

### Description

The Si3217x is a family of pin-compatible single-channel ProSLIC products that implement a complete foreign exchange station (FXS) telephony interface solution in accordance with all relevant LSSGR, ITU and ETSI specifications. Select parts in the series also implement Silicon Laboratories' patented capacitive isolation technology to enable seamless connection to Si3291x series foreign exchange office (FXO) line-side devices. The Si3217x ProSLIC ICs operate from a 3.3 V supply and interface to standard PCM/SPI digital interfaces. The Si3217x integrated dc-dc controller automatically generates the optimal battery voltages required for each line-state. Si3217x ICs are available with voltage ratings of –110 V or –135 V to support a wide range of ringing voltages. The Si3217x is available in a 5x7 mm 42-pin QFN package. The Si3291x is available in a 16-pin SOIC package.

### Si3217x Features

- Performs all BORSCHT functions
- Ideal for short to medium loops
- Global programmability
- Simplified configuration and diagnostics
  - Supported by ProSLIC API

- Low power standby operation
- Tracking dc-dc controller
- Patented low-power ringing
- Wideband voice support
- DTMF detection
- Pulse metering
- 3.3 V operation
- Pb-free/RoHS-compliant packaging

### Si3291x Features

- Greater than 5 kV isolation
- Global programmability
- Up to +6 dBm TX/RX level
- Parallel handset detection
- Type I and II caller ID support
- Integrated ring detector
- Programmable digital hybrid

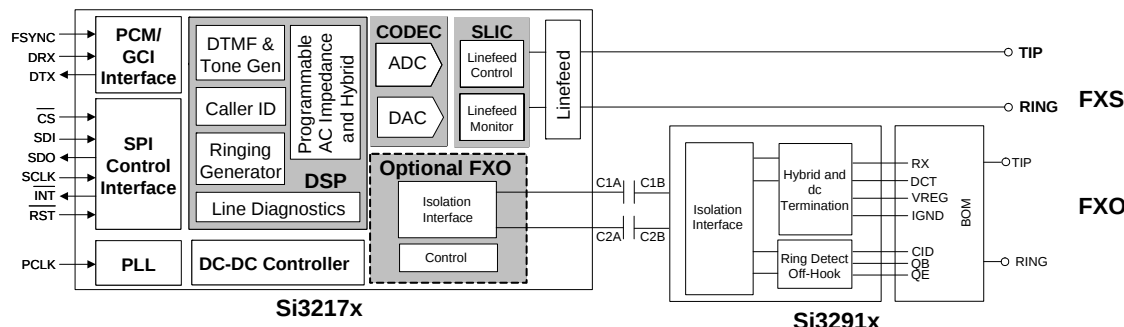
### Applications

- Customer Premise Equipment (CPE)
- VoIP DSL Gateways and Routers
- Wireless Local Loop (WLL)
- Integrated Access Devices (IAD)
- Analog Terminal Adapters (ATA)
- Small Office/Home Office (SOHO) PBX

### Ordering Guide

| FXS P/N      | Description                                            | Max Vbat | Temperature  |
|--------------|--------------------------------------------------------|----------|--------------|
| Si32176-B-FM | FXS, wideband capable                                  | –110 V   | 0 to 70 °C   |
| Si32176-B-GM | FXS, wideband capable                                  | –110 V   | –40 to 85 °C |
| Si32177-B-FM | FXS, wideband capable                                  | –135 V   | 0 to 70 °C   |
| Si32177-B-GM | FXS, wideband capable                                  | –135 V   | –40 to 85 °C |
| Si32178-B-FM | FXS, DTMF detection, wideband capable with FXO support | –110 V   | 0 to 70 °C   |
| Si32171-B-FM | FXS, DTMF detection, pulse metering                    | –110 V   | 0 to 70 °C   |
| Si32171-B-GM | FXS, DTMF detection, pulse metering                    | –110 V   | –40 to 85 °C |

| FXO P/N      | Region    | Ringer Thresholds | On-hook Speeds | RoHS Compliant | Temperature |
|--------------|-----------|-------------------|----------------|----------------|-------------|
| Si32911-A-FS | FCC/CTR21 | 1                 | 2              | Yes            | 0 to 70 °C  |
| Si32919-A-FS | Global    | 3                 | 3              | Yes            | 0 to 70 °C  |





# Si3217x and Si3291x

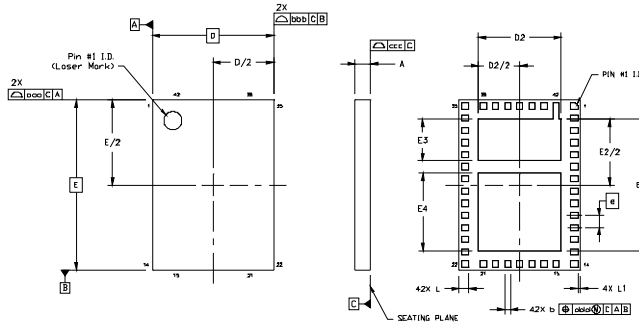
## ProSLIC® Single-Chip FXS Solution with FXO Option

### Selected Electrical Specifications

| Parameter                                                 | Symbol                          | Test Condition                                     | Min  | Typical | Max       | Unit     |
|-----------------------------------------------------------|---------------------------------|----------------------------------------------------|------|---------|-----------|----------|
| Ambient Temperature                                       | $T_A$                           | F-Grade                                            | 0    | 25      | 70        | °C       |
|                                                           |                                 | G-Grade                                            | -40  | 25      | 85        | °C       |
| Supply Voltage, Si3217x                                   | $V_{DD}$                        |                                                    | 3.13 | 3.3     | 3.47      | V        |
| Battery Voltage, Si3217x                                  | $V_{BAT}$                       |                                                    | -15  | —       | -136/-110 | V        |
| Maximum Loop Resistance (loop + load)                     | $R_{LOOP}$                      | $I_{LOOP}=18\text{ mA}$ , $V_{BAT} = -48\text{ V}$ | —    | —       | 2000      | $\Omega$ |
| DC Differential Output Resistance                         | $R_{DO}$                        | $I_{LOOP} < I_{LIM}$                               | 160  | —       | 640       | $\Omega$ |
| Idle Channel Noise                                        |                                 | C-Message weighted                                 | —    | 8       | 12        | dBrnC    |
| PSRR from $V_{DD}$                                        |                                 | RX and TX, dc to 3.4 kHz                           | —    | 55      | —         | dB       |
| Longitudinal to Metallic/PCM Balance (forward or reverse) |                                 | 200 Hz to 1 kHz                                    | 58   | 60      | —         | dB       |
|                                                           |                                 | 1 kHz to 3.4 kHz                                   | 53   | 58      | —         | dB       |
| Metallic/PCM to Longitudinal Balance                      |                                 | 200 Hz to 3.4 kHz                                  | 40   | —       | —         | dB       |
| Longitudinal Impedance                                    |                                 | 200 Hz to 3.4 kHz at TIP or RING                   | —    | 50      | —         | $\Omega$ |
| Longitudinal Current per Pin                              |                                 | Active off-hook<br>200 Hz to 3.4 kHz               | —    | 25      | —         | mA       |
| DC Feed Current                                           | See Table 5, Si3217x Data Sheet | $V_{TR} = 0\text{ V}$                              | —    | —       | 45        | mA       |
| 2-Wire Return Loss                                        |                                 | 200 Hz to 3.4 kHz                                  | 26   | 30      | —         | dB       |
| Transhybrid Balance                                       |                                 | 300 Hz to 3.4 kHz                                  | 26   | 30      | —         | dB       |
| Thermal Resistance (QFN-42)                               | $\theta_{JA}$                   |                                                    | —    | 32      | —         | °C/W     |
| Thermal Resistance (SOIC-16)                              | $\theta_{JA}$                   |                                                    | —    | 85      | —         | °C/W     |
| Continuous Power Dissipation (QFN-42)                     | $P_D$                           | $T_A = 85\text{ °C}$                               | —    | 1.3     | —         | W        |
| Continuous Power Dissipation (SOIC-16)                    | $P_D$                           | $T_A = 85\text{ °C}$                               | —    | 0.47    | —         | W        |

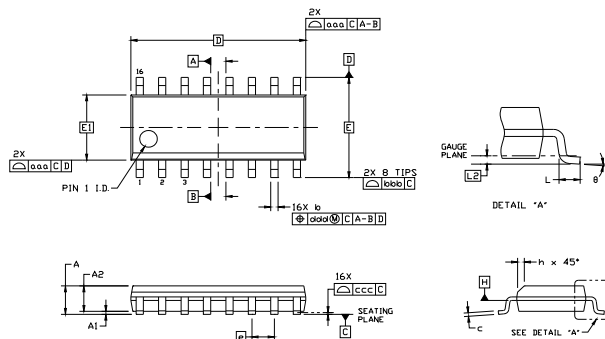
### Package Information

#### 42-Pin QFN



|    | MM       |      |      |
|----|----------|------|------|
|    | Min      | Typ  | Max  |
| A  | 0.60     | 0.65 | 0.70 |
| b  | 0.20     | 0.25 | 0.30 |
| D  | 5.00 BSC |      |      |
| D2 | 3.35     | 3.40 | 3.45 |
| e  | 0.50 BSC |      |      |
| E  | 7.00 BSC |      |      |
| E2 | 5.35     | 5.40 | 5.45 |
| E3 | 1.65     | 1.70 | 1.75 |
| E4 | 3.15     | 3.20 | 3.25 |
| L  | 0.35     | 0.40 | 0.45 |
| L1 | 0.05     | 0.10 | 0.15 |

#### 16-Pin SOIC



|    | Min      | Max  |
|----|----------|------|
| A  | —        | 1.75 |
| A1 | 0.10     | 0.25 |
| A2 | 1.25     | —    |
| b  | 0.31     | 0.51 |
| c  | 0.17     | 0.25 |
| D  | 9.90 BSC |      |
| E  | 6.00 BSC |      |
| E1 | 3.90 BSC |      |
| e  | 1.27 BSC |      |
| L  | 0.40     | 1.27 |
| L2 | 0.25 BSC |      |
| h  | 0.25     | 0.50 |
| Ø  | 0°       | 8°   |

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