

Preliminary 10W Power Transistor

RT240PD

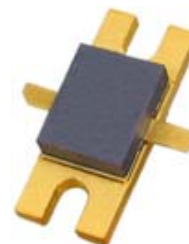
RFHIC

Product Features

- High Output Power
P1dB = 40dBm(Typ.)@2.14GHz
- High Efficiency
- High Power Gain
G1dB = 17dB(Typ.)@900MHz
G1dB = 13dB(Typ.)@2.14GHz
- High Linearity
- Hermetically sealed package
- GaN HFET

Application

- Repeater
- RF Sub-Systems
- Base Station
- Converter
- IMT-2000
- ISM
- MMDS
- Wi-Fi, Wi-max



Description

The RT240PD is designed for base stations and cell extenders as cellular and GSM, PCS, IMT-2000, ISM, MMDS, Wi-Fi, Wi-MAX frequency systems, GaN HFET is used and attached on a gold sub carrier.

● Typical Specifications

Parameter	Specifications				
Frequency (MHz)	900	1800	2140	2640	3500
Small Signal Gain (dB)	17	14	13	12	10
VSWR (Input / Output)	2.0 : 1				
1dB Compression Point (dBm)	40			39	
*CDMA Power (1FA) (dBm)	33	33			
*CDMA Power (7FA) (dBm)	29	29			
Vdd / Ids (CDMA Only)	+28V / 600mA				
**WCDMA Power (1FA) (dBm)			31		
**WCDMA Power (2FA) (dBm)			28		
**WCDMA Power (4FA) (dBm)			26		
OIP3 (dBm)	50 @ 27dBm/tone			48 @ 27dBm/tone	
Operating Temp Range	-25°C ~ +70°C				

* IS-95 (±750kHz offset@-29dBc ACPR, ±1.98MHz offset@-39dBc ACPR)

** Test Model 1ch/64DPCH (±5MHz offset@-45dBc ACLR, ±10MHz offset@-50dBc ACLR)

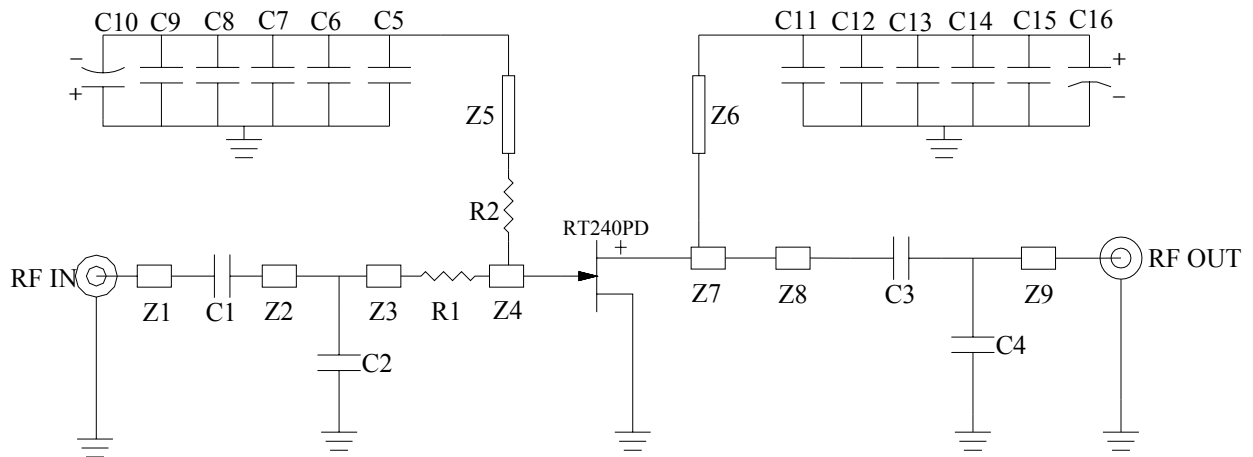
- All specifications may change without notice.
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● Application Circuit (900MHz)

Schematic



Typical Specifications	
Frequency	880 ~ 960MHz
Gain(S21)	17.2dB
Return loss(S11)	-13dB
Return loss(S22)	-17dB
OIP3(@27dBm/tone)	50dBm
*CDMA(1FA)	33dBm
*CDMA(7FA)	29dBm
P1dB	40dBm
Test Conditions	$V_{ds}=+28V, I_{dq}=600mA, T_C=25^\circ C$

* IS-95

 $(\pm 750kHz \text{ offset}@-31dBc, \pm 1.98MHz \text{ offset}@-40dBc \text{ ACPR})$

Bill of Material						
Text	Value	Size(mm)	Text	Value	Size(mm)	
C1	12pF	1608	C3	100pF	2012	
*C2	6pF		**C4	4.7pF		
C5,C11	10pF		C9,C15	1uF	3216	
C6,C12	100pF		C10,C16	22uF/+50V		
C7,C13	1nF		R1	3.3Ω	1608	
C8,C14	100nF		R2	100Ω		
Z1	W x L		1.4 x 4.9	Z6	W x L	0.7 x 40.1
Z2			1.4 x 9.6	Z7		4.5 x 6.1
Z3		1.4 x 1.3	Z8	1.4 x 9.7		
Z4		9.0 x 8.1	Z9	1.4 x 9.2		
Z5		0.5 x 42.8	PCB	FR-4 , 0.8mm, er=4.7		

* S11 & Gain Tuning Point

** S22, Gain & OIP3, P1dB Tuning Point

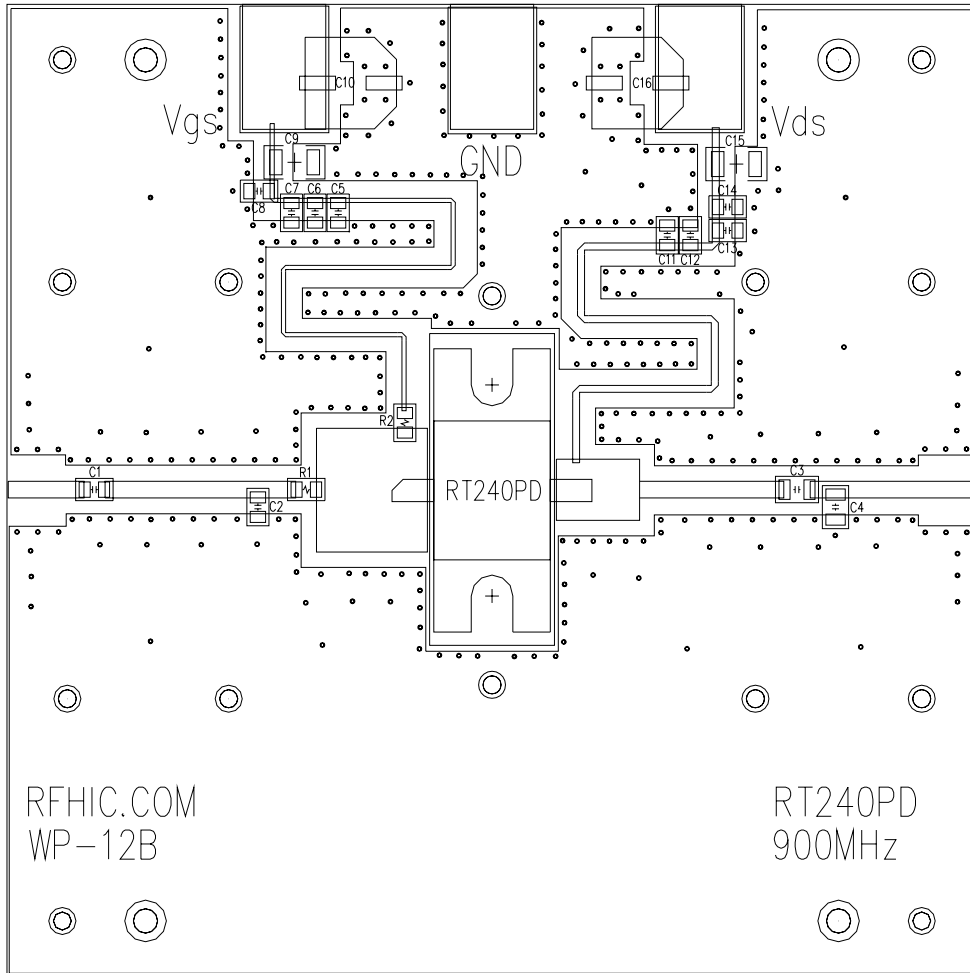
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Test Circuit Board



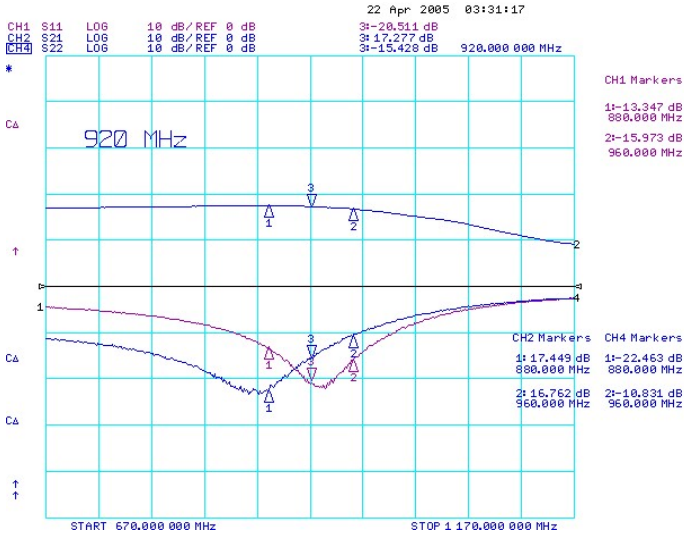
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Preliminary 10W Power Transistor

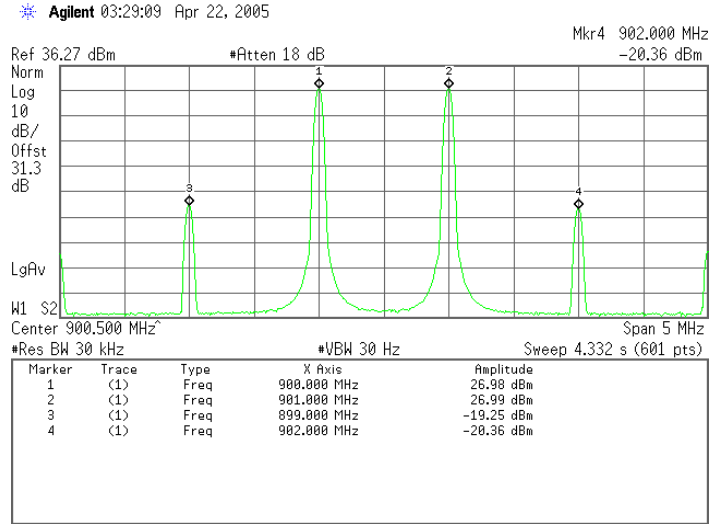
RT240PD



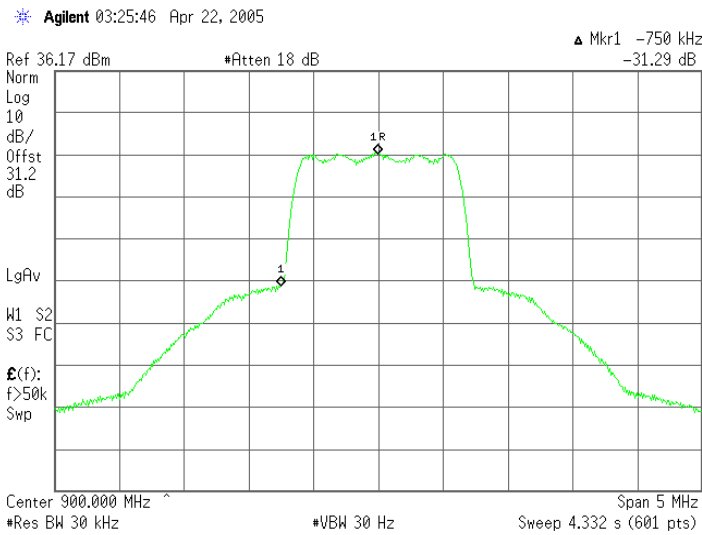
● Measure Data (900MHz)



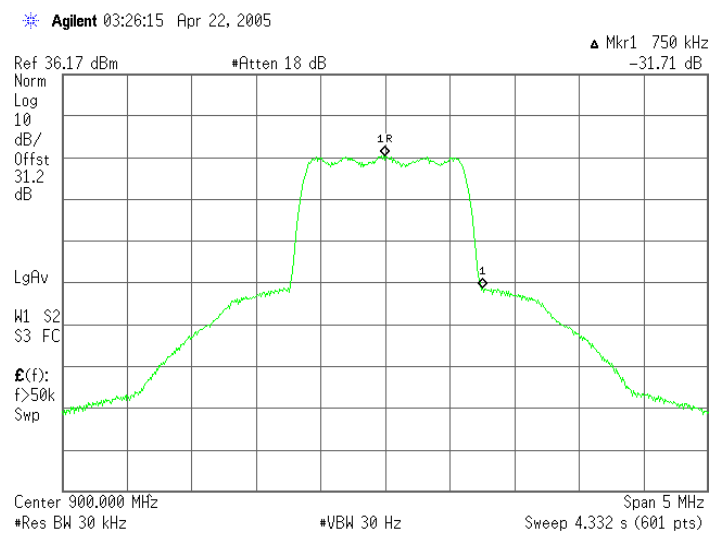
(S-Parameter)



(OIP3)



(CDMA 1FA 33dBm @ -750kHz offset)



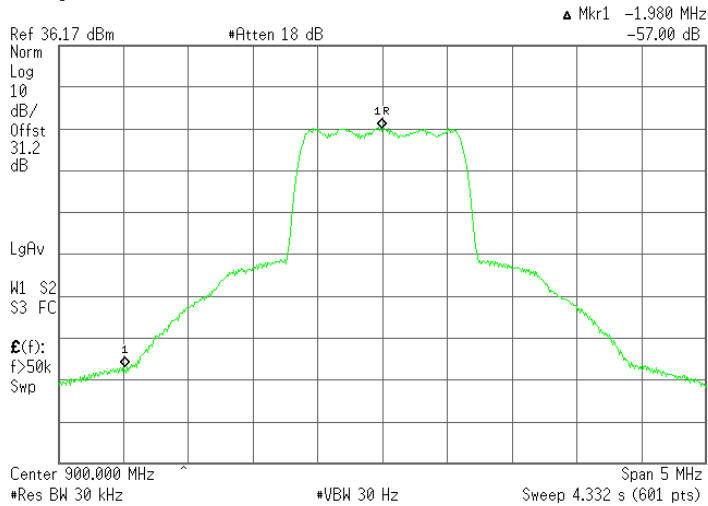
(CDMA 1FA 33dBm @ +750kHz offset)

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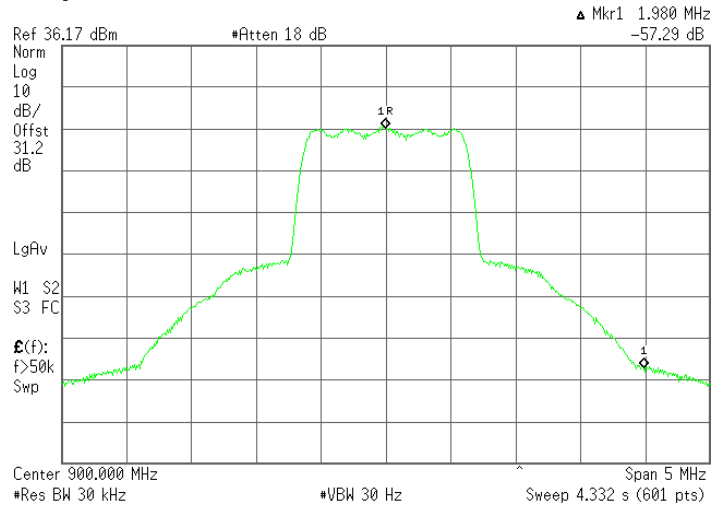


Agilent 03:26:50 Apr 22, 2005



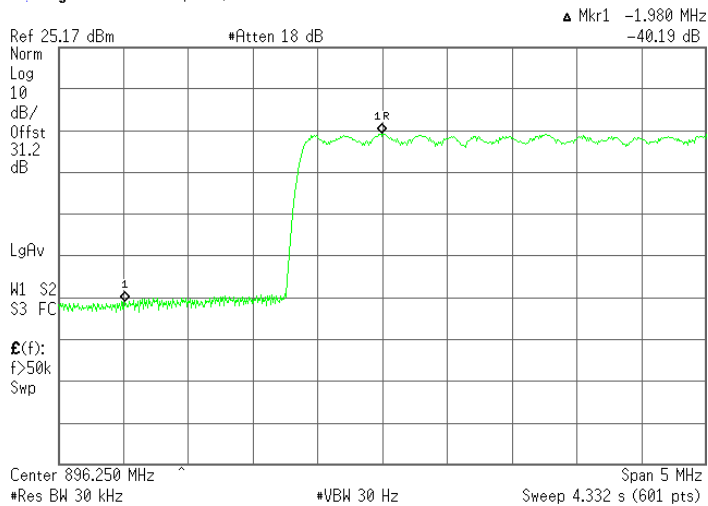
(CDMA 1FA 33dBm @ -1.98MHz offset)

Agilent 03:27:14 Apr 22, 2005



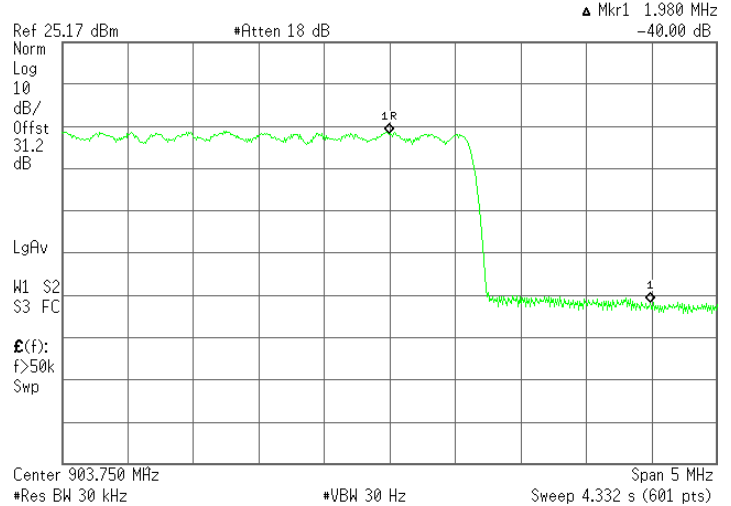
(CDMA 1FA 33dBm @ +1.98MHz offset)

Agilent 03:21:15 Apr 22, 2005



(CDMA 7FA 29dBm @ -1.98MHz offset)

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(CDMA 7FA 29dBm @ +1.98MHz offset)

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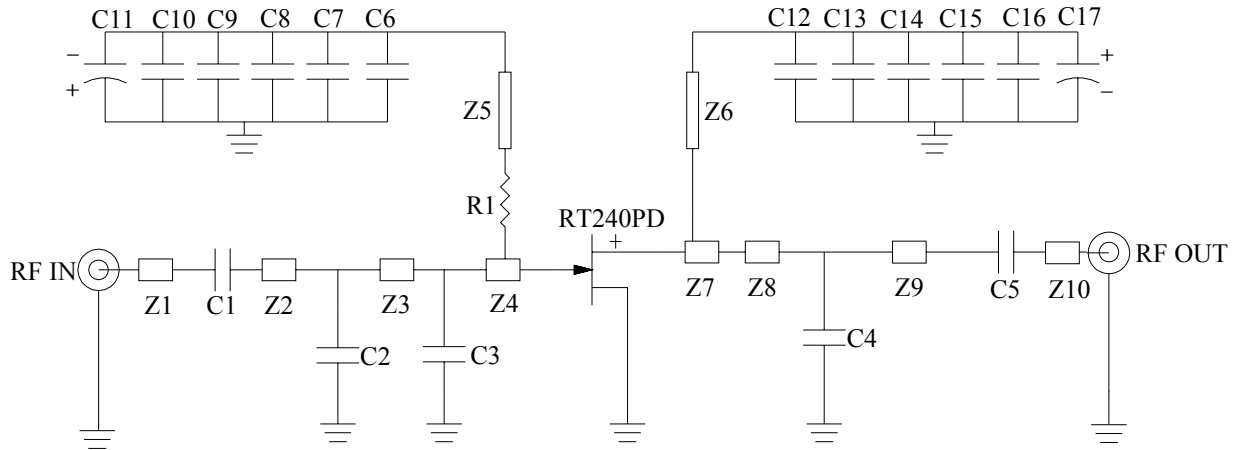
Preliminary 10W Power Transistor

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● Application Circuit (2.14GHz)

Schematic



Typical Specifications	
Frequency	2110 ~ 2170MHz
Gain(S21)	13.5dB
Return loss(S11)	-13dB
Return loss(S22)	-17dB
OIP3(@27dBm/tone)	51dBm
*WCDMA(1FA)	31dBm
*WCDMA(2FA)	28dBm
*WCDMA(4FA)	26dBm
P1dB	41dBm
Test Conditions	$V_{ds}=+28V, I_{dq}=600mA, T_C=25^{\circ}C$

* Test Model 1ch/64DPCH

(±5MHz offset@-45dBc, ±10MHz offset@-50dBc ACLR)

Bill of Material						
Text	Value	Size(mm)	Text	Value	Size(mm)	
C1	5pF	1608	C9,C15	100nF	1608	
*C2	2pF		***C4	2pF	2012	
**C3	1pF		C5	10pF		
C6,C12	10pF		C10,C16	1uF	3216	
C7,C13	100pF		C11,C17	22uF/+50V		
C8,C14	1nF		R1	100Ω	1608	
Z1	W x L		1.4 x 4.9	Z6	W x L	0.7 x 18.5
Z2			1.4 x 1.8	Z7		4.5 x 6.1
Z3		1.4 x 11.1	Z8	1.4 x 2.2		
Z4		9.0 x 8.1	Z9	1.4 x 13.2		
Z5		0.5 x 18.5	Z10	1.4 x 3.7		
PCB		FR-4, 0.8mm, εr=4.7				

* S11 & Gain Tuning Point

** S11 Tuning Point

*** S22, Gain & OIP3, P1dB Tuning Point

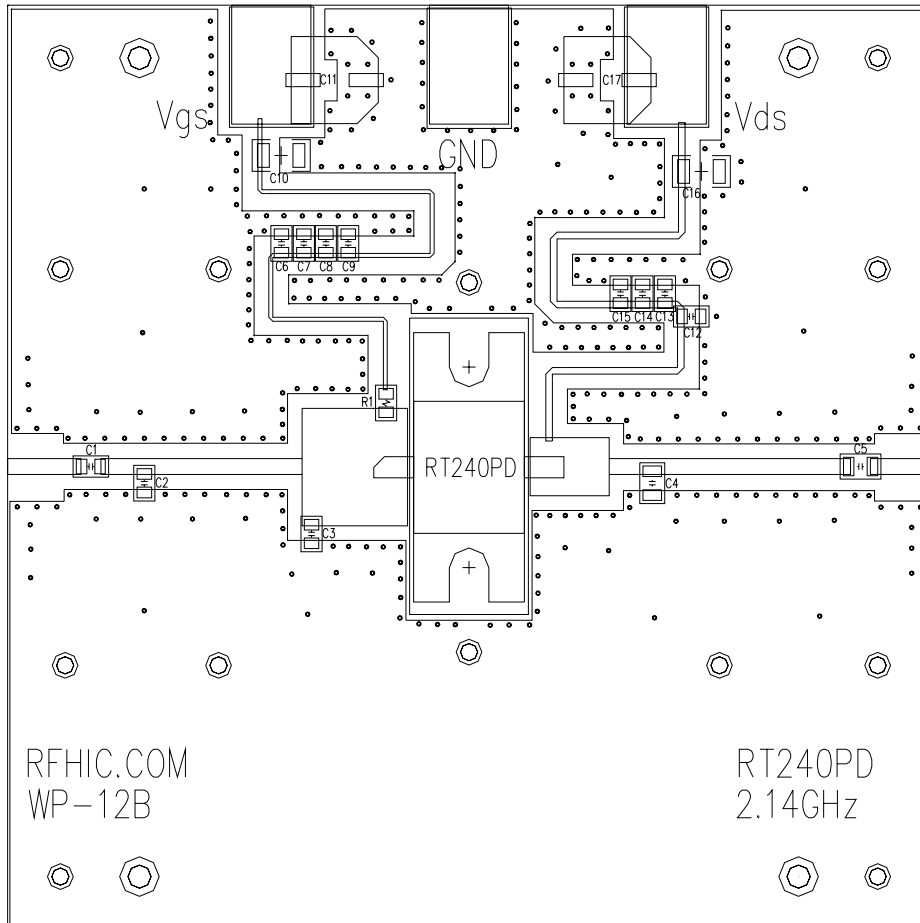
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Test Circuit Board



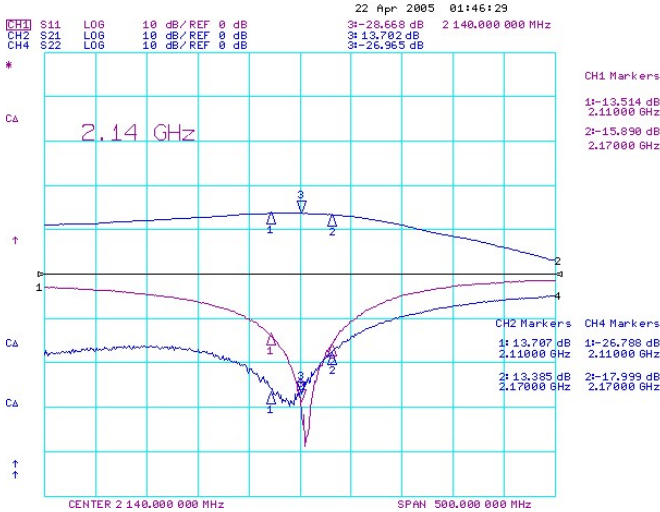
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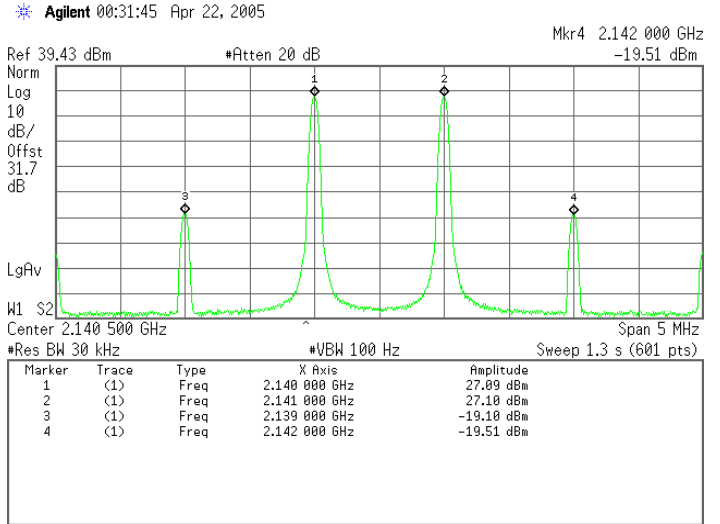
RT240PD



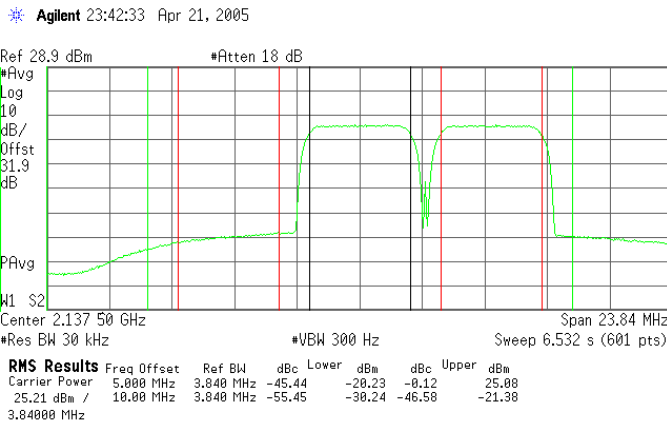
● Measure Data (2.14GHz)



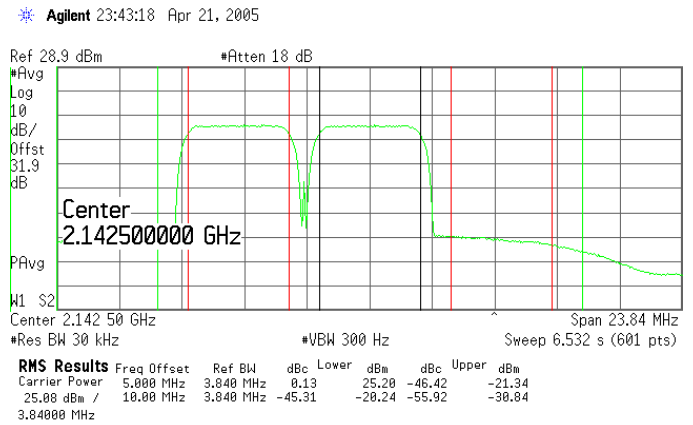
(S-Parameter)



(OIP3)



(WCDMA 2FA 28dBm @ -5MHz, -10MHz offset)



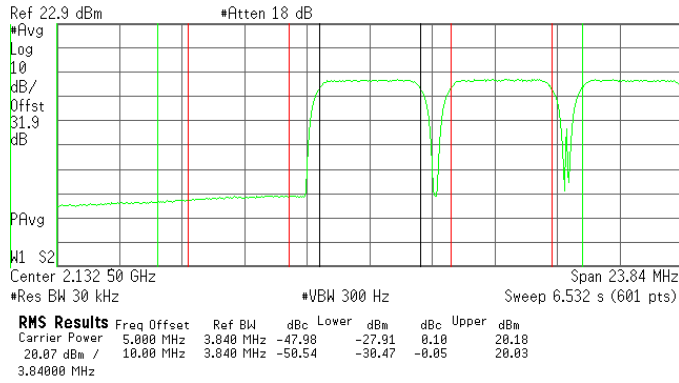
(WCDMA 2FA 28dBm @ +5MHz, +10MHz offset)

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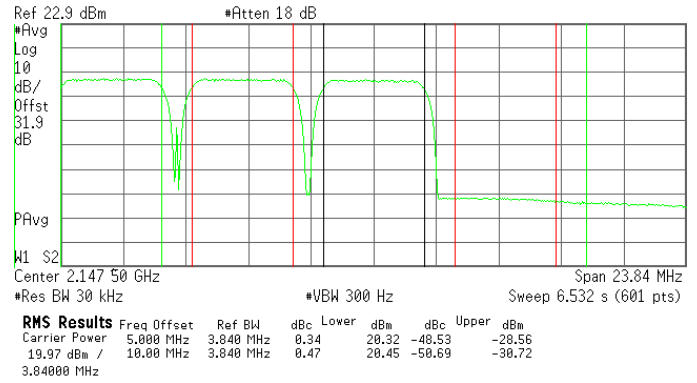
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Agilent 23:47:16 Apr 21, 2005



Agilent 23:49:11 Apr 21, 2005



(WCDMA 4FA 26dBm @ -5MHz, -10MHz offset)

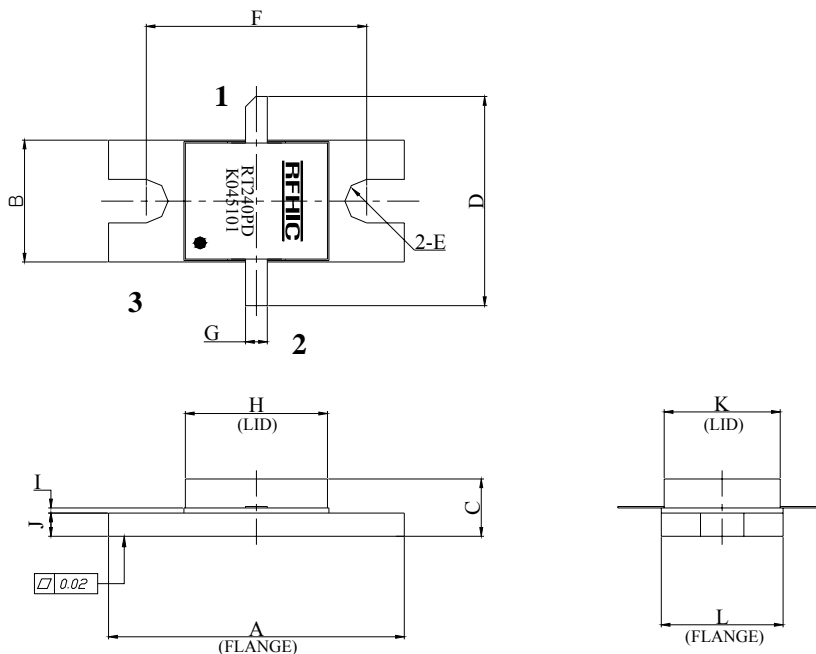
(WCDMA 4FA 26dBm @ +5MHz, +10MHz offset)

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● Dimension in mm



Dimension	Size(mm)			Dimension	Size(mm)		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	20.3	20.4	20.5	G	1.45	1.5	1.55
B	8.3	8.4	8.5	H	9.7	9.8	9.9
C	3.8	3.9	4.0	I	0.3	0.35	0.4
D	14.3	14.4	14.5	J	1.55	1.6	1.65
E	Ø1.48	Ø 1.5	Ø1.52	K	7.9	8.0	8.1
F	15.1	15.2	15.3	L	8.3	8.4	8.5

● Pin Map

Pin 1	Pin2	Pin3
Gate	Drain	Source

● All specifications may change without notice.
● www.rfhic.com