

LV2241PQA

FM Splitter IC



ON Semiconductor[®]
www.onsemi.com

Overview

LV2241 is FM splitter IC for Car Infotainment System .

Features

- 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

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 (Note 1)

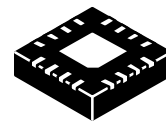
Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V _{CC}		6.0	V
Allowable power dissipation	P _{d max}	Ta ≤ 105°C (Note 2)	580	mW
Junction temperature	T _j		+150	°C
Operating temperature	T _{opr}		-40 to +105	°C
Storage temperature	T _{stg}		-55 to +150	°C
Maximum PIN Diode Drive Current	I _{pindr}	Pin6=3.3V	20	mA

1. Stresses exceeding those listed in the Absolute Maximum Rating 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.
2. Specified board is attached : 2500 mm² × 0.6t mm, glass epoxy board

Recommendation Operating Conditions at Ta = 25°C (Note 3)

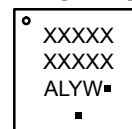
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Recommended supply voltage	V _{CC}			5.0		V
Operating supply voltage range	V _{CC op}		4.5	5.0	5.5	V

3. 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.



QFN16 3×3 , 0.5P

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.

ORDERING INFORMATION

Ordering Code:
LV2241PQATXG

Package
QFN16 3×3
(Pb-Free / Halogen Free)

Shipping (Qty / packing)
3000 / Tape & Reel

† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.
http://www.onsemi.com/pub_link/Collateral/BRD8011-D.PDF

LV2241PQA

Electrical Characteristics at Ta = 25°C, VCC = 5V (Note 4)

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

4. 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 Ta = 25°C, VCC = 5V

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Voltage gain	Gv	100MHz	6.8	9.8	12.8	dB
Input VSWR (Note 5)	VSWR1	Zi=50Ω			3	-
Output VSWR (Note 5)	VSWR2	Zo=50Ω			3	-
Input frequency range	fcfm		76		108	MHz
IIP3	IIP3fm	100MHz/101MHz@90dBμV	120	128		dBμV
Noise Figure (Note 5)	NF			2.5		dB

5. For reference purpose only.

AGC at Ta = 25°C, VCC = 5V

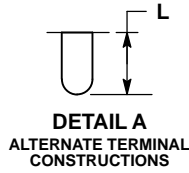
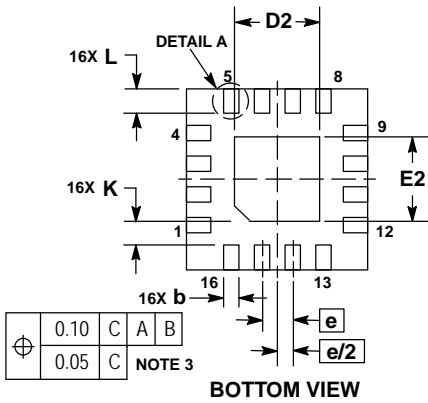
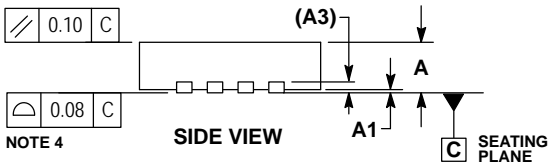
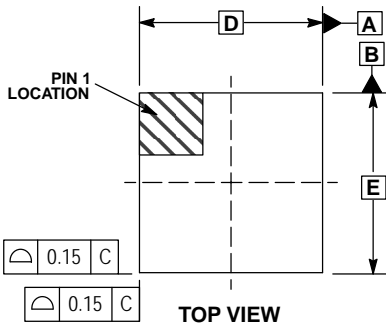
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
AGC attack point	Gattfm	Rattfm=56Ω	88	94	100	dBμV

LV2241PQA

Package Dimensions

unit : mm

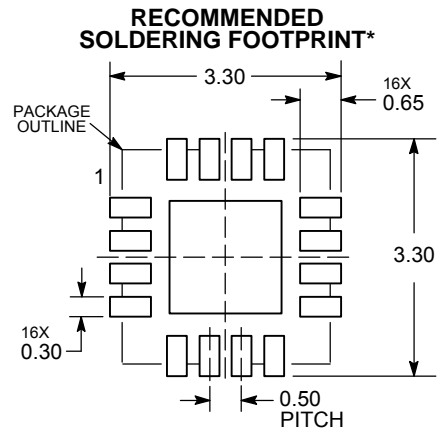
QFN16 3x3, 0.5P



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



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.

LV2241PQA

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

LV2241PQA

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.	

Continued on next page.

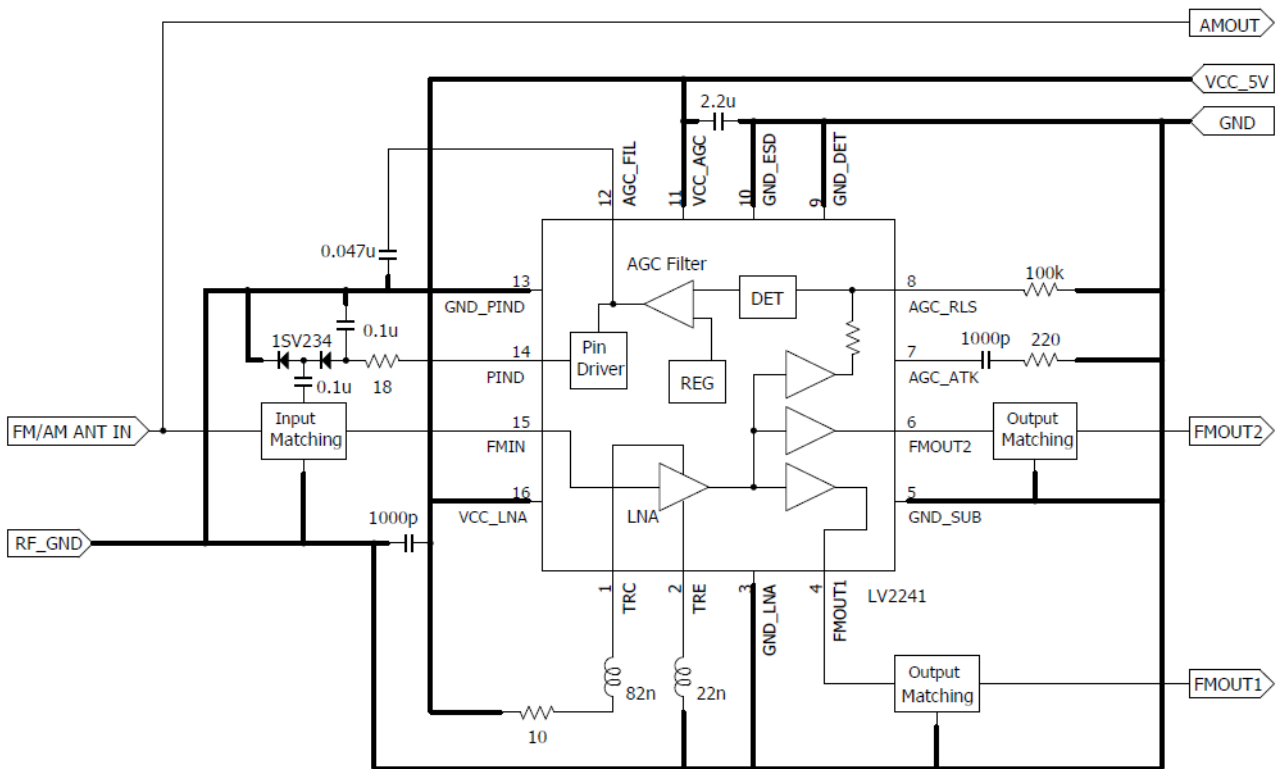
LV2241PQA

Continued from preceding page.

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	

LV2241PQA

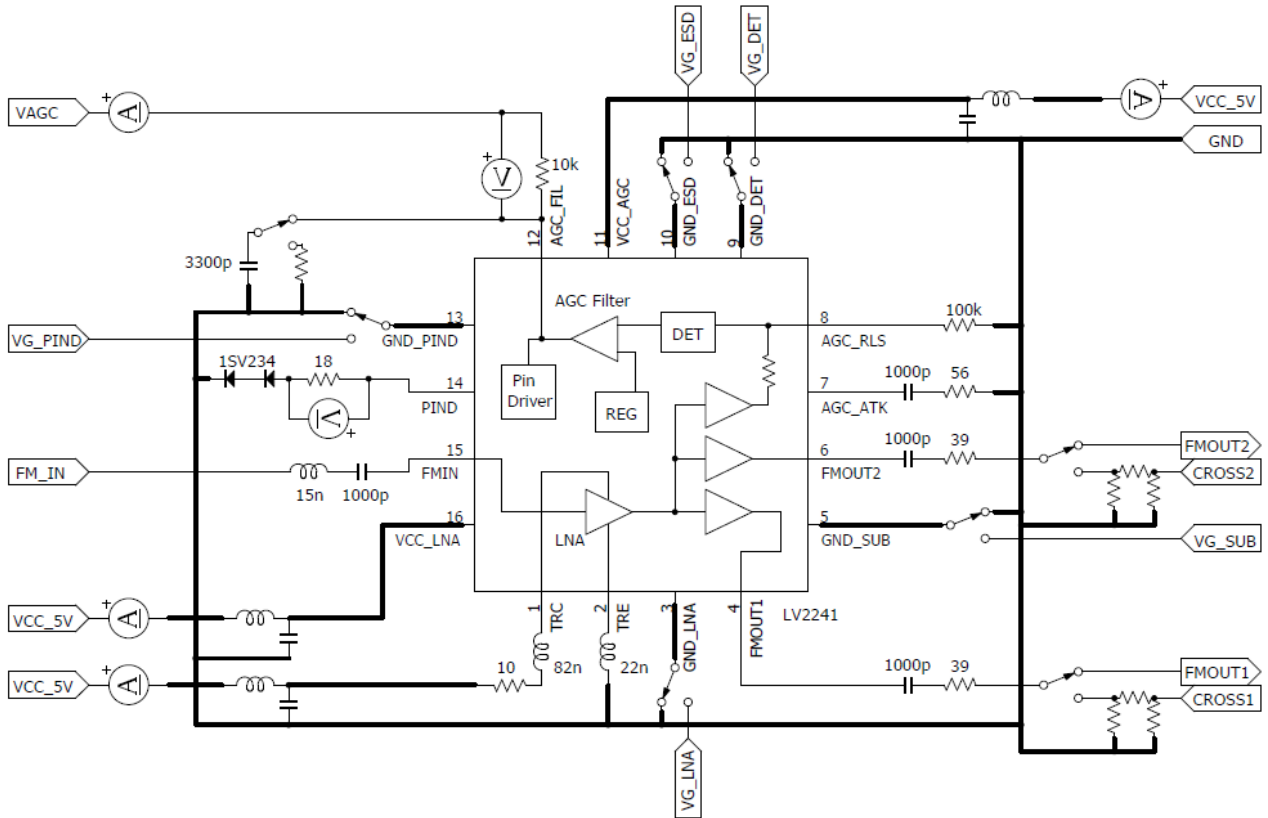
Typical Application Circuit



Please contact us about Input/Output matching circuits.

LV2241PQA

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.

ON Semiconductor and the ON logo are registered trademarks of Semiconductor Components Industries, LLC (SCILLC) or its subsidiaries in the United States and/or other countries. SCILLC owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of SCILLC's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.