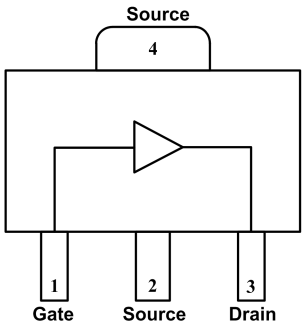
Description

Innotion’s YP601238T is a 7-watt, unmatched gallium nitride (GaN) high electron mobility transistor (HEMT) designed specifically with high efficiency, high gain and wide bandwidth capabilities with frequency up to 7200MHz. The transistor is supplied in a plastic SOT-89 package.



Package: SOT89-3

Mark: YP601238T

Features

- High Efficiency and Linear Gain Operation
- Negative Gate Voltage and Bias Sequencing Required
- Excellent Thermal Stability and Excellent Ruggedness
- Gold Metallization System: Chip-Wire Bond-Package

Applications

- Industry heating
- Wideband amplifier
- Wireless communication infrastructure
- ISM

DC Bias Sequencing

Turn On GaN Device	Turn Off GaN Device
1. RF Power Off 2. Set VGS=-5V (Negative Voltage to Pinch Off) 3. Turn on VDD Voltage 4. Slowly Increase VGS Until Bias Current IDQ is set 5. Turn On RF Power	1. Turn Off RF Power 2. Turn off VDD Voltage 3. After VDD is Discharged, Set VGS=-5V 4. Turn off VGS Voltage

Maximum Ratings

Rating	Symbol	Value	Unit
Drain-Source Voltage	VDSS	+160	Vdc
Gate-Source Voltage	VGS	-10 to +2	Vdc
Operating Voltage	VDD	+55	Vdc
Storage Temperature Range	T_{stg}	-65 to +150	°C
Case Operating Temperature	T_C	+150	°C
Operating Junction Temperature	T_J	+225	°C

Electrical Characteristics

Characteristics	Symbol	Min.	Typ.	Max.	Unit	Conditions
DC Characteristics						
Gate Threshold Voltage	VGS(th)		-2.8		V	VDS=28V, IDS=1.6mA
Gate Quiescent Voltage	VGS(Q)		-2.65		V	VDS=28V, IDS=50mA
Drain-Source Breakdown Voltage	VBR		120		V	VGS=-10V,IDS=1.6mA
Total Device Power Dissipation (Derated above 25°C)	Pdiss		7.2		W	
Thermal Characteristics						
Thermal Resistance	$R_{\theta JC}$		12.6		°C/W	Junction to Case Tc=85°C,TJ=200°C, Pdiss=7.2W

Typical Performance of Demonstration Amplifier (Tc=25℃)

Application 1

1.5~2.1GHz CW (Test in Innotion Fixture)

Driver: YP2233W of Innotion (Bias: VCC= 5.0V, Vref=2.7V, ICQ=200mA)

GaN: YP601238T (Bias: VDD=28V, VGS=-2.6V, IDQ=100mA)

Frequency (MHz)	Psat(dBm)	ICC(mA)@5V	IDS(mA)@28V
1500	38.9	500	650
1600	38.7	510	640
1700	38.5	490	630
1800	38.5	490	610
1900	38.4	480	620
2000	38.4	490	610
2100	38.3	480	600

Application 2

3.3~3.8GHz CW (Test in Innotion Fixture)

Driver: YP352833 of Innotion (Bias: VCC= 5.0V, Vref=2.7V, ICQ=150mA)

GaN: YP601238T (Bias: VDD=28V, VGS=-2.6V, IDQ=100mA)

Frequency (MHz)	Psat(dBm)	ICC(mA)@5V	IDS(mA)@28V
3300	39.4	410	620
3400	39.4	450	610
3500	39.5	480	590
3600	39.4	480	580
3700	39.4	470	570
3800	39.2	470	560

Application 3

5.1~5.9GHz CW (Test in Innotion Fixture)

Driver: YP553030 of Innotion (Bias: VCC= 5.0V, PEN=2.7V, ICQ=170mA)

GaN: YP601238T (Bias: VDD=28V, VGS=-2.58V, IDQ=120mA)

Frequency (MHz)	Psat(dBm)	ICC(mA)@5V	IDS(mA)@28V
5100	39.1	880	600
5500	39	830	590
5900	39.1	850	580

Application 4

6.0~7.2GHz CW (Test in Innotion Fixture)

Driver: YP702530 of Innotion (Bias: VCC= 5.0V, Vref=2.8V, ICQ=350mA)

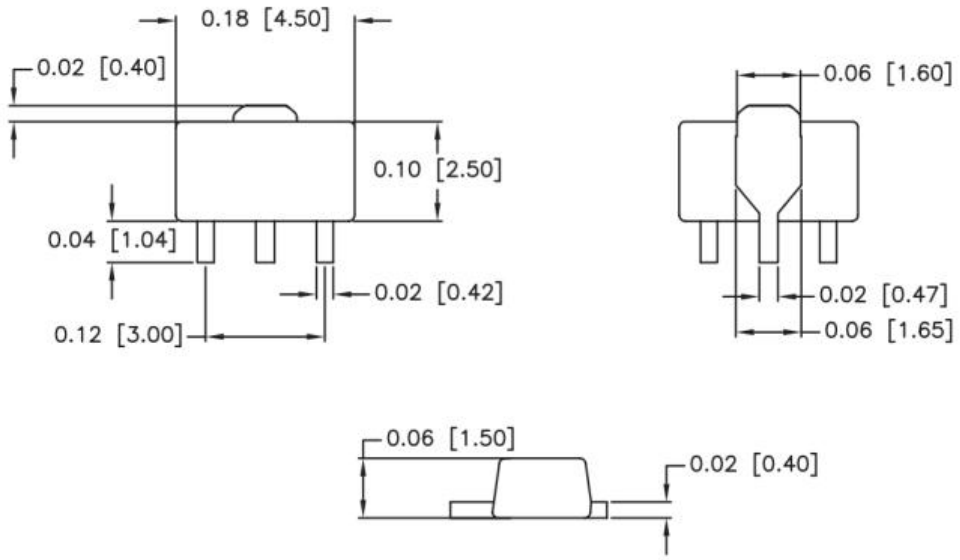
GaN: YP601238T (Bias: VDD=28V, VGS=-2.58V, IDQ=120mA)

Frequency (MHz)	Psat(dBm)	ICC(mA)@5V	IDS(mA)@28V
6000	37.2	920	550
6300	37.3	950	560
6600	37.5	1030	590
6900	37.3	980	580
7200	37.2	950	570

Units: millimeters

Packaging Diagram

SOT-89



PCB Land Pattern