EiC Corp.

Excellence in Communications

PRELIMINARY DATA

EC-2067

1W CLASS A POWER AMPLIFIER

800–1000 MHz

Features

- +32.0 dBm Maximum Output Power at 3.6V Vcc
- Single 3.3V to 6.0V Power Supply
- 32 dB Small Signal Gain
- Power-down Capability

Applications

- Analog Cellular
- ISM 900
- 2-Way Paging
- Portable Battery-powered Equipment

Description

The EC-2067 is a 1W Class A power amplifier at 3.6 Volt Vcc with high efficiency. This device was developed using EiC's own Gallium Arsenide Heterojunction Bipolar Transistor (HBT) process.This device can be used for cellular and ISM band applications as well as for other portable battery-powered equipment in the 800 MHz to 1000 MHz band. This device operates from a single +3.3V to 6.0V supply and includes a power-down feature. This device is available in a low-cost, surface-mountable plastic SOIC-8 slug package.

Electrical Specifications

Test Conditions: Ta = 25°C, V_{CC} = +3.6 V, V_{PD} (power-down voltage) = +3.6 V, F = 915 MHz

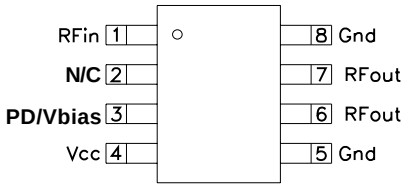
SYMBOL	PARAMETER	LIMITS			UNIT	TEST CONDITION
		MIN.	TYP.	MAX.		
F	Frequency	800		1000	MHz	
G	Gain	30	33	36	dB	NOTE 1
P_{MAX}	Maximum output Power	31	31.5	32	dBm	
P_{1dB}	Output Power at 1 dB Compression	28.5	29		dBm	NOTE 1
IRL	Input Return Loss		10		dB	NOTE 1
PAE	Power Added Efficiency @ P-1dB GCP	30	>33		%	
PAE	Power Added Efficiency @ P-6dB GCP	40	44		%	
	Output Stability		>10:1		VSWR	NOTE 1, NOTE 2
	Output Stability		4:01		VSWR	NOTE 1, NOTE 5
Icc	Supply Current		745	800	mA	
ICC_{PD}	Supply Current, Power-down Mode			10	µA	NOTE 3
Vcc	Supply Voltage	3.3		6.0	Vdc	
V_{PD} On	V_{PD} Pin "On" Voltage	2.8		3.6	Vdc	NOTE 4
NOTE 1: Using Application Schematic						
NOTE 2: No oscillation all phases (no RF signal applied)						
NOTE 3: V_{cc}=3.6 V, V_{PD}=0.0 V (To turn the device off)						
NOTE 4: "On" voltage for normal amplifier operation. (Do not attempt to operate the device below the Vpd min. spec)						
NOTE 5: No oscillation all phases (all RF drive levels when following the recommendations in the EC-2067 Application Note).						
NOTE 6: These are considered Class 1 devices when referring to ESD Testing using the Human Body Model.						

Caution Notes:

Do not operate the PA into an open circuit or a VSWR of >5:1 for longer than 1 second.
Do not operate the PA with .5V<Vpd<2.8V. Except when turning the P.A. "ON" or "OFF" with a transistion time <10 µ sec.
For PA power control, we recommend using an adjustable voltage on Pin 4 Vcc.

CAUTION!
SENSITIVE ELECTRONIC DEVICE

Package



SOIC-8 Slug
(Top View)

Pin Definitions

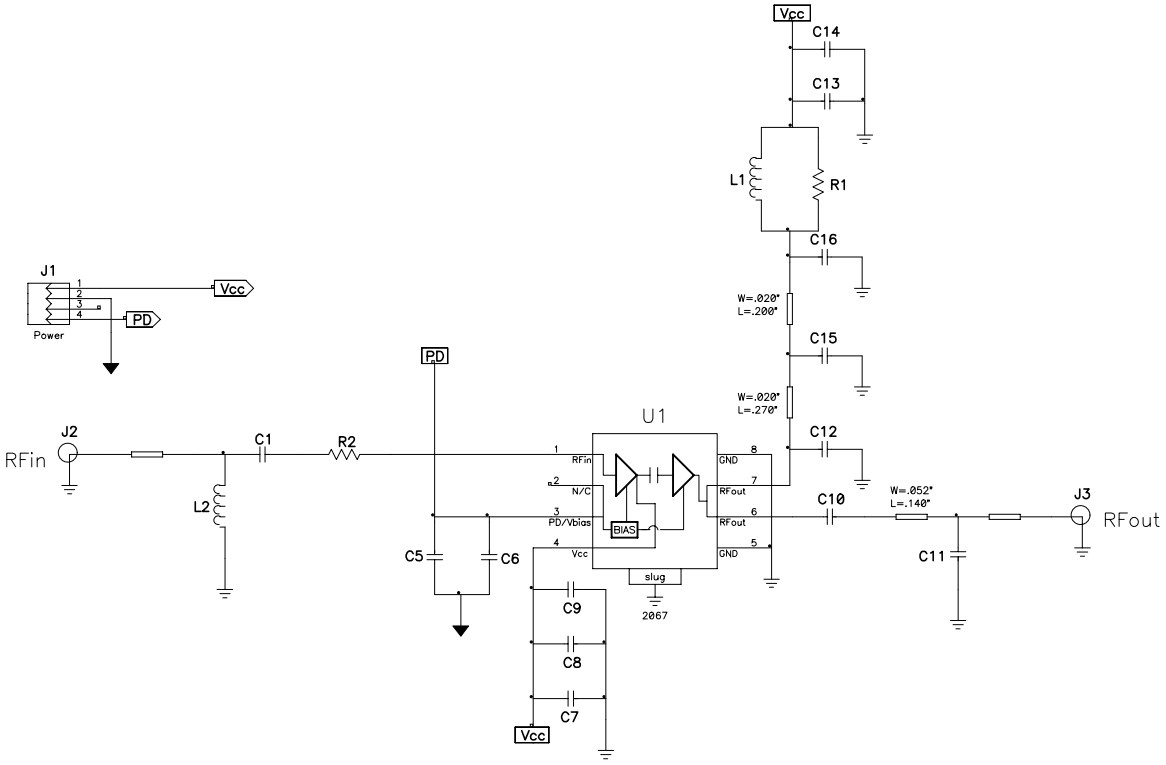
PIN	FUNCTION	DEFINITION
3	PD/Vbias	This pin provides current to the bias circuit for both power transistors. Typically Vbias = Vcc. A 100 pF AC bypass capacitor should be as close as practically possible to this pin. This pin also sets the reference / quiescient current for both input and output stages. For atypical application, total Icq = 700mA and Vpd = 3.6 VDC.
1	RF in	This pin connects to the input of the 1st stage transistor. It will have a dc
4	Vcc	This provides DC bias to the output of the 1st stage transistor.
6,7	RF out	These are the output pins, which connects to the collector of the power
5, 8	Gnd	These pins are connected to ground.
2	N/C	These pins are not connected.

Absolute Maximum Ratings

PARAMETER	RATING	UNIT	TEST CONDITION
Supply Voltage	7	Volts	V_{PD}=3.6V
Power-down Voltage(Vcc=V_{PD})	4	Volts	V_{CC}=V_{PD}
RF Power Input	+15	dBm	V_{CC},V_{PD}=3.0V
Ambient Operating Temperature	-40 to +85	°C	

Note: Exceeding any of the absolute maximum ratings may cause permanent damage to the device.

Evaluation Board Application Schematic
Cellular Band (824 - 849 MHz)



Component Values

VALUE	DESIGNATORS	COMMENTS
3.3 pF	C1	
.1 uF	C5,C7,C14,C13	
47 pF	C6	
4.7 pF	C15,C12	
1 nF	C8	
22 pF	C9	
43 pF	C10	High Q
9.1 pF	C11	High Q
33 pF	C16	
5.1 Ohm	R1	
10 Ohm	R2	
22 nH	L1	Size is 2512
4.7 nH	L2	Size is 0805
EC-2067	U1	

Note 1: All capacitors are general purpose unless otherwise noted.
Note 2: All resistors, inductors and capacitors are size 0603 unless otherwise noted.

Typical Characteristics

(using EIC's EV-2067-1 Evaluation Board over an average performance of 20 devices)

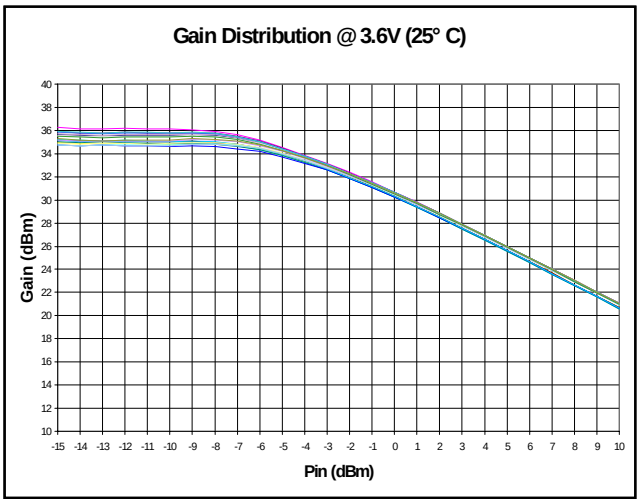


Figure 1

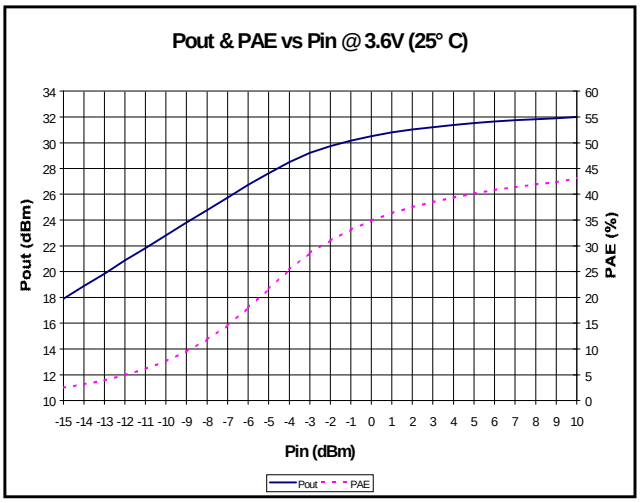


Figure 2

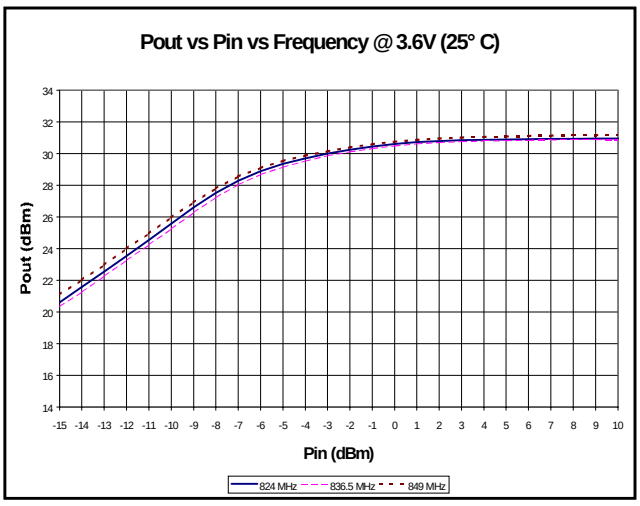


Figure 3

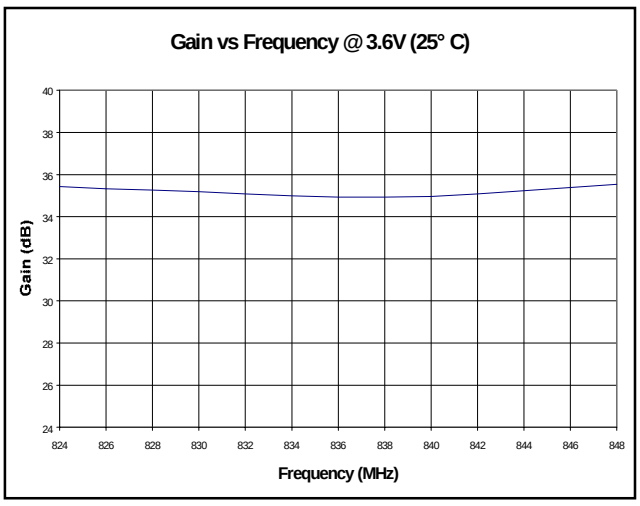
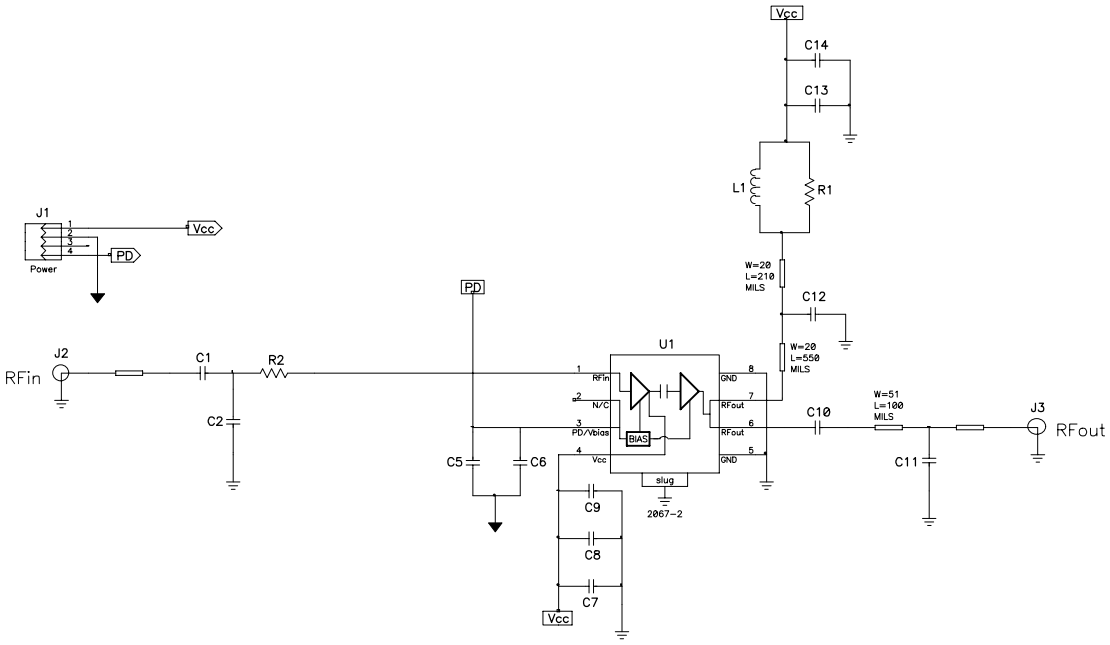


Figure 4

Evaluation Board Application Schematic
ISM Band (902 - 928 MHz)



Component Values

VALUE	DESIGNATORS	COMMENTS
68 pF	C1	
4.7 pF	C2	
.1 uF	C5,C7,C13,C14	
47 pF	C6,C12	
1 nF	C8	
22 pF	C9	
47 pF	C10	High Q
9.1 pF	C11	High Q
5.1 Ohm	R1	
8.2 Ohm	R2	
22 nH	L1	Size is 2512
EC-2067	U1	

Note 1: All capacitors are general purpose unless otherwise noted.
Note 2: All resistors, inductors and capacitors are size 0603 unless otherwise noted.

Typical Characteristics

(using EIC's EV-2067-2 Evaluation Board over an average performance of 20 devices)

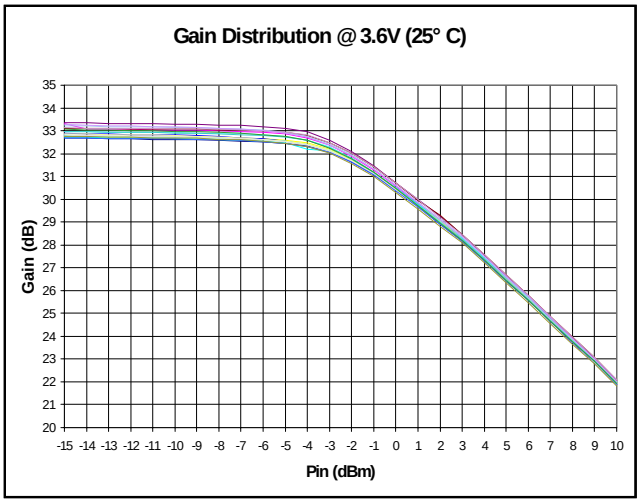


Figure 1

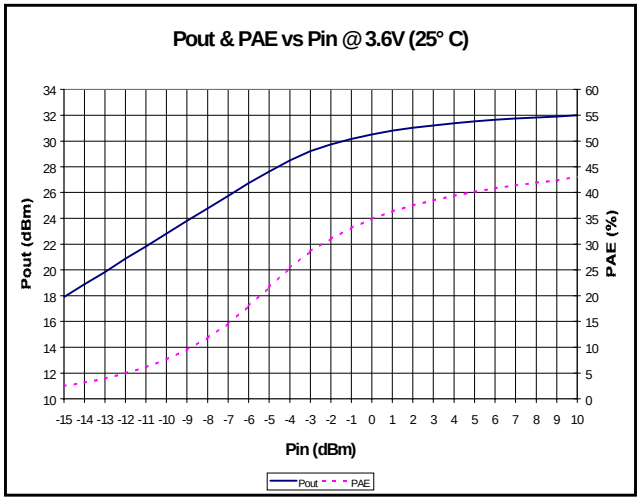


Figure 2

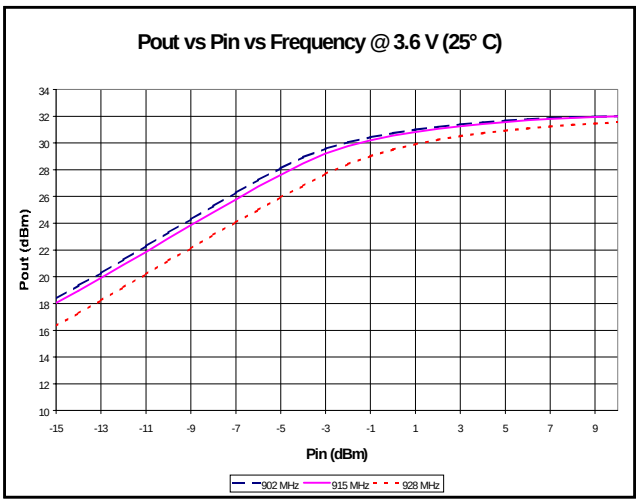


Figure 3

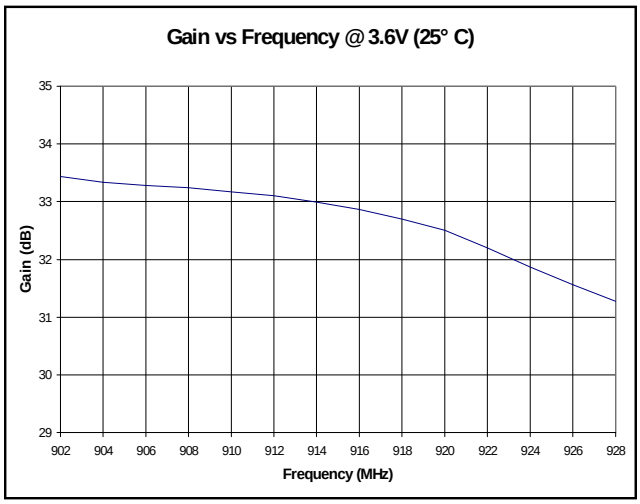
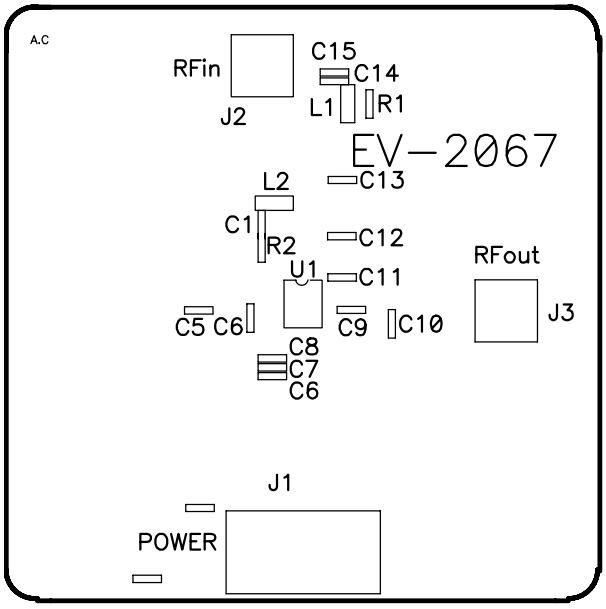
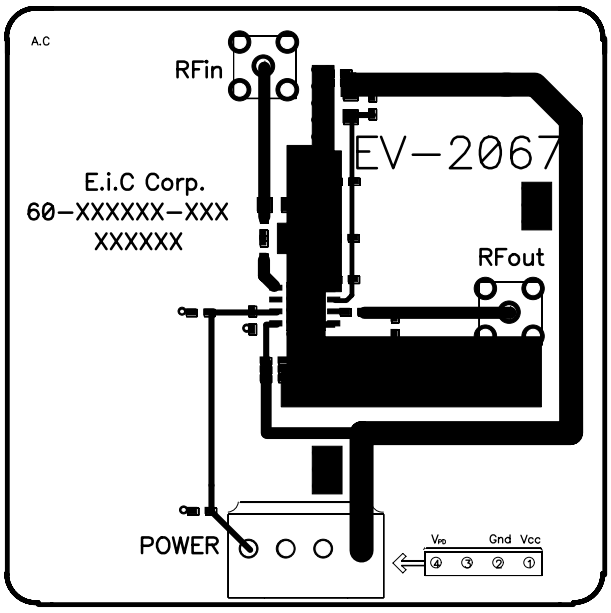


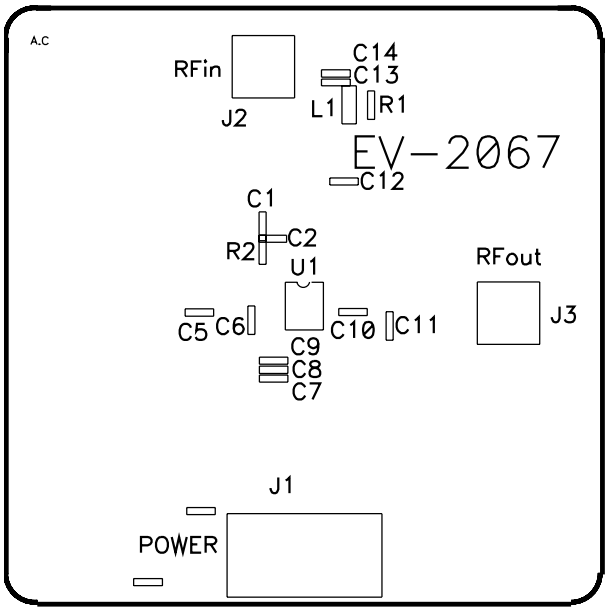
Figure 4

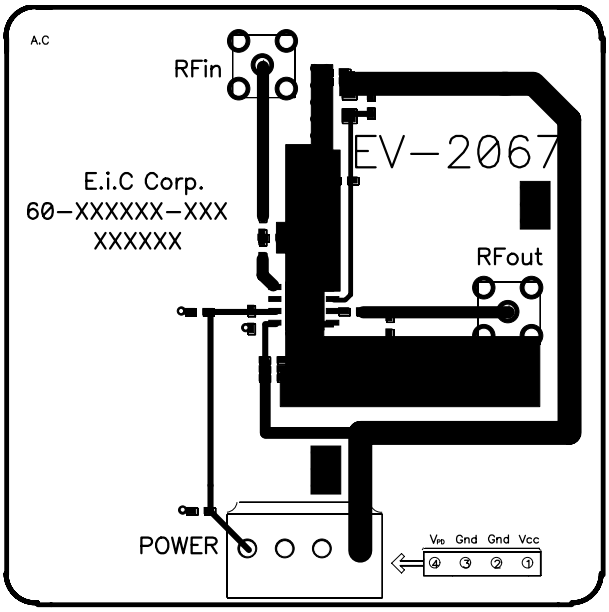
Evaluation Board Layout
EV-2067-1
2.5" X 2.5"





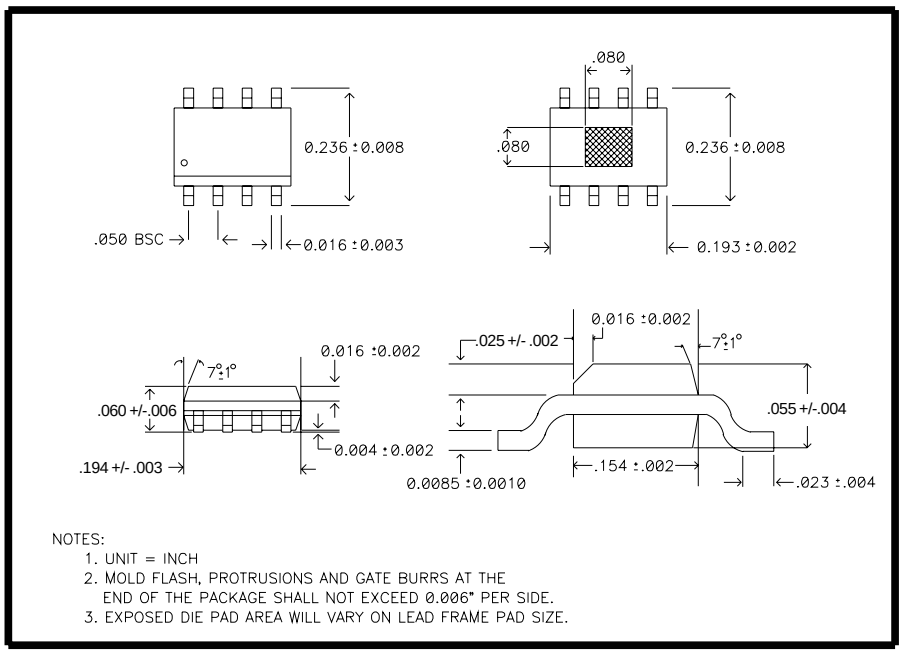
Evaluation Board Layout
EV-2067-2
2.5" X 2.5"





The sample evaluation board that is supplied may not exactly match (visually) the layouts shown above. However, the electrical performance of the board will match a data sheet that reflects the same revision level.

Package Outline



NOTES:
1. UNIT = INCH
2. MOLD FLASH, PROTRUSIONS AND GATE BURRS AT THE END OF THE PACKAGE SHALL NOT EXCEED 0.006" PER SIDE.
3. EXPOSED DIE PAD AREA WILL VARY ON LEAD FRAME PAD SIZE.