

HTT2403



LOW-NOISE AMPLIFIER

□ GENERAL DESCRIPTION

The HTT2403 is a low-noise amplifier (LNA), which is used by frequency 50~2150MHz for terrestrial and satellite television transmission. The device works with the low power supply voltage using a CMOS process, with external enable control mode

□ APPLICATION

Digital terrestrial and Satellite television RF module
50M~2150MHz

□ FEATURES

Operation Voltage Range : 3.135V~3.465V
Operating Temperature Range : -40°C~+85°C
Ultra Small Package : SON-6L
Environmentally Friendly: EU RoHS Compliant, Pb Free

Current Circuit 1 : 49mA(TYP.)

Noise Figure

:NF=2.5dB(TYP.) (@ 1000MHz)

Input return loss

:S11=12.5dB(TYP.) (@ 1000MHz)

Output return loss

:S22=14dB(TYP.) (@ 1000MHz)

Gain

:|S21|=14dB(TYP.) (@ 1000MHz)

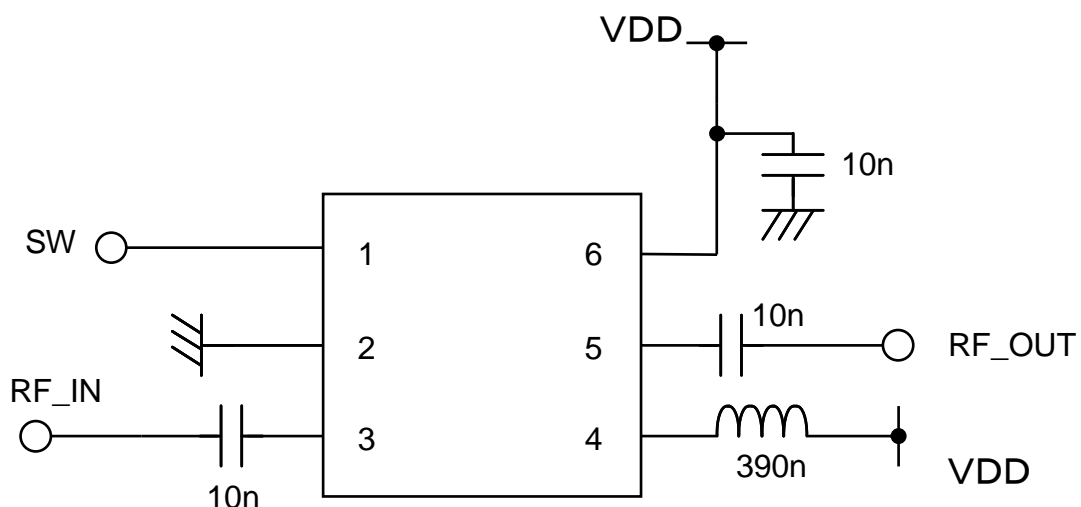
IIP3

:+13.7dBm

enable control (SW=0)

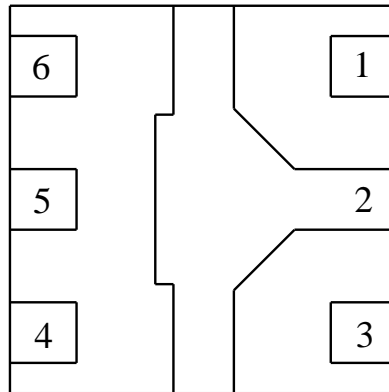
:Current = 0 μ A

□ TYPICAL APPLICATION CIRCUIT



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PIN CONFIGURATION



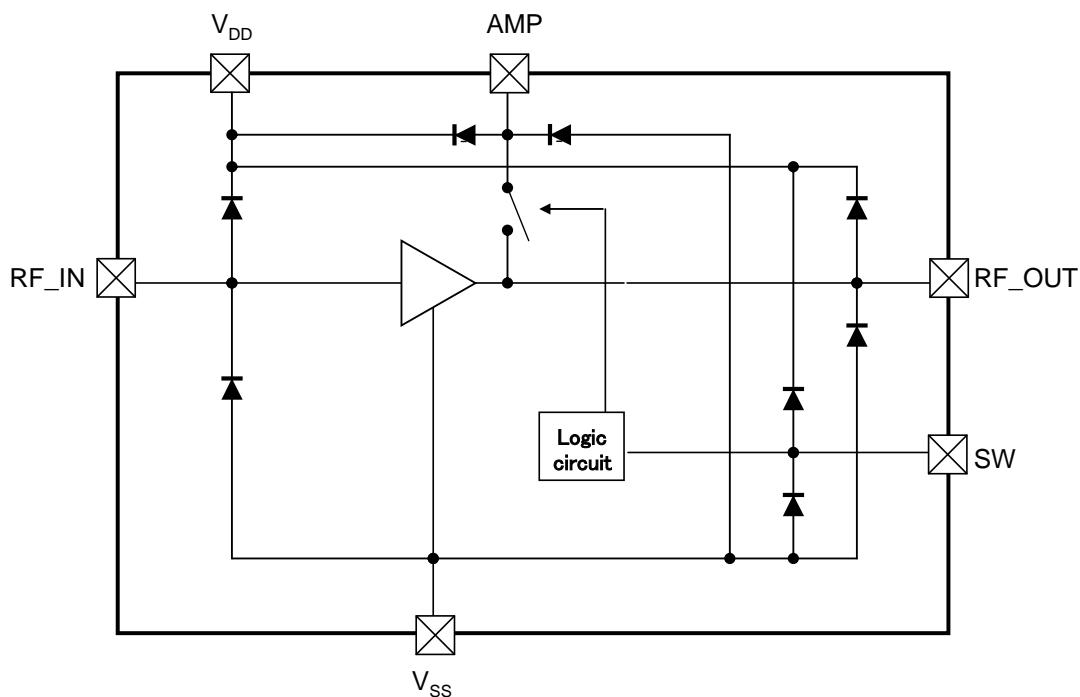
SON-6L
(BOTOM VIEW)

PIN ASSIGNMENT

PIN NUMBER	PIN NAME	FUNCTIONS
1	SW	Enable Switching
2	V _{SS}	Ground
3	RF_IN	RF Signal Input
4	AMP	Amplifier circuit pin
5	RF_OUT	RF Signal Output
6	V _{DD}	Power Supply

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□ BLOCK DIAGRAM



□ Absolute Maximum Ratings

PARAMETER	SYMBOL	RATING	UNITS
Power Supply Voltage	V_{DD}	4.4	V
Device Current	I_{DD}	120	mA
RF Input Power	P_{IN}	10	dBm
Total Power Dissipation[P_d	400	mW
operating ambient temperature range	T_a	-40~+85	°C
storage temperature range	T_{stg}	-55~+125	°C

ELECTRICAL CHARACTERISTICS

DC Characteristics

Ta=25°C

PARAMETER	SYMBOL	CONDITIONS	Value of standard			UNITS	Measurem ent circuit
			MIN.	TYP.	MAX.		
Power Supply Pin Voltage	V _{DD}	-	3.135	3.30	3.465	V	①
Current Circuit 1 (Enable Mode)	I _{DD}	V _{DD} =3.3V (SW=H)	-	49	-	mA	①
Current Circuit 2 (Disable Mode)	I _{DD}	V _{DD} =3.3V (SW=L)	-	0	-	uA	①
SW "H" Level Voltage	V _{sw(H)}		0.9	1.8	3.465	V	①
SW "L" Level Voltage	V _{sw(L)}			0	0.5	V	①

AC Characteristics 1 (Enable Mode)

V_{DD}=3.3V Ta=25°C SW(H)

PARAMETER	SYMBOL	CONDITIONS	Value of standard			UNITS	Measurem ent circuit
			MIN.	TYP.	MAX.		
Frequency	f		50		2150	MHz	
Power Gain	S ₂₁	f=1000MHz、Z ₀ =50Ω	-	14	-	dB	②
Input Return Loss	S ₁₁	f=1000MHz、Z ₀ =50Ω	-	12.5		dB	②
	V _{SWRi}	f=1000MHz、Z ₀ =50Ω		1.63			②
Output Return Loss	S ₂₂	f=1000MHz、Z ₀ =50Ω	-	14		dB	②
	V _{SWRo}	f=1000MHz、Z ₀ =50Ω		1.5			②
Noise Figure *1	NF	f=1000MHz、Z ₀ =50Ω	-	2.5		dB	③
Input Power IP3	I _{IP3}	f=1000MHz, 1001MHz Pin = -25dBm	-	13.7	-	dBm	④
Input Power @1dB Gain Compression	P _{1dB}	f=1000MHz	-	0	-	dBm	②

*1 NF is the value including the PCB loss.

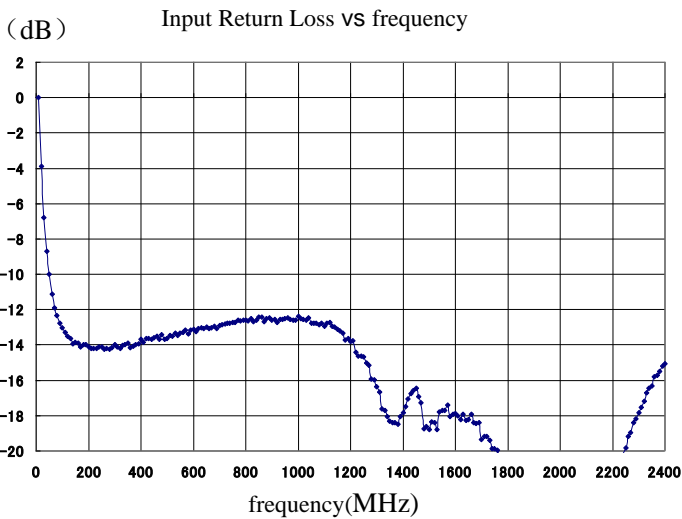
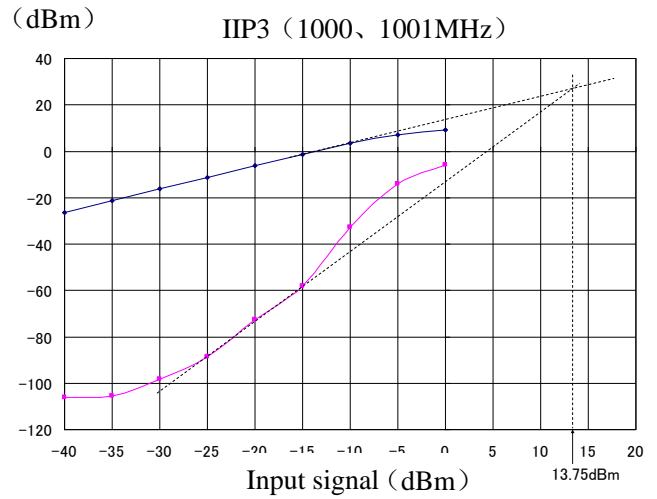
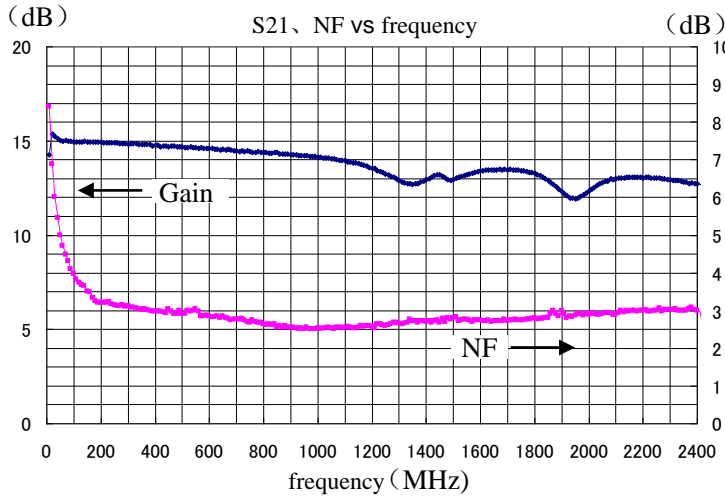
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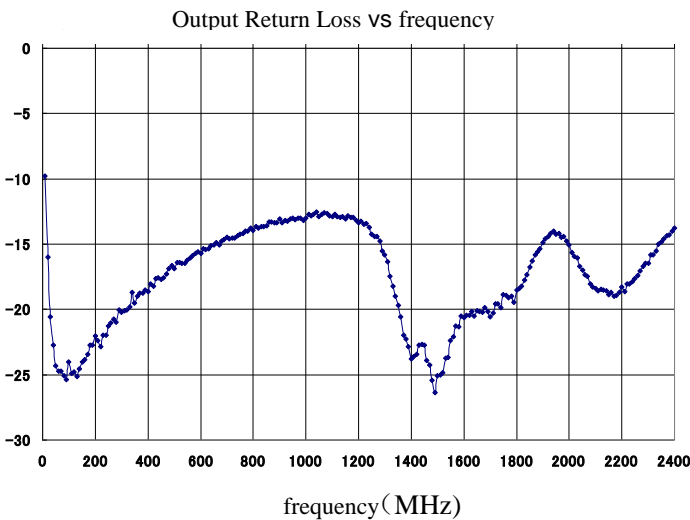
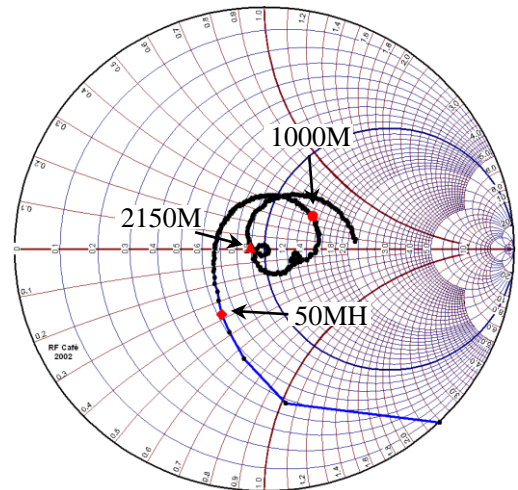
LOW-NOISE AMPLIFIER

● Operating Characteristics

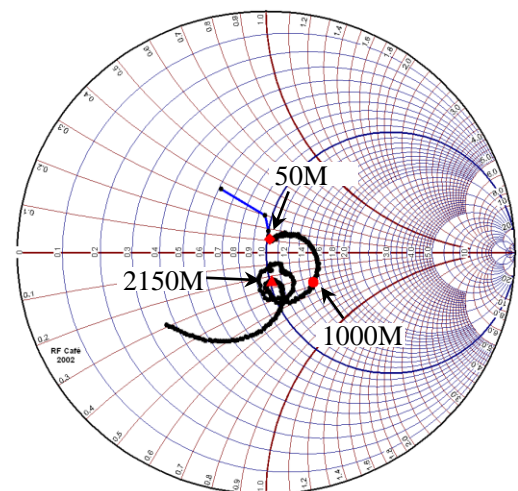
Condition: $V_{DD}=3.3V$ 、 $T=25^{\circ}C$ 、 $Z=50\Omega$



Input Return Loss vs frequency (Smith chart)

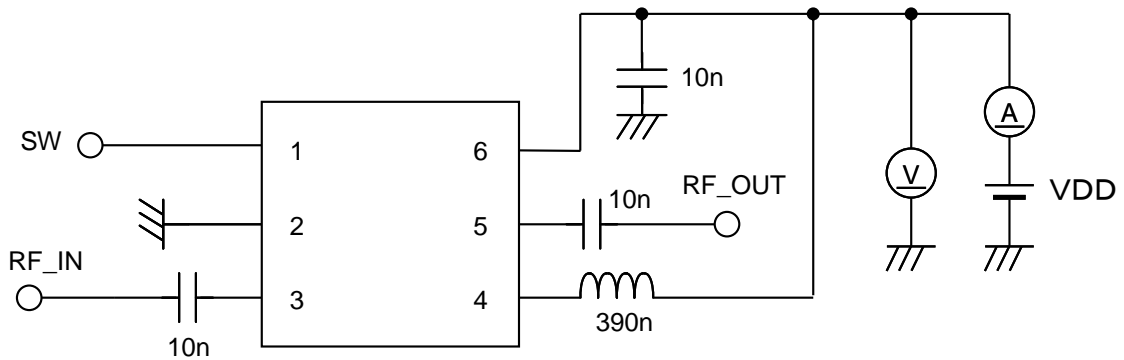


Output Return Loss vs frequency (Smith chart)



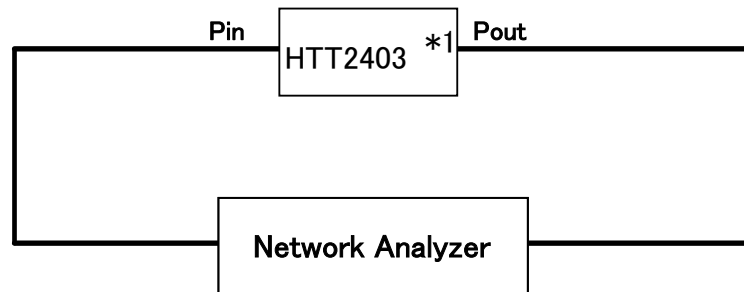
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Measurement Circuit 1 (DC Characteristics)



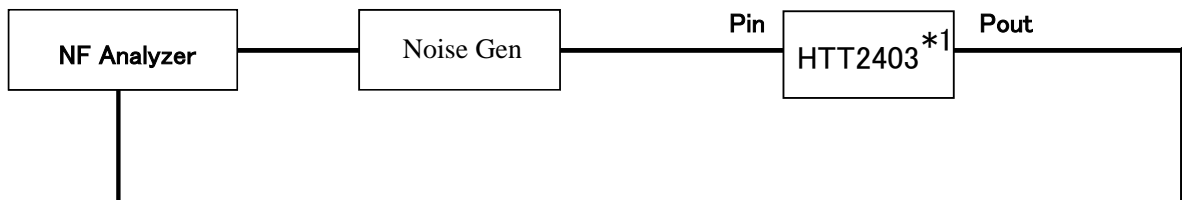
* Pin/Pout 50Ω Termination

Measurement Circuit 2 (S11、S21、S22、S12、P1dB)



*1: The block inside details refer to measurement circuit 5.

Measurement Circuit 3 (NF)

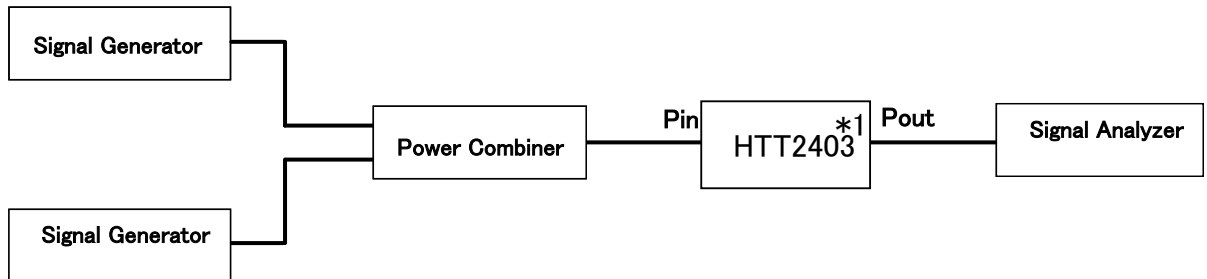


*1: The block inside details refer to measurement circuit 5.

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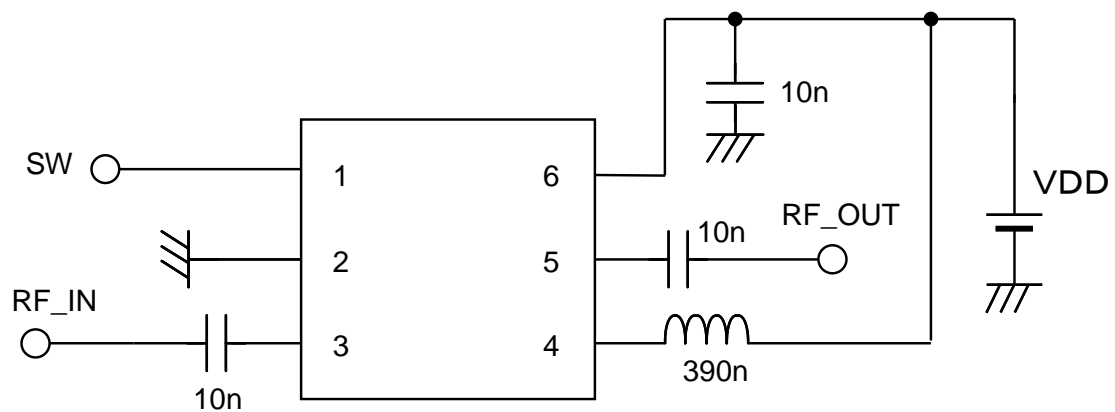
□ The measurement Circuit

Measurement Circuit 4 (Input IP3)



*1: The block inside details refer to measurement circuit 5.

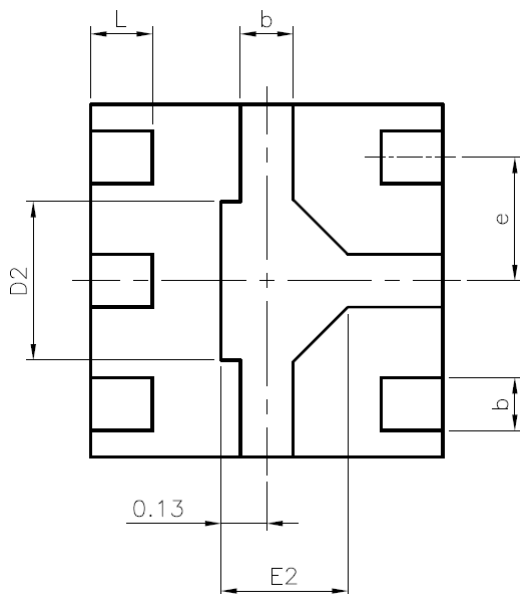
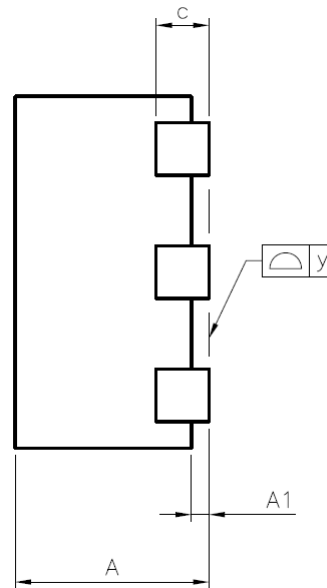
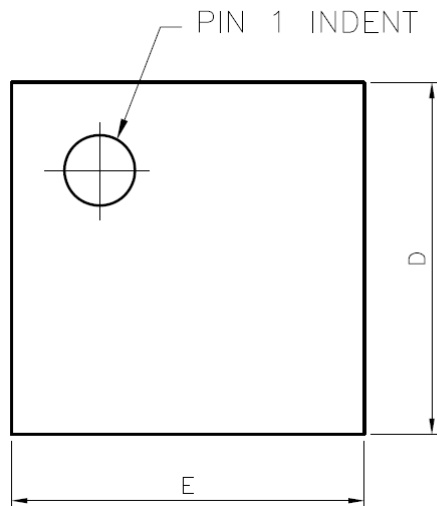
Measurement Circuit 5 (THH2403- block inside details)



HTT2403

PACKAGING INFORMATION

●SON-6L



SYMBOLS	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	0.50	0.55	0.60
A1	0.00	0.02	0.05
c	—	0.15 REF.	—
b	0.10	0.15	0.20
D	0.90	1.00	1.10
D2	0.40	0.45	0.50
E	0.90	1.00	1.10
E2	0.31	0.36	0.41
e	—	0.35	—
L	0.125	0.175	0.225
y	0.00	—	0.075