

Comander IC Monolithic IC MM1100

Outline

This IC was developed for use in mobile communication equipment. It is a compander IC incorporating compressor/expander circuits for a significant noise reduction effect without complicated external circuitry. On the transmission side, the dynamic range of audio signals is compressed by the compressor circuit; on the receiving side, the expander expands the signals. As a result the dynamic range over the transmission channel is reduced logarithmically by one-half.

Features

1. Can be driven at low voltages (down to 2.4V)
2. Compression and expansion circuits enable suppression of unwanted radio waves
3. Consumption current 2.8mA typ.

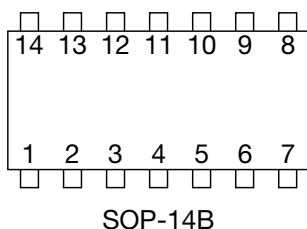
Package

SOP-14B (MM1100XF)

Applications

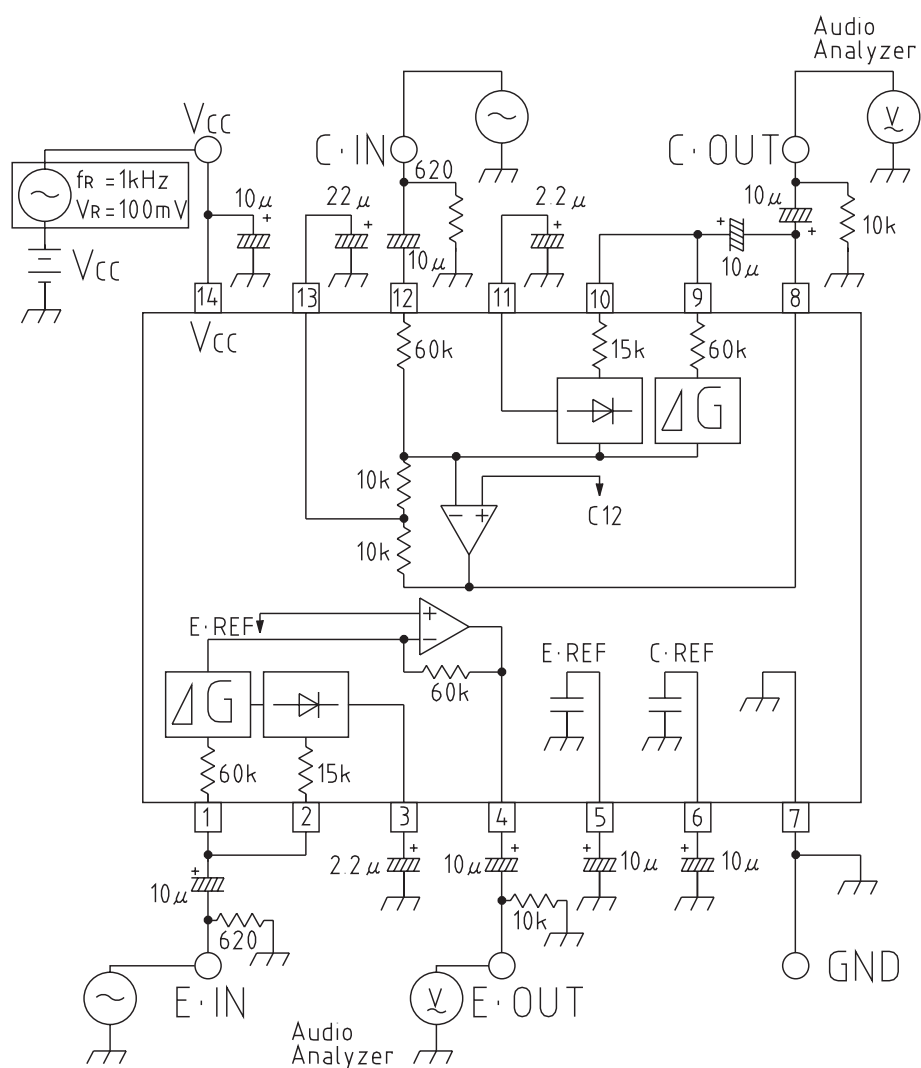
1. Cordless telephones
2. Various mobile communication devices

Pin Assignment



1	E.GIN	8	C.OUT
2	E.RIN	9	C.GIN
3	E.RECT	10	C.RIN
4	E.OUT	11	C.RECT
5	E.REF	12	C.IN
6	C.REF	13	C.NF
7	GND	14	V _{CC}

Block Diagram



Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Ratings	Units
Storage temperature	T _{STG}	-40~+125	°C
Operating temperature	T _{OPR}	-10~+70	°C
Power supply voltage	V _{CC max.}	-0.3~+8	V
Allowable loss	P _d	350	mW
Operating voltage	V _{OP}	+2.4~+7	V

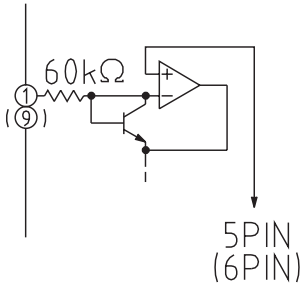
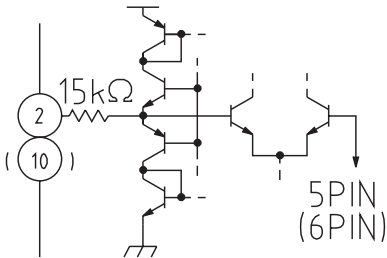
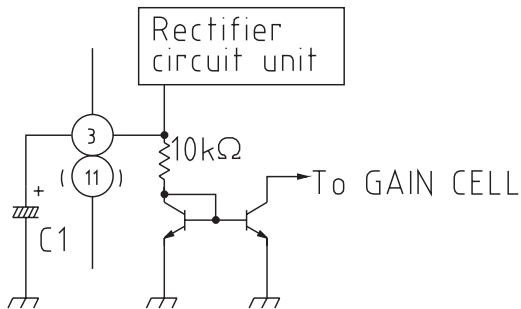
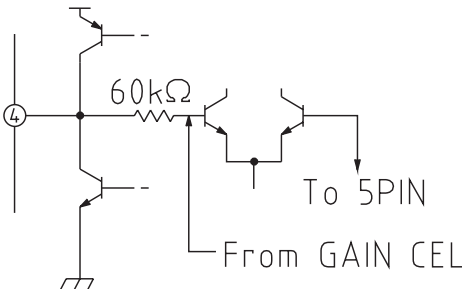
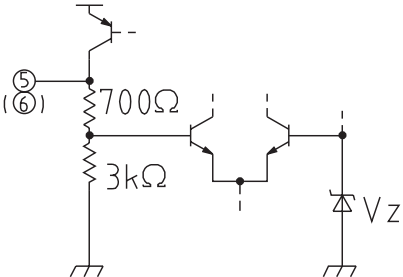
Electrical Characteristics (Except where noted otherwise, Ta=25°C, Vcc=3V, f_{IN}=1kHz, VR=0mVrms)

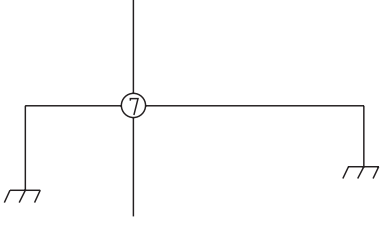
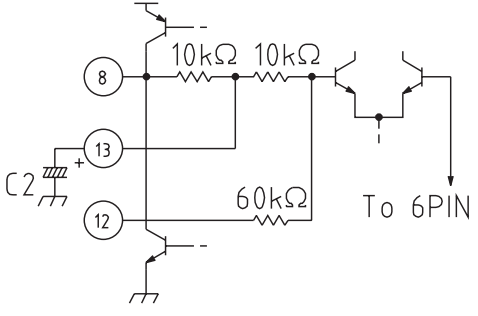
Item		Symbol	Measurement conditions	Min.	Typ.	Max.	Units
	Consumption current	I _{cc}	No signal	1.8	2.8	3.8	mA
	Compressor reference voltage	V _{refc}	6PIN DC voltage	1.3	1.4	1.5	V
	Expander reference voltage	V _{refc}	5PIN DC voltage	1.3	1.4	1.5	V
Compressor unit	Input reference level	V _{inc}	V _{OC} =300mVrms, V _{IN} =0dB	100	120	145	mVrms
	Gain error difference *	G _{ec1}	V _{IN} =-20dB	-0.5	0	0.5	dB
		G _{ec2}	V _{IN} =-40dB	-1.0	0	1.0	dB
	Distortion	THDC	V _{IN} =0dB		0.3	1.0	%
	Output noise voltage	V _{nc}	No signal (CCITT)		2.5	5.0	mVrms
	Limit voltage	V _{limc}	THD=10%	1.20	1.40	1.60	V _{P-P}
	Crosstalk	CT _c	EXPV _{IN} =0dB		-45	-35	dB
Expander unit	Ripple rejection ratio	RR _c	V _R =100mVrms, f _r =1kHz		-20	-12	dB
	Input reference level	V _{ine}	V _{oe} =300mVrms, V _{IN} =0dB	310	375	450	mVrms
	Gain error difference *	G _{ee1}	V _{IN} =-10dB	-0.5	0	0.5	dB
		G _{ee2}	V _{IN} =-20dB	-1.0	0	1.0	dB
		G _{ee3}	V _{IN} =-30dB	-1.5	0	1.5	dB
	Distortion	THDe	V _{IN} =0dB		0.15	1.0	%
	Maximum output voltage	V _{e max.}	THD=10%	700	900		mVrms
	Output noise voltage	V _{ne}	No signal (CCITT)		20	40	uVrms
	Crosstalk	CT _e	COMPV _{IN} =0dB		-75	-60	dB
	Ripple rejection ratio	RR _e	V _R =100mVrms, f _r =1kHz		-60	-50	dB

*Gain error difference = (V_{OUT} (dBv) + 10.46dB) - V_{IN} (dB) × G (dB)

G : COMP=0.5, EXP=2

Pin Description

Pin no.	Function	Pin voltage (typ.)	Internal equivalent circuit
1 9	Input pin E Feedback signal input pin	1.4V 1.4V	
2 10	Rectifier input pin E Rectifier input pin C	1.4V 1.4V	
3 11	Rectifier pin E Rectifier pin C The rectifier is a full-wave rectifier. The response characteristics (attack time, release time) are determined by the time constant of the external capacitor C1 and the internal resistance (10kΩ)	0.7V 0.7V	
4	Output pin E	1.4V	
5 6	Reference voltage pin E Reference voltage pin C	1.4V 1.4V	

7	GND pin	0V	
8 12 13	Output pin C Input pin E AC signal cut pin The compressor amp must have a DC gain of unity and AC gain of infinity. In order to satisfy this requirement, a capacitor C2 is connected to pin 13 to remove AC components. The cutoff frequency is determined by the product with the internal resistance (10kΩ)	1.4V 1.4V 1.4V	
14	Vcc pin	3.0V	