E-pHEMT MMIC

AE362

Product Features

- 30 ~ 4000MHz
- GaAs E-pHEMT MMIC
- Higher linearity
- Low Noise Figure
- High Max input power
- SOT-89 SMD Type package
- Higher productivity
- Lower 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

AE362 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 30~4000MHz Wireless technologies such as Cellular, GSM, PCS, W-CDMA, Wibro, WiMax System.
The data in this spec sheet is valid only for 50 ohm application.

Electrical Specifications

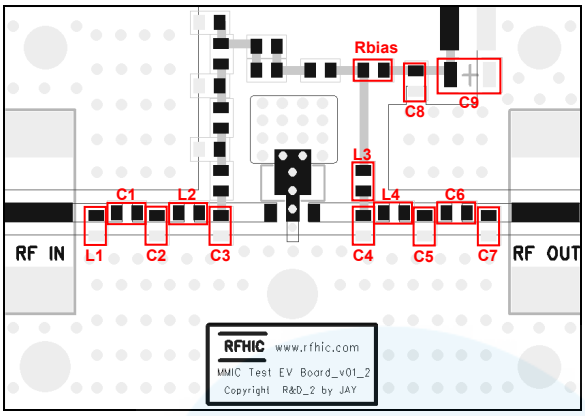
PARAMETER	UNIT	Test Frequency			REMARK
		850MHz	2050MHz	2500MHz	
Small Signal Gain	dB	20.5	15.2	14	-
Input Return Loss	dB	-10	-13	-12	-
Output Return Loss	dB	-15	-11	-10	-
Output IP3*	dBm	31	32	32	-
1dB Compression Point	dBm	19	20	20	-
Noise Figure	dB	1.2	1.2	1.3	-
WCDMA**	dBm	8.5	8.5	8.5	@-50dBc ACLR
Supply Voltage/DC Current	V/mA	4.5/45			-

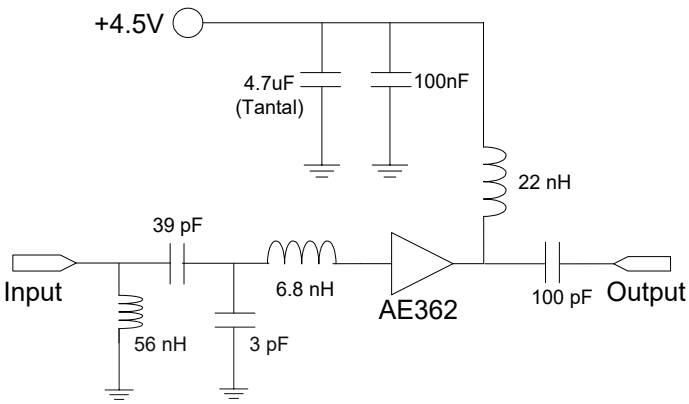
Note
1. OIP3 measured with 2 tones at an output power of +0dBm/tone separated by 1MHz
2. WCDMA 3G 4FA Test Model1 64DPCH

Absolute Maximum Ratings

PARAMETER	UNIT	MIN	TYP	MAX	REMARK
Device Voltage	V	-	4.5	8	-
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	-	123.5	-	

Application Circuit @ 800 ~ 900MHz, 50ohm System





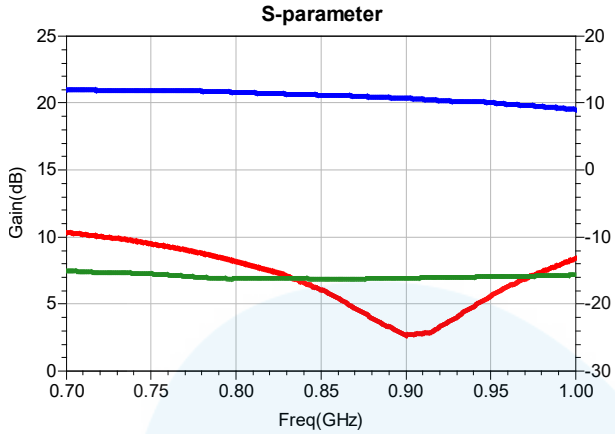
EVB BOM			
Description	**Reference Designator**	**Manufacturer**	**Manufacturer's P/N**
CAP, 3pF, 1608	C2	Murata	GRM1885C1H3R0CZ01D
CAP, 39pF, 1608	C1	Murata	GRM2165C1H390JZ01D
CAP, 100pF, 1608	L4	Murata	GRM1885C1H101JA01D
CAP, 100nF, 1608	C8	Murata	GRM188R71C104KA01D
CAP, 4.7uF, 3216-18	C9	AVX	TAJA475M016RNJ
IND, 6.8nH, 1608	L2	Taiyo Yuden	HK16086N8J-T
IND, 22nH, 1608	L3	Taiyo Yuden	HK160822NJ-T
IND, 56nH, 1608	L1	Taiyo Yuden	HK160856NJ-T
RES, 0Ohm, 1608	C6, Rbias	ROHM	MCR03 EZPJ000
DNP	C3, C4, C5, C7	-	-

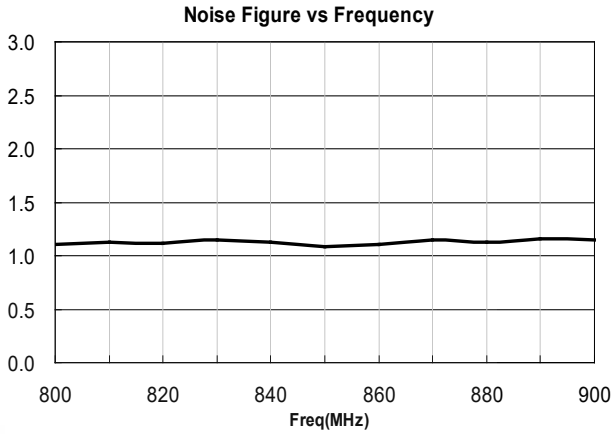
Typical Performance

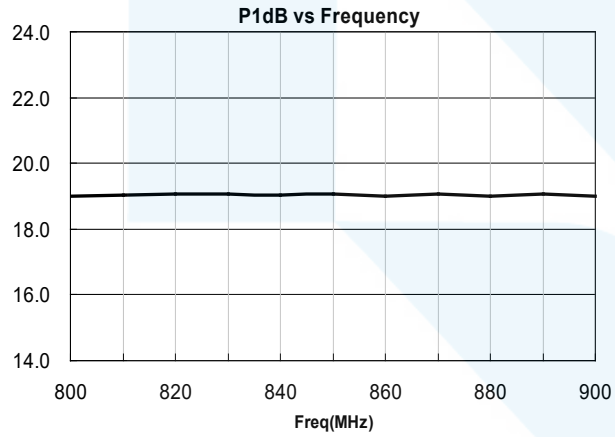
PARAMETER	UNIT	TYPICAL	REMARK
Operational Frequency Range	MHz	800 ~ 900	-
Small Signal Gain(S21)	dB	20.5	@ 850MHz
Input Return Loss(S11)	dB	-10	-
Output Return Loss(S22)	dB	-15	-
Output IP3(OIP3)	dBm	31	@ 850MHz
1dB Compression Point(P_1dB)	dBm	19	
Noise Figure(NF)	dB	1.2	-
WCDMA**	dBm	8.5	-
Supply Voltage/DC Current	V/mA	4.5/45	-

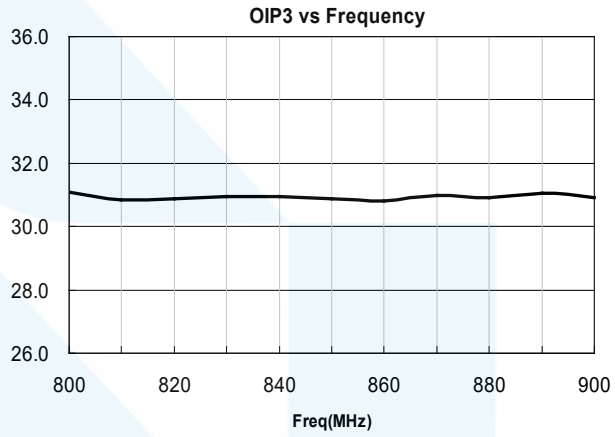
Note
1. OIP3 measured with 2 tones at an output power of +0dBm/tone separated by 1MHz
2. WCDMA 3G 4FA Test Model1 64DPCH

Typical Performance @ VDD=4.5V, IDS=45mA, T=25℃, 50ohm System

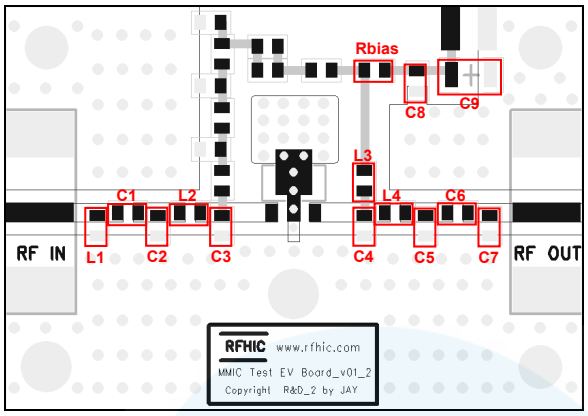


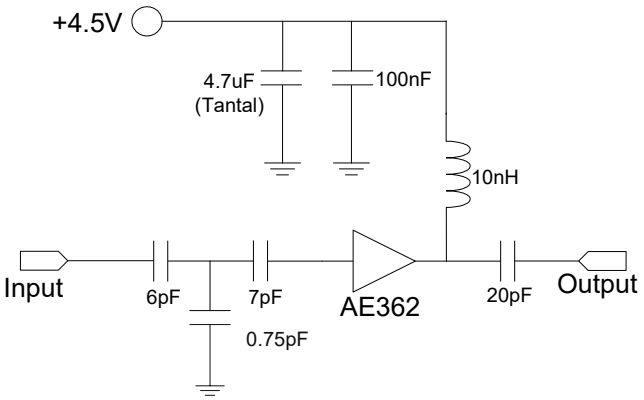






Application Circuit @ 1900 ~ 2200MHz, 50ohm System





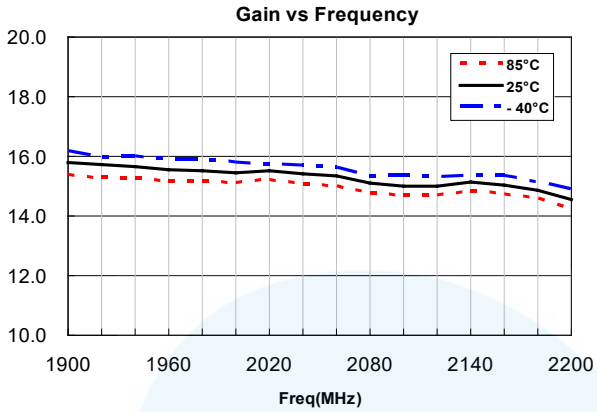
EVB BOM			
Description	**Reference Designator**	**Manufacturer**	**Manufacturer's P/N**
CAP, 0.75pF, 1608	C2	Murata	GRM1885C1HR75CZ01D
CAP, 6pF, 1608	C2, C5	Murata	GRM1885C1H6R0DZ01D
CAP, 7pF, 1608	L2	Murata	GRM1885C1H7R0CZ01D
CAP, 20pF, 1608	L4	Murata	GRM1885C1H200JA01D
CAP, 100nF, 1608	C8	Murata	GRM188R71C104KA01D
CAP, 4.7uF, 3216-18	C9	AVX	TAJA475M016RNJ
IND, 10nH, 1608	L3	Taiyo Yuden	HK160810NJ-T
RES, 0Ohm, 1608	C1, R1, C6	ROHM	MCR03 EZPJ000
DNP	L1, C4, C7	-	-

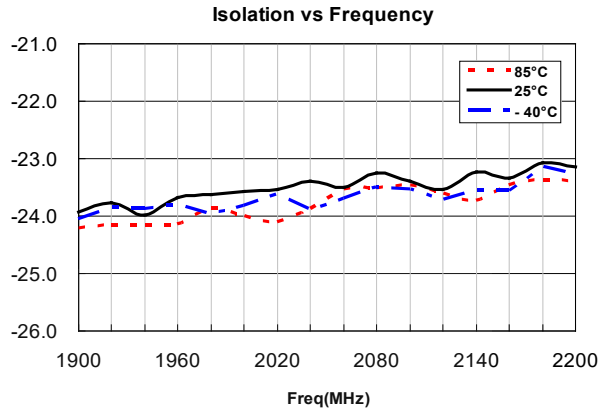
Typical Performance

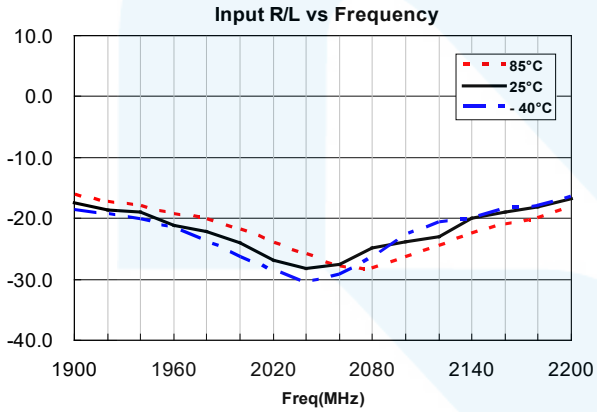
PARAMETER	UNIT	TYPICAL	REMARK
Operational Frequency Range	MHz	1900 ~ 2200	-
Small Signal Gain(S21)	dB	15.2	@ 2050MHz
Input Return Loss(S11)	dB	-13	-
Output Return Loss(S22)	dB	-11	-
Output IP3(OIP3)	dBm	32	@ 2050MHz
1dB Compression Point(P_1dB)	dBm	20	
Noise Figure(NF)	dB	1.2	-
WCDMA**	dBm	8.5	-
Supply Voltage/DC Current	V/mA	4.5/45	-

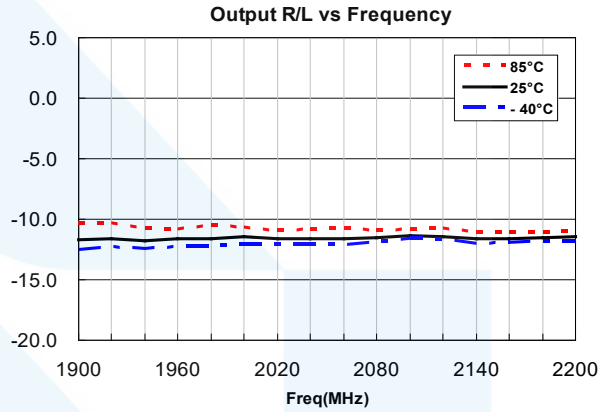
Note
1. OIP3 measured with 2 tones at an output power of +0dBm/tone separated by 1MHz
2. WCDMA 3G 1FA Test Model1 64DPCH

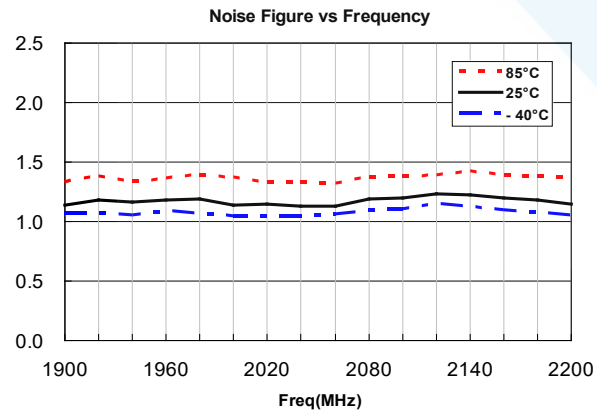
Typical Performance @ VDD=4.5V, IDS=45mA, 50ohm System

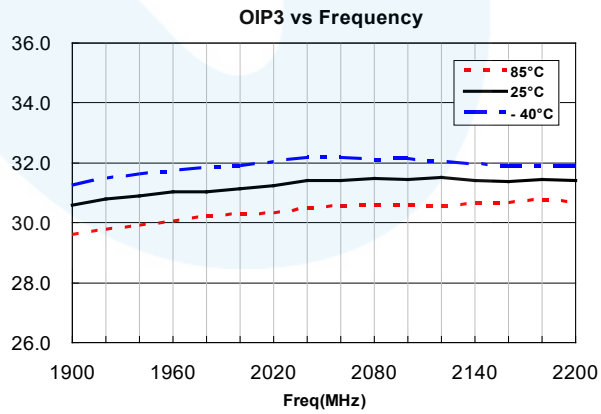




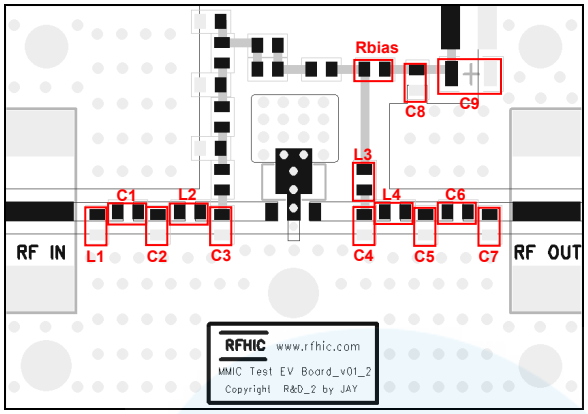


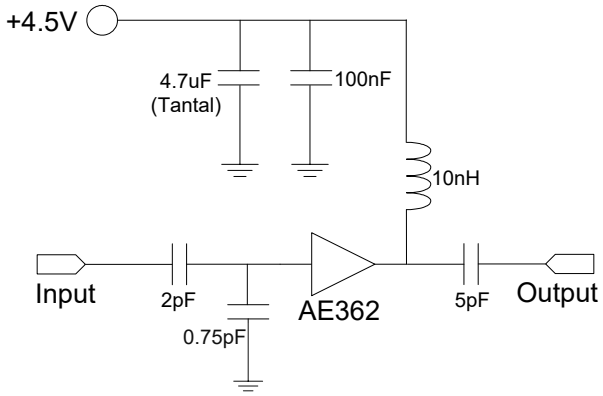






Application Circuit @ 2400 ~ 2600MHz, 50ohm System





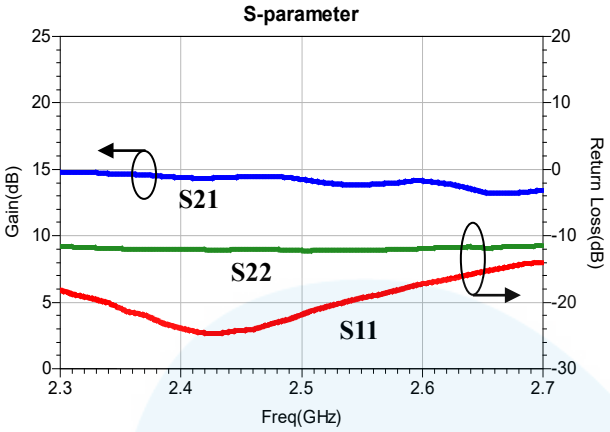
EVB BOM			
Description	**Reference Designator**	**Manufacturer**	**Manufacturer's P/N**
CAP, 0.75 pF, 1608	C3	Murata	GRM1885C1HR75CZ01D
CAP, 2pF, 1608	L2	Murata	GRM1885C1H2R0CZ01D
CAP, 5pF, 1608	L4	Murata	GRM1885C1H5R0CZ01D
CAP, 100nF, 1608	C8	Murata	GRM188R71C104KA01D
CAP, 4.7uF, 3216-18	C9	AVX	TAJA475M016RNJ
IND, 10nH, 1608	L3	Taiyo Yuden	HK160810NJ-T
RES, 0Ohm, 1608	C1, Rbias, C6	ROHM	MCR03 EZPJ000
DNP	L1, C2, C4, C5, C7	-	-

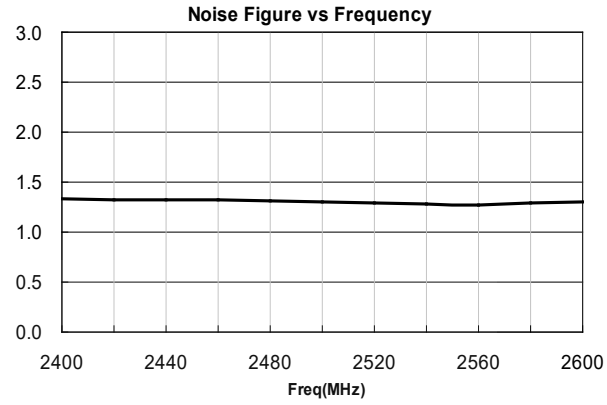
Typical Performance

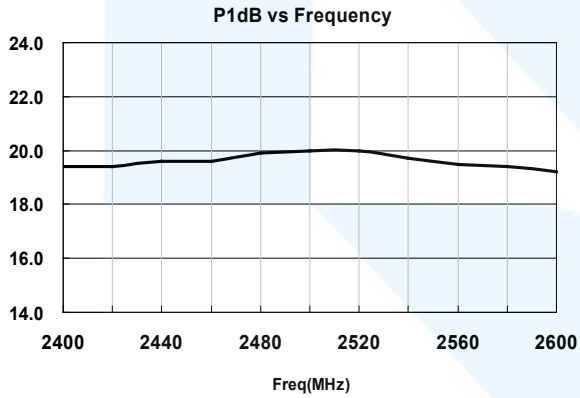
PARAMETER	UNIT	TYPICAL	Reamrk
Operational Frequency Range	MHz	2400 ~ 2600	-
Small Signal Gain(S21)	dB	14	@ 2500MHz
Input Return Loss(S11)	dB	-12	-
Output Return Loss(S22)	dB	-10	-
Output IP3(OIP3)	dBm	32	@ 2500MHz
1dB Compression Point(P_1dB)	dBm	20	
Noise Figure(NF)	dB	1.3	-
WCDMA**	dBm	8.5	-
Supply Voltage/DC Current	V/mA	4.5/45	-

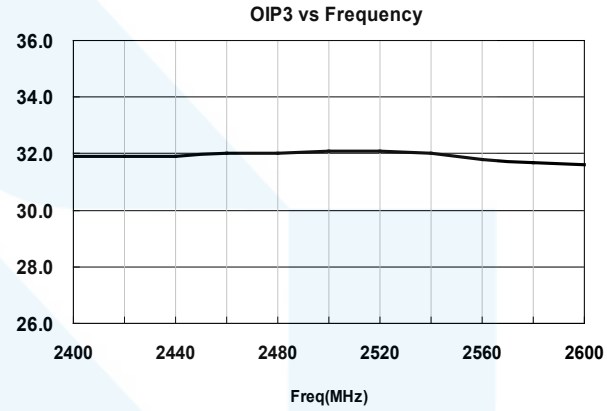
Note
1. OIP3 measured with 2 tones at an output power of +0dBm/tone separated by 1MHz
2. WCDMA 3G 4FA Test Model1 64DPCH

Typical Performance @ VDD=4.5V, IDS=45mA, 50ohm System



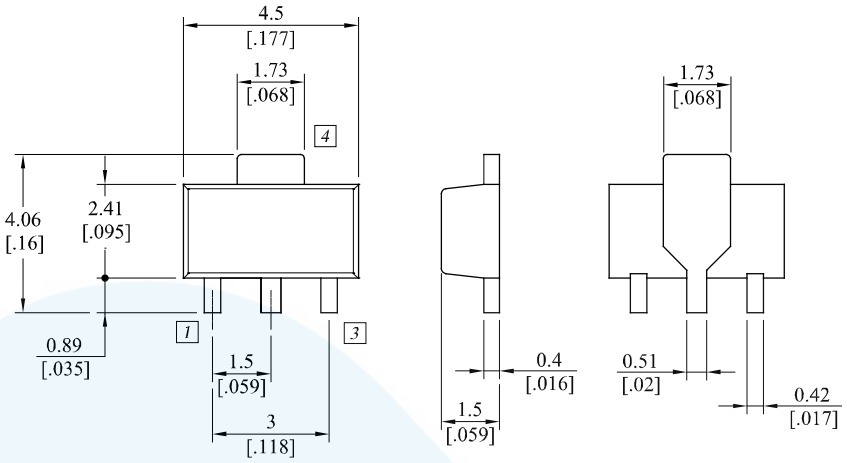






Package Dimensions (Type: SOT-89)

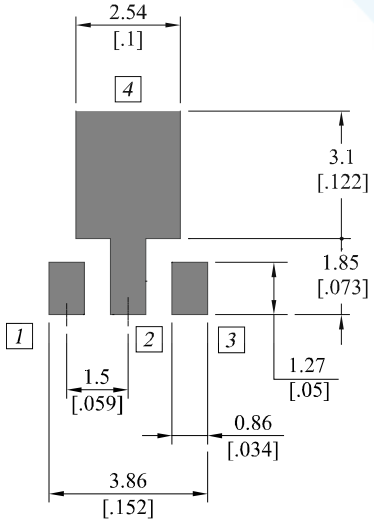
* Unit: mm[inch] | Tolerance ±0.2[.008]



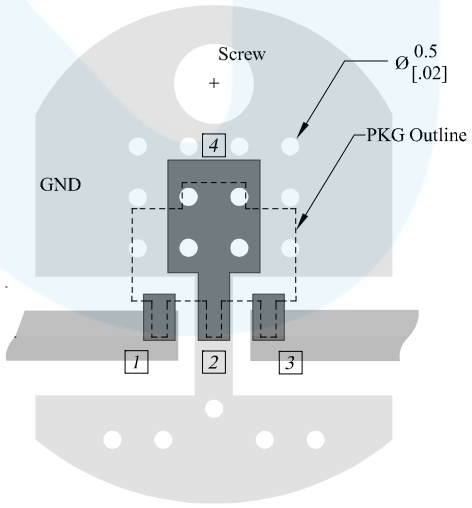
▲ Top View ▲ Side View ▲ Bottom View

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
AE362	2014.4.11	1.3	Revision : Absolute Maximum Ratings	-
AE362	2012.10.17	1.2	New datasheet format	-
AE362	2012.5.12	1.1	FIXED : Operating Frequency Range	-
AE362	2010.2.22	1.0	Initial Release.	-

Certification

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