Title: VP2Refresh system specification

Project:	VP2Refresh		
Maturity:	draft/ ready/ reviewed	**Version:**	A01

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Purpose:

This document describes the VP2 system specification

History of Content Changes

Version	**Status**	**Date dd-Mmm-YYYY**	**Document Owner, Department**	**Changes** (e.g. CR-number)
A01	released	07-Sep-2015	F. Born I IC RD G EE D2	First version

Table of contents

1 Introduction

This document shows an overview of the VP2Refresh radio system.

The VP2Refresh is a multi media radio with an on board Bluetooth chip from CSR which support the Bluetooth version V2.1+EDR with a max. data rate up to 3Mbit/s in EDR mode.

1.1 System description

The Bluetooth chip in the VP2Refresh system is implemented for hands free audio and data connections with mobile devices like mobile phones.

The basic function of the VP2Refresh Bluetooth system is the hands free functionality in combination with the car internal loudspeaker and microphone.

The Bluetooth IC work with an 26MHz crystal.

The following pictures show the VP2Refresh radio hardware with the housing:

Figure1: VP2Refresh radio, front top view

Figure2: VP2Refresh radio, front view

1.2 HW/SW information

The VP2Refresh radio system is designed for use in several countries with varying HW variants dependent to the car model and car internal accessory variants, for this reason the VP2Refresh could be delivered with different HW and SW version (e.g. BT radio connect with main board PCB antenna or with antenna on the front PCB).

For the Bluetooth certification a variant with antenna on the front PCB will be used.

The HW / SW version is marked on the top label see figure3 (e.g. SW:20.00.26.01, HW:F.EU.D2.V22).

For the Bluetooth RF radio part at VP2Refresh only one HW version exists, this version is defined as: "**Model: VP2Refresh**", see figure3 label.

Figure3: VP2Refresh label example

1.3 Block diagram

The following picture shows the block diagram of the VP2Refresh:

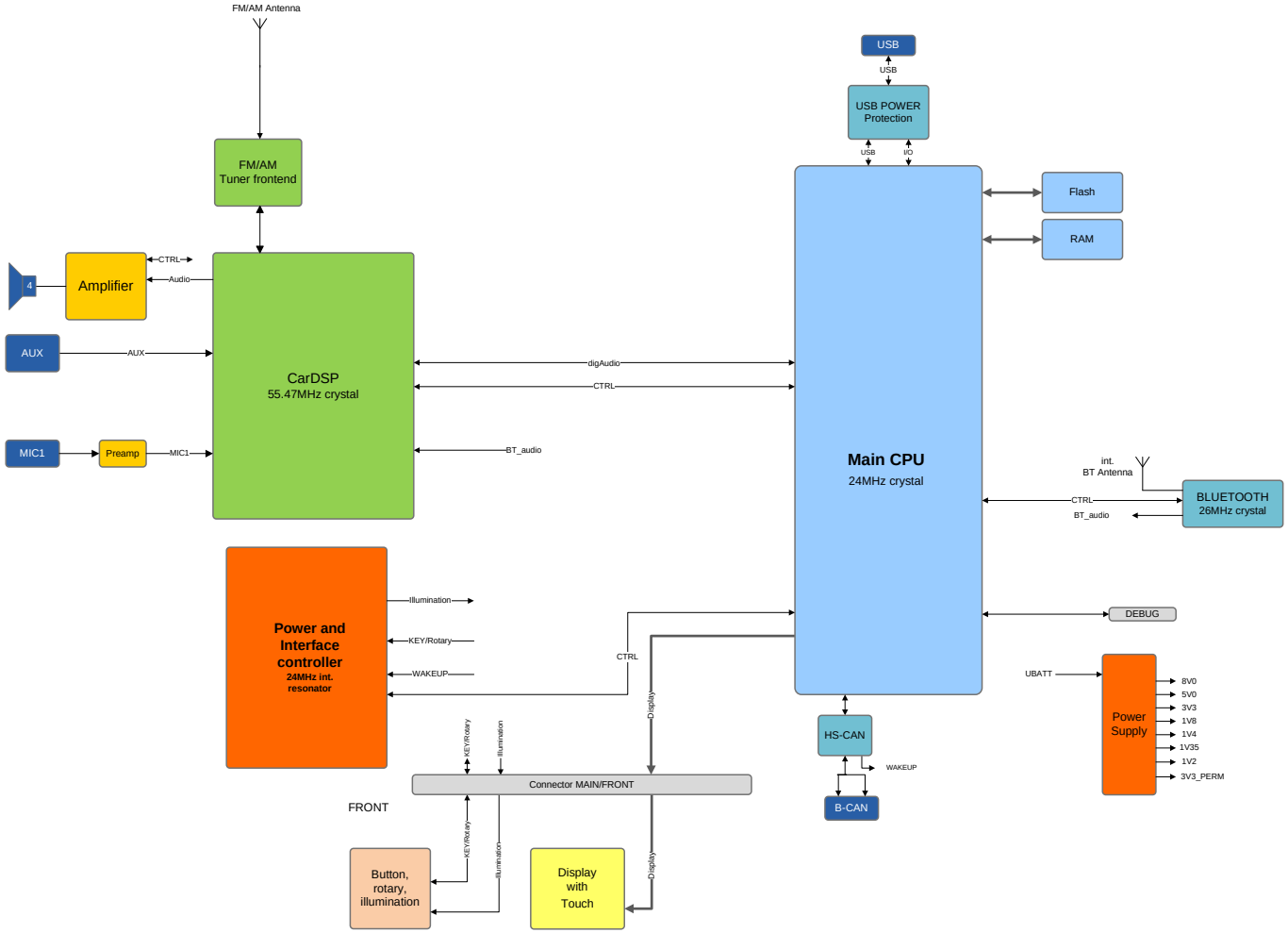

Figure4: VP2Refresh block diagram

1.4 Electrical characteristics

The following table shows the electrical characteristics of the VP2 system and the on board Bluetooth IC.

characteristics	min.	typ.	max.	value
DC power supply	10	13.5	16	V
load current at sleep mode	-	400	2000	µA
Typical load current during constant operation with low volume	-	1.3	-	A
Typical load current during constant operation with high volume	-	7	-	A
max. current limited by lead car fuse	-	-	15	A
Operating temperature	-40	-	+85	°C
Weight of radio		1.3		kg
Chassis width incl. Front		275		mm
Chassis high incl. Front		120		mm
Chassis depth incl. Front		245		mm
Bluetooth characteristics				
Transmit frequency	2402	-	2480	MHz
Transmit power, class2 module	-6	0	+4	dBm
Receive sensitivity of Bluetooth IC	-81	-87	-	dBm
Crystal for Bluetooth IC		26		MHz

Table1: VP2Refresh electrical characteristics

1.5 VP2Refresh radio function block description

- AM/FM Radio
- USB audio
- AUX input
- Bluetooth HFP
- Microphone input
- High speed CAN

FM Tuner Section

Tuning Range: see following country dependent informations
FM Mono: 22.5kHz deviation 1kHz
FM Stereo: 22.5kHz deviation 1kHz, pilot(19kHz) 7.5kHz deviation
Useable Sensitivity: 6dBµV
SNR: Mono 60dBµV / Stereo 55dBµV
Europe setup:
FM range: 87.5MHz – 108MHz with 100kHz steps
America setup:
FM range: 87.9MHz – 107.9MHz with 200kHz (country dependent 100kHz) steps

AM Tuner Section

Tuning Range: see following country dependent informations
26dB S/N Sensitivity: 32dBµV
SNR: 55dB
Europe setup:
AM range: 531kHz – 1602kHz with 9kHz steps
America setup:
AM range: 530kHz – 1710kHz with 10kHz steps

USB Section

USB 2.0 type
1.1A max. output current supply
USB “Mass Storage Class”
Audio file format: MP3 / AAC / WMA

AUX Section

Channel Balance: 0dB+/-2
Distortion: 0.3%

Bluetooth Section

Bluetooth Profiles: HFP, PBAP, PCE, OPP, SPP, A2DP, AVRCP, DUN, MAP, SAP, HID, PAN, GOEP, SyncML, Device ID profile