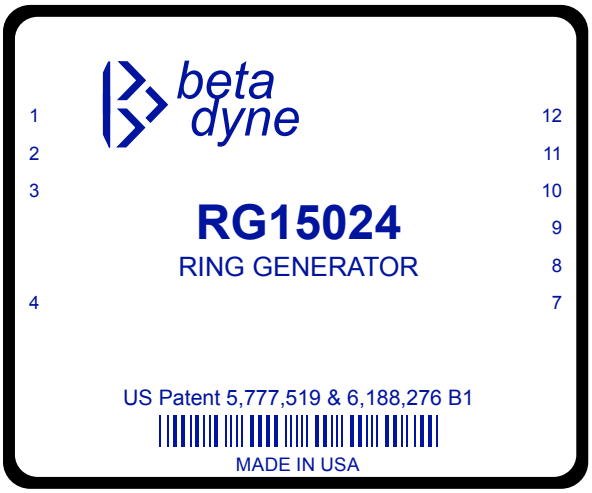
RG15000 SERIES
RING GENERATOR

beta dyne **PRELIMINARY**

Key Features

- External frequency selection 18Hz to 80Hz
- External amplitude selection 10Vdc to 220Vdc
- Onboard sinewave programmable reference
- Remote ON/OFF control
- Wide input voltage range
- Isolated output
- Over/under input voltage protection
- Short circuit protection
- Over temperature protection
- Six-sided shielding



Beta Dyne is protected under various patents, including but not limited to U.S. Patent numbers: 5,777,519; 6,188,276; 6,262,901; 6,452,818; 6,473,3171.

Applications

PBX, PABX, DLC and Key Systems

POTS

Wireless Local Loop Systems

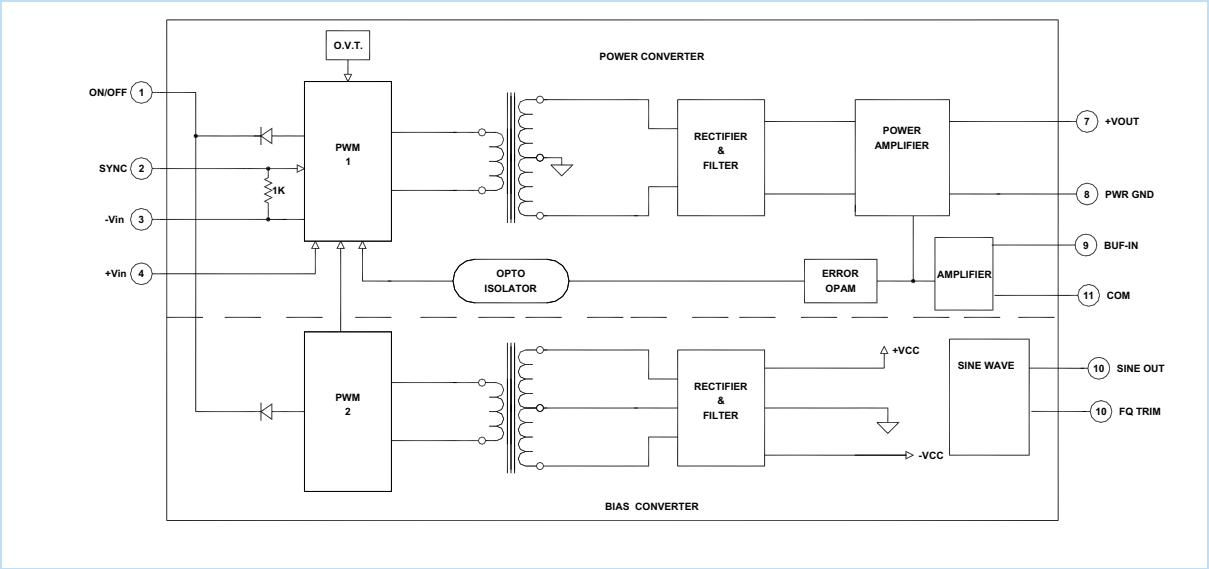
Short/Long Loop Applications

Test Equipment

Longitudinal Noise Generator

Functional Description

The RG15000 is a power-processing device based on a unique architecture suitable for multiple applications. The RG15000 can operate as a ring generator, low-frequency power amplifier, programmable AC power supply or as a high-voltage electronic load for test equipment applications. Key features include isolated output, over/under voltage protection, short circuit protection and thermal protection.



Typical Block Diagram

Ring Generator

PERFORMANCE / FUNCTIONAL SPECIFICATIONS

Unless otherwise specified, all parameters are given under typical +25°C with nominal input voltage and under full output load conditions.

Specifications typical at: T_A = +25°C, V_{IN} = nominal, V_{OUT} = 70V_{RMS}, REN=15(C1 = 144µF, R_L=455Ω)
Setup according to Typical Application 1. See Application Note RG-001.

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
SUPPLY					
Supply Voltage (V_{IN})	See Table				Vdc
Conducted Noise	Conducted current noise measured through +V_{IN} terminal with DC power source impedance of maximum 0.1Ω.		200		mA_{PP}
Switching Frequency		260	280	290	kHz
Remote ON/OFF					
Ringer ON	Pin 1 open (open circuit voltage is 12V)				
Ringer OFF		0		.8	Vdc
Input Logic Reference	-Vin Pin 3 for ON/OFF and Sync				
Synch High		2		5	Vdc
Synch Low		0		.8	Vdc
Under Voltage Threshold, V_{IN} UV	See Table				Vdc
Over Voltage Threshold, V_{IN} OV					Vdc
Recovery from UV/OV				1	S
Current Consumption, Device Off	Pin 1 connected to Pin 2		1	2	mA
Current Consumption, No Load	Pin 1 = open, Vdc at Pin 1 = 10V See Table				
Current Consumption, Full Load	Pin 1 = open, Vdc at Pin 1 = 10V See Table				
OUTPUT					
Power	Continuous loading	17	20	25	VA
Power Factor (PF) (cos θ)	R_L = 455Ω, C_L = 144µF		0.983	1	
Output Voltage		0	70	78	V_{RMS}
Amplitude TC	-40° to +85°C, V_O = 200V_{PP}		0.08		V_{PP}/°C
Output Capacitance		0.15			µF
Voltage Accuracy			±1	±2	%
Line Regulation			±1	±2	%
Load Regulation			±2	±2	%
Combined Regulation			±2	±5	%
Output Frequency, R_{ADJ} = ∞			20		Hz
Output Frequency, R_{ADJ} = 0	Refer to the Output Frequency Setting table		80		Hz
Frequency Accuracy			1	±2	%
THD			1.0	3.0	%
Sinewave Frequency TC	-40°C to +85°C		0.12		%FS/°C
Turn On Delay			500		mS
Sine Amplitude			6.6		V_{PP}
Isolation			1500		Vdc
THERMAL					
Operating Temperature Range	R_L = 455Ω, C_L = 144µF, V_{OUT} = 70V_{RMS}	-40		75	°C
Derating (above 65°C)	R_L = 455Ω, C_L = 144µF, V_{OUT} = 70V_{RMS}		0.2		°C/W
Thermal Resistance				1.2	°C/W
Thermal Shutdown Case Temperature			88		°C
MTBF	per MIL-HDBK-217F (Ground benign, +25°C)		300,000		hours

Model Selection Guide

-MODEL NUMBER	INPUT							OUTPUT		
	Voltage (Vdc)				Current (mA)			Voltage (V_{rms})	Current (mA) Io_{rms}	Efficiency Full Load (%)
	Nominal	Range	Voltage Threshold		No Load I_{inrms}	Full Load I_{inrms}				
			Under	Over						
RG15012	12	9.5–18	9	20	205	1946		76	165	60
RG15024	24	18–36	16	40	190	1270		84	183	61
RG15048	48	36-72	34	76	160	464		77	168	64

Efficiency measurements, input and output currents taken with a Voltech PM100 Power Analyzer

Table 1. Output Frequency Settings

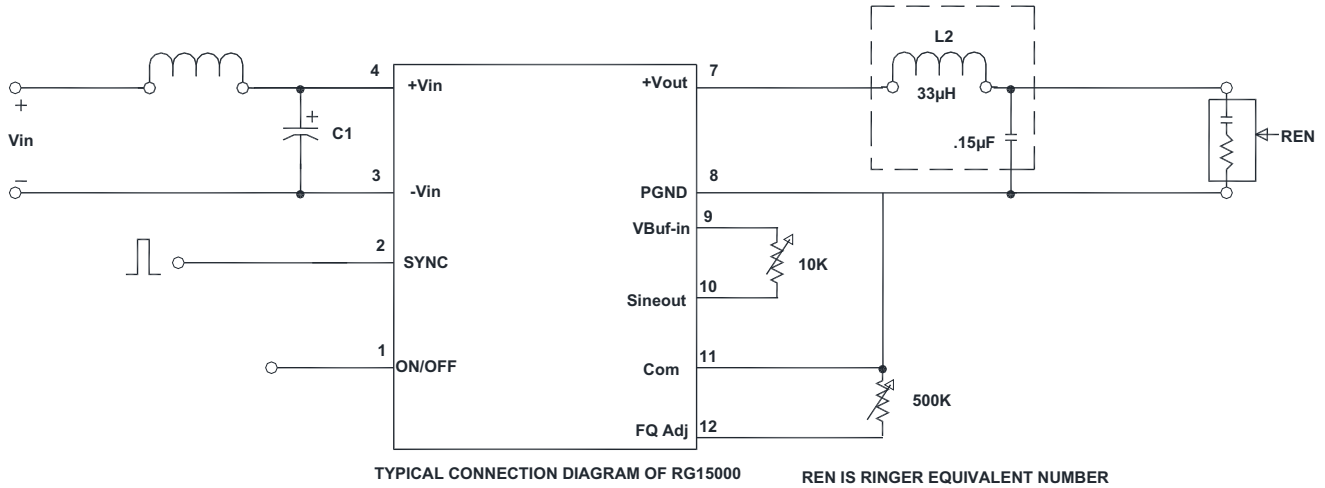
F_{OUT}(Hz)	R_{Trim}
20.6	OPEN
25	80K
30	30K
35	18K
40	11.4K
45	7.5K
50	5.6K
55	4.0K
60	3.0K
65	2.2K
70	1.4K
75	1K

Table 1. Output Voltage Settings

R	V_{orms}
47K	15
24K	24
13K	35
10K	40
7.5K	45.6
5.7K	50.4
4.3K	55
3.3K	60
2.2K	65
1.2K	70
0.4K	75
0	80

Output Specifications

Figure 1. Typical Connection Diagram



TYPICAL CONNECTION DIAGRAM OF RG15000

REN IS RINGER EQUIVALENT NUMBER
1 REN (USA) IS C=8µH, R=6830 OHMS
1 REN (GERMANY) IS C=.85µH, R=1800 OHMS

V_{in}	L1(uH)	C1(uF)
12	.68	470uF@25V
24	1.2	220uF@50V
48	2.2	100uF@100V

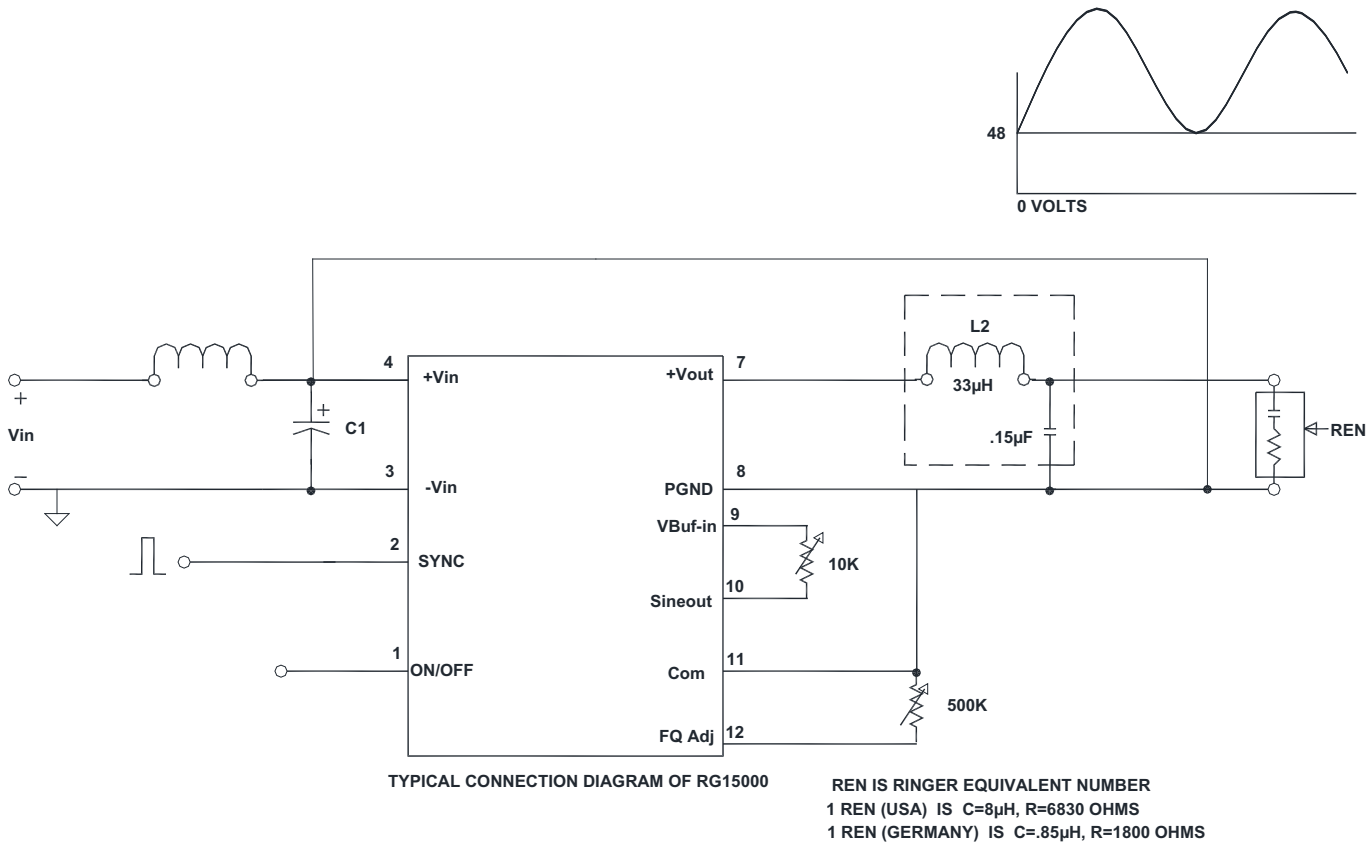


Figure 2. Typical connection diagram for sine wave on +48V bus

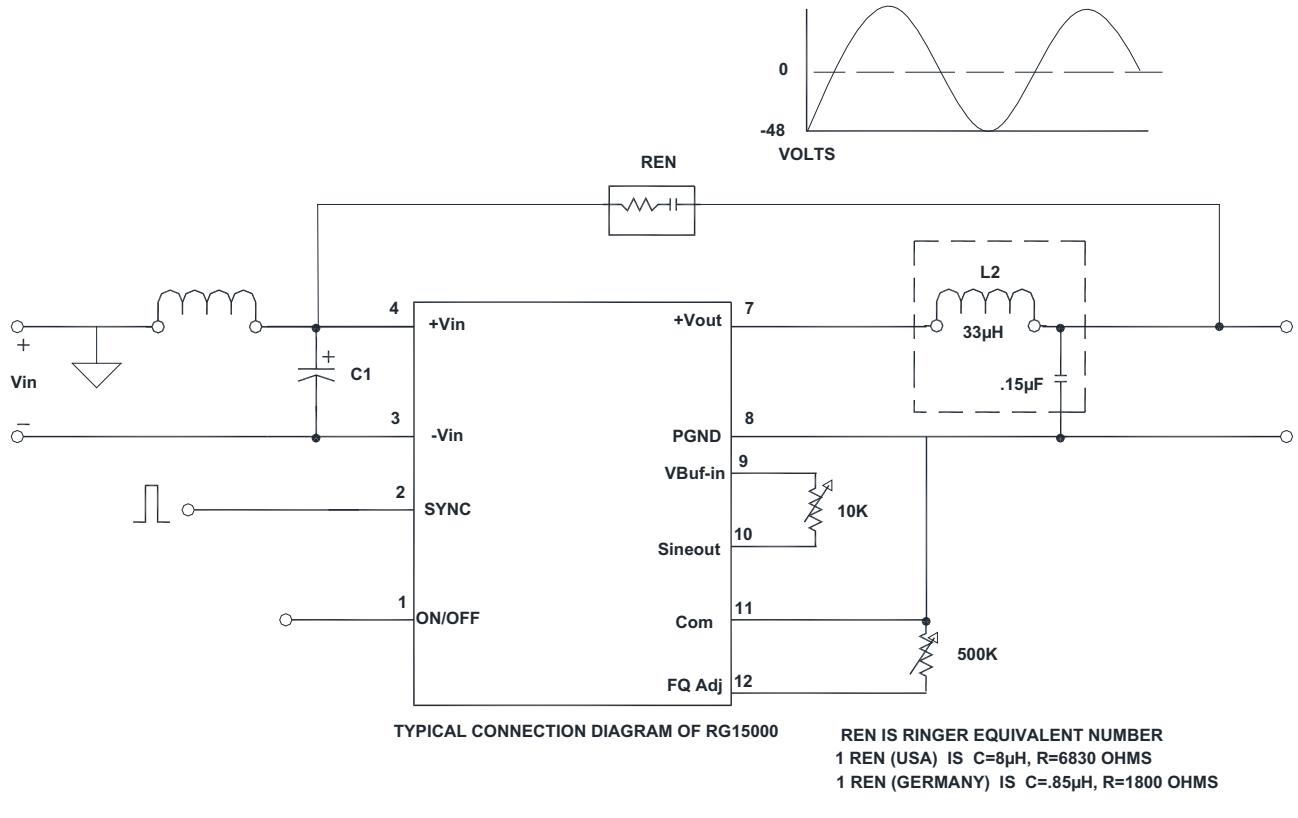


Figure 3. Typical connection diagram for sine wave on -48V bus

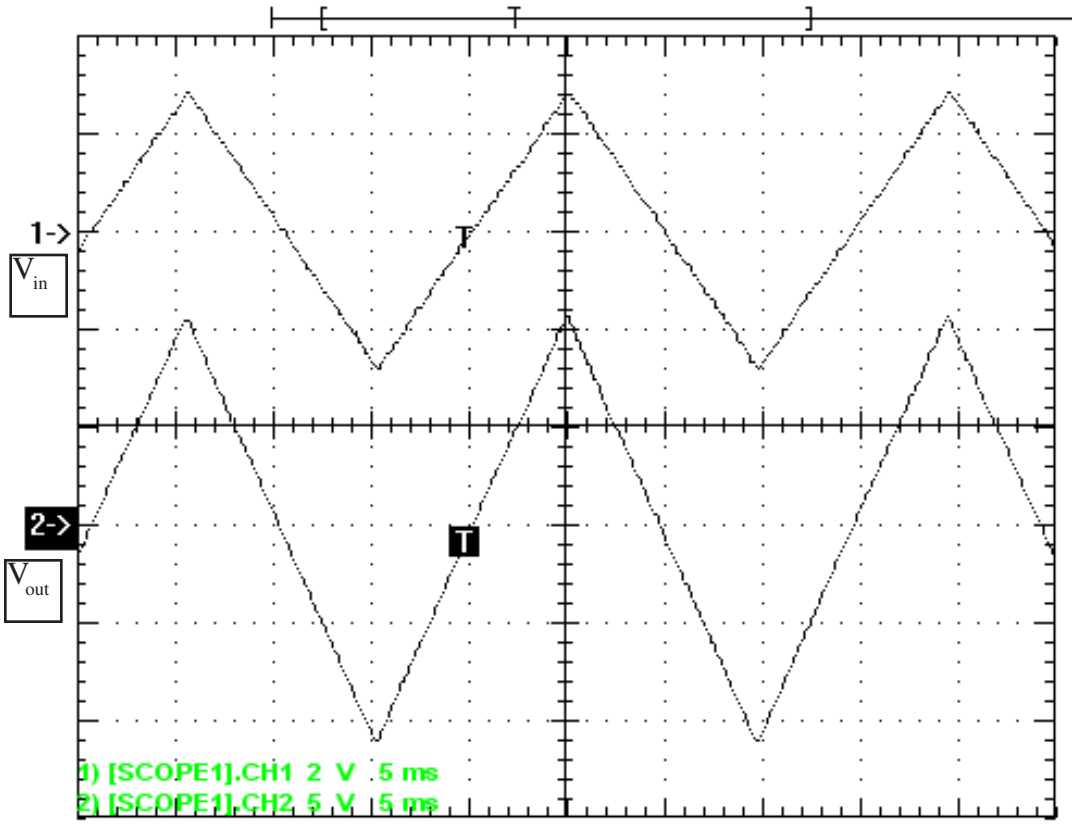


Figure 4. Vin vs. Vout

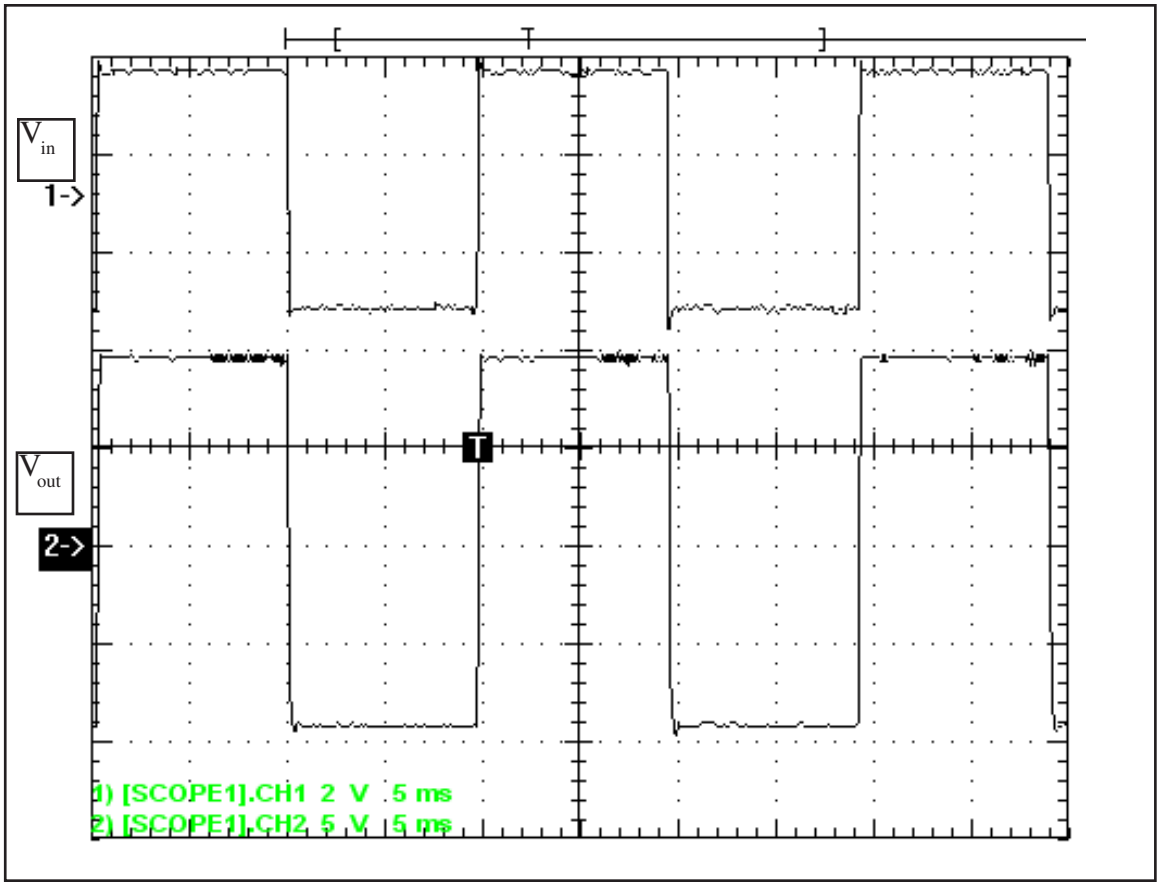


Figure 5. Vin vs. Vout

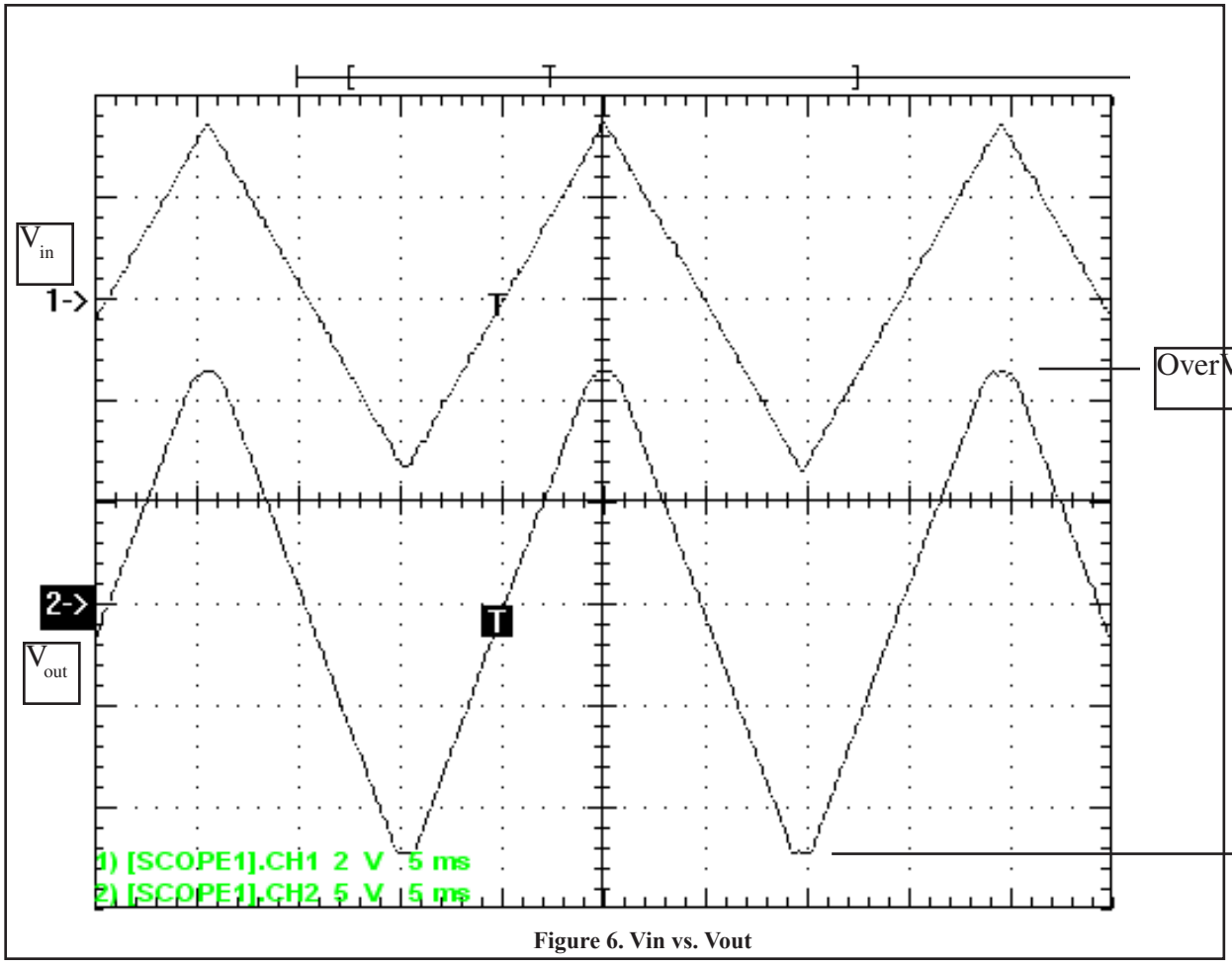


Figure 6. Vin vs. Vout

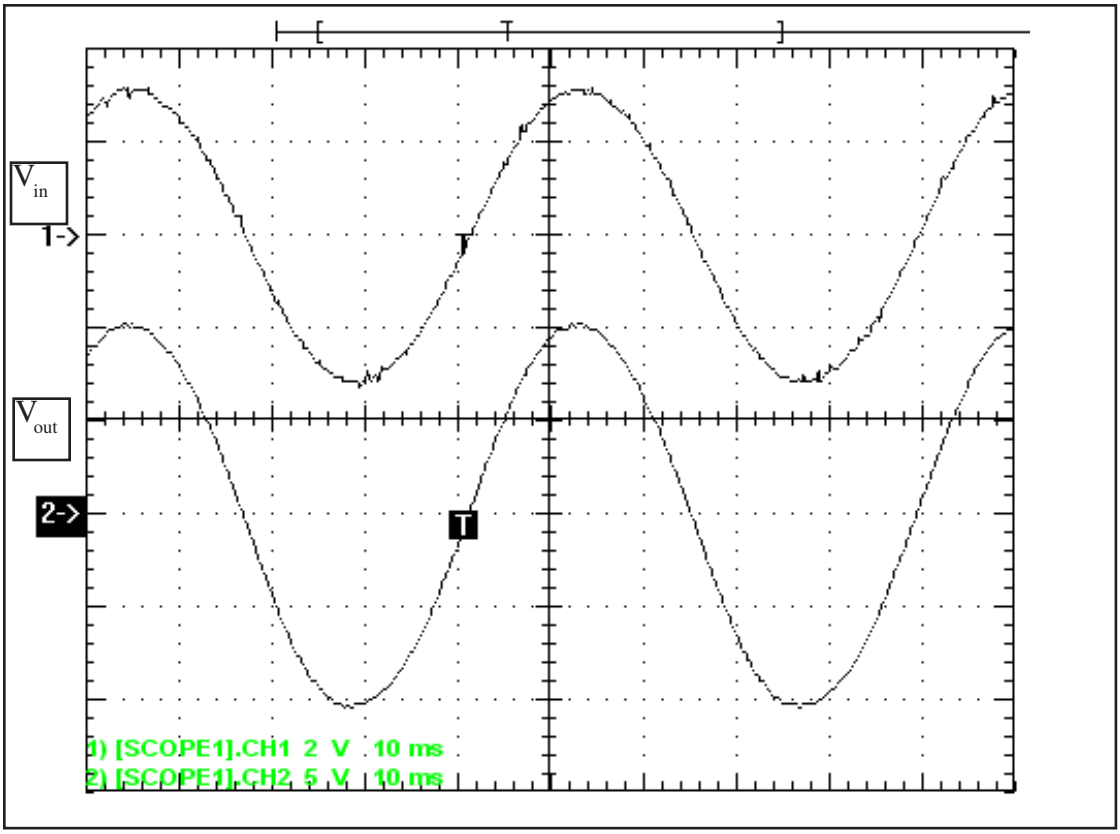
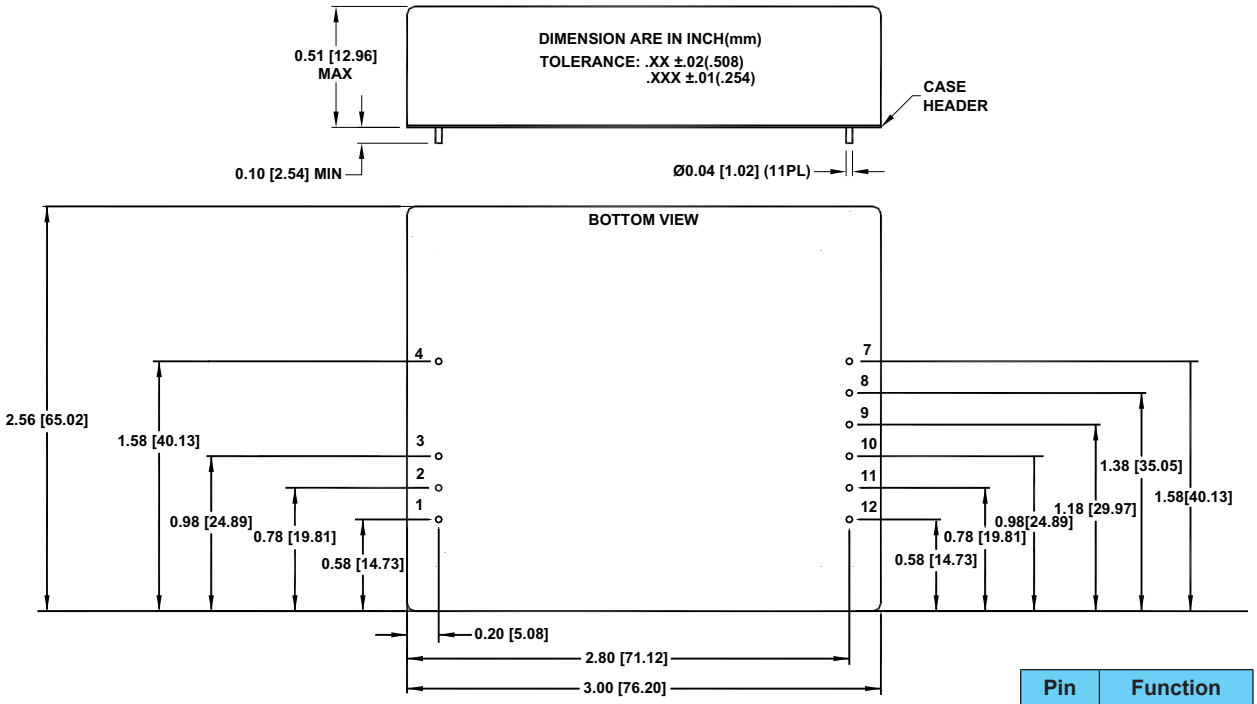


Figure 7. Vin vs. Vout

MECHANICAL SPECIFICATIONS

in inches [mm]



Pin	Function
1	ON/OFF
2	SYNC
3	$-V_{IN}$
4	$+V_{IN}$
7	$+V_{OUT}$
8	PWR GND
9	BUFFER IN
10	SINE OUT
11	COMMON
12	FQ TRIM