CP4519: 5-6 GHz WLAN Front End Module

Applications

- IEEE 802.11 ac WLAN
- Media gateways
- Set-top boxes
- LCD TVs

Features

- Integrated 5GHz PA, LNA with Bypass and T/R switch
- Integrated power detector
- Transmit gain : > +35 dB
- Receiver gain : > +16 dB
- Output power: +23 dBm @ -35 dB DEVM, HT80, MCS9, 5V
- Output power: +24 dBm @ -30 dB DEVM, HT40, MCS7, 5V
- Output power: +27 dBm @Mask with 3dB Magin, HT20, MCS0, 5V
- 3x5x0.85 mm 24-Pin QFN package

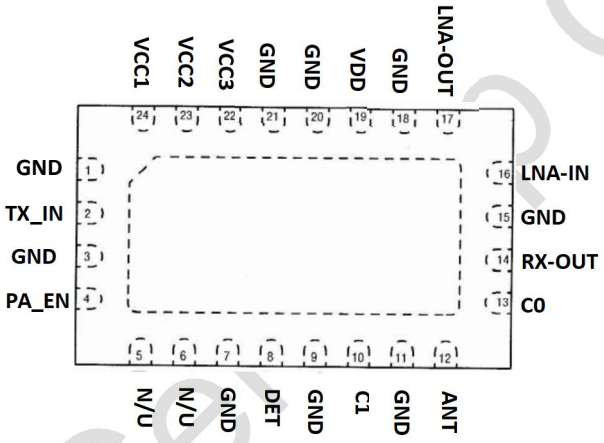


Figure 2. CP4519 Pinout – 24 Pin QFN
(Top View)

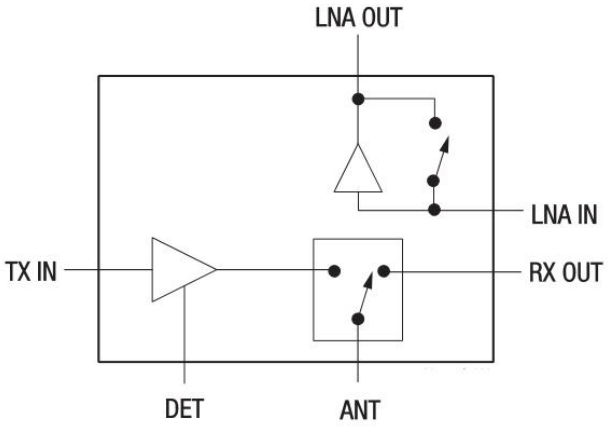


Figure 1. CP4519 Block Diagram

Description

The CP4519 is a highly integrated 5 GHz FEM incorporating 5GHz SPDT T/R switch, 5 GHZ high gain LNA with bypass, and 5 GHz PA intended for high-power 802.11 ac applications and systems.

The device is sold in a RoHS compliant miniature 3 x 5 x 0.85mm 24-pin QFN package to make automated assembly simple. Its small and thin package size makes the device an ideal solution for radios built in small form factors for mobile applications.

Table 1. CP4519 Signal Descriptions

Pin #	Name	Description	Pin #	Name	Description
1	GND	Ground	12	ANT	Antenna
2	TX_IN	Transmit Input	13	C0	Control pin 0
3	GND	Ground	14	RX-OUT	Switch RX output
4	PA_EN	PA Enable	15/18/20/21	GND	Ground
5/6	N/U	Not used (open circuit)	16	LNA-IN	LNA input
7	GND	Ground	17	LNA-OUT	LNA output
8	DET	Detect output	19	VDD	LNA supply voltage
9	GND	Ground	22	VCC3	PA 3rd stage supply voltage
10	C1	Control pin 1	23	VCC2	PA 2nd stage supply voltage
11	GND	Ground	24	VCC1	PA 1st stage supply voltage

Electrical Specifications

The absolute maximum ratings of the CP4519 are provided in Table 2. The DC electrical characteristics and AC electrical characteristics are also provided in Tables 3 and 4, respectively. The state of CP4519 is determined by the logic provided in Table 5.

Table 2. Absolute Maximum Ratings

Parameter	Min.	Max.	Units	Comments
VCC1, VCC2, VCC3	-0.5	+5.5	V	RF OFF
Collector Current		1.2	A	
RF Input Power		+10	dBm	CW
Operating Temperature Range	-40	+85	°C	
Maximum Junction Temperature		+170	°C	
Storage Temperate Range	-40	+150	°C	
Soldering Conditions		+260	°C	Peak for 20 Seconds
Electrostatic discharge: Human Body Model (HBM), Class 1B		1000	V	

Note: Stress in excess of the absolute maximum ratings may cause permanent damage to the devices.

Table 3. DC Electrical Characteristics (Temp.=+25°C)

Parameter	Condition	Min.	Typ.	Max.	Units
Supply Voltages					
VCC1, VCC2, VCC3, VDD		4.5	5.0	5.5	Volts
Control logic High Low		 1.6 0		 3.6 0.4	Volts
Supply Currents					
Icq, PA	Quiescent (no RF)		300		mA
Icq, LNA	Quiescent (no RF)		16		mA

Table 4. AC Electrical Characteristics (VCC1,2,3=+5.0V, VDD=+5V, PA_EN=+2.5V, Temp.=+25°C)

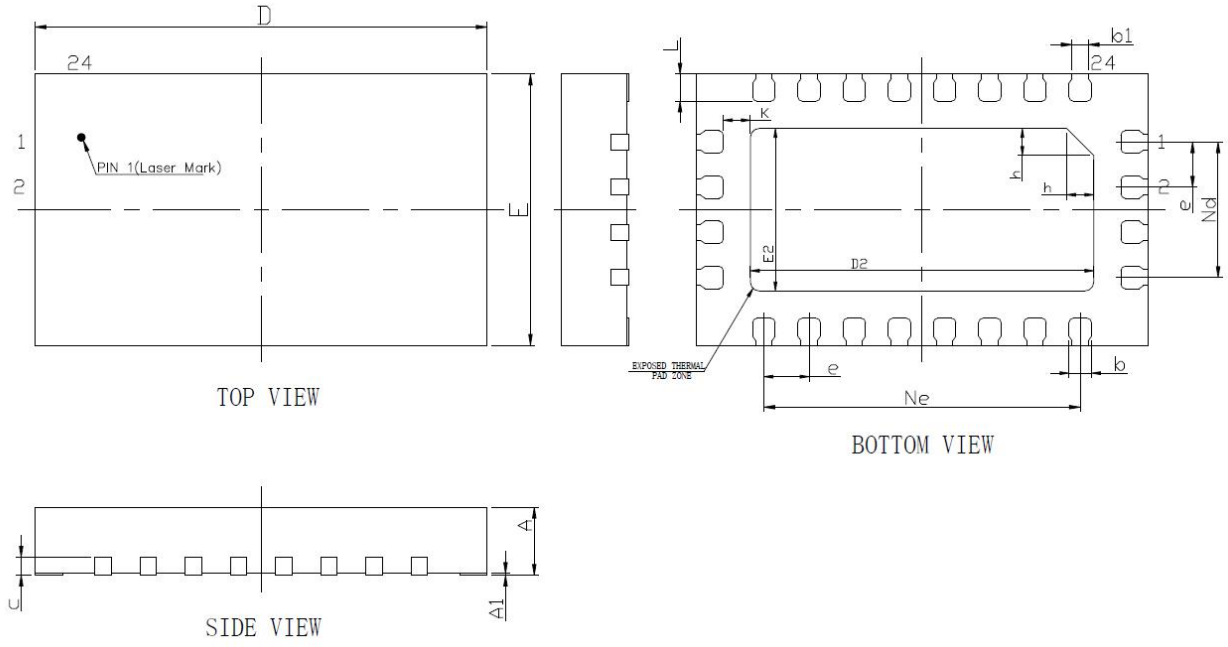
Parameter	Condition	Min.	Typ.	Max.	Units
Transmit Mode					
RF Frequency Range (Note 1)		5.15		5.85	GHz
Transmit Gain			35		dB
Isolation	ANT->RX in TX mode		-40		dB
	ANT->TX in RX mode		-50		dB
Input Return Loss |S11|	Transmit	10			dB
Output Return Loss |S22|	Transmit	10			dB
Detector Voltage Range	No RF		0.4		V
	Pout = +22 dBm		1.0		V
	Pout = +27dBm		1.6		V
Output Power	MCS9, HT80, -35 dB DEVM		23		dBm
	MCS7, HT40, -30 dB DEVM		24		dBm
2fo/3fo harmonics	Pout=+26dBm		-40/-40		dBm/MHz
Receive/Bypass Mode					
Gain	LNA active LNA bypass	15	16.5 -6		dB
1 dB input compression point	LNA active LNA bypass		0 +25		dBm
Noise Figure	ANT to LNA-OUT		2.0		dB
Input return loss |S11|	LNA active LNA bypass	10 10			dB
Output return loss|S22|	LNA active LNA bypass	10 8			dB
Switching time	LNA<-->bypass Tx <--> Rx		200 400		ns

Note 1: Operation outside this range is possible, but not guaranteed.

Table 5. Logic Table

Mode	State	PA_EN	C0	C1
TX to ANT	1	1	0	1
RX-LNA to ANT	2	0	1	0
RX-Bypass to ANT	3	0	1	1
All off	4	0	0	0

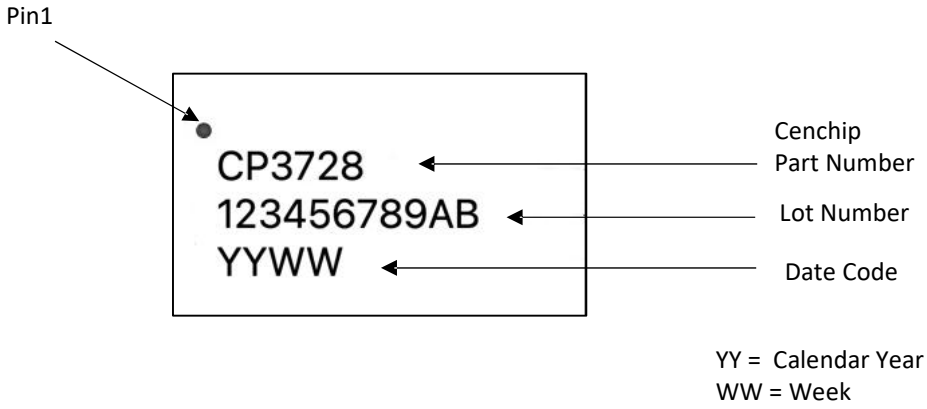
Package Dimensions



MILLIMETER	SYMBOL															
	A		A1	b	b1	c	D	D2	e	Ne	Nd	E	E2	L	h	k
MIN	0.70	0.80	0	0.20			4.90	3.70				2.90	1.70	0.25		
NOM	0.75	0.85	0.02	0.25	0.18REF	0.203REF	5.00	3.80	0.50BSC	3.50BSC	1.50BSC	3.00	1.80	0.30	0.30REF	0.30REF
MAX	0.80	0.90	0.05	0.30			5.10	3.90				3.10	1.90	0.35		

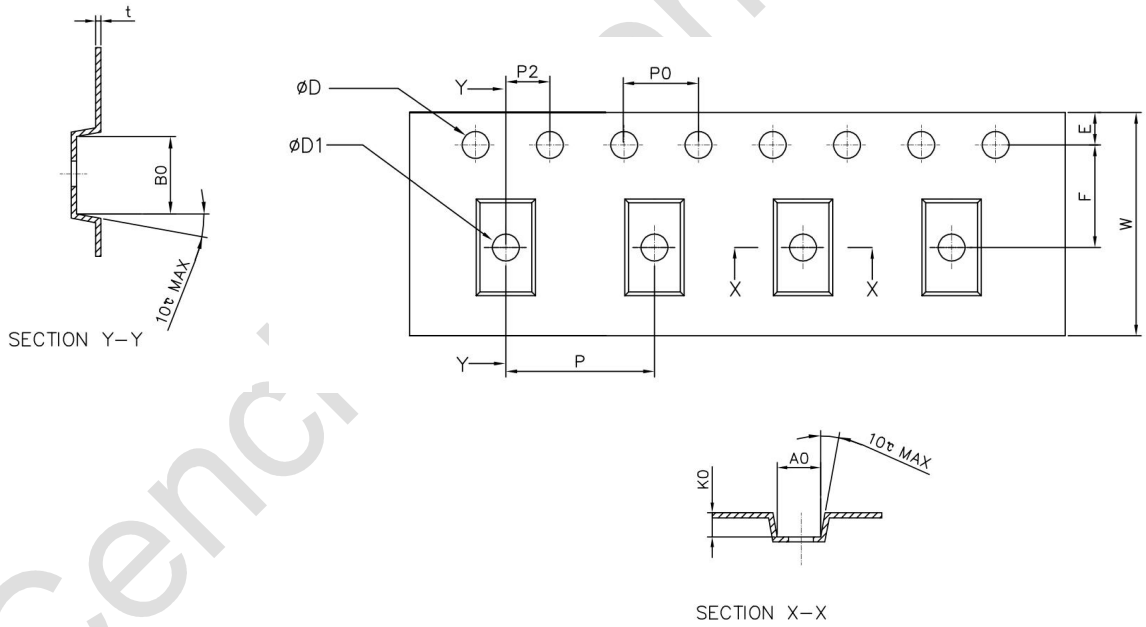
Figure 3. CP4519 Package Dimensions

Marking Detail



YY = Calendar Year
WW = Week

Packing Information



E	1.75±0.10
F	5.50±0.05
P2	2.00±0.05
D	$1.50^{+0.10}_{0}$
D1	$1.50^{+0.25}_{0}$
P0	4.00±0.10
10P0	40.0±0.20

W	$12.00^{+0.30}_{-0.10}$
P	8.00±0.10
A0	3.25±0.10
B0	5.25±0.10
K0	1.13±0.10
t	0.25±0.02