SPDT SWITCH GaAs MMIC

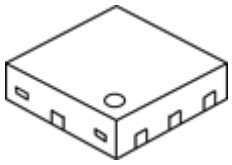
■ GENERAL DESCRIPTION

The NJG1801K75 is a SPDT switch IC suited for switching transmit/receive signals at 802.11 a/b/g/n/ac applications.

The NJG1801K75 features low insertion loss, high isolation, and high handling power.

This switch exhibits wide frequency coverage up to 6.0GHz. And the ultra small and ultra thin package of DFN6-75 is adopted.

■ PACKAGE OUTLINE



NJG1801K75

■ APPLICATION

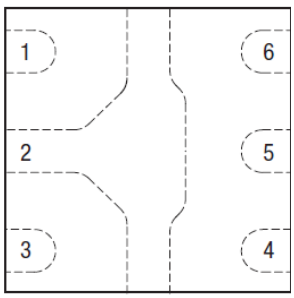
802.11 a/b/g/n/ac networks applications
Transmit / receive switching, path switching applications

■ FEATURES

- Control voltage — $V_{CTL(H)}$=3.0V typ.
  $V_{CTL(L)}$=0V typ.
- Low insertion loss — 0.35dB typ. @f=2.4 to 2.5GHz
  0.45dB typ. @f=4.9 to 5.9GHz
- High isolation — 28dB typ. @f=2.4 to 2.5GHz
  30dB typ. @f=4.9 to 5.9GHz
- P-1dB — P_{-1dB}=31 dBm typ. @f=2.5GHz
  P_{-1dB}=31 dBm typ. @f=5.9GHz
- Ultra small & ultra thin package — DFN6-75 (Package Size: 1.0x1.0x0.375mm typ.)
- RoHS compliant and Halogen Free, MSL1

■ PIN CONFIGURATION

(Top view)



Pin connection

1. P1
2. GND
3. P2
4. VCTL2
5. PC
6. VCTL1

■ TRUTH TABLE

"H"=$V_{CTL(H)}$, "L"=$V_{CTL(L)}$

ON PATH	VCTL1	VCTL2
PC-P1	L	H
PC-P2	H	L

NOTE: Please note that any data or drawing in this catalog is subject to change.

■ ABSOLUTE MAXIMUM RATINGS

T_a=+25°C, Z_S=Z_l=50 Ω

PARAMETER	SYMBOL	CONDITIONS	RATINGS	UNITS
RF Input Power	P_{IN}	$V_{CTL(L)}$=0V,$V_{CTL(H)}$=3.0V, ON State Port	+31	dBm
Control Voltage	V_{CTL}		6.0	V
Power Dissipation	P_D	4-layer FR4 PCB without through-hole (76.2x114.3mm), T_j=150°C	430	mW
Operating Temperature	T_{opr}		-40 to +105	°C
Storage Temperature	T_{stg}		-55 to +150	°C

■ ELECTRICAL CHARACTERISTICS1 (DC CHARACTERISTICS)

(General conditions: $V_{CTL(H)}$=3.0V, $V_{CTL(L)}$=0V,T_a=+25°C, with application circuit)

PARAMETERS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Control Voltage (HIGH)	$V_{CTL(H)}$		1.8	3.0	5.0	V
Control Voltage (LOW)	$V_{CTL(L)}$		-0.2	-	0.2	V
Control Current	I_{CTL}		-	5	10	μA

■ **ELECTRICAL CHARACTERISTICS2** (RF CHARACTERISTICS)

(General conditions: $V_{CTL(H)}$=3.0V, $V_{CTL(L)}$=0V, T_a=+25°C, Z_S=Z_l=50 Ω, with application circuit)

PARAMETERS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Insertion loss1	LOSS1	f=2.4 to 2.5GHz	-	0.35	0.55	dB
Insertion loss2	LOSS2	f=4.9 to 5.9GHz	-	0.45	0.70	dB
Isolation1	ISL1	f=2.4 to 2.5GHz	25	28	-	dB
Isolation2	ISL2	f=4.9 to 5.9GHz	25	30	-	dB
Return loss1	RL1	f=2.4 to 2.5GHz	18	28	-	dB
Return loss2	RL2	f=4.9 to 5.9GHz	15	20	-	dB
Input power at 1dB compression point1	$P_{-1dB}1$	f=2.4 to 2.5GHz	29	31	-	dBm
Input power at 1dB compression point2	$P_{-1dB}2$	f=4.9 to 5.9GHz	28	31	-	dBm
Switching time	T_{SW}	50% VCTL to 10%/90% RF	-	100	300	ns

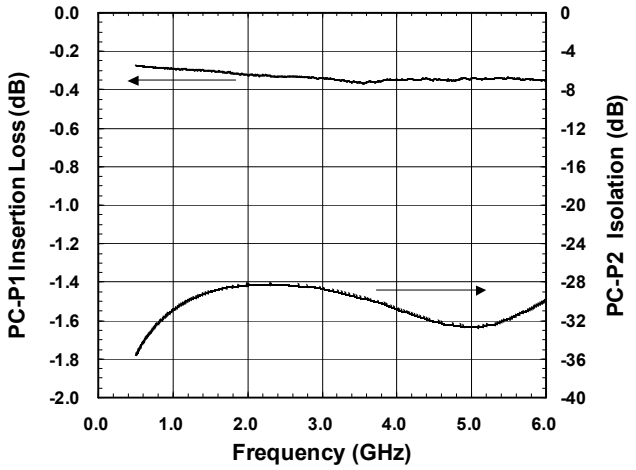
■ TERMINAL INFORMATION

No.	SYMBOL	DESCRIPTION
1	P1	RF terminal. An external DC blocking capacitor is required.
2	GND	Ground terminal. Please connect this terminal with ground plane as close as possible for excellent RF performance.
3	P2	RF terminal. An external DC blocking capacitor is required.
4	VCTL2	Control voltage input terminal.
5	PC	Common RF terminal. An external DC blocking capacitor is required.
6	VCTL1	Control voltage input terminal.

■ ELECTRICAL CHARACTERISTICS

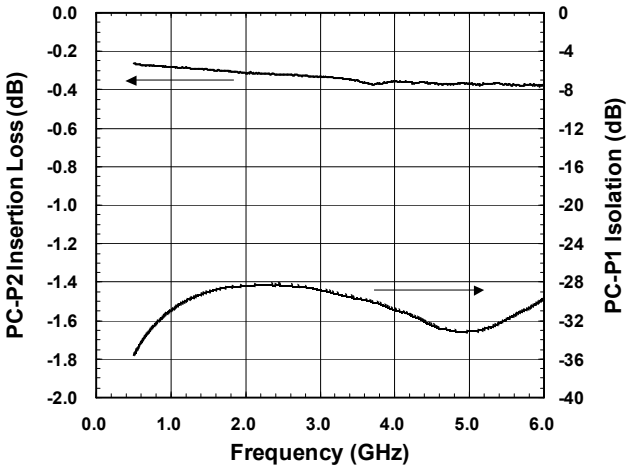
Loss, ISL vs Frequency

(PC-P1 ON, $V_{CTL(H)}$=3.0V, $V_{CTL(L)}$=0V)



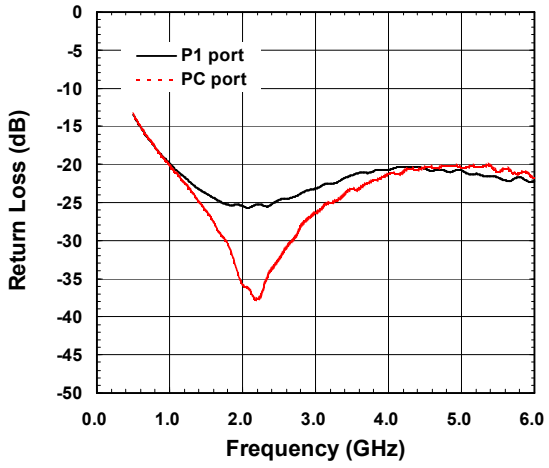
Loss, ISL vs Frequency

(PC-P2 ON, $V_{CTL(H)}$=3.0V, $V_{CTL(L)}$=0V)



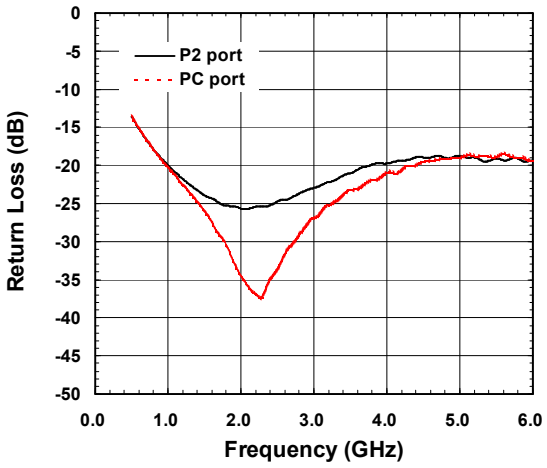
Return Loss vs Frequency

(PC-P1 ON, $V_{CTL(H)}$=3.0V, $V_{CTL(L)}$=0V)



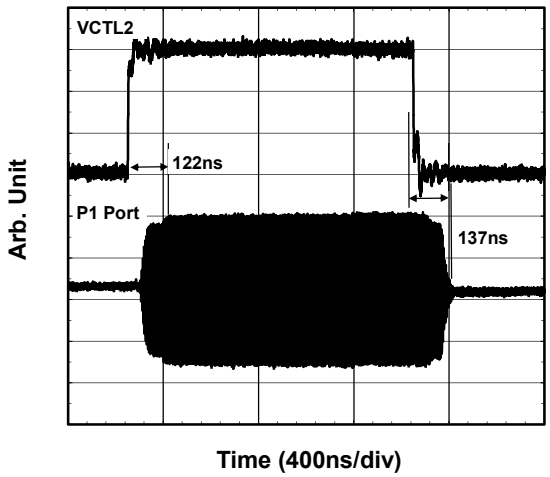
Return Loss vs Frequency

(PC-P2 ON, $V_{CTL(H)}$=3.0V, $V_{CTL(L)}$=0V)



Switching Time

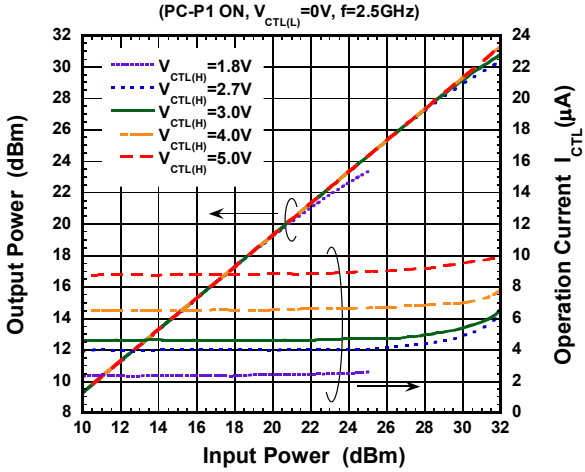
(PC-P1 Path, $V_{CTL(H)}$=3.0V, $V_{CTL(L)}$=0V)



■ ELECTRICAL CHARACTERISTICS

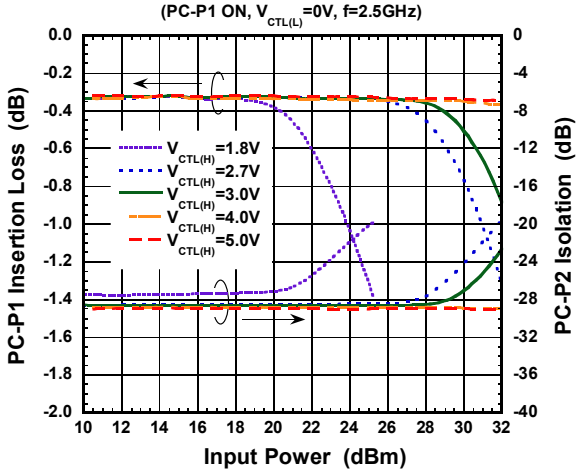
Output Power, I_{CTL} vs Input Power

(PC-P1 ON, $V_{CTL(L)}$=0V, f=2.5GHz)



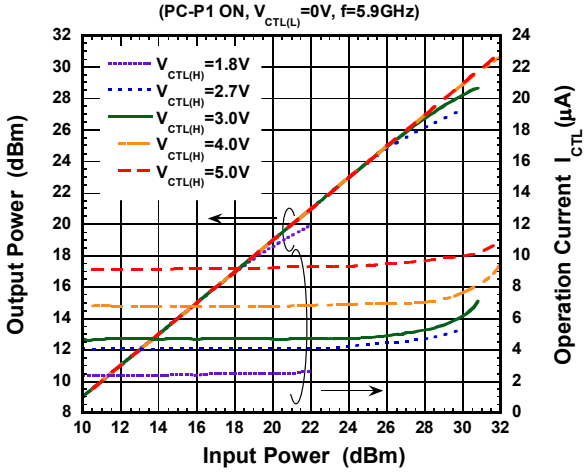
Loss, ISL vs Input Power

(PC-P1 ON, $V_{CTL(L)}$=0V, f=2.5GHz)



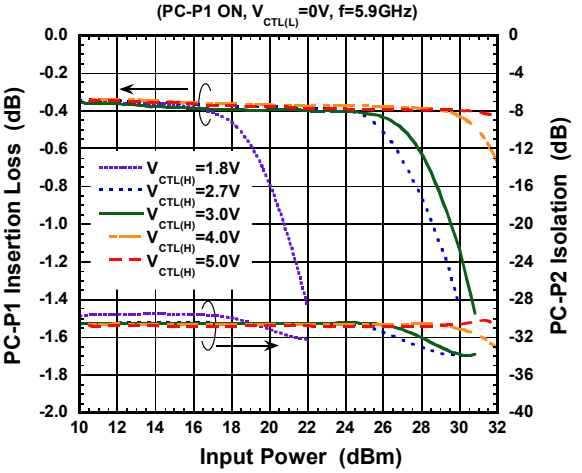
Output Power, I_{CTL} vs Input Power

(PC-P1 ON, $V_{CTL(L)}$=0V, f=5.9GHz)



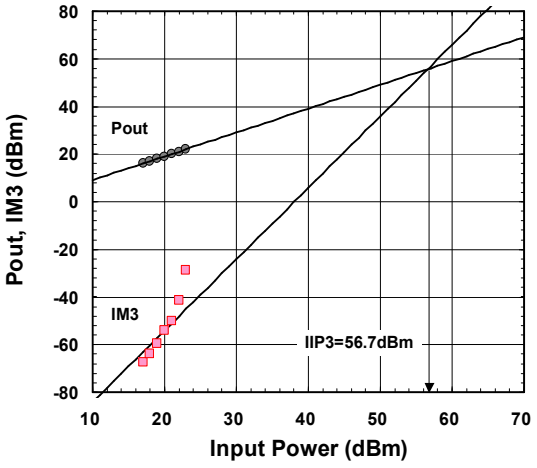
Loss, ISL vs Input Power

(PC-P1 ON, $V_{CTL(L)}$=0V, f=5.9GHz)



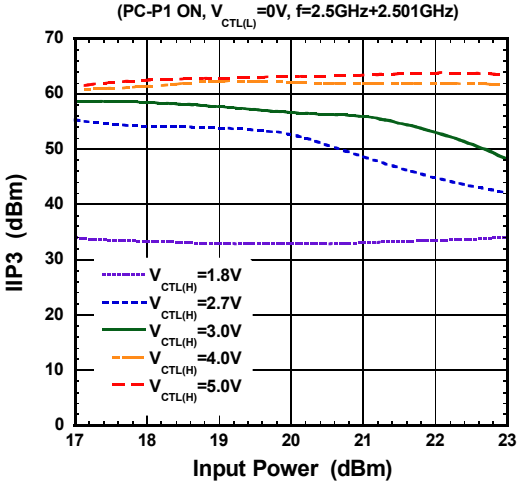
Output Power, IM3 vs Input Power

(PC-P1 ON, $V_{CTL(H)}$=3.0V, $V_{CTL(L)}$=0V, f=2.5GHz+2.501GHz)

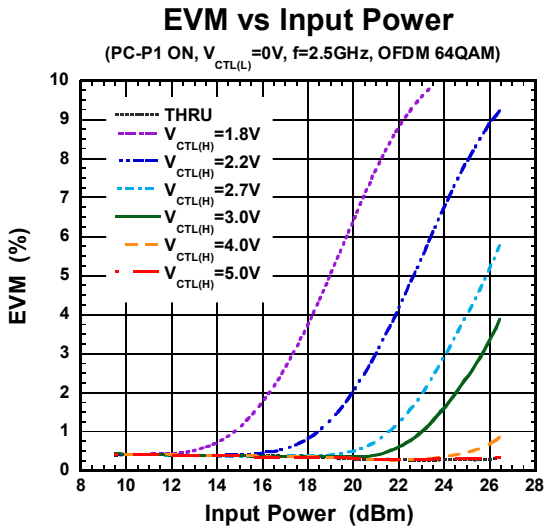


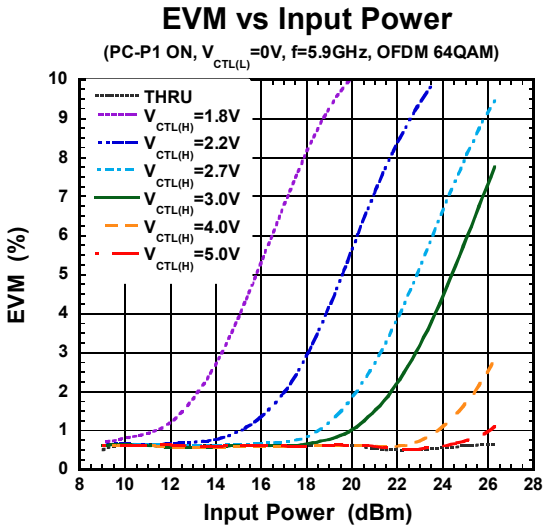
IIP3 vs Input Power

(PC-P1 ON, $V_{CTL(L)}$=0V, f=2.5GHz+2.501GHz)



■ ELECTRICAL CHARACTERISTICS

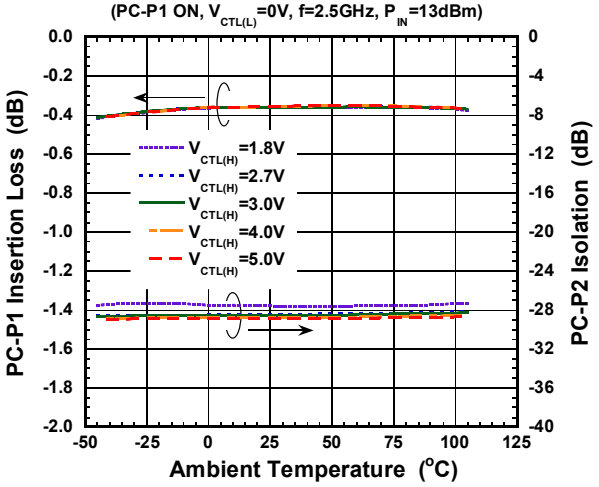




■ ELECTRICAL CHARACTERISTICS

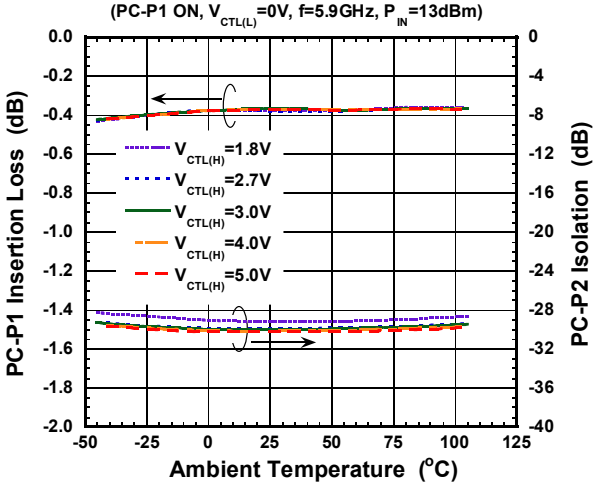
Loss, ISL vs Temperature

(PC-P1 ON, $V_{CTL(L)}$=0V, f=2.5GHz, P_{IN}=13dBm)



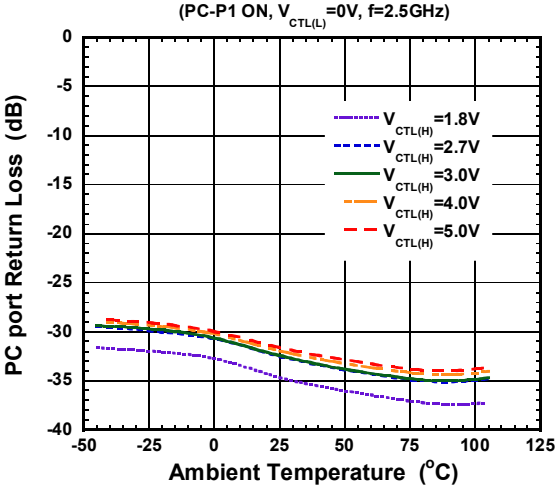
Loss, ISL vs Temperature

(PC-P1 ON, $V_{CTL(L)}$=0V, f=5.9GHz, P_{IN}=13dBm)



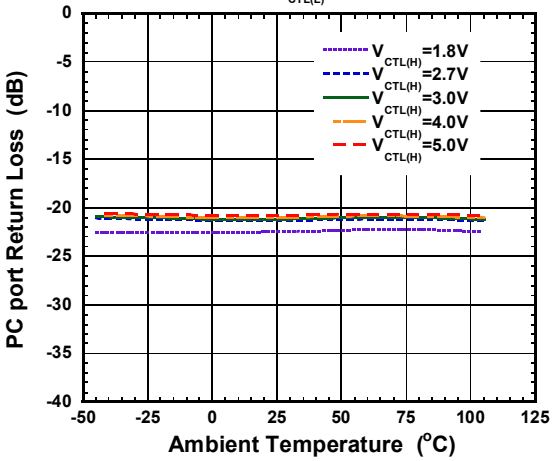
Return Loss vs Temperature

(PC-P1 ON, $V_{CTL(L)}$=0V, f=2.5GHz)



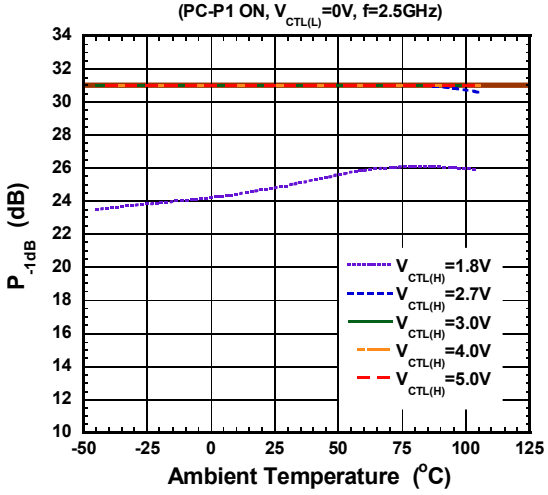
Return Loss vs Temperature

(PC-P1 ON, $V_{CTL(L)}$=0V, f=5.9GHz)



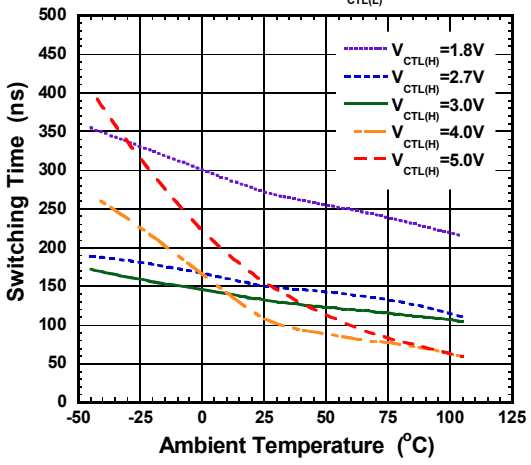
P_{-1dB} vs Temperature

(PC-P1 ON, $V_{CTL(L)}$=0V, f=2.5GHz)



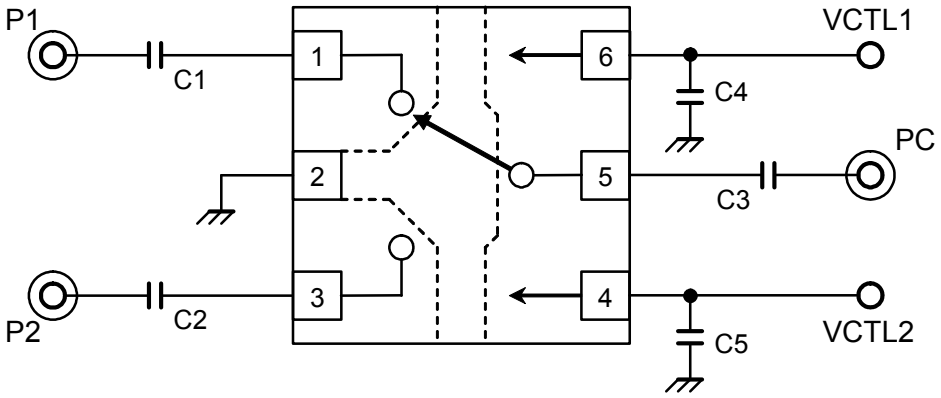
Switching Time(rise) vs Temperature

(PC-P1 path, P1 port, $V_{CTL(L)}$=0V)



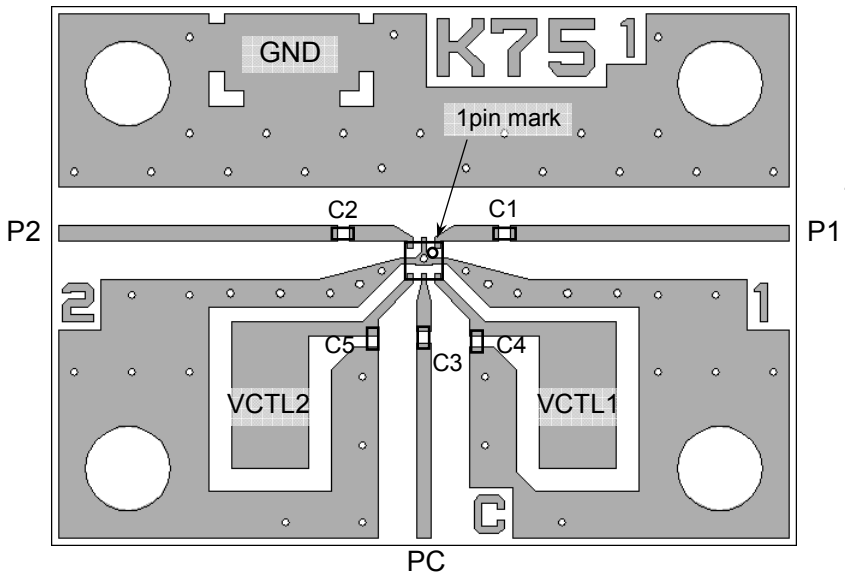
■ APPLICATION CIRCUIT

(TOP VIEW)



■ RECOMMENDED PCB DESIGN

(TOP VIEW)



PCB: FR-4, t=0.2mm
Capacitor Size: 0603 (0.6 x 0.3 mm)
Strip Line Width: 0.4mm
PCB Size: 19.4 x 14.0mm
Through Hole Diameter: 0.2mm

■ Loss of PCB, capacitor and connectors

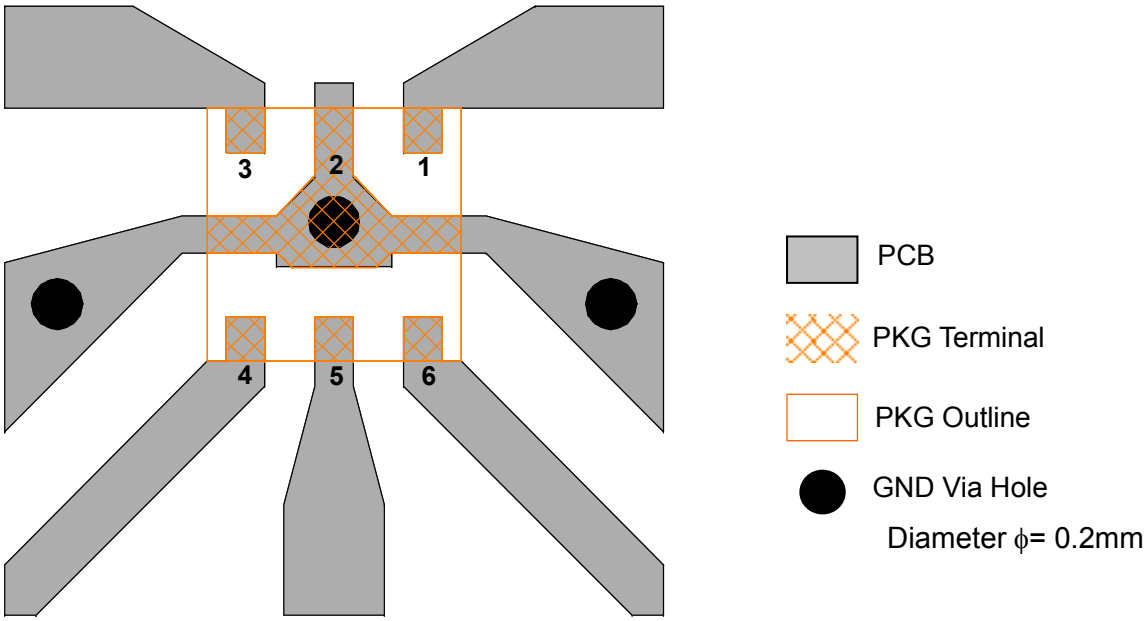
Frequency (GHz)	Loss (dB)
2.4	0.33
2.5	0.34
4.9	0.55
5.9	0.65

■ PARTS LIST

No.	Value	Notes
C1 to C3	27pF	Murata MFG (GRM03 series)
C4 to C5	10pF	

■ PCB LAYOUT GUIDELINE

(TOP VIEW)



PRECAUTIONS

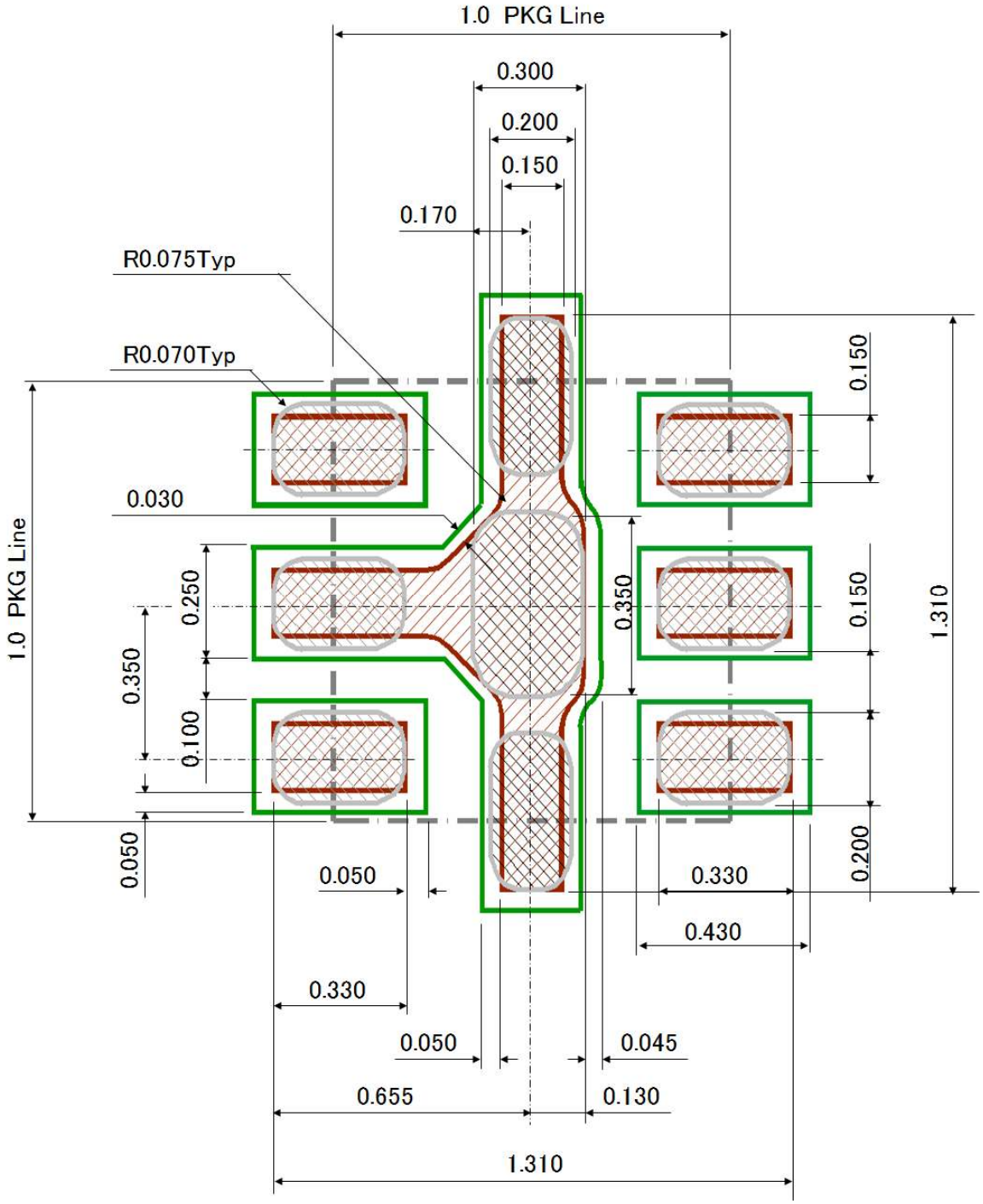
[1] The DC blocking capacitors should be placed at RF terminals. Please choose appropriate capacitance value at the application frequency.

[2] For good RF performance, exposed pad should be connected to PCB ground plane as close as possible.

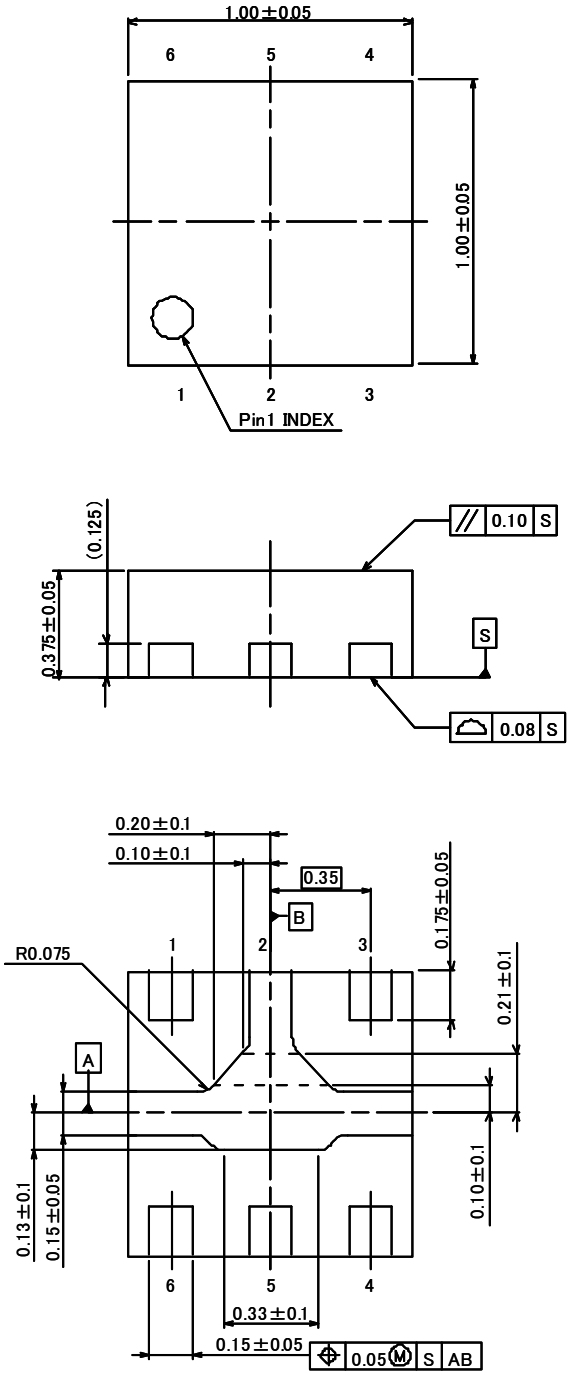
■ RECOMMENDED FOOTPRINT PATTERN (6pin DFN Package 1.0x1.0mm) <Reference>

Package: 1.0mm x 1.0mm
Pin pitch: 0.35mm

: Land
: Mask (Open area) *Metal mask thickness: 100μm
: Resist (Open area)



■ PACKAGE OUTLINE (DFN6-75)



Unit	: mm
Board	: Cu
Terminal Treat	: Ni/Pd/Au
Molding Material	: Epoxy resin
Weight	: 1.2mg

Cautions on using this product

This product contains Gallium-Arsenide (GaAs) which is a harmful material.

- Do NOT eat or put into mouth.
- Do NOT dispose in fire or break up this product.
- Do NOT chemically make gas or powder with this product.
- To waste this product, please obey the relating law of your country.

This product may be damaged with electric static discharge (ESD) or spike voltage. Please handle with care to avoid these damages.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

NJR:

NJG1801K75 NJG1801K75-TE1

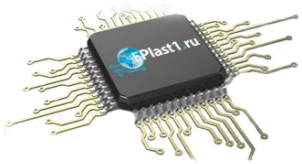
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)
Факс: 8 (812) 320-02-42
Электронная почта: org@eplast1.ru
Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.