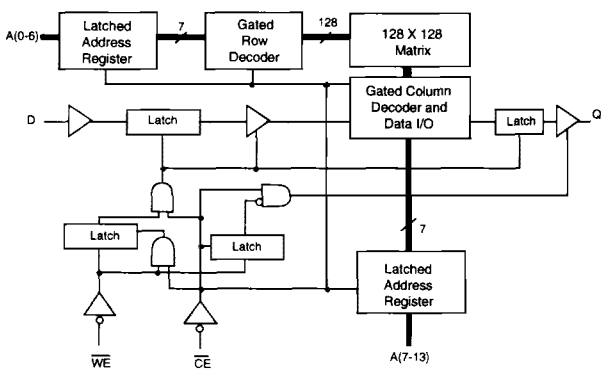
NON-VOLATILE RAM *Advance Information*

16K x 1 NON-VOLATILE RAM-MAGNETORESISTIVE HC7116

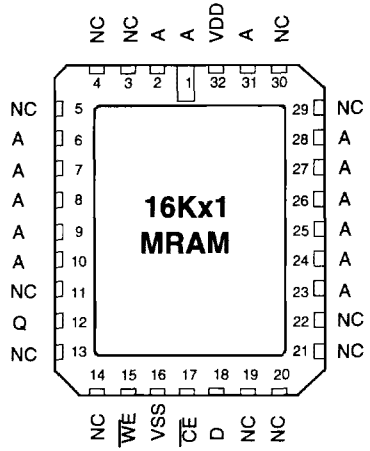
FEATURES

- Non-volatile and NDRO (Non-destructive read out)
- Unlimited read/write (>1E15 cycles)
- Unlimited Power Off Data Retention
- Fabricated with Bulk CMOS 0.8 µm Process
- 300 ns Access Time
- 350 ns Read Cycle Time
- 200 ns Write Cycle Time
- Synchronous Operation
- CMOS Input Levels (TTL Optional)
- Tri-State Outputs
- High Output Drive
- Full Military Temperature Operation (-55°C to 125°C)
- Single 5 V ± 10% Power Supply
- Power is 300mW Active, 10mW Standby

FUNCTIONAL DIAGRAM



PINOUT CONFIGURATION



TRUTH TABLE

$\overline{CE}$	$\overline{WE}$	D	Q	MODE
L	H	X	Data Out	Read
L	L	Data In	High Z	Write
H	X	X	High Z	Disabled

Note: X: $V_I = V_{IH}$ or V_{IL}

GENERAL DESCRIPTION

The 16Kx1 Magnetoresistive RAM (MRAM™) is a non-volatile and non-destructive read out random access memory. Fabricated with our standard bulk CMOS process, it is designed for extreme environments. Attractive features include unlimited power off storage, unlimited read/write cycles, and 5 volt operation. The 16Kx1 is offered in a JEDEC compatible 32 pad leadless chip carrier.

7

DC and AC ELECTRICAL CHARACTERISTICS (1)

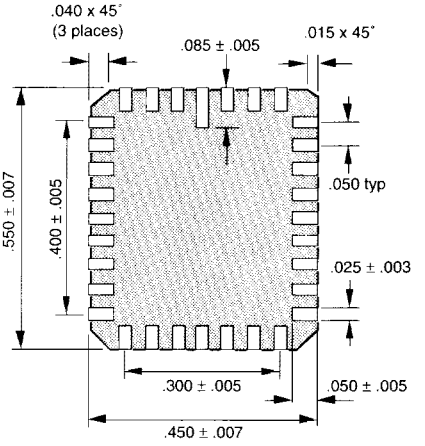
Symbol	Parameter	Min	Max	Units	Test Condition
IDDSB	Standby Supply Current		2	mA	VIH/VIL=VDD/VSS IO=0, Inputs Stable
IDDOP	Dynamic Supply Current, Selected		60	mA	f=1 MHz VIH/VIL=VDD/VSS IO=0, (3)
VIL	Low-Level Input Voltage (CMOS)		0.3*V_{DD}	V	Addr. Compliment Pattern VDD=4.5V
VIH	High-Level Input Voltage (CMOS)	0.7*V_{DD}		V	Addr. Compliment Pattern VDD=4.5V
VOL	Low-Level Output Voltage		0.4	V	IOL=4 ma, VDD=4.5V
VOH	High-Level Output Voltage	4.2		V	IOH=-1 ma, VDD=4.5V
II	Input Leakage Current	-1	1	µA	VSS≤VI≤VDD
IOZ	Output Leakage Current	-1	1	µA	VSS≤VO≤VDD Output=highZ
TELELR	Read Cycle Time	350		ns	(2)
TELELW	Write Cycle Time	200		ns	(2)
TAVEL	Address Set Up Time	10		ns	
TELQV	Chip Enable Access Time		300	ns	
TEHQV	Chip Deselect to Output High Z Time		25	ns	
TPUP	Power Up Time from 0V to Spec.	2		µs	
HEXT	Shielding to External Magnetic Fields		50	Oe	Either AC or DC fields 1Oersted=79.58 Amps/meter

(1) Worst case operating conditions: VDD=4.5 V to 5.5 V, TA=-55°C to +125°C.
(2) Input levels are VIL/VIH=0.5/VDD-0.5V, input rise and fall times <5ns, timing reference =VDD/2 V, CL=50pF.
(3) All inputs switching. DC average current.

ORDERING INFORMATION

H C 7116 M S C

- **SOURCE** H=HONEYWELL
- **PROCESS** C=CMOS
- **PART NUMBER**
- **PACKAGE DESIGNATION** M=32 Pad Leadless Chip Carrier
- **SCREEN LEVEL** C=Brass Board, S=Class S, B=Class B
- **INPUT BUFFER TYPE** C=CMOS Levels, T=TTL Levels



Bottom View - 32 Pad LCC

Honeywell reserves the right to make changes to any products or technology herein to improve reliability, function or design. Honeywell does not assume any liability arising out of the application or use of any product or circuit described herein; neither does it convey any license under its patent rights nor the rights of others.