FCT vs. ABT Logic Comparison

Delays-Noise-Power

This brief shows that PERICOM FCT **Quiet Series** is faster and has less noise than ABT logic. With recent improvements in PERICOM FCT, propagation delays have reached 3.2 ns maximum, which is faster than ABT. For example, PERICOM FCT has excellent performance under heavy loads whereas the competing ABT part is slower. The ABT undershoot (shown table 1)are twice that of the PERICOM parts. Figures 1 shows FCT heavy load comparison to ABT logic. Figures 2 & 3 show light load comparisons.Table 2 shows PERICOM has 30% less power consumption.

Bus Contention

When a bus driver is in tri-state, bus contention is not a problem. But when 2 or more drivers want control of the bus at the same time, data can be disrupted and damage to a driver is possible. Normally the PERICOM FCT can handle a contending device in the following worstcase scenarios:

1. When FCT device is low and contending device is high...FCT will sink ~120mA through the active pull-down. See the data sheet parameter I_{ODL}.

2. When the FCT device is high and a contending driver is low...drive current is ~ 100mA. See data sheet parameters I_{ODH} and I_{OS}.

With all of the outputs switching simultaneously, maximum current must be observed. Based on the above, PERICOM FCT will not be damaged, yet ABT would typically exhibit damage to the part.

Table 1 Comparison Chart To ABT Logic

Parameter & Conditions	FCT162244	FCT162Q244 Quiet Series	ABT16244A
t_P (typ) 120pF All Bits Switching	3.6ns (Fig. 1)	4.0ns	4.4ns
t_P (typ) 50pF 1 Bit Switching	3.0ns (Fig. 2)	3.1ns	3.6ns
t_P (typ) 50pF All Bits Switching	3.3ns (Fig. 3)	3.6ns	4.0ns
Undershoot 120pF All Bits Switching	-0.75V (Fig. 1)	-0.1V	-1.7V
Undershoot 50pF 1 Bit Switching	-0.85V (Fig. 2)	-0.2V	-1.3V
Undershoot 50pF All Bits Switching	-1.2V (Fig. 3)	-0.3V	-1.6V

Table 2 Power Comparison

Parameter / Part	**PERICOM** PI74FCT162Q244/245 /162244	**ABT Logic** 74ABT162244/245
$I_{CC,}$ C_L = 20pF, f = 20MHz	90mA	110mA
$I_{CC,}$ C_L = 20pF, f = 30MHz	140mA	160mA
$I_{CC,}$ C_L = 20pF, f = 40MHz	170mA	220mA
$I_{CC,}$ C_L = 20pF, f = 50MHz	230mA	310mA

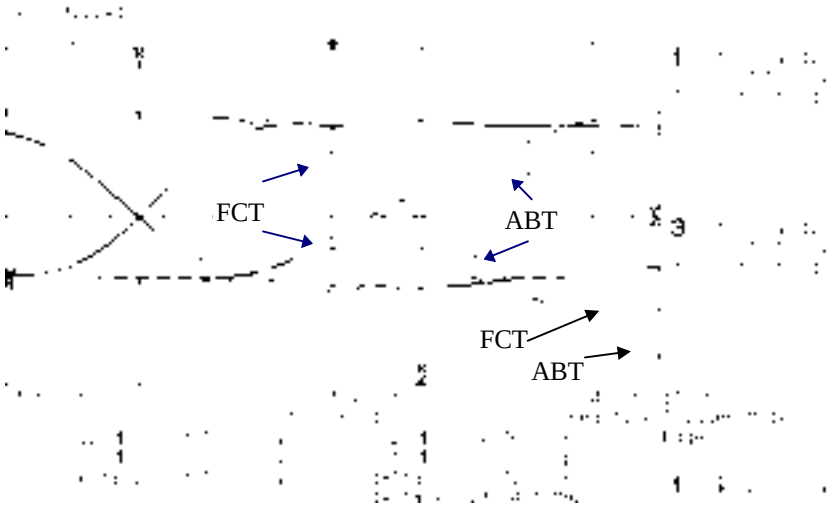

Figure 1 PI74FCT162244E Comparison to ABT16244A' 120pF, All Bits Switching

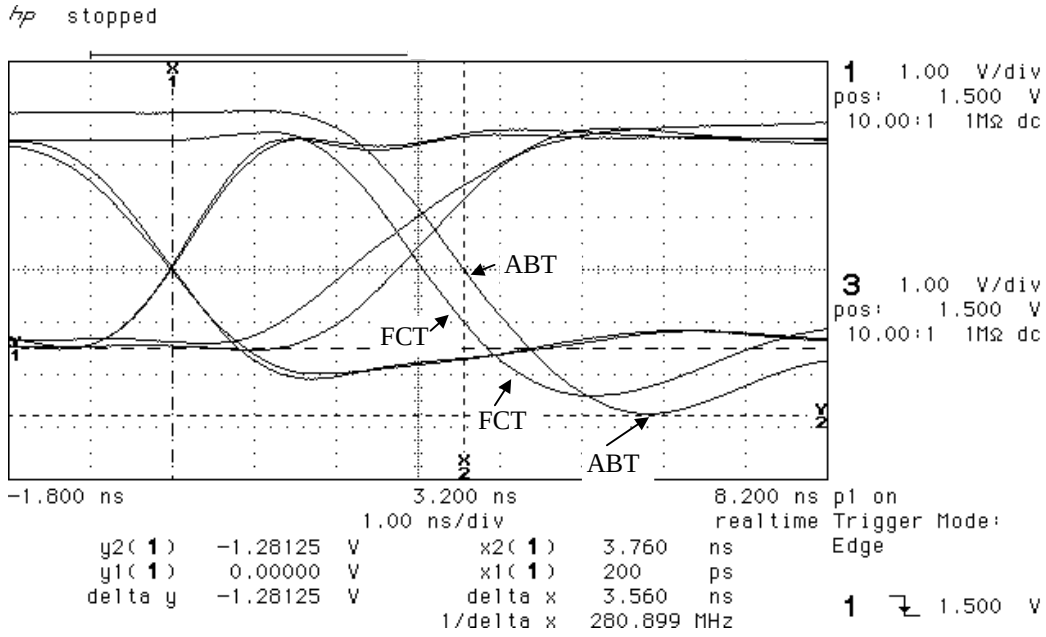

Figure. 2 PI74FCT162244E Comparison to ABT16244A , 50 pF, 1-Bit Switching

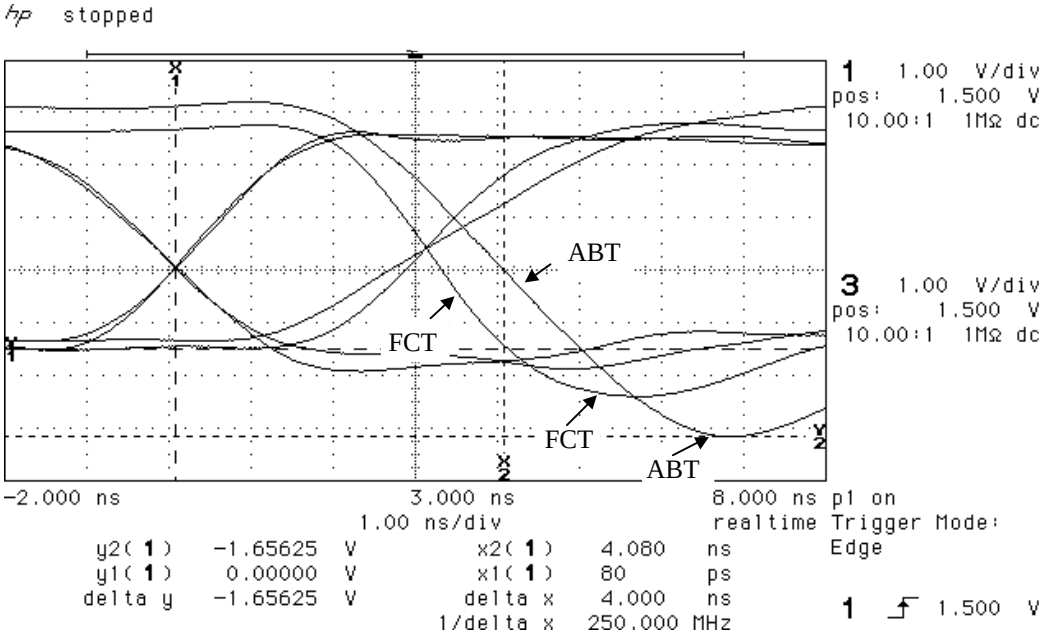

Figure 3. PI74FCT162244E Comparison to ABT16244A, 50 pF, All Bits Switching