

This document describes the changes to the E2900 radio in relation to the application for a Class II permissive change under rules CFR 47 § 2.1043(a), and under the FCC Permissive Change Policy 178919 DO1 v06

The change involves replacing the obsolete National Semiconductor PLL IC LMX2352 with Analog Devices PLL IC ADF4212L. Both parts are Duall PLL IC, and perform the same function in the circuit. The function of the IC is to generate the Intermediate Frequency (IF) and Local Oscillator (LO) signals for receive, and to generate the rf signal for transmit operation.

The relevant section of FCC 178919 DO1 Permissive Change Policy v06 is Section III – PCB or Hardware Changes

III. PRINTED CIRCUIT BOARD (PCB) OR HARDWARE CHANGES

A. Changes described in § 2.1043(a) that result in a non-electrically equivalent device require a new grant of certification (FCC ID).

The changes result in an electrically equivalent device, so this Clause does not apply.

B. Depopulated versions of a transmitter require authorization under separate FCC IDs for each version.

The changes do not involve depopulating a transmitter, so this Clause does not apply.

C. Versions of a device with different integral active hardware components (e.g., amplifiers and crystals) that result in different radio parameters (e.g., output power, frequency), or that result in the device not being electrically identical, require authorization under a different grant of certification (FCC ID) for each version. Such changes are NOT considered electrically identical.⁵ For example, versions of a device with different internal filter designs that operate on different frequencies must be filed under different certification grants (FCC IDs).

⁵Electrically identical device considerations:

- For Part 95 devices (i.e., Part 95 Subpart C) the FCC does not allow device designs that permit end-users to change plug-in crystals. When the plug-in crystal is only changed by the original equipment manufacturer, the grantee may receive authorization for multiple crystals under one grant of certification (FCC ID). Historically, this has not been considered a design change for Part 95 devices, as the change involves exchanging one crystal for another. A permissive change request for a new crystal(s) is acceptable if the new crystal does not cause the frequency range to exceed that granted in the original authorization. A new FCC ID is required if the new crystal causes the device to exceed the frequency range approved in the original authorization.
- If the transmitter PCB board and enclosure remains the same, external or internal mechanical passive filters for a transmitter may be approved under one grant of certification (FCC ID) and/or can be added with a Class II permissive change even if the mechanical passive filters result in different frequency bands of operation. If the change in these filters result in a reduced frequency band from the original grant and all emissions have not been degraded, a Class I permissive change is acceptable.
- Part 74 and Part 90 wireless microphones – Minor differences in passive components (resistor or capacitor) for internal circuitry is allowed in an original application for authorization, but not in a permissive change application.

The active hardware component in this case is the Phase-Locked-Loop IC. This change does not result in different radio parameters, and the device is electrically equivalent as stated in A. above. None of the considerations in note 5 apply to this change. This clause does not apply.

- D. Part substitution – electrically identical parts may be substituted. An initial evaluation of test results will determine if a Class I or Class II permissive change application is required. A chip replacement of a portion of the transmitter that performs some sub-function such as an amplifier chip, oscillator chip, or frequency determining chip, may be considered a Class II permissive change under the following conditions; however, replacement of a chip that constitutes a complete transmitter shall require a new grant of certification (FCC ID):**

This clause is applicable to the proposed change. The change is a chip replacement of a portion of the transmitter that performs a sub-function. The conditions are addressed below.

- 1) The new chip component is pin-for-pin compatible.**

The new PLL IC is pin-for-pin compatible with the replaced device. The pin numbers have changed, but pin function is the same. The IC acts as a dual Phase Locked Loop, providing frequency control for IF VCO and RF VCO.

- 2) The new chip has the same basic function as the old chip, from an external perspective (internal circuitry may differ).**

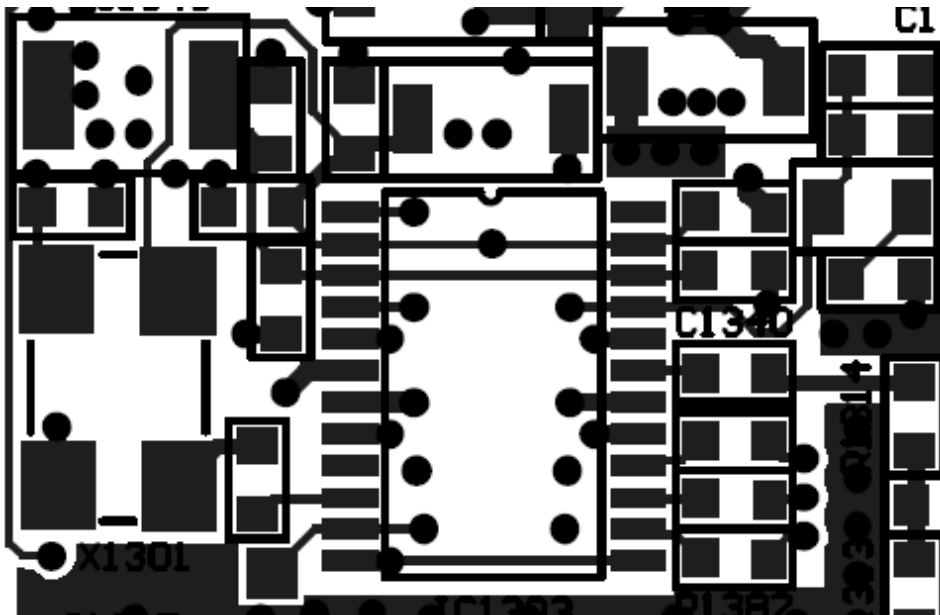
It has the same basic function, although the internal circuitry differs. The original device operated as a fractional PLL. This device operates as an integer PLL.

- 3) No change in radio parameters has occurred.**

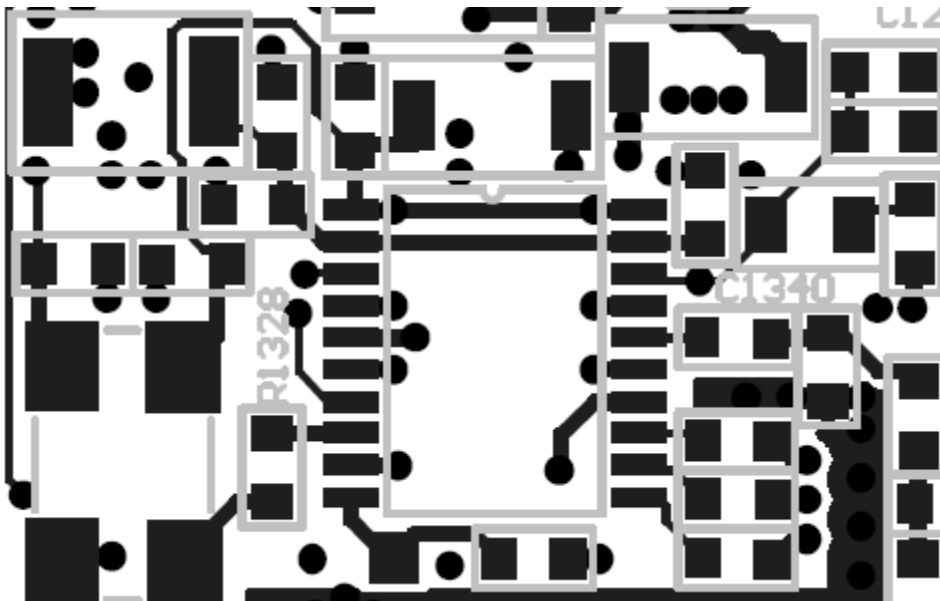
There has been no change in the radio parameters. Refer Test Report.

- 4) The same conditions apply when a small area (approximately the same area as the chip) of the PCB is replaced with an equivalent chip.**

The area of the PCB that has changed is effectively the same as the chip. The diagram below shows the PCB changes. It can be seen that the layout changes are minimal, and the connections to the Chip are pin-for-pin.



Previous Revision



New Revision