NEC

GaAs INTEGRATED CIRCUIT

μPG2134TB

L-BAND PA DRIVER AMPLIFIER

DESCRIPTION

The μPG2134TB is GaAs MMIC for PA driver amplifier which were developed for mobile phone and another L-band application.

This device can operate with 3.0 V TYP., having the high gain and low distortion. This device is housed in a 6-pin super minimold package. And this package is able to high-density surface mounting.

FEATURES

- Operation frequency : f_{opt} = 1 429 to 1 453 MHz (1 441 MHz TYP.)
- Supply voltage : V_{DD1} = 2.7 to 3.3 V (3.0 V TYP.)
  : V_{DD2} = 2.7 to 4.2 V (3.5 V TYP.)
- Circuit current : I_{DD} = 28 mA TYP. @ V_{DD1} = 3.0 V, V_{DD2} = 3.5 V, V_{AGC} = 2.5 V, P_{in} = –15 dBm
- Power gain : G_P = 28 dB TYP. @ V_{DD1} = 3.0 V, V_{DD2} = 3.5 V, V_{AGC} = 2.5 V, P_{in} = –15 dBm
- Gain control range : GCR = 42 dB TYP. @ V_{DD1} = 3.0 V, V_{DD2} = 3.5 V, V_{AGC} = 0.5 to 2.5 V, P_{in} = –15 dBm
- Low distortion : P_{adj1} = –60 dBc TYP. @ V_{DD1} = 3.0 V, V_{DD2} = 3.5 V, V_{AGC} = 2.5 V, P_{out} = +10 dBm, f = 1 441 MHz, Δf = ±50 kHz, 21 kHz Bandwidth
- High-density surface mounting : 6-pin super minimold package (2.0 × 1.25 × 0.9 mm)

APPLICATION

- Digital Cellular: PDC 1.5 GHz etc.

ORDERING INFORMATION

Part Number	Package	Marking	Supplying Form
μPG2134TB-E3	6-pin super minimold	G3B	• Embossed tape 8 mm wide • Pin 1, 2, 3 face the perforation side of the tape • Qty 3 kpcs/reel

Remark To order evaluation samples, contact your nearby sales office.
Part number for sample order: μPG2134TB

Caution Observe precautions when handling because these devices are sensitive to electrostatic discharge.

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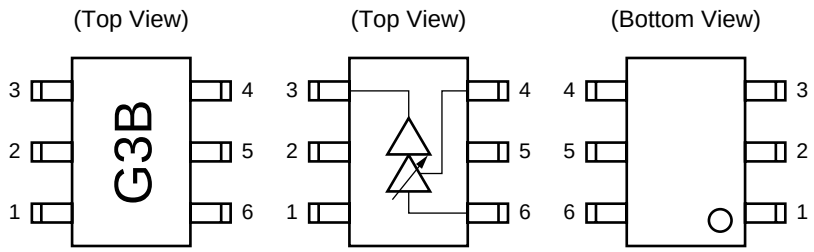
PIN CONNECTIONS AND INTERNAL BLOCK DIAGRAM



Pin No.	Pin Name
1	V_{DD1}
2	GND
3	OUTPUT/V_{DD2}
4	V_{AGC}
5	GND
6	INPUT

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

Parameter	Symbol	Ratings	Unit
Supply Voltage1, 2	$V_{DD1, 2}$	6.0	V
Gain Control Voltage	V_{AGC}	6.0	V
Input Power	P_{in}	–8	dBm
Power Dissipation	P_D	140 Note	mW
Operating Ambient Temperature	T_A	–30 to +90	°C
Storage Temperature	T_{stg}	–35 to +150	°C

Note Mounted on double-sided copper-clad 50 × 50 × 1.6 mm epoxy glass PWB, T_A = +85°C

RECOMMENDED OPERATING RENGE (T_A = +25°C, unless otherwise specified)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Operating Frequency	f_{opt}	1 429	1 441	1 453	MHz
Supply Voltage1	V_{DD1}	2.7	3.0	3.3	V
Supply Voltage2	V_{DD2}	2.7	3.5	4.2	V
Gain Control Voltage	V_{AGC}	0	–	2.5	V
Input Power	P_{in}	–	–15	–10	dBm

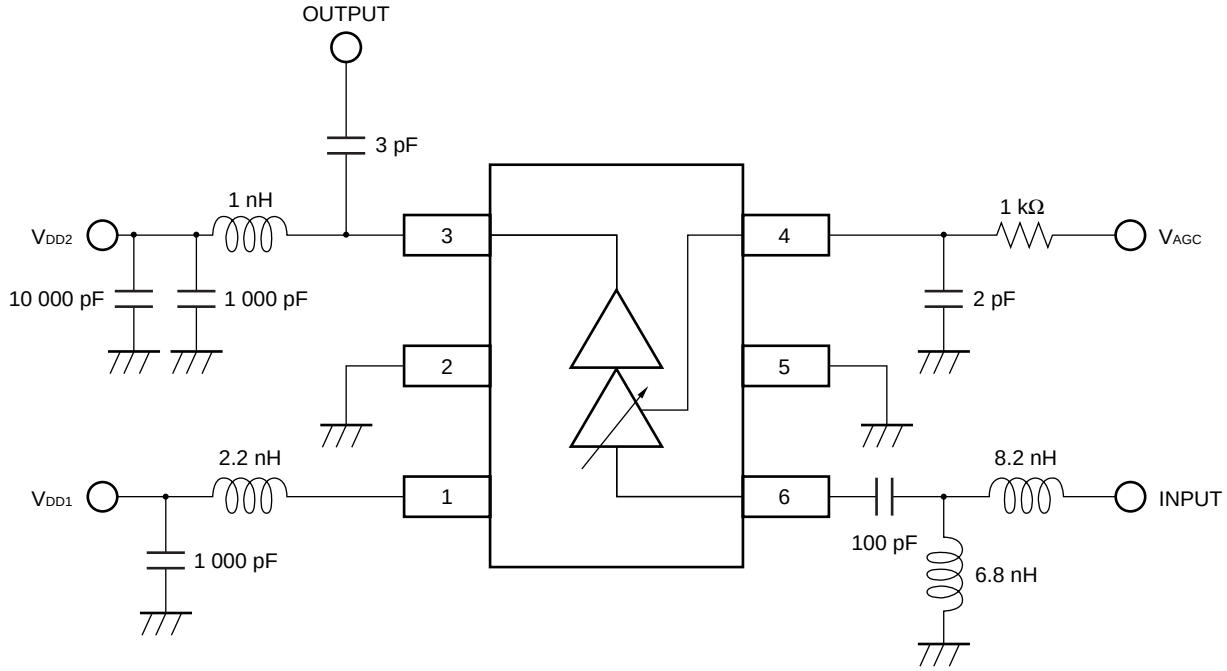
ELECTRICAL CHARACTERISTICS

(T_A = +25°C, V_{DD1} = 3.0 V, V_{DD2} = 3.5 V, π/4DQPSK modulated signal input, with external input and output matching, unless otherwise specified)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Operating Frequency	f_{opt}		1 429	1 441	1 453	MHz
Circuit Current	I_{DD}	P_{in} = –15 dBm, V_{AGC} = 2.5 V	–	28	35	mA
Power Gain	G_P	P_{in} = –15 dBm, V_{AGC} = 2.5 V	26	28	–	dB
Adjacent Channel Power Leakage 1	P_{adj1}	P_{out} = +10 dBm, V_{AGC} = 2.5 V, Δf = ±50 kHz, 21 kHz Bandwidth	–	–60	–55	dBc
Adjacent Channel Power Leakage 2	P_{adj2}	P_{out} = +10 dBm, V_{AGC} = 2.5 V, Δf = ±100 kHz, 21 kHz Bandwidth	–	–70	–65	dBc
Gain Control Range	GCR	P_{in} = –15 dBm, V_{AGC} = 0.5 to 2.5 V	37	42	–	dB
Gain Control Current	I_{AGC}	V_{AGC} = 0.5 to 2.5 V	–	1	20	μA

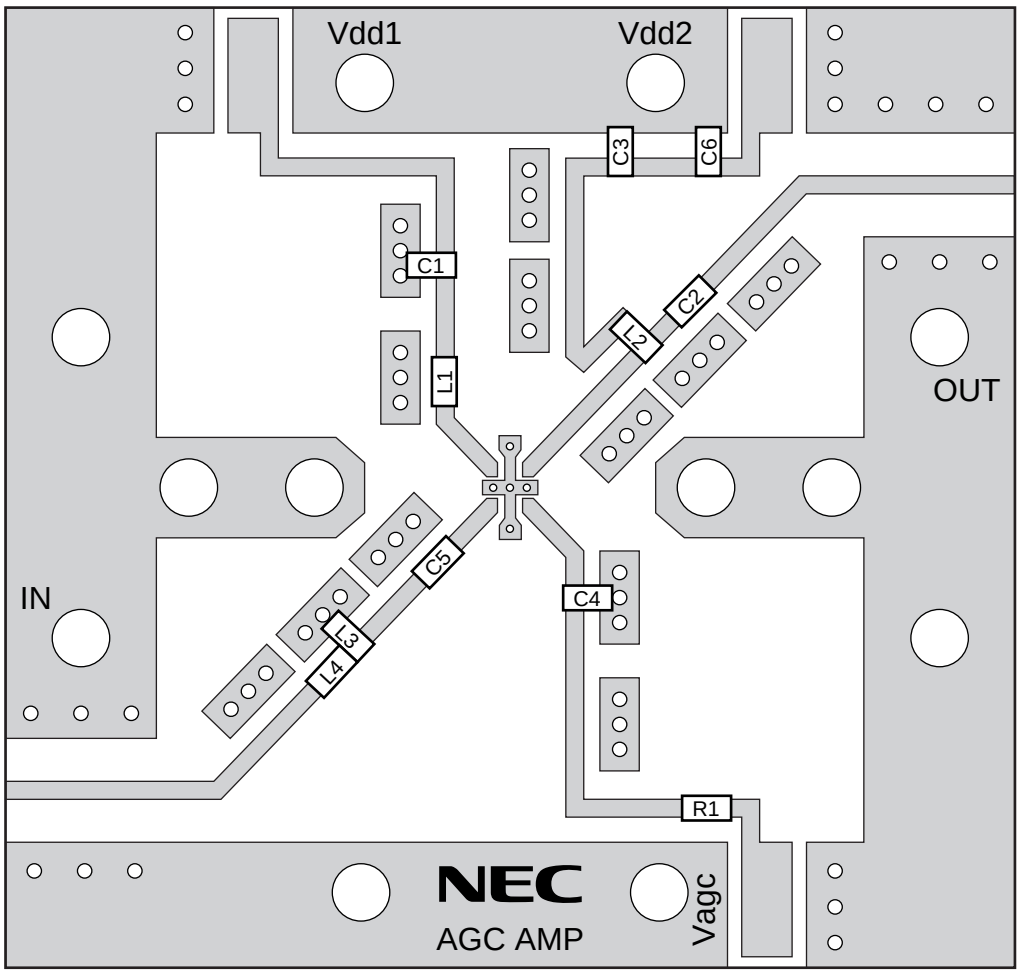
EVALUATION CIRCUIT

f = 1 441 MHz, V_{DD1} = 3.0 V, V_{DD2} = 3.5 V



The application circuits and their parameters are for reference only and are not intended for use in actual design-ins.

ILLUSTRATION OF THE TEST CIRCUIT ASSEMBLED ON EVALUATION BOARD

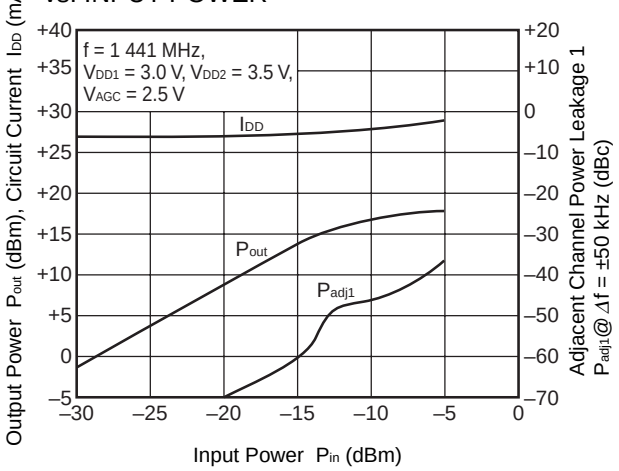


USING THE NEC EVALUATION BOARD

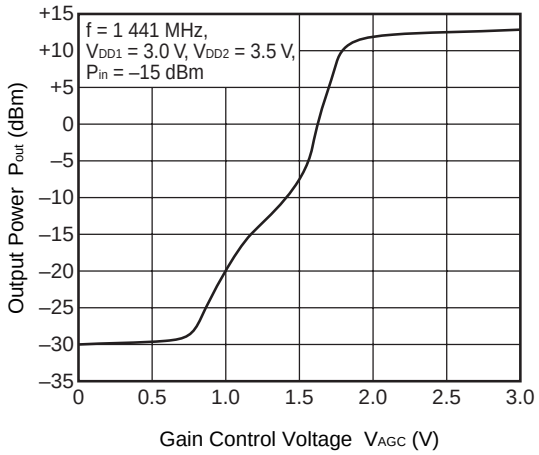
Symbol	Values	Part Number	Maker
C1, C3	1 000 pF	GRM39CH102J25PB	muRata
C2	3 pF	GRM39CH030C50PB	muRata
C4	2 pF	GRM39CH020C50PB	muRata
C5	100 pF	GRM39CH101J50PB	muRata
C6	10 000 pF	GRM39CH103J25PB	muRata
L1	2.2 nH	TFL0816-2N7	Susumu
L2	1.0 nH	TFL0816-1N0	Susumu
L3	6.8 nH	TFL0816-6N8	Susumu
L4	8.2 nH	TFL0816-8N2	Susumu
R1	1 kΩ	RR0816P-102-D	Susumu

TYPICAL CHARACTERISTICS (T_A = +25°C, unless otherwise specified)

OUTPUT POWER, CIRCUIT CURRENT, ADJACENT CHANNEL POWER LEAKAGE vs. INPUT POWER



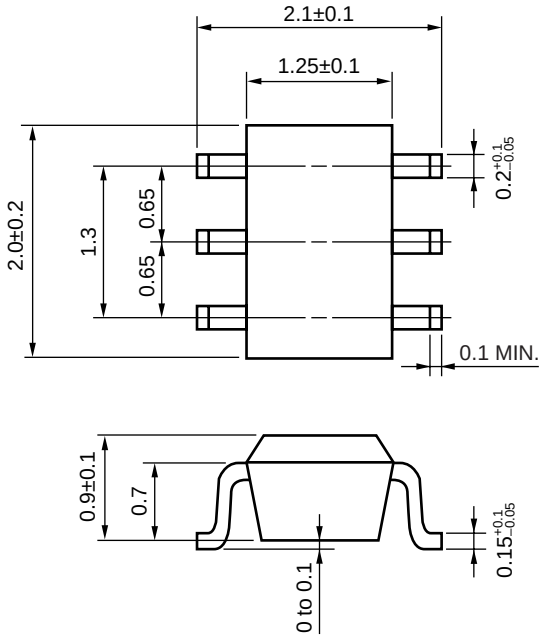
OUTPUT POWER vs. GAIN CONTROL VOLTAGE



Remark The graphs indicate nominal characteristics.

PACKAGE DIMENSIONS

6-PIN SUPER MINIMOLD (UNIT: mm)



RECOMMENDED SOLDERING CONDITIONS

This product should be soldered and mounted under the following recommended conditions. For soldering methods and conditions other than those recommended below, contact your nearby sales office.

Soldering Method	Soldering Conditions		Condition Symbol
Infrared Reflow	Peak temperature (package surface temperature) Time at peak temperature Time at temperature of 220°C or higher Preheating time at 120 to 180°C Maximum number of reflow processes Maximum chlorine content of rosin flux (% mass)	: 260°C or below : 10 seconds or less : 60 seconds or less : 120±30 seconds : 3 times : 0.2%(Wt.) or below	IR260
VPS	Peak temperature (package surface temperature) Time at temperature of 200°C or higher Preheating time at 120 to 150°C Maximum number of reflow processes Maximum chlorine content of rosin flux (% mass)	: 215°C or below : 25 to 40 seconds : 30 to 60 seconds : 3 times : 0.2%(Wt.) or below	VP215
Wave Soldering	Peak temperature (molten solder temperature) Time at peak temperature Preheating temperature (package surface temperature) Maximum number of flow processes Maximum chlorine content of rosin flux (% mass)	: 260°C or below : 10 seconds or less : 120°C or below : 1 time : 0.2%(Wt.) or below	WS260
Partial Heating	Peak temperature (pin temperature) Soldering time (per side of device) Maximum chlorine content of rosin flux (% mass)	: 350°C or below : 3 seconds or less : 0.2%(Wt.) or below	HS350

Caution Do not use different soldering methods together (except for partial heating).

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SAFETY INFORMATION ON THIS PRODUCT

Caution GaAs Products	The product contains gallium arsenide, GaAs. GaAs vapor and powder are hazardous to human health if inhaled or ingested. • Do not destroy or burn the product. • Do not cut or cleave off any part of the product. • Do not crush or chemically dissolve the product. • Do not put the product in the mouth. Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.

▶Business issue

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▶Technical issue

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