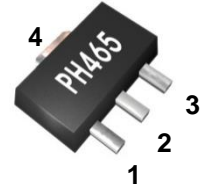


Features

- 500MHz - 3000MHz
- 19.0 dB Gain at 900MHz
- +25.5 dBm P1dB
- +42 dBm Output IP3
- Single Voltage Supply
- Lead-free / Green / RoHS-compliant SOT-89 Package

Applications

- Mobile Infrastructure
- PCS, WCDMA, WiBro
- W-LAN / ISM
- RFID / Fixed Wireless

Functional Diagram


| Function | Pin No. |
|---------------|---------|
| RF IN | 1 |
| RF OUT / Bias | 3 |
| Ground | 2,4 |

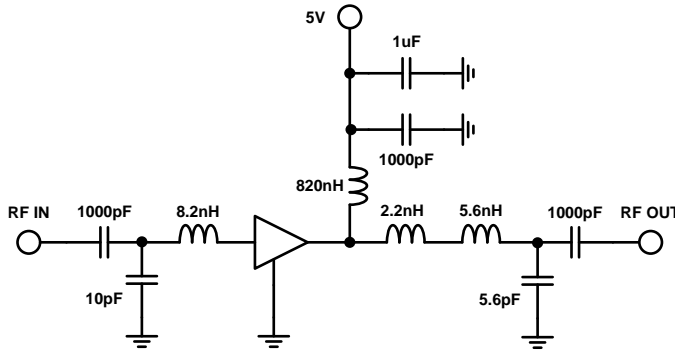
Description

The PH465 is a high performance InGaP HBT MMIC Amplifier and high linearity driver amplifier in a high quality SOT-89 package. The device features excellent Input and output return loss, highly linear performance. The device can be easily matched to obtain optimum power and linearity. The product is targeted for use as driver amplifier for wireless infrastructure applications. The PH465 operates from a single +5 voltage supply and have an internal active bias. All devices are 100% RF and DC tested

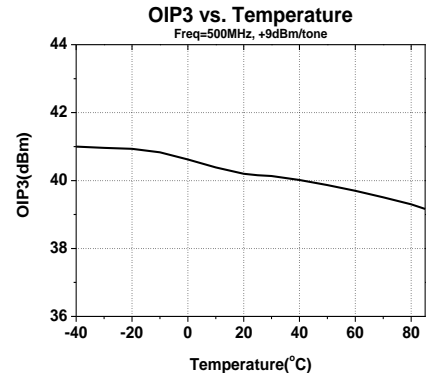
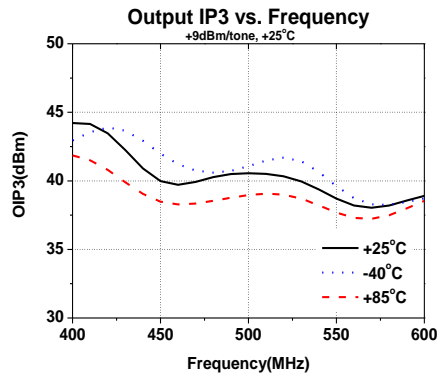
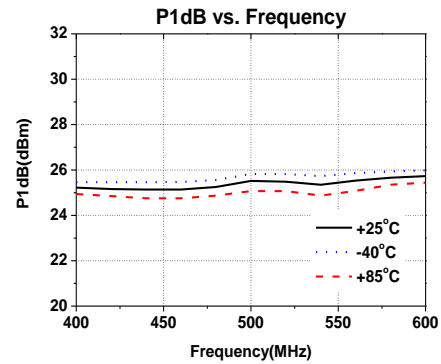
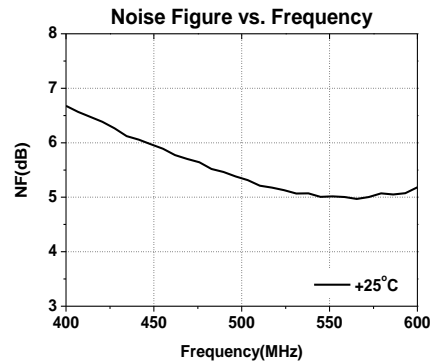
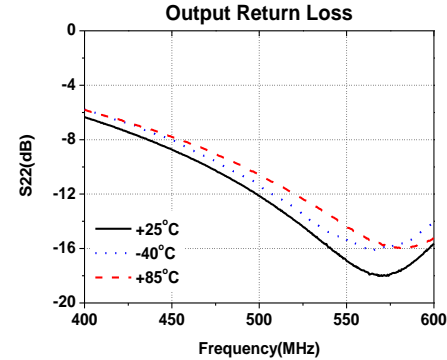
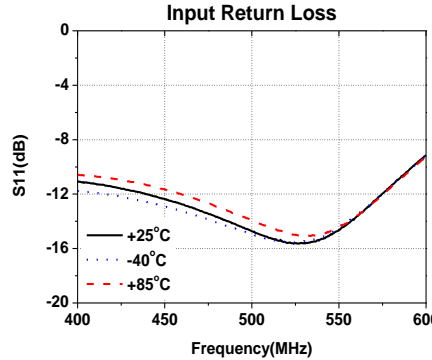
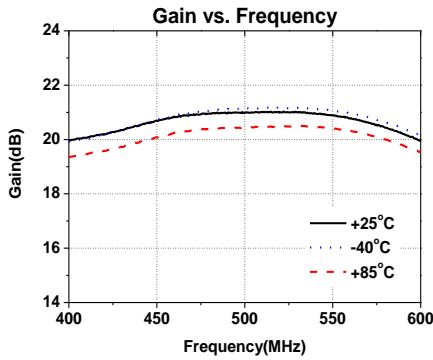
Specifications

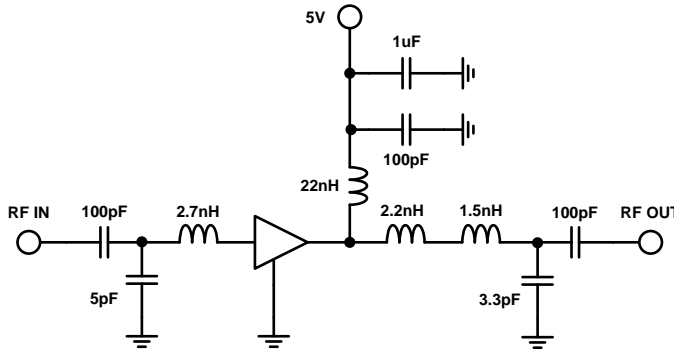
| Symbol | Parameters | Units | Freq. | Min. | Typ. | Max. |
|--------|-------------------------------|-------|--|------|--|------|
| S21 | Gain | dB | 500 MHz 900 MHz 1900 MHz 2140 MHz 2300 MHz 2600 MHz | | 20.0 19.0 15.0 13.3 12.5 13.0 | |
| S11 | Input Return Loss | dB | 500 MHz 900 MHz 1900 MHz 2140 MHz 2300 MHz 2600 MHz | | -13 -13 -12 -11 -10 -12 | |
| S22 | Output Return Loss | dB | 500 MHz 900 MHz 1900 MHz 2140 MHz 2300 MHz 2600 MHz | | -10 -11 -11 -14 -12 -11 | |
| P1dB | Output Power @1dB compression | dBm | 500 MHz 900 MHz 1900 MHz 2140 MHz 2300 MHz 2600 MHz | | 25.3 25.5 25.1 25.2 25.0 25.0 | |
| OIP3 | Output Third Order intercept | dBm | 500 MHz 900 MHz 1900 MHz 2140 MHz 2300 MHz 2600 MHz | | 40.0 41.5 41.5 41.0 42.0 42.5 | |
| NF | Noise Figure | dB | 500 MHz 900 MHz 1900 MHz 2140 MHz 2300 MHz 2600 MHz | | 5.4 3.8 3.2 3.3 3.4 3.4 | |
| V / I | Device voltage / current | V/mA | | | 5/148 | |
| Rth | Thermal Resistance | °C/W | | | 34 | |

500 MHz Application Circuit

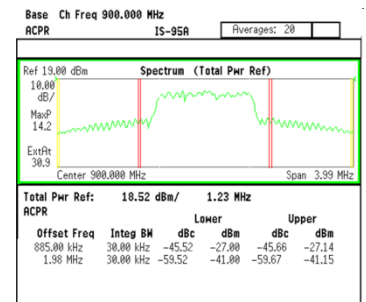
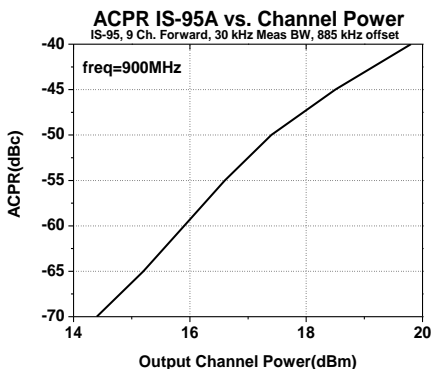
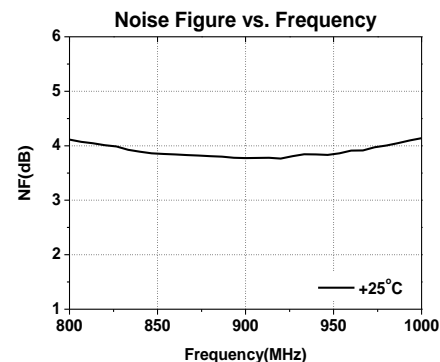
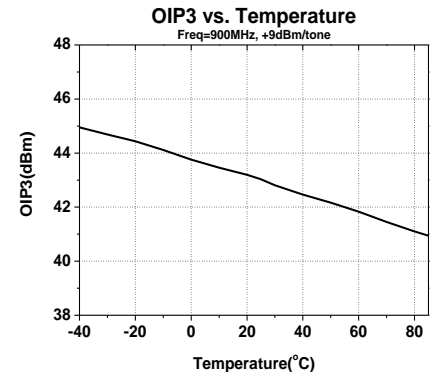
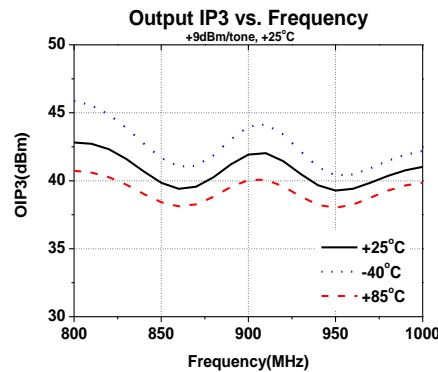
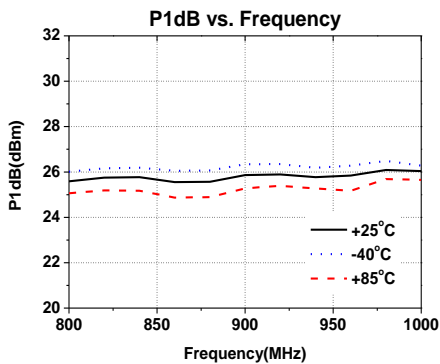
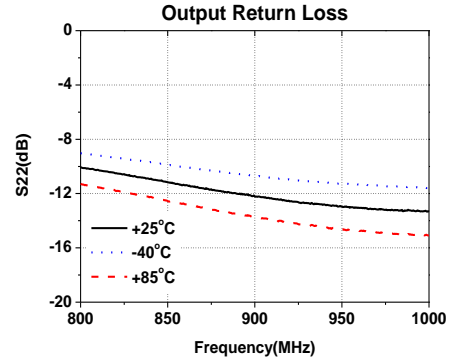
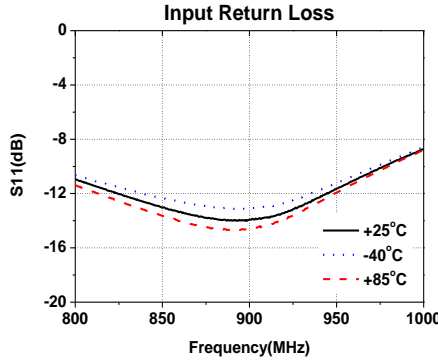
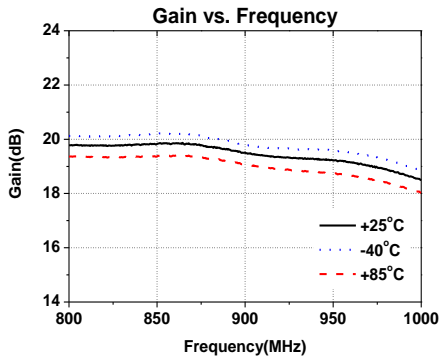


| | |
|--------------------------|------------|
| Frequency | 500 MHz |
| S21 : Gain | 20.5 dB |
| S11 : Input Return Loss | -14 dB |
| S22 : Output Return Loss | -11 dB |
| Output P1dB | + 25.5 dBm |
| Output IP3 @9dBm | +40.5 dBm |
| Noise Figure | 5.4 dB |
| Supply Voltage | 5 V |
| Current | 146 mA |

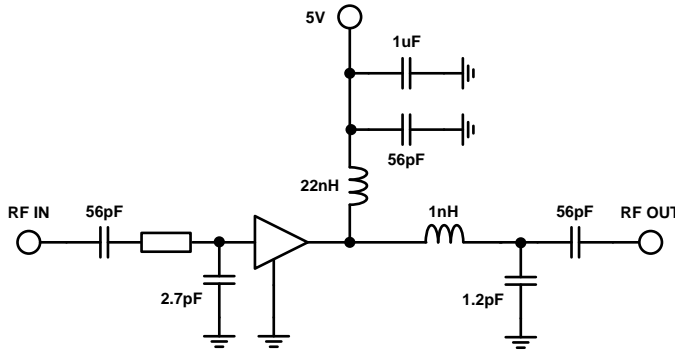


900 MHz Application Circuit


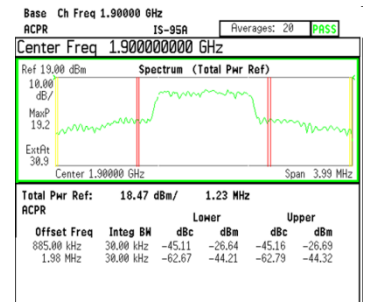
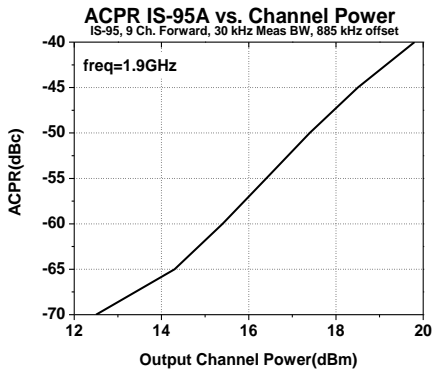
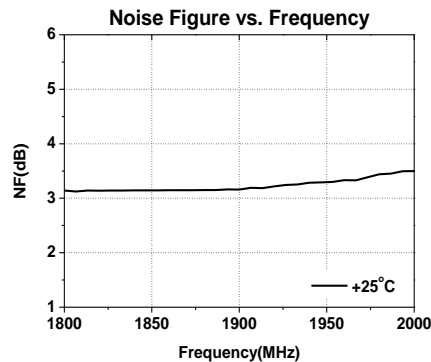
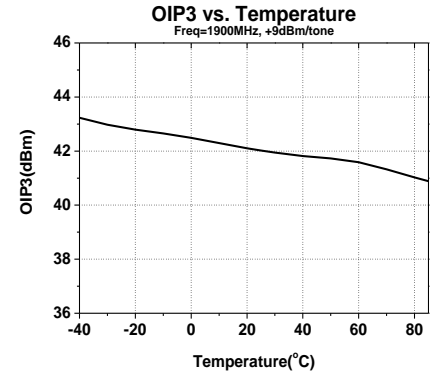
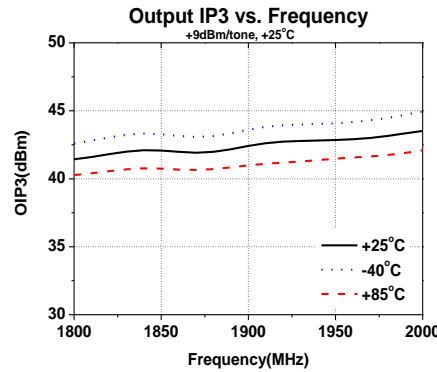
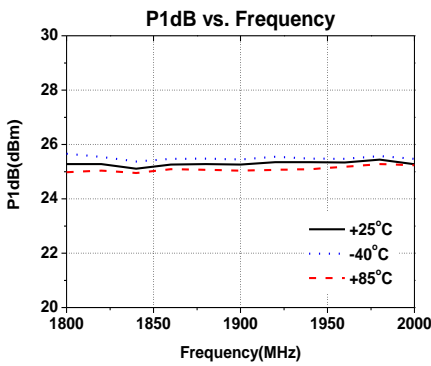
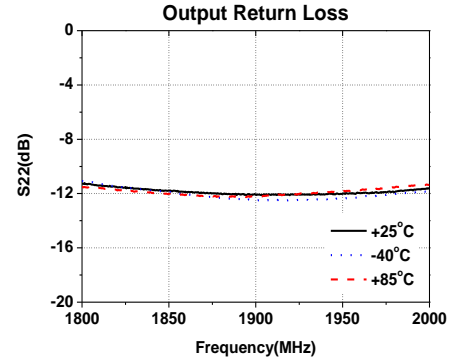
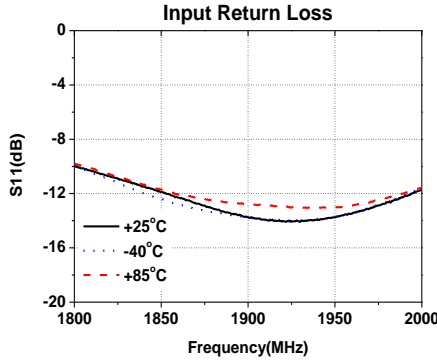
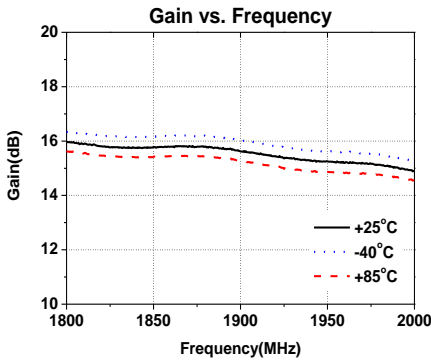
| Frequency | 900 MHz |
|--------------------------------|-----------|
| S21 : Gain | 19.3 dB |
| S11 : Input Return Loss | -14 dB |
| S22 : Output Return Loss | -12 dB |
| Output P1dB | +25.8 dBm |
| Output IP3 @9dBm | +42.0 dBm |
| IS-95A Ch. Power @ -45dBc ACPR | +18.5 dBm |
| Noise Figure | 3.8 dB |
| Supply Voltage | 5 V |
| Current | 148 mA |



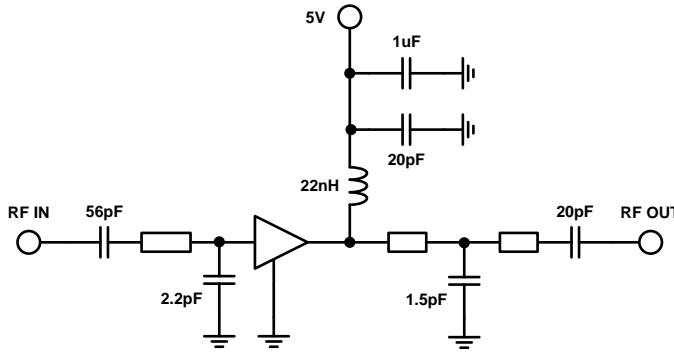
1900 MHz Application Circuit



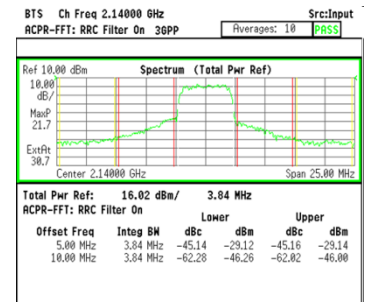
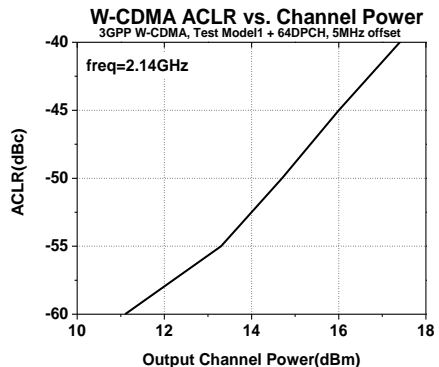
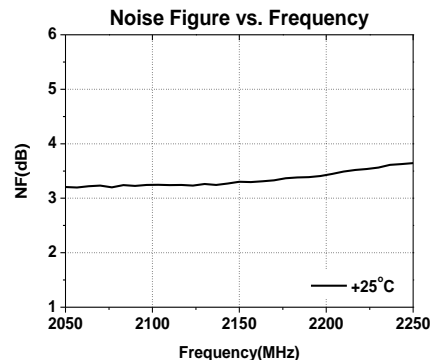
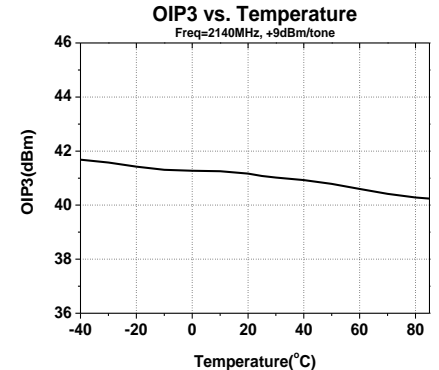
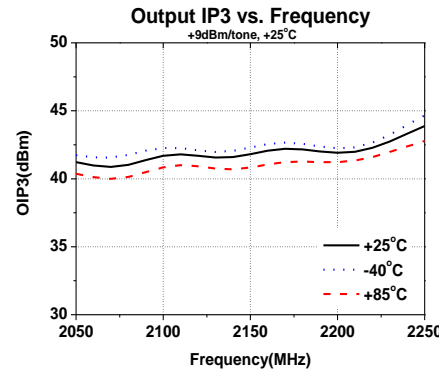
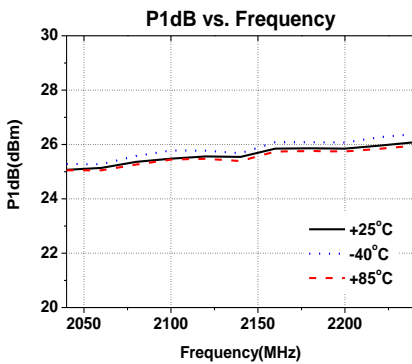
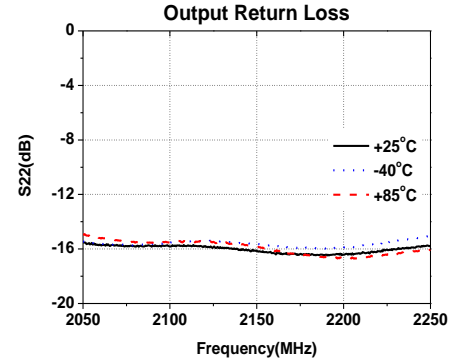
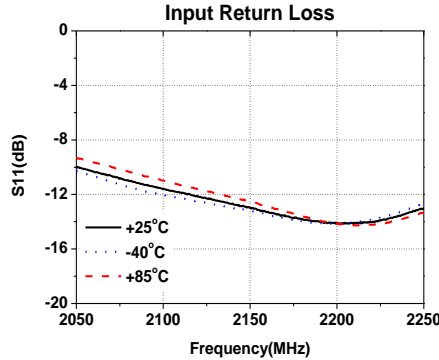
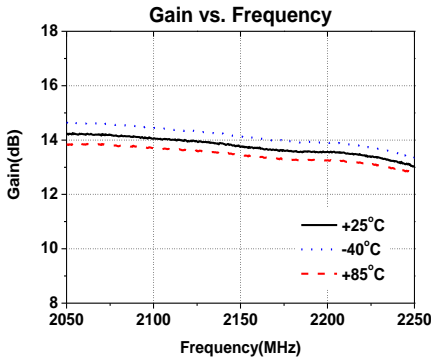
| Frequency | 1900 MHz |
|--------------------------------|-----------|
| S21 : Gain | 15.5 dB |
| S11 : Input Return Loss | -13 dB |
| S22 : Output Return Loss | -12 dB |
| Output P1dB | +25.3 dBm |
| Output IP3 @7dBm | +42.0 dBm |
| IS-95A Ch. Power @ -45dBc ACPR | +18.5 dBm |
| Noise Figure | 3.2 dB |
| Supply Voltage | 5 V |
| Current | 148 mA |



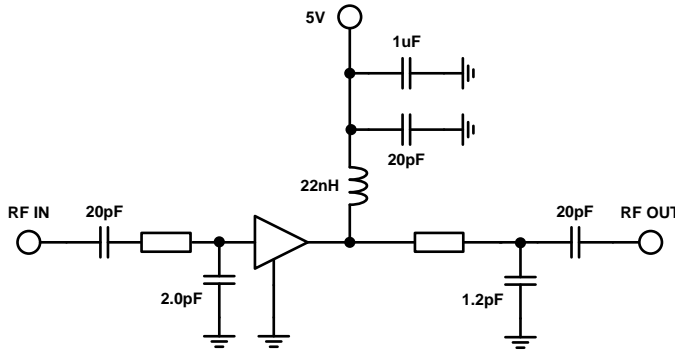
2140 MHz Application Circuit



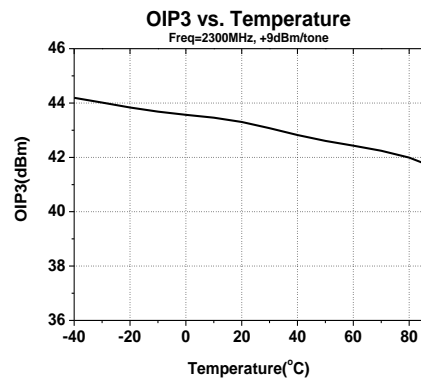
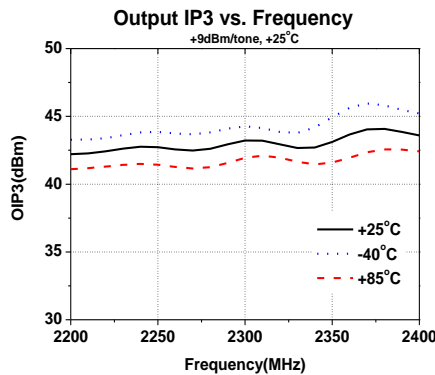
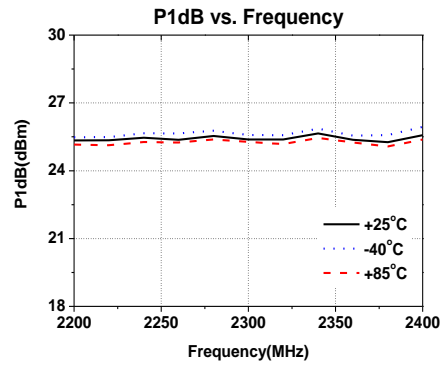
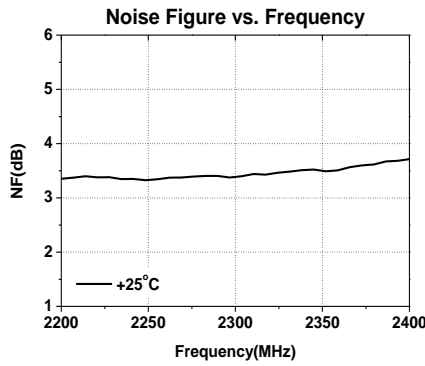
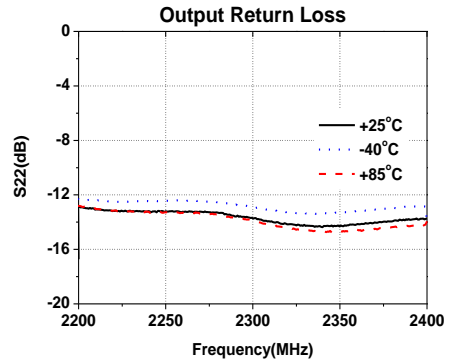
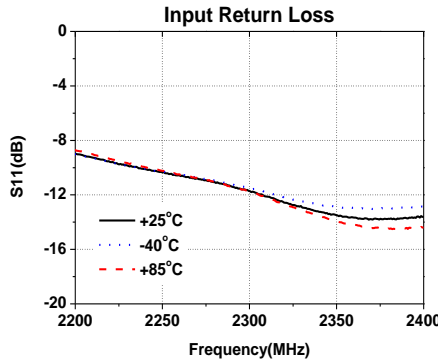
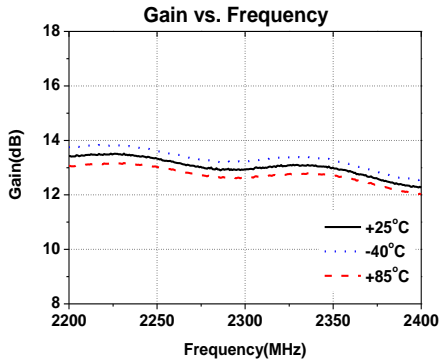
| Frequency | 2140 MHz |
|-------------------------------|------------|
| S21 : Gain | 13.6 dB |
| S11 : Input Return Loss | -12 dB |
| S22 : Output Return Loss | -15 dB |
| Output P1dB | + 25.5 dBm |
| Output IP3 @7dBm | +41.5 dBm |
| WCDMA Ch. Power @ -45dBc ACLR | +16.0 dBm |
| Noise Figure | 3.3 dB |
| Supply Voltage | 5 V |
| Current | 148 mA |

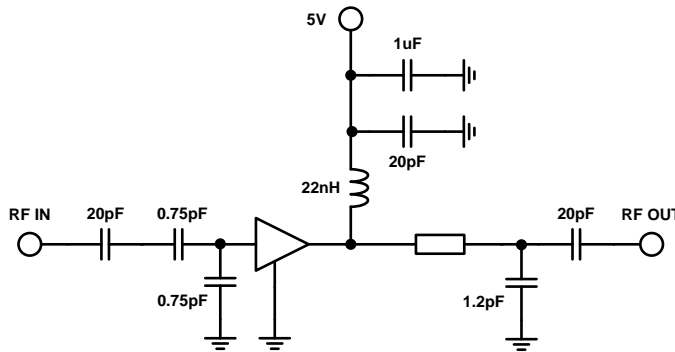


2300 MHz Application Circuit

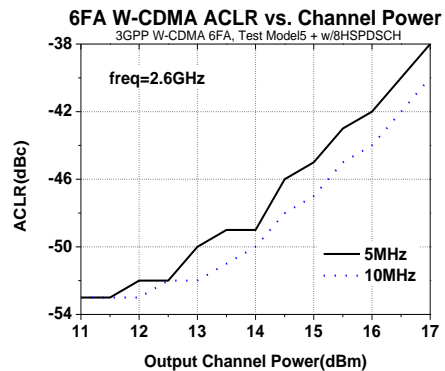
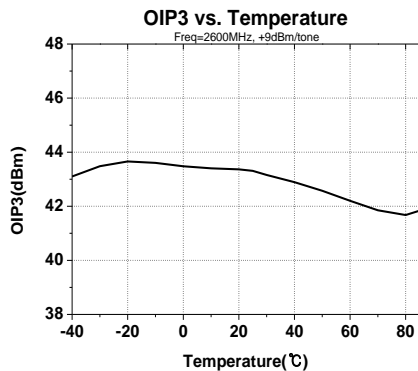
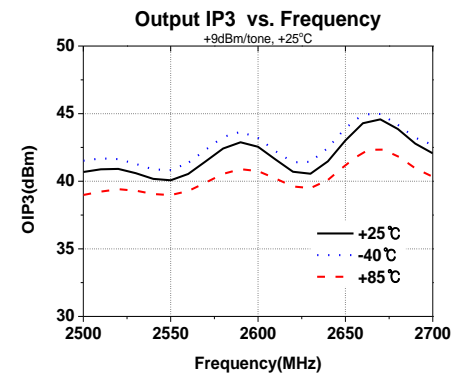
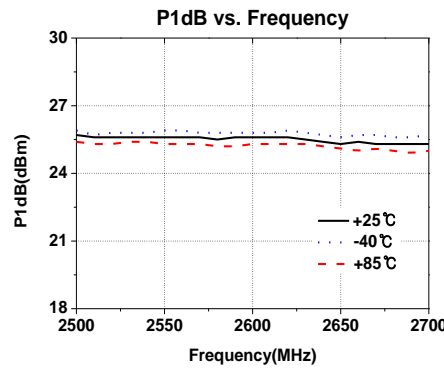
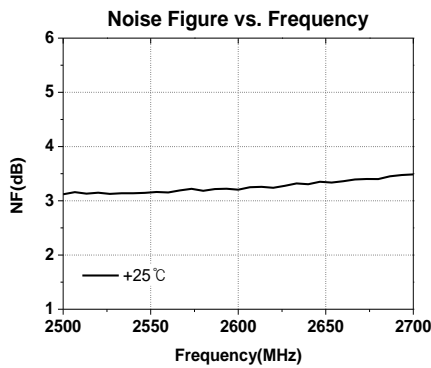
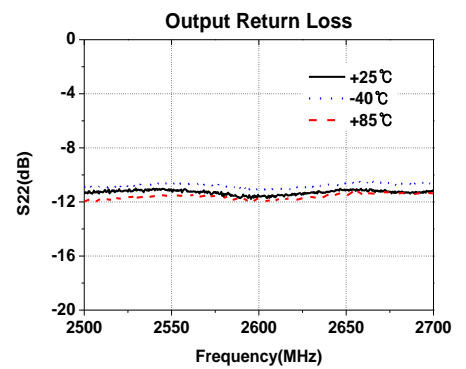
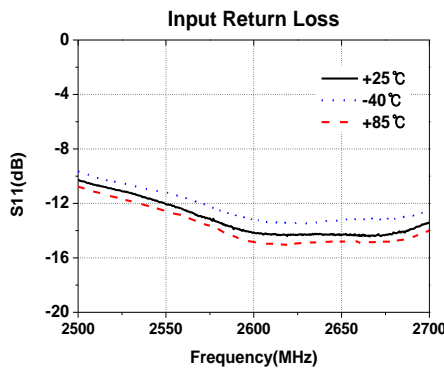
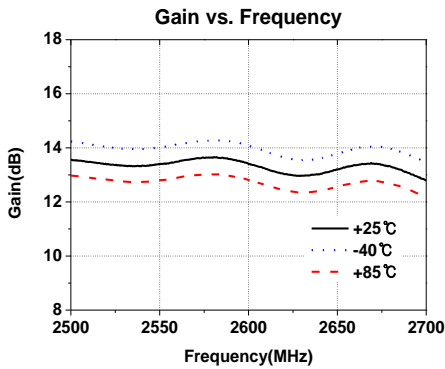


| Frequency | 2300 MHz |
|--------------------------|-----------|
| S21 : Gain | 12.9 dB |
| S11 : Input Return Loss | -11 dB |
| S22 : Output Return Loss | -13 dB |
| Output P1dB | +25.2 dBm |
| Output IP3 @9dBm | +43.0 dBm |
| Noise Figure | 3.4 dB |
| Supply Voltage | 5 V |
| Current | 150 mA |



2600 MHz Application Circuit


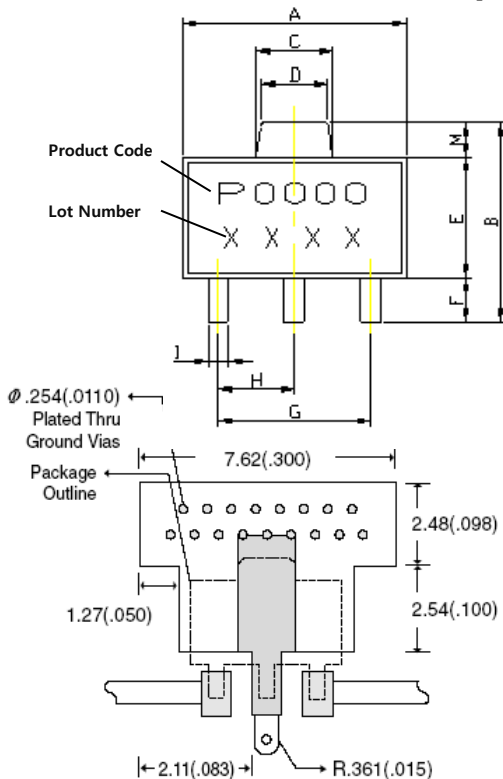
| Frequency | 2600 MHz |
|--------------------------|-----------|
| S21 : Gain | 13.0 dB |
| S11 : Input Return Loss | -13 dB |
| S22 : Output Return Loss | -11 dB |
| Output P1dB | +25.4 dBm |
| Output IP3 @9dBm | +42.5 dBm |
| Noise Figure | 3.4 dB |
| Supply Voltage | 5 V |
| Current | 150 mA |



Absolute Maximum Ratings

| Parameter | Rating | Unit |
|--|-------------|------|
| Supply Voltage | +6 | V |
| Supply Current | 220 | mA |
| RF Power Input | 12 | dBm |
| Storage Temperature | -55 to +125 | °C |
| Ambient Operating Temperature | -40 to +85 | °C |
| Junction Temperature for >10 ⁶ hours MTTF | 187 | °C |

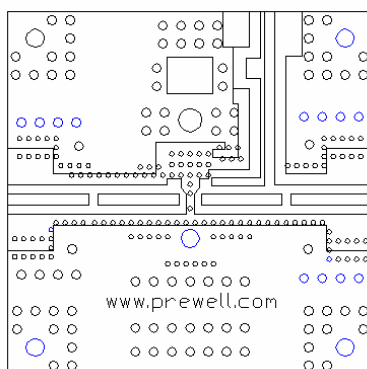
Operation of this device above any of these parameters may cause permanent damage.

Lead-free / RoHS Compliant / Green SOT-89 Package Outline


| REF | DIMENSIONS | |
|-----|-------------|------|
| | Millimeters | |
| | Min. | Max. |
| A | 4.40 | 4.60 |
| B | 4.05 | 4.25 |
| C | 1.50 | 1.70 |
| D | 1.30 | 1.50 |
| E | 2.40 | 2.60 |
| F | 0.89 | 1.20 |
| G | 3.00 REF. | |
| H | 1.50 REF. | |
| I | 0.40 | 0.52 |
| J | 1.40 | 1.60 |
| K | 0.35 | 0.41 |
| L | 5° TYP. | |
| M | 0.70 REF. | |

ESD / MSL Ratings

- ESD sensitive device.
Observe Handling Precautions.
- ESD Rating : Class 1C(Passes at 1000V min.)
Human Body Model (HBM), JESD22-A114
- ESD Rating : Class IV (Passes at 1000V min.)
Charged Device Model (CDM), JESD22-C101
- MSL (Moisture Sensitive Level) Rating : Level 1
at +260°C Convection reflow, J-STD-020

Evaluation Board Layout (4x4)

Mounting Instructions

- Use a large ground pad area with many plated through-holes as shown.
- We recommend 1 oz copper minimum.
- Measurement for our data sheet was made on 0.8mm thick FR-4 Board.
- Add as much copper as possible to inner and outer layers near the part to ensure optimal thermal performance.
- RF trace width depends on the board material and construction.
- Add mounting screws near the part to fasten the board to a heatsink.

<http://www.prewell.com>