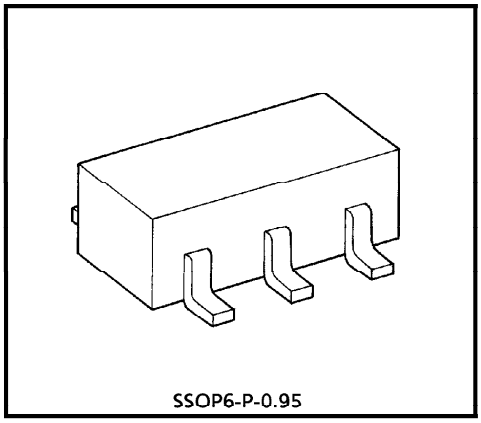
TOSHIBA GaAs LINEAR INTEGRATED CIRCUIT GaAs MONOLITHIC

# TG2202F

## 1.9GHz BAND ATTENUATOR
## (PHS DIGITAL CORDLESS TELEPHONE)

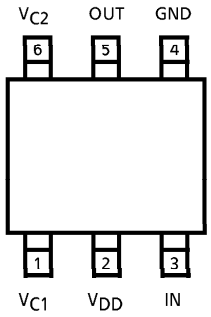
**FEATURES**

- ATTENUATION : ATT = 22dB (Typ.)
- CONTROL VOLTAGE : 0V / 3V

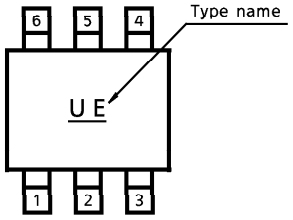



Weight : 0.014g (Typ.)

**PIN CONNECTION** (TOP VIEW)




**MARKING**




**MAXIMUM RATINGS** (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|---|---|---|---|
| Supply Voltage | $V_{DD}$ | 5 | V |
| Control Voltage | $V_{C1}$ | 5 | V |
| | $V_{C2}$ | 5 | V |
| Input Power | $P_i$ | 100 | mW |
| Operating Temperature Range | $T_{opr}$ | −40~85 | °C |
| Storage Temperature Range | $T_{stg}$ | −55~125 | °C |

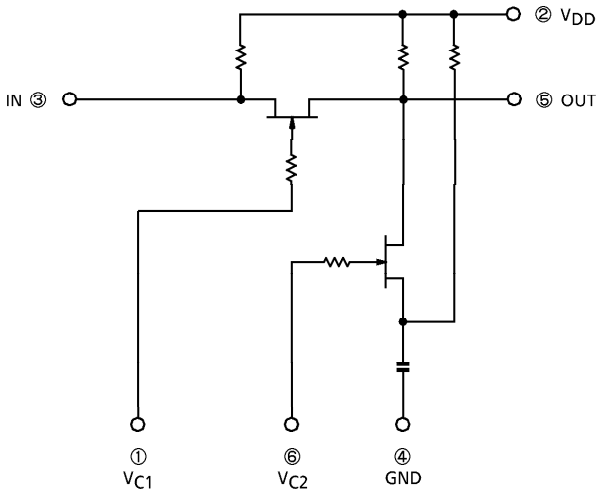
**ELECTRICAL CHARACTERISTICS** ($V_{DD}$ = 3V, Ta = 25°C, $Z_g = Z_l = 50\Omega$)

| CHARACTERISTIC | SYMBOL | TEST CIR-CUIT | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|
| Frequency Range | $f_{range}$ | — | — | 1895 | — | 1918 | MHz |
| Insertion Loss | $L_{OSS}$ | 1 | $V_{C1}$ = 3V, $V_{C2}$ = 0V, $P_i$ = 0dBmW | — | 0.7 | 1.5 | dB |
| Attenuation | ATT | 1 | $V_{C1}$ = 0V, $V_{C2}$ = 3V, $P_i$ = 0dBmW | 19 | 22 | 25 | dB |
| Supply Current | $I_{DD}$ | — | $V_{C1}$ = 3V, $V_{C2}$ = 0V or $V_{C1}$ = 0V, $V_{C2}$ = 3V | — | — | 0.1 | mA |
| Control Current | $I_{C1}$ | | | — | — | 0.1 | mA |
| | $I_{C2}$ | | | — | — | 0.1 | mA |
| Input VSWR | $VSWR_{in}$ | 1 | $V_{C1}$ = 3V, $V_{C2}$ = 0V, $P_i$ = 0dBmW | — | 1.4 | 2.0 | — |
| Output VSWR | $VSWR_{out}$ | | | — | 1.4 | 2.0 | — |
| Output Power at 1dB Gain Compression | $P_{o1dB}$ | | | — | 10 | — | dBm W |

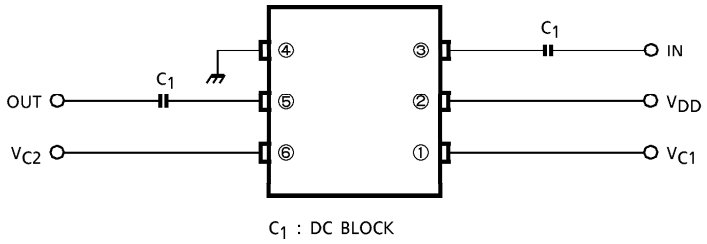
**TRUTH TABLE**

| CONTROL VOLTAGE | | ATTENUATOR CONDITION |
|---|---|---|
| $V_{C1}$ | $V_{C2}$ | IN-OUT |
| 3V | 0V | ATTENUATE OFF |
| 0V | 3V | ATTENUATE ON |

**EQUIVALENT CIRCUIT**



**TEST CIRCUIT 1**

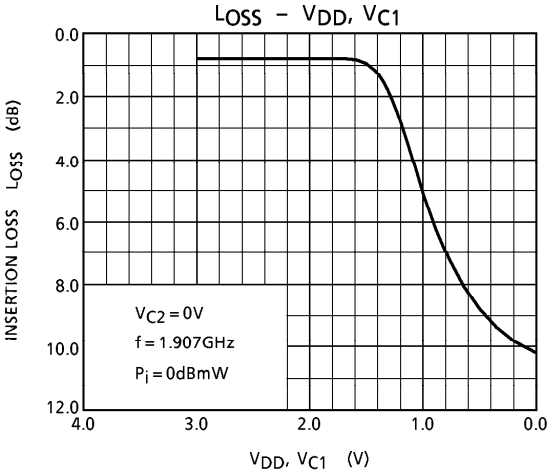


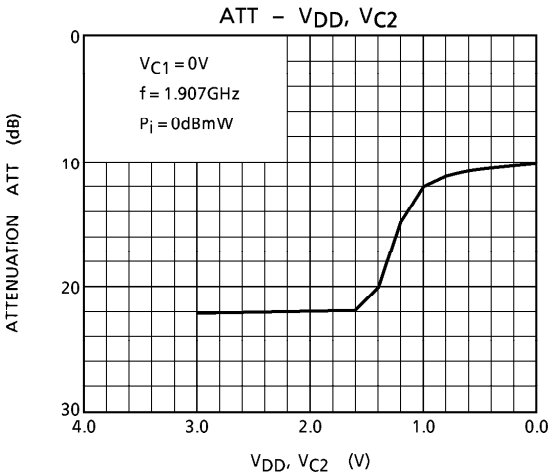

$C_1$ : DC BLOCK

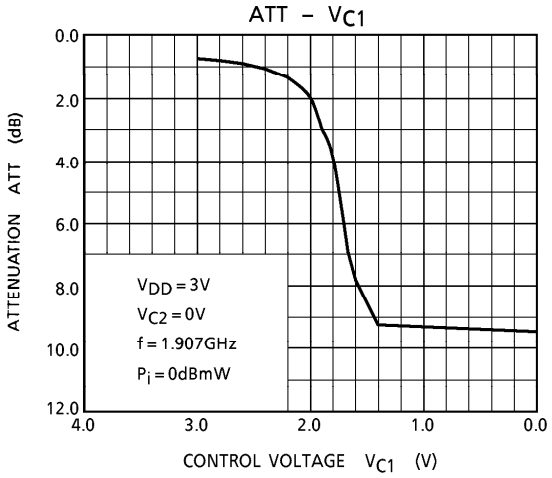
(Note) $V_{C1}$, $V_{C2}$ and $V_{DD}$ are connected to GND by capacitor (9pF) in order to measure dependence on frequency of $L_{OSS}$ and ATT.

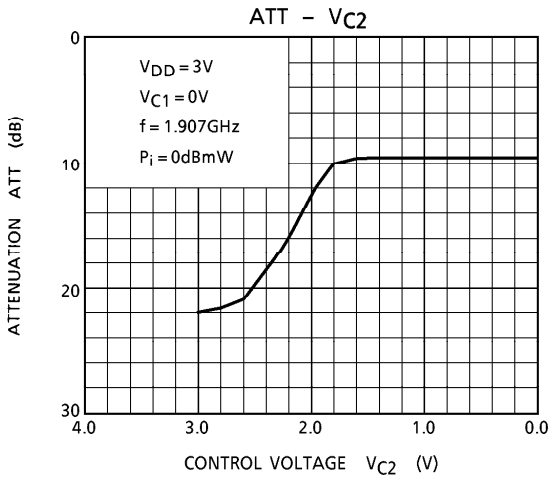
**CAUTION**

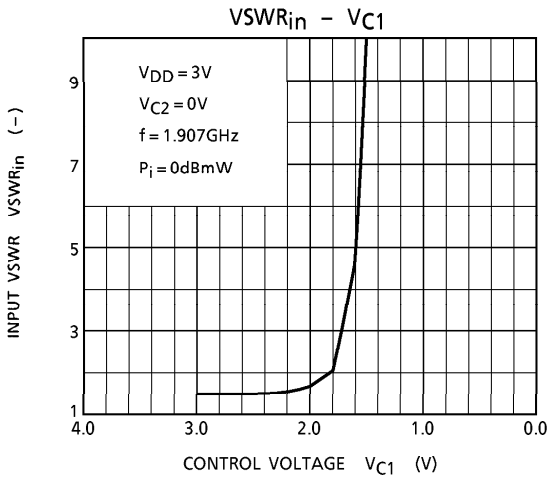
This device is electrostatic sensitivity. Please handle with caution.

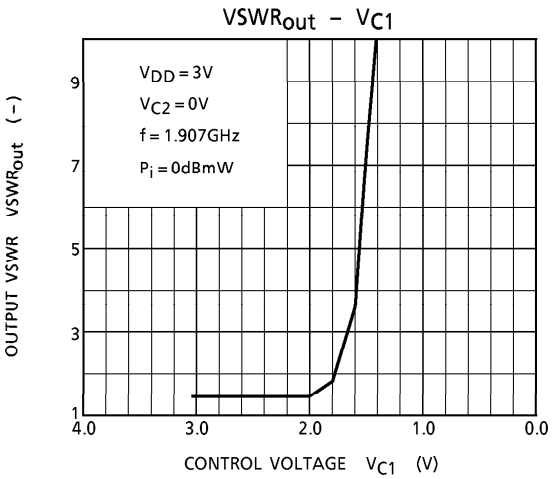

LOSS – VDD, VC1
INSERTION LOSS LOSS (dB)
0.0
2.0
4.0
6.0
8.0
10.0
12.0
VC2 = 0V
f = 1.907GHz
Pi = 0dBmW
4.0
3.0
2.0
1.0
0.0
VDD, VC1 (V)


ATT – VDD, VC2
ATTENUATION ATT (dB)
0
10
20
30
VC1 = 0V
f = 1.907GHz
Pi = 0dBmW
4.0
3.0
2.0
1.0
0.0
VDD, VC2 (V)

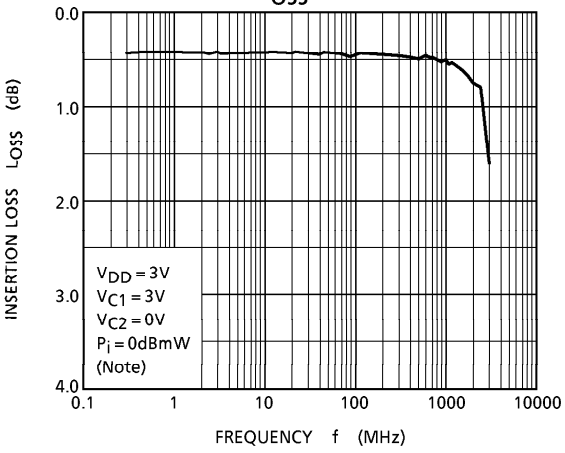

ATT – VC1
ATTENUATION ATT (dB)
0.0
2.0
4.0
6.0
8.0
10.0
12.0
VDD = 3V
VC2 = 0V
f = 1.907GHz
Pi = 0dBmW
4.0
3.0
2.0
1.0
0.0
CONTROL VOLTAGE VC1 (V)


ATT – VC2
ATTENUATION ATT (dB)
0
10
20
30
VDD = 3V
VC1 = 0V
f = 1.907GHz
Pi = 0dBmW
4.0
3.0
2.0
1.0
0.0
CONTROL VOLTAGE VC2 (V)

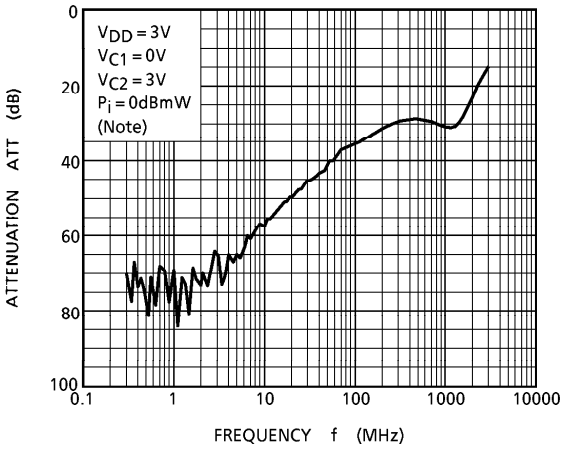

VSWRin – VC1
INPUT VSWR VSWRin (–)
9
7
5
3
1
VDD = 3V
VC2 = 0V
f = 1.907GHz
Pi = 0dBmW
4.0
3.0
2.0
1.0
0.0
CONTROL VOLTAGE VC1 (V)


VSWRout – VC1
OUTPUT VSWR VSWRout (–)
9
7
5
3
1
VDD = 3V
VC2 = 0V
f = 1.907GHz
Pi = 0dBmW
4.0
3.0
2.0
1.0
0.0
CONTROL VOLTAGE VC1 (V)

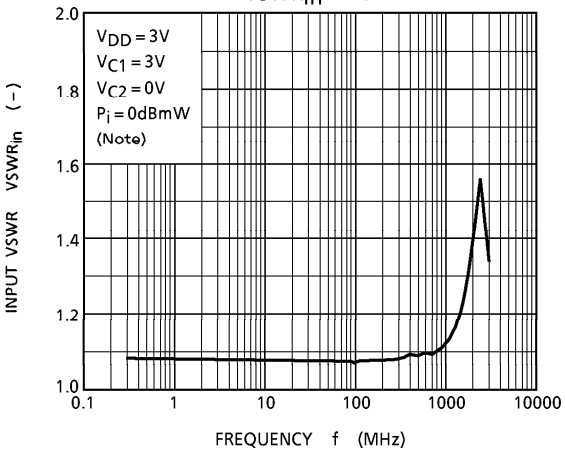
$L_{OSS}$ – f



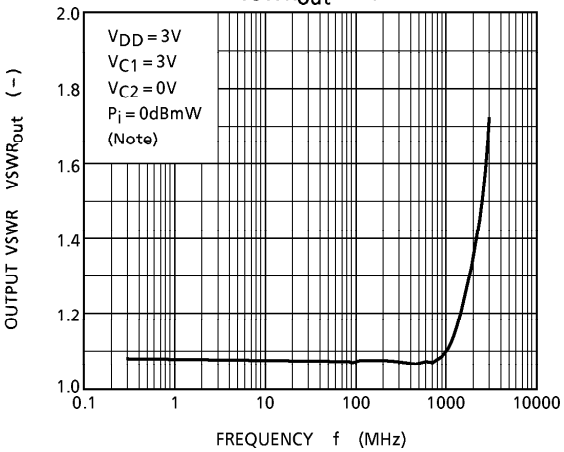

ATT – f



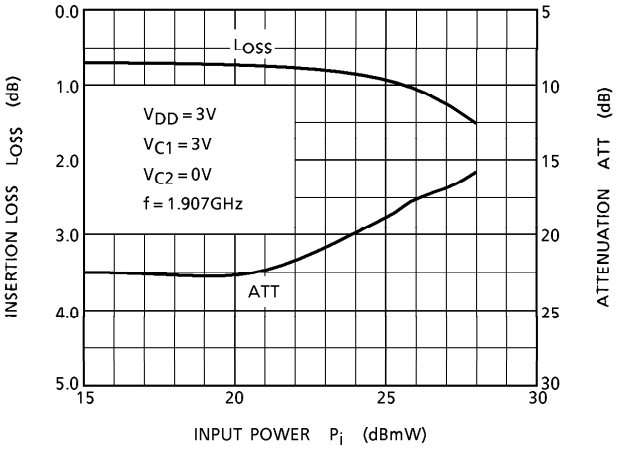

$VSWR_{in}$ – f




$VSWR_{out}$ – f



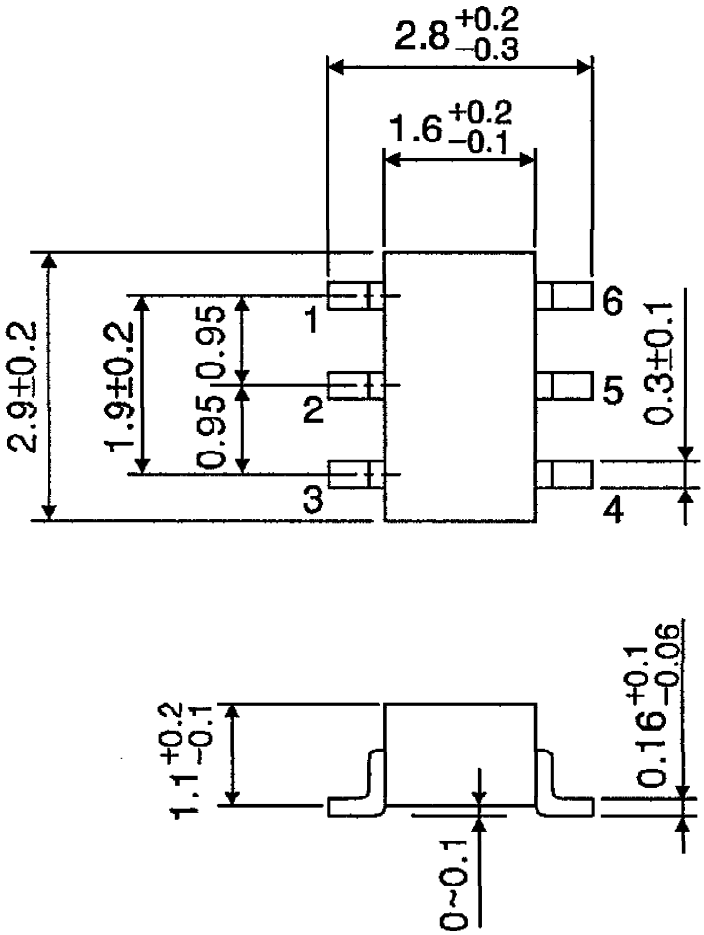

$L_{OSS}$, ATT – $P_i$



**OUTLINE DRAWING**

SSOP6-P-0.95

Unit : mm




Weight : 0.014g (Typ.)