

Product Features

5800MHz(ISM band)
 110W(typical) and 100W(min) CW@ @25 degree
 130W(typical) and 120W(min) pulse CW
 50% Drain Efficiency@50V
 50ohm in and out, 10*20mm, screw down

Applications

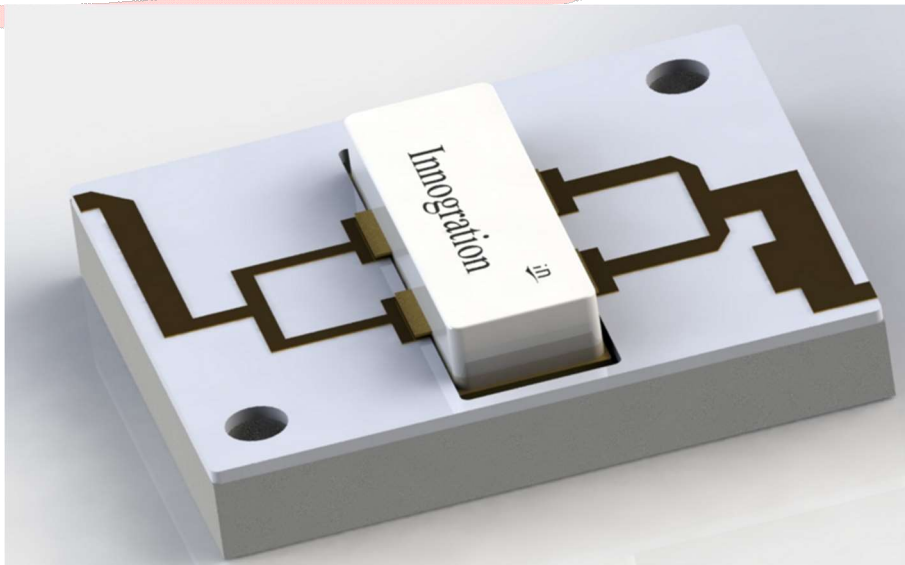
Industrial
 Scientific
 Medical
 Plasma Lighting
 RF Cooking

Description

The SMPA5759-100V is designed for Industrial, Scientific, Medical(ISM) and Plasma Lighting application at 5800MHz. This Amplifier pallet is suitable for use in CW and pulse applications. This high efficiency rugged amplifier pallet is targeted to replace Industrial magnetrons and other vacuum tubes currently powering industrial heating, drying, plasma lighting and medical systems.

Featured by its tiny size 10*20mm, and 50ohm fully matched at input and output, drop-in placement by screwing it down and 100% RF test, it enables easier power combination to reach higher power with high production yield as part of customer's power amplifier system.

Also, it can be used for 4.8-6GHz as wideband power amplifier, as extended application





Electrical Specifications @VCC=50V, T=25°C, 50Ωsystem

| PARAMETER | UNIT | MIN | TYP | MAX | SYMBOL |
|---------------------|------|------|------|------|--------|
| Operating Frequency | MHz | 5700 | - | 5900 | fo |
| Operating Bandwidth | MHz | - | 200 | - | OBW |
| CW Output Power | W | 100 | 110 | - | Pout |
| Power Gain | dB | 9.5 | 10.5 | - | Gp |
| Gain Flatness | dB | - | - | ±0.5 | Gf |
| Input Return Loss | dB | - | - | -10 | S11 |
| Operating Voltage | V | - | 50 | - | Vcc |
| Quiescent Current | mA | - | 100 | - | Ibq |
| Efficiency@100W CW | % | 48 | 50 | - | Eff |

Environmental Characteristics

| PARAMETER | UNIT | MIN | TYP | MAX | SYMBOL |
|------------------------------------|------|-----|-----|-----|--------|
| Operating Case Temperature | °C | 0 | - | 60 | Ta |
| Storage Temperature | °C | -40 | - | 100 | Tstg |
| Relative humidity w/o condensation | % | - | - | 95 | RH |

Mechanical Specifications

| PARAMETER | UNIT | VALUE |
|-----------------------|------|--------------------|
| Dimensions(L × W × H) | mm | 20×24×4 |
| Weight | g | 50 |
| RF Input Connector | - | N/A |
| RF Output Connector | - | N/A |
| Cooling | - | External Heat-sink |



Typical performance

- Pulsed CW performance

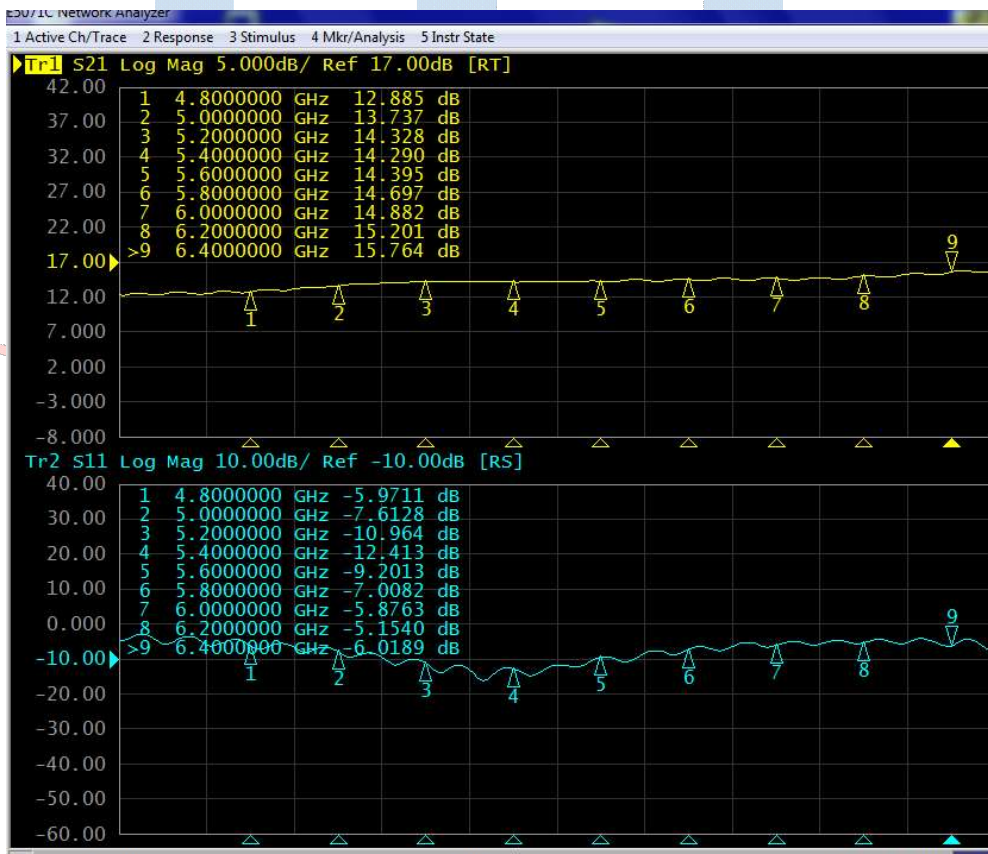
Test Condition: Vds=+50V, IDQ=100mA, T=25°C, pulse width 100us, duty cycle 10%,

| Freq(MHz) | P_1dB(dBm) | P_1dB(W) | P_1dB Eff(%) | Gain(P_1dB) | P_3dB(dBm) | P_3dB(W) | P_3dB Eff(%) |
|-----------|------------|----------|--------------|-------------|------------|----------|--------------|
| 5600 | 49.85 | 96.67 | 51.19 | 13.15 | 51.25 | 133.42 | 55.72 |
| 5700 | 49.81 | 95.81 | 51.65 | 13.58 | 51.23 | 132.86 | 56.39 |
| 5800 | 49.79 | 95.36 | 51.79 | 13.75 | 51.17 | 131.01 | 56.15 |
| 5900 | 49.47 | 88.6 | 50.13 | 13.37 | 51.07 | 127.99 | 55.75 |

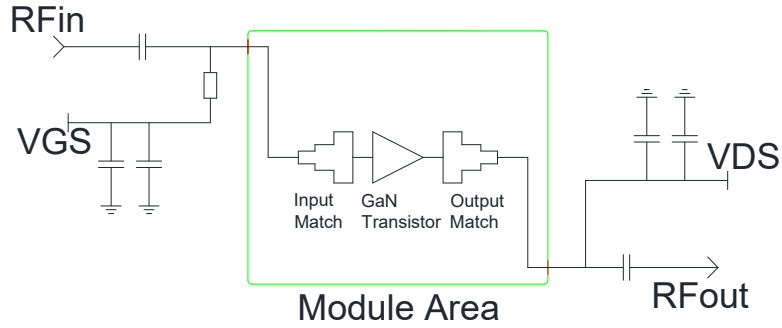
- CW performance

| Freq(MHz) | Pin(dBm) | Pout(dBm) | Pout(W) | IDS(A) | Gain(dB) | Eff(%) |
|-----------|----------|-----------|---------|--------|----------|--------|
| 5600 | 39.6 | 50.45 | 110.92 | 4.54 | 10.85 | 48.86 |
| 5700 | 39.37 | 50.5 | 112.20 | 4.48 | 11.13 | 50.09 |
| 5800 | 39.2 | 50.42 | 110.15 | 4.42 | 11.22 | 49.84 |
| 5900 | 39.6 | 50.33 | 107.89 | 4.35 | 10.73 | 49.61 |

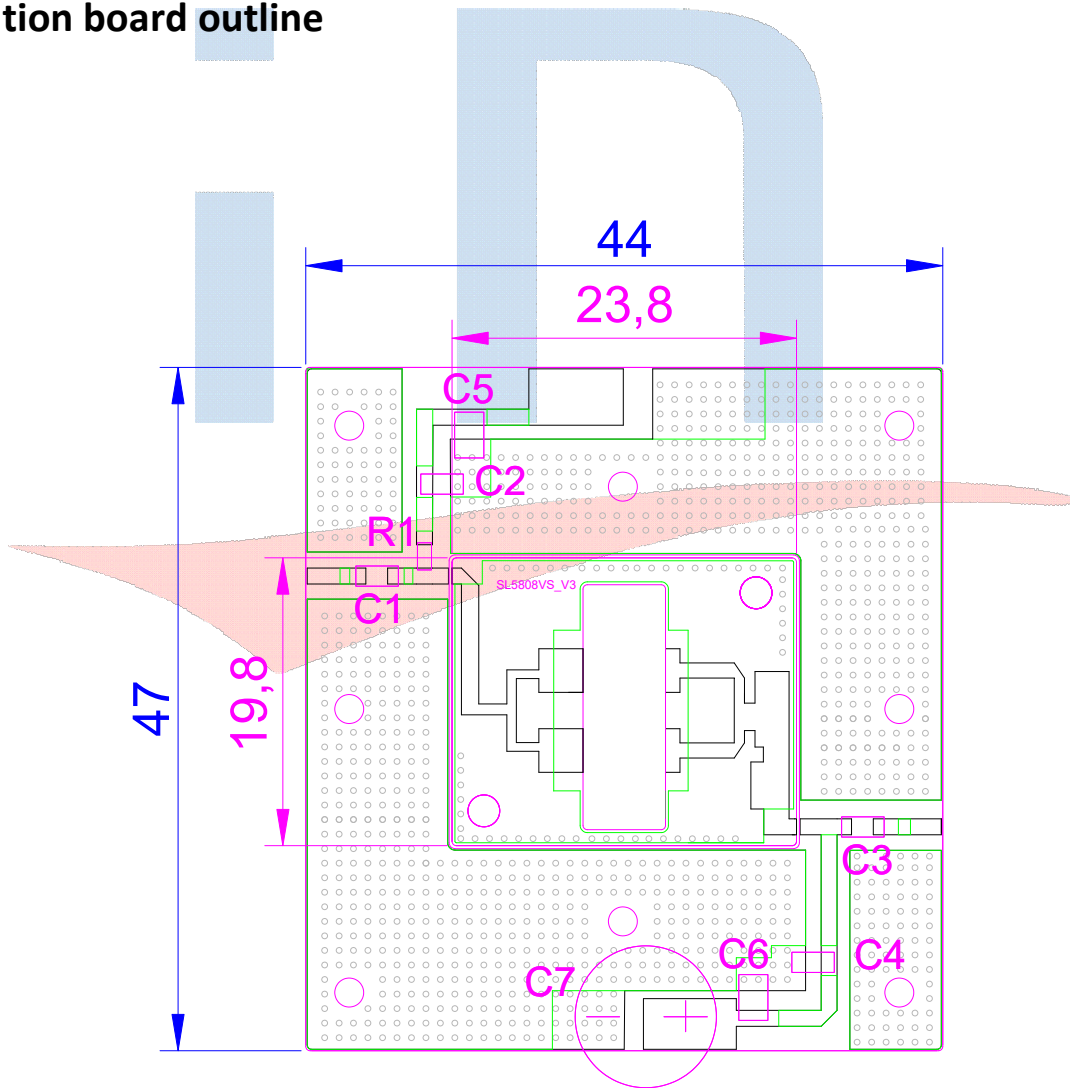
- Network analyzer (S11/S21)



Evaluation board Block Diagram



Evaluation board outline





Revision History

Document revision history

| Date | Revision | Datasheet Status |
|-----------|----------|---|
| 2020/4/23 | Rev 1.0 | Preliminary Datasheet |
| 2020/8/25 | Rev 1.1 | Update based on bonding wire modification |
| | | |

Application data based on YHG-20-24



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