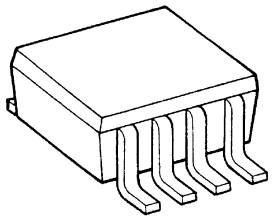
TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

TA4018F

VHF Gain Control Amplifier Application

Features

- High gain: $|S21|^2$ = 11dB (@45 MHz, at Maximum gain)
- Gain control range: GR = 37dB (@45 MHz)
- Low distortion: IM3 = 42dB (@45 MHz, at Maximum gain)
- Operating supply voltage: V_{CC} = 4.75 V~5.25 V



SSOP8-P-0.65

Weight: 0.02g (typ.)

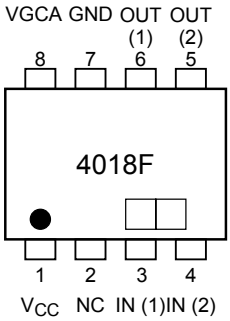
Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Supply voltage	V_{CC}	5.5	V
Total power dissipation	P_D (Note 1)	550	mW
Operating temperature	T_{opr}	−40~85	°C
Storage temperature	T_{stg}	−55~150	°C

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings and the operating ranges.
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook (“Handling Precautions”/“Derating Concept and Methods”) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Note 1: When mounted on the glass epoxy of 2.5 cm^2 × 0.4 t

Pin Assignment



Electrical Characteristics (Ta = 25°C, V_{CC} = 5 V, Zg = Zl = 50 Ω)

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Circuit current	I_{CC}	Fig1	VGCA = 3 V, Non carrier	21	28	35	mA
Input return loss	$\|S11\|^2$		VGCA = 3 V, f = 45 MHz	—	−0.3	—	dB
Insertion gain (1)	$\|S21\|^2(1)$		VGCA = 3 V, f = 45 MHz	8	11	—	dB
Insertion gain (2)	$\|S21\|^2(2)$		VGCA = 1 V, f = 45 MHz	−36	−26	−16	dB
Isolation	$\|S12\|^2$		VGCA = 3 V, f = 45 MHz	—	−50	—	dB
Output return loss	$\|S22\|^2$		VGCA = 3 V, f = 45 MHz	—	−5	—	dB
Gain control range	GR		$\|S21\|^2(2)-\|S21\|^2(1)$	24	37	—	dB
Noise figure	NF		VGCA = 5 V, f = 45 MHz	—	11.5	15	dB
3rd order Inter Modulation	IM3		VGCA = 3 V, f1 = 45 MHz, f2 = 44 MHz Pin = −20dBmW	32	42	—	dB

CAUTION: This device electrostatic sensitivity. Please handle with caution.

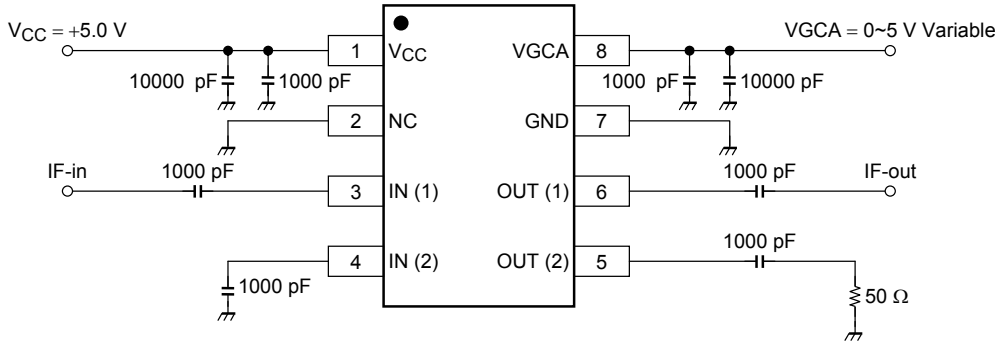


Figure 1 Measurement circuit

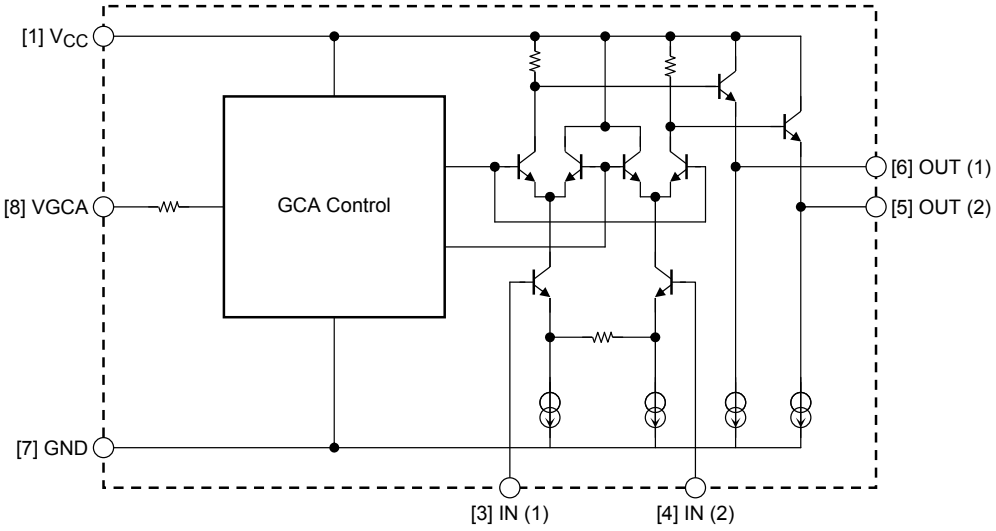
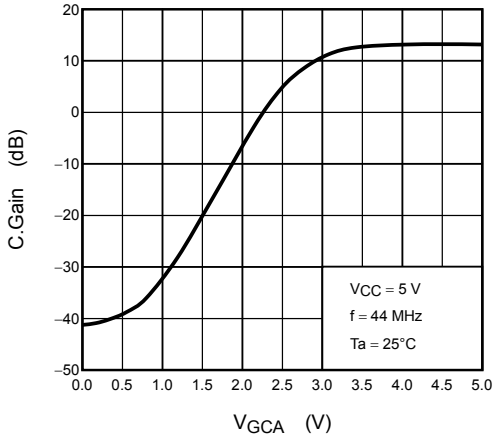


Figure 2 Equivalent circuit

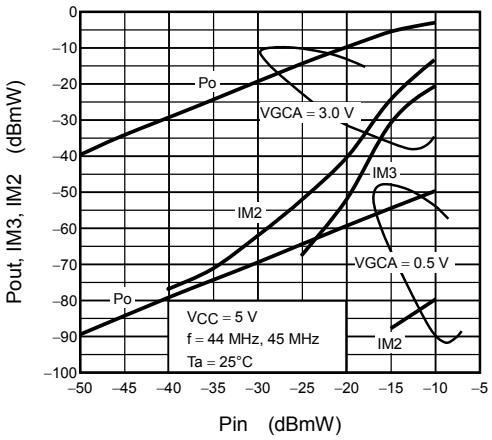
Notice

The circuits and measurements contained in this document are given only in the context of as examples of applications for these products.
Moreover, these example application circuits are not intended for mass production, since the high-frequency characteristics (the AC characteristics) of these devices will be affected by the external components which the customer uses, by the design of the circuit and by various other conditions.
It is the responsibility of the customer to design external circuits which correctly implement the intended application, and to check the characteristics of the design.
TOSHIBA assume no responsibility for the integrity of customer circuit designs or applications.

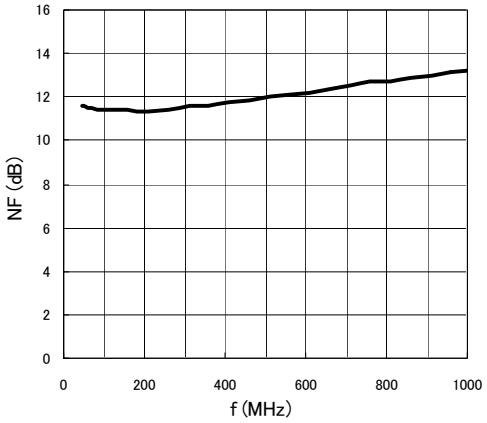
C.Gain – V_{GCA}



Pout, IM3, IM2 – Pin

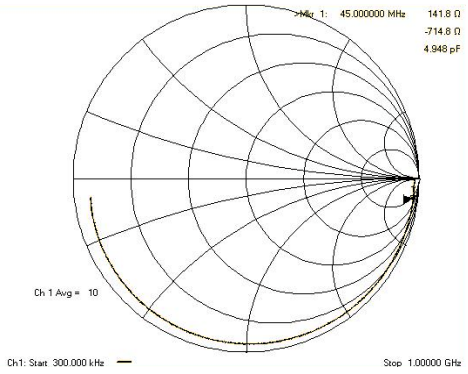


NF−f

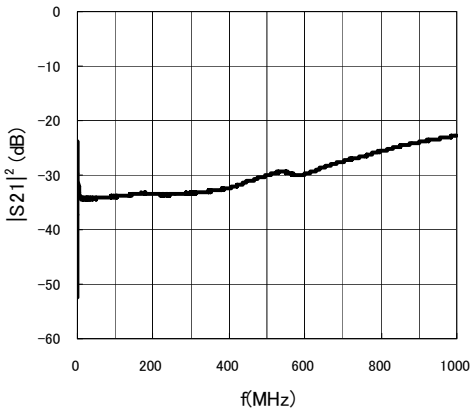


VGC=0.5V
Vcc=5V

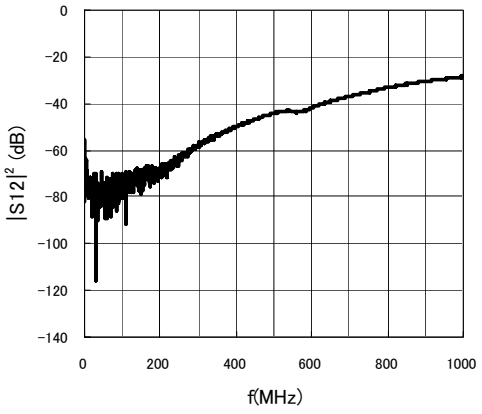
S11



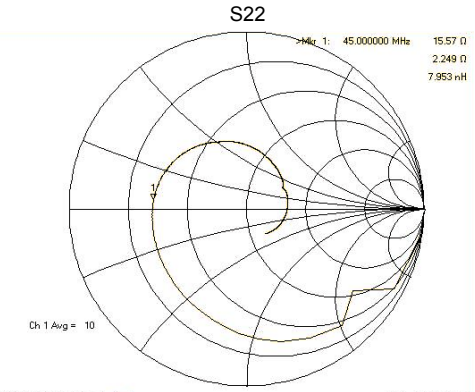
$|S21|^2$–f



$|S12|^2$–f

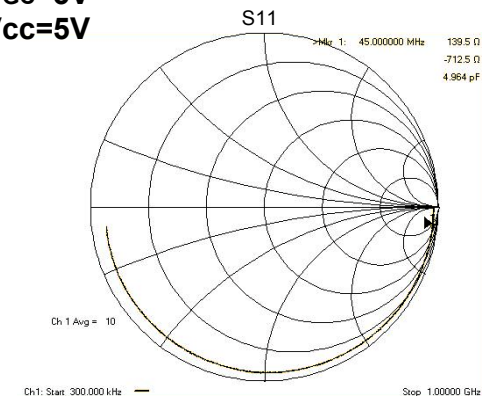


S22

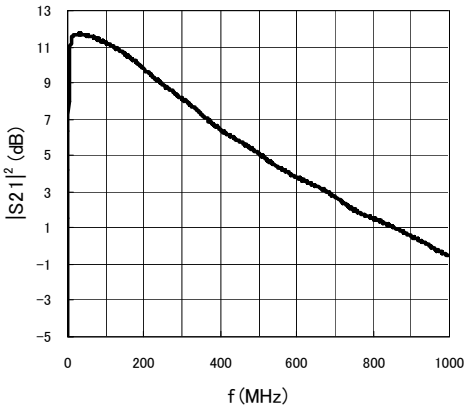


VGC=3V
Vcc=5V

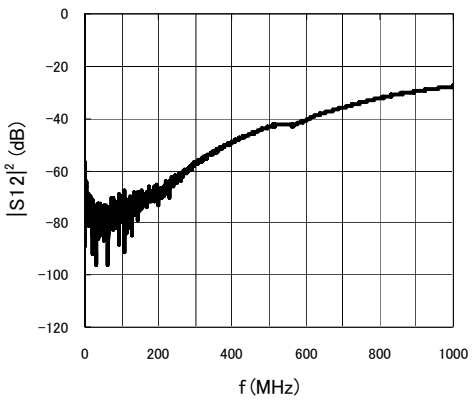
S11



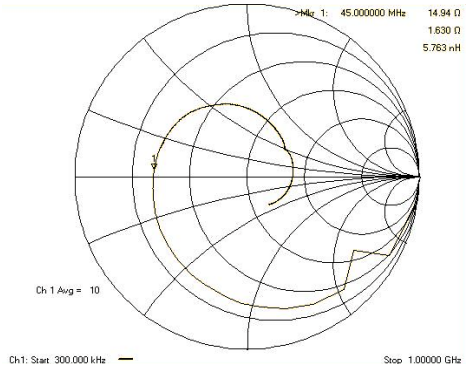
$|S21|^2$–f



$|S12|^2$–f

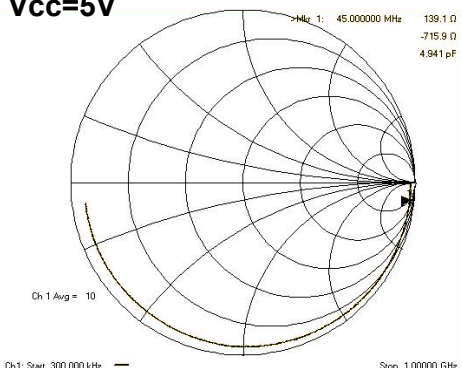


S22

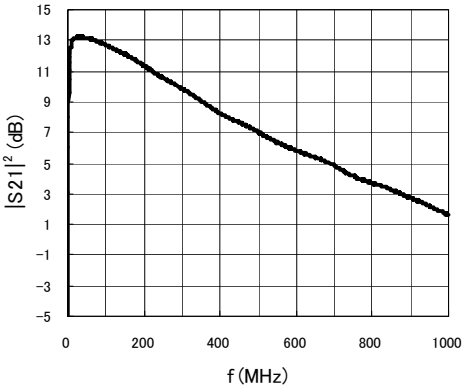


VGC=5V
Vcc=5V

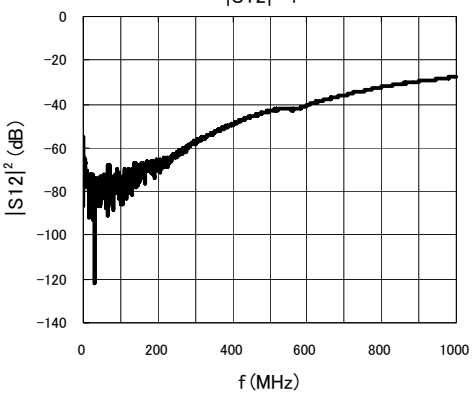
S11



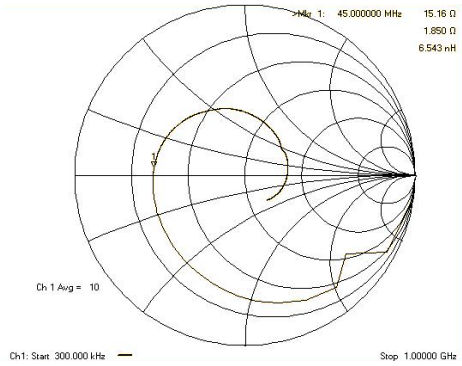
$|S21|^2$–f



$|S12|^2$–f

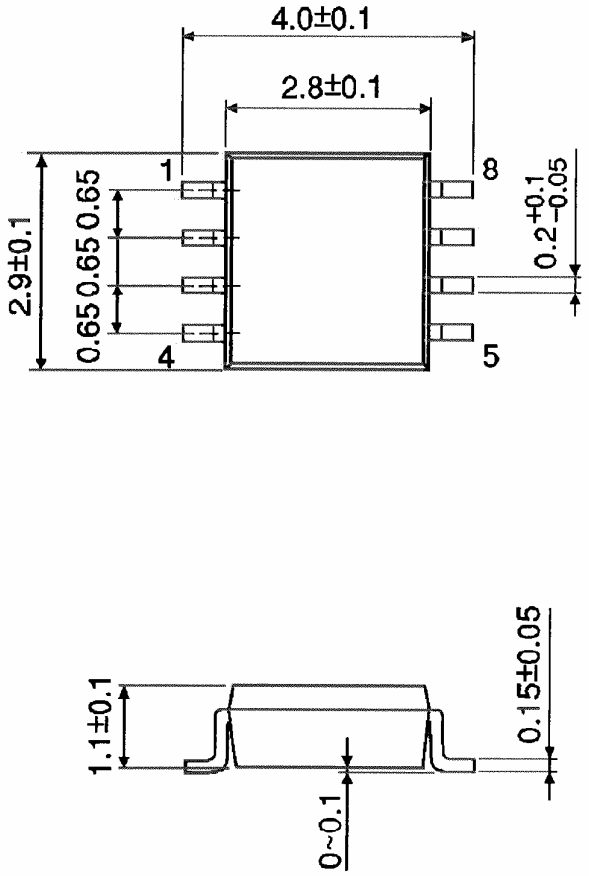


S22



Package Dimensions

SSOP8-P-0.65 Unit : mm



Weight: 0.02g (typ.)

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20070701-EN GENERAL

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