

*BI-NEU Radio Transceiver Module (RTM)**Homologation Document**Part Number: DG9T-15K619-CF*Table of Content

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## 1. Preface

This document provides an overview of the North American Bi-Directional Radio Transceiver Module for Homologation Testing

**„NOTICE:**

*This device complies with Part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard.*

*Operation is subject to the following two conditions:*

- (1) this device may not cause harmful interference, and*
- (2) this device must accept any interference received, including interference that may cause undesired operation.*

*Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:*

- (1) l'appareil ne doit pas produire de brouillage, et*
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

**NOTICE:**

*Changes or modifications made to this equipment not expressly approved by (manufacturer name) may void the FCC authorization to operate this equipment.”*

## 2. Configuration and Identification of Equipment Under Test (EUT)

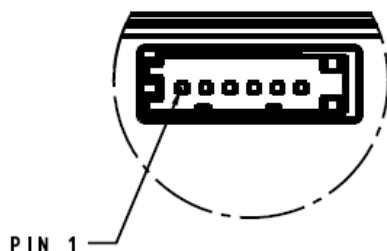
### 2.1 Description

The EUT contains circuitry and software in order to receive Long range RF data from vehicle equipped Remote Keyless Entry Transmitters and short range RF data from Tire Pressure Wheel Sensors. The EUT demodulates and determines whether the demodulated data should be sent to vehicle Body Control Module via a dedicated vehicle serial bus. This EUT also generates RF data messages using vehicle status information from the CAN serial bus for long range RF transmissions to the Remote Keyless Entry transmitters based upon receipt of a Data request RF message.

The following are pictures of the EUT:

<Take & Insert Top & Bottom pictures of 902MHz BI-NEU Module (with housing)>

<Take & Insert picture of 902MHz BI-NEU PCB top side and bottom side>



MATING INTERFACE (HARNES CONNECTOR) TO BE USED  
FORD P/N: 4F1T-14489-AB  
TYCO P/N: 1488752-3  
KEYING OPTION "C"

SIGNAL	CONNECTOR PIN	MAXIMUM CURRENT	TERMINAL SIZE
GND_LOGIC	1	N/A	64
KL. ING	2	50mA	64
PESCAN_L	3	70mA	64
PESCAN_H	4	70mA	64
UNUSED	5	N/A	N/A
BATT	6	240mA	64

### 2.2 Identification-Labeling

The following figures define the identification labeling for the EUT:

<Take & Insert Picture of BI-NEU Label attached to housing>

<Take & Insert Clear pictures of Text that is molded into the various sides of the BI Housing>

### 2.3 Operation Declarations

The following table provides general operation declaration information for the EUT:

Equipment Type	RF Receiver	Country of Origin:	Mexico
Operating Voltage	7.0VDC to 24VDC 8.0 VDC to 16VDC (Nominal)	Operating Temperature	-40 deg C to + 105deg C
Operating Freq Range	902.425 MHz +/- 210kHz (RKE Channel 1) 902.375 MHz +/- 210kHz (RKE Channel 2) 903.425MHz +/- 360kHz (PEPS Channel) 315.000 MHz +/- 360 kHz (TPM)	Modulation	FSK w/ $\pm$ 7.5kHz Deviation (RKE) FSK w/ $\pm$ 15kHz (PEPS) ASK (TPM) FSK w/ $\pm$ 35kHz deviation (TPM)
RX Data Frame Size	105 bits (RKE) 80 bits (TPM) 85 bits to 160 bits (PEPS)	RX Data Rate	2.1kbps +/- 0.4% (RKE)  9.6 kbps +/- 0.4% (TPM)  9.6 kbps +/- 0.4% (PEPS)
RX Data Encoding	Manchester	Antenna Type:	Integral Diversity antenna structure for RKE and single antenna for TPM reception (Insert dimensions from part dwg)
TX Operating Freq Range	902.425 MHz +/- 40kHz (RKE Channel 1)  902.375 MHz +/- 40kHz (RKE Channel 2)	Antenna Gain	N/A
TX Data Frame Size	37 bits	TX Modulation	OOK
TX Data Encoding	Manchester	TX Data Rate	1.95kHz +/- 0.4%

## 2.3.1 Modes of Operation

The EUT is powered via a fused feed from the vehicle battery power distribution center and the feed is always active.

### 2.3.1.1 Receive

The EUT has two modes of Receiver operation depending upon the vehicle status:

- Receiver is periodically activated and deactivated (Polling mode) whenever the RTM is not awake and the vehicle CAN serial bus is asleep.
  - Note: Polling operation requires RKE Fob ID's to be learned and/or TPM functionality to be enabled.
- Receiver is continuously active whenever RTM is awake or vehicle CAN serial bus is awake.

### 2.3.1.2 Transmit

The EUT transmit operation is activated whenever a valid received RF data message contains a Vehicle status request action code. TX mode is terminated when the message has been transmitted. RX mode will not be active when the EUT TX mode is in operation.

- Vehicle status request transmission from RKE Fob occurs either following a vehicle Remote Start or Stop request or after a certain period of time expires following the receipt of a function pending status request.

### 2.3.2 Variants

The EUT only supports one configuration setting

- \$DE00 = 0x1

## 2.4 EUT Samples & Configuration

One unmodified sample, one receive test sample for low band reception (315MHz), one receive test sample for high band reception (903MHz) and eight transmit test samples were provided to the homologation vendor for certification testing and approval in the countries defined in the statement of work.

### 2.4.1 Functional Configuration/Operation Modifications

The samples provided for certification testing were modified/programmed by the manufacturer based on the following:

- 2 receive test samples provided for certification testing runs in polling mode whenever 8V to 16V (12.8V) is applied to the power supply input pin and were modified by the manufacturer in order to indicate a correct received frame with a LED at the LIN output of the module to see if the module is still in polling mode and able to receive telegrams.
- 4 samples (one for each channel / antenna combination) have special SW in order to transmit a continuous carrier to conduct the Transmit certification testing.
- 4 samples (one for each channel / antenna combination) have special SW in order to transmit continuously an ACK frame to conduct the Transmit certification testing.

### 2.4.2 Production Intent

The samples provided for certification testing are ready for production and were produced via the production intent processes.

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