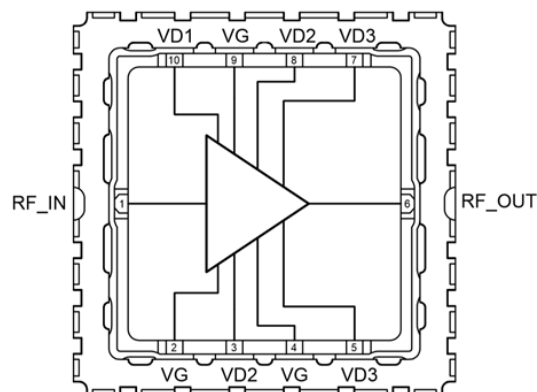


8.5 – 12GHz 20W GaN High Power Amplifier

Features

- ◆ Frequency Range : 8.5 – 12 GHz
- ◆ Small signal Gain : 28 dB
- ◆ Power Gain : 23 dB
- ◆ Psat : 43 dBm (typ)
- ◆ PAE : 35%
- ◆ Package Size : 7 mm x 7 mm x 1.5 mm



Typical Applications

- ◆ Communications
- ◆ Electronic Warfare
- ◆ Test Instrumentation
- ◆ EMC Amplifier

Description

The ASTRA 3144012C7 is a three stage High Power Amplifier designed to operate from 8.5 to 12 GHz frequency band. This Amplifier features 43dBm saturated output power with power gain of 23dB. The power amplifier designed using highly reliable AlGaIn/GaN HEMT process.

Absolute Maximum Ratings¹

Parameter	Absolute Maximum	Units
Drain supply voltage ²	32	volts
Drain current (Idq _{Peak}) ²	3	A
RF input power at Vd=28V	33	dBm
Operating temperature	-40 to +80	°C
Storage Temperature	-65 to +150	°C

1. Operation beyond these limits may cause permanent damage to the component
2. Operating Pulse Duty Cycle is 20% (max) unless otherwise specified

**Electrical Specifications @ $T_A = 25\text{ }^\circ\text{C}$, $Z_o = 50\ \Omega$** *$V_d=28\text{V}$, $I_{dq_{Avg}}=150\text{mA}$, Pulse Duty Cycle=10%*

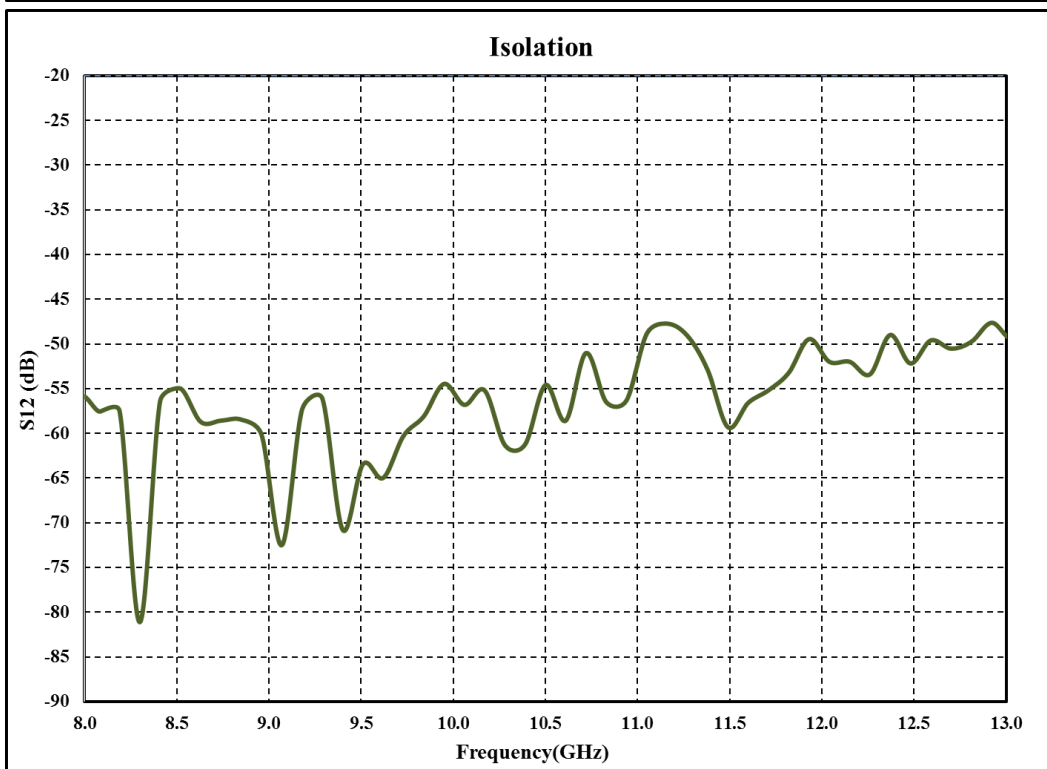
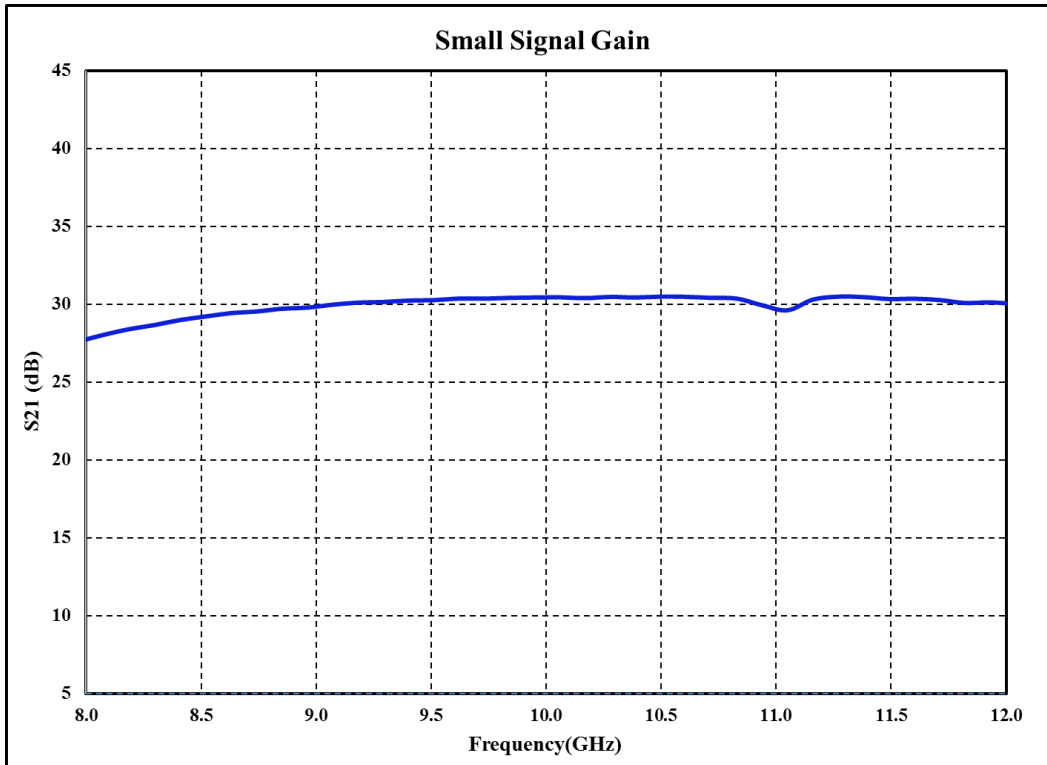
S.No	Parameter	Typical Value	Units
1	Frequency	8.5 – 12	GHz
2	Small Signal Gain	28	dB
3	Input Return Loss	10	dB
4	Output Return Loss	10	dB
5	Saturated Output Power	43	dBm
6	Power Gain	23	dB
7	PAE	35	%
8	Drain Voltage (V_d)	28	V
9	Quiescent Current ($I_{dq_{Avg}}$)	150	mA
10	Saturated current ($I_{dsat_{Avg}}$)	200	mA
11	Package Size	7 x 7 x 1.5	mm

Note:

1. The above parameters specified are measured in 50-Ohm test fixture.
2. Adjust V_g between -3.5V to -2.5V to achieve required I_{dq} .

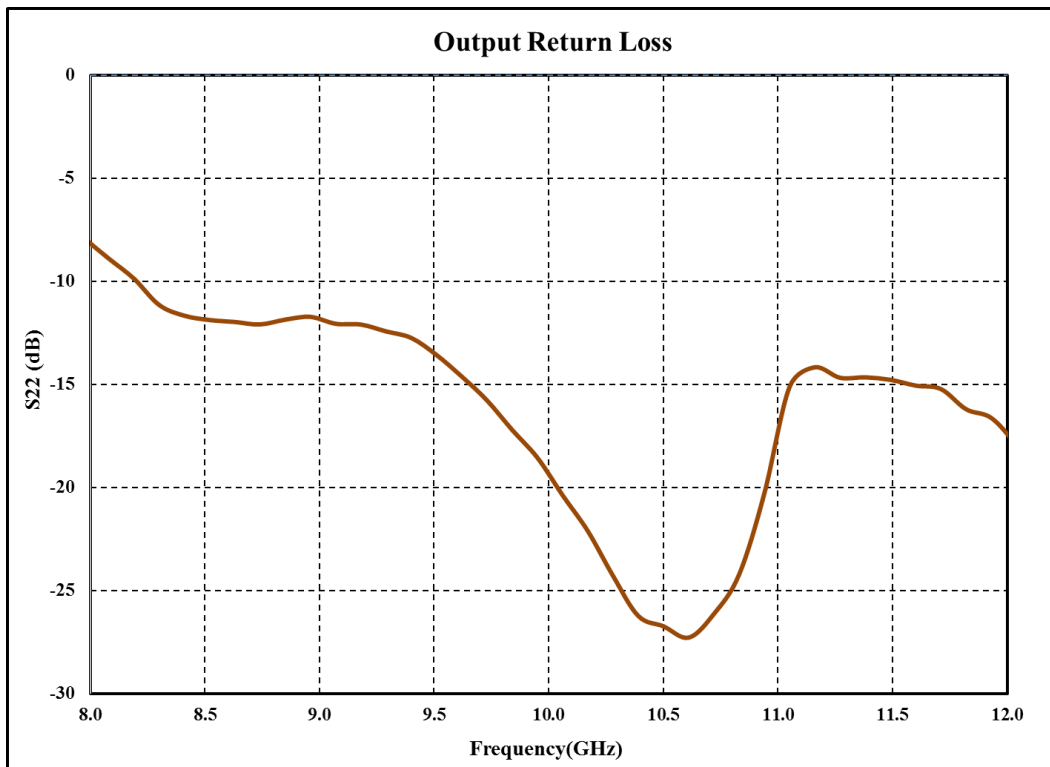
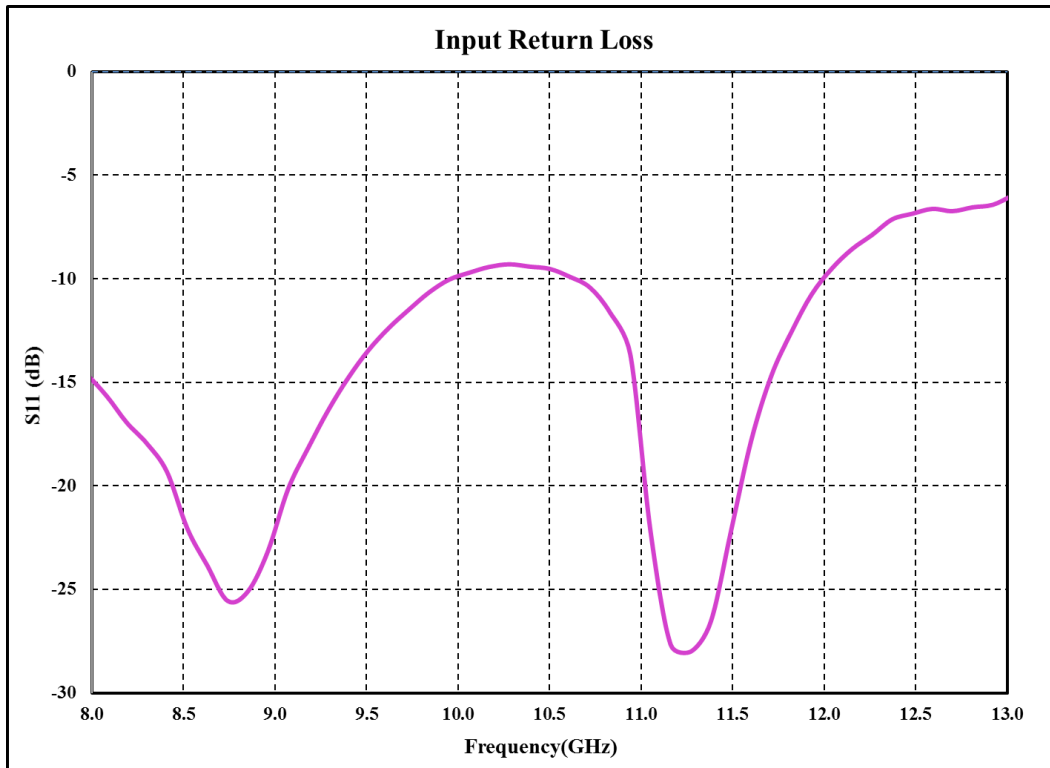


Test Fixture Data for $V_d=28V$, $I_{dq_{Avg}}=150mA$,
 $T_A = 25^\circ C$, $Z_o=50 \Omega$, *Pulse Duty Cycle=10%*



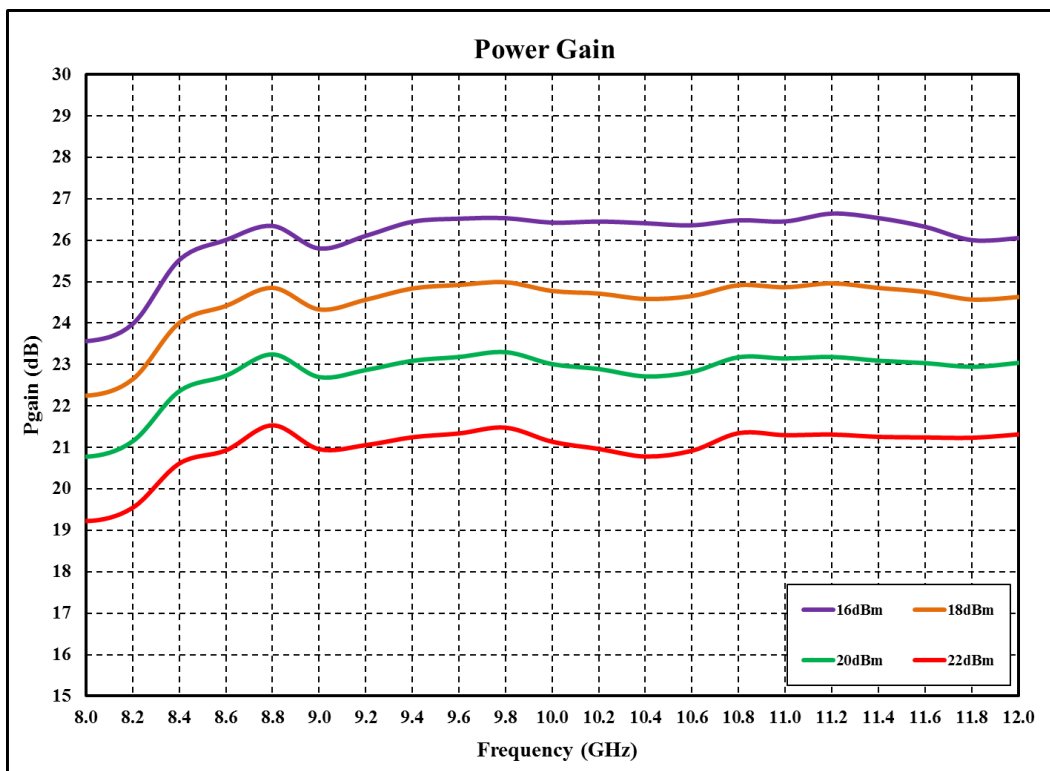
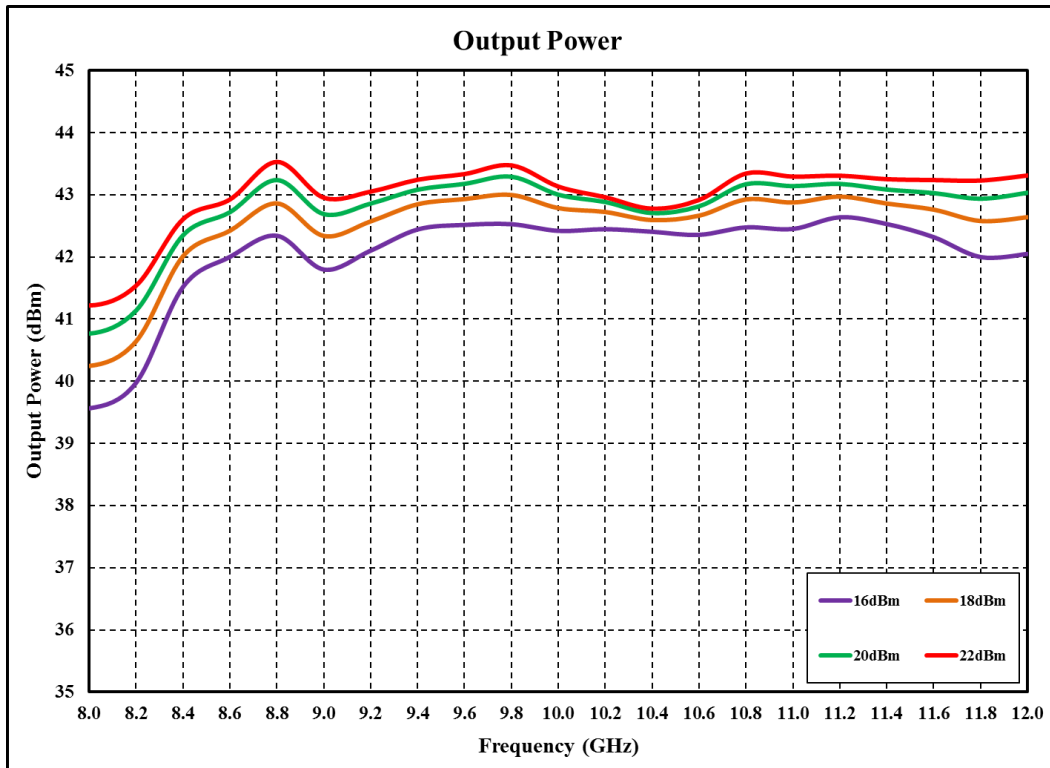


Test Fixture Data for $V_d=28V$, $I_{dq,avg}=150mA$,
 $T_A = 25^\circ C$, $Z_o=50 \Omega$, Pulse Duty Cycle=10%



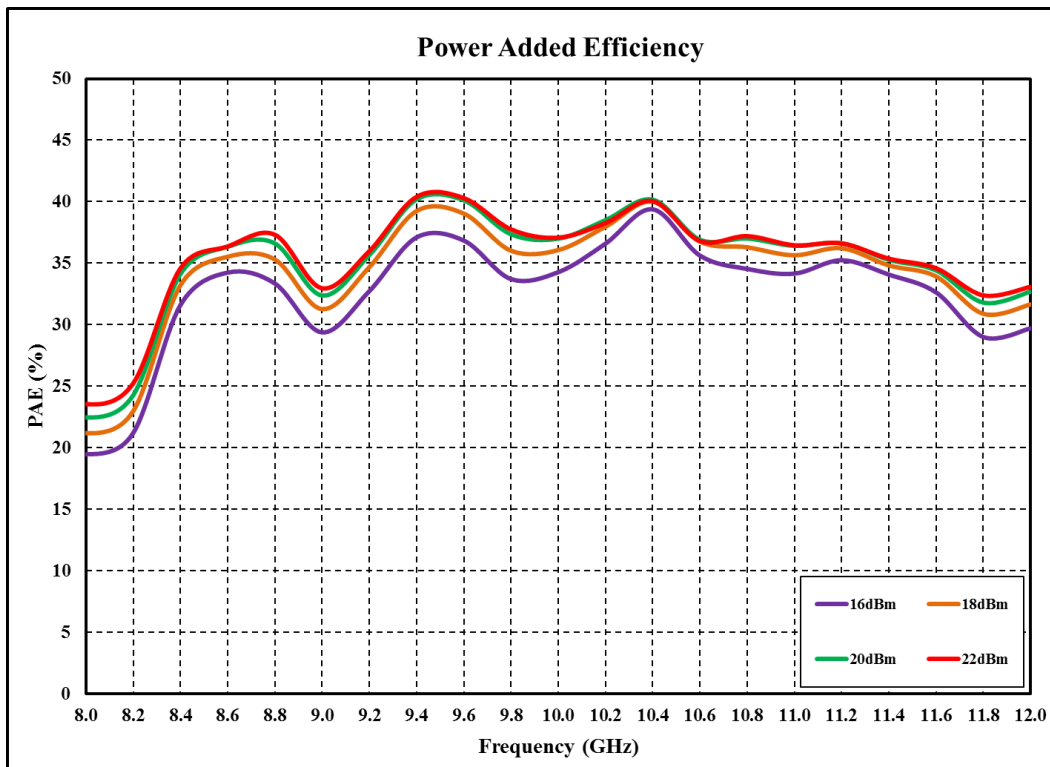
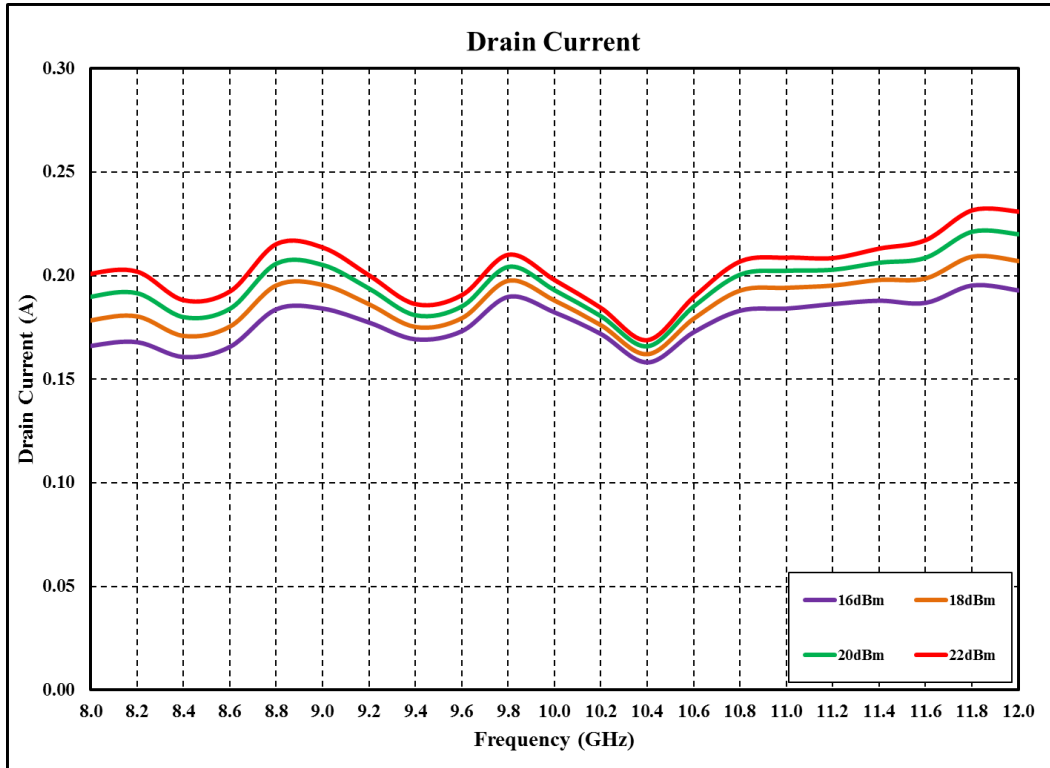


Test Fixture Data for $V_d=28V$, $I_{dq_{Avg}}=150mA$,
 $T_A = 25^\circ C$, $Z_o=50 \Omega$, Pulse Duty Cycle=10%

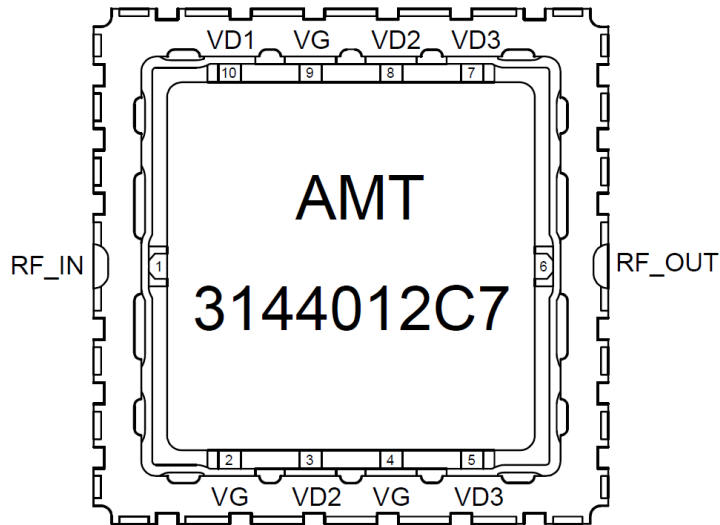




Test Fixture Data for $V_d=28V$, $I_{dq_{Avg}}=150mA$,
 $T_A = 25^\circ C$, $Z_o=50 \Omega$, Pulse Duty Cycle=10%



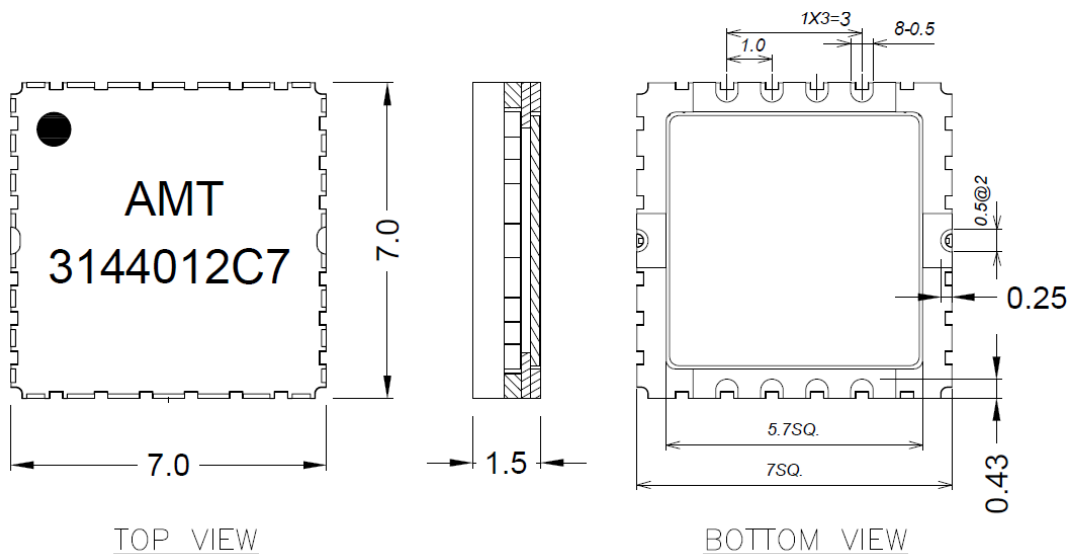
Pin Configuration Details



Pin Description:

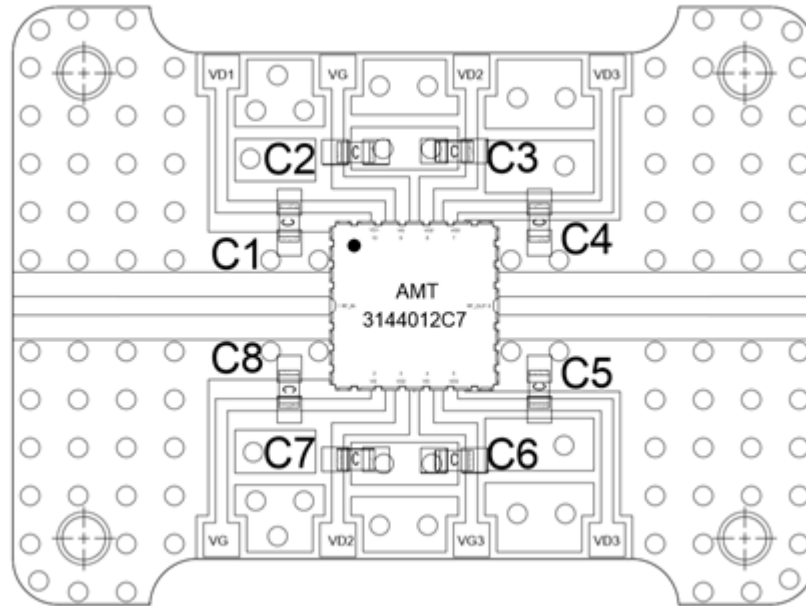
Pin 1	: RF IN
Pin 10	: VD1 (Drain bias voltage)
Pin 2, 4 & 9	: VG (Gate bias voltage)
Pin 3 & 8	: VD2 (Drain bias voltage)
Pin 5 & 7	: VD3 (Drain bias voltage)
Pin 6	: RF OUT

QFN package outline



Units: All dimensions are in millimeters

Recommended Assembly Diagram



Bill of Material

S No.	Component	Part Number	Vendor
C1	CAP MCC 1UF±10% 50V 0603 X5R	C1608X5R1H105K080AB ¹	KEMET
C2	CAP MCC 1KPF±10% 16V 0402 X7R	CD1020K12J4RACTU ¹	KEMET
C3	CAP MCC 1UF±10% 50V 0603 X5R	C1608X5R1H105K080AB ¹	KEMET
C4	CAP MCC 1UF±10% 50V 0603 X5R	C1608X5R1H105K080AB ¹	KEMET
C5	CAP MCC 1UF±10% 50V 0603 X5R	C1608X5R1H105K080AB ¹	KEMET
C6	CAP MCC 1KPF±10% 16V 0402 X7R	CD1020K12J4RACTU ¹	KEMET
C7	CAP MCC 1UF±10% 50V 0603 X5R	C1608X5R1H105K080AB ¹	KEMET
C8	CAP MCC 1KPF±10% 16V 0402 X7R	CD1020K12J4RACTU ¹	KEMET

- Any other equivalent component part with similar parameters can be used as a substitute in place of the part no's mentioned above.

Note:

- Input and output 50-ohm lines are preferably on 5mil or 10mil RT Duroid substrate.
- Gate Bypass Capacitors "C2, C6, C8" and the Drain Bypass Capacitors "C1, C3, C4, C5 and C7" need to be placed close to the chip.
- Use high thermal conductive material for die mounting/die attachment for long-term reliability.



GaN MMIC devices are susceptible to Electrostatic discharge. Proper precautions should be observed during handling, assembly & testing

All information and Specifications are subject to change without prior notice. Before using the product, please download and refer to latest datasheet from website.