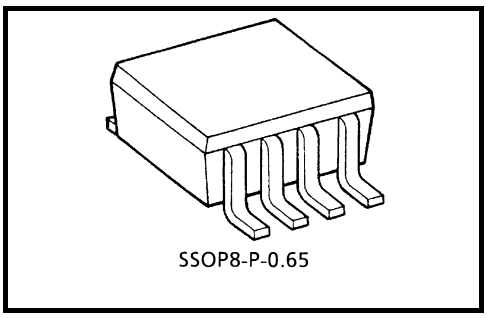
TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

TA4107F

1 GHz Band Down Converter Application
CATV Analog/Digital Tuner
Terrestrial Digital TV Tuner

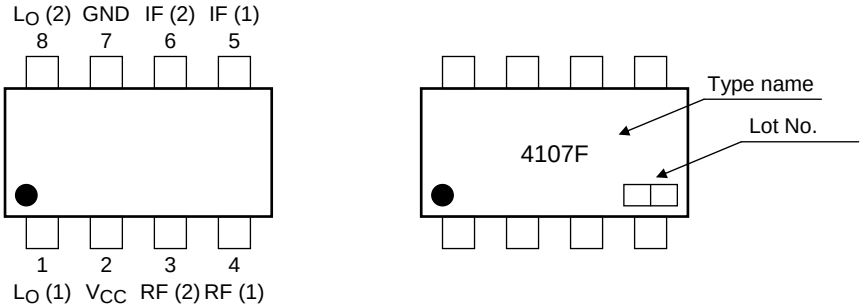


Weight: 0.021 g (typ.)

Features

- Low distortion at high RF signal input (IIP3): +13dBmW
- Performance at low Lo signal input: −5dBmW
- Double balanced Mix circuit
- Small package: SM8 (2.9 × 4.0)
- Recommended operating voltage: V_{CC} = 4.25~4.75 V

Pin Connection, Marking



Absolute Maximum Ratings (Ta = 25℃)

Characteristics	Symbol	Rating	Unit
Supply voltage	V_{CC}	5.5	V
Power dissipation	P_D (note 1)	375	mW
Operating temperature range	T_{opr}	−40~85	℃
Storage temperature range	T_{stg}	−55~150	℃

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 the glass epoxy board of 2.5 cm2 × 1.6 t

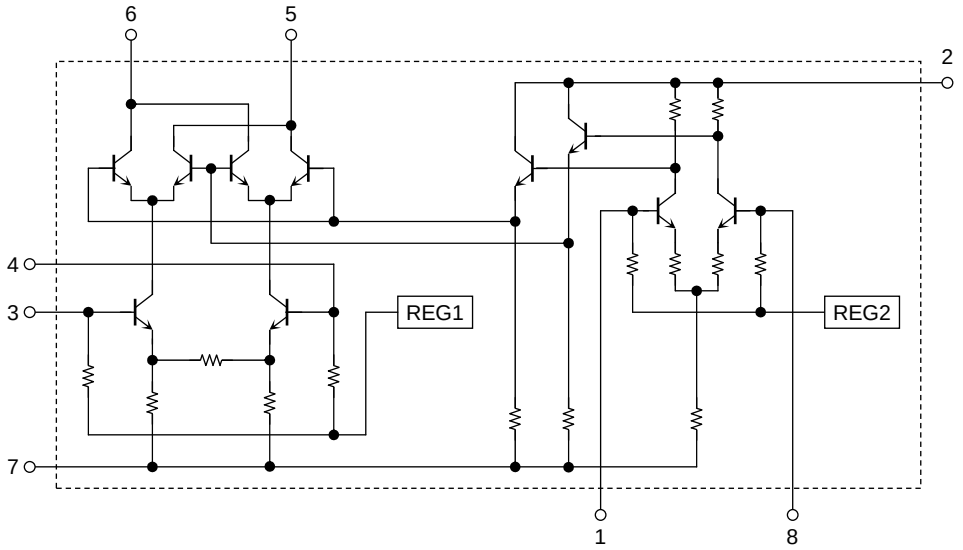
Caution

This device is electrostatic sensitivity. Please handle with caution.

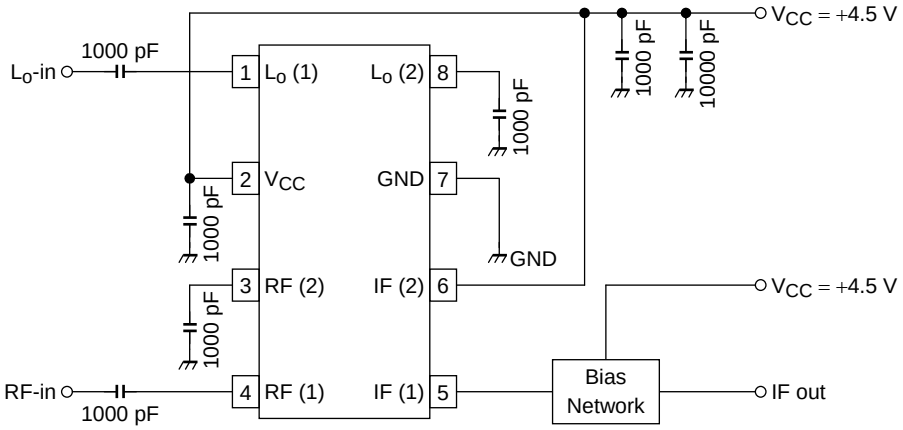
Electrical Characteristics (V_{CC} = 4.5 V, Ta = 25℃, Zg = Zl = 50 Ω)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Circuit current	I_{CC}	non carrier	22.5	29.5	40.5	mA
Conversion gain	C. Gain	RFin = 1 GHz/−15dBmW, Loin = 950 MHz/−5dBmW	−3.5	−0.5	3.5	dB
Input IP3	IIP3	RF (1) = 996 MHz/−15dBmw, RF (2) = 1000 MHz/−15dBmW, Loin = 950 MHz/−5dBmW	8	12	—	dBmW
Noise figure	NF	Loin = 950 MHz/−5dBmw, DSB	—	12	16	dB
RF → L_O Leakage power	$P_{RF \rightarrow Lo}$	RFin = 1 GHz/−15dBmW	—	−57	—	dBmW
L_O → RF Leakage power	$P_{Lo \rightarrow RF}$	Loin = 950 MHz/−5dBmW	—	−46	—	dBmW

Equivalent Circuit

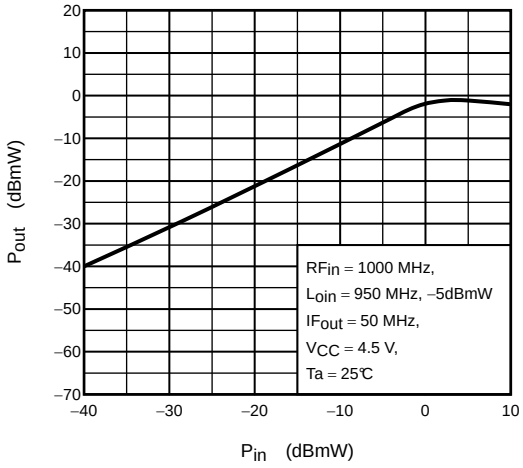


Test Circuit

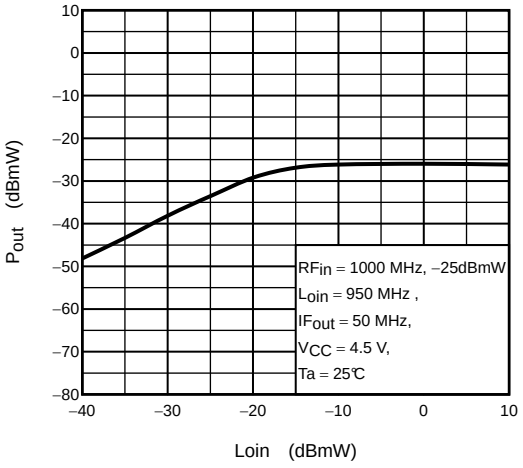


Please bias V_{CC}, IF (1) and IF (2) terminals at the same time not to damage.

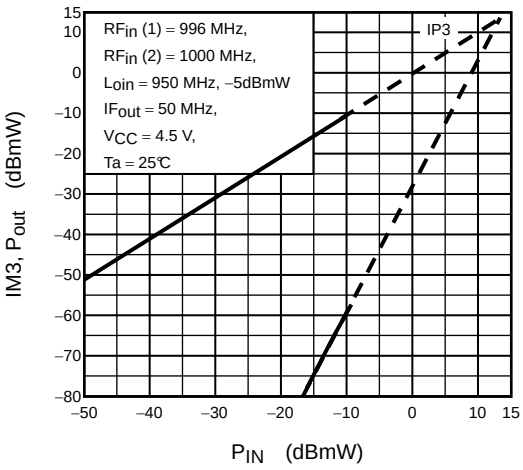
$P_{out} - P_{in}$



$P_{out} - L_{oin}$



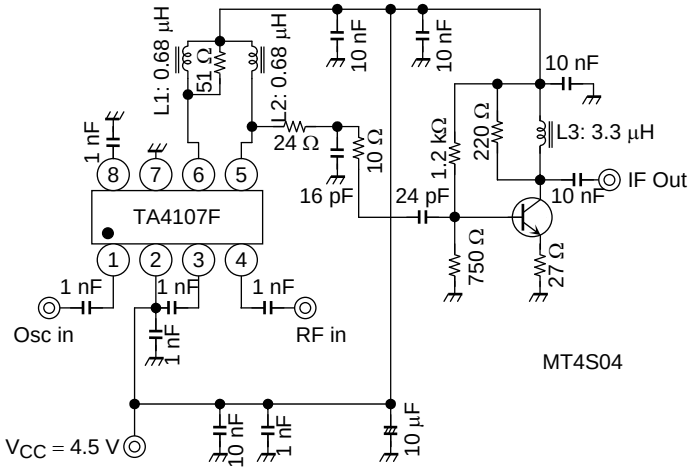
IM3, $P_{out} - P_{in}$



Application circuit for CATV/DTV (VSB) Tuner

TA4107F
V_{CC}: 4.5 V/32 mA
IF Amp.MT4S04
V_{CC}: 5.0 V/32 mA

RFin = 1400/1401 MHz/−20 dBmW
IFout = 44/45MHz
Loin = 1356 MHz/Pin = −5 dBmW
C.G. = 18 dB
NF = 12.5 dB (DSB)
IIP3 = + 12 dBmW
IP3out = +30 dBmW



Notice

The circuits and measurements contained in this document are given only in the context of as examples of applications for these products.

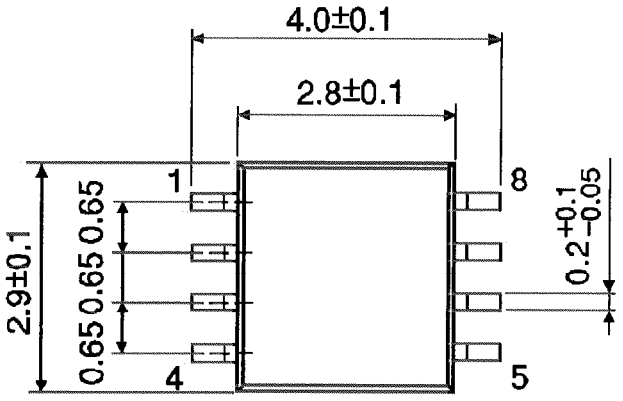
Moreover, these example application circuits are not intended for mass production, since the high-frequency characteristics (the AC characteristics) of these devices will be affected by the external components which the customer uses, by the design of the circuit and by various other conditions.

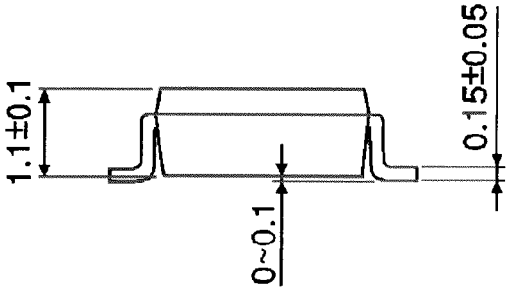
It is the responsibility of the customer to design external circuits which correctly implement the intended application, and to check the characteristics of the design.

TOSHIBA assume no responsibility for the integrity of customer circuit designs or applications.

Package Dimensions

SSOP8-P-0.65 Unit : mm





Weight: 0.021 g (typ.)

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