

SCCS055C - August 1994 - Revised September 2001

16-Bit Registers

Features

- Ioff supports partial-power-down mode operation
- Edge-rate control circuitry for significantly improved noise characteristics
- Typical output skew < 250 ps
- ESD > 2000V
- TSSOP (19.6-mil pitch) and SSOP (25-mil pitch) packages
- Industrial temperature range of -40°C to +85°C
- $V_{CC} = 5V \pm 10\%$

CY74FCT16374T Features:

- 64 mA sink current, 32 mA source current
- Typical V_{OLP} (ground bounce) <1.0V at V_{CC} = 5V, T_A = 25°C

CY74FCT162374T Features:

- · Balanced 24 mA output drivers
- · Reduced system switching noise
- Typical V_{OLP} (ground bounce) <0.6V at V_{CC} = 5V, T_A = 25°C

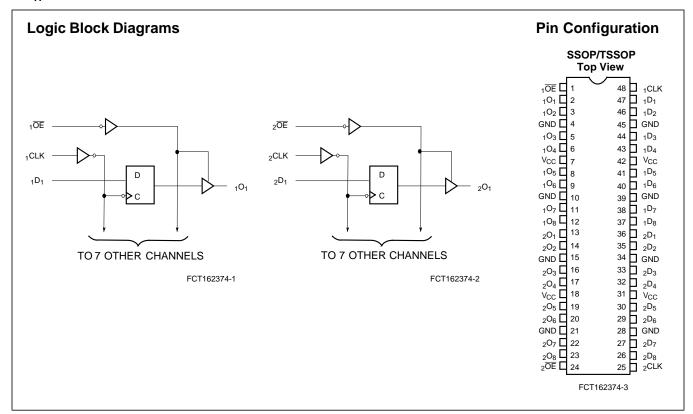
Functional Description

CY74FCT16374T and CY74FCT162374T are 16-bit D-type registers designed for use as buffered registers in high-speed, low power bus applications. These devices can be used as two independent 8-bit registers or as a single 16-bit register by connecting the output Enable (OE) and Clock (CLK) inputs. Flow-through pinout and small shrink packaging aid in simplifying board layout.

This device is fully specified for partial-power-down applications using I_{off} . The I_{off} circuitry disables the outputs, preventing damaging current backflow through the device when it is powered down.

The CY74FCT16374T is ideally suited for driving high-capacitance loads and low-impedance backplanes.

The CY74FCT162374T has 24-mA balanced output drivers with current limiting resistors in the outputs. This reduces the need for external terminating resistors and provides for minimal undershoot and reduced ground bounce. The CY74FCT162374T is ideal for driving transmission lines.





Function Table^[1]

	Inputs		Outputs	
D	CLK	ŌĒ	0	Function
Х	L	Н	Z	High-Z
Х	Н	Н	Z	
L	7	L	L	Load
Н	7	L	Н	Register
L	7	Н	Z	
Н	7	Н	Z	

Pin Description

Name	Description
D	Data Inputs
CLK	Clock Inputs
ŌĒ	Three-State Output Enable Inputs (Active LOW)
0	Three-State Outputs

Maximum Ratings^[2, 3]

(Above which the useful life may be impaired. For use guidelines, not tested.)
Storage Temperature55°C to +125°C
Ambient Temperature with Power Applied55°C to +125°C
DC Input Voltage0.5V to +7.0V
DC Output Voltage0.5V to +7.0V
DC Output Current (Maximum Sink Current/Pin)60 to +120 mA
Power Dissipation1.0W
Static Discharge Voltage>2001V (per MIL-STD-883, Method 3015)

Operating Range

Range	Ambient Temperature	V _{CC}
Industrial	-40°C to +85°C	5V ± 10%

Electrical Characteristics Over the Operating Range

Parameter	Description	Test Conditions	Min.	Typ. ^[4]	Max.	Unit
V _{IH}	Input HIGH Voltage		2.0			V
V _{IL}	Input LOW Voltage				0.8	V
V _H	Input Hysteresis ^[5]			100		mV
V _{IK}	Input Clamp Diode Voltage	V _{CC} =Min., I _{IN} =-18 mA		-0.7	-1.2	V
I _{IH}	Input HIGH Current	V _{CC} =Max., V _I =V _{CC}			±1	μΑ
I _{IL}	Input LOW Current	V _{CC} =Max., V _I =GND			±1	μΑ
l _{OZH}	High Impedance Output Current (Three-State Output pins)	V _{CC} =Max., V _{OUT} =2.7V			±1	μΑ
I _{OZL}	High Impedance Output Current (Three-State Output pins)	V _{CC} =Max., V _{OUT} =0.5V			±1	μΑ
Ios	Short Circuit Current ^[6]	V _{CC} =Max., V _{OUT} =GND	-80	-140	-200	mA
Io	Output Drive Current ^[6]	V _{CC} =Max., V _{OUT} =2.5V	-50		-180	mA
I _{OFF}	Power-Off Disable	V _{CC} =0V, V _{OUT} ≤4.5V ^[7]			±1	μΑ

Output Drive Characteristics for CY74FCT16374T

Parameter	Description	Test Conditions	Min.	Typ. ^[4]	Max.	Unit
V _{OH}	Output HIGH Voltage	V _{CC} =Min., I _{OH} =-3 mA	2.5	3.5		V
		V _{CC} =Min., I _{OH} =–15 mA	2.4	3.5		V
		V _{CC} =Min., I _{OH} =-32 mA	2.0	3.0		V
V _{OL}	Output LOW Voltage	V _{CC} =Min., I _{OL} =64 mA		0.2	0.55	V

Notes:

- H = HIGH Voltage Level. L = LOW Voltage Level. X = Don't Care. Z = HIGH Impedance. \square = LOW-to-HIGH Transition. Operation beyond the limits set forth may impair the useful life of the device. Unless otherwise noted, these limits are over the operating free-air temperature range.

- range. Unused inputs must always be connected to an appropriate logic voltage level, preferably either V_{CC} or ground. Typical values are at V_{CC} = 5.0V, T_A = +25°C ambient. This parameter is specified but not tested. Not more than one output should be shorted at a time. Duration of short should not exceed one second. The use of high-speed test apparatus and/or sample and hold techniques are preferable in order to minimize internal chip heating and more accurately reflect operational values. Otherwise prolonged shorting of a high output may raise the chip temperature well above normal and thereby cause invalid readings in other parametric tests. In any sequence of parameter tests, I_{OS} tests should be performed last. Tested at +25°C.



Output Drive Characteristics for CY74FCT162374T

Parameter	Description	Test Conditions	Min.	Typ. ^[4]	Max.	Unit
I _{ODL}	Output LOW Current ^[6]	V _{CC} =5V, V _{IN} =V _{IH} or V _{IL} , V _{OUT} =1.5V	60	115	150	mA
I _{ODH}	Output HIGH Current ^[6]	V _{CC} =5V, V _{IN} =V _{IH} or V _{IL} , V _{OUT} =1.5V	-60	-115	-150	mA
V _{OH}	Output HIGH Voltage	V _{CC} =Min., I _{OH} =–24 mA	2.4	3.3		V
V _{OL}	Output LOW Voltage	V _{CC} =Min., I _{OL} =24 mA		0.3	0.55	V

Capacitance^[5] ($T_A = +25^{\circ}C$, f = 1.0 MHz)

Parameter	Description	Test Conditions	Typ. ^[4]	Max.	Unit
C _{IN}	Input Capacitance	$V_{IN} = 0V$	4.5	6.0	pF
C _{OUT}	Output Capacitance	V _{OUT} = 0V	5.5	8.0	pF

Power Supply Characteristics

Parameter	Description	Test Condition	ons	Typ. ^[4]	Max.	Unit
I _{CC}	Quiescent Power Supply Current	V _{CC} =Max.	V _{IN} ≤0.2V, V _{IN} ≥V _{CC} −0.2V	5	500	μА
Δl _{CC}	Quiescent Power Supply Current (TTL inputs HIGH)	V _{CC} =Max.	V _{IN} =3.4V ^[8]	0.5	1.5	mA
I _{CCD}	Dynamic Power Supply Current ^[9]	V _{CC} =Max., One Input Toggling, 50% <u>Duty</u> Cycle, Outputs Open, OE =GND	V _{IN} =V _{CC} or V _{IN} =GND	60	100	μΑ/ MHz
I _C	Total Power Supply Current ^[10]	V _{CC} =Max., f ₀ =10 MHz, f ₁ =5 MHz, 50% Duty Cycle,	V _{IN} =V _{CC} or V _{IN} =GND	0.6	1.5	mA
		Outputs Open, One Bit Toggling, OE=GND	V _{IN} =3.4V or V _{IN} =GND	1.1	3.0	mA
		V _{CC} =Max., f ₀ =10 MHz, f ₁ =2.5 MHz, 50% Duty	V _{IN} =V _{CC} or V _{IN} =GND	3.0	5.5 ^[11]	mA
		Cycle, Outputs Open, Sixteen Bits Toggling, OE=GND	V _{IN} =3.4V or V _{IN} =GND	7.5	19.0 ^[11]	mA

 $\begin{array}{llll} \textbf{Note:} \\ 8. & \text{Per TTL driven input } (V_{\text{IN}}{=}3.4\text{V}); \text{ all other inputs at V}_{\text{CC}} \text{ or GND.} \\ 9. & \text{This parameter is not directly testable, but is derived for use in Total Power Supply calculations.} \\ 10. & |_{C} & = & |_{QUIESCENT} + |_{\text{INPUTS}} + |_{\text{DYNAMIC}} \\ |_{C} & = & |_{CC^{+}\Delta|_{CC}D_{\text{H}}N_{\text{T}}+|_{CD}(f_0/2 + f_1N_1)} \\ |_{CC} & = & \text{Quiescent Current with CMOS input levels} \\ |_{\Delta I_{CC}} & = & \text{Power Supply Current for a TTL HIGH input } (V_{\text{IN}}{=}3.4\text{V}) \\ |_{D_{\text{H}}} & = & \text{Duty Cycle for TTL inputs HIGH} \\ |_{N_{\text{T}}} & = & \text{Number of TTL inputs at D}_{\text{H}} \\ |_{CCD} & = & \text{Dynamic Current caused by an input transition pair (HLH or LHL)} \\ |_{f_0} & = & \text{Clock frequency for registered devices, otherwise zero} \\ \end{aligned}$

= Clock frequency for registered devices, otherwise zero

= Input signal frequency

= Number of inputs changing at f₁

All currents are in milliamps and all frequencies are in megahertz.

11. Values for these conditions are examples of the I_{CC} formula. These limits are specified but not tested.



Switching Characteristics Over the Operating Range^[12]

			CY74FCT16374T CY74FCT162374T		CY74FCT16374AT CY74FCT162374AT		Fig
Parameter	Description	Min.	Max.	Min.	Max.	Unit	Fig. No. ^[13]
t _{PLH} t _{PHL}	Propagation Delay CLK to O	2.0	10.0	2.0	6.5	ns	1, 5
t _{PZH} t _{PZL}	Output Enable Time	1.5	12.5	1.5	6.5	ns	1, 7, 8
t _{PHZ}	Output Disable Time	1.5	8.0	1.5	5.5	ns	1, 7, 8
t _{SU}	Set-Up Time HIGH or LOW, D to CLK	2.0		2.0		ns	4
t _H	Hold Time HIGH or LOW, D to CLK	1.5		1.5		ns	4
t _W	CLK Pulse Width HIGH or LOW	5.0		5.0		ns	5
t _{SK(O)}	Output Skew ^[14]		0.5		0.5	ns	

			CY74FCT16374CT CY74FCT162374CT		
Parameter	Description	Min.	Max.	Unit	Fig. No. ^[13]
t _{PLH} t _{PHL}	Propagation Delay CLK to O	2.0	5.2	ns	1, 5
t _{PZH} t _{PZL}	Output Enable Time	1.5	5.5	ns	1, 7, 8
t _{PHZ} t _{PLZ}	Output Disable Time	1.5	5.0	ns	1, 7, 8
t _{SU}	Set-Up Time HIGH or LOW, D to CLK	2.0		ns	4
t _H	Hold Time HIGH or LOW, D to CLK	1.5		ns	4
t _W	CLK Pulse Width HIGH or LOW	3.3		ns	5
t _{SK(O)}	Output Skew ^[14]		0.5	ns	

Notes:

Minimum limits are specified but not tested on Propagation Delays.
 See "Parameter Measurement Information" in the General Information section.
 Skew between any two outputs of the same package switching in the same direction. This parameter is ensured by design.



Ordering Information CY74FCT16374T

Speed (ns)	Ordering Code	Package Name	Package Type	Operating Range
5.2	CY74FCT16374CTPACT	Z48	48-Lead (240-Mil) TSSOP	Industrial
	CY74FCT16374CTPVC/PVCT	O48	48-Lead (300-Mil) SSOP	
6.5	CY74FCT16374ATPACT	Z48	48-Lead (240-Mil) TSSOP	Industrial
	CY74FCT16374ATPVC/PVCT	O48	48-Lead (300-Mil) SSOP	
10.0	CY74FCT16374TPVC/PVCT	O48	48-Lead (300-Mil) SSOP	Industrial

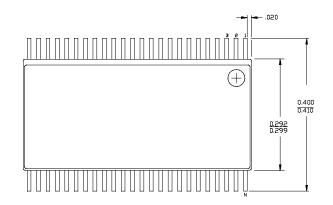
Ordering Information CY74FCT162374T

Speed (ns)	Ordering Code	Package Name	Package Type	Operating Range
5.2	74FCT162374CTPACT	Z48	48-Lead (240-Mil) TSSOP	Industrial
	CY74FCT162374CTPVC	O48	48-Lead (300-Mil) SSOP	
	74FCT162374CTPVCT	O48	48-Lead (300-Mil) SSOP	
6.5	74FCT162374ATPACT	Z48	48-Lead (240-Mil) TSSOP	Industrial
	CY74FCT162374ATPVC	O48	48-Lead (300-Mil) SSOP	
	74FCT162374ATPVCT	O48	48-Lead (300-Mil) SSOP	
10.0	CY74FCT162374TPVC/PVCT	O48	48-Lead (300-Mil) SSOP	Industrial

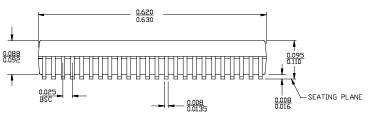


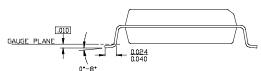
Package Diagrams

48-Lead Shrunk Small Outline Package O48

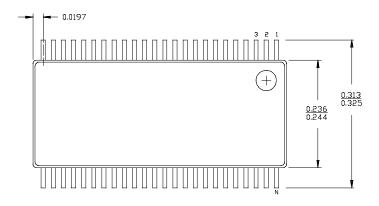


DIMENSIONS IN INCHES MIN. MAX.

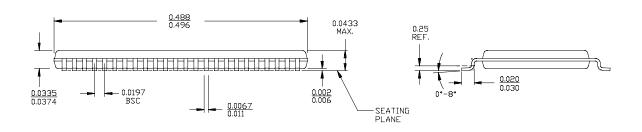




48-Lead Thin Shrunk Small Outline Package Z48



DIMENSIONS IN INCHES MIN. MAX.





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PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	e Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp (3)
74FCT162374ATPACT	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74FCT162374ATPVCG4	ACTIVE	SSOP	DL	48	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74FCT162374ATPVCT	ACTIVE	SSOP	DL	48	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74FCT162374CTPACT	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74FCT162374CTPVCG4	ACTIVE	SSOP	DL	48	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74FCT162374CTPVCT	ACTIVE	SSOP	DL	48	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74FCT162374ETPACT	OBSOLETE	TSSOP	DGG	48		TBD	Call TI	Call TI
74FCT162374ETPVCT	OBSOLETE	SSOP	DL	48		TBD	Call TI	Call TI
74FCT162374TPVCTG4	ACTIVE	SSOP	DL	48	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74FCT16374ATPACTE4	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74FCT16374ATPACTG4	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74FCT16374ATPVCG4	ACTIVE	SSOP	DL	48	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74FCT16374ATPVCTG4	ACTIVE	SSOP	DL	48	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74FCT16374CTPACTE4	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74FCT16374CTPACTG4	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74FCT16374CTPVCG4	ACTIVE	SSOP	DL	48	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74FCT16374CTPVCTG4	ACTIVE	SSOP	DL	48	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74FCT16374TPVCG4	ACTIVE	SSOP	DL	48	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT162374ATPVC	ACTIVE	SSOP	DL	48	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT162374CTPVC	ACTIVE	SSOP	DL	48	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT162374ETPAC	OBSOLETE	TSSOP	DGG	48		TBD	Call TI	Call TI
CY74FCT162374ETPVC	OBSOLETE	SSOP	DL	48		TBD	Call TI	Call TI
CY74FCT162374TPVCT	ACTIVE	SSOP	DL	48	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT16374ATPACT	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT16374ATPVC	ACTIVE	SSOP	DL	48	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT16374ATPVCT	ACTIVE	SSOP	DL	48	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT16374CTPACT	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS &	CU NIPDAU	Level-1-260C-UNLIM

PACKAGE OPTION ADDENDUM

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Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	e Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
						no Sb/Br)		
CY74FCT16374CTPVC	ACTIVE	SSOP	DL	48	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT16374CTPVCT	ACTIVE	SSOP	DL	48	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
CY74FCT16374ETPAC	OBSOLETE	TSSOP	DGG	48		TBD	Call TI	Call TI
CY74FCT16374ETPACT	OBSOLETE	TSSOP	DGG	48		TBD	Call TI	Call TI
CY74FCT16374ETPVC	OBSOLETE	SSOP	DL	48		TBD	Call TI	Call TI
CY74FCT16374ETPVCT	OBSOLETE	SSOP	DL	48		TBD	Call TI	Call TI
CY74FCT16374TPVC	ACTIVE	SSOP	DL	48	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
FCT162374ATPACTE4	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
FCT162374ATPACTG4	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
FCT162374ATPVCTG4	ACTIVE	SSOP	DL	48	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
FCT162374CTPACTE4	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
FCT162374CTPACTG4	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
FCT162374CTPVCTG4	ACTIVE	SSOP	DL	48	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM

⁽¹⁾ The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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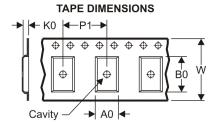
to Customer on an annual basis.

PACKAGE MATERIALS INFORMATION

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TAPE AND REEL INFORMATION





	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal

Device	Package Type	Package Drawing		SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
74FCT162374ATPACT	TSSOP	DGG	48	2000	330.0	24.4	8.6	15.8	1.8	12.0	24.0	Q1
74FCT162374ATPVCT	SSOP	DL	48	1000	330.0	32.4	11.35	16.2	3.1	16.0	32.0	Q1
74FCT162374CTPACT	TSSOP	DGG	48	2000	330.0	24.4	8.6	15.8	1.8	12.0	24.0	Q1
74FCT162374CTPVCT	SSOP	DL	48	1000	330.0	32.4	11.35	16.2	3.1	16.0	32.0	Q1
CY74FCT162374TPVCT	SSOP	DL	48	1000	330.0	32.4	11.35	16.2	3.1	16.0	32.0	Q1
CY74FCT16374ATPACT	TSSOP	DGG	48	2000	330.0	24.4	8.6	15.8	1.8	12.0	24.0	Q1
CY74FCT16374ATPVCT	SSOP	DL	48	1000	330.0	32.4	11.35	16.2	3.1	16.0	32.0	Q1
CY74FCT16374CTPACT	TSSOP	DGG	48	2000	330.0	24.4	8.6	15.8	1.8	12.0	24.0	Q1
CY74FCT16374CTPVCT	SSOP	DL	48	1000	330.0	32.4	11.35	16.2	3.1	16.0	32.0	Q1

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*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
74FCT162374ATPACT	TSSOP	DGG	48	2000	346.0	346.0	41.0
74FCT162374ATPVCT	SSOP	DL	48	1000	346.0	346.0	49.0
74FCT162374CTPACT	TSSOP	DGG	48	2000	346.0	346.0	41.0
74FCT162374CTPVCT	SSOP	DL	48	1000	346.0	346.0	49.0
CY74FCT162374TPVCT	SSOP	DL	48	1000	346.0	346.0	49.0
CY74FCT16374ATPACT	TSSOP	DGG	48	2000	346.0	346.0	41.0
CY74FCT16374ATPVCT	SSOP	DL	48	1000	346.0	346.0	49.0
CY74FCT16374CTPACT	TSSOP	DGG	48	2000	346.0	346.0	41.0
CY74FCT16374CTPVCT	SSOP	DL	48	1000	346.0	346.0	49.0

DGG (R-PDSO-G**)

PLASTIC SMALL-OUTLINE PACKAGE

48 PINS SHOWN



NOTES: A. All linear dimensions are in millimeters.

B. This drawing is subject to change without notice.

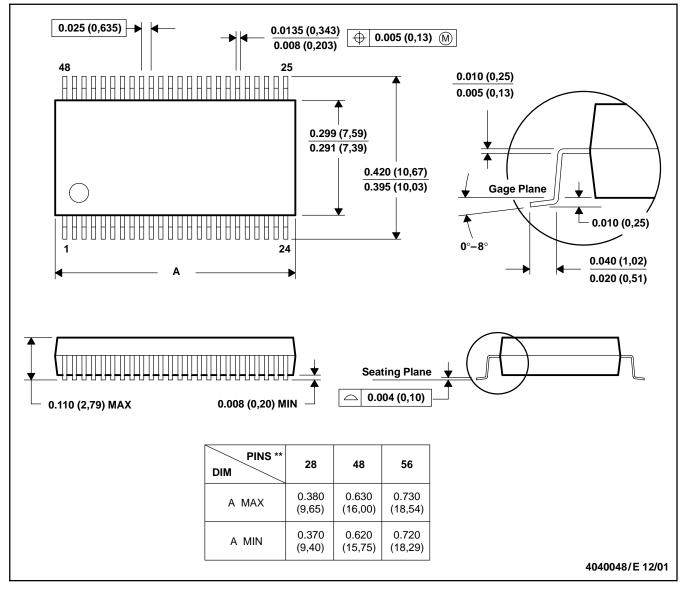
C. Body dimensions do not include mold protrusion not to exceed 0,15.

D. Falls within JEDEC MO-153

DL (R-PDSO-G**)

48 PINS SHOWN

PLASTIC SMALL-OUTLINE PACKAGE



NOTES: A. All linear dimensions are in inches (millimeters).

B. This drawing is subject to change without notice.

C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).

D. Falls within JEDEC MO-118



7-Jun-2010

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/ Ball Finish	MSL Peak Temp ⁽³⁾	Samples (Requires Login)
74FCT162374ATPACT	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Contact TI Distributor or Sales Office
74FCT162374ATPVCG4	ACTIVE	SSOP	DL	48	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
74FCT162374ATPVCT	ACTIVE	SSOP	DL	48	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
74FCT162374CTPACT	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Contact TI Distributor or Sales Office
74FCT162374CTPVCG4	ACTIVE	SSOP	DL	48	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
74FCT162374CTPVCT	ACTIVE	SSOP	DL	48	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
74FCT162374ETPACT	OBSOLETE	TSSOP	DGG	48		TBD	Call TI	Call TI	Samples Not Available
74FCT162374ETPVCT	OBSOLETE	SSOP	DL	48		TBD	Call TI	Call TI	Samples Not Available
74FCT162374TPVCTG4	ACTIVE	SSOP	DL	48	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
74FCT16374ATPACTE4	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
74FCT16374ATPACTG4	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
74FCT16374ATPVCG4	ACTIVE	SSOP	DL	48	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
74FCT16374ATPVCTG4	ACTIVE	SSOP	DL	48	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
74FCT16374CTPACTE4	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
74FCT16374CTPACTG4	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
74FCT16374CTPVCG4	ACTIVE	SSOP	DL	48	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
74FCT16374CTPVCTG4	ACTIVE	SSOP	DL	48	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
74FCT16374TPVCG4	ACTIVE	SSOP	DL	48	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples



7-Jun-2010

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/ Ball Finish	MSL Peak Temp ⁽³⁾	Samples (Requires Login)
CY74FCT162374ATPVC	ACTIVE	SSOP	DL	48	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
CY74FCT162374CTPVC	ACTIVE	SSOP	DL	48	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
CY74FCT162374ETPAC	OBSOLETE	TSSOP	DGG	48		TBD	Call TI	Call TI	Samples Not Available
CY74FCT162374ETPVC	OBSOLETE	SSOP	DL	48		TBD	Call TI	Call TI	Samples Not Available
CY74FCT162374TPVCT	ACTIVE	SSOP	DL	48	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
CY74FCT16374ATPACT	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
CY74FCT16374ATPVC	ACTIVE	SSOP	DL	48	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
CY74FCT16374ATPVCT	ACTIVE	SSOP	DL	48	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
CY74FCT16374CTPACT	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
CY74FCT16374CTPVC	ACTIVE	SSOP	DL	48	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
CY74FCT16374CTPVCT	ACTIVE	SSOP	DL	48	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
CY74FCT16374ETPAC	OBSOLETE	TSSOP	DGG	48		TBD	Call TI	Call TI	Samples Not Availabl
CY74FCT16374ETPACT	OBSOLETE	TSSOP	DGG	48		TBD	Call TI	Call TI	Samples Not Availabl
CY74FCT16374ETPVC	OBSOLETE	SSOP	DL	48		TBD	Call TI	Call TI	Samples Not Availabl
CY74FCT16374ETPVCT	OBSOLETE	SSOP	DL	48		TBD	Call TI	Call TI	Samples Not Availabl
CY74FCT16374TPVC	ACTIVE	SSOP	DL	48	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
FCT162374ATPACTE4	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Contact TI Distributo or Sales Office
FCT162374ATPACTG4	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Contact TI Distributo or Sales Office
FCT162374ATPVCTG4	ACTIVE	SSOP	DL	48	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
FCT162374CTPACTE4	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Contact TI Distributo or Sales Office



PACKAGE OPTION ADDENDUM

7-.lun-2010

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/ Ball Finish	MSL Peak Temp ⁽³⁾	Samples (Requires Login)
FCT162374CTPACTG4	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Contact TI Distributor or Sales Office
FCT162374CTPVCTG4	ACTIVE	SSOP	DL	48	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples

(1) The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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PACKAGE MATERIALS INFORMATION

www.ti.com 29-Jul-2009

TAPE AND REEL INFORMATION





	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal

Device	Package Type	Package Drawing		SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
74FCT162374ATPACT	TSSOP	DGG	48	2000	330.0	24.4	8.6	15.8	1.8	12.0	24.0	Q1
74FCT162374ATPVCT	SSOP	DL	48	1000	330.0	32.4	11.35	16.2	3.1	16.0	32.0	Q1
74FCT162374CTPACT	TSSOP	DGG	48	2000	330.0	24.4	8.6	15.8	1.8	12.0	24.0	Q1
74FCT162374CTPVCT	SSOP	DL	48	1000	330.0	32.4	11.35	16.2	3.1	16.0	32.0	Q1
CY74FCT162374TPVCT	SSOP	DL	48	1000	330.0	32.4	11.35	16.2	3.1	16.0	32.0	Q1
CY74FCT16374ATPACT	TSSOP	DGG	48	2000	330.0	24.4	8.6	15.8	1.8	12.0	24.0	Q1
CY74FCT16374ATPVCT	SSOP	DL	48	1000	330.0	32.4	11.35	16.2	3.1	16.0	32.0	Q1
CY74FCT16374CTPACT	TSSOP	DGG	48	2000	330.0	24.4	8.6	15.8	1.8	12.0	24.0	Q1
CY74FCT16374CTPVCT	SSOP	DL	48	1000	330.0	32.4	11.35	16.2	3.1	16.0	32.0	Q1

www.ti.com 29-Jul-2009



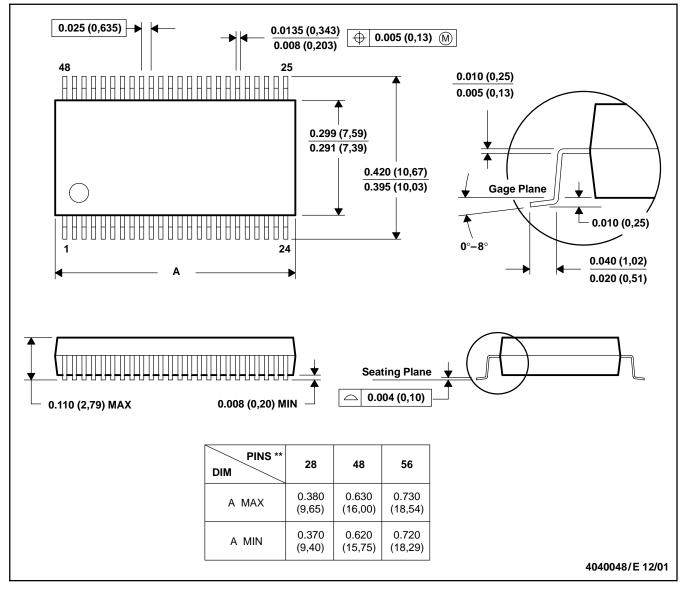
*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
74FCT162374ATPACT	TSSOP	DGG	48	2000	346.0	346.0	41.0
74FCT162374ATPVCT	SSOP	DL	48	1000	346.0	346.0	49.0
74FCT162374CTPACT	TSSOP	DGG	48	2000	346.0	346.0	41.0
74FCT162374CTPVCT	SSOP	DL	48	1000	346.0	346.0	49.0
CY74FCT162374TPVCT	SSOP	DL	48	1000	346.0	346.0	49.0
CY74FCT16374ATPACT	TSSOP	DGG	48	2000	346.0	346.0	41.0
CY74FCT16374ATPVCT	SSOP	DL	48	1000	346.0	346.0	49.0
CY74FCT16374CTPACT	TSSOP	DGG	48	2000	346.0	346.0	41.0
CY74FCT16374CTPVCT	SSOP	DL	48	1000	346.0	346.0	49.0

DL (R-PDSO-G**)

48 PINS SHOWN

PLASTIC SMALL-OUTLINE PACKAGE



NOTES: A. All linear dimensions are in inches (millimeters).

B. This drawing is subject to change without notice.

C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).

D. Falls within JEDEC MO-118

DGG (R-PDSO-G**)

PLASTIC SMALL-OUTLINE PACKAGE

48 PINS SHOWN



NOTES: A. All linear dimensions are in millimeters.

B. This drawing is subject to change without notice.

C. Body dimensions do not include mold protrusion not to exceed 0,15.

D. Falls within JEDEC MO-153

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