

Birth of the T Series: Rapidly Responding to Market Needs for Even Lower Voltage Operation Standard SRAMs Featuring Low-Voltage Operation and a Wider Operating Temperature Range

CXK5T8257BTM/BYM/BM

CXK5T8512TM/TN

CXK5T81000ATM/AYM/ATN/AYN/AM

CXK5T16100TM

Sony is now releasing a series of SRAM products that feature the 3-V operation (2.7 to 3.6 V) and that also feature an extended operating temperature range: from -25°C to $+85^{\circ}\text{C}$, optimal for portable equipment such as the portable telephone .

These products are available in four capacity types: 256K ($\times 8$), 512K ($\times 8$), 1M ($\times 8$), and 1M ($\times 16$).

In addition to the package types previously available, a slim TSOP package has been added to the product line to respond to desires for further miniaturization.

These products can replace earlier low-voltage products, such as the LB and LLB versions and the V series.

- Provided in capacities from 256K to 1M
- Low-voltage operation: 2.7 to 3.6 V
- Wide operating temperature range: -25°C to $+85^{\circ}\text{C}$
- Speed: 100 and 120 ns
- Low standby/data retention current
- New ultraminiature package: 32-pin slim TSOP (512K and 1M ($\times 8$) versions)

■ T Series Standard SRAM

Both the fabrication process and the internal circuit design were optimized to achieve low-voltage operation and a wider operating temperature range and these devices achieve speeds of 100 and 120 ns at a minimum operating voltage of 2.7 V. (These speeds are increased to 85 and 100 ns at 3.0 V.) These are upwardly compatible with the B version and V series of earlier products and can directly replace those devices. (However, note that the maximum value of the recommended operating voltage for these products is 3.6 V.)

■ New Ultraminiature Package Adopted

In addition to the earlier 32-pin TSOP, a 32-pin slim TSOP package (size: 8×13.4 mm) that requires only 2/3 the mounting area has been added for the 512K and 1M ($\times 8$) products. The 1M ($\times 16$) product is still only available in the earlier 44-pin TSOP type II package. Due to optimization of the memory cell, data retention currents of $6.0 \mu\text{A}$ maximum for the 256K products (at 3.0 V, 85°C), $12 \mu\text{A}$ for the 512K products, and $24 \mu\text{A}$ for the 1M products are guaranteed.

■ Addendum

[T Series]

-25 to 85°C , 2.7 to 3.6 V products

Product name		
CXK5T	-	LLX

[V series]

-25 to 85°C , 3.0 to 3.6 V products

Product name		
CXK5V	-	LLX

[LB/LLB versions]

0 to 70°C , 2.7 to 5.5 V products

Product name		
CXK5	-	LB/LLB

■ The 3-V Operation Optimal for Portable Equipment

These memory products are targeted for the market for portable telephones and terminals for digital cellular communication systems such as GSM, PDC, PHS, and CDMA; a market that is expected to grow rapidly in the near future. Sony is currently investigating the expansion of the SRAM product line into lower operating voltages (2.7 V and lower) and wider temperature ranges (-40 to $+85^{\circ}\text{C}$), and is committed to expanding its product line to meet the needs of the portable equipment market.

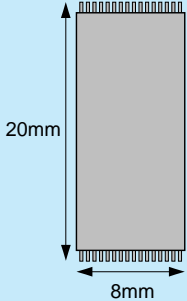
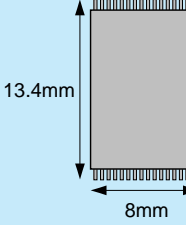
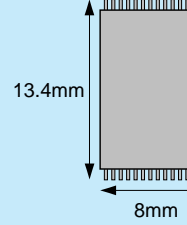
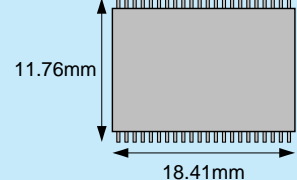
V O I C E

The most significant point in the development of these ICs was how large an operating margin could be acquired in the low operating voltage; this was an issue that caused us much distress. We spent day and night evaluating low-voltage margins, and each time we would run into a problem, everyone concerned would pool their strengths and work together until the problem was solved. We believe that these ICs will prove useful in improving the performance of portable equipment.



*New
Products*

■ Table 1 TSOP Package Comparison

Capacity	<Earlier package> 1M(×8)/512K	<New package> 1M(×8)/512K	256K	1M (×16)
Package	TSOP Type I	TSOP Type I (Slim TSOP)	TSOP Type I	TSOP Type II
Package dimensions [mm ²]	8×20	8×13.4	8×13.4	18.41×11.76
Relative area	1	0.67	0.67	1.35
Lead pitch [mm]	0.5	0.5	0.55	0.8
Number of pins	32	32	28	44
Corresponding product name	5T81000ATM 5T81000AYM* 5T8512TM	5T81000ATN 5T81000AYN* 5T8512TN	5T8257BTM 5T8257BYM*	5T16100TM
Package outline				

* : Reverse pin

■ Table 2 Standby Current/Data Retention Current Specifications

Capacity		256K	512K	1M (×8, ×16)
Product name		5T8257B	5T8512	5T81000A/5T16100
Standby current (ISB1) [μA]	For Ta = -25 to +85°C, Vcc = 3.6V max.	7.0	14.0	28.0
	For Ta = -25 to +70°C, Vcc = 3.6V max.	3.5	7.0	14.0
	For Ta = 25°C, Vcc = 3.3V typ.	0.12	0.24	0.48
Data retention current (ICCDR1) [μA]	For Ta = -25 to +85°C, Vcc = 3.0V max.	6.0	12.0	24.0
	For Ta = -25 to +70°C, Vcc = 3.0V max.	3.0	6.0	12.0
	For Ta = 25°C, Vcc = 3.0V typ.	0.1	0.2	0.4