

## High Power SP3T Switch with Logic Control

### Description

This IC can be used in wireless communication systems, for example, W-CDMA handsets.

The IC has on-chip logic for operation with 2 CMOS control inputs.

The Sony JPHEMT process is used for low insertion loss and on-chip logic circuit.

### Features

- Low insertion loss: 0.3dB@1.95GHz, 0.35dB@2.14GHz
- 2 CMOS compatible control line
- Small package size: 12-pin UQFN

### Applications

Antenna switch for cellular handsets  
W-CDMA

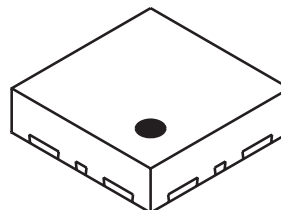
### Structure

GaAs JPHEMT MMIC

### Absolute Maximum Ratings (Ta = 25°C)

- |                         |                  |             |    |
|-------------------------|------------------|-------------|----|
| • Bias voltage          | V <sub>DD</sub>  | 7           | V  |
| • Control voltage       | V <sub>ctl</sub> | 5           | V  |
| • Operation temperature | T <sub>opr</sub> | -35 to +85  | °C |
| • Storage temperature   | T <sub>stg</sub> | -65 to +150 | °C |

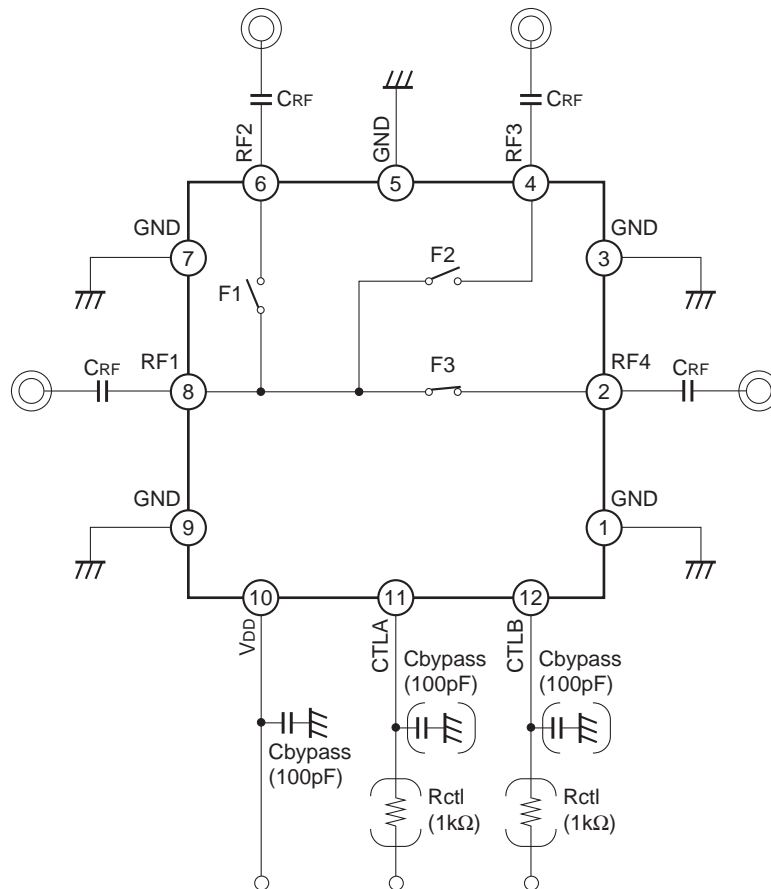
12 pin UQFN (Plastic)



GaAs MMIC's are ESD sensitive devices. Special handling precautions are required.

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Block Diagram and Recommended Circuit



When using this IC, the following external components should be used:

Rctl: This resistor is used to improve ESD performance. 1kΩ is recommended.

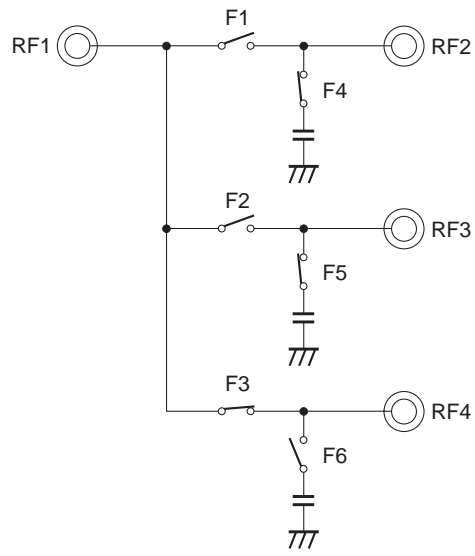
CRF: This capacitor is used for RF De-coupling and must be used all application.

Cbypass: This capacitor is used for DC line filtering. 100pF is recommended.

Truth Table

State	CTLA	CTLB	ON State	F1	F2	F3	F4	F5	F6
1	H	H	RF1 – RF2	ON	OFF	OFF	OFF	ON	ON
2	L	H	RF1 – RF3	OFF	ON	OFF	ON	OFF	ON
3	H/L	L	RF1 – RF4	OFF	OFF	ON	ON	ON	OFF

Block Diagram



**DC Bias Condition** (Ta = 25°C)

Item	Min.	Typ.	Max.	Unit
Vctl (H)	2.0	2.85	3.6	V
Vctl (L)	0	—	0.4	V
VDD	2.5	2.85	3.6	V

**Electrical Characteristics** (Ta = 25°C)

Item	Symbol	State	Condition	Min.	Typ.	Max.	Unit
Insertion loss	IL	1	RF1 – RF2, 1920 to 1980MHz		0.30	0.55	dB
			2110 to 2170MHz		0.35	0.60	dB
		2	RF1 – RF3, 1920 to 1980MHz		0.30	0.55	dB
			2110 to 2170MHz		0.35	0.60	dB
		3	RF1 – RF4, 1920 to 1980MHz		0.30	0.55	dB
			2110 to 2170MHz		0.35	0.60	dB
Isolation	ISO.	2, 3	RF1 – RF2, 1920 to 2170MHz	20	30		dB
		1, 3	RF1 – RF3, 1920 to 2170MHz	20	30		dB
		1, 2	RF1 – RF4, 1920 to 2170MHz	20	30		dB
VSWR	VSWR		50Ω		1.2	1.5	—
Switching speed	TSW				5	10	μs
ACLR	ACLR1	±5MHz	*1		-60	-50	dBc
	ACLR2	±10MHz	*1		-65	-55	dBc
Harmonics	2fo		*1		-70	-55	dBc
	3fo		*1		-70	-55	dBc
Bias current	IDD		VDD = 2.85V		0.07	0.15	mA
Control current	Ictl		Vctl (H) = 2.85V		14	25	μA

\*1 Pin = 25dBm, 0/2.85V control, VDD = 2.85V, 1920 to 1980MHz

**Pin Description**

Pin No.	Symbol	Description
2	RF4	RF input/output. Connect capacitor (recommended value: 100pF) in use
4	RF3	RF input/output. Connect capacitor (recommended value: 100pF) in use
6	RF2	RF input/output. Connect capacitor (recommended value: 100pF) in use
8	RF1	RF input/output. Connect capacitor (recommended value: 100pF) in use
10	V <sub>DD</sub>	DC power supply
11	CTLA	Logic control
12	CTLB	Logic control
1, 3, 5, 7, 9	GND	GND

