



# ICS552-01C

## Crystal Oscillator with 8 Low Skew Outputs

### Description

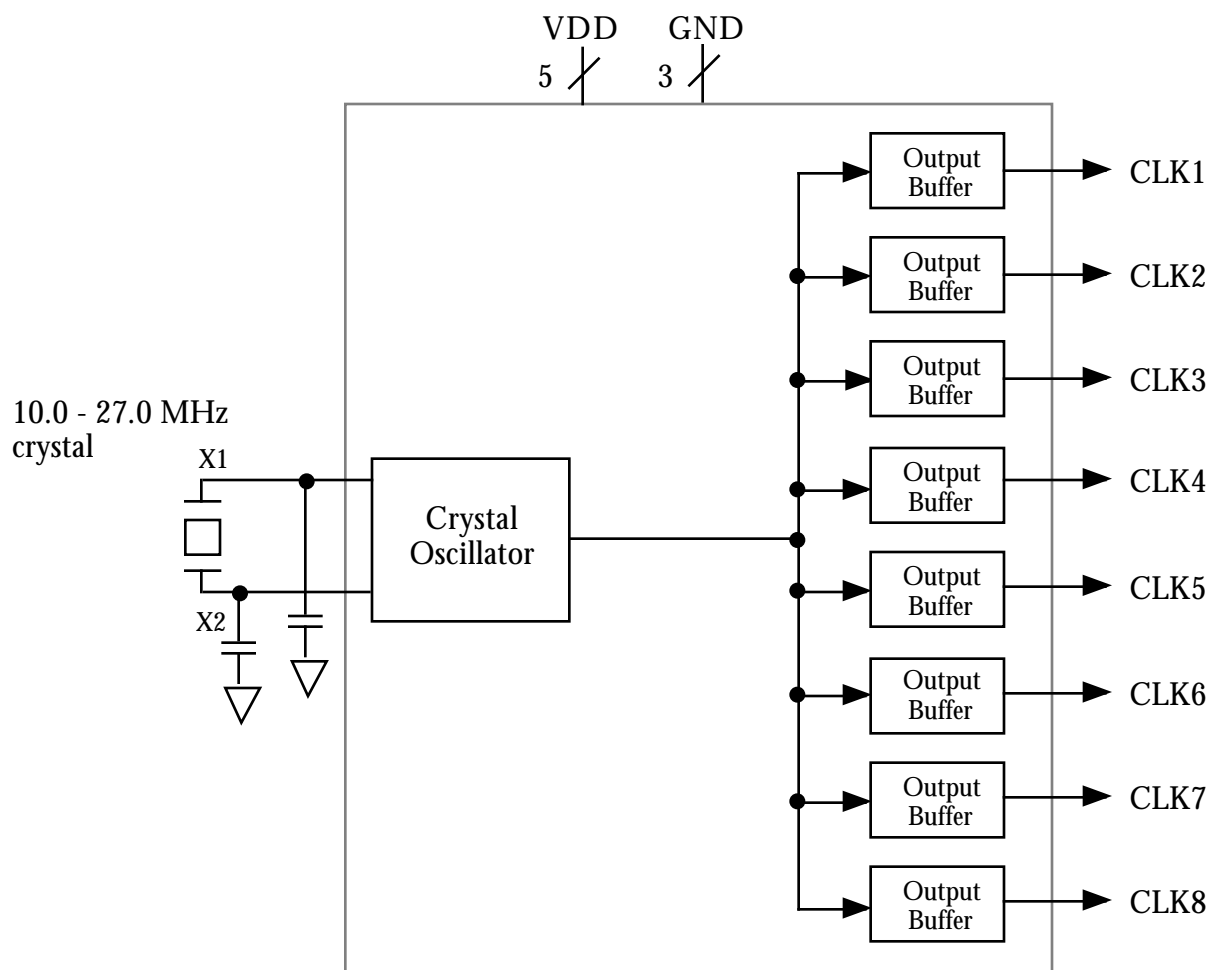
The ICS552-01C produces 8 low skew copies of the output of a crystal oscillator when a fundamental, parallel-mode crystal is connected to it. It is ideal for distributing multiple, low-phase-noise clocks.

### Features

- Packaged in 20 pin SSOP (QSOP)
- Input frequency of 10.0 - 27.0 MHz
- Provides 8 low skew outputs (<250 ps)
- Output clock duty cycle of 40/60 at 3.3 V
- Operating voltages of 3.0 V to 5.5 V
- Industrial temperature available
- Use with 25 MHz crystal for networking
- Use with 27 MHz crystal for MPEG



### Block Diagram





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### Pin Assignment

DC	1	20	VDD
X2	2	19	DC
X1	3	18	CLK8
VDD	4	17	CLK7
GND	5	16	VDD
GND	6	15	VDD
CLK1	7	14	GND
CLK2	8	13	CLK6
CLK3	9	12	CLK5
CLK4	10	11	VDD

20 pin SSOP (QSOP)

### Pin Descriptions

Pin #	Name	Type	Description
1	DC	-	Don't connect.
2	X2	XO	Crystal connection. Connect to a 10 - 27 MHz fundamental mode crystal.
3	X1	XI	Crystal connection. Connect to a 10 - 27 MHz fundamental mode crystal.
4	VDD	P	Connect to +3.3 V or +5.0 V. Decouple with pin 6.
5	GND	P	Connect to ground.
6	GND	P	Connect to ground.
7	CLK1	O	Clock Output 1.
8	CLK2	O	Clock Output 2.
9	CLK3	O	Clock Output 3.
10	CLK4	O	Clock Output 4.
11	VDD	P	Connect to +3.3 V or +5.0 V.
12	CLK5	O	Clock Output 5.
13	CLK6	O	Clock Output 6.
14	GND	P	Connect to ground.
15	VDD	P	Connect to +3.3 V or +5.0 V.
16	VDD	P	Connect to +3.3 V or +5.0 V. Decouple with pin 14.
17	CLK7	O	Clock Output 7.
18	CLK8	O	Clock Output 8.
19	DC	-	Don't connect.
20	VDD	P	Connect to +3.3 V or +5.0 V.

Key: I = Input; O = output; P = power supply connection, XI, XO = crystal connections



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### Electrical Specifications

Parameter	Conditions	Minimum	Typical	Maximum	Units
<b>ABSOLUTE MAXIMUM RATINGS (note 1)</b>					
Supply voltage, VDD	Referenced to GND			7	V
Inputs and Clock Outputs	Referenced to GND	-0.5		VDD+0.5	V
Ambient Operating Temperature		0		70	°C
Soldering Temperature	Max of 10 seconds			260	°C
Storage temperature		-65		150	°C
<b>DC CHARACTERISTICS (VDD = 3.3 V or 5 V unless noted)</b>					
Operating Voltage, VDD		3.0		5.5	V
Input High Voltage, VIH	ICLK	(VDD/2)+1	VDD/2		V
Input Low Voltage, VIL	ICLK		VDD/2	(VDD/2)-1	V
Output High Voltage, VOH	VDD=3.3V, IOH=-8mA	2.4			V
Output Low Voltage, VOL	VDD=3.3V, IOL=8mA			0.4	V
Output High Voltage, VOH, VDD = 3.3 or 5 V	IOH=-8mA	VDD-0.4			V
Operating Supply Current, IDD, at 5 V	No Load, 27 MHz		19		mA
Operating Supply Current, IDD, at 3.3 V	No Load, 27 MHz		11		mA
Short Circuit Current, VDD = 3.3 V	Each output		±50		mA
<b>AC CHARACTERISTICS (VDD = 3.3 V or 5 V unless noted)</b>					
Input Crystal or Clock Frequency		10		27	MHz
Output Clock Rise Time	0.8 to 2.0 V			1.5	ns
Output Clock Fall Time	2.0 to 0.8 V			1.5	ns
Output Clock Duty Cycle	At VDD/2	40	50	60	%
Output to Output Skew	Rising edges at VDD/2			250	ps

Note: 1. Stresses beyond those listed under Absolute Maximum Ratings could cause permanent damage to the device. Prolonged exposure to levels above the operating limits but below the Absolute Maximums may affect device reliability.

### External Components

A minimum number of external components are required for proper operation. A decoupling capacitor of 0.01 uF should be connected between VDD and GND on pins 4 and 6, and 16 and 14. Other VDDs and GNDs can be connected to these pins or directly to their respective power planes. A 33 series terminating resistor may be used on the clock output if the trace is longer than 1 inch.

The crystal should be a fundamental mode (do not use third overtone), parallel resonant, with accuracy as required by the application. Crystal capacitors should be connected from pins X1 to ground and X2 to ground. The value of these capacitors is given by the following equation, where  $C_L$  is the crystal load capacitance: Crystal caps (pF) =  $(C_L - 12) \times 2$ . So for a crystal with 18pF load capacitance, two 12pF caps should be used.



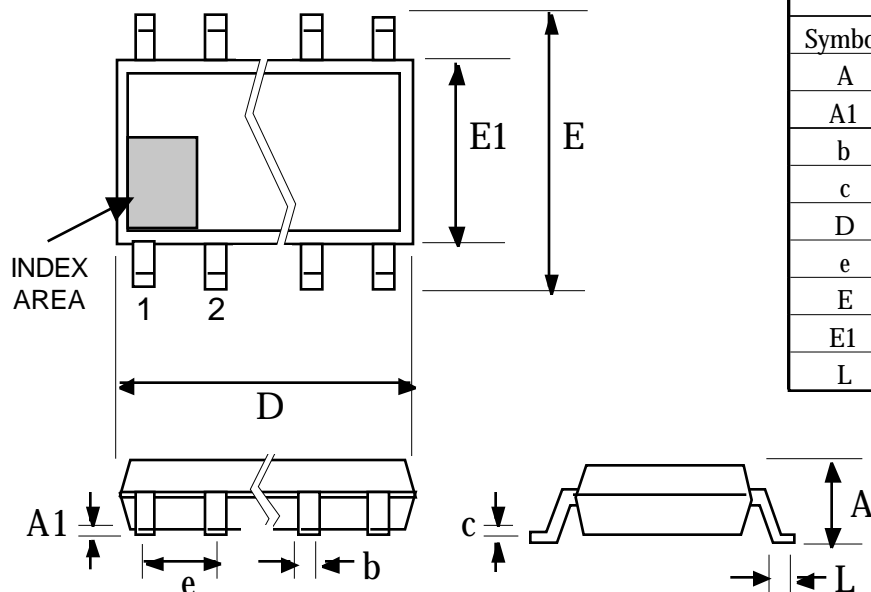
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## Crystal Oscillator with 8 Low Skew Outputs

### Package Outline and Package Dimensions

(For current dimensional specifications, see JEDEC Publication No. 95.)

#### 20 pin SSOP



	Inches		Millimeters	
Symbol	Min	Max	Min	Max
A	0.053	0.069	1.35	1.75
A1	0.004	0.010	0.10	0.25
b	0.008	0.012	0.20	0.30
c	0.007	0.010	0.19	0.25
D	0.337	0.344	8.56	8.74
e	.025 BSC		0.635 BSC	
E	0.228	0.244	5.79	6.20
E1	0.150	0.157	3.81	3.99
L	0.016	0.050	0.41	1.27

### Ordering Information

Part/Order Number	Marking	Package	Shipping	Temperature
ICS552R-01	ICS552R-01	20 pin SSOP	Tubes	0 to 70 °C
ICS552R-01T	ICS552R-01	20 pin SSOP	Tape and Reel	0 to 70 °C
ICS552R-01I	ICS552R-01I	20 pin SSOP	Tubes	-40 to 85 °C
ICS552R-01IT	ICS552R-01I	20 pin SSOP	Tape and Reel	-40 to 85 °C

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