

L-BAND PA DRIVER AMPLIFIER

DESCRIPTION

The μ PG2124TH is GaAs MMIC for PA driver amplifier with variable gain function which were developed for W-CDMA and another L-band application. The device can operate with 2.85 V, having the high gain and low distortion.

FEATURES

- Low operation voltage: $V_{DD1} = V_{DD2} = V_{DD3} = +2.85 \text{ V}$
- Low distortion: $P_{adj1} = -50 \text{ dBc TYP. @ } V_{DD1} = V_{DD2} = V_{DD3} = +2.85 \text{ V, } P_{out} = +8 \text{ dBm, } V_{AGC} = +2.5 \text{ V}$
External input and output matching
- Low operation current: $I_{DD} = 40 \text{ mA TYP. @ } V_{DD1} = V_{DD2} = V_{DD3} = +2.85 \text{ V, } P_{out} = +8 \text{ dBm, } V_{AGC} = +2.5 \text{ V}$
External input and output matching
- Variable gain control function: $\Delta G = 28 \text{ dB TYP. @ } V_{AGC} = 0.5 \text{ to } 2.5 \text{ V}$
External input and output matching
- 10-pin plastic TSSOP

APPLICATION

- Digital cellular: W-CDMA etc.

ORDERING INFORMATION

Part Number	Package	Supplying Form
μ PG2124TH-E1	10-pin plastic TSSOP	<ul style="list-style-type: none"> • Embossed tape 12 mm wide • Pin 1 indicates pull-out direction of tape • Qty 2 kpcs / reel

Remark To order evaluation samples, please contact your local NEC sales office.

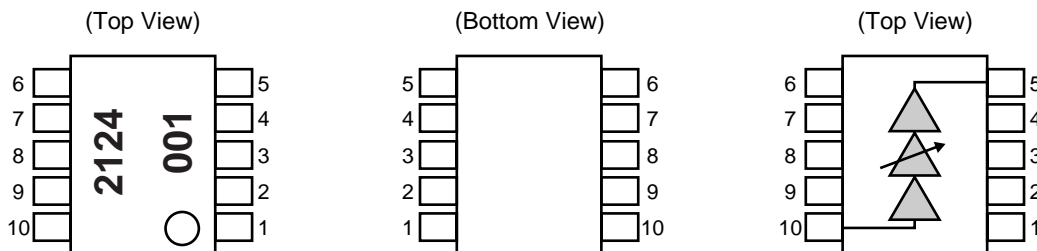
Part number for sample order: μ PG2124TH

Caution The IC must be handled with care to prevent static discharge because its circuit composed of GaAs HJ-FET.

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Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

PIN CONNECTIONS

Pin No.	Connection	Pin No.	Connection
1	V _{DD1}	6	GND
2	V _{AGC}	7	V _{DD2}
3	GND	8	GND (ATT)
4	Non-connection	9	GND
5	V _{DD3} and OUT	10	IN



ABSOLUTE MAXIMUM RATINGS (T_A = +25°C)

Parameter	Symbol	Ratings	Unit
Supply Voltage	V _{DD1, 2, 3}	6.0	V
AGC Control Voltage	V _{AGC}	6.0	V
Input Power	P _{in}	0	dBm
Total Power Dissipation	P _{tot}	190 ^{Note}	mW
Operating Ambient Temperature	T _A	-30 to +85	°C
Storage Temperature	T _{stg}	-35 to +150	°C

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

ELECTRICAL CHARACTERISTICS (T_A = +25°C)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Supply Voltage	V _{DD1, 2, 3}	+2.7	+2.85	+3.0	V
Input Power	P _{in}	–	–30	–10	dBm
AGC Control Voltage	V _{AGC}	0.5	–	2.5	V

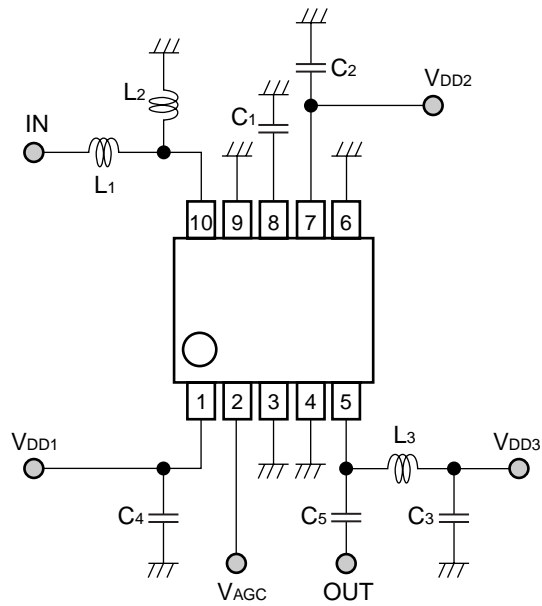
ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, T_A = +25°C, V_{DD1} = V_{DD2} = V_{DD3} = +2.85 V, V_{AGC} = +2.5 V, HPSK modulated single input, External input and output matching)

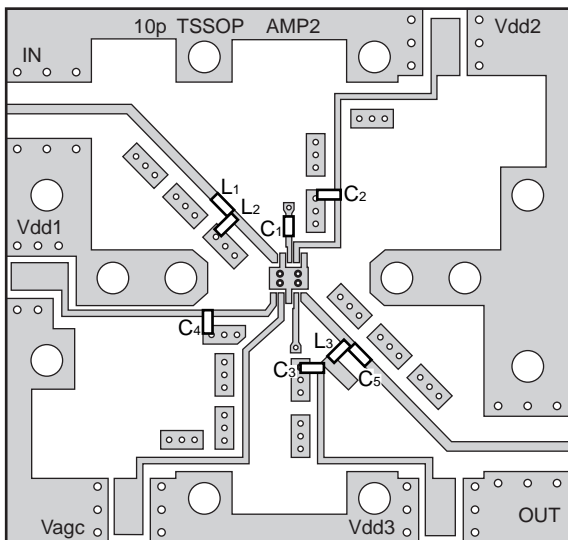
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Operating Frequency	f		1 920	–	1 980	MHz
Power Gain	G _p	P _{out} = +8 dBm	25	30	–	dB
Total Current	I _{DD}	P _{out} = +8 dBm	–	40	55	mA
Adjacent Channel Power Leakage 1	P _{adj1}	P _{out} = +8 dBm, Δf = ±5 MHz, 3.84 MHz band width	–	–50	–45	dBc
Adjacent Channel Power Leakage 2	P _{adj2}	P _{out} = +8 dBm, Δf = ±10 MHz, 3.84 MHz band width	–	–60	–55	dBc
Variable Gain Range	ΔG	P _{in} = –30 dBm, V _{AGC} = 0.5 to 2.5 V	25	28	–	dB
AGC Control Current	I _{AGC}	P _{out} = +8 dBm	–	200	250	μA
Noise Figure	NF	Small signal input	–	4	–	dB

EVALUATION CIRCUIT

T_A = +25°C, V_{DD1} = V_{DD2} = V_{DD3} = +2.85 V, f = 1 950 MHz



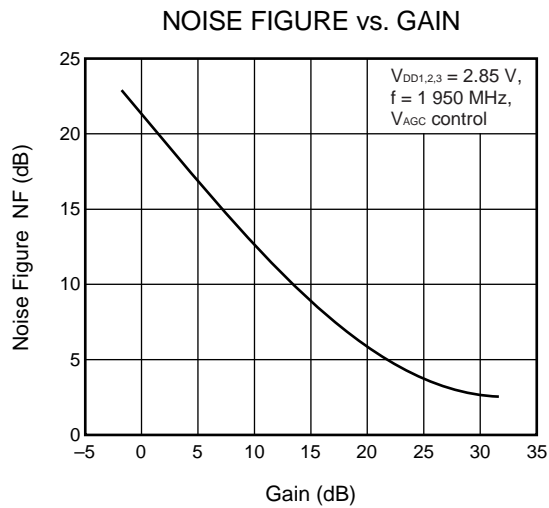
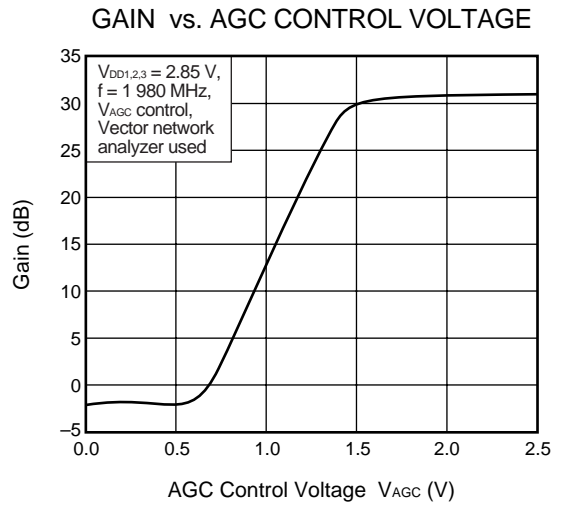
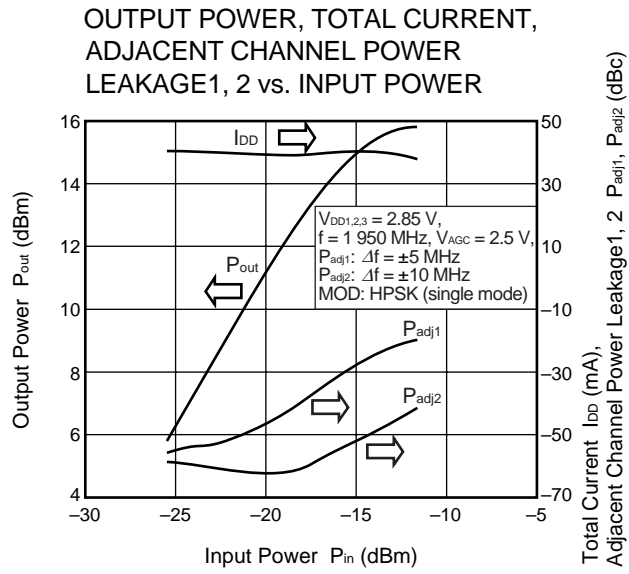
EVALUATION BOARD



USING THE NEC EVALUATION BOARD

Symbol	Values	Part Number	Maker
C1	5 pF	GRM39CH 050 C50	muRata
C2, C3, C4	1 000 pF	GRM39B 102 K50	muRata
C5	1.5 pF	GRM39CK 1R5 C50	muRata
L1, L2	3.3 nH	TFL0816-3N3	susumu
L3	2.7 nH	TFL0816-2N7	susumu

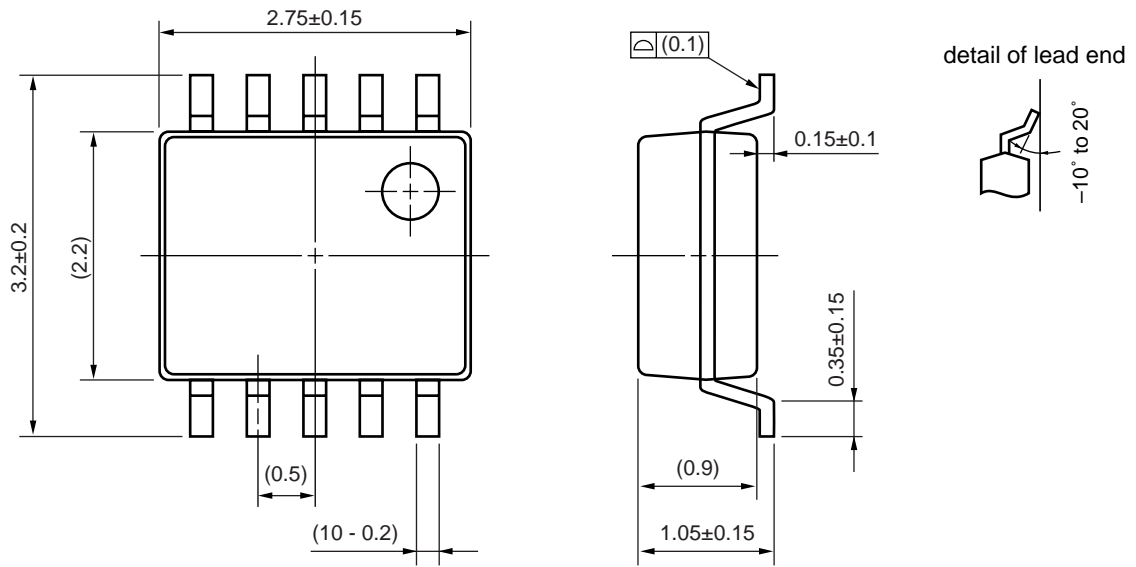
TYPICAL CHARACTERISTICS (Unless otherwise specified, T_A = +25°C)



Remark The graphs indicate nominal characteristics.

PACKAGE DIMENSIONS

10-PIN PLASTIC TSSOP (UNIT: mm)



Remark (): reference

RECOMMENDED SOLDERING CONDITIONS

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

Soldering Method	Soldering Conditions	Recommended Condition Symbol
Infrared Reflow	Package peak temperature: 235°C or below Time: 30 seconds or less (at 210°C) Count: 3, Exposure limit: None ^{Note}	IR35-00-3
VPS	Package peak temperature: 215°C or below Time: 40 seconds or less (at 200°C) Count: 3, Exposure limit: None ^{Note}	VP15-00-3
Wave Soldering	Soldering bath temperature: 260°C or below Time: 10 seconds or less Count: 1, Exposure limit: None ^{Note}	WS60-00-1
Partial Heating	Pin temperature: 300°C or below Time: 3 seconds or less (per side of device) Exposure limit: None ^{Note}	—

Note After opening the dry pack, keep it in a place below 25°C and 65% RH for the allowable storage period.

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

For details of recommended soldering conditions for surface mounting, refer to information document SEMICONDUCTOR DEVICE MOUNTING TECHNOLOGY MANUAL (C10535E).

SAFETY INFORMATION ON THIS PRODUCT

<p>Caution</p>	<p>GaAs Products</p>	<p>The product contains gallium arsenide, GaAs. GaAs vapor and powder are hazardous to human health if inhaled or ingested.</p> <ul style="list-style-type: none"> • 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. <p>Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.</p>
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