

## **Exhibit O: Transient Frequency Response**

**FCC ID: CW21669-3**

## **Transient Frequency Response**

The Transient Frequency Response data that was approved by the FCC during the certification of CW21668-1 is being referenced for this application.

## 10. Transient Frequency Behavior

### 10.1 Test Technical Standard

Sec. 90.214 Transient frequency behavior.

Transmitters designed to operate in the 150-174 MHz and 421-512 MHz frequency bands must maintain transient frequencies within the maximum frequency difference limits during the time intervals indicated:

| Time intervals <sup>1,2</sup>   | Maximum frequency difference <sup>3</sup> | All equipment  |                |
|---|---|----------------|----------------|
|   |   | 150 to 174 MHz | 421 to 512 MHz |
| Transient Frequency Behavior for Equipment Designed to Operate on 12.5 kHz Channels |   |                |                |
| t <sub>1</sub> <sup>4</sup>   | ±12.5 kHz                                 | 5.0 mSec       | 10.0 mSec      |
| t <sub>2</sub>  | ±6.25 kHz                                 | 20.0 mSec      | 25.0 mSec      |
| t <sub>3</sub> <sup>4</sup>   | ±12.5 kHz                                 | 5.0 mSec       | 10.0 mSec      |

<sup>1</sup>  $t_{on}$  is the instant when a 1 kHz test signal is completely suppressed, including any capture time due to phasing.

$t_1$  is the time period immediately following  $t_{on}$ .

$t_2$  is the time period immediately following  $t_1$ .

$t_3$  is the time period from the instant when the transmitter is turned off until  $t_{off}$ .

$t_{off}$  is the instant when the 1 kHz test signal starts to rise.

<sup>2</sup> During the time from the end of  $t_2$  to the beginning of  $t_3$ , the frequency difference must not exceed the limits specified in Sec. 90.213.

<sup>3</sup> Difference between the actual transmitter frequency and the assigned transmitter frequency.

<sup>4</sup> If the transmitter carrier output power rating is 6 watts or less, the frequency difference during this time period may exceed the maximum frequency difference for this time period.

### 10.2 Test Procedure

TIA/EIA-603:1993 Section 2.2.19

### 10.3 Test equipment

|           |                            |            |             |
|-----------|----------------------------|------------|-------------|
| IFR       | Communications Monitor     | COM-120A   | 485002436   |
| HP        | Signal Generator           | 8640B      | 1741A07326  |
| HP        | VHF Attenuator             | 355D       | 1204A24115  |
| HP        | Triple Output Power Supply | 6235A      | 2450A-06875 |
| Tektronix | Digital Oscilloscope       | TDS620B    | B030182     |
| Instek    | Laboratory DC Supply       | PS-3030    | 9669588     |
| JFW       | Directional Coupler        | 50C-007-10 | 207963      |
| JFW       | RF Detector                | 50D-003    | N/A         |
| RE        | Combiner                   | 50-500 Mhz | N/A         |

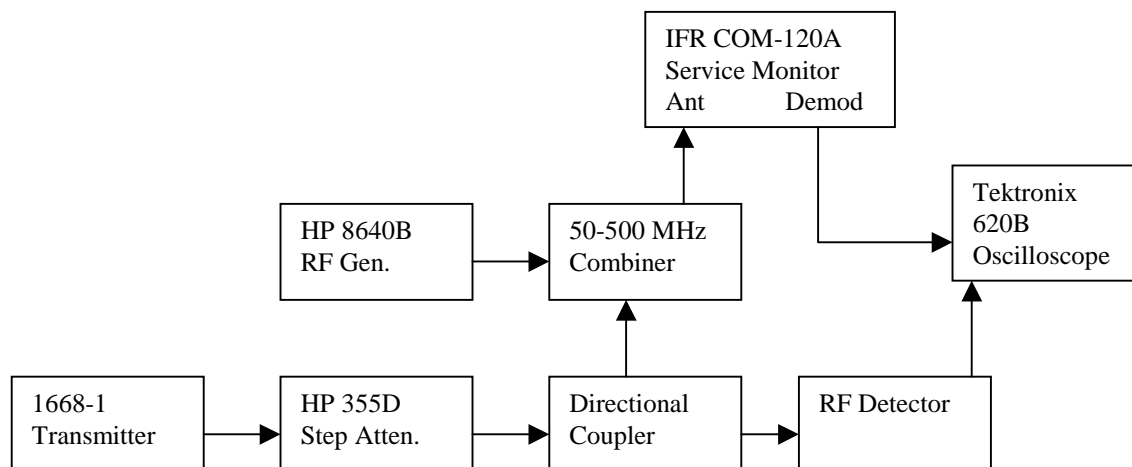
## 10.4 Test Results

### RFD Controller 1668-1 Transient Frequency Tests With Unmodulated Signal

| Time Interval            | Allowed Frequency Deviation | Measured Frequency Deviation | Delta to limit |
|--------------------------|-----------------------------|------------------------------|----------------|
| t <sub>1</sub> 5.0 mSec  | No limit EUT < 6 Watts      | 11.25 kHz                    | N/A            |
| t <sub>2</sub> 20.0 mSec | 6.25 kHz                    | 2.5 kHz                      | -3.75 kHz      |
| t <sub>3</sub> 5.0 mSec  | No limit EUT < 6 Watts      | none                         | N/A            |

### RFD Controller 1668-1 Transient Frequency Tests With Modulated Signal

| Time Interval            | Allowed Frequency Deviation | Measured Frequency Deviation | Delta to limit |
|--------------------------|-----------------------------|------------------------------|----------------|
| t <sub>1</sub> 5.0 mSec  | No limit EUT < 6 Watts      | 11.25 kHz                    | N/A            |
| t <sub>2</sub> 20.0 mSec | 6.25 kHz                    | 2.5 kHz                      | -3.75 kHz      |
| t <sub>3</sub> 5.0 mSec  | No limit EUT < 6 Watts      | none                         | N/A            |

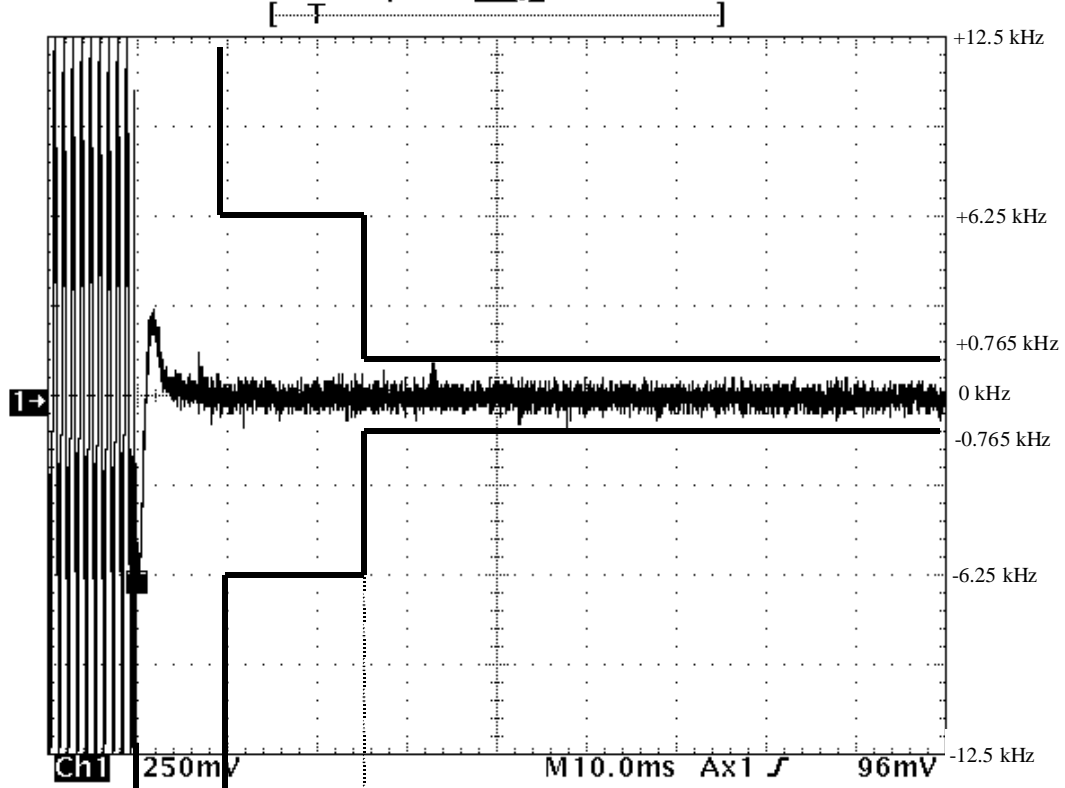


Block Diagram of Test Setup

Tek Run: 50.0kS/s

Sample

Trig?

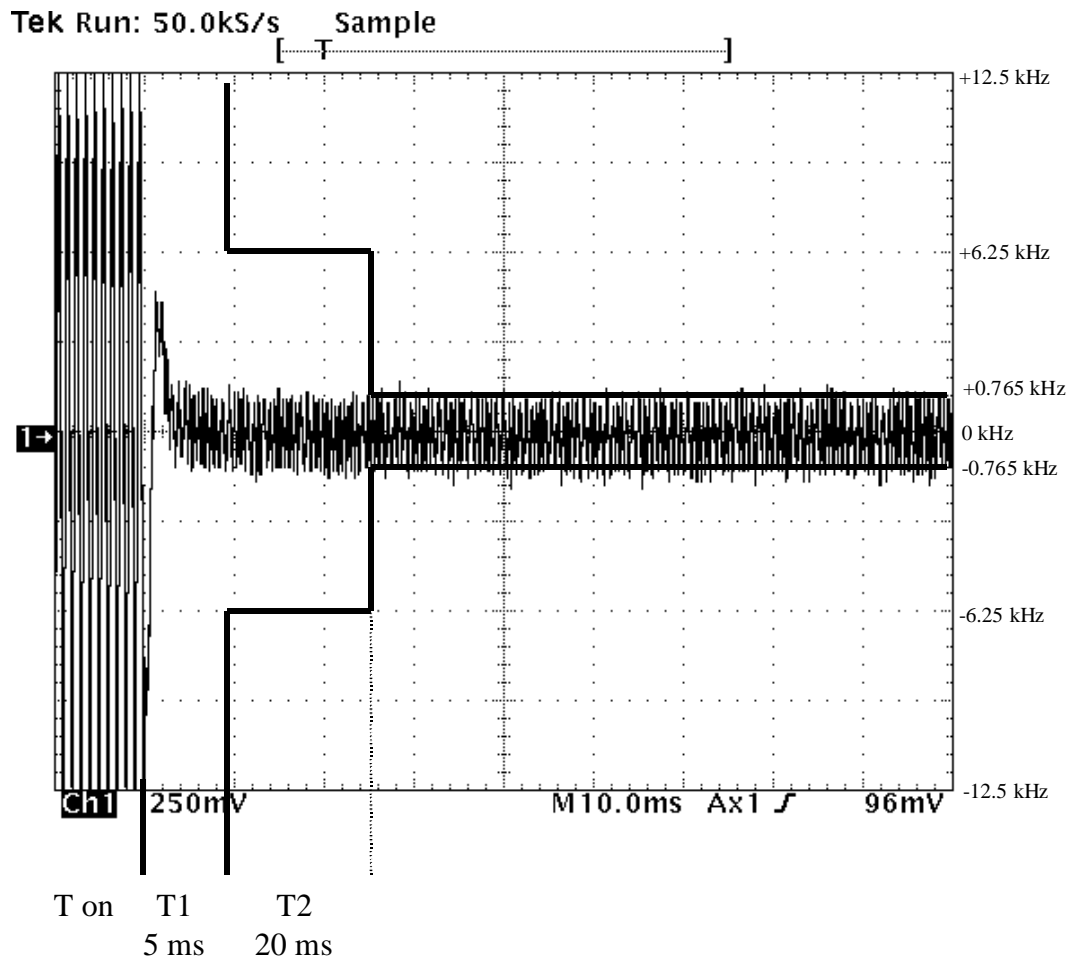


T on

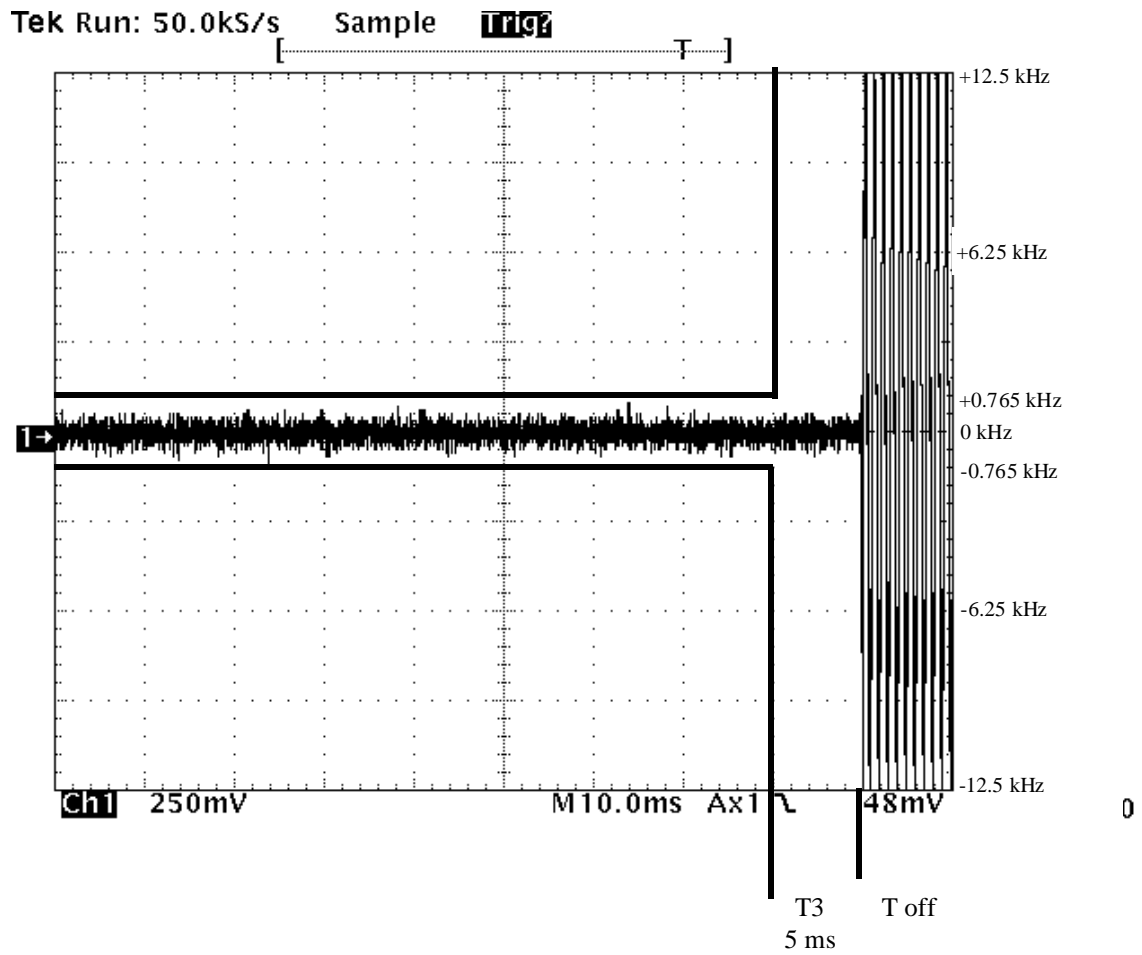
T1  
5 ms

T2  
20 ms

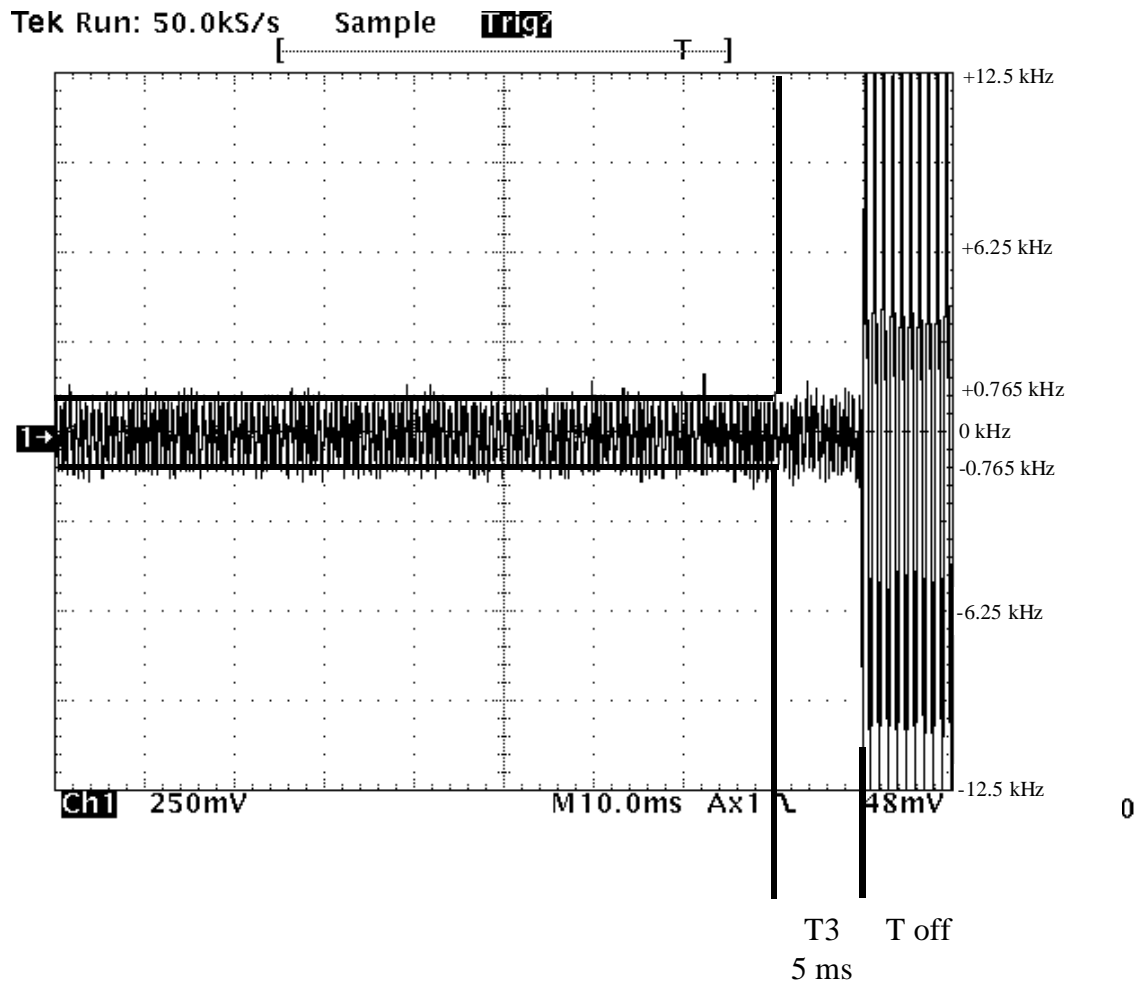
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Turn On Transient – Modulated with data



Turn Off Transient – No Modulation



Turn Off Transient – Modulated with data