SIEMENS

HYB 514265 BJ/BJL -40/-45/-50

256k x 16 - Bit EDO-Dynamic RAM

INFORMATION NOTE

High Speed 256kx16 DYNAMIC MEMORIES

CHARACTERISATION DATA

3.97

INFOCD1.DOC

This information note is intended to provide technical information on the SIEMENS HYB514265BJ/BJL high speed 256kx16 DYNAMIC ACCESS MEMORIES (16M Cutdown) with EDO capability, operating from 5V power supply.

CHARACTERISTICS OF DC - PARAMETERS

The SIEMENS HYB514265BJ/BJL high speed 256kx16 wordwide DRAM devices are guarantied to meet certain DC parametric limits over the temperature range 0^{o} to 70^{o}C. This information note shows the actual performance levels that can typically be expected from devices. Samples with speed grade -40 out of three different production lots have been randomly selected and characterised.

Typical values of operation currents as a function of cycle time are shown in figure 1 and figure 2.

Other DC - parameters measured at room temperature and with two voltages (VCC = 4.5 V and 5.5 V) are shown in table 1.

CHARACTERISTICS OF AC - PARAMETERS

All AC - parameters measured at two voltages (VCC = 4.5 V and 5.5 V) and two temperatures (+85^{o}C and - 10^{o}C) are put together in table 2.

All measurements shown in this information note have been performed on an ADVANTEST 5381 dedicated memory test system.

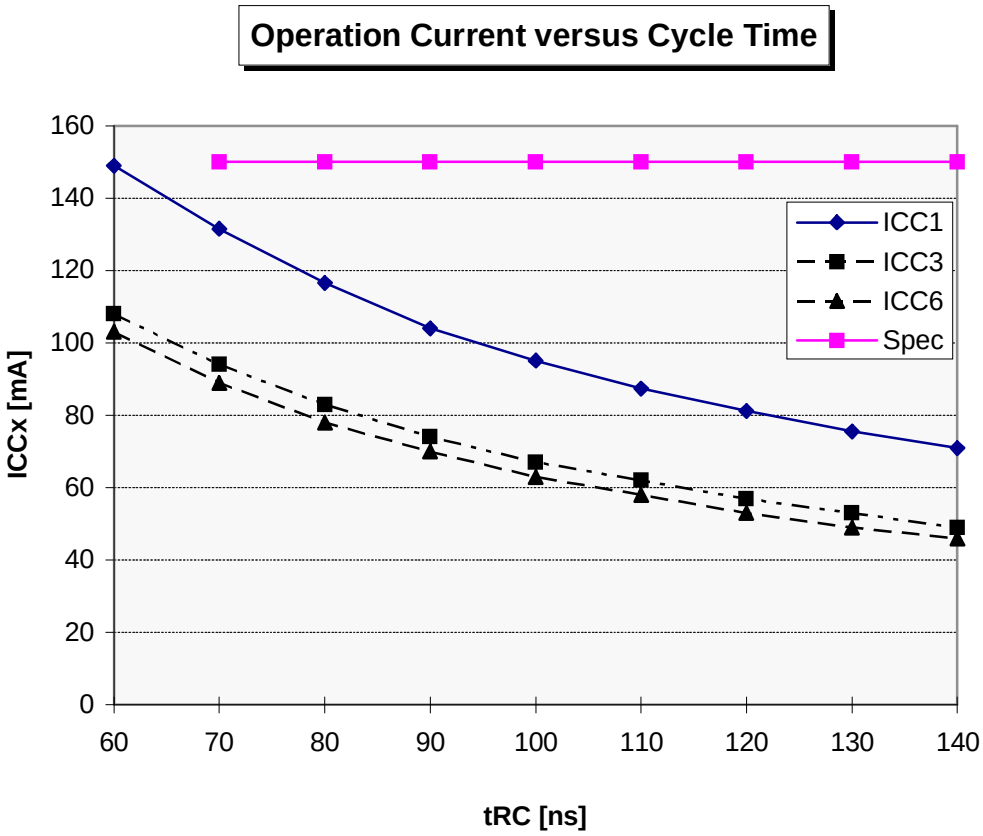
Operation Current versus Cycle Time
160
140
120
100
80
60
40
20
0
ICCx [mA]
60
70
80
90
100
110
120
130
140
tRC [ns]
ICC1
ICC3
ICC6
Spec

fig.1

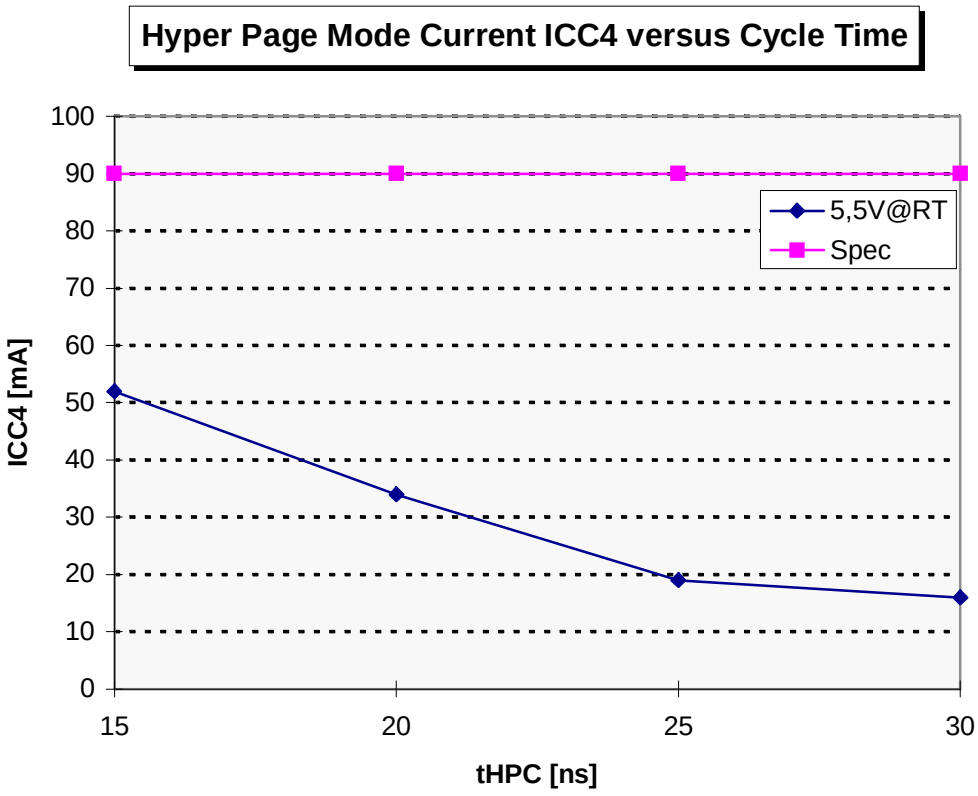
Hyper Page Mode Current ICC4 versus Cycle Time
100
90
80
70
60
50
40
30
20
10
0
ICC4 [mA]
15
20
25
30
tHPC [ns]
5,5V@RT
Spec

fig.2

Table 1: DC CHARACTERISTICS

Device: 256k x 16 EDO-DRAM 40ns, 5V power supply version

Parameter	Spec -40ns		Measurement Ta=RT	
		max.	Vcc = 4.5V	Vcc = 5.5V
Standby Current TTL	ICC2	2 mA	350 uA	450 uA
Standby Current CMOS	ICC5	1 mA	300 uA	350 uA

Table 2: AC CHARACTERISTICS
Device: 256k x 16 EDO-DRAM 40ns, 5V power supply version

Parameter	Spec -40ns		Measurement (tT = 2ns)				
	Unit [ns]		Ta = -10°C		Ta = +85°C		note
	min.	max.	Vcc = 4.5V	Vcc = 5.5V	Vcc = 4.5V	Vcc = 5.5V	1)
Common Parameters							
trc	69	-	54	54	66	67	
trp	25	-	19	19	25	25	
tras	40	10000	22	22	<10	<10	2)
tcas	6	10000	3	3	4	4	3)
tasr	0	-	-4	-4	-5	-5	
trah	5	-	3	2	3	3	
tasc	0	-	-4	-4	-4	-4	
tcah	5	-	2	2	2	2	
trcd (min)	9		2	3	4	4	
trcd (max)	-	30	25	24	30	30	4)
trad	7	20	5	4	5	5	
trsh	6	-	2	2	3	3	
tcsh	32	-	23	23	24	24	
tcrp	5	-	0	0	0	0	
Read Cycle							
	Unit [ns]		Ta = -10°C		Ta = +85°C		
	min.	max.	Vcc = 4.5V	Vcc = 5.5V	Vcc = 4.5V	Vcc = 5.5V	
trac	-	40	30	29	36	36	
tcac	-	10	7	7	9	10	
taa	-	17	12	12	15	15	
toea	-	10	4	4	5	5	
tral	20	-	4	4	5	5	
trcs	0	-	-2	-2	-3	-3	
trch	0	-	-4	-4	-5	-5	
trrh	0	-	-3	-3	-4	-4	
tclz	0	-	3	3	4	4	
toff	0	10	6	6	8	8	
toez	0	10	6	4	7	5	
Write Cycle							
	Unit [ns]		Ta = -10°C		Ta = +85°C		
	min.	max.	Vcc = 4.5V	Vcc = 5.5V	Vcc = 4.5V	Vcc = 5.5V	
twch	5	-	0	0	0	0	
twp	5	-	1	1	1	1	
twcs	0	-	-3	-3	-3	-3	
trwl	10	-	2	2	2	2	
tcwl	10	-	3	3	3	3	
tds	0	-	-4	-4	-4	-4	
tdh	5	-	2	2	3	3	

Read-Modify-Write Cycle

	Unit [ns]		Ta = -10°C		Ta = +85°C	
	min.	max.	Vcc = 4.5V	Vcc = 5.5V	Vcc = 4.5V	Vcc = 5.5V
trwc	93	-	81	81	87	89
trwd	52	-	39	39	44	44
tcwd	22	-	14	14	15	15
tawd	32	-	21	21	24	24

CAS-before-RAS refresh cycle

	Unit [ns]		Ta = -10°C		Ta = +85°C	
	min.	max.	Vcc = 4.5V	Vcc = 5.5V	Vcc = 4.5V	Vcc = 5.5V
tcsr	5	-	-3	-3	-3	-3
tchr	5	-	-1	-1	-1	-1

Hyper Page Mode -- EDO cycle

	Unit [ns]		Ta = -10°C		Ta = +85°C	
	min.	max.	Vcc = 4.5V	Vcc = 5.5V	Vcc = 4.5V	Vcc = 5.5V
thpc	15	-	11	11	12	13
tcac(RTR)	10	-	7	7	9	10
tcp	8	-	1	1	1	1
tcpa	-	21	14	14	17	182
tcoh	3	-	3	3	3	3
tras	40	200000	21	21	<10	<10

Hyper Page Mode- EDO Read-modify-Write Cycle

	Unit [ns]		Ta = -10°C		Ta = +85°C	
	min.	max.	Vcc = 4.5V	Vcc = 5.5V	Vcc = 4.5V	Vcc = 5.5V
tprwc	55	-	35	35	38	38

CAS-before-RAS counter test cycle

	Unit [ns]		Ta = -10°C		Ta = +85°C	
	min.	max.	Vcc = 4.5V	Vcc = 5.5V	Vcc = 4.5V	Vcc = 5.5V
tcpt	25	-	0	1	1	1

Notes:

1) all AC-parameters are measured with 0.8V/2.4V levels on clocks and addresses

2) the "min."-value is shown

3) tcas(min)-value in a write cycle is shown

4) trcd(max.) is the reference point where the access time is controlled by tcac