HA22016

1.9GHz GaAs MMIC
Antenna Switch

HITACHI

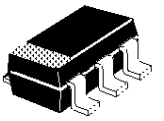
ADE-207-237 (Z)
1st. Edition
May 1997

Features

- Suitable for Antenna switch of PHS (1.9GHz)
- Low insertion loss (0.7dBtyp.)
- Switching voltage (3 / 0 V)
- Surface mount package (MPAK-6)

Outline

MPAK–6



- This document may, wholly or partially, be subject to change without notice.
- This Device is sensitive to Electro Static Discharge.
- An Adequate handling procedure is requested.

Note: This product uses GaAs. Since dust or fume of GaAs is highly poisonous to human body, please do not treat them mechanically in the manner which might expose to the Aer. And it should never be thrown out with general industrial or domestic wastes.

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Supply voltage	Vdd	5	V
Maximum current	Idd	10	mA
Power dissipation	Pd	100	mW
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C
Operation temperature	Topr	–20 to +70	°C

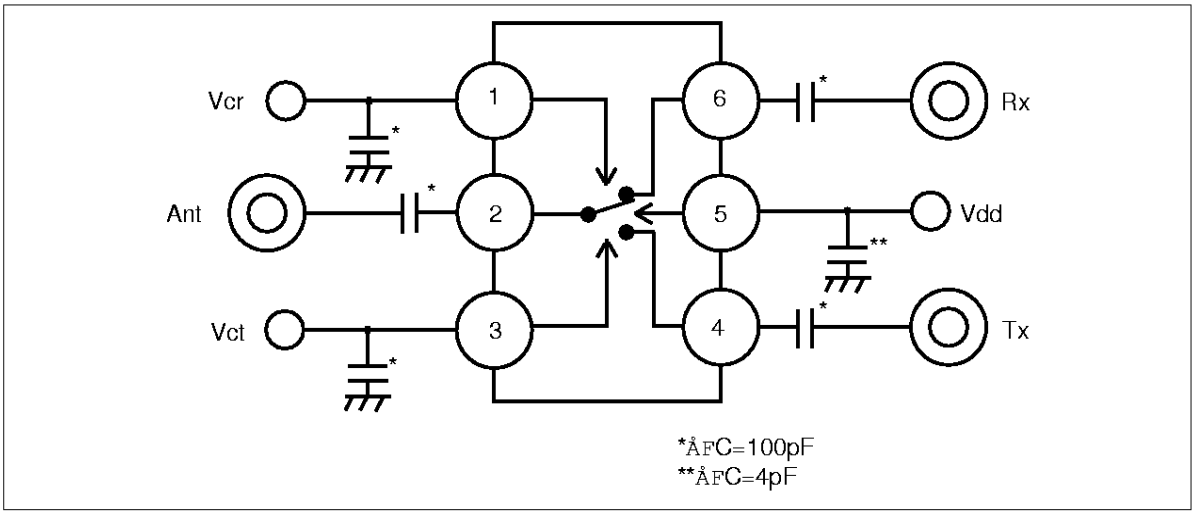
Electrical Characteristics (Ta = 25°C, Vdd = 3V, f=1.9GHz)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions	Pin
Quiescent current	Idd	—	—	100	µA	No signal	
Insertion loss (Ant→Rx)	Li-rx	—	0.7	1.2	dB	Vcr=3V, Vct=0	
Insertion loss (Tx→Ant)	Li-tx	—	0.7	1.2	dB	Vct=0 , Vcr=3V	
Isolation (Rx-Tx),@Rx mode	ISO1	20	23	—	dB	Vcr=3V, Vct=0	
Isolation (Tx-Rx),@Tx mode	ISO2	20	23	—	dB	Vcr=0 , Vct=3V	

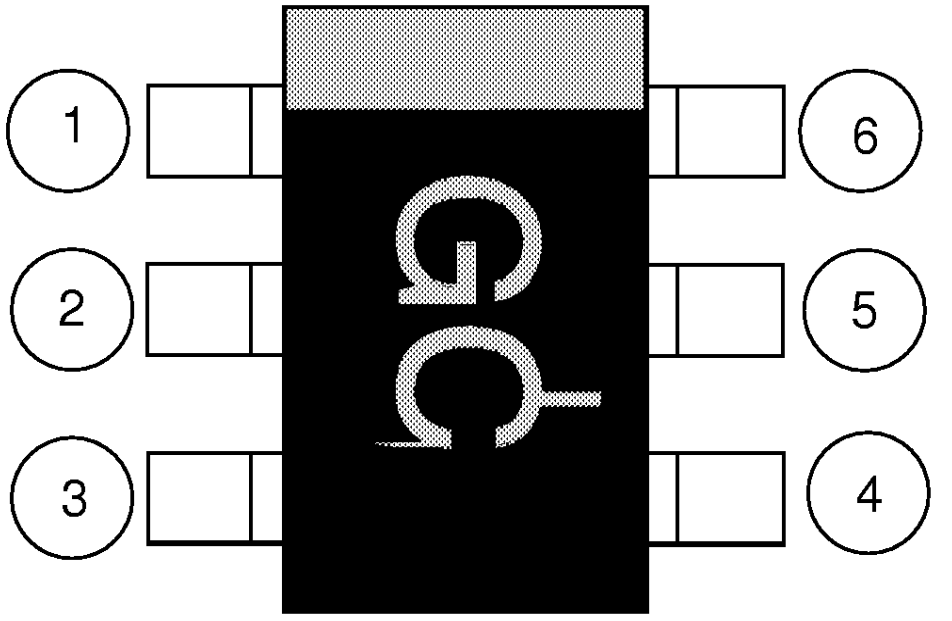
Typical Performance (Ta = 25°C, Vdd = 3V , f=1.9GHz)

Item	Symbol	Typ	Unit	Test Conditions	Pin
VSWR (Ant)	VSWR Ant	1.2	—	Vcr=3 / 0 V , Vct=0 / 3 V	2
VSWR (Rx)	VSWR Rx	1.2	—	Vcr=3 V , Vct=0	4
VSWR (Tx)	VSWR Tx	1.2	Å\	Vcr=0 , Vct=3 V	6
Pout @1dB Gain compression (Ant→Rx),@Rx mode	P1dB Rx	19	dBm	Vcr=3 V , Vct=0	
Pout @1dB Gain compression (Tx→Ant),@Tx mode	P1dB Tx	25	dBm	Vcr=0 , Vct=3 V	
Adjacent Channel Leakage Power(Tx→Ant),@Tx mode	ACP600	-73	dBc	Vcr=0 , Vct=3 V, Pin=+21dBm , PN9 signal	

Block Diagram



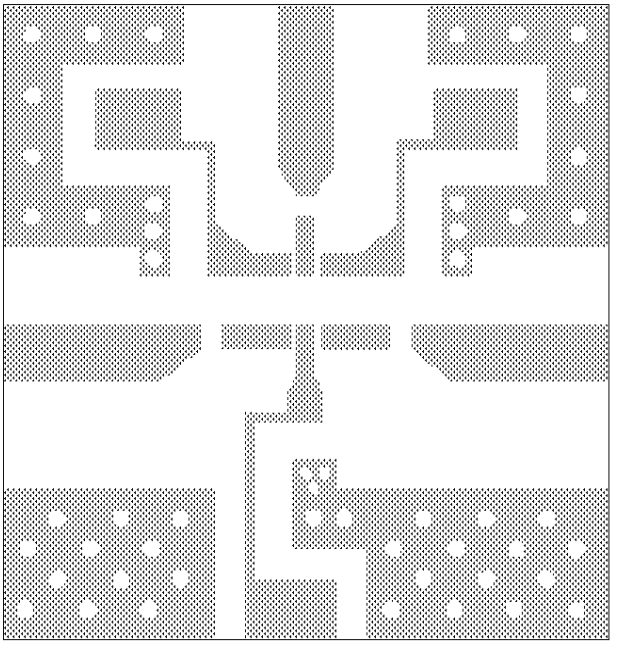
Pin Arrangement



Top View

Pin No.	Pin name	Function
1	Vcr	Control
2	ANT	Antenna
3	Vct	Control
4	TX	Transmission
5	Vdd	Power supply
6	RX	Receiver

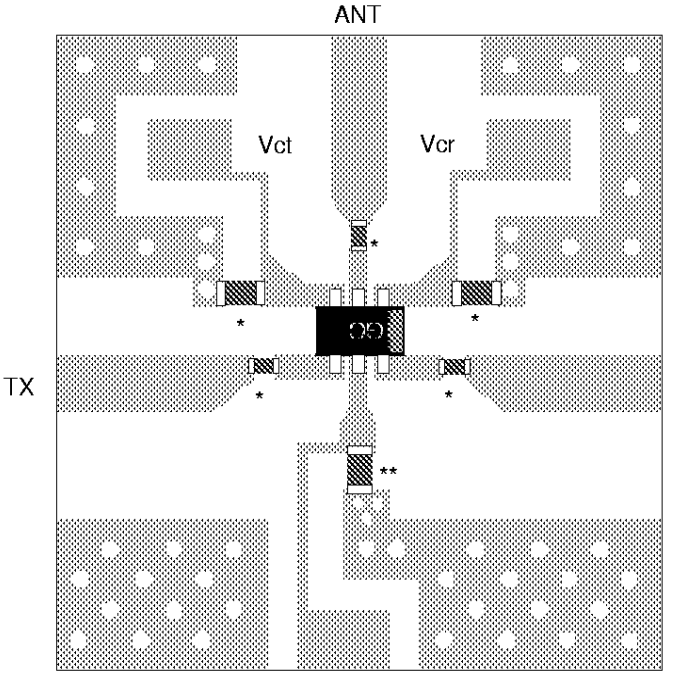
Pattern Layout



scale 4/1

: É"0.5mm
: É"0.3mm

Front Side View of PCB Pattern



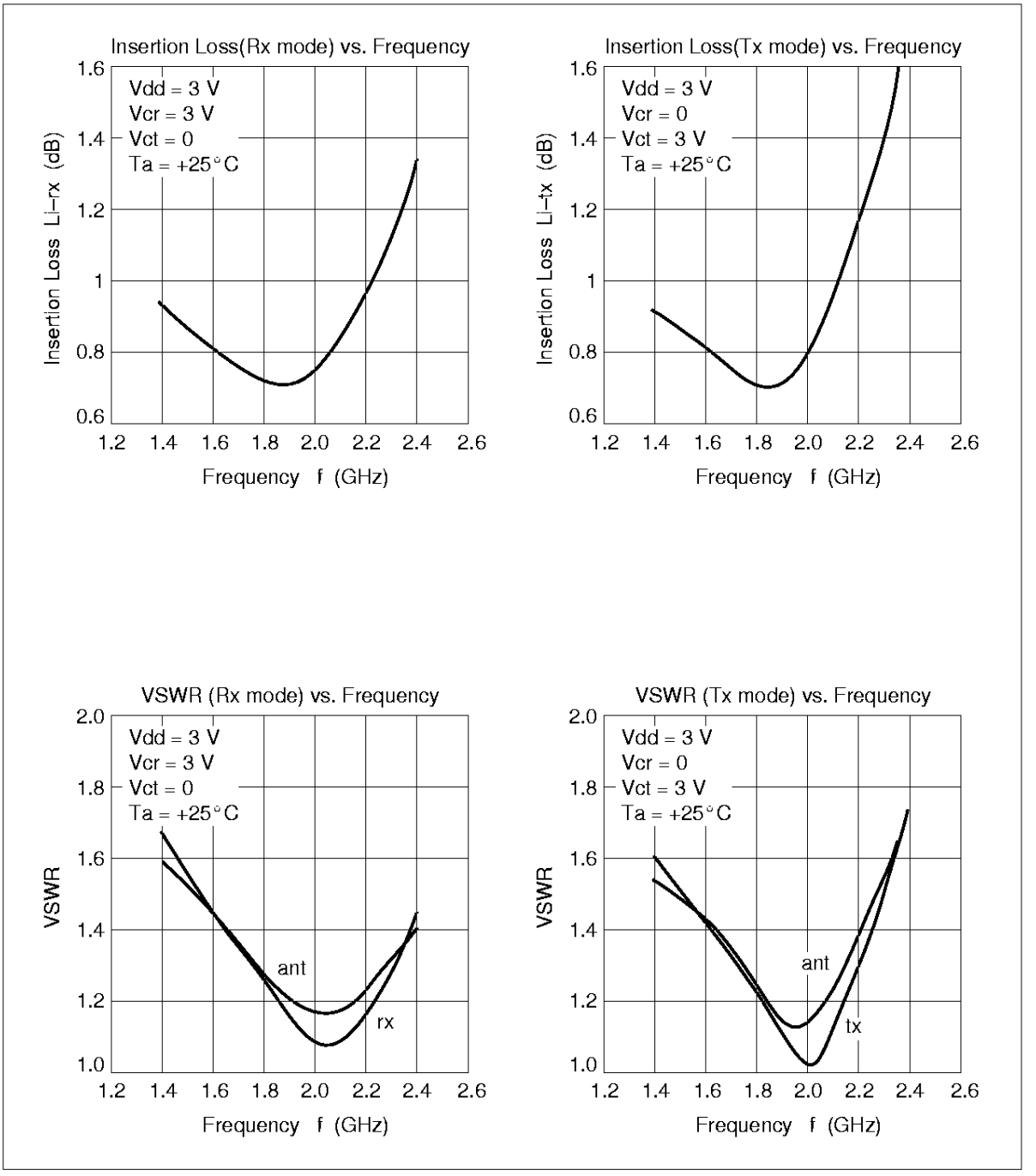
scale 4/1

: Capacitor
(*: 100pF)
(**: 4pF)

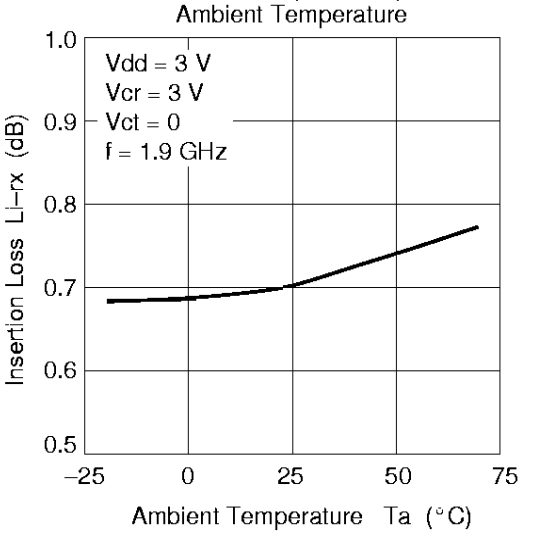
ER=4.8
H=1mm

Front Side View of Part Layout

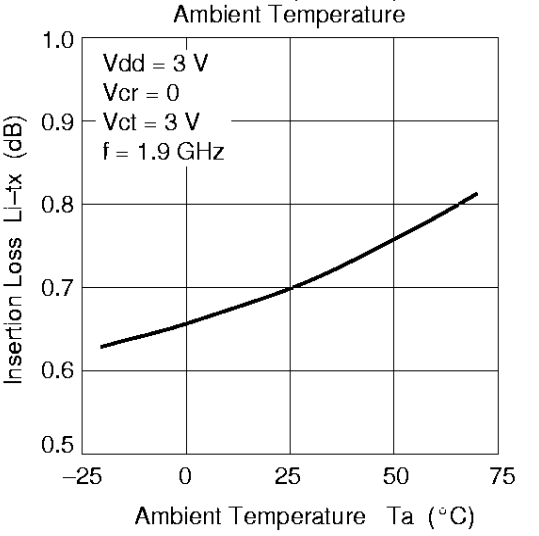
Main Characteristics



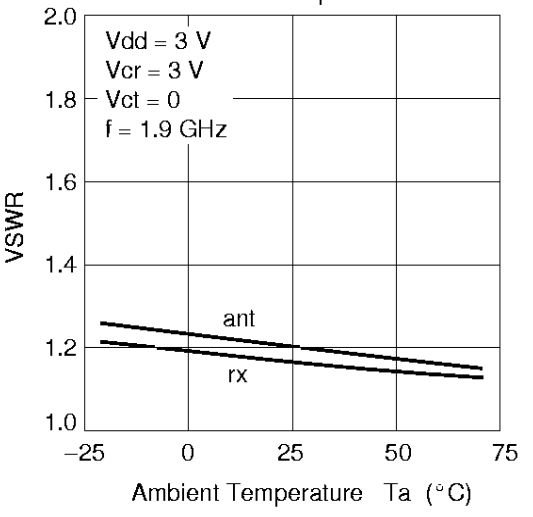
Insertion Loss(Rx mode) vs. Ambient Temperature



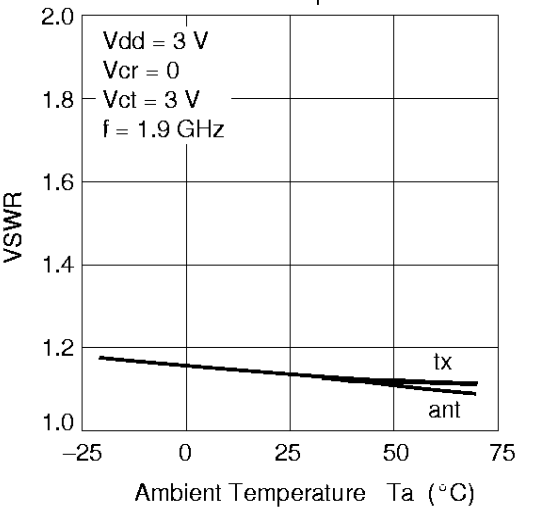
Insertion Loss(Tx mode) vs. Ambient Temperature



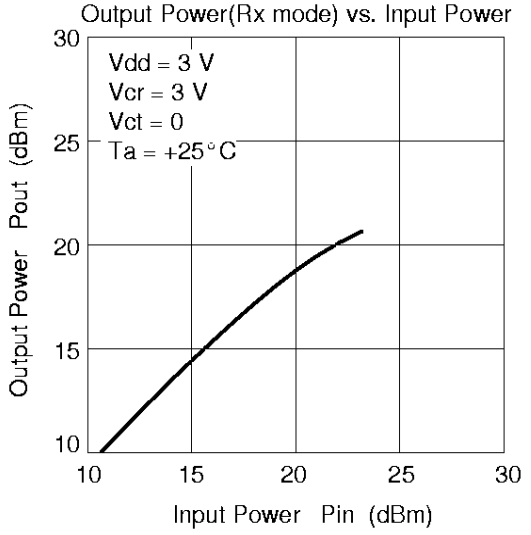
VSWR (Rx mode) vs. Ambient Temperature



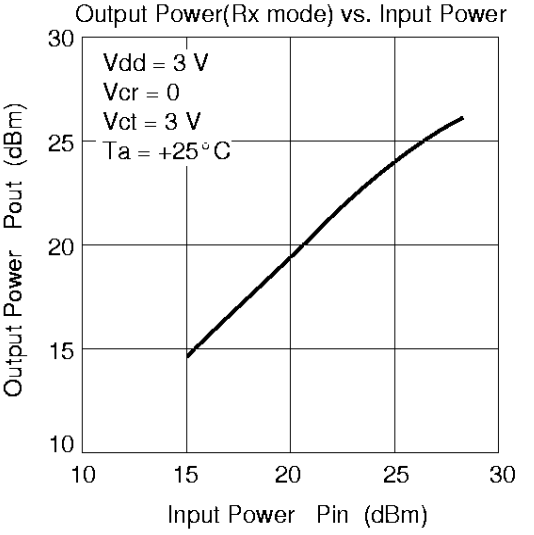
VSWR (Tx mode) vs. Ambient Temperature



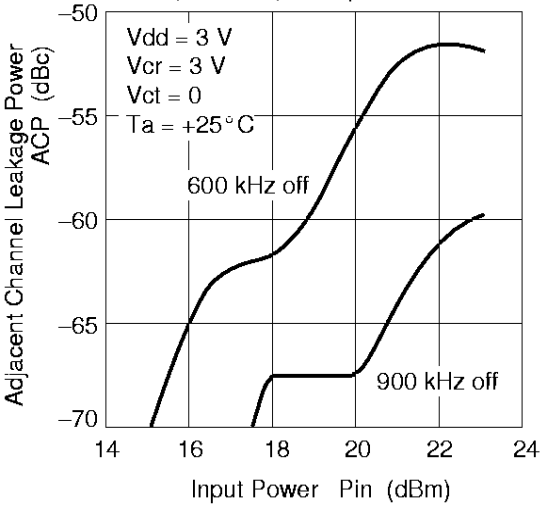
Output Power(Rx mode) vs. Input Power



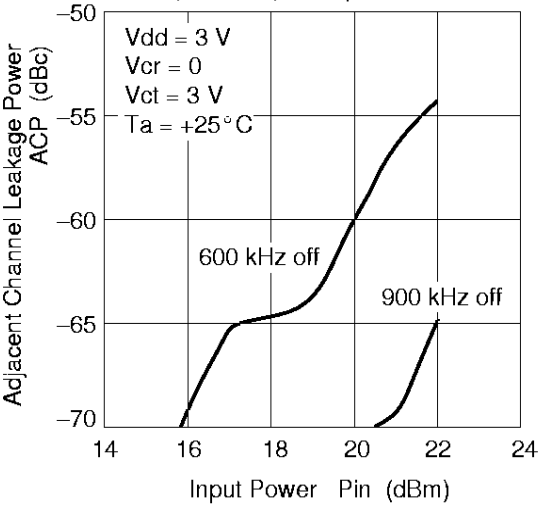
Output Power(Rx mode) vs. Input Power

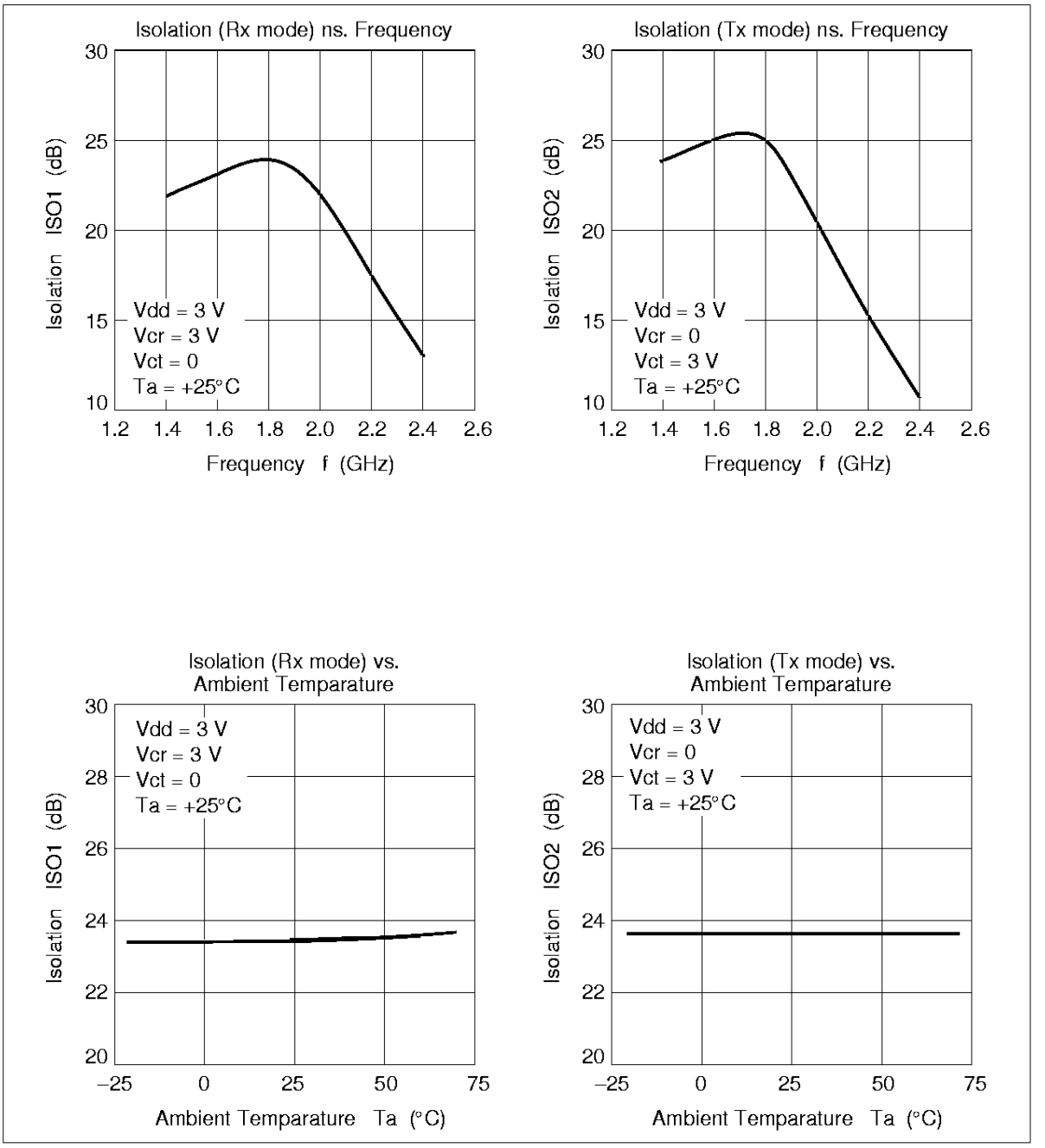


Adjacent Channel Leakage Power (Rx mode) vs. Input Power

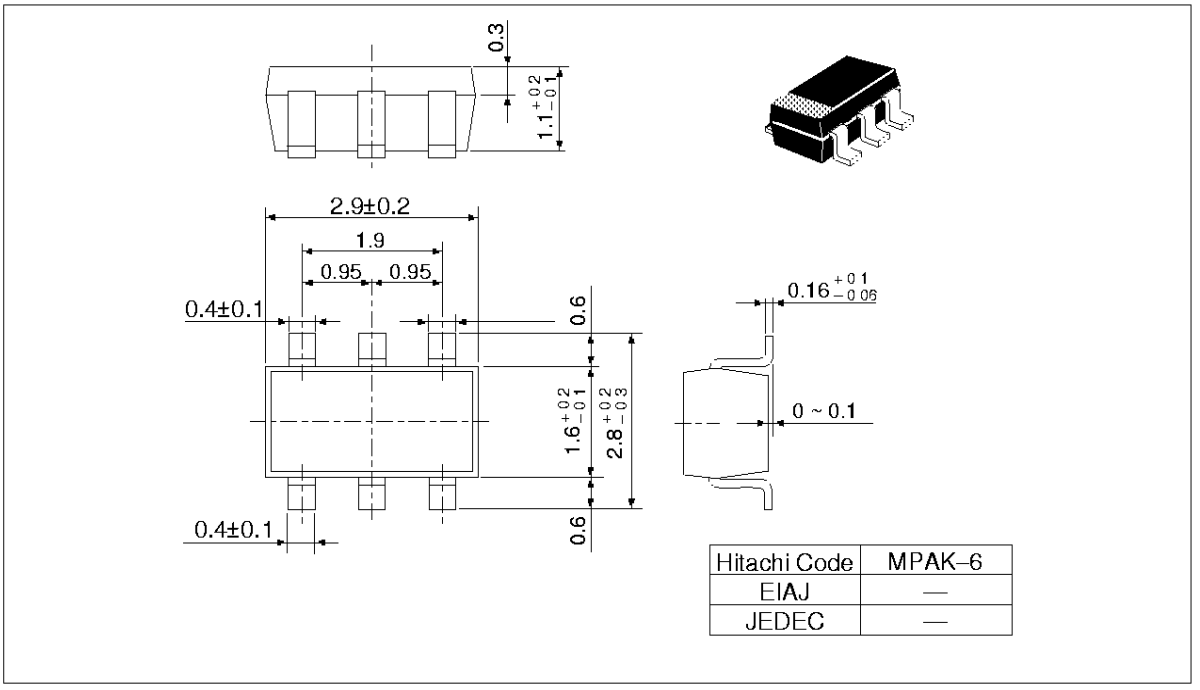


Adjacent Channel Leakage Power (Tx mode) vs. Input Power




Isolation (Rx mode) ns. Frequency
Isolation ISO1 (dB)
30
25
20
15
10
Vdd = 3 V
Vcr = 3 V
Vct = 0
Ta = +25°C
1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6
Frequency f (GHz)
Isolation (Tx mode) ns. Frequency
Isolation ISO2 (dB)
30
25
20
15
10
Vdd = 3 V
Vcr = 0
Vct = 3 V
Ta = +25°C
1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6
Frequency f (GHz)
Isolation (Rx mode) vs.
Ambient Temparature
Isolation ISO1 (dB)
30
28
26
24
22
20
Vdd = 3 V
Vcr = 3 V
Vct = 0
Ta = +25°C
–25 0 25 50 75
Ambient Temparature Ta (°C)
Isolation (Tx mode) vs.
Ambient Temparature
Isolation ISO2 (dB)
30
28
26
24
22
20
Vdd = 3 V
Vcr = 0
Vct = 3 V
Ta = +25°C
–25 0 25 50 75
Ambient Temparature Ta (°C)

Package Dimensions/ Unit: mm



Hitachi Code	MPAK–6
EIAJ	—
JEDEC	—

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