
HD74HC564/HD74HC574

Octal D-type Flip-Flops (with 3-state outputs)

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Description



These devices are positive edge triggered flip-flops. The difference between HD74HC564 and HD74HC574 is only that the former has inverting outputs and the latter has noninverting outputs.

Data at the D inputs, meeting the set-up and hold time requirements, are transferred to the Q or \bar{Q} outputs on positive going transitions of the clock (CK) input. When a high logic level is applied to the output control (OC) input, all outputs go to a high impedance state, regardless of what signals are present at the other inputs and the state of the storage elements.

Features

- High Speed Operation: t_{pd} (Clock to Output) = 13 ns typ ($C_L = 50$ pF)
- High Output Current: Fanout of 15 LSTTL Loads
- Wide Operating Voltage: $V_{CC} = 2$ to 6 V
- Low Input Current: 1 μ A max
- Low Quiescent Supply Current: I_{CC} (static) = 4 μ A max ($T_a = 25^\circ\text{C}$)

Function Table

Output Control	Clock	Data	Outputs	
			HD74HC564	HD74HD574
L		H	L	H
L		L	H	L
L	L	X	\bar{Q}_0	Q_0
H	X	X	Z	Z

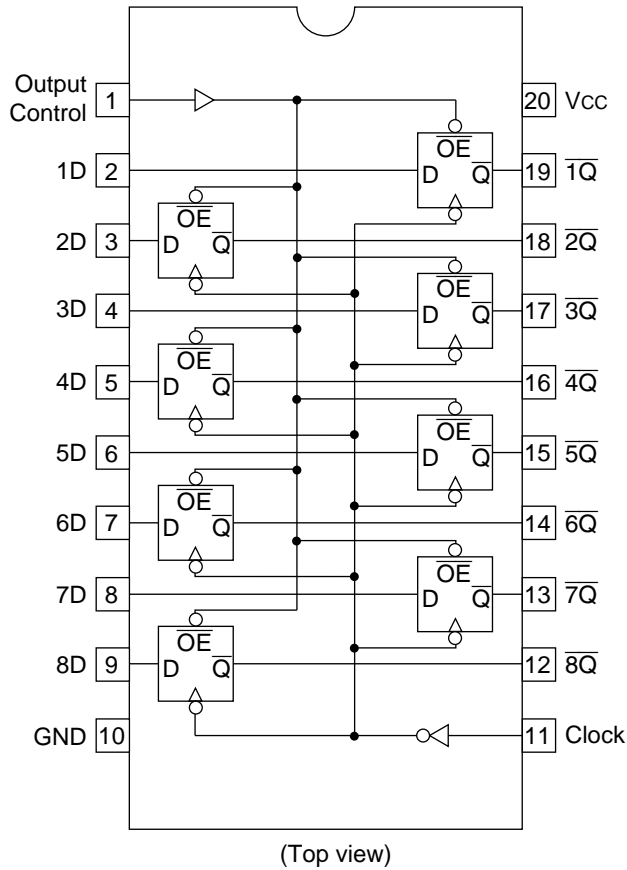
Q_0 : level of Q before the indicated Steady-state input conditions were established.

\bar{Q}_0 : complement of Q_0 or level of \bar{Q} before the indicated Steady-state input Conditions were established.

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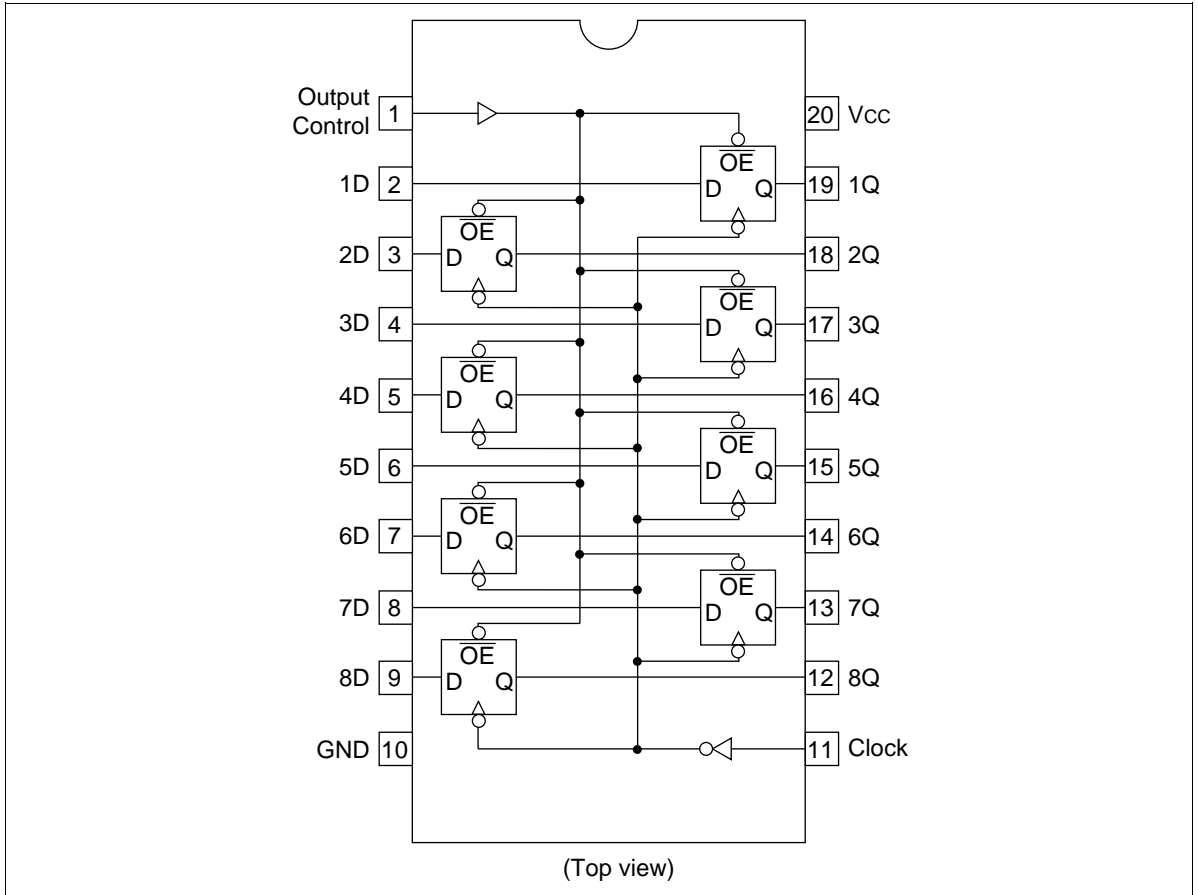
Pin Arrangement

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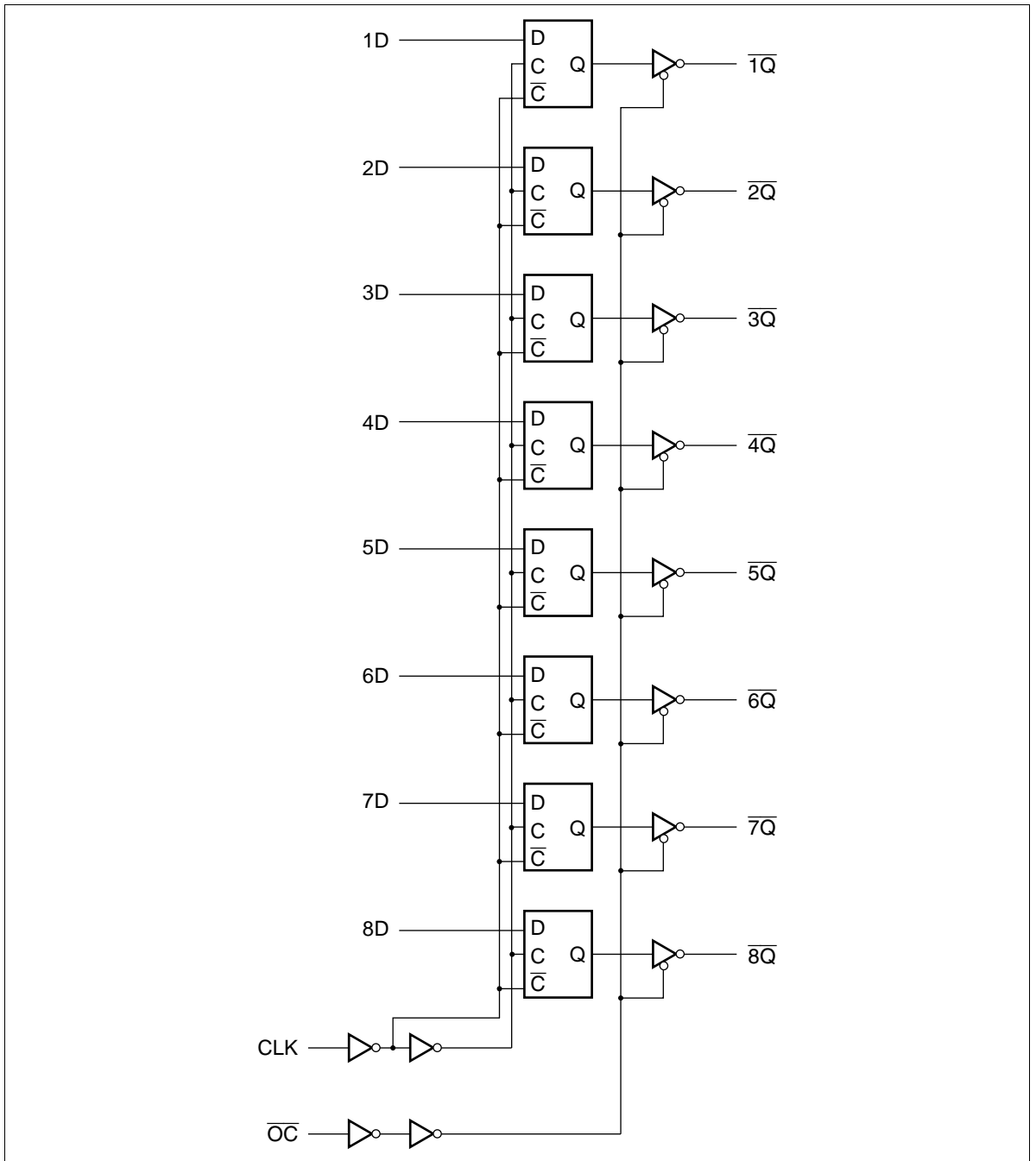
Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Supply voltage range	V_{CC}	-0.5 to +7.0	V
Input voltage	V_{IN}	-0.5 to $V_{CC} + 0.5$	V
Output voltage	V_{OUT}	-0.5 to $V_{CC} + 0.5$	V
Output current	I_{OUT}	± 35	mA
DC current drain per V_{CC} , GND	I_{CC} , I_{GND}	± 75	mA
DC input diode current	I_{IK}	± 20	mA
DC output diode current	I_{OK}	± 20	mA
Power Dissipation per package	P_T	500	mW
Storage temperature	T_{stg}	-65 to +150	$^{\circ}C$

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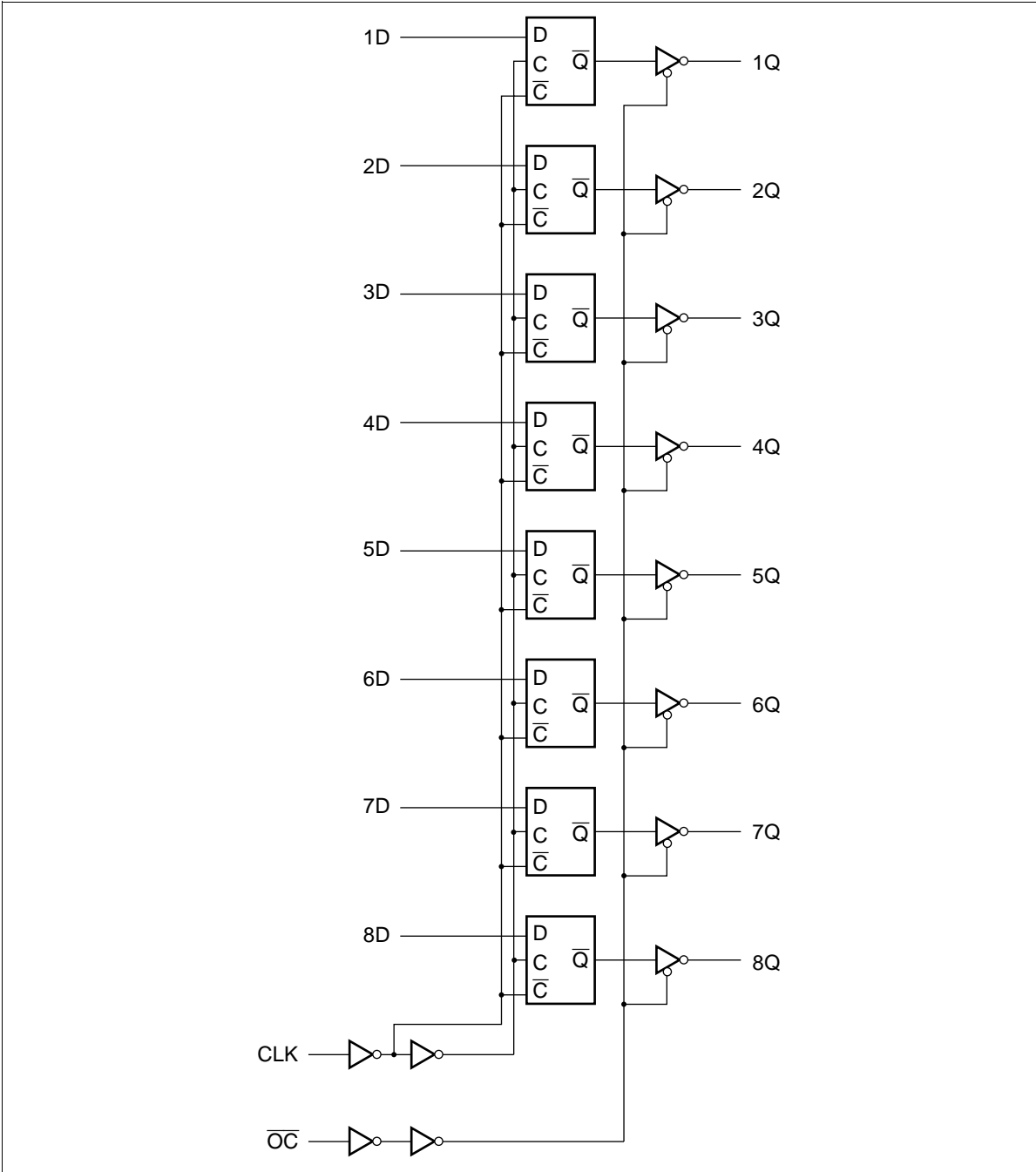
Block Diagram

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HD74HC574

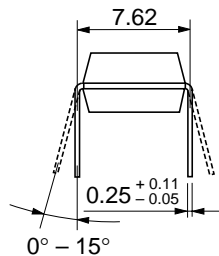
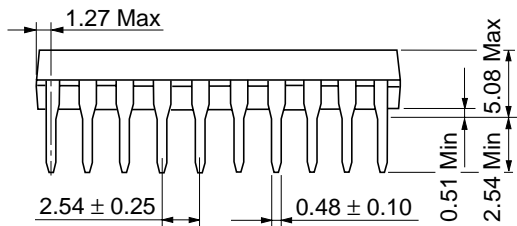
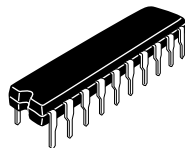
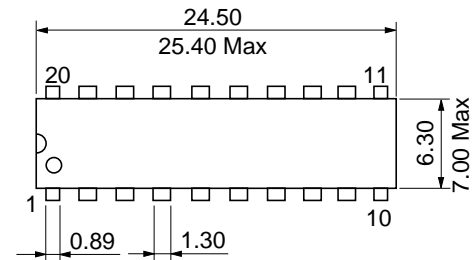


DC Characteristics

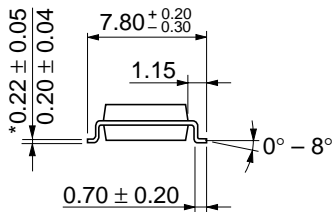
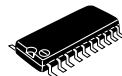
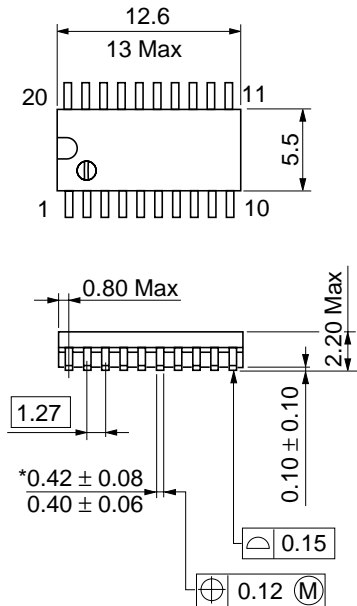
Item	Symbol	V _{CC} (V)	Ta = 25°C		Ta = -40 to +85°C		Unit	Test Conditions	
			Min	Typ	Max	Min			Max
Input voltage	V _{IH}	2.0	1.5	—	—	1.5	—	V	
		4.5	3.15	—	—	3.15	—		
		6.0	4.2	—	—	4.2	—		
	V _{IL}	2.0	—	—	0.5	—	0.5		V
		4.5	—	—	1.35	—	1.35		
		6.0	—	—	1.8	—	1.8		
Output voltage	V _{OH}	2.0	1.9	2.0	—	1.9	—	Vin = V _{IH} or V _{IL} I _{OH} = -20 μA	
		4.5	4.4	4.5	—	4.4	—		
		6.0	5.9	6.0	—	5.9	—		
		4.5	4.18	—	—	4.13	—		I _{OH} = -6 mA
		6.0	5.68	—	—	5.63	—		I _{OH} = -7.8 mA
		6.0	—	0.0	0.1	—	0.1		Vin = V _{IH} or V _{IL} I _{OL} = 20 μA
	V _{OL}	4.5	—	0.0	0.1	—	0.1		
		6.0	—	0.0	0.1	—	0.1		
		4.5	—	—	0.26	—	0.33	I _{OL} = 6 mA	
		6.0	—	—	0.26	—	0.33	I _{OL} = 7.8 mA	
Off-state output current	I _{OZ}	6.0	—	—	±0.5	—	±5.0	μA	Vin = V _{IH} or V _{IL} , Vout = V _{CC} or GND
Input current	I _{in}	6.0	—	—	±0.1	—	±1.0	μA	Vin = V _{CC} or GND
Quiescent supply current	I _{CC}	6.0	—	—	4.0	—	40	μA	Vin = V _{CC} or GND, Iout = 0 μA

AC Characteristics ($C_L = 50$ pF, Input $t_r = t_f = 6$ ns)

Item	Symbol	V_{CC} (V)	$T_a = 25^\circ\text{C}$			$T_a = -40$ to $+85^\circ\text{C}$		Unit	Test Conditions
			Min	Typ	Max	Min	Max		
Maximum clock frequency	f_{max}	2.0	—	—	6	—	5	MHz	Clock to output
		4.5	—	—	30	—	24		
		6.0	—	—	35	—	28		
Propagation delay time	t_{PLH}	2.0	—	—	155	—	195	ns	Clock to output
	t_{PHL}	4.5	—	13	31	—	39		
		6.0	—	—	26	—	33		
Output enable time	t_{ZH}	2.0	—	—	150	—	190	ns	
	t_{ZL}	4.5	—	13	30	—	38		
		6.0	—	—	26	—	33		
Output disable time	t_{HZ}	2.0	—	—	150	—	190	ns	
	t_{LZ}	4.5	—	15	30	—	38		
		6.0	—	—	26	—	33		
Setup time	t_{su}	2.0	—	—	100	—	125	ns	
		4.5	—	1	20	—	25		
		6.0	—	—	17	—	21		
Hold time	t_h	2.0	5	—	—	5	—	ns	
		4.5	5	0	—	5	—		
		6.0	5	—	—	5	—		
Pulse width	t_w	2.0	80	—	—	100	—	ns	
		4.5	16	4	—	20	—		
		6.0	14	—	—	17	—		
Output rise/fall time	t_{TLH}	2.0	—	—	60	—	75	ns	
	t_{THL}	4.5	—	4	12	—	15		
		6.0	—	—	10	—	13		
Input capacitance	C_{in}	—	—	5	10	—	10	pF	

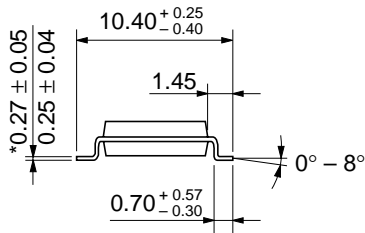
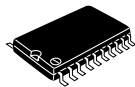
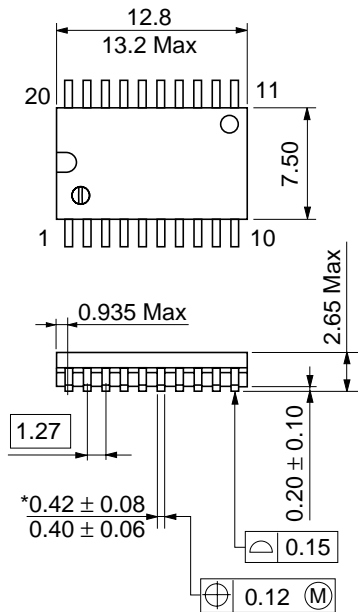


Hitachi Code	DP-20N
JEDEC	—
EIAJ	Conforms
Weight (reference value)	1.26 g



Hitachi Code	FP-20DA
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.31 g

*Dimension including the plating thickness
Base material dimension



*Dimension including the plating thickness
Base material dimension

Hitachi Code	FP-20DB
JEDEC	Conforms
EIAJ	—
Weight (reference value)	0.52 g

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