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NTE1639
Integrated Circuit
CMOS Clock Generator/Driver for BBDs

Description:

The NTE1639 is a CMOS LSI Clock Generator ina 8–Lead DIP type package capable of generating two phase clock signals of low output impedance for use as a BBD driver. The built–in V_{GG} power supply circuit provides the proper voltages needed for driving BBDs such as the NTE1641.

Features:

- BBD Direct Driving Capability of up to two BBD's
- Self and Separate Oscillations.
- Two Phase Clock Output (Duty: 1/2)
- Built–in V_{GG} Voltage Generator for Driving the NTE1641 BBD.
- Single Power Supply: –8V to –16V.

Applications:

- BBD Clock Generator/Driver.

Absolute Maximum Ratings: (T_A = +25°C unless otherwise specified)

Drain Supply Voltage, V_{DD} . . . . . –18V to +0.3V
Input/Output Pin Voltage, V_I, V_O . . . . . V_{DD} –0.3V to +0.3V
Power Dissipation, P_D 200mW
Operating Ambient Temperature Range, T_{opr} . . . . . –10° to +70°C
Storage Temperature Range, T_{stg} . . . . . –30° to +125°C

Recommended Operating Conditions: (T_A = +25°C unless otherwise specified)

Item	Symbol	Condition	Min	Typ	Max	Unit
Drain Supply Voltage	V_{DD}	GND = 0V	–8	–15	–16	V

Electrical Characteristics: (T_A = +25°C, V_{DD} = –15V, GND = 0V unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Input Drain Current	I_{DD}	No load Clock Output 40kH_Z	–	3	–	mA
Total Power Dissipation	P_{tot}		–	45	–	mW
OX1 Input Pin						
Voltage “H” Level	V_{IH}		0	–	–1	V
Voltage “L” Level	V_{IL}		V_{DD}+1	–	V_{DD}	V
Input Leakage Current	I_{Leak}	V_I = 0V to –15V	–	–	30	µA
OX2 Output Pin						
Output Current “H” Level	$I_{OH(1)}$	V_O = –1V	0.6	–	–	mA
Output Current “L” Level	$I_{OL(1)}$	V_O = –14V	0.5	–	–	mA
Output Leakage Current	$I_{LOL(1)}$	$V_O = V_{DD}$ V_O = GND	– –	– –	30 30	µA µA
OX3 Output pin						
Output Current “H” Level	$I_{OH(2)}$	V_O = –1V	1.5	–	–	mA
Output Current “L” Level	$I_{OL(2)}$	V_O = –14V	2	–	–	mA
Output Leakage Current	$I_{LOL(2)}$	$V_O = V_{DD}$ V_O = GND	– –	– –	30 30	µA µA
CP1, CP2 output pin						
Output Current “H” Level	$I_{OH(3)}$	V_O = –1V	10	–	–	mA
Output Current “L” Level	$I_{OL(3)}$	V_O = –14V	10	–	–	mA
Output Leakage Current	$I_{LOL(3)}$	$V_O = V_{DD}$ V_O = GND	– –	– –	30 30	µA µA
V_{GG} OUT output pin (Note 1)						
Output Voltage	$V_{GG(Out)}$			–14		V

Note 1. This pin generates the V_{GG} voltage for a BBD manufactured by NTE. So therefore, it might not be applicable for other devices. In any case, the $V_{GG(OUT)}$ changes by the following formula depending on the value of V_{DD}.

$$V_{GG(OUT)} \cong \frac{14}{15} V_{DD}$$

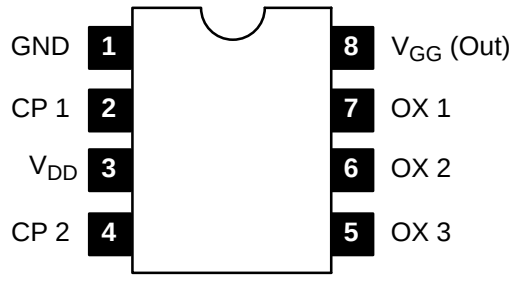
Pin Descriptions:

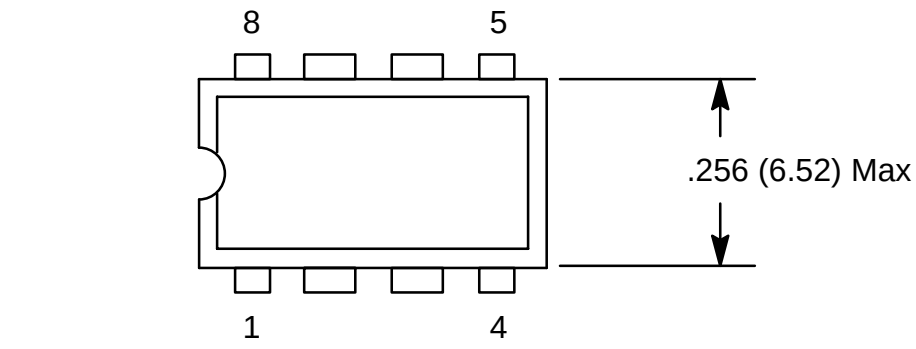
Pin No.	Symbol	Pin Name	Description	
1	GND	Ground	Connected to GND of the circuit.	
2	CP1	Clock Output 1	This pin outputs a clock signal that is the reverse phase of CP2 with a Duty Cycle of 1/2 the frequency of oscillation.	
3	V_{DD}	V_{DD} apply	–15V is applied	
4	CP2	Clock Output 2	This pin outputs a clock signal that is a the reverse phase of CP1	
5	OX3	OSC connections to C_1, R_2, and R_1 separately	R, C are connected for the internal clock.	In case of separate excitation, OX3 and OX2 are opened and OX1 is set to OSC input.
6	OX2			
7	OX1			
8	$V_{GG\ OUT}$	V_{GG} Voltage Output	–14V is output. (V_{DD} = –15V) $V_{GG\ OUT}$ = 14/15V_{DD}.	

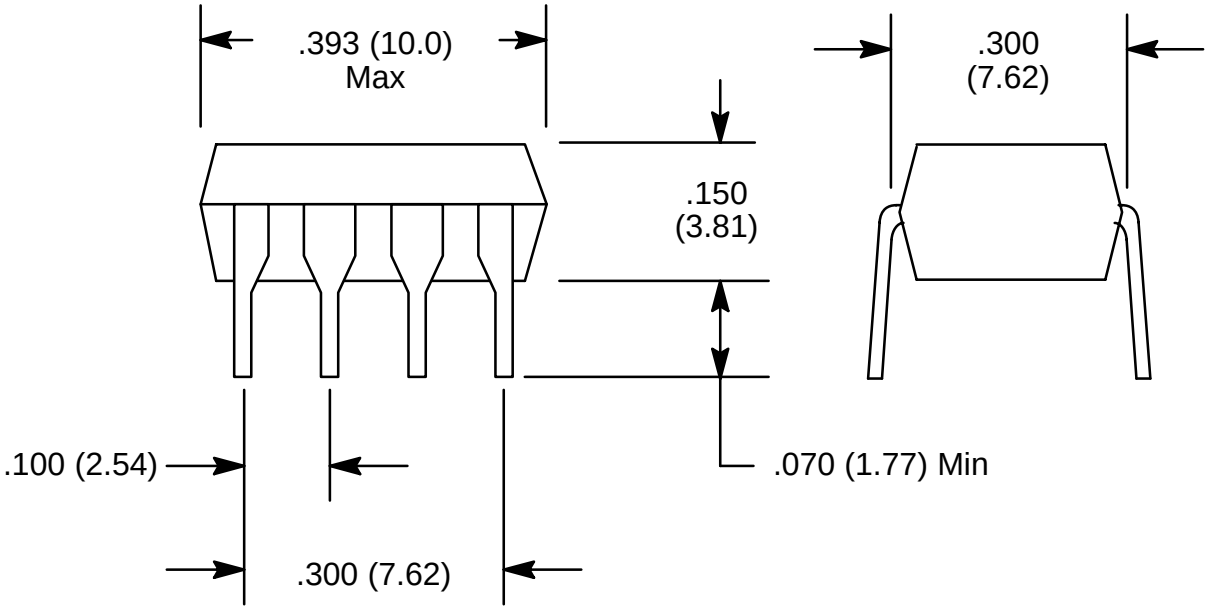
The Maximum Clock Frequency:

The upper limit value of the clock frequency is determined by the load capacitance and power consumption. The maximum power dissipation for the NTE1639 is P_D = 200mW. If the clock frequency of the load capacitance is increased, the power consumption will be increased. Accordingly, in order to utilize this device with a dissipation less than the permissible value, it is necessary to select adequate values for the clock frequency and load capacitance. By connecting a resistance to the clock output pin, it is possible to increase the value of the maximum clock frequency without increasing dissipation. Because the dissipation on the LSI side is lessened, part of the power consumption required for driving the load capacitance is consumed by the series resistance.

Pin Connection Diagram




8
5
.256 (6.52) Max
1
4


.393 (10.0)
Max
.300
(7.62)
.150
(3.81)
.100 (2.54)
.070 (1.77) Min
.300 (7.62)