

## Product Features

- Small size
- Higher Gain
- Higher linearity
- SOIC-8 SMD Type package
- Higher productivity
- Lower manufacturing cost
- -70dBc CSO 79 Channels @ +39dBmV/ch
- -63dBc CTB 79 Channels @ +39dBmV/ch
- -56dBc XMD 79 Channels @ +39dBmV/ch
- Low Noise Figure

## Application

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



## Description

AE514 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. 50 ohm data is in a separate spec sheet.

## Specifications

PARAMETER		UNIT	MIN	TYP	MAX	Condition
Frequency		MHz	50 ~ 2150			
Gain		dB	16	18		
Flatness		dB		1		
Input Return Loss		dB	-8	-20		
Output Return Loss		dB	-8	-20		
Output IP3		dBm	37	40		At 500MHz/10dBm 2tone
1dB Compression Point		dBm	22	25		At 500MHz
Noise Figure		dB		2.5	4	
CSO	30 ~ 870MHz	dBc		-70	-65	79 channel, +39dBmV/ch
CTB		dBc		-63	-58	
XMOD		dBc		-56	-51	
CSO	30 ~ 870MHz	dBc		-65	-60	135 channel, +37dBmV/ch
CTB		dBc		-66	-60	
XMOD		dBc		-58	-53	
DC Current		mA		205		Vdd = 5.0V

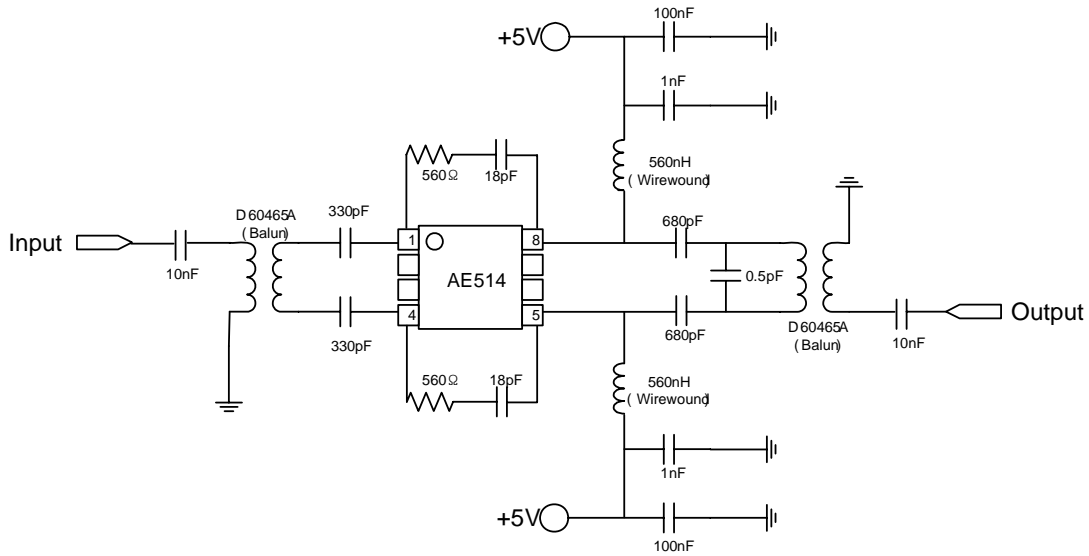
### NOTE

1. Test conditions unless otherwise noted. Test Freq = 500MHz, T=25°C, Vdd=5V, 75Ω system
2. OIP3 measured with 2 tones at an output power of +10dBm/tone separated by 1MHz, Test Freq = 500MHz

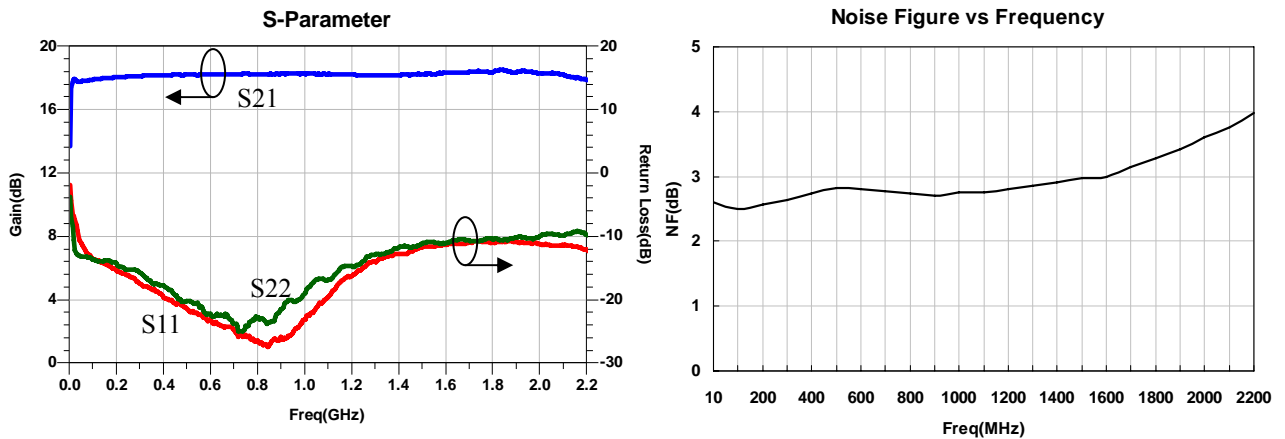
### Absolute Minimum and Maximum Ratings

PARAMETER	UNIT	MIN	TYP	MAX
Device Voltage	VDC		+5	+5.5
Operating Temperature	°C	-40		+85
Storage Temperature	°C	-40		+150

© Application Circuit: 50MHz ~ 2150MHz, 75ohm System



© Typical RF Performance:  $V_{DD}=5V$ ,  $I_{DS}=205mA$ ,  $T=25^{\circ}C$ . 75ohm System



© Multi-Tone Test 79CH\_FLAT@Output Power +39dBmV/Ch

Level: +39dBmV		Tilt: 79CH_FLAT								
FRQ	XMD(NCTA)	CTB_RAW	CTB_COR	N-FLR	CSU_RAW	CSU_COR	CSU_FRQ	CSL_RAW	CSL_COR	CSL_FRQ
55.25	56.5	63.9	63.9	85.8	82	84.5	55.99	70.3	70.5	53.99
211.25	56.8	64	64	90.1	77.2	77.5	212.5	76.2	76.4	209.99
331.25	56.6	63.5	63.5	91.4	75.3	75.5	332.49	78.1	78.3	329.99
445.25	56.6	64.5	64.5	92.2	76	76.1	446.49	82	82.5	443.99
547.25	57.1	65.7	65.7	91.6	75.3	75.4	548.49	84.6	85.7	546.49
Min	56.5	63.5	63.5	85.8	75.3	75.4	55.99	70.3	70.5	53.99
Max	57.1	65.7	65.7	92.2	82	84.5	548.49	84.6	85.7	546.49

### © Multi-Tone Test 135CH\_FLAT@Output Power +37dBmV/Ch

Level: +37dBmV		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	58.9	67	67.1	82.8	79.7	82.7	56	65.2	65.2	53.99
77.25	59.1	68.5	68.7	82.9	65.6	65.6	77.99	82.6	86.9	76.19
109.25	59.6	66.5	66.5	83.4	79.1	81	109.99	67.4	67.5	108
211.25	59.4	67	67.1	83.6	75.2	75.9	212.49	68.6	68.8	209.99
331.25	59.8	66.2	66.3	82.1	70.9	71.3	332.49	70.3	70.6	329.99
445.25	59.6	66.6	66.7	82.9	70.4	70.7	446.49	72.3	72.6	443.99
547.25	61.2	67.1	67.3	81	68.2	68.5	548.5	73.5	74.5	545.99
637.25	61.1	66.5	66.7	81.4	67.3	67.5	638.5	75.8	77.2	635.98
745.25	60.9	67.2	67.4	81.2	65.7	65.8	746.49	77.8	80.4	743.99
859.25	60.9	67.8	68.1	79.2	64.5	64.7	860.49	77	80.6	858.49
Min	58.9	66.2	66.3	79.2	64.5	64.7	56	65.2	65.2	53.99
Max	61.2	68.5	68.7	83.6	79.7	82.7	860.49	82.6	86.9	858.49

#### ■ Gate Bias Control Specifications

PARAMETER		UNIT	MIN	TYP	MAX	Condition
Frequency		MHz	50 ~ 2150			
Gain		dB	16	18		
Flatness		dB		1		
Input Return Loss		dB	-8	-20		
Output Return Loss		dB	-8	-20		
Output IP3		dBm	37	40		At 500MHz/10dBm 2tone
1dB Compression Point		dBm	22	25		At 500MHz
Noise Figure		dB		2.5	4	
CSO	30 ~ 870MHz	dBc		-67		135 channel, +37dBmV/ch
CTB		dBc		-69		
XMOD		dBc		-61		
DC Current		mA		250		Vdd = 5.0V

#### NOTE

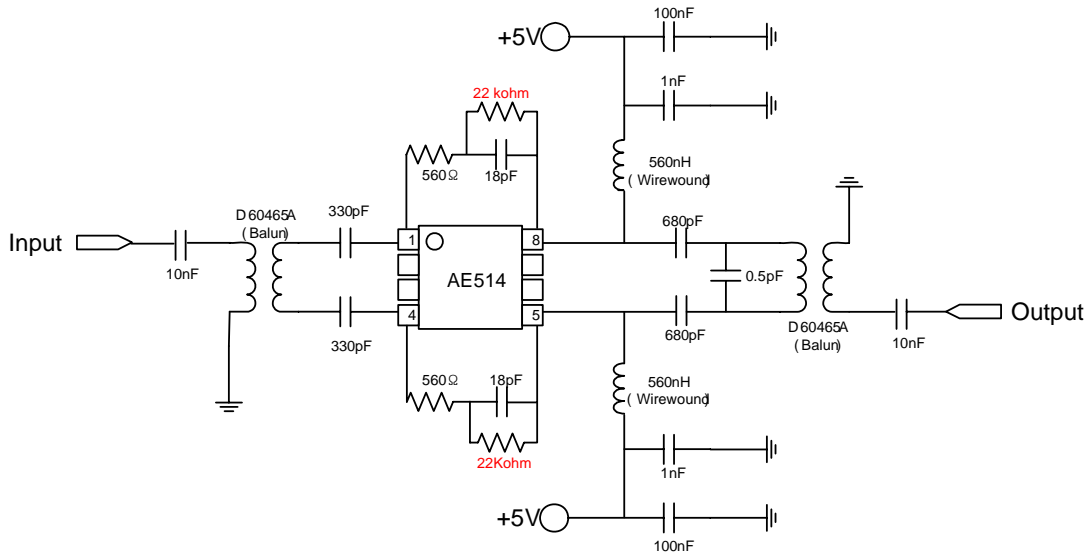
1. Test conditions unless otherwise noted. Test Freq = 500MHz, T=25°C, Vdd=5V, 75Ω system
2. OIP3 measured with 2 tones at an output power of +10dBm/tone separated by 1MHz, Test Freq = 500MHz

# AE514 (Preliminary)

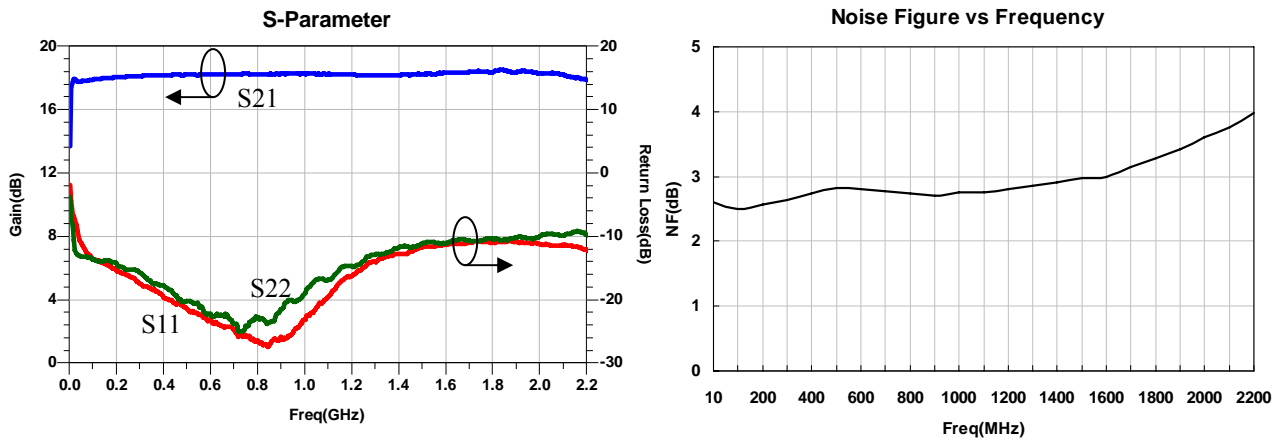
## E-pHEMT MMIC



### © Application Circuit: 50MHz ~ 2150MHz, 75ohm System



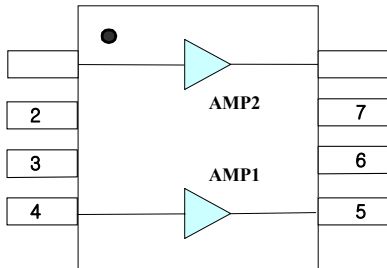
### © Typical RF Performance: V<sub>DD</sub>=5V, I<sub>DS</sub>=250mA, T=25°C. 75ohm System



### © Multi-Tone Test 135CH\_FLAT@Output Power +37dBmV/Ch

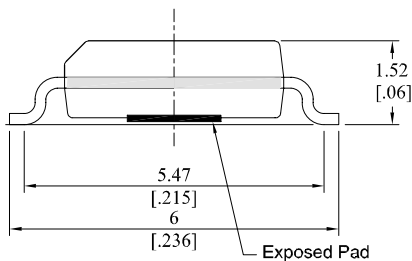
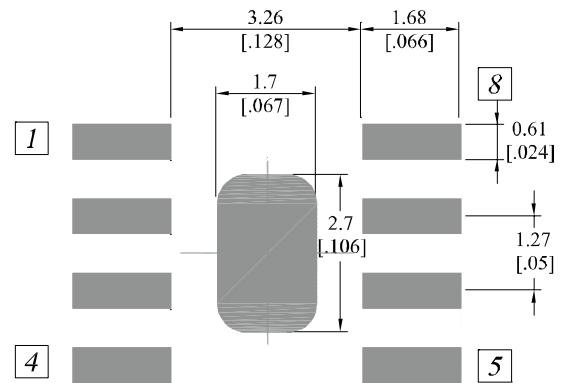
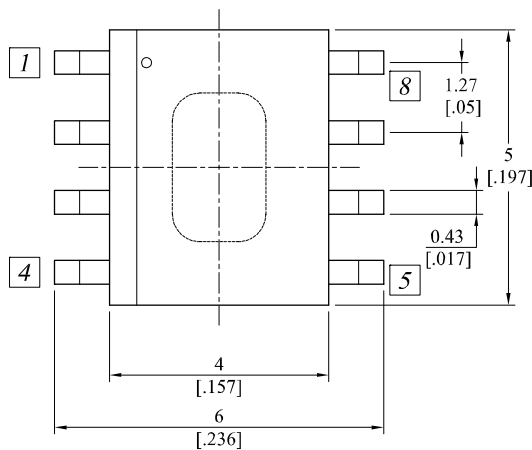
FRQ	XMD(NCTA)	CTB_RAW	CTB_COR	N-FLR	CSU_RAW	CSU_COR	CSU_FRQ	CSL_RAW	CSL_COR	CSL_FRQ
55.25	61.4	70	70.2	83	81.1	85.4	56	67.5	67.7	54
77.25	62	71.6	71.9	82.6	68.2	68.4	77.99	82.5	86.8	76.2
109.25	62.4	70	70.2	83.6	80.9	84.5	109.99	69.6	69.8	107.99
211.25	62	70.3	70.5	83.4	78.1	79.5	212.49	70.9	71.2	209.99
331.25	62.6	69.2	69.4	82.2	73.9	74.6	332.5	72.6	73.1	329.99
445.25	62.6	69.8	70	82.8	72.9	73.3	446.49	73.9	74.5	443.99
547.25	63.7	70.7	71.2	80.5	70.9	71.4	548.49	74.9	76.3	545.99
637.25	63.4	69.8	70.1	81.3	70.4	70.8	638.49	77	78.9	635.99
745.25	63.4	70.2	70.5	81	68.5	68.7	746.49	78.4	82	743.98
859.25	63.2	70.8	71.5	79.1	67	67.3	860.49	77.8	82.1	858.49
Min	61.4	69.2	69.4	79.1	67	67.3	56	67.5	67.7	54
Max	63.7	71.6	71.9	83.6	81.1	85.4	860.49	82.5	86.8	858.49

## Pin Description



PIN No	Description
1	RF IN(2)
5	RF OUT(1)
4	RF IN(1)
8	RF OUT(2)
2, 3, 6, 7	N.C
Exposed slug	GND

## Package Dimensions (Type: SOIC-8)



Unit : $\frac{\text{mm}}{\text{[inch]}}$	Tolerance : $\pm \frac{0.2}{.008}$
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