GSR2337

2.4 GHz Front End Module

Product Description

The GSR2337 is a highly integrated front end module (FEM) designed for 2.4GHz 802.11b/g/n/ac/ax systems. The device provides all the functionality of a fully matched power amplifier (PA), power detector, a 2.4G low-noise amplifier (LNA), and a single-pole, double-throw (SPDT) switches.

The GSR2337 provides a complete 2.4 GHz WLAN RF solution from the output of the transceiver to the antenna, and from the antenna to the input of the transceiver. The LNA increases the receive sensitivity of embedded solutions to improve range or to overcome the insertion loss of cellular filters (often included for mobile applications).

The GSR2337 also includes a transmitter power detector with 20 dB dynamic range, and a digital enable control for transmitter power ramp on/off control.

The device is provided in a compact, 16-pin 3.0 x 3.0 mm Quad Flat No-Lead (QFN) package. Pin map is shown in Figure 1. A functional block diagram is shown in Figure 2.

Pin Map

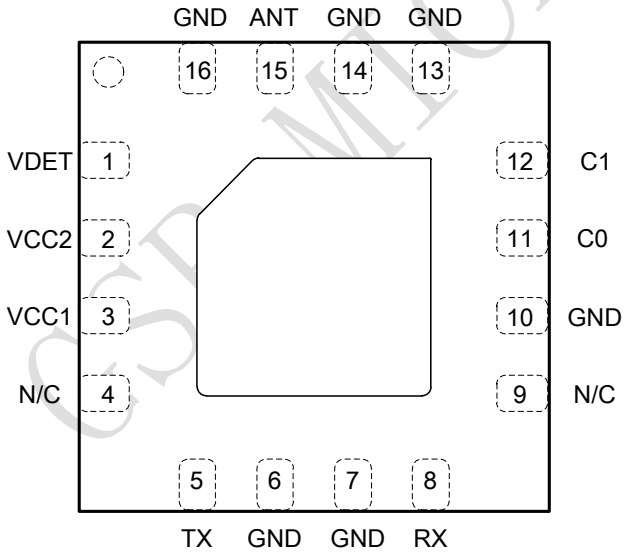


Figure 1 GSR2337 Pin Map (Top View)

Functional Block Diagram

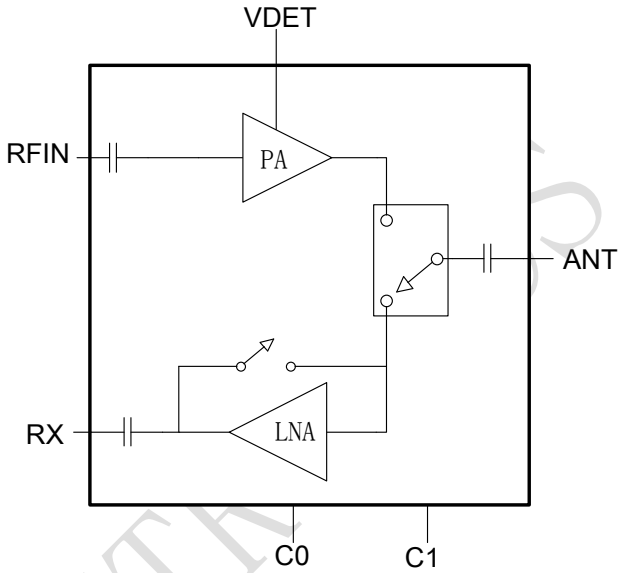


Figure 2 Block Diagram

Key Features

- Pout = +18 dBm HE40 MCS11 -47dB DEVM
- Pout = +21 dBm HE40 MCS11 -43dB DEVM
- Pout = +22 dBm HE40 MCS11 -40dB DEVM
- Pout = +23 dBm VTH40 MCS9 -35dB DEVM
- Pout = +24 dBm HT40/20 MCS7 -30dB DEVM
- Integrated positive slope power detector
- Receive gain: 15 dB
- 1.6 dB LNA Noise Figure

Applications

- Mobile Access Points
- Mobile Phones
- Consumer Electronics
- Customer Premise Equipment
- Internet of Things

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Pin Description

Pin	Name	Description
1	VDET	Power detector output voltage
2	VCC2	PA supply voltage
3	VCC1	PA supply voltage
4	N/C	No connection
5	TX	RF transmit input
6	GND	Ground
7	GND	Ground
8	RX	RF receive output
9	N/C	No connection
10	GND	Ground
11	C0	Control input
12	C1	Control input
13	GND	Ground
14	GND	Ground
15	ANT	Antenna
16	GND	Ground

Absolute Maximum Ratings

Parameter	Conditions	Rating
DC Supply Voltage		-0.3 to +5.25 V
Control Voltage (C0,C1)		-0.3 to +3.6 V
Storage Temperature		-40 to 150 ℃
Junction Temperature		Max 150 ℃
RF Input Power at TX	ANT connect 50 Ω Load	+10 dBm
RF Input Power at ANT	RX connect 50 Ω Load, LNA active	+10 dBm
RF Input Power at ANT	RX connect 50 Ω Load, LNA off	+30 dBm

Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability.

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Recommended Operating Conditions

Parameter	Min	Typ	Max	Units
Operating Frequency	2400	-	2500	MHz
DC Supply Voltage	3	5	5.25	V
Control Voltage – High	1.8	-	3.6	V
Control Voltage – Low	0	-	0.4	V
Operating temperature	-40	25	85	℃

Logic Truth Table

Mode	C0	C1
All off	0	0
WLAN receive LNA	1	0
WLAN receive bypass	1	1
WLAN transmit	0	1

Electrical Specifications

Parameter	Conditions	Min	Typ	Max	Units
Transmit Mode	Unless otherwise noted: VCC1, VCC2 =5 V, Temp=+25ºC, C1 =3.3 V,C0=0 V				
11ax Output Power	HE40 MCS11 1024QAM		18		dBm
Dynamic EVM			-47		dB
11ax Output Power			21		dBm
Dynamic EVM			-43		dBm
11ax Output Power			22		dB
Dynamic EVM			-40		dB
11ac Output Power	VHT40 MCS9 256QAM		23		dBm
Dynamic EVM			-35		dB
11n HT20 Output Power	MCS7 64QAM		24		dBm
Dynamic EVM			-30		dB
mask compliant power	802.11n HT20 MCS0		27		dBm
Gain			28		dB
Gain Flatness	Across any 40 MHz Channel	-0.5		+0.5	dB
TX Port Return Loss			12		dB
ANT Port Return Loss			13		dB
Quiescent Current	RF OFF		150		mA
Operating Current	Pout=21 dBm, HE40 MCS11		230		mA
	Pout=24 dBm, HT20 MCS7		280		mA

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Operating Current	Pout=27 dBm, HT20 MCS0		370		mA
C1 Current	C1=High		5		uA
2nd Harmonics	Pout=25 dBm, 11b 1Mbps		-25		dBm/MHz
3rd Harmonics	Pout=25 dBm, 11b 1Mbps		-30		dBm/MHz
VDET Voltage	RF OFF		0.19		V
	Pout=18 dBm, CW		0.69		V
	Pout=24 dBm, CW		0.88		V
Switching Time	LNA On or Bypass to Transmit Mode		400		nS
Ruggedness	Rated power = 27 dBm, load VSWR 10:1	No damage			
Receive LNA Mode	Unless otherwise noted: VCC1, VCC2 =5 V, Temp=+25ºC, C0=3.3 V, C1= 0 V				
Noise Figure			1.6		dB
Gain			15		dB
Gain Flatness	Across any 40 MHz Channel	-0.5		+0.5	dB
Out of Band Gain	f = 5000 ~ 6000 MHz		3		dB
RX Port Return Loss			8		dB
ANT Port Return Loss			10		dB
Quiescent Current			21		mA
C0 Current	C0=High		8		uA
Input P1dB			-4		dBm
Switching Time	Transmit to Receive LNA Mode		400		nS
	Bypass to LNA Mode		400		nS
Receive Bypass Mode	Unless otherwise noted: VCC1, VCC2 =5 V, Temp=+25ºC, C0=C1=3.3V				
Gain			-2.5		dB
Gain Flatness	Across any 40 MHz Channel	-0.25		+0.25	dB
Out of Band Gain	f = 5000 ~ 6000 MHz		-2.5		dB
RX Port Return Loss			12		dB
ANT Port Return Loss			12		dB
Quiescent Current	RF OFF		150		uA
Input P1dB			25		dBm
Switching Time	Transmit to Receive Bypass Mode		400		nS
	LNA to Bypass Mode		400		nS

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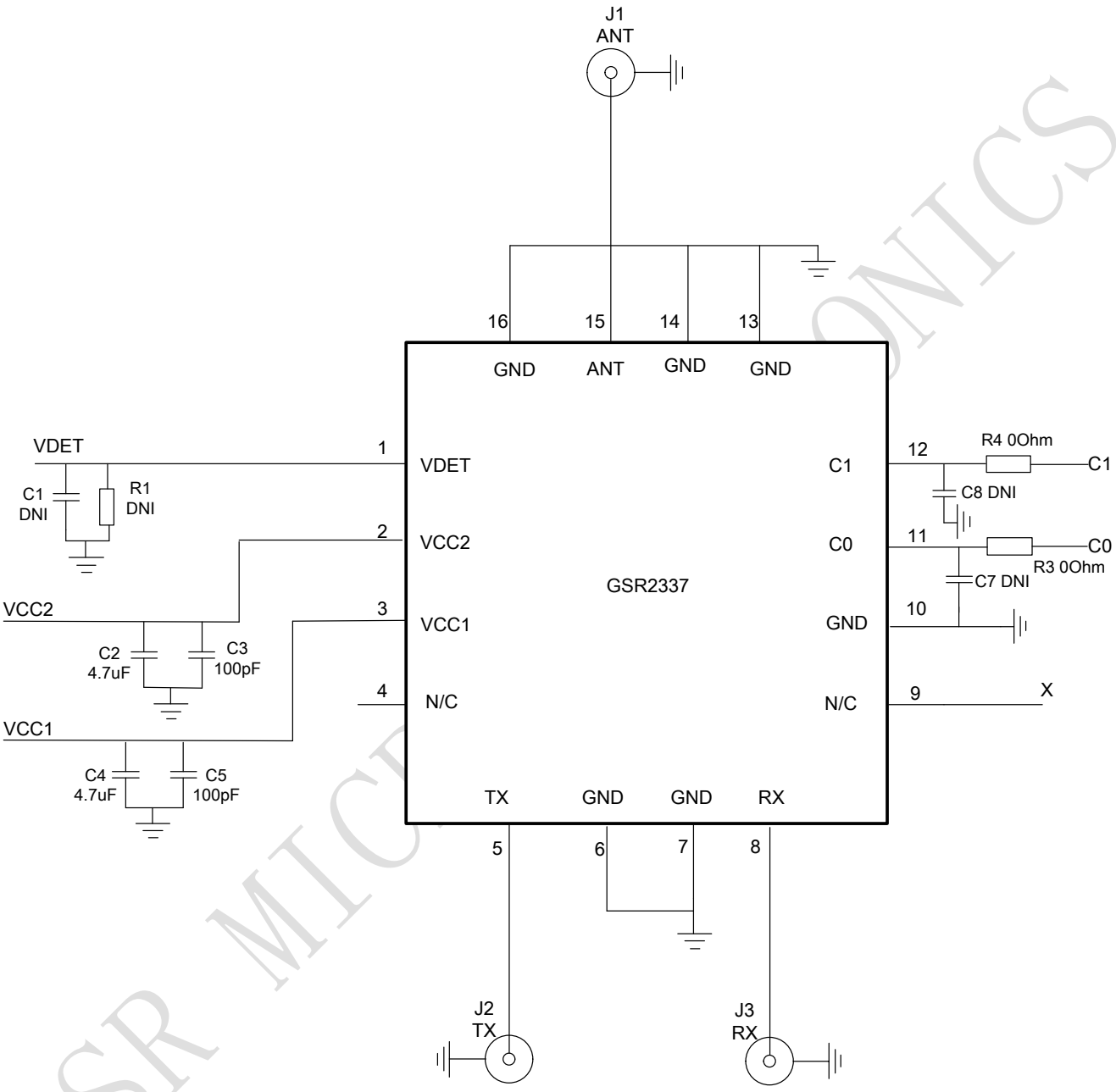
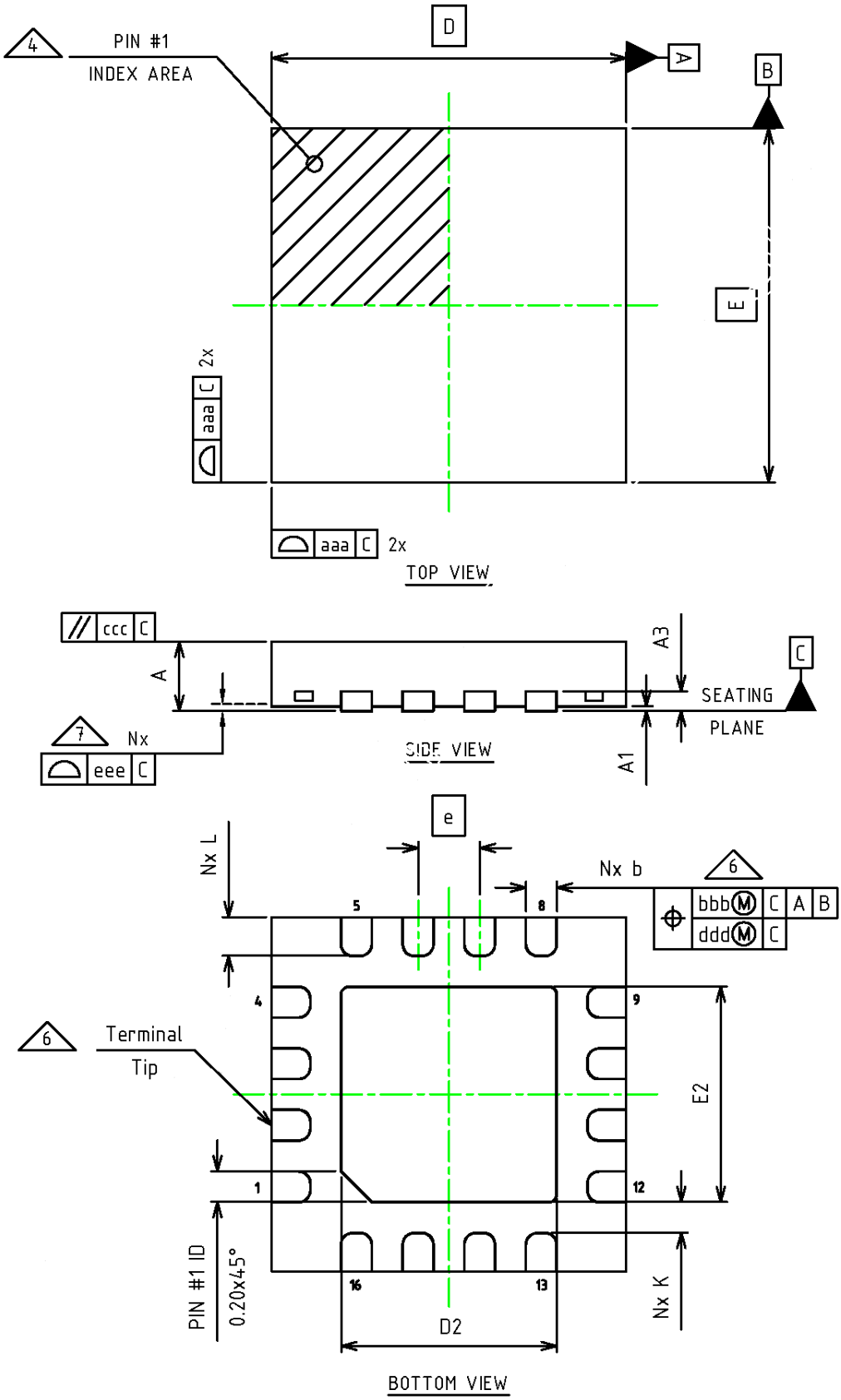


Figure 3 GSR2337 Application Schematic

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Package Outline



Dimension Table				
	MINIMUM	NOMINAL	MAXIMUM	NOTE
A	0.51	0.55	0.60	
b	0.18	0.25	0.3	
D		3.0		
E		3.0		
e		0.5		
D2	1.55	1.70	1.80	
E2	1.55	1.70	1.80	
K	0.15			
L	0.3	0.4	0.5	
N		16		

Notes: All dimensions are in millimeters.

Handling Precautions

Parameter	Rating	Value	Standard
ESD Human Body Model (HBM)	Class 1C	>=1000V	ESDA/JEDEC JS-001-2017
ESD Human Body Model (CDM)	Class C2	>=500V	ESDA/JEDEC JS-002-2018
MSL – Moisture Sensitivity Level	3		JESD22-A113

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Contact Information

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