SN54174, SN54175, SN54LS174, SN54LS175, SN54S174, SN54S175, SN74174, SN74175, SN74LS174, SN74LS175, SN74S174, SN74S175
HEX/QUADRUPLE D-TYPE FLIP-FLOPS WITH CLEAR

SDLS068A – DECEMBER 1972 – REVISED OCTOBER 2001

'174, 'LS174, 'S174 . . . HEX D-TYPE FLIP-FLOPS
'175, 'LS175, 'S175 . . . QUADRUPLE D-TYPE FLIP-FLOPS

- '174, 'LS174, 'S174 Contain Six Flip-Flops with Single-Rail Outputs
- '175, 'LS175, 'S175 Contain Four Flip-Flops with Double-Rail Outputs
- Three Performance Ranges Offered: See Table Lower Right
- Buffered Clock and Direct Clear Inputs
- Individual Data Input to Each Flip-Flop
- Applications include:
  - Buffer/Storage Registers
  - Shift Registers
  - Pattern Generators

description

These monolithic, positive-edge-triggered flip-flops utilize TTL circuitry to implement D-type flip-flop logic. All have a direct clear input, and the '175, 'LS175, and 'S175 feature complementary outputs from each flip-flop.

Information at the D inputs meeting the setup time requirements is transferred to the Q outputs on the positive-going edge of the clock pulse. Clock triggering occurs at a particular voltage level and is not directly related to the transition time of the positive-going pulse. When the clock input is at either the high or low level, the D input signal has no effect at the output.

These circuits are fully compatible for use with most TTL circuits.

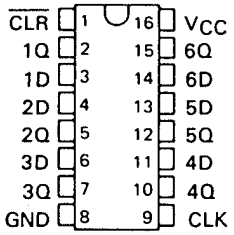
FUNCTION TABLE
(EACH FLIP-FLOP)

INPUTS			OUTPUTS	
CLEAR	CLOCK	D	Q	$\bar{Q}$†
L	X	X	L	H
H	↑	H	H	L
H	↑	L	L	H
H	L	X	Q_0	$\bar{Q}_0$

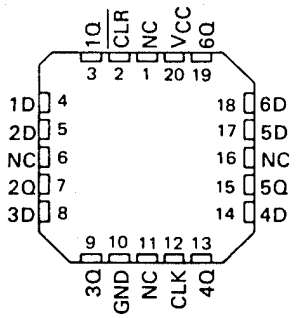
H = high level (steady state)
L = low level (steady state)
X = irrelevant
↑ = transition from low to high level
Q_0 = the level of Q before the indicated steady-state input conditions were established.
† = '175, 'LS175, and 'S175 only

TYPES	TYPICAL MAXIMUM CLOCK FREQUENCY	TYPICAL POWER DISSIPATION PER FLIP-FLOP
'174, '175	35 MHz	38 mW
'LS174, 'LS175	40 MHz	14 mW
'S174, 'S175	110 MHz	75 mW

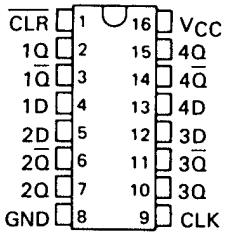
SN54174, SN54LS174, SN54S174 . . . J OR W PACKAGE
SN74174 . . . N PACKAGE
SN74LS174, SN74S174 . . . D OR N PACKAGE
(TOP VIEW)



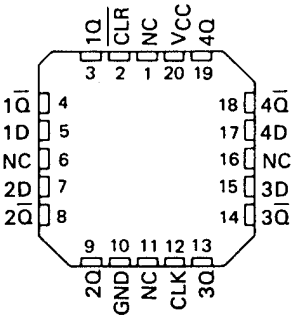
SN54LS174, SN54S174 . . . FK PACKAGE
(TOP VIEW)



SN54175, SN54LS175, SN54S175 . . . J OR W PACKAGE
SN74175 . . . N PACKAGE
SN74LS175, SN74S175 . . . D OR N PACKAGE
(TOP VIEW)



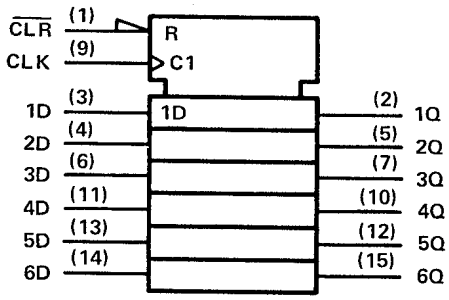
SN54LS175, SN54S175 . . . FK PACKAGE
(TOP VIEW)



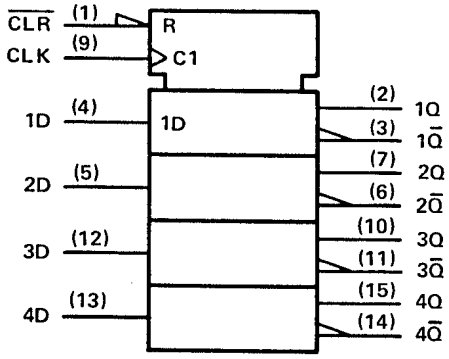
NC – No internal connection

logic symbols†

'174



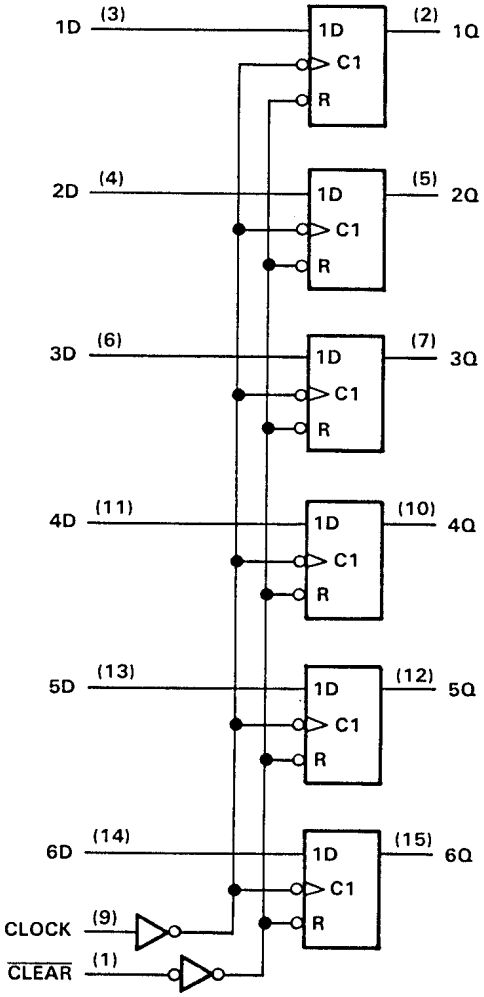
'175



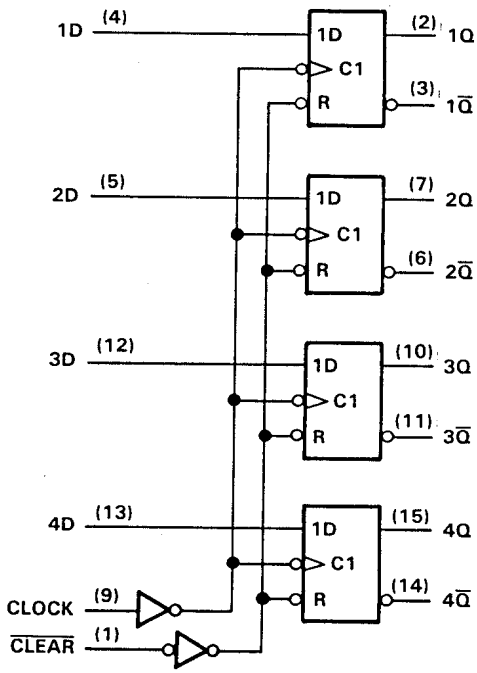
†These symbols are in accordance with ANSI/IEEE Std. 91-1984 and IEC Publication 617-12.
Pin numbers shown are for D, J, N, and W packages.

logic diagrams (positive logic)

'174, 'LS174, 'S174



'175, 'LS175, 'S175

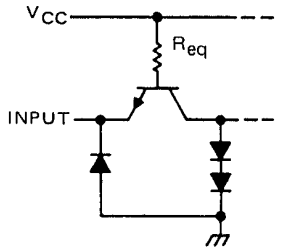


Pin numbers shown are for D, J, N, and W packages.

schematics of inputs and outputs

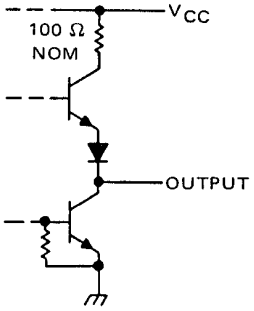
SN54174, SN54175, SN74174, SN74175

EQUIVALENT OF ALL INPUTS



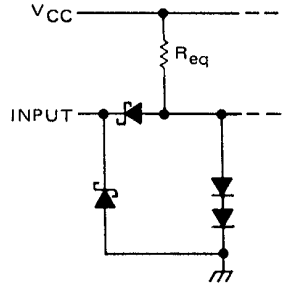
Clock, D: R_{eq} = 8 kΩ NOM
$\overline{\text{Clear}}$: R_{eq} = 4 kΩ NOM

TYPICAL OF ALL OUTPUTS



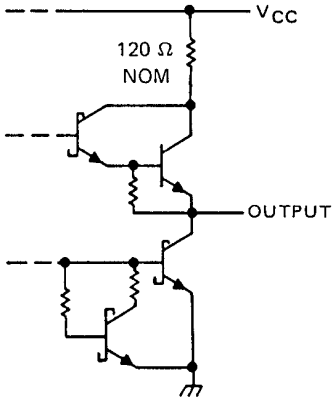
SN54LS174, SN54LS175, SN74LS174, SN74LS175

EQUIVALENT OF ALL INPUTS



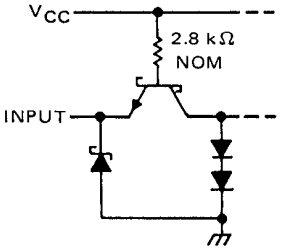
Clock: R_{eq} = 23 kΩ NOM
$\overline{\text{Clear}}$, D: R_{eq} = 28 kΩ NOM

TYPICAL OF ALL OUTPUTS

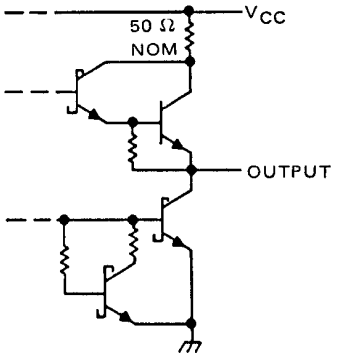


SN54S174, SN54S175, SN74S174, SN74S175

EQUIVALENT OF ALL INPUTS



TYPICAL OF ALL OUTPUTS



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

Supply voltage, V_{CC} (see Note 1) . . . . . 7 V
Input voltage . . . . . 5.5 V
Operating free-air temperature range: SN54174, SN54175 Circuits . . . . . −55°C to 125°C
SN74174, SN74175 Circuits . . . . . 0°C to 70°C
Storage temperature range . . . . . −65°C to 150°C

NOTE 1: Voltage values are with respect to network ground terminal.

recommended operating conditions

		SN54174, SN54175			SN74174, SN74175			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
Supply voltage, V_{CC}		4.5	5	5.5	4.75	5	5.25	V
High-level output current, I_{OH}				−800			−800	μA
Low-level output current, I_{OL}				16			16	mA
Clock frequency, f_{clock}		0		25	0		25	MHz
Width of clock or clear pulse, t_w		20			20			ns
Setup time, t_{su}	Data input	20			20			ns
	Clear inactive-state	25			25			ns
Data hold time, t_h		5			5			ns
Operating free-air temperature, T_A		−55		125	0		70	°C

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

PARAMETER		TEST CONDITIONS†		MIN	TYP‡	MAX	UNIT
V_{IH}	High-level input voltage			2			V
V_{IL}	Low-level input voltage					0.8	V
V_{IK}	Input clamp voltage	V_{CC} = MIN, I_I = −12 mA				−1.5	V
V_{OH}	High-level output voltage	V_{CC} = MIN, V_{IH} = 2 V, V_{IL} = 0.8 V, I_{OH} = −800 μA		2.4	3.4		V
V_{OL}	Low-level output voltage	V_{CC} = MIN, V_{IH} = 2 V, V_{IL} = 0.8 V, I_{OL} = 16 mA			0.2	0.4	V
I_I	Input current at maximum input voltage	V_{CC} = MAX, V_I = 5.5 V				1	mA
I_{IH}	High-level input current	V_{CC} = MAX, V_I = 2.4 V				40	μA
I_{IL}	Low-level input current	V_{CC} = MAX, V_I = 0.4 V				−1.6	mA
I_{OS}	Short-circuit output current§	V_{CC} = MAX	SN54′	−20		−57	mA
			SN74′	−18		−57	
I_{CC}	Supply current	V_{CC} = MAX, See Note 2	′174		45	65	mA
			′175		30	45	

†For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable device type.

‡All typical values are at V_{CC} = 5 V, T_A = 25°C.

§Not more than one output should be shorted at a time.

NOTE 2: With all outputs open and 4.5 V applied to all data and clear inputs, I_{CC} is measured after a momentary ground, then 4.5 V, is applied to clock.

switching characteristics, V_{CC} = 5 V, T_A = 25°C

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
f_{max}	Maximum clock frequency	C_L = 15 pF, R_L = 400 Ω, See Note 3	25	35		MHz
t_{PLH}	Propagation delay time, low-to-high-level output from clear (SN54175, SN74175 only)			16	25	ns
t_{PHL}	Propagation delay time, high-to-low-level output from clear			23	35	ns
t_{PLH}	Propagation delay time, low-to-high-level output from clock			20	30	ns
t_{PHL}	Propagation delay time, high-to-low-level output from clock			24	35	ns

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.

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

Supply voltage, V_{CC} (see Note 1) . . . . . 7 V
Input voltage . . . . . 7 V
Operating free-air temperature range: SN54LS174, SN54LS175 Circuits . . . . . −55°C to 125°C
SN74LS174, SN74LS175 Circuits . . . . . 0°C to 70°C
Storage temperature range . . . . . −65°C to 150°C

NOTE 1: Voltage values are with respect to network ground terminal.

recommended operating conditions

		SN54LS174 SN54LS175			SN74LS174 SN74LS175			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
Supply voltage, V_{CC}		4.5	5	5.5	4.75	5	5.25	V
High-level output current, I_{OH}				−400			−400	μA
Low-level output current, I_{OL}				4			8	mA
Clock frequency, f_{clock}		0		30	0		30	MHz
Width of clock or clear pulse, t_w		20			20			ns
Setup time, t_{su}	Data input	20			20			ns
	Clear inactive-state	25			25			ns
Data hold time, t_h		5			5			ns
Operating free-air temperature, T_A		−55		125	0		70	°C

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

PARAMETER		TEST CONDITIONS†		SN54LS174 SN54LS175			SN74LS174 SN74LS175			UNIT
				MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V_{IH}	High-level input voltage			2			2			V
V_{IL}	Low-level input voltage					0.7			0.8	V
V_{IK}	Input clamp voltage	V_{CC} = MIN, I_I = −18 mA				−1.5			−1.5	V
V_{OH}	High-level output voltage	V_{CC} = MIN, V_{IH} = 2 V, V_{IL} = V_{IL}max, I_{OH} = −400 μA		2.5	3.5		2.7	3.5		V
V_{OL}	Low-level output voltage	V_{CC} = MIN, V_{IH} = 2 V, V_{IL} = V_{IL} max	I_{OL} = 4 mA		0.25	0.4		0.25	0.4	V
			I_{OL} = 8 mA					0.35	0.5	
I_I	Input current at maximum input voltage	V_{CC} = MAX, V_I = 7 V				0.1			0.1	mA
I_{IH}	High-level input current	V_{CC} = MAX, V_I = 2.7 V				20			20	μA
I_{IL}	Low-level input current	V_{CC} = MAX, V_I = 0.4 V				−0.4			−0.4	mA
I_{OS}	Short-circuit output current§	V_{CC} = MAX		−20		−100	−20		−100	mA
I_{CC}	Supply current	V_{CC} = MAX, See Note 2	'LS174		16	26		16	26	mA
			'LS175		11	18		11	18	

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.
§ Not more than one output should be shorted at a time, and duration of the short-circuit should not exceed one second.
NOTE 2: With all outputs open and 4.5 V applied to all data and clear inputs, I_{CC} is measured after a momentary ground, then 4.5 V, is applied to clock.

switching characteristics, V_{CC} = 5 V, T_A = 25°C

PARAMETER		TEST CONDITIONS	'LS174			'LS175			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
f_{max}	Maximum clock frequency	C_L = 15 pF, R_L = 2 kΩ, See Note 3	30	40		30	40		MHz
t_{PLH}	Propagation delay time, low-to-high-level output from clear						20	30	ns
t_{PHL}	Propagation delay time, high-to-low-level output from clear			23	35		20	30	ns
t_{PLH}	Propagation delay time, low-to-high-level output from clock			20	30		13	25	ns
t_{PHL}	Propagation delay time, high-to-low-level output from clock			21	30		16	25	ns

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.

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

Supply voltage, V_{CC} (see Note 1) . . . . . 7 V
Input voltage . . . . . 5.5 V
Operating free-air temperature range: SN54S174, SN54S175 Circuits . . . . . −55°C to 125°C
SN74S174, SN74S175 Circuits . . . . . 0°C to 70°C
Storage temperature range . . . . . −65°C to 150°C

NOTE 1: Voltage values are with respect to network ground terminal.

recommended operating conditions

		SN54S174, SN54S175			SN74S174, SN74S175			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
Supply voltage, V_{CC}		4.5	5	5.5	4.75	5	5.25	V
High-level output current, I_{OH}				−1			−1	mA
Low-level output current, I_{OL}				20			20	mA
Clock frequency, f_{clock}		0		75	0		75	MHz
Pulse width, t_w	Clock	7			7			ns
	Clear	10			10			
Setup time, t_{su}	Data input	5			5			ns
	Clear inactive-state	5			5			
Data hold time, t_h		3			3			ns
Operating free-air temperature, T_A		−55		125	0		70	°C

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

PARAMETER		TEST CONDITIONS†		MIN	TYP‡	MAX	UNIT
V_{IH}	High-level input voltage			2			V
V_{IL}	Low-level input voltage					0.8	V
V_{IK}	Input clamp voltage	V_{CC} = MIN, I_I = −18 mA				−1.2	V
V_{OH}	High-level output voltage	V_{CC} = MIN, V_{IH} = 2 V, V_{IL} = 0.8 V, I_{OH} = −1 mA	SN54S'	2.5	3.4		V
			SN74S'	2.7	3.4		
V_{OL}	Low-level output voltage	V_{CC} = MIN, V_{IH} = 2 V, V_{IL} = 0.8 V, I_{OL} = 20 mA				0.5	V
I_I	Input current at maximum input voltage	V_{CC} = MAX, V_I = 5.5 V				1	mA
I_{IH}	High-level input current	V_{CC} = MAX, V_I = 2.7 V				50	μA
I_{IL}	Low-level input current	V_{CC} = MAX, V_I = 0.5 V				−2	mA
I_{OS}	Short-circuit output current§	V_{CC} = MAX		−40		−100	mA
I_{CC}	Supply current	V_{CC} = MAX, See Note 2	'174		90	144	mA
			'175		60	96	

†For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable device type.
‡All typical values are at V_{CC} = 5 V, T_A = 25°C.
§Not more than one output should be shorted at a time, and duration of the short-circuit should not exceed one second.
NOTE 2: With all outputs open and 4.5 V applied to all data and clear inputs, I_{CC} is measured after a momentary ground, then 4.5 V, is applied to clock.

switching characteristics, V_{CC} = 5 V, T_A = 25°C

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
f_{max}	Maximum clock frequency	C_L = 15 pF, R_L = 280 Ω, See Note 3	75	110		MHz
t_{PLH}	Propagation delay time, low-to-high-level $\overline{Q}$ output from clear (SN54S175, SN74S175 only)			10	15	ns
t_{PHL}	Propagation delay time, high-to-low-level Q output from clear			13	22	ns
t_{PLH}	Propagation delay time, low-to-high-level output from clock			8	12	ns
t_{PHL}	Propagation time, high-to-low-level output from clock			11.5	17	ns

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.

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)
JM38510/07105BEA	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 07105BEA
JM38510/07105BEA.A	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 07105BEA
JM38510/07105BFA	Active	Production	CFP (W) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 07105BFA
JM38510/07105BFA.A	Active	Production	CFP (W) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 07105BFA
JM38510/07106BEA	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 07106BEA
JM38510/07106BEA.A	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 07106BEA
JM38510/30106B2A	Active	Production	LCCC (FK) | 20	55 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30106B2A
JM38510/30106B2A.A	Active	Production	LCCC (FK) | 20	55 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30106B2A
JM38510/30106BEA	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30106BEA
JM38510/30106BEA.A	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30106BEA
JM38510/30106BFA	Active	Production	CFP (W) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30106BFA
JM38510/30106BFA.A	Active	Production	CFP (W) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30106BFA
JM38510/30107B2A	Active	Production	LCCC (FK) | 20	55 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30107B2A
JM38510/30107B2A.A	Active	Production	LCCC (FK) | 20	55 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30107B2A
JM38510/30107BEA	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30107BEA
JM38510/30107BEA.A	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30107BEA

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)
JM38510/30107BFA	Active	Production	CFP (W) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30107BFA
JM38510/30107BFA.A	Active	Production	CFP (W) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30107BFA
M38510/07105BEA	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 07105BEA
M38510/07105BFA	Active	Production	CFP (W) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 07105BFA
M38510/07106BEA	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 07106BEA
M38510/30106B2A	Active	Production	LCCC (FK) | 20	55 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30106B2A
M38510/30106BEA	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30106BEA
M38510/30106BFA	Active	Production	CFP (W) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30106BFA
M38510/30107B2A	Active	Production	LCCC (FK) | 20	55 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30107B2A
M38510/30107BEA	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30107BEA
M38510/30107BFA	Active	Production	CFP (W) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	JM38510/ 30107BFA
SN54LS174J	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54LS174J
SN54LS174J.A	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54LS174J
SN54LS175J	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54LS175J
SN54LS175J.A	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54LS175J
SN54S174J	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54S174J
SN54S174J.A	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54S174J
SN54S175J	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54S175J
SN54S175J.A	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54S175J
SN74LS174D	Obsolete	Production	SOIC (D) | 16	-	-	Call TI	Call TI	0 to 70	LS174
SN74LS174DR	Active	Production	SOIC (D) | 16	2500 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	LS174
SN74LS174DR.A	Active	Production	SOIC (D) | 16	2500 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	LS174
SN74LS174N	Active	Production	PDIP (N) | 16	25 | TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74LS174N

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)
SN74LS174N.A	Active	Production	PDIP (N) | 16	25 | TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74LS174N
SN74LS174NSR	Active	Production	SOP (NS) | 16	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	74LS174
SN74LS174NSR.A	Active	Production	SOP (NS) | 16	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	74LS174
SN74LS175D	Obsolete	Production	SOIC (D) | 16	-	-	Call TI	Call TI	0 to 70	LS175
SN74LS175DR	Active	Production	SOIC (D) | 16	2500 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	LS175
SN74LS175DR.A	Active	Production	SOIC (D) | 16	2500 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	LS175
SN74LS175N	Active	Production	PDIP (N) | 16	25 | TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74LS175N
SN74LS175N.A	Active	Production	PDIP (N) | 16	25 | TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74LS175N
SN74LS175NE4	Active	Production	PDIP (N) | 16	25 | TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74LS175N
SN74LS175NSR	Active	Production	SOP (NS) | 16	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	74LS175
SN74LS175NSR.A	Active	Production	SOP (NS) | 16	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	74LS175
SN74S175D	Active	Production	SOIC (D) | 16	40 | TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	S175
SN74S175D.A	Active	Production	SOIC (D) | 16	40 | TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	S175
SN74S175N	Active	Production	PDIP (N) | 16	25 | TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74S175N
SN74S175N.A	Active	Production	PDIP (N) | 16	25 | TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74S175N
SNJ54LS174FK	Active	Production	LCCC (FK) | 20	55 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS 174FK
SNJ54LS174FK.A	Active	Production	LCCC (FK) | 20	55 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS 174FK
SNJ54LS174J	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS174J
SNJ54LS174J.A	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS174J
SNJ54LS174W	Active	Production	CFP (W) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS174W
SNJ54LS174W.A	Active	Production	CFP (W) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS174W
SNJ54LS175FK	Active	Production	LCCC (FK) | 20	55 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS 175FK
SNJ54LS175FK.A	Active	Production	LCCC (FK) | 20	55 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS 175FK
SNJ54LS175J	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS175J
SNJ54LS175J.A	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS175J
SNJ54LS175W	Active	Production	CFP (W) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS175W
SNJ54LS175W.A	Active	Production	CFP (W) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54LS175W
SNJ54S174J	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54S174J

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)
SNJ54S174J.A	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54S174J
SNJ54S174W	Active	Production	CFP (W) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54S174W
SNJ54S174W.A	Active	Production	CFP (W) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54S174W
SNJ54S175J	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54S175J
SNJ54S175J.A	Active	Production	CDIP (J) | 16	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SNJ54S175J

(1) **Status:** For more details on status, see our product life cycle.

(2) **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.

(3) **RoHS values:** Yes, No, RoHS Exempt. See the TI RoHS Statement for additional information and value definition.

(4) **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.

(5) **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.

(6) **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.

OTHER QUALIFIED VERSIONS OF SN54LS174, SN54LS175, SN54S175, SN74LS174, SN74LS175, SN74S175 :

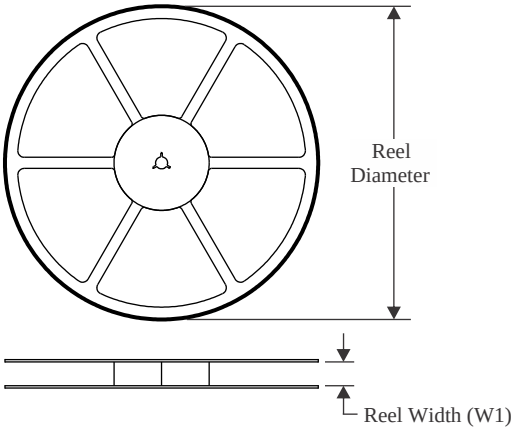
- Catalog : SN74LS174, SN74LS175, SN74S175
- Military : SN54LS174, SN54LS175, SN54S175

NOTE: Qualified Version Definitions:

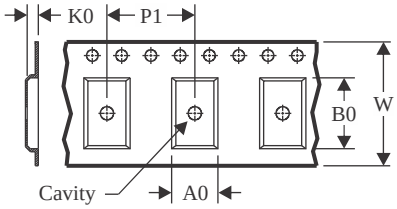
- Catalog - TI's standard catalog product
- Military - QML certified for Military and Defense Applications

TAPE AND REEL INFORMATION

REEL DIMENSIONS

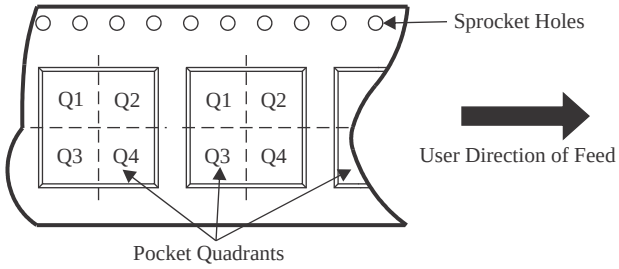


TAPE DIMENSIONS



A0	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

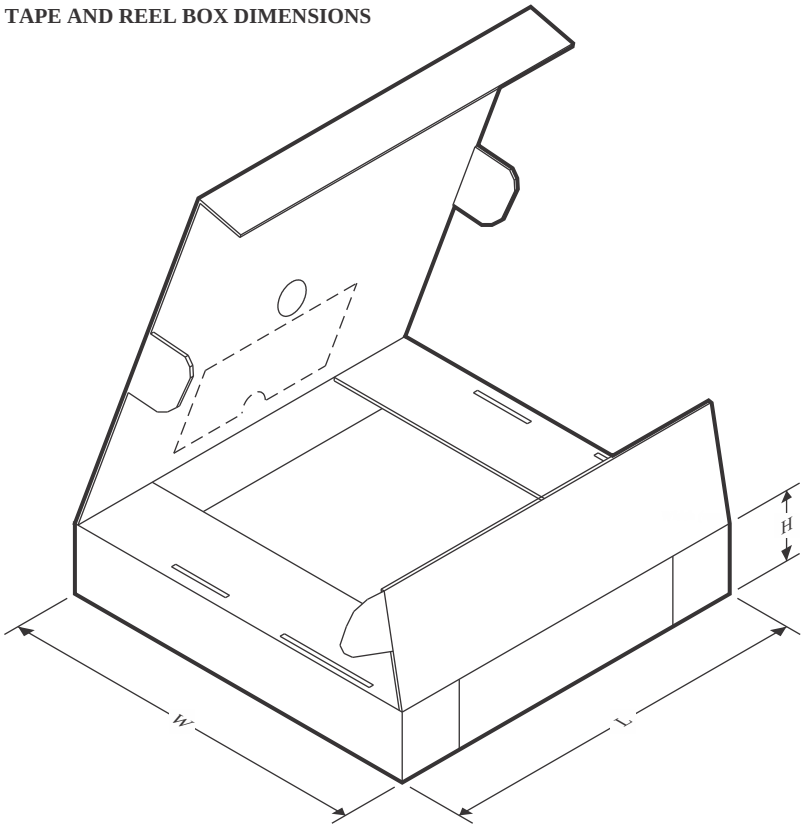
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74LS174DR	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	8.0	16.0	Q1
SN74LS174NSR	SOP	NS	16	2000	330.0	16.4	8.1	10.4	2.5	12.0	16.0	Q1
SN74LS175DR	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	8.0	16.0	Q1
SN74LS175NSR	SOP	NS	16	2000	330.0	16.4	8.1	10.4	2.5	12.0	16.0	Q1

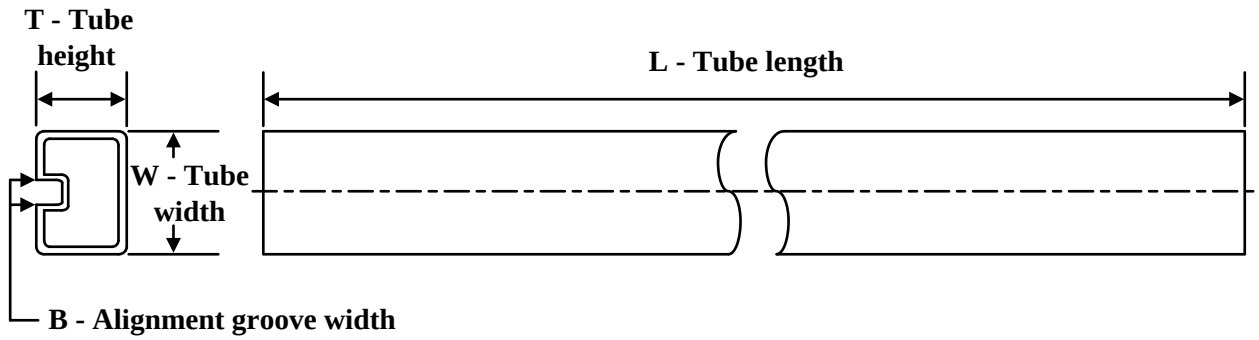
TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74LS174DR	SOIC	D	16	2500	353.0	353.0	32.0
SN74LS174NSR	SOP	NS	16	2000	353.0	353.0	32.0
SN74LS175DR	SOIC	D	16	2500	340.5	336.1	32.0
SN74LS175NSR	SOP	NS	16	2000	353.0	353.0	32.0

TUBE



*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (µm)	B (mm)
JM38510/07105BFA	W	CFP	16	25	506.98	26.16	6220	NA
JM38510/07105BFA.A	W	CFP	16	25	506.98	26.16	6220	NA
JM38510/30106B2A	FK	LCCC	20	55	506.98	12.06	2030	NA
JM38510/30106B2A.A	FK	LCCC	20	55	506.98	12.06	2030	NA
JM38510/30106BFA	W	CFP	16	25	506.98	26.16	6220	NA
JM38510/30106BFA.A	W	CFP	16	25	506.98	26.16	6220	NA
JM38510/30107B2A	FK	LCCC	20	55	506.98	12.06	2030	NA
JM38510/30107B2A.A	FK	LCCC	20	55	506.98	12.06	2030	NA
JM38510/30107BFA	W	CFP	16	25	506.98	26.16	6220	NA
JM38510/30107BFA.A	W	CFP	16	25	506.98	26.16	6220	NA
M38510/07105BFA	W	CFP	16	25	506.98	26.16	6220	NA
M38510/30106B2A	FK	LCCC	20	55	506.98	12.06	2030	NA
M38510/30106BFA	W	CFP	16	25	506.98	26.16	6220	NA
M38510/30107B2A	FK	LCCC	20	55	506.98	12.06	2030	NA
M38510/30107BFA	W	CFP	16	25	506.98	26.16	6220	NA
SN74LS174N	N	PDIP	16	25	506	13.97	11230	4.32
SN74LS174N	N	PDIP	16	25	506	13.97	11230	4.32
SN74LS174N.A	N	PDIP	16	25	506	13.97	11230	4.32
SN74LS174N.A	N	PDIP	16	25	506	13.97	11230	4.32
SN74LS175N	N	PDIP	16	25	506	13.97	11230	4.32
SN74LS175N	N	PDIP	16	25	506	13.97	11230	4.32
SN74LS175N.A	N	PDIP	16	25	506	13.97	11230	4.32
SN74LS175N.A	N	PDIP	16	25	506	13.97	11230	4.32
SN74LS175NE4	N	PDIP	16	25	506	13.97	11230	4.32
SN74LS175NE4	N	PDIP	16	25	506	13.97	11230	4.32
SN74S175D	D	SOIC	16	40	507	8	3940	4.32
SN74S175D.A	D	SOIC	16	40	507	8	3940	4.32
SN74S175N	N	PDIP	16	25	506	13.97	11230	4.32
SN74S175N	N	PDIP	16	25	506	13.97	11230	4.32

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (µm)	B (mm)
SN74S175N.A	N	PDIP	16	25	506	13.97	11230	4.32
SN74S175N.A	N	PDIP	16	25	506	13.97	11230	4.32
SNJ54LS174FK	FK	LCCC	20	55	506.98	12.06	2030	NA
SNJ54LS174FK.A	FK	LCCC	20	55	506.98	12.06	2030	NA
SNJ54LS174W	W	CFP	16	25	506.98	26.16	6220	NA
SNJ54LS174W.A	W	CFP	16	25	506.98	26.16	6220	NA
SNJ54LS175FK	FK	LCCC	20	55	506.98	12.06	2030	NA
SNJ54LS175FK.A	FK	LCCC	20	55	506.98	12.06	2030	NA
SNJ54LS175W	W	CFP	16	25	506.98	26.16	6220	NA
SNJ54LS175W.A	W	CFP	16	25	506.98	26.16	6220	NA

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