SONY

CXK58257CTM/CYM/CM/CP -55LL/70LL

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

Description

The CXK58257CTM/CYM/CM/CP is 262,144 bits high speed CMOS static RAM organized as 32768 words by 8 bits.

Special feature are operating on a single 5V supply, low power consumption, high speed and broad package line-up.

The CXK58257CTM/CYM/CM/CP is a suitable RAM for portable equipment with battery back up.

Features

- Single +5V supply: 5V ± 10%
- Fast access time:

CXK58257CTM/CYM/CM/CP	(Access time)
-55LL	55ns (Max.)
-70LL	70ns (Max.)

- Low standby current: 5µA (Max.)
- Low data retention current: 3µA (Max.)
- Direct TTL compatible: All inputs and outputs
- Data retention voltage: 2.0V (Min.)
- Broad package line-up

CXK58257CTM/CYM	8mm × 13.4mm 28 pin TSOP Package
CXK58257CM	450mil 28 pin SOP Package
CXK58257CP	600mil 28 pin DIP Package

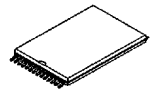
Function

32768-word × 8 bit static RAM

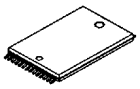
Structure

Silicon gate CMOS IC

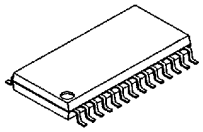
CXK58257CTM
28 pin TSOP (Plastic)



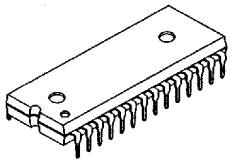
CXK58257CYM
28 pin TSOP (Plastic)



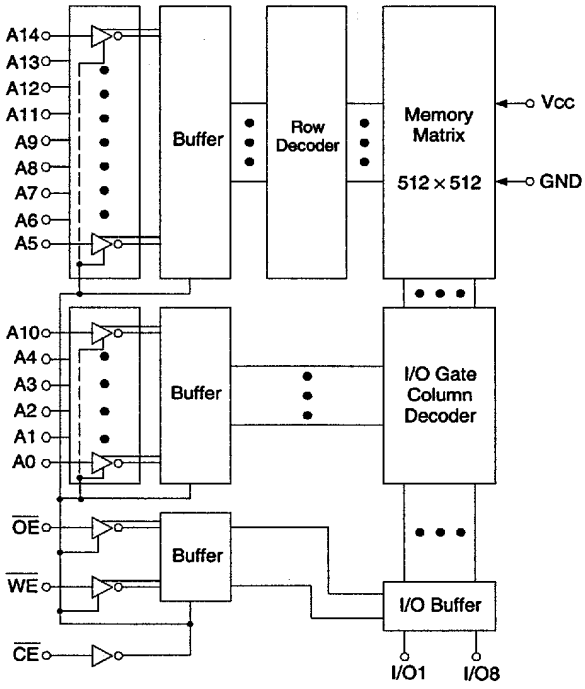
CXK58257CM
28 pin SOP (Plastic)



CXK58257CP
28 pin DIP (Plastic)



Block Diagram



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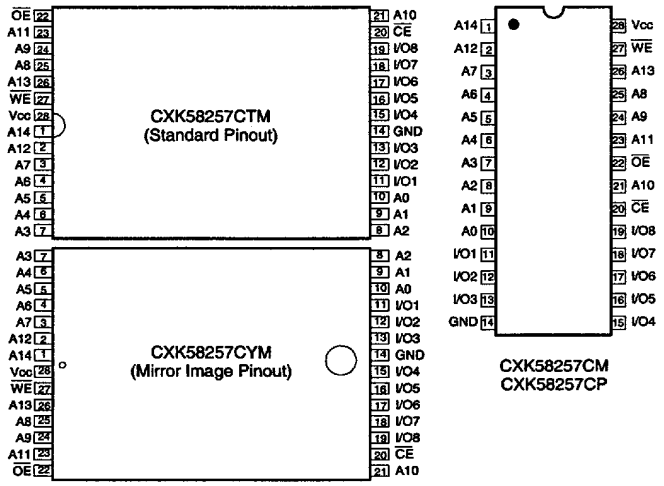
Pin Configuration (Top View)



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
Vcc	+5V power supply
GND	Ground

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

Item	Symbol		Rating	Unit
Supply voltage	V_{CC}		–0.5 to +7.0	V
Input voltage	V_{IN}		–0.5*1 to Vcc + 0.5	
Input and output voltage	$V_{I/O}$		–0.5*1 to Vcc + 0.5	
Allowable power dissipation	P_D	CXK58257CP	1.0	W
		CXK58257CTM/CYM/CM	0.7	
Operating temperature	Topr		0 to +70	°C
Storage temperature	Tstg		–55 to +150	
Soldering temperature · time	Tsolder	CXK58257CP	260 · 10	°C · s
		CXK58257CTM/CYM/CM	235 · 10	

*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 pin	Vcc 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 = 0 to +70°C, GND = 0V)

Item	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	Vcc	4.5	5.0	5.5	V
Input high voltage	V_{IH}	2.2	—	Vcc + 0.3	
Input low voltage	V_{IL}	–0.3*2	—	0.8	

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

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Electrical Characteristics

• DC characteristics (Vcc = 5V ± 10%, GND = 0V, Ta = 0 to +70°C)

Item	Symbol	Test Conditions		Min.	Typ.*1	Max.	Unit
Input leakage current	I_{LI}	V_{IN} = GND to Vcc		–0.5	—	0.5	µA
Output leakage current	I_{LO}	$\overline{CE}$ = V_{IH} or $\overline{OE}$ = V_{IH} or $\overline{WE}$ = V_{IL} $V_{I/O}$ = GND to Vcc		–0.5	—	0.5	µA
Operation power supply current	I_{CC1}	$\overline{CE}$ = V_{IL} V_{IN} = V_{IH} or V_{IL} I_{OUT} = 0mA		—	3	10	mA
Average operating current	I_{CC2}	Min. cycle duty = 100% I_{OUT} = 0mA	-55LL	—	45	70	mA
			-70LL	—	40	50	
Standby current	I_{SB1}	$\overline{CE}$ ≥ Vcc – 0.2V	0 to +70°C	—	—	5	µA
			0 to +40°C	—	—	1	
			+25°C	—	0.2	0.5	
	I_{SB2}	$\overline{CE}$ = V_{IH}		—	0.4	2	mA
Output high voltage	V_{OH}	I_{OH} = –1.0mA		2.4	—	—	V
Output low voltage	V_{OL}	I_{OL} = 2.1mA		—	—	0.4	V

*1 Vcc = 5V, Ta = 25°C

I/O capacitance (Ta = 25°C, f = 1MHz)

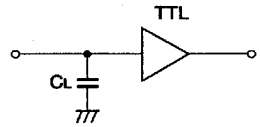
Item	Symbol	Test condition	Min.	Typ.	Max.	Unit
Input capacitance	C_{IN}	V_{IN} = 0V	—	—	7	pF
I/O capacitance	$C_{I/O}$	$V_{I/O}$ = 0V	—	—	8	

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

AC Characteristics

• AC test conditions (Vcc = 5V ± 10%, Ta = 0 to +70°C)

Item		Conditions
Input pulse high level		V_{IH} = 2.2V
Input pulse low level		V_{IL} = 0.8V
Input rise time		tr = 5ns
Input fall time		tf = 5ns
Input and output reference level		1.5V
Output load conditions	-55LL	C_L*2 = 30pF, 1TTL
	-70LL	C_L*2 = 100pF, 1TTL



*2 CL includes scope and jig capacitances.

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

Item	Symbol	-55LL		-70LL		Unit
		Min.	Max.	Min.	Max.	
Read cycle time	t_{RC}	55	—	70	—	ns
Address access time	t_{AA}	—	55	—	70	
Chip enable access time	t_{CO}	—	55	—	70	
Output enable to output valid	t_{OE}	—	30	—	40	
Output hold from address change	t_{OH}	15	—	20	—	
Chip enable to output in low Z ($\overline{CE}$)	t_{LZ}	10	—	10	—	
Output enable to output in low Z ($\overline{OE}$)	t_{OLZ}	5	—	5	—	
Chip disable to output in high Z ($\overline{CE}$)	t_{HZ}*1	—	20	—	25	
Output disable to output in high Z ($\overline{OE}$)	t_{OHZ}*1	—	20	—	25	

*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	-55LL		-70LL		Unit
		Min.	Max.	Min.	Max.	
Write cycle time	t_{WC}	55	—	70	—	ns
Address valid to end of write	t_{AW}	50	—	60	—	
Chip enable to end of write	t_{CW}	50	—	60	—	
Data to write time overlap	t_{DW}	25	—	30	—	
Data hold from write time	t_{DH}	0	—	0	—	
Write pulse width	t_{WP}	40	—	50	—	
Address setup time	t_{AS}	0	—	0	—	
Write recovery time ($\overline{WE}$)	t_{WR}	0	—	0	—	
Write recovery time ($\overline{CE}$)	t_{WR1}	0	—	0	—	
Output active from end of write	t_{OW}	10	—	10	—	
Write to output in high Z	t_{WHZ}*2	—	20	—	25	

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

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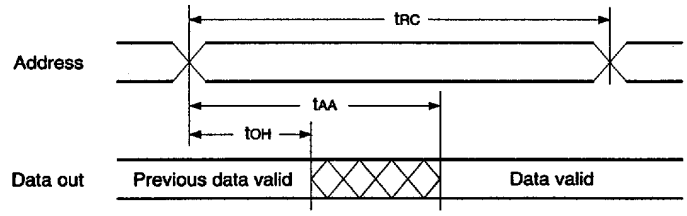
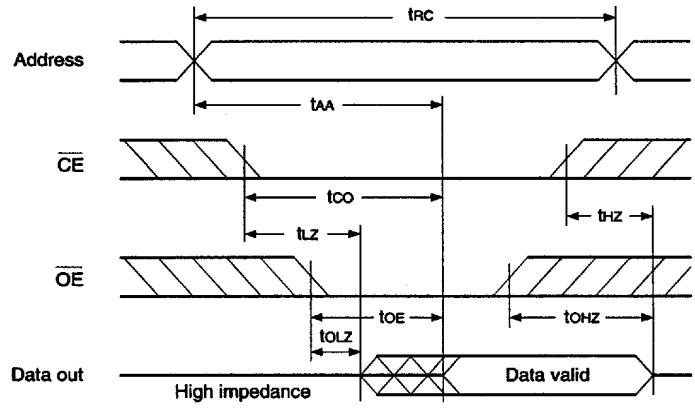
Timing Waveform

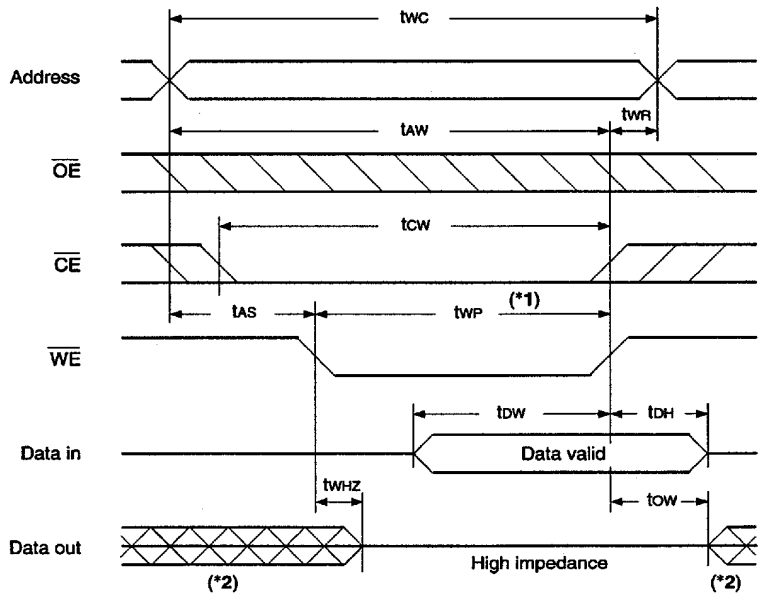
• **Read cycle (1):** $\overline{CE}$ = $\overline{OE}$ = V_{IL}, $\overline{WE}$ = V_{IH}



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



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



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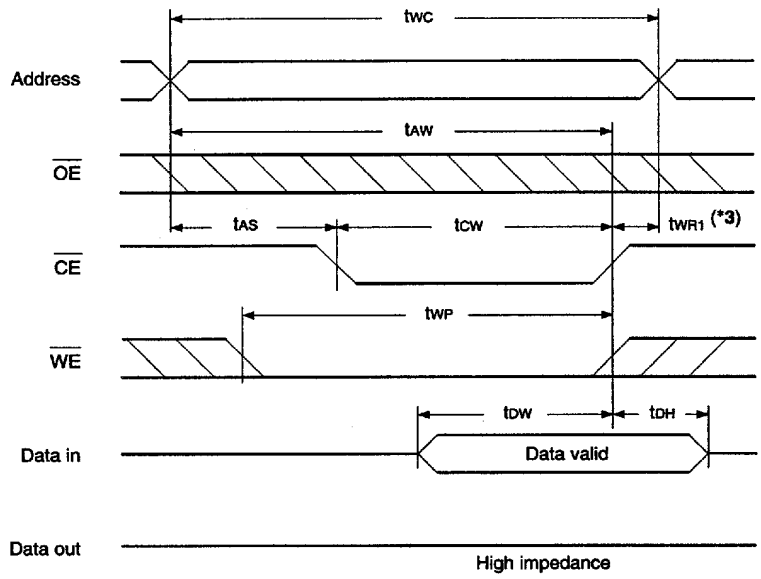
• **Write cycle (2):** $\overline{CE}$ control



*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 in output condition.

*3 t_{WR1} is tested from the rising edge of $\overline{CE}$, until the end of the write cycle.

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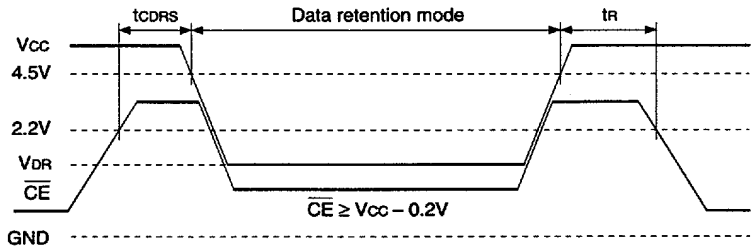
Data retention waveform

• Low supply voltage data retention waveform



Data Retention Characteristics (Ta = 0 to +70°C)

Item	Symbol	Test condiitions		Min.	Typ.	Max.	Unit
Data retention voltage	V_{DR}	$\overline{CE} \geq V_{CC} - 0.2V$		2.0	—	5.5	V
Data retention current	I_{CCDR1}	V_{CC} = 3.0V $\overline{CE} \geq$ 2.8V	0 to +70°C	—	—	3	μA
			0 to +40°C	—	—	0.6	
			+25°C	—	0.1	0.3	
	I_{CCDR2}	V_{CC} = 2.0 to 5.5V $\overline{CE} \geq V_{CC} - 0.2V$		—	0.2*1	5	
Data retention setup time	t_{CDRS}	Chip disable to data retention mode		0	—	—	ns
Recovery time	t_R			5	—	—	ms

*1 V_{CC} = 5V, Ta = 25°C

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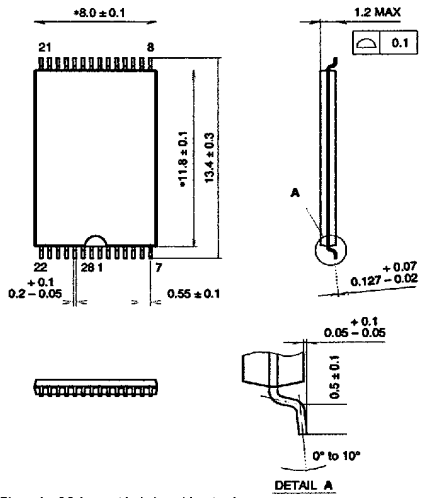
Package Outline Unit: mm

CXK58257CTM

28PIN TSOP (Plastic)



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

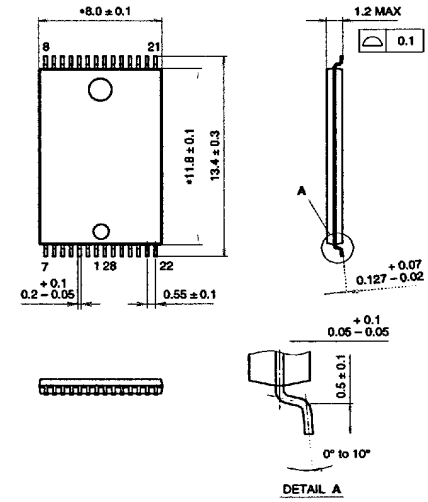
SONY CODE	TSOP-28P-L01
EIAJ CODE	TSOP028-P-0000-A
JEDEC CODE	————

PACKAGE STRUCTURE

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

CXK58257CYM

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

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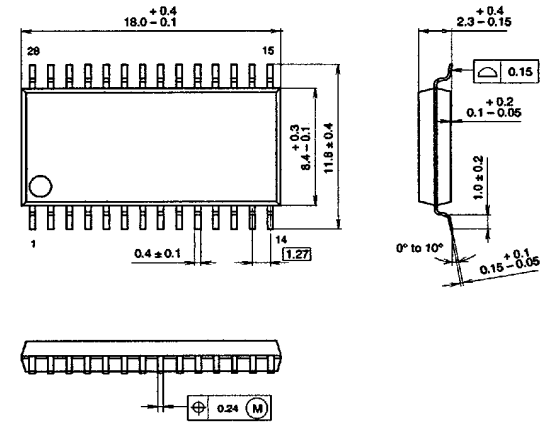
CXK58257CM

28PIN SOP (PLASTIC)



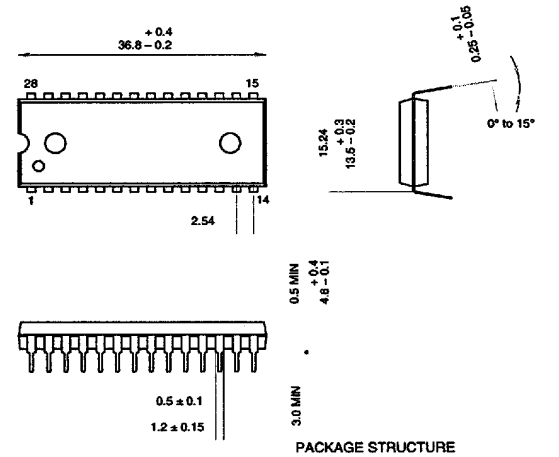
SONY CODE	SOP-28P-L05
EIAJ CODE	*SOP028-P-0450
JEDEC CODE	————

PACKAGE STRUCTURE

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

CXK58257CP

28PIN DIP (PLASTIC) 600mil



SONY CODE	DIP-28P-04
EIAJ CODE	*DIP028-P-0600-D
JEDEC CODE	————

PACKAGE STRUCTURE

PACKAGE MATERIAL	EPOXY RESIN
LEAD TREATMENT	SOLDER PLATING
LEAD MATERIAL	COPPER / 42 ALLOY
PACKAGE WEIGHT	4.2g

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