



# NEC's 2.4 GHz Si LD MOS POWER AMPLIFIER

## UPD5702TU

### FEATURES

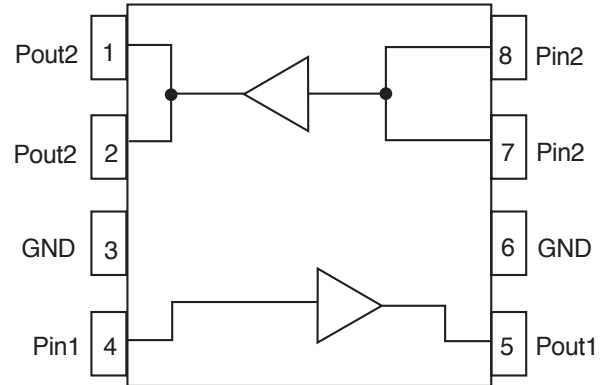
- **MEDIUM OUTPUT POWER:**  
P<sub>OUT</sub> = +21 dBm TYP @ P<sub>IN</sub> = -2 dBm, f = 2.45 GHz
- **ON CHIP OUTPUT POWER CONTROL FUNCTION**
- **SINGLE SUPPLY VOLTAGE:**  
V<sub>DS</sub> = 3.0 V TYP
- **PACKAGED IN 8 PIN L2MM (2.0 X 2.2 X 0.5mm)  
SUITABLE FOR HIGH-DENSITY SURFACE MOUNT**

### DESCRIPTION

NEC's UPD5702TU is a silicon LD MOS IC designed for use as a power amplifier up to 2.4 GHz application. This IC consists of two stage amplifiers. The device is packaged in a low cost, surface mount 8 pin L2MM (Leadless Mini Mold) plastic package. Ideally suited for high density surface mount designs.

NEC's stringent quality assurance and test procedures ensure the highest reliability and performance.

### INTERNAL BLOCK DIAGRAM



### APPLICATIONS

- 1.9 GHz Application Ex. PHS etc.
- 2.4 GHz application Ex. Bluetooth, Wireless LAN, etc.
- General purpose medium power AGC amplifier

### ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C, V<sub>DS</sub> = 3.0 V, f = 1.9 GHz, unless otherwise specified)

PART NUMBER			UPD5702TU□		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
I <sub>DS</sub>	Circuit Current, P <sub>IN</sub> = -5 dBm, P <sub>OUT</sub> = +20.5 dBm	mA		150	
V <sub>GS</sub>	Gate Bias Voltage, P <sub>IN</sub> = -5 dBm, P <sub>OUT</sub> = +20.5 dBm	V		2.0	
P <sub>OUT</sub>	Output Power, P <sub>IN</sub> = -5 dBm	dBm	20.5		
PAE	Power Added Efficiency, P <sub>IN</sub> = -5 dBm, P <sub>OUT</sub> = +20.5 dBm	%		27	
Padj1	Adjacent Channel Power 1, P <sub>IN</sub> = -5 dBm, P <sub>OUT</sub> = +20.5 dBm	dBc		-61	
Padj2	Adjacent Channel Power 2, P <sub>IN</sub> = -5 dBm, P <sub>OUT</sub> = +20.5 dBm	dBc		-76	
IRL	Input Return Loss, P <sub>IN</sub> = -20 dBm	dB		10	
ORL	Output Return Loss, P <sub>IN</sub> = -20 dBm	dB		10	
ISOL	Isolation, P <sub>IN</sub> = -20 dBm	dB		45	
OBW	Occupied Bandwidth, P <sub>IN</sub> = -5 dBm, P <sub>OUT</sub> = +20.5 dBm	dB		TBD	

**ABSOLUTE MAXIMUM RATINGS<sup>1</sup>**

(TA = 25°C unless otherwise specified)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V <sub>DS</sub>	Supply Voltage 1	V	6.0
V <sub>GS</sub>	Supply Voltage 2	V	6.0
P <sub>D</sub>	Power Dissipation <sup>2</sup>	W	0.866
T <sub>A</sub>	Operating Ambient Temp.	°C	-40 to +85
T <sub>STG</sub>	Storage Temp. Range	°C	-65 to +150
P <sub>IN(MAX)</sub>	Maximum Input Level	dBm	+10
T <sub>j</sub>	Junction Temperature	°C	+150

Notes:

1. Operation in excess of any one of these conditions may result in permanent damage.
2. TA = 25°C, mounted on 330 x 21 mm epoxy glass PWB.

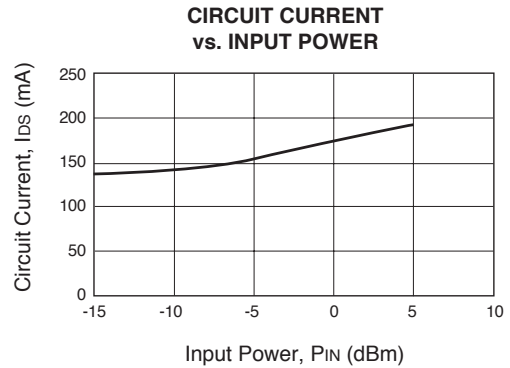
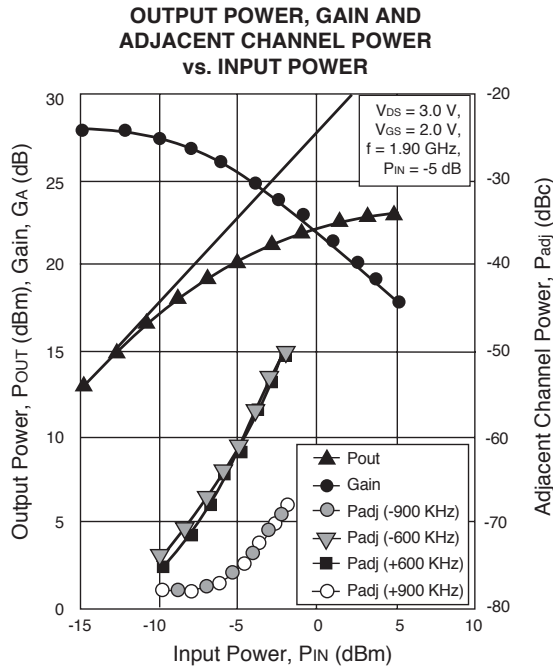
**RECOMMENDED OPERATING CONDITIONS**

SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
V <sub>DS</sub>	Supply Voltage 1	V	2.7	3.0	3.6
V <sub>GS</sub>	Supply Voltage 2	V	0.0	0.2	-
P <sub>IN</sub>	Maximum Input Power	dBm	-	+5	-
I <sub>D</sub>	Drain Current	mA	-	165	-

**ORDERING INFORMATION**

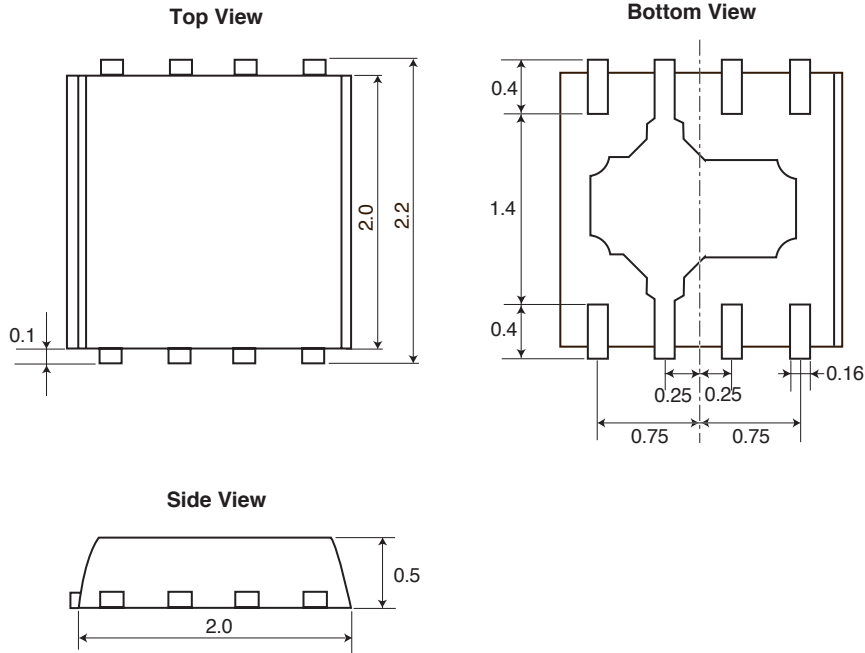
PART NUMBER	QUANTITY
UPD5702TU-E2-A	TBD

**TYPICAL PERFORMANCE CURVES** (TA = 25°C, f = 1.9 GHz, V<sub>GS</sub> = 2.0 V unless otherwise specified)



**PACKAGE DIMENSIONS** (Units in mm)

**PACKAGE OUTLINE TU**



Life Support Applications

These NEC products are not intended for use in life support devices, appliances, or systems where the malfunction of these products can reasonably be expected to result in personal injury. The customers of CEL using or selling these products for use in such applications do so at their own risk and agree to fully indemnify CEL for all damages resulting from such improper use or sale.

**CEL** California Eastern Laboratories, Your source for NEC RF, Microwave, Optoelectronic, and Fiber Optic Semiconductor Devices.  
4590 Patrick Henry Drive • Santa Clara, CA 95054-1817 • (408) 988-3500 • FAX (408) 988-0279 • [www.cel.com](http://www.cel.com)

DATA SUBJECT TO CHANGE WITHOUT NOTICE

02/04/2004

Subject: Compliance with EU Directives

CEL certifies, to its knowledge, that semiconductor and laser products detailed below are compliant with the requirements of European Union (EU) Directive 2002/95/EC Restriction on Use of Hazardous Substances in electrical and electronic equipment (RoHS) and the requirements of EU Directive 2003/11/EC Restriction on Penta and Octa BDE.

CEL Pb-free products have the same base part number with a suffix added. The suffix –A indicates that the device is Pb-free. The –AZ suffix is used to designate devices containing Pb which are exempted from the requirement of RoHS directive (\*). In all cases the devices have Pb-free terminals. All devices with these suffixes meet the requirements of the RoHS directive.

This status is based on CEL’s understanding of the EU Directives and knowledge of the materials that go into its products as of the date of disclosure of this information.

Restricted Substance per RoHS	Concentration Limit per RoHS (values are not yet fixed)	Concentration contained in CEL devices	
		-A	-AZ
Lead (Pb)	< 1000 PPM	Not Detected	(*)
Mercury	< 1000 PPM	Not Detected	
Cadmium	< 100 PPM	Not Detected	
Hexavalent Chromium	< 1000 PPM	Not Detected	
PBB	< 1000 PPM	Not Detected	
PBDE	< 1000 PPM	Not Detected	

If you should have any additional questions regarding our devices and compliance to environmental standards, please do not hesitate to contact your local representative.

Important Information and Disclaimer: Information provided by CEL on its website or in other communications concerning the substance content of its products represents knowledge and belief as of the date that it is provided. CEL bases its knowledge and belief on information provided by third parties and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. CEL has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. CEL and CEL suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall CEL’s liability arising out of such information exceed the total purchase price of the CEL part(s) at issue sold by CEL to customer on an annual basis.

See CEL Terms and Conditions for additional clarification of warranties and liability.