TRANSCOM

# TC5287C

PRE.2_11/01/2021

## 26.5 – 31.5 GHz 3-Stages 3W PA MMIC(Chip Form)

### FEATURES

- Psat : ~ +34.0dBm
- P1dB : ~ +32.0dBm
- IMD3 : +44.0dBc @ Pscl +20dBm
- Small Signal Gain: ~ 23dB
- Bias Condition: 1400mA @ +6V

### APPLICATIONS

- New 5G Radio Link
- VSAT
- Sat-Com
- Point-to-Point Radio

### DESCRIPTION

The TC5287C is a three-stages PHEMT high power amplifier MMIC that operates from 26.5 to 31.5 GHz. The amplifier provides a typical 23 dB of gain and delivers +34 dBm of Psat. The MMIC is fabricated using Transcom's proprietary matured GaAs PHEMT process. The process features full passivation for increased performance and reliability. All devices are 100 % DC tested to assure consistent quality. Bond pads are gold plated for either thermocompression or thermosonic wire bonding. Backside gold plating is compatible with standard AuSn die-attach.

### ELECTRICAL SPECIFICATIONS (Ta = 25 °C)

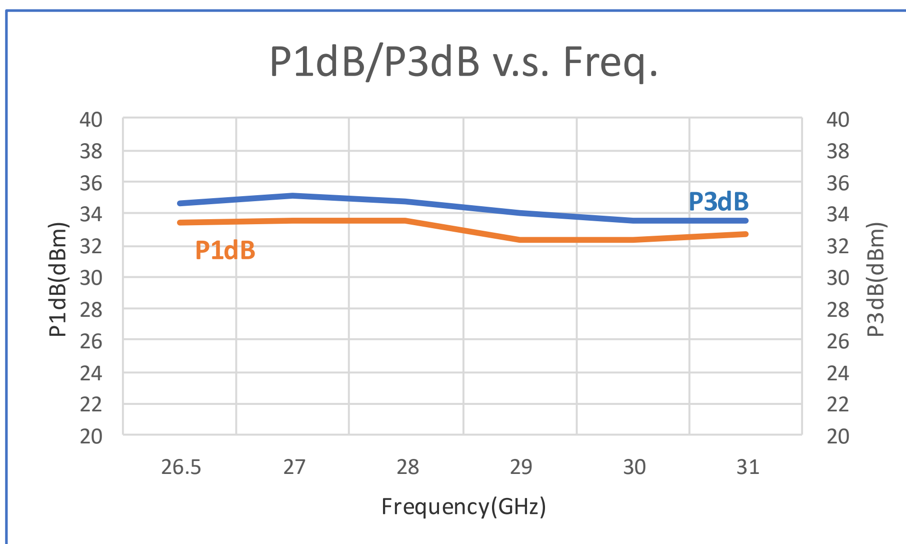
| SYMBOL | DESCRIPTION | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|
| **FREQ** | Frequency Range | 26.5 | | 31.5 | GHz |
| **SSG** | Small Signal Gain | | 23 | | dB |
| **Psat** | Saturation Output Power | | 34.0 | | dBm |
| **P1dB** | 1dB Compression Output Power | | 32.0 | | dBm |
| **IMD3** | The Third Intermodulation level at Pout +20dBm/tone, △f=1MHz | | 44.0 | | dBc |
| **I.L., IN** | Input Return Loss | | 8 | | dB |
| **I.L., OUT** | Output Return Loss | | 10 | | dB |
| **VDD** | Supply Drain Voltage | | +6 | | Volt |
| **IDQ** | Current Supply Without RF | | 1,400 | | mA |
| **IDRF** | Current Supply @ Psat | | 2,600 | | mA |
| **VG** | Supply Gate Voltage | | -1.1 | | Volt |

## ABSOLUTE MAXIMUM RATINGS

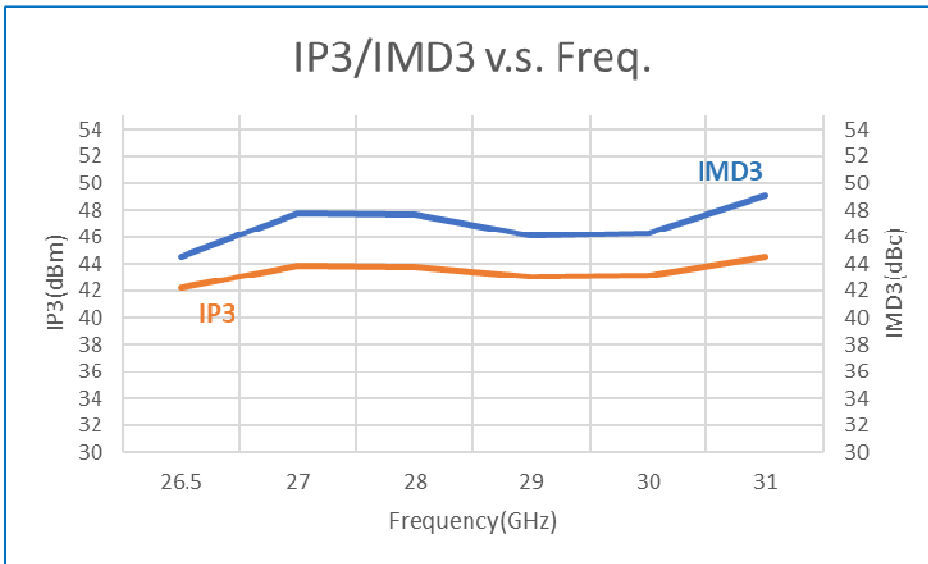
| Symbol | Parameter | Rating |
|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | 7 V |
| $I_D$ | Drain Current | 4 A |
| $P_T$ | Continuous Dissipation | 20 W |
| $P_{in}$ | Input Power, CW | +25 dBm |
| $T_{CH}$ | Junction Temperature | +175 |
| $T_{OTR}$ | Operation Temperature | - 40 °C to +85 °C |
| $T_{STG}$ | Storage Temperature | - 50 °C to +150 °C |

## TYPICAL CHARACTERISTICS

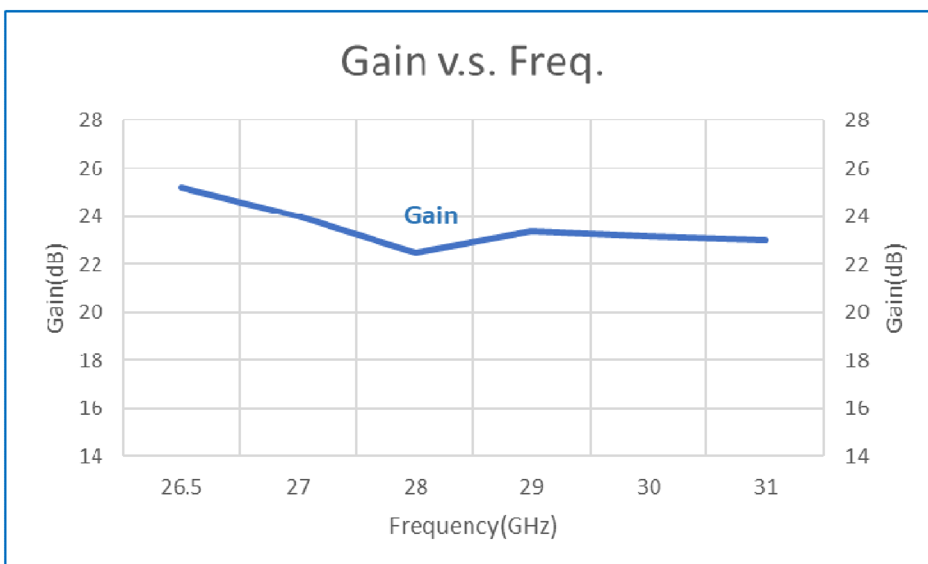
Pout vs Freq.



IP3 / IMD3 vs Freq (@Pscl = +20dBm, △f=1MHz)

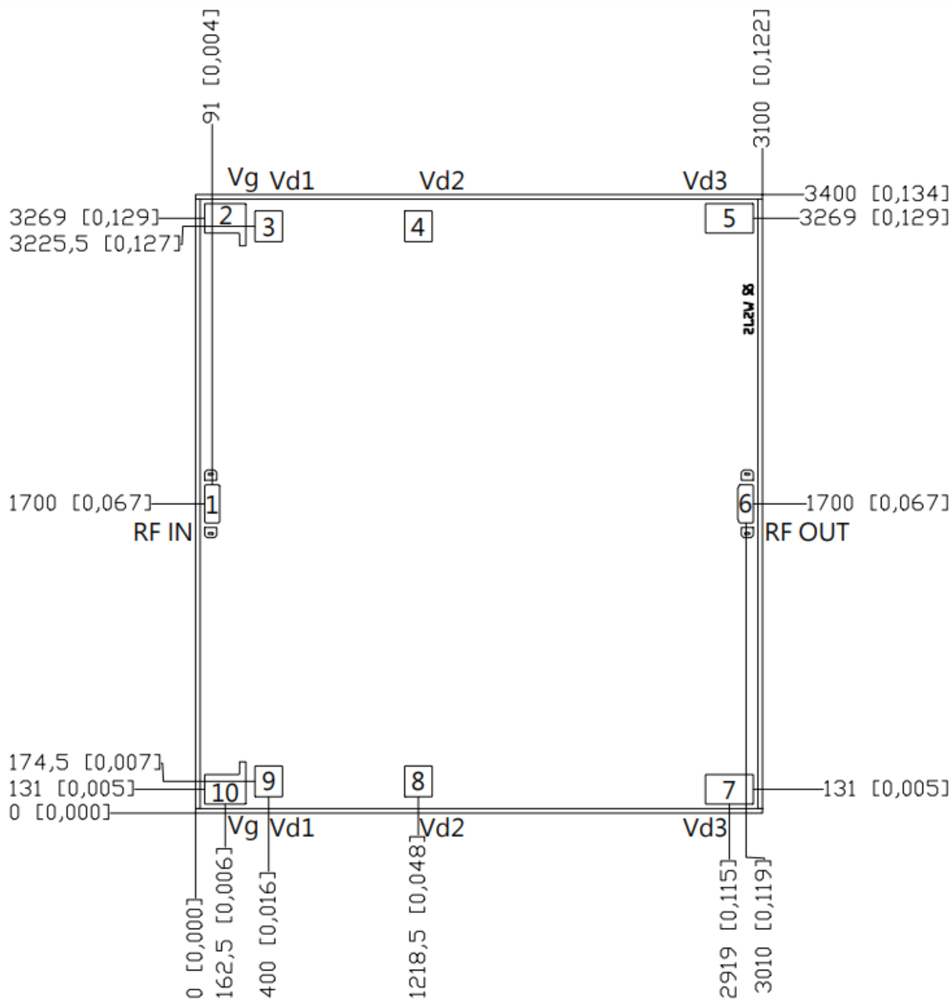



Gain vs Freq



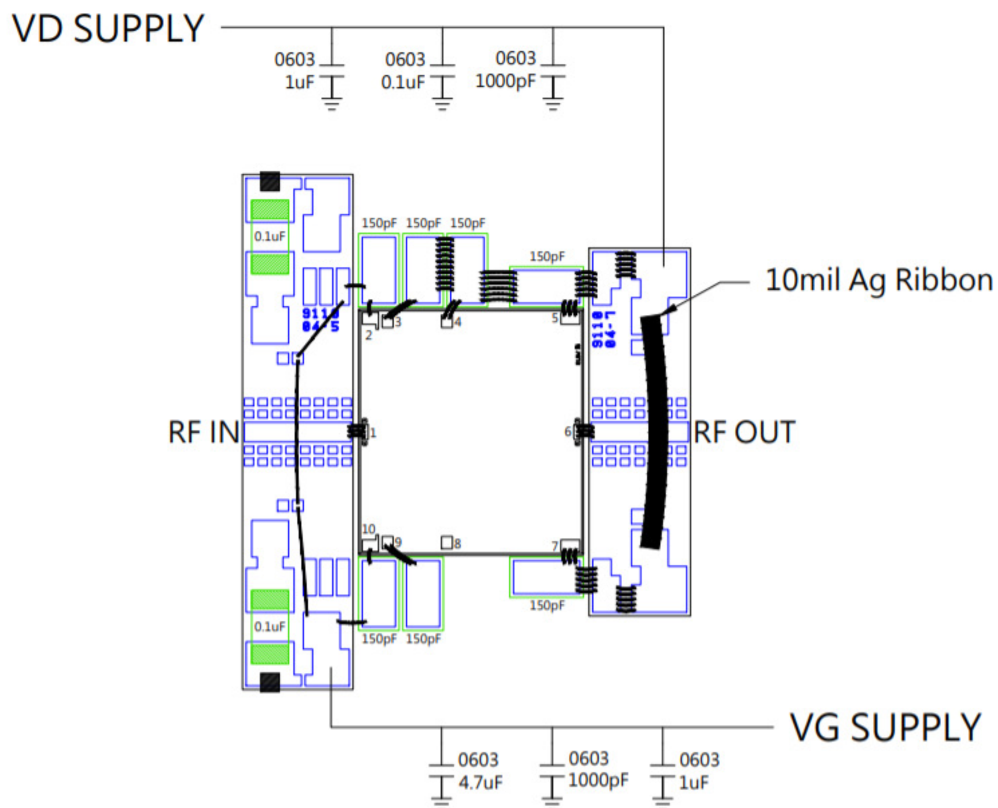
## MECHANICAL OUTLINE

Units : micrometer (inch)
Thickness : 50.8 (0.002)
Chip Size : 3100 ± 50.8 × 3400 ± 50.8 ( 0.122 ± 0.002 × 0.134 ± 0.002 )
Bond pad # 1 (RF In) : 82 × 210 (0.0032 ×0.0083)
Bond pad # 2,10 (Vg ) : 225 × 162 (0.0089 ×0.0064)
Bond pad # 3,9 (Vd1 ) : 150 × 169 (0.0059 ×0.0067)
Bond pad # 4,8 (Vd2 ) : 150 × 169 (0.0059 ×0.0067)
Bond pad # 5,7 (Vd3 ) : 262× 162 (0.0103 ×0.0064)
Bond pad # 6 (RF Out) : 85.5 × 210 (0.0034 ×0.0083)



## ASSEMBLY DIAGRAM

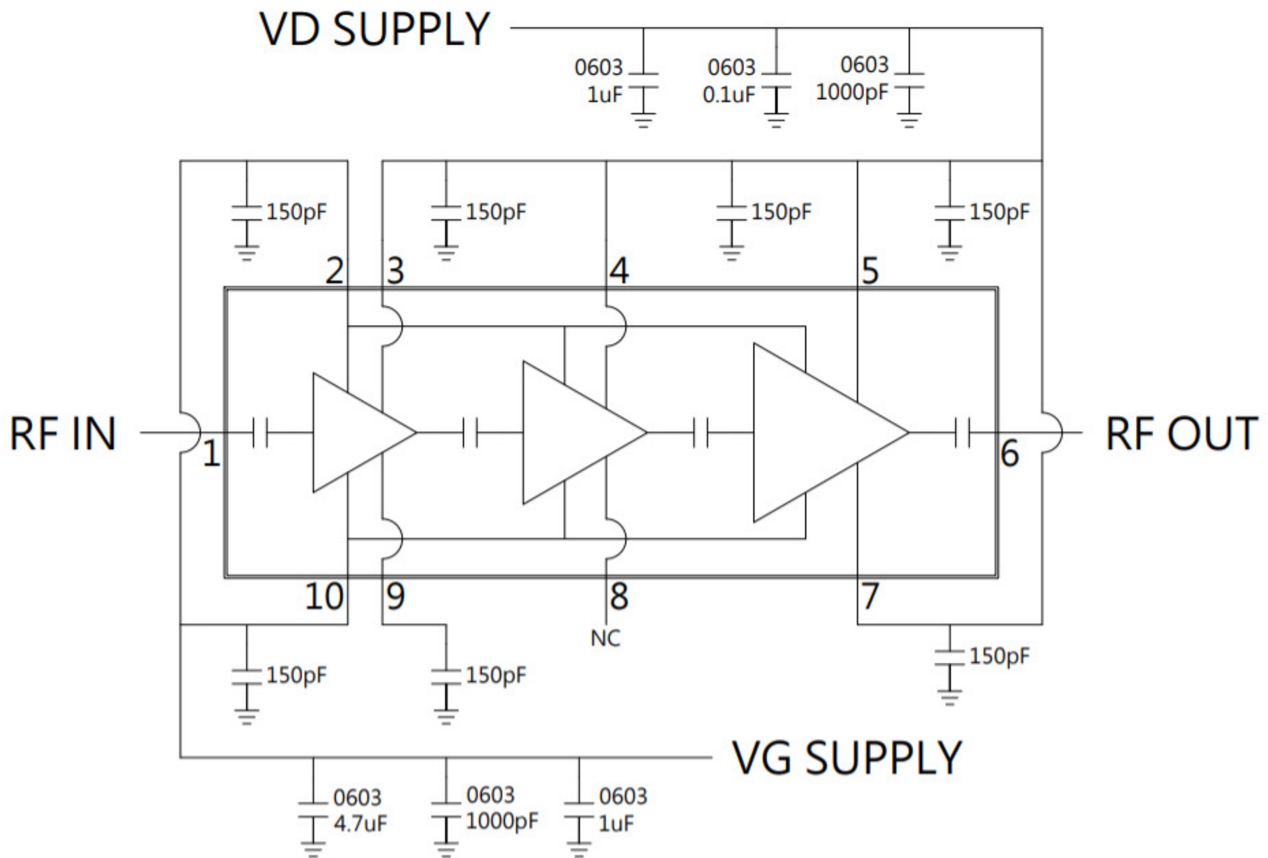
1. Using 1mil Au Wire.
2. Substrate Material : Al2O3
3. Substrate Thickness : 10 mil
4. 150pF capacitors are MIS capacitors




Other listing matrials

| Value | Description | Manufacturer | Part Number |
|---|---|---|---|
| 1000pF | 0603, ±5%, +50 V, C0G | Murata | GRM1885C1H102JA01 |
| 0.1uF | 0603, ±10%, +50V, X7R | Murata | GRM188R71H104KA93D |
| 1uF | 0603, ±10%, +25V, X7R | Murata | GCJ188R71E105KA01D |
| 4.7uF | 0603, ±10%, +10V, X7S | Murata | GRM188C71A475KE11D |

## APPLICATION CIRCUIT




Note: All 150pF are thin film capacitor.

**TRANSCOM, INC.,** 90 Dasoong 7th Road, Tainan Science- Based Industrial Park, Hsin-She Dist., Tainan Taiwan
Web-Site: www.transcominc.com.tw Phone: 886-6-5050086 Fax: 886-6-5051602