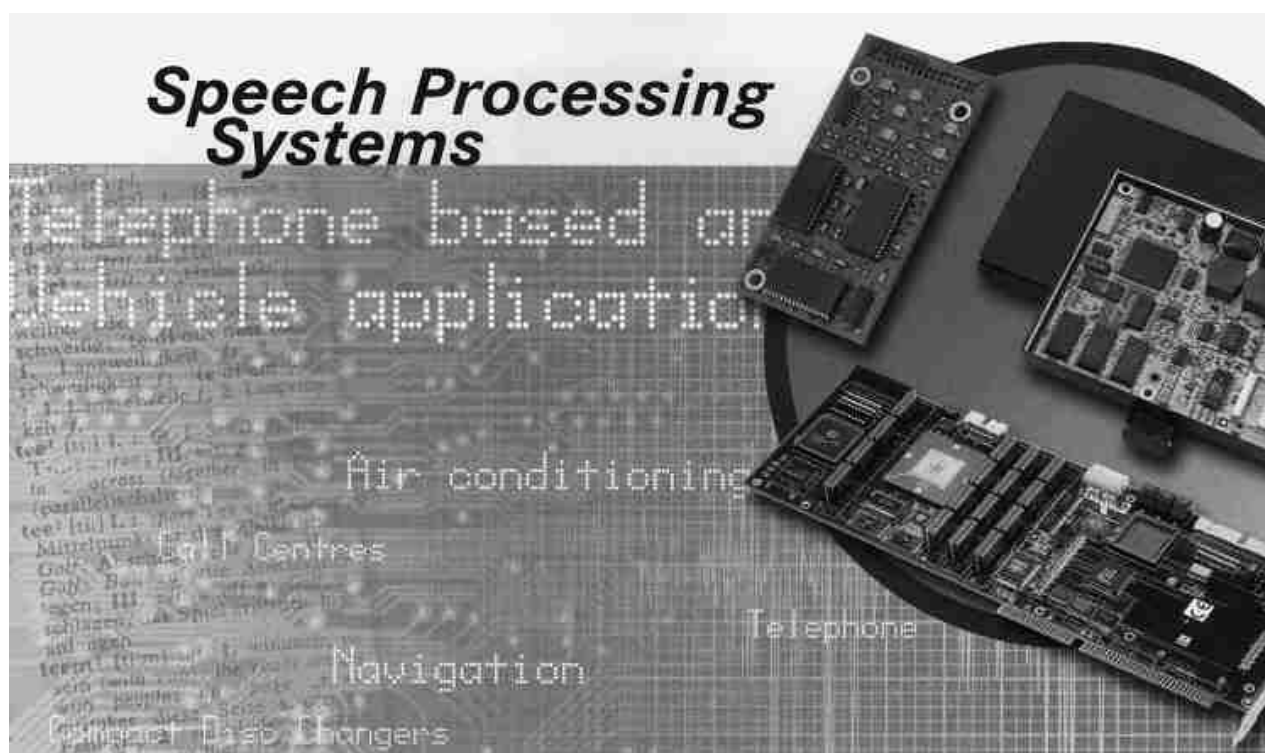


## Carkit CAN

### Bluetooth



## Product description

### Carkit CAN\_BT\_0001

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				Department		Carkit CAN Bluetooth	Page
				Date	Name		
				Drawn	15.03.05	Schneider	
				Check			
				Rel.			
				QME			
02	Second Edition	15.03.05	Schneid	<b>TEMIC</b> TEMIC SDS GmbH			1
01	First Edition	01.03.05	Schneid				of 5
Rev.	Change / Note	Date	Name	File	Product description_v2.doc		Printed. 15.03.05

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## 1 Abstract

### 1.1 Revision index

No.	State	Version	Change Description	Changed pages	Autor
01		02	More detailed functional description	5	Schneider

### 1.2 Aplicable dokumente

Ref.	State	Version	Document Description	Autor

1.3 Abbreviations

	Document Description
BT	Bluetooth
CAN	Controller area network, automotive bus
EC	Echo cancellation
NR	Noise reduction

## 1.4 Purpose of the document

Short description of the Carkit CAN.

## 2 Functions

### 2.1 General

The Carkit CAN is a wireless handsfree carkit based on Bluetooth technology. It transfers audio and control signals to and from a corresponding Bluetooth Audio gateway (mobile with Bluetooth capability).

The Carkit CAN has following functions:

- Noise reduction
- Echo cancellation
- Speaker independent and speaker dependent voice recognition for command and control (e.g. "dial number")
- Connection to the mobile phone via Bluetooth or via cradle
- Connected to the CAN-bus of the car

### 2.2 Bluetooth – How it works

Bluetooth operates in the 2.4 GHz ISM (Industrial Scientific Medicine) band at 2.4 GHz. A frequency hop transceiver is applied to combat interference and fading. Modulation is GFSK (Gaussian Frequency Shift Keying) with a BT=0.5. The Modulation index is 0.32. A binary one is represented by a positive frequency deviation, and a binary zero is represented by a negative frequency deviation. The symbol rate is 1 Ms/s.

For full duplex transmission, a Time-Division Duplex (TDD) scheme is used. On the channel, information is exchanged through packets. Each packet is transmitted on a different hop frequency. A packet nominally covers a single slot, but can be extended to cover up to five slots. The Bluetooth protocol uses a combination of circuit and packet switching. Slots can be reserved for synchronous packets. Bluetooth can support an asynchronous data channel, up to three simultaneous synchronous voice channels, or a channel which simultaneously supports asynchronous data and synchronous voice. Each voice channel supports a 64 kb/s synchronous (voice) channel in each direction. The asynchronous channel can support maximal 723.2 kb/s asymmetric (and still up to 57.6 kb/s in the return direction), or 433.9 kb/s symmetric.

## 3 Hardware description

The Hardware consists of the following main blocks:

- DSP TDA7590 "Salieri"
  - Main processor
  - Application software

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- Noise reduction and echo cancellation
  - Voice recognition
  - Bluetooth-Stack
  - A/D and D/A conversion with the internal codec (audio in/ out)
  - Internal SRAM
- Memory
  - NOR-Flash
  - NAND-Flash
- Bluetooth
  - Infineon PMB8761
  - Rf-connector (FAKRA type)
- CAN interface
  - Transceiver TJA1054
  - Microcontroller (see below)
- Microcontroller ST7
  - Wake up
  - Diagnostics
  - CAN
- Power supply block
- System connector