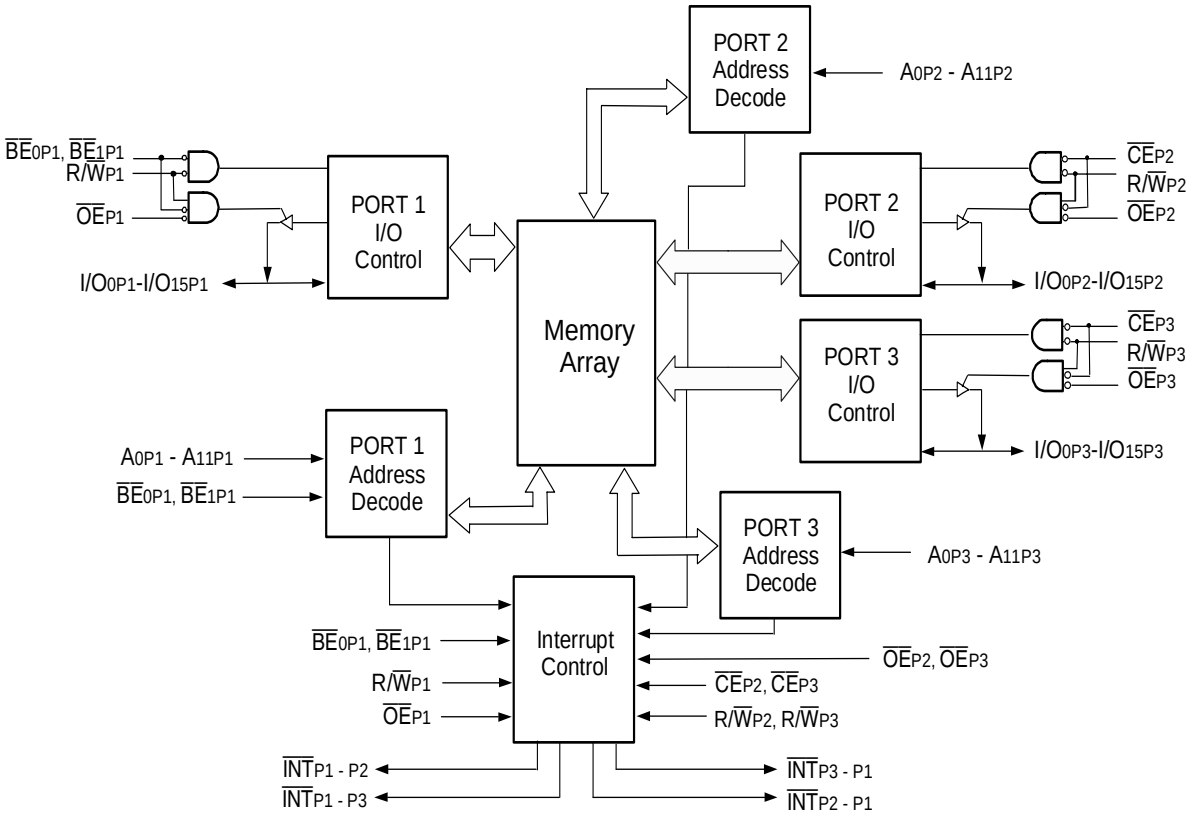
HIGH-SPEED 8K x 16 TriPort STATIC RAM

IDT70P5258ML
IDT70P525ML
IDT70V525ML

Features

- **High-speed access**
  - *Industrial: 55ns (max.)*
- **Low-power operation**
  - *IDT70P5258ML and IDT70P525ML*
    Active: 54mW (typ.)
    Standby: 7.2µW (typ.)
  - *IDT70V525ML*
    Active: 450mW (typ.)
    Standby: 250µW (typ.)
- **TriPort architecture allows simultaneous access to the memory from all three ports**
- **Fully asynchronous operation from each of the three ports: P1, P2, and P3**
- **IDT70P5258 supports 3.0V and 1.8V I/O's**
- **Available in 144-ball 0.5mm-pitch *fp*BGA**
- **Industrial temperature range (–40°C to +85°C)**
- **Greeen parts available, see ordering information**

Functional Block Diagram



5681 drw 01

JANUARY 2009

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Description

The IDT70X525X is a high-speed 8K x 16 TriPort Static RAM designed to be used in systems where multiple access into a common RAM is required. This TriPort Static RAM offers increased system performance in multiprocessor systems that have a need to communicate in real time and also offers added benefit for high-speed systems in which multiple access is required in the same cycle.

The IDT70X525X is also designed to be used in systems where on-chip hardware port arbitration is not needed. This part lends itself to those systems which cannot tolerate wait states or are designed to be able to externally arbitrated or withstand contention when more than one port simultaneously accesses the same TriPort RAM location.

The IDT70X525X provides three independent ports with separate control, address, and I/O pins that permit independent, asynchronous access for reads or writes to any location in memory. It is the user's responsibility to ensure data integrity when simultaneously accessing the same memory location from mutiple ports. An automatic power down feature, controlled by $\overline{BE}_0$ and $\overline{BE}_1$ on Port 1 and $\overline{CE}$ on Port 2 and on Port 3, permits the on-chip circuitry of each port to enter a very low power standby power mode.

The IDT70X525X is packaged in a 144-ball 0.5mm-pitch *fp*BGA.

Pin Configurations[1,2,3]

70(P/V)525XBZ
BZ-144

Top View

12/19/03

A1 I/O_{7P3}	A2 I/O_{6P2}	A3 I/O_{4P3}	A4 I/O_{3P2}	A5 I/O_{1P2}	A6 $\overline{OE}_{P3}$	A7 $R/\overline{W}_{P2}$	A8 NC	A9 A_{11P2}	A10 A_{9P2}	A11 A_{7P2}	A12 A_{6P2}
B1 I/O_{7P2}	B2 I/O_{6P3}	B3 V_{DD}(1)	B4 I/O_{2P3}	B5 I/O_{0P3}	B6 $\overline{OE}_{P2}$	B7 $\overline{CE}_{P3}$	B8 NC	B9 A_{10P3}	B10 A_{8P3}	B11 A_{6P3}	B12 A_{5P3}
C1 I/O_{9P2}	C2 V_{SS}	C3 I/O_{5P2}	C4 I/O_{2P2}	C5 I/O_{0P2}	C6 $R/\overline{W}_{P3}$	C7 $\overline{CE}_{P2}$	C8 A_{11P3}	C9 A_{10P2}	C10 A_{8P2}	C11 A_{5P2}	C12 A_{4P3}
D1 I/O_{10P3}	D2 I/O_{8P2}	D3 I/O_{5P3}	D4 I/O_{3P3}	D5 I/O_{1P3}	D6 V_{DD}	D7 V_{DD}(1)	D8 V_{SS}	D9 A_{9P3}	D10 A_{7P3}	D11 A_{4P2}	D12 A_{3P2}
E1 I/O_{11P3}	E2 I/O_{11P2}	E3 I/O_{8P3}	E4 I/O_{4P2}	E5 V_{DD}	E6 V_{SS}	E7 V_{SS}	E8 V_{SS}	E9 A_{0P3}	E10 A_{3P3}	E11 A_{2P3}	E12 A_{2P2}
F1 I/O_{12P3}	F2 I/O_{12P2}	F3 I/O_{9P3}	F4 V_{DD}(1)	F5 V_{DD}(1)	F6 V_{SS}	F7 V_{SS}	F8 V_{SS}	F9 V_{SS}	F10 V_{DD}	F11 A_{1P3}	F12 A_{0P2}
G1 I/O_{15P2}	G2 I/O_{13P3}	G3 I/O_{10P2}	G4 I/O_{13P2}	G5 V_{SS}	G6 V_{SS}	G7 V_{SS}	G8 V_{SS}	G9 V_{SS}	G10 V_{DD}	G11 A_{1P2}	G12 V_{DD}(1)
H1 I/O_{15P3}	H2 I/O_{14P3}	H3 I/O_{14P2}	H4 V_{DD}	H5 V_{SS}	H6 V_{SS}	H7 V_{SS}	H8 V_{SS}	H9 V_{DD}	H10 V_{DD}	H11 $\overline{INT}_{P3P1}$	H12 $\overline{INT}_{P2P1}$
J1 I/O_{2P1}	J2 I/O_{1P1}	J3 V_{DD}	J4 V_{SS}	J5 V_{SS}	J6 V_{SS}	J7 V_{SS}	J8 V_{DD}	J9 V_{DD}	J10 A_{0P1}	J11 $\overline{INT}_{P1P3}$	J12 $\overline{INT}_{P1P2}$
K1 I/O_{3P1}	K2 I/O_{0P1}	K3 I/O_{4P1}	K4 V_{SS}	K5 V_{DD}	K6 V_{SS}	K7 V_{DD}	K8 V_{DD}	K9 A_{10P1}	K10 A_{3P1}	K11 A_{2P1}	K12 A_{1P1}
L1 I/O_{6P1}	L2 I/O_{5P1}	L3 I/O_{8P1}	L4 I/O_{10P1}	L5 I/O_{12P1}	L6 I/O_{14P1}	L7 $\overline{OE}_{P1}$	L8 $\overline{BE}_{0P1}$	L9 NC	L10 A_{9P1}	L11 A_{7P1}	L12 A_{4P1}
M1 I/O_{7P1}	M2 V_{DD}	M3 I/O_{9P1}	M4 I/O_{11P1}	M5 I/O_{13P1}	M6 I/O_{15P1}	M7 $R/\overline{W}_{P1}$	M8 $\overline{BE}_{1P1}$	M9 A_{11P1}	M10 A_{8P1}	M11 A_{6P1}	M12 A_{5P1}

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NOTES:
1. V_{DDQ} for 70P5258.

Pin Configurations[1,2]

Symbol	Pin Name
A_{0P1} - A_{11P1}	Address Lines - Port 1 (Input)
A_{0P2} - A_{11P2}	Address Lines - Port 2 (Input)
A_{0P3} - A_{11P3}	Address Lines - Port 3 (Input)
I/O_{0P1} - I/O_{15P1}	Data I/O - Port 1
I/O_{0P2} - I/O_{15P2}	Data I/O - Port 2
I/O_{0P3} - I/O_{15P3}	Data I/O - Port 3
$R/\overline{W}_{P1}$	Read/Write - Port 1 (Input)
$R/\overline{W}_{P2}$	Read/Write - Port 2 (Input)
$R/\overline{W}_{P3}$	Read/Write - Port 3 (Input)
$\overline{CE}_{P2}$	Chip Enable - Port 2 (Input)
$\overline{CE}_{P3}$	Chip Enable - Port 3 (Input)
$\overline{OE}_{P1}$	Output Enable - Port 1 (Input)
$\overline{OE}_{P2}$	Output Enable - Port 2 (Input)
$\overline{OE}_{P3}$	Output Enable - Port 3 (Input)
$\overline{BE}_{0P1}$	Bank Enable 0 - Port 1 (Input)
$\overline{BE}_{1P1}$	Bank Enable 1 - Port 1 (Input)
$\overline{INT}_{P1 - P2}$	Interrupt $_{P1 - P2}$ - Port 1 (Output)
$\overline{INT}_{P1 - P3}$	Interrupt $_{P1 - P3}$ - Port 1 (Output)
$\overline{INT}_{P2 - P1}$	Interrupt $_{P2 - P1}$ - Port 2 (Output)
$\overline{INT}_{P3 - P1}$	Interrupt $_{P3 - P1}$ - Port 3 (Output)
V_{DD}	Power (Input)
V_{DDQ}	Port Power Supply (Input)[3,4]
V_{SS}	Ground (Input)

5681 tbl 01

NOTES:
1. All V_{DD} pins must be connected to the power supply.
2. All V_{SS} pins must be connected to the ground supply.
3. IDT70P5258 only.
4. For Port 2 and Port 3.

Capacitance[1]

(T_A = +25°C, f = 1.0MHz)

Symbol	Parameter	Port	Conditions[2]	Max	Unit
C_{IN}	Input Capacitance	Port 1	V_{IN} = 3dV	18	pF
		Port 2 & 3	V_{IN} = 3dV	9	pF
C_{OUT}	Output Capacitance	Port 1	V_{OUT} = 3dV	20	pF
		Port 2 & 3	V_{OUT} = 3dV	11	pF

5681 tbl 03

NOTES:
1. This parameter is determined by device characterization but is not production tested.
2. 3dV references the interpolated capacitance when the input and the output signals switch from 0V to 3V or from 3V to 0V.

Maximum Operating Temperature and Supply Voltage[1]

Grade	Ambient Temperature	Device	V_{SS}	V_{DD}
Industrial	-40°C to +85°C	70P525 70P5258	0V	1.8V ± 100mV
		70V525	0V	3.0V ± 300mV

5681 tbl 04

NOTE:
1. This is the parameter T_A. This is the "instant on" case temperature.

Absolute Maximum Ratings(1)

Symbol	Rating	Industrial	Unit
V_{TERM}	Supply Voltage on V_{DD} with Respect to GND	-0.5 to +2.9	V
V_{TERM}	Supply Voltage on V_{DDQ} with Respect to GND	-0.5 to +3.6	V
V_{TERM}(2)	Terminal Voltage with Respect to GND	-0.5 to V_{DD} + 0.3(4)	V
T_{BIAS}(3)	Temperature Under Bias	-55 to +125	°C
T_{STG}	Storage Temperature	-65 to +150	°C
T_{JN}	Junction Temperatue	+150	°C
I_{OUT} (for 70V525)	DC Output Current	50	mA
I_{OUT} (for 70P525 and 70P5258)	DC Output Current	20	mA

5681 tbl 05

NOTES:
1. 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 operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.
2. V_{TERM} must not exceed V_{DD} + 10% for Port 1 or V_{DDQ} + 10% for Port 2 and Port 3 for more than 25% of the cycle time or 10ns maximum, and is limited to $\leq$ 20mA for the period of $V_{TERM} \geq V_{DD}$ + 10% (Port 1) or V_{DDQ} + 10% (Port 2 and Port 3).
3. Ambient Temperature under DC Bias. No AC Conditions. Chip Deselected.
4. V_{DDQ} + 0.3V for 70P5258.

Recommended DC Operating Conditions

Symbol	Device	Port	Parameter	Min.	Typ.	Max.	Unit
V_{DD}	70P5258	All	Supply Voltage	1.7	1.8	1.9	V
	70P525			1.7	1.8	1.9	
	70V525			2.7	3	3.3	
V_{DDQ}	70P5258	Port 2 & 3	I/O Supply Voltage(1)	2.7	3	3.3	V
	70P525	N/A		—	—	—	
	70V525	N/A		—	—	—	
V_{SS}	All	All	Ground	0	0	0	V
V_{IH}	70P5258	Port 1	Input High Voltage	1.2	—	V_{DD}+0.2	V
		Port 2 & 3		2	—	V_{DDQ}+0.2	
	70P525	All		1.2	—	V_{DD}+0.2	
	70V525	All		2	—	V_{DD}+0.2	
V_{IL}	70P5258	Port 1	Input Low Voltage	-0.2	—	0.4	V
		Port 2 & 3		-0.2	—	0.6	
	70P525	All		-0.2	—	0.4	
	70V525	All		-0.2	—	0.6	

5681 tbl 02

NOTES:
1. The supply voltage for all ports on the IDT70P525 and IDT70V525 is supplied by V_{DD} so there are no V_{DDQ} pins on these devices.
2. $V_{IL} \geq$ -1.5V for pulse width less than 10ns.
3. V_{TERM} must not exceed V_{DD} + 10% for Port 1 or V_{DDQ} + 10% for Port 2 and Port 3.

DC Electrical Characteristics Over the Operating Temperature and Supply Voltage Range(1,4)

Symbol	Parameter	Test Condition	Version	70P5258 70P525 Ind'l Only		70V525 Ind'l Only		Unit
				Typ.(1)	Max.	Typ.(1)	Max.	
I_{DD}	Dynamic Operating Current (Both Ports Active - CMOS Level Inputs)	$\overline{CE}$ = V_{IL}, Outputs Open f = f_{MAX}(2)	IND'L L	30	50	150	180	mA
I_{SB1}	Standby Current (Both Ports - CMOS Level Inputs)	$\overline{CE}_R$ and $\overline{CE}_L$ = V_{IH} f = f_{MAX}(2)	IND'L L	.004	.016	5	10	mA
I_{SB2}	Standby Current (One Port - CMOS Level Inputs)	$\overline{CE}_{"A"}$ = V_{IL} and $\overline{CE}_{"B"}$ = V_{IH}(3), Active Port Outputs Open f = f_{MAX}(2)	IND'L L	17	28	90	110	mA
I_{SB3}	Full Standby Current (Both Ports - CMOS Level Inputs)	Both Ports $\overline{CE}_L$ and $\overline{CE}_R \geq V_{DDQ}$ - 0.2V, $V_{IN} \geq V_{DDQ}$ - 0.2V or $V_{IN} \leq$ 0.2V f = f_{MAX}(2)	IND'L L	4	16	84	150	µA
I_{SB4}	Standby Current (One Port - CMOS Level Inputs)	$\overline{CE}_{"A"} \leq$ 0.2V and $\overline{CE}_{"B"} \geq V_{DDQ}$ - 0.2V(3) $V_{IN} \geq V_{DDQ}$ - 0.2V or $V_{IN} \leq$ 0.2V, Active Port Outputs Open f = f_{MAX}(2)	IND'L L	17	28	90	110	mA

5681 tbl 06

NOTES:
1. V_{DD} = 1.8V for 70P5258 and 70P525. V_{DD} = 3.0V for 70V525, T_A = +25°C, and are not production tested. $I_{DD\,DC}$ = 15mA (typ.)
2. At f = f_{MAX}, address and control lines are cycling at the maximum frequency read cycle of 1/t_{RC}, and using "AC Test Conditions".
3. For the 70P5258, if Port "A" is Port 1 then Port "B" may be either Port 2 or Port 3. If Port "A" is either Port 2 or Port 3, Port "B" must be Port 1.
4. V_{DD} = 1.8V ± 100mV for 70P525 and 70P5258. V_{DD} = 3.0V ± 300mV for 70V525.

DC Electrical Characteristics Over the Operating Temperature and Supply Voltage Range(2)

Symbol	Device	Port	Parameter	Test Conditions	Min.	Max.	Unit
I_{LI}	70P5258	All	Input Leakage Current	V_{DD} = 1.8V, V_{IN} = 0V to V_{DD}	—	1	µA
	70P525	All		V_{DD} = 1.8V, V_{IN} = 0V to V_{DD}	—	1	
	70V525	All		V_{DD} = 3.0V, V_{IN} = 0V to V_{DD}	—	1	
I_{LO}	70P5258	All	Output Leakage Current	$\overline{CE}x$ = $\overline{BE}x$ = V_{IH}, V_{OUT} = 0V to V_{DD}	—	1	µA
	70P525	All		$\overline{CE}x$ = $\overline{BE}x$ = V_{IH}, V_{OUT} = 0V to V_{DD}	—	1	
	70V525	All		$\overline{CE}x$ = $\overline{BE}x$ = V_{IH}, V_{OUT} = 0V to V_{DD}	—	1	
V_{OL}	70P5258	Port 1	Output Low Voltage	I_{OL} = +0.1mA	—	0.2	V
		Port 2 & 3		I_{OL} = +2mA	—	0.4	
	70P525	All		I_{OL} = +0.1mA	—	0.2	
	70V525	All		I_{OL} = +2mA	—	0.4	
V_{OH}	70P5258	Port 1	Output High Voltage	I_{OH} = -0.1mA	1.4	—	V
		Port 2 & 3		I_{OH} = -2mA	2.1	—	
	70P525	All		I_{OH} = -0.1mA	1.4	—	
	70V525	All		I_{OH} = -2mA	2.1	—	

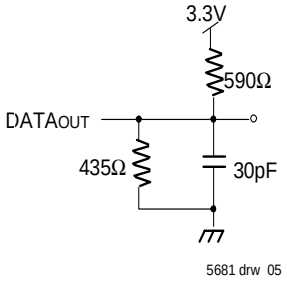
5681 tbl 07

NOTE:
1. At $V_{DD} \leq$ 2.0V input leakages are undefined.
2. V_{DD} = 1.8V ± 100mV for 70P525 and 70P5258. V_{DD} = 3.0V ± 300mV for 70V525.

AC Test Conditions

Input Pulse Levels	GND to 3.0V/GND to 1.8V
Input Rise/Fall Times	3ns Max.
Input Timing Reference Levels	1.5V/0.9V
Output Reference Levels	1.5V/0.9V
Output Load	Figures 1, 2 and 3

5681 tbl 08

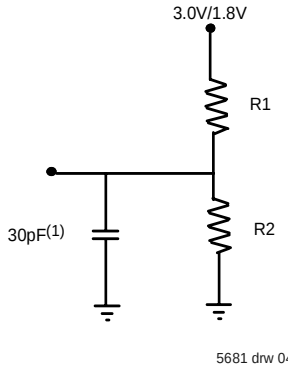


5681 drw 05

Figure 2. AC Output Test Load for the 70V525

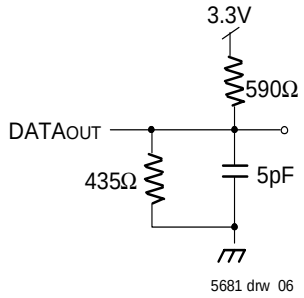
	3.0V	1.8V
R1	1022Ω	13500Ω
R2	729Ω	10800Ω

5681 tbl 09



5681 drw 04

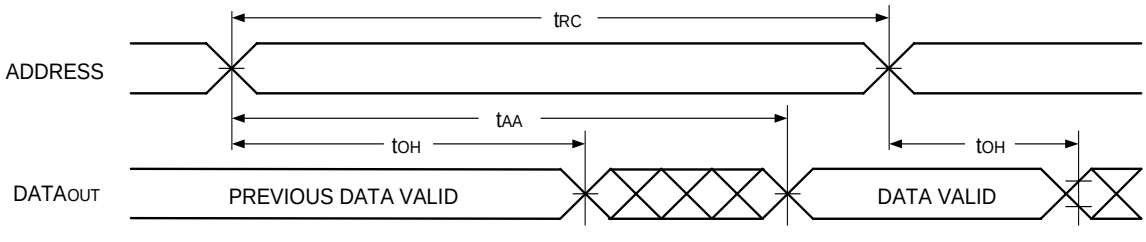
Figure 1. AC Output Test Load for the 70P525 and 70P5258



5681 drw 06

Figure3. AC Output Test Load for the 70V525 (for t_{HZ}, t_{LX}, t_{WZ}, t_{OW})

Timing Waveform of Read Cycle No. 1, Any Port(1)



5681 drw 07

NOTE:
1. $R/\overline{W}$ = V_{IH} and $\overline{CE}$ (or $\overline{BE}_X$) = V_{IL}.

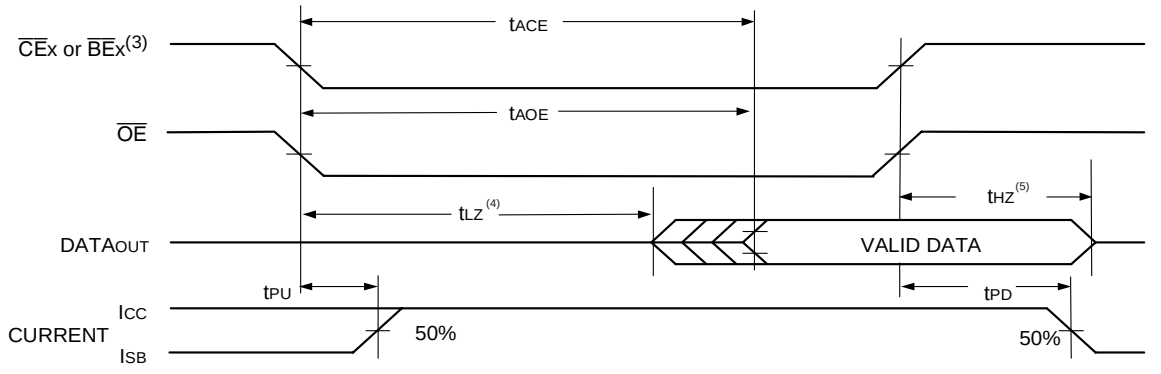
AC Electrical Characteristics Over the Operating Temperature and Supply Voltage

Symbol	Parameter	70X525X Ind'l Only		Unit
		Min.	Max.	
READ CYCLE				
t_{RC}	Read Cycle Time	55	—	ns
t_{AA}	Address Access Time	—	55	ns
t_{ACE}	Chip Enable Access Time	—	55	ns
t_{AOE}	Output Enable Access Time	—	30	ns
t_{OH}	Output Hold from Address Change	5	—	ns
t_{LZ}	Output Low-Z Time(1,2)	5	—	ns
t_{HZ}	Output High-Z Time(1,2)	—	25	ns
t_{PU}	Chip Enable to Power Up Time(2)	0	—	ns
t_{PD}	Chip Disable to Power Down Time(2)	—	55	ns

5681 tbl0

NOTES:
1. Transition is measured 0mV from Low or High-impedance voltage with the Output Test Load (Figure 2).
2. This parameter is guaranteed by device characterization but is not production tested.

Timing Waveform of Read Cycle No. 2, Any Port(1, 2)



5681 drw 08

NOTES:
1. R/$\overline{W}$ = V_{IH} for Read Cycles.
2. Addresses valid prior to or coincident with $\overline{CE}$ (or $\overline{BE}$x) transition LOW.
3. $\overline{CE}$ for Port 2 or Port 3, $\overline{BE}$x for Port 1.
4. Timing depends on which signal is asserted last, $\overline{CE}$ (or $\overline{BE}$x) or $\overline{OE}$.
5. Timing depends on which signal is deasserted first, $\overline{CE}$ (or $\overline{BE}$x) or $\overline{OE}$.

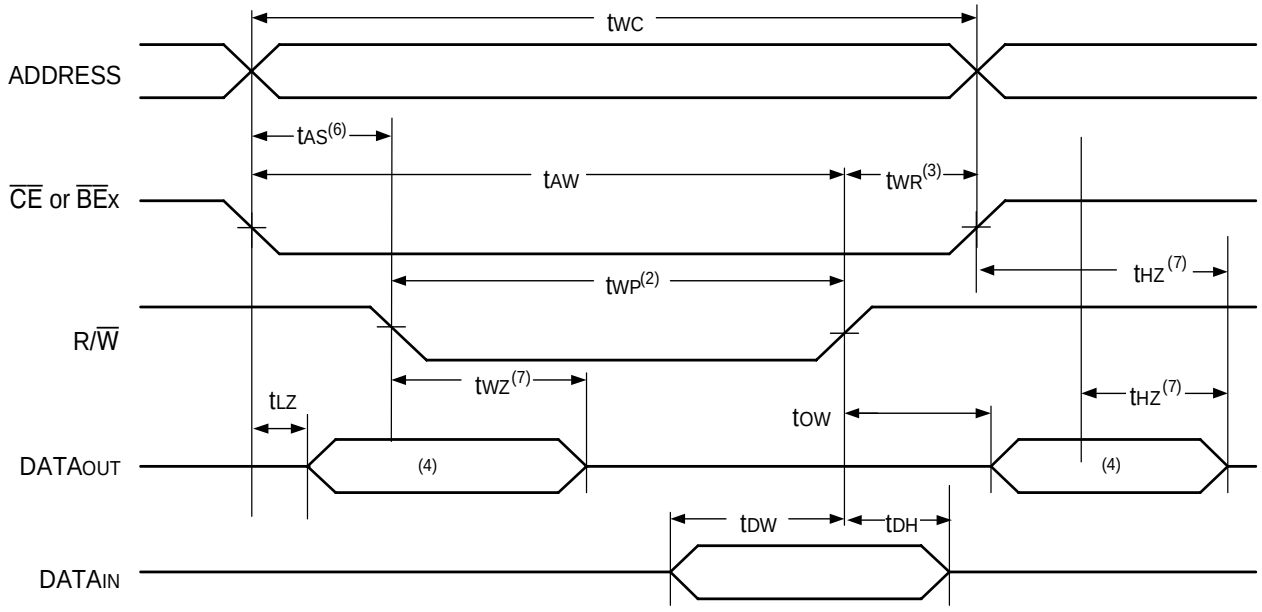
AC Electrical Characteristics Over the Operating Temperature and Supply Voltage

Symbol	Parameter	70X525X Ind'l Only		Unit
		Min.	Max.	
WRITE CYCLE				
t_{WC}	Write Cycle Time	55	—	ns
t_{EW}	Chip Enable to End-of-Write	45	—	ns
t_{AW}	Address Valid to End-of-Write	45	—	ns
t_{AS}	Address Set-up Time	0	—	ns
t_{WP}	Write Pulse Width[3]	40	—	ns
t_{WR}	Write Recovery Time	0	—	ns
t_{DW}	Data Valid to End-of-Write	30	—	ns
t_{HZ}	Output High-Z Time[1,2]	—	25	ns
t_{DH}	Data Hold Time	0	—	ns
t_{WZ}	Write Enable to Output in High-Z[1,2]	—	25	ns
t_{OW}	Output Active from End-of-Write[1,2]	0	—	ns

5681 tbl 11

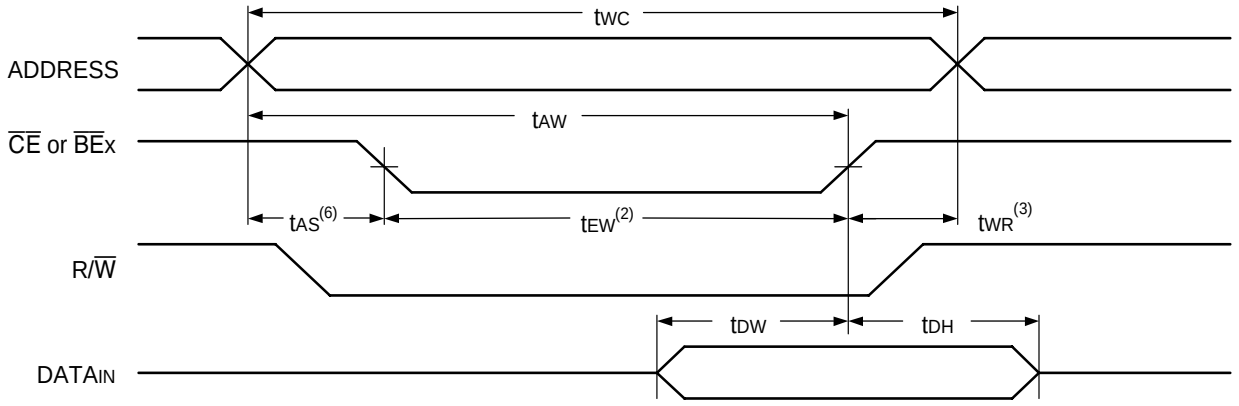
NOTES:
1. Transition is measured 0mV from Low or High-impedance voltage with the Output Test Load (Figure 2).
2. This parameter is guaranteed by device characterization but is not production tested.

Timing Waveform of Write Cycle No. 1, R/$\overline{W}$ Controlled Timing(5)



5681 drw 09

Timing Waveform of Write Cycle No. 2, $\overline{CE}$ Controlled Timing(1,5)



5681 drw 10

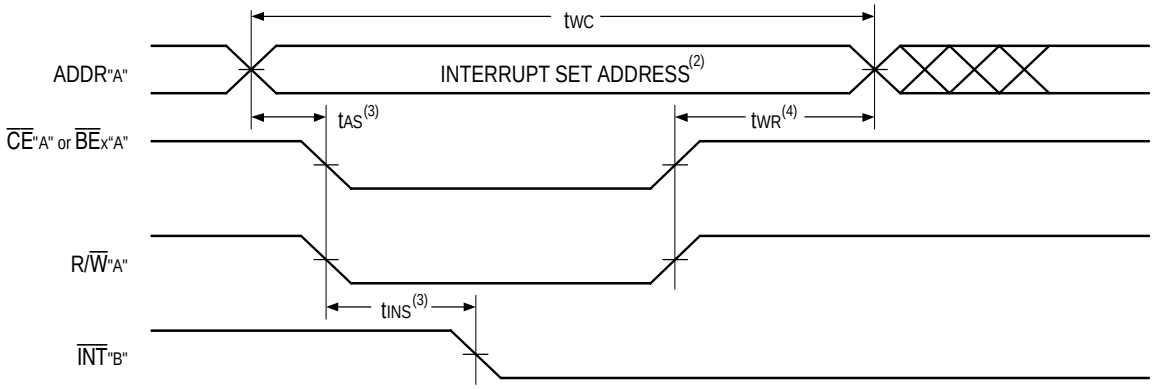
NOTES:
1. R/$\overline{W}$ or $\overline{CE}$ (or $\overline{BE}$x) = V_{IH} during all address transitions.
2. A write occurs during the overlap (t_{EW} or t_{WP}) of a $\overline{CE}$ (or $\overline{BE}$x) = V_{IL} and a R/$\overline{W}$ = V_{IL}.
3. t_{WR} is measured from the earlier of $\overline{CE}$ (or $\overline{BE}$x) or R/$\overline{W}$ = V_{IH} to the end of write cycle.
4. During this period, the I/O pins are in the output state, and input signals must not be applied.
5. If the $\overline{CE}$ (or $\overline{BE}$x) LOW transition occurs simultaneously with or after the R/$\overline{W}$ = V_{IL} transition, the outputs remain in the High-impedance state.
6. Timing depends on which enable signal is asserted last, $\overline{CE}$ (or $\overline{BE}$x) or R/$\overline{W}$.
7. Transition is measured 0mV from Low or High-impedance voltage with the Output Test Load (Figure 3). This parameter is guaranteed but is not production tested.

AC Electrical Characteristics Over the Operating Temperature and Supply Voltage Range

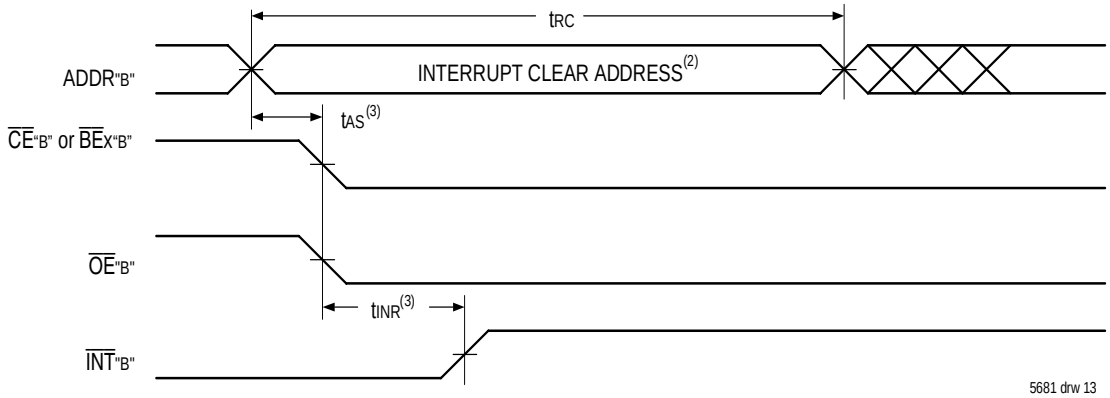
		70X525X Ind'l Only		
Symbol	Parameter	Min.	Max.	Unit
INTERRUPT TIMING				
t_{AS}	Address Set-up Time	0	—	ns
t_{WR}	Write Recovery Time	0	—	ns
t_{INS}	Interrupt Set Time	—	45	ns
t_{INR}	Interrupt Reset Time	—	45	ns

5681 tbl 12

Waveform of Interrupt Timing(1)



5681 drw 12



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NOTES:
1. If Port A is Port 1, Port B may be either Port 2 or Port 3. If Port A is either Port 2 or Port 3, Port B must be Port 1.
2. See Interrupt Truth Table II.
3. Timing depends on which enable signal ($\overline{CE}$ or R/$\overline{W}$) is asserted last.
4. Timing depends on which enable signal ($\overline{CE}$ or R/$\overline{W}$) is de-asserted first.

Functional Description

The IDT70X525X provides three ports with separate control, address, and I/O pins that permit independent access for reads or writes to the two banks of memory. These devices have an automatic power down feature controlled by $\overline{BE}_0$ and $\overline{BE}_1$ on Port 1 and $\overline{CE}$ on Port 2 and Port 3. The $\overline{CE}$ (or $\overline{BE}_X$) controls on-chip power down circuitry that permits the respective port to go into standby mode when not selected ($\overline{CE}$ or $\overline{BE}_X$ = V_{IH}). When Port 1 is enabled, it has access to the full memory. When Port 2 is active it has access to Bank 1 of the memory. When Port 3 is active it has access to Bank 2 of the memory. See Truth Table I for a description of the Read/Write operation.

Truth Table I – Read/Write Control

	$\overline{BE}_0$	$\overline{BE}_1$	R/$\overline{W}$	$\overline{CE}$	$\overline{OE}$	D_0-D_{15}	Function
PORT 1	H	H	X	X	X	Z	Port Deselected
	L	H	L	X	X	$DATA_{IN}$	Data on port written into Memory Bank 0
	L	H	H	X	L	$DATA_{OUT}$	Data in Memory Bank 0 output on port
	H	L	L	X	X	$DATA_{IN}$	Data on port written into Memory Bank 1
	H	L	H	X	L	$DATA_{OUT}$	Data in Memory Bank 1 output on port
	X	X	X	X	H	Z	Outputs Disabled
	L	L	X	X	X	X	Not Allowed
PORT 2 or PORT 3	X	X	X	H	X	Z	Port Deselected
	X	X	L	L	X	$DATA_{IN}$	Data on port written into Memory Bank(2)
	X	X	H	L	L	$DATA_{OUT}$	Data in Memory Bank(2) output on port
	X	X	X	X	H	Z	Outputs Disabled
	H	H	X	H	X	Z	$\overline{BE}_0$ = $\overline{BE}_1$ = $\overline{CE}_{P3}$ = V_{IH}, Sleep mode

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NOTE:
1. Both $\overline{BE}_0$, and $\overline{BE}_1$ cannot be active ($\overline{BE}x$ = V_{IL}) simultaneously.
2. Memory Bank 0 for Port 2. Memory Bank 1 for Port 3.

Interrupts

If the user chooses the interrupt function, a memory location (mailbox or message center) is assigned to each port. Interrupt $\overline{INT}_{P1-P2}$ of Port 1 ($\overline{INT}_{P1-P2}$) is asserted when Port 2 writes to memory location FFE(HEX), where a write is defined as $\overline{CE} = R/\overline{W} = V_{IL}$ per Truth Table II. Port 1 clears the interrupt by accessing address location FFE when $\overline{BE}_0 = V_{IL}$, $R/\overline{W}$ is a "don't care". Interrupt $\overline{INT}_{P1-P3}$ of Port 1 ($\overline{INT}_{P1-P3}$) is asserted when Port 3 writes to memory location FFE (HEX), where a write is defined as $\overline{CE} = R/\overline{W} = V_{IL}$. Port 1 clears the interrupt by accessing address location FFE when $\overline{BE}_1 = V_{IL}$, $R/\overline{W}$ is a "don't care". Port 2's interrupt flag ($\overline{INT}_{P2-P1}$) is asserted when Port 1 writes to memory location FFF (HEX), where a write is defined as $\overline{BE}_0 = R/\overline{W} = V_{IL}$. Port 2 clears the interrupt by accessing address location FFF when $\overline{CE} = V_{IL}$, $R/\overline{W}$ is a "don't care". Likewise, Port 3's interrupt flag ($\overline{INT}_{P3-P1}$) is asserted when Port 1 writes to memory location FFF (HEX), where a write is defined as $\overline{BE}_1 = R/\overline{W} = V_{IL}$. Port 3 clears the interrupt by accessing address location FFF when $\overline{CE} = V_{IL}$, R/W is a "don't care".

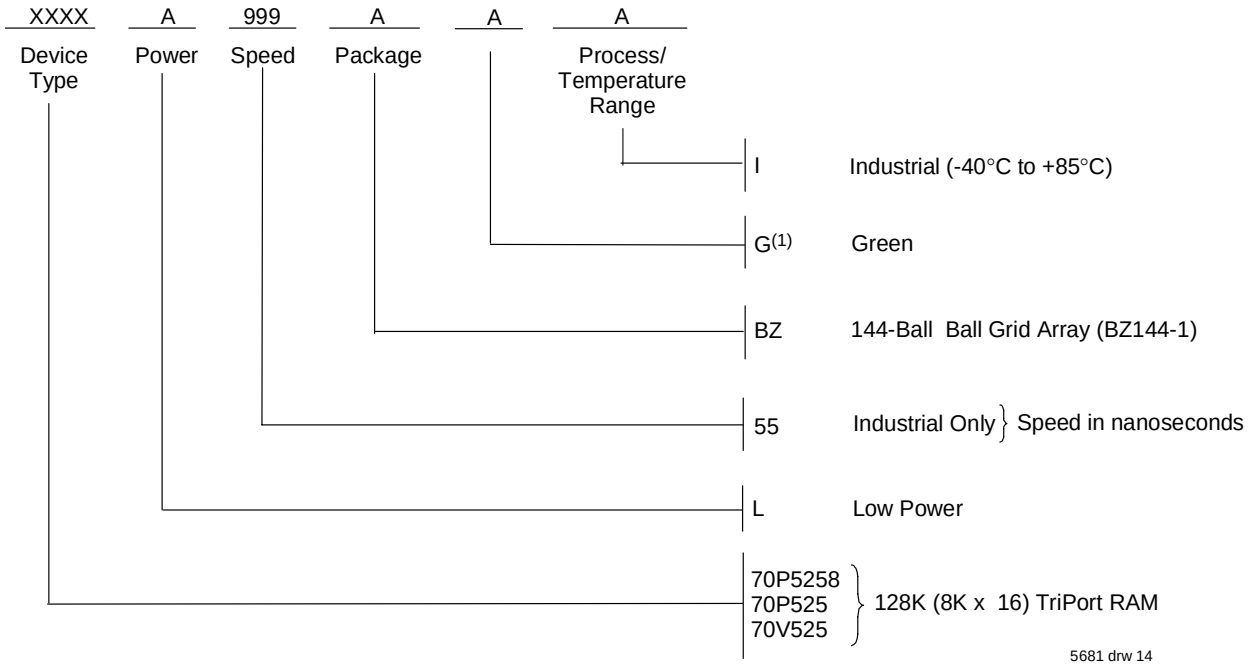
Truth Table II - Interrupt Flag

Port 1							Port 2 or 3					
$R/\overline{W}$	$\overline{BE}_0$	$\overline{BE}_1$	$\overline{OE}$	$A_{11} - A_0$	$\overline{INT}_{P1-P2}$	$\overline{INT}_{P1-P3}$	$R/\overline{W}$	$\overline{CE}$	$\overline{OE}$	$A_{11} - A_0$	$\overline{INT}_{Px-P1}$	Function
L	L	H	X	FFF	X	X	X	X	X	X	L	Set P2 $\overline{INT}$ Flag
X	X	X	X	X	X	X	X	L	L	FFF	H	Reset P2 $\overline{INT}$ Flag
L	H	L	X	FFF	X	X	X	X	X	X	L	Set P3 $\overline{INT}$ Flag
X	X	X	X	X	X	X	X	L	L	FFF	H	Reset P3 $\overline{INT}$ Flag
X	X	X	X	X	L	X	L	L	X	FFE	X	Set P1 $\overline{INT}_{P1-P2}$ Flag(1)
X	L	H	L	FFE	H	X	X	X	X	X	X	Reset P1 $\overline{INT}_{P1-P2}$ Flag
X	X	X	X	X	X	L	L	L	X	FFE	X	Set P1 $\overline{INT}_{P1-P3}$ Flag(2)
X	H	L	L	FFE	X	H	X	X	X	X	X	Reset P1 $\overline{INT}_{P1-P3}$ Flag

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NOTE:
1. Port 2 sets the $\overline{INT}_{P1-P2}$ flag on Port 1 so all signals refer to Port 2.
2. Port 3 sets the $\overline{INT}_{P1-P3}$ flag on Port 1 so all signals refer to Port 3.

Ordering Information



NOTE:
1. Green parts available. For specific speeds, packages and powers contact your sales office.

Datasheet Document History

10/14/03:	Initial datasheet	
03/23/04:	Page 7	Corrected t_{OH} spec min to 5ns in AC Electrical Characteristics Table 10
5/26/05:	Page 1	Added green availability to features
	Page 13	Added green indicator to ordering information
	Page 1 & 13	Replaced old logo ® with new ™ logo
05/08/06:	Page 5	Updated V_{TERM} in Absolute Maximum Ratings table and added footnote 3 & 4
07/25/08:	Page 6	Corrected a typo in the DC Chars table
01/19/09:	Page 14	Removed "IDT" from orderable part number

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