CEL

NEC's 1.5W GaAs MMIC POWER AMPLIFIER

UPG2118K

FEATURES

- **E-MODE HJ-FET TECHNOLOGY**
- **SINGLE +3.2V POWER SUPPLY**
- **HIGH EFFICIENCY:** PAE = 42% MIN
- **HIGH SATURATED POWER:** Pout = +31.5 dBm MIN
- **FLEXIBLE FREQUENCY RANGE**
- **20-PIN QFN PACKAGE:**
  (4.15 x 4.15 x 0.9 mm)

DESCRIPTION

NEC's UPG2118K is a 1.5W, 3 stage power amplifier developed primarily for DCS/PCS1800 applications. With modified external matching the UPG2118K can be tuned from 800 to 2500 MHz.

Use of E-mode FET technology delivers high efficiency and high linearity with a single positive low voltage supply.

APPLICATIONS

- **1800 MHz DCS/PCS**
- **AUTOMATIC METER READERS**
- **WIRELESS SECURITY**
- **SATELLITE UPLINK**

ORDERING INFORMATION

PART NUMBER	MARKING	PACKAGE	SUPPLYING FORM
UPG2118K-E3	30C48	20-pin QFN	• Embossed tape 12mm wide • 4.5 K pcs/reel

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C, unless otherwise specified)

PARAMETERS	SYMBOL	RATINGS	UNIT
Storage Temperature	T_{stg}	–45 to +85	°C
Operating Temperature	T_{opt}	–45 to +85	°C
Supply Voltage1,2,3	V_D1,2,3	8.0	V
Active Bias Circuit Voltage	V_{ABC}	8.0	V
Reference Voltage	V_{ref}	5.0	V
Junction Temperature	T_j	150	°C
Input Power	P_{in}	15	dBm
Total Power Dissipation	P_{tot}	4.0	W

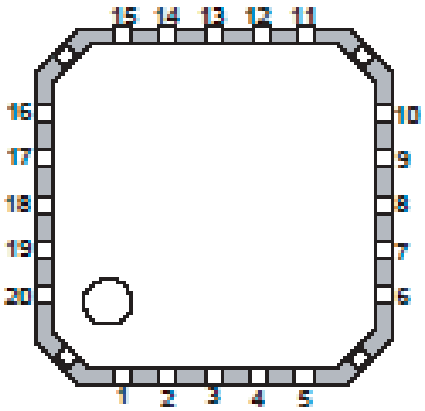
Caution This device is ESD sensitive. Please take ESD precautions.

The information contained in this document is being issued in advance of the production cycle for the device. The parameters for the device may change before final production or NEC Corporation, at its own discretion, may withdraw the device prior to its production.

PIN CONNECTIONS

PIN NO.	CONNECTION	PIN NO.	CONNECTION
1	V_G3	11	GND
2	$V_{ref}1,2$	12	NC
3	V_{ABC}	13	NC
4	$V_{ref}3$	14	GND
5	$V_G1,2$	15	V_D2
6	GND	16	V_D1
7	V_D3/RF OUT	17	GND
8	V_D3/RF OUT	18	GND
9	V_D3/RF OUT	19	V_{attn}
10	V_D3/RF OUT	20	RF IN

(Top View)



RECOMMENDED OPERATING CONDITIONS (T_A = 25°C)

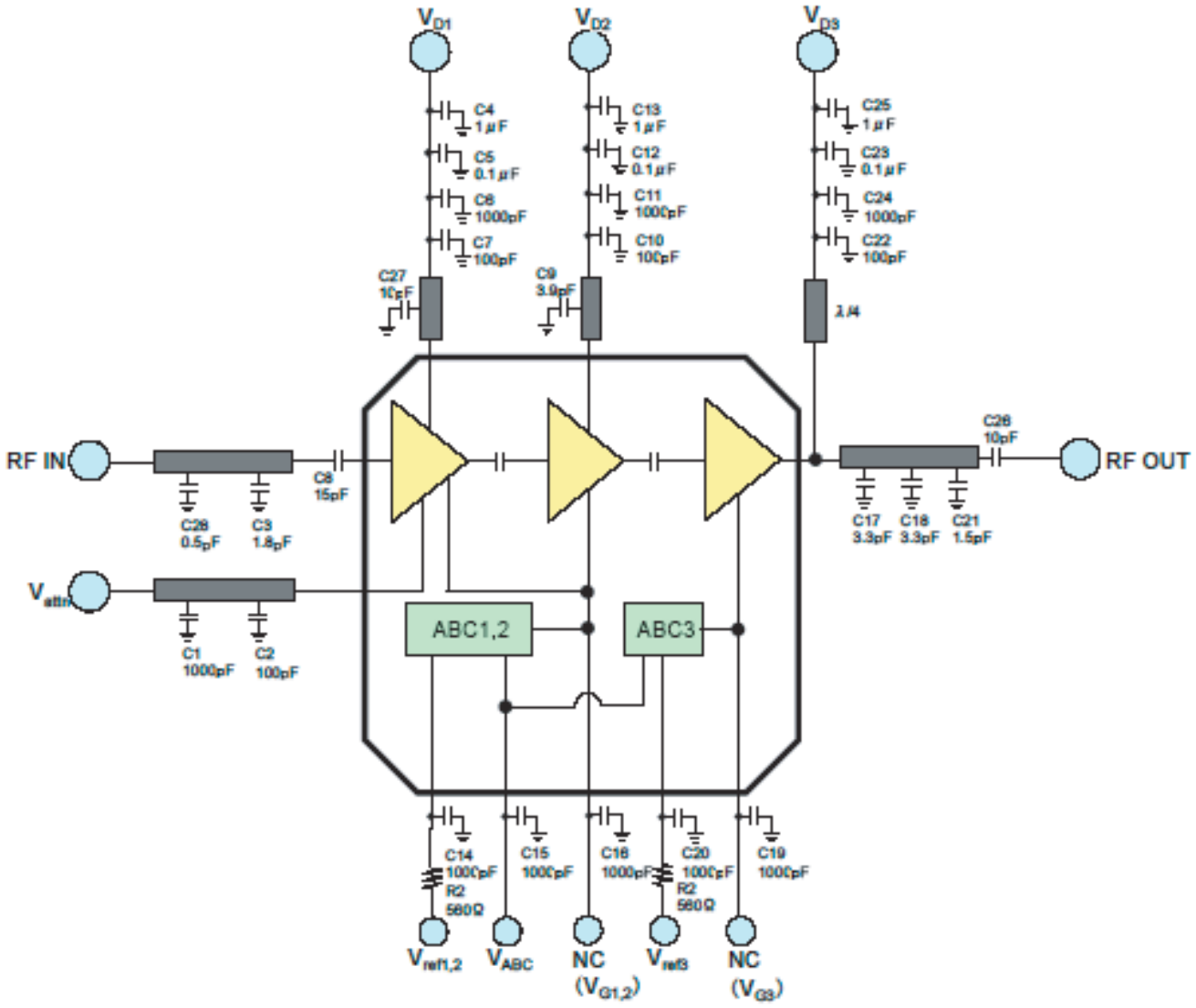
PARAMETERS	SYMBOL	MIN	TYP	MAX	UNIT
Supply Voltage	$V_D1,2,3$	+2.8	+3.2	+5.5	V
Reference Voltage	V_{ref}	+0.04	-	+1.8	V
Active Bias Circuit Voltage	V_{ABC}	0	2.6	5.5	V
Input Power	P_{in}	5	-	10	dBm

ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, TA=+25°C,f=1880MHz,V_D=+3.2V,V_{ABC}=+2.6V,V_{ref}=V_{attn}=1.8V, P_{in}=+5dBm)

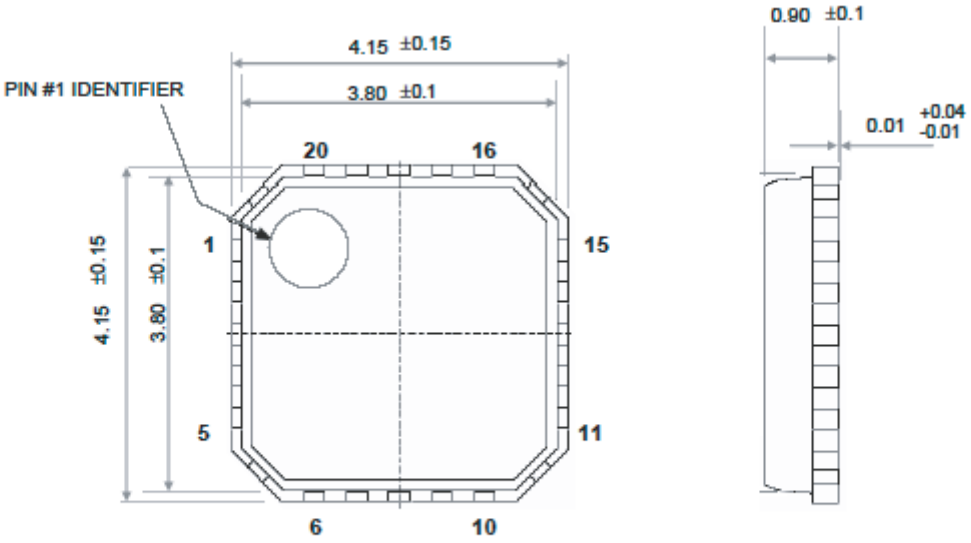
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Active Bias Circuit Current	I_{ABC}	P_{out}=31.5dBm,V_{ABC}=Arbitrary	-	-	30	mA
Reference Current	I_{ref}	V_{ref}=V_{attn}=0.04 to 1.8V	-	-	10	mA
RF Leakage Current	I_{leak}	V_{ref}=V_{attn}=0.04 V V_{ABC}=10K ohm+Load	-	-	50	dB
Output Power	P_{out}		31.5	-	-	dBm
Power Added Efficiency	PAE		42.0	-	-	%
Power Control Slope	P_{slope}	V_{ref}=V_{attn}=0.04 V to 1.8V ΔV_{ref}=0.01V	-	-	50:1	Vrms/ Vref
Minimum Output Power	M_{Pout}	V_{ref}=V_{attn}=0.04 V	-	-	-20	dBc

TEST CIRCUIT



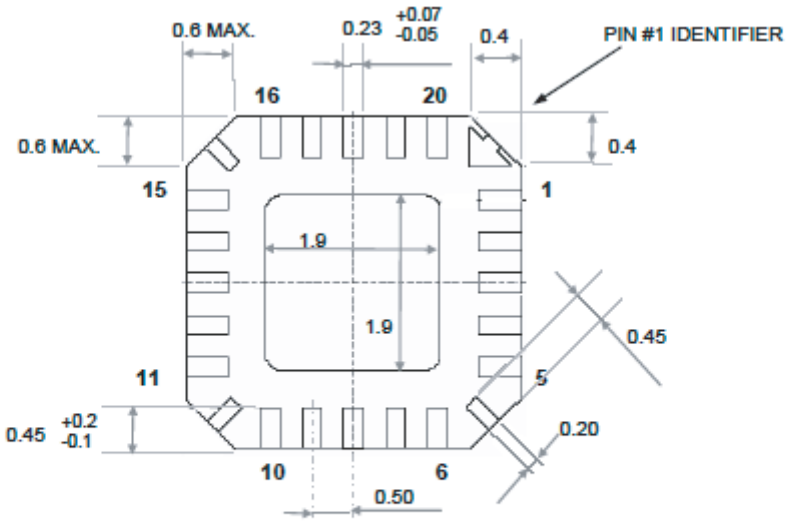
NC (VG1,2 VG3) These pins must be connected to ground via a 1000pF capacitor for stability.

PACKAGE DIMENSIONS (UNIT: mm)



Top View

Side View



Bottom View