Am100415

1024 x 1 IMOX™ II ECL Bipolar RAM

DISTINCTIVE CHARACTERISTICS

- Fast access time (8 ns typ.) — improves system cycle speeds
- Enhanced output voltage level compensation providing 6X (improvement in) V_{OL} and V_{OH} stability over supply and temperature ranges
- Internally voltage and temperature compensated providing flat AC performance
- Outputs preconditioned during write cycle eliminating write recovery glitch
- Emitter follower outputs — easy wire-ORing
- Power dissipation decreases with increasing temperature

GENERAL DESCRIPTION

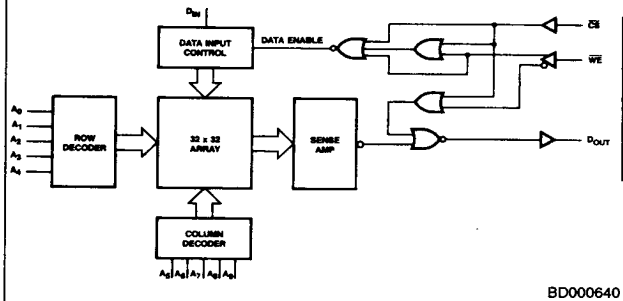
The Am100415 is a fully decoded 1024-bit ECL RAM organized 1024 words by one bit. Bit selection is achieved by means of a 10-bit address, A_0 through A_9. Easy memory expansion is provided by an active-LOW chip select ($\overline{CS}$) input and an unterminated OR-tieable emitter follower output.

An active-LOW write line ($\overline{WE}$) controls the write/read operation of the memory. When the chip select and write lines are LOW, the data input (D_{IN}) is written into the addressed memory word simultaneously preconditioning the output so true data is present when the write cycle is complete. This preconditioning operation insures minimum write recovery times by eliminating the "write recovery glitch."

Reading is performed with the chip select line LOW and the write line HIGH. The information stored in the addressed word is read out on the noninverting output (D_{OUT}).

During the writing operation or when the chip select line is HIGH, the output of the memory goes to a LOW state.

BLOCK DIAGRAM



BD000640

MODE SELECT TABLE

Input			Output	
$\overline{CS}$	$\overline{WE}$	D_{IN}	D_{OUT}	Mode
H	X	X	L	Not Selected
L	L	L	L	Write "0"
L	L	H	L	Write "1"
L	H	X	D_{OUT}	Read

H = HIGH = −0.9 V
L = LOW = −1.7 V
X = Don't Care

PRODUCT SELECTOR GUIDE

Highlights of Key Performance Parameters (Commercial)

Part Number	Am100415-10	Am100415A	Am100415
Address Access Time (t_{AA})	10 ns	15 ns	20 ns
Write Pulse Width (t_W)	10 ns	10 ns	12 ns
Write Recovery (t_{WR})	10 ns	12 ns	15 ns
Chip Select Access/ Recovery (t_{ACS}/t_{RCS})	8 ns	8 ns	8 ns
Write Disable (t_{WS})	10 ns	10 ns	10 ns
Power Supply (I_{EE})	150 mA	150 mA	150 mA

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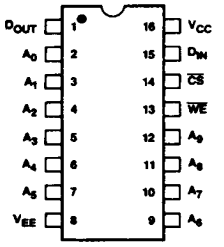
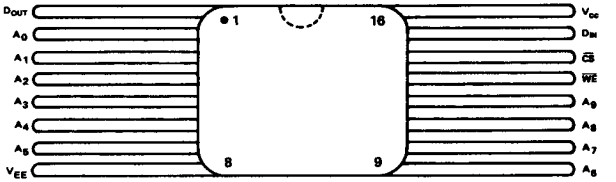
CONNECTION DIAGRAMS
Top View



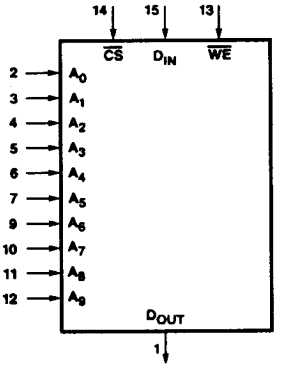
CD000920



CD009800

Note: Pin 1 is marked for orientation.

LOGIC SYMBOL



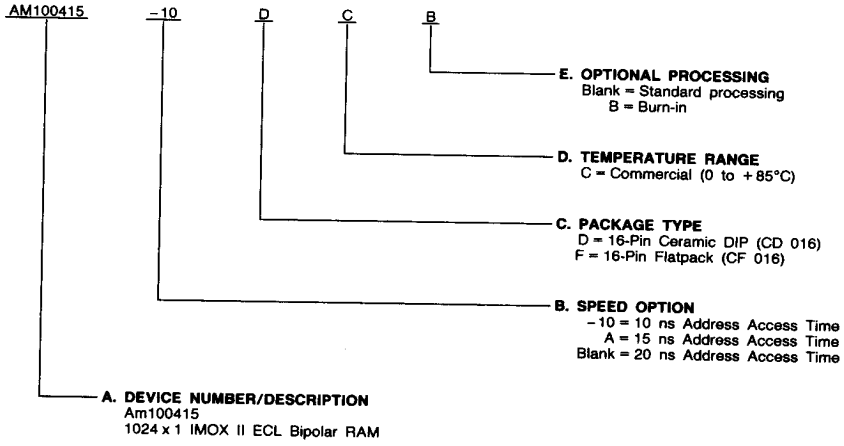
LS000241

V_{CC} = Pin 16
V_{EE} = Pin 8

ORDERING INFORMATION

Standard Products

AMD standard products are available in several packages and operating ranges. The order number (Valid Combination) is formed by a combination of: **A. Device Number**
B. Speed Option (if applicable)
C. Package Type
D. Temperature Range
E. Optional Processing



Valid Combinations	
AM100415-10	DC, DCB FC, FCB
AM100415A	
Am100415	

Valid Combinations

Valid Combinations list configurations planned to be supported in volume for this device. Consult the local AMD sales office to confirm availability of specific valid combinations, to check on newly released combinations, and to obtain additional data on AMD's standard military grade products.

ABSOLUTE MAXIMUM RATINGS

Storage Temperature ..... −65 to +150°C
Case Temperature with
Power Applied ..... −55 to +125°C
V_{EE} Pin Potential to
GND Pin ..... −7.0 V to +0.5 V
Input Voltage (DC) ..... V_{EE} to +0.5 V
Output Current (DC Output HIGH) .... −30 mA to +0.1 mA

Stresses above those listed under ABSOLUTE MAXIMUM RATINGS may cause permanent device failure. Functionality at or above these limits is not implied. Exposure to absolute maximum ratings for extended periods may affect device reliability.

OPERATING RANGES

Commercial (C) Devices
Temperature ..... 0 to +85°C
Supply Voltage ..... −5.7 V to −4.2 V

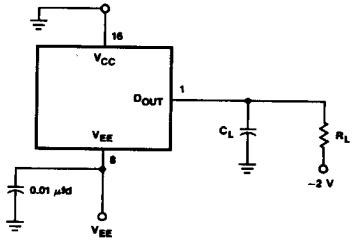
Operating ranges define those limits between which the functionality of the device is guaranteed.

DC CHARACTERISTICS V_{EE} = −4.5 V, V_{CC} = GND (Note 2)

Parameter Symbol	Parameter Description	Test Conditions		B(Note 3)	Typ. (Note 1)	A (Note 3)	Units
V_{OH}	Output Voltage HIGH	$V_{IN} = V_{IHA}$ or V_{ILB}	Loading is 50 Ω to −2.0 V	−1025	−955	−880	mV
V_{OL}	Output Voltage LOW			−1810	−1715	−1620	mV
V_{OHC}	Output Voltage HIGH	$V_{IN} = V_{IHB}$ or V_{ILA}		−1035			mV
V_{OLC}	Output Voltage LOW					−1610	mV
V_{IH}	Input Voltage HIGH	Guaranteed Input Voltage HIGH for all inputs (Note 4)		−1165		−880	mV
V_{IL}	Input Voltage LOW	Guaranteed Input Voltage LOW for all inputs (Note 4)		−1810		−1475	mV
I_{IH}	Input Current HIGH	$V_{IN} = V_{IHA}$				220	μA
I_{IL}	Input Current LOW Chip Select ($\overline{CS}$) All Other Inputs	$V_{IN} = V_{ILB}$		0.5 −50		170	μA
I_{EE}	Power Supply Current (Pin 8)	All Inputs and Outputs Open		−150	−105		mA

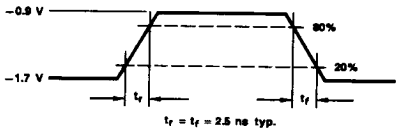
Notes: 1. Typical values are at V_{EE} = −4.5 V, T = 25°C and maximum loading.
2. Output load = 50 Ω and 30 pF to −2.0 V
T = T_A = 0 to +85°C for Ceramic DIPs.
Guaranteed with transverse air flow exceeding 400 linear F.P.M. and 2-minute warm-up period. Approximate resistance values of the package are:
θ_{JA} (Junction to Ambient) = 90°C/Watt (still air)
θ_{JA} (Junction to Ambient) = 50°C/Watt (at 400 F.P.M. air flow)
T = T_C = 0 to +85°C for Flatpacks and Leadless Chip Carriers
θ_{JC} (Junction to Case) = 25°C/Watt
3. Definition of symbols and terms used in this product specification: The relative values of the specified conditions and limits will be referenced to an algebraic scale. The extremities of the scale are: "A" the value closest to positive infinity, "B" the value closest to negative infinity.
4. These are absolute voltages with respect to device ground pin and include all overshoots due to system and/or tester noise. Do not attempt to test these values without suitable equipment.

SWITCHING TEST CIRCUIT



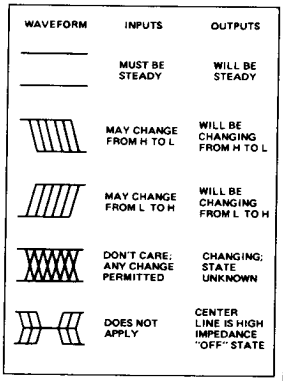
TC000221

SWITCHING TEST WAVEFORM



TW000310

KEY TO SWITCHING WAVEFORMS



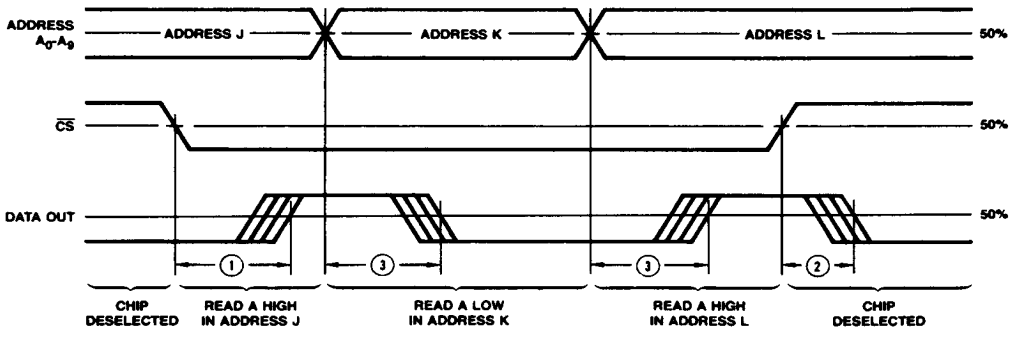
KS000010

$R_L = 50\ \Omega$ termination of measurement system
$C_L = 30$ pF (including stray jig capacitance)

SWITCHING CHARACTERISTICS $V_{EE} = -4.27$ to -4.73 V (Note 2)

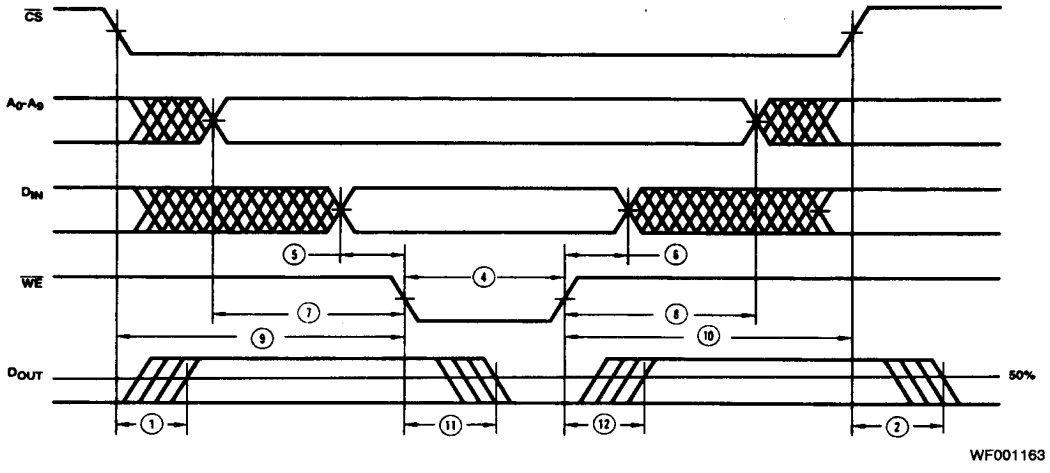
No.	Parameter Symbol	Parameter Description	Test Conditions	Am100415A-10 Min.	Am100415A-10 Typ. (Note 1)	Am100415A-10 Max.	Am100415A Min.	Am100415A Typ. (Note 1)	Am100415A Max.	Am100415 Min.	Am100415 Typ. (Note 1)	Am100415 Max.	Units
READ MODE													
1	t_{ACS}	Chip Select Access Time	Measured at 50% of input to valid output (V_{ILA} for V_{OL} or V_{IHB} for V_{OH})		5	8		5	8		5	8	ns
2	t_{RCS}	Chip Select Recovery Time			5	8		5	8		5	8	
3	t_{AA}	Address Access Time			8	10		10	15		12	20	
WRITE MODE													
4	t_W	Write Pulse Width (to Guarantee Writing)	$t_{WSA} = t_{WSA}$(Min.)	10	6		10	6		12	9		ns
5	t_{WSD}	Data Setup Time Prior to Write		1	0		2	0		4	0		ns
6	t_{WHD}	Data Hold Time After Write		1	0		2	0		4	0		ns
7	t_{WSA}	Address Setup Time Prior to Write	$t_W = t_W$(Min.)	1	0		3	3		5	3		ns
8	t_{WHA}	Address Hold Time After Write		1	0		2	0		3	0		ns
9	t_{WSCS}	Chip Select Setup Time Prior to Write	Measured at 50% of input to valid output (V_{ILA} for V_{OL} or V_{IHB} for V_{OH})	1	0		2	0		4	0		ns
				1	0		2	0		4	0		ns
					5	10		5	10		5	10	ns
					6	10		6	12		7	15	ns
RISE TIME AND FALL TIME													
	t_r	Output Rise Time	Measured between 20% and 80% points		2.5			2.5			2.5		ns
	t_f	Output Fall Time			2.5			2.5			2.5		
CAPACITANCE													
	C_{IN}	Input Pin Capacitance	Measure with a Pulse Technique		4	5		4	5		4	5	pF
	C_{OUT}	Output Pin Capacitance			7	8		7	8		7	8	pF

SWITCHING WAVEFORMS



WF001173

Read Mode



WF001163

Write Mode