

# CY54FCT245T, CY74FCT245T 8-BIT TRANSCEIVERS WITH 3-STATE OUTPUTS

SCCS018B – MAY 1994 – REVISED NOVEMBER 2001

- Function, Pinout, and Drive Compatible With FCT and F Logic
- Reduced  $V_{OH}$  (Typically = 3.3 V) Versions of Equivalent FCT Functions
- Edge-Rate Control Circuitry for Significantly Improved Noise Characteristics
- $I_{off}$  Supports Partial-Power-Down Mode Operation
- ESD Protection Exceeds JESD 22
  - 2000-V Human-Body Model (A114-A)
  - 200-V Machine Model (A115-A)
  - 1000-V Charged-Device Model (C101)
- Matched Rise and Fall Times
- Fully Compatible With TTL Input and Output Logic Levels
- CY54FCT245T
  - 48-mA Output Sink Current
  - 12-mA Output Source Current
- CY74FCT245T
  - 64-mA Output Sink Current
  - 32-mA Output Source Current
- 3-State Outputs

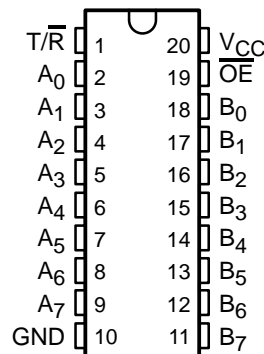
## description

The 'FCT245T devices contain eight noninverting bidirectional buffers with 3-state outputs and are intended for bus-oriented applications.

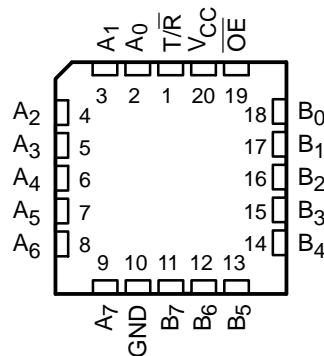
The transmit/receive ( $T/\bar{R}$ ) input determines the direction of data flow through these bidirectional transceivers. Transmit (active high) enables data from A ports to B ports. The output enable ( $\overline{OE}$ ), when high, disables both the A and B ports by putting them in the high-impedance state.

These devices are 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.

CY54FCT245T . . . D PACKAGE  
CY74FCT245T . . . P, Q, OR SO PACKAGE  
(TOP VIEW)



CY54FCT245T . . . L PACKAGE  
(TOP VIEW)



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

**TEXAS  
INSTRUMENTS**

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On products compliant to MIL-PRF-38535, all parameters are tested unless otherwise noted. On all other products, production processing does not necessarily include testing of all parameters.

# CY54FCT245T, CY74FCT245T

## 8-BIT TRANSCEIVERS

### WITH 3-STATE OUTPUTS

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#### ORDERING INFORMATION

T <sub>A</sub>	PACKAGE†		SPEED (ns)	ORDERABLE PART NUMBER	TOP-SIDE MARKING
–40°C to 85°C	QSOP – Q	Tape and reel	3.8	CY74FCT245DTQCT	FCT245D
	QSOP – Q	Tape and reel	4.1	CY74FCT245CTQCT	FCT245C
	SOIC – SO	Tube	4.1	CY74FCT245CTSOC	FCT245C
		Tape and reel	4.1	CY74FCT245CTSOCT	
	DIP – P	Tube	4.6	CY74FCT245ATPC	CY74FCT245ATPC
	QSOP – Q	Tape and reel	4.6	CY74FCT245ATQCT	FCT245A
	SOIC – SO	Tube	4.6	CY74FCT245ATSOC	FCT245A
		Tape and reel	4.6	CY74FCT245ATSOCT	
	QSOP – Q	Tape and reel	7	CY74FCT245TQCT	FCT245
–55°C to 125°C	SOIC – SO	Tube	7	CY74FCT245TSOC	FCT245
		Tape and reel	7	CY74FCT245TSOCT	
	CDIP – D	Tube	4.5	CY54FCT245CTDMB	
	LCC – L	Tube	4.5	CY54FCT245CTLMB	
	CDIP – D	Tube	4.9	CY54FCT245ATDMB	
	LCC – L	Tube	4.9	CY54FCT245ATLMB	
	CDIP – D	Tube	7.5	CY54FCT245TDMB	
	LCC – L	Tube	7.5	CY54FCT245TLMB	

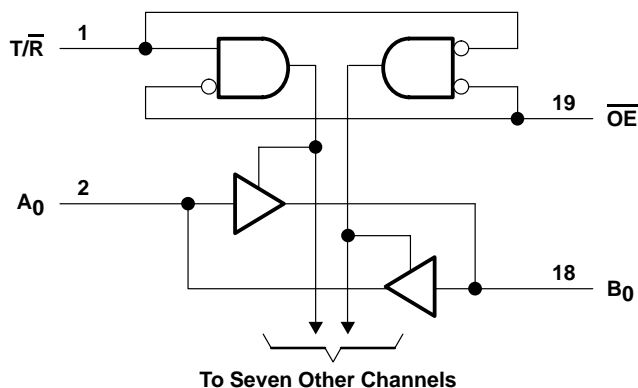
† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at [www.ti.com/sc/package](http://www.ti.com/sc/package).

#### FUNCTION TABLE

INPUTS		OPERATION
$\overline{OE}$	T/R	
L	L	B data to bus A
L	H	A data to bus B
H	X	Z

H = High logic level, L = Low logic level,  
X = Don't care, Z = High-impedance state

#### logic diagram (positive logic)



**CY54FCT245T, CY74FCT245T**  
**8-BIT TRANSCEIVERS**  
**WITH 3-STATE OUTPUTS**

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**absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†**

Supply voltage range to ground potential	–0.5 V to 7 V
DC input voltage range	–0.5 V to 7 V
DC output voltage range	–0.5 V to 7 V
DC output current (maximum sink current/pin)	120 mA
Package thermal impedance, $\theta_{JA}$ (see Note 1): P package	69°C/W
Q package	68°C/W
SO package	58°C/W
Ambient temperature range with power applied, $T_A$	–65°C to 135°C
Storage temperature range, $T_{stg}$	–65°C to 150°C

† Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied.

Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTE 1: The package thermal impedance is calculated in accordance with JESD 51-7.

**recommended operating conditions (see Note 2)**

	CY54FCT245T			CY74FCT245T CY74FCT245AT CY74FCT245CT CY74FCT245DT			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
$V_{CC}$ Supply voltage	4.5	5	5.5	4.75	5	5.25	V
$V_{IH}$ High-level input voltage	2			2			V
$V_{IL}$ Low-level input voltage			0.8			0.8	V
$I_{OH}$ High-level output current			–12			–32	mA
$I_{OL}$ Low-level output current			48			64	mA
$T_A$ Operating free-air temperature	–55		125	–40		85	°C

NOTE 2: All unused inputs of the device must be held at  $V_{CC}$  or GND to ensure proper device operation.



# CY54FCT245T, CY74FCT245T

## 8-BIT TRANSCEIVERS

### WITH 3-STATE OUTPUTS

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electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER	TEST CONDITIONS	CY54FCT245T			CY74FCT245T			UNIT
		MIN	TYP†	MAX	MIN	TYP†	MAX	
$V_{IK}$	$V_{CC} = 4.5 \text{ V}$ , $I_{IN} = -18 \text{ mA}$	-0.7	-1.2					V
	$V_{CC} = 4.75 \text{ V}$ , $I_{IN} = -18 \text{ mA}$				-0.7	-1.2		
$V_{OH}$	$V_{CC} = 4.5 \text{ V}$ , $I_{OH} = -12 \text{ mA}$	2.4	3.3					V
	$V_{CC} = 4.75 \text{ V}$ , $I_{OH} = -32 \text{ mA}$				2			
	$I_{OH} = -15 \text{ mA}$				2.4	3.3		
$V_{OL}$	$V_{CC} = 4.5 \text{ V}$ , $I_{OL} = 48 \text{ mA}$	0.3	0.55					V
	$V_{CC} = 4.75 \text{ V}$ , $I_{OL} = 64 \text{ mA}$				0.3	0.55		
$V_{hys}$	All inputs	0.2			0.2			V
$I_I$	$V_{CC} = 5.5 \text{ V}$ , $V_{IN} = V_{CC}$			5				$\mu\text{A}$
	$V_{CC} = 5.25 \text{ V}$ , $V_{IN} = V_{CC}$						5	
$I_{IH}$	$V_{CC} = 5.5 \text{ V}$ , $V_{IN} = 2.7 \text{ V}$			$\pm 1$				$\mu\text{A}$
	$V_{CC} = 5.25 \text{ V}$ , $V_{IN} = 2.7 \text{ V}$						$\pm 1$	
$I_{IL}$	$V_{CC} = 5.5 \text{ V}$ , $V_{IN} = 0.5 \text{ V}$			$\pm 1$				$\mu\text{A}$
	$V_{CC} = 5.25 \text{ V}$ , $V_{IN} = 0.5 \text{ V}$						$\pm 1$	
$I_{OZH}$	$V_{CC} = 5.5 \text{ V}$ , $V_{OUT} = 2.7 \text{ V}$			10				$\mu\text{A}$
	$V_{CC} = 5.25 \text{ V}$ , $V_{OUT} = 2.7 \text{ V}$						10	
$I_{OZL}$	$V_{CC} = 5.5 \text{ V}$ , $V_{OUT} = 0.5 \text{ V}$			-10				$\mu\text{A}$
	$V_{CC} = 5.25 \text{ V}$ , $V_{OUT} = 0.5 \text{ V}$						-10	
$I_{OS}^\ddagger$	$V_{CC} = 5.5 \text{ V}$ , $V_{OUT} = 0 \text{ V}$	-60	-120	-225				mA
	$V_{CC} = 5.25 \text{ V}$ , $V_{OUT} = 0 \text{ V}$				-60	-120	-225	
$I_{off}$	$V_{CC} = 0 \text{ V}$ , $V_{OUT} = 4.5 \text{ V}$			$\pm 1$			$\pm 1$	$\mu\text{A}$
$I_{CC}$	$V_{CC} = 5.5 \text{ V}$ , $V_{IN} \leq 0.2 \text{ V}$ , $V_{IN} \geq V_{CC} - 0.2 \text{ V}$	0.1	0.2					mA
	$V_{CC} = 5.25 \text{ V}$ , $V_{IN} \leq 0.2 \text{ V}$ , $V_{IN} \geq V_{CC} - 0.2 \text{ V}$				0.1	0.2		
$\Delta I_{CC}$	$V_{CC} = 5.5 \text{ V}$ , $V_{IN} = 3.4 \text{ V}^\S$ , $f_1 = 0$ , Outputs open	0.5	2					mA
	$V_{CC} = 5.25 \text{ V}$ , $V_{IN} = 3.4 \text{ V}^\S$ , $f_1 = 0$ , Outputs open				0.5	2		
$I_{CCD}^\P$	$V_{CC} = 5.5 \text{ V}$ , One input switching at 50% duty cycle, Outputs open, $\overline{T/R}$ or $\overline{OE} = \text{GND}$ and $V_{IN} \leq 0.2 \text{ V}$ or $V_{IN} \geq V_{CC} - 0.2 \text{ V}$	0.06	0.12					mA/ MHz
	$V_{CC} = 5.25 \text{ V}$ , One input switching at 50% duty cycle, Outputs open, $\overline{T/R}$ or $\overline{OE} = \text{GND}$ and $V_{IN} \leq 0.2 \text{ V}$ or $V_{IN} \geq V_{CC} - 0.2 \text{ V}$				0.06	0.12		

† Typical values are at  $V_{CC} = 5 \text{ V}$ ,  $T_A = 25^\circ\text{C}$ .

‡ 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 to minimize internal chip heating and more accurately reflect operational values. Otherwise, prolonged shorting of a high output can raise the chip temperature well above normal and cause invalid readings in other parametric tests. In any sequence of parameter tests,  $I_{OS}$  tests should be performed last.

§ Per TTL-driven input ( $V_{IN} = 3.4 \text{ V}$ ); all other inputs at  $V_{CC}$  or GND

¶ This parameter is derived for use in total power-supply calculations.



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electrical characteristics over recommended operating free-air temperature range (unless otherwise noted) (continued)

PARAMETER	TEST CONDITIONS			CY54FCT245T			CY74FCT245T			UNIT
				MIN	TYP†	MAX	MIN	TYP†	MAX	
I <sub>C</sub> <sup>#</sup>	V <sub>CC</sub> = 5.5 V, Outputs open, T/R or $\overline{\text{OE}}$ = GND	One bit switching at f <sub>1</sub> = 10 MHz at 50% duty cycle	V <sub>IN</sub> ≤ 0.2 V or V <sub>IN</sub> ≥ V <sub>CC</sub> – 0.2 V	0.7	1.4				mA	
			V <sub>IN</sub> = 3.4 V or GND	1.2	3.4					
		Eight bits switching at f <sub>1</sub> = 2.5 MHz at 50% duty cycle	V <sub>IN</sub> ≤ 0.2V or V <sub>IN</sub> ≥ V <sub>CC</sub> – 0.2 V	1.3	2.6					
			V <sub>IN</sub> = 3.4 V or GND	3.3	10.6					
	V <sub>CC</sub> = 5.25 V, Outputs open, T/R or $\overline{\text{OE}}$ = GND	One bit switching at f <sub>1</sub> = 10 MHz at 50% duty cycle	V <sub>IN</sub> ≤ 0.2 V or V <sub>IN</sub> ≥ V <sub>CC</sub> – 0.2 V				0.7	1.4		
			V <sub>IN</sub> = 3.4 V or GND				1.2	3.4		
		Eight bits switching at f <sub>1</sub> = 2.5 MHz at 50% duty cycle	V <sub>IN</sub> ≤ 0.2V or V <sub>IN</sub> ≥ V <sub>CC</sub> – 0.2 V				1.3	2.6		
			V <sub>IN</sub> = 3.4 V or GND				3.3	10.6		
C <sub>i</sub>				5	10		5	10	pF	
C <sub>O</sub>				9	12		9	12	pF	

† Typical values are at  $V_{CC} = 5 \text{ V}$ ,  $T_A = 25^\circ\text{C}$ .

#  $I_C = I_{CC} + \Delta I_{CC} \times D_H \times N_T + I_{CCD} (f_0/2 + f_1 \times N_1)$

Where:

$I_C$  = Total supply current

$I_{CC}$  = Power-supply current with CMOS input levels

$\Delta I_{CC}$  = Power-supply current for a TTL high input ( $V_{IN} = 3.4 \text{ V}$ )

$D_H$  = Duty cycle for TTL inputs high

$N_T$  = Number of TTL inputs at  $D_H$

$I_{CCD}$  = Dynamic current caused by an input transition pair (HLH or LHL)

$f_0$  = Clock frequency for registered devices, otherwise zero

$f_1$  = Input signal frequency

$N_1$  = Number of inputs changing at  $f_1$

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

|| Values for these conditions are examples of the  $I_{CC}$  formula.

# CY54FCT245T, CY74FCT245T

## 8-BIT TRANSCEIVERS

### WITH 3-STATE OUTPUTS

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#### switching characteristics over operating free-air temperature range (see Figure 1)

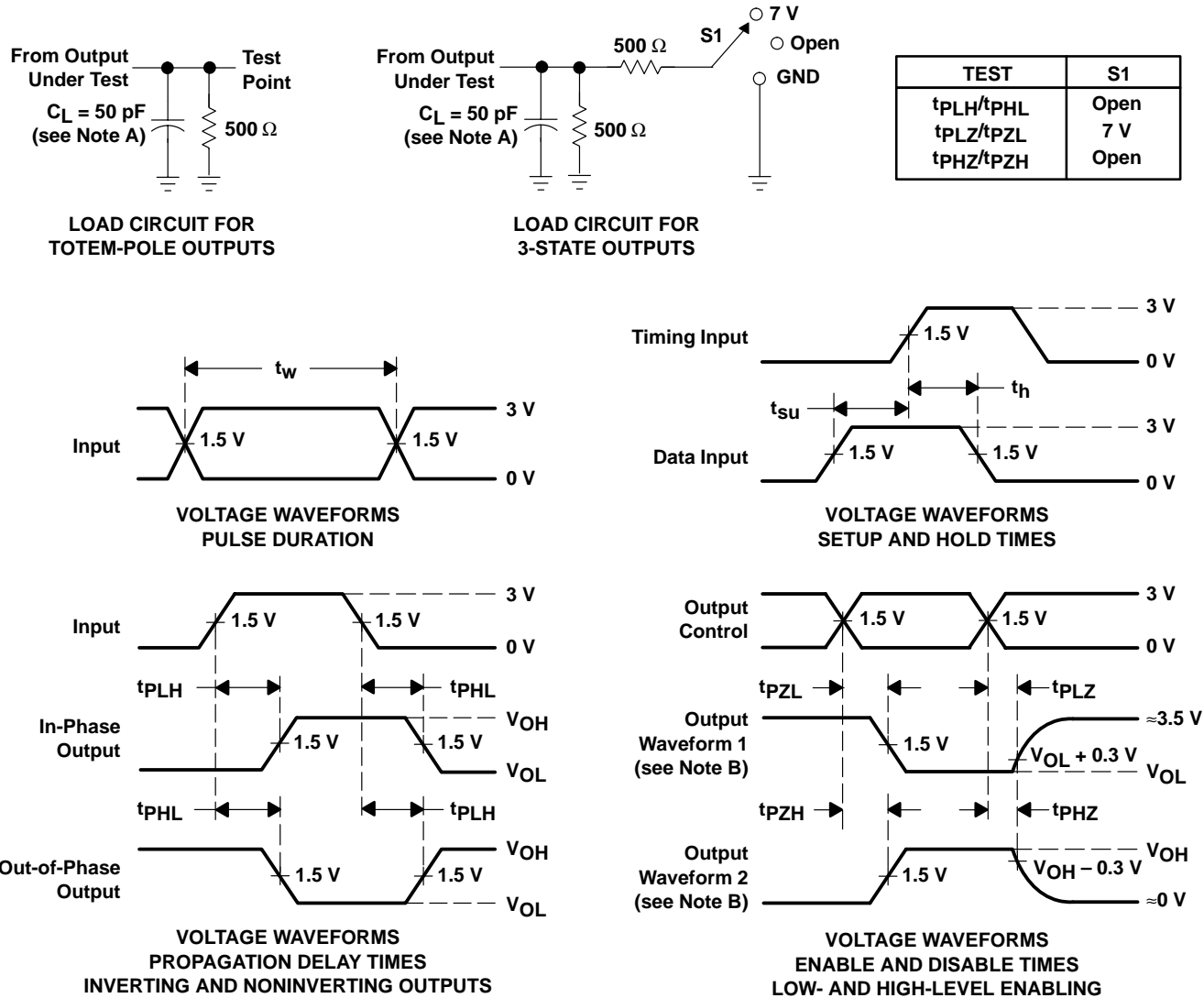
PARAMETER	FROM (INPUT)	TO (OUTPUT)	CY54FCT245T		CY54FCT245AT		CY54FCT245CT		UNIT
			MIN	MAX	MIN	MAX	MIN	MAX	
t <sub>PLH</sub>	A or B	B or A	1.5	7.5	1.5	4.9	1.5	4.5	ns
t <sub>PHL</sub>			1.5	7.5	1.5	4.9	1.5	4.5	
t <sub>PZH</sub>	$\overline{OE}$ or T/ $\overline{R}$	A or B	1.5	10	1.5	6.5	1.5	6.2	ns
t <sub>PZL</sub>			1.5	10	1.5	6.5	1.5	6.2	
t <sub>PHZ</sub>	$\overline{OE}$ or T/ $\overline{R}$	A or B	1.5	10	1.5	6	1.5	5.2	ns
t <sub>PLZ</sub>			1.5	10	1.5	6	1.5	5.2	

#### switching characteristics over operating free-air temperature range (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	CY74FCT245T		CY74FCT245AT		CY74FCT245CT		CY74FCT245DT		UNIT
			MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t <sub>PLH</sub>	A or B	B or A	1.5	7	1.5	4.6	1.5	4.1	1.5	3.8	ns
t <sub>PHL</sub>			1.5	7	1.5	4.6	1.5	4.1	1.5	3.8	
t <sub>PZH</sub>	$\overline{OE}$ or T/ $\overline{R}$	A or B	1.5	9.5	1.5	6.2	1.5	5.8	1.5	5	ns
t <sub>PZL</sub>			1.5	9.5	1.5	6.2	1.5	5.8	1.5	5	
t <sub>PHZ</sub>	$\overline{OE}$ or T/ $\overline{R}$	A or B	1.5	7.5	1.5	5	1.5	4.8	1.5	4.3	ns
t <sub>PLZ</sub>			1.5	7.5	1.5	5	1.5	4.8	1.5	4.3	



## PARAMETER MEASUREMENT INFORMATION



- NOTES: A.  $C_L$  includes probe and jig capacitance.  
 B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.  
 C. The outputs are measured one at a time with one input transition per measurement.

**Figure 1. Load Circuit and Voltage Waveforms**

## PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package   Pins	Package qty   Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
<a href="#">5962-9221401M2A</a>	Active	Production	LCCC (FK)   20	55   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962- 9221401M2A CY54FCT 245TLMB
<a href="#">5962-9221401MRA</a>	Active	Production	CDIP (J)   20	20   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9221401MR A
<a href="#">5962-9221403M2A</a>	Active	Production	LCCC (FK)   20	55   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962- 9221403M2A
<a href="#">5962-9221403MRA</a>	Active	Production	CDIP (J)   20	20   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9221403MR A CY54FCT245ATDM B
<a href="#">5962-9221405M2A</a>	Active	Production	LCCC (FK)   20	55   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962- 9221405M2A CY54FCT 245CTLMB
<a href="#">5962-9221405MRA</a>	Active	Production	CDIP (J)   20	20   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9221405MR A
<a href="#">CY54FCT245ATDMB</a>	Active	Production	CDIP (J)   20	20   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9221403MR A CY54FCT245ATDM B
<a href="#">CY54FCT245CTLMB</a>	Active	Production	LCCC (FK)   20	55   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962- 9221405M2A CY54FCT 245CTLMB
<a href="#">CY54FCT245TLMB</a>	Active	Production	LCCC (FK)   20	55   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962- 9221401M2A CY54FCT 245TLMB
<a href="#">CY74FCT245ATPC</a>	Active	Production	PDIP (N)   20	20   TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 85	CY74FCT245ATPC
CY74FCT245ATPC.B	Active	Production	PDIP (N)   20	20   TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 85	CY74FCT245ATPC
<a href="#">CY74FCT245ATQCT</a>	Active	Production	SSOP (DBQ)   20	2500   LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 85	FCT245A
CY74FCT245ATQCT.B	Active	Production	SSOP (DBQ)   20	2500   LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 85	FCT245A



Orderable part number	Status (1)	Material type (2)	Package   Pins	Package qty   Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
CY74FCT245ATQCTG4	Active	Production	SSOP (DBQ)   20	2500   LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 85	FCT245A
CY74FCT245ATQCTG4.B	Active	Production	SSOP (DBQ)   20	2500   LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 85	FCT245A
<a href="#">CY74FCT245ATSOC</a>	Active	Production	SOIC (DW)   20	25   TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	FCT245A
CY74FCT245ATSOC.B	Active	Production	SOIC (DW)   20	25   TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	FCT245A
<a href="#">CY74FCT245ATSOCT</a>	Active	Production	SOIC (DW)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	FCT245A
CY74FCT245ATSOCT.B	Active	Production	SOIC (DW)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	FCT245A
<a href="#">CY74FCT245CTQCT</a>	Active	Production	SSOP (DBQ)   20	2500   LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 85	FCT245C
CY74FCT245CTQCT.B	Active	Production	SSOP (DBQ)   20	2500   LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 85	FCT245C
<a href="#">CY74FCT245CTSOC</a>	Active	Production	SOIC (DW)   20	25   TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	FCT245C
CY74FCT245CTSOC.B	Active	Production	SOIC (DW)   20	25   TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	FCT245C
<a href="#">CY74FCT245TQCT</a>	Active	Production	SSOP (DBQ)   20	2500   LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 85	FCT245
CY74FCT245TQCT.B	Active	Production	SSOP (DBQ)   20	2500   LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 85	FCT245
CY74FCT245TQCTG4	Active	Production	SSOP (DBQ)   20	2500   LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 85	FCT245
CY74FCT245TQCTG4.B	Active	Production	SSOP (DBQ)   20	2500   LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	-40 to 85	FCT245
<a href="#">CY74FCT245TSOC</a>	Active	Production	SOIC (DW)   20	25   TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	FCT245
CY74FCT245TSOC.B	Active	Production	SOIC (DW)   20	25   TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	FCT245
CY74FCT245TSOCG4	Active	Production	SOIC (DW)   20	25   TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	FCT245
CY74FCT245TSOCG4.B	Active	Production	SOIC (DW)   20	25   TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	FCT245
<a href="#">CY74FCT245TSOCT</a>	Active	Production	SOIC (DW)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	FCT245
CY74FCT245TSOCT.B	Active	Production	SOIC (DW)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	FCT245

<sup>(1)</sup> **Status:** For more details on status, see our [product life cycle](#).

<sup>(2)</sup> **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

<sup>(3)</sup> **RoHS values:** Yes, No, RoHS Exempt. See the [TI RoHS Statement](#) for additional information and value definition.

<sup>(4)</sup> **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

<sup>(5)</sup> **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

<sup>(6)</sup> **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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## TAPE AND REEL INFORMATION



\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
CY74FCT245ATQCT	SSOP	DBQ	20	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
CY74FCT245ATQCTG4	SSOP	DBQ	20	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
CY74FCT245ATSOCT	SOIC	DW	20	2000	330.0	24.4	10.8	13.3	2.7	12.0	24.0	Q1
CY74FCT245CTQCT	SSOP	DBQ	20	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
CY74FCT245TQCT	SSOP	DBQ	20	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
CY74FCT245TQCTG4	SSOP	DBQ	20	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
CY74FCT245TSOCT	SOIC	DW	20	2000	330.0	24.4	10.8	13.3	2.7	12.0	24.0	Q1

## TAPE AND REEL BOX DIMENSIONS



\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
CY74FCT245ATQCT	SSOP	DBQ	20	2500	353.0	353.0	32.0
CY74FCT245ATQCTG4	SSOP	DBQ	20	2500	353.0	353.0	32.0
CY74FCT245ATSOCT	SOIC	DW	20	2000	356.0	356.0	45.0
CY74FCT245CTQCT	SSOP	DBQ	20	2500	353.0	353.0	32.0
CY74FCT245TQCT	SSOP	DBQ	20	2500	353.0	353.0	32.0
CY74FCT245TQCTG4	SSOP	DBQ	20	2500	353.0	353.0	32.0
CY74FCT245TSOCT	SOIC	DW	20	2000	356.0	356.0	45.0

## TUBE

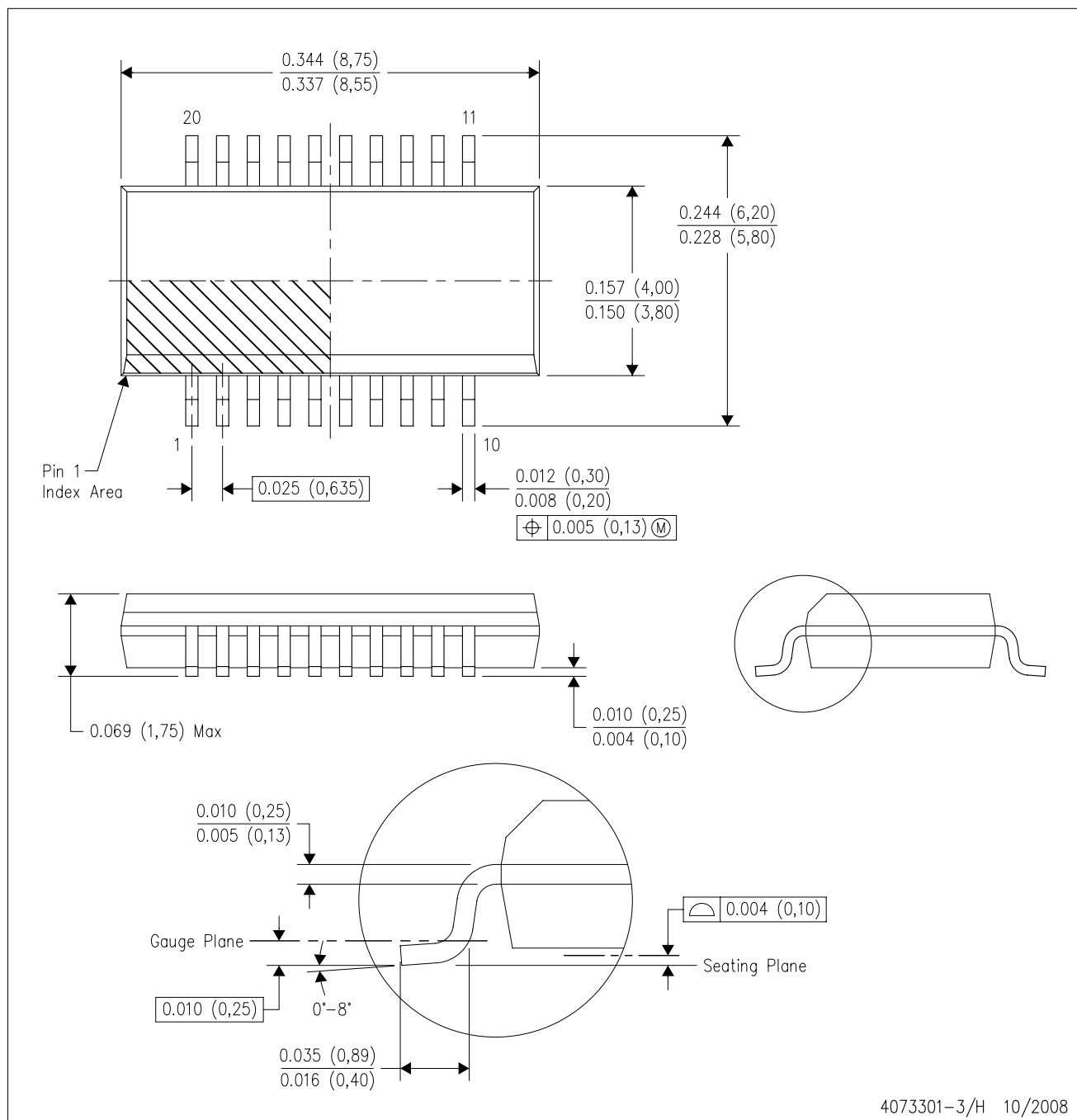


\*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (μm)	B (mm)
5962-9221401M2A	FK	LCCC	20	55	506.98	12.06	2030	NA
5962-9221403M2A	FK	LCCC	20	55	506.98	12.06	2030	NA
5962-9221405M2A	FK	LCCC	20	55	506.98	12.06	2030	NA
CY54FCT245CTLMB	FK	LCCC	20	55	506.98	12.06	2030	NA
CY54FCT245TLMB	FK	LCCC	20	55	506.98	12.06	2030	NA
CY74FCT245ATPC	N	PDIP	20	20	506	13.97	11230	4.32
CY74FCT245ATPC.B	N	PDIP	20	20	506	13.97	11230	4.32
CY74FCT245ATSOC	DW	SOIC	20	25	507	12.83	5080	6.6
CY74FCT245ATSOC.B	DW	SOIC	20	25	507	12.83	5080	6.6
CY74FCT245CTSOC	DW	SOIC	20	25	507	12.83	5080	6.6
CY74FCT245CTSOC.B	DW	SOIC	20	25	507	12.83	5080	6.6
CY74FCT245TSOC	DW	SOIC	20	25	507	12.83	5080	6.6
CY74FCT245TSOC.B	DW	SOIC	20	25	507	12.83	5080	6.6
CY74FCT245TSOCG4	DW	SOIC	20	25	507	12.83	5080	6.6
CY74FCT245TSOCG4.B	DW	SOIC	20	25	507	12.83	5080	6.6

DBQ (R-PDSO-G20)

PLASTIC SMALL-OUTLINE PACKAGE



4073301-3/H 10/2008

- NOTES:
- All linear dimensions are in inches (millimeters).
  - This drawing is subject to change without notice.
  - Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15) per side.
  - Falls within JEDEC MO-137 variation AD.

J (R-GDIP-T\*\*)

14 LEADS SHOWN

# CERAMIC DUAL IN-LINE PACKAGE



PINS ** DIM	14	16	18	20
A	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC
B MAX	0.785 (19,94)	.840 (21,34)	0.960 (24,38)	1.060 (26,92)
B MIN	—	—	—	—
C MAX	0.300 (7,62)	0.300 (7,62)	0.310 (7,87)	0.300 (7,62)
C MIN	0.245 (6,22)	0.245 (6,22)	0.220 (5,59)	0.245 (6,22)



4040083/F 03/03

- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - C. This package is hermetically sealed with a ceramic lid using glass frit.
  - D. Index point is provided on cap for terminal identification only on press ceramic glass frit seal only.
  - E. Falls within MIL STD 1835 GDIP1-T14, GDIP1-T16, GDIP1-T18 and GDIP1-T20.

## GENERIC PACKAGE VIEW

**FK 20**

**LCCC - 2.03 mm max height**

8.89 x 8.89, 1.27 mm pitch

LEADLESS CERAMIC CHIP CARRIER

This image is a representation of the package family, actual package may vary.  
Refer to the product data sheet for package details.



4229370VA\



## N (R-PDIP-T\*\*)

16 PINS SHOWN

## PLASTIC DUAL-IN-LINE PACKAGE



PINS **	14	16	18	20
DIM				
A MAX	0.775 (19,69)	0.775 (19,69)	0.920 (23,37)	1.060 (26,92)
A MIN	0.745 (18,92)	0.745 (18,92)	0.850 (21,59)	0.940 (23,88)
MS-001 VARIATION	AA	BB	AC	AD



14/18 Pin Only  
20 Pin vendor option

4040049/E 12/2002

- NOTES:
- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).
  - The 20 pin end lead shoulder width is a vendor option, either half or full width.



4220724/A 05/2016

## NOTES:

1. All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.43 mm per side.
5. Reference JEDEC registration MS-013.

# EXAMPLE BOARD LAYOUT

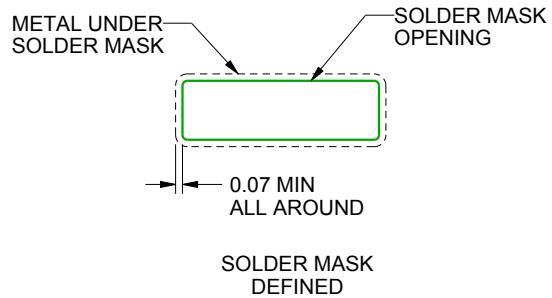
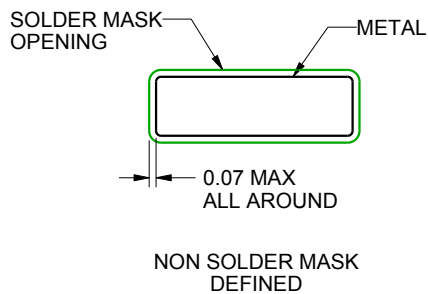
DW0020A

SOIC - 2.65 mm max height

SOIC



LAND PATTERN EXAMPLE  
SCALE:6X



SOLDER MASK DETAILS

4220724/A 05/2016

NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

## EXAMPLE STENCIL DESIGN

DW0020A

SOIC - 2.65 mm max height

SOIC



SOLDER PASTE EXAMPLE  
BASED ON 0.125 mm THICK STENCIL  
SCALE:6X

4220724/A 05/2016

NOTES: (continued)

8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
9. Board assembly site may have different recommendations for stencil design.

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