# SIEMENS

## Mobile Communications Prescaler Circuit

**PMB 2312**

**Preliminary Data**

**Bipolar IC**

### Features

- Low Current Consumption
- Wide Input Sensitivity
- Wide Input Frequency Range
- TTL/CMOS compatible MOD input
- Standby Mode
- Switchable divider ratios 64/65 or 128/129

**P-DSO-8**

### Applications

- With its very low (5.7 mA) current consumption the IC has been particularly designed for use in mobile communications. Furthermore, it can be switched to a low-power standby mode. Depending on the external network configuration, dividing ratios of 64/65 or 128/129 can be selected.

| Type | Ordering Code | Package |
|---|---|---|
| PMB 2312 | Q67000-A6039 | P-DSO-8 (SMD) |

### Circuit Description

The symmetrical differential inputs of the IC may be connected asymmetrically. In this case the unused input must be RF-grounded with a capacitor (ca. 1.5 nF) with a low serial inductance.

Depending on the logic level at SW input the basic divide ratio of the ECL-stages is fixed to 1 : 64/65 or 1 : 128/129. The MOD input determines whether modulus 1 : n or 1 : n + 1 (n = 64 or 128 according to SW-level) is active.

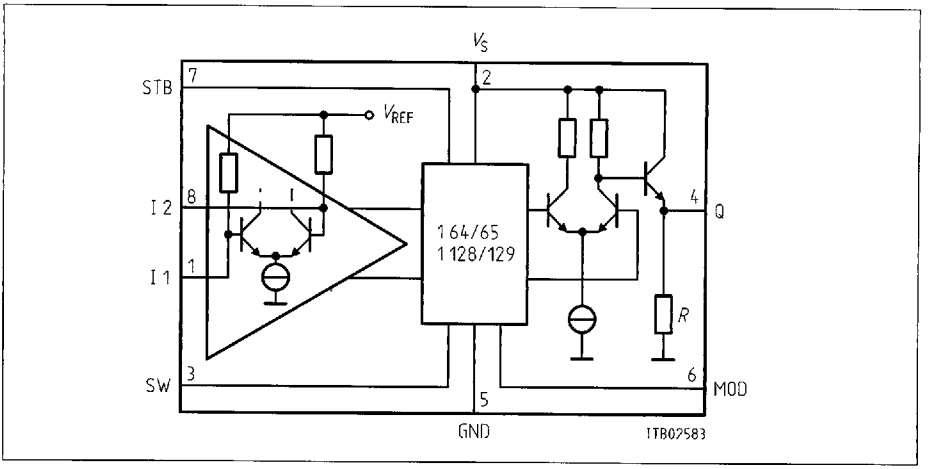
The IC can be switched to a low-power standby mode (input STB).

The MOD input is TTL/CMOS compatible.

The open-emitter output is CMOS compatible according to the **application circuit.** The minimum logic swing is fixed to 1 Vpp.

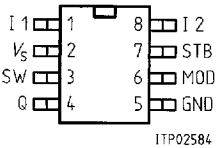
### Function Table

| Input Pin | Logic Level | Prescaler Function |
|---|---|---|
| SW | high = 3.0 to $V_s$<br>low = GND to 0.8 V or open | 1 : 64/65<br>1 : 128/129 |
| MOD | high = 2.0 V to $V_S$ or open<br>low = GND to 0.8 V | 1 : 64/1 : 128<br>1 : 65/1 : 129 |
| STB | high = $V_S$ – 0.1 V to $V_S$ or open<br>low = GND to 0.8 V | Divider<br>Q = high, standby-mode |




**Block Diagram**

**Pin Configuration**
(top view)




**Pin Definitions and Functions**

| Pin No. | Symbol | Function |
|---|---|---|
| 1 | I1 | Input I1 |
| 2 | $V_S$ | Supply voltage |
| 3 | SW | Divide ratio 1 : 64/65 – 1 : 128/129 control input |
| 4 | Q | Output |
| 5 | GND | Ground |
| 6 | MOD | Modulus 1 : n/n + 1 (n = 64 or 128) control input |
| 7 | STB | Standby mode control input |
| 8 | I2 | Input I2 |

## Electrical Characteristics

### Absolute Maximum Ratings

$T_A$ = – 40 to 85 °C

| Parameter | Symbol | Limit Values | | Unit |
|---|---|---|---|---|
| | | min. | max. | |
| Supply voltage | $V_S$ | – 0.3 | 6 | V |
| Input level (pin 1; pin 8) | $V_I$ | 1 | 5 | V |
| Voltage swing (pin 1 to pin 8) | $V_{I18}$ | – 3 | 3 | V |
| Input level (pin 3; pin 6; pin 7) | $V_{SW}$, $V_{MOD}$, $V_{ST\,B}$ | – 0.3 | 6 | V |
| Output level (pin 4) | $V_Q$ | | $V_S$ | V |
| Output current (pin 4) | $-I_Q$ | | 10 | mA |
| Junction temperature | $T_j$ | | 125 | °C |
| Storage temperature | $T_{stg}$ | – 65 | 125 | °C |
| Thermal resistance system-ambient | $R_{thSA}$ | | 185 | K/W |

### Operating Range

| | | | | |
|---|---|---|---|---|
| Supply Voltage | $V_S$ | 4.0 | 5.5 | V |
| Input frequency | $f$ | 130 | 1100 | MHz |
| Ambient temperature | $T_A$ | – 40 | 85 | °C |

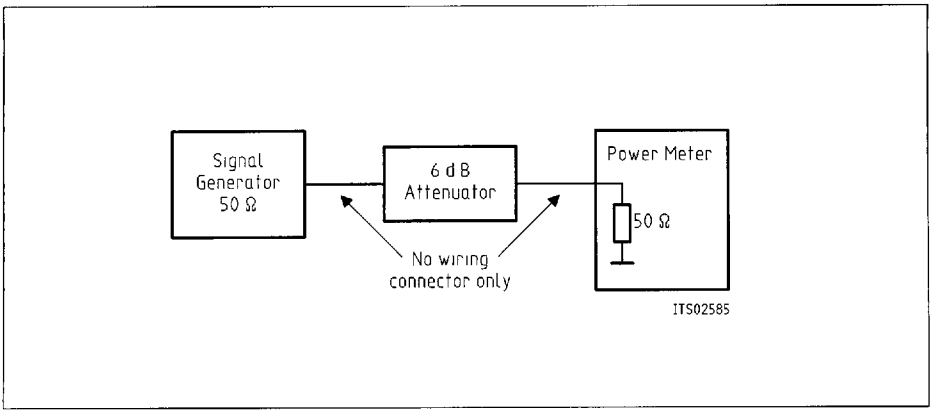
**AC/DC Characteristics**

$V_S$ = 4.0 to 5.5 V; $T_A$ = – 40 to 85 °C; refer to test circuit

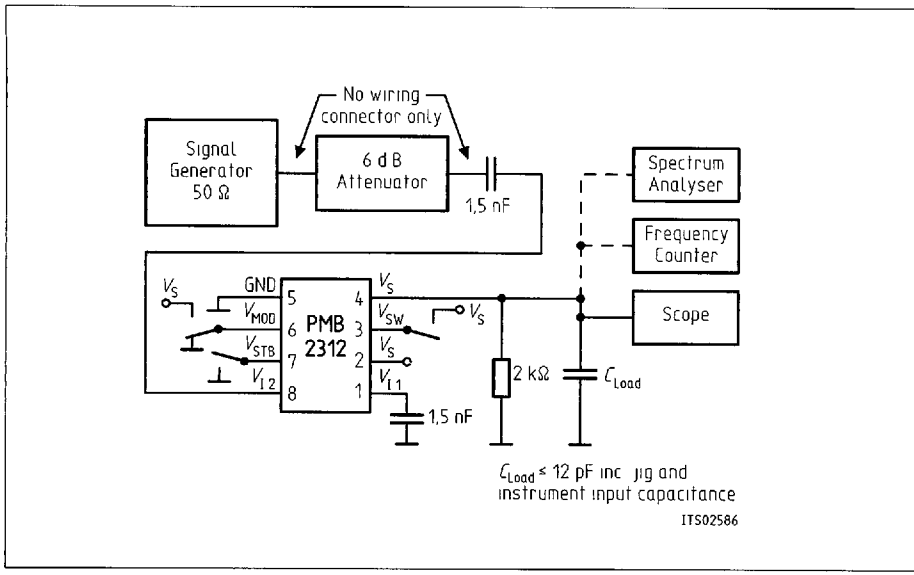
| Parameter | Symbol | Limit Values | | | Unit | Test Condition |
|---|---|---|---|---|---|---|
| | | min. | typ. | max. | | |
| Supply current | $I_S$ | | 5.7 | 7.4 | mA | inputs RF-grounded, $V_S$ = 4.0 V, $T_A$ = 25 °C STB open, output open |
| Supply current | $I_S$ | | 5.8 | 7.5 | mA | inputs RF-grounded, $V_S$ = 5.0 V, $T_A$ = 25 °C STB open, output open |
| Supply current | $I_S$ | | 5.9 | 7.7 | mA | inputs RF-grounded, $V_S$ = 5.5 V, $T_A$ = 25 °C STB open, output open |
| Supply current in standby-mode | $I_{SSTB}$ | | 0.3 | 0.45 | mA | inputs RF-grounded, output open, STB = GND |
| Input level | $V_I$ | 25 | | 400 | mVrms | 140 – 1000 MHz |
| Input sensitivity (**diagram 2**) | | – 19 | | 5 | dBm | sine wave |
| Output logic swing | $V_Q$ | 1 | | | Vpp | $C_L \leq 12$ pF |
| SW threshold voltage high | $V_{SWH}$ | 3.0 | | $V_S$ | V | |
| SW threshold voltage low | $V_{SWL}$ | GND | | 0.8 | V | |
| SW input current high | $I_{SWH}$ | | | 100 | µA | SW = $V_S$ |
| SW input current low | $-I_{SWL}$ | | | 50 | µA | SW = GND |
| MOD threshold voltage high | $V_{MODH}$ | 2.0 | | $V_S$ | V | |
| MOD threshold voltage low | $V_{MODL}$ | GND | | 0.8 | V | |
| MOD input current high | $I_{MODH}$ | | | 50 | µA | MOD = $V_S$ |
| MOD input current low | $-I_{MODL}$ | | | 100 | µA | MOD = GND |
| STB threshold voltage high | $V_{STBH}$ | $V_S$ – 0.1 | | $V_S$ | V | |
| STB threshold voltage low | $V_{STBL}$ | | | 0.8 | V | |
| STB input current high | $I_{STBH}$ | | | 50 | µA | STB = $V_S$ |
| STB input current low | $-I_{STBL}$ | | | 160 | µA | STB = GND |
| Internal load resistance (**see block diagram**) | $R$ | | 50 | | kΩ | |

**Delay Times**

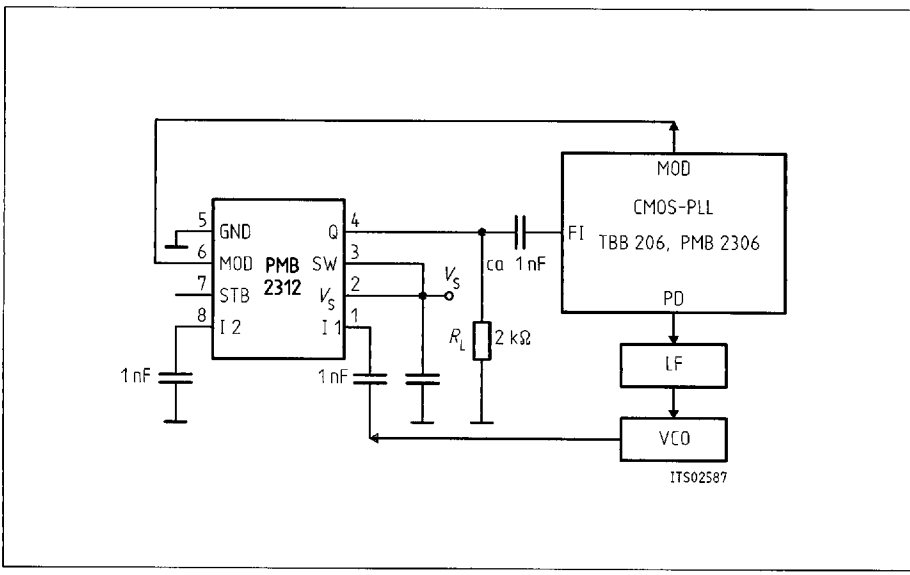
| | | | | | | |
|---|---|---|---|---|---|---|
| MOD setup time (**diagram 1**) | $t_{set}$ | | | 29 | ns | |




**Test Circuits Calibration of the Signal Generator**




**Input Sensitivity and Output Logic Swing Measurement**




**Application Circuit**

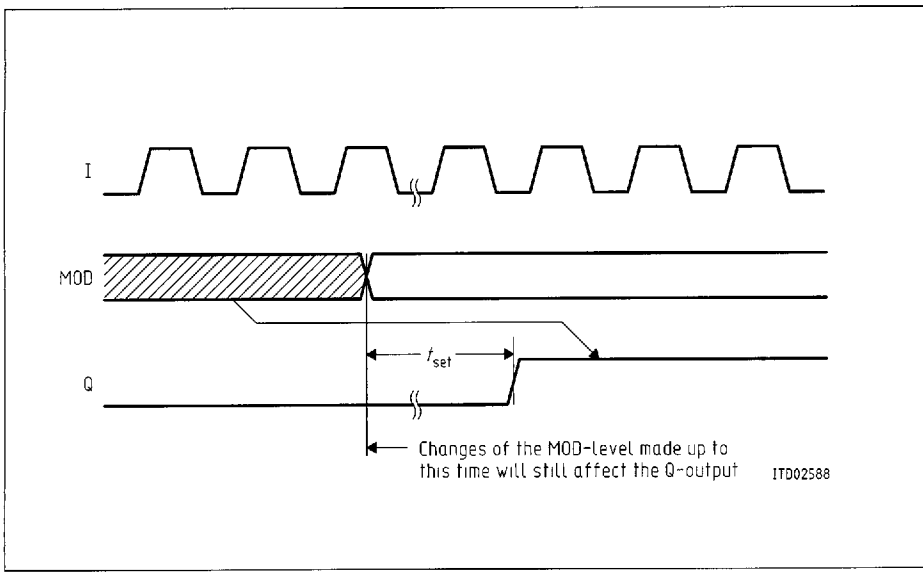



**Diagram 1**

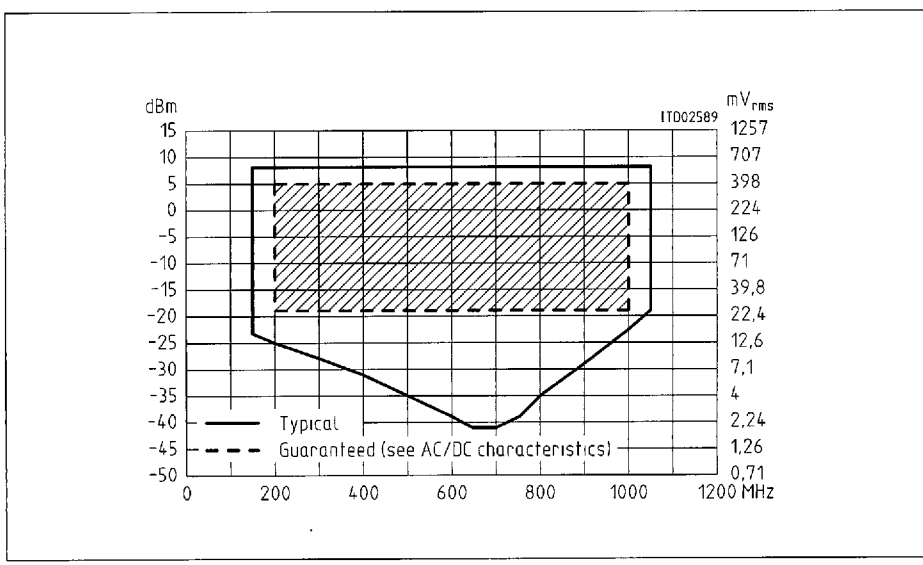
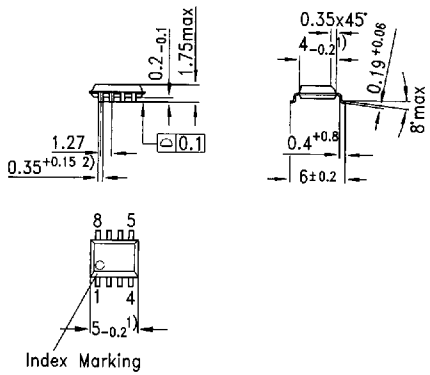



**Diagram 2**
**Input Sensitivity**

**Plastic Package, P-DSO-8 (SMD)**
(Plastic Dual Small Outline)




1) Does not include plastic or metal protrusions of 0.15 max per side
2) Does not include dambar protrusion of 0.05 max per side

GPS05121

**Sorts of Packing**
Package outlines for tubes, trays etc. are contained in our Data Book "Package Information"
SMD = Surface Mounted Device

Dimensions in mm



B115-H6626-G1-X-7600