

## HIGH TEMPERATURE CRYSTAL CLOCK GENERATOR

## HTCCG

### FEATURES

- Specified Over -55 to +225°C
- CMOS/TTL Compatible
- Output Frequencies of 24 KHz–20 MHz
- Divide by 2, 4, 8
- Single 5V Supply
- Hermetic 14-Pin Ceramic DIP
- Interfaces With External Crystal

### APPLICATIONS

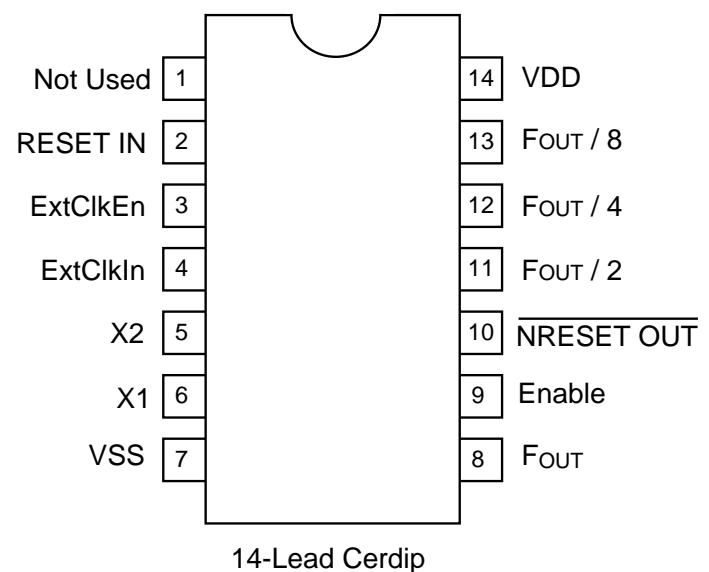
- Down-Hole Oil Well
- Avionics
- Turbine Engine Control
- Industrial Process Control
- Nuclear Reactor
- Electric Power Conversion
- Heavy Duty Internal Combustion Engines

### GENERAL DESCRIPTION

The HTCCG is a high temperature clock oscillator fabricated in Honeywell's HTMOS™ high temperature process. The chip contains a crystal controlled oscillator driver, divider chain, low voltage monitor, and enable and reset lines. Using an external crystal, it is intended to provide reliable precision performance throughout the -55 to +225°C temperature band. All parts are burned in at 250°C to eliminate infant mortality. Typically, parts will operate up to +300°C for a year, with derated performance.

The HTCCG operates from input crystal frequencies of 48KHz to 40MHz. The base frequency output ranges from 24KHz to 20Mhz, with divide by two, four, and eight frequency outputs also provided. An Enable pin is included for extremely low power applications, and a Reset pin for prototyping purposes. The crystal driver may be bypassed for applications requiring only a precision divider chain.

### PACKAGE PINOUT



# HTCCG

## DC ELECTRICAL CHARACTERISTICS

Symbol	Reset Parameters	Typ	Min	Max	Units	Notes
VOLrb	NRESET OUT VOL			0.4	V	
IOLrb	NRESET OUT IOL		16.0		mA	@RESET_BAR=0.4V
VOHrb	NRESET OUT VOH		2.4		V	
IOHrb	NRESET OUT IOH		400.0		μA	@RESET_BAR=2.4V
NRID	RESET IN Detect		1.8	3.3	V	

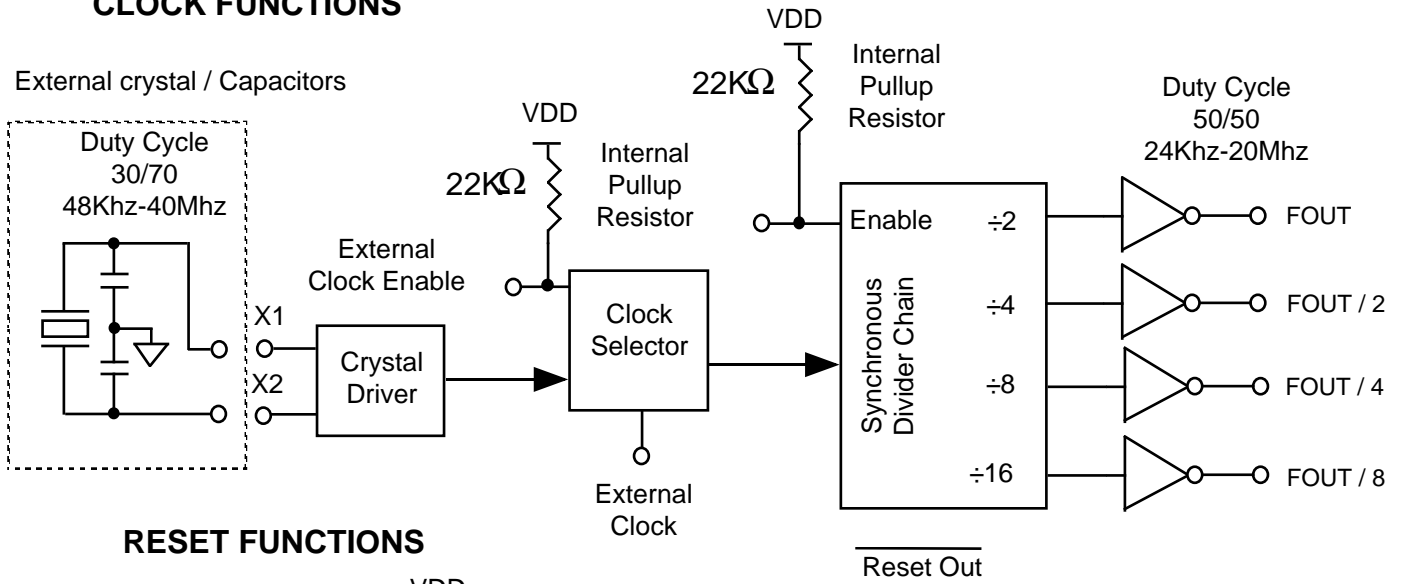
Symbol	Clock Parameters	Typ	Min	Max	Units	Notes
VILen	OUTPUT ENABLE VIL			0.8	V	
VIHen	OUTPUT ENABLE VIH		2.0		V	
IOLen	OUTPUT ENABLE IIL			300	μA	22KΩ Pullup Resistor Current
IOHen	OUTPUT ENABLE IIH			50	μA	22KΩ Pullup Resistor Current
VILen	CLOCK SELECT ENABLE VIL			0.8	V	
VIHen	CLOCK SELECT ENABLE VIH		2.0		V	
IOLen	CLOCK SELECT ENABLE IIL			300	μA	22KΩ Pullup Resistor Current
IOHen	CLOCK SELECT ENABLE IIH			50	μA	22KΩ Pullup Resistor Current
IDD	Supply Current		5.0	50	mA	
	Supply Voltage		4.5	5.5	V	
VOHf	FOUT VOH		2.4			Outputs Disabled
IOHf	FOUT IOH		400μA			
VOHf2	FOUT2 VOH		2.4			Outputs Disabled
IOHf2	FOUT2 IOH		400μA			
VOHf4	FOUT4 VOH		2.4			Outputs Disabled
IOHf4	FOUT4 IOH		400μA			
VOHf8	FOUT8 VOH		2.4			Outputs Disabled
IOHf8	FOUT8 IOH		400μA			

## AC ELECTRICAL CHARACTERISTICS

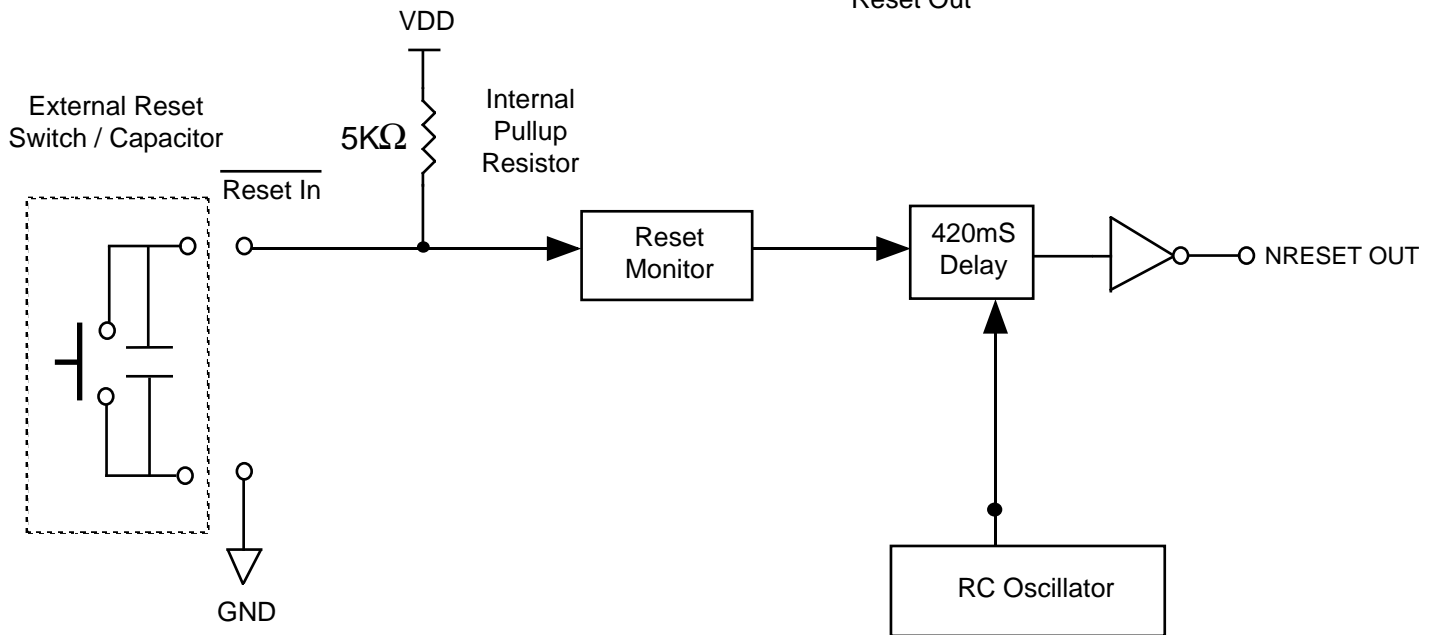
Symbol	Reset Parameters	Typ	Min	Max	Units	Notes
tRST	NRESET OUT Active Time	420	320.0	520	mS	Active Reset Pulse Time
tRPD	RESET IN to NRESET OUT Low			100	nS	

**SIMPLIFIED SCHEMATIC**

**CLOCK FUNCTIONS**



**RESET FUNCTIONS**



# HTCCG

---

## SPECIFICATIONS

Crystal Frequency Range	24KHz—20MHz
Output Symmetry	50 ± 5 %
Supply Voltage	5V ±10%
Supply Current	<10mA

## ABSOLUTE MAXIMUM RATINGS (1)

Input Voltage,  $V_{DD}$  to  $V_{SS}$  ..... -0.5 V to 7.0 V  
Voltage On Any Pin to  $V_{SS}$  ..... -0.5 V to  $V_{DD}+0.3$  V  
Power Dissipation ..... 500 mW  
Storage Temperature ..... -65 to +325°C  
Lead Temperature (attachment, 10 sec) ..... 355°C

Stresses in excess of those listed above may result in permanent damage. These are stress ratings only, and operation at these levels is not implied. Frequent or extended exposure to absolute maximum conditions may effect device reliability.

## ORDERING INFORMATION

### HTCCGDC

D - Indicates package type                      C - Indicates screening level  
D = 14-Lead Ceramic DIP                      C = Commercial

For packaging options, call Honeywell

**To learn more about Honeywell Solid State Electronics Center,  
visit our web site at <http://www.ssec.honeywell.com>**

---

Honeywell reserves the right to make changes to any products or technology herein to improve reliability, function or design. Honeywell does not assume any liability arising out of the application or use of any product or circuit described herein; neither does it convey any license under its patent rights nor the rights of others.

**Honeywell**