

The output tri-state function is achieved using two different methods. Each method is dependent on the internal configuration of the oscillator ASIC and provides different functional characteristics. A brief description of each method follows.

TRI-STATE – OSCILLATOR STOP

The oscillator stop function is represented by the schematic of Figure 1. In this configuration, when the INH pin is at Logic 1 or left floating, transistor M1 is turned off allowing the oscillator to run. The output buffer is also activated and the clock signal is present at the output pin. When INH is pulled to Logic 0, transistor M1 is turned on pulling the input to the oscillator gate to ground forcing it to stop oscillating. This also disables (tri-state) the output buffer placing the output pin into a high impedance state. The standby current is very low due to the oscillator shutting off, but the clock signal will take longer to reactivate at the output because the oscillator must restart. Table 1 provides a summary of typical specifications for this method.

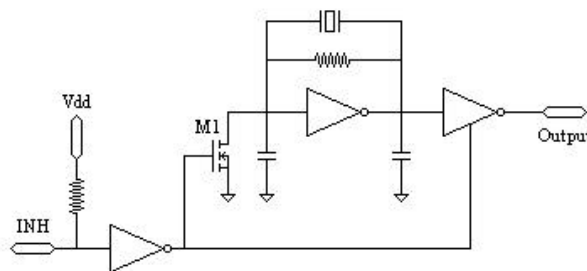


FIGURE 1

TRI-STATE – OSCILLATOR STOP

PARAMETER	SYMBOL	CONDITION	MINIMUM	MAXIMUM	UNITS
Enable Input Voltage	V_{IH}	Logic 1 or NC	2.0		V
Disable Input Voltage	V_{IL}	Output High Impedance	-	0.8	V
Standby Current	I_{ST}	$V_{IL} = 0.8V$ Oscillator stops running	-	15	μA
Output Enable Time	t_{PLZ}	$V_{IH} = 2.0V$	-	10	mS
Oscillator Start-up Time	-	Application of V_{CC}	-	10	mS

TABLE 1

TRI-STATE – OSCILLATOR RUN

The oscillator run function is represented by the schematic of Figure 2. In this configuration, when the INH pin is at Logic 1 or left floating, the oscillator stage is running and the output buffer is active. The clock signal is present at the output pin. When INH is pulled to Logic 0, the output buffer is disabled (tri-state) placing the output pin into a high impedance state, but the oscillator stage remains running. The standby current will be higher in this configuration due to an active oscillator stage, but the clock signal can be reactivated at the output much faster since there is no wait time for the oscillator to start-up. Table 2 provides a summary of typical specifications for this method.

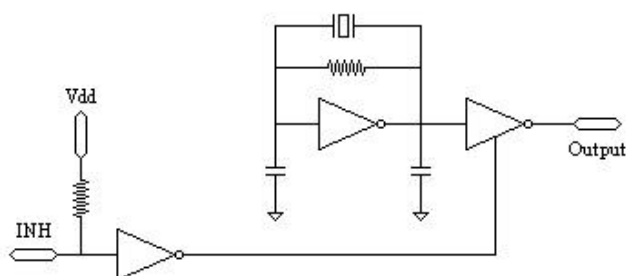


FIGURE 2

TRI-STATE – OSCILLATOR RUN

PARAMETER	SYMBOL	CONDITION	MINIMUM	MAXIMUM	UNITS
Enable Input Voltage	V_{IH}	Logic 1 or NC	2.0		V
Disable Input Voltage	V_{IL}	Output High Impedance	-	0.8	V
Tri-state Current	I_z	$V_{IL} = 0.8V$ Oscillator remains running	-	I_{CC}	mA
Output Enable Time	t_{PLZ}	$V_{IH} = 2.0V$	-	100	nS
Oscillator Start-up Time	-	Application of V_{CC}	-	10	mS

TABLE 2

Each method described above is approved by CTS and both technologies are used in the CB3 and MXO45 clock oscillator product families. The following table indicates which method of tri-state function will be used for a given product family.

PRODUCT FAMILY	TRI-STATE METHOD
MXO45TLV	OSCILLATOR STOP
MXO45HSTLV	
CB3LV	
MXO45T	OSCILLATOR STOP or OSCILLATOR RUN
MXO45HST	
CB3	