Preliminary

GaN Power Amp Pallet RTP21005-11

RFHIC

RoHS Comply

Product Features

- GaN on SiC + Doherty Technology
- High Efficiency
- Solid-state Linear Design
- Small and Light Weight
- Suitable for WCDMA/LTE
- 50 Ohm Input/Output Impedance
- High Reliability and Ruggedness
- Built in Output Isolator

Applications

- WCDMA / LTE Repeater

Description

This HPA Module is a high gain and compact amplifier module for WCDMA and LTE Repeater use.

Electrical Specifications @ VDD= 28V, 50Ω System

PARAMETER		UNIT	MIN	TYP	MAX	SYMBOL
Frequency Range		MHz	2110	-	2170	f_O
Operating Bandwidth		MHz	-	60	-	OBW
Average Output Power		dBm	-	37	-	Pout
SPECTRUM EMISSION MASK (with DPD)		-	PER 3GPP TS-25.141 & TS25.141			SEM
ACLR (WCDMA 4FA) @ Po=37dBm (typ.)	Pre-DPD	dBc	-	-25@±5MHz -28@±10MHz	-	ACLR
	Post-DPD		-	-45@±5MHz -48@±10MHz	-	
ACLR (LTE 10MHz 1FA) @ Po=37dBm Avg.	Pre-DPD	dBc	-	-28@±10MHz	-	ACLR
	Post-DPD		-	-52@±10MHz	-	
Harmonics (2nd, with DPD)		dBc	-45 (Max.)			H
RF Gain @ 25℃		dB	-	45	-	G_P
Gain Variation		dB	±3dB @ -30 ~ +60°C			ΔG
Gain Flatness		dB	-	±2	-	G_F
Input Return Loss		dB	-	-	-16	S_{11}
Output Return Loss		dB	-	-	-18	S_{22}
Operating Voltage		V	V_{DC1} : 5.6, V_{DC2} : 28			VDC
Current Consumption		A	0.12 @ 5.6V, 0.42 @ 28V			IDD
Efficiency		%	-	40	-	Eff
Feedback Output level @ 40dBm		dBm	-	2	-	FB
Operating Temperature		℃	-30	-	60	T_O

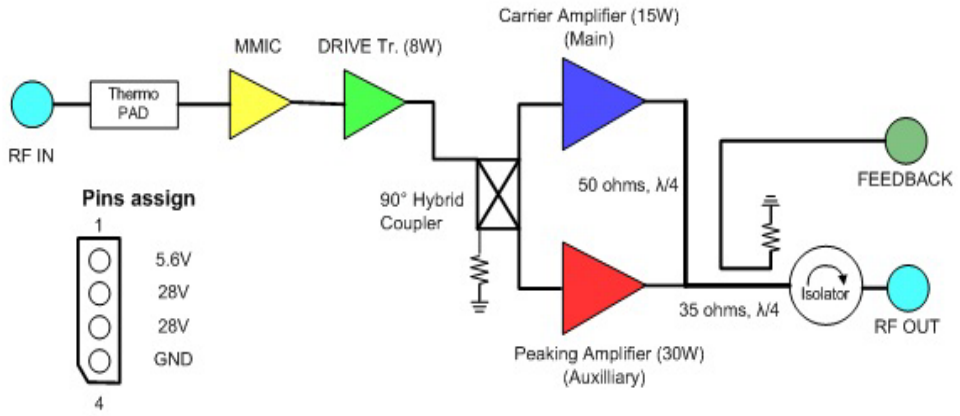
Absolute Maximum Ratings

PARAMETER	UNIT	RATING	SYMBOL
Input Overdrive	Max.	-2dBm	P_{OD}
Load VSWR	Nom.	∞ : 1 (All Phase & Amplitude)	Ψ
Operating Case Temperature	℃	100	Tc

Environmental Characteristics

PARAMETER	UNIT	MIN	TYP	MAX	SYMBOL
Operating Ambient Temperature	℃	-30	-	60	Ta
Storage Temperature	℃	-40	-	130	Tstg
Relative humidity w/o condensation	%	-	-	95	RH

Budget



Mechanical Specifications

PARAMETER	UNIT	VALUE
Dimensions	mm	100 x 50 x 20
Weight	Kg	0.2(max)
RF Input Connector	-	MCX(Female)
RF Output Coupling Connector	-	MCX(Female)
RF Output Connector	-	SMA(Female)
I/O Connector	-	MOLEX 4pin(Male)
Cooling	-	External Heat-sink

Typical Performance @ 25℃

PARAMETER			UNIT	VALUE		
Gain			dB	45		
Gain Flatness			dB	0.5		
S11 (Max.)			dB	-20		
S22 (Max.)			dB	-18.9		
Test Frequency			MHz	2120	2140	2160
Psat			dBm	46.0	46.0	45.8
WCDMA 4FA @ 5W PAR:7.5dB	ACLR @ ±5MHz	Pre-DPD	dBc	-27.1	-29.2	-31.1
		Post-DPD		-54.4	-55.2	-55.6
	ACLR @ ±10MHz	Pre-DPD		-29.7	-31.6	-33.3
		Post-DPD		-55.1	-55.8	-56.4
	ACLR @ ±15MHz	Pre-DPD		-33.8	-35.6	-37.2
		Post-DPD		-56.1	-56.3	-56.7
125mA/5.6V, Current/28V			mA	408	413	424
Efficiency			%	41.2	40.8	39.8
LTE 10MHz 1FA @5W	ACLR @ ±10MHz	Pre-DPD	dBc	-30.2	-32.5	-35.1
		Post-DPD		-57.5	-58.1	-58.3
125mA/5.6V, Current/28V			mA	395	398	416
Efficiency			%	42.5	42.2	40.5

Test Data (Test Results: DPD Operation)

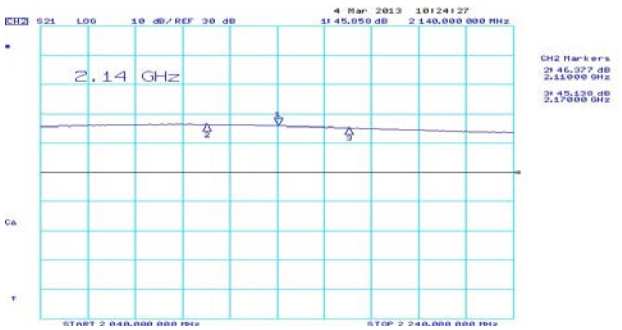
Test Equipments

- DPD Engine (Optichron OP6180 board)
- Signal Generator : E4438C (Agilent)
- Spectrum Analyzer : E4440A (Agilent)
- Network Analyzer : 8753ES (Agilent)
- Power Supply : 6674A (Agilent)

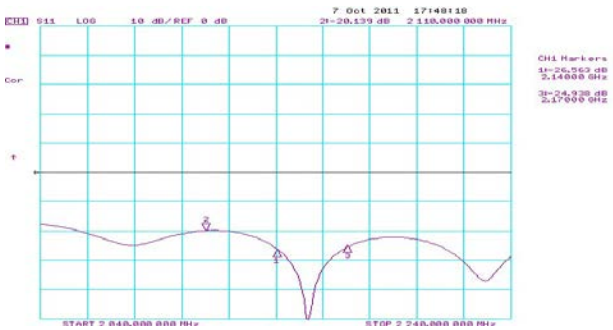
Test Condition

- Signal : WCDMA 4FA (Test Model 1 W/ 64DPCH) & LTE 1FA 10MHz(PAPR 7.5dB)
- CFR apply
- AMP Temperature: 40°C

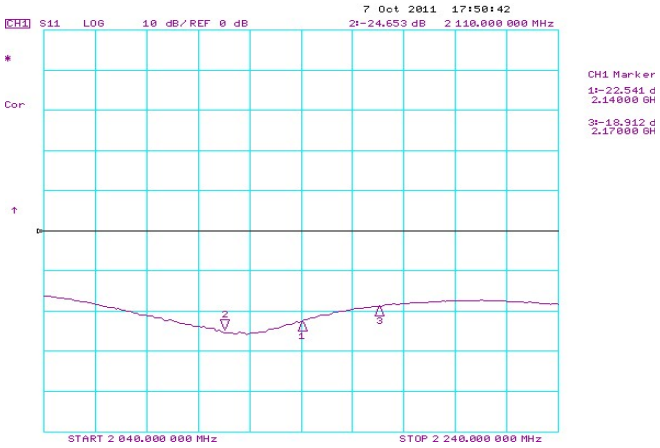
Gain



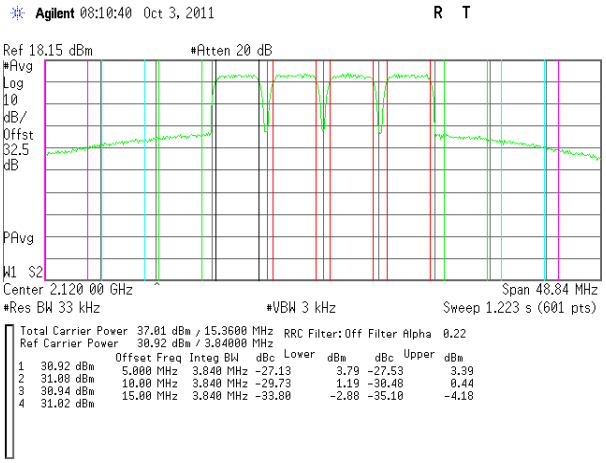
Input VSWR



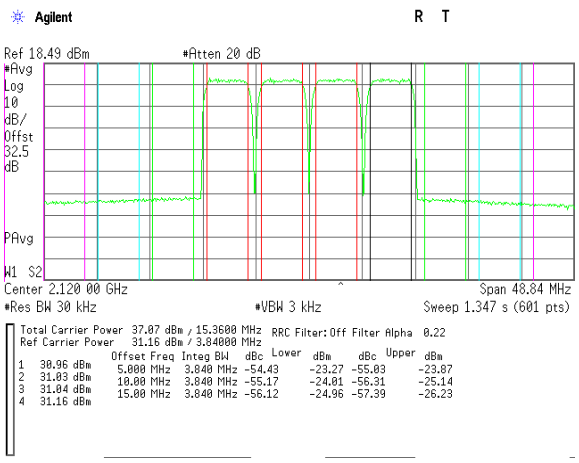
Output VSWR



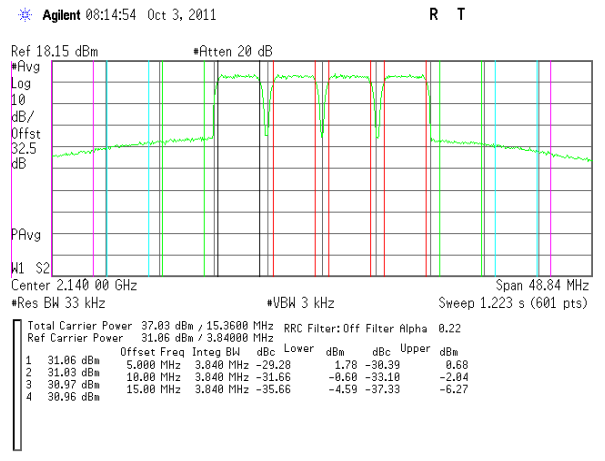
Pre – DPD @ 2120MHz, WCDMA 4FA



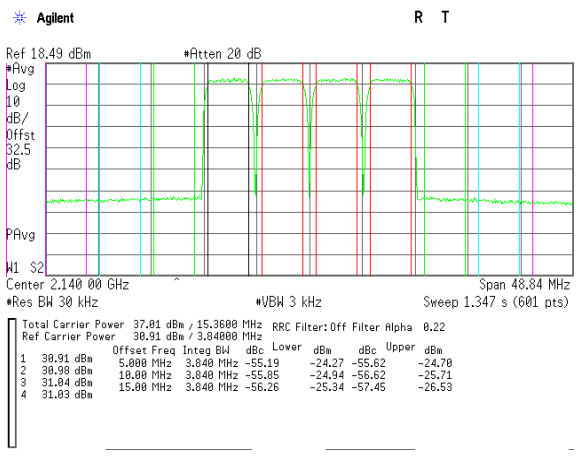
Post- DPD @ 2120MHz, WCDMA 4FA



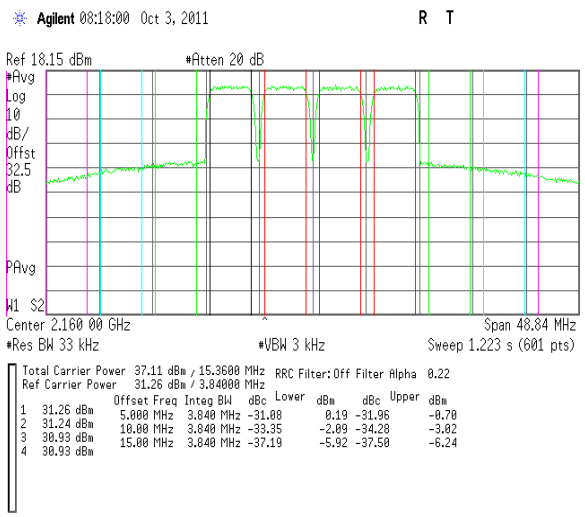
Pre – DPD @ 2140MHz, WCDMA 4FA



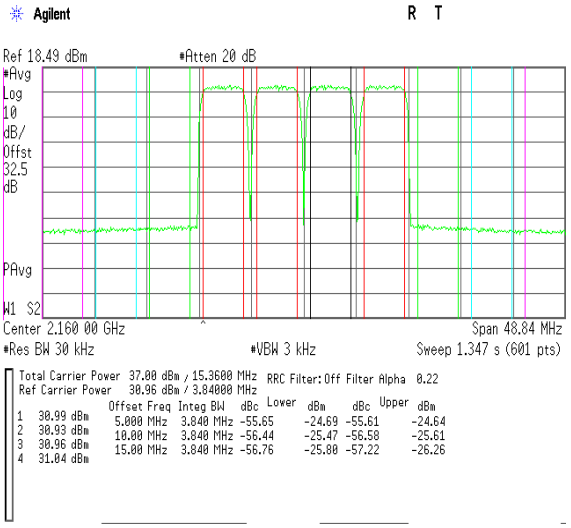
Post- DPD @ 2140MHz, WCDMA 4FA



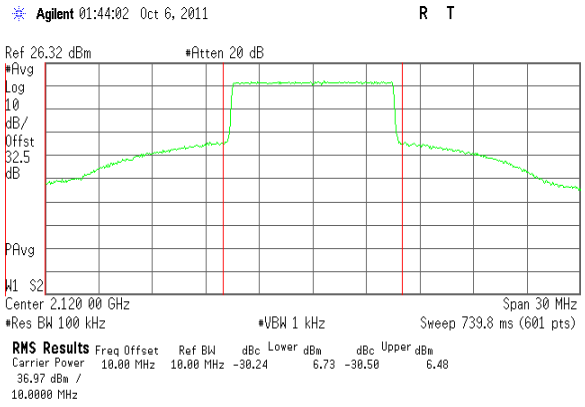
Pre – DPD @ 2160MHz, WCDMA 4FA



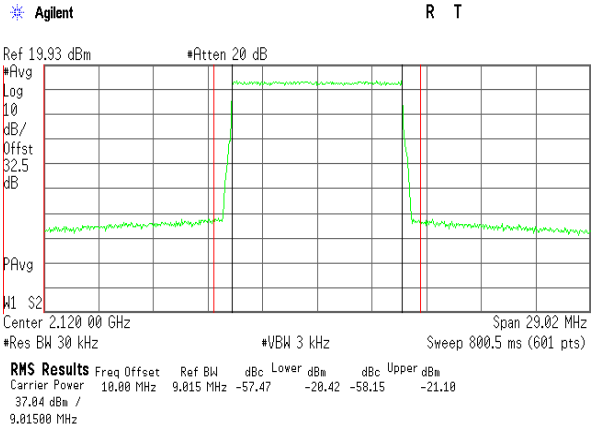
Post- DPD @ 2160MHz, WCDMA 4FA



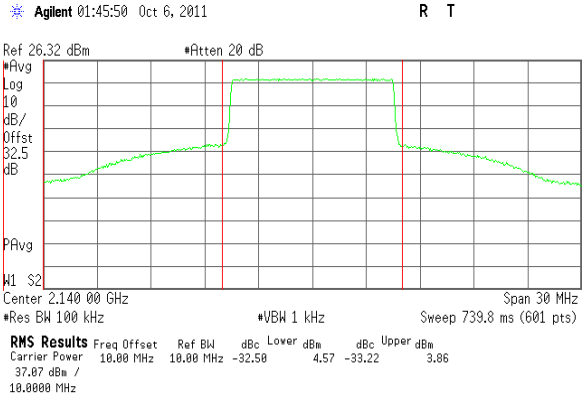
Pre – DPD @ 2120MHz, LTE 10MHz 1FA



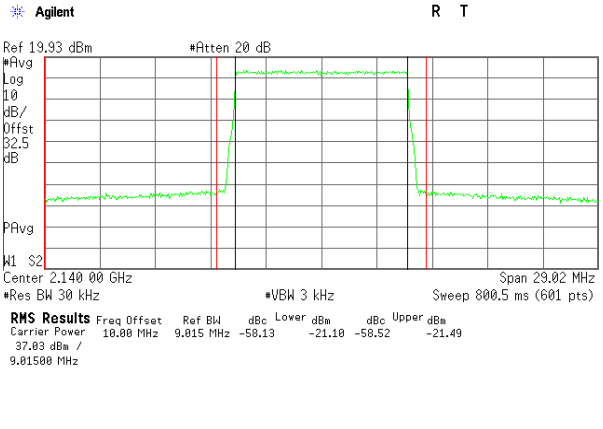
Post- DPD @ 2120MHz, LTE 10MHz 1FA



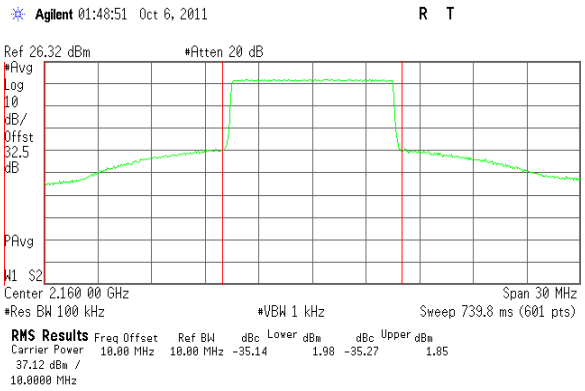
Pre – DPD @ 2140MHz, LTE 10MHz 1FA



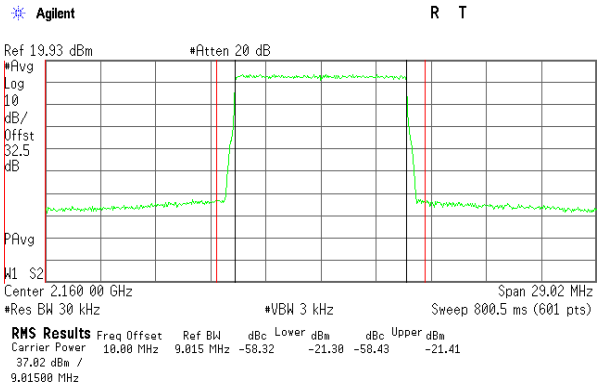
Post- DPD @ 2140MHz, LTE 10MHz 1FA



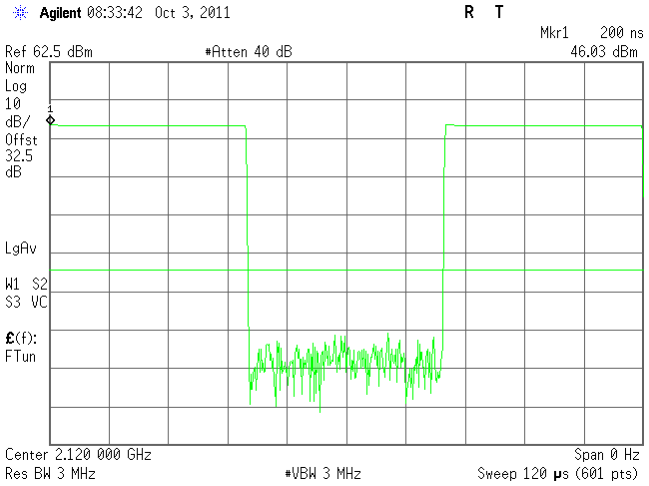
Pre – DPD @ 2160MHz, LTE 10MHz 1FA



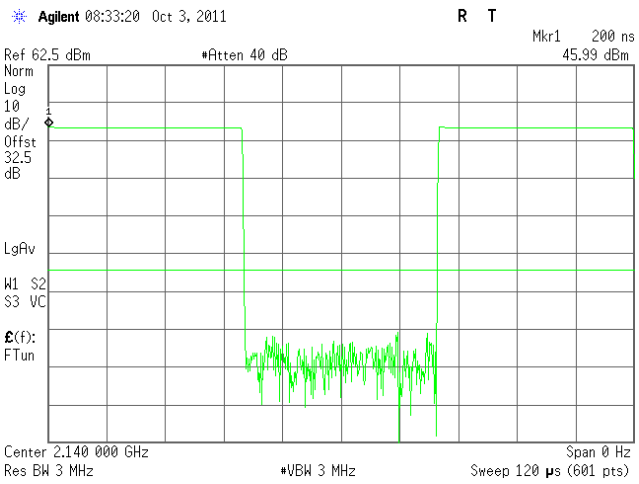
Post- DPD @ 2160MHz, LTE 10MHz 1FA



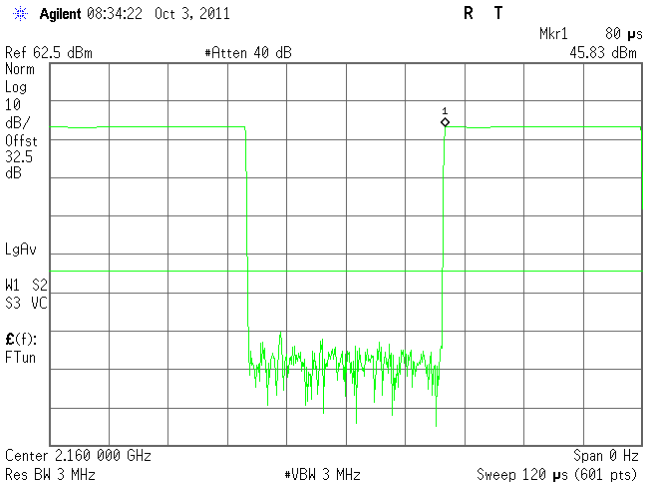
Pulse Duty 10% @ 2120MHz



Pulse Duty 10% @ 2140MHz

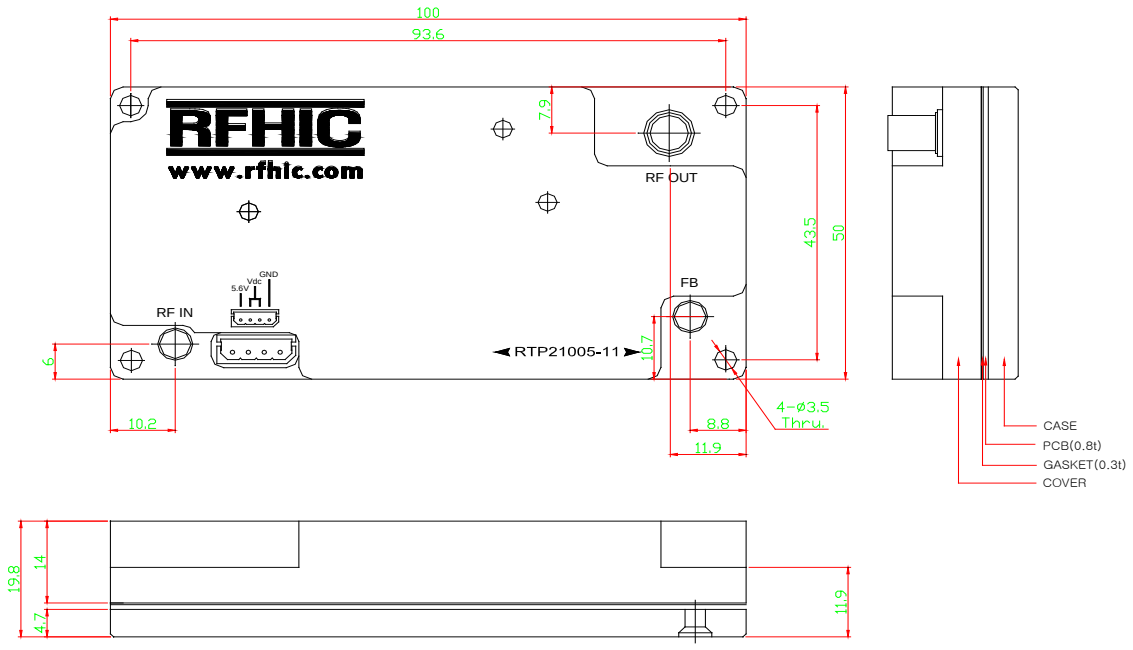


Pulse Duty 10% @ 2160MHz



Outline Drawing

* Unit: mm[inch] | Tolerance: ±0.2[.008]



Note
Connector positions and module mount holes may be subjected change.

Interface Connector

4 Pin-Control (MOLEX_0022035045)

Pin No	Description	Specification
1	**Vcc**	5.6V
2	**Vcc**	28V
3	**Vcc**	28V
4	**GND**	GROUND

Revision History

Part Number	Release Date	Version	Modification	Data Sheet Status
RTP21005-11	2013.3.06	1.2	Modify the gain : 47dB → 45dB	Preliminary
RTP21005-11	2012.9.13	1.1	-	Preliminary