

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

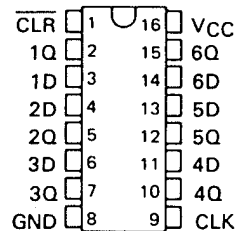
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'174, 'LS174, 'S174 ... HEX D-TYPE FLIP-FLOPS
'175, 'LS175, 'S175 ... QUADRUPLE D-TYPE FLIP-FLOPS

- '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

SN54174, SN54LS174, SN54S174 ... J OR W PACKAGE
SN74174 ... N PACKAGE
SN74LS174, SN74S174 ... D OR N PACKAGE

(TOP VIEW)



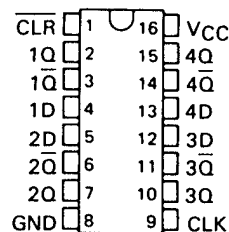
SN54LS174, SN54S174 ... FK PACKAGE

(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

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

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

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logic symbols†



†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)



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



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

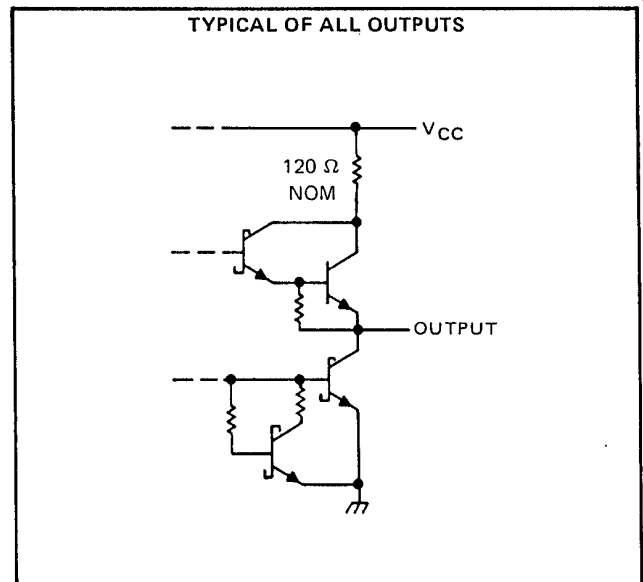
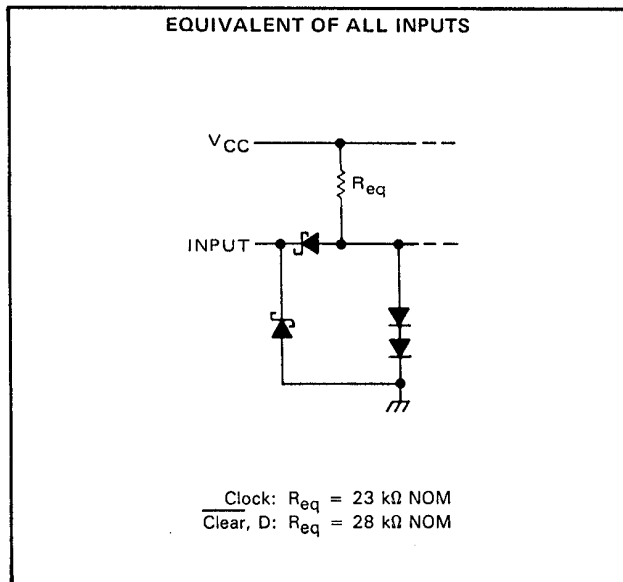
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schematics of inputs and outputs

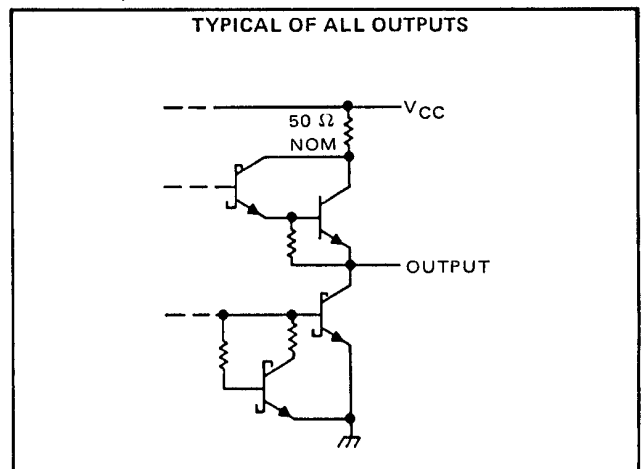
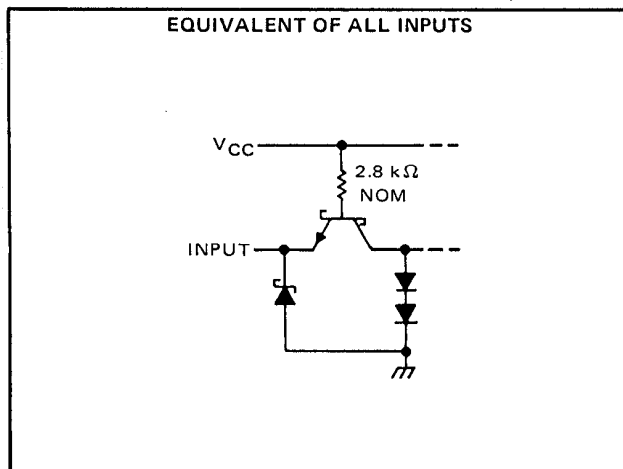
SN54174, SN54175, SN74174, SN74175



SN54LS174, SN54LS175, SN74LS174, SN74LS175



SN54S174, SN54S175, SN74S174, SN74S175



SN54174, SN54175, SN74174, SN74175 HEX/QUADRUPLE D-TYPE FLIP-FLOPS WITH CLEAR

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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	μ A		
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			ns		
	Clear inactive-state			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	$V_{CC} = \text{MIN}, I_I = -12 \text{ mA}$			-1.5	V
V_{OH} High-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V}, V_{IL} = 0.8 \text{ V}, I_{OH} = -800 \mu\text{A}$	2.4	3.4		V
V_{OL} Low-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V}, V_{IL} = 0.8 \text{ V}, I_{OL} = 16 \text{ mA}$		0.2	0.4	V
I_I Input current at maximum input voltage	$V_{CC} = \text{MAX}, V_I = 5.5 \text{ V}$			1	mA
I_{IH} High-level input current	$V_{CC} = \text{MAX}, V_I = 2.4 \text{ V}$			40	μ A
I_{IL} Low-level input current	$V_{CC} = \text{MAX}, V_I = 0.4 \text{ V}$			-1.6	mA
I_{OS} Short-circuit output current§	$V_{CC} = \text{MAX}$	SN54'	-20	-57	mA
		SN74'	-18	-57	
I_{CC} Supply current	$V_{CC} = \text{MAX}, \text{ See Note 2}$	'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 $V_{CC} = 5 \text{ V}, T_A = 25^\circ\text{C}$.

§ 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, $V_{CC} = 5 \text{ V}, T_A = 25^\circ\text{C}$

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
f_{max} Maximum clock frequency		25	35		MHz
t_{PLH} Propagation delay time, low-to-high-level output from clear (SN54175, SN74175 only)	$C_L = 15 \text{ pF}, R_L = 400 \Omega, \text{ See Note 3}$		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.



SN54LS174, SN54LS175, SN74LS174, SN74LS175 HEX/QUADRUPLE D-TYPE FLIP-FLOPS WITH CLEAR

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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	μ A
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	$V_{CC} = \text{MIN}, I_I = -18 \text{ mA}$			-1.5			-1.5	V
V_{OH} High-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V},$ $V_{IL} = V_{IL \text{ max}}, I_{OH} = -400 \mu\text{A}$	2.5	3.5		2.7	3.5		V
V_{OL} Low-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V},$ $V_{IL} = V_{IL \text{ max}}$	$I_{OL} = 4 \text{ mA}$	0.25	0.4	0.25	0.4		V
		$I_{OL} = 8 \text{ mA}$			0.35	0.5		
I_I Input current at maximum input voltage	$V_{CC} = \text{MAX}, V_I = 7 \text{ V}$			0.1			0.1	mA
I_{IH} High-level input current	$V_{CC} = \text{MAX}, V_I = 2.7 \text{ V}$			20			20	μ A
I_{IL} Low-level input current	$V_{CC} = \text{MAX}, V_I = 0.4 \text{ V}$			-0.4			-0.4	mA
I_{OS} Short-circuit output current §	$V_{CC} = \text{MAX}$	-20		-100	-20		-100	mA
I_{CC} Supply current	$V_{CC} = \text{MAX},$ 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 $V_{CC} = 5 \text{ V}, T_A = 25^\circ\text{C}$.

§ 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, $V_{CC} = 5 \text{ V}, T_A = 25^\circ\text{C}$

PARAMETER	TEST CONDITIONS	'LS174			'LS175			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
f_{max} Maximum clock frequency	$C_L = 15 \text{ pF},$ $R_L = 2 \text{ k}\Omega,$ 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.



SN54S174, SN54S175, SN74S174, SN74S175 HEX/QUADRUPLE D-TYPE FLIP-FLOPS WITH CLEAR

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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	$V_{CC} = \text{MIN}, I_I = -18 \text{ mA}$			-1.2	V
V_{OH} High-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V},$ $V_{IL} = 0.8 \text{ V}, I_{OH} = -1 \text{ mA}$	SN54S'	2.5	3.4	V
		SN74S'	2.7	3.4	
V_{OL} Low-level output voltage	$V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V},$ $V_{IL} = 0.8 \text{ V}, I_{OL} = 20 \text{ mA}$			0.5	V
I_I Input current at maximum input voltage	$V_{CC} = \text{MAX}, V_I = 5.5 \text{ V}$			1	mA
I_{IH} High-level input current	$V_{CC} = \text{MAX}, V_I = 2.7 \text{ V}$			50	μA
I_{IL} Low-level input current	$V_{CC} = \text{MAX}, V_I = 0.5 \text{ V}$			-2	mA
I_{OS} Short-circuit output current §	$V_{CC} = \text{MAX}$	-40		-100	mA
I_{CC} Supply current	$V_{CC} = \text{MAX},$ 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 $V_{CC} = 5 \text{ V}, T_A = 25^\circ\text{C}$.

§ 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, $V_{CC} = 5 \text{ V}, T_A = 25^\circ\text{C}$

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
f_{max} Maximum clock frequency		75	110		MHz
t_{PLH} Propagation delay time, low-to-high-level \bar{Q} output from clear (SN54S175, SN74S175 only)	$C_L = 15 \text{ pF},$ $R_L = 280 \Omega,$ See Note 3		10	15	ns
t_{PHL} Propagation delay time, high-to-low-level \bar{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 Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
JM38510/07105BEA	ACTIVE	CDIP	J	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	JM38510/ 07105BEA	Samples
JM38510/07105BFA	ACTIVE	CFP	W	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	JM38510/ 07105BFA	Samples
JM38510/07106BEA	ACTIVE	CDIP	J	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	JM38510/ 07106BEA	Samples
JM38510/30106B2A	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	-55 to 125	JM38510/ 30106B2A	Samples
JM38510/30106BEA	ACTIVE	CDIP	J	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	JM38510/ 30106BEA	Samples
JM38510/30106BFA	ACTIVE	CFP	W	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	JM38510/ 30106BFA	Samples
JM38510/30107B2A	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	-55 to 125	JM38510/ 30107B2A	Samples
JM38510/30107BEA	ACTIVE	CDIP	J	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	JM38510/ 30107BEA	Samples
JM38510/30107BFA	ACTIVE	CFP	W	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	JM38510/ 30107BFA	Samples
M38510/07105BEA	ACTIVE	CDIP	J	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	JM38510/ 07105BEA	Samples
M38510/07105BFA	ACTIVE	CFP	W	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	JM38510/ 07105BFA	Samples
M38510/07106BEA	ACTIVE	CDIP	J	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	JM38510/ 07106BEA	Samples
M38510/30106B2A	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	-55 to 125	JM38510/ 30106B2A	Samples
M38510/30106BEA	ACTIVE	CDIP	J	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	JM38510/ 30106BEA	Samples
M38510/30106BFA	ACTIVE	CFP	W	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	JM38510/ 30106BFA	Samples
M38510/30107B2A	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	-55 to 125	JM38510/ 30107B2A	Samples
M38510/30107BEA	ACTIVE	CDIP	J	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	JM38510/ 30107BEA	Samples

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
										30107BEA	
M38510/30107BFA	ACTIVE	CFP	W	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	JM38510/ 30107BFA	Samples
SN54LS174J	ACTIVE	CDIP	J	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	SN54LS174J	Samples
SN54LS175J	ACTIVE	CDIP	J	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	SN54LS175J	Samples
SN54S174J	ACTIVE	CDIP	J	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	SN54S174J	Samples
SN54S175J	ACTIVE	CDIP	J	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	SN54S175J	Samples
SN74LS174D	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	NIPDAU	Level-1-260C-UNLIM	0 to 70	LS174	Samples
SN74LS174DR	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	NIPDAU	Level-1-260C-UNLIM	0 to 70	LS174	Samples
SN74LS174N	ACTIVE	PDIP	N	16	25	Green (RoHS & no Sb/Br)	NIPDAU	N / A for Pkg Type	0 to 70	SN74LS174N	Samples
SN74LS174NSR	ACTIVE	SO	NS	16	2000	Green (RoHS & no Sb/Br)	NIPDAU	Level-1-260C-UNLIM	0 to 70	74LS174	Samples
SN74LS175D	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	NIPDAU	Level-1-260C-UNLIM	0 to 70	LS175	Samples
SN74LS175DR	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	NIPDAU	Level-1-260C-UNLIM	0 to 70	LS175	Samples
SN74LS175N	ACTIVE	PDIP	N	16	25	Green (RoHS & no Sb/Br)	NIPDAU	N / A for Pkg Type	0 to 70	SN74LS175N	Samples
SN74LS175NE4	ACTIVE	PDIP	N	16	25	Green (RoHS & no Sb/Br)	NIPDAU	N / A for Pkg Type	0 to 70	SN74LS175N	Samples
SN74LS175NSR	ACTIVE	SO	NS	16	2000	Green (RoHS & no Sb/Br)	NIPDAU	Level-1-260C-UNLIM	0 to 70	74LS175	Samples
SN74S175D	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	NIPDAU	Level-1-260C-UNLIM	0 to 70	S175	Samples
SN74S175N	ACTIVE	PDIP	N	16	25	Green (RoHS & no Sb/Br)	NIPDAU	N / A for Pkg Type	0 to 70	SN74S175N	Samples
SNJ54LS174FK	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	-55 to 125	SNJ54LS 174FK	Samples
SNJ54LS174J	ACTIVE	CDIP	J	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	SNJ54LS174J	Samples

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
SNJ54LS174W	ACTIVE	CFP	W	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	SNJ54LS174W	Samples
SNJ54LS175FK	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	-55 to 125	SNJ54LS 175FK	Samples
SNJ54LS175J	ACTIVE	CDIP	J	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	SNJ54LS175J	Samples
SNJ54LS175W	ACTIVE	CFP	W	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	SNJ54LS175W	Samples
SNJ54S174J	ACTIVE	CDIP	J	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	SNJ54S174J	Samples
SNJ54S174W	ACTIVE	CFP	W	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	SNJ54S174W	Samples
SNJ54S175J	ACTIVE	CDIP	J	16	1	TBD	SNPB	N / A for Pkg Type	-55 to 125	SNJ54S175J	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) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".

RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.

Green: TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

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

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(6) Lead finish/Ball material - Orderable Devices 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.

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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

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
SN74LS174DR	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	8.0	16.0	Q1
SN74LS174NSR	SO	NS	16	2000	330.0	16.4	8.2	10.5	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	SO	NS	16	2000	330.0	16.4	8.2	10.5	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	333.2	345.9	28.6
SN74LS174NSR	SO	NS	16	2000	367.0	367.0	38.0
SN74LS175DR	SOIC	D	16	2500	333.2	345.9	28.6
SN74LS175NSR	SO	NS	16	2000	367.0	367.0	38.0

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