

# Preliminary 10W Power Transistor

RT240PD

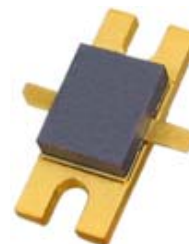
**RFHIC**

## 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℃ ~ +70℃				

\* IS-95 (  $\pm 750\text{kHz}$  offset@-29dBc ACPR,  $\pm 1.98\text{MHz}$  offset@-39dBc ACPR )

\*\* Test Model 1ch/64DPCH (  $\pm 5\text{MHz}$  offset@-45dBc ACLR,  $\pm 10\text{MHz}$  offset@-50dBc ACLR )

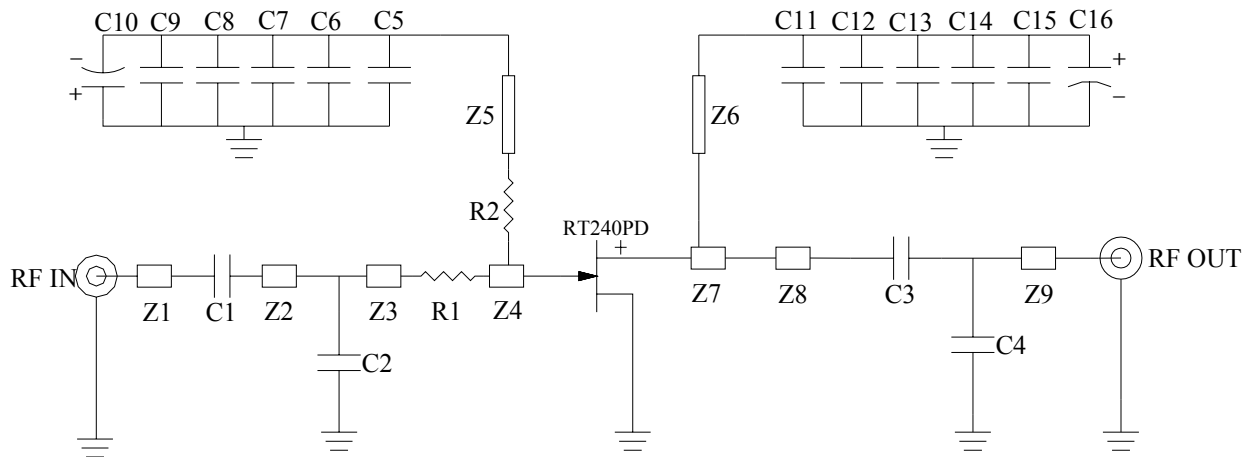
# Preliminary 10W Power Transistor

RT240PD

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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

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

### Bill of Material

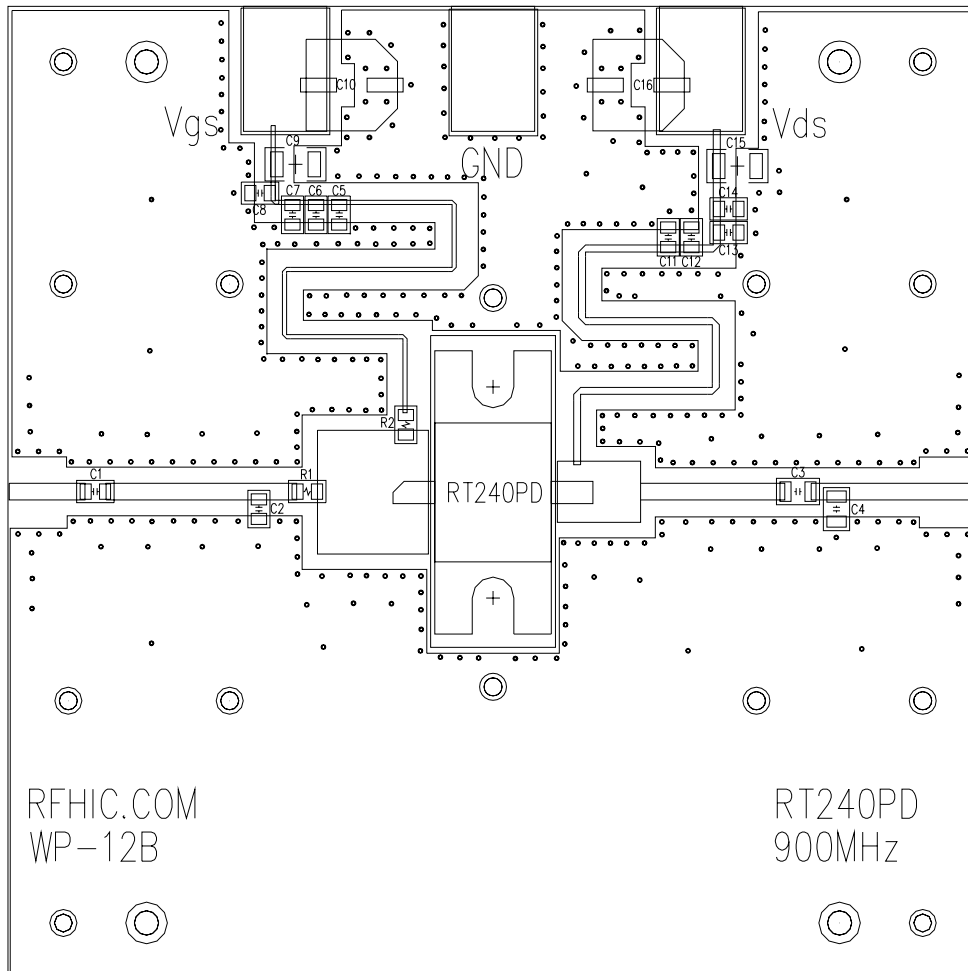
Text	Value	Size(mm)	Text	Value	Size(mm)
C1	12pF	1608	C3	100pF	2012
*C2	6pF		**C4	4.7pF	
C5,C11	10pF		C9,C15	1uF	3216
C6,C12	100pF		C10,C16	22uF/+50V	
C7,C13	1nF		R1	3.3 $\Omega$	1608
C8,C14	100nF		R2	100 $\Omega$	
Z1	W x L	1.4 x 4.9	Z6	W x L	0.7 x 40.1
Z2		1.4 x 9.6	Z7		4.5 x 6.1
Z3		1.4 x 1.3	Z8		1.4 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

- All specifications may change without notice.
- [www.rfhic.com](http://www.rfhic.com)

**Test Circuit Board**

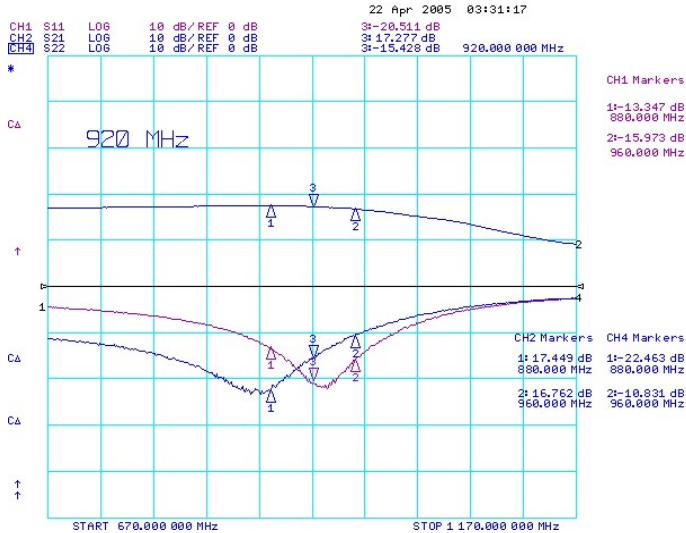


# Preliminary 10W Power Transistor

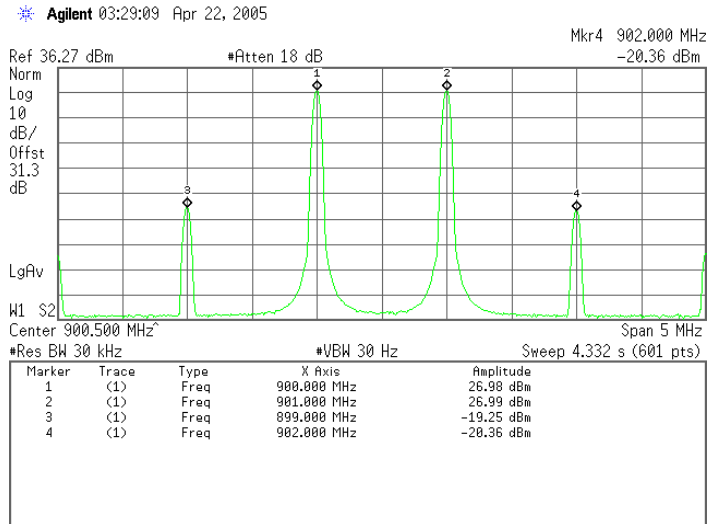
RT240PD

**RFHIC**

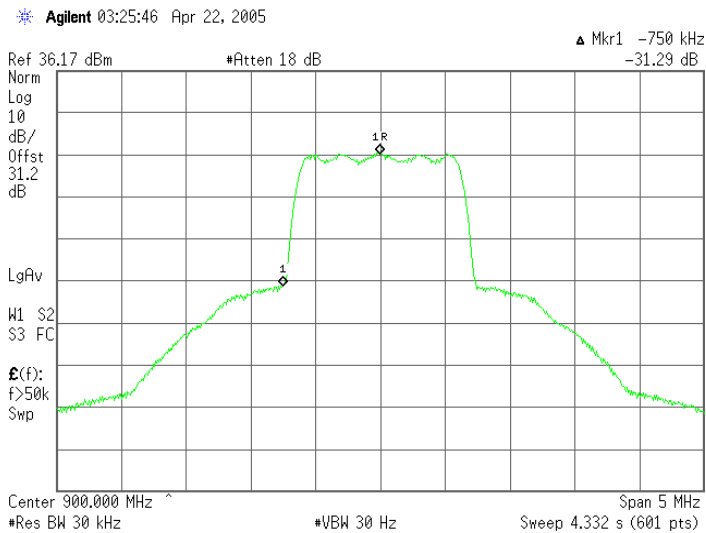
## ● Measure Data ( 900MHz )



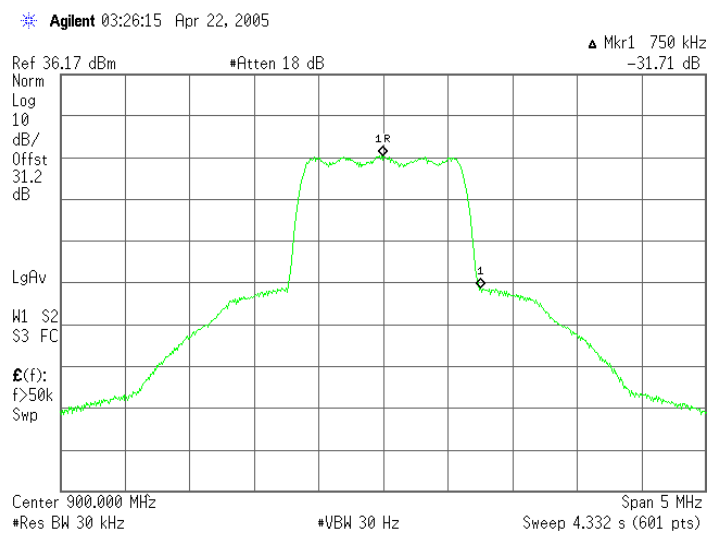
( S-Parameter )



( OIP3 )



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



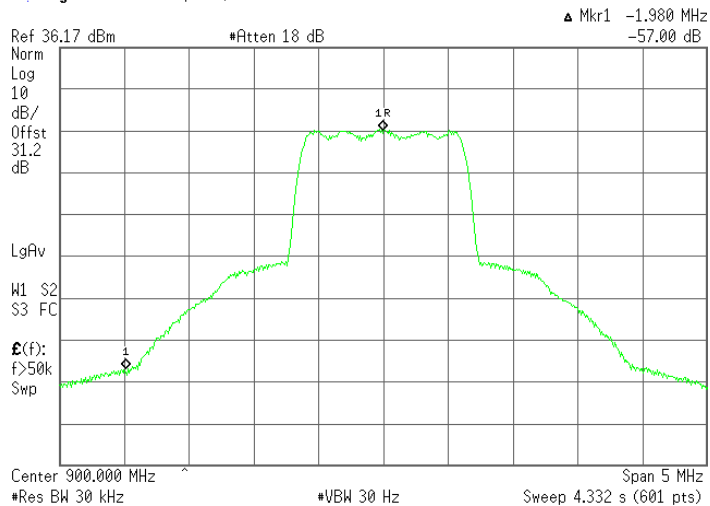
( CDMA 1FA 33dBm @ +750kHz offset )

# Preliminary 10W Power Transistor

RT240PD

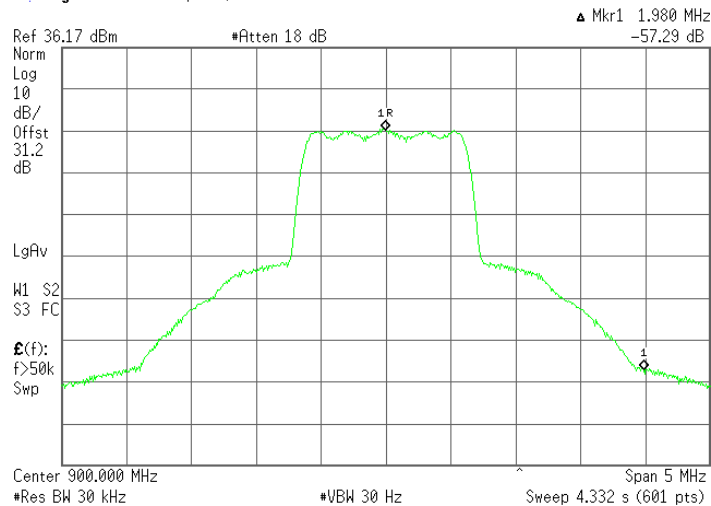
**RFHIC**

Agilent 03:26:50 Apr 22, 2005



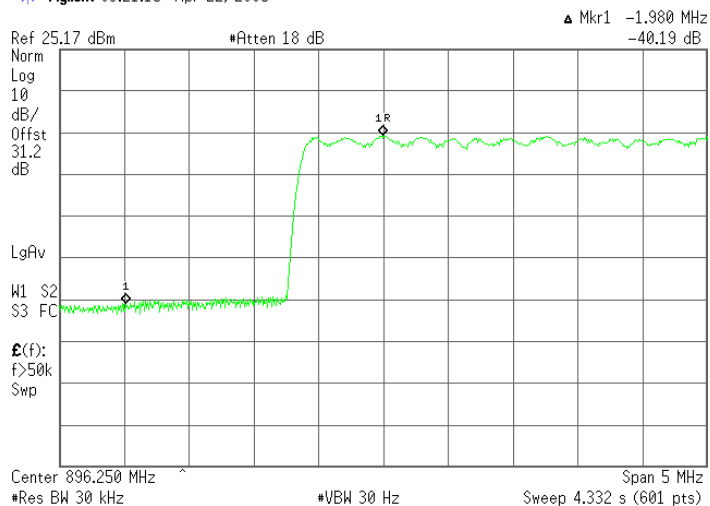
( CDMA 1FA 33dBm @ -1.98MHz offset )

Agilent 03:27:14 Apr 22, 2005



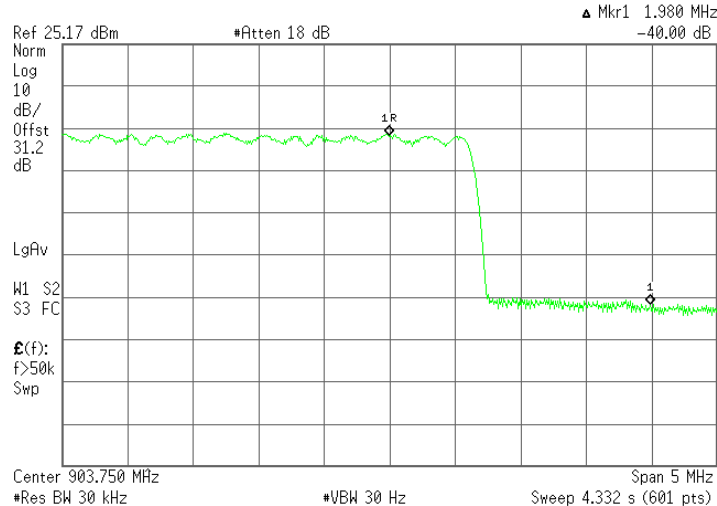
( CDMA 1FA 33dBm @ +1.98MHz offset )

Agilent 03:21:15 Apr 22, 2005



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

Agilent 03:21:43 Apr 22, 2005



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

- All specifications may change without notice.
- [www.rfhic.com](http://www.rfhic.com)

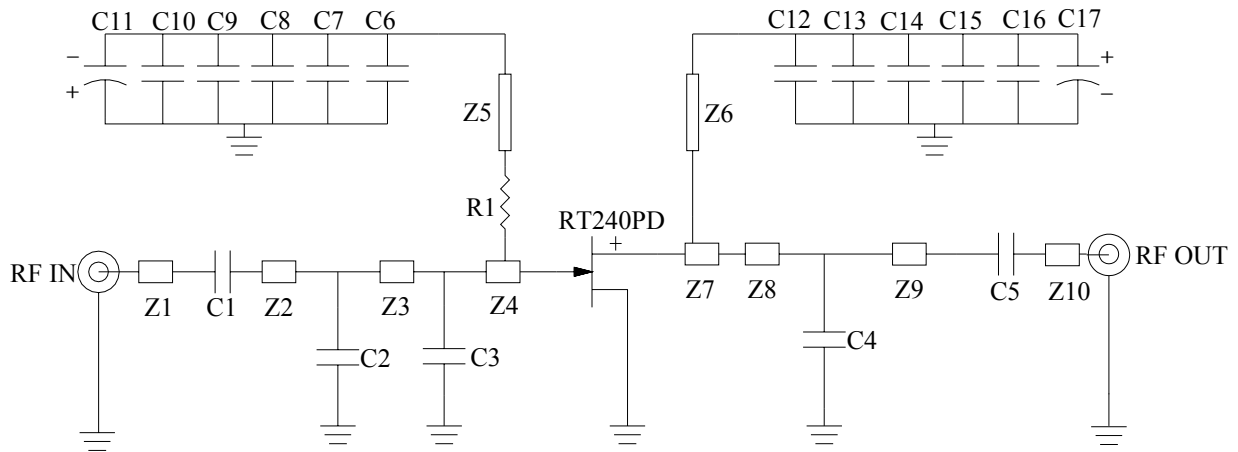
# Preliminary 10W Power Transistor

RT240PD

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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

( $\pm 5MHz$  offset@-45dBc,  $\pm 10MHz$  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 × L	1.4 × 4.9	Z6	W × L	0.7 × 18.5
Z2		1.4 × 1.8	Z7		4.5 × 6.1
Z3		1.4 × 11.1	Z8		1.4 × 2.2
Z4		9.0 × 8.1	Z9		1.4 × 13.2
Z5		0.5 × 18.5	Z10		1.4 × 3.7
PCB	FR-4, 0.8mm, , er=4.7				

\* S11 & Gain Tuning Point

\*\* S11 Tuning Point

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

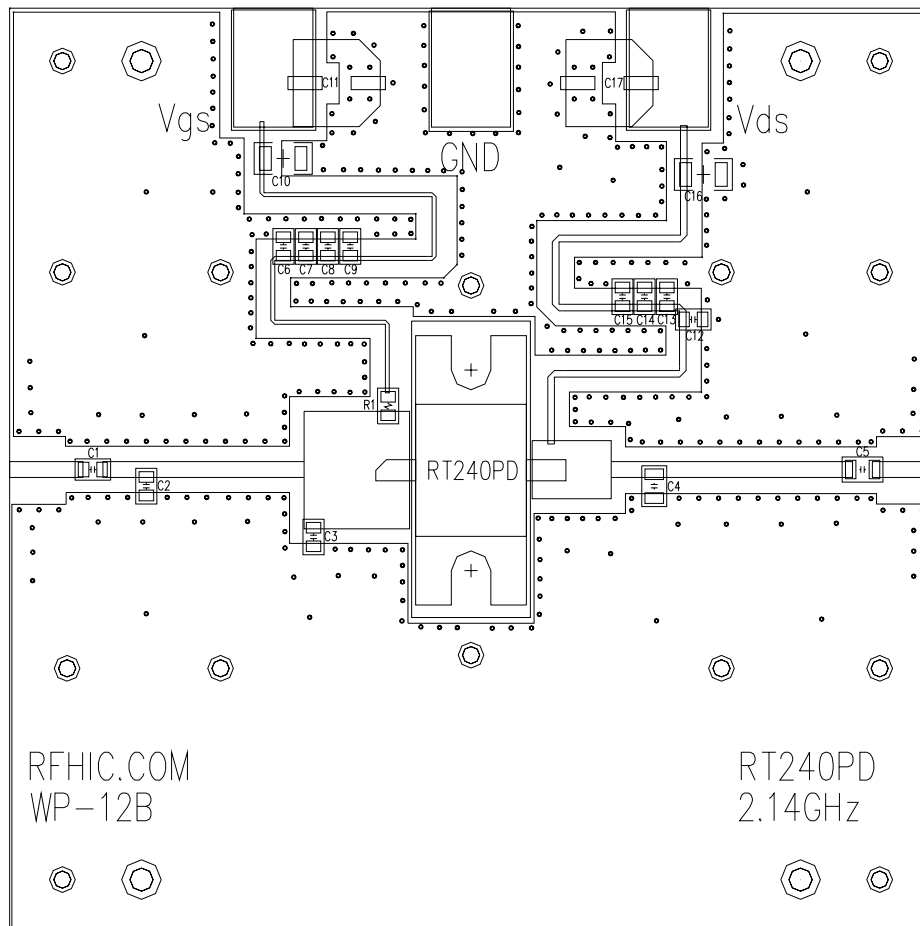
- All specifications may change without notice.
- [www.rfhic.com](http://www.rfhic.com)

# Preliminary 10W Power Transistor

RT240PD

**RFHIC**

## Test Circuit Board



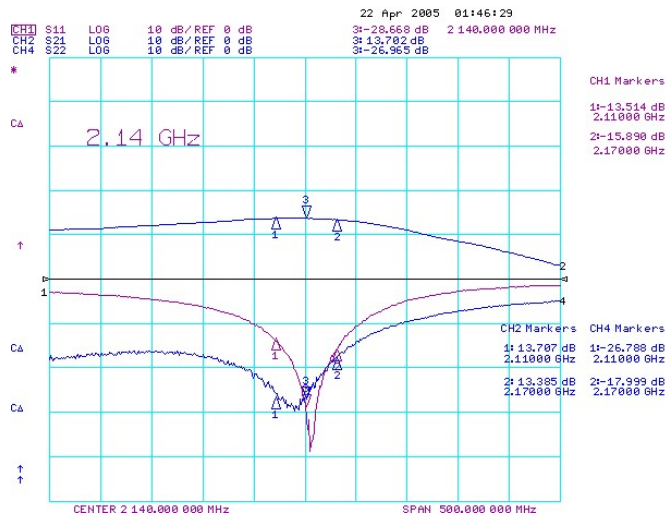
- All specifications may change without notice.
- [www.rfhic.com](http://www.rfhic.com)

# Preliminary 10W Power Transistor

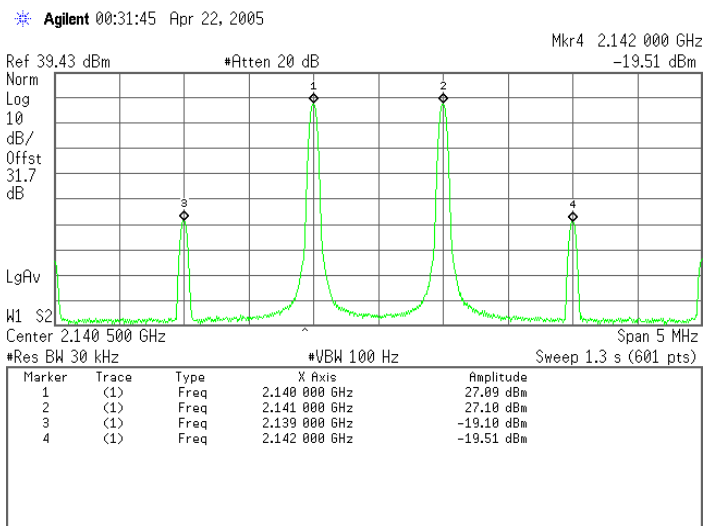
RT240PD

**RFHIC**

## ● Measure Data ( 2.14GHz )

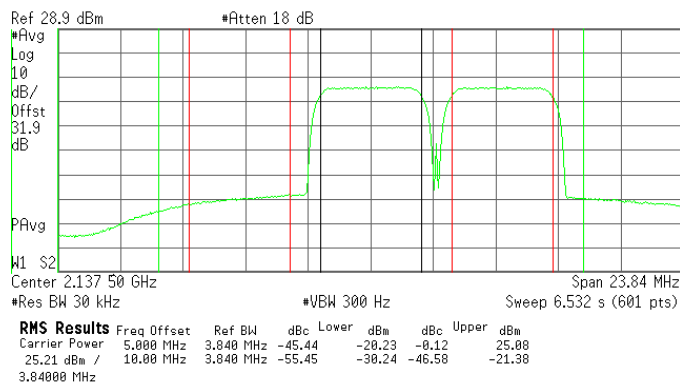


( S-Parameter )



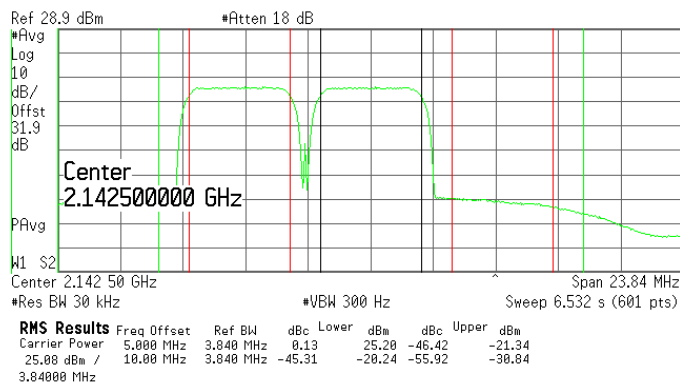
( OIP3 )

Agilent 23:42:33 Apr 21, 2005



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

Agilent 23:43:18 Apr 21, 2005



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

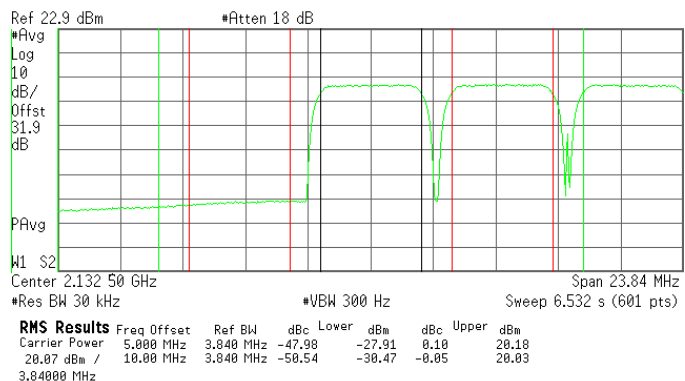


# Preliminary 10W Power Transistor

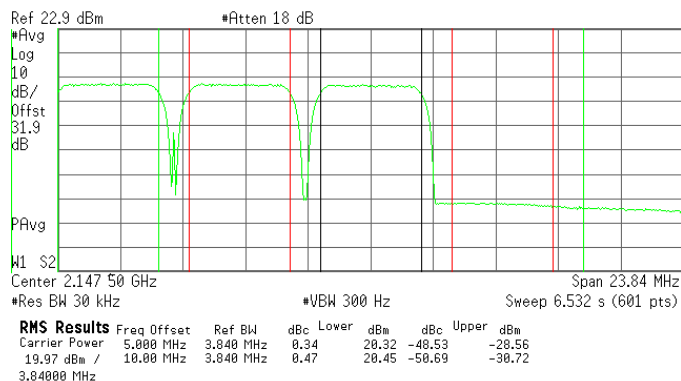
RT240PD

**RFHIC**

✱ Agilent 23:47:16 Apr 21, 2005



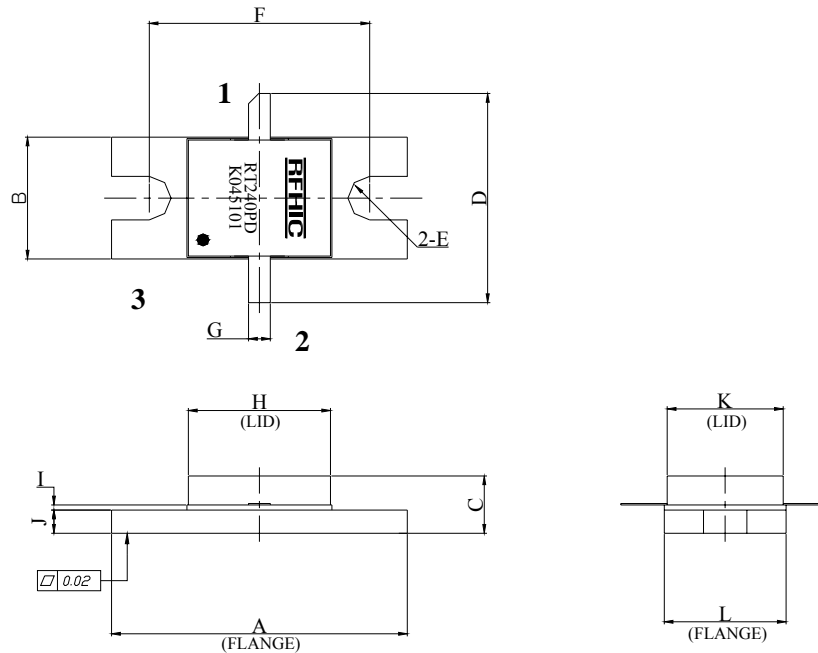
✱ Agilent 23:49:11 Apr 21, 2005



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

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

● 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