2Mb Low Power SRAM
M-die Specification

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Document Title

128Kx16 & 256Kx8 Bit Low Power SRAM

Revision History

Rev. No.	History	Draft Date	Remark
0.0	Initial Draft	Nov. 2015	Preliminary
0.1	Add typical I_{DR} value	Dec. 2015	Preliminary
1.0	Final version release Split Icc1 spec value depending on Vcc ; 2.3~3.6V : 3mA ; 4.5~5.5V : 4mA Add 32SOP, 32TSOP1 and 32TSOP2	Feb. 2016	Final
1.1	Add commercial temperature range	Apr. 2016	Final

128Kx16 & 256Kx8 Bit Low Power SRAM

Features

- Fast Access Time : 45, 55, 70ns(Max.)
- CMOS Low Power Dissipation
  Standby Current (Typical) : 2μA
  (Maximum) : 10μA
  Operating Current (Typical) : 15mA (tAA=55ns)
  (Maximum) : 20mA (tAA=55ns)
- Wide range or Single 5.0V Power Supply
  - S6L20xxW : 2.3V ~ 3.6V Vcc
  - S6L20xxC : 4.5V ~ 5.5V Vcc
- Fully Static Operation, No Clock or Refresh required
- Three State Outputs
- Data Byte Control (x16 Mode)
  $\overline{LB}$: I/O0~ I/O7, $\overline{UB}$: I/O8~ I/O15
- Standard 32SOP, 32TSOP1, 32sTSOP1, 32TSOP2, 44TSOP2, 48FBGA Package Pin Configuration
- ROHS compliant
- Operating in Commercial and Industrial Temperature range.
- 2CS Option Available

General Description

The S6L2016(W/C) and S6L2008(W/C) are a 2,097,152-bit high-speed Static Random Access Memory organized as 128K (256K) words by 16(8) bits. S6L2016(W/C) allows that lower and upper byte access by data byte control($\overline{UB}$, $\overline{LB}$). The device is fabricated using advanced CMOS process,6-TR based cell technology and designed for low power circuit technology. It is particularly well suited for use in battery back up application for low data retention current.

The S6L2016(W/C) is packaged in a 44-pin TSOP2 and 48FBGA.

The S6L2008(W/C) is packaged in a 32SOP, 32TSOP1, 32sTSOP1 and 32TSOP2.

2Mb Low Power SRAM Ordering Information (128Kx16) - 1CS

Density	Org.	Part Number	Typical Vcc (V)	Speed		Package	TEMP
				tAA(ns)	tOE(ns)		
2Mb	128Kx16	S6L2016W1M-UC(I)45	2.5, 3.3	45	20	44 TSOP2	C : Commercial Temp. (0°C ~ 70°C) I : Industrial Temp. (-40°C ~ 85°C)
		S6L2016W1M-UC(I)55	2.5, 3.3	55	25	44 TSOP2	
		S6L2016W1M-UC(I)70	2.5, 3.3	70	35	44 TSOP2	
		S6L2016C1M-UC(I)45	5.0	45	20	44 TSOP2	
		S6L2016C1M-UC(I)55	5.0	55	25	44 TSOP2	
		S6L2016C1M-UC(I)70	5.0	70	35	44 TSOP2	
		S6L2016W1M-XC(I)45	2.5, 3.3	45	20	48 FBGA	
		S6L2016W1M-XC(I)55	2.5, 3.3	55	25	48 FBGA	
		S6L2016W1M-XC(I)70	2.5, 3.3	70	35	48 FBGA	
		S6L2016C1M-XC(I)45	5.0	45	20	48 FBGA	
		S6L2016C1M-XC(I)55	5.0	55	25	48 FBGA	
		S6L2016C1M-XC(I)70	5.0	70	35	48 FBGA	

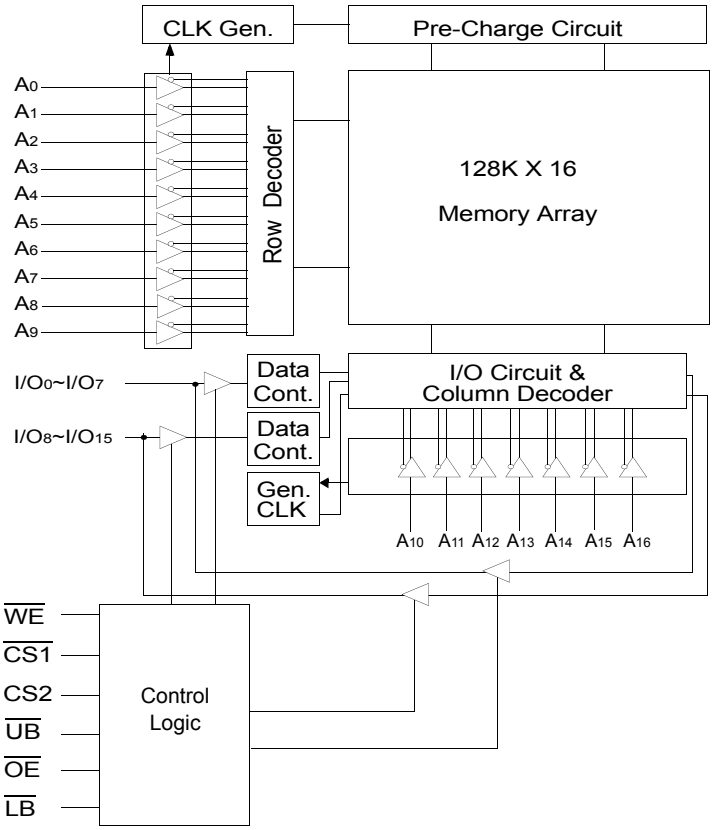
2Mb Low Power SRAM Ordering Information (128Kx16) - 2CS

Density	Org.	Part Number	Typical Vcc (V)	Speed		Package	TEMP
				tAA(ns)	tOE(ns)		
2Mb	128Kx16	S6L2016W2M-XC(I)45	2.5, 3.3	45	20	48 FBGA	C : Commercial Temp. (0°C ~ 70°C) I : Industrial Temp. (-40°C ~ 85°C)
		S6L2016W2M-XC(I)55	2.5, 3.3	55	25	48 FBGA	
		S6L2016W2M-XC(I)70	2.5, 3.3	70	35	48 FBGA	
		S6L2016C2M-XC(I)45	5.0	45	20	48 FBGA	
		S6L2016C2M-XC(I)55	5.0	55	25	48 FBGA	
		S6L2016C2M-XC(I)70	5.0	70	35	48 FBGA	

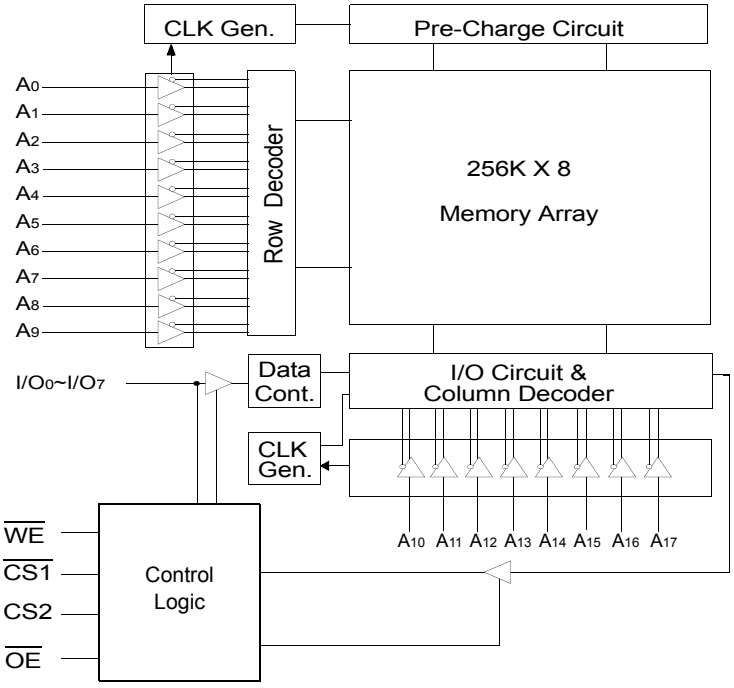
2Mb Low Power SRAM Ordering Information (256Kx8) - 2CS

Density	Org.	Part Number	Typical Vcc (V)	Speed		Package	TEMP
				tAA(ns)	tOE(ns)		
2Mb	256Kx8	S6L2008W2M-BC(I)45	2.5, 3.3	45	20	32 SOP	C : Commercial Temp. (0°C ~ 70°C) I : Industrial Temp. (-40°C ~ 85°C)
		S6L2008W2M-BC(I)55	2.5, 3.3	55	25	32 SOP	
		S6L2008W2M-BC(I)70	2.5, 3.3	70	35	32 SOP	
		S6L2008C2M-BC(I)45	5.0	45	20	32 SOP	
		S6L2008C2M-BC(I)55	5.0	55	25	32 SOP	
		S6L2008C2M-BC(I)70	5.0	70	35	32 SOP	
		S6L2008W2M-TC(I)45	2.5, 3.3	45	20	32 TSOP1	
		S6L2008W2M-TC(I)55	2.5, 3.3	55	25	32 TSOP1	
		S6L2008W2M-TC(I)70	2.5, 3.3	70	35	32 TSOP1	
		S6L2008C2M-TC(I)45	5.0	45	20	32 TSOP1	
		S6L2008C2M-TC(I)55	5.0	55	25	32 TSOP1	
		S6L2008C2M-TC(I)70	5.0	70	35	32 TSOP1	
		S6L2008W2M-LC(I)45	2.5, 3.3	45	20	32 sTSOP1	
		S6L2008W2M-LC(I)55	2.5, 3.3	55	25	32 sTSOP1	
		S6L2008W2M-LC(I)70	2.5, 3.3	70	35	32 sTSOP1	
		S6L2008C2M-LC(I)45	5.0	45	20	32 sTSOP1	
		S6L2008C2M-LC(I)55	5.0	55	25	32 sTSOP1	
		S6L2008C2M-LC(I)70	5.0	70	35	32 sTSOP1	
		S6L2008W2M-NC(I)45	2.5, 3.3	45	20	32 TSOP2	
		S6L2008W2M-NC(I)55	2.5, 3.3	55	25	32 TSOP2	
		S6L2008W2M-NC(I)70	2.5, 3.3	70	35	32 TSOP2	
		S6L2008C2M-NC(I)45	5.0	45	20	32 TSOP2	
		S6L2008C2M-NC(I)55	5.0	55	25	32 TSOP2	
		S6L2008C2M-NC(I)70	5.0	70	35	32 TSOP2	

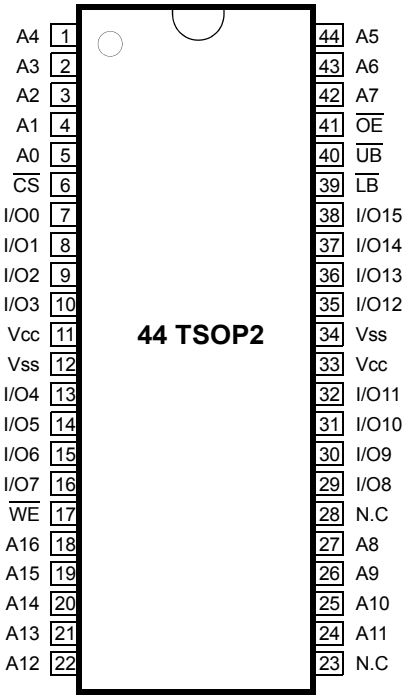
Logic Block Diagram - 128K x 16



Logic Block Diagram - 256K x 8



44 TSOP2 Package Pin Configurations(Top View) - S6L2016(W/C)1M (128K x 16) - 1CS

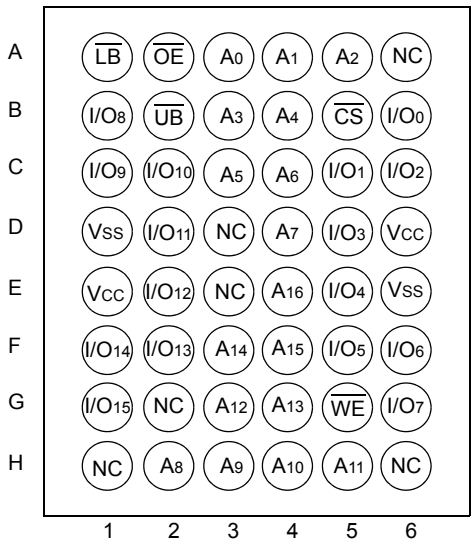


Pin Function

Pin Name	Pin Function
A_0 - A_{16}	Address Inputs
$\overline{WE}$	Write Enable Input
$\overline{CS}$	Chip Select Input
$\overline{OE}$	Output Enable Input
$\overline{LB}$	Lower-byte Control(I/O_0~I/O_7)
$\overline{UB}$	Upper-byte Control(I/O_8~I/O_{15})
I/O_0 ~ I/O_{15}	Data Inputs/Outputs
V_{CC}	Power
V_{SS}	Ground
N.C	No Connection

48FBGA - S6L2016(W/C)1M (128K x 16) - 1CS - Top View

PKG Pin Configurations

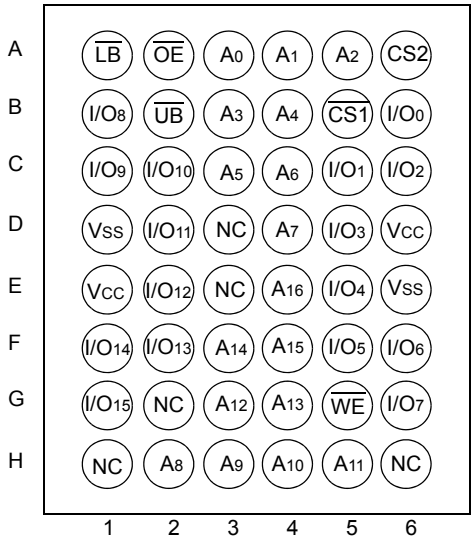


Pin Function

Pin Name	Pin Function
A_0 - A_{16}	Address Inputs
$\overline{WE}$	Write Enable Input
$\overline{CS}$	Chip Select Input
$\overline{OE}$	Output Enable Input
$\overline{LB}$	Lower-byte Control(I/O_0~I/O_7)
$\overline{UB}$	Upper-byte Control(I/O_8~I/O_{15})
I/O_0 ~ I/O_{15}	Data Inputs/Outputs
V_{CC}	Power
V_{SS}	Ground
N.C	No Connection

48FBGA - S6L2016(W/C)2M (128K x 16) - 2CS - Top View

PKG Pin Configurations

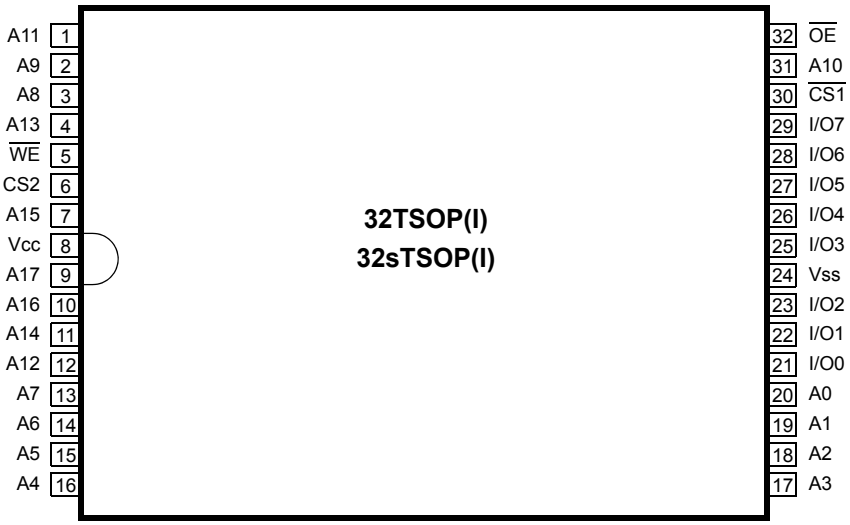


Pin Function

Pin Name	Pin Function
A_0 - A_{16}	Address Inputs
$\overline{WE}$	Write Enable Input
$\overline{CS1}$	Chip Select Input1
CS2	Chip Select Input2
$\overline{OE}$	Output Enable Input
$\overline{LB}$	Lower-byte Control(I/O_0~I/O_7)
$\overline{UB}$	Upper-byte Control(I/O_8~I/O_{15})
I/O_0 ~ I/O_{15}	Data Inputs/Outputs
V_{CC}	Power
V_{SS}	Ground
N.C	No Connection

32 TSOP1 and 32 sTSOP1 Package(Top View) - S6L2008(W/C)2M (256K x 8) - 2CS

PKG Pin Configurations

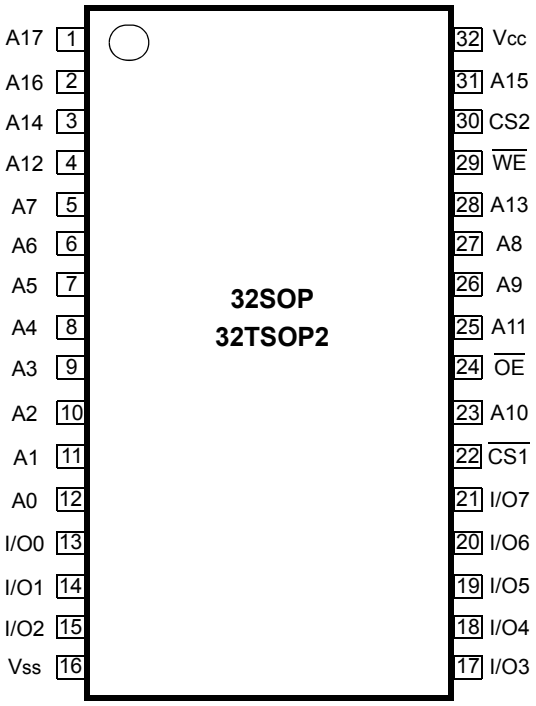


Pin Function

Pin Name	Pin Function
A_0 - A_{17}	Address Inputs
$\overline{WE}$	Write Enable
$\overline{CS1}$	Chip Select1
CS2	Chip Select2
$\overline{OE}$	Output Enable
I/O_0 ~ I/O_7	Data Inputs/Outputs
V_{CC}	Power
V_{SS}	Ground

32 SOP and 32 TSOP2 Package(Top View) - S6L2008(W/C)2M (512K x 8) - 2CS

PKG Pin Configurations



Pin Function

Pin Name	Pin Function
A_0 - A_{17}	Address Inputs
$\overline{WE}$	Write Enable
$\overline{CS1}$	Chip Select1
CS2	Chip Select2
$\overline{OE}$	Output Enable
I/O_0 ~ I/O_7	Data Inputs/Outputs
V_{CC}	Power
V_{SS}	Ground

Absolute Maximum Ratings*

Parameter		Symbol	Rating	Unit
Voltage on Any Pin relative to V_{SS}		V_{IN}, V_{OUT}	-0.5 to Vcc+0.5V	V
Voltage on Vcc Supply Relative to V_{SS}	Wide Vcc** Product	V_{IN}, V_{OUT}	-0.5 to 4.6	V
	5.0V Product		-0.5 to 7.0	
Power Dissipation		P_D	1.0	W
Storage Temperature		T_{STG}	-65 to +150	°C
Operating Temperature	Commercial	T_A	0 to 70	°C
	Industrial	T_A	-40 to 85	°C

* Stresses greater than 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 operating sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

** Wide Vcc range is 2.3V ~ 3.6V.

Recommended DC Operating Conditions (TA= -40 to 85°C)

Parameter	Operating Vcc(V)	Symbol	Min	Typ	Max	Unit
Supply Voltage	5.0	V_{CC}	4.5	5.0	5.5	V
	Wide 2.3 ~ 3.6	V_{CC}	2.3	2.5/3.3	3.6	
Ground		V_{SS}	0	0	0	V
Input High Voltage	5.0	V_{IH}	2.2	-	V_{CC}+0.5	V
	Wide 2.3 ~ 2.7	V_{IH}	1.8	-	V_{CC}+0.3	
	Wide 2.7 ~ 3.6	V_{IH}	2.2	-	V_{CC}+0.3	
Input Low Voltage	5.0	V_{IL}	-0.3	-	0.8	V
	Wide 2.3 ~ 2.7	V_{IL}	-0.3	-	0.6	
	Wide 2.7 ~ 3.6	V_{IL}	-0.3	-	0.8	

DC and Operating Characteristics (TA= -40 to 85°C)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Input Leakage Current	I_{LI}	V_{IN}=Vss to Vcc		-1	-	1	μA
Output Leakage Current	I_{LO}	$\overline{CS1}$=V_{IH} or CS2=V_{IL} or $\overline{OE}$=V_{IH} or $\overline{WE}$=V_{IL}		-1	-	1	μA
Operating Current	I_{CC}	f=fmax,Vcc=Vccmax, I_{OUT}=0mA, V_{IN}≥Vcc-0.2V or V_{IN}≤0.2V	45ns	-	-	20	mA
			55ns	-	-	20	
			70ns	-	-	15	
	I_{CC1}	f=1MHz, Vcc=Vccmax, I_{OUT}=0mA, V_{IN}≥Vcc-0.2V or V_{IN}≤0.2V	Vcc=2.3~3.6V	-	-	3	mA
			Vcc=4.5~5.5V	-	-	4	
Standby Current	I_{SB} (TTL)	Vcc=Vccmax, CS2=V_{IL}, Others=V_{IH} or V_{IL}	2CS	-	-	0.3	mA
		Vcc=Vccmax, $\overline{CS1}$=V_{IH}, Others=V_{IH} or V_{IL}	1CS				
	I_{SB1} (CMOS)	Vcc=Vccmax, V_{IN}≥Vcc-0.2V or V_{IN}≤0.2V, 1) CS2≤0.2V, or 2) CS2≥Vcc-0.2V, $\overline{CS1}$≥Vcc-0.2V, or 3)CS2≥Vcc-0.2V, CS1≤0.2V, UB=LB≥Vcc-0.2V	2CS	-	2	10	μA
		Vcc=Vccmax, V_{IN}≥Vcc-0.2V or V_{IN}≤0.2V, 1) $\overline{CS}$≥Vcc-0.2V, or 2) $\overline{CS}$≤0.2V, $\overline{UB}$=$\overline{LB}$≥Vcc-0.2V	1CS				
Output Low Voltage Level	V_{OL}	Vcc=4.5V, I_{OL}=2.1mA, 5.0V Product		-	-	0.4	V
		Vcc=2.7V, I_{OL}=2.1mA, Wide Vcc* Product		-	-	0.4	
		Vcc=2.3V, I_{OL}=2.1mA, Wide Vcc* Product		-	-	0.4	
Output High Voltage Level	V_{OH}	Vcc=4.5V, I_{OH}=-1mA, 5.0V Product		2.4	-	-	V
		Vcc=2.7V, I_{OH}=-1mA, Wide Vcc* Product		2.4	-	-	
		Vcc=2.3V, I_{OH}=-1mA, Wide Vcc* Product		1.8	-	-	

Note : Typical parameters indicates the value for the center of distribution at Vcc=3.0V and Ta=25°C, and not 100% tested.
* Wide Vcc range is 2.3V ~ 3.6V.

Capacitance*(TA=25°C, f=1.0MHz)

Item	Symbol	Test Conditions	TYP	Max	Unit
Input/Output Capacitance	$C_{I/O}$	$V_{I/O}$=0V	-	8	pF
Input Capacitance	C_{IN}	V_{IN}=0V	-	6	pF

* Capacitance is sampled and not 100% tested.

Functional Description (x8 Mode) - 2CS

$\overline{CS1}$	CS2	$\overline{WE}$	$\overline{OE}$	Mode	I/O Pin	Supply Current
H	X*	X	X	Not Select	High-Z	I_{SB}, I_{SB1}
X	L	X	X	Not Select	High-Z	I_{SB}, I_{SB1}
L	H	H	H	Output Disable	High-Z	I_{CC}
L	H	H	L	Read	D_{OUT}	I_{CC}
L	H	L	X	Write	D_{IN}	I_{CC}

* X means Don't Care.

Functional Description (x16 Mode) - 1CS

$\overline{CS}$	$\overline{WE}$	$\overline{OE}$	$\overline{LB}$	$\overline{UB}$	I/O Pin		Mode	Supply Current
					I/O_0~I/O_7	I/O_8~I/O_{15}		
H	X*	X	X	X	High-Z	High-Z	Not Select	I_{SB}, I_{SB1}
X	X	X	H	H				
L	H	H	L	X	High-Z	High-Z	Output disable	I_{CC}
L	H	H	X	L				
L	H	L	L	H	D_{OUT}	High-Z	Lower Byte Read	I_{CC}
			H	L	High-Z	D_{OUT}	Upper Byte Read	
			L	L	D_{OUT}	D_{OUT}	Word Read	
L	L	X	L	H	D_{IN}	High-Z	Lower Byte Write	I_{CC}
			H	L	High-Z	D_{IN}	Upper Byte Write	
			L	L	D_{IN}	D_{IN}	Word Write	

* X means Don't Care.

Functional Description (x16 Mode) - 2CS

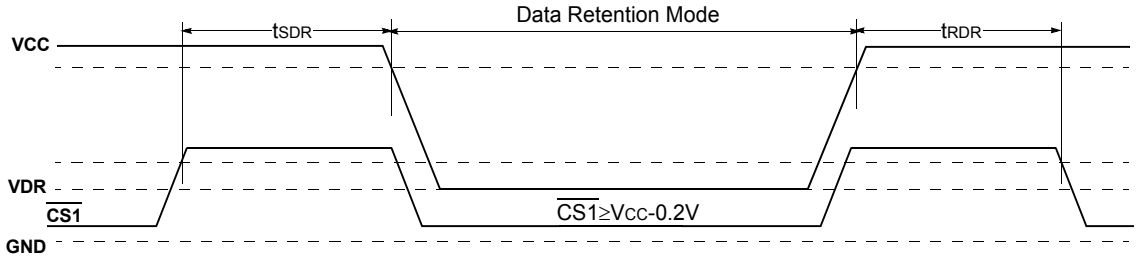
$\overline{CS1}$	CS2	$\overline{WE}$	$\overline{OE}$	$\overline{LB}$	$\overline{UB}$	I/O Pin		Mode	Supply Current
						I/O_0~I/O_7	I/O_8~I/O_{15}		
H	X*	X	X	X	X	High-Z	High-Z	Not Select	I_{SB}, I_{SB1}
X	L	X	X	X	X				
X	X	X	X	H	H				
L	H	H	H	L	X	High-Z	High-Z	Output disable	I_{CC}
L	H	H	H	X	L				
L	H	H	L	L	H	D_{OUT}	High-Z	Lower Byte Read	I_{CC}
				H	L	High-Z	D_{OUT}	Upper Byte Read	
				L	L	D_{OUT}	D_{OUT}	Word Read	
L	H	L	X	L	H	D_{IN}	High-Z	Lower Byte Write	I_{CC}
				H	L	High-Z	D_{IN}	Upper Byte Write	
				L	L	D_{IN}	D_{IN}	Word Write	

* X means Don't Care.

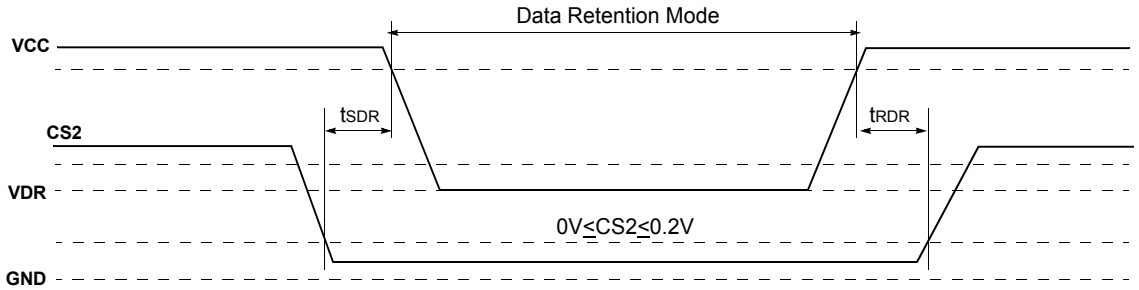
Data Retention Characteristics (TA= -40 to 85°C)

Parameter	Symbol	Test Condition		Min.	Typ.	Max.	Unit
V_{CC} for Data Retention	V_{DR}	Refer to Data Retention Waveform		1.5	-	-	V
Data Retention Current	I_{DR}	V_{CC}=1.5V, V_{IN}≥V_{CC}-0.2V or V_{IN}≤0.2V 1) CS2≤0.2V, or 2) CS2≥V_{CC}-0.2V, $\overline{CS1}$≥V_{CC}-0.2V, or 3) CS2≥V_{CC}-0.2V, $\overline{CS1}$≤0.2V, $\overline{UB}$=$\overline{LB}$≥V_{CC}-0.2V	2CS	-	2	10	µA
		V_{CC}=1.5V, V_{IN}≥V_{CC}-0.2V or V_{IN}≤0.2V 1) $\overline{CS}$≥V_{CC}-0.2V, or 2) $\overline{CS}$≤0.2V, $\overline{UB}$=$\overline{LB}$≥V_{CC}-0.2V	1CS				
Data Retention Set-Up Time	t_{SDR}	Refer to Data Retention Waveform		0	-	-	ns
Recovery Time	t_{RDR}			t_{RC}	-	-	ns

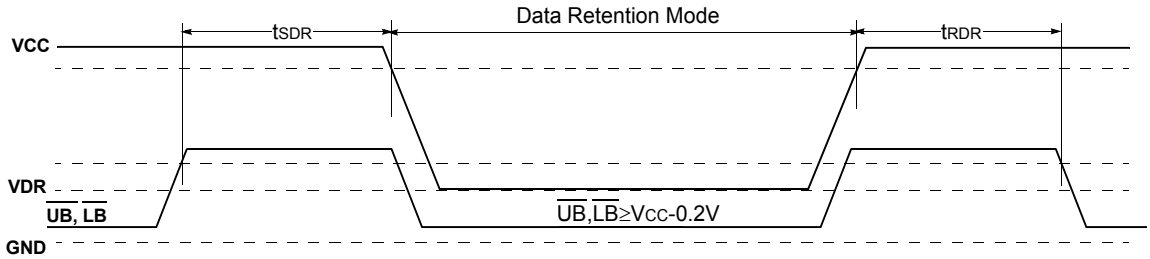
Data Retention Wave Form (1) - $\overline{CS1}$ Controlled



Data Retention Wave Form (2) - CS2 controlled



Data Retention Wave Form (3) - $\overline{UB}$, $\overline{LB}$ Controlled



AC Test Conditions

Parameter	Value
Input Pulse Level	0 to 3.0V (Vcc=3.3V or 5.0V)
	0 to 2.5V (Vcc=2.5V)
Input Rise and Fall Time	3ns
Input and Output Timing Reference Levels	1.5V (Vcc=3.3V or 5.0V)
	1/2Vcc (Vcc=2.5V)
Output Load	CL=30pF + 1TTL, I_{OH}/I_{OL}=-1mA/2.1mA

Read Cycle (TA= -40 to 85°C)

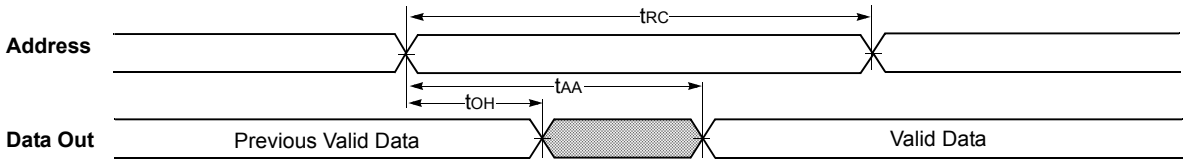
Parameter	Symbol	45ns		55ns		70ns		Unit
		Min	Max	Min	Max	Min	Max	
Read Cycle Time	t_{RC}	45	-	55	-	70	-	ns
Address Access Time	t_{AA}	-	45	-	55	-	70	ns
Output Hold from Address Change	t_{OH}	10	-	10	-	10	-	ns
$\overline{CS}$ Low to Valid Output	t_{CO}	-	45	-	55	-	70	ns
$\overline{OE}$ Low to Valid Output	t_{OE}	-	22	-	25	-	35	ns
$\overline{CS}$ Low to Low-Z Output	t_{LZ}	10	-	10	-	10	-	ns
$\overline{OE}$ Low to Low-Z Output	t_{OLZ}	5	-	5	-	5	-	ns
$\overline{CS}$ High to High-Z Output	t_{HZ}	-	18	0	20	0	25	ns
$\overline{OE}$ High to High-Z Output	t_{OHZ}	-	18	0	20	0	25	ns
$\overline{UB}$, $\overline{LB}$ Access Time	t_{BA}	-	45	-	55	-	70	ns
$\overline{UB}$, $\overline{LB}$ Low to Low-Z Output	t_{BLZ}	5	-	5	-	5	-	ns
$\overline{UB}$, $\overline{LB}$ High to High-Z Output	t_{BHZ}	-	18	0	20	0	25	ns

Write Cycle (TA= -40 to 85°C)

Parameter	Symbol	45ns		55ns		70ns		Unit
		Min	Max	Min	Max	Min	Max	
Write Cycle Time	t_{WC}	45	-	55	-	70	-	ns
$\overline{CS}$ Low to End of Write	t_{CW}	35	-	45	-	60	-	ns
Address Set-up to Start of Write	t_{AS}	0	-	0	-	0	-	ns
Address Set-up to End of Write	t_{AW}	35	-	45	-	60	-	ns
Address Hold from End of Write	t_{WR}	0	-	0	-	0	-	ns
$\overline{WE}$ Pulse Width	t_{WP}	35	-	40	-	55	-	ns
$\overline{UB}$, $\overline{LB}$ Low to End of Write	t_{BW}	35	-	45	-	60	-	ns
Data Set-up to End of Write	t_{DW}	25	-	25	-	30	-	ns
Data Hold from End of Write	t_{DH}	0	-	0	-	0	-	ns
$\overline{WE}$ Low to Output High-Z	t_{WHZ}	-	18	-	20	-	25	ns
$\overline{WE}$ High to Output Low-Z	t_{OW}	5	-	5	-	5	-	ns

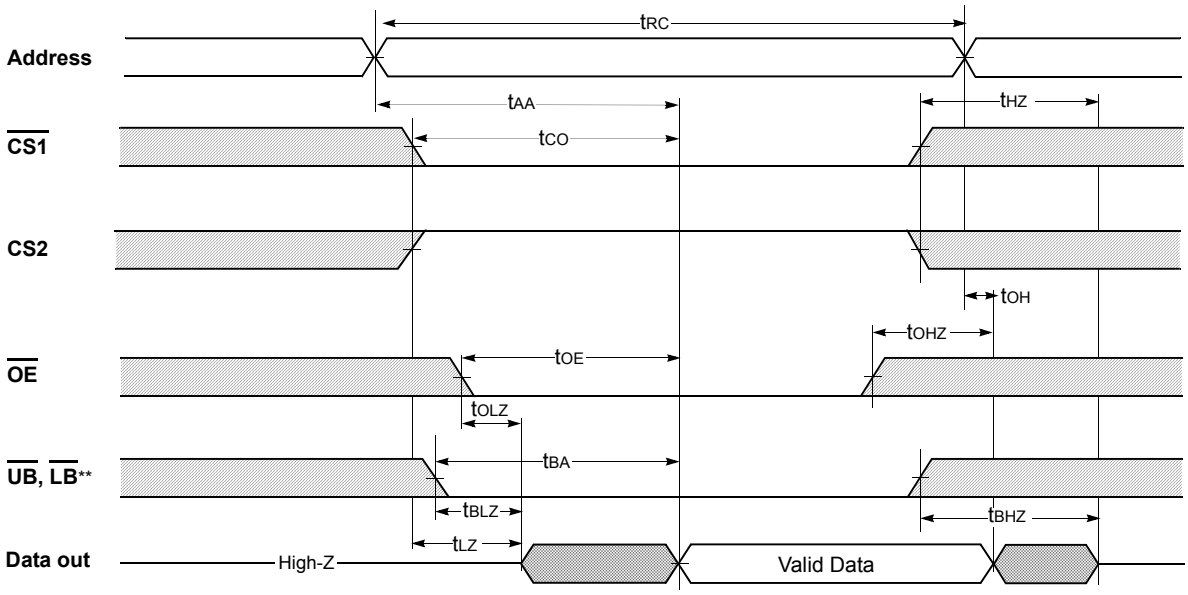
Timing Diagrams

Timing Waveform Of Read Cycle(1) (Address Controlled, $\overline{CS1}$=$\overline{OE}$=V_{IL}, CS2=$\overline{WE}$=V_{IH}, $\overline{UB}$=$\overline{LB}$=V_{IL} *)



* Those parameters are applied for x16 mode only.

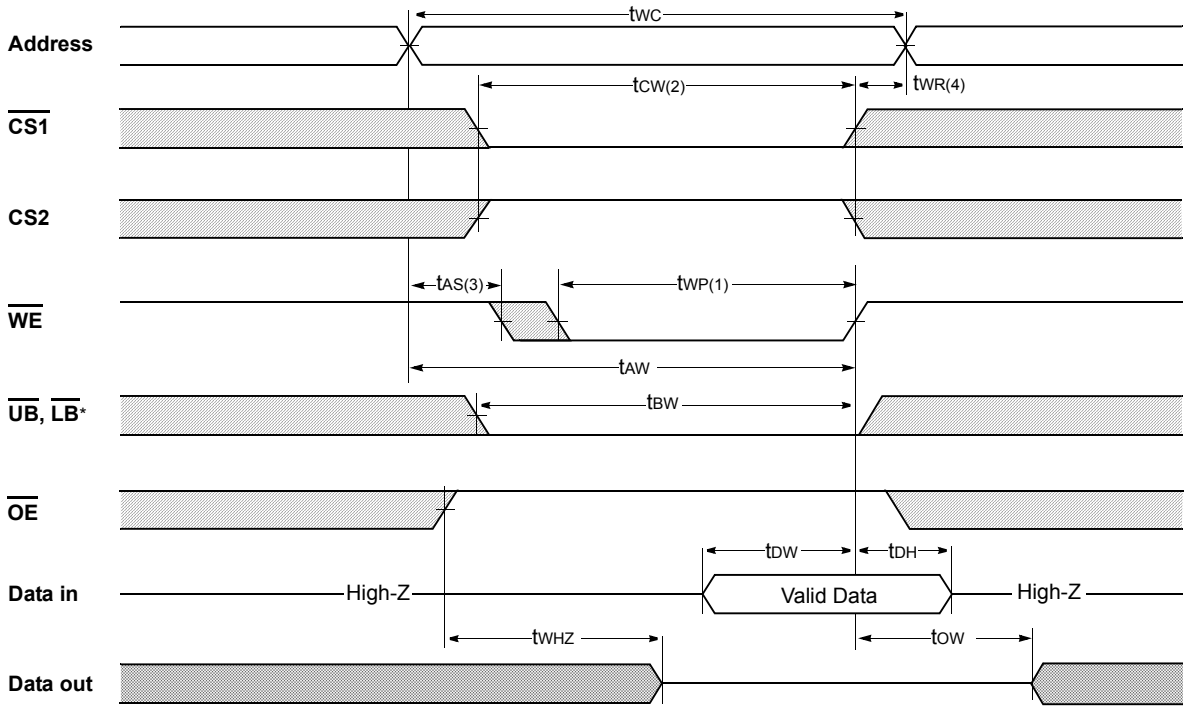
Timing Waveform Of Read Cycle(2) ($\overline{WE}$=V_{IH}, $\overline{OE}$ Controlled)



NOTES(Read Cycle)

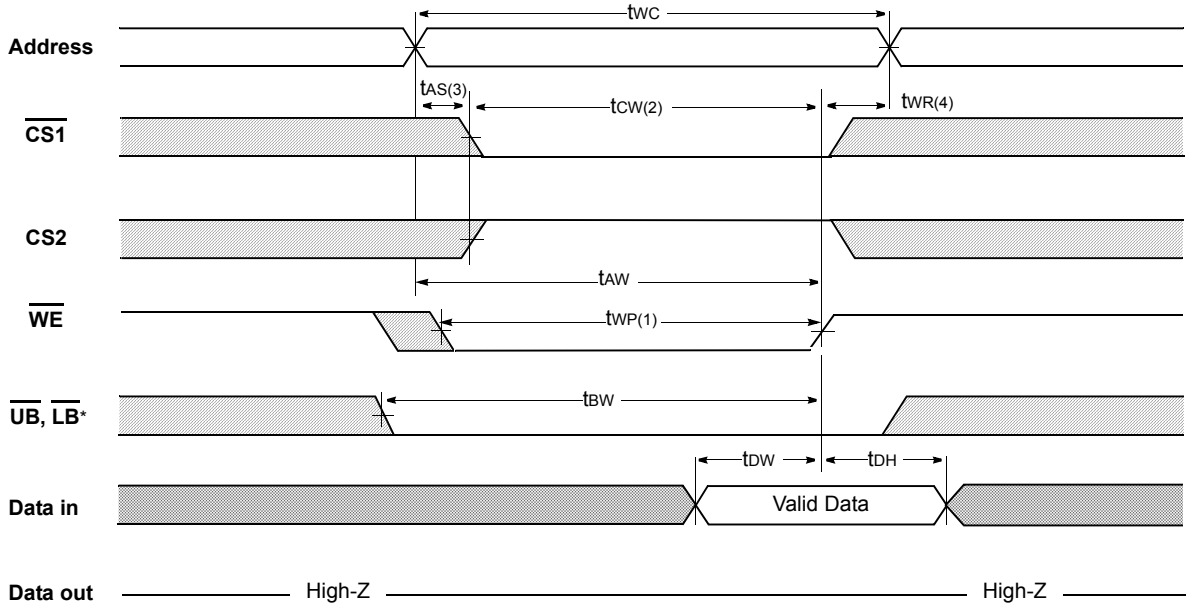
1. t_{HZ} and t_{OHZ} are defined as the time at which the outputs achieve the open circuit conditions and are not referenced to output voltage levels.
2. At any given temperature and voltage condition, t_{HZ}(Max.) is less than t_{LZ}(Min.) both for a given device and from device to device interconnection.

Timing Waveform Of Write Cycle(1) ($\overline{WE}$ Controlled)



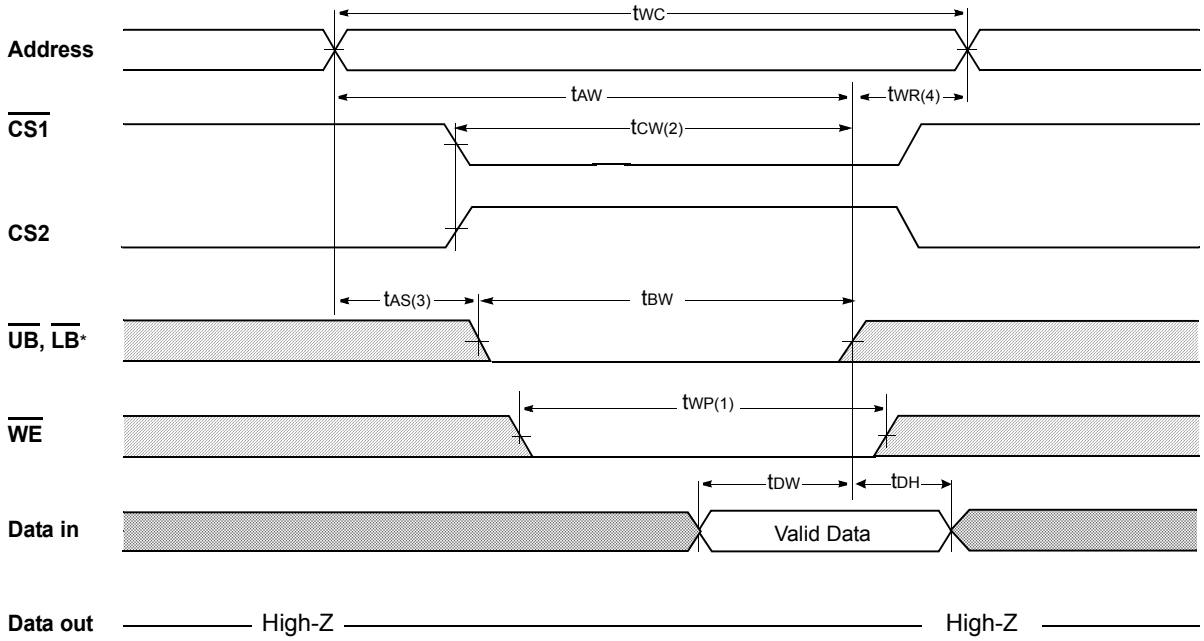
* Those parameters are applied for x16 mode only.

Timing Waveform Of Write Cycle(2) ($\overline{CS1}$, CS2 Controlled)



* Those parameters are applied for x16 mode only.

Timing Waveform Of Write Cycle(3) ($\overline{UB}$, $\overline{LB}$ Controlled)



* Those parameters are applied for x16 mode only.

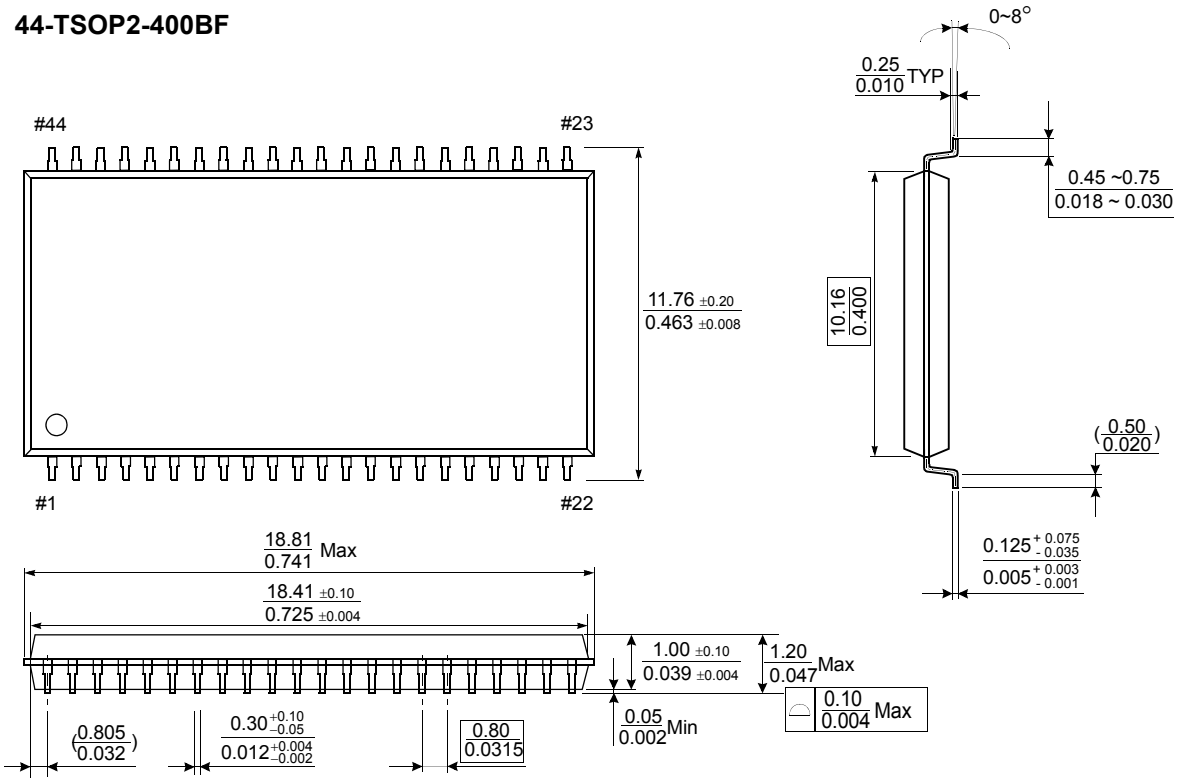
NOTES (Write Cycle)

1. A write occurs during the overlap(tWP) of low $\overline{CS1}$ and low $\overline{WE}$. A write begins when $\overline{CS1}$ goes low and $\overline{WE}$ goes low with asserting $\overline{UB}$ or $\overline{LB}$ for single byte operation or simultaneously asserting $\overline{UB}$ and $\overline{LB}$ for double byte operation. A write ends at the earliest transition when $\overline{CS1}$ goes high and $\overline{WE}$ goes high. The tWP is measured from the beginning of write to the end of write.
2. tCW is measured from the $\overline{CS1}$ going low to the end of write.
3. tAS is measured from the address valid to the beginning of write.
4. tWR is measured from the end of write to the address change. tWR applied in case a write ends as $\overline{CS1}$ or $\overline{WE}$ going high.

Package Dimensions

Units:millimeters/Inches

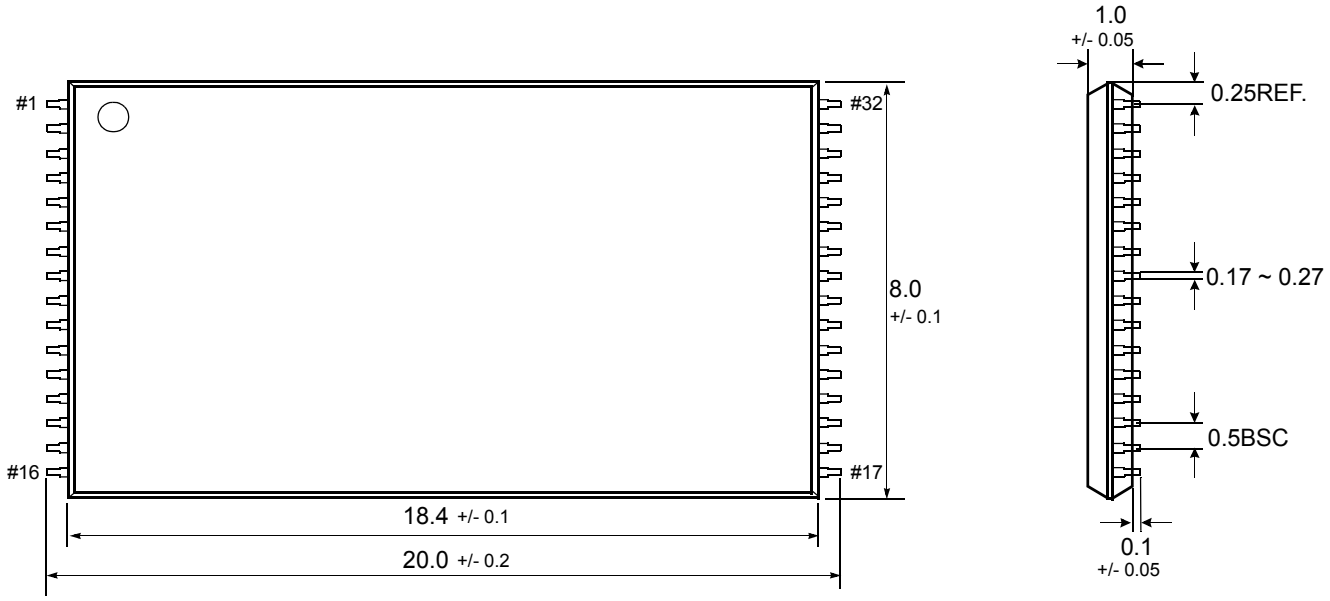
44-TSOP2-400BF



Package Dimensions

32TSOP1

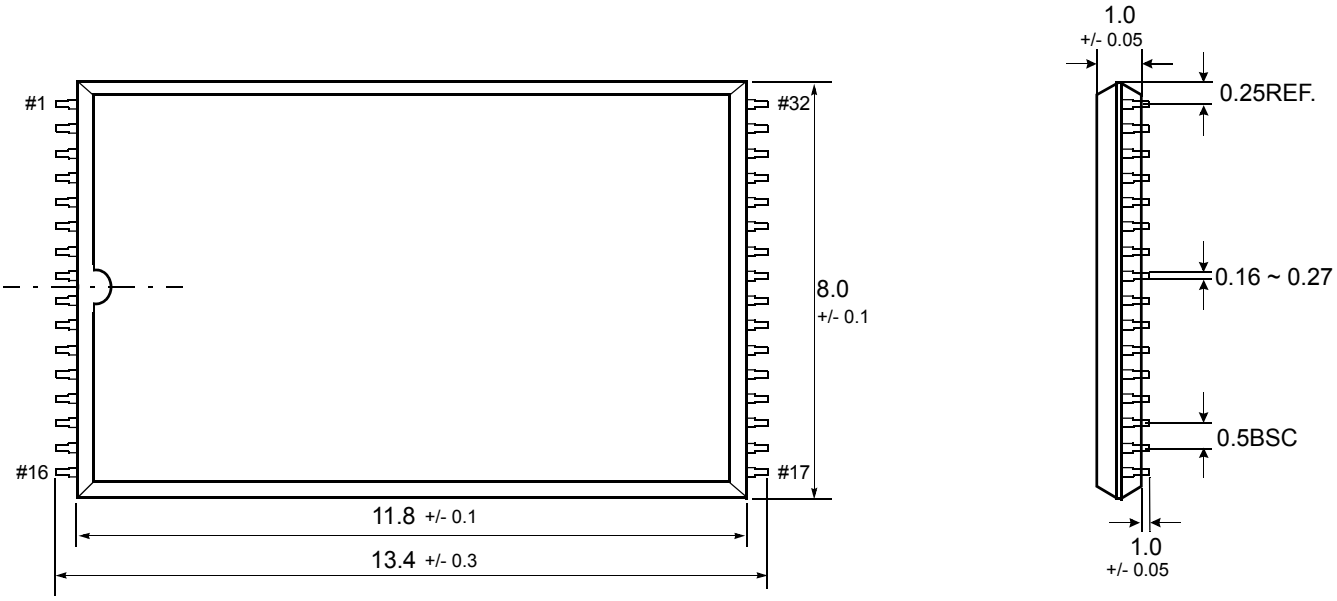
Units:millimeters



Package Dimensions

32sTSOP1

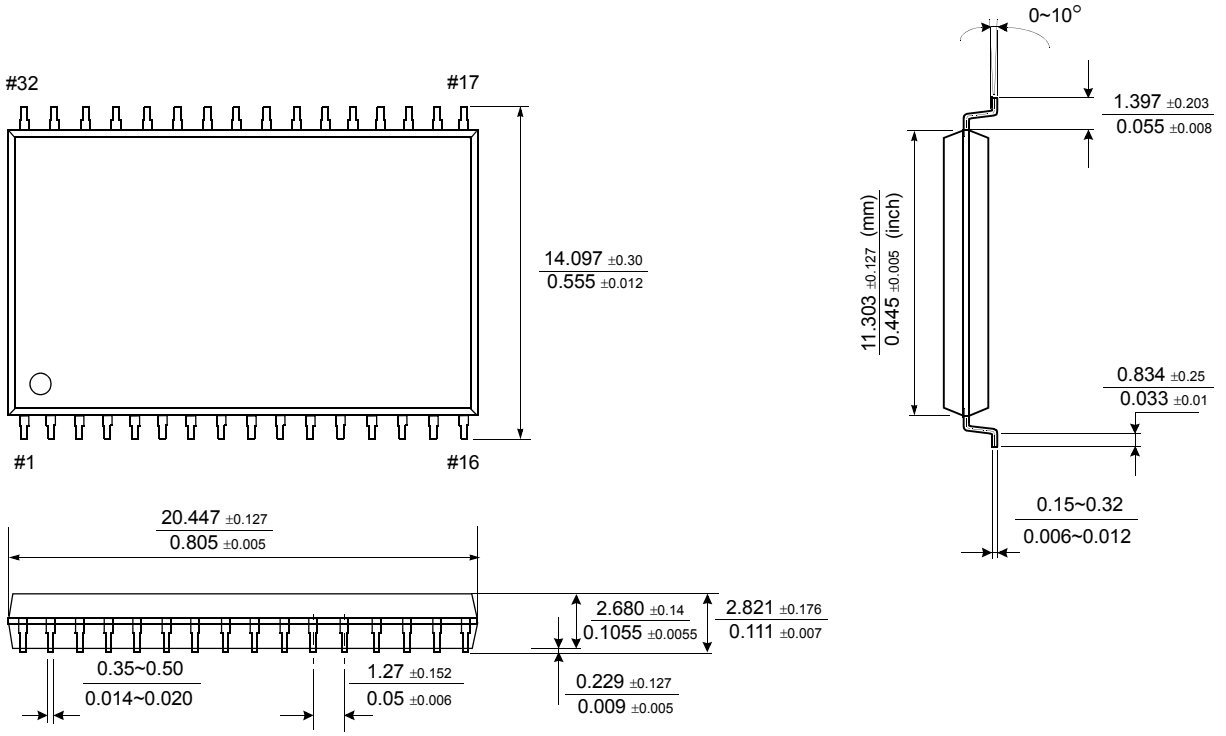
Units:millimeters



Package Dimensions

32SOP

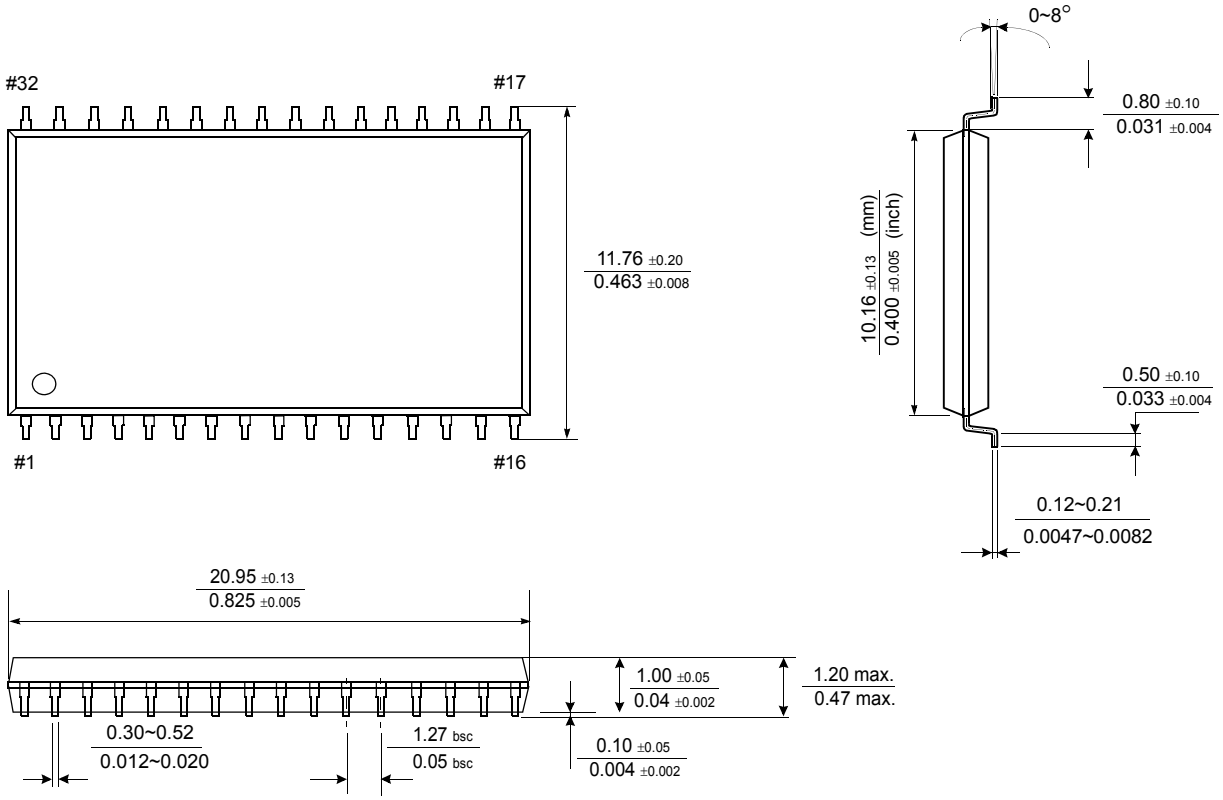
Units:millimeters/Inches



Package Dimensions

32TSOP2

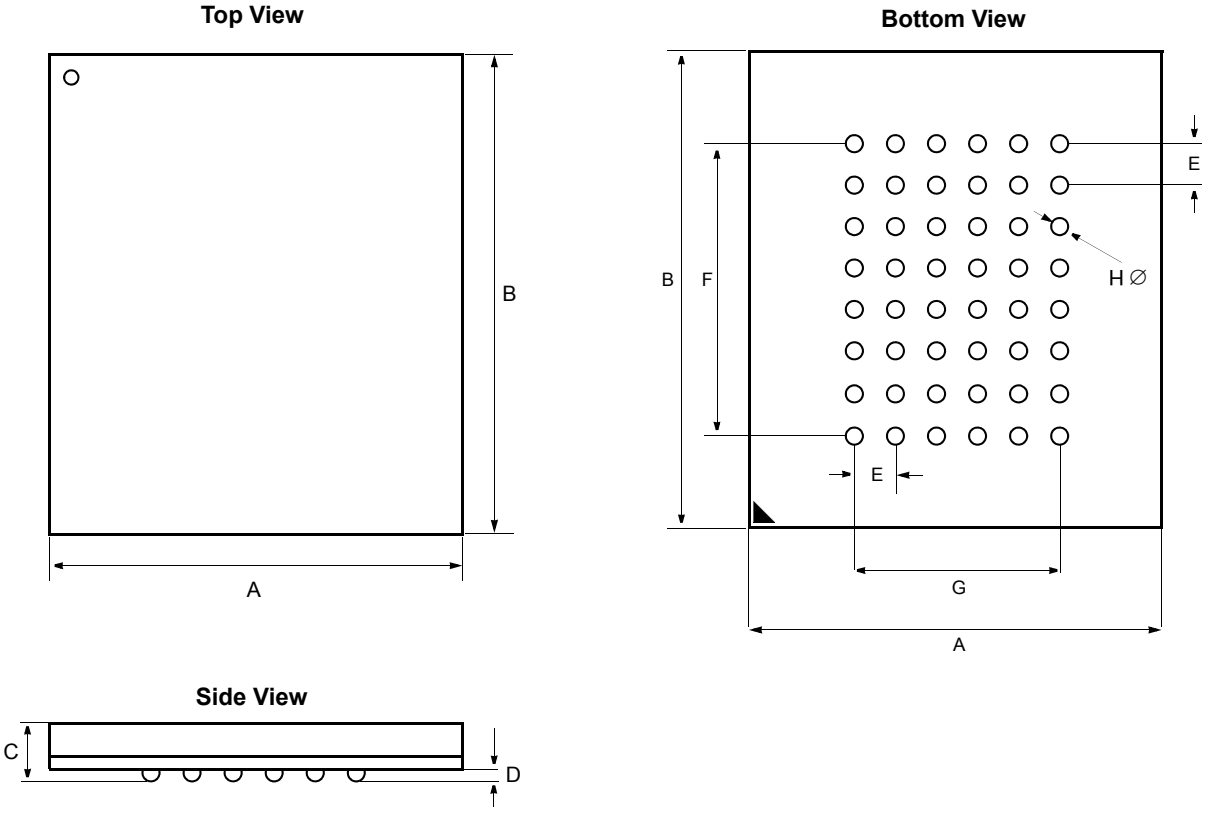
Units:millimeters/Inches



Package Dimensions

48-FBGA

6mm x 8mm Body, 0.75mm Bump Pitch, 6 x 8 Ball Grid Array



Symbol	Value	Units	Note	Symbol	Value	Units	Note
A	6 ± 0.1	mm		**E**	0.75	mm	
B	8 ± 0.1	mm		**F**	5.25	mm	
C	1.1 ± 0.1	mm		**G**	3.75	mm	
D	0.25 ± 0.05	mm		**H**	0.35 ± 0.05	mm	