



Austin Semiconductor, Inc.

SRAM

MT5C2568

AS5C2568

32K x 8 SRAM

SRAM MEMORY ARRAY

AVAILABLE AS MILITARY SPECIFICATIONS

- SMD 5962-88662
- SMD 5962-88552
- MIL-STD-883

FEATURES

- Access Times: 12, 15, 20, 25, 35, 45, 55, 70, & 100ns
- Battery Backup: 2V data retention
- Low power standby
- High-performance, low-power CMOS double-metal process
- Single +5V (+10%) Power Supply
- Easy memory expansion with CE\
- All inputs and outputs are TTL compatible

OPTIONS

- Timing
 - 12ns access¹
 - 15ns access¹
 - 20ns access
 - 25ns access
 - 35ns access
 - 45ns access
 - 55ns access²
 - 70ns access²
 - 100ns access

MARKING

- 12
- 15
- 20
- 25
- 35
- 45
- 55
- 70
- 100

- Package(s)³

Ceramic DIP (300 mil)	C	No. 108
Ceramic DIP (600 mil)	CW	No. 110
Ceramic LCC (28 leads)	EC	No. 204
Ceramic LCC (32 leads)	ECW	No. 208
Ceramic LCC	ECJ	No. 605
Ceramic Flat Pack	F	No. 302
Ceramic SOJ	DCJ	No. 500

- Operating Temperature Ranges

Military -55°C to +125°C	XT
Industrial -40°C to +85°C	IT

- 2V data retention/low power L

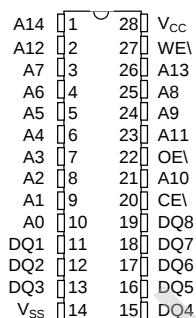
NOTES:

1. -12 available in IT only.
2. Electrical characteristics identical to those provided for the 45ns access devices.
3. Plastic SOJ (DJ Package) is available on the AS5C2568 datasheet.

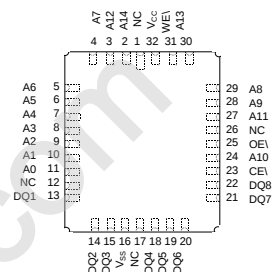
For more products and information
please visit our web site at
www.austinsemiconductor.com

PIN ASSIGNMENT (Top View)

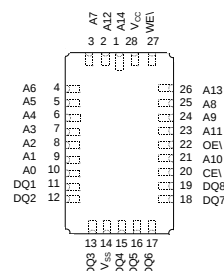
28-PIN SOJ (DCJ)
28-Pin DIP (C, CW)



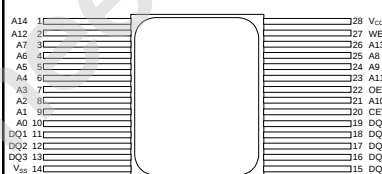
32-Pin LCC (ECW)



28-Pin LCC (EC)



28-Pin Flat Pack (F)



GENERAL DESCRIPTION

The Austin Semiconductor SRAM family employs high-speed, low power CMOS designs using a four-transistor memory cell. These SRAMs are fabricated using double-layer metal, double-layer polysilicon technology.

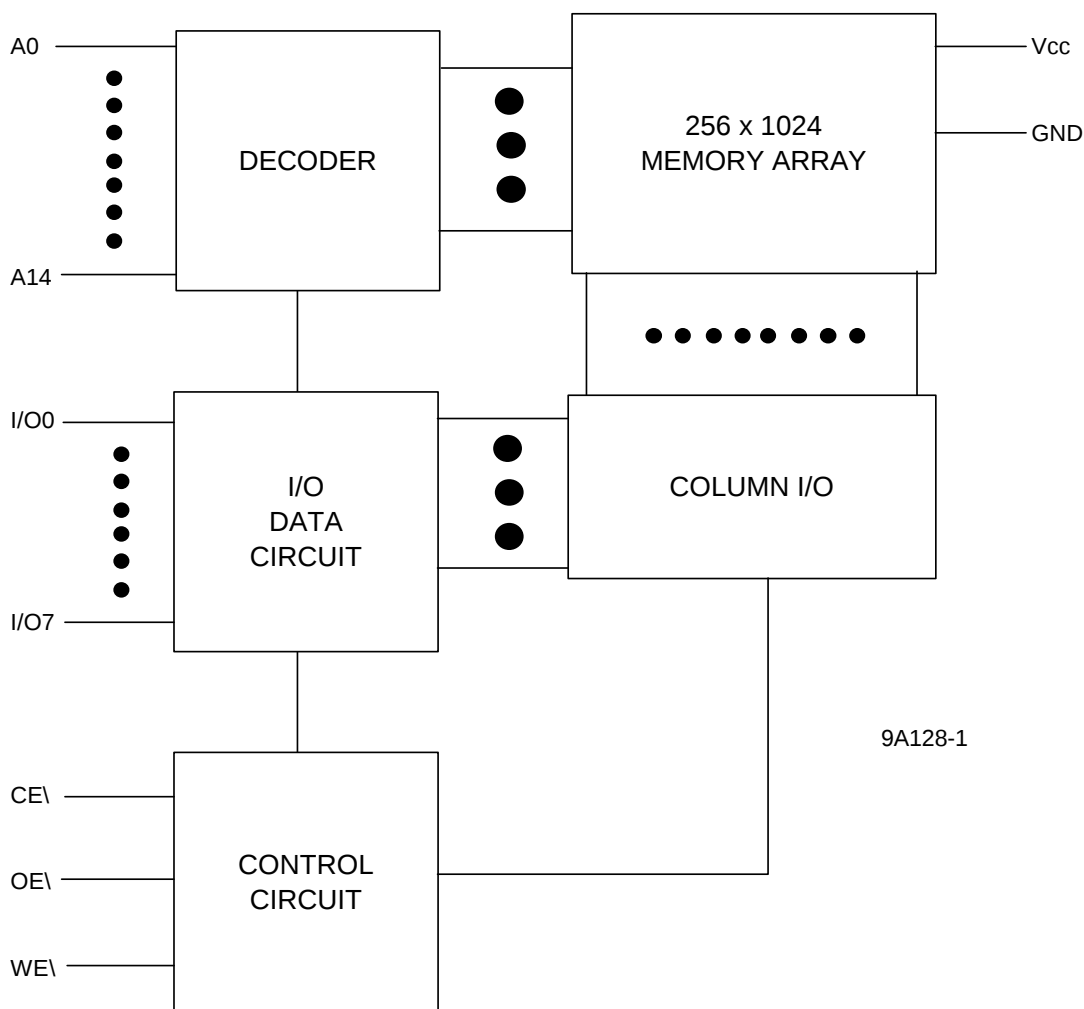
For flexibility in high-speed memory applications, Austin Semiconductor offers chip enable (CE\) and output enable (OE\) capability. These enhancements can place the outputs in High-Z for additional flexibility in system design.

Writing to these devices is accomplished when write enable (WE\) and CE\ inputs are both LOW. Reading is accomplished when WE\ remains HIGH and CE\ and OE\ go LOW. The device offers a reduced power standby mode when disabled. This allows system designs to achieve low standby power requirements.

The "L" version provides a battery backup/low voltage data retention mode, offering 2mW maximum power dissipation at 2 volts. All devices operate from a single +5V power supply and all inputs and outputs are fully TTL compatible.



FUNCTIONAL BLOCK DIAGRAM



TRUTHTABLE

MODE	OE\	CE\	WE\	DQ	POWER
STANDBY	X	H	X	HIGH-Z	STANDBY
READ	L	L	H	Q	ACTIVE
READ	H	L	H	HIGH-Z	ACTIVE
WRITE	X	L	L	D	ACTIVE



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ABSOLUTE MAXIMUM RATINGS*

Voltage on Any Input or DQ Relative to Vss.....	-0.5V to V _{CC} +0.5V
Voltage on V _{CC} Supply Relative to Vss.....	-1V to +7V
Storage Temperature.....	-65°C to +150°C
Power Dissipation.....	1W
Short Circuit Output Current.....	50mA
Lead Temperature (soldering 10 seconds).....	+260°C
Max. Junction Temperature.....	+175°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 operation section of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

ELECTRICAL CHARACTERISTICS AND RECOMMENDED DC OPERATING CONDITIONS

(-55°C ≤ T_C ≤ 125°C or -40°C to +85°C; V_{CC} = 5.0V ±10%)

DESCRIPTION	CONDITIONS	SYM	MIN	MAX	UNITS	NOTES
Input High (Logic 1) Voltage		V _{IH}	2.2	V _{CC} +0.5	V	1
Input Low (Logic 0) Voltage		V _{IL}	-0.5	0.8	V	1,2
Input Leakage Current	0V ≤ V _{IN} ≤ V _{CC}	I _{LI}	-10	10	μA	
Output Leakage Current	Output(s) disabled 0V ≤ V _{OUT} ≤ V _{CC}	I _{LO}	-10	10	μA	
Output High Voltage	I _{OH} = -4.0mA	V _{OH}	2.4		V	1
Output Low Voltage	I _{OL} = 8.0mA	V _{OL}		0.4	V	1

DESCRIPTION		CONDITIONS	SYM	MAX						UNITS	NOTES
				-12	-15	-20	-25	-35	-45		
Power Supply Current: Operating		CE ≤ V _{IL} ; V _{CC} = MAX f = MAX = 1/τ _{RC} (MIN) Output Open	I _{CC}	190	180	170	160	150	150	mA	3
Power Supply Current: Standby	TTL	CE ≤ V _{IH} ; Outputs Open V _{CC} = MAX	I _{SBT}	60	50	40	35	35	35	mA	
	CMOS	CE ≥ V _{CC} -0.2V; V _{CC} = MAX V _{IN} ≤ +0.2V or ≥ V _{CC} -0.2V; f = 0 Hz, Outputs Open	I _{SBC}	20	20	20	20	20	20	mA	
		"L" Version Only	I _{SBC2}	4	4	4	4	4	4	mA	

CAPACITANCE

PARAMETER	CONDITIONS	SYM	MAX	UNITS	NOTES
Input Capacitance	T _A = 25°C, f = 1MHz V _{CC} = 5V	C _{IN}	11	pF	4
Output Capacitance		C _{IO}	11	pF	4



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ELECTRICAL CHARACTERISTICS AND RECOMMENDED AC OPERATING CONDITIONS

(Note 5) $(-55^{\circ}\text{C} \leq T_c \leq 125^{\circ}\text{C}$ or -40°C to $+85^{\circ}\text{C}$; $V_{cc} = 5.0\text{V} \pm 10\%$)

DESCRIPTION	SYM	-12		-15		-20		-25		-35		-45		UNITS	NOTES
		MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX		
READ CYCLE															
READ cycle time	t _{RC}	12		15		20		25		35		45		ns	
Address access time	t _{AA}		12		15		20		25		35		45	ns	
Chip enable access time	t _{ACE}		12		15		20		25		35		45	ns	
Output hold from address change	t _{OH}	2		3		3		3		3		3		ns	
Chip enable to output in Low-Z	t _{LZCE}	2		3		3		3		3		3		ns	7
Chip disable to output in High-Z	t _{HZCE}		7		10		10		15		35		20	ns	6, 7
Output enable to access time	t _{AOE}		6		8		10		15		20		20	ns	
Output enable to output in Low-Z	t _{LZOE}	0		0		0		0		2		0		ns	
Output disable to output in High-Z	t _{HZOE}		7		10		10		15		35		20	ns	6
WRITE CYCLE															
WRITE cycle time	t _{WC}	12		15		20		25		35		45		ns	
Chip enable to end of write	t _{CW}	10		12		15		20		30		40		ns	
Address valid to end of write	t _{AW}	10		12		15		20		30		40		ns	
Address setup time	t _{AS}	0		0		0		0		0		0		ns	
Address hold from end of write	t _{AH}	2		0		0		0		0		0		ns	
WRITE pulse width	t _{WP}	10		12		15		20		30		40		ns	
Data setup time	t _{DS}	8		10		10		15		20		20		ns	
Data hold time	t _{DH}	0		0		0		0		0		3		ns	
Write disable to output in Low-Z	t _{LZWE}	0		0		0		3		3		3		ns	7
Write enable to output in High-Z	t _{HZWE}		7		10		10		15		35		20	ns	6, 7



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ACTEST CONDITIONS

Input pulse levels.....	V_{SS} to 3V
Input rise and fall times.....	5ns
Input timing reference level.....	1.5V
Output reference level.....	1.5V
Output load.....	See figures 1 & 2

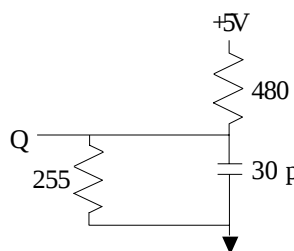


Fig. 1
OUTPUT LOAD
EQUIVALENT

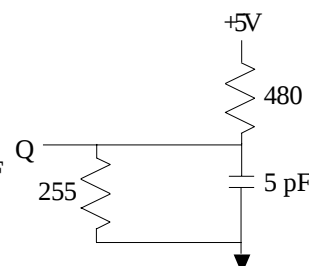


Fig. 2
OUTPUT LOAD
EQUIVALENT

NOTES

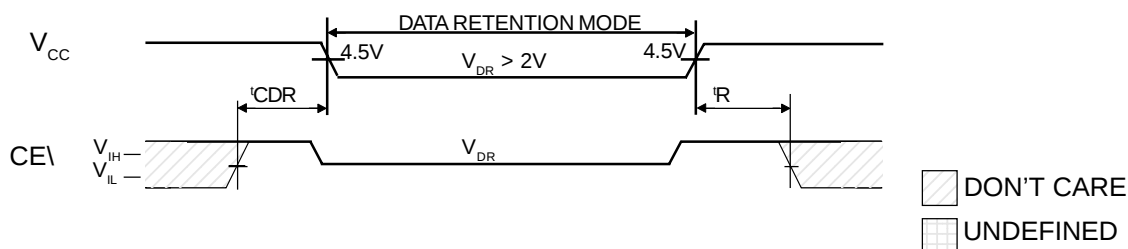
- All voltages referenced to V_{SS} (GND).
- 3V for pulse width < 20ns
- I_{CC} is dependent on output loading and cycle rates. The specified value applies with the outputs unloaded, and

$$f = \frac{1}{RC \text{ (MIN)}} \text{ Hz.}$$
- This parameter is guaranteed but not tested.
- Test conditions as specified with the output loading as shown in Fig. 1 unless otherwise noted.
- t_{HZCE} , t_{HZOE} and t_{HZWE} are specified with $C_L = 5\text{pF}$ as in Fig. 2. Transition is measured $\pm 500\text{mV}$ typical from steady state voltage, allowing for actual tester RC time constant.
- At any given temperature and voltage condition, t_{HZCE} is less than t_{LZCE} , and t_{HZWE} is less than t_{LZWE} .
- $WE\backslash$ is HIGH for READ cycle.
- Device is continuously selected. Chip enables and output enables are held in their active state.
- Address valid prior to, or coincident with, latest occurring chip enable.
- t_{RC} = Read Cycle Time.
- Chip enable ($CE\backslash$) and write enable ($WE\backslash$) can initiate and terminate a WRITE cycle.

DATA RETENTION ELECTRICAL CHARACTERISTICS (L Version Only)

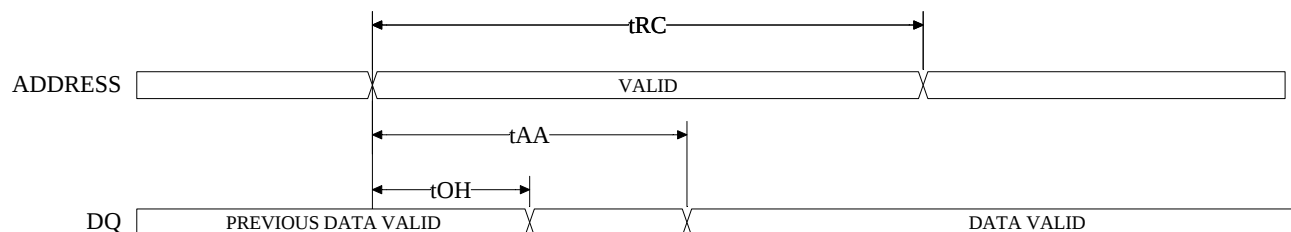
DESCRIPTION	CONDITIONS	SYM	MIN	MAX	UNITS	NOTES
V_{CC} for Retention Data		V_{DR}	2		V	
Data Retention Current	$CE\backslash \geq (V_{CC}-0.2V)$ $V_{IN} \geq (V_{CC}-0.2V)$ or $\leq 0.2V$	I_{CCDR}		1	mA	
Chip Deselect to Data Retention Time		t_{CDR}	0	--	ns	4
Operation Recovery Time		t_R	t_{RC}		ns	4, 11

LOW V_{CC} DATA RETENTION WAVEFORM

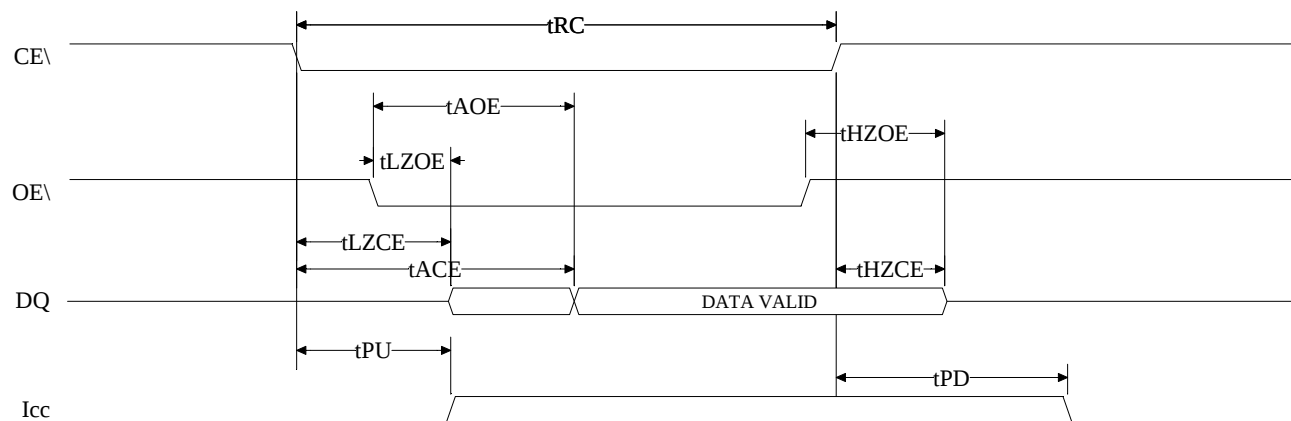




READ CYCLE NO. 1 ^{8, 9}



READ CYCLE NO. 2 ^{7, 8, 10, 12}

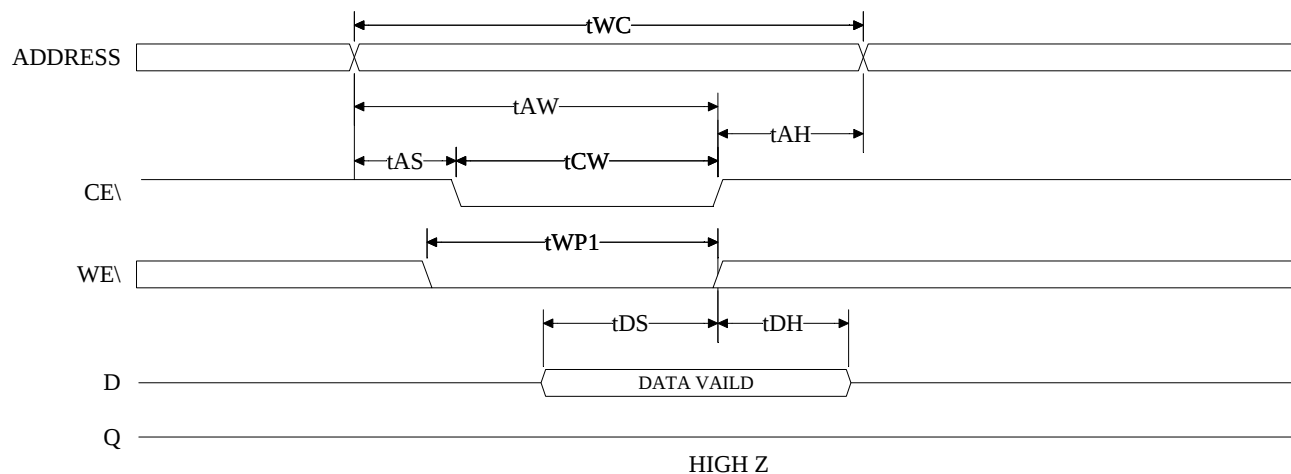




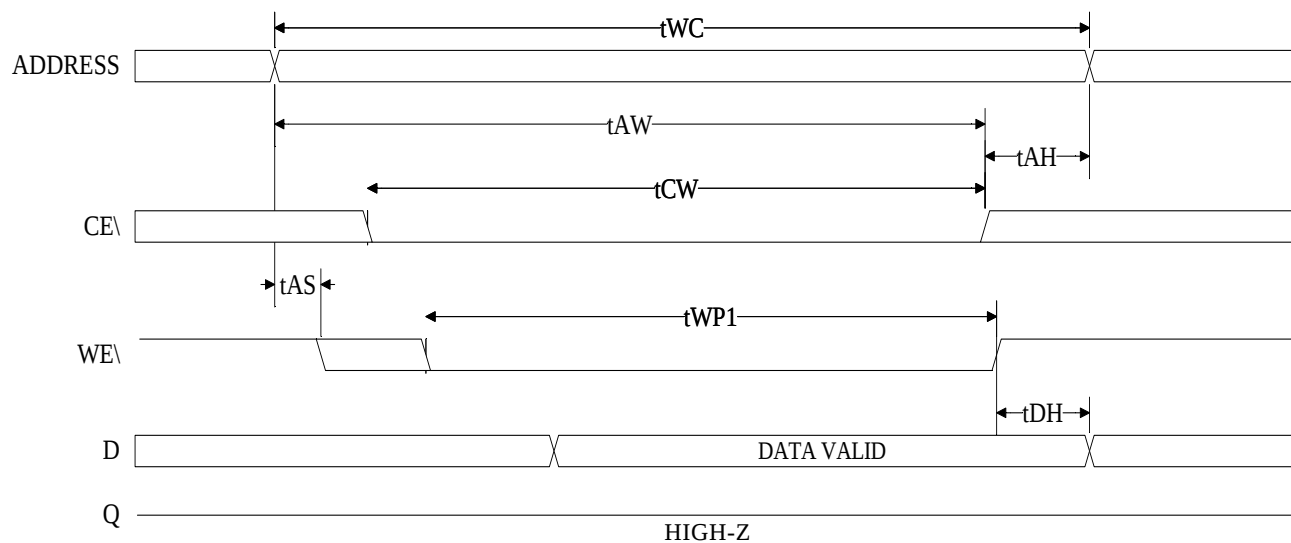
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WRITE CYCLE NO. 1 ¹² (Chip Enabled Controlled)



WRITE CYCLE NO. 2 ^{7, 12} (Write Enabled Controlled)



NOTE: Output enable (OE\) is inactive (HIGH).

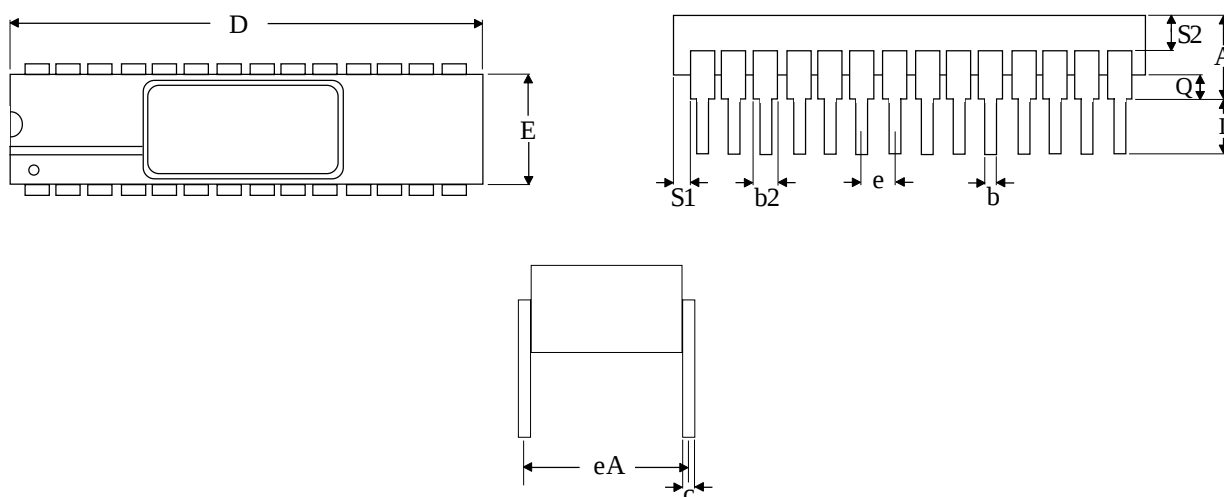


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MECHANICAL DEFINITIONS*

ASI Case #108 (Package Designator C)
SMD 5962-88662, Case Outline N



SYMBOL	SMD SPECIFICATIONS	
	MIN	MAX
A	---	0.225
b	0.014	0.026
b2	0.045	0.065
c	0.008	0.018
D	---	1.485
E	0.240	0.310
eA	0.300 BSC	
e	0.100 BSC	
L	0.125	0.200
Q	0.015	0.070
S1	0.005	---
S2	0.005	---

NOTE: These dimensions are per the SMD. ASI's package dimensional limits may differ, but they will be within the SMD limits.

* All measurements are in inches.

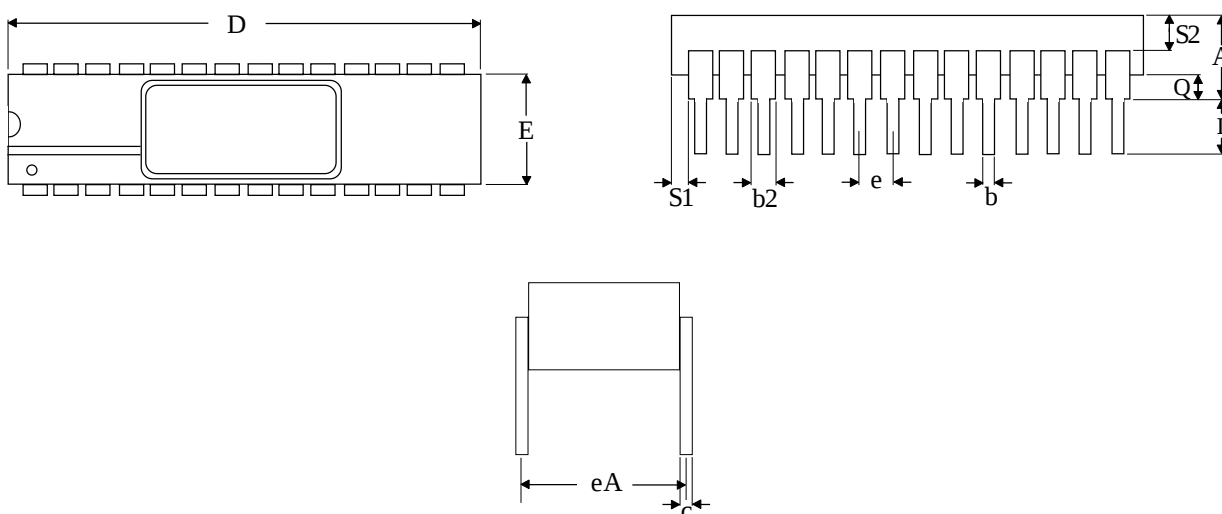


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MECHANICAL DEFINITIONS*

ASI Case #110 (Package Designator CW)
SMD 5962-88662, Case Outline X



SYMBOL	SMD SPECIFICATIONS	
	MIN	MAX
A	---	0.232
b	0.014	0.026
b2	0.045	0.065
c	0.008	0.018
D	---	1.490
E	0.500	0.610
eA	0.600 BSC	
e	0.100 BSC	
L	0.125	0.200
Q	0.015	0.060
S1	0.005	---
S2	0.005	---

NOTE: These dimensions are per the SMD. ASI's package dimensional limits may differ, but they will be within the SMD limits.

* All measurements are in inches.

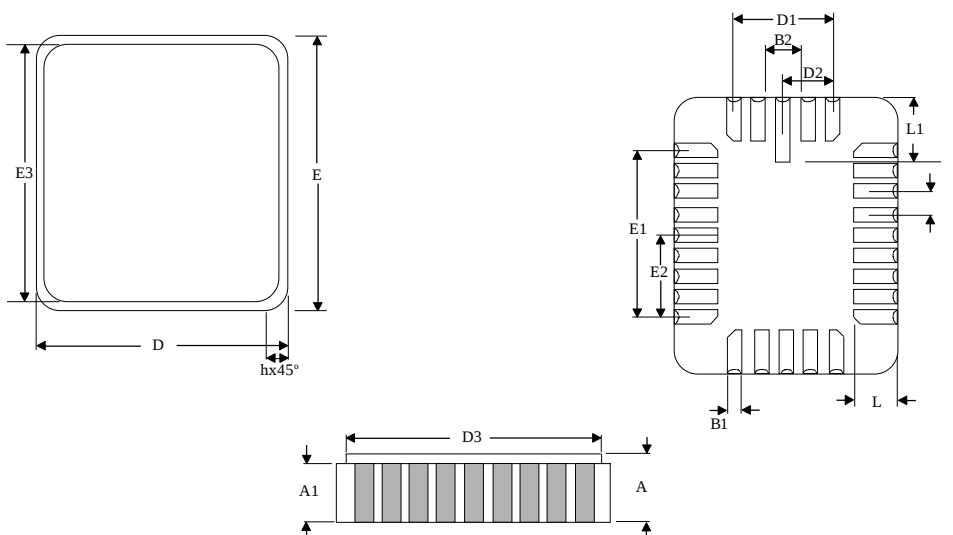


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MECHANICAL DEFINITIONS*

ASI Case #204 (Package Designator EC)
SMD 5962-88662, Case Outline U



SYMBOL	SMD SPECIFICATIONS	
	MIN	MAX
A	0.060	0.120
A1	0.050	0.088
B1	0.022	0.028
B2	0.072 REF	
D	0.342	0.358
D1	0.200 BSC	
D2	0.100 BSC	
D3	---	0.358
E	0.540	0.560
E1	0.400 BSC	
E2	0.200 BSC	
E3	---	0.558
e	0.050 BSC	
h	0.040 REF	
L	0.045	0.055
L1	0.075	0.095

NOTE: These dimensions are per the SMD. ASI's package dimensional limits may differ, but they will be within the SMD limits.

* All measurements are in inches.

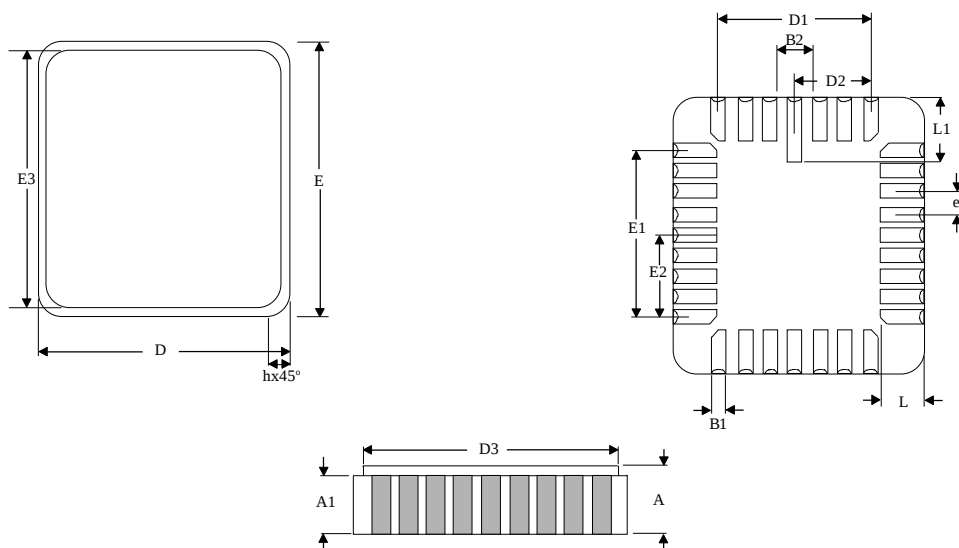


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MECHANICAL DEFINITIONS*

ASI Case #208 (Package Designator ECW)
SMD 5962-88662, Case Outline Y



SYMBOL	SMD SPECIFICATIONS	
	MIN	MAX
A	0.060	0.120
A1	0.050	0.088
B1	0.022	0.028
B2	0.072 REF	
D	0.442	0.458
D1	0.300 BSC	
D2	0.150 BSC	
D3	---	0.458
E	0.540	0.560
E1	0.400 BSC	
E2	0.200 BSC	
E3	---	0.558
e	0.050 BSC	
h	0.040 REF	
L	0.045	0.055
L1	0.075	0.095

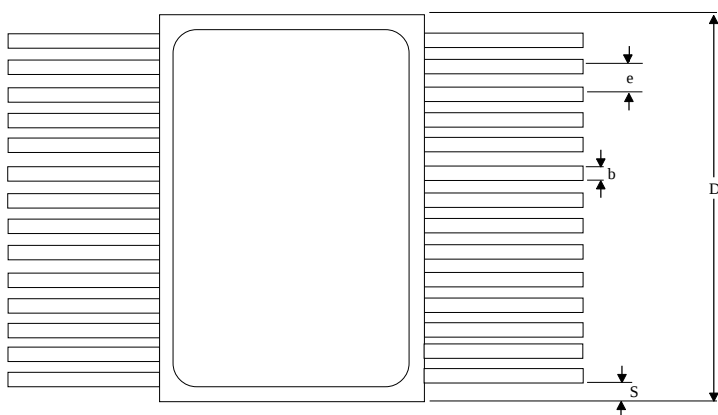
NOTE: These dimensions are per the SMD. ASI's package dimensional limits may differ, but they will be within the SMD limits.

* All measurements are in inches.

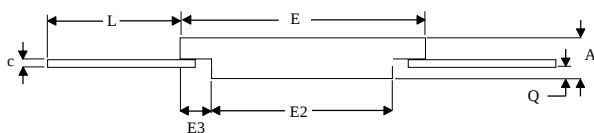


MECHANICAL DEFINITIONS*

ASI Case #302 (Package Designator F)
SMD 5962-88662, Case Outline T



Top View



SYMBOL	SMD SPECIFICATIONS	
	MIN	MAX
A	0.090	0.130
b	0.015	0.019
c	0.004	0.009
D	---	0.740
E	0.380	0.420
E2	0.180	---
E3	0.030	---
e	0.050 BSC	
L	0.250	0.370
Q	0.026	0.045
S	0.000	0.045

NOTE: These dimensions are per the SMD. ASI's package dimensional limits may differ, but they will be within the SMD limits.

* All measurements are in inches.

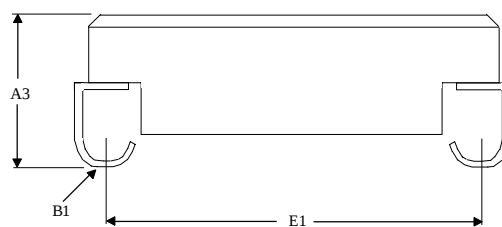
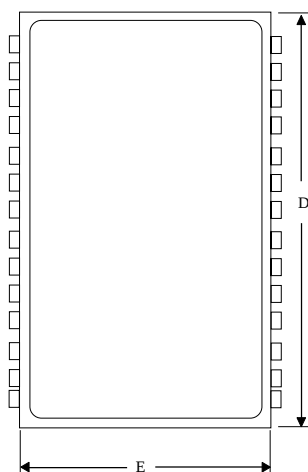
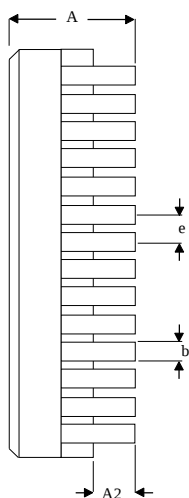


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MECHANICAL DEFINITIONS*

ASI Case #500 (Package Designator DCJ)



SYMBOL	ASI SPECIFICATIONS	
	MIN	MAX
A	0.116	0.166
A2	0.026	0.036
A3	---	0.166
B1	0.030	0.040
b	0.015	0.019
D	---	0.740
E	0.380	0.420
E1	0.395	0.410
e	0.050 BSC	

* All measurements are in inches.



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ORDERING INFORMATION

EXAMPLE: MT5C2568CW-25L/XT

EXAMPLE: MT5C2568ECW-15L/IT

Device Number	Package Type	Speed ns	Options**	Process
MT5C2568	C	-12	L	/*
MT5C2568	CW	-12	L	/*
MT5C2568	C	-15	L	/*
MT5C2568	CW	-15	L	/*
MT5C2568	C	-20	L	/*
MT5C2568	CW	-20	L	/*
MT5C2568	C	-25	L	/*
MT5C2568	CW	-25	L	/*
MT5C2568	C	-35	L	/*
MT5C2568	CW	-35	L	/*
MT5C2568	C	-45	L	/*
MT5C2568	CW	-45	L	/*
MT5C2568	C	-55	L	/*
MT5C2568	CW	-55	L	/*
MT5C2568	C	-70	L	/*
MT5C2568	CW	-70	L	/*
MT5C2568	CW	-100	L	/*

Device Number	Package Type	Speed ns	Options**	Process
MT5C2568	EC	-12	L	/*
MT5C2568	ECW	-12	L	/*
MT5C2568	EC	-15	L	/*
MT5C2568	ECW	-15	L	/*
MT5C2568	EC	-20	L	/*
MT5C2568	ECW	-20	L	/*
MT5C2568	EC	-25	L	/*
MT5C2568	ECW	-25	L	/*
MT5C2568	EC	-35	L	/*
MT5C2568	ECW	-35	L	/*
MT5C2568	EC	-45	L	/*
MT5C2568	ECW	-45	L	/*
MT5C2568	EC	-55	L	/*
MT5C2568	ECW	-55	L	/*
MT5C2568	EC	-70	L	/*
MT5C2568	ECW	-70	L	/*
MT5C2568	ECW	-100	L	/*

EXAMPLE: MT5C2568F-55/XT

EXAMPLE: MT5C2568DCJ-70L/IT

Device Number	Package Type	Speed ns	Options**	Process
MT5C2568	F	-12	L	/*
MT5C2568	F	-15	L	/*
MT5C2568	F	-20	L	/*
MT5C2568	F	-25	L	/*
MT5C2568	F	-35	L	/*
MT5C2568	F	-45	L	/*
MT5C2568	F	-55	L	/*
MT5C2568	F	-70	L	/*
MT5C2568	F	-100	L	/*

Device Number	Package Type	Speed ns	Options**	Process
MT5C2568	DCJ	-12	L	/*
MT5C2568	DCJ	-15	L	/*
MT5C2568	DCJ	-20	L	/*
MT5C2568	DCJ	-25	L	/*
MT5C2568	DCJ	-35	L	/*
MT5C2568	DCJ	-45	L	/*
MT5C2568	DCJ	-55	L	/*
MT5C2568	DCJ	-70	L	/*

*AVAILABLE PROCESSES

IT = Industrial Temperature Range

XT = Extended Temperature Range

883C = Full Military Processing

-40°C to +85°C

-55°C to +125°C

-55°C to +125°C

12ns offered in IT only

**DEFINITION OF OPTIONS

2V Data Retention / Low Power

L

**ASI TO DSCC PART NUMBER
CROSS REFERENCE*****ASI Package Designator C & CW****ASI Package Designator EC & ECW**

<u>ASI Part #</u>	<u>SMD Part #</u>
MT5C2568C-20/883C	5962-8866207NX
MT5C2568C-25/883C	5962-8866206NX
MT5C2568C-35/883C	5962-8866205NX
MT5C2568C-45/883C	5962-8866204NX
MT5C2568C-55/883C	5962-8866203NX
MT5C2568C-70/883C	5962-8866202NX

MT5C2568CW-20/883C	5962-8866207XX
MT5C2568CW-25/883C	5962-8866206XX
MT5C2568CW-35/883C	5962-8866205XX
MT5C2568CW-45/883C	5962-8866204XX
MT5C2568CW-55/883C	5962-8866203XX
MT5C2568CW-70/883C	5962-8866202XX
MT5C2568CW-100/883C	5962-8866201XX

AS5C2568C-12L/883C	5962-8855213UA
AS5C2568C-15L/883C	5962-8855212UA
AS5C2568C-17L/883C	5962-8855211UA
AS5C2568C-20L/883C	5962-8855210UA
AS5C2568C-25L/883C	5962-8855206UA
AS5C2568C-35L/883C	5962-8855205UA
AS5C2568C-45L/883C	5962-8855209UA
AS5C2568C-55L/883C	5962-8855208UA
AS5C2568C-70L/883C	5962-8855207UA

AS5C2568CW-12L/883C	5962-8855213XA
AS5C2568CW-15L/883C	5962-8855212XA
AS5C2568CW-17L/883C	5962-8855211XA
AS5C2568CW-20L/883C	5962-8855210XA
AS5C2568CW-25L/883C	5962-8855206XA
AS5C2568CW-35L/883C	5962-8855205XA
AS5C2568CW-45L/883C	5962-8855209XA
AS5C2568CW-55L/883C	5962-8855208XA
AS5C2568CW-70L/883C	5962-8855207XA

<u>ASI Part #</u>	<u>SMD Part #</u>
MT5C2568EC-20/883C	5962-8866207UX
MT5C2568EC-25/883C	5962-8866206UX
MT5C2568EC-35/883C	5962-8866205UX
MT5C2568EC-45/883C	5962-8866204UX
MT5C2568EC-55/883C	5962-8866203UX
MT5C2568EC-70/883C	5962-8866202UX

MT5C2568ECW-20/883C	5962-8866207YX
MT5C2568ECW-25/883C	5962-8866206YX
MT5C2568ECW-35/883C	5962-8866205YX
MT5C2568ECW-45/883C	5962-8866204YX
MT5C2568ECW-55/883C	5962-8866203YX
MT5C2568ECW-70/883C	5962-8866202YX
MT5C2568ECW-100/883C	5962-8866201YX

AS5C2568EC-12L/883C	5962-8855213MA
AS5C2568EC-15L/883C	5962-8855212MA
AS5C2568EC-17L/883C	5962-8855211MA
AS5C2568EC-20L/883C	5962-8855210MA
AS5C2568EC-25L/883C	5962-8855206MA
AS5C2568EC-35L/883C	5962-8855205MA
AS5C2568EC-45L/883C	5962-8855209MA
AS5C2568EC-55L/883C	5962-8855208MA
AS5C2568EC-70L/883C	5962-8855207MA

AS5C2568ECW-12L/883C	5962-8855213YA
AS5C2568ECW-15L/883C	5962-8855212YA
AS5C2568ECW-17L/883C	5962-8855211YA
AS5C2568ECW-20L/883C	5962-8855210YA
AS5C2568ECW-25L/883C	5962-8855206YA
AS5C2568ECW-35L/883C	5962-8855205YA
AS5C2568ECW-45L/883C	5962-8855209YA
AS5C2568ECW-55L/883C	5962-8855208YA
AS5C2568ECW-70L/883C	5962-8855207YA

* ASI part number is for reference only. Orders received referencing the SMD part number will be processed per the SMD.



ASI TO DSCC PART NUMBER CROSS REFERENCE*

ASI Package Designator F

ASI Part #	SMD Part #
MT5C2568F-20/883C	5962-8866207TX
MT5C2568F-25/883C	5962-8866206TX
MT5C2568F-35/883C	5962-8866205TX
MT5C2568F-45/883C	5962-8866204TX
MT5C2568F-55/883C	5962-8866203TX
MT5C2568F-70/883C	5962-8866202TX
MT5C2568F-100/883C	5962-8866201TX
AS5C2568F-12L/883C	5962-8855213TA
AS5C2568F-15L/883C	5962-8855212TA
AS5C2568F-17L/883C	5962-8855211TA
AS5C2568F-20L/883C	5962-8855210TA
AS5C2568F-25L/883C	5962-8855206TA
AS5C2568F-35L/883C	5962-8855205TA
AS5C2568F-45L/883C	5962-8855209TA
AS5C2568F-55L/883C	5962-8855208TA
AS5C2568F-70L/883C	5962-8855207TA

* ASI part number is for reference only. Orders received referencing the SMD part number will be processed per the SMD.