E-pHEMT MMIC

AE417 (Preliminary)

RFHIC

Product Features

- Small size
- Higher linearity
- SOT89 SMD Type package
- Higher productivity
- Lower manufacturing cost
- -63dBc CSO 135 Channels @ +30dBmV/ch
- -74dBc CTB 135 Channels @ +30dBmV/ch
- -73dBc XMD 135 Channels @ +30dBmV/ch

Application

- Low Noise Amplifier for CATV, Satellite
- Cable Modem
- FTTH (G-PON, GE-PON)
- Optical node

RoHS Comply



Package : SOT-89

Description

AE417 is designed as low cost drive amplifiers for many applications including FTTH, CATV System.
This MMIC is based on Gallium Arsenide Enhancement Mode pHEMT which shows low current draw and very low noise.
The data in this spec sheet is valid only for 75 ohm application.

Specifications

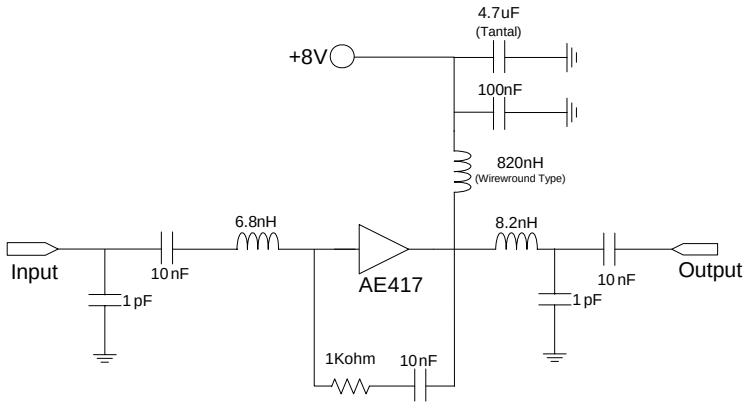
PARAMETER		UNIT	MIN	TYP	MAX	Condition
Frequency		MHz	50 ~ 1000			
Gain		dB		11		
Input Return Loss		dB		-19		
Output Return Loss		dB		-18		
Output IP3		dBm	38	41		At 500MHz/10dBm 2tone
1dB Compression Point		dBm	22	24.8		At 500MHz
Noise Figure		dB		4	5	
CSO	30 ~ 870MHz	dBc		-63	-58	135 channel, +30dBmV/ch
CTB		dBc		-74	-69	135 channel, +30dBmV/ch
XMOD		dBc		-73	-68	135 channel, +30dBmV/ch
DC Current		mA		115		Vdd = 8.0V

NOTE
1. Test conditions unless otherwise noted. Test Freq = 500MHz, T=25℃, Vdd=8V, 75Ω system
2. OIP3 measured with 2 tones at an output power of +10dBm/tone separated by 1MHz, Test Freq = 500MHz

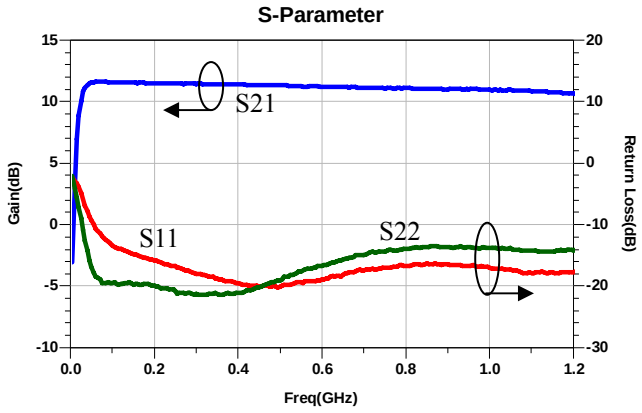
Absolute Minimum and Maximum Ratings

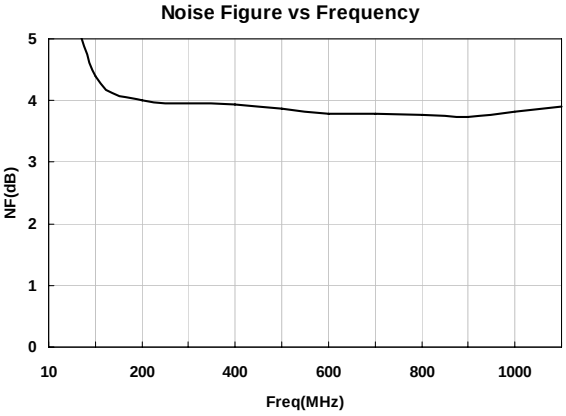
PARAMETER	UNIT	MIN	TYP	MAX
Device Voltage	VDC		+8	+9
Operating Temperature	℃	-40		+85
Storage Temperature	℃	-40		+150

◎ Application Circuit: 50MHz ~ 1000MHz, 75ohm System



◎ Typical RF Performance: VDD=8V, IDS=115mA, T=25℃, 75ohm System





◎ Multi-Tone Test 135CH_FLAT@Output Power +30dBmV/Ch

Level: +30dBmV **Tilt: 135CH_FLAT**

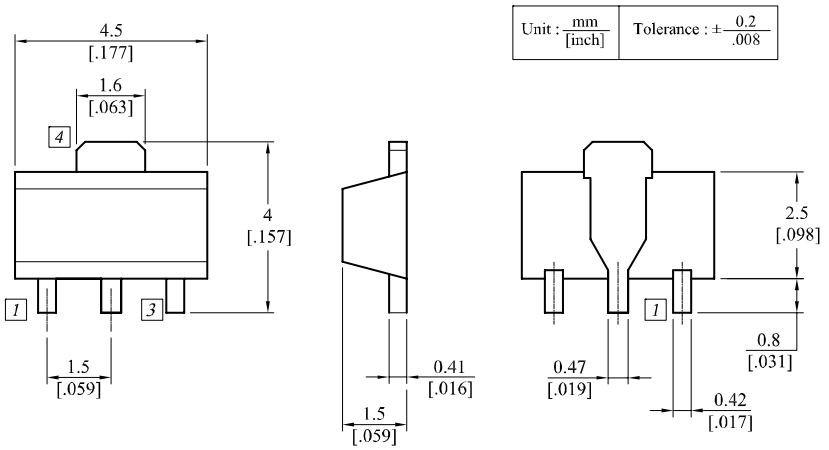
FRQ	XMD(NCTA)	CTB_RAW	CTB_COR	N-FLR	CSU_RAW	CSU_COR	CSU_FRQ	CSL_RAW	CSL_COR	CSL_FRQ
55.25	73.8	74.8	79.1	75.6	75.4	79.8	56.09	63.4	63.6	54
77.25	75.2	75	79.3	75.6	63.9	64.2	77.99	75.3	79.7	76.45
109.25	75.9	74.8	79.1	75.8	75.1	79.4	110	64	64.3	107.99
211.25	75.1	74.6	78.9	75.8	75	79.3	211.98	64.2	64.4	209.99
331.25	75.9	72.8	77.1	74	72.7	77	331.99	64.2	64.6	329.99
445.25	74.9	73.5	77.8	75.6	72.9	76.5	446.49	64.5	64.9	443.99
547.25	73.9	71.9	76.2	73	70.6	74.2	548.49	64.2	64.8	545.99
637.25	74.4	71.6	75.9	73.3	69.4	71.6	638.49	65.3	66.1	635.98
745.25	74.5	71.6	76	73.7	67.8	69.2	746.49	67.4	68.7	743.99
859.25	73.9	70.3	74.6	71.2	66.2	67.8	860.49	70.3	74.6	858.49
Min	73.8	70.3	74.6	71.2	63.9	64.2	56.09	63.4	63.6	54
Max	75.9	75	79.3	75.8	75.4	79.8	860.49	75.3	79.7	858.49

ESD Protection

For a safe use in all situations, it is recommended to have proper ESD control techniques while the device is being handled. Here are some recommended precautions;

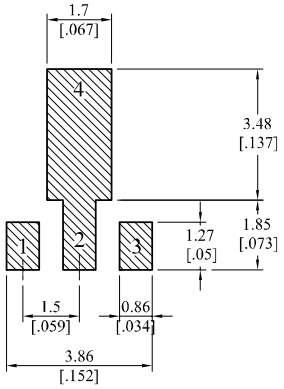
- Person at a workbench should be earthed via a wrist strap and a resistor.
- All mains-powered equipment should be connected to the mains via an earth-leakage switch.
- Equipment cases should be grounded.
- Relative humidity should be maintained between 40% and 50%.
- An ionizer is recommended.
- Keep static materials, such as plastic envelopes and plastic trays etc. away from the workbench

Dimensions

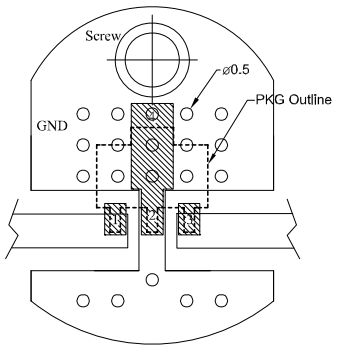


Pin No	Function
1	Input
2	Ground
3	Output/Bias
4	Ground

PCB Pad Layout



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.
7. All dimensions are in millimeters.

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