

IL2601

Quad-Band GSM/GPRS Transmit Module With 2 UMTS Ports

Feature

- Quad-Band Power Amplifier with antenna switch
- 50Ω input and output matching
- Integrated ESD protection at antenna pPort
- High efficiency
 - GSM 850MHz 44%
 - EGSM 900MHz 43%
 - DCS 1800MHz 40.6%
 - PCS 1900MHz 39%
- Low current consumption
 - GSM 850MHz 1.38A
 - EGSM 900MHz 1.36A
 - DCS 1800MHz 0.92A
 - PCS 1900MHz 0.93A
- Low RX insertion loss
- Interchangeable RX ports
- ROHS Compliant
- 6.63 x 5.24 x 1.1mm LGA package

Application

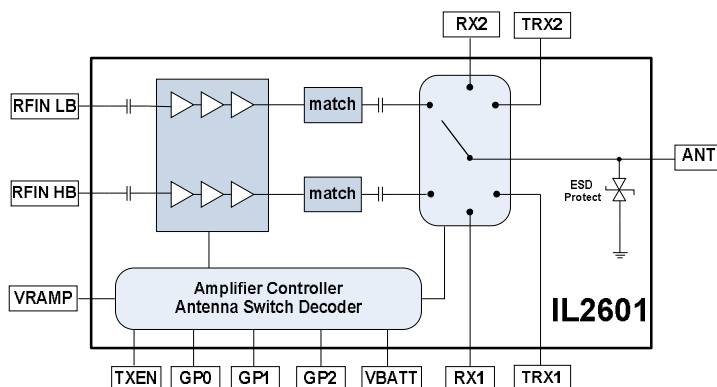
Quad-Band GSM/GPRS Class 12 wireless communication mobile applications. IL2601 integrates 2 receive ports and 2 UMTS ports for single and dual-band multimode applications.

Product Description

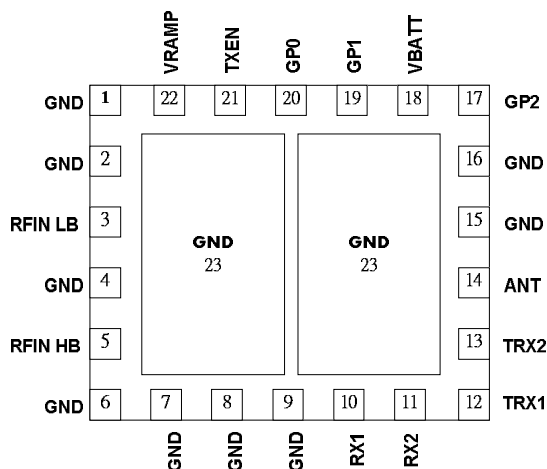
IL2601 integrates 2 receive ports and 2 UMTS ports for single and dual-band multimode applications.

Both input and output of IL2601 are matched with 50Ω, eliminating extra external matching circuitry and reducing PCB size. The IL2601 integrates ESD protection at antenna port and power compensation circuit to minimize the loss of miss-match at antenna port.

Block Diagram



Pin Out (Top View)



Pin Description

Pin	Name	Description
1	GND	Ground
2	GND	Ground
3	RFIN LB	50Ω input. RF input to GSM850/EGSM900.
4	GND	Ground
5	RFIN HB	50Ω input. RF input to DCS1800/PCS1900.
6	GND	Ground
7	GND	Ground
8	GND	Ground
9	GND	Ground
10	RX1	50Ω input. RX1 of antenna switch. RX1 is interchangeable with RX2
11	RX2	50Ω input. RX2 of antenna switch. RX2 is interchangeable with RX1.
12	TRX1	50Ω input/output. TRX1 UMTS port of antenna switch.
13	TRX2	50Ω input/output. TRX2 UMTS port of antenna switch.
14	Antenna	Antenna port
15	GND	Ground
16	GND	Ground
17	GP2	Mode select control pin2
18	VBATT	Power supply
19	GP1	Mode select control pin1
20	GP0	Mode select control pin1
21	TXEN	Module enable pin.
22	VRAMP	VRAMP ramping signal from DAC. VRAMP may or may not require extra filtering depending on the baseband selected
23	GND	Ground

Absolute Maximum Rating

Description	Rating	Unit
DC Supply Voltage	-0.3 to +5.0	V
Power Control Voltage (VRAMP)	-0.3 to Vcc-0.2	V
Input RF Power	+15	dBm
Operating Temperature	-20 to +85	°C
Storage Temperature	-55 to +150	°C

Parameter	Spec			Unit	Conditions
	Min	Typ	Max		
Power Supply Voltage	2.7	3.3	4.8	V	
GP0, GP1, GP2 "Low"	-0.1	--	0.5	V	
GP0, GP1, GP2 "High"	1.2	--	Vcc	V	
GP0, GP1, GP2 "High Current"		1	20	μA	
TX Enable "Low"	-0.1	--	30%V _{LOGIC}	V	
TX Enable "High"	70%V _{LOGIC}	--	V _{LOGIC}	V	
TX Enable "High current"		8	20	μA	
RF Port Input and Output Impedance		50		Ω	

GSM850 Band

Parameter	Spec			Unit	Conditions
	Min	Typ	Max		
Operating Frequency Range	824		849	MHz	
Input Power	0	3	6	dBm	
Input VSWR		1.5:1	2.5:1		P _{OUT} =5 to 33dBm
Output Power	32.8	33.4		dBm	Vcc=3.8V, T _{CASE} =+25°C, P _{IN} =3dBm
VRAMP	0.2		1.8	V	
PAE	40	42		%	Vcc=3.8V, P _{OUT} =33dBm
Peak Supply Current (Max P _{OUT})		1380	1500	mA	Vcc=3.4V, P _{OUT} =33dBm, P _{IN} =3dBm
Peak Supply current (Min P _{OUT})		51	60	mA	Vcc=3.4V, P _{OUT} =5dBm, P _{IN} =3dBm
Harmonics (2 nd ~13 th)		-35	-33	dBm	BW=3MHz, 5dBm≤P _{OUT} ≤33dBm
Insertion Loss (ANT to RX)		1.0	1.3	dB	
VSWR (ANT to RX)		1.2:1	1.5:1		

EGSM900 Band

Parameter	Spec			Unit	Conditions
	Min	Typ	Max		
Operating Frequency Range	880		915	MHz	
Input Power	0	3	6	dBm	
Input VSWR		1.5:1	2.5:1		$P_{OUT} = 5$ to 33dBm
Output Power	33.1	33.6		dBm	$V_{CC}=3.8V$, $T_{CASE}=+25^{\circ}C$, $P_{IN}=3dBm$
VRAMP	0.2		1.8	V	
PAE	40	43		%	$V_{CC}=3.8V$, $P_{OUT}=33dBm$
Peak Supply Current (Max P_{OUT})		1360	1500	mA	$V_{CC}=3.4V$, $P_{OUT}=33dBm$, $P_{IN}=3dBm$
Peak Supply current (Min P_{OUT})		51	60	mA	$V_{CC}=3.4V$, $P_{OUT}=5dBm$, $P_{IN}=3dBm$
Harmonics (2 nd ~13 th)		-36	-33	dBm	$BW=3MHz$, $5dBm \leq P_{OUT} \leq 33dBm$
Insertion Loss (ANT to RX)		1.0	1.3	dB	
VSWR (ANT to RX)		1.2:1	1.5:1		

DCS1800 Band

Parameter	Spec			Unit	Conditions
	Min	Typ	Max		
Operating Frequency Range	1710		1785	MHz	
Input Power	0	3	6	dBm	
Input VSWR		1.5:1	2.5:1		$P_{OUT} = 0$ to 31dBm
Output Power	31.0	32.3		dBm	$V_{CC}=3.8V$, $P_{IN}=3dBm$
VRAMP	0.2		1.8	V	
PAE	36	40.6		%	$V_{CC}=3.8V$, $P_{OUT}=31dBm$
Peak Supply Current (Max P_{OUT})		920	1100	mA	$V_{CC}=3.8V$, $P_{OUT}=31dBm$, $P_{IN}=3dBm$
Peak Supply current (Min P_{OUT})		38	58	mA	$V_{CC}=3.8V$, $P_{OUT}=0dBm$, $P_{IN}=3dBm$
Harmonics (2 nd ~13 th)		-38	-33	dBm	$BW=3MHz$, $0dBm \leq P_{OUT} \leq 31dBm$
Insertion Loss (ANT to RX)		1.2	1.5	dB	
VSWR (ANT to RX)		1.2:1	1.5:1		

PCS1900 Band

Parameter	Spec			Unit	Conditions
	Min	Typ	Max		
Operating Frequency Range	1850		1910	MHz	
Input Power	0	3	6	dBm	
Input VSWR		1.5:1	2.5:1		$P_{OUT} = 0$ to 31dBm
Output Power	31.0	32.1		dBm	$V_{CC}=3.8V$, $P_{IN}=3dBm$
VRAMP	0.2		1.8	V	
PAE	35	39		%	$V_{CC}=3.8V$, $P_{OUT}=31dBm$
Peak Supply Current (Max P_{OUT})		930	1200	mA	$V_{CC}=3.8V$, $P_{OUT}=31dBm$, $P_{IN}=3dBm$
Peak Supply current (Min P_{OUT})		35	65	mA	$V_{CC}=3.8V$, $P_{OUT}=0dBm$, $P_{IN}=3dBm$
Harmonics (2 nd ~13 th)		-39	-33	dBm	$BW=3MHz$, $0dBm \leq P_{OUT} \leq 31dBm$
Insertion Loss (ANT to RX)		1.2	1.5	dB	
VSWR (ANT to RX)		1.2:1	1.5:1		

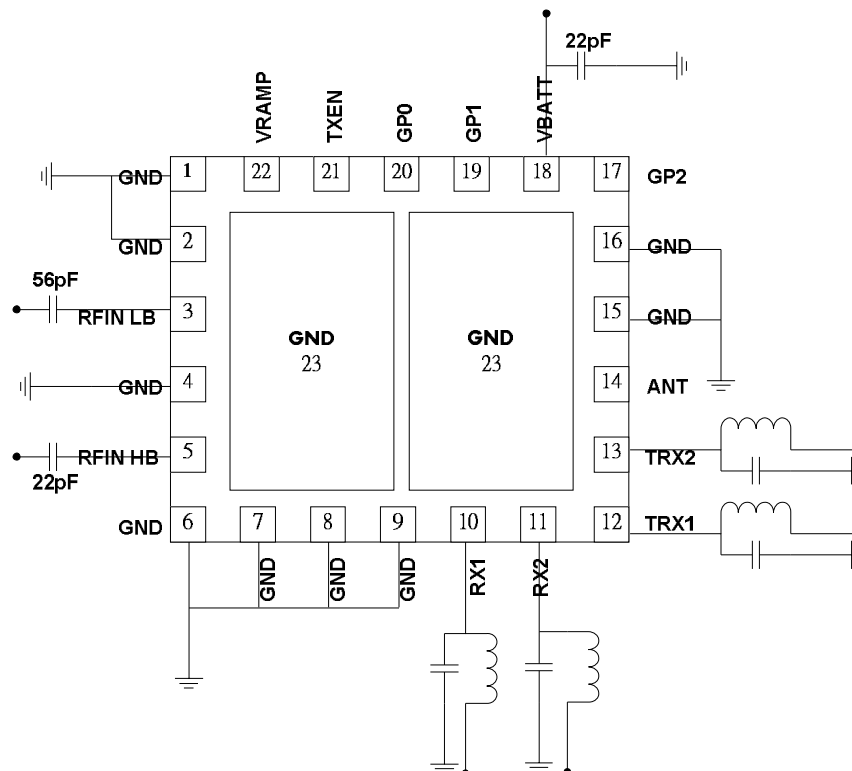
TRX

Parameter	Spec			Unit	Conditions
	Min	Typ	Max		
Insertion Loss AVT-TRX1		0.7		dB	Freq=824MHz to 960MHz
In-Band Ripple ANT-TRX1		0.2		dB	Freq=824MHz to 960MHz
Input VSWR ANT-TRX1		1.2:1			Freq=824MHz to 960MHz
TRX1 Isolation to all RX/TRX Ports		28		dB	Freq=824MHz to 960MHz
Insertion Loss AVT-TRX2		1.0		dB	Freq=1710MHz to 2170MHz
In-Band Ripple ANT-TRX2		0.2		dB	Freq=1710MHz to 2170MHz
Input VSWR ANT-TRX2		1.2:1			Freq=1710MHz to 2170MHz
TRX2 Isolation to all RX/TRX Ports		23		dB	Freq=1710MHz to 2170MHz

Module Control and Antenna Switch Logic

TXEN	GP2	GP1	GP0	Tx Module Mode
0	0	0	0	Standby
0	1	0	0	RX1
0	0	1	0	RX2
0	0	1	1	TRX1
0	0	0	1	TRX2
1	0	1	0	GSM850/900 TX Mode
1	0	1	1	DCS1800/PCS1900 TX Mode

Application Circuit



Ordering Information:

IL2601 Tape & Reel Package