

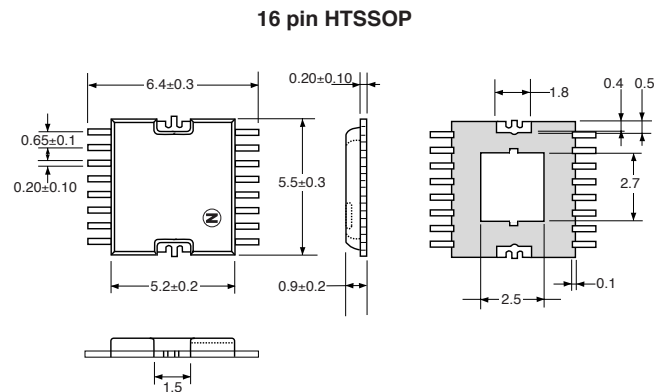


# GaAs MMIC DBS TWIN IF SWITCH UPG181GR

## FEATURES

- TWO INDEPENDENT IF CHANNELS
- INTEGRAL SWITCHING TO CHANNEL INPUT TO EITHER CHANNEL OUTPUT
- INSERTION LOSS PER CHANNEL:  
5.0 dB TYP ( $Z_0 = 50 \Omega$ )
- FREQUENCY RANGE:  
950 MHz to 2150 MHz
- CHANNEL TO CHANNEL ISOLATION:  
33 dB TYP
- SMALL 16 PIN HTSSOP PACKAGE
- AVAILABLE ON TAPE AND REEL

## OUTLINE DIMENSIONS (Units in mm)



## DESCRIPTION

NEC's UPG181GR 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 and is available on tape-and-reel. The UPG181GR is easy to install and contributes to miniaturizing the systems.

## ELECTRICAL CHARACTERISTICS

( $T_A = +25^\circ\text{C}$ , unless otherwise specified,  $V_{\text{CONT}1}$  to  $V_{\text{CONT}4} = 0/+5 \text{ V}$ ,  $Z_0 = 50 \Omega$ , LL, LR, RL, RR Each Port)

PART NUMBER PACKAGE OUTLINE			UPG181GR 16 pin HTSSOP		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
LINS	Insertion Loss, $f = 0.95 \text{ GHz to } 2.15 \text{ GHz}$	dB	—	5.0	7.0
$\Delta\text{LINS}$	Insertion Loss Flatness, $  \text{LINS} (0.95 \text{ GHz}) - \text{LINS} (1.7 \text{ GHz})  $	dB	—	0.5	1.2
$\Delta\text{LINS}$	Insertion Loss Flatness, $  \text{LINS} (0.95 \text{ GHz}) - \text{LINS} (2.15 \text{ GHz})  $	dB	—	0.8	1.5
ISOL	Channel Isolation, $f = 0.95 \text{ GHz to } 1.7 \text{ GHz}$	dB	30	33	—
ISOL	Channel Isolation, $f = 1.7 \text{ GHz to } 2.15 \text{ GHz}$	dB	25	30	—
RLOUT	Output Return Loss, $f = 0.95 \text{ GHz to } 2.15 \text{ GHz}$	dB	13	16	—
I <sub>CONT</sub>	Control Current, $V_{\text{CONT}} = +5 \text{ V}/0 \text{ V}$ , RF OFF	$\mu\text{A}$	—	—	200

**ABSOLUTE MAXIMUM RATINGS<sup>1</sup>** (T<sub>A</sub> = +25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V <sub>CONT1,2,3,4</sub>	Control Voltage 1, 2, 3, 4 <sup>2</sup>	V	-1 to +6
P <sub>TOT</sub>	Total Power Dissipation <sup>3</sup>	W	2
T <sub>A</sub>	Operating Ambient Temp.	°C	-40 to +85
T <sub>STG</sub>	Storage Temperature	°C	-65 to +150

Notes:

1. Operation in excess of any one of these parameters may result in permanent damage.
2. |V<sub>CONT(H)</sub> - V<sub>CONT(L)</sub>| ≤ 6.0 V
3. Mounted on a 50x50x1.6 mm double copper clad epoxy glass PWB, T<sub>c</sub> = +85°C.

**RECOMMENDED OPERATING CONDITIONS** (T<sub>A</sub> = +25°C)

SYMBOLS	PARAMETERS	UNITS	MIN	TYP	MAX
V <sub>CONT(H)</sub>	Control Voltage (High)	V	+4.5	+5	+5.5
V <sub>CONT(L)</sub>	Control Voltage (Low)	V	-0.5	0	+0.5

**ORDERING INFORMATION**

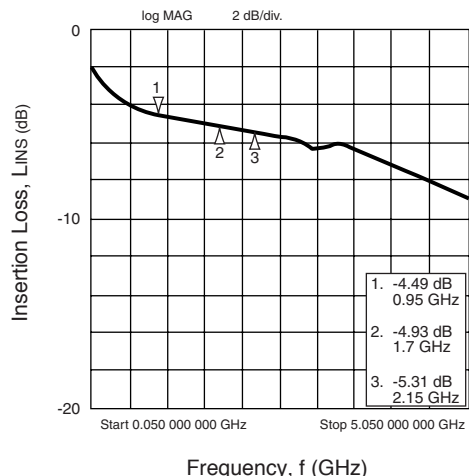
PART NUMBER	PACKAGE	QUANTITY
UPG181GR-E1-A	16-pin Plastic HTSSOP	2500/Reel

Notes:

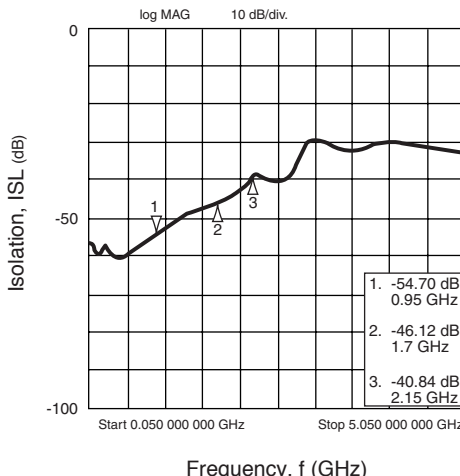
1. Embossed tape, 12 mm wide.

**TYPICAL PERFORMANCE CURVES** (T<sub>A</sub> = +25°C, unless otherwise specified)

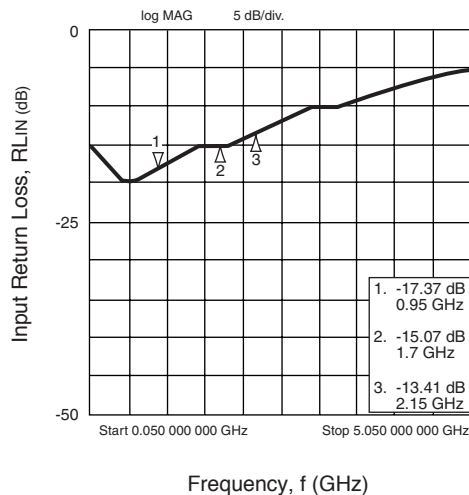
**INSERTION LOSS vs. FREQUENCY**



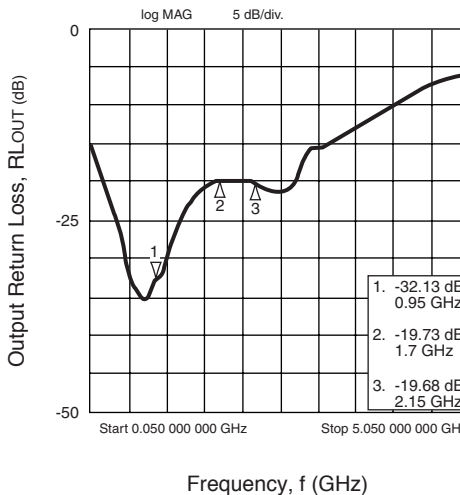
**ISOLATION vs. FREQUENCY**



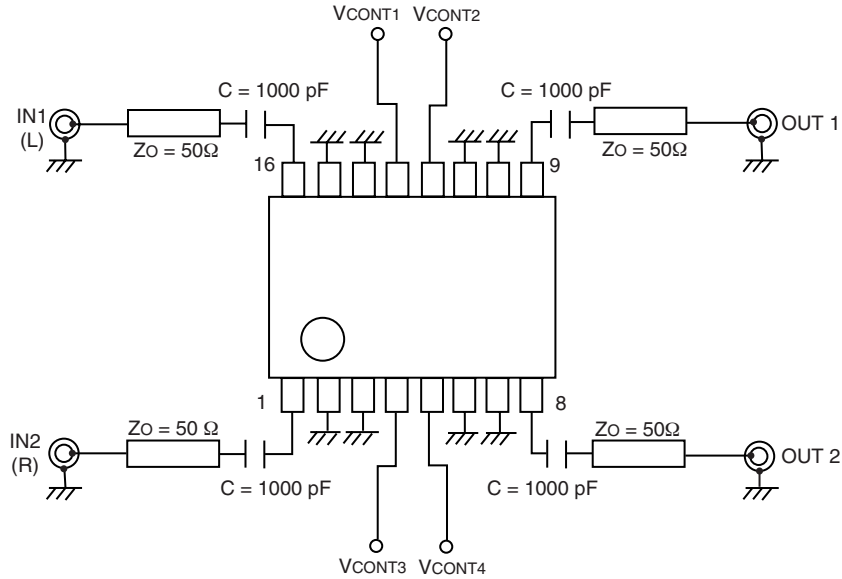
**INPUT RETURN LOSS vs. FREQUENCY**



**OUTPUT RETURN LOSS vs. FREQUENCY**



**EVALUATION CIRCUIT** ( $V_{CONT1}$  to  $V_{CONT4} = 0/+5$  V,  $Z_0 = 50 \Omega$ , DC Blocking Capacitor = 1000 pF)



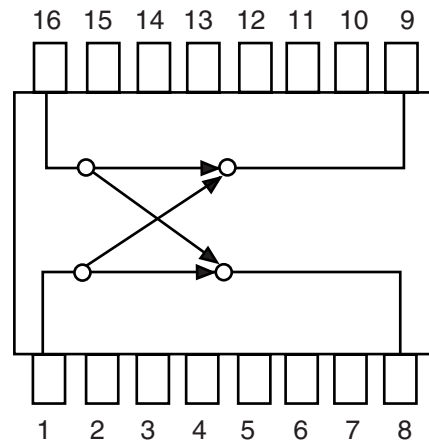
**CHANNEL SELECT TRUTH TABLE**

OUTPUT		On-Channel	CONTROL PIN			
OUT1	OUT2		VCONT1	VCONT2	VCONT3	VCONT4
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

**PIN CONNECTION AND INTERNAL BLOCK DIAGRAM**

PIN NO.	CONNECTION	PIN NO.	CONNECTION
1	IN2	9	OUT1
2	GND	10	GND
3	GND	11	GND
4	VCONT3	12	VCONT2
5	VCONT4	13	VCONT1
6	GND	14	GND
7	GND	15	GND
8	OUT2	16	IN1

**TOP VIEW**



**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.

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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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