

GaAs MMIC DBS Twin IF Switch

DESCRIPTION

The μPG181GR is intended for use in Direct Broadcast Satellite (DBS) applications within the Low Noise Block (LNB) down-converter for systems where at least two LNB outputs are required.

It offers two intermediate frequency amplifier channels that can independently select 1 of 2 IF inputs. It is housed in a very small 16-pin plastic HTSSOP package available on tape-and-reel and easy to install and contributes to miniaturizing the systems.

FEATURES

- Two Independent IF Channels
- Integral Switching to Channel Input to Either Channel Output
- Insertion Loss Per Channel : 5.0 dB TYP. ($Z_o = 50 \Omega$)
- Frequency Range : 950 MHz to 2 150 MHz
- Channel to Channel Isolation : 33 dB TYP.
- Small 16-pin HTSSOP Package

ORDERING INFORMATION (PLAN)

Part Number	Package	Supplying Form
μPG181GR-E1	16-pin Plastic HTSSOP	Carrier tape width 12 mm. Qty 3 kp/reel.

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Remark To order evaluation samples, please contact your local NEC sales office. (Part number for sample order: μPG181GR)

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

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

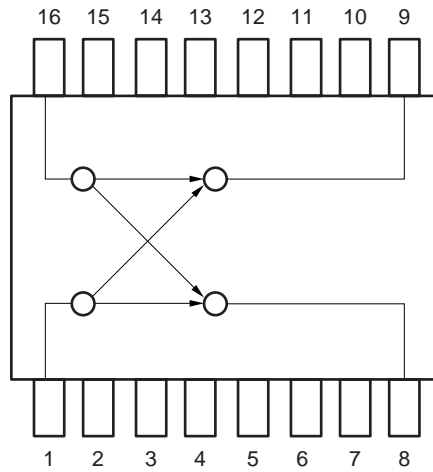
ABSOLUTE MAXIMUM RATINGS (T_A = +25 °C)

Parameter	Symbol	Ratings	Unit
Control Voltage 1, 2, 3, 4	V _{CONT1, 2, 3, 4}	-6 to +6 ^{Note 1}	V
Total Power Dissipation	P _{tot}	2 ^{Note 2}	W
Operating Ambient Temperature	T _A	-40 to +85	°C
Storage Temperature	T _{stg}	-65 to +150	°C

- Notes**
1. $|V_{CONT(H)} - V_{CONT(L)}| \leq 6.0 \text{ V}$
 2. Mounted on 50 × 50 × 1.6 mm double copper clad epoxy glass PWB, T_C = +85 °C

PIN CONNECTION AND INTERNAL BLOCK DIAGRAM (TOP VIEW)

Pin No.	Connection	Pin No.	Connection	Pin No.	Connection	Pin No.	Connection
1	IN2	5	V _{CONT4}	9	OUT1	13	V _{CONT1}
2	GND	6	GND	10	GND	14	GND
3	GND	7	GND	11	GND	15	GND
4	V _{CONT3}	8	OUT2	12	V _{CONT2}	16	IN1



RECOMMENDED OPERATING CONDITIONS (T_A = +25 °C)

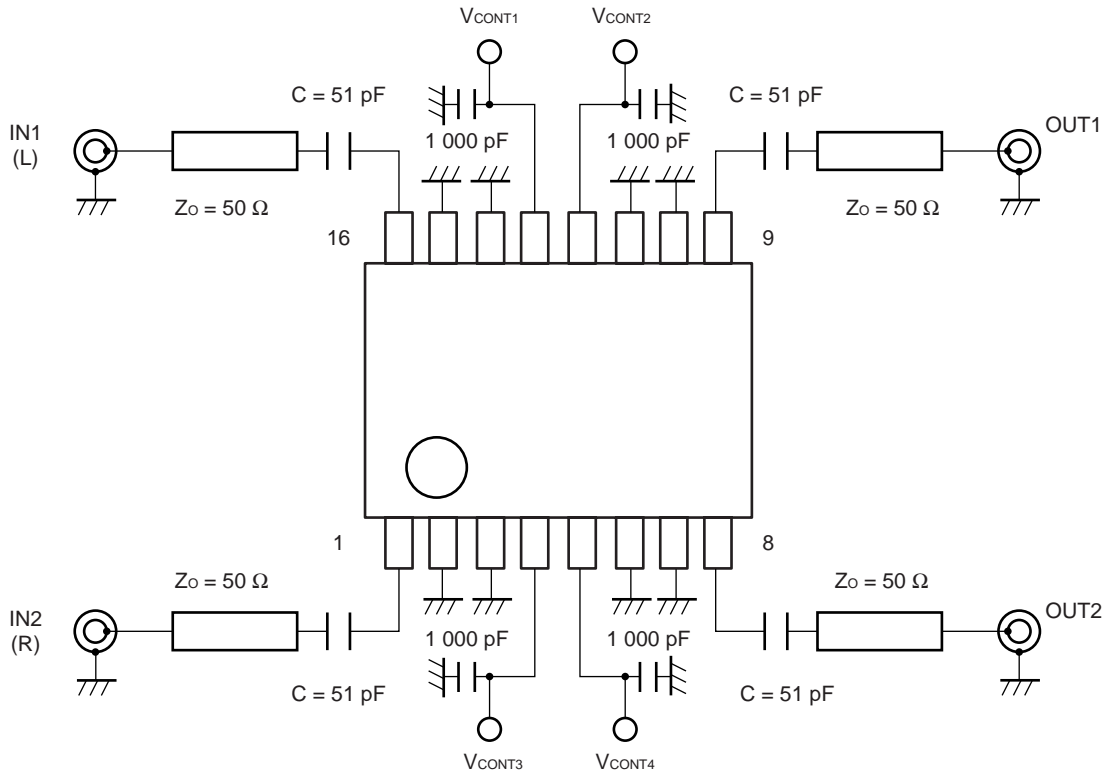
Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Control Voltage (High)	V _{CONT(H)}	+4.5	+5	+5.5	V
Control Voltage (Low)	V _{CONT(L)}	-0.5	0	+0.5	V

ELECTRICAL CHARACTERISTICS (T_A = +25 °C, unless otherwise specified: V_{CONT1} to V_{CONT4} = 0/ +5 V, Z_o = 50 Ω, LL, LR, RL, RR Each Port)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Insertion Loss	L _{INS}	f = 0.95 GHz to 2.15 GHz	-	5.0	7.0	dB
Insertion Loss Flatness	ΔL _{INS}	L _{INS} (0.95 GHz) - L _{INS} (1.7 GHz)	-	0.5	1.2	dB
Insertion Loss Flatness	ΔL _{INS}	L _{INS} (0.95 GHz) - L _{INS} (2.15 GHz)	-	0.8	1.5	dB
Channel Isolation	ISL	f = 0.95 GHz to 1.7 GHz	30	33	-	dB
Channel Isolation	ISL	f = 1.7 GHz to 2.15 GHz	25	30	-	dB
Output Return Loss	RL _{out}	f = 0.95 GHz to 2.15 GHz	13	16	-	dB
Control Current	I _{CONT}	V _{CONT} = +5 V/0 V, RF OFF	-	-	200	μA

★ EVALUATION CIRCUIT

V_{CONT1} to V_{CONT4} = 0/ +5 V, Z_o = 50 Ω, DC Blocking Capacitor = 51 pF

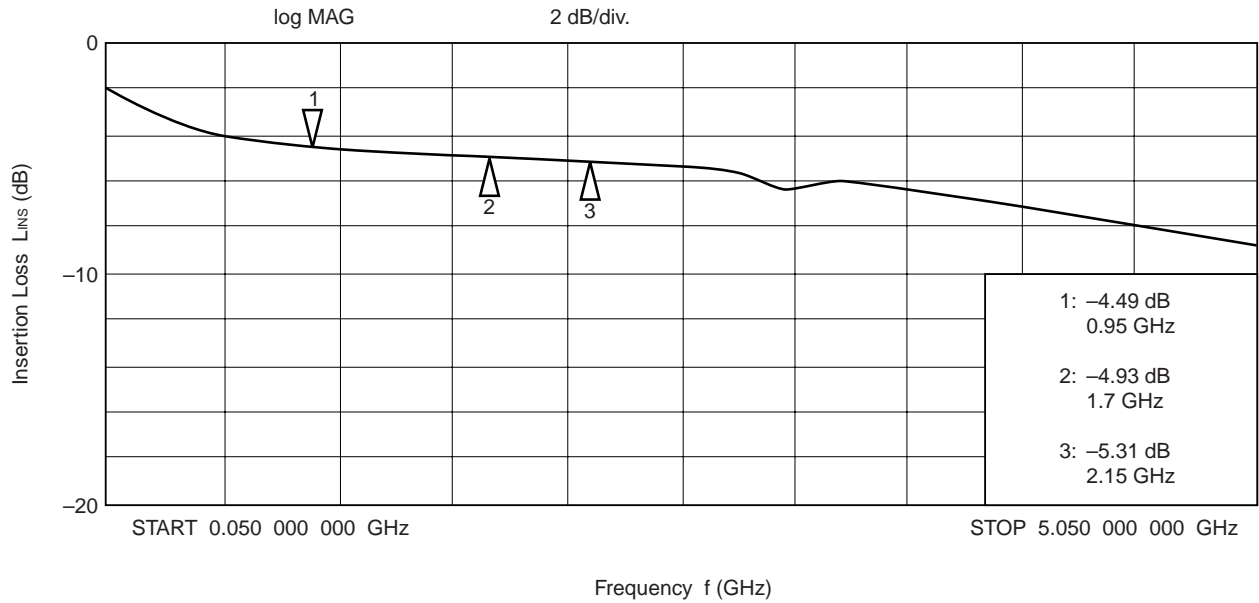


CHANNEL SELECT TRUTH TABLE

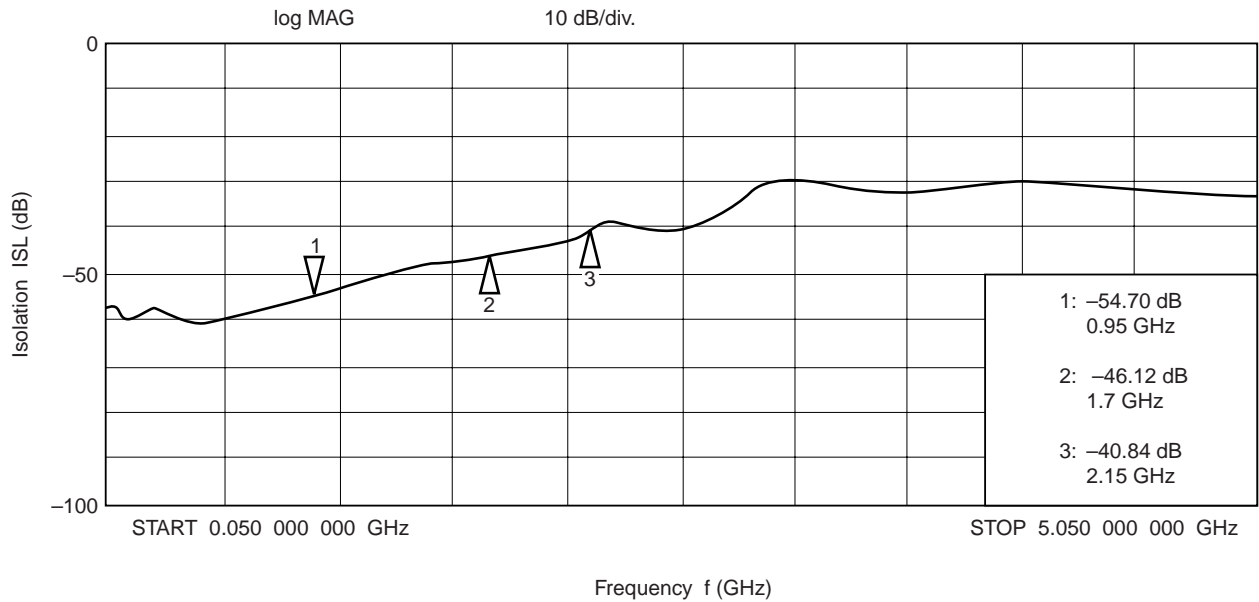
Output		On Channel	Control Pin			
OUT1	OUT2		V _{CONT1}	V _{CONT2}	V _{CONT3}	V _{CONT4}
L	L	IN1 – OUT1 IN1 – OUT2	Low	High	High	Low
L	R	IN1 – OUT1 IN2 – OUT2	Low	High	Low	High
R	L	IN2 – OUT1 IN1 – OUT2	High	Low	High	Low
R	R	IN2 – OUT1 IN2 – OUT2	High	Low	Low	High

TYPICAL CHARACTERISTICS (T_A = +25 °C)

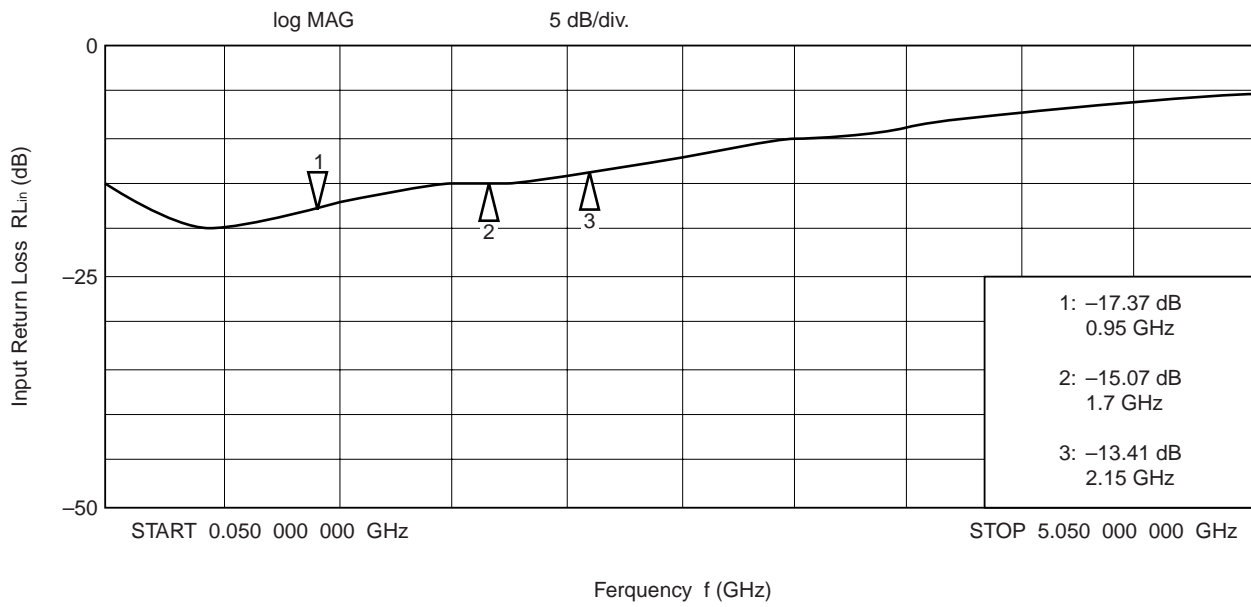
INSERTION LOSS vs. FREQUENCY



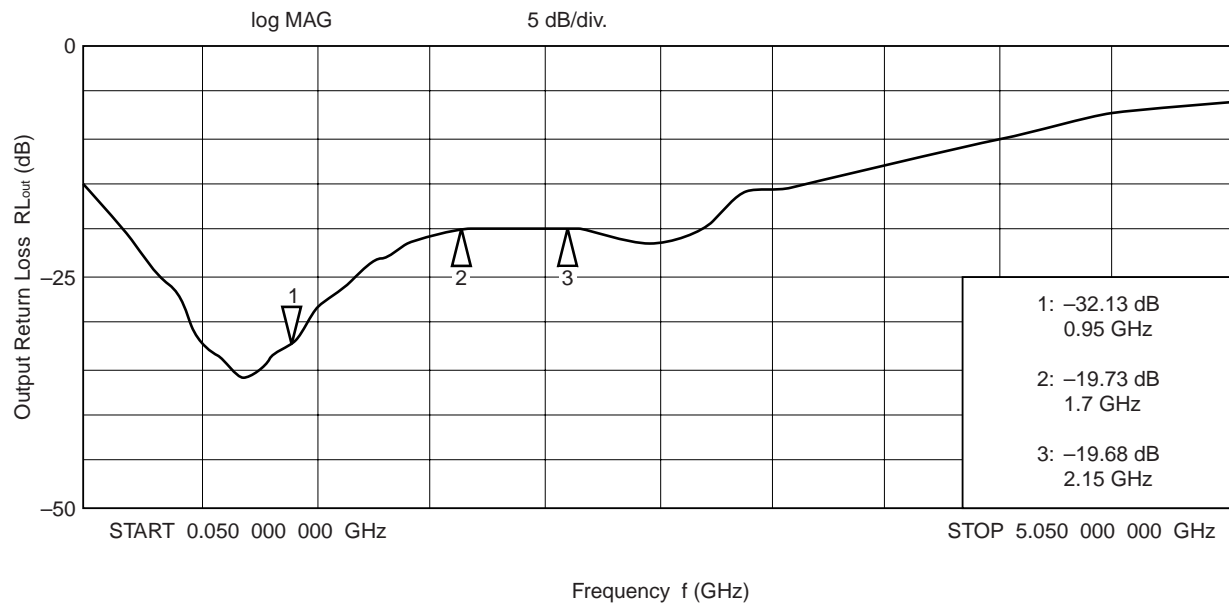
ISOLATION vs. FREQUENCY



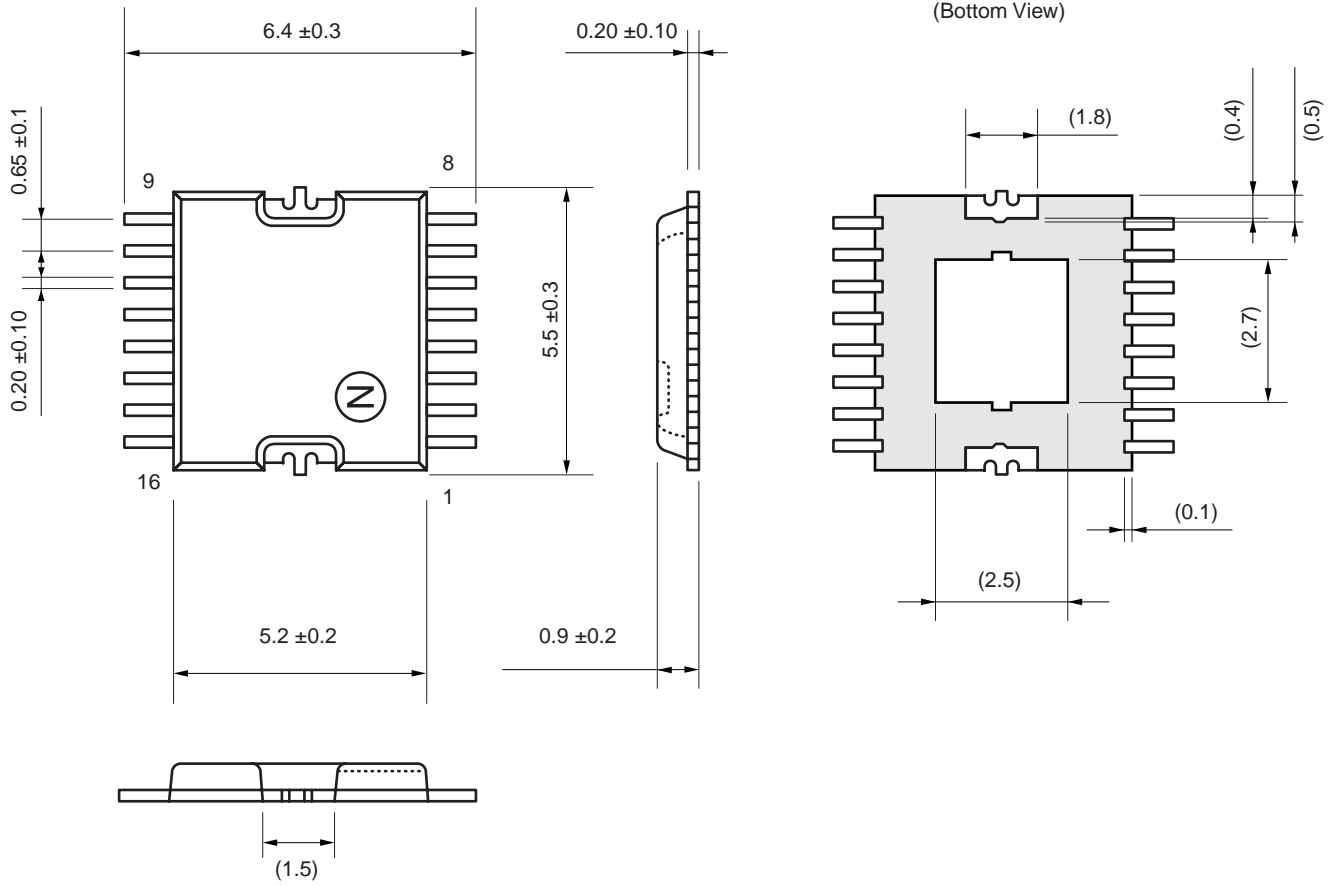
INPUT RETURN LOSS vs. FREQUENCY



OUTPUT RETURN LOSS vs. FREQUENCY



PACKAGE DIMENSIONS
16 PIN HTSSOP (Unit: mm)



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 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).

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CAUTION

The Great Care must be taken in dealing with the devices in this guide.

The reason is that the material of the devices is GaAs (Gallium Arsenide), which is designated as harmful substance according to the law concerned.

Keep the law concerned and so on, especially in case of removal.

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