



L-BAND PA DRIVER AMPLIFIER

UPG2110TB

FEATURES

- **LOW VOLTAGE OPERATION:** $V_{DD1} = V_{DD2} = 3.0\text{ V}$, $f_{RF} = 1850\text{ to }1910\text{ MHz}$ @ $P_{OUT} = +8\text{ dBm}$
- **LOW DISTORTION:** $P_{ADJ1} = 60\text{ dBc TYP}$ @ $V_{DD} = 3.0\text{ V}$, $P_{OUT} = +8\text{ dBm}$, $V_{AGC} = 2.5\text{ V}$
- **LOW CURRENT OPERATION :** $I_{DD} = 20\text{ mA TYP}$ @ $V_{DD} = 3.0\text{ V}$, $P_{OUT} = +8\text{ dBm}$, $V_{AGC} = 2.5\text{ V}$
- **EXTERNAL INPUT AND OUTPUT MATCHING**
- **VARIABLE GAIN CONTROL FUNCTION :** $G = 35\text{ dB TYP}$ @ $V_{AGC} = 0.5\text{ to }2.5\text{ V}$
- **6 PIN SUPER MINI-MOLD PACKAGE**

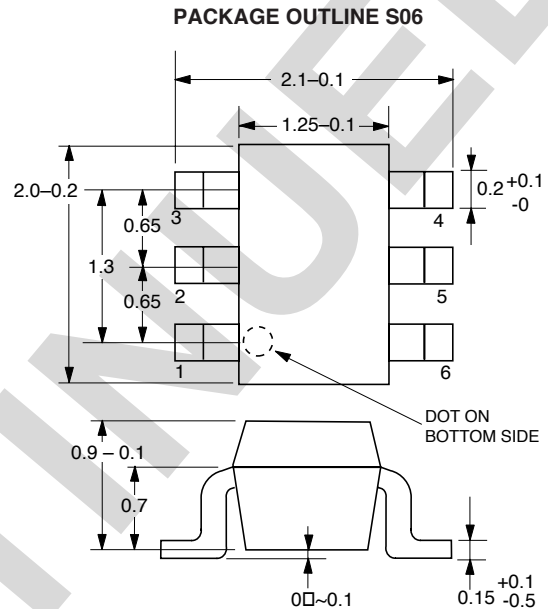
DESCRIPTION

NEC's UPG2110TB is a GaAs MMIC for PA driver amplifiers with variable gain functions which was developed for L-band applications. The device can operate with 3.0 V, having high gain and low distortion.

APPLICATION

- **DIGITAL CELLULAR PDC, IS-136**

OUTLINE DIMENSIONS (Units in mm)



ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, $V_{DD1} = V_{DD2} = +3.0\text{ V}$, $\pi/4\text{DQPSK}$ modulated input signal, external input and output matching, unless otherwise specified)

PART NUMBER PACKAGE OUTLINE			UPG2110TB S06			
SYMBOLS	PARAMETERS AND CONDITIONS		UNITS	MIN	TYP	MAX
f	Operating Frequency		MHz	1850		1910
I _{DD}	Total Current	$P_{OUT} = +8\text{ dBm}$, $V_{AGC} = 2.5\text{ V}$	mA		20	30
I _{AGC}	AGC Control Current	$V_{AGC} = 0.5\text{ to }2.5\text{ V}$	μA		200	500
GP	Power Gain	$P_{IN} = -18\text{ dBm}$, $V_{AGC} = 2.5\text{ V}$	dB	17.5	19.5	
G	Variable Gain Range	$P_{IN} = -18\text{ dBm}$, $V_{AGC} = 0.5\text{ to }2.5\text{ V}$	dB	30	35	
P _{ADJ1}	Adjacent Channel Power Leakage 1	$P_{OUT} = +8\text{ dBm}$, $V_{AGC} = 2.5\text{ V}$, $\Delta f = \pm 50\text{ KHz}$, 21 kHz Bandwidth	dBc		60	55
P _{ADJ2}	Adjacent Channel Power Leakage 2	$P_{OUT} = +8\text{ dBm}$, $V_{AGC} = 2.5\text{ V}$, $\Delta f = \pm 100\text{ KHz}$, 21 kHz Bandwidth	dBc		70	65

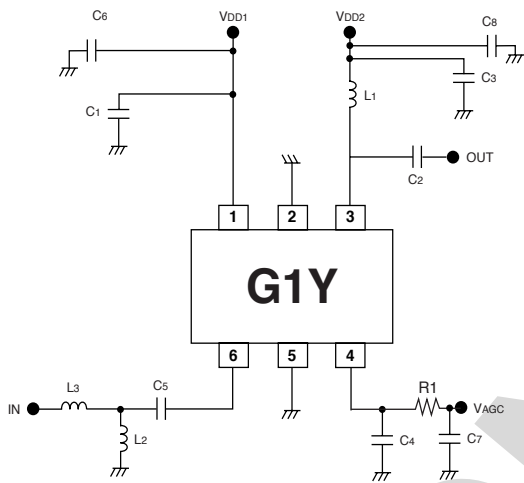
ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V _{DD}	Supply Voltage	V	6.0
V _{AGC}	AGC Control Voltage	V	6.0
P _{IN}	Input Power	dBm	8
P _T	Total Power Dissipation ²	mW	200
T _{OP}	Operating Temperature	°C	-30 to +90
T _{STG}	Storage Temperature	°C	-35 to +150

Notes:

1. Operation excess of any one of these parameters may result in permanent damage.
2. Mounted on a 50 x 50 x 1.6mm double copper clad epoxy glass PWB, T_A = +85 °C

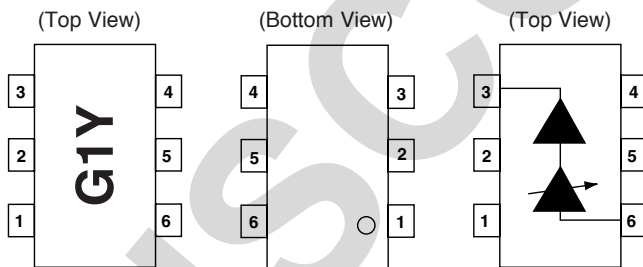
TEST CIRCUIT¹



Note:

1. V_{DD1} = V_{DD2} = +3.0 V, f = 1880 MHz.

PIN CONNECTIONS AND INTERNAL BLOCK DIAGRAM



1. V_{DD1}
2. GND
3. V_{DD2} & Output
4. V_{AGC}
5. GND
6. Input

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.

RECOMMENDED OPERATING CONDITIONS (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
V _{DD}	Supply Voltage	V	+2.7	+3.0	+3.3
P _{IN}	Input Power	dBm		-18	-15
V _{AGC}	AGC Control Voltage	V	0		2.5

PIN NO.	CONNECTION
C1, C3, C6, C7, C8	1000 pF
C2	1.5 pF
C4	3.3 pF
C5	1.8 pF
L1	1.8 nH
L2	5.6 nH
L3	8.2 nH
R1	1 kΩ

ORDERING INFORMATION

PART NUMBER	QTY
UPG2110TB-E3-A	3 kpcs Per Reel

Note:

1. Embossed tape, 8 mm wide.

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.

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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.

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