# DATA SHEET

# OM5604; OM5606
## Multimedia radio tuner

Preliminary specification
Supersedes data of 1995 Aug 31
File under Integrated Circuits, IC01

1995 Oct 10



Philips Semiconductors

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## FEATURES

- Local/DX switching to improve large signal handling on FM when an outdoor antenna or cable network is connected
- Local/DX function provides different search levels which are useful for spectrum analyser functions
- Three extra I/O expander ports are available for general purpose ($I^2C$-bus only)
- RDS-MPX signal available
- The module meets the *"FCC regulations"*
- The OM5604; OM5606 is in accordance with *"CENELEC EN55022"* and *"CENELEC EN50082-1"*.

## GENERAL DESCRIPTION

The OM5604; OM5606 is an FM-radio tuner which includes a brand new concept in tuning techniques. The new tuning concept combines the advantages of hand tuning together with electronic facilities and features. The tuner is $I^2C$-bus controlled.

## ANTENNA CONNECTOR

### RF connector

- OM5604: F-connector (FM input impedance = 75 Ω)
- OM5606: IEC-connector (FM input impedance = 75 Ω).


Fig.1 OM5604; OM5606 connector.

## ORDERING INFORMATION

| UNIT | FREQUENCY (MHz) | BUS | RF CONNECTOR |
|---|---|---|---|
| FM $I^2C$-bus | 87.5 to 108 | $I^2C$-bus | F-connector for OM5604 |
| | | | IEC-connector for OM5606 |

## PINNING

| PIN | DESCRIPTION |
|---|---|
| 1 | port 5 PCF8574A ($I^2C$-bus) |
| 2 | port 6 PCF8574A ($I^2C$-bus) |
| 3 | port 7 PCF8574A ($I^2C$-bus) |
| 4 | serial clock input(1) |
| 5 | stereo indicator |
| 6 | serial data input/output(1) |
| 7 | supply voltage (+5 V) |
| 8 | supply voltage (+12 V) |
| 9 | audio right output |
| 10 | ground |
| 11 | audio left output |
| 12 | MPX signal for RDS demodulation |

**Note**

1. See *"The $I^2C$-bus and how to use it"* (ordering number 9398 393 40011).

## INTERFACE

- Digital driving: $I^2C$-bus
- Audio output: typical 900 mV RMS (load 600 Ω) for FM Δf = 75 kHz
- Supply: 5 V ±10% current ≤30 mA and 12 V ±1%, ripple ≤1 V, current ≤2 mA
- RDS-MPX: DC coupled (load ≥39 kΩ), amplitude typical 150 mV (Δf = 75 kHz)
- RF input connector (75 Ω)
- 12 pin connector.

## LIMITING VALUES

IEC publication 68-1; full specification; EMC behaviour: the module is designed to be FCC friendly (part 15).

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| T | temperature | | 15 | 35 | °C |
| RH | relative humidity | | 25 | 85 | % |
| $T_{amb}$ | operating ambient temperature | functional operation | –10 | +60 | °C |
| $T_{stg}$ | storage temperature | | –20 | +70 | °C |
| $V_{esd(pc)}$ | electrostatic handling for pin connector | note 1 | – | 2 | kV |
| | | note 2 | – | 300 | V |
| $V_{esd(RFc)}$ | electrostatic handling for RF-connector | note 3 | – | 4 | kV |
| | | note 4 | – | 500 | V |

**Notes**

1. Class B: human body model (1.5 kΩ, 100 pF).
2. Class B: charge device model (0 Ω, 200 pF).
3. Class A: human body model (1.5 kΩ, 100 pF).
4. Class A: charge device model (0 Ω, 200 pF).

**CHARACTERISTICS**

Direct coaxial feed to 75 Ω RF-connector; signal generator impedance = 75 Ω; RF levels are EMF/2; $\Delta f$ = 75 kHz; $f_i$ = 98 MHz; $f_{mod}$ = 1 kHz; left and right audio output; $R_L$ = 600 Ω; audio filter = 22 Hz to 15 kHz; temperature range = 15 to 35 °C.

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| **FM mono** | | | | | | |
| $\Phi_{lim}$ | 3 dB limiting sensitivity | $V_{11, 12}$ = –3 dB; $V_{11, 12}$ = 0 dB at $V_{FMi}$ > 100 μV | – | 3.5 | 5 | μV |
| $\Phi_{RF}$ | RF sensitivity | (S + N)/N = 26 dB | – | 2.2 | 4 | μV |
| S/N | signal-to-noise ratio | $V_{FMi}$ = 1 mV | – | 71 | – | dB |
| $f_L$ | lower audio frequency bandwidth limit | measured lower limit (–3 dB); $f_{ref}$ = 1 kHz; measured with pre-emphasis | – | 40 | 70 | Hz |
| $f_H$ | upper audio frequency bandwidth limit | measured upper limit (–3 dB); $f_{ref}$ = 1 kHz; measured with pre-emphasis | 12.5 | 14 | – | kHz |
| $\alpha_{AM}$ | AM suppression | AM modulation m = 30%; $f_{AF}$ = 1 kHz | 40 | 58 | – | dB |
| THD | total harmonic distortion | | – | 1.5 | 3 | % |
| $V_{FMi}$ | search sensitivity | search stop bits 17 and 16 = 0 | – | 12 | 36 | μV |
| $V_{FMi}$ | large signal handling | DX mode; measured distortion = 10% | – | 1000 | – | mV |
| $att_{RF}$ | RF attenuation in local mode | | 15 | 20 | 30 | dB |
| $V_{FM}$ | audio output voltage level | $V_{FMi}$ = 1 mV; $\Delta f$ = 75 kHz; $f_{AF}$ = 400 Hz | 700 | 850 | – | mV |
| **FM stereo** | | | | | | |
| S/N | signal-to-noise ratio | $V_{FMi}$ = 1 mV | 60 | 63 | – | dB |
| $\alpha_{cs}$ | channel separation | $f_{AF}$ = 1 kHz; $V_{FMi}$ = 1 mV | 22 | 28 | – | dB |
| $\lvert\Delta I_O\rvert$ | channel imbalance | $f_{AF}$ = 1 kHz; $V_{FMi}$ = 1 mV | – | 0.5 | 3 | dB |
| $\alpha_{19}$ | carrier and harmonic suppression | | 25 | 26 | – | dB |
| $\alpha_{38}$ | carrier and harmonic suppression | | 25 | 27 | – | dB |
| α | stereo blend function | $V_{FMi}$ = 100 μV | 5 | 10 | – | dB |
| THD | total harmonic distortion | | – | – | 3 | % |

**PACKAGE OUTLINES**

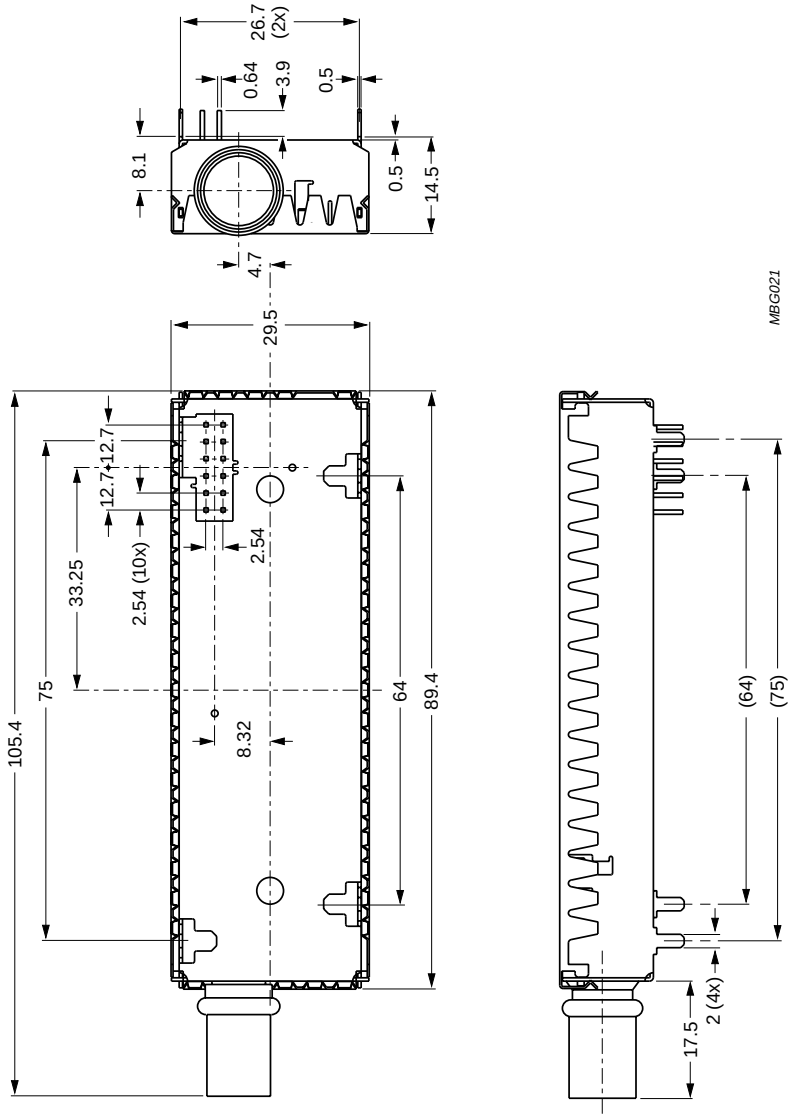


Fig.2 Package outline for OM5604 (F connector).

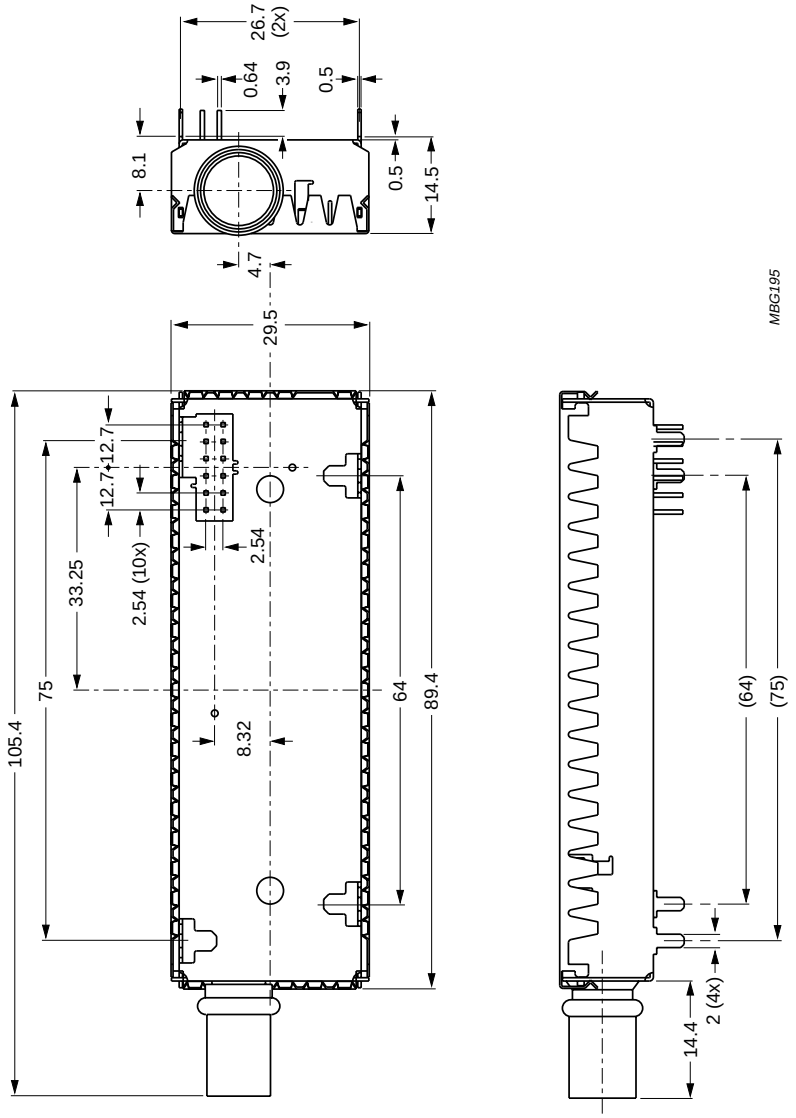


Fig.3 Package outline for OM5606 (IEC connector).

## DEFINITIONS

| **Data sheet status** | |
|---|---|
| Objective specification | This data sheet contains target or goal specifications for product development. |
| Preliminary specification | This data sheet contains preliminary data; supplementary data may be published later. |
| Product specification | This data sheet contains final product specifications. |
| **Limiting values** | |
| Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability. | |
| **Application information** | |
| Where application information is given, it is advisory and does not form part of the specification. | |

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SCD44




Printed in The Netherlands

513061/1500/02/pp8 Date of release: 1995 Oct 10

Document order number: 9397 750 00352


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