SONY

CXK5T8257BTM/BYM/BM -10LLX/12LLX

32768-word × 8-bit High Speed CMOS Static RAM *Preliminary*

For the availability of this product, please contact the sales office.

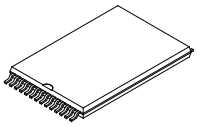
Description

The CXK5T8257BTM/BYM/BM is 262,144 bits high speed CMOS static RAM organized as 32768-words by 8 bits.

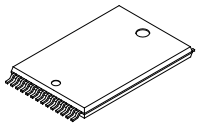
Special feature are low power consumption and high speed.

The CXK5T8257BTM/BYM/BM is a suitable RAM for portable equipment with battery back up.

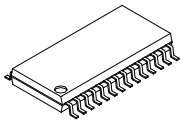
CXK5T8257BTM
28 pin TSOP (Plastic)



CXK5T8257BYM
28 pin TSOP (Plastic)



CXK5T8257BM
28 pin SOP (Plastic)



Features

- Extended operating temperature range: –25 to +85°C
- Wide supply voltage range operation: 2.7 to 3.6V
- Fast access time: (Access time)

3.0V operation	-10LLX	100ns (Max.)
	-12LLX	120ns (Max.)
3.3V operation	-10LLX	85ns (Max.)
	-12LLX	100ns (Max.)

- Low standby current: 7.0µA (Max.)
- Low power data retention: 2.0V (Min.)
- Available in many packages

  CXK5T8257BTM/BYM
  8mm × 13.4mm 28 pin TSOP Package

  CXK5T8257BM
  450mil 28 pin SOP Package

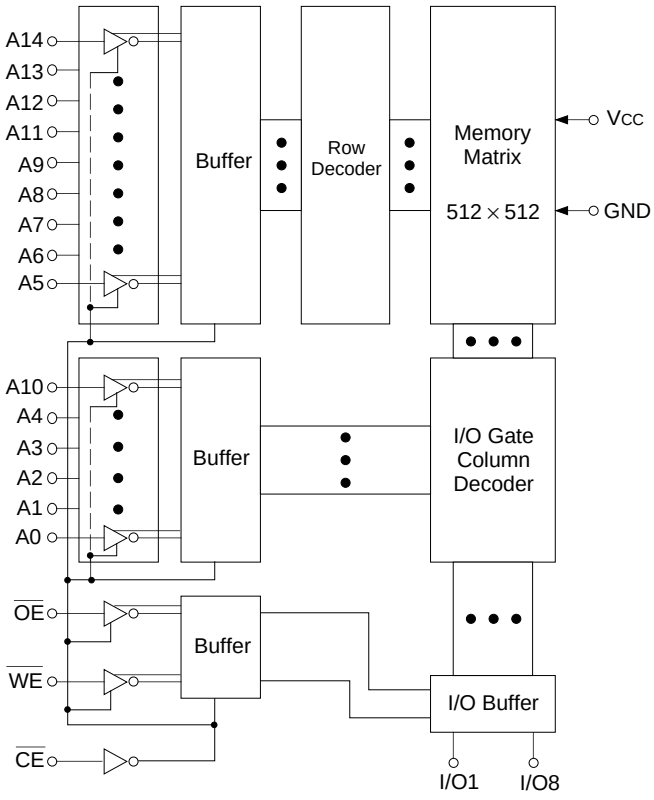
Function

32768-word × 8 bit static RAM

Structure

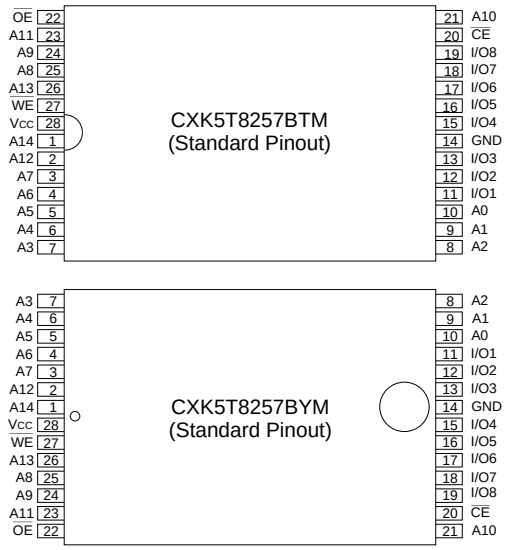
Silicon gate CMOS IC

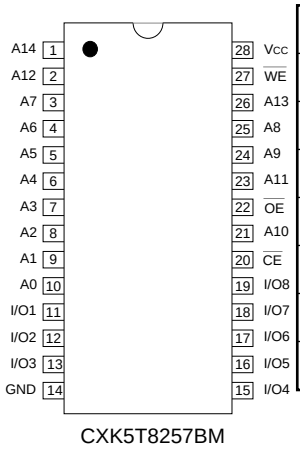
Block Diagram



PE96509-ST

Pin Configuration (Top View)





CXK5T8257BM

Pin Description

Symbol	Description
A0 to A14	Address input
I/O1 to I/O8	Data input/output
$\overline{CE}$	Chip enable input
$\overline{WE}$	Write enable input
$\overline{OE}$	Output enable input
V_{CC}	Power supply
GND	Ground

Absolute Maximum Ratings (Ta = 25°C, GND = 0V)

Item	Symbol	Rating	Unit
Supply voltage	V_{CC}	–0.5 to +4.6	V
Input voltage	V_{IN}	–0.5*1 to V_{CC} + 0.5	V
Input and output voltage	$V_{I/O}$	–0.5*1 to V_{CC} + 0.5	V
Allowable power dissipation	P_D	0.7	W
Operating temperature	Topr	–25 to +85	°C
Storage temperature	Tstg	–55 to +150	°C
Soldering temperature · time	Tsolder	235 · 10	°C · s

*1 V_{IN}, $V_{I/O}$ = –3.0V Min. for pulse width less than 50ns.

Truth Table

$\overline{CE}$	$\overline{OE}$	$\overline{WE}$	Mode	I/O1 to I/O8	V_{CC} Current
H	×	×	Not selected	High Z	I_{SB1}, I_{SB2}
L	H	H	Output disable	High Z	I_{CC1}, I_{CC2}
L	L	H	Read	Data out	I_{CC1}, I_{CC2}
L	×	L	Write	Data in	I_{CC1}, I_{CC2}

×: "H" or "L"

DC Recommended Operating Conditions (Ta = –25 to +85°C, GND = 0V)

Item	Symbol	V_{CC} = 2.7 to 3.6V			V_{CC} = 3.3V ± 0.3V			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	
Supply voltage	V_{CC}	2.7	3.3	3.6	3.0	3.3	3.6	V
Input high voltage	V_{IH}	2.4	—	V_{CC} + 0.3	2.2	—	V_{CC} + 0.3	
Input low voltage	V_{IL}	–0.3*1	—	0.4	–0.3*1	—	0.6	

*1 V_{IL}=–3.0V Min. for pulse width less than 50ns.

Electrical Characteristics

• **DC characteristics** (V_{CC} = 2.7 to 3.6V, GND = 0V, Ta = –25 to +85°C)

Item	Symbol	Test Conditions		Min.	Typ.*2	Max.	Unit
Input leakage current	I_{LI}	V_{IN} = GND to V_{CC}		–0.5	—	0.5	µA
Output leakage current	I_{LO}	$\overline{CE}$ = V_{IH} $\overline{OE}$ = V_{IH} or $\overline{WE}$ = V_{IL} $V_{I/O}$ = GND to V_{CC}		–0.5	—	0.5	
Operating power supply current	I_{CC1}	$\overline{CE}$ = V_{IL} V_{IN} = V_{IH} or V_{IL} I_{OUT} = 0mA		—	0.9	2	mA
Average operating current	I_{CC2}	Min. cycle duty = 100%, I_{OUT} = 0mA	10LLX	—	18*3	35*4	
			12LLX	—	18	35	
Standby current	I_{SB1}	$\overline{CE}$ ≥ V_{CC} – 0.2V	–25 to +85°C	—	—	7.0	µA
			–25 to +70°C	—	—	3.5	
			+25°C	—	0.12	—	
	I_{SB2}	$\overline{CE}$ = V_{IH}		—	0.06	0.7	mA
Output high voltage	V_{OH}	I_{OH} = –2mA		2.4	—	—	V
Output low voltage	V_{OL}	I_{OL} = 2.0mA		—	—	0.4	

*2 V_{CC} = 3.3V, Ta = 25°C

*3 I_{CC2} = 21mA for 3.3V operation (V_{CC} = 3.3V ± 0.3V)

*4 I_{CC3} = 40mA for 3.3V operation (V_{CC} = 3.3V ± 0.3V)

I/O capacitance (Ta = 25°C, f = 1MHz)

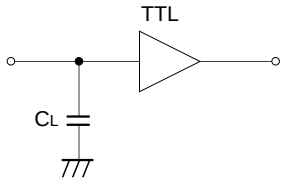
Item	Symbol	Test condition	Min.	Typ.	Max.	Unit
Input capacitance	C_{IN}	V_{IN} = 0V	—	—	8	pF
I/O capacitance	$C_{I/O}$	$V_{I/O}$ = 0V	—	—	10	pF

Note) This parameter is sampled and is not 100% tested.

AC Characteristics

• **AC test conditions** (Ta = –25 to +85°C)

Item		Conditions	
		V_{CC} = 2.7 to 3.6V	V_{CC} = 3.3V ± 0.3V
Input pulse high level		V_{IH} = 2.4V	V_{IH} = 2.2V
Input pulse low level		V_{IL} = 0.4V	V_{IL} = 0.6V
Input rise time		tr = 5ns	tr = 5ns
Input fall time		tf = 5ns	tf = 5ns
Input and output reference level		1.4V	1.4V
Output load conditions	-10LLX	C_L*1 = 100pF, 1TTL	C_L*1 = 30pF, 1TTL
	-12LLX	C_L*1 = 100pF, 1TTL	C_L*1 = 100pF, 1TTL



*1 C_L includes scope and jig capacitances.

• **Read cycle** ($\overline{WE}$ = "H")

Item	Symbol	V_{CC} = 2.7 to 3.6V				V_{CC} = 3.3V ± 0.3V				Unit
		-10LLX		-12LLX		-10LLX		-12LLX		
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
Read cycle time	t_{RC}	100	—	120	—	85	—	100	—	ns
Address access time	t_{AA}	—	100	—	120	—	85	—	100	
Chip enable access time ($\overline{CE}$)	t_{CO}	—	100	—	120	—	85	—	100	
Chip enable to output valid	t_{OE}	—	50	—	60	—	50	—	50	
Chip hold from address change	t_{OH}	20	—	20	—	20	—	20	—	
Chip enable to output in low Z ($\overline{CE}$)	t_{LZ}	10	—	10	—	10	—	10	—	
Output enable to output in low Z ($\overline{OE}$)	t_{OLZ}	10	—	10	—	10	—	10	—	
Chip disable to output in high Z ($\overline{CE}$)	t_{HZ}*1	—	35	—	40	—	35	—	35	
Output disable to output in high Z ($\overline{OE}$)	t_{OHZ}*1	—	35	—	35	—	35	—	35	

*1 t_{HZ} and t_{OHZ} are defined as the time required for outputs to turn to high impedance state and are not referred to as output voltage levels.

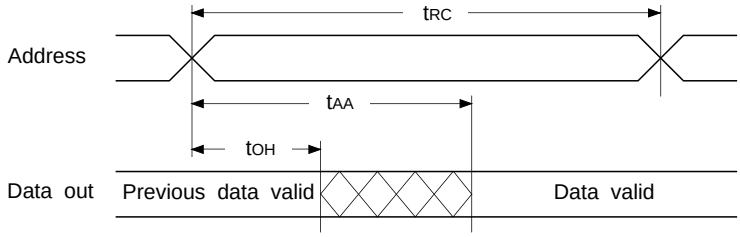
• **Write cycle**

Item	Symbol	V_{CC} = 2.7 to 3.6V				V_{CC} = 3.3V ± 0.3V				Unit
		-10LLX		-12LLX		-10LLX		-12LLX		
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
Write cycle time	t_{WC}	100	—	120	—	85	—	100	—	ns
Address valid to end of write	t_{AW}	80	—	100	—	80	—	80	—	
Chip enable to end of write	t_{CW}	80	—	100	—	80	—	80	—	
Data to write time overlap	t_{DW}	35	—	50	—	35	—	35	—	
Data hold from write time	t_{DH}	0	—	0	—	0	—	0	—	
Write pulse width	t_{WP}	60	—	70	—	60	—	60	—	
Address setup time	t_{AS}	0	—	0	—	0	—	0	—	
Write recovery time ($\overline{WE}$)	t_{WR}	0	—	0	—	0	—	0	—	
Write recovery time ($\overline{CE}$)	t_{WR1}	0	—	0	—	0	—	0	—	
Output active from end of write	t_{OW}	10	—	10	—	10	—	10	—	
Write to output in high Z	t_{WHZ}*2	—	35	—	40	—	35	—	35	

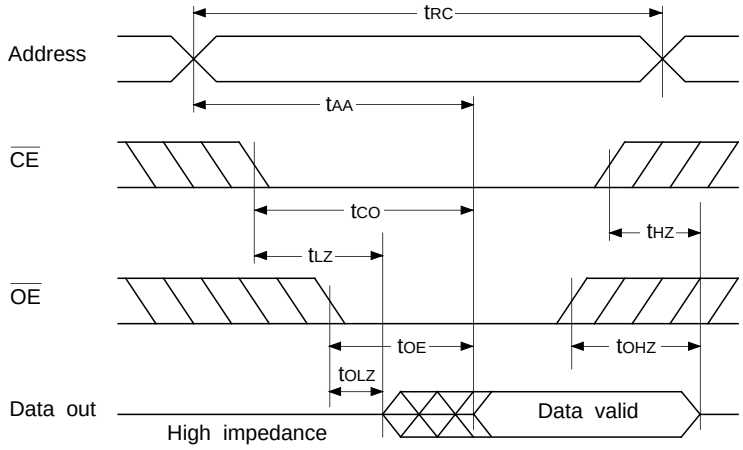
*2 t_{WHZ} is defined as the time requied for outputs to turn to high impedance state and is not referred to as output voltage level.

Timing waveform

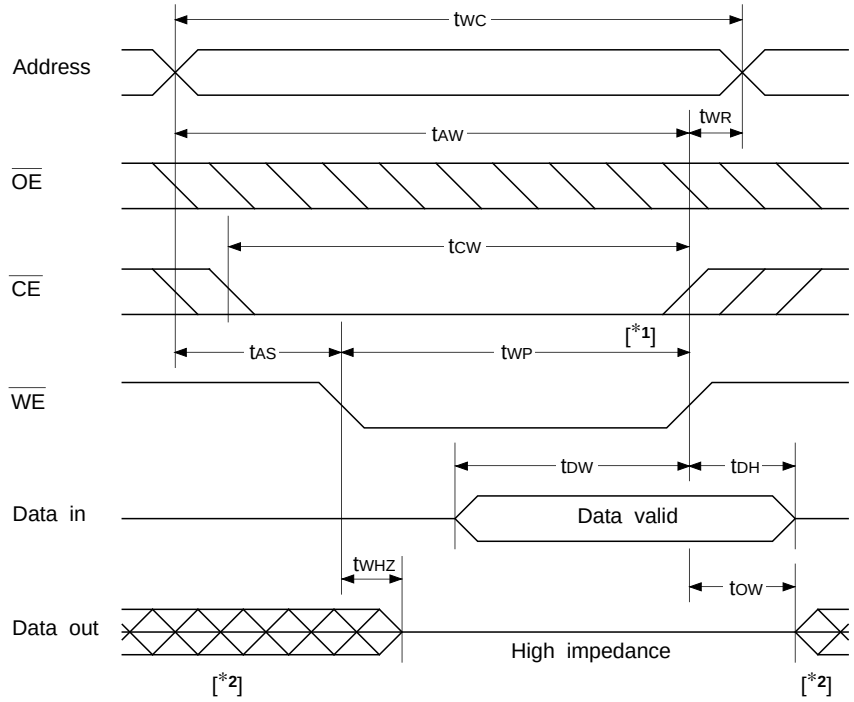
• **Read cycle (1)** : $\overline{CE}$ = $\overline{OE}$ =V_{IL}, $\overline{WE}$ = V_{IH}



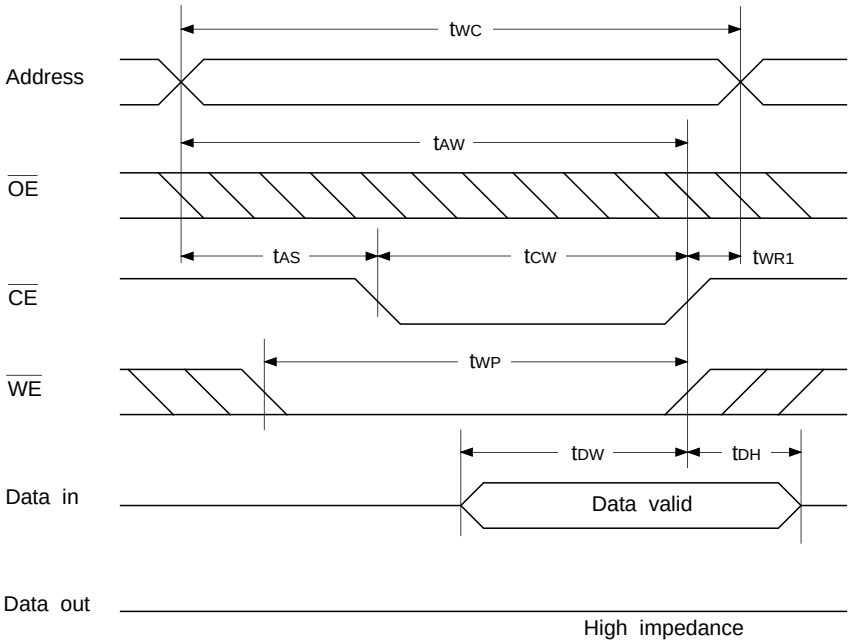
• **Read cycle (2)**: $\overline{WE}$ = V_{IH}



• **Write cycle (1)** : $\overline{WE}$ contorl



• **Write cycle (2)**: $\overline{CE}$ control

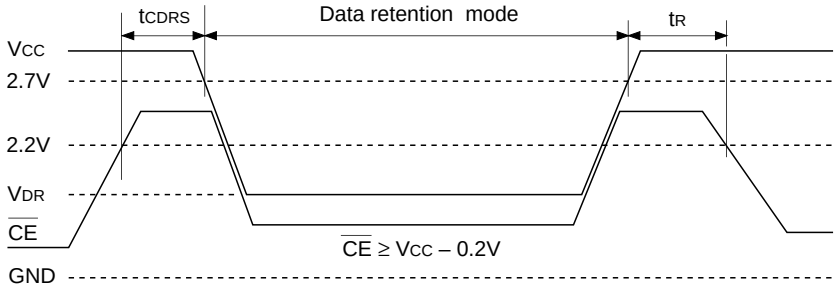


*1 Write is executed when both $\overline{CE}$ and $\overline{WE}$ are at low simultaneously.

*2 Do not apply the data input voltage of the opposite phase to the output while I/O pin is output condition.

Data Retention Waveform

• Low supply voltage data retention waveform



Data Retention Characteristics (Ta = –25 to +85°C)

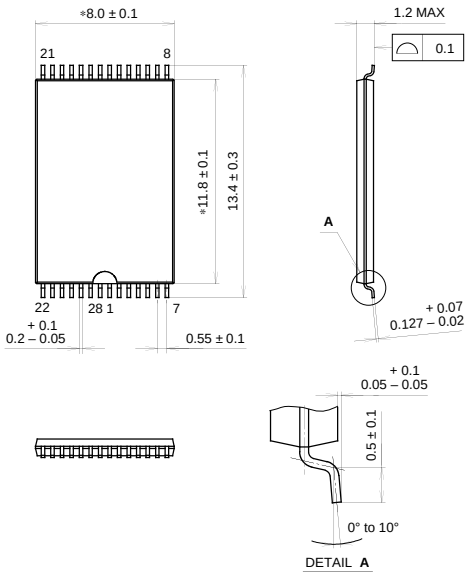
Item	Symbol	Test conditions		Min.	Typ.	Max.	Unit
Data retention voltage	V_{DR}	$\overline{CE} \geq V_{CC} - 0.2V$		2	—	3.6	V
Data retention current	I_{CCDR1}	V_{CC} = 3.0V $\overline{CE} \geq$ 2.8V	–25 to +85°C	—	—	6	µA
			–25 to +70°C	—	—	3	
			+25°C	—	0.1	—	
	I_{CCDR2}	V_{CC} = 2.0 to 3.6V $\overline{CE} \geq V_{CC} - 0.2V$		—	0.12*1	7.0	
Data retention setup time	t_{CDRS}	Chip disable to data retention mode		0	—	—	ns
Recovery time	t_R			5	—	—	ms

*1 V_{CC} = 3.3V, Ta = 25°C

Package Outline Unit: mm

CXK5T8257BTM

28PIN TSOP (Plastic)



NOTE: Dimension "∗" does not include mold protrusion.

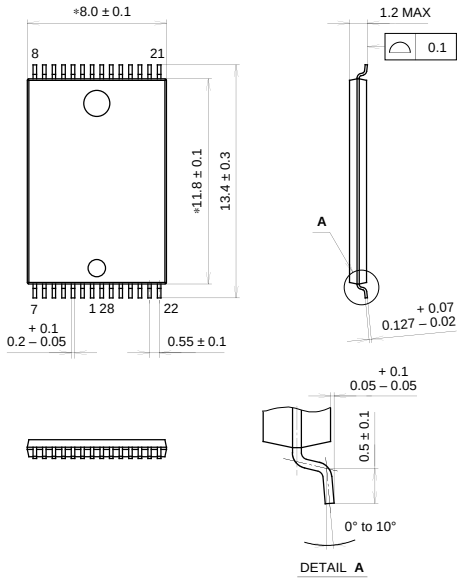
SONY CODE	TSOP-28P-L01
EIAJ CODE	TSOP028-P-0000-A
JEDEC CODE	————

PACKAGE STRUCTURE

PACKAGE MATERIAL	EPOXY RESIN
LEAD TREATMENT	SOLDER PLATING
LEAD MATERIAL	COPPER / 42 ALLOY
PACKAGE WEIGHT	0.2g

CXK5T8257BYM

28PIN TSOP (Plastic)



NOTE: Dimension "∗" does not include mold protrusion.

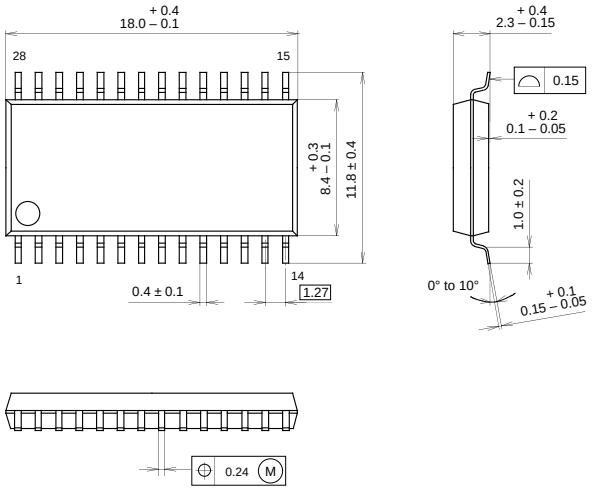
SONY CODE	TSOP-28P-L01R
EIAJ CODE	TSOP028-P-0000-B
JEDEC CODE	————

PACKAGE STRUCTURE

PACKAGE MATERIAL	EPOXY RESIN
LEAD TREATMENT	SOLDER PLATING
LEAD MATERIAL	COPPER / 42 ALLOY
PACKAGE WEIGHT	0.2g

CXK5T8257BM

28PIN SOP (PLASTIC)



PACKAGE STRUCTURE

SONY CODE	SOP-28P-L05
EIAJ CODE	*SOP028-P-0450
JEDEC CODE	

PACKAGE MATERIAL	EPOXY RESIN
LEAD TREATMENT	SOLDER PLATING
LEAD MATERIAL	42 ALLOY
PACKAGE WEIGHT	0.7g