	10	

NOTES: 1. CMOS inputs: GND ± 0.3V or V_{CC} ± 0.3V. 3. Add 3 mA/MHz for A.C. power component.
 2. TTL inputs. V_{IL} ≤ 0.8V, V_{IH} ≥ 2.0V.

AC READ CHARACTERISTICS Over Operating Range. (See Above)

PARAMETER	SYMBOL	57C43B-35		57C43B-45		57C43B-55		57C43B-70		UNITS
		MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
Address to Output Delay	t _{ACC}		35		45		55		70	ns
\overline{CS} to Output Delay	t _{CS}		20		25		25		25	
Output Disable to Output Float	t _{DF}		25		25		25		25	
Address to Output Hold	t _{OH}	0		0		0		0		

AC READ TIMING DIAGRAM



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CAPACITANCE⁽⁴⁾ $T_A = 25^\circ\text{C}$, $f = 1\text{ MHz}$

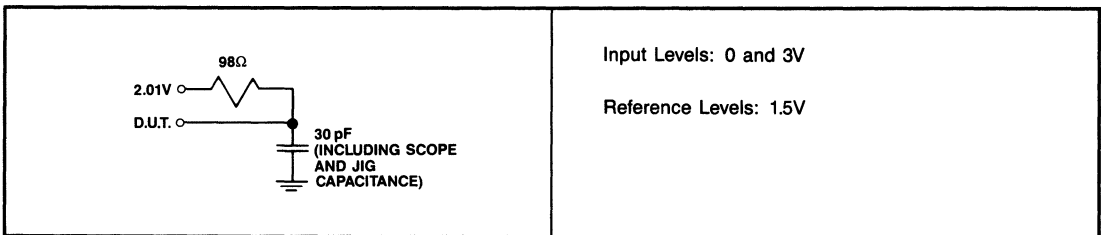
SYMBOL	PARAMETER	CONDITIONS	TYP ⁽⁵⁾	MAX	UNITS
C_{IN}	Input Capacitance	$V_{IN} = 0V$	4	6	pF
C_{OUT}	Output Capacitance	$V_{OUT} = 0V$	8	12	pF
C_{VPP}	V_{PP} Capacitance	$V_{PP} = 0V$	18	25	pF

NOTES:

- 4. This parameter is only sampled and is not 100% tested.
- 5. Typical values are for $T_A = 25^\circ\text{C}$ and nominal supply voltages.

TEST LOAD (High Impedance Test Systems)

TIMING LEVELS



Input Levels: 0 and 3V

Reference Levels: 1.5V

PROGRAMMING INFORMATION

DC CHARACTERISTICS ($T_A = 25 \pm 5^\circ\text{C}$, $V_{CC} = 5.50\text{V} \pm 5\%$, $V_{PP} = 13.5 \pm 0.5\text{V}$)

PARAMETER	SYMBOLS	MIN	MAX	UNIT
Input Leakage Current $V_{IN} = V_{CC}$ or Gnd	I_{LI}	-10	10	μA
V_{PP} Supply Current During Programming Pulse	I_{PP}		60	mA
V_{CC} Supply Current (Notes 2 and 3)	I_{CC}		30	mA
Input Low Level	V_{IL}	-0.1	0.8	V
Input High Level	V_{IH}	2.0	$V_{CC} + 0.3$	V
Output Low Voltage During Verify ($I_{OL} = 16\text{ mA}$)	V_{OL}		0.45	V
Output High Voltage During Verify ($I_{OH} = -4\text{ mA}$)	V_{OH}	2.4		V

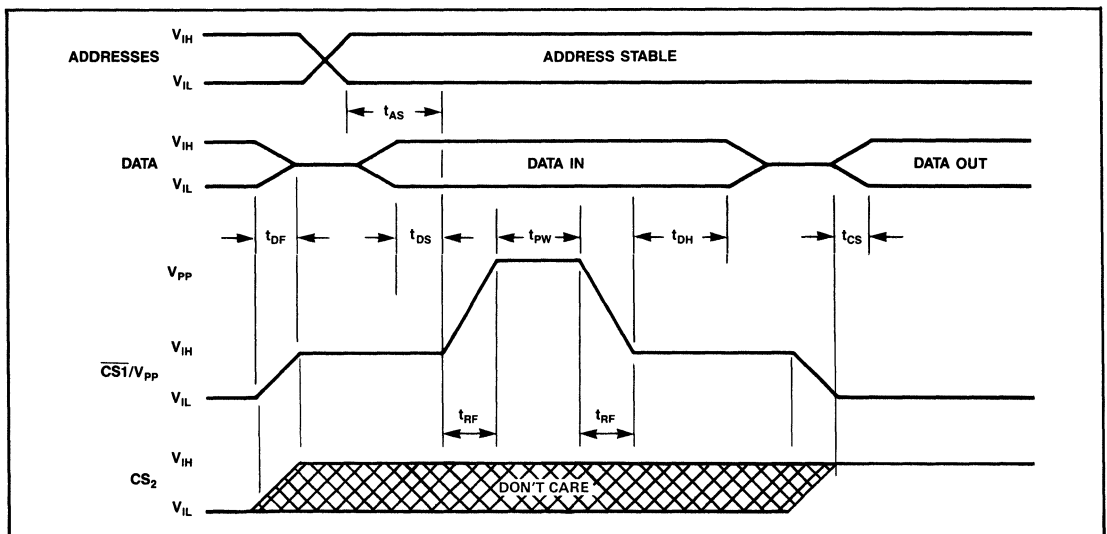
NOTE: 6. V_{PP} must not be greater than 14 volts including overshoot.

AC CHARACTERISTICS ($T_A = 25 \pm 5^\circ\text{C}$, $V_{CC} = 5.5\text{V} \pm 5\%$, $V_{PP} = 13.5 \pm 0.5\text{V}$)

PARAMETER	SYMBOLS	MIN	TYP	MAX	UNIT
Address Setup Time	t_{AS}	2			μs
Chip Disable Setup Time	t_{DF}			30	ns
Data Setup Time	t_{DS}	2			μs
Program Pulse Width	t_{PW}	1	3	10	ms
Data Hold Time	t_{DH}	2			μs
Chip Select Delay	t_{CS}			30	ns
V_{PP} Rise and Fall Time	t_{RF}	1			μs

NOTE: A single shot programming algorithm should use one 10 ms pulse.

PROGRAMMING WAVEFORM



PROGRAMMING/ERASURE/PROGRAMMERS

Refer to Section 5.

ORDERING INFORMATION

PART NUMBER	SPEED (ns)	PACKAGE TYPE	PACKAGE DRAWING	OPERATING TEMPERATURE RANGE	WSI MANUFACTURING PROCEDURE
WS57C43B-35D	35	24 Pin Cerdip, 0.6"	D1	Comm'l	Standard
WS57C43B-35J	35	28 Pin PLDCC	J3	Comm'l	Standard
WS57C43B-35S	35	24 Pin Plastic DIP, 0.3"	S1	Comm'l	Standard
WS57C43B-35T	35	24 Pin Cerdip, 0.3"	T1	Comm'l	Standard
WS57C43B-45CMB	45	28 Pad CLLCC	C1	Military	MIL-STD-883C
WS57C43B-45D	45	24 Pin Cerdip, 0.6"	D1	Comm'l	Standard
WS57C43B-45DI	45	24 Pin Cerdip, 0.6"	D1	Industrial	Standard
WS57C43B-45DMB	45	24 Pin Cerdip, 0.6"	D1	Military	MIL-STD-883C
WS57C43B-45J	45	28 Pin PLDCC	J3	Comm'l	Standard
WS57C43B-45S	45	24 Pin Plastic DIP, 0.3"	S1	Comm'l	Standard
WS57C43B-45T	45	24 Pin Cerdip, 0.3"	T1	Comm'l	Standard
WS57C43B-45TI	45	24 Pin Cerdip, 0.3"	T1	Industrial	Standard
WS57C43B-45TMB	45	24 Pin Cerdip, 0.3"	T1	Military	MIL-STD-883C
WS57C43B-45Y	45	24 Pin Cerdip, 0.6"	Y3	Comm'l	Standard
WS57C43B-55CMB	55	28 Pad CLLCC	C1	Military	MIL-STD-883C
WS57C43B-55D	55	24 Pin Cerdip, 0.6"	D1	Comm'l	Standard
WS57C43B-55DMB	55	24 Pin Cerdip, 0.6"	D1	Military	MIL-STD-883C
WS57C43B-55TI	55	24 Pin Cerdip, 0.3"	T1	Industrial	Standard
WS57C43B-55TMB	55	24 Pin Cerdip, 0.3"	T1	Military	MIL-STD-883C
WS57C43B-55Y	55	24 Pin Cerdip, 0.6"	Y3	Comm'l	Standard
WS57C43B-70D	70	24 Pin Cerdip, 0.6"	D1	Comm'l	Standard
WS57C43B-70TMB	70	24 Pin Cerdip, 0.3"	T1	Military	MIL-STD-883C

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