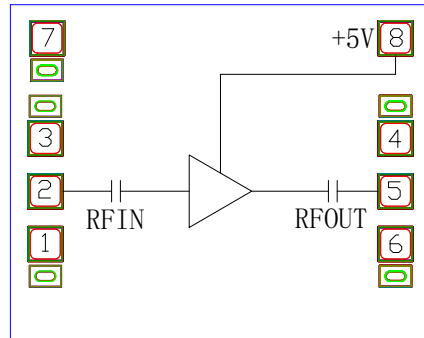


**Features**

- Freq: 3.0-20.0 GHz
- NF: 1.6dB
- Gain: 11dB
- Gain Flatness: ±2.3dB
- OP-1dB: 16.5 dBm
- Psat Satisfaction: 18 dBm
- OIP3: 30 dBm
- Supply Voltage: +5V/40mA
- 50Ω Input/ Output
- Die Size: 1.2×0.95×0.1mm<sup>3</sup>

**Functional Diagram**



**General Description**

The MC10017 is a Low Noise Amplifier which operates during 3.0-20.0 GHz. The amplifier Provides 11 dB of gain and 16.5 dBm of P-1dB Output power from a single bias supply of +5V/40mA with a noise figure of 1.6 dB.

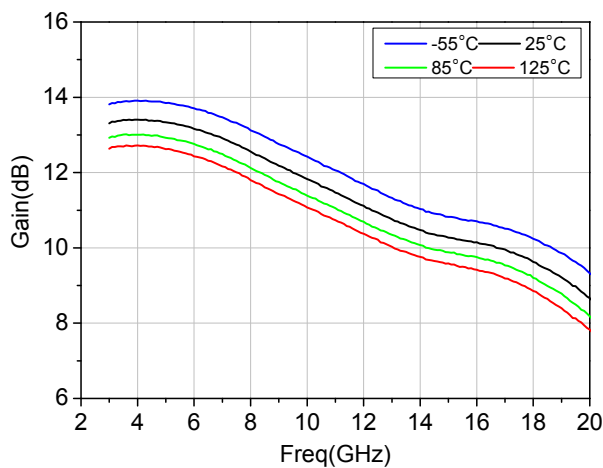
The Chip applies the on-chip metallization through-hole technology thus no need for additional grounding measures which makes it easy and convenient to use. The backside of the chip is metallized, suitable for conductive adhesive bonding or eutectic mounting process.

**Electrical Specifications (TA=+25°C, 50Ω system, VD=+5V, Idd=40mA)**

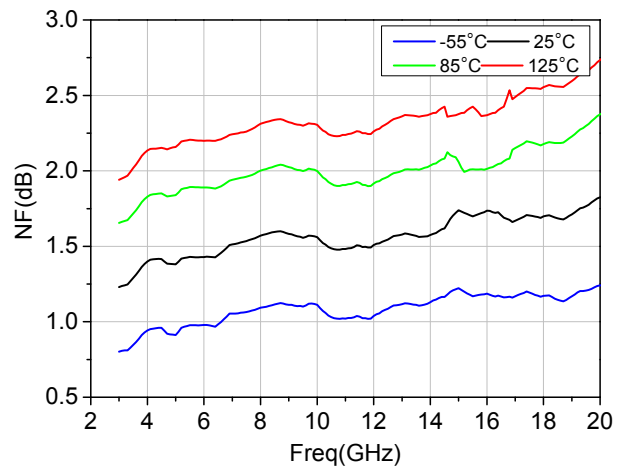
| Parameter                          |        | Min. | Typ. | Max. | Unit |
|------------------------------------|--------|------|------|------|------|
| Frequency Range                    | Freq   | 3.0  | -    | 20.0 | GHz  |
| Gain                               | Gain   | -    | 11   | -    | dB   |
| Gain Flatness                      | △ Gain | -    | ±2.3 | -    | dB   |
| Noise Figure                       | NF     | -    | 1.6  | -    | dB   |
| Output P-1dB                       | P-1dB  | -    | 16.5 | -    | dBm  |
| Input Return Loss                  | IRL    | -    | -11  | -    | dB   |
| Output Return Loss                 | ORL    | -    | -12  | -    | dB   |
| Saturated Output Power             | Psat   | -    | 18   | -    | dBm  |
| Output Third Order Intercept Point | OIP3   | -    | 30   | -    | dBm  |
| Quiescent Current                  | Idd    | -    | 40   | -    | mA   |

[1] The chips are 100% DC and RF tested.

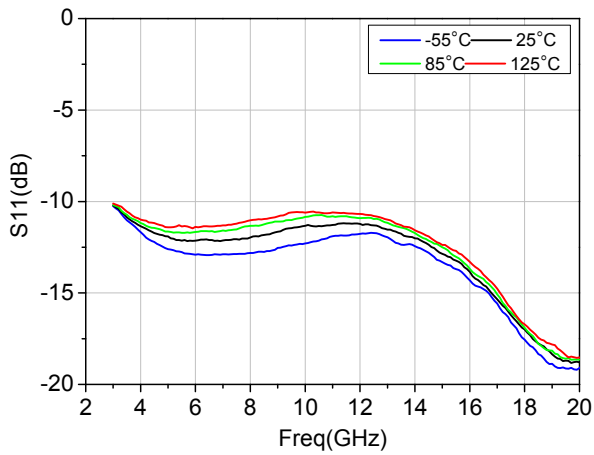
**Typical Testing Characteristics**



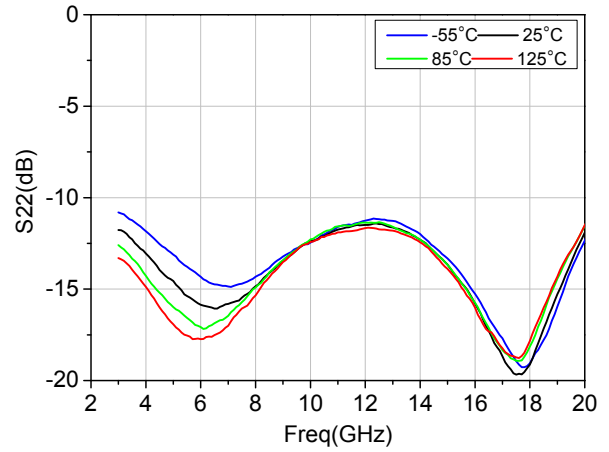
Gain vs Frequency



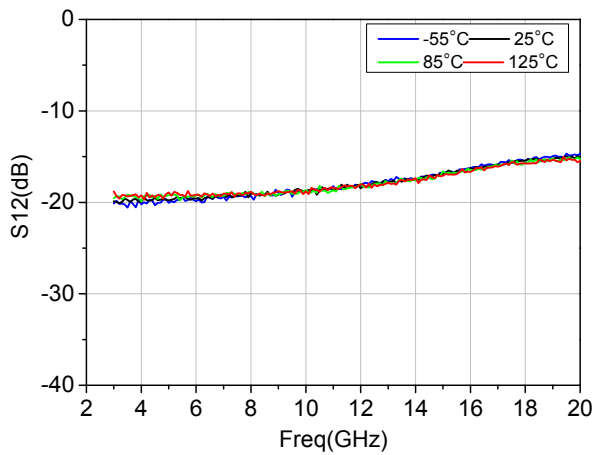
NF vs Frequency



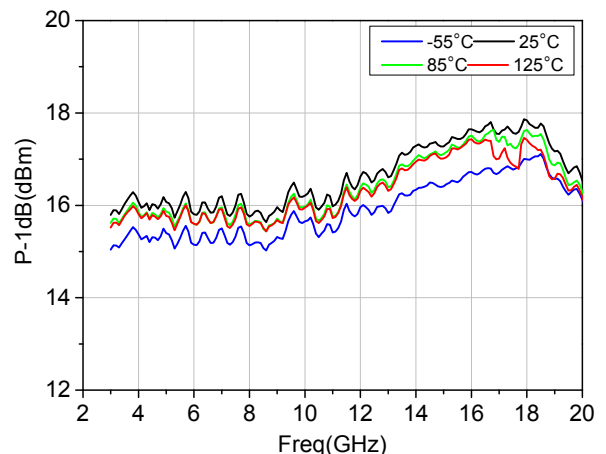
Input Return Loss vs Frequency



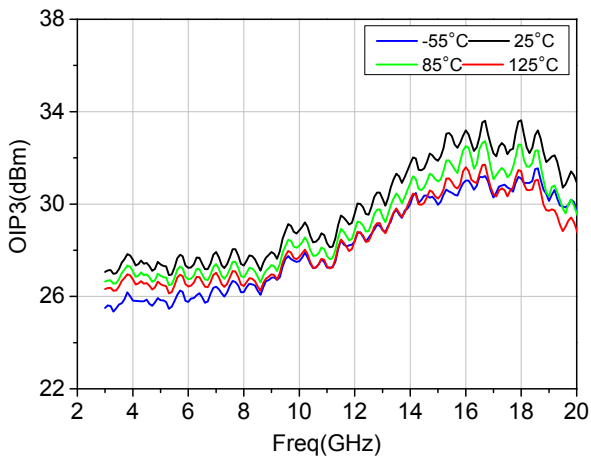
Output Return Loss vs Frequency



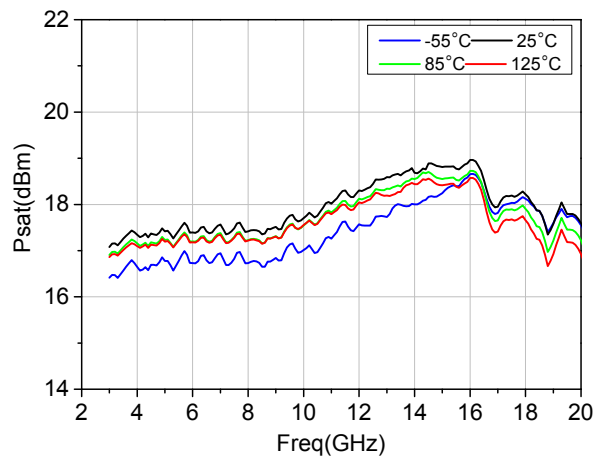
Reverse Isolation vs Frequency



Output P-1dB vs Frequency




OIP3 vs Frequency



Psat vs Frequency

### Absolute Maximum Ratings

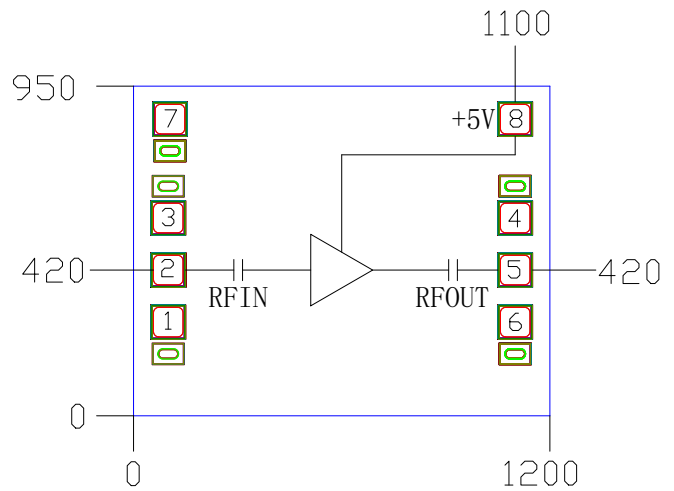
| Parameter Limits  | Value      |
|---|------------|
| Input Power, 50Ω  | 15dBm      |
| Drain Bias Voltage VD   | +6V        |
| Storage Temperature   | -65~+150°C |
| Operating Temperature   | -55~+125°C |
| Mounting Temperature (30s, N <sub>2</sub> Protection)                 | 300°C      |
| Exceeding the above conditions may cause permanent damage to the chip |            |



This product is ESD(Electrostatic discharge) sensitive. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

- Assembling in a clean environment.
- Avoiding rapid temperature changes during the mounting process.
- Do not touch the surface or use dry/wet chemical methods to clean the surface
- 2 bonding wires for input and output (in figure 八), the bonding wires should be as short as possible.
- Storing in a dry, N<sub>2</sub> protection environment.

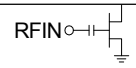
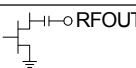
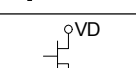
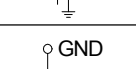

### Outline Drawing



### Notes:

1. Unit: μm
2. Back Side Metallization: Gold
3. Back side metal is ground
4. Bonding pad size: 100μm
5. Outline Dimensional Tolerance: ±50 μm

### Pad Descriptions

| Pad No.       | Function | Description  | Interface Schematic   |
|---------------|----------|--|---|
| 2             | RFIN     | RF signal input , 50Ω matched, with blocking capacitor inside                      |  |
| 5             | RFOUT    | RF Signal output, 50Ω matched, with blocking capacitor inside                      |  |
| 8             | VD       | Bias supplying voltage for the amplifier. External 100pF filter capacitor required |  |
| 1, 3, 4, 6, 7 | GND      | Grounding pad for probe test   |  |
| Die Bottom    | GND      | Die bottom must be connected to RF/DC ground                                       |  |

### Assembly Diagram

