

## Frequency Standard

- ◆ **Rubidium Vapor or Ovenized Crystal Oscillator**
- ◆ **Three Independently Buffered Outputs**
- ◆ **1 MHz, 5 MHz Output and 10 MHz Frequency**
- ◆ **Optional 1 PPS Output**
- ◆ **C-size, Double-Wide VXIbus Module**
- ◆ **Precision Frequency Distribution System**

### Stable, Accurate Signal Measurement for VXIbus

As VXIbus systems become more sophisticated and are configured to automatically test high-performance units, the need to improve the accuracy and stability of signal generation and measurement will increase proportionally. To meet these tighter frequency and time requirements, the 3351 provides either a high-stability oven oscillator ( $<5 \times 10^{-10}$  per day) or an ultra-stable rubidium oscillator ( $<5 \times 10^{-11}$  per month).

The Option 01T interface controls the 1260-39, using both register-based and message-based operation. Refer to the applicable Option 01T data sheet for specifications and product features such as include, exclude, and scan lists, relay coil-current monitoring, and user-defined path names and reset states.

### High-Level Frequency Stability

As defined by the VXIbus specification, the Slot 0 Controller provides a common 10 MHz clock source CLK10 which is distributed on the VXIbus backplane. However, the minimum accuracy of this clock is 100 ppm (or  $<1 \times 10^{-4}$ ) which is not adequate for demanding test and measurement applications in the RF or time generation environment. Use of a high-stability rubidium or ovenized reference can improve the repeatability and accuracy of sophisticated measurements by a factor of up to 2500 per month.

### Flexibility

Independent buffering allows the three outputs to be used simultaneously with no reduction in output performance. This permits its use as a precision frequency standard and as a frequency distribution system. For satellite and telemetry applications, a one pulse per second (PPS) output may be substituted for one of the standard frequency outputs.

### Locks With VXIbus and Other Instruments

The three outputs of the 3351 may be used to lock IEEE-STD-488 and other rack-and-stack instruments residing outside the VXIbus chassis to the high-stability reference. Or, one of the outputs may be connected directly to the External Device Reference Input on a VXIbus module or a Slot 0 Controller. The Reference Input on Racal Instruments 1260-00C Slot 0 or National Instruments embedded controller automatically locks the CLK10 to the higher accuracy reference of the 3351. All instruments that use CLK10 on the VXIbus are then automatically locked to this higher stability oscillator.

# 3352 PRODUCT SPECIFICATIONS

## OUTPUT CHARACTERISTICS

### Channels

3

### Frequency Choices

Standard: 1 MHz, 5 MHz and 10 MHz  
Option 10 M: 10 MHz on 3 channels

### Amplitude

900 mV<sub>rms</sub> (min.) into 50 Ω

## TIMEBASE CHARACTERISTICS

(3351E Ovenized Oscillator)

### Temperature Stability (0° to 50° C)

±7 ppb

### Short Term Stability

30 min. Warm Up: 0.5 ppb<sub>rms</sub>  
5 hr. Warm Up: 0.05 ppb<sub>rms</sub>

### Aging Rate (at shipment)

Short Term: 0.5 ppb/day  
Medium Term: 10 ppb/3 mos.  
Long Term: 200 ppb/year

### Retrace

30 min. Warm Up: 0.02 ppb  
5 hr. Warm Up: 0.01 ppb

### Trim Range

Fine: ±0.1 ppm  
Coarse: ±1 ppm

## TIMEBASE CHARACTERISTICS

(3351R Rubidium Oscillator)

**Accuracy** (after 4 min. @ 25° C)  
1 ppb/year

**Aging Rate** (after warm up)  
Short Term: 0.04 ppb/day  
Medium Term: 0.05 ppb/mo.

**Retrace** (after 1 hr. @ 25° C)  
0.02 ppb

### Trim Range

±1 ppb

### Trim Setable Resolution

0.01 ppb

## FRONT PANEL I/O

### Inputs

+24 V Standby: BNC (3351R only)

### Outputs (Channels 1-3, BNC, 50 Ω)

Default: 1 MHz, 5 MHz, 10 MHz  
Option 10M: Chan. 1-3 are 10 MHz

## OPTIONS

### Option 01: 1 PPS Output

One of the output channels is replaced by a 1 pulse/s reference.

### Option 10M

10 MHz Output on all 3 Channels

## VXIBUS INTERFACE DATA

(Dual slot, message-based, VXIbus 1.4 Compliant)

### Status Lights

Red: Fail Self-Test  
Green: Output On (Each Channel)  
Green: Rubidium Std. Locked (3351R)

## Peak Current & Power Consumption

	+24 V	+5 V	24 V	+5 Vstby
I <sub>pm</sub> (A, 3351E)	0.0	3.0	0.1	0.75
I <sub>pm</sub> (A, 3351R)	2.0	2.3	0.1	0.0
Total Power (3351E):	21 Watts (3351R): 62 Watts			

## ENVIRONMENTAL

### Temperature

Operating (3351E): 0° C to 50° C  
Operating (3351R): 0° C to 55° C  
Storage: -40° C to +70° C

### Weight


6 lbs. (2.7 kg)

### EMC (Council Directive 89/336/EEC)

EN55011, Group 1, Class A  
EN50082-1, IEC 801-2,3,4

### Safety (Low Voltage Directive 73/23/EEC)

EN61010-1, IEC1010-1, UL3111-1,  
CSA22.2#1010

 The CE Mark indicates that the product has completed and passed rigorous testing in the area of RF Emissions, Immunity to Electromagnetic Disturbances and complies with European electrical safety standards.

## ORDERING INFORMATION

### MODEL/DESCRIPTION

Racal Instruments 3351E, VXIbus Ovenized Frequency Standard (1 MHz, 5 MHz, 10 MHz Outputs)  
Racal Instruments 3351E/01, 3351E with Option 01, (Channel 3 is a 1 PPS Output)  
Racal Instruments 3351E/10M, 3351E with Option 10 M (all Outputs 10 MHz)  
Racal Instruments 3351R, VXIbus Rubidium Frequency Standard (1 MHz, 5 MHz, 10 MHz Outputs)  
Racal Instruments 3351R/01, 3351R with Option 01 (Channel 3 is a 1 PPS Output)  
Racal Instruments 3351ER/10M, 3351R with Option 10 M (All Outputs 10 MHz)

### PART NUMBER

404947-001  
404947-002  
404947-003  
404946-001  
404946-002  
404946-003

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