



***Low Profile
30 Watt Sine Wave
Telephone Ring Generator
40REN@86Vrms to 100REN@45Vrms***



PC-R302 Series

- ◇ PCR-302-925
 - ◇ PCR-302-926
 - ◇ PCR-302-825
 - ◇ PCR-302-543
-



PC-R302 Series LOW PROFILE 30 Watt Sine Wave Telephone Ring Generator

FEATURES

- ◆ External Digital Frequency Selection 17, 20, 25 and 50Hz
- ◆ External Digital/Analog Output Voltage Control 45-86Vrms¹
- ◆ Overload Protection with Advanced Output Power Control
- ◆ Output Short Circuit Protection
- ◆ Isolated Cadence Remote On/Off Control
- ◆ Soft Transition (Zero Crossing) Turn On & Off
- ◆ Isolated Zero Crossing Synchronization Output
- ◆ Isolated Output Good Indication Output
- ◆ Internal Thermal SOA Protection
- ◆ Input Under/Over Voltage Protection
- ◆ Internal RFI Filter
- ◆ UL1950, CSA C22.2 No. 950 and EN60950 Approved
- ◆ Four Quadrant Switch Mode Topology
- ◆ Flat Package Design. Only 0.5" Height
- ◆ High Reliability using SMD and Planar Magnetic Components
- ◆ 90 Days Warranty
- ◆ PC-R301-XXX Series Compatibility

APPLICATIONS

- ◆ PBX, PABX, DLC and Key Systems
- ◆ Rural Telephony Systems
- ◆ Wireless Local Loop Systems
- ◆ Short/Long Loop POTS Applications
- ◆ Satellite Telephone and VSAT Terminals
- ◆ Test Equipment

DESCRIPTION

The PC-R302 Series Telephone Ring Generators offer a line of high performance sine wave ring generators with an advanced constant output power driving stage. The device is internally controlled by a unique micro-controller, which enables flexibility in setting both the output frequency in the range of 15 to 50Hz and output amplitude in the range of 45 to 86Vrms¹. The internal controller automatically adjusts and recovers the output amplitude for overload, over-temperature, and short circuit.

At power connection or start-up by the Inhibit terminal, the device turns its output On and Off at the sine wave zero crossing, and provides an isolated zero crossing synchronization output. The PC-R302 Series advanced four-quadrant power topology delivers high efficiency over the entire input voltage range of 36-72Vdc, and operates at -40°C to +85°C.

Automatic Overload Control

Loads exceeding the maximum rated load by 1% to 20% activate the Overload Protection. While the Overload Protection is active, the ring generator automatically reduces its output amplitude and raises its output current limit in order to sustain output power of approximately 30 Watt. The ring generator gradually reduces its output amplitude from any set nominal amplitude until it reaches 45Vrms² for an unlimited period. For handling overload that requires voltage lower than 45Vrms, the device reduces its output amplitude to 30Vrms and remains at this level for duration limited only by the thermal protection. The device will shut off for a maximum duration of 2 seconds if the output current exceeds approximately 1Arms. While the output is disabled, the Test output changes to a low logic level. After a maximum delay of 2 seconds, the ring generator automatically reverts to normal operation depending on its existing load condition. This unique procedure ensures continuous service during overload conditions.

¹ The PC-R302-825 offers an extended output voltage control of 50-95Vrms.

² The minimum output voltage of the PC-R302-825 is 50Vrms.



Output Overvoltage Protection

An independent internal protection circuitry shuts down the ring generator in the event that the output voltage tries to exceed its defined operating range. This feature allows meeting international safety standards. The ring generator automatically recovers when the output voltage returns to its safe operating range. An external Transient Voltage Suppressor device should be used for external high voltage transient protection.

Input Under/Over Voltage Protection

The input voltage protection circuitry shuts down the ring generator when the input voltage is under/over the defined operating range. The ring generator automatically reverts to normal operation when the input voltage returns to its defined operating range.

Thermal Protection

An internal thermal protection automatically reduces the ring generator output power, according to an internally programmed Safe Operating Area, in the event that the internal temperature exceeds a preset threshold. The ring generator automatically reverts to full output power once the internal temperature reduces to the specified operating temperature range.

Digital On/Off Control

The Inhibit control terminal (pin 7) functions to shut down the output and reduces the device current consumption to an idling level. TTL logic levels referenced to the FGND terminal (pin 6) operate the Inhibit terminal. When this input is disconnected or tied to a TTL low level, the output is enabled. A logic high level inhibits the output and minimizes the device's current consumption to an idling level. Turn On and Off functions are executed during the output sine wave zero crossing, improving reliability.

Note that the Inhibit control can be used to generate the ringing signal's On/Off intervals. Inhibit control eliminates the need for additional external components in cadence implementation.



PC-R302 Series LOW PROFILE 30 Watt Sine Wave Telephone Ring Generator

Output Amplitude Setting

The PC-R302-925/926 ring generator output amplitudes may be set to any value in the range of 45Vrms to 86Vrms. The PC-R302-825 ring generator has an extended output amplitude range of 50-95Vrms. The PC-R302-543 ring generator output amplitude is set to 86Vrms.

The V0 input terminal (pin 10) controls the output amplitude in digital and analog operation modes. When V0 is set to <1V in reference to the DGND terminal (pin 12), or shorted to DGND, the output amplitude is set to its default 75Vrms value. When V0 >4V or V0 is left open, the output voltage is set to 86Vrms. When applying to V0 voltage in the range of 1.152V to 3.804V the device changes to its analog amplitude setting mode, and sets its output amplitude according to the table below. Any output voltage setting will take effect only at startup, by power connection or by Inhibit command.

Minimum V0 Voltage in reference to DGND	Maximum V0 Voltage in reference to DGND	Output Amplitude Vrms PC-R302-925/926	Output Amplitude Vrms PC-R302-825
Digital Mode, 0V	1.0 V	75.0 Vrms	82.5 Vrms
1.152 V	1.308 V	45.0 Vrms	50.0 Vrms
1.308 V	1.464 V	47.0 Vrms	52.0 Vrms
1.464 V	1.620 V	49.5 Vrms	54.5 Vrms
1.620 V	1.776 V	52.0 Vrms	57.0 Vrms
1.776 V	1.932 V	54.0 Vrms	54.0 Vrms
1.932 V	2.088 V	56.0 Vrms	59.5 Vrms
2.088 V	2.244 V	58.0 Vrms	58.0 Vrms
2.244 V	2.400 V	60.0 Vrms	64.0 Vrms
2.400 V	2.556 V	62.5 Vrms	69.0 Vrms
2.556 V	2.712 V	65.0 Vrms	65.0 Vrms
2.712 V	2.868 V	67.0 Vrms	71.5 Vrms
2.868 V	3.024 V	70.0 Vrms	77.0 Vrms
3.024 V	3.180 V	73.0 Vrms	80.0 Vrms
3.180 V	3.336 V	75.0 Vrms	82.5 Vrms
3.336 V	3.492 V	77.5 Vrms	85.25 Vrms
3.492 V	3.648 V	80.0 Vrms	88.0 Vrms
3.648 V	3.804 V	83.0 Vrms	91.5 Vrms
3.804 V	3.960 V	86.0 Vrms	95.0 Vrms
Digital Mode, 4.0V	5.0 V	86.0 Vrms	95.0 Vrms

$$R_{set} [K\Omega] = 10 * V_{set} / (5 - V_{set})$$

Zero Crossing Synchronization Output

The SYNC output terminal (pin 9) provides a square wave at the ring generators output frequency and phase. The output is an open collector referenced to the FGND terminal (pin 6). This output may provide up to 30V signal level by using an external pull up voltage. This can be used to synchronize relay switching with output's zero crossing. When the ring generator shuts down as a result of shorted output, over-temperature or disconnected input voltage, this output will revert to a high level.

Output Frequency Setting

The PC-R302-925/926/825 ring generator supports all four popular output frequencies: 17, 20, 25 and 50Hz. The F0 (pin 8) and F1 (pin 11) input terminals select the device output frequency by TTL logic levels referenced to the DGND terminal (pin 12). Changes take effect at startup, by power connection or by Inhibit command activation. The PC-R302-543 ring generator output frequency is set to 25Hz.

Output Frequency	F1	F0
17Hz	"0" ref. To DGND	"0" ref. to DGND
20Hz	"0" ref. To DGND	"1" or disconnected
25Hz	"1" or disconnected	"1" or disconnected
50Hz	"1" or disconnected	"0" ref. to DGND

Other output frequencies, in the range of 15Hz to 50Hz, in 1Hz resolution may be ordered.

Test Output Signal

The Test output terminal (pin 5), based on an independent internal circuit, provides an open collector logic high level, referenced to the FGND terminal (pin 6), to indicate proper functioning of the ring generator output. A low logic level appears at this terminal when one of the following occurs: Output Overcurrent, Over Temperature, Vin Undervoltage/Overvoltage, High Logic Level at the Inhibit Control Terminal or an Output Overvoltage. While the unit is normally operated, this output will be at high level. The Test Output Signal can be used as 'Output Good Signal'.

Ring Generator Fault Detection

A Ring Generator Fault Detection indication can be achieved using the Test, the Sync and the Inhibit Outputs, as seen below:

Conditions			Status		
Inhibit	Load	Input Voltage	Output	Sync	Test
"1"	X	Normal	Off	"1"	"0"
X	X	Under/Over or Disconnected Input Voltage	Off	"1"	"0"
"0"	Normal	Normal	On	Square Wave	"1"
"0"	Over-Load*	Normal	Lower Amplitude	Square Wave	"1"
"0"	Short	Normal	Off	"1"	"0"
Over-Temp., Internal Temp. >100°C			Off	"1"	"0"

*Load > 30VA = Overload

Output DC Biasing

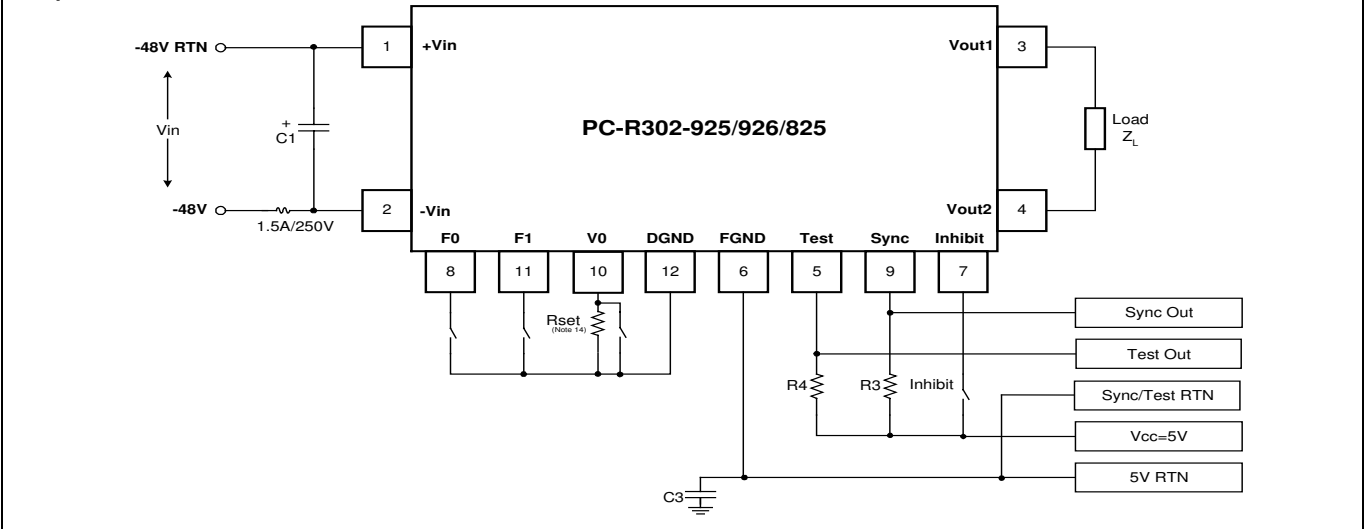
Since the ring generator's output is isolated and floating, it can be superimposed on negative or positive DC voltage. When this DC bias option is utilized it is recommended to follow the connections described in the Typical Application 2 schematics.



PC-R302 Series
LOW PROFILE 30 Watt Sine Wave Telephone Ring Generator

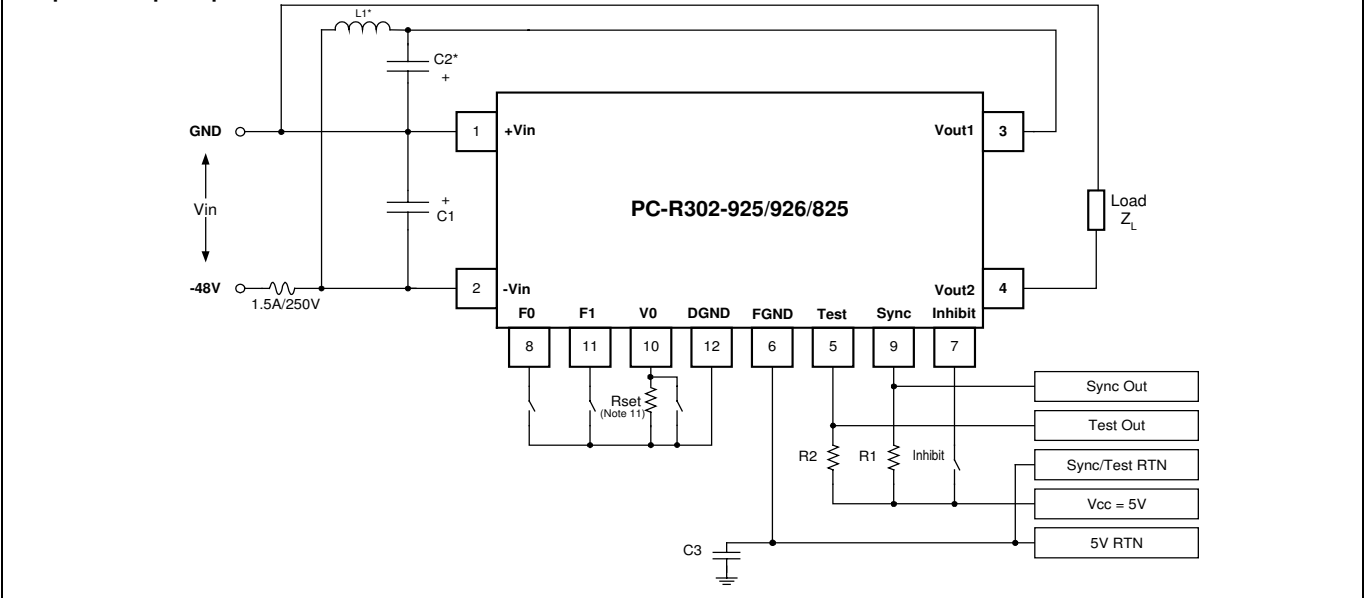
TYPICAL APPLICATION 1

Simple Connection



TYPICAL APPLICATION 2

Output AC superimposed on DC bias





PC-R302 Series LOW PROFILE 30 Watt Sine Wave Telephone Ring Generator

Notes:

1. The DGND may be connected only to the V0, F0 and F1 terminals. **Do not connect the DGND to any point other than including any DC input, AC Output, Test, Sync or the Inhibit terminals.**
2. FGND is a floating GND and can be connected to any system ground.
3. Do not connect a capacitor in parallel to load without a minimum series resistor equal to the impedance of this capacitor.
4. The PC-R302-925 is **not protected against input reverse polarity.**
5. $R1_{max}=(V_{cc(min)}-V_{OH}) / I_x$, $R1_{min}=(V_{cc(max)}-V_{OL})/(I_{OL} - I_x)$, $I_{OL} \times V_{OL}=13.5 \text{ mW}_{max}$, $V_{cc \ max}=30V$,
 I_x = external load current tied to R1. Typical $R1 = 10K\Omega$, $C1 \geq 47\mu F/100V$.
6. The use of C2 and L1 is advised for filtering the ring generator's input switching frequency noise from contaminating the ringing signal output.
When this filtering level is not required, C1 may be omitted and a short may replace L1.
 $C2 \geq 100\mu F/100V$, $L1 = 10\mu H/2A$ (such as TOKO R622LY-100K, Coil Craft PCV-2-103-05, 3L COILS PKB0865-100K or similar).
7. When using an independent power source for the output DC Bias, C2 and L1 are not required.
When using $C1 > 2200\mu F$, $ESR < 0.05\Omega @ 125 \text{ kHz}$, C2 and L1 are not required.
8. When $V_{out}=86V_{rms}$, $Z_{Lmin} = V_{outmax}^2/P_{outmax}=86^2/30=246.5\Omega$ in normal operation, Power Factor ≥ 0.5 . Lower values of Z_{Lmin} are considered as overload conditions, see Automatic Overload Control paragraph for device behavior.
9. Power Factor = $\text{COS}(\text{ATAN}(1/2 \cdot \pi \cdot F \cdot R_L \cdot C_L))$, Z_L = Resistor (R_L) in series with capacitor (C_L)
10. $C3 = 1 \div 10nF/500V$ may be added to reduce noise on the Sync and Test output terminals when FGND is floating.
11. V0 may be left unconnected or shorted to DGND if only two discrete output voltage levels are required.
12. $R2_{max}=(V_{cc(min)}-V_{OH}) / I_x$, $R2_{min}=(V_{cc(max)}-V_{OL})/(I_{OL} - I_x)$, $I_{OL} \times V_{OL}=13.5 \text{ mW}_{max}$, $V_{cc \ max}=30V$,
 I_x =external load current tied to R2. Typical $R2=10K\Omega$.
13. Thermal characteristics were measured assuming connections made according to Typical Application 1, and vertical mounting.
14. The PC-R302-925 is designed to meet the EN55022 class B standard requirements with an external EMI filter.

SAFETY INSTRUCTIONS (According to UL1950, CSA C22.2 No. 950 and EN60950 Safety Standards requirements)

1. For North America, input voltage (nominal 48Vdc, tolerance 36-60Vdc) must be applied by isolated DC source complying with the earthed SELV or TNV requirements of the UL1950, Third edition.
For other countries, input voltage (nominal 48Vdc, tolerance 36-72Vdc) must be supplied by isolated DC source complying with the earthed SELV or TNV requirements of the latest version of EN60950.
2. DC input must be protected by UL Listed fuse rated maximum T2A, 250V (slow-blow 2A, 250V fuse).
3. When applicable, protection from excessive voltage on the output should be tested in end-use equipment.
4. For output voltage exceeding 80Vrms, compliance with the ringing signal requirements should be tested in end-use equipment.
When output voltage is set to less than 80Vrms, ringing signal complies with M.2 requirements of IEC950.



PC-R302 Series

LOW PROFILE 30 Watt Sine Wave Telephone Ring Generator

ABSOLUTE MAXIMUM RATINGS*

Supply Voltage	+90V
Output Voltage**	±170V
Control Input Voltage	-0.5V to +7.0V
TEST output (Referenced to FGND pin)	30V
SYNC output (Referenced to FGND pin)	30V
Operating Ambient Temperature (T _A)	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Lead Temperature (Soldering, 10 sec max.)	+300°C

*These are stress ratings. Exposure of the device to conditions beyond the listed parameters may adversely affect long-term reliability. Proper operation other than as specified in the PERFORMANCE/FUNCTIONAL SPECIFICATIONS is not implied.

**The Steady State Output Voltage measured on the Ring Generator output terminal should not exceed 170V (V_{out}+V_{dcBias}<170V). If higher voltages are expected, i.e. during arc conditions or when using inductive load, an external Transient Voltage Suppressor or other Over-Voltage protection circuit should be connected between the output terminals of the module.

PERFORMANCE / FUNCTIONAL SPECIFICATIONS

Specifications typical at: T_A = +25°C, V_{in} = 48Vdc, Load=250Ω Resistive, V_{out}=86Vrms (V_{out}=95Vrms for the PC-R302-825), C1=100μF, C3=10nF, R3=10KΩ, R4=10KΩ, Setup according to Typical Application 1.

Parameters	Conditions	Min	Typ	Max	Units
Supply					
Supply Voltage (V _{in})	Measured between +Vin & -Vin terminals	36.0	48.0	72.0	Vdc
Conducted Noise	125KHz, 36.0≤V _{in} ≤72.0Vdc, @30W Load Conducted current noise measured through the +Vin terminal with DC power source impedance of maximum 0.1Ω		250		mAp-p
Under Voltage (UV) Threshold, Vin UV		30		36	Vdc
Over Voltage (OV) Threshold, Vin OV		72		90	Vdc
Recovery from UV/OV				2	sec
Current Consumption					
Device Inhibited			100	65	mA
No Load				120	mA
Full Load	Load=30W, @ Vin=36V			1190	mA
Peak Current	Load=30W, @ Vin=36V			2.38	A
Efficiency					
	Pout = 30W, Resistive Load	70	75		%
Output Power					
PC-R302-925/926/543	Continuous Loading			30	VA
PC-R302-825	Continuous Loading, 42.0≤V _{in} ≤65.0Vdc			30	VA
	Continuous Loading, 36.0≤V _{in} ≤72Vdc			25	VA
Output Current	AC + DC Current			750	mArms
Power Factor (PF)		0.5			cos ρ
Output Voltage					
PC-R302-925/926	Pout=30VA V0≤1.0V ("0") V0≥4.0V ("1") 1<V0<4V, see output voltage table		75 86 45-86		Vrms Vrms Vrms
PC-R302-825	Pout=30VA V0≤1.0V ("0") V0≥4.0V ("1") 1<V0<4V, see output voltage table		82.5 95 50-95		Vrms Vrms Vrms
PC-R302-543	Pout=30VA		86		Vrms
Voltage Accuracy			±3	±5	%
Line Regulation	36.0≤V _{in} ≤72.0Vdc		±1	±3	%
Load Regulation	0≤Pout≤30VA, PF ≥ 0.7		±2	±3	%
Combined Regulation	Line/Load/Temperature/Accuracy/0≤T _A ≤+85°C		±5	±10	%
Output Frequency					
PCR-302-925/926/825	Refer to the Output Frequency Setting table		17, 20, 25, 50 25		Hz
PCR-302-543					Hz
Frequency Accuracy	Selected Frequency, 36.0≤V _{in} ≤72.0, 0≤Pout≤30VA, PF >0.5, 0≤T _A ≤+60°C			±2	%
THD	Selected Frequency, 36.0≤V _{in} ≤72.0Vdc, 0≤Pout≤30VA, PF >0.7, 0≤T _A ≤+60°C		1.5	5.0	%
General					
Switching Frequency			125		KHz

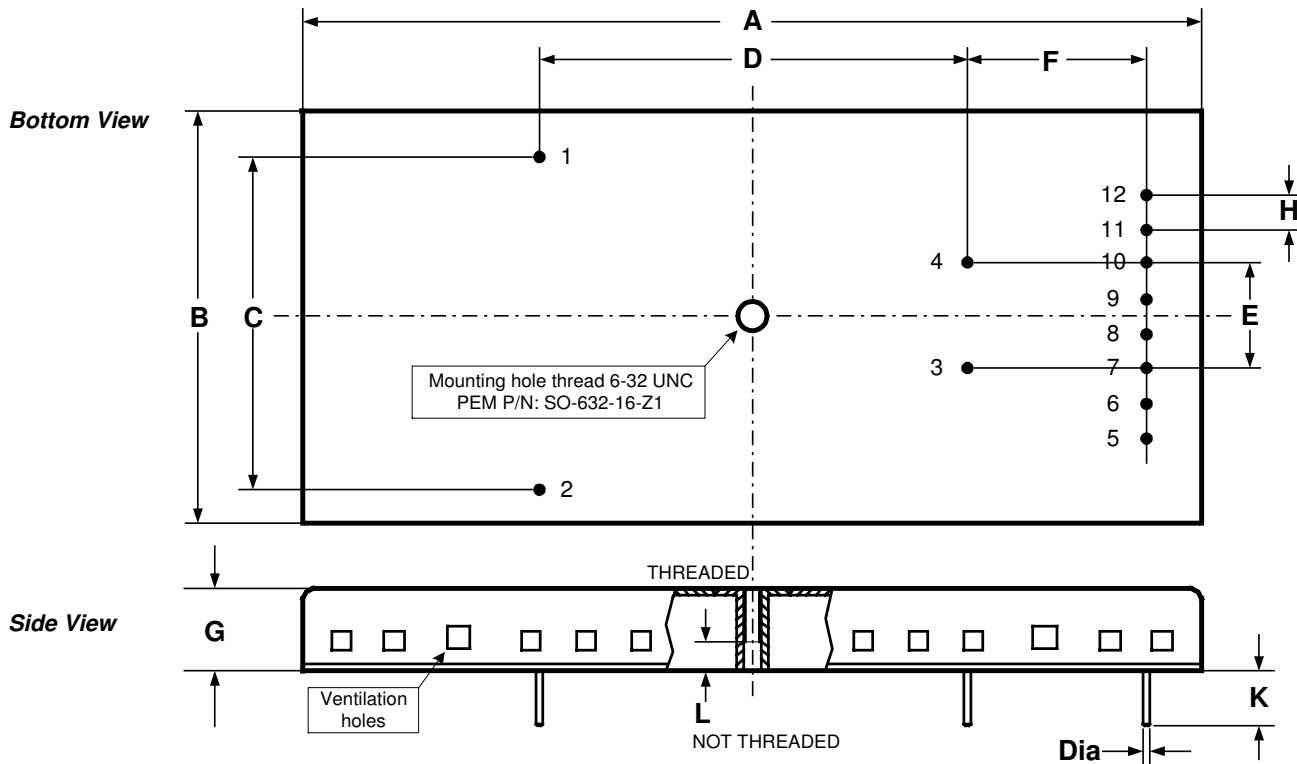


PC-R302 Series
LOW PROFILE 30 Watt Sine Wave Telephone Ring Generator

Parameters	Conditions	Min	Typ	Max	Units
Inhibit Input					
Disable Voltage V_{IH}	Voltage Referenced to FGND Terminal	2.0		5.5	Vdc
Disable Input Current		1.0	1.6	5.0	mA
Enable Voltage V_{IL}		-0.3	0	1.0	Vdc
Inhibit Response					
Time to Turn-On		12.5 Max.			ms
Time to Turn-Off		12.5+1/[2 f _{out}] Max.			ms
Sync Output Signal					
High Level Output Voltage, V_{OH}	(Open Collector Output) Terminal Connected to External DC Source Referenced to FGND	3.0		30.0	Vdc
Low Level Output Voltage, V_{OL}	Terminal Connected with R3 to +5V Source Referenced to FGND IOL=0.5mA, R3=10K Ω IOL=Max, R3=1K Ω		0.2 1.6	0.4	Vdc Vdc
Low Level Output Current, I_{OL}				3	mA
Rise Time, T_r	R3=10K Ω			2	ms
Fall Time, T_f	R3=10K Ω			2	ms
Test Output Signal					
High Level Output Voltage, V_{OH}	(Open Collector Output) Terminal Connected to External DC Source Referenced to FGND	3		30	Vdc
Low Level Output Voltage, V_{OL}	Terminal Connected with R4 to +5V Source Referenced to FGND IOL=0.5mA, R3=10K Ω IOL=Max, R3=1K Ω		0.2 1.6	0.4	Vdc Vdc
Low Level Output Current, I_{OL}				3	mA
Output Auto Recovery Time	After Shorted Output Was Removed [Shorted Output = Load <54 Ω]	0.0125		2	s
Environment: PC-R302-925/543					
Ambient Temperature (T_A) Without Derating	65Vrms \leq Vout \leq 86Vrms	-40		+60	$^{\circ}$ C
With Derating	From +60 $^{\circ}$ C output derated by 1W/ $^{\circ}$ C	-40		+85	$^{\circ}$ C
Ambient Temperature (T_A) Without Derating	45Vrms \leq Vout < 65Vrms	-40		+50	$^{\circ}$ C
With Derating	From +50 $^{\circ}$ C output derated by 1.25W/ $^{\circ}$ C	-40		+70	$^{\circ}$ C
Environment: PC-R302-926					
Ambient Temperature (T_A) Without Derating	Vout \geq 86Vrms From +65 $^{\circ}$ C to 75 $^{\circ}$ C output derated by 1.00W/ $^{\circ}$ C	-40		+65	$^{\circ}$ C
With Derating	From 75 $^{\circ}$ C to 85 $^{\circ}$ C output derated by 1.50W/ $^{\circ}$ C	+65		+75	$^{\circ}$ C
Ambient Temperature (T_A) Without Derating	45Vrms \leq Vout < 86Vrms	-40		+58	$^{\circ}$ C
With Derating	From +58 $^{\circ}$ C output derated by 1.80W/ $^{\circ}$ C	-40		+75	$^{\circ}$ C
Environment: PC-R302-825					
Ambient Temperature (T_A) Without Derating	71.5Vrms \leq Vout \leq 95Vrms	-40		+60	$^{\circ}$ C
With Derating	From +60 $^{\circ}$ C output derated by 1W/ $^{\circ}$ C	-40		+85	$^{\circ}$ C
Ambient Temperature (T_A) Without Derating	50Vrms \leq Vout < 71.5Vrms	-40		+50	$^{\circ}$ C
With Derating	From +50 $^{\circ}$ C output derated by 1.25W/ $^{\circ}$ C	-40		+70	$^{\circ}$ C
Humidity	Non-Condensing, Per IEC 68-2-56			93	%
Reliability					
Calculated MTBF	Continuous Operation @30 $^{\circ}$ C Ambient temperature; Calculation method: Relx Bellcore Software Version 5.30	3,000,000			Hours
Isolation					
Input DC to Output AC	500 Vdc, 10s	10			M Ω
Input DC to Inhibit, Test & Sync Terminals	500 Vdc, 10s	10			M Ω
Output AC to Inhibit, Test & Sync Terminals	500 Vdc, 10s	10			M Ω
All Terminals to Case	500 Vdc, 10s, All Terminals Tied Together	10			M Ω
Package Weight:					
PC-R302-925/825/543				200	g
PC-R302-926				370	g



MECHANICAL DETAILS: PC-R302-925/PC-R302-825



Notes:

1. Terminals are electrically isolated from metal case. Capacitance between Pin 1 and Pin 2 to metal case are 20nF maximum.
2. Mounting Hole is electrically connected to metal case. May be grounded for RFI shielding.
3. Terminals grid is 0.1" (2.54mm).
4. Bottom cover made of Polycarbonat PER L-P-393A or MIL-P-81390 T.11 (Black).

DIMENSIONS

Dim	mm	Inch
A	138.00 +/- 0.50	5.433 +/- .020
B	64.50 +/- 0.50	2.54 +/- .02
C	53.35 +/- 0.25	2.10 +/- .01
D	66.05 +/- 0.25	2.60 +/- .01
E	15.25 +/- 0.25	.60 +/- .01
F	27.95 +/- 0.25	1.10 +/- .01
G	12.70 +/- 0.25	.50 +/- .01
Dia	1.00 +/- 0.10	.041 +/- .004
H	5.08 +/- 0.25	.20 +/- .01
K	5.08 Min.	.20 Min.
L	4.75 +/- 0.25	.187 +/- .010

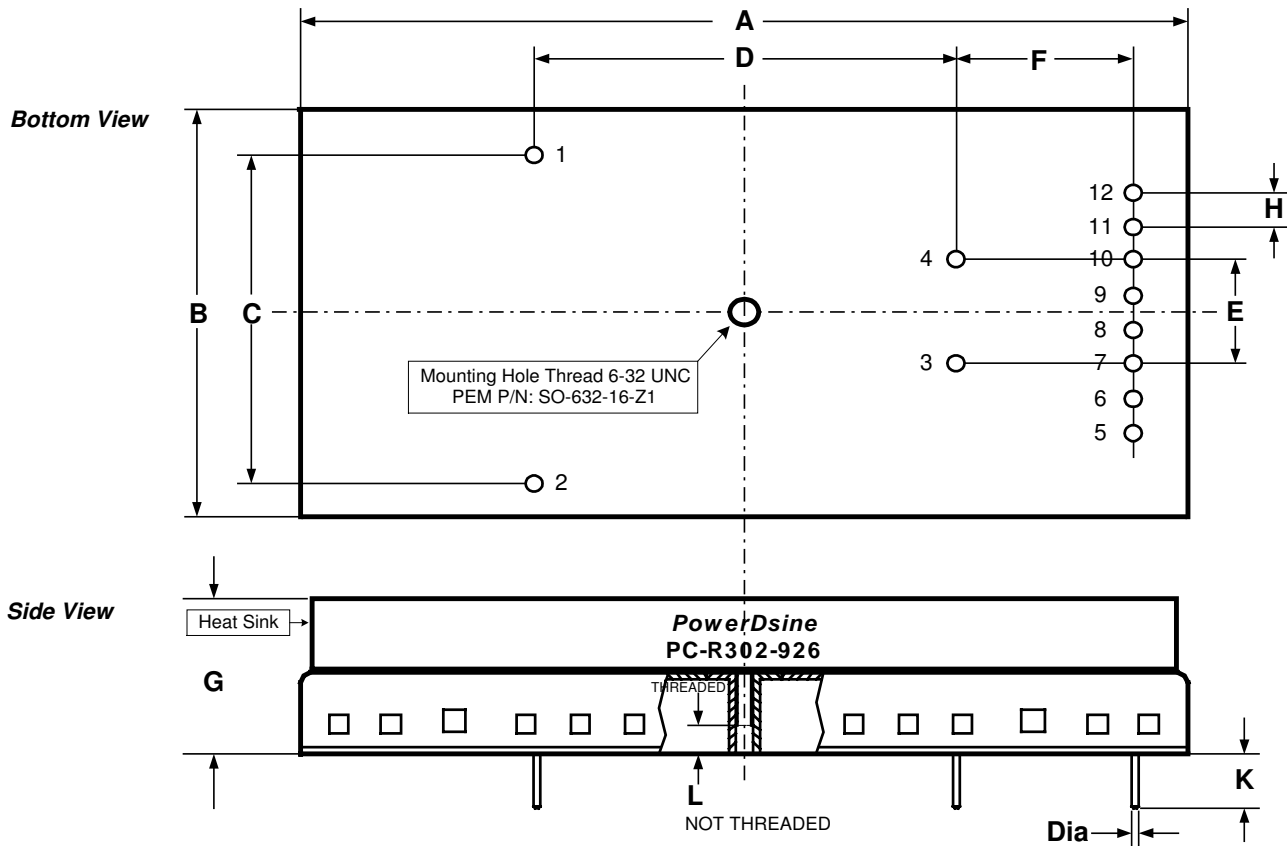
PINOUT

Pin	Symbol	Description
1	+Vin	Positive supply (reference to -Vin)
2	-Vin	Negative supply
3	Vout1	Floating ringing output (referenced to Vout2)
4	Vout2	Floating ringing output
5	Test	Fault indication output (reference to FGND)
6	FGND	Floating command/telemetry GND
7	Inhibit	Digital On/Off control (reference to FGND)
8	F0	Output frequency setup (reference to DGND)
9	Sync	Output frequency setup (reference to FGND)
10	V0	Output amplitude control (reference to DGND)
11	F1	Output frequency setup (reference to DGND)
12	DGND	Digital GND (This terminal may be connected only to the V0, F0 and F1. Do not connect the DGND to any point including the DC input, AC Output, Test, Sync or to the Inhibit terminals.)



PC-R302 Series
LOW PROFILE 30 Watt Sine Wave Telephone Ring Generator

MECHANICAL DETAILS: PC-R302-926



Notes:

1. Terminals are electrically isolated from metal case. Capacitance between Pin 1 and Pin 2 to metal case are 20nF maximum.
2. Mounting Hole is electrically connected to metal case. May be grounded for RFI shielding.
3. Terminals grid is 0.1" (2.54mm).
4. Bottom cover made of Polycarbonat PER L-P-393A or MIL-P-81390 T.11 (Black).
5. If unit is mounted vertically on the PCB, use of a 6/32 UNC x 5/16 screw is recommended to secure the ringer to the PCB in order to avoid stress to the solder terminal.

DIMENSIONS

Dim	mm	Inch
A	138.00 +/- 0.50	5.433 +/- .020
B	64.50 +/- 0.50	2.54 +/- .02
C	53.35 +/- 0.25	2.10 +/- .01
D	66.05 +/- 0.25	2.60 +/- .01
E	15.25 +/- 0.25	.60 +/- .01
F	27.95 +/- 0.25	1.10 +/- .01
G	38.10 Max.	1.50 Max.
Dia	1.00 +/- 0.10	.041 +/- .004
H	5.08 +/- 0.25	.20 +/- .01
K	5.08 Min.	.20 Min.
L	4.75 +/- 0.25	.187 +/- .010

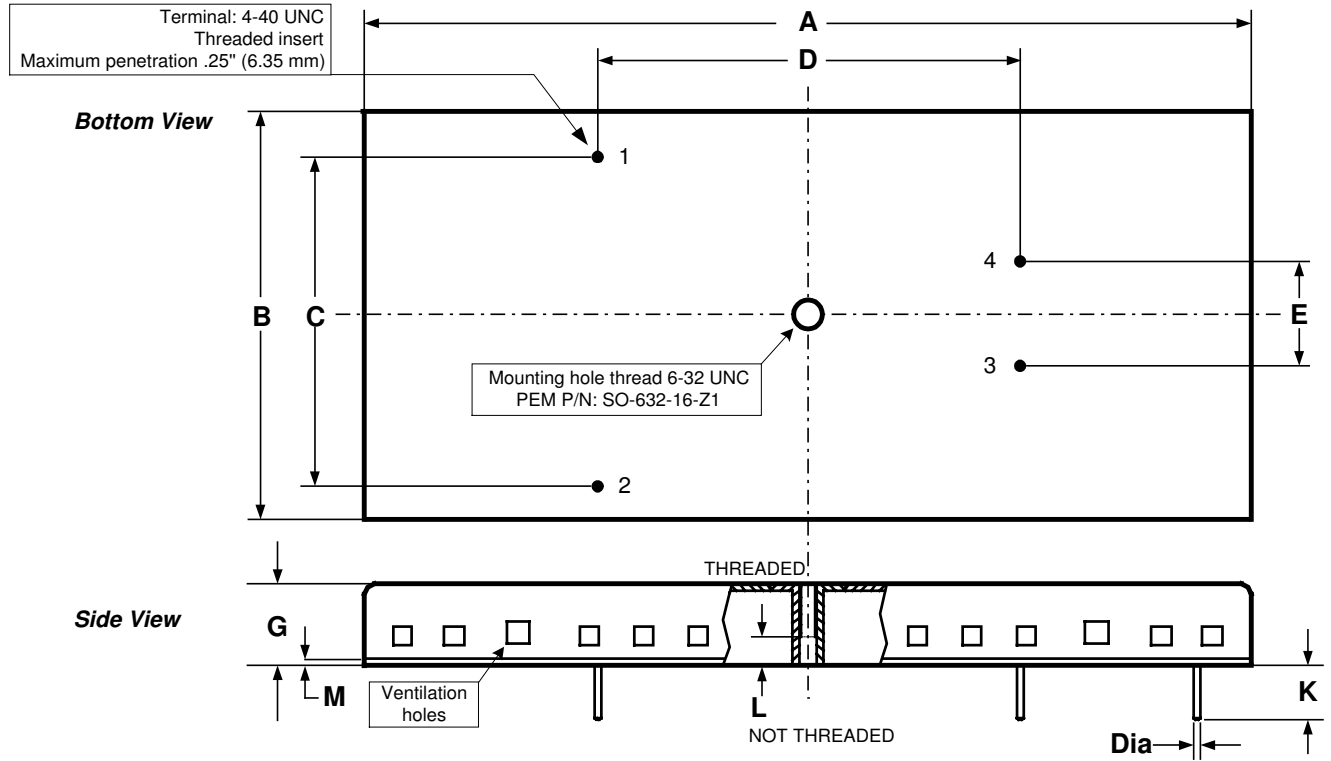
PINOUT

Pin	Symbol	Description
1	+Vin	Positive supply (reference to -Vin)
2	-Vin	Negative supply
3	Vout1	Floating ringing output (referenced to Vout2)
4	Vout2	Floating ringing output
5	Test	Fault indication output (reference to FGND)
6	FGND	Floating command/telemetry GND
7	Inhibit	Digital On/Off control (reference to FGND)
8	F0	Output frequency setup (reference to DGND)
9	Sync	Output frequency setup (reference to FGND)
10	V0	Output amplitude control (reference to DGND)
11	F1	Output frequency setup (reference to DGND)
12	DGND	Digital GND (This terminal may be connected only to the V0, F0 and F1. Do not connect the DGND to any point including the DC input, AC Output, Test, Sync or to the Inhibit terminals.)



PC-R302 Series
LOW PROFILE 30 Watt Sine Wave Telephone Ring Generator

MECHANICAL DETAILS: PCR-302-543



Notes:

1. All dimensions are in inches and (mm).
2. Terminals grid is 0.1" (2.54 mm).
3. Mounting hole is electrically connected to the metal case. May be grounded for RFI shielding.
4. Terminals are electrically isolated from metal case. Capacitance between Pin 1 and Pin 2 to metal case are 20nF maximum.
5. Bottom cover made of Polycarbonat PER L-P-393A or MIL-P-81390 T.11 (Black).

DIMENSIONS

Dim	mm	Inch
A	138.00 +/- 0.50	5.433 +/- .020
B	64.50 +/- 0.50	2.54 +/- .02
C	53.35 +/- 0.25	2.10 +/- .01
D	66.05 +/- 0.25	2.60 +/- .01
E	15.25 +/- 0.25	.60 +/- .01
G	12.70 +/- 0.05	.50 +/- .002
L	4.75 +/- 0.25	.187 +/- .010
M	1.00 REF	.04 REF

PINOUT

Pin	Symbol	Description
1	+Vin	Positive supply (reference to -Vin)
2	-Vin	Negative supply
3	Vout1	Floating ringing output (referenced to Vout2)
4	Vout2	Floating ringing output