VTECH ENGINEERING CANADA LTD.

TITLE	Changes to Vtech PDL Cordless Phone Platform
MODEL	PDLB & PDLC (Models VT1901 & VT1920c)

"identical to Sony SPP-ID910 except cosmetic"

1   Introduction

The following is a summary of the changes between the original PDL and the PDL MKII cordless telephone platforms. The purpose of the MKII is to perform a cost reduction as well as performance improvements over the MKI platform. This document will discuss the changes to handset and to the base unit separately in the following sections.

2   Handset Changes

Changes to the handset do not involve any exterior cosmetic or chassis changes. The PCB dimensions remain unchanged as well as most of the major component locations and general topology. There is no change to the antenna or antenna structure.

2.1   Handset Unit RF Circuit Changes

The RF changes do not significantly change the RF circuit layout - most changes are limited to component values only. The structure of the RF circuit, the RF shielding configuration (including the location of internal partition walls), and the IF and LO frequencies are not changed in any way. Frequency control of the on-board oscillators is via an unchanged reference frequency circuit, and an unchanged PLL.

Change	Reason for Change
- SAW Filter F3 is changed from a leaded to a surface mount package.	- Cost reduction, no performance change.
- change Q2 from NE68139 to NE68130	Change package style for receiver LNA transistor for cost reduction. Transistor die remains the same.
- change Q4 from NE85633 to NE85630	Change package style for 2nd receiver amp for cost reduction. Transistor die remains the same.
- change Q1 from BFR92A to 2SC4083	Change transistor in transmit amp for cost reduction. Transistor die does not remain the same, however, its performance for this application is similar to that provided by the original transistor.
- delete Q10, Q11 (BRF92A) - delete R56, R544 - change R55, R43, C80, C73 to 0r - delete C25, C90 - change R32, R41 from 470r to 300r	More detailed testing along with an improvement in the minimum input level spec for synthesizer U2 has revealed that the transmit and receive PLL buffers Q10 and Q11 are not required. Identical performance can be obtained by eliminating Q10 & Q11 and slightly increasing the input level by reducing R32 & R41.
- change Q8 from BFR92A to 2SC4083 - change R31 from 150r 1% to 100r 1% - change R29 from 47r to 24r	Change transistor in transmit VCO for cost reduction. Transistor die does not remain the same, however, its performance for this application is similar to that provided by the original transistor. 2 bias resistor changes were made to maintain system performance.

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Change	Reason for Change
- change Q9 from BFR92A to 2SC4083 - change R39 from 15k0 1% to 10k0 1% - change R38 from 10k0 1% to 11k0 1%	Change transistor in receive VCO for cost reduction. Transistor die does not remain the same, however, its performance for this application is similar to that provided by the original transistor. 2 bias resistor changes were made to maintain system performance.
- remove C49 tuning cap - remove C53 - change C54 from 1p5 to N/U - change C52 from 7p5 to 4p7 - change R58 from 3k9 to 1k8 - change C83 from 470n to 1u - change C84 from 100n to 220n	Remove tuning capacitor from transmit VCO for cost reduction and to improve manufacturability and long-term reliability. Our manufacturing process control has demonstrated that we can remove the tuning capacitor from the VCO while maintaining the required level of performance. Removing the tuning cap eliminates any potential problems caused by drift and mechanical vibration. Surrounding capacitor and resistor changes are to compensate for the removal of the tuning cap.
- remove C88 tuning cap - remove C68 - change C69 from 4p7 to 10p - change C67 from 2p7 to 1p8 - change R47 from 51k to 18k - change C76 from 15n to 39n - change C89 from 4n7 to 12n	Remove tuning capacitor from receive VCO for cost reduction and to improve manufacturability and long-term reliability. Our manufacturing process control has demonstrated that we can remove the tuning capacitor from the VCO while maintaining the required level of performance. Removing the tuning cap eliminates any potential problems caused by drift and mechanical vibration. Surrounding capacitor and resistor changes are to compensate for the removal of the tuning cap.

2.2 Handset Unit Audio Circuit Changes

The handset audio changes consist of changes to different packages and component substitutions to facilitate cost reductions.

Change	Reason for Change
- C103 & C87 have been changed from an SMD to a leaded package (now C91 & C123).	Cost reduction; no performance change.
- U11 will be directly die-bonded to a small daughter PCB & soldered directly to the main PCB.	Cost reduction; the exact same semiconductor die will be used, only the packaging is changed.
- Voltage regulator U5 (NS LP2981) will be substituted with a Torex XC62AP30 (U6).	Cost reduction; drop in replacement part.
- C98, C94 changed from SMD to leaded capacitor (now C93, C99) - C119 deleted.	Cost reduction —

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3 Base Unit Changes

Changes to the basedo not involve any exterior cosmetic or chassis changes. There is no change to the antenna or antenna structure.

Changes to the base components are made to the RF circuit (the same changes as those made to the handset RF circuit), to the audio circuits and to the PCB construction. The original base unit consists of a single PCB that contains the RF, audio, and telephone line interface circuits. The revised base unit will contain 2 PCBs, splitting the telephone line interface from the RF and audio circuits.

3.1 Base Unit RF Circuit Changes

The RF changes made to the base unit do not significantly change the RF circuit layout – most changes are limited to component values only. The structure of the RF circuit, the RF shielding configuration (including the location of internal partition walls), and the IF and LO frequencies are not changed in any way. Frequency control of the on-board oscillators is via an unchanged reference frequency circuit, and an unchanged PLL.

Change	Reason for Change
- SAW Filter F3 is changed from a leaded to a surface mount package.	- Cost reduction, no performance change.
- change Q2 from NE68139 to NE68130 (now Q24)	Change package style for receiver LNA transistor for cost reduction. Transistor die remains the same.
- change Q4 from NE85633 to NE85630	Change package style for 2nd receiver amp for cost reduction. Transistor die remains the same.
- change Q1 from BFR92A to 2SC4083	Change transistor in transmit amp for cost reduction. Transistor die does not remain the same, however, its performance for this application is similar to that provided by the original transistor.
- delete Q10, Q11 (BRF92A) - delete R56, R44,R55, R43, C80, C73, C25, C90	More detailed testing along with an improvement in the minimum input level spec for synthesizer U2 has revealed that the transmit and receive PLL buffers Q10 and Q11 are not required.
- change Q8 from BFR92A to 2SC4083	Change transistor in transmit VCO for cost reduction. Transistor die does not remain the same, however, its performance for this application is similar to that provided by the original transistor
- change Q9 from BFR92A to 2SC4083	Change transistor in receive VCO for cost reduction. Transistor die does not remain the same, however, its performance for this application is similar to that provided by the original transistor.

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Change	Reason for Change
- remove C49 tuning cap - remove C53 - change C52 from 4p7 tp 9p1 - change R58 from 3k9 to 1k8 - change C83 from 470n to 1u - change C84 from 100n to 220n	Remove tuning capacitor from transmit VCO for cost reduction and to improve manufacturability and long-term reliability. Our manufacturing process control has demonstrated that we can remove the tuning capacitor from the VCO while maintaining the required level of performance. Removing the tuning cap eliminates any potential problems caused by drift and mechanical vibration. Surrounding capacitor and resistor changes are to compensate for the removal of the tuning cap.
- remove C88 tuning cap - remove C68 - change C69 from 4p7 to 10p - change C67 from 2p7 to 1p8 - change R47 from 51k to 18k - change C76 from 15n to 39n - change C89 from 4n7to 12n	Remove tuning capacitor from receive VCO for cost reduction and to improve manufacturability and long-term reliability. Our manufacturing process control has demonstrated that we can remove the tuning capacitor from the VCO while maintaining the required level of performance. Removing the tuning cap eliminates any potential problems caused by drift and mechanical vibration. Surrounding capacitor and resistor changes are to compensate for the removal of the tuning cap.

3.2 Base Unit Baseband Changes

Change	Reason for Change
- All components on the Line Interface PCB are now leaded components (as opposed to SMD). All values are the same except as described below.	Cost reduction.
- U8 will be directly die-bonded to a small daughter PCB & soldered directly to the main PCB.	Cost reduction; the exact same semiconductor die will be used, only the packaging is changed.
- Voltage regulator U6(NS LP2981) will be substituted with a Torex XC62AP30 (U9.	Cost reduction; drop in replacement part.
- C120, C87 changed from SMD to leaded capacitor (now C91, C99)	Cost reduction
- Optocoupler U4 deleted. - delete R46, R84, R85, R88, R86, Q12 - change U10C to U10A	Circuit simplification which will allow the ring detection to take place using the high input impedance OP-Amp circuit already in place for extracting type II CID information from tip & ring

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Change	Reason for Change
- change U10D to U1C on Line interface PCB - delete Q14, R116, R120 - delete R110, R111	Simplify & cost reduce parallel telephone detection circuit function.
- Change U10 to U1 on the Line interface PCB	Designator and change to leaded on line interface PCB.
- delete LM324 U9 and replace with an LM393 comparator U10.	Replace LM324 where used as a comparator with an actual comparator for cost reduction.

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