EC-1017

DRIVER AMPLIFIER

500–3000 MHz

Features

- Single 3.5 to 5.0 Vdc Operation
- High Linearity for Digital Modulation Systems
- Power-down Capability
- Class A Operation

Applications

- CDMA
- Cellular
- GSM
- ISM
- PCS
- WLL
- TDMA
- Spread Spectrum
- Portable Battery-powered Equipment

Description

The EC-1017 is a high-performance, internally matched, broadband driver amplifier optimized for commercial mobile communications. Utilizing advanced Gallium Arsenide heterojunction bipolar transistor technology (GaAs HBT), the amplifier features good linearity. The EC-1017 operates from a single 3.5 to 5.0 volt supply, and is available in a low-cost, surface-mountable plastic SOIC-8 slug package.

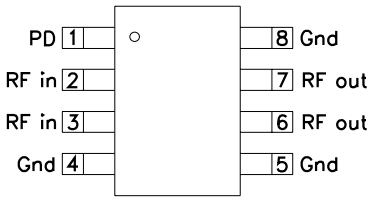
Electrical Specifications

Test Conditions: Ta = 25°C, V_{CC} = +3.5 V, V_{PD} (power-down voltage) = +3.5 V, F = 1900 MHz

SYMBOL	PARAMETER	LIMITS			UNIT	TEST CONDITION
		MIN.	TYP.	MAX.		
F	Frequency	500		3000	MHz	
G	Small Signal Gain (P_{in} = 0 dBm)	8.5	9	11	dB	NOTE 1
P_{sat}	Saturated Output Power		17		dBm	NOTE 1
OIP3	Third Order Output Intercept Point	24	28		dBm	NOTE 2
NF	Noise Figure		5		dB	
IRL	Input Return Loss		-7.5		dB	
ORL	Output Return Loss		-12		dB	
I_{CC}	Supply Current	50	55	70	mA	
I_{CCPD}	Supply Current, Power-down Mode		0.5		μA	NOTE 3
V_{CC}	Supply Voltage	3.5		5.0	Vdc	
NOTE 1: Using Application Schematic						
NOTE 2: P_{IN} per tone = -8 dBm, F_1 = 1900 MHz, F_2 = 1901 MHz						
NOTE 3: V_{CC} = 3.5 V, V_{PD} = 0.0 V						

CAUTION!
SENSITIVE ELECTRONIC DEVICE

Package



SOIC-8 Slug
(Top View)

Pin Definitions

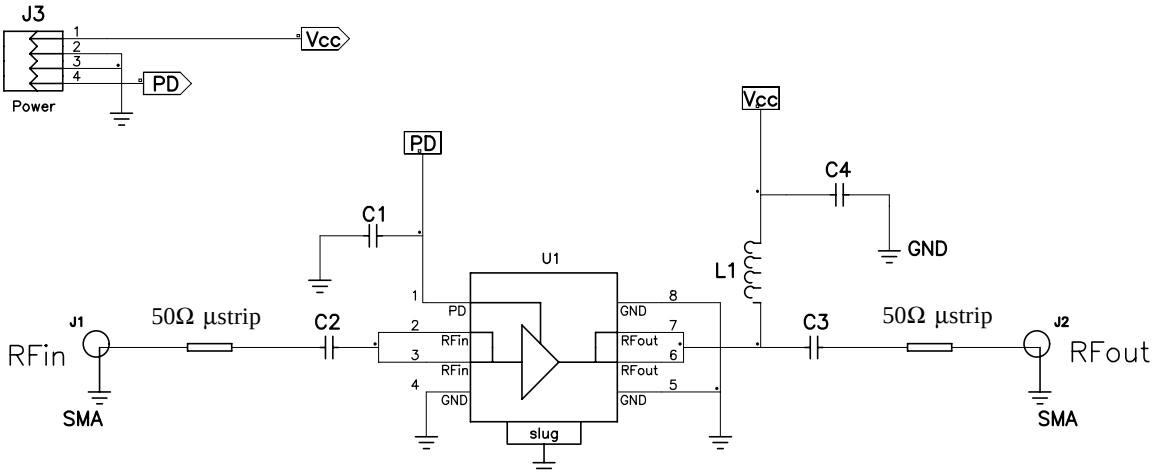
PIN	FUNCTION	DEFINITION
1	PD	Power down pin and voltage reference pin for normal operation. The voltage applied to this pin should be 3.0 VDC but should not exceed 3.5 VDC. Zero (0) VDC on this pin turns the device OFF (approx. 0.5 μA). See Figure 1 for transfer characteristics.
2, 3	RF in	RF input pins. These are generally connected together to reduce package parasitic inductance and to get a higher frequency response. These pins require an external DC block capacitor (see schematic) to prevent loading the internal DC bias condition which would severly affect the RF performance.
4, 5, 8	Gnd	Ground connection pins. It is suggested to individually connect these pins directly to slug ground connection. This is to keep a low ground inductance and maintain high frequency performance.
6, 7	RF out	RF output pins. The open collector output requires a DC supply through a small inductor and a DC blocking capacitor (see schematic) that also provide some impedance matching. For narrow band applications, C3 can be optimized for best match. The supply side of the inductor should be RF bypassed to ground through an appropriate value capacitor for the frequency band of interest.
Slug	Gnd	Primary ground connection as well as for thermal management. This must be directly connected to the RF ground plane for the best high frequency performance and the lowest operating temperature.

Absolute Maximum Ratings

PARAMETER	RATING	UNIT
Supply Voltage	7	Volts
Power-down Voltage	6	Volts
RF Power Input	+15	dBm
Storage Temperature	-65 to +150	°C
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

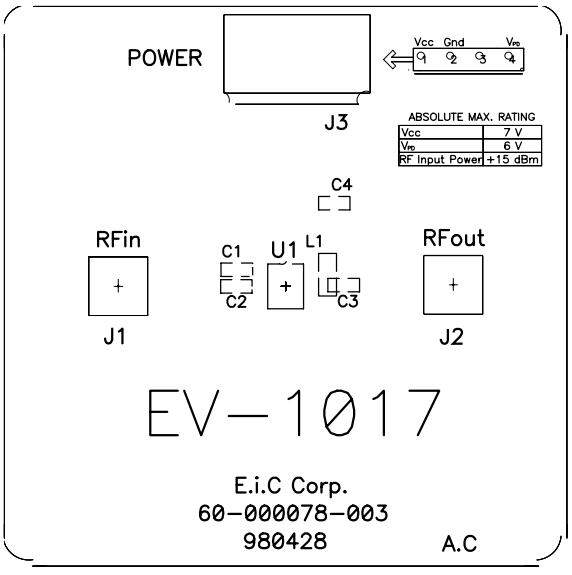


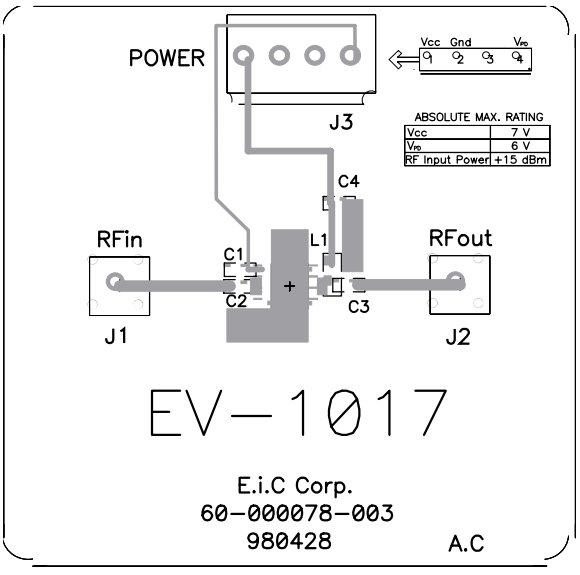
Evaluation Board Materials 500 - 3000 MHz

QTY.	DESCRIPTION	VALUE	DESIGNATORS
1	Inductor (0805)	15nH	L1
2	Capacitor(0603)	100pF	C2, C3
2	Capacitor(0603)	1nF	C1, C4
2	SMA Connector	-	J1, J2
1	.156" Center Header	-	J3
1	Driver Amplifier	-	U1

Evaluation Board Layout

2.5" x 2.5"





Typical Characteristics

(using *EIC*'s EV-1017 Evaluation Board over an average performance of 20 devices)

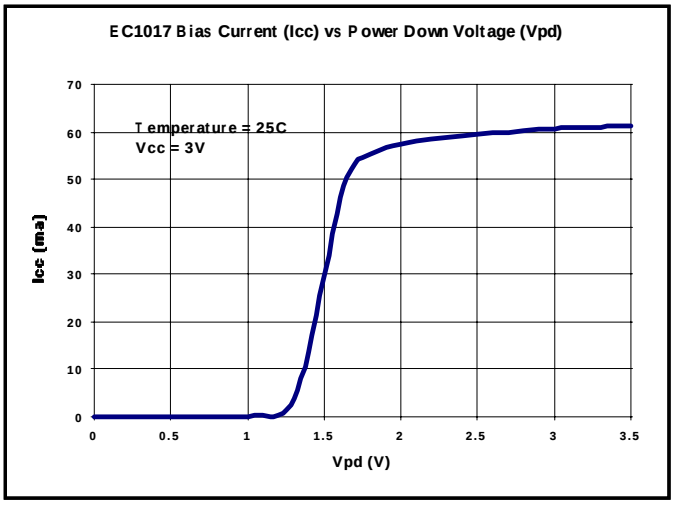


Figure 1

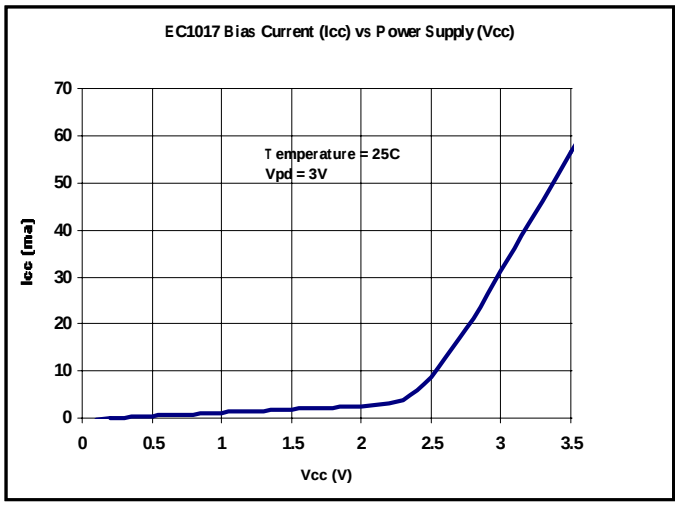


Figure 2

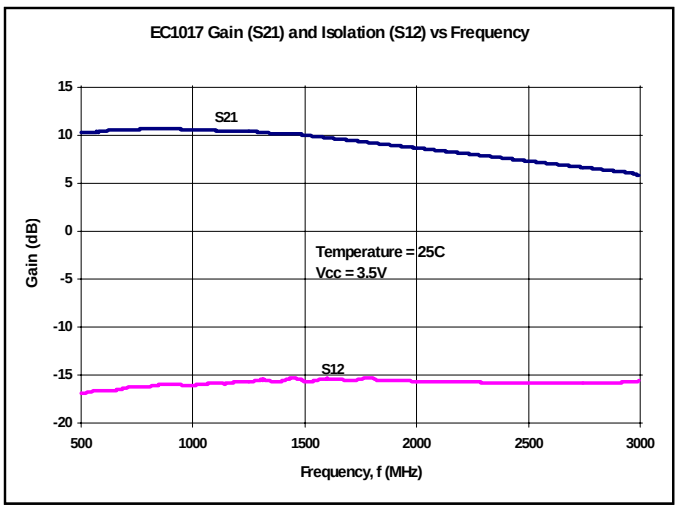


Figure 3

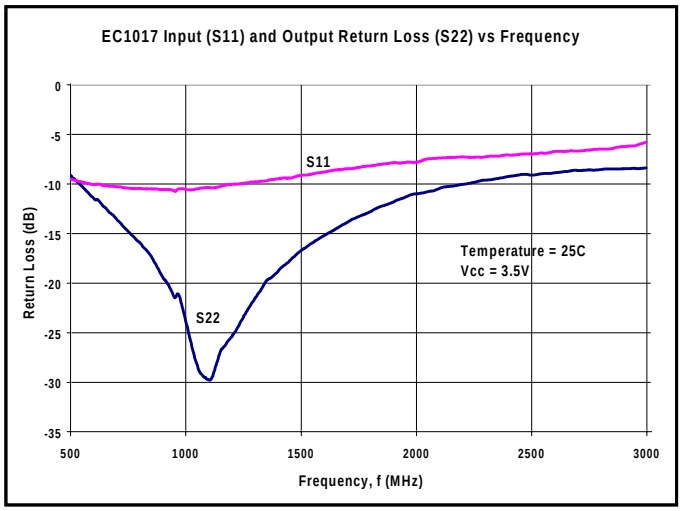


Figure 4

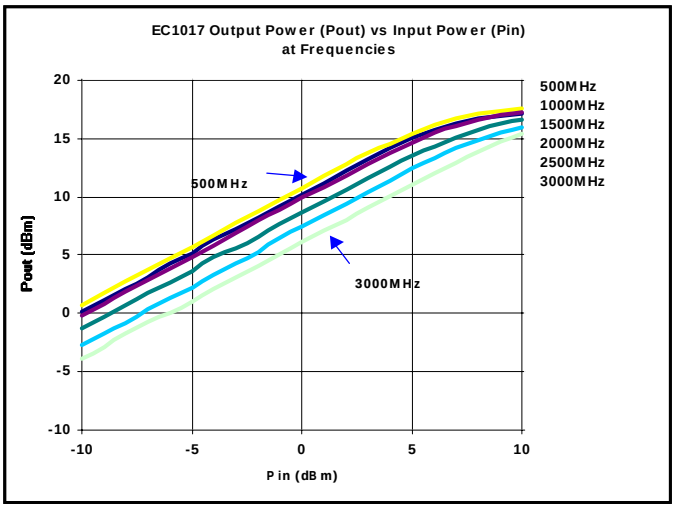


Figure 5

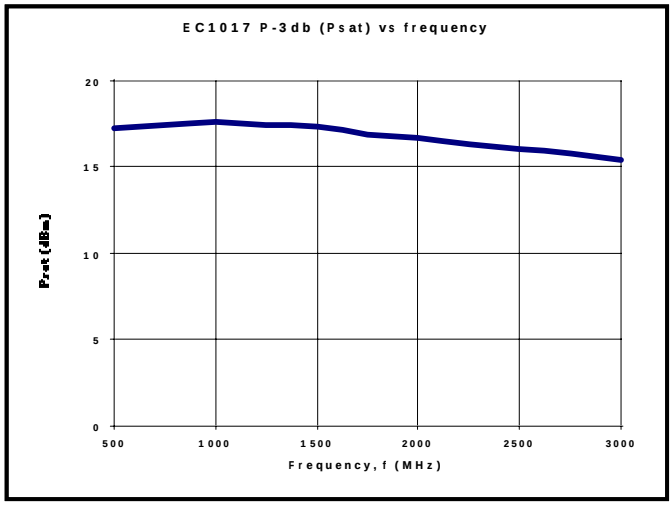


Figure 6

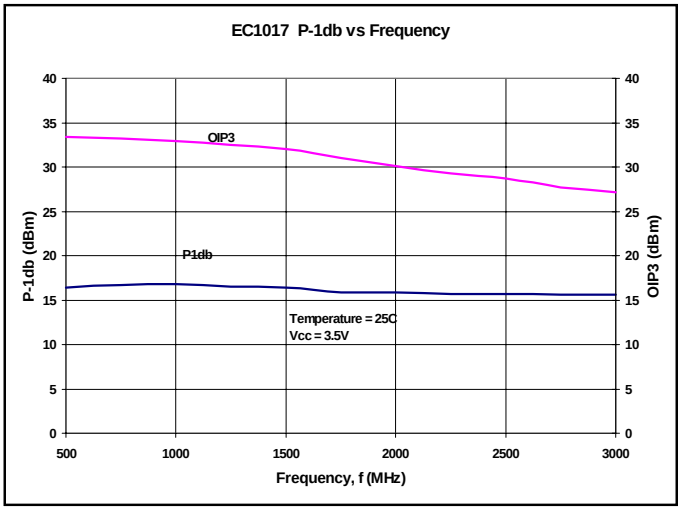


Figure 7

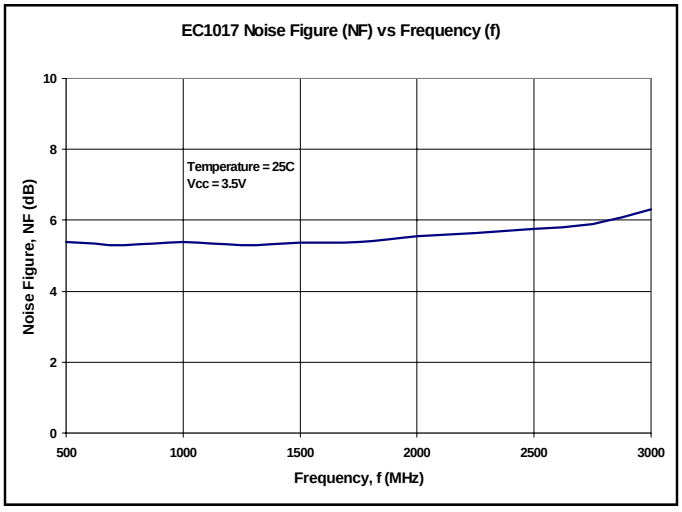
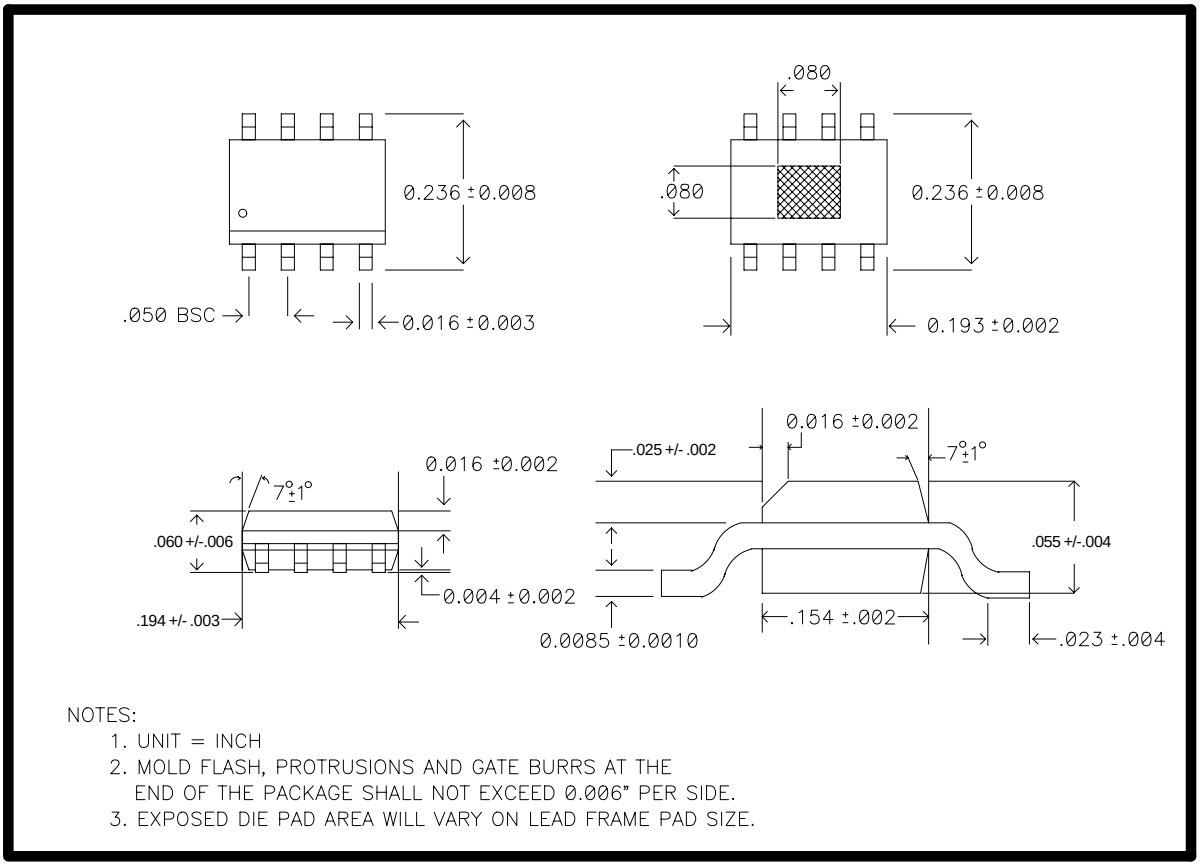


Figure 8

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.