



## One-Time Programmable Clock Oscillator

### Features

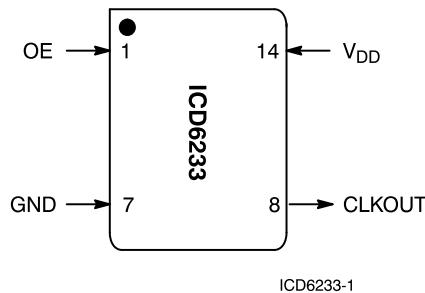
- Industry standard 14-pin package footprint
- Frequency can be programmed one time to values in a wide frequency range (937 kHz to 90 MHz)
- Programmable option allows output to meet both CMOS and TTL duty cycle requirements
- Example applications:
  - Replace custom-frequency metal can oscillators to reduce time to market

- Allows prototyping with custom frequencies
- Reduces inventory needs
- Output can be three-stated
- Output enabled if pin 1 left floating
- Grounded metal cover reduces EMI
- Internal bypass capacitors—no external components required
- Sophisticated PLL technology with Internal Loop-Filter
- 5V operation in CMOS technology

### Functional Description

The ICD6233 is a pin-for-pin-compatible metal can oscillator that allows the user to customize the output frequency. The ICD6233 may be programmed one time for an output in the range of 937 KHz to 90 MHz. At manufacturing time, the desired output frequency is programmed using a popular third-party programmer like Data I/O Unisite or SMS.

### Pin Configurations



### Pin Names

Name	Number	Description
OE	1	Three-State Output Enable; internal pull-up allows no-connect
GND	7	Ground
CLKOUT	8	Programmable Clock Output
V <sub>DD</sub>	14	+5 Volts

**Maximum Ratings**

(Above which the useful life may be impaired. For user guidelines, not tested.)

Supply Voltage to Ground Potential . . . . .  $-0.5\text{V}$  to  $+7.0\text{V}$   
 DC Input Voltage . . . . .  $-0.5\text{V}$  to  $V_{DD} + 0.5\text{V}$   
 Storage Temperature . . . . .  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$   
 Max soldering temperature (10 sec) . . . . .  $260^{\circ}\text{C}$   
 Junction Temperature . . . . .  $+125^{\circ}\text{C}$

**Operating Range**

Ambient Temperature	$V_{DD}$
$0^{\circ}\text{C} \leq T_{\text{AMBIENT}} \leq 70^{\circ}\text{C}$	$5\text{V} \pm 10\%$
$C_L$ 25 pF max.	

**Electrical Characteristics** Over the Operating Range

Parameter	Description	Test Conditions	Min.	Max.	Unit
$I_{DD}$	Supply Current	$V_{DD} = \text{Max.}$ , Output $< 90\text{ MHz}$ CE = $V_{DD}$		55.0	mA
$V_{OH}$	Output HIGH Voltage	$I_{OH} = -4.0\text{mA}$	2.4		V
$V_{OL}$	Output LOW Voltage	$I_{OL} = 4.0\text{ mA}$		0.4	V
$V_{IH}$	Input HIGH Voltage		2.0		V
$V_{IL}$	Input LOW Voltage			0.8	V
$I_{IH}$	Input HIGH Current	$V_{IH} = V_{DD} - 0.5\text{V}$		100.0	$\mu\text{A}$
$I_{IL}$	Input LOW Current	$V_{IL} = +0.5\text{V}$		-250.0	$\mu\text{A}$

**Switching Characteristics** Over the Operating Range<sup>[1]</sup>

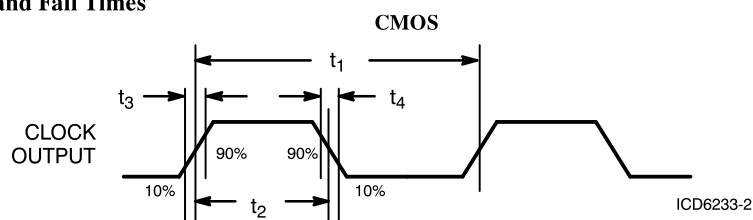
Parameter	Description	Test Conditions	Min.	Max.	Unit
$t_1$	Output Period	5V Operation	11.1 90 MHz	1066.7 937.5 KHz	ns
	Output Duty Cycle	Duty cycle for output pads, define as $t_1 \div t_2$	40	60	%
$t_3$	Rise Time	Clock output rise time		4	ns
$t_4$	Fall Time	Clock output fall time		4	ns
$t_5$	Power-Up	Time for output to become valid		15	msec
$t_6$	Three-State	Time for output oscillator to enter three-state mode after OE goes LOW		12	ns
$t_7$	CLK Valid	Time for output oscillator to enter three-state mode after OE goes HIGH		12	ns

**Note:**

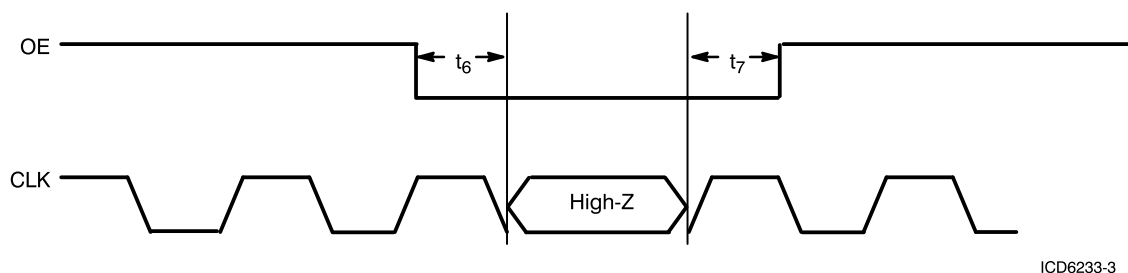
1. Input capacitance is typically 10pF.

## Switching Waveforms

### Rise and Fall Times



### OE Timing



## Ordering Information<sup>[2]</sup>

Ordering Code	Package Name	Package Type	Operating Range
ICD6233–	M	14-Pin Metal Can	Commercial <sup>[3]</sup>

### Note:

2. Call Cypress's IC Designs division at (800) 669-0557 and specify frequency (937.5 KHz to 90 MHz) and output duty cycle (TTL or CMOS).
3. 0°C to +70°C

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