



FCM34018

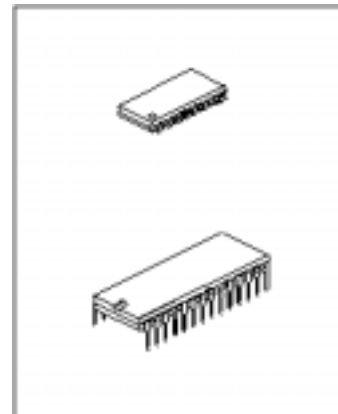
LINEAR INTEGRATED CIRCUIT VOICE SWITCHED SPEAKER- PHONE CIRCUIT

DESCRIPTION

The Contek FCM34018 speaker-phone integrated circuit incorporates the necessary functions to produce a high quality hands-free speaker-phone system. The applications include household and office speaker-phones, intercom systems, hand free kit for mobile phones, and others

FEATURES

- *All necessary level detection and attenuation controls for a hand-free telephone included.
- *Background noise level monitoring with long time constant.
- *Background sound level compensation for transmit and receive levels as well as the background level.
- *Wide operating dynamic range through signal compression.
- *On-chip voltage regulators illuminate external regulators for lining operation.
- *Power audio amplifier for typical 100mW output (into 25 ohms)with peak limiting for speaker to minimize distortion.
- *Chip Select pin for active/stand by operation.
- *Volume control function for external volume control.
- *Standard 28-pin plastic DIP and SOP package.



SOP-28

DIP-28

ABSOLUTE MAXIMUM RATINGS(Ta=25 C,Voltages referred to pin 22)

PARAMETER	VALUE	UNIT
V+ terminal Voltage (pin 16)	+12,-1.0	V
CS (pin 18)	+12,-1.0	V
Speaker amplifier Ground(pin 14)	+3.0,-1.0	V
VLC(pin 24)	+VCC,-1.0	V
Storage temperature	-65 ~ +150	C

RECOMMENDED OPERATION CONDITIONS

PARAMETER	VALUE	UNIT
V+ Terminal Voltage (pin 16)	+6.0 to +11	V
CS (pin 18)	0 to +11	V
Vcc (pin 20)	0 to 3.0	mA
VLC(pin 24)	0.55VB to VB	V
Receive Signal(pin 27)	0 to 250	mVrms
Microphone Signal(pin 9)	0 to 5.0	mVrms
Speaker Amplifier Ground (pin 14)	-10 to +10	mVdc
Ambient Temperature	-20 to +60	C

(continued)

PIN	NAME	DESCRIPTION
23	XDC	Transmit detector output. A resistor and capacitor at his pin hold the system in the transmit mode during pauses between words or phrases. When the XDC pin voltage decays to ground, the attenuators switch from the transmit mode to idle mode. The internal resistor at XDC is nominally 2.6k ohms(see fig.1).
24	VLC	Volume control input>connecting this pin to the slider of a variable resistor provides receive mode volume control. The VLC pin voltage should be less than or equal to VB
25	ACF	Attenuator control filter. A capacitor connected to this pin reduces noise transient as the attenuator control switches level of attenuation
26	RXO	Output of the receive attenuator. Normally this pin is ac coupled to the input of the speaker amplifier
27	RXI	Input of the receive attenuator. Input impedance is nominally is 5.0k ohms
28	RRX	A resistor to ground determines the nominal gain of the receive attenuator. The receive channel gain is directly proportional to the RRX resistance

ELECTRICAL CHARACTERISTICS(referred to fig. 1)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
SUPPLY VOLTAGES					
V+ Supply Current V+=11V, Pin 18=0.7V V+=11V, Pin 18=1.6V	Iv+			9.0 800	mA A
VCC Voltage (V+=7.5V) Line Regulation (6.5V<V+<11V) Output Resistance (Icc=3mA)	Vcc VcCLN RoVcc Vccsat	4.9	5.4 65 6.0 80	5.9 150 20 300	Vdc MV ohms mV
VB Voltage(V+=7.5V) Output Resistance (Ib=1.7mA)	Vb Rovb	2.5	2.9 250	3.3	Vdc ohms
ATTENUATORS					
Receive Attenuator Gain (1.0kHz) Rx Mode, Pin 24= VB, Pin 27 = 250mVrms Range (Rx to Tx Modes) Idle Mode, Pin 27= 250mVrms	GRX GRX GRI	2.0 40 -20	6.0 44 -16	10 48 -12	dB dB dB
RXO Voltage (Rx Mode) Delta RXO Voltage (Switch from Rx to Tx Mode)	VRXO VRXO	1.8	2.3	3.2 100	mV mV
RXO Sink Current (Rx mode)	IRXOL	75			A
TXO Source Current (Tx mode)	ITXOH	1.0		3.0	mA
TXO Input Resistance	RTXI	3.5	5.0	8.0	k
ACF Voltage (VCC-Pin 25 Voltage) Rx Mode Tx Mode Idle Mode	VACF		150 6.0 75		mV mV mV
SPEAKER AMPLIFIER					
Speaker Amp Gain (pin 19 = 20mVrms)	GSPK	33	34	35	dB
SKI Input Resistance	RSKI	15	22	37	k
SKO Voltage (Pin 19 =Cap couple to GND)	VSKO	2.4	3.0	3.6	Vdc
SKO High Voltage (Pin 19 = 0.1V, -100mA Load at Pin 15)	VSKOH	5.5			Vdc
SKO Low Voltage (pin 19=0.1V, +100mA Load at Pin 15)	VSKOL			600	mV
MICROPHONE AMPLIFIER					
Microphone Amp Gain (Pin 9 = 10mVrms,1KHz)	GMCI	32.5	34	35	dB
Microphone Amp Input Resistance	RMCI	6.5	10	16	k
LOGAMPS					
RLO Leakage Current (Pin 8 = VB+1.0V)	ILKRLO			2.0	A
TLO Leakage Current (Pin 6 = VB+1.0V)	ILKTLO			2.0	A
Transmit-Receive Switching Threshold (Ratio of I _{TLI} to I _{RLI} - at 20 A - to Switch Tx-Rx Comparator)	ITH	25			
TRANSMIT DETECTOR					
XDC Voltage Idle Mode Tx Mode	VXDC		0 4.0		Vdc Vdc
CP2 Current Source	ICP2	5.0	10	13	A
Distortion Rx Mode RXI to SKO (pin 27 = 10mVrms,1KHz)	RXD		1.5		%
Tx Mode MCI to TXO (Pin 9 = 5mVrms,1KHz)	TXD		2.0		%

Note 1:V+=7.5V, \overline{CS} =0.7V except where noted.

Note 2:Rx mode:pin7=-100 A, pin5=+100 A, except where noted

Tx mode: pin 5,13=-100 A, pin 7=+100 A, pin 11=0V. Idle mode: Pin 5=-100A, pin 7,13=+100 A

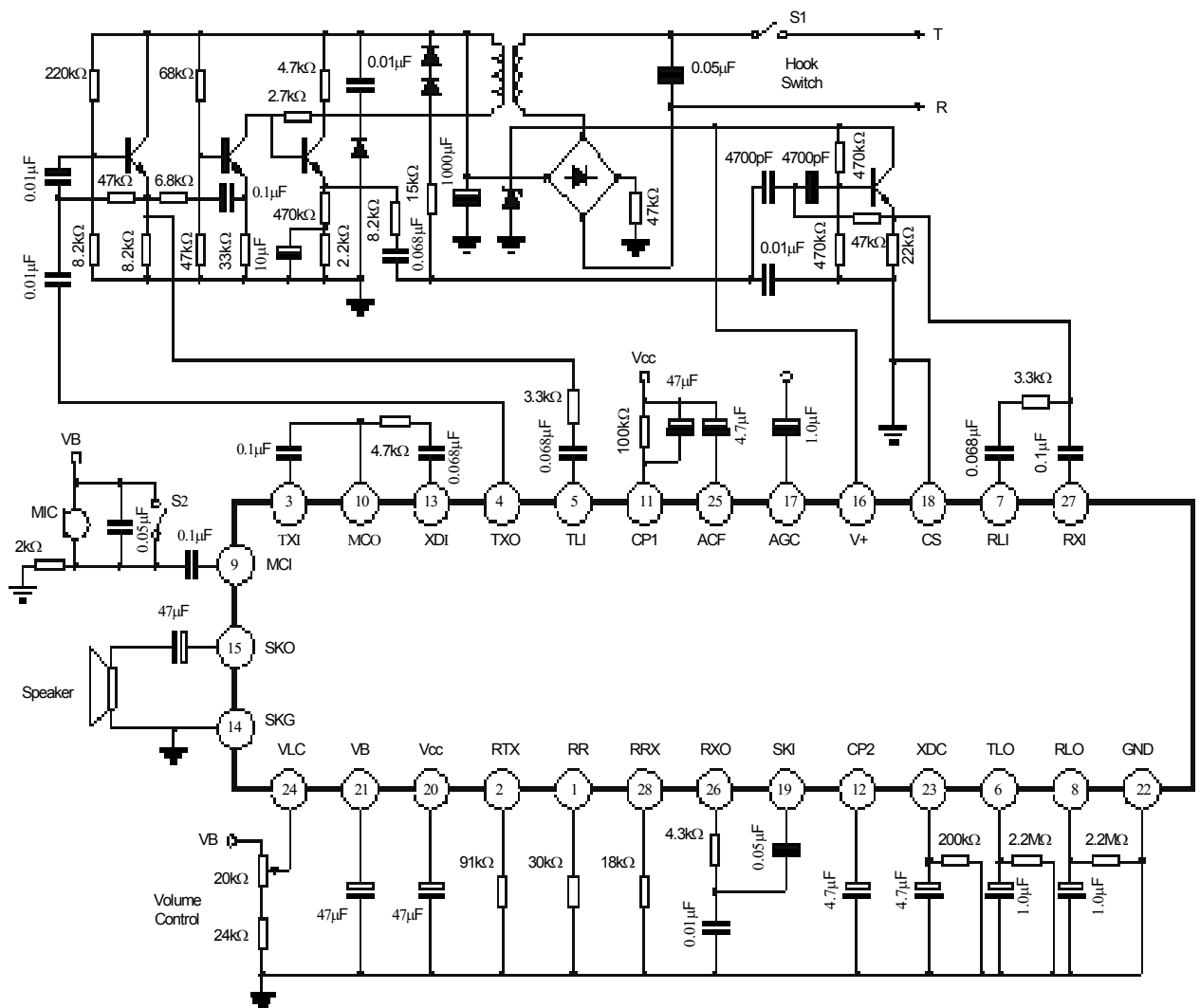
Note 3:Current into a pin designed as + ,current out of a pin designed -;

Note 4:Voltage referred to pin 22,Tamb=25 C

TEMPERATURE CHARACTERISTICS(-20 TO +60 C)

PARAMETER	PIN	TYP CHANGE	UNIT
V+ Supply Current (V+ 11V,Pin 18 = 0.7V)	16	-0.2	%/ C
V+ Supply Current(V+ 11V,Pin 18 = 1.6V)	16	-0.4	%/ C
VCC Voltage(V+ = 7.5V)	20	+0.1	%/ C
Attenuator Gain (Max and Min Setting)		+/-0.003	dB/ C
Delta RXO,TXO Voltage	4,26	+/-0.24	%/ C
Speaker AMP Gain	15,19	+/-0.001	dB/ C
Microphone AMP Gain	9,10	+/-0.4	dB/ C
Microphone Amp Input Resistance	9	+0.4	%/ C
Tx-Rx Switching Threshold (20 A)	5,7	+/-0.2	nA/ C

Fig 2 - Basic Line powered Speakerphone



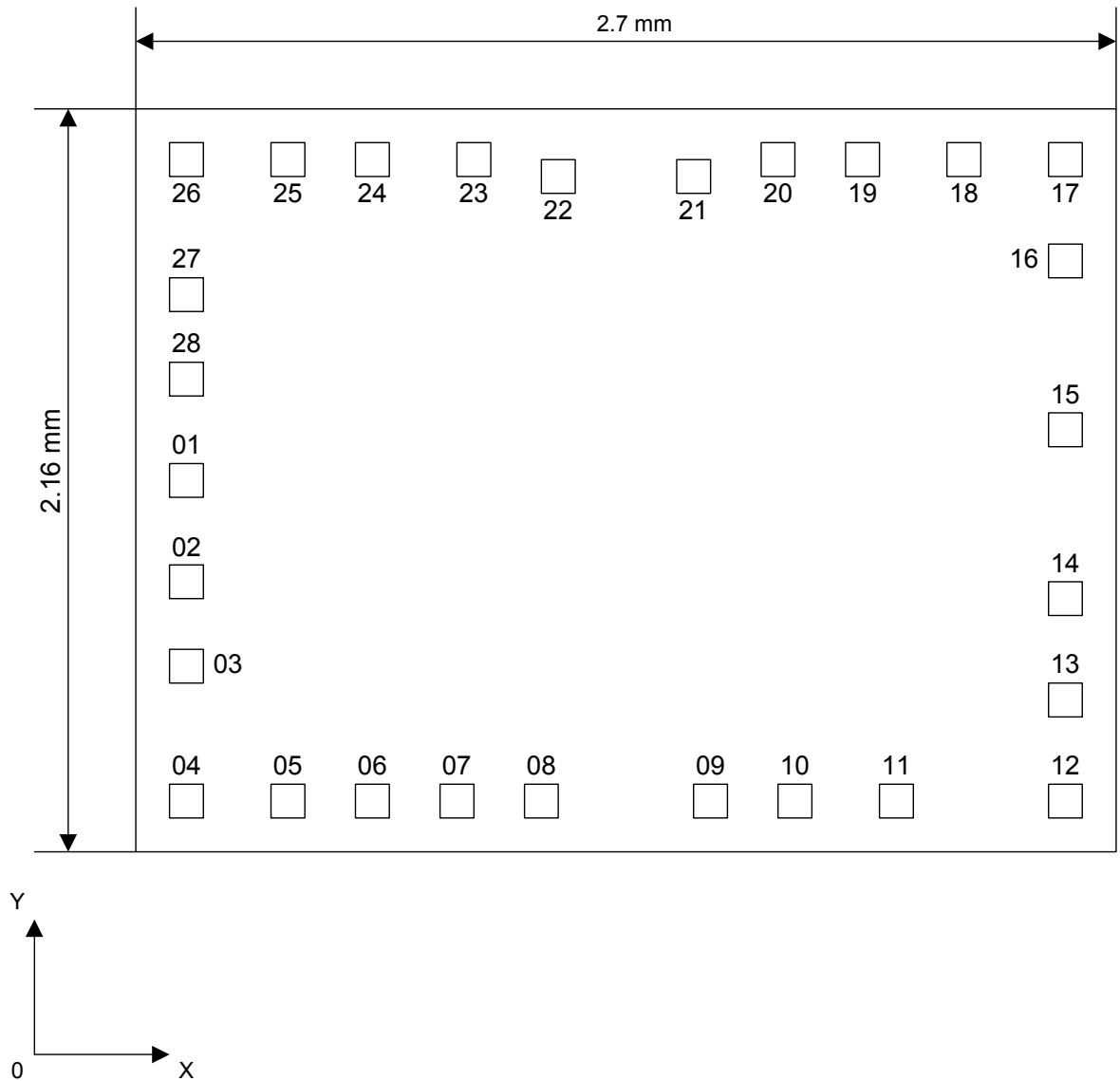


Fig 3 - Pads location of FCM34018

Die size Xr=2.7mm, Yr=2.16 mm (pad size 100x100 mkm²)

No of pad	X	Y
01	0,088	0,955
02	0,088	0,723
03	0,088	0,418
04	0,088	0,088
05	0,388	0,088
06	0,635	0,088
07	0,851	0,088
08	1,065	0,088
09	1,495	0,088
10	1,717	0,088
11	1,938	0,088
12	2,512	0,088
13	2,512	0,307
14	2,512	0,523
15	2,512	1,204
16	2,512	1,725
17	2,512	1,972
18	2,095	1,972
19	1,884	1,972
20	1,667	1,972
21	1,438	1,919
22	1,086	1,919
23	0,826	1,972
24	0,580	1,972
25	0,334	1,972
26	0,088	1,972
27	0,088	1,455
28	0,088	1,181

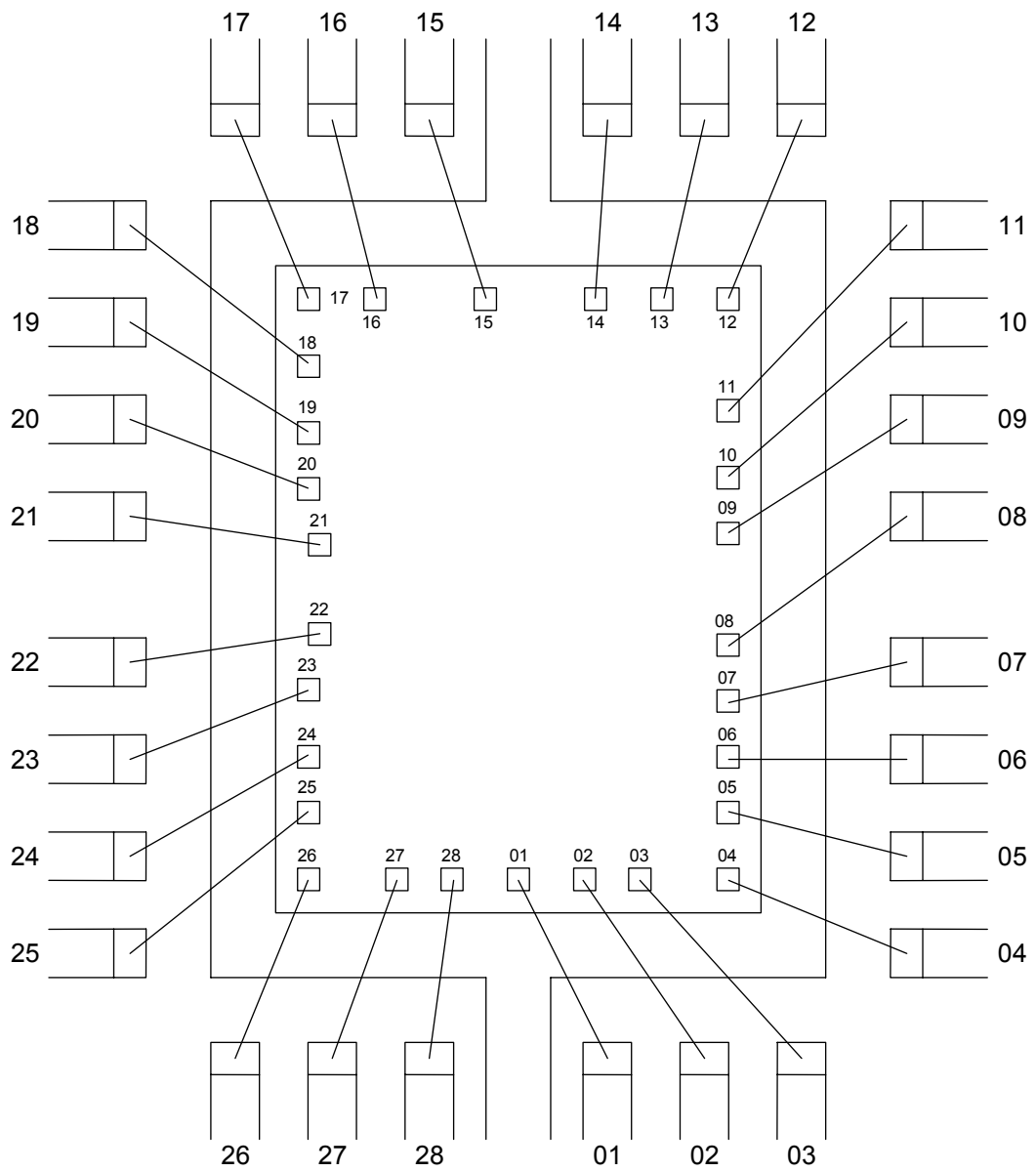


Fig 4 - Bonding diagram of FCM34018