

2. Pin Configuration

Figure 2-1. Pinning PSSO20 with Down Set Paddle

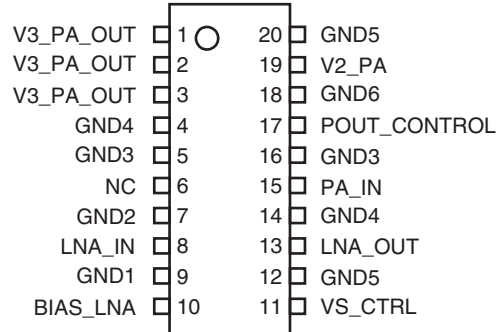


Table 2-1. Pin Description

| Pin | Symbol | Function |
|-----|--------------|--|
| 1 | V3_PA_OUT | Matching network for power amplifier output |
| 2 | V3_PA_OUT | Inductor to power supply and matching network for power amplifier output |
| 3 | V3_PA_OUT | Inductor to power supply and matching network for power amplifier output |
| 4 | GND4 | Ground |
| 5 | GND3 | Ground |
| 6 | NC | Not connected |
| 7 | GND2 | Ground |
| 8 | LNA_IN | Low-noise amplifier input |
| 9 | GND1 | Ground |
| 10 | BIAS_LNA | Resistor to V_S sets the LNA current |
| 11 | VS_CTRL | Supply voltage for control of power amplifier |
| 12 | GND5 | Ground |
| 13 | LNA_OUT | Low-noise amplifier output and supply voltage |
| 14 | GND4 | Ground |
| 15 | PA_IN | Power amplifier input |
| 16 | GND3 | Ground |
| 17 | POUT_CONTROL | Power amplifier control input |
| 18 | GND6 | Ground |
| 19 | V2_PA | Supply voltage for power amplifier |
| 20 | GND5 | Ground |

3. Absolute Maximum Ratings

All voltages are referred to GND (Pins 7, 9, 16, 18, 20, Slug)

| Parameters | Symbol | Min. | Max. | Unit |
|--|--------------|------|------|------|
| Supply voltage PA, TX, pins 1, 2, 3, 11, 19 | V_{S_PA} | | 5 | V |
| Supply voltage LNA, RX, pin 13 | V_{S_LNA} | | 2.8 | V |
| PA control voltage, TX, pin 17 | V_{CNTL} | | 5 | V |
| Junction temperature | T_{jmax} | | 150 | °C |
| Storage temperature | T_{Stg} | −55 | +125 | °C |
| Electrostatic handling HMB, all RF pins | V_{ESD} | | 200 | V |
| Electrostatic handling HMB, all control pins | V_{ESD} | | 2 | kV |

4. Operating Range

All voltages are referred to GND (Pins 7, 9, 16, 18, 20, Slug). The following table represents the sum of all supply currents into the mentioned pins.

| Parameters | Test Conditions/Pins | Symbol | Min. | Typ. | Max. | Unit |
|---------------------|--------------------------|--------------|------|------|------|------|
| Supply voltage PA | TX, pins 1, 2, 3, 11, 19 | V_{S_PA} | 3.0 | 3.6 | 4.5 | V |
| Supply voltage LNA | RX, pin 13 | V_{S_LNA} | 2.4 | 2.5 | 2.6 | V |
| Supply current PA | TX, pins 1, 2, 3, 11, 19 | I_{S_PA} | | 400 | | mA |
| Supply current LNA | Pins 10, 13 | I_{S_LNA} | | 2.5 | | mA |
| Ambient temperature | | T_{amb} | −30 | +25 | +60 | °C |

5. Thermal Resistance

| Parameters | Symbol | Value | Unit |
|------------------|------------|-------|------|
| Junction ambient | R_{thJA} | 19 | K/W |

6. Electrical Characteristics

Test conditions (unless otherwise specified) : $V_{S_PA} = 3.6V$, $T_{amb} = 25^{\circ}C$.

| Parameters | Test Conditions/Pins | Symbol | Min. | Typ. | Max. | Unit |
|--------------------------------------|--|------------------|---------|------|---------|---------|
| Power Amplifier⁽¹⁾ | | | | | | |
| Supply voltage | TX, pins 1, 2, 3, 11, 19 | V_{S_PA} | 3.0 | 3.6 | 4.5 | V |
| Supply current | TX, pins 1, 2, 3, 11, 19 | I_{S_PA} | | 400 | 550 | mA |
| Frequency range | TX | f | 300 | | 500 | MHz |
| Power gain | TX, pin 15 to pins 1, 2, 3 | Gp | 30 | 34 | | dB |
| Output power control range | TX | ΔP_{out} | ± 1 | | ± 3 | dB |
| Control voltage | TX, output power (maximum), pin 17 | | | 2.0 | 2.5 | V |
| | TX, output power (minimum), pin 17 | | | 0.7 | | V |
| Control current | Pin 17 | | 0 | | 400 | μA |
| Shut down mode | Control voltage $\leq 0.1V$, pins 1, 2, 3, 11, 19 | I_{S_PA} | | 10 | 20 | μA |
| Power added efficiency | TX at 466 MHz | PAE | 50 | 55 | | % |
| Saturated output power | TX, input power 3 dBm | Psat | 27.5 | 29 | 30.5 | dBm |
| Harmonics | TX, input power 3 dBm | 2 fo | | -20 | | dBc |
| | TX, input power 3 dBm | 3 fo | | -20 | | dBc |
| Low-noise Amplifier | | | | | | |
| Supply voltage | RX, pins 10, 13 | V_{S_LNA} | 2.4 | 2.5 | 2.6 | V |
| Supply current | RX, pins 10, 13 | I_{S_LNA} | | 2.5 | 3.5 | mA |
| Frequency range | RX | f | 300 | | 500 | MHz |
| Power gain | RX at $R1 = 5.6 k\Omega$, $I_S = 2.5 mA$ | Gp | 17.5 | 19 | 20.5 | dB |
| Noise figure ⁽²⁾ | RX at $R1 = 5.6 k\Omega$, $I_S = 2.5 mA$ | NF | | 1.5 | 2.0 | dB |
| Isolation | RX at $R1 = 5.6 k\Omega$, $I_S = 2.5 mA$ | ISO | | 20 | | dB |
| Third-order input interception point | RX at $R1 = 5.6 k\Omega$, $I_S = 2.5 mA$ | IIP3 | -13 | -10 | | dBm |

- Notes:
1. Power amplifier should be unconditionally stable, maximum duty cycle 100%, true cw operation, maximum load mismatch 10:1 for 5s at 3.6V
 2. Ensured by design

7. Typical Characteristics

Figure 7-1. Power Sweep

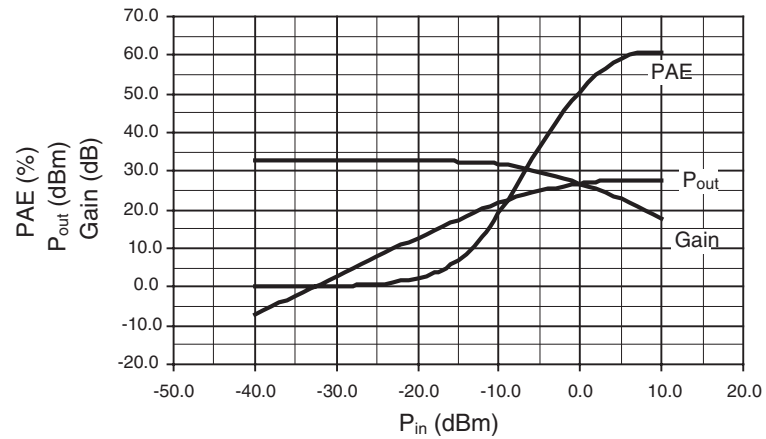


Figure 7-2. Ramp Sweep

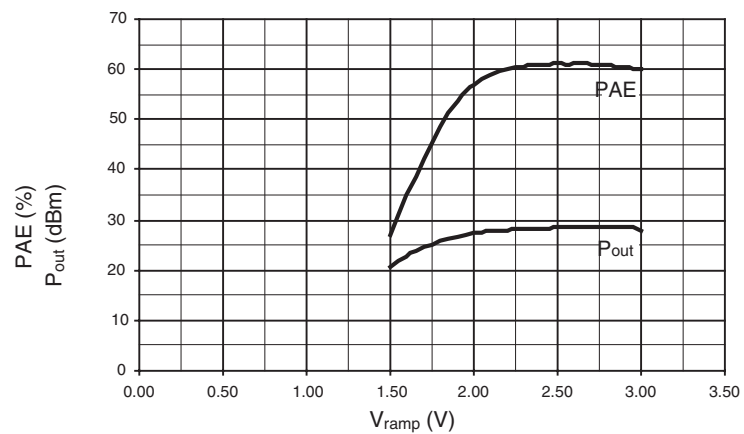
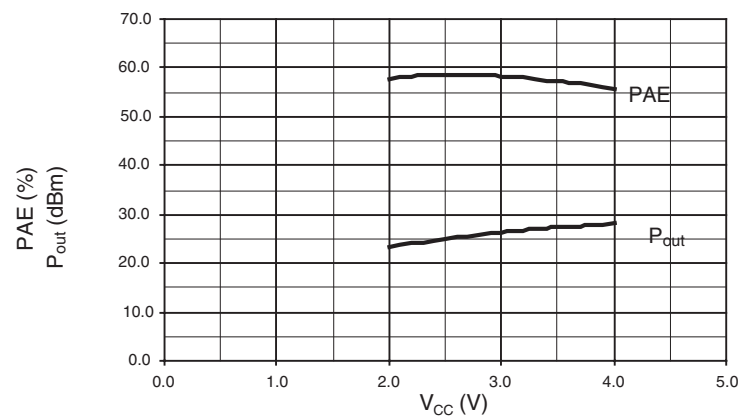


Figure 7-3. V_{CC} Sweep



8. Application Circuit

Figure 8-1. Typical Application Circuit

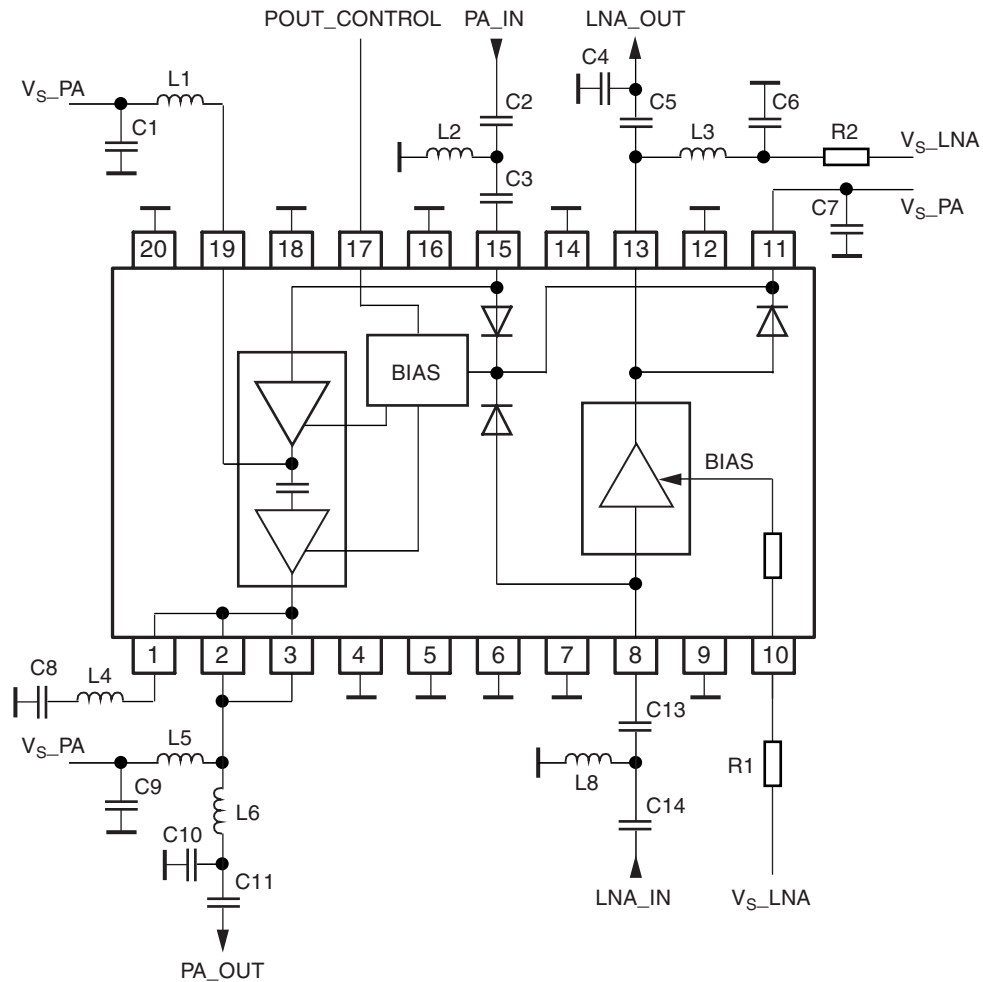


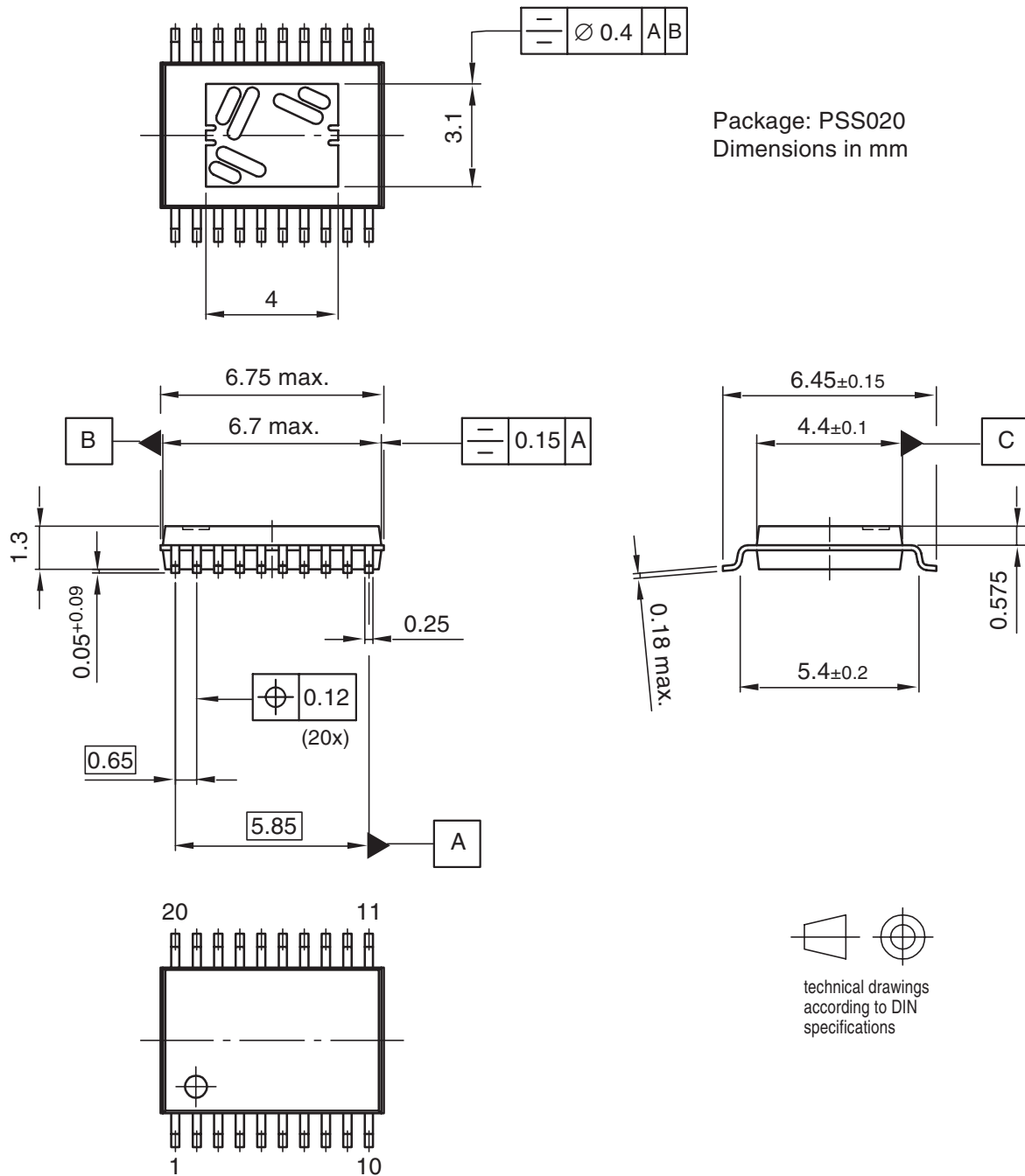
Table 8-1. Bill of Materials for 460 MHz Applications

| Part No. | Description | Part Value | Package | Vendor |
|--------------------------|-------------|------------|---------|----------|
| C1 | Capacitor | 1 nF | 0603 | Standard |
| C2, C3, C7, C9, C11, C13 | Capacitor | 100 pF | 0603 | Standard |
| C4 | Capacitor | n.c. | 0603 | Standard |
| C5 | Capacitor | 3.9 pF | 0603 | Standard |
| C6 | Capacitor | 220 pF | 0603 | Standard |
| C8 | Capacitor | 2.7 pF | 0604 | Standard |
| C10 | Capacitor | 12 pF | 0603 | Standard |
| C14 | Capacitor | 8.2 pF | 0603 | Standard |
| L1 | Inductor | 1.5 nH | 0805 | Standard |
| L2 | Inductor | 39 nH | 0805 | Standard |
| L3, L5, L8 | Inductor | 22 nH | 0805 | Standard |
| L4 | Inductor | 6.8 nH | 0805 | Standard |
| L6 | Inductor | 3.9 nH | 0805 | Standard |
| R2 | Resistor | 0 | 0603 | Standard |

9. Ordering Information

| Extended Type Number | Package | Remarks |
|----------------------|---------|------------------|
| ATR0981-TRUY | PSSO20 | Tube |
| ATR0981-TRHY | PSSO20 | Taped and reeled |

10. Package Information



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