



**THE DATASHEET OF  
SI32178-B-FM**



### 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



### 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 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

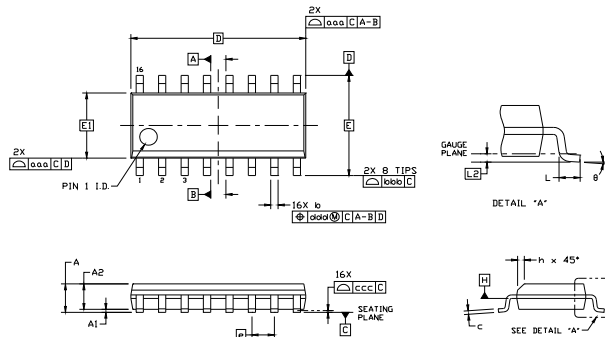
### Package Information

#### 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
$\phi$	0°	8°

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