

LV2241PQA



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Advance Information

Bi-CMOS LSI

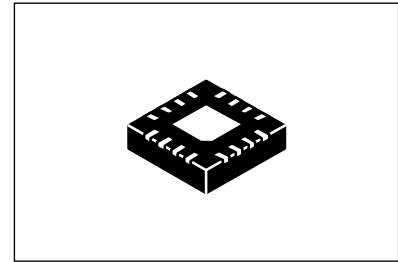
RF Splitter IC

Overview

LV2241 is RF splitter IC for Car Infotainment System .

Feature

- Integrated AGC Function
- Integrated LNA, Level Detector, and Pin Driver
- Enables splitting of FM signals to radio tuner and data tuner
- Simplify design of antenna input stage
- Reduce board size



QFN16 3×3 , 0.5P

Typical Applications

- FM Signal Amplifier and Splitter for Car Audio System and Navigation System (Car Infotainment System).

Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V _{CC} max		6.0	V
Allowable power dissipation	P _d max	T _a ≤ 105°C *	580	mW
Junction temperature	T _j		+150	°C
Operating temperature	T _{opr}		-40 to +105	°C
Storage temperature	T _{stg}		-55 to +150	°C
Maximum PIN Diode Drive Current	I _{pindr}	Pin6=3.3V	20	mA

* : Specified board is attached : 2500 mm² × 0.6t mm, glass epoxy board

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

This document contains information on a new product. Specifications and information herein are subject to change without notice.

ORDERING INFORMATION

See detailed ordering and shipping information on page 9 of this data sheet.

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Recommended Operating Conditions at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Recommended supply voltage	V_{CC}			5.0		V
Operating supply voltage range	$V_{CC\ op}$		4.5	5.0	5.5	V

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

Electrical Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC} = 5\text{V}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current consumption	I_{CC}	When no signal input	25	51	85	mA
Crosstalk (1)	S23	PIN4/PIN6	30			dB
Crosstalk (2)	S32	PIN6/PIN4	30			dB

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

LNA at $T_a = 25^\circ\text{C}$, $V_{CC} = 5\text{V}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Voltage gain	G_v	100MHz	6.8	9.8	12.8	dB
Input VSWR (*1)	VSWR1	$Z_i=50\Omega$			3	-
Output VSWR (*1)	VSWR2	$Z_o=50\Omega$			3	-
Input frequency range	fcm		76		108	MHz
IIP3	IIP3fm	100MHz/101MHz@90dB μ V	120	128		dB μ V
Noise Figure (*1)	NF			2.5		dB

(*1): For reference purpose only

AGC at $T_a = 25^\circ\text{C}$, $V_{CC} = 5\text{V}$

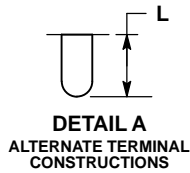
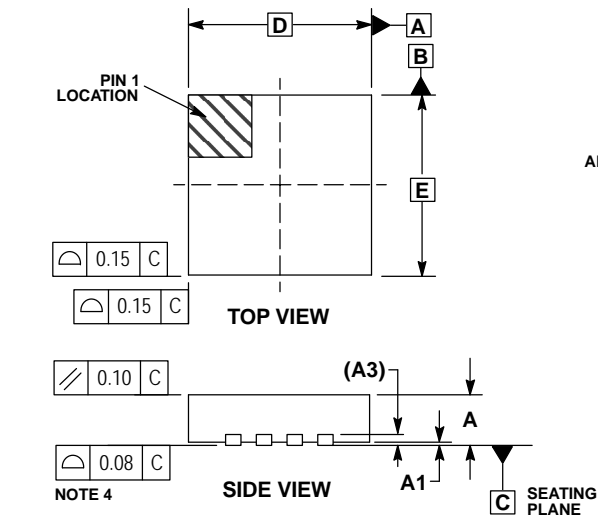
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
AGC attack point	G_{attfm}	$R_{attfm}=56\Omega$	88	94	100	dB μ V

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Package Dimensions

unit : mm

QFN16 3x3, 0.5P

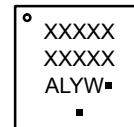


NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.25 AND 0.30 MM FROM TERMINAL.
4. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.
5. OUTLINE MEETS JEDEC DIMENSIONS PER MO-220, VARIATION VEED-6.

DIM	MILLIMETERS	
	MIN	MAX
A	0.80	1.00
A1	0.00	0.05
A3	0.20 REF	
b	0.18	0.30
D	3.00 BSC	
D2	1.25	1.55
E	3.00 BSC	
E2	1.25	1.55
e	0.50 BSC	
K	0.20	---
L	0.30	0.50

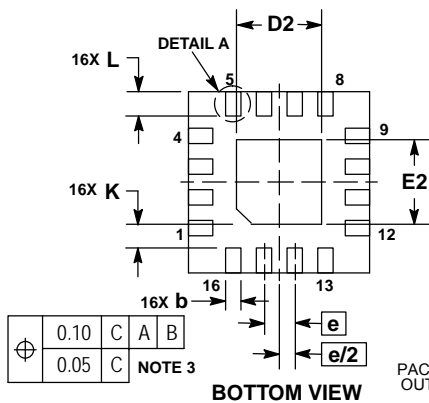
GENERIC MARKING DIAGRAM*



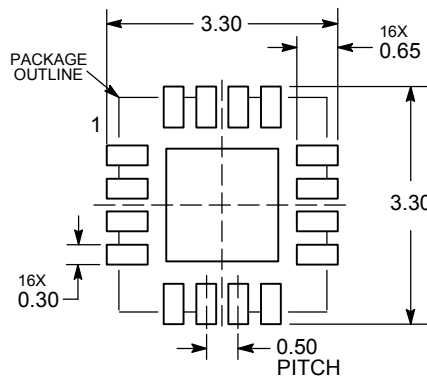
- A = Assembly Location
- L = Wafer Lot
- Y = Year
- W = Work Week
- = Pb-Free Package

(Note: Microdot may be in either location)

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "■", may or may not be present.



RECOMMENDED SOLDERING FOOTPRINT*



DIMENSIONS: MILLIMETERS

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

Pin Assignment

Pin No.	Pin name	I/O	Function
1	TRC	O	Collector for FMLNA
2	TRE	O	Emitter for FMLNA
3	GND_LNA	P	GND for FMLNA
4	FMOUT1	O	FMLNA Output1
5	GND_SUB	P	GND for SUB
6	FMOUT2	O	FMLNA Output2
7	AGC_ATK	O	FMAGC Attack Point Control
8	AGC_RLS	O	FMAGC Time Constant Control
9	GND_DET	P	GND for Level Detector
10	GND_ESD	P	GND for ESD
11	VCC_AGC	P	VCC for AGC
12	AGC_FIL	O	AGC Filter for FMAGC
13	GND_PIND	P	GND for Pin Diode Driver
14	PIND	O	PIN Diode Driver Output
15	FMIN	I	FMLNA Input
16	VCC_LNA	P	VCC for FMLNA

Pin Function

Pin No.	Pin name	Function	Equivalent circuit
1 2 15	TRC TRE FMIN	Collector for FMLNA Emitter for FMLNA FMLNA Input Note: External components of PIN1, 2, 15 decide antenna impedance matching / gain / distortion / noise figure.	
3	GND_LNA	GND for FMLNA	
4 6	FMOUT1 FMOUT2	FMLNA Output1 FMLNA Output2 Note: External components of PIN4, 6 decide output impedance matching / gain / distortion / noise figure. Recommended unused pin connections is open.	
5	GND_SUB	GND for SUB	
7	AGC_ATK	FMAGC Attack Point Control Note: External components of PIN7 decide AGC attack point. Cap = for DC bias cut. Res = High -> AGC on level is low. = Low -> AGC on level is high.	

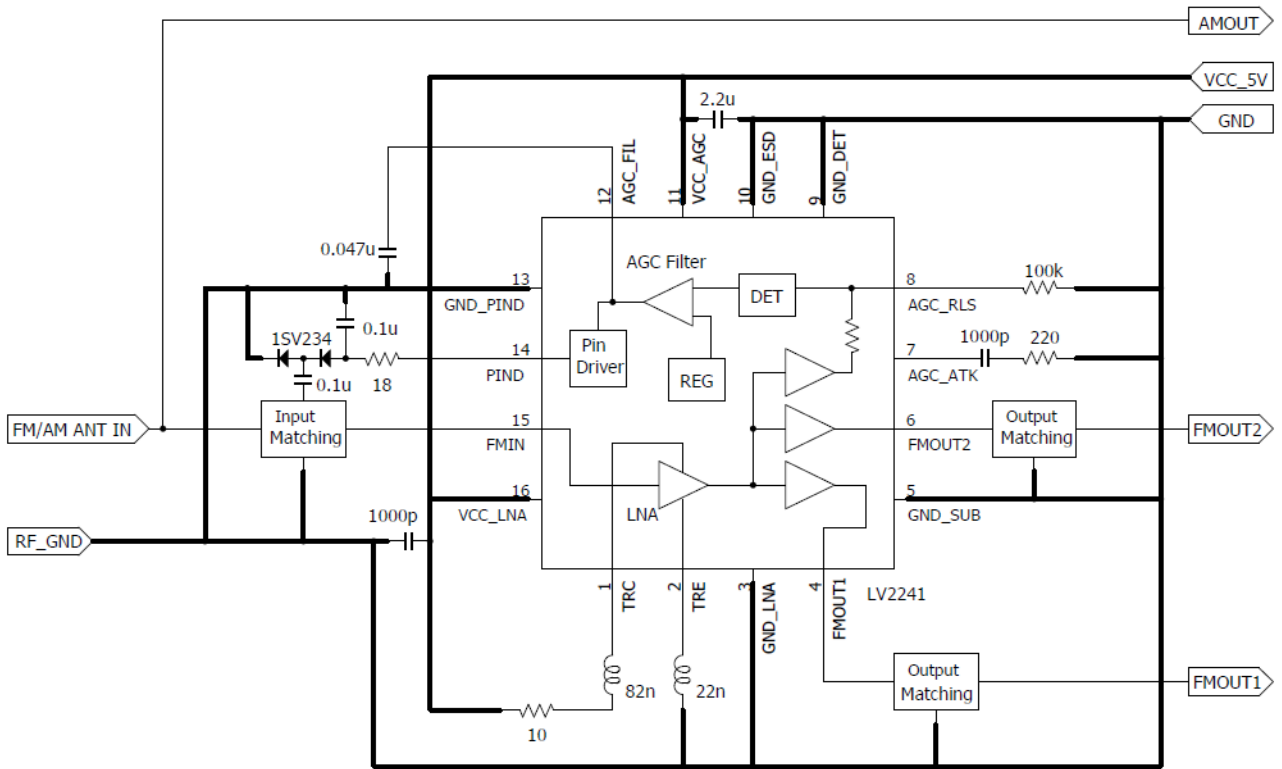
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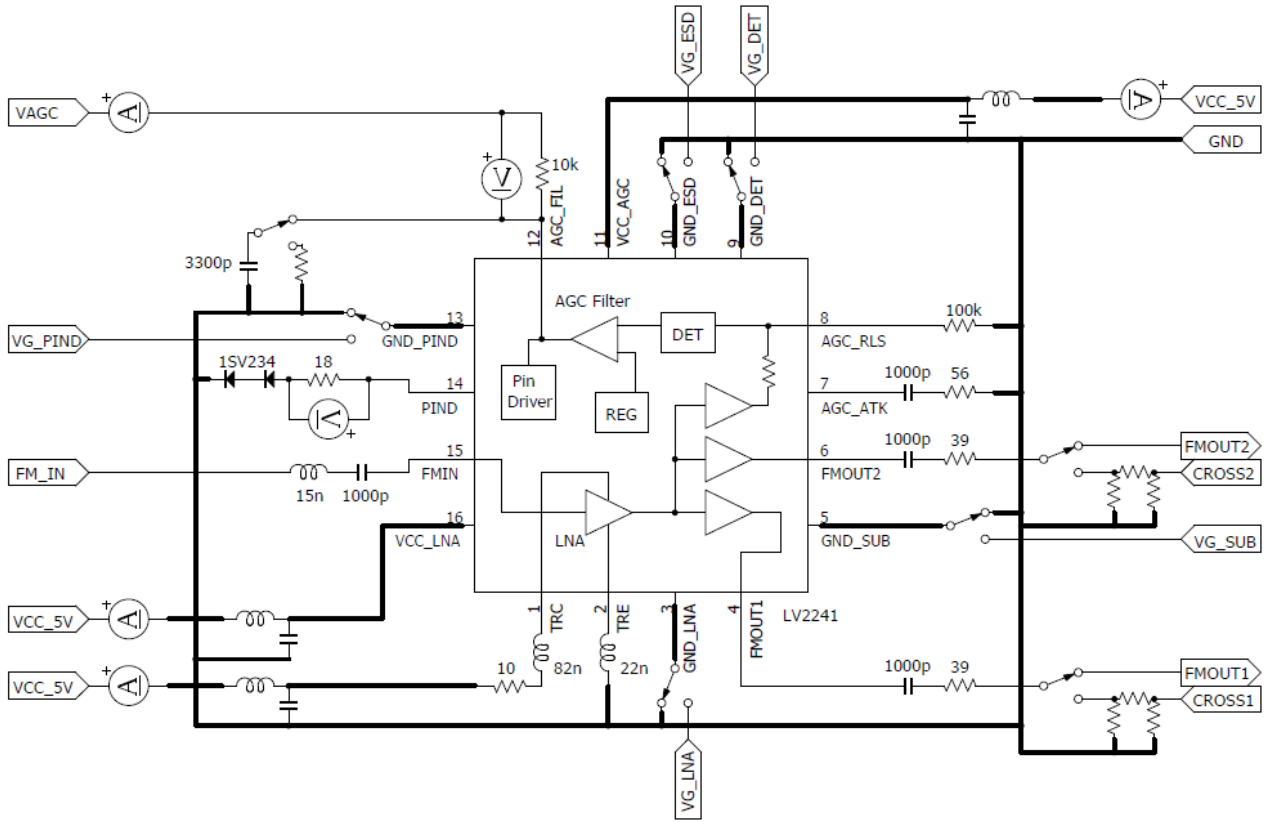
Pin No.	Pin name	Function	Equivalent circuit
8 12	AGC_RLS AGC_FIL	FMAGC Time Constant Control AGC Filter for FMAGC Note: External resistor of PIN8 decides AGC release time constant (= sink current of PIN12). Res = 100kΩ -> sink current = 200nA. Note: External capacitor of PIN12 decides AGC time constant.	
9	GND_DET	GND for Level Detector	
10	GND_ESD	GND for ESD	
11	VCC_AGC	VCC for AGC	
13	GND_PIND	GND for Pin Diode Driver	
14	PIND	PIN Diode Driver Output Note: Please use 2 device type PIN-Diode for external components.	
16	VCC_LNA	VCC for FMLNA	

Typical Application Circuit



Please contact us about Input/Output matching circuits.

AC Test Circuit
Block Diagram



Electrical characteristic in this datasheet is measured by this application circuit. A voltage gain is 9.8dB at 100MHz. The Input/Output impedance is 50Ω.

ORDERING INFORMATION

Device	Package	Shipping (Qty / Packing)
LV2241PQATXG	QFN16 3×3 (Pb-Free / Halogen Free)	3000 / Tape & Reel

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