

DATA SHEET

NEC

GaAs INTEGRATED CIRCUITS μ PG2106TB, μ PG2110TB

L-BAND PA DRIVER AMPLIFIER

Phase-out/Discontinued

DESCRIPTION

The μ PG2106TB and μ PG2110TB are GaAs MMIC for PA driver amplifier which were developed for mobile phone and another L-band application. These devices can operate with 3.0 V TYP., having the high gain and low distortion.

These devices are housed in a 6-pin super minimold package. And this package is able to high-density surface mounting.

★ FEATURES

- Operation frequency : μ PG2106TB : $f_{opt} = 889$ to 960 MHz
: μ PG2110TB : $f_{opt} = 1\,429$ to $1\,453$ MHz
- Supply voltage : μ PG2106TB, μ PG2110TB : $V_{DD1,2} = 2.7$ to 3.3 V (3.0 V TYP.)
- Circuit current : μ PG2106TB, μ PG2110TB : $I_{DD} = 25$ mA TYP. @ $V_{DD1,2} = 3.0$ V, $V_{AGC} = 2.5$ V, $P_{out} = +8$ dBm
- High power gain : μ PG2106TB : $G_P = 30$ dB TYP. @ $V_{DD1,2} = 3.0$ V, $V_{AGC} = 2.5$ V, $P_{in} = -18$ dBm
: μ PG2110TB : $G_P = 27$ dB TYP. @ $V_{DD1,2} = 3.0$ V, $V_{AGC} = 2.5$ V, $P_{in} = -18$ dBm
- Gain control range : μ PG2106TB, μ PG2110TB : $GCR = 40$ dB TYP. @ $V_{DD1,2} = 3.0$ V, $V_{AGC} = 0.5$ to 2.5 V, $P_{in} = -18$ dBm
- Low distortion : μ PG2106TB : $P_{adj1} = -60$ dBc TYP. @ $V_{DD1,2} = 3.0$ V, $V_{AGC} = 2.5$ V, $P_{out} = +8$ dBm, $f = 925$ MHz, $\Delta f = \pm 50$ kHz, 21 kHz Bandwidth
: μ PG2110TB : $P_{adj1} = -60$ dBc TYP. @ $V_{DD1,2} = 3.0$ V, $V_{AGC} = 2.5$ V, $P_{out} = +8$ dBm, $f = 1\,441$ MHz, $\Delta f = \pm 50$ kHz, 21 kHz Bandwidth
- High-density surface mounting : 6-pin super minimold package ($2.0 \times 1.25 \times 0.9$ mm)

★ APPLICATION

- Digital Cellular: PDC 800 MHz, PDC 1.5 GHz etc.

ORDERING INFORMATION

Part Number	Package	Marking	Supplying Form
μ PG2106TB-E3	6-pin super minimold	G1V	<ul style="list-style-type: none"> • Embossed tape 8 mm wide • Pin 1, 2, 3 face the perforation side of the tape • Qty 3 kpcs/reel
μ PG2110TB-E3		G1Y	

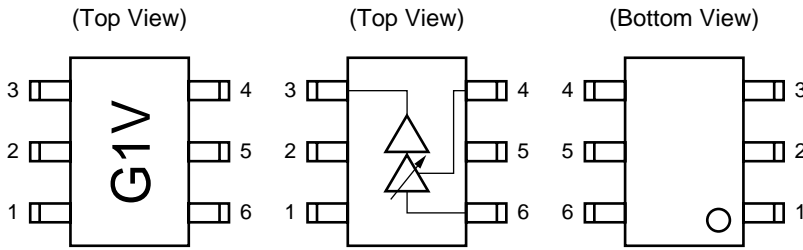
Remark To order evaluation samples, contact your nearby sales office.

Part number for sample order: μ PG2106TB, μ PG2110TB

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

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

★ 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

Caution Marking is an example of μ PG2106TB.

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

Parameter	Symbol	Ratings	Unit
Supply Voltage _{1, 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	-40 to +90	°C
★ Storage Temperature	T _{stg}	-45 to +150	°C

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

RECOMMENDED OPERATING RANGE (T_A = +25°C)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Supply Voltage _{1, 2}	V _{DD1, 2}	2.7	3.0	3.3	V
Gain Control Voltage	V _{AGC}	0	-	2.5	V
Input Power	P _{in}	-	-18	-10	dBm

★ ELECTRICAL CHARACTERISTICS

($T_A = +25^\circ\text{C}$, $V_{DD1,2} = 3.0\text{ V}$, $\pi/4$ DQPSK modulated signal input, with external input and output matching, unless otherwise specified)

μ PG2106TB

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Operating Frequency	f_{opt}		889	–	960	MHz
Circuit Current	I_{DD}	$P_{out} = +8\text{ dBm}$, $V_{AGC} = 2.5\text{ V}$	–	25	35	mA
Power Gain	GP	$P_{in} = -18\text{ dBm}$, $V_{AGC} = 2.5\text{ V}$	26	30	–	dB
Adjacent Channel Power Leakage 1	P_{adj1}	$P_{out} = +8\text{ dBm}$, $V_{AGC} = 2.5\text{ V}$, $\Delta f = \pm 50\text{ kHz}$, 21 kHz Bandwidth	–	-60	-55	dBc
Adjacent Channel Power Leakage 2	P_{adj2}	$P_{out} = +8\text{ dBm}$, $V_{AGC} = 2.5\text{ V}$, $\Delta f = \pm 100\text{ kHz}$, 21 kHz Bandwidth	–	-70	-65	dBc
Gain Control Range	GCR	$P_{in} = -18\text{ dBm}$, $V_{AGC} = 0.5\text{ to }2.5\text{ V}$	35	40	–	dB
Gain Control Current	I_{AGC}	$V_{AGC} = 0.5\text{ to }2.5\text{ V}$	–	200	500	μA

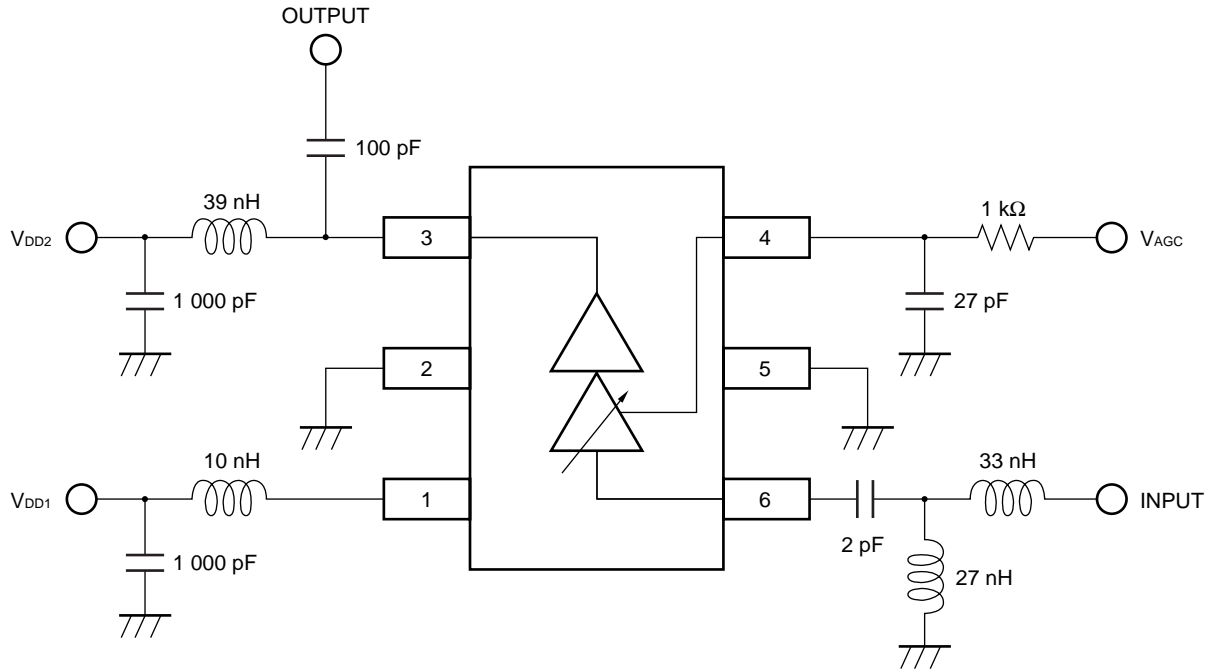
μ PG2110TB

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Operating Frequency	f_{opt}		1 429	–	1 453	MHz
Circuit Current	I_{DD}	$P_{out} = +8\text{ dBm}$, $V_{AGC} = 2.5\text{ V}$	–	25	35	mA
Power Gain	GP	$P_{in} = -18\text{ dBm}$, $V_{AGC} = 2.5\text{ V}$	24	27	–	dB
Adjacent Channel Power Leakage 1	P_{adj1}	$P_{out} = +8\text{ dBm}$, $V_{AGC} = 2.5\text{ V}$, $\Delta f = \pm 50\text{ kHz}$, 21 kHz Bandwidth	–	-60	-55	dBc
Adjacent Channel Power Leakage 2	P_{adj2}	$P_{out} = +8\text{ dBm}$, $V_{AGC} = 2.5\text{ V}$, $\Delta f = \pm 100\text{ kHz}$, 21 kHz Bandwidth	–	-70	-65	dBc
Gain Control Range	GCR	$P_{in} = -18\text{ dBm}$, $V_{AGC} = 0.5\text{ to }2.5\text{ V}$	35	40	–	dB
Gain Control Current	I_{AGC}	$V_{AGC} = 0.5\text{ to }2.5\text{ V}$	–	200	500	μA

★ EVALUATION CIRCUIT

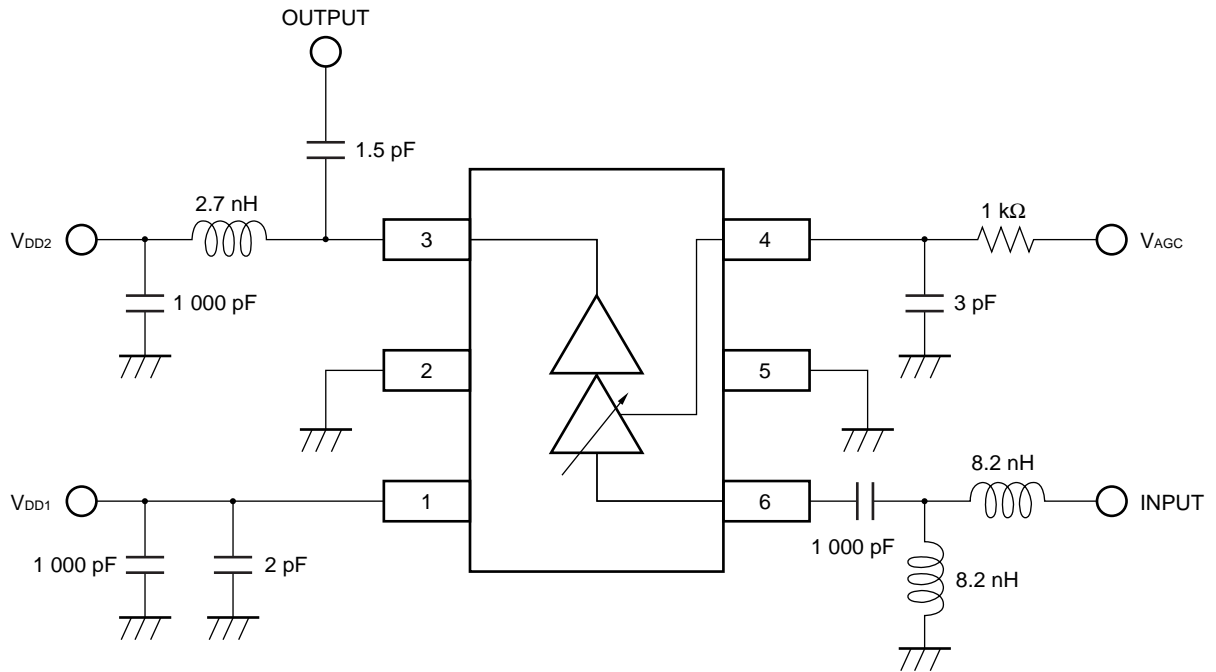
μ PG2106TB

f = 925 MHz, V_{DD1,2} = 3.0 V



μ PG2110TB

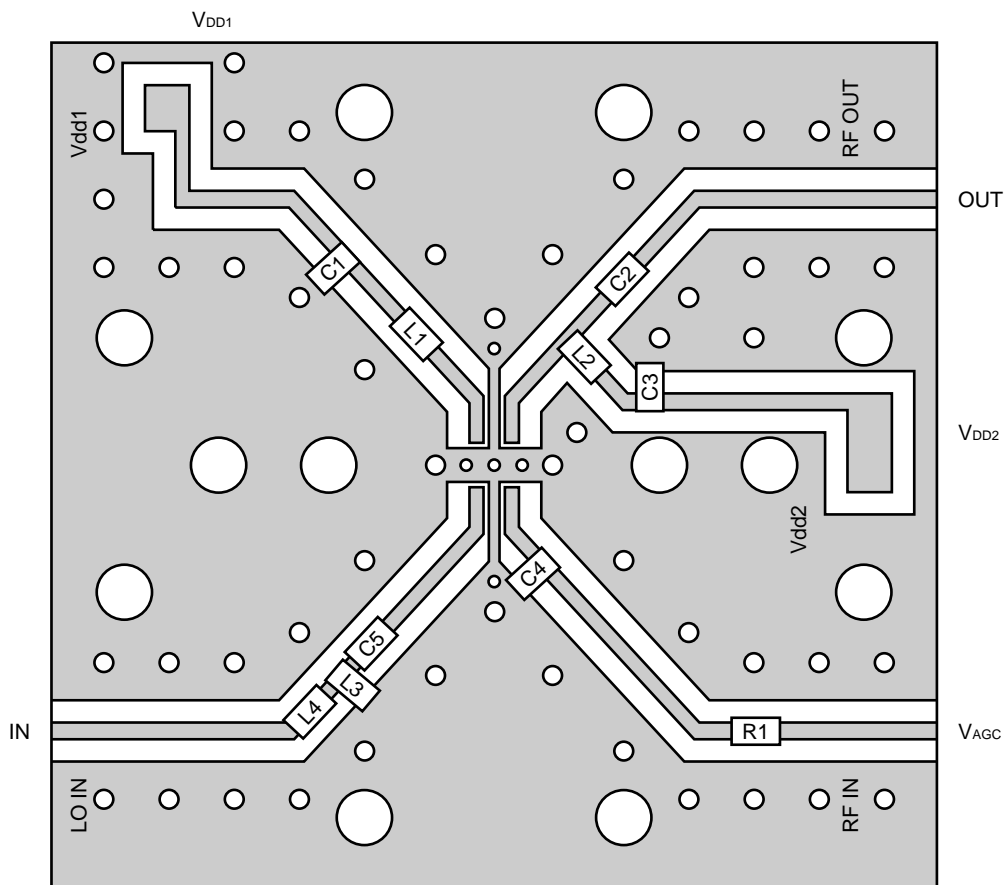
f = 1 441 MHz, V_{DD1,2} = 3.0 V



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

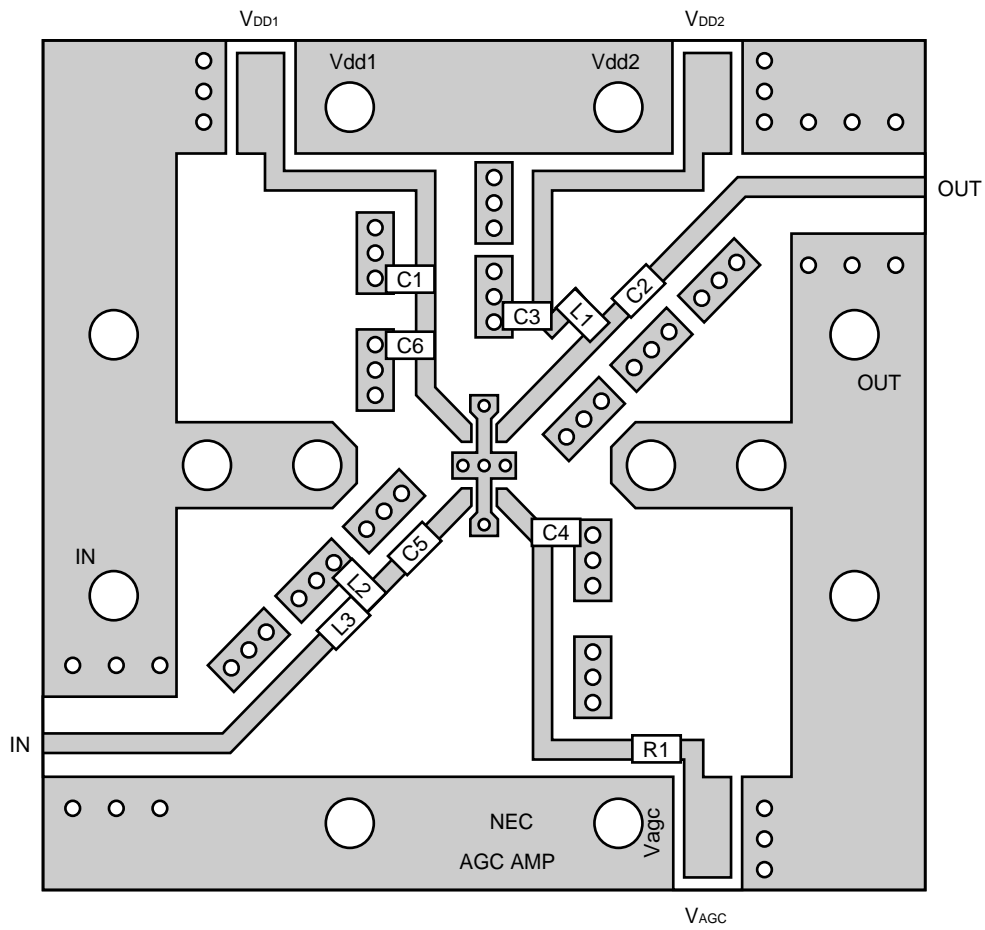
μ PG2106TB



USING THE NEC EVALUATION BOARD

Symbol	Values	Part Number	Maker
C1, C3	1 000 pF	GRM39CH102J25PB	muRata
C2	100 pF	GRM39CH101J50PB	muRata
C4	27 pF	GRM39CH270J50PB	muRata
C5	2 pF	GRM39CH020C50PB	muRata
L1	10 nH	TFL0816-10N	Susumu
L2	39 nH	TFL0816-39N	Susumu
L3	27 nH	TFL0816-27N	Susumu
L4	33 nH	TFL0816-33N	Susumu
R1	1 k Ω	RR0816P-102-D	Susumu

μPG2110TB



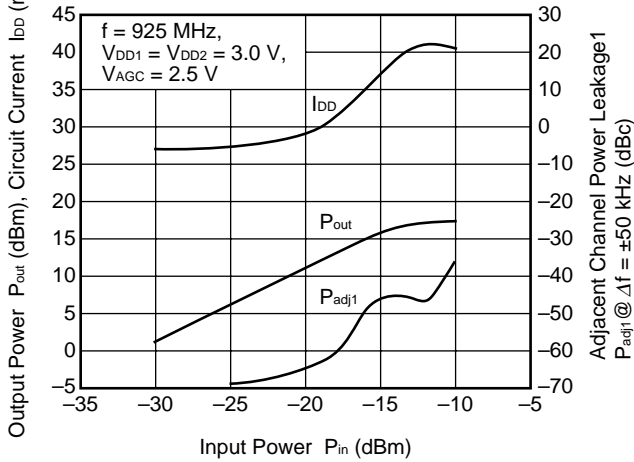
USING THE NEC EVALUATION BOARD

Symbol	Values	Part Number	Maker
C1, C3, C5	1 000 pF	GRM39CH102J25PB	muRata
C2	1.5 pF	GRM39CH1R5C50PB	muRata
C4	3 pF	GRM39CH030C50PB	muRata
C6	2 pF	GRM39CH020C50PB	muRata
L1	2.7 nH	TFL0816-2N7	Susumu
L2, L3	8.2 nH	TFL0816-8N2	Susumu
R1	1 kΩ	RR0816P-102-D	Susumu

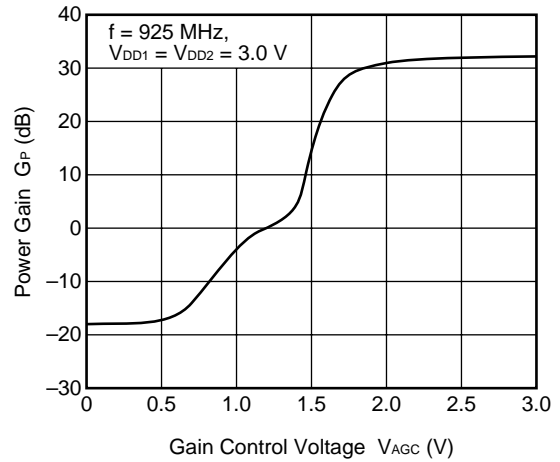
TYPICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$, unless otherwise specified)

μ PG2106TB

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

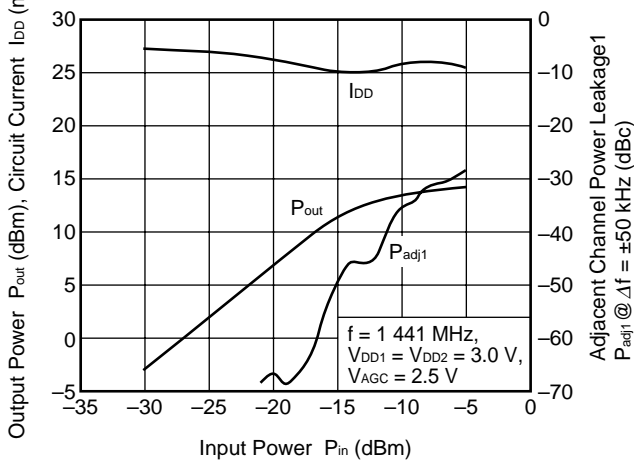


POWER GAIN vs. GAIN CONTROL VOLTAGE

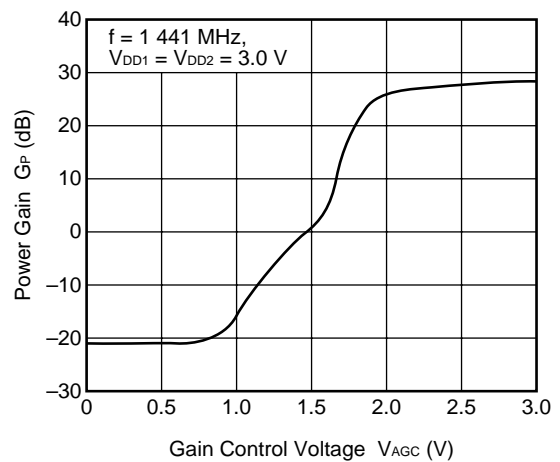


μ PG2110TB

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



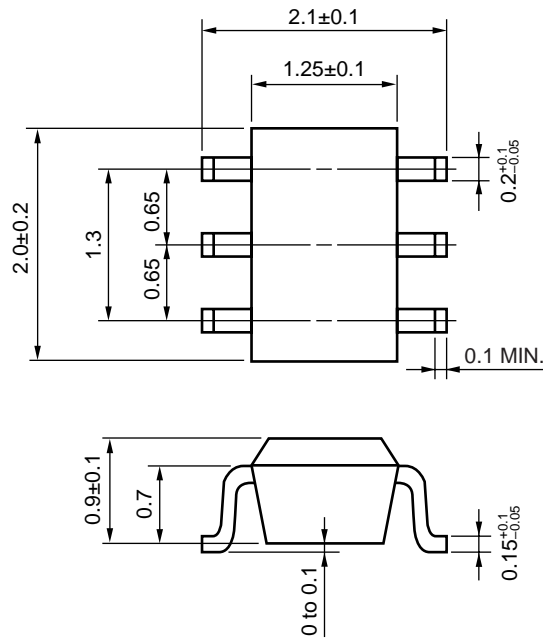
POWER GAIN vs. GAIN CONTROL VOLTAGE



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

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

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M8E 00.4-0110

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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► **Business issue**

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► **Technical issue**

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