E-pHEMT MMIC

AE410

Product Features

- 50ohm, 30 ~ 3000MHz
- GaAs E-pHEMT MMIC
- High linearity
- Low Noise Figure
- High productivity
- Low manufacturing cost
- Pb Free / RoHS Standard

Applications

- Cellular, GSM
- PCS, DCS, W-CDMA
- Wibro, WiMax, WiFi
- Tetra, CATV, Satellite system
- RFID, Femtocell
- Multi-metering

Package Type : SOT-89

Description

AE410 is a drive or pre-drive amplifier designed in a low cost SOT-89 package.
This MMIC is based on Gallium Arsenide Enhancement Mode pHEMT which shows low current and high IP3.
It is designed as driver devices for infrastructure equipment in the 30~3000MHz Wireless technologies such as Cellular, GSM, PCS, W-CDMA, Wibro, WiMax System.
The data in this spec sheet is valid only for 50ohm application.

Electrical Specifications

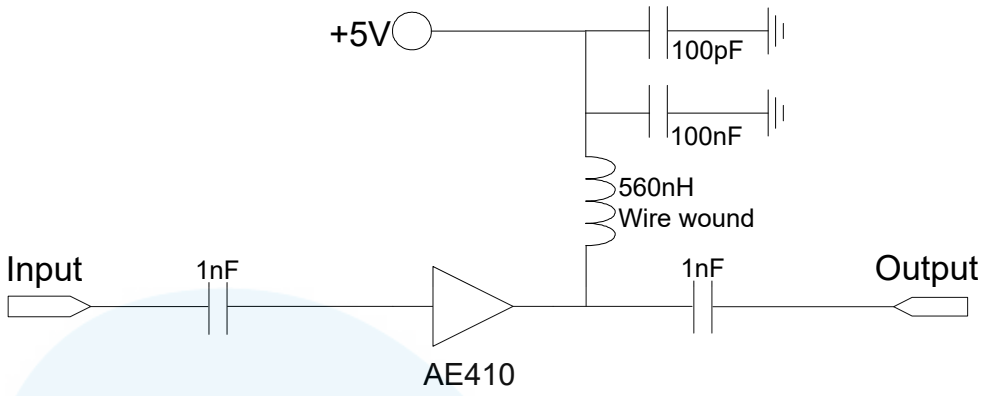
PARAMETER	UNIT	MIN	TYP	MAX	Remark
Frequency Range	MHz	30	-	3000	-
Gain	dB	19	20	-	@ 900MHz
Input Return Loss	dB	-	-13	-	-
Output Return Loss	dB	-	-13	-	-
Output IP3	dBm	32	34	-	@ 900MHz
1dB Compression Point	dBm	-	20	-	
Noise Figure	dB	-	2.3	-	-
DC Current	mA	-	100	-	-
Supply Voltage	V	-	5	-	-

Note
1. Test conditions unless otherwise noted. Freq = At 900MHz, Vdd=+5V, T=25℃, 50Ω system
2. OIP3 measured with 2 tones at an output power of +5dBm/tone separated by 1MHz

Absolute Maximum Ratings

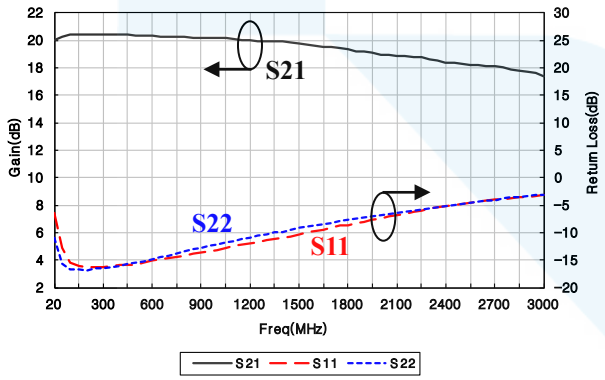
PARAMETER	UNIT	MIN	TYP	MAX	REMARK
Device Voltage	V	-	5	7	-
Operating Case Temperature	℃	-40	-	85	-
Storage Temperature	℃	-40	-	150	-
ESD Human Body Model	-	-	Class 1A	-	-
Moisture Sensitivity Level	-	-	MSL1	-	-
Junction Temperature (Tj)	℃	-	-	180	@ quiescent current, No RF, Tc = 85℃
Thermal Resistance (Rth)	℃/W	-	70	-	

Application Circuit @ 50 ~ 3000MHz, 50ohm System

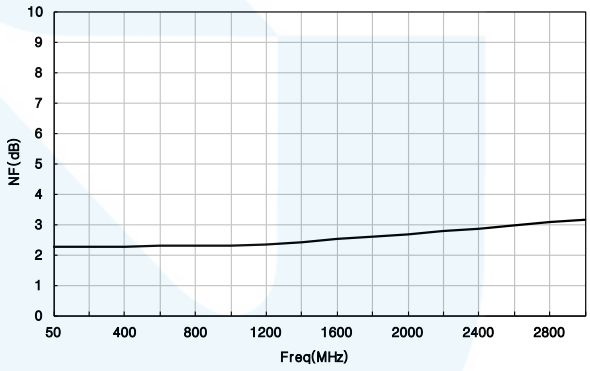


Typical RF Performance @ V_{DD}=5V, I_{DS}=100mA, T=25℃, 50ohm System

S-parameter

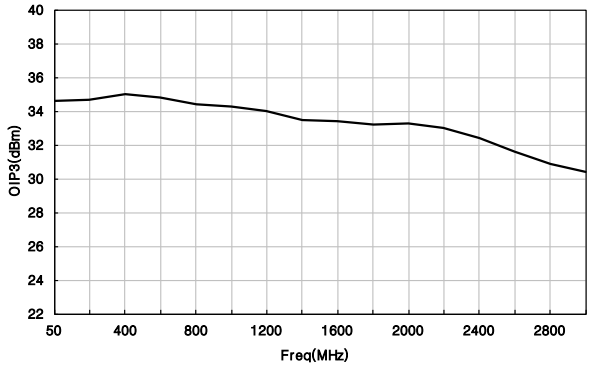


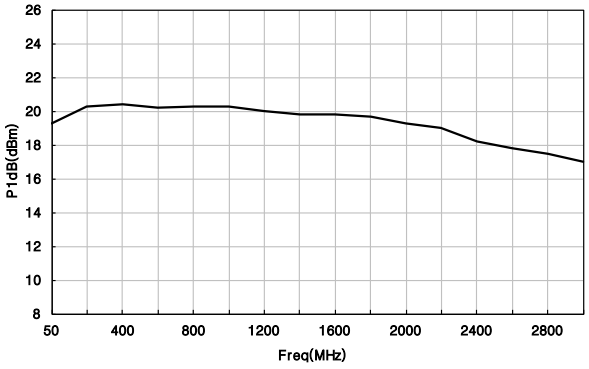
Noise Figure vs. Frequency



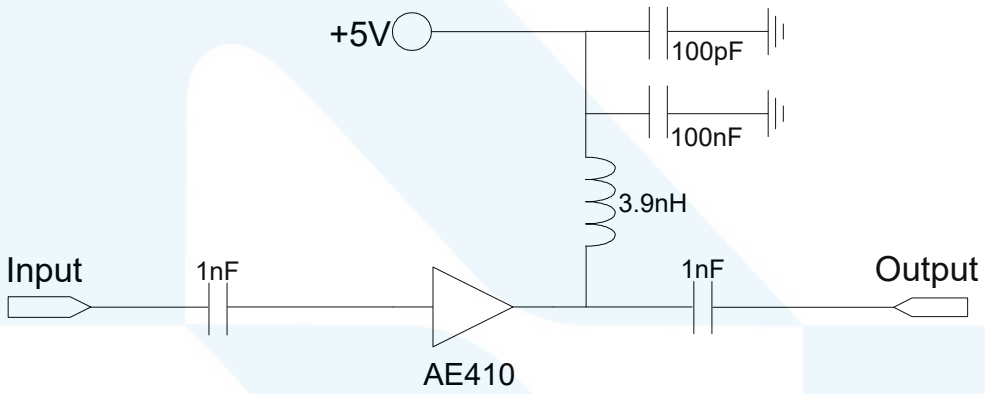
OIP3 vs. Frequency

P1dB vs. Frequency



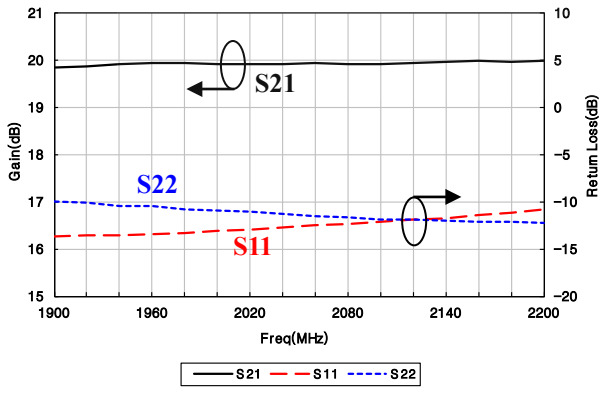


Application Circuit @ 1900 ~ 2200MHz, 50ohm System

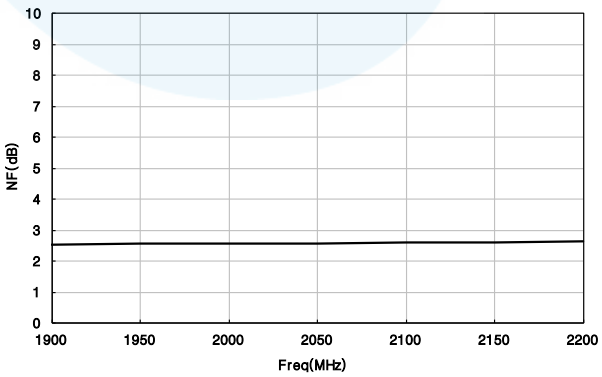


Typical RF Performance @ V_{DD}=5V, I_{DS}=100mA, T=25℃, 50ohm System

S-parameter

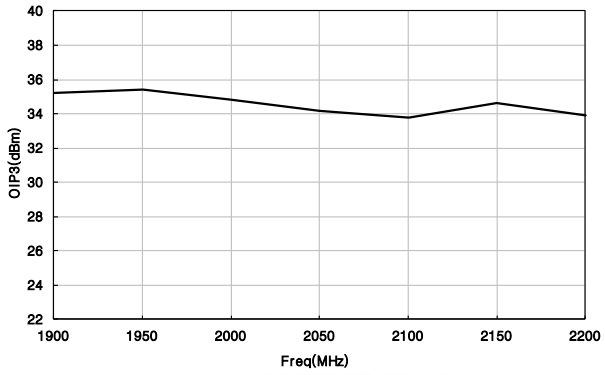


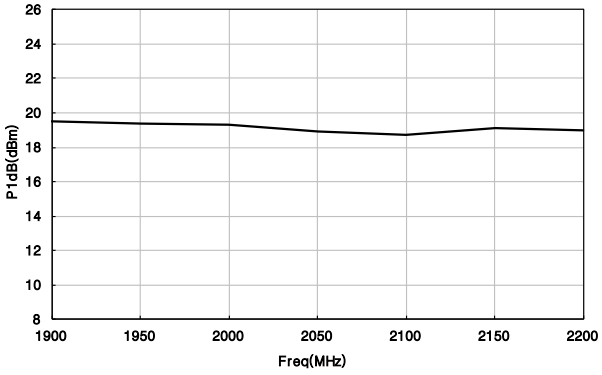
Noise Figure vs. Frequency



OIP3 vs. Frequency

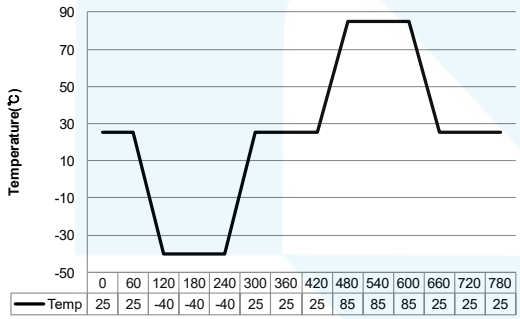
P1dB vs. Frequency





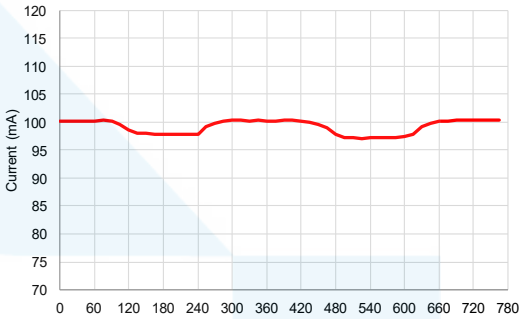
Temperature Test @ -40℃ ~ +85℃, 50ohm System

Temperature Cycle

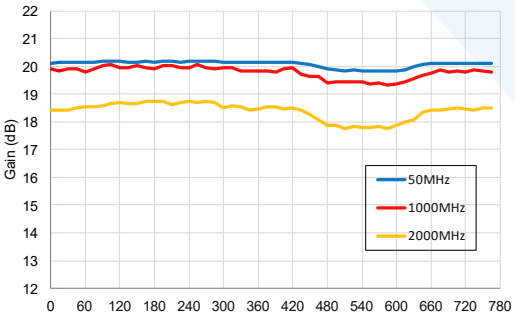


	0	60	120	180	240	300	360	420	480	540	600	660	720	780
Temp	25	25	-40	-40	-40	25	25	25	85	85	85	25	25	25

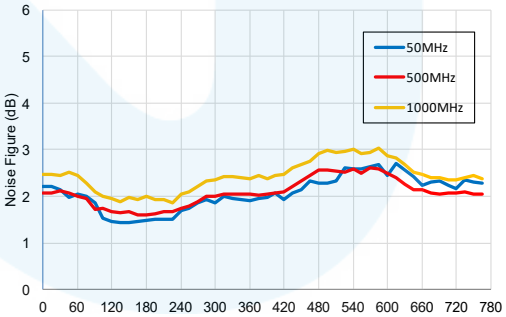
Temperature Range: Current



Temperature Range: Gain

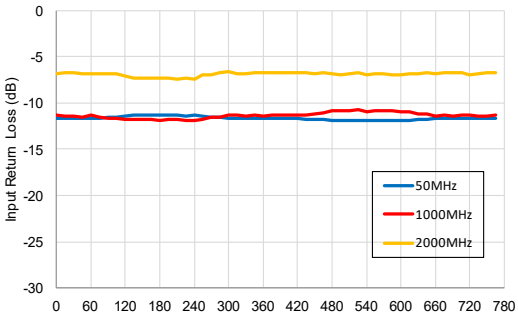


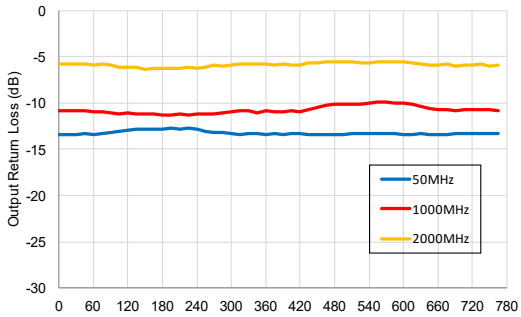
Temperature Range: Noise Figure



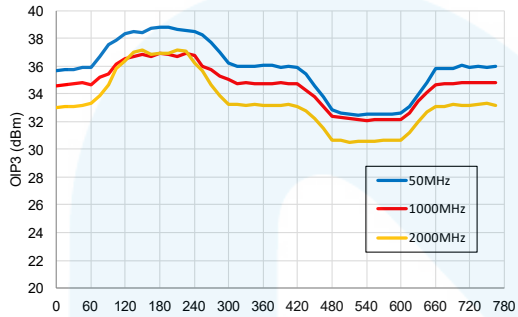
Temperature Range: Input Return Loss

Temperature Range: Output Return Loss

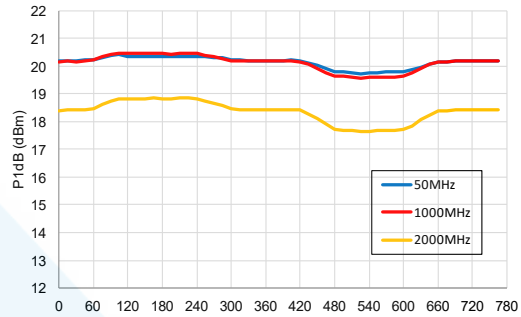




Temperature Range: OIP3

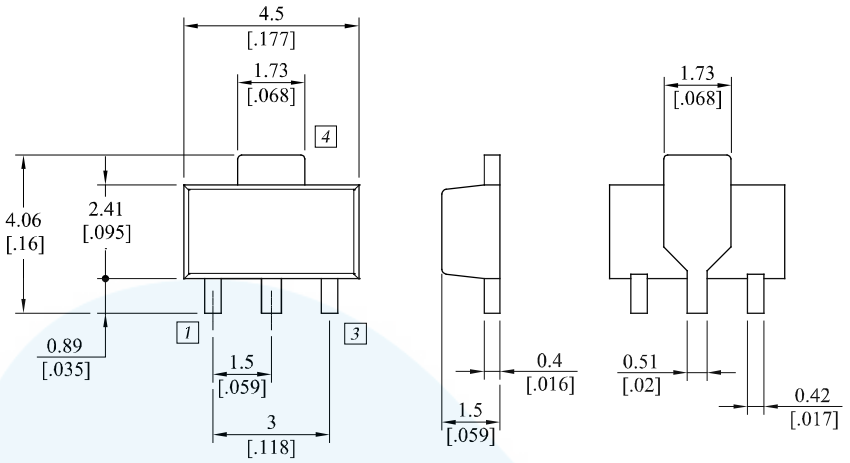


Temperature Range: P1dB



Package Dimensions (Type: SOT-89)

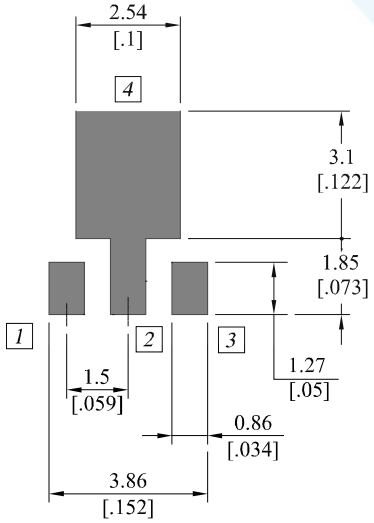
* Unit: mm[inch] | Tolerance ±0.1[.004]



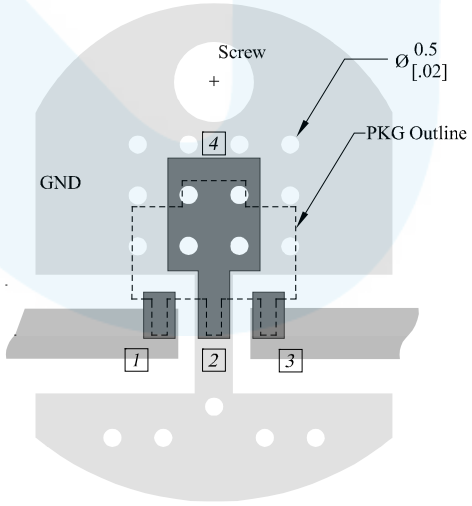
▲ Top View ▲ Side View ▲ Bottom View

Pin Description			
Pin No	**Function**	**Pin No**	**Function**
1	Input	4	GND
2	GND	-	-
3	Output / Bias	-	-

Recommended Pattern



Recommended Mounting Configuration



*** Mounting Configuration Notes**

1. Ground / thermal via holes are critical for the proper performance of this device.
2. Add as much copper as possible to inner and outer layers near the part to ensure optimal thermal performance.
3. Mounting screws can be added near the part to fasten the board to a heatsink. Ensure that the ground / thermal via hole region contacts the heatsink.
4. Do not put solder mask on the backside of the PCB in the region where the board contacts the heatsink.
5. RF trace width depends upon the PCB material and construction.
6. Use 1 oz. Copper minimum.

Revision History

Part Number	Release Date	Version	Modification	Data Sheet Status
AE410	2012.12.04	1.1	Revision : Absolute Maximum Ratings	-
AE410	2012.12.04	1.0	Added Temperature Data	-
AE410	2012.09.07	0.1	Initial Release	Preliminary

Certification

This product is manufactured by a company that is certified for the AS9100D quality management system.