



Integrated Device Technology, Inc.

HIGH-SPEED CMOS LOGIC

ADVANCE INFORMATION FCTXXXT/AT TTL OUTPUT ONLY SERIES

FEATURES:

- FCTXXXT series equivalent to FCT and FAST™ speeds and drive
- FCTXXXAT series equivalent to FCTA speeds and drive
- CMOS devices with TRUE TTL input and output compatibility
 - $V_{OH} = 3.3V$ (typ.)
 - $V_{OL} = 0.3V$ (typ.)
- I_{OL} up to 64mA (Commercial) and 48mA (Military)
- CMOS power levels (1mW typical static)
- JEDEC standard pinout for DIP, SOIC and LCC packages
- Military Product Compliant to MIL-STD-883, Class B
- Available in Rad Hard and Rad Tolerant Versions

DESCRIPTION:

The FCTXXXT and FCTXXXAT are high-speed CMOS logic products designed with true TTL level input and output voltages. The reduced voltage swing (3.4 Volts rail to rail) results in lower AC switching noise. Effectively, the FCTXXXT and FCTXXXAT products combine the high-speed, low power advantages of CMOS logic products with the lower AC switching noise of traditional Bipolar logic families.

The FCTXXXT and FCTXXXAT series of CMOS devices are built using advanced CEMOS™, a dual metal CMOS technology. This technology is designed to supply the highest device speeds while maintaining CMOS power levels.

Information on our FCTXXXT and FCTXXXAT series include the Absolute Maximum Ratings and DC Electrical Characteristics. For more detailed information on specifications (Pin Description, Block Diagram, Truth Table and Power Supply and Switching Characteristics), refer to the appropriate data sheets in the 1989 Data Book Supplement.

Products to be offered:

IDT54/74FCT240T/AT refer to IDT54/74FCT240/A page S10-82
IDT54/74FCT241T/AT refer to IDT54/74FCT241/A page S10-86
IDT54/74FCT244T/AT refer to IDT54/74FCT244/A page S10-86
IDT54/74FCT245T/AT refer to IDT54/74FCT245/A page S10-92
IDT54/74FCT373T/AT refer to IDT54/74FCT373/A page S10-105
IDT54/74FCT374T/AT refer to IDT54/74FCT374/A page S10-109
IDT54/74FCT540T/AT refer to IDT54/74FCT540/A page S10-122
IDT54/74FCT541T/AT refer to IDT54/74FCT541/A page S10-122
IDT54/74FCT646T/AT refer to IDT54/74FCT646/A page S10-140
IDT54/74FCT821T/AT refer to IDT54/74FCT821/A page S10-152
IDT54/74FCT823T/AT refer to IDT54/74FCT823/A page S10-152
IDT54/74FCT827T/AT refer to IDT54/74FCT827/A page S10-158
IDT54/74FCT841T/AT refer to IDT54/74FCT841/A page S10-171
IDT54/74FCT843T/AT refer to IDT54/74FCT843/A page S10-171

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FAST is a trademark of Fairchild Semiconductor Co.

MILITARY AND COMMERCIAL TEMPERATURE RANGES

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ABSOLUTE MAXIMUM RATINGS ⁽¹⁾

SYMBOL	RATING	COMMERCIAL	MILITARY	UNIT
V _{TERM} (2)	Terminal Voltage with Respect to GND	-0.5 to +7.0	-0.5 to +7.0	V
V _{TERM} (3)	Terminal Voltage with Respect to GND	-0.5 to V _{CC}	-0.5 to V _{CC}	V
T _A	Operating Temperature	0 to +70	-55 to +125	°C
T _{BIAS}	Temperature Under Bias	-55 to +125	-65 to +135	°C
T _{STG}	Storage Temperature	-55 to +125	-65 to +150	°C
P _T	Power Dissipation	0.5	0.5	W
I _{OUT}	DC Output Current	120	120	mA

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. Input and V_{CC} terminals only.
3. Outputs and I/O terminals only.

CAPACITANCE (T_A = +25°C, f = 1.0MHz)

SYMBOL	PARAMETER (1)	CONDITIONS	TYP.	MAX.	UNIT
C _{IN}	Input Capacitance	V _{IN} = 0V	6	10	pF
C _{OUT}	Output Capacitance	V _{OUT} = 0V	8	12	pF
C _{I/O}	I/O Capacitance	V _{OUT} = 0V	8	12	pF

NOTE:

1. This parameter is measured at characterization but not tested.

DC ELECTRICAL CHARACTERISTICS OVER OPERATING RANGE

Following Conditions Apply Unless Otherwise Specified:

Commercial: $T_A = 0^\circ\text{C}$ to $+70^\circ\text{C}$; $V_{CC} = 5.0\text{V} \pm 5\%$ Military: $T_A = -55^\circ\text{C}$ to $+125^\circ\text{C}$; $V_{CC} = 5.0\text{V} \pm 10\%$

SYMBOL	PARAMETER	TEST CONDITIONS ⁽¹⁾		MIN.	TYP. ⁽²⁾	MAX.	UNIT
V_{IH}	Input HIGH Level	Guaranteed Logic High Level		2.0	-	-	V
V_{IL}	Input LOW Level	Guaranteed Logic Low Level		-	-	0.8	V
I_{IH}	Input HIGH Current	$V_{CC} = \text{Max.}$ $V_I = 2.7\text{V}$	Except I/O Pins	-	-	5	μA
			I/O Pins	-	-	15	
I_{IL}	Input LOW Current	$V_{CC} = \text{Max.}$ $V_I = 5\text{V}$	Except I/O Pins	-	-	-5	μA
			I/O Pins	-	-	-15	
I_{OZH}	High Impedance Output Current	$V_{CC} = \text{Max.}$	$V_O = 2.7\text{V}$	-	-	10	μA
I_{OZL}			$V_O = -5\text{V}$	-	-	-10	
I_I	Input HIGH Current	$V_{CC} = \text{Max.}$ $V_I = V_{CC} (\text{Max.})$		-	-	100	μA
V_{IK}	Clamp Diode Voltage	$V_{CC} = \text{Min.}$, $I_N = -18\text{mA}$		-	-0.7	-1.2	V
I_{CS}	Short Circuit Current	$V_{CC} = \text{Max.}$ ⁽³⁾ , $V_O = \text{GND}$		-60	-	-225	mA
V_{OH}	Output HIGH Voltage	$V_{CC} = \text{Min.}$ $V_{IN} = V_{IH}$ or V_{IL}	$I_{OH} = -6\text{mA MIL.}$ $I_{OH} = -8\text{mA COM'L.}$	2.4	3.3	-	V
			$I_{OH} = -12\text{mA MIL.}$ $I_{OL} = -15\text{mA COM'L.}$	2.0	3.0	-	V
V_{OL}	Output LOW Voltage	$V_{CC} = \text{Min.}$ $V_{IN} = V_{IH}$ or V_{IL} Line Drivers	$I_{OL} = 48\text{mA MIL.}$ $I_{OL} = 64\text{mA COM'L.}$	-	0.3	0.55	V
V_{OL}	Output LOW Voltage	$V_{CC} = \text{Min.}$ $V_{IN} = V_{IH}$ or V_{IL} Standard, 3-State, and 800 Series	$I_{OL} = 32\text{mA MIL.}$ $I_{OL} = 48\text{mA COM'L.}$	-	0.3	0.5	V
V_H	Input Hysteresis	$V_{CC} = 5\text{V}$		-	200	-	mV
I_{CC}	Quiescent Power Supply Current	$V_{CC} = \text{Max.}$, $V_I \geq \text{GND}$ or V_C		-	0.2	1.5	mA

NOTES:

1. For conditions shown as max. or min., use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical values are at $V_{CC} = 5.0\text{V}$, $+25^\circ\text{C}$ ambient and maximum loading.
3. Not more than one output should be shorted at one time. Duration of the short circuit test should not exceed one second.
4. This parameter is guaranteed but not tested.