

To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

Send any inquiries to <http://www.renesas.com/inquiry>.

The Renesas logo, consisting of a stylized 'R' followed by the word 'RENESAS' in a bold, sans-serif font.

Not recommended
for new design

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CMOS INTEGRATED CIRCUIT

μ PD5720K

CMOS MMIC 4 x 2 IF SWITCH MATRIX

FEATURES

- 4 independent IF channels, integral switching to channel input to either channel output
- Integrated 4 bit decoder
- With enable external pins for each OUT ports enabled/disabled
- Frequency range : $f = 250$ to $2\ 150$ MHz
- High isolation : $ISL = 42$ dB TYP.
- Insertion loss : $L_{INS} = 7.0$ dB TYP. @ $Z_O = 50\ \Omega$
- Insertion loss flatness : $\Delta L_{INS} = 0.6$ dB TYP.
- Control voltage : $V_{CONT} = 0\text{ V}/+5.0\text{ V}$
- 20-PIN 4×4 mm SQUARE MICRO LEAD PACKAGE (20-pin plastic QFN (0.5 mm pitch))

APPLICATIONS

- DBS IF switching
- Switch box
- 4×2 switching application for microwave signal

ORDERING INFORMATION

Part Number	Order Number	Package	Marking	Supplying Form
μ PD5720K-E3	μ PD5720K-E3-A	20-pin plastic QFN (0.5 mm pitch) (Pb-Free)	D5720	• Embossed tape 12 mm wide • Pin 1 to 5 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: μ PD5720K

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

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Not all products and/or types are available in every country. Please check with an NEC Electronics sales representative for availability and additional information.

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

Parameter	Symbol	Ratings	Unit
Supply Voltage	V _{DD}	−0.5 to +6.0	V
Switch Control Voltage	V _{CONT} 1, 2, 3, 4	−0.5 to +6.0	V
Enable Control Voltage	V _{EA} 1, 2	−0.5 to +6.0	V
Input Power	P _{in}	+15	dBm
Operating Ambient Temperature	T _A	−40 to +85	°C
Storage Temperature	T _{stg}	−55 to +150	°C

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

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Supply Voltage ^{Note 1, 2}	V _{DD}	+4.0	+5.0	+5.5	V
Control Voltage (H) ^{Note 1}	V _{CONT} (H)	+4.0	+5.0	+5.5	V
Control Voltage (L)	V _{CONT} (L)	−0.2	0	+0.4	V
Enable Control Voltage (H) ^{Note 2}	V _{EA} (H)	+4.0	+5.0	+5.5	V
Enable Control Voltage (L)	V _{EA} (L)	−0.2	0	+0.4	V

Notes 1. V_{DD} − 0.4 V ≤ V_{CONT} (H) ≤ V_{DD} + 0.2 V

2. V_{DD} − 0.4 V ≤ V_{EA} (H) ≤ V_{DD} + 0.2 V

ELECTRICAL CHARACTERISTICS (T_A = +25°C, V_{DD} = +5.0 V, V_{CONT} = +5.0 V/0 V, V_{EA}1 = V_{EA}2 = +5.0 V (both OUTs enabled), P_{in} = 0 dBm, Z_o = 50 Ω for each port, worst mode, unless otherwise specified)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Insertion Loss	L _{INS}	f = 0.25 to 2.15 GHz	—	7.0	9.0	dB
Insertion Loss Flatness	ΔL _{INS}	L _{INS} (0.25 GHz) − L _{INS} (2.15 GHz)	—	0.6	3.0	dB
Isolation ^{Note 1}	ISL	f = 0.25 to 2.15 GHz	37	42	—	dB
Output Return Loss	RL _{out}	f = 0.25 to 2.15 GHz	10	16	—	dB
Supply Current	I _{DD}	V _{DD} = +5.0 V, V _{CONT} = +5.0 V/0 V, V _{EA} = +5.0 V/0 V, non-RF	—	50	100	μA
Switch Control Current ^{Note 2}	I _{CONT}	V _{DD} = +5.0 V, V _{CONT} = +5.0 V/0 V, V _{EA} = +5.0 V/0 V, non-RF	—	50	100	μA
Enable Control Current ^{Note 2}	I _{EA}	V _{DD} = +5.0 V, V _{CONT} = +5.0 V/0 V, V _{EA} = +5.0 V/0 V, non-RF	—	50	100	μA

Notes 1. Isolation = Signal leakage (off-state)

2. Per 1 control pin

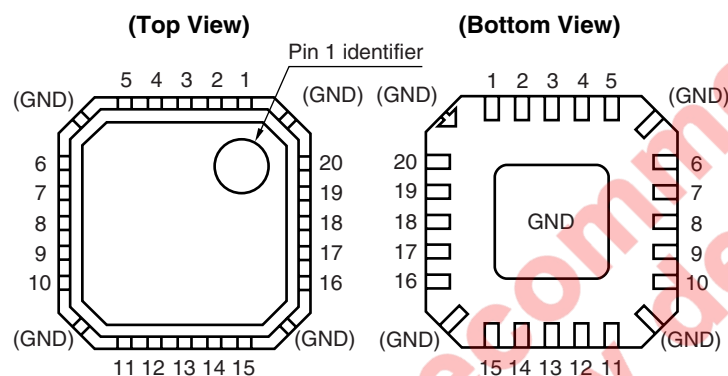
STANDARD CHARACTERISTICS FOR REFERENCE

($T_A = +25^{\circ}\text{C}$, $V_{DD} = +5.0\text{ V}$, $V_{CONT} = +5.0\text{ V/0 V}$, $V_{EA1} = V_{EA2} = +5.0\text{ V}$ (both OUTs enabled), $P_{in} = 0\text{ dBm}$, $Z_o = 50\ \Omega$ for each port, worst mode, unless otherwise specified)

Parameter	Symbol	Test Conditions	Reference Value	Unit
Isolation D/U-ratio ^{Note}	$ISL_{D/U}$	$f = 0.25\text{ to }2.15\text{ GHz}$	35	dB
Input Return Loss	RL_{in}	$f = 0.25\text{ to }2.15\text{ GHz}$	21	dB
Isolation of Disable Mode	ISL_{DA}	$f = 0.25\text{ to }2.15\text{ GHz}$ $V_{EA1} = 0\text{ V}$ and/or $V_{EA2} = 0\text{ V}$	40	dB

Note Isolation D/U-ratio = $|(\text{Isolation (off-state)}) - (\text{Insertion loss (on-state)})|$

PIN CONNECTIONS



Pin No.	Pin Name	Pin No.	Pin Name
1	V_{CONT1}	11	GND
2	V_{CONT2}	12	IN-C
3	Enable1	13	Enable2
4	IN-A	14	V_{CONT4}
5	GND	15	V_{CONT3}
6	IN-B	16	OUT2
7	GND	17	GND
8	GND	18	V_{DD}
9	GND	19	GND
10	IN-D	20	OUT1

Remark Heat Sink : GND

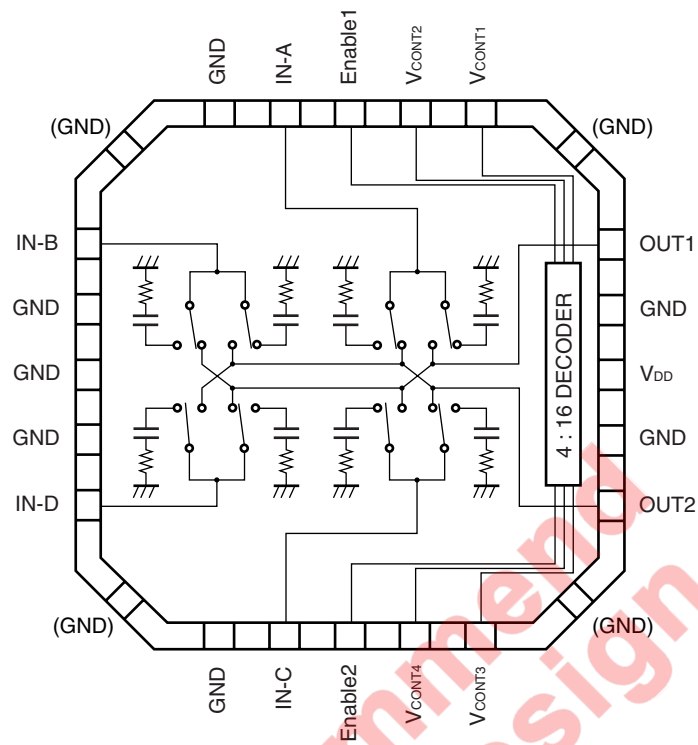
TRUTH TABLE OF SWITCHING BY CONDITION OF CONTROL VOLTAGE

State			Output Signal		Control Pins					
No.	Mode		OUT1	OUT2	V _{CONT1}	V _{CONT2}	V _{CONT3}	V _{CONT4}	Enable1	Enable2
1	Both OUTs Enabled	AA	IN-A	IN-A	Low	Low	Low	Low	High	High
2		AB		IN-B	Low	Low	Low	High	High	High
3		AC		IN-C	Low	Low	High	Low	High	High
4		AD		IN-D	Low	Low	High	High	High	High
5		BA	IN-B	IN-A	Low	High	Low	Low	High	High
6		BB		IN-B	Low	High	Low	High	High	High
7		BC		IN-C	Low	High	High	Low	High	High
8		BD		IN-D	Low	High	High	High	High	High
9		CA	IN-C	IN-A	High	Low	Low	Low	High	High
10		CB		IN-B	High	Low	Low	High	High	High
11		CC		IN-C	High	Low	High	Low	High	High
12		CD		IN-D	High	Low	High	High	High	High
13		DA	IN-D	IN-A	High	High	Low	Low	High	High
14		DB		IN-B	High	High	Low	High	High	High
15		DC		IN-C	High	High	High	Low	High	High
16		DD		IN-D	High	High	High	High	High	High
17	OUT1 Disabled	NA	None	IN-A	Any ^{Note}	Any ^{Note}	Low	Low	Low	High
18		NB		IN-B	Any ^{Note}	Any ^{Note}	Low	High	Low	High
19		NC		IN-C	Any ^{Note}	Any ^{Note}	High	Low	Low	High
20		ND		IN-D	Any ^{Note}	Any ^{Note}	High	High	Low	High
21	OUT2 Disabled	AN	IN-A	None	Low	Low	Any ^{Note}	Any ^{Note}	High	Low
22		BN	IN-B		Low	High	Any ^{Note}	Any ^{Note}	High	Low
23		CN	IN-C		High	Low	Any ^{Note}	Any ^{Note}	High	Low
24		DN	IN-D		High	High	Any ^{Note}	Any ^{Note}	High	Low
25	Both OUTs Disabled		None	None	Any ^{Note}	Any ^{Note}	Any ^{Note}	Any ^{Note}	Low	Low

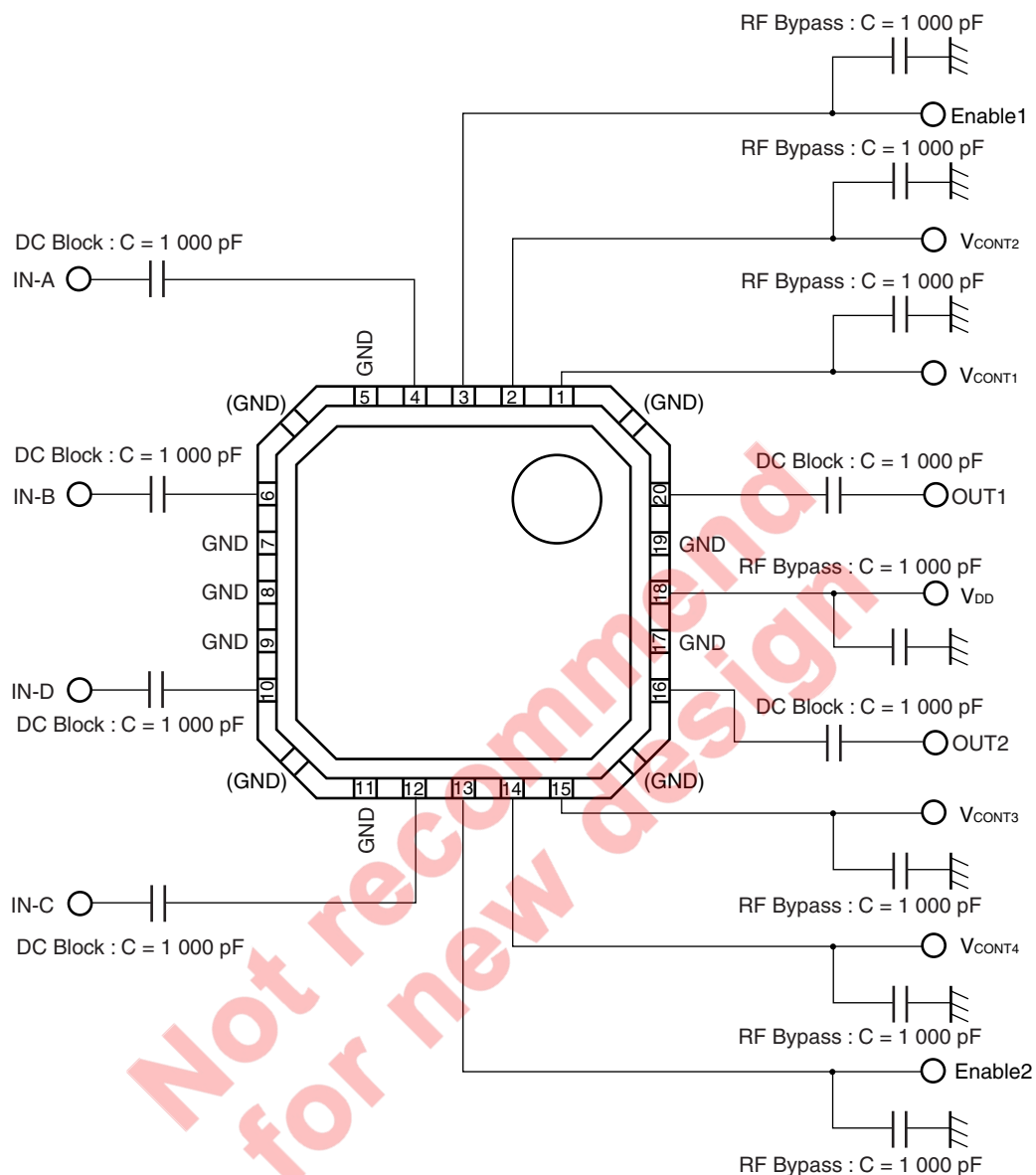
Note Any means High or Low.

Remark High : +5.0 Vdc, Low : 0 Vdc, V_{DD} = +5 Vdc

FUNCTIONAL DIAGRAM



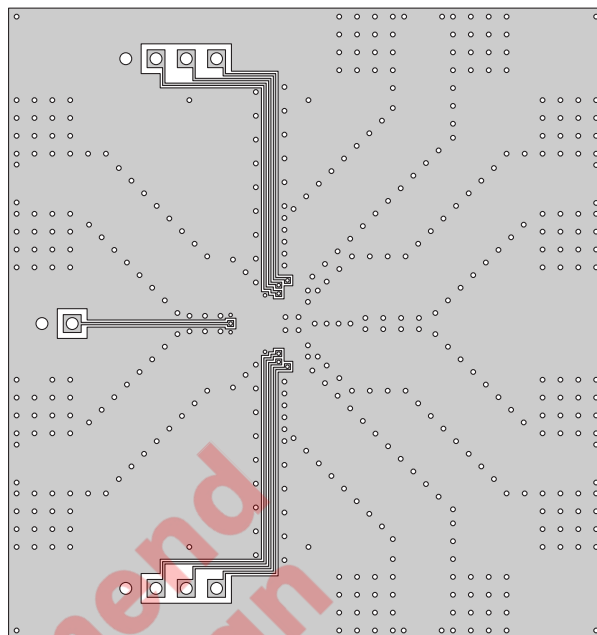
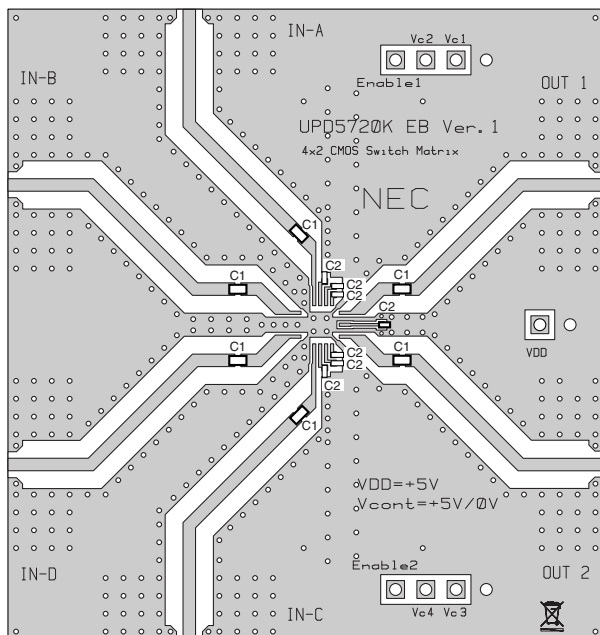
EVALUATION CIRCUIT



Caution In order to avoid degradation of system by the standing waves, turn off V_{cc} bias of 2nd IF AMP on occasion of turning off the enable – terminal.

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

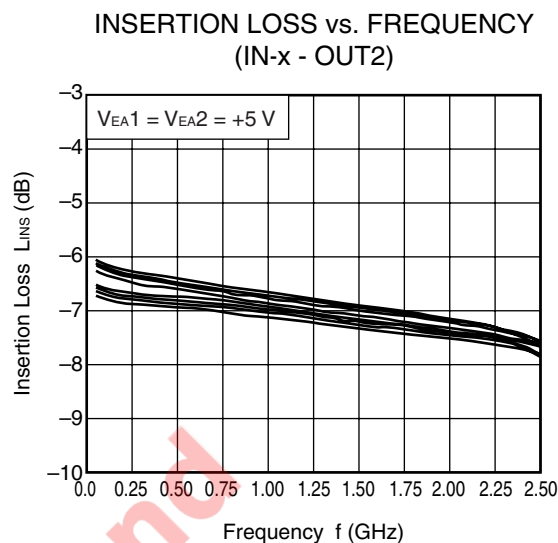
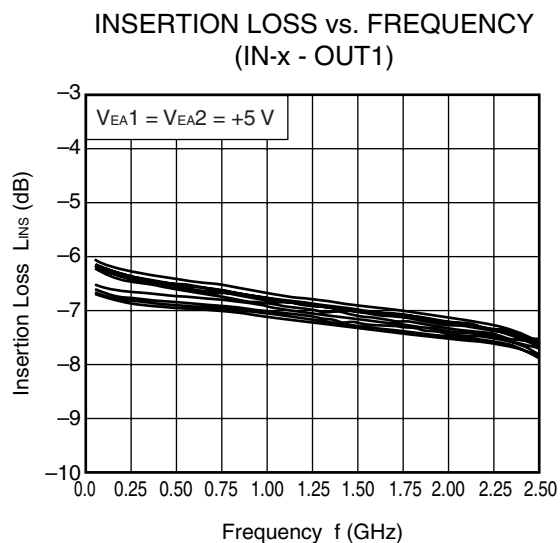
ILLUSTRATION OF THE TEST CIRCUIT ASSEMBLED ON EVALUATION BOARD



Notes

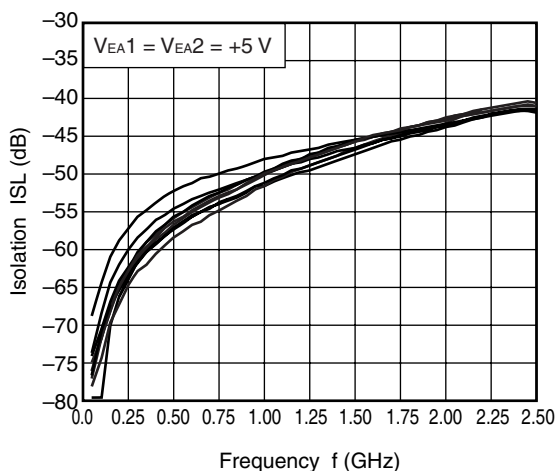
1. 50 × 53 × 0.51 mm double sided copper clad RO4003 (Rogers) board ($\epsilon_r = 3.38$).
2. Au plated on pattern
3. $\circ$: Through holes
4. C1, C2: 1 000 pF

TYPICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$, $V_{DD} = +5.0\text{ V}$, $V_{CONT} = +5.0\text{ V/0 V}$, $V_{EA1} = V_{EA2} = +5.0\text{ V}$ (both OUTs enabled), $P_{in} = 0\text{ dBm}$, $Z_o = 50\ \Omega$ for each port, unless otherwise specified)

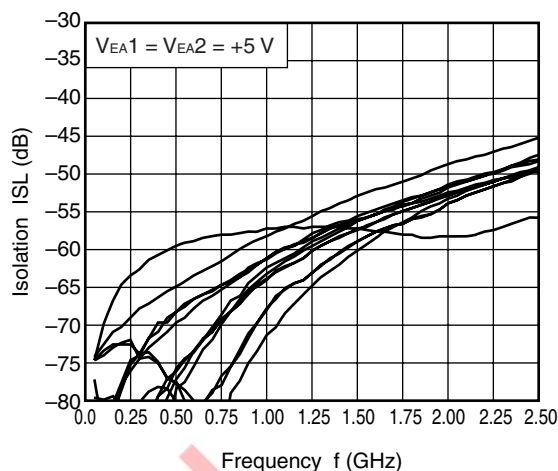


Remark The graphs indicate nominal characteristics.

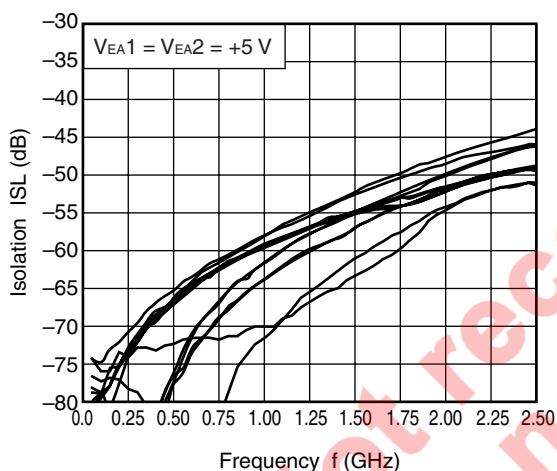
ISOLATION vs. FREQUENCY
(IN-A - OUT1)



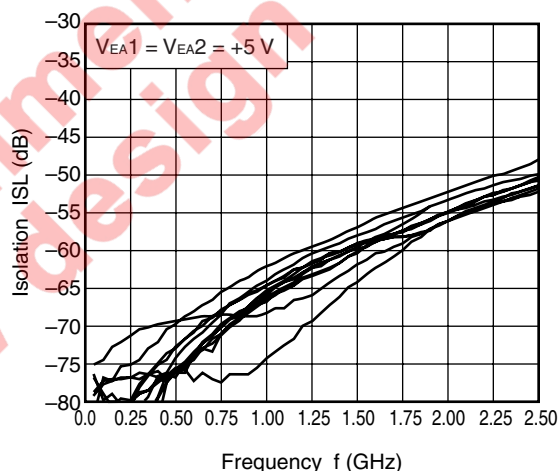
ISOLATION vs. FREQUENCY
(IN-B - OUT1)



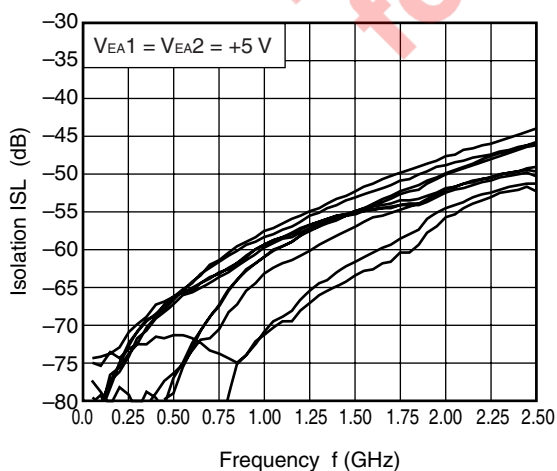
ISOLATION vs. FREQUENCY
(IN-C - OUT1)



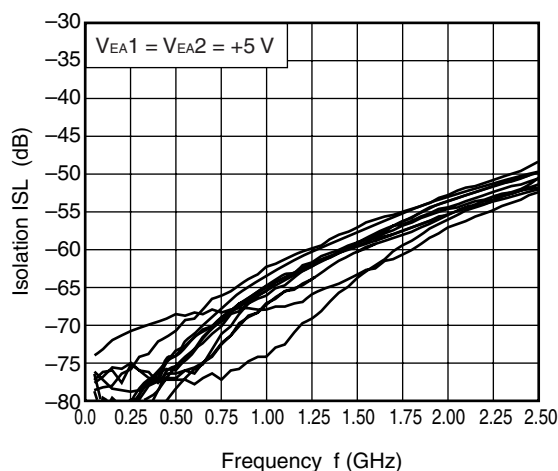
ISOLATION vs. FREQUENCY
(IN-D - OUT1)



ISOLATION vs. FREQUENCY
(IN-A - OUT2)

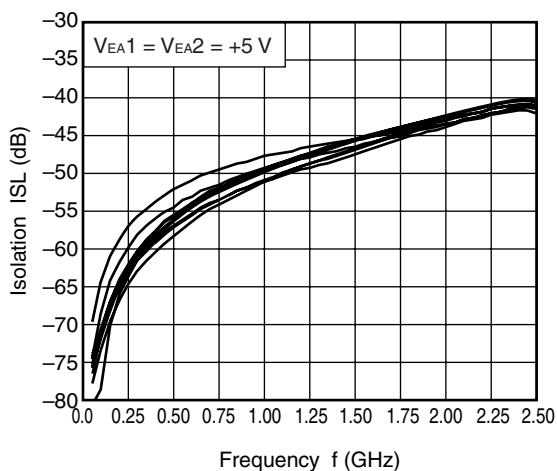


ISOLATION vs. FREQUENCY
(IN-B - OUT2)

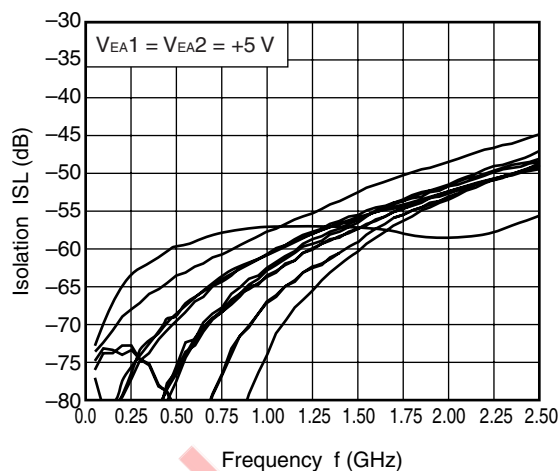


Remark The graphs indicate nominal characteristics.

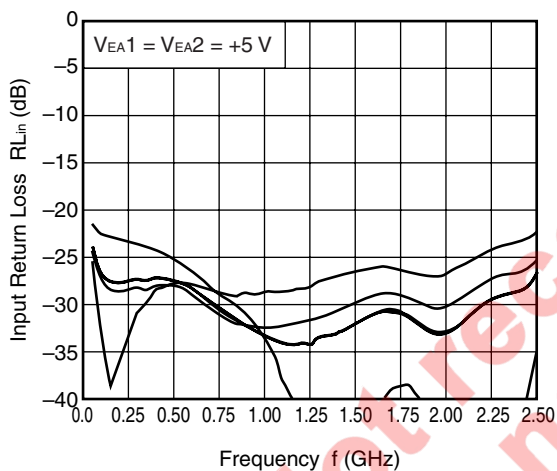
ISOLATION vs. FREQUENCY
(IN-C - OUT2)



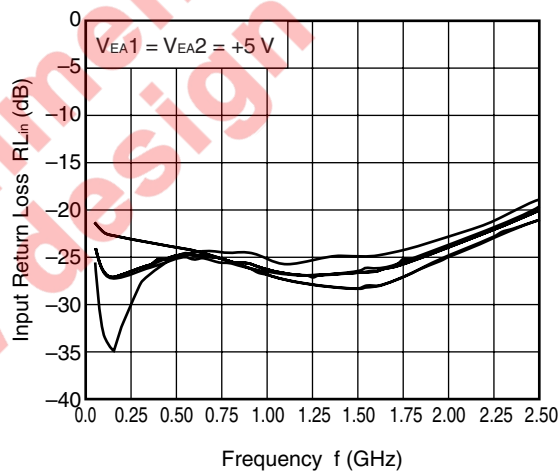
ISOLATION vs. FREQUENCY
(IN-D - OUT2)



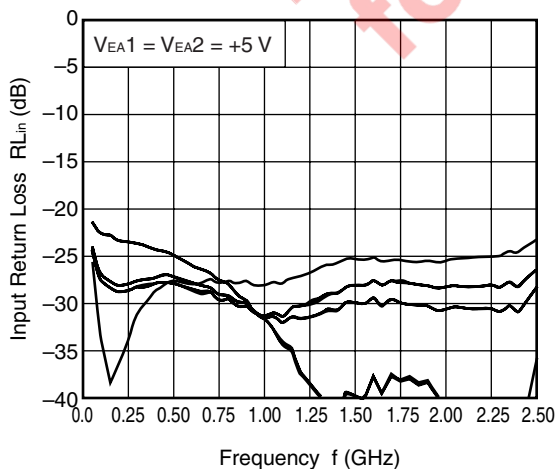
INPUT RETURN LOSS vs. FREQUENCY
(IN-A - OUT1)



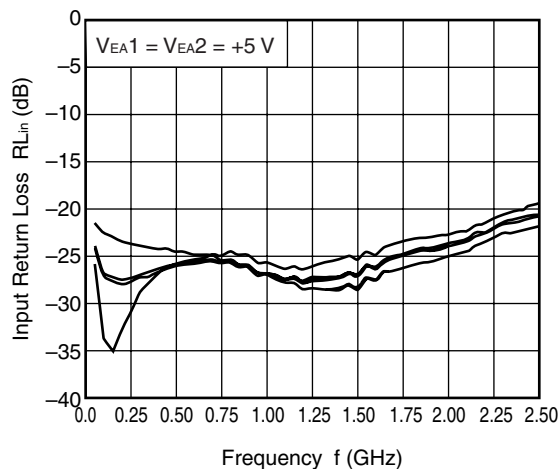
INPUT RETURN LOSS vs. FREQUENCY
(IN-B - OUT1)



INPUT RETURN LOSS vs. FREQUENCY
(IN-C - OUT1)

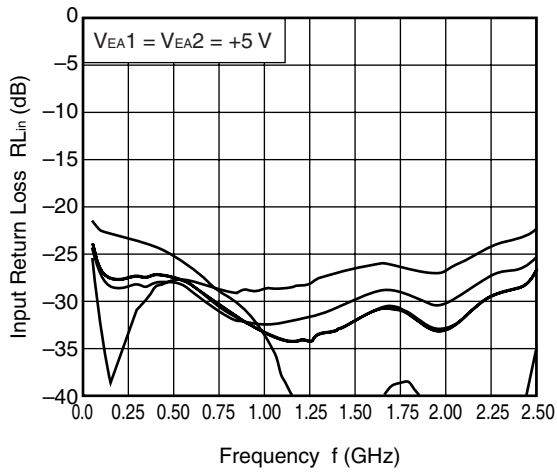


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(IN-D - OUT1)

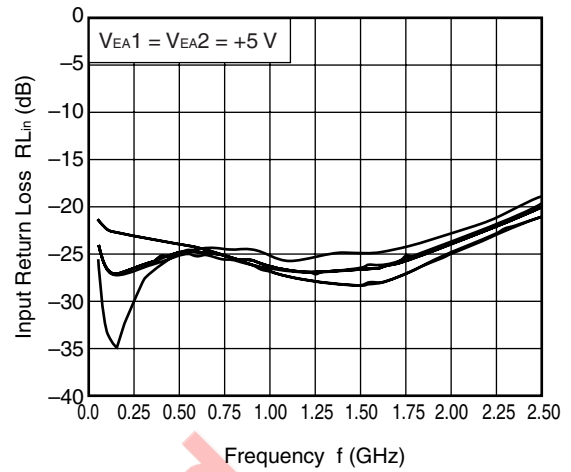


Remark The graphs indicate nominal characteristics.

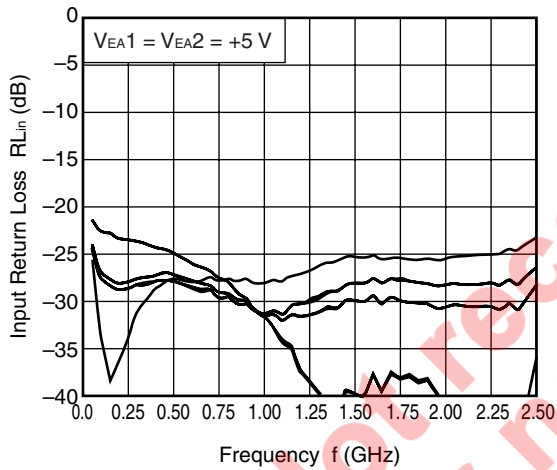
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(IN-A - OUT2)



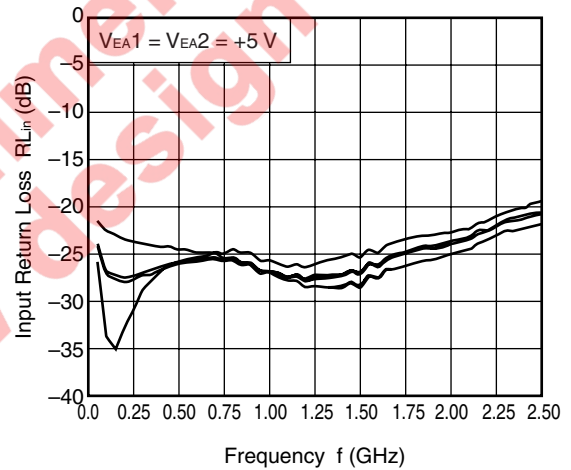
INPUT RETURN LOSS vs. FREQUENCY
(IN-B - OUT2)



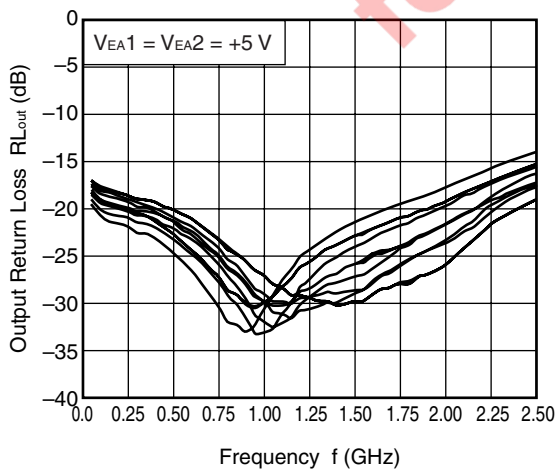
INPUT RETURN LOSS vs. FREQUENCY
(IN-C - OUT2)



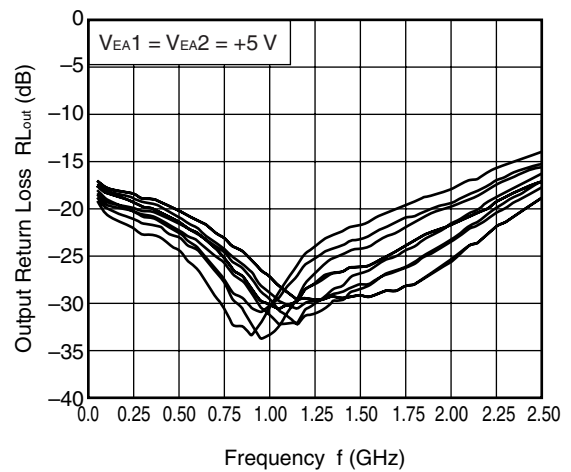
INPUT RETURN LOSS vs. FREQUENCY
(IN-D - OUT2)



OUTPUT RETURN LOSS vs. FREQUENCY
(IN-A - OUT1)

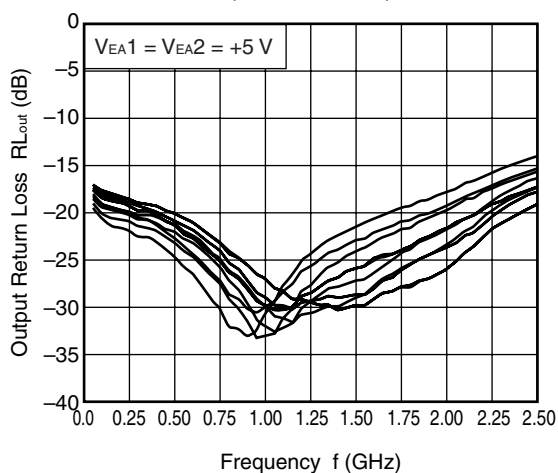


OUTPUT RETURN LOSS vs. FREQUENCY
(IN-B - OUT1)

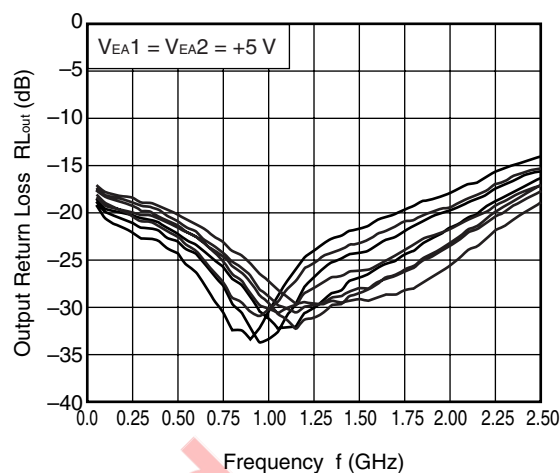


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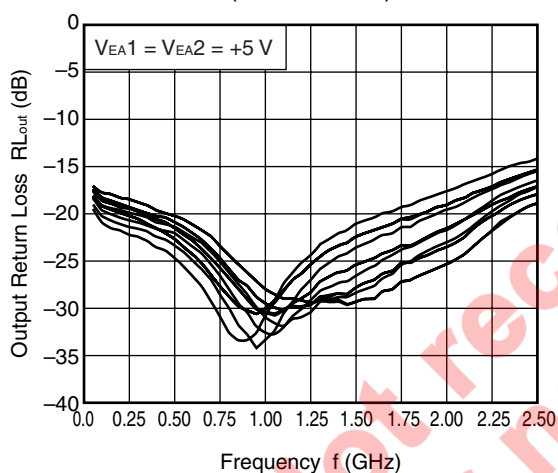
OUTPUT RETURN LOSS vs. FREQUENCY
(IN-C - OUT1)



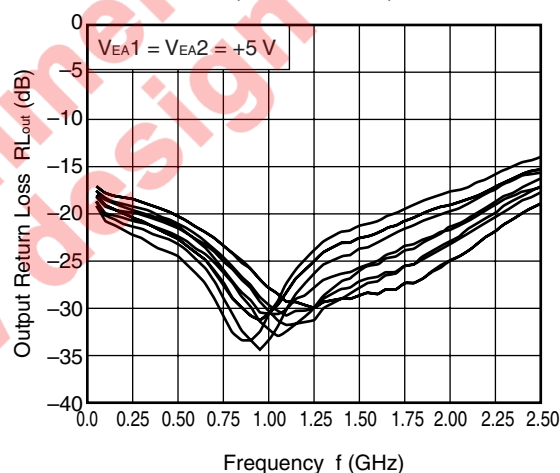
OUTPUT RETURN LOSS vs. FREQUENCY
(IN-D - OUT1)



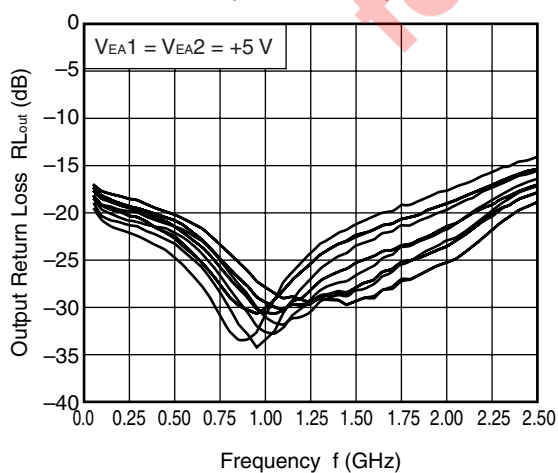
OUTPUT RETURN LOSS vs. FREQUENCY
(IN-A - OUT2)



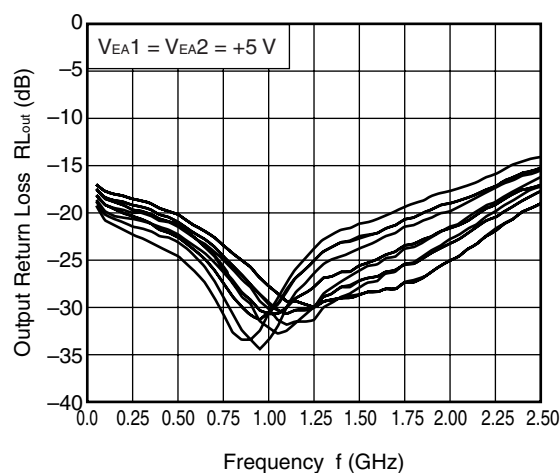
OUTPUT RETURN LOSS vs. FREQUENCY
(IN-B - OUT2)



OUTPUT RETURN LOSS vs. FREQUENCY
(IN-C - OUT2)

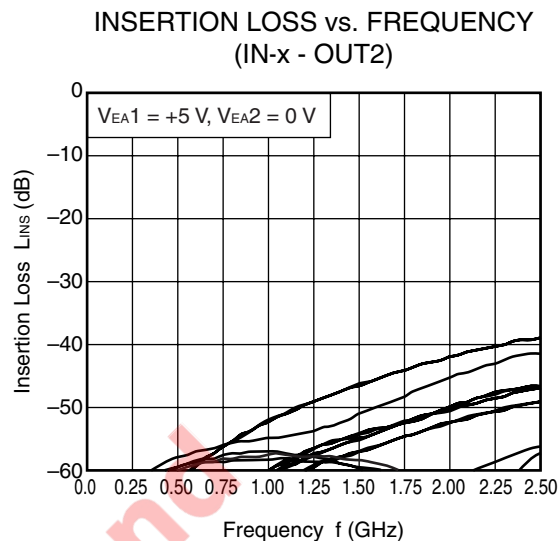
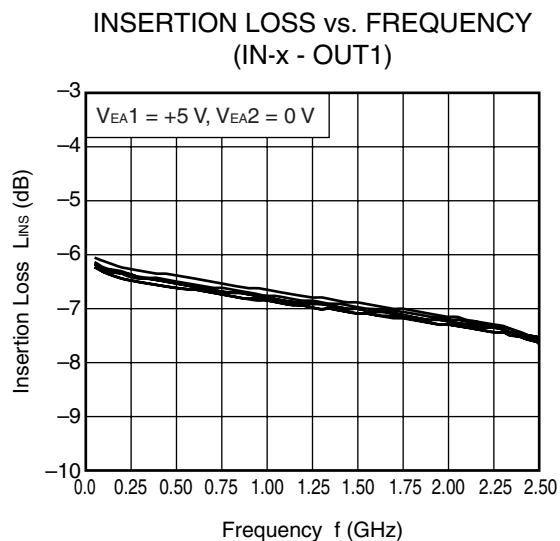


OUTPUT RETURN LOSS vs. FREQUENCY
(IN-D - OUT2)



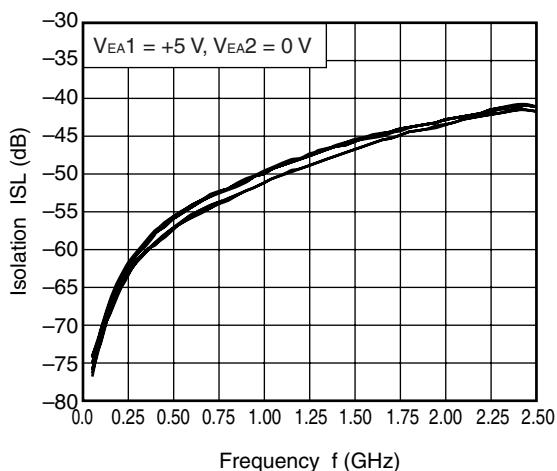
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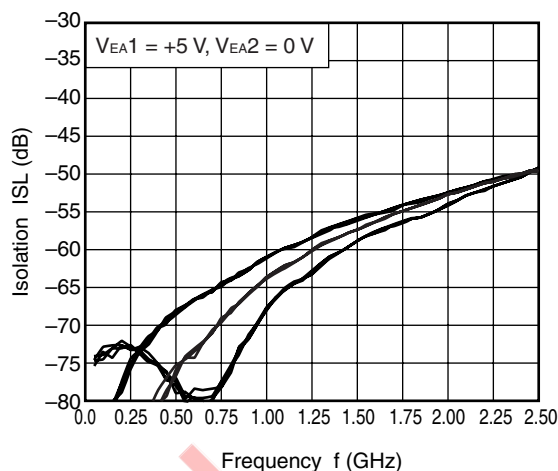


Remark The graphs indicate nominal characteristics.

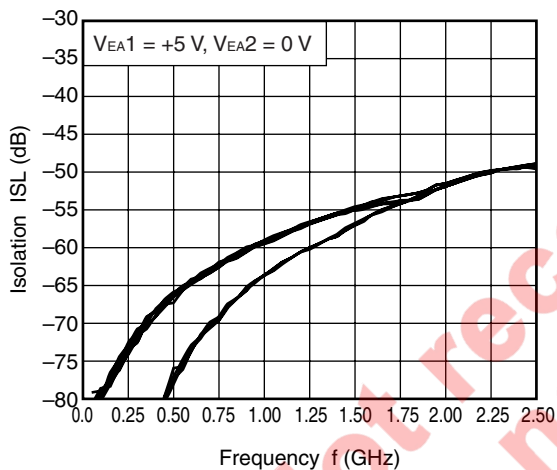
ISOLATION vs. FREQUENCY
(IN-A - OUT1)



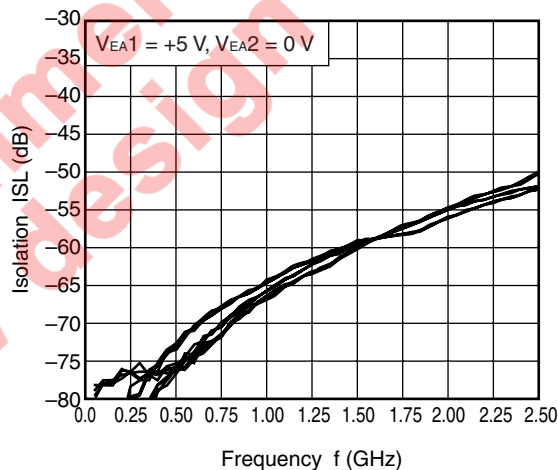
ISOLATION vs. FREQUENCY
(IN-B - OUT1)



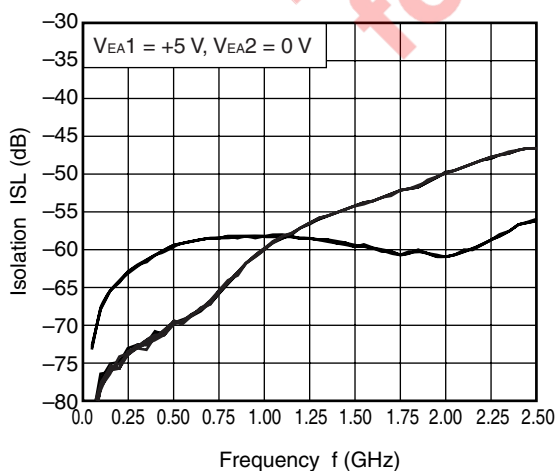
ISOLATION vs. FREQUENCY
(IN-C - OUT1)



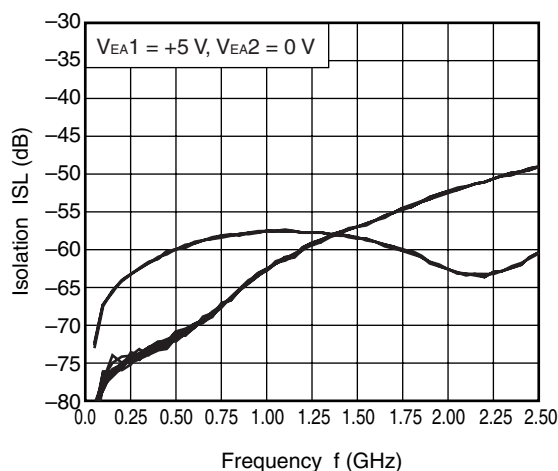
ISOLATION vs. FREQUENCY
(IN-D - OUT1)



ISOLATION vs. FREQUENCY
(IN-A - OUT2)

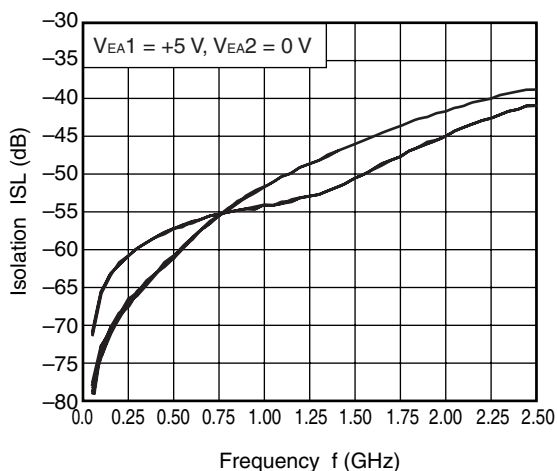


ISOLATION vs. FREQUENCY
(IN-B - OUT2)

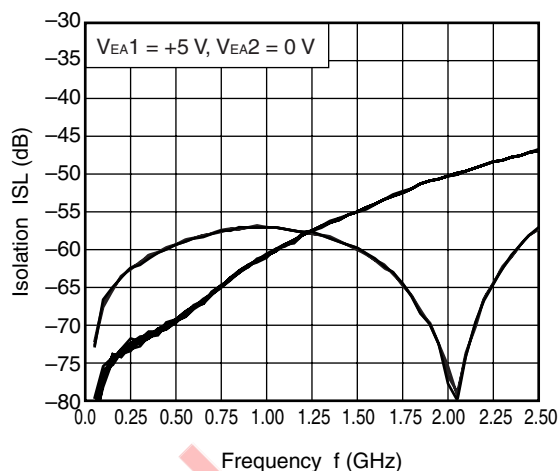


Remark The graphs indicate nominal characteristics.

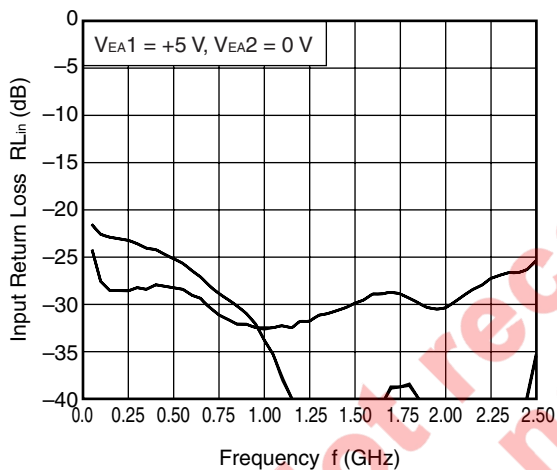
ISOLATION vs. FREQUENCY
(IN-C - OUT2)



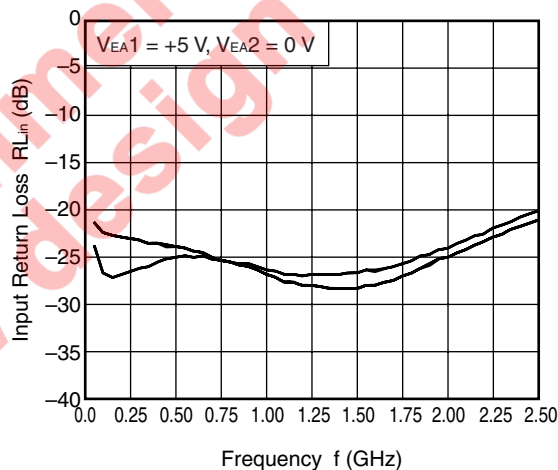
ISOLATION vs. FREQUENCY
(IN-D - OUT2)



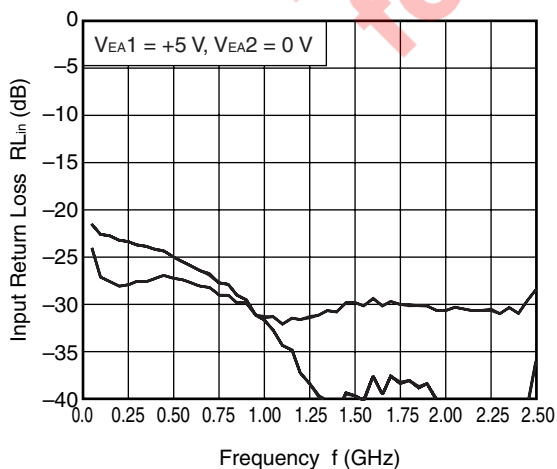
INPUT RETURN LOSS vs. FREQUENCY
(IN-A - OUT1)



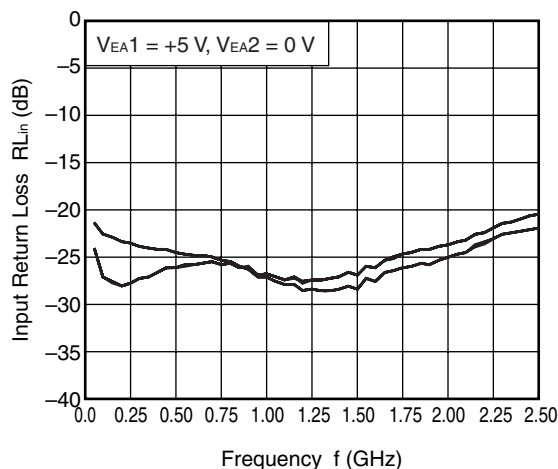
INPUT RETURN LOSS vs. FREQUENCY
(IN-B - OUT1)



INPUT RETURN LOSS vs. FREQUENCY
(IN-C - OUT1)

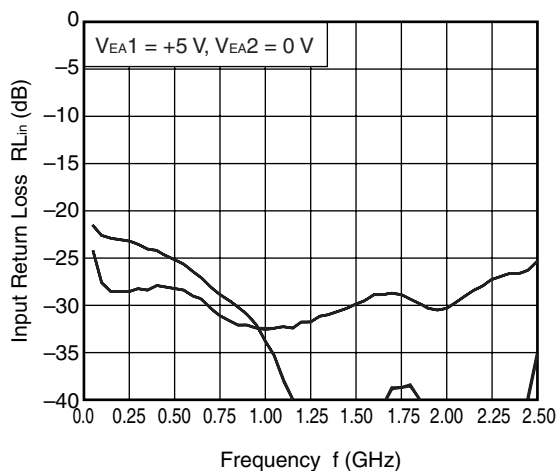


INPUT RETURN LOSS vs. FREQUENCY
(IN-D - OUT1)

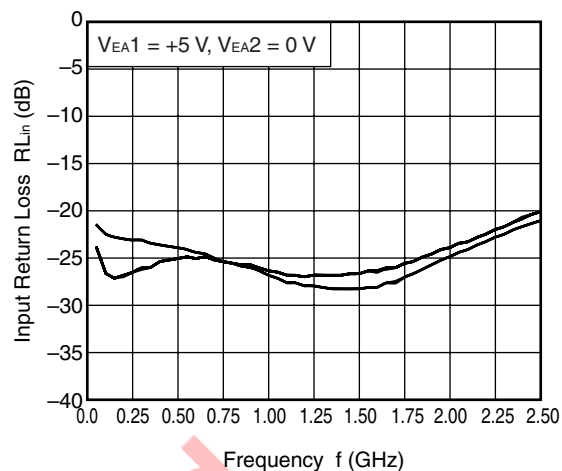


Remark The graphs indicate nominal characteristics.

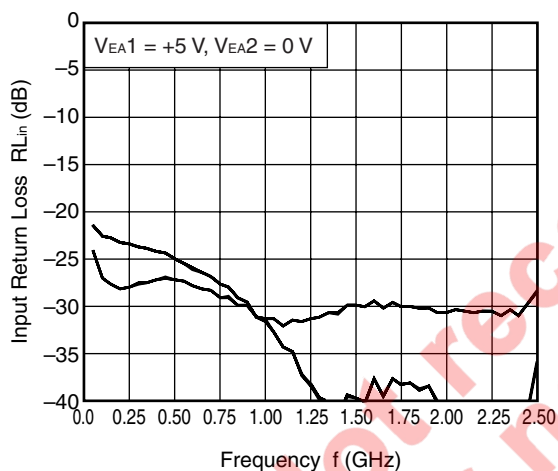
INPUT RETURN LOSS vs. FREQUENCY
(IN-A - OUT2)



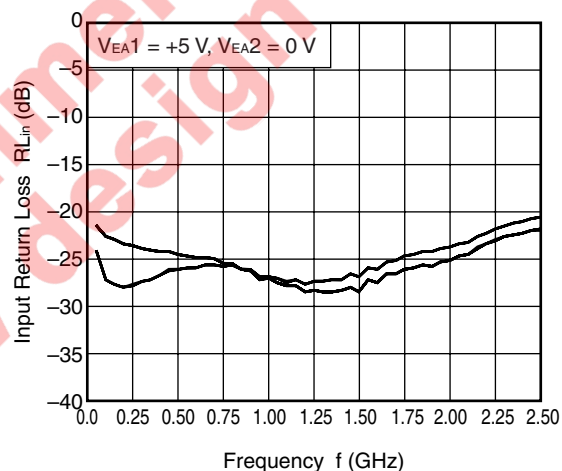
INPUT RETURN LOSS vs. FREQUENCY
(IN-B - OUT2)



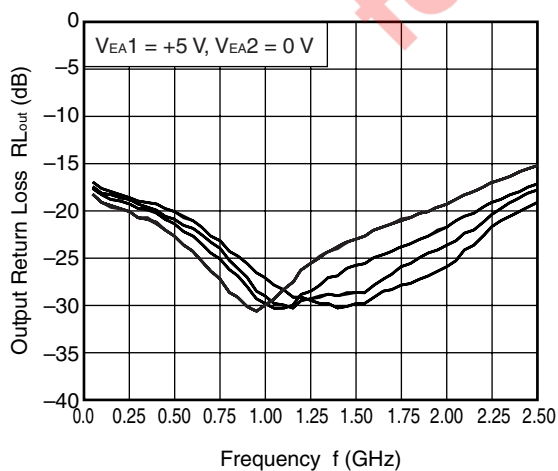
INPUT RETURN LOSS vs. FREQUENCY
(IN-C - OUT2)



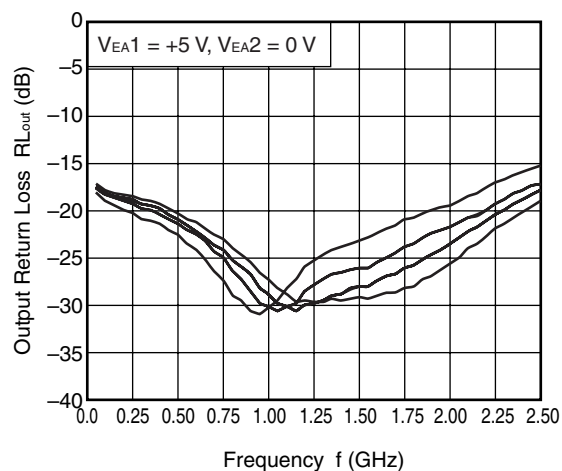
INPUT RETURN LOSS vs. FREQUENCY
(IN-D - OUT2)



OUTPUT RETURN LOSS vs. FREQUENCY
(IN-A - OUT1)

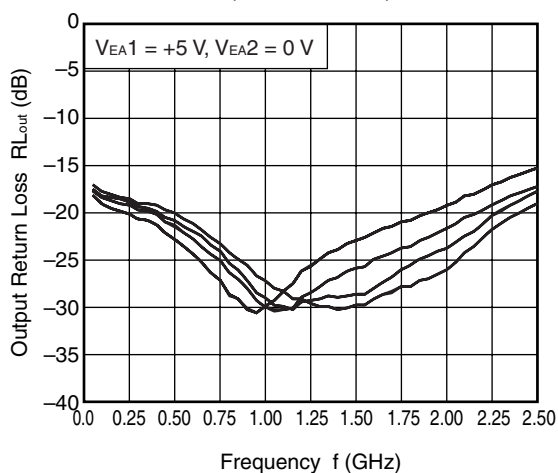


OUTPUT RETURN LOSS vs. FREQUENCY
(IN-B - OUT1)

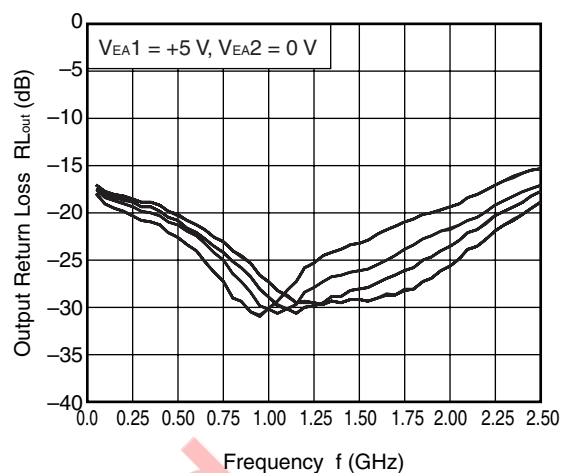


Remark The graphs indicate nominal characteristics.

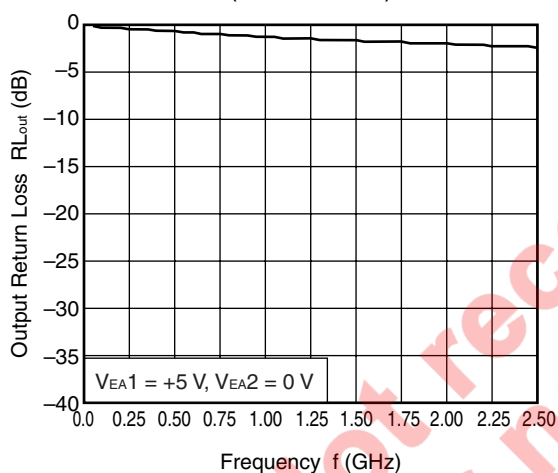
OUTPUT RETURN LOSS vs. FREQUENCY
(IN-C - OUT1)



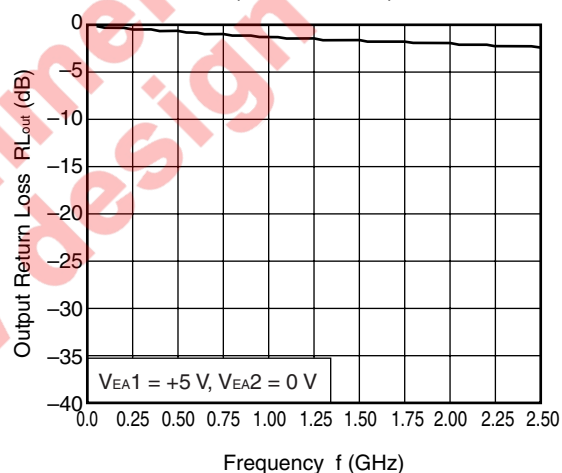
OUTPUT RETURN LOSS vs. FREQUENCY
(IN-D - OUT1)



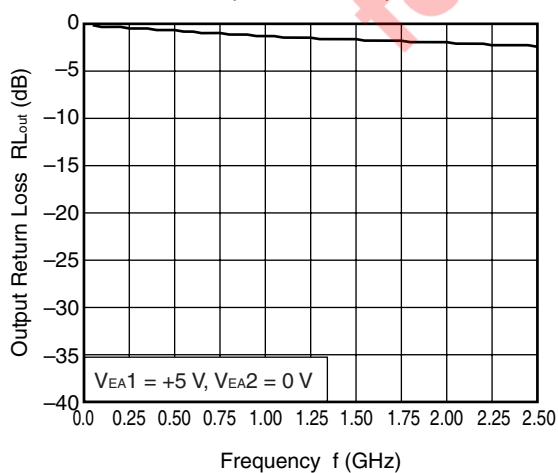
OUTPUT RETURN LOSS vs. FREQUENCY
(IN-A - OUT2)



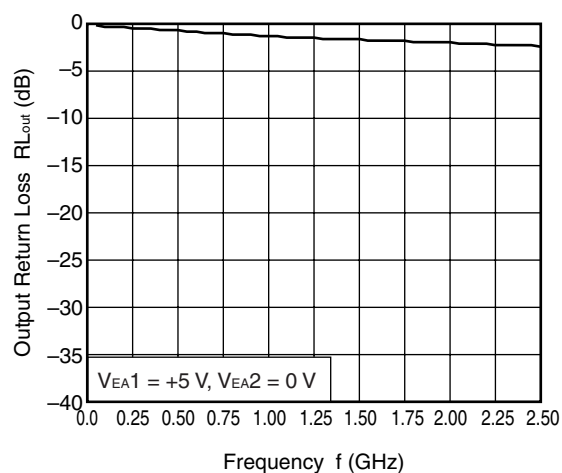
OUTPUT RETURN LOSS vs. FREQUENCY
(IN-B - OUT2)



OUTPUT RETURN LOSS vs. FREQUENCY
(IN-C - OUT2)

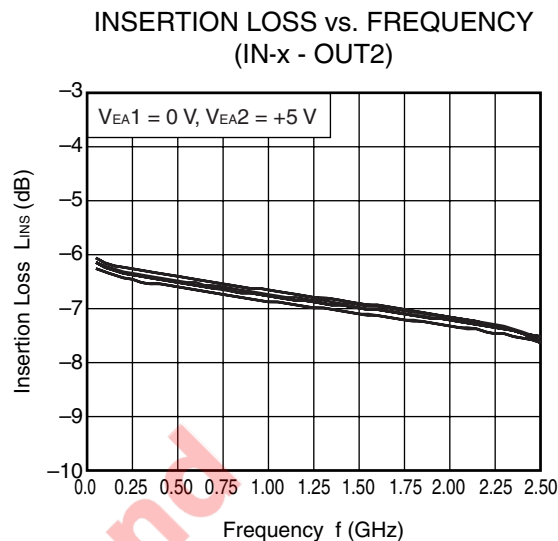
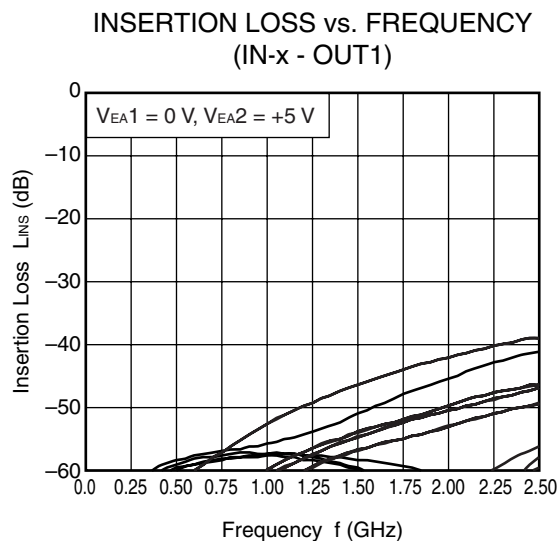


OUTPUT RETURN LOSS vs. FREQUENCY
(IN-D - OUT2)



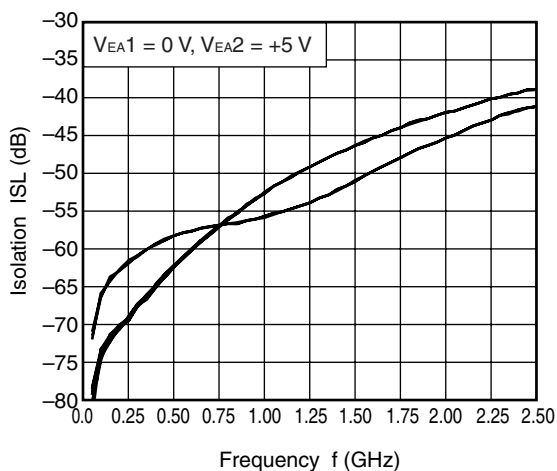
Remark The graphs indicate nominal characteristics.

TYPICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$, $V_{DD} = +5.0\text{ V}$, $V_{CONT} = +5.0\text{ V/0 V}$, $V_{EA1} = 0\text{ V}$ (OUT1 disabled), $V_{EA2} = +5.0\text{ V}$, $P_{in} = 0\text{ dBm}$, $Z_o = 50\ \Omega$ for each port, unless otherwise specified)

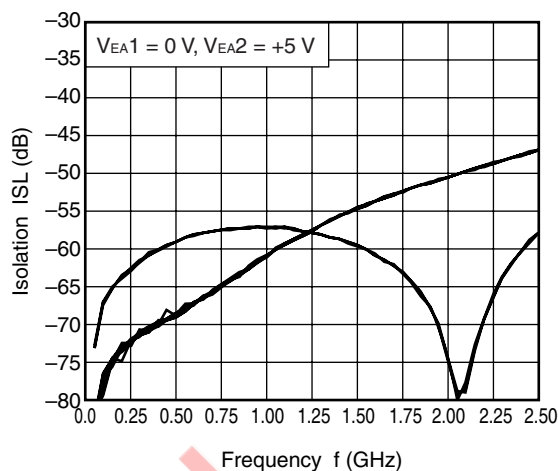


Remark The graphs indicate nominal characteristics.

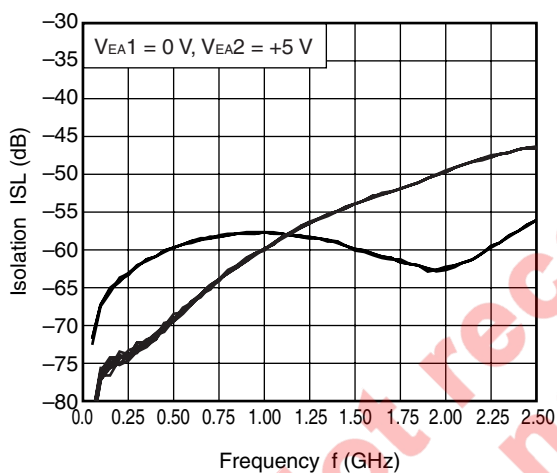
ISOLATION vs. FREQUENCY
(IN-A - OUT1)



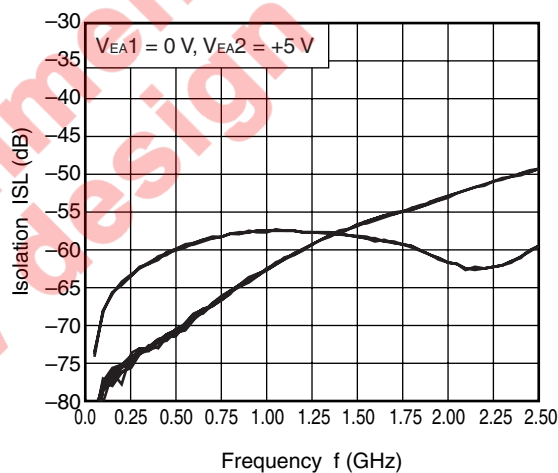
ISOLATION vs. FREQUENCY
(IN-B - OUT1)



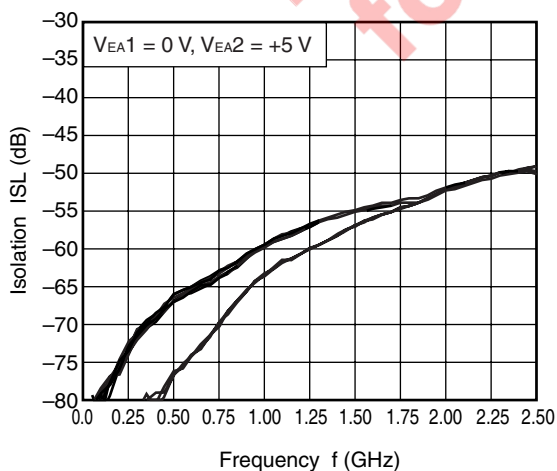
ISOLATION vs. FREQUENCY
(IN-C - OUT1)



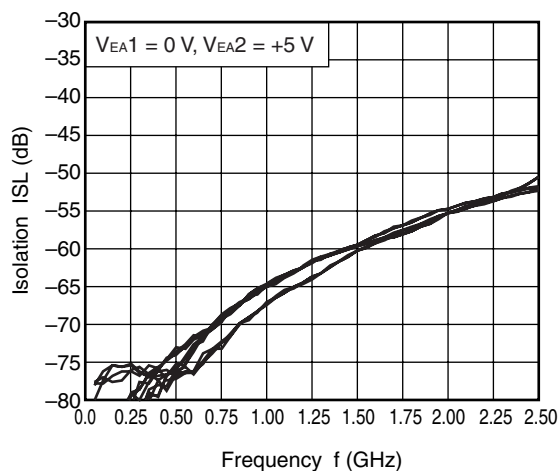
ISOLATION vs. FREQUENCY
(IN-D - OUT1)



ISOLATION vs. FREQUENCY
(IN-A - OUT2)

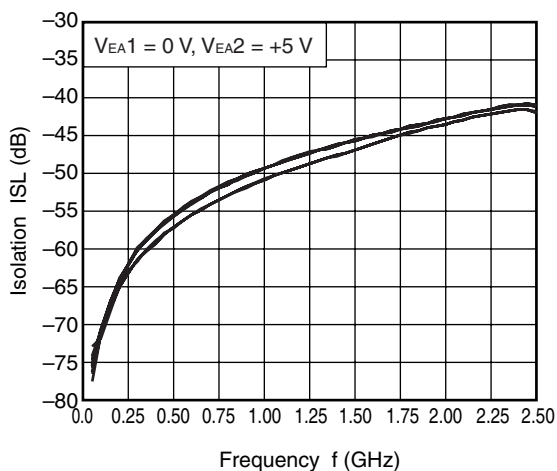


ISOLATION vs. FREQUENCY
(IN-B - OUT2)

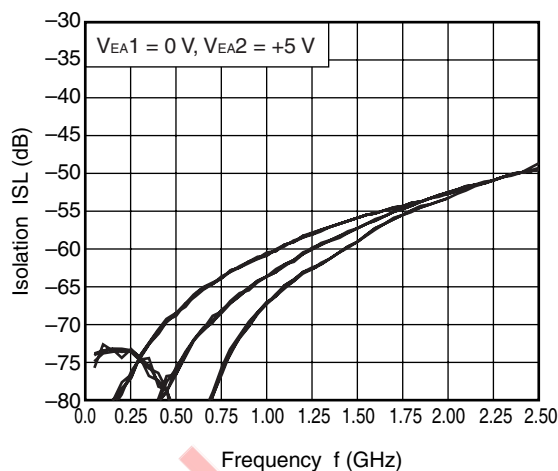


Remark The graphs indicate nominal characteristics.

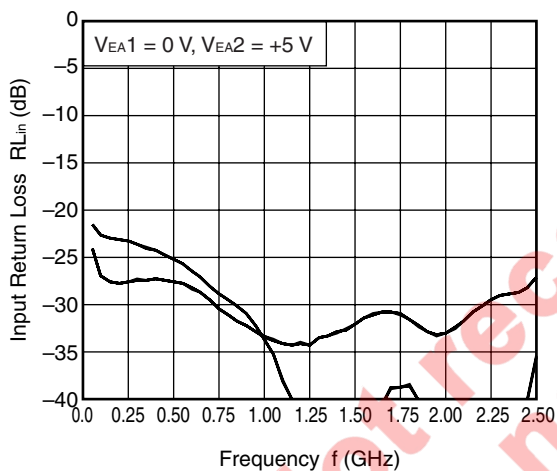
ISOLATION vs. FREQUENCY
(IN-C - OUT2)



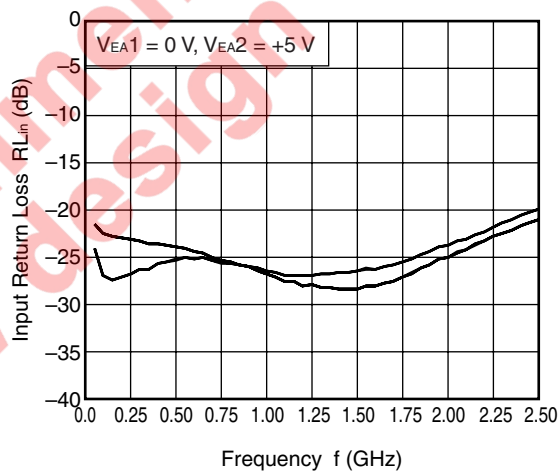
ISOLATION vs. FREQUENCY
(IN-D - OUT2)



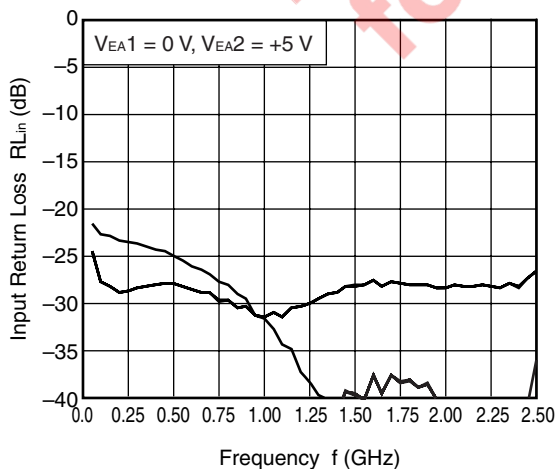
INPUT RETURN LOSS vs. FREQUENCY
(IN-A - OUT1)



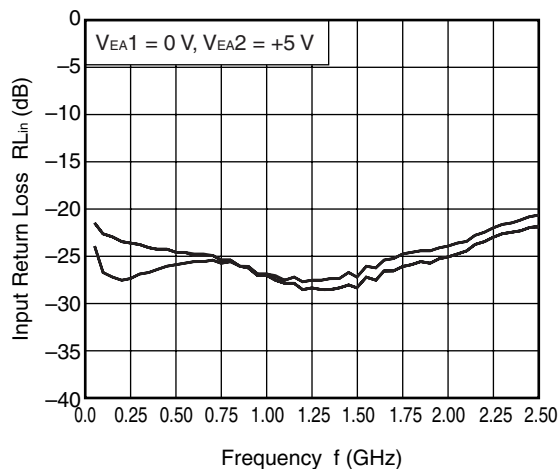
INPUT RETURN LOSS vs. FREQUENCY
(IN-B - OUT1)



INPUT RETURN LOSS vs. FREQUENCY
(IN-C - OUT1)

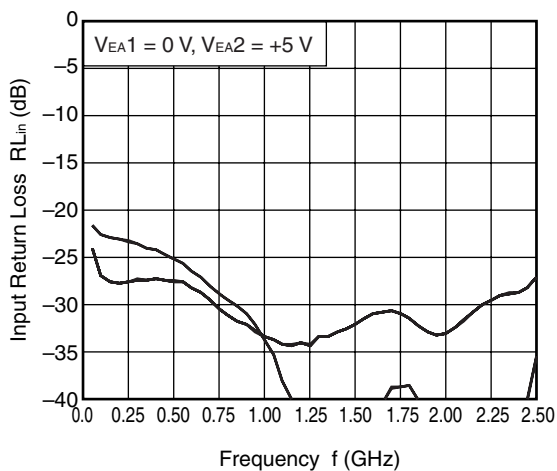


INPUT RETURN LOSS vs. FREQUENCY
(IN-D - OUT1)

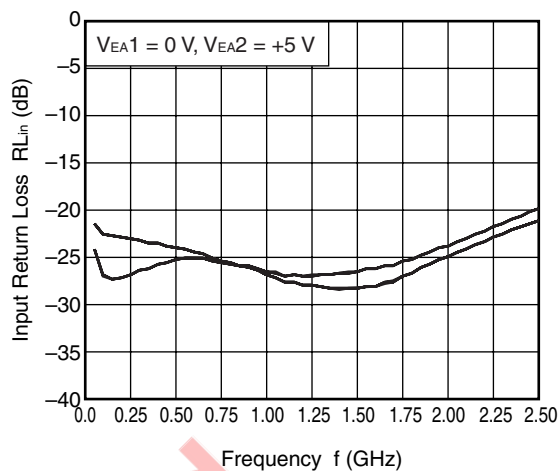


Remark The graphs indicate nominal characteristics.

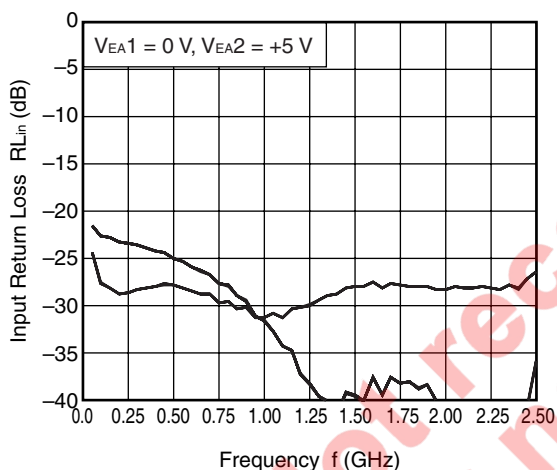
INPUT RETURN LOSS vs. FREQUENCY
(IN-A - OUT2)



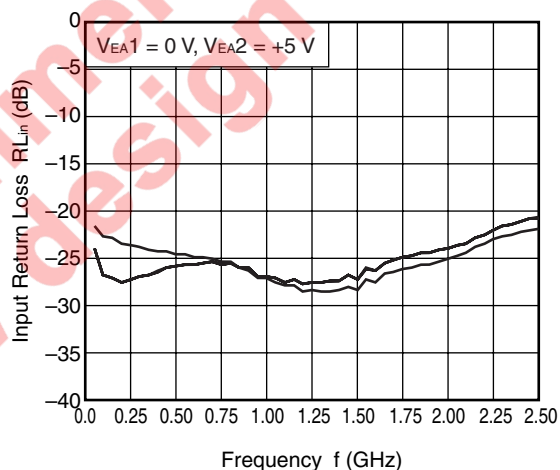
INPUT RETURN LOSS vs. FREQUENCY
(IN-B - OUT2)



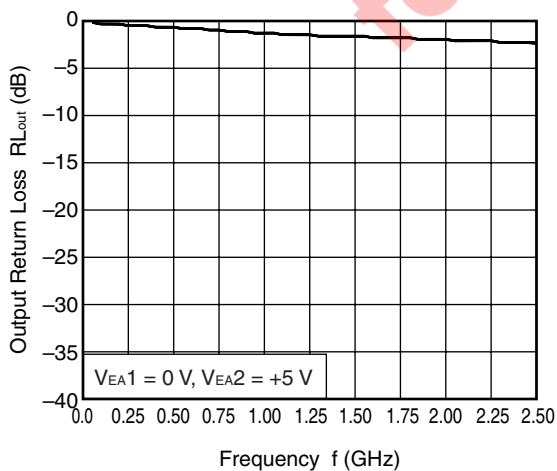
INPUT RETURN LOSS vs. FREQUENCY
(IN-C - OUT2)



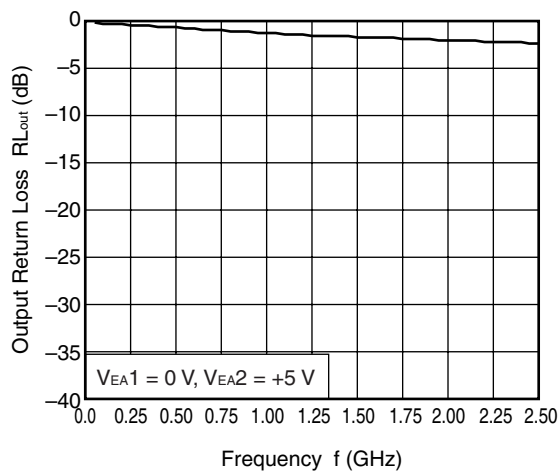
INPUT RETURN LOSS vs. FREQUENCY
(IN-D - OUT2)



OUTPUT RETURN LOSS vs. FREQUENCY
(IN-A - OUT1)

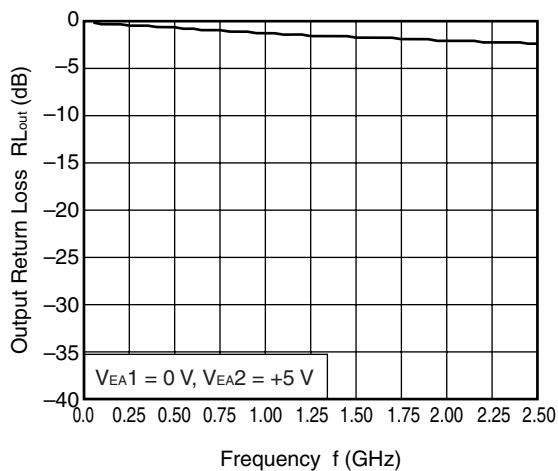


OUTPUT RETURN LOSS vs. FREQUENCY
(IN-B - OUT1)

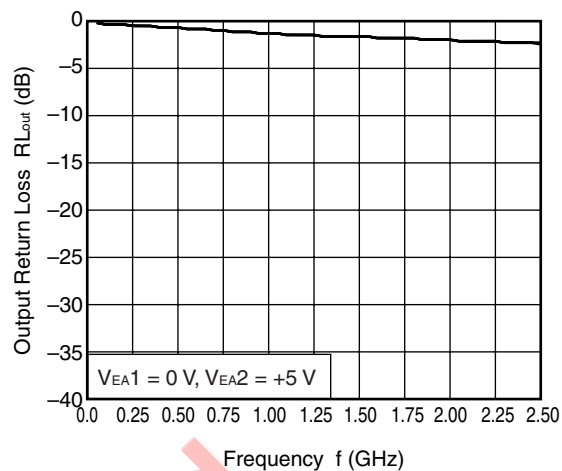


Remark The graphs indicate nominal characteristics.

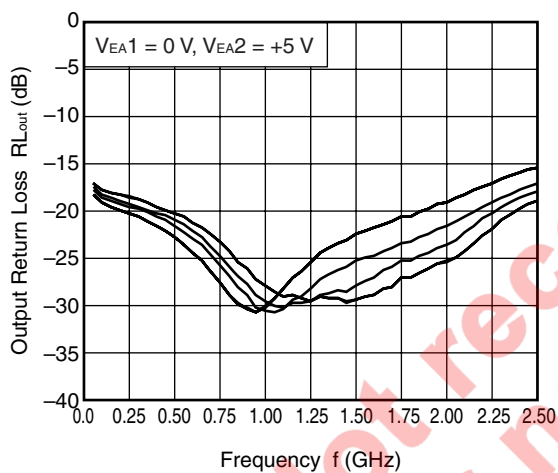
OUTPUT RETURN LOSS vs. FREQUENCY
(IN-C - OUT1)



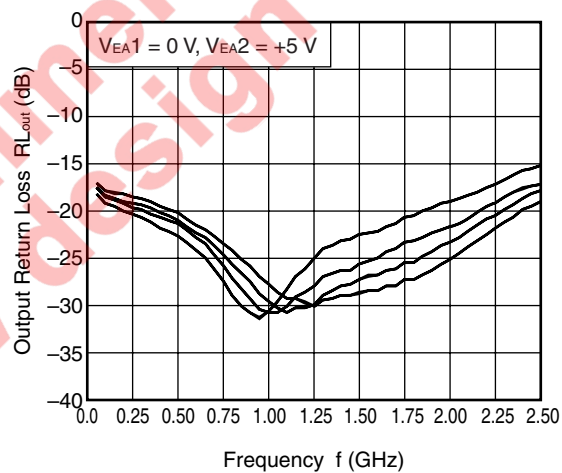
OUTPUT RETURN LOSS vs. FREQUENCY
(IN-D - OUT1)



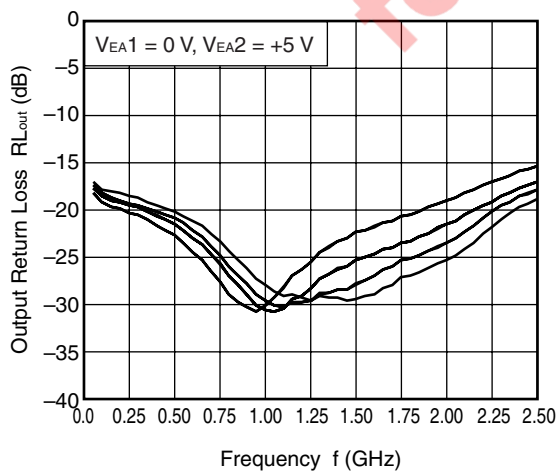
OUTPUT RETURN LOSS vs. FREQUENCY
(IN-A - OUT2)



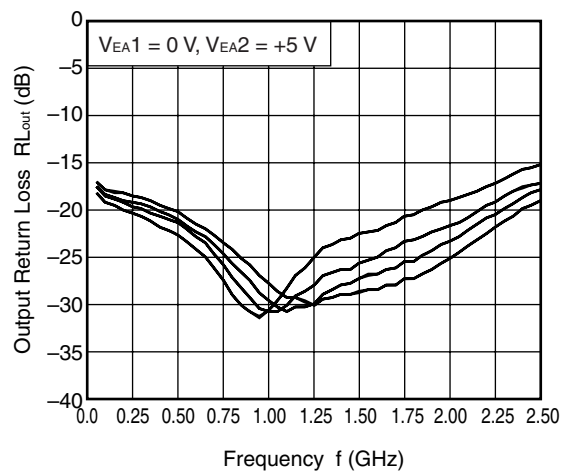
OUTPUT RETURN LOSS vs. FREQUENCY
(IN-B - OUT2)



OUTPUT RETURN LOSS vs. FREQUENCY
(IN-C - OUT2)

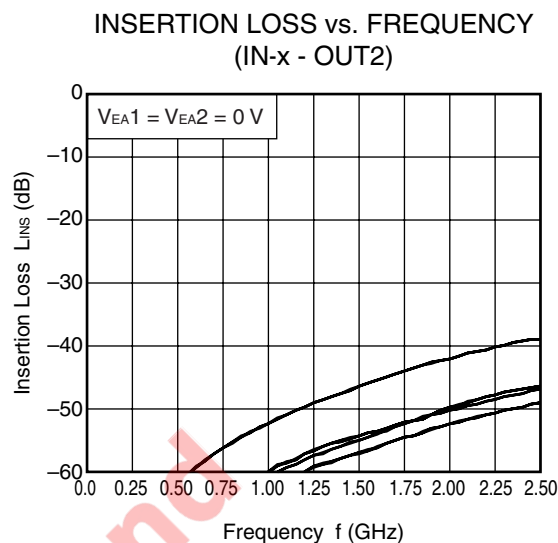
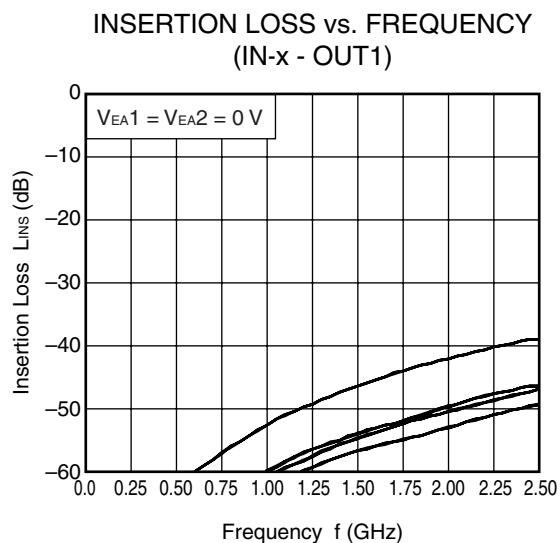


OUTPUT RETURN LOSS vs. FREQUENCY
(IN-D - OUT2)



Remark The graphs indicate nominal characteristics.

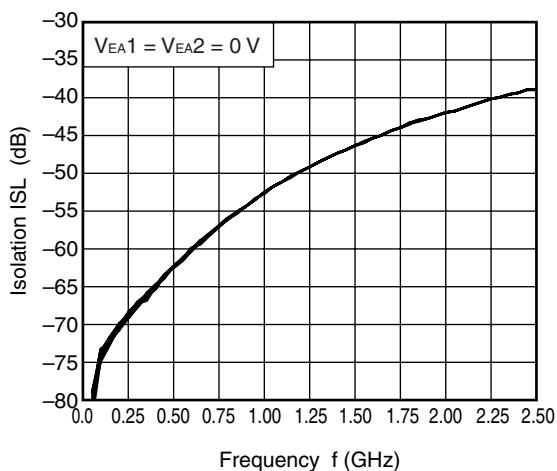
TYPICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$, $V_{DD} = +5.0\text{ V}$, $V_{CONT} = +5.0\text{ V/0 V}$, $V_{EA1} = V_{EA2} = 0\text{ V}$ (both OUTs enabled), $P_{in} = 0\text{ dBm}$, $Z_o = 50\ \Omega$ for each port, unless otherwise specified)



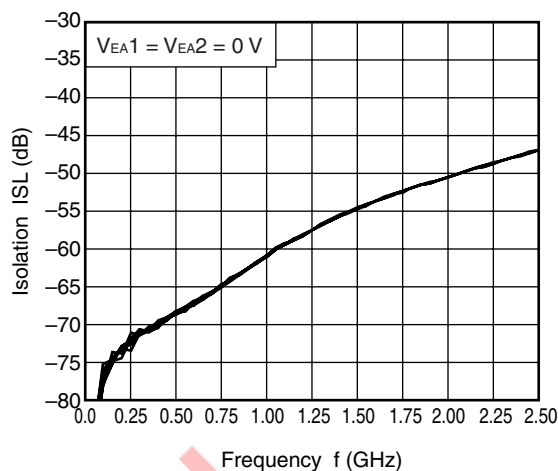
Remark The graphs indicate nominal characteristics.

Not recommended
for new design

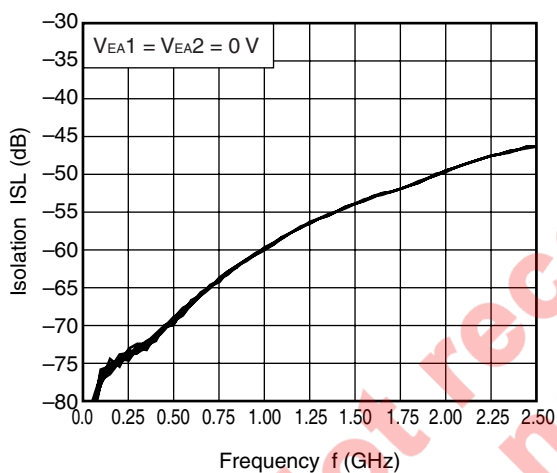
ISOLATION vs. FREQUENCY
(IN-A - OUT1)



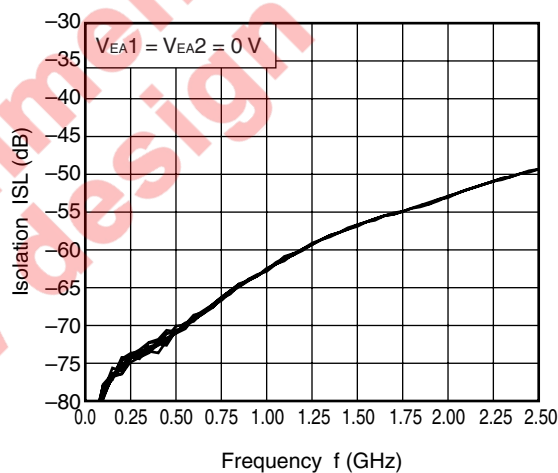
ISOLATION vs. FREQUENCY
(IN-B - OUT1)



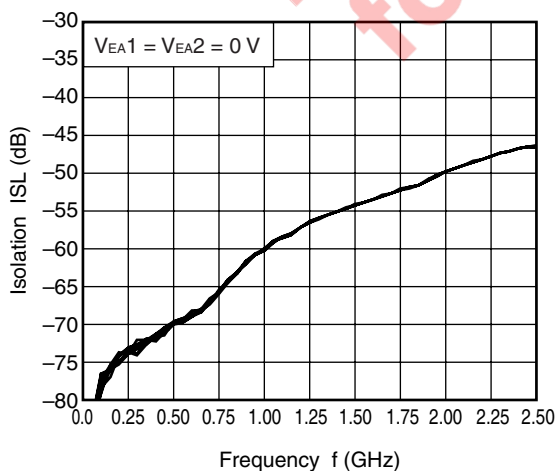
ISOLATION vs. FREQUENCY
(IN-C - OUT1)



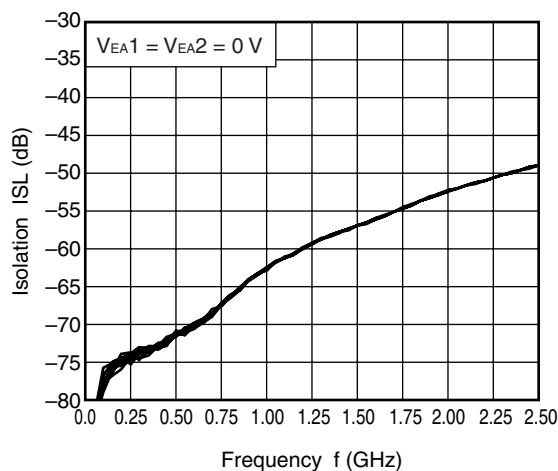
ISOLATION vs. FREQUENCY
(IN-D - OUT1)



ISOLATION vs. FREQUENCY
(IN-A - OUT2)

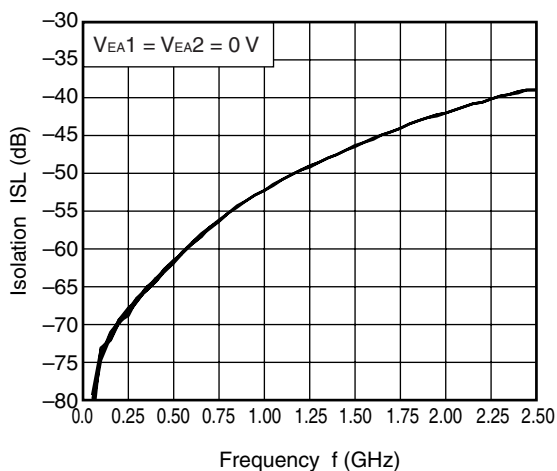


ISOLATION vs. FREQUENCY
(IN-B - OUT2)

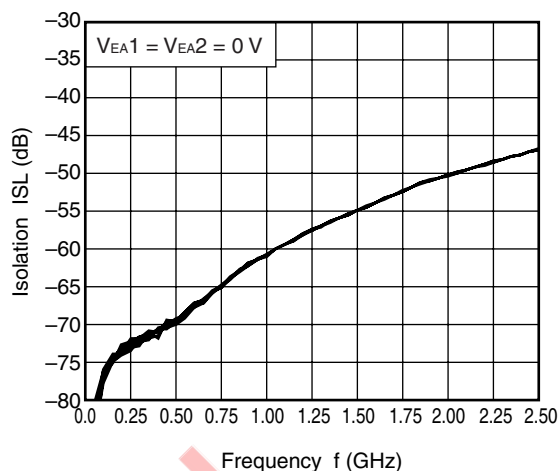


Remark The graphs indicate nominal characteristics.

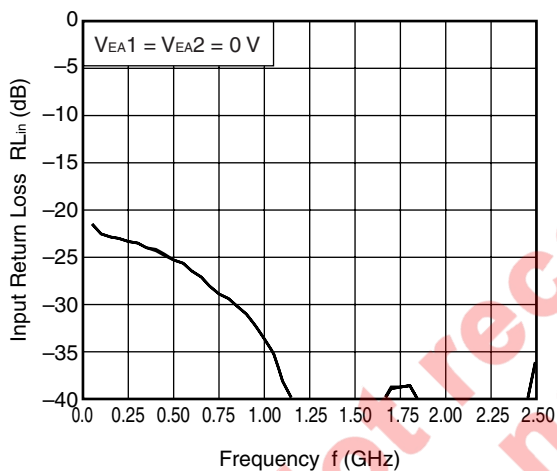
ISOLATION vs. FREQUENCY
(IN-C - OUT2)



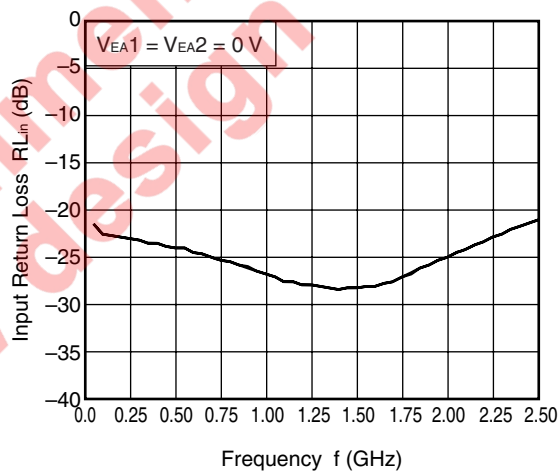
ISOLATION vs. FREQUENCY
(IN-D - OUT2)



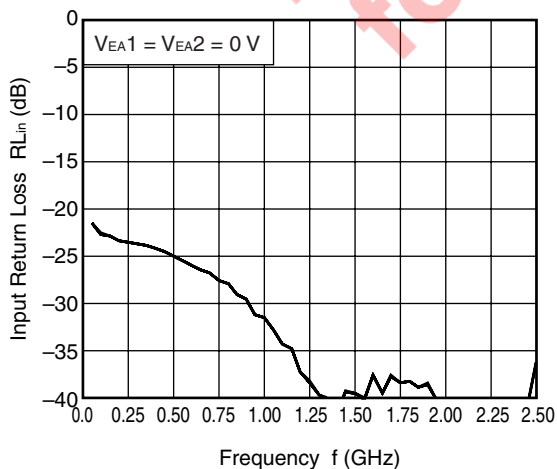
INPUT RETURN LOSS vs. FREQUENCY
(IN-A - OUT1)



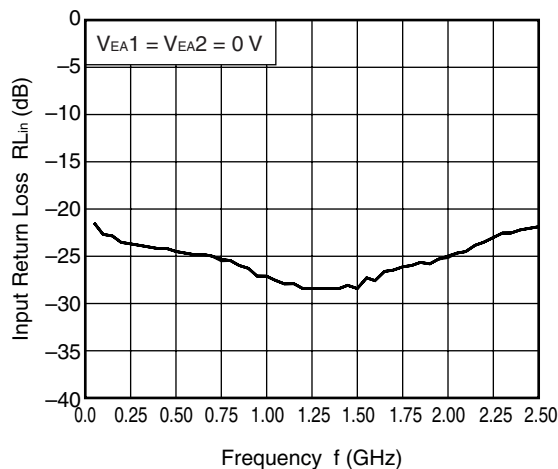
INPUT RETURN LOSS vs. FREQUENCY
(IN-B - OUT1)



INPUT RETURN LOSS vs. FREQUENCY
(IN-C - OUT1)

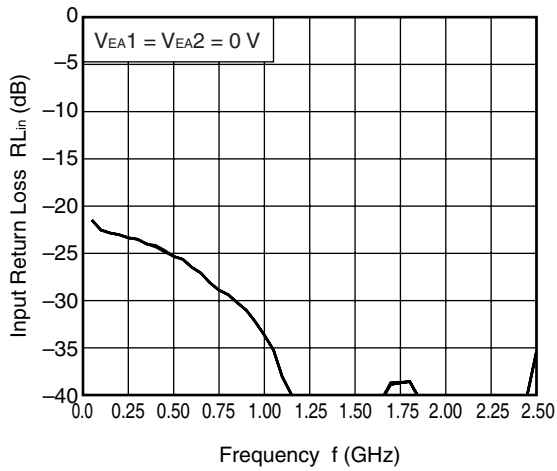


INPUT RETURN LOSS vs. FREQUENCY
(IN-D - OUT1)

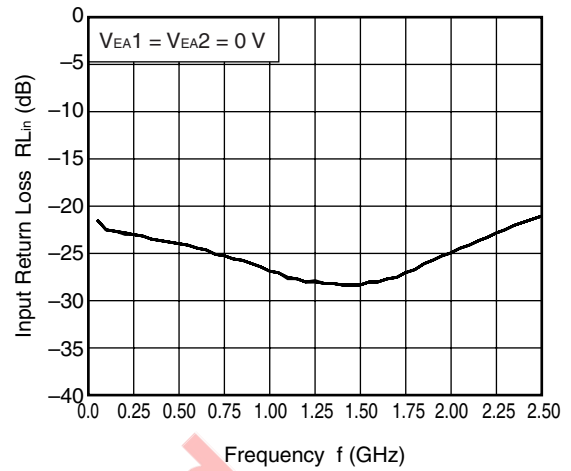


Remark The graphs indicate nominal characteristics.

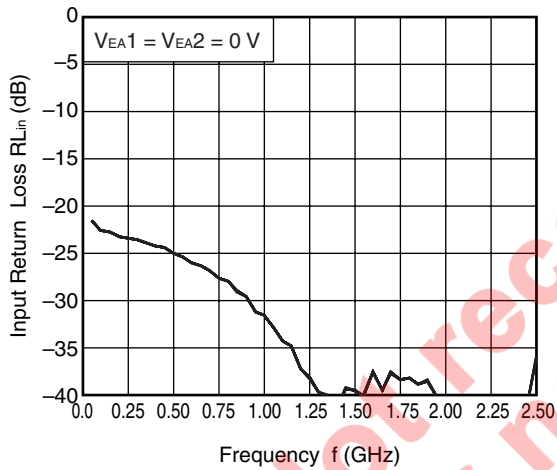
INPUT RETURN LOSS vs. FREQUENCY
(IN-A - OUT2)



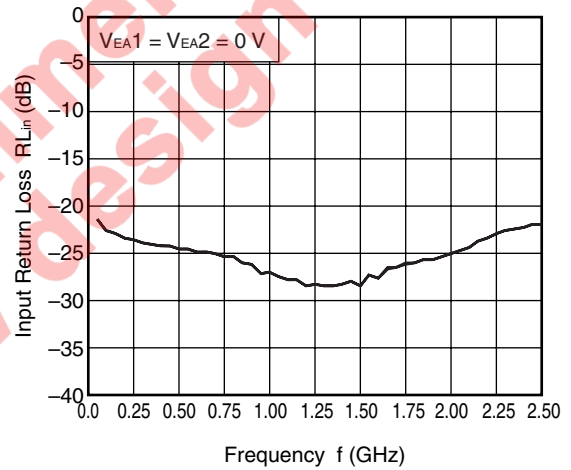
INPUT RETURN LOSS vs. FREQUENCY
(IN-B - OUT2)



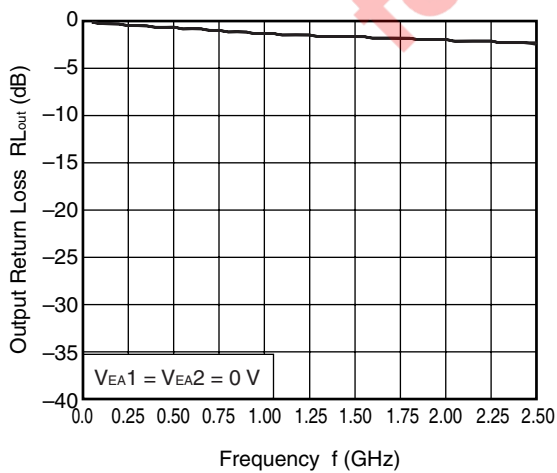
INPUT RETURN LOSS vs. FREQUENCY
(IN-C - OUT2)



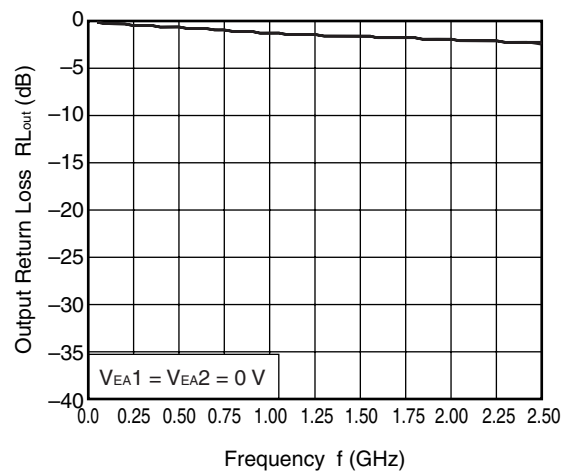
INPUT RETURN LOSS vs. FREQUENCY
(IN-D - OUT2)



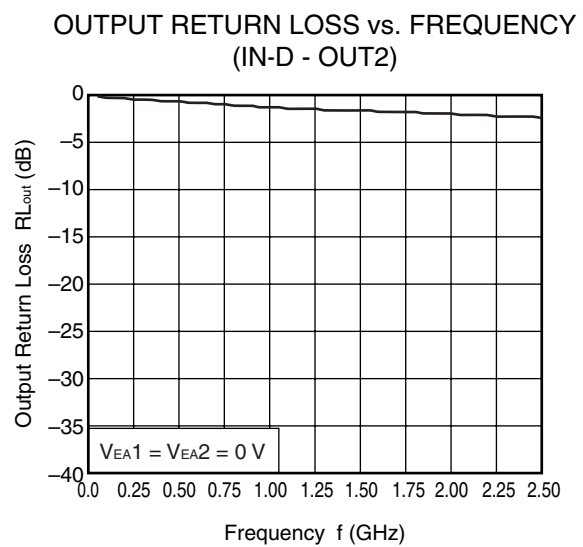
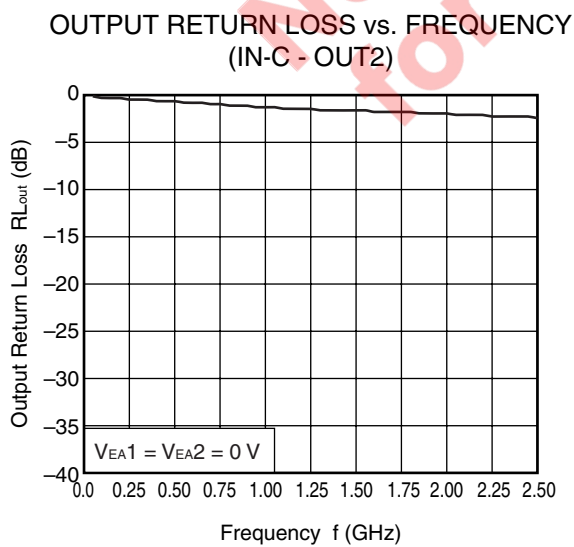
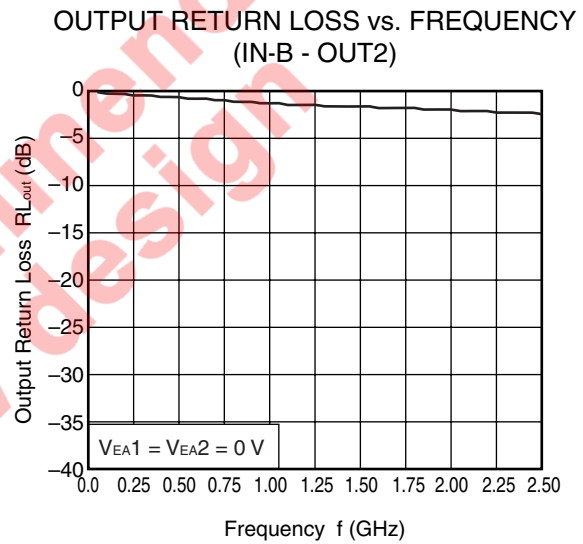
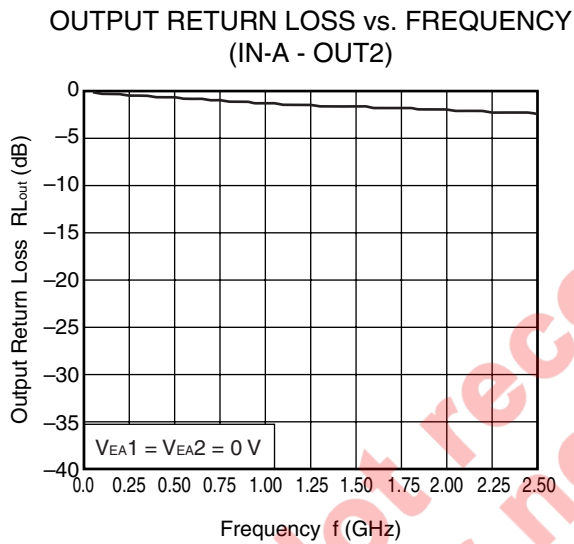
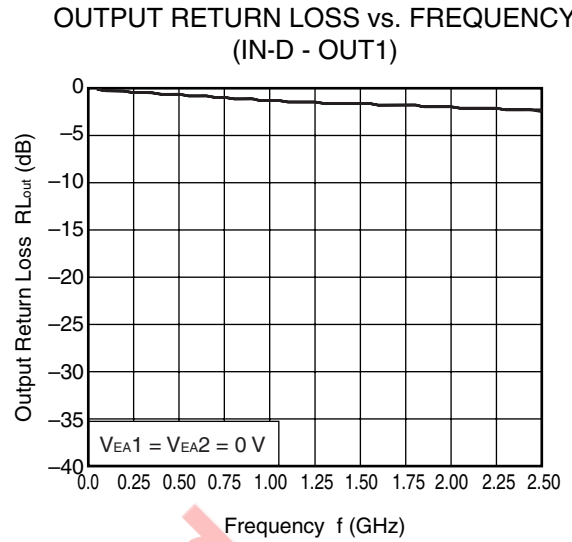
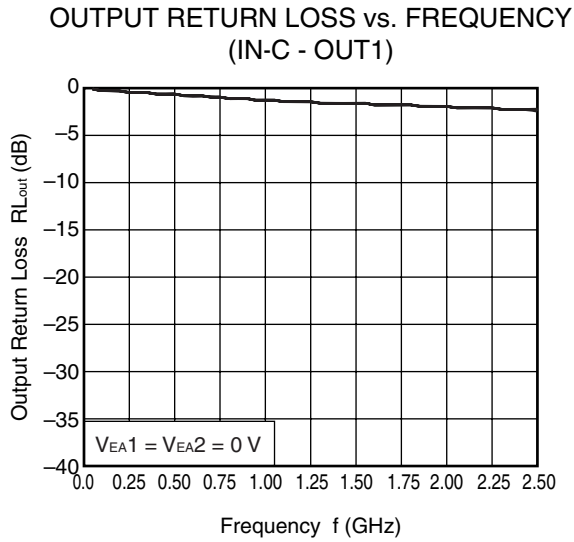
OUTPUT RETURN LOSS vs. FREQUENCY
(IN-A - OUT1)



OUTPUT RETURN LOSS vs. FREQUENCY
(IN-B - OUT1)



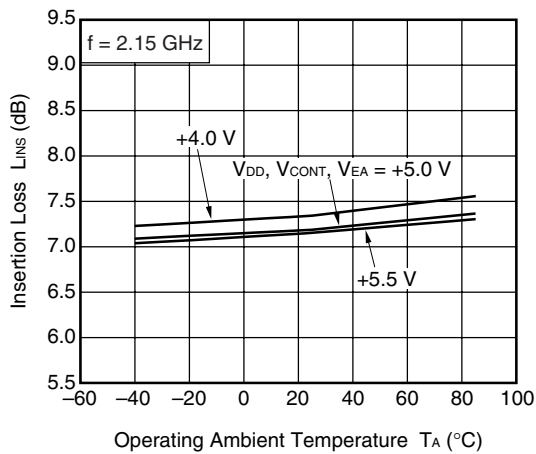
Remark The graphs indicate nominal characteristics.



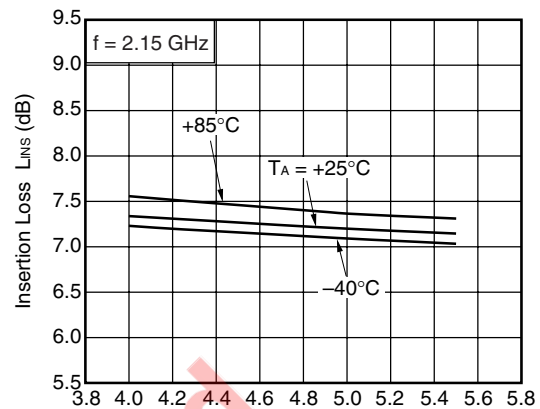
Remark The graphs indicate nominal characteristics.

TYPICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$, $V_{DD} = +5.0\text{ V}$, $V_{CONT} = +5.0\text{ V/0 V}$, $V_{EA1} = V_{EA2} = +5.0\text{ V}$ (both OUTs enabled), $P_{in} = 0\text{ dBm}$, $Z_o = 50\ \Omega$ for each port, unless otherwise specified)

INSERTION LOSS vs.
OPERATING AMBIENT TEMPERATURE

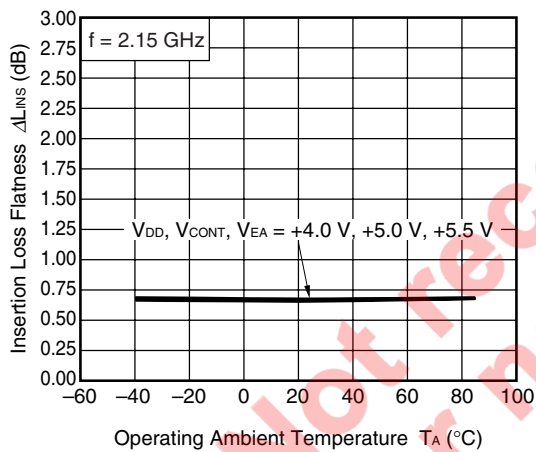


INSERTION LOSS vs. V_{DD} , V_{CONT} , V_{EA}

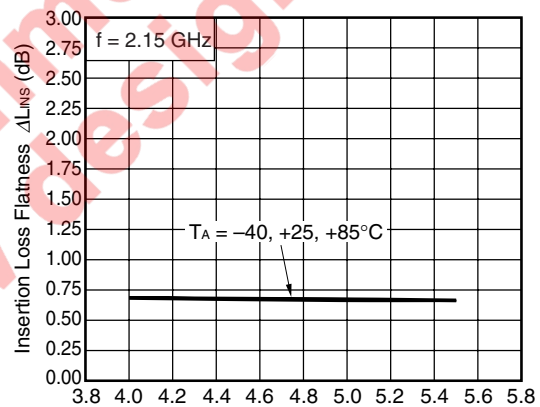


Supply Voltage V_{DD} (V), Switch Control Voltage V_{CONT} (V),
Enable Control Voltage V_{EA} (V)

INSERTION LOSS FLATNESS vs.
OPERATING AMBIENT TEMPERATURE

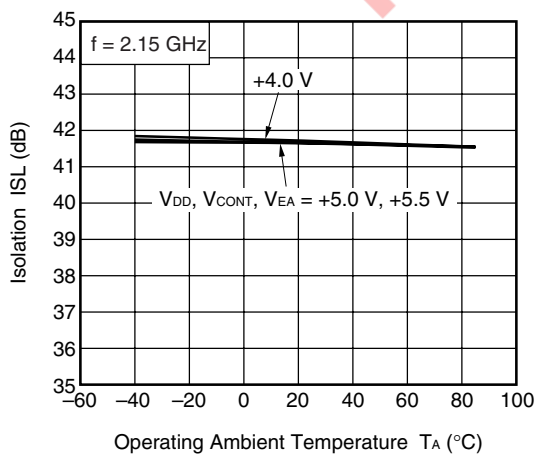


INSERTION LOSS FLATNESS vs.
 V_{DD} , V_{CONT} , V_{EA}

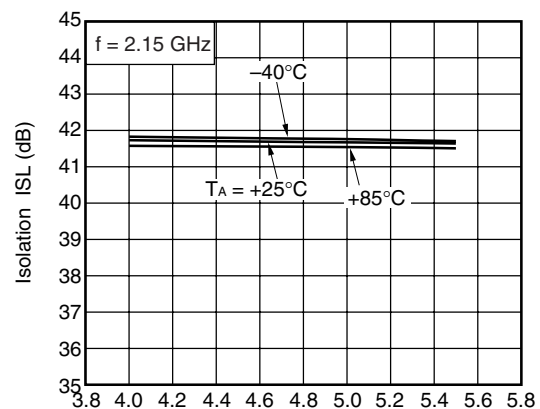


Supply Voltage V_{DD} (V), Switch Control Voltage V_{CONT} (V),
Enable Control Voltage V_{EA} (V)

ISOLATION vs.
OPERATING AMBIENT TEMPERATURE



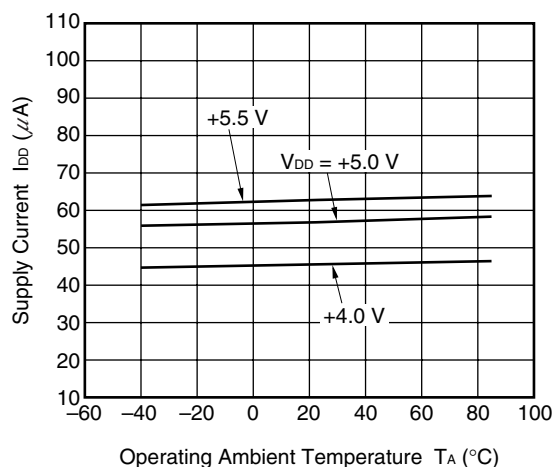
ISOLATION vs. V_{DD} , V_{CONT} , V_{EA}



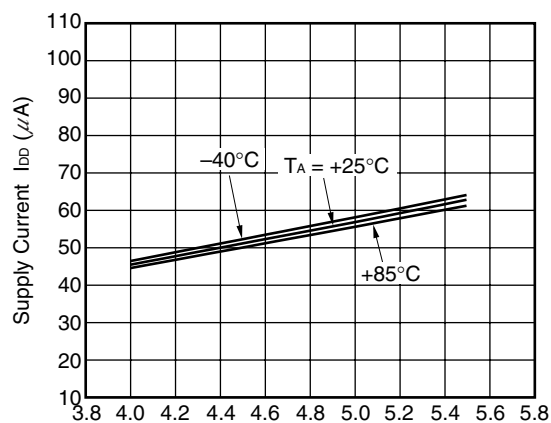
Supply Voltage V_{DD} (V), Switch Control Voltage V_{CONT} (V),
Enable Control Voltage V_{EA} (V)

Remark The graphs indicate nominal characteristics.

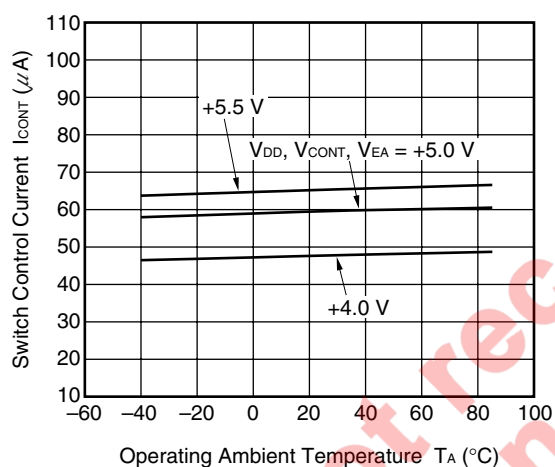
SUPPLY CURRENT vs.
OPERATING AMBIENT TEMPERATURE



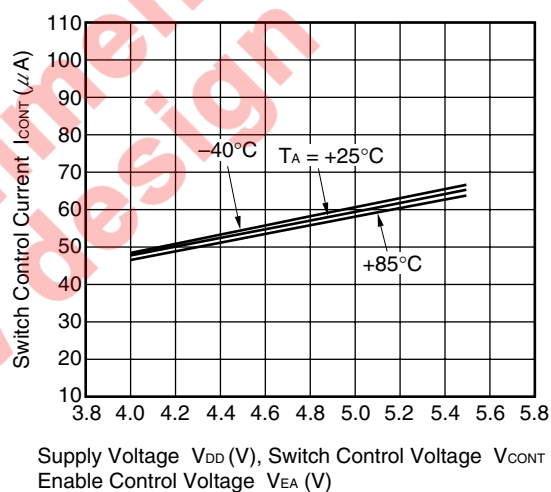
SUPPLY CURRENT vs. V_{DD} , V_{CONT} , V_{EA}



SWITCH CONTROL CURRENT vs.
OPERATING AMBIENT TEMPERATURE

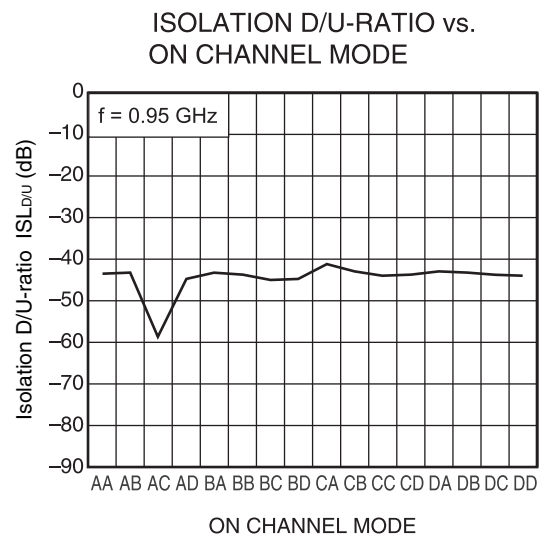
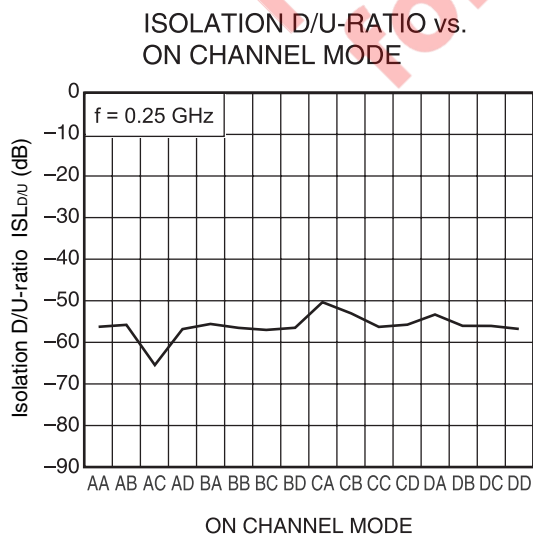
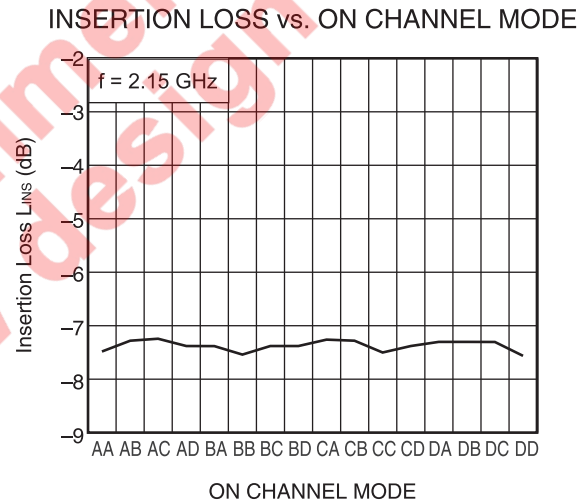
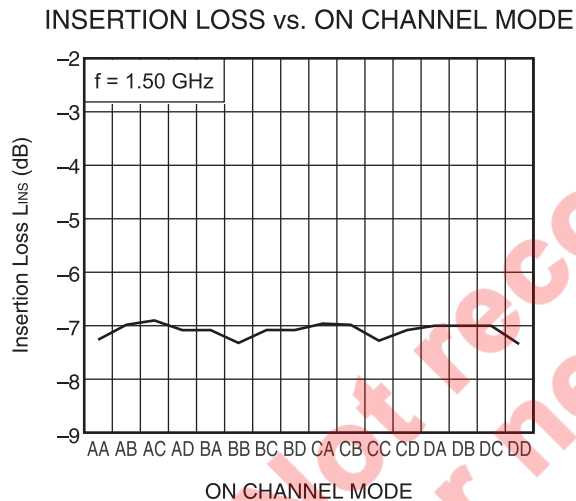
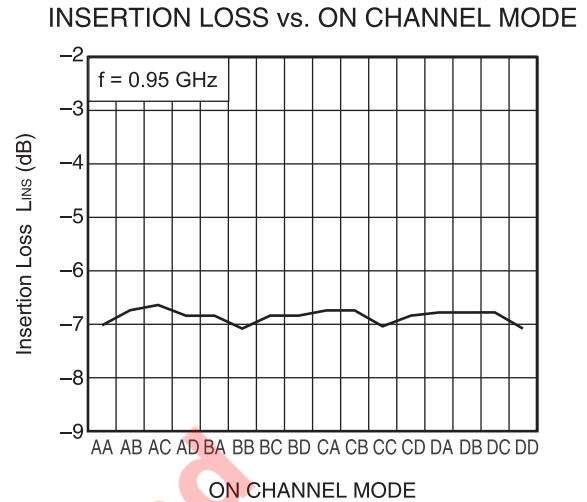
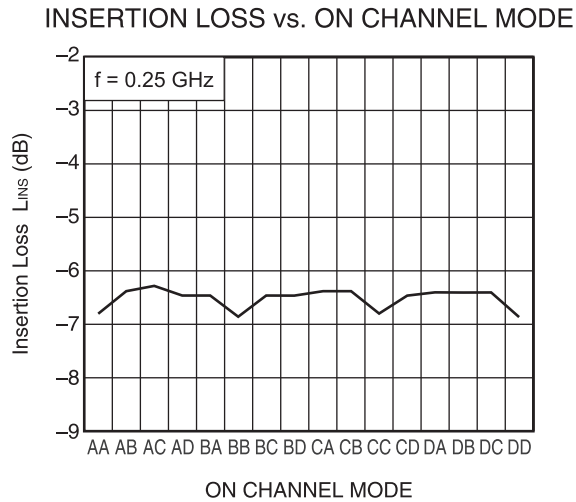


SWITCH CONTROL CURRENT vs.
 V_{DD} , V_{CONT} , V_{EA}

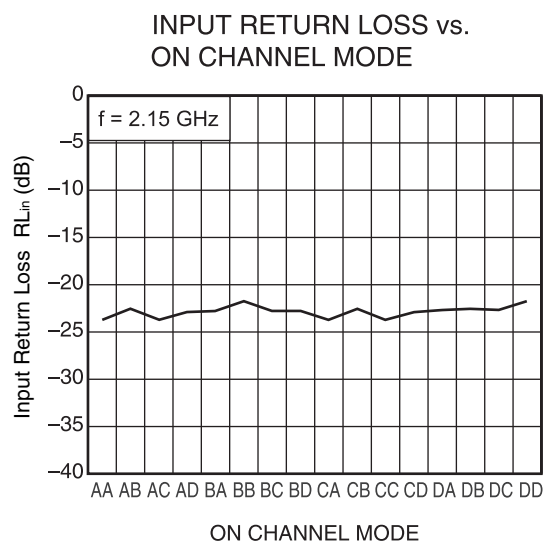
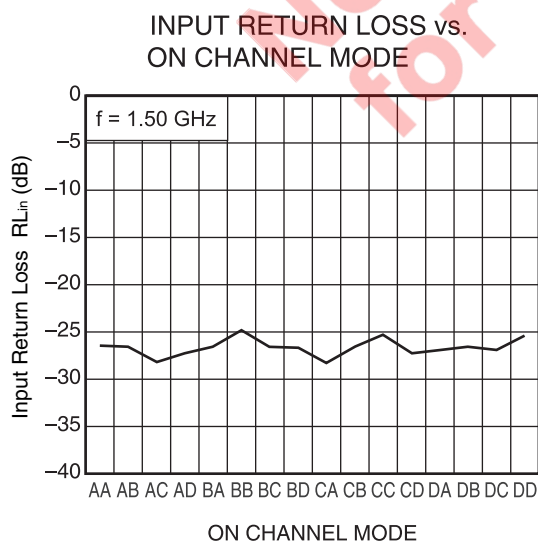
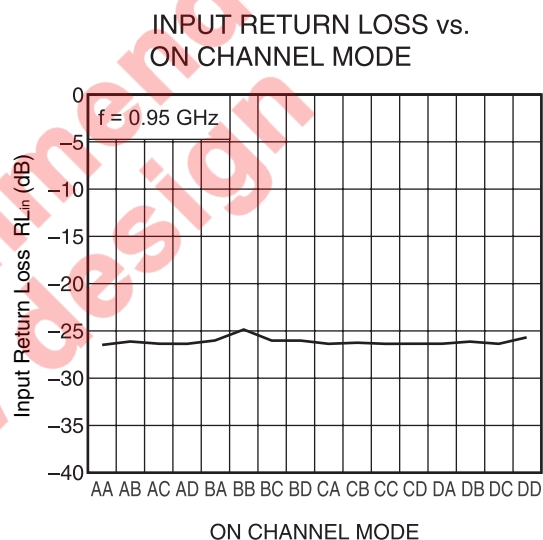
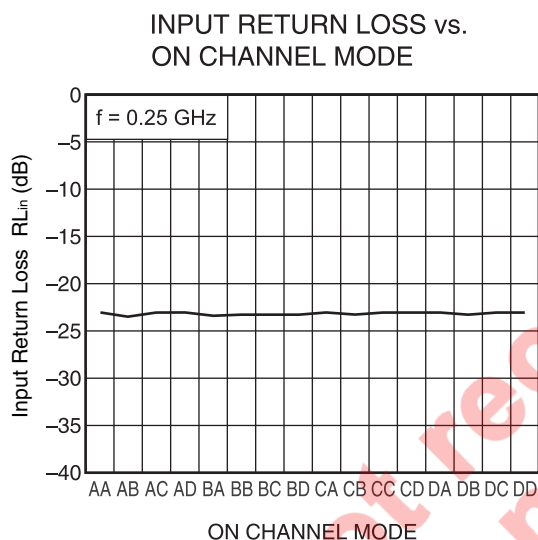
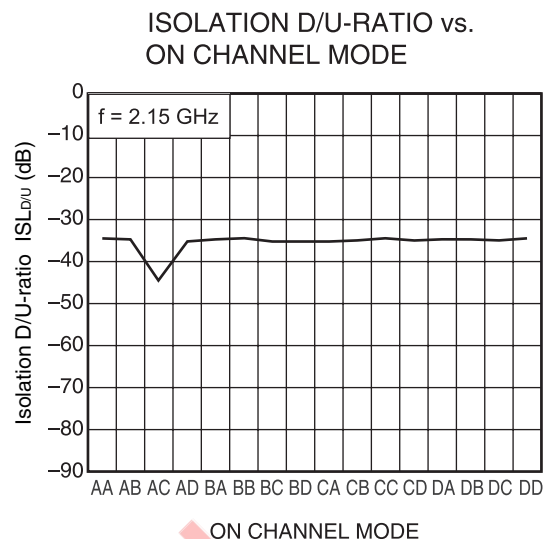
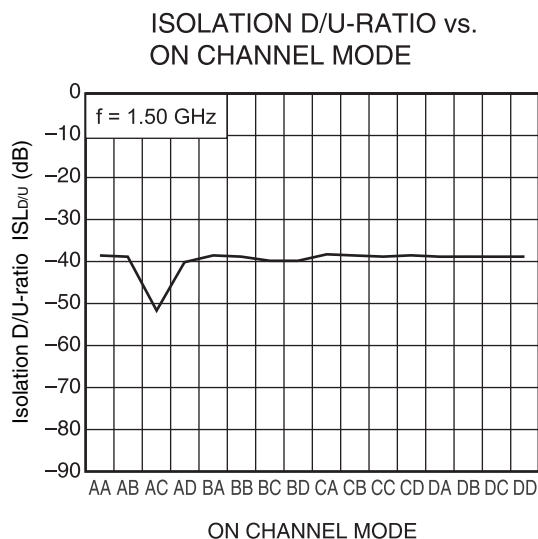


Remark The graphs indicate nominal characteristics.

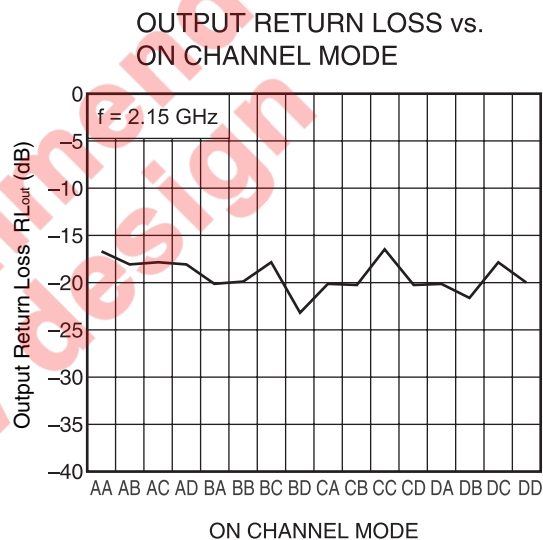
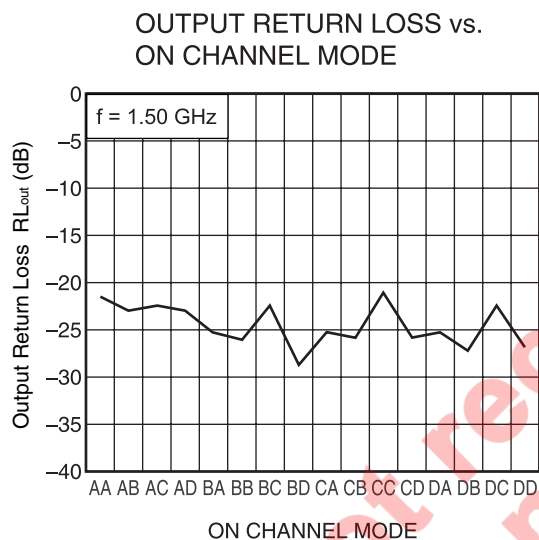
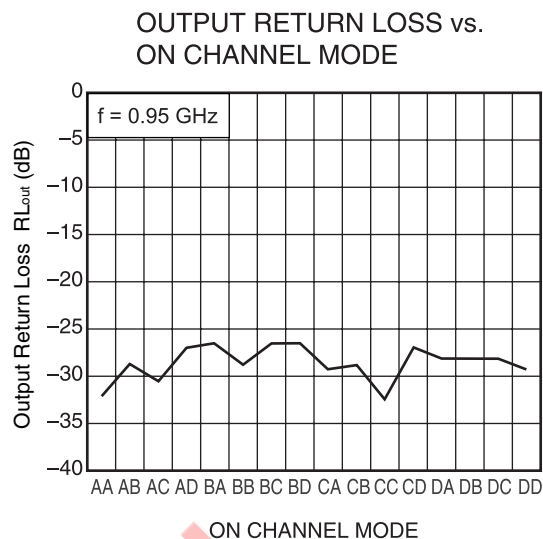
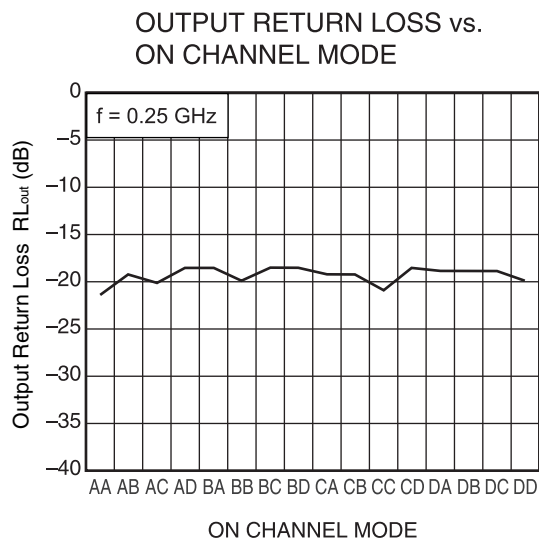
TYPICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$, $V_{DD} = +5.0\text{ V}$, $V_{CONT} = +5.0\text{ V/0 V}$, $V_{EA1} = V_{EA2} = +5.0\text{ V}$ (both OUTs enabled), $P_{in} = 0\text{ dBm}$, $Z_o = 50\ \Omega$ for each port, unless otherwise specified)



Remark The graphs indicate nominal characteristics.



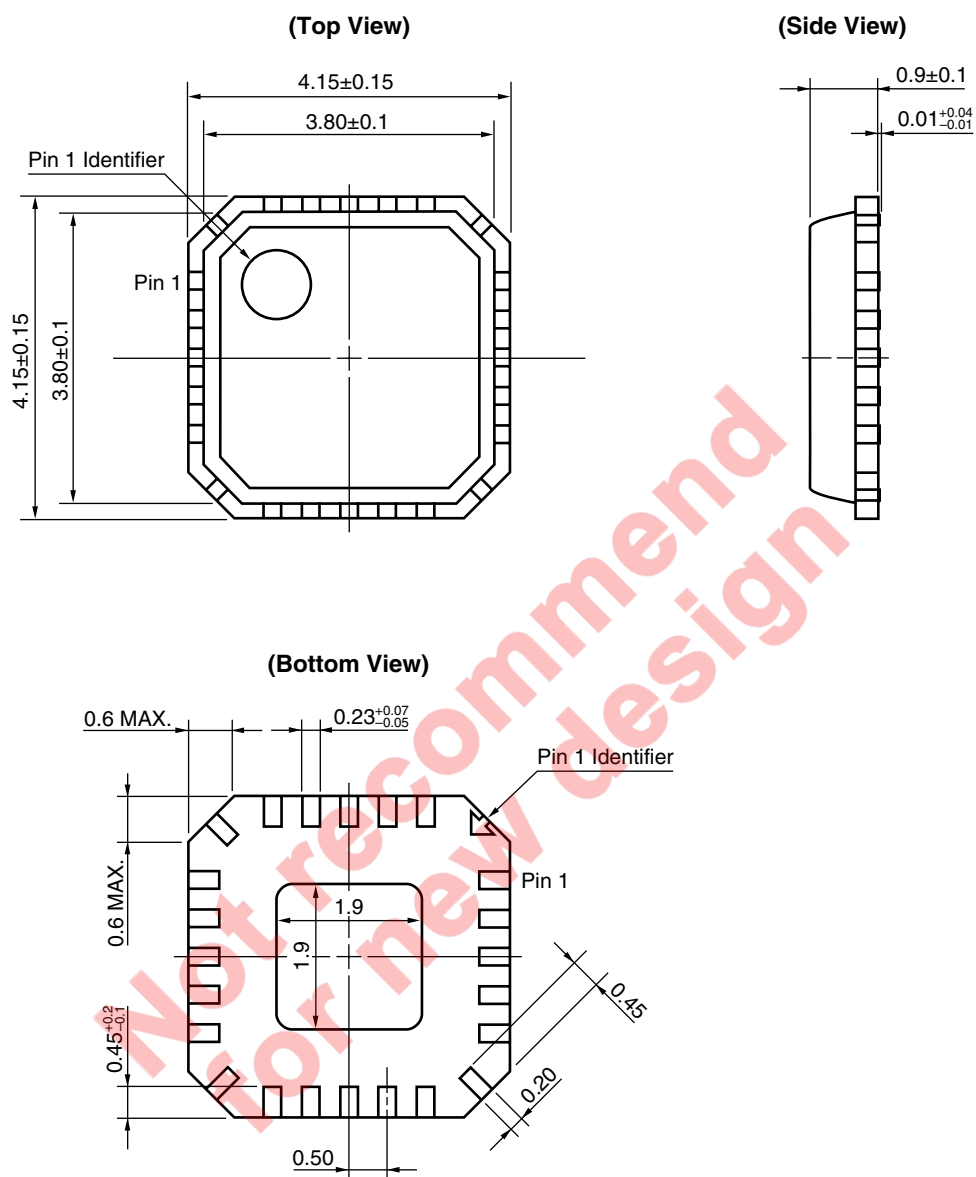
Remark The graphs indicate nominal characteristics.



Remark The graphs indicate nominal characteristics.

PACKAGE DIMENSIONS

20-PIN 4 × 4 mm SQUARE MICRO LEAD PACKAGE (20-pin plastic QFN (0.5 mm pitch)) (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
Partial Heating	Peak temperature (terminal 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).

Not recommended
for new design

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"Standard": Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots.

"Special": Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support).

"Specific": Aircraft, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems and medical equipment for life support, etc.

The quality grade of NEC Electronics products is "Standard" unless otherwise expressly specified in NEC Electronics data sheets or data books, etc. If customers wish to use NEC Electronics products in applications not intended by NEC Electronics, they must contact an NEC Electronics sales representative in advance to determine NEC Electronics' willingness to support a given application.

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