SYNCHRO/RESOLVER/INDUCTOSYN® REFERENCE OSCILLATOR

DESCRIPTION

The OSC-15801 is a quadrature power oscillator with two outputs that are 90° out of phase. These outputs provide both the reference and quadrature signals, simultaneously, making the OSC-15801 ideally suited for Inductosyn applications.

The oscillator's outputs are pin-programmable for both frequency and amplitude. The output frequency can be programmed from 400 Hz to 20 kHz by simply connecting two external capacitors. The Reference output voltage, 8.8 Vrms at 20 kHz, can be scaled down by connecting a single resistor.

APPLICATIONS

Packaged in an 18-pin hermetic DDIP, the OSC-15801 operates over a temperature range of -55°C to +125°C. This, combined with its small size and programmable output voltage and frequency capabilities, makes it an excellent choice for use in Inductosyn applications.

FEATURES

- ***Quadrature Reference Output Voltages for Inductosyn Applications***
- ***Programmable Output Frequency from 400 Hz to 20 kHz***
- ***Small 18-Pin DDIP***
- ***Scalable Reference Output***
- ***-55°C to +125°C Operating Temperature Range***

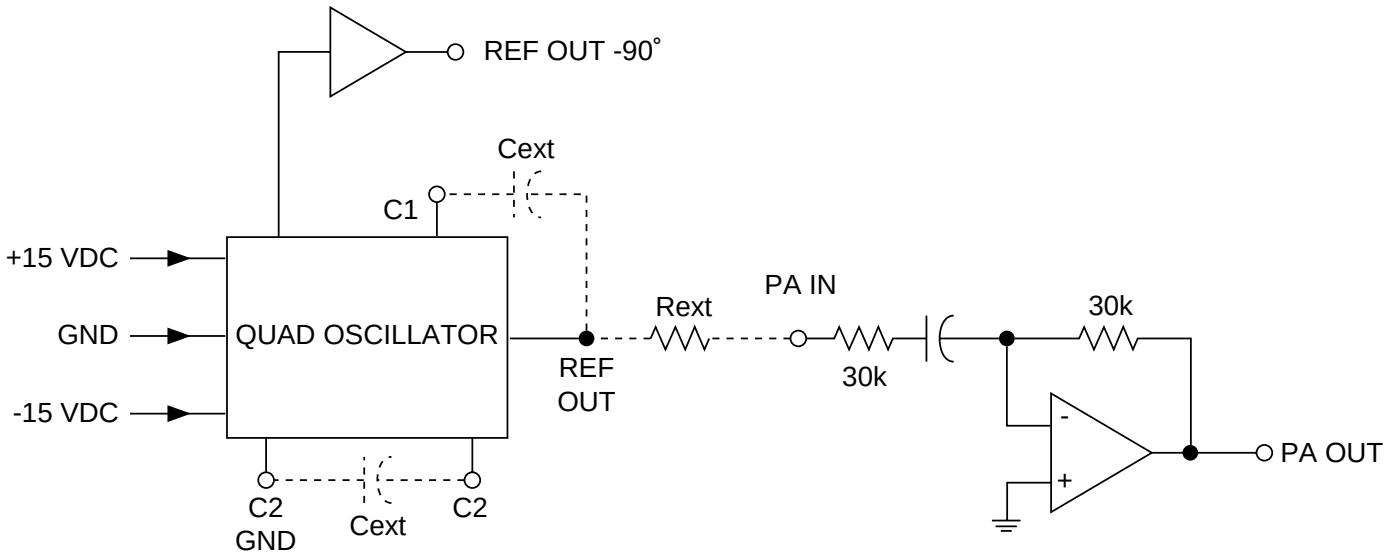


FIGURE 1. OSC-15801 BLOCK DIAGRAM

TABLE 1. OSC-15801 SPECIFICATIONS		
Specifications apply over temperature range and power supply range.		
PARAMETER	**UNITS**	**VALUE**
FREQUENCY	Hz	Programmable from 400 to 20k
OUTPUTS (Note 1)		
PA OUT		
Voltage	V rms	7.1 to 8.8
Continuous Current	mA rms	215 max
Protection		Momentary short circuit (1 sec. max.)
REF		
Voltage	V rms	7.1 to 8.8
Continuous Current	mA rms	3 max
Protection		Momentary short circuit (5 sec. max.)
REF -90°		
Voltage	V rms	(Note 2)
Continuous Current	mA rms	3 max
Protection		Momentary short circuit (5 sec. max.)
POWER SUPPLIES		
Voltage	Vdc	±15 ±5%
Current	mA	10 max plus current load
Max Voltage without damage	Vdc	±18
TEMPERATURE RANGE		
Operating		
-10X	°C	-55 to +125
-30X	°C	0 to +70
Storage	°C	-65 to +150
PHYSICAL CHARACTERISTICS		
Size	in (mm)	1.0 x 0.8 x 0.2 (25.45 x 20.32 x 4.83)
Package Type		18-pin DDIP
Weight	oz (gm)	0.4 (1)

Notes:
1. Output voltage tracks ±15 V supply levels.
2. Clipped sine wave for demodulator drive only, 10 Vrms typ.

OSC-15801 OPERATION

PROGRAMMABLE FREQUENCY OUTPUT

The output frequency of the OSC-15801 is programmable from 20 kHz down to 400 Hz. The frequency is programmed using two external equal value capacitors (see FIGURE 2). The value of the capacitors (C_{ext}) is calculated as follows:

$$C_{ext} = (2{,}400{,}000/f) - 100$$

where: C_{ext} is capacitance in picofarads,
f is frequency in Hertz.

PROGRAMMABLE REFERENCE VOLTAGE OUTPUT

The PA OUT (REF), pin 13, provides from 7.1 to 8.8 Vrms, depending on the operating frequency. TABLE 2 lists the PA OUT voltages at the (programmed) operating frequency. These voltages are the maximum voltages obtained at these frequencies, with the R_{ext} = 0 Ohms (pin 7 jumped to pin 3).

TABLE 2. PA OUT/FREQUENCY	
PA OUT	**FREQUENCY**
8.8 Vrms	20 kHz
7.5 Vrms	10 kHz
7.1 Vrms	.4 kHz

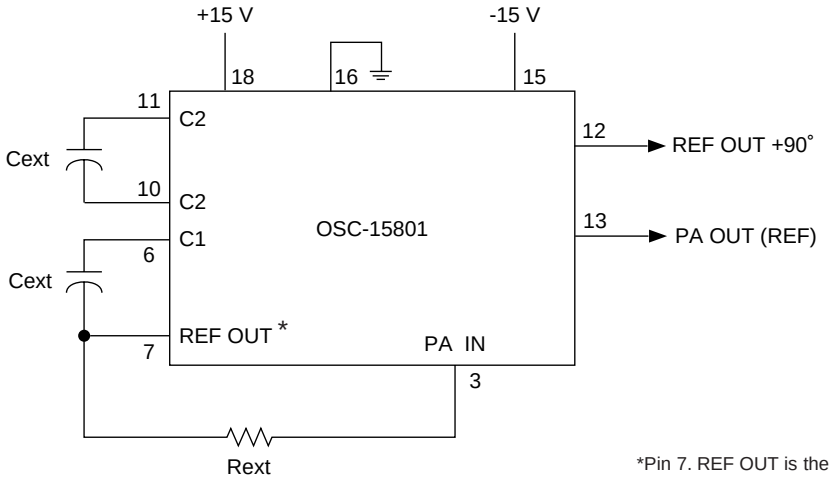
To scale down the PA OUT voltage, an external resistor (R_{ext}) is connected between pins 3 and 7. The value of R_{ext} is calculated as follows:

$$R_{ext} = 30\ [(\text{PA OUT/desired voltage}) - 1]$$

where: R_{ext} is in kOhms,
desired voltage is in Vrms,
PA OUT is dependent on frequency used.

FOR EXAMPLE, to scale down PA OUT to 5 Vrms at 10 kHz, the value of R_{ext} would be calculated as follows:

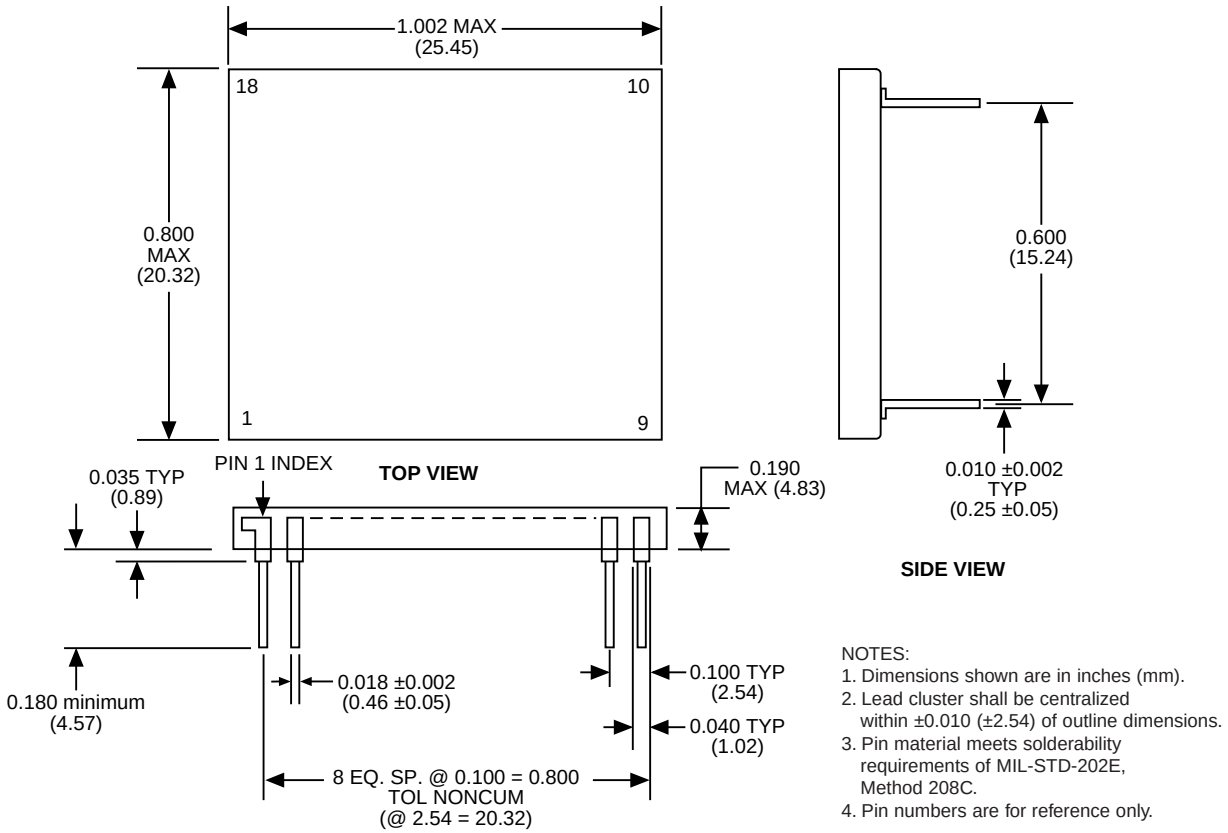
$$R_{ext} = 30\ [(\text{PA OUT/desired voltage}) - 1]$$
$$R_{ext} = 30\ [(7.5/5) - 1]$$
$$R_{ext} = 15k\Omega$$



*Pin 7. REF OUT is the unbuffered output of oscillator

FIGURE 2. PROGRAMMING RESISTOR AND CAPACITOR CONNECTIONS

TABLE 3. OSC-15801 PIN FUNCTIONS		
PIN	**NAME**	**FUNCTION**
1	NC	No connection
2	NC	No connection
3	PA IN	Power amplifier inverting input
4	NC	No connection
5	NC	No connection
6	C1	Capacitor connection (pin-programmable freq.)
7	REF OUT	Reference output
8	NC	No connection
9	NC	No connection
10	C2	Capacitor connection (pin-programmable freq.)
11	C2 GND	Capacitor connection (pin-programmable freq.)
12	REF OUT -90°	-90° reference output signal
13	PA OUT	Power amplifier output
14	NC	No connection
15	-15 V	-15 Vdc power supply voltage
16	GND	Ground
17	NC	No connection
18	+15 V	+15 Vdc power supply voltage



NOTES:
1. Dimensions shown are in inches (mm).
2. Lead cluster shall be centralized within ±0.010 (±2.54) of outline dimensions.
3. Pin material meets solderability requirements of MIL-STD-202E, Method 208C.
4. Pin numbers are for reference only.

FIGURE 3. OSC-15801 MECHANICAL OUTLINE

ORDERING INFORMATION

OSC-15801- X X 0 X

Supplemental Process Requirements:
- S = Pre-Cap Source Inspection
- L = Pull Test
- Q = Pull Test and Pre-Cap Inspection
- K = One Lot Date Code
- W = One Lot Date Code and Pre-Cap Source
- Y = One Lot Date Code and 100% Pull Test
- Z = One Lot Date Code, Pre-Cap Source and 100% Pull Test
- Blank = None of the Above

Process Requirements:
- 0 = Standard DDC Processing, no Burn-In
- 1 = MIL-PRF-38534 Compliant
- 2 = B*
- 3 = MIL-PRF-38534 Compliant with PIND Testing
- 4 = MIL-PRF-38534 Compliant with Solder Dip
- 5 = MIL-PRF-38534 Compliant with PIND Testing and Solder Dip
- 6 = B* with PIND Testing
- 7 = B* with Solder Dip
- 8 = B* with PIND Testing and Solder Dip
- 9 = Standard DDC Processing with Solder Dip, no Burn-In

Temperature Grade/Data Requirements:
- 1 = -55°C to +125°C
- 2 = -40°C to +85°C
- 3 = 0°C to +70°C
- 4 = -55°C to +125°C with Variables Test Data
- 5 = -40°C to +85°C with Variables Test Data
- 8 = 0°C to +70°C with Variables Test Data

*Standard DDC Processing with burn-in and full temperature test - see table below

STANDARD DDC PROCESSING		
TEST	**MIL-STD-883**	
	METHOD(S)	**CONDITION(S)**
INSPECTION	2009, 2010, 2017, and 2032	—
SEAL	1014	A and C
TEMPERATURE CYCLE	1010	C
CONSTANT ACCELERATION	2001	A
BURN-IN	1015, Table 1	—

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