

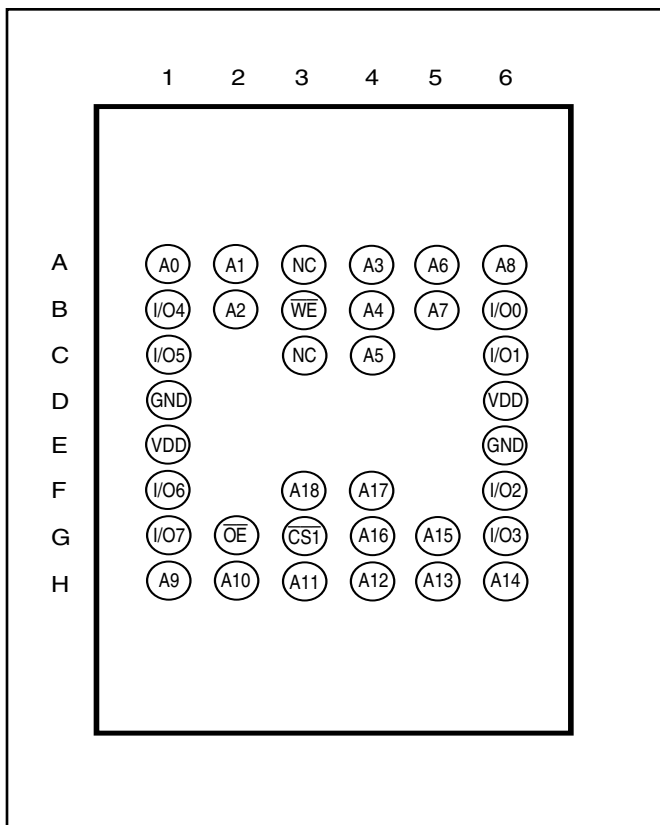


IS62WV5128ALL, IS62WV5128BLL

PIN DESCRIPTIONS

A0-A18	Address Inputs
CS1	Chip Enable 1 Input
OE	Output Enable Input
WE	Write Enable Input
I/O0-I/O7	Input/Output
NC	No Connection
V _{DD}	Power
GND	Ground

36-pin mini BGA (B) (6mm x 8mm) (Package Code B)

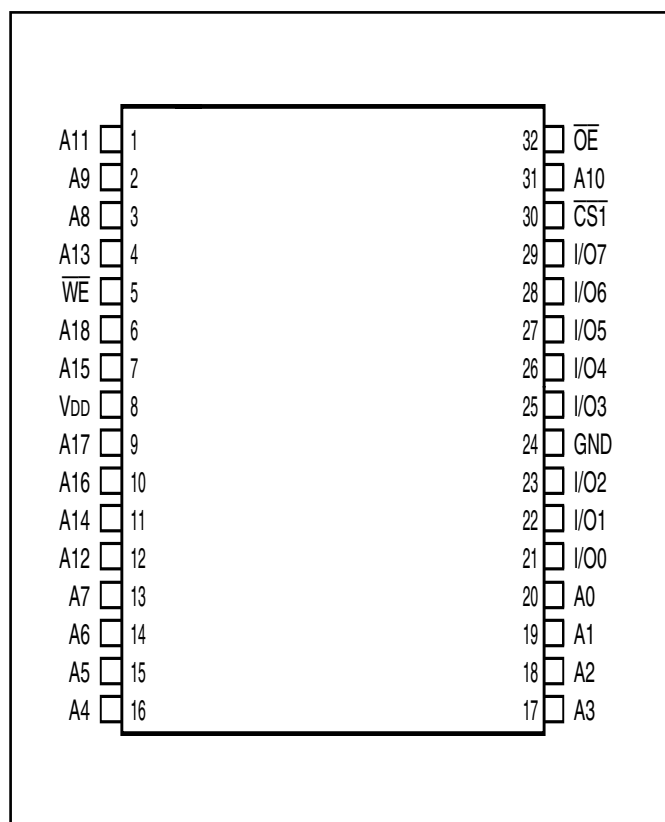


PIN DESCRIPTIONS

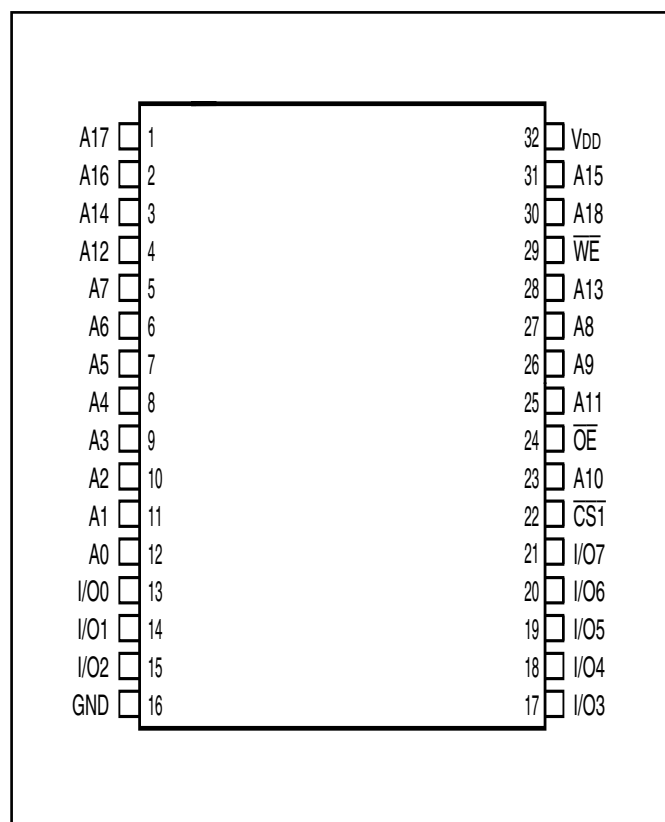
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CS1	Chip Enable 1 Input
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WE	Write Enable Input
I/O0-I/O7	Input/Output
V _{DD}	Power
GND	Ground

PIN CONFIGURATION

32-pin TSOP (TYPE I), (Package Code T)
32-pin sTSOP (TYPE I) (Package Code H)



32-pin SOP (Package Code Q)
32-pin TSOP (TYPE II) (Package Code T2)





IS62WV5128ALL, IS62WV5128BLL

OPERATING RANGE (V_{DD})

Range	Ambient Temperature	IS62WV5128ALL	IS62WV5128BLL
Commercial	0°C to +70°C	1.65V - 2.2V	2.5V - 3.6V
Industrial	-40°C to +85°C	1.65V - 2.2V	2.5V - 3.6V

ABSOLUTE MAXIMUM RATINGS⁽¹⁾

Symbol	Parameter	Value	Unit
V_{TERM}	Terminal Voltage with Respect to GND	-0.2 to $V_{DD}+0.3$	V
V_{DD}	V_{DD} Related to GND	-0.2 to $V_{DD}+0.3$	V
T_{STG}	Storage Temperature	-65 to +150	°C
P_T	Power Dissipation	1.0	W

Note:

1. Stress 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 operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

DC ELECTRICAL CHARACTERISTICS (Over Operating Range)

Symbol	Parameter	Test Conditions	V_{DD}	Min.	Max.	Unit
V_{OH}	Output HIGH Voltage	$I_{OH} = -0.1 \text{ mA}$	1.65-2.2V	1.4	—	V
		$I_{OH} = -1 \text{ mA}$	2.5-3.6V	2.2	—	V
V_{OL}	Output LOW Voltage	$I_{OL} = 0.1 \text{ mA}$	1.65-2.2V	—	0.2	V
		$I_{OL} = 2.1 \text{ mA}$	2.5-3.6V	—	0.4	V
V_{IH}	Input HIGH Voltage		1.65-2.2V	1.4	$V_{DD} + 0.2$	V
			2.5-3.6V	2.2	$V_{DD} + 0.3$	V
$V_{IL}^{(1)}$	Input LOW Voltage		1.65-2.2V	-0.2	0.4	V
			2.5-3.6V	-0.2	0.6	V
I_{LI}	Input Leakage	$GND \leq V_{IN} \leq V_{DD}$		-1	1	μA
I_{LO}	Output Leakage	$GND \leq V_{OUT} \leq V_{DD}$, Outputs Disabled		-1	1	μA

Notes:

1. V_{IL} (min.) = -1.0V for pulse width less than 10 ns.

CAPACITANCE⁽¹⁾

Symbol	Parameter	Conditions	Max.	Unit
C _{IN}	Input Capacitance	V _{IN} = 0V	8	pF
C _{OUT}	Input/Output Capacitance	V _{OUT} = 0V	10	pF

Note:

1. Tested initially and after any design or process changes that may affect these parameters.

AC TEST CONDITIONS

Parameter	IS62WV5128ALL (Unit)	IS62WV5128BLL (Unit)
Input Pulse Level	0.4V to V _{DD} -0.2V	0.4V to V _{DD} -0.3V
Input Rise and Fall Times	5 ns	5ns
Input and Output Timing and Reference Level	V _{REF}	V _{REF}
Output Load	See Figures 1 and 2	See Figures 1 and 2

	IS62WV5128ALL 1.65 - 2.2V	IS62WV5128BLL 2.5V - 3.6V
R1(Ω)	3070	3070
R2(Ω)	3150	3150
V _{REF}	0.9V	1.5V
V _{TM}	1.8V	2.8V

AC TEST LOADS

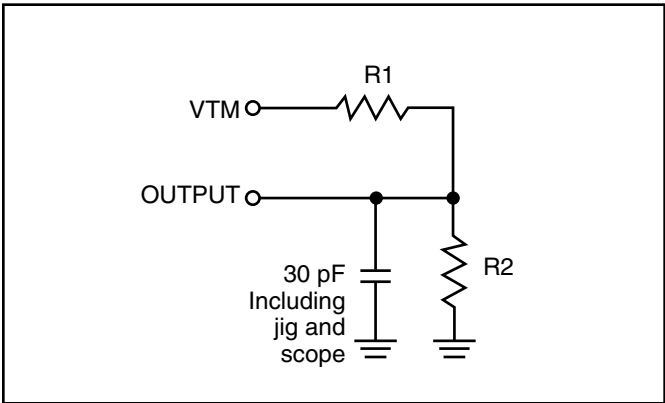


Figure 1

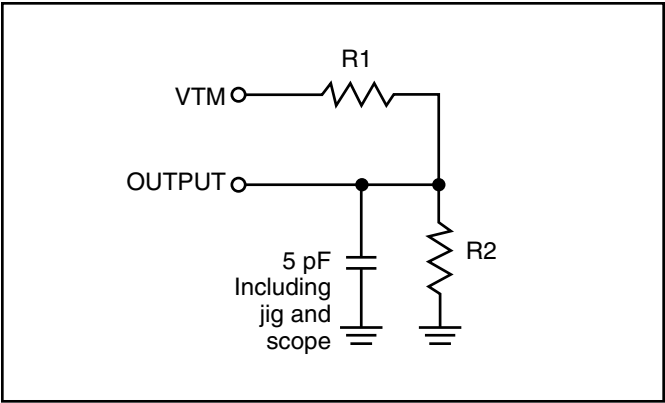


Figure 2

POWER SUPPLY CHARACTERISTICS⁽¹⁾ (Over Operating Range)**62WV5128ALL (1.65V - 2.2V)**

Symbol	Parameter	Test Conditions	Max. 70 ns	Unit
I _{CC}	V _{DD} Dynamic Operating Supply Current	V _{DD} = Max., I _{OUT} = 0 mA, f = f _{MAX}	Com. Ind. 25 30	mA
I _{CC1}	Operating Supply Current	V _{DD} = Max., CS1 = 0.2V WE = V _{DD} -0.2V f=1MHz	Com. Ind. 10 10	mA
I _{SB1}	TTL Standby Current (TTL Inputs)	V _{DD} = Max., V _{IN} = V _{IH} or V _{IL} CS1 = V _{IH} , f = 1 MHz	Com. Ind. 0.35 0.35	mA
I _{SB2}	CMOS Standby Current (CMOS Inputs)	V _{DD} = Max., CS1 ≥ V _{DD} - 0.2V, V _{IN} ≥ V _{DD} - 0.2V, or V _{IN} ≤ 0.2V, f = 0	Com. Ind. 15 15	μA

Note:

1. At f = f_{MAX}, address and data inputs are cycling at the maximum frequency, f = 0 means no input lines change.**POWER SUPPLY CHARACTERISTICS⁽¹⁾ (Over Operating Range)****62WV5128BLL (2.5V - 3.6V)**

Symbol	Parameter	Test Conditions	Max. 55 ns	Unit
I _{CC}	V _{DD} Dynamic Operating Supply Current	V _{DD} = Max., I _{OUT} = 0 mA, f = f _{MAX}	Com. Ind. 40 45	mA
I _{CC1}	Operating Supply Current	V _{DD} = Max., CS1 = 0.2V WE = V _{DD} -0.2V f=1MHz	Com. Ind. 15 15	mA
I _{SB1}	TTL Standby Current (TTL Inputs)	V _{DD} = Max., V _{IN} = V _{IH} or V _{IL} CS1 = V _{IH} , f = 1 MHz	Com. Ind. 0.35 0.35	mA
I _{SB2}	CMOS Standby Current (CMOS Inputs)	V _{DD} = Max., CS1 ≥ V _{DD} - 0.2V, V _{IN} ≥ V _{DD} - 0.2V, or V _{IN} ≤ 0.2V, f = 0	Com. Ind. 15 15	μA

Note:

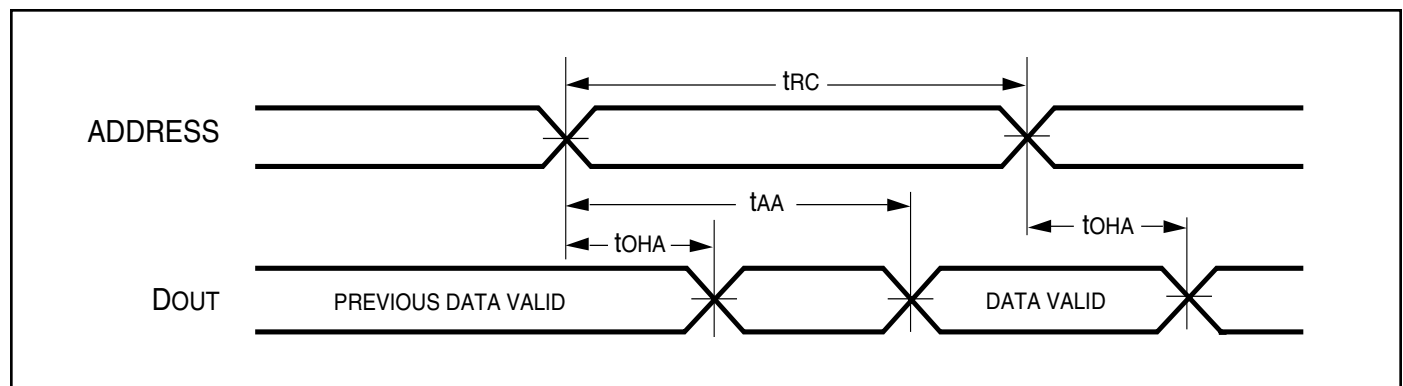
1. At f = f_{MAX}, address and data inputs are cycling at the maximum frequency, f = 0 means no input lines change.

READ CYCLE SWITCHING CHARACTERISTICS⁽¹⁾ (Over Operating Range)

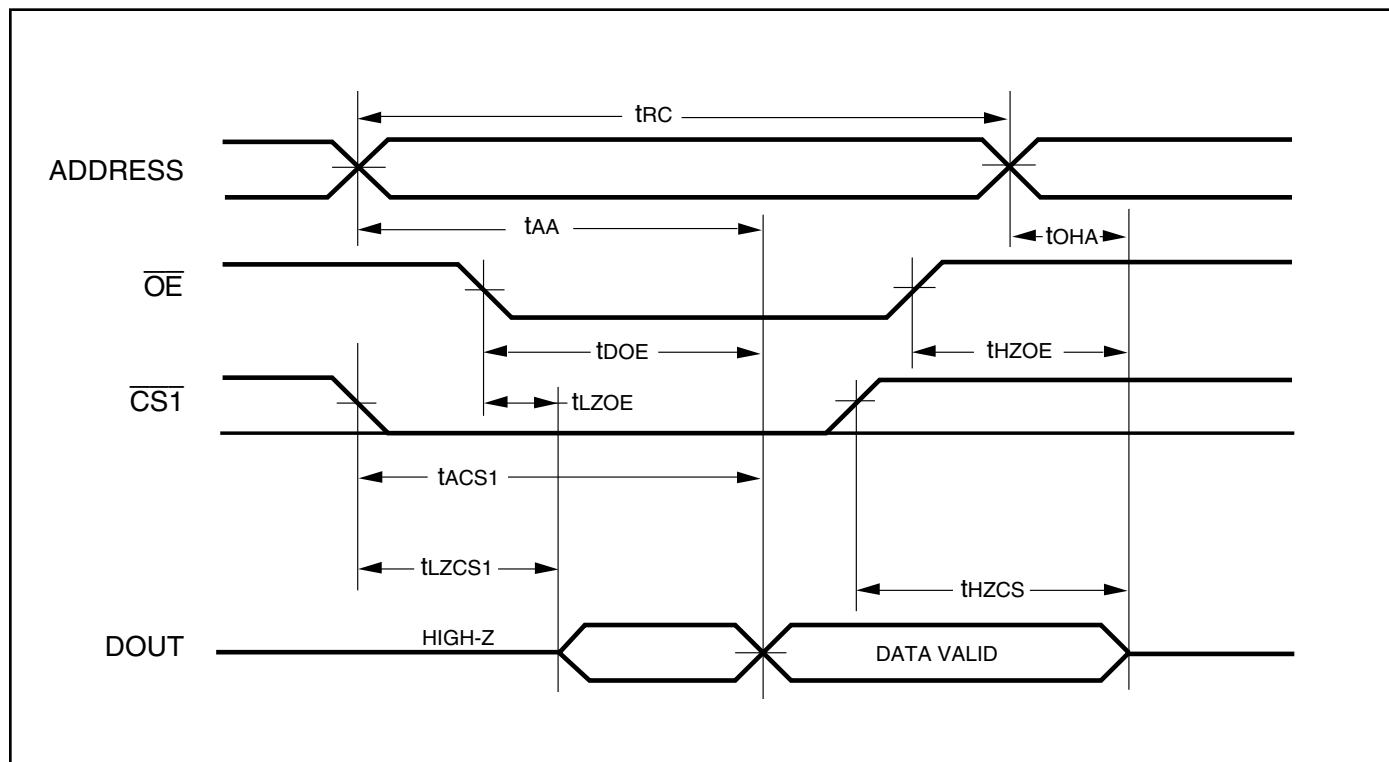
Symbol	Parameter	55 ns		70 ns		Unit
		Min.	Max.	Min.	Max.	
t_{RC}	Read Cycle Time	55	—	70	—	ns
t_{AA}	Address Access Time	—	55	—	70	ns
t_{OHA}	Output Hold Time	10	—	10	—	ns
t_{ACS1}	CS1 Access Time	—	55	—	70	ns
t_{DOE}	OE Access Time	—	25	—	35	ns
$t_{HZOE}^{(2)}$	OE to High-Z Output	—	20	—	25	ns
$t_{LZOE}^{(2)}$	OE to Low-Z Output	5	—	5	—	ns
t_{HZCS1}	CS1 to High-Z Output	0	20	0	25	ns
t_{LZCS1}	CS1 to Low-Z Output	10	—	10	—	ns

Notes:

1. Test conditions assume signal transition times of 5 ns or less, timing reference levels of 0.9V/1.5V, input pulse levels of 0.4 to $V_{DD}-0.2V/V_{DD}-0.3V$ and output loading specified in Figure 1.
2. Tested with the load in Figure 2. Transition is measured ± 500 mV from steady-state voltage. Not 100% tested.

AC WAVEFORMS**READ CYCLE NO. 1^(1,2) (Address Controlled) (CS1 = OE = V_{IL} , WE = V_{IH})**

AC WAVEFORMS

READ CYCLE NO. 2^(1,3) (CS1, OE Controlled)

Notes:

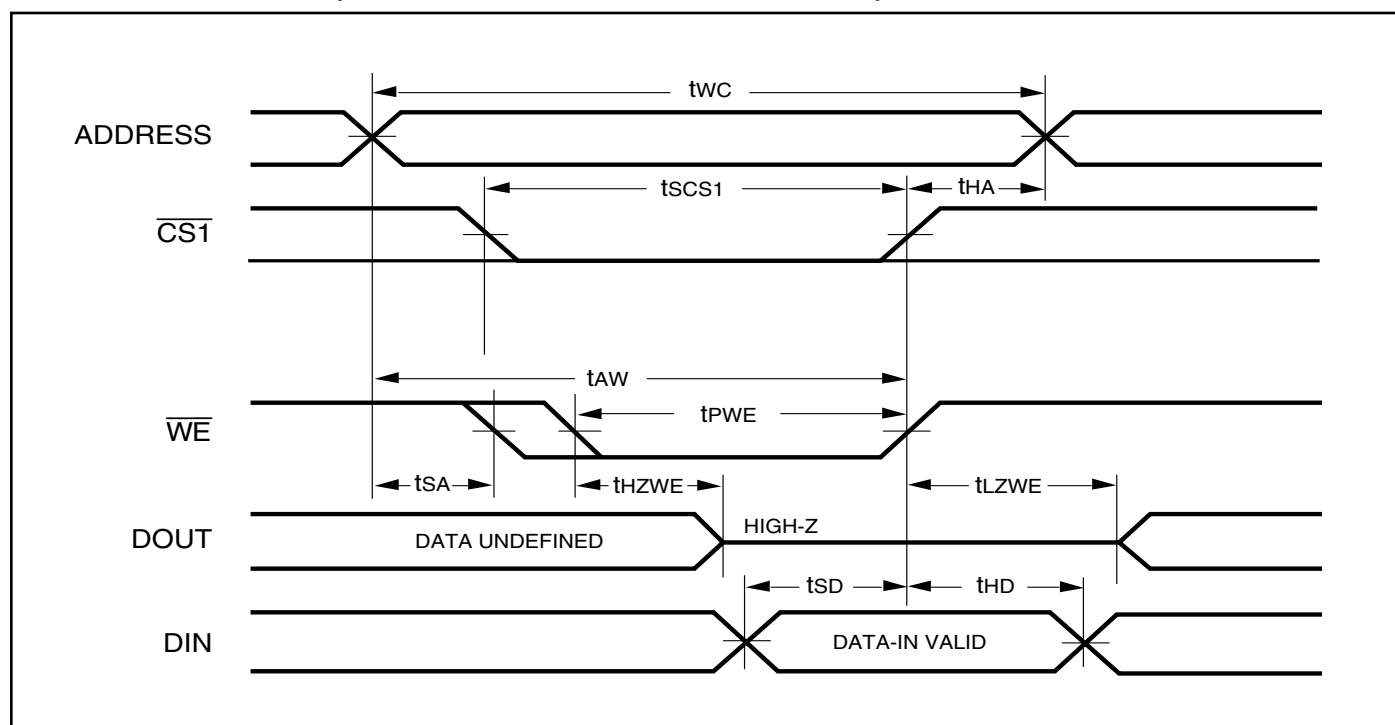
1. WE is HIGH for a Read Cycle.
2. The device is continuously selected. OE, CS1 = V_{IL} . WE = V_{IH} .
3. Address is valid prior to or coincident with CS1 LOW transition.

WRITE CYCLE SWITCHING CHARACTERISTICS^(1,2) (Over Operating Range)

Symbol	Parameter	55 ns		70 ns		Unit
		Min.	Max.	Min.	Max.	
t _{WC}	Write Cycle Time	55	—	70	—	ns
t _{SCS1}	CS1 to Write End	45	—	60	—	ns
t _{AW}	Address Setup Time to Write End	45	—	60	—	ns
t _{HA}	Address Hold from Write End	0	—	0	—	ns
t _{SA}	Address Setup Time	0	—	0	—	ns
t _{PWE}	WE Pulse Width	40	—	50	—	ns
t _{SD}	Data Setup to Write End	25	—	30	—	ns
t _{HD}	Data Hold from Write End	0	—	0	—	ns
t _{HZWE} ⁽³⁾	WE LOW to High-Z Output	—	20	—	20	ns
t _{LZWE} ⁽³⁾	WE HIGH to Low-Z Output	5	—	5	—	ns

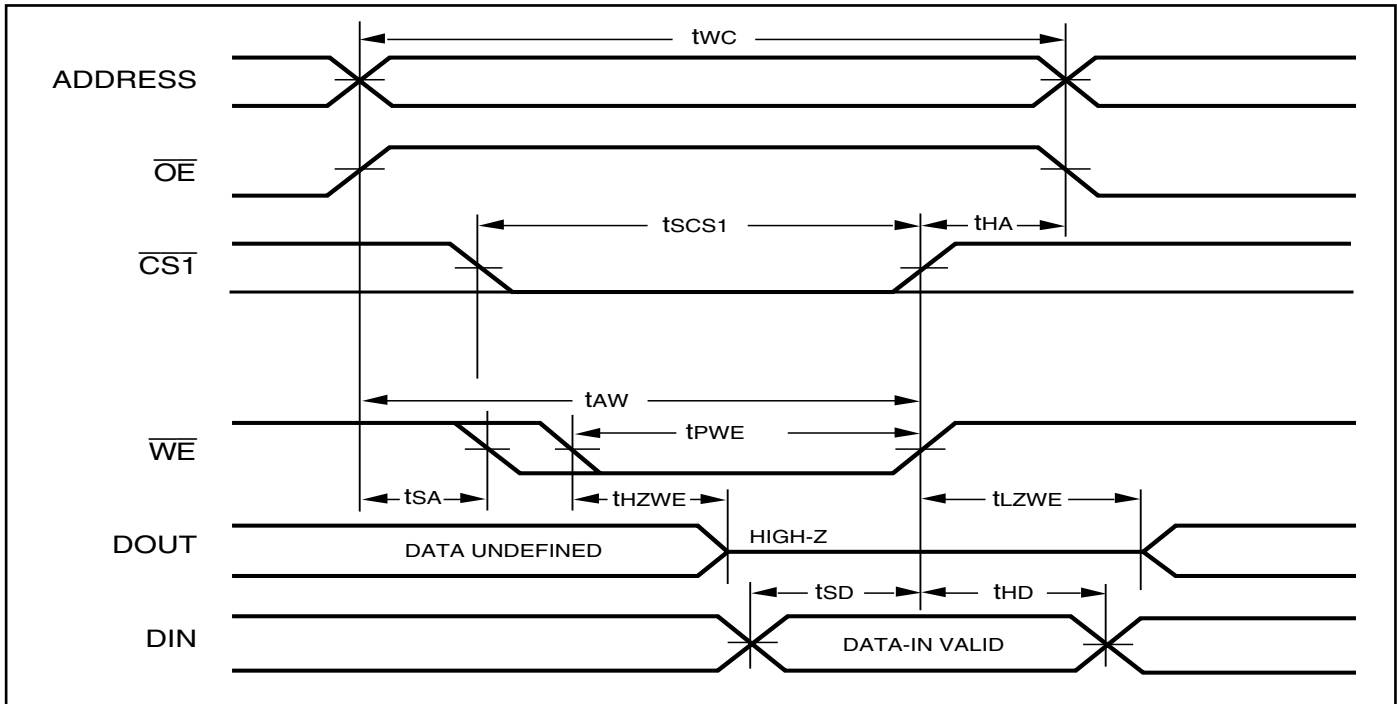
Notes:

1. Test conditions assume signal transition times of 5 ns or less, timing reference levels of 0.9V/1.5V, input pulse levels of 0.4V to V_{DD}-0.2V/V_{DD}-0.3V and output loading specified in Figure 1.
2. The internal write time is defined by the overlap of CS1 LOW and WE LOW. All signals must be in valid states to initiate a Write, but any one can go inactive to terminate the Write. The Data Input Setup and Hold timing are referenced to the rising or falling edge of the signal that terminates the write.
3. Tested with the load in Figure 2. Transition is measured ±500 mV from steady-state voltage. Not 100% tested.

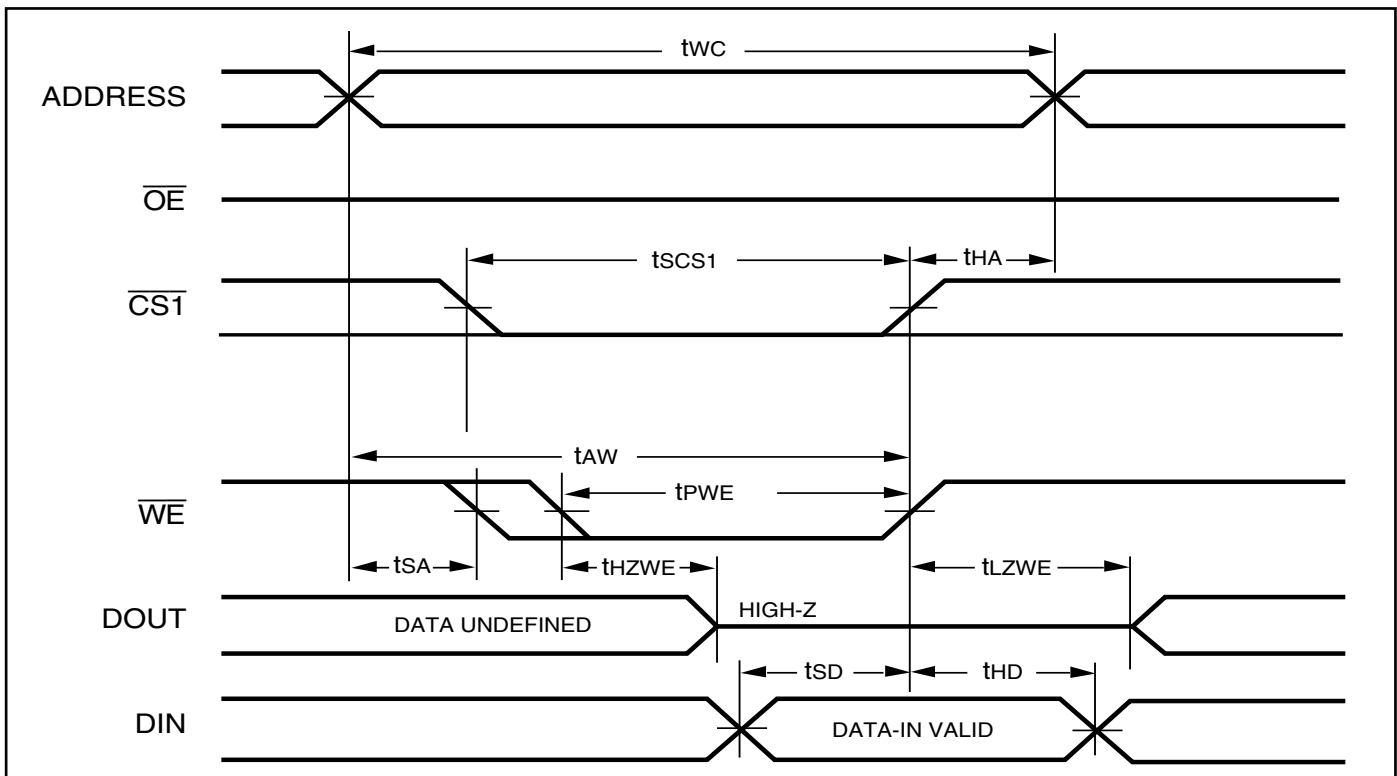
AC WAVEFORMS**WRITE CYCLE NO. 1 (CS1 Controlled, OE = HIGH or LOW)**

IS62WV5128ALL, IS62WV5128BLL

WRITE CYCLE NO. 2 (WE Controlled: OE is HIGH During Write Cycle)

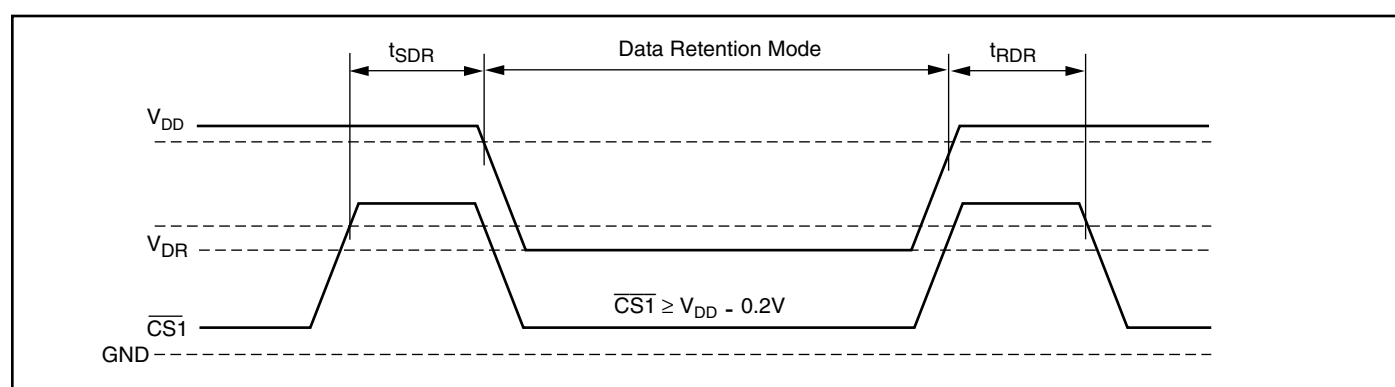


WRITE CYCLE NO. 3 (WE Controlled: OE is LOW During Write Cycle)



DATA RETENTION SWITCHING CHARACTERISTICS

Symbol	Parameter	Test Condition	Min.	Max.	Unit
V_{DR}	V_{DD} for Data Retention	See Data Retention Waveform	1.2	3.6	V
I_{DR}	Data Retention Current	$V_{DD} = 1.2V$, $\overline{CS1} \geq V_{DD} - 0.2V$	—	15	μA
t_{SDR}	Data Retention Setup Time	See Data Retention Waveform	0	—	ns
t_{RDR}	Recovery Time	See Data Retention Waveform	t_{RC}	—	ns

DATA RETENTION WAVEFORM (CS1 Controlled)




IS62WV5128ALL, IS62WV5128BLL

ORDERING INFORMATION

IS62WV5128ALL (1.65V-2.2V)

Industrial Range: -40°C to +85°C

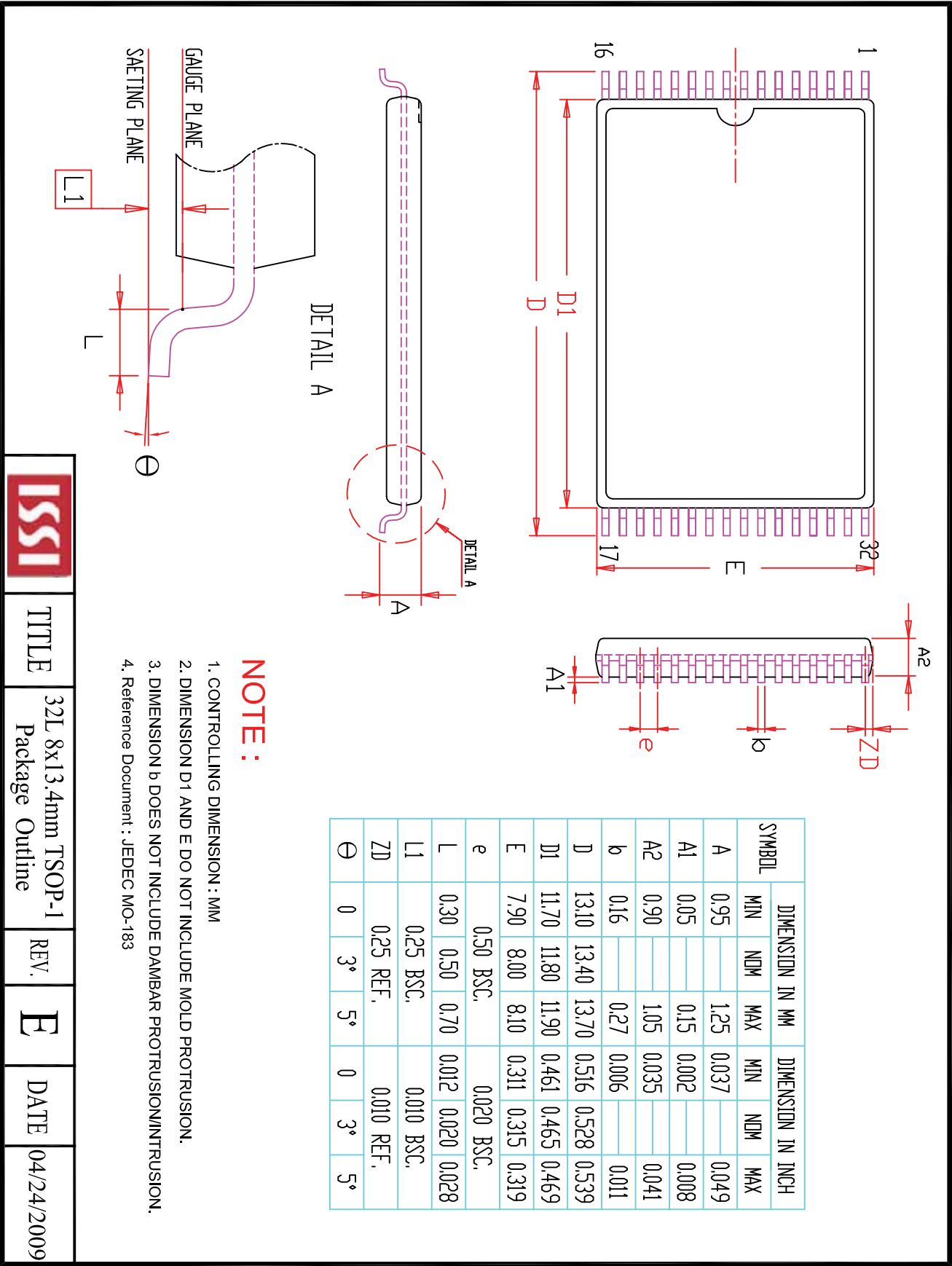
Speed (ns)	Order Part No.	Package
70	IS62WV5128ALL-70BI	mini BGA (6mmx8mm)

ORDERING INFORMATION

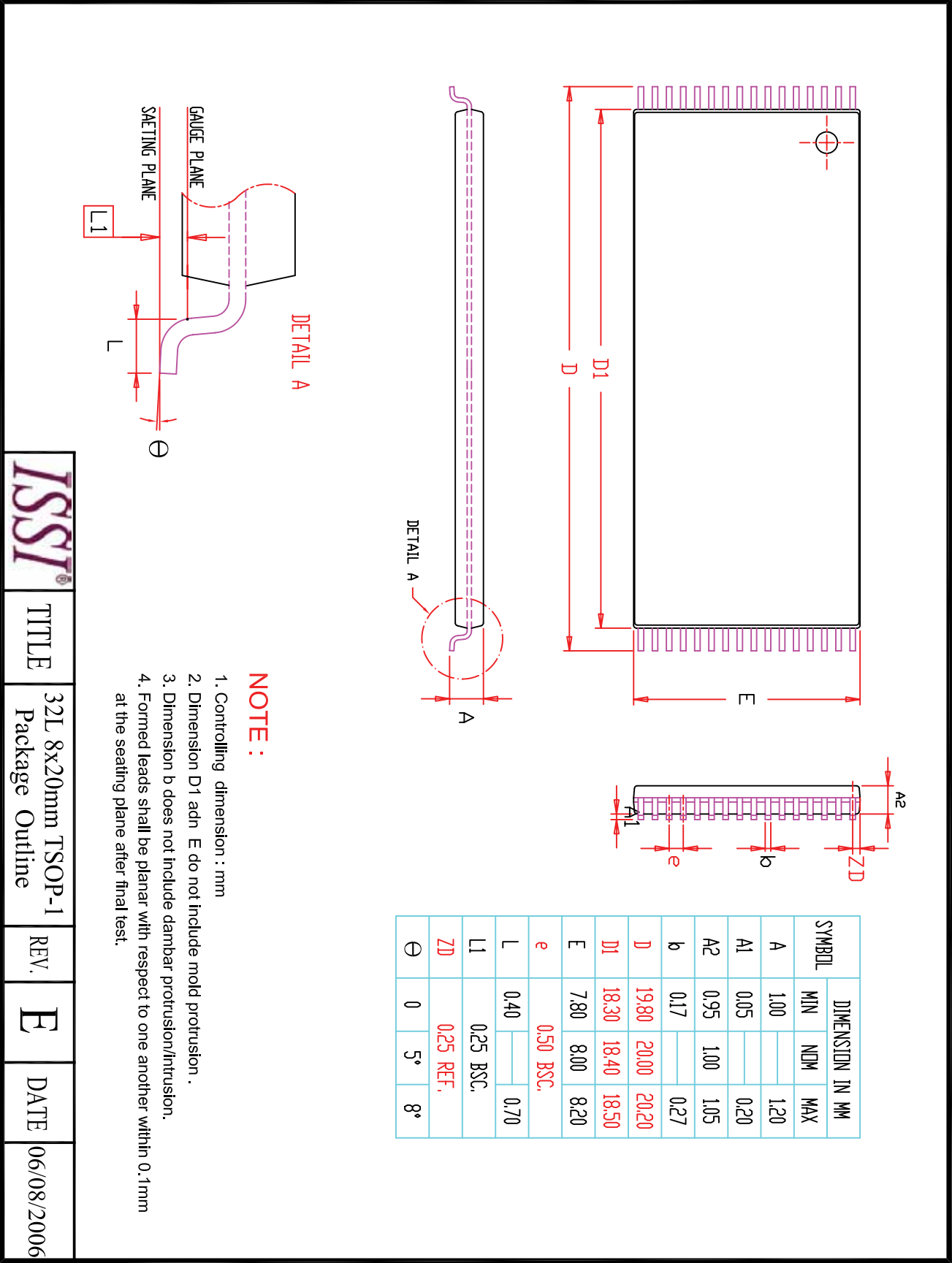
IS62WV5128BLL (2.5V - 3.6V)

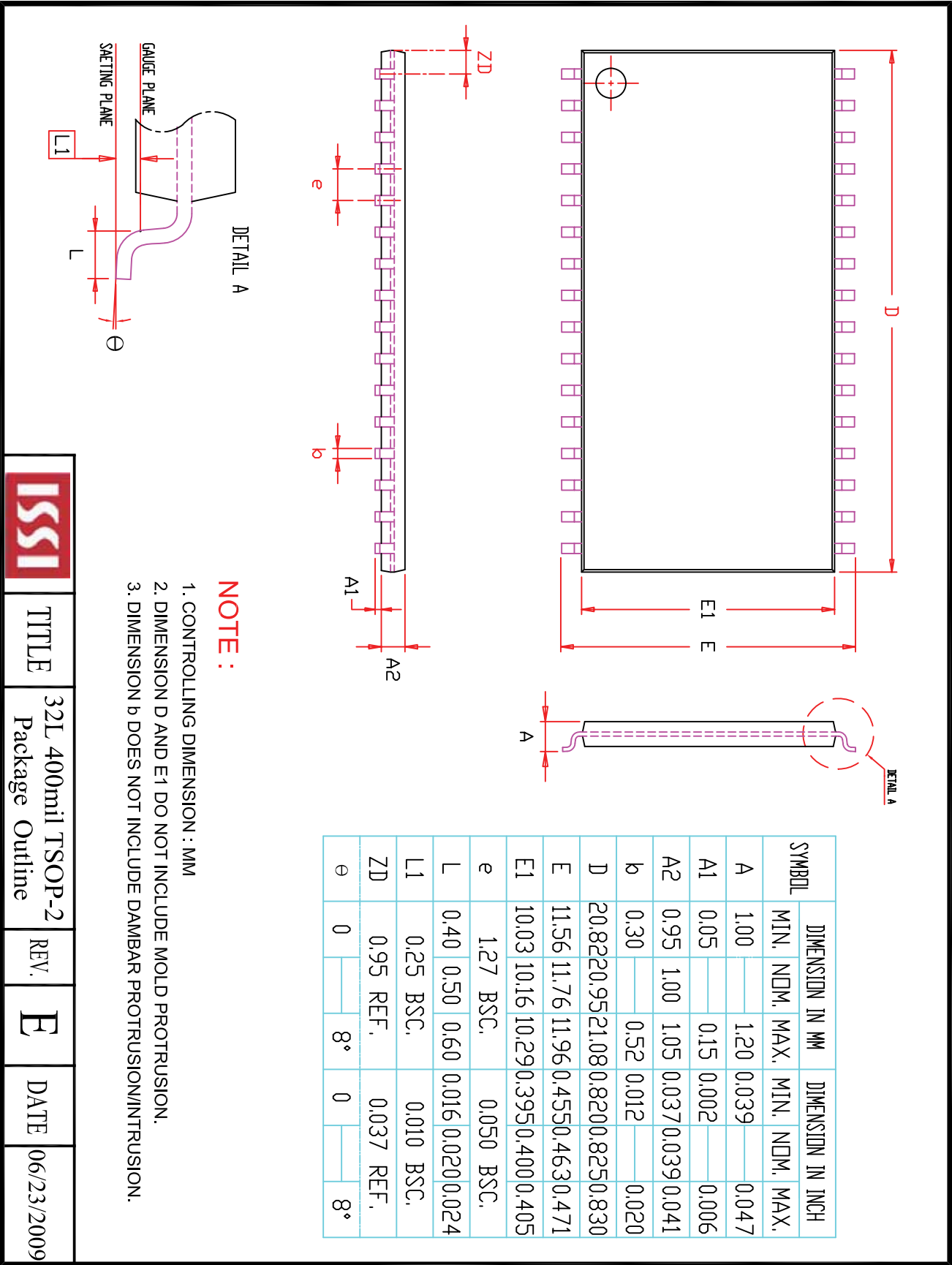
Industrial Range: -40°C to +85°C

Speed (ns)	Order Part No.	Package
55	IS62WV5128BLL-55TLI	TSOP, TYPE I, Lead-free
55	IS62WV5128BLL-55QLI	SOP, Lead-free
55	IS62WV5128BLL-55T2LI	TSOP, TYPE II, Lead-free
55	IS62WV5128BLL-55HLI	sTSOP, TYPE I, Lead-free
55	IS62WV5128BLL-55BI	mini BGA (6mmx8mm)
55	IS62WV5128BLL-55BLI	mini BGA (6mmx8mm), Lead-free



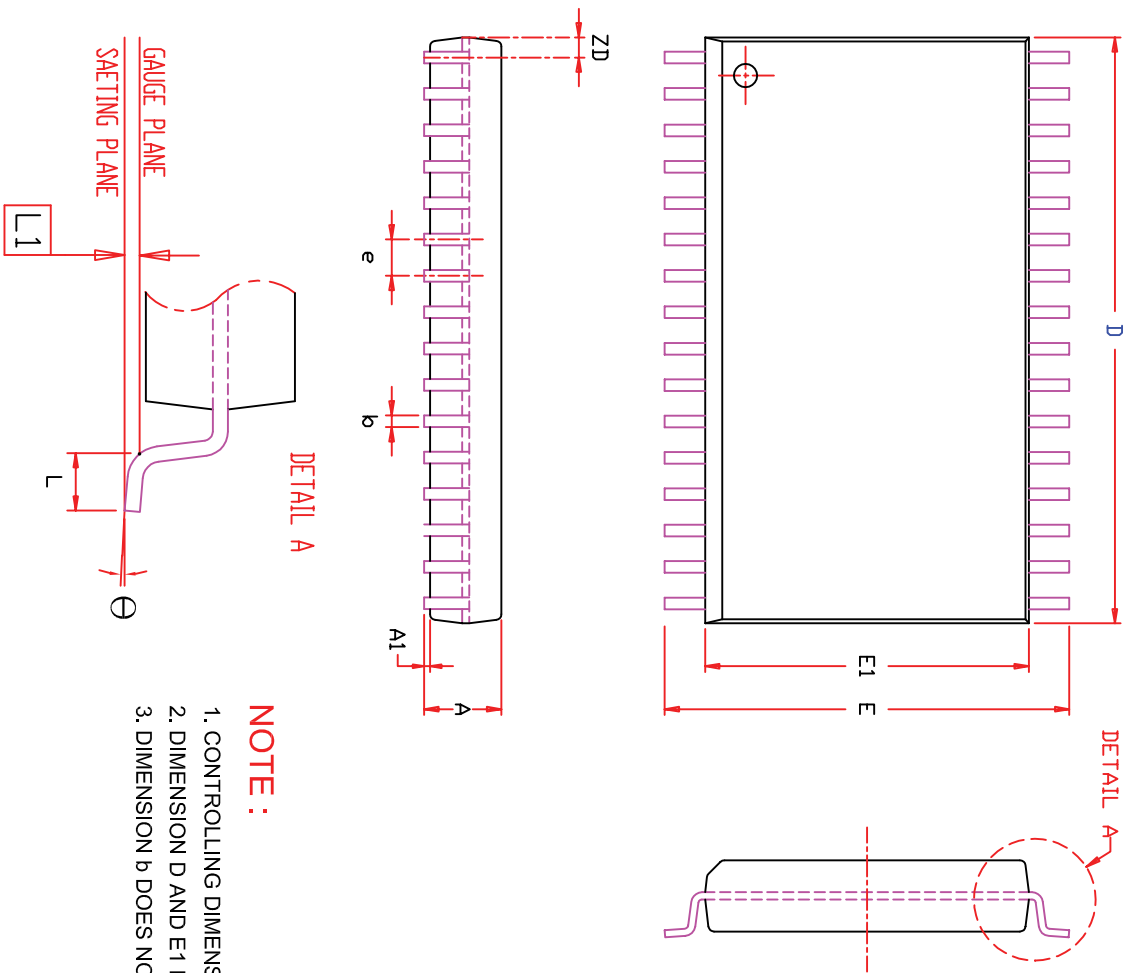
IS62WV5128ALL, IS62WV5128BLL







IS62WV5128ALL, IS62WV5128BLL



SYMBOL	DIMENSION IN MM			DIMENSION IN INCH		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	2.62		3.05	0.103		0.120
A1	0.05		0.30	0.002		0.012
b	0.33		0.51	0.013		0.020
D	20.24		20.750.797			0.817
E	13.79		14.450.543			0.569
E1	11.18		11.43 0.440			0.450
e	1.27	BSC.		0.050	BSC.	
L	0.38		1.27	0.015		0.050
L1	0.25	BSC.		0.010	BSC.	
ZD	0.725	REF.		0.029	REF.	
θ	0		8°	0		8°

NOTE:

- 1. CONTROLLING DIMENSION : MM
- 2. DIMENSION D AND E1 DO NOT INCLUDE MOLD PROTRUSION.
- 3. DIMENSION b DOES NOT INCLUDE DAMBAR PROTRUSION/INTRUSION.

ISSI	TITLE	32L 450mil SOP Package Outline	REV.	F	DATE	09/23/2013
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