# RF AMPLIFIER
# MODEL *TM6509PM*

**Available as:** TM6509PM, 4 Pin TO-8 (T4)
TN6509PM, 4 Pin .450" Sq. Surface Mount (SM3)
PN6509PM, 4 Pin .375" Sq. Surface Mount (SM14)
FP6509PM, 4 Pin .500" Sq. Flatpack (FP4)
BX6509PM, SMA Connectorized Housing (H1)

## Features

- Superior Phase Noise Performance
- High Output Power: +23 dBm Typical
- High Third Order Intercept: +36 dBm Typical
- Operating Temp. -55 ºC to +85 ºC
- Environmental Screening Available, Lead-Free LF Option

## Specifications

| CHARACTERISTIC | TYPICAL Ta= 25 ºC | MIN/MAX Ta = -55 ºC to +85 ºC |
|---|---|---|
| Frequency | 5 - 500 MHz | 5 - 500 MHz |
| Gain (dB) | 14.5 | 13.0 Min. |
| Power @ 1 dB Comp. (dBm) | +23 | +20 Min. |
| Reverse Isolation (dB) | -18 | -15 Max. |
| VSWR In<br>Out | 1.4:1<br>1.2:1 | 2.0:1 Max.<br>2.0:1 Max. |
| Noise Figure (dB) | 4.6 | 6.0 Max. |
| Power Vdc<br>mA | +15<br>88 | +15<br>95 Max. |

Note: Care should always be taken to effectively ground the case of each unit.

Revision: Feb 5, 2024 Revised Residual Phase Noise Data

## Typical Intermodulation Performance at 25 ºC

Second Order Harmonic Intercept Point ..... +56 dBm (Typ.)
Second Order Two Tone Intercept Point ..... +50 dBm (Typ.)
Third Order Two Tone Intercept Point ..... +36 dBm (Typ.)

## Maximum (No Damage) Ratings

Max. Ambient Operating Temperature ..... -55ºC to +100 ºC
Max. Storage Temperature ..... -62ºC to +125 ºC
Max. Case Temperature ..... +125 ºC
Max. DC Voltage ..... +18 Volts
Continuous RF Input Power ..... +13 dBm
Short Term RF Input Power ..... 50 mW (1 Minute Max.)
Maximum Peak Power ..... 0.5 Watt (3 µsec Max.)
Junction Temp. Rise above Case .....54ºC

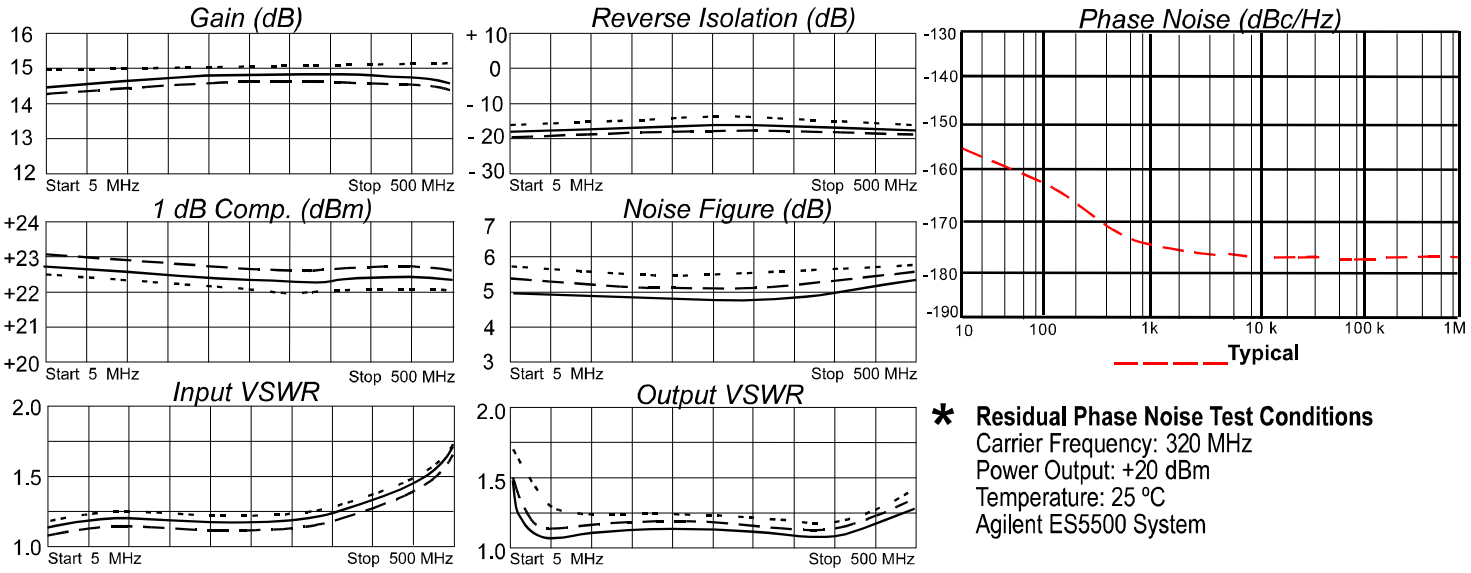
**MTBF Calculation for Ground Benign Environment** @ 25 ºC
.....9,248,445 Hrs

**Guaranteed** @ 25 ºC **(500 MHz) Phase Noise Performance** (dBc/Hz)*

| Frequency | Typical | Guaranteed |
|---|---|---|
| 10 Hz | -155 | -151 |
| 100 Hz | -164 | -160 |
| 1 kHz | -172 | -168 |
| 10 kHz | -173 | -169 |
| 100 kHz | -175 | -171 |
| 1 MHz | -176 | -172 |

*Note: Phase Noise Performance typically tested at midband. Bandedge performance may vary.

## Typical Performance Data




*** Residual Phase Noise Test Conditions**
Carrier Frequency: 320 MHz
Power Output: +20 dBm
Temperature: 25 ºC
Agilent ES5500 System

*Legend* ——— +25 ºC — — — +85 ºC - - - - - - -55 ºC

### Linear S-Parameters

| FREQ. MHz | S11 Mag | S11 Deg | S21 Mag | S21 Deg | S12 Mag | S12 Deg | S22 Mag | S22 Deg |
|---|---|---|---|---|---|---|---|---|
| 5 | .23 | -41 | 5.86 | -163 | .08 | 19 | .27 | 86 |
| 100 | .13 | 80 | 5.46 | 159 | .11 | 3 | .05 | 23 |
| 200 | .40 | 24 | 5.51 | 137 | .12 | 3 | .04 | 23 |
| 300 | .58 | -31 | 5.50 | 114 | .14 | 2 | .04 | 45 |
| 400 | .10 | -91 | 5.53 | 90 | .15 | -1 | .08 | 71 |
| 500 | .20 | -137 | 5.45 | 64 | .17 | -9 | .17 | 66 |

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