



## **MXD8621**

SPDT Switch for 3G/4G Application



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### General Description

The MXD8621 is a Single-Pole, Double-Throw (SPDT) LTE/WCDMA/GSM receive switch. Switching is controlled by an integrated GPIO interface with a single control pin.

No external DC blocking capacitors are required as long as no DC voltage is applied on any RF path.

The MXD8621 is provided in a compact 1.1mm x 0.7mm x 0.45mm 6-lead LGA package that meets requirements for board-level assembly.

A functional block diagram and the pin configuration are shown in Figure 1.

### Applications

- GSM/WCDMA/LTE receive

### Features

- Broadband frequency range: 0.1 to 3.0 GHz
- Low insertion loss: 0.45 dB @ 2.7 GHz
- High isolation: 25 dB up to 2.7 GHz
- P0.1dB 29dBm
- No external DC blocking capacitors required
- Single GPIO control line with VDD voltage regulator:  
 $V_{CTL} = 1.6$  to  $3.00$  V  
 $V_{DD} = 2.5$  to  $3.00$  V
- Small, 6-Lead LGA, 400 um pitch (1.1mm x 0.7mm x 0.45 mm) package

### Functional Block Diagram and Pin Function

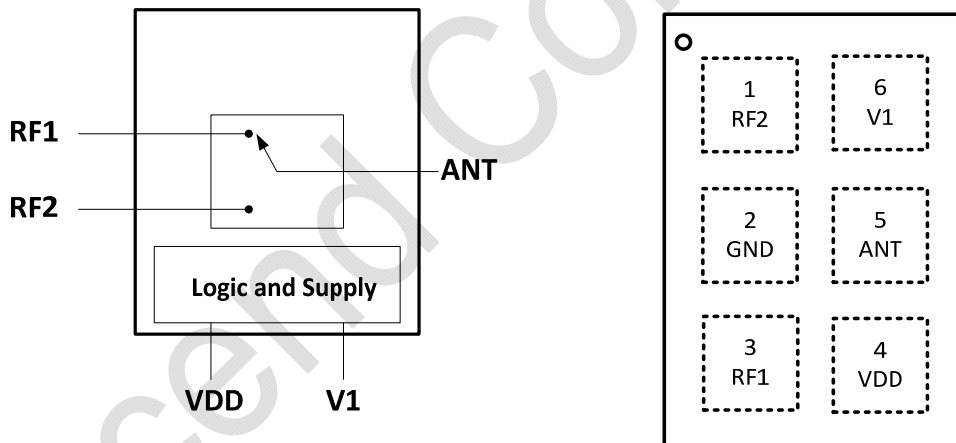
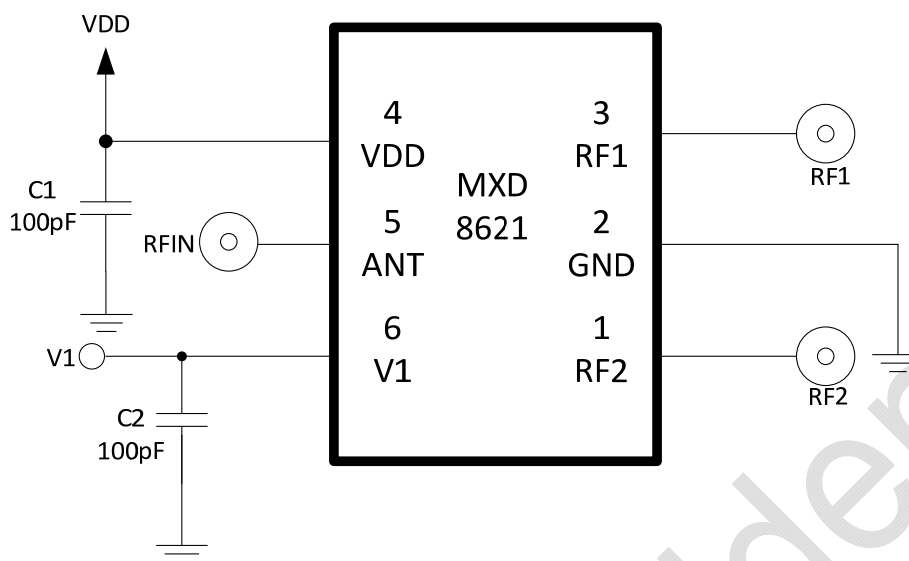


Figure 1 Functional Block Diagram and Pin-out (Top View)

**Application Circuit**

**Figure 2 MXD8621 Application Circuit**
**Table 1. Pin Description**

Pin No.	Name	Description	Pin No.	Name	Description
1	RF2	RF I/O. Throw 1 of the switch.	6	V1	Digital
2	GND	Ground	5	ANT	Antenna
3	RF1	RF I/O. Throw 2 of the switch.	4	VDD	Supply

**Truth Table**
**Table 2.**

State	Active Path	V1
0	ANT to RF1	0
1	ANT to RF2	1

Note: "1" = 1.6 V to 3.00 V. "0" = 0 V to +0.3 V.

**Recommended Operation Range**
**Table 3.**

Parameters	Symbol	Min	Typ	Max	Units
Operation Frequency	f1	0.1	-	3.0	GHz
Power supply	V <sub>DD</sub>	2.5	2.8	3.0	V
Switch Control Voltage High	V <sub>CTL H</sub>	1.6	1.8	3.0	V
Switch Control Voltage Low	V <sub>CTL L</sub>	0	0	0.3	V

**Specifications**
**Table 4. Electrical Specifications**

Parameter	Symbol	Specification			Units	Test Condition
		Min.	Typical	Max.		
<b>DC Specifications</b>						
Supply voltage	$V_{DD}$	2.5	2.8	3.0	V	
Control voltage: Low	$V_{CTL\_L}$	0	0	+0.3	V	
High	$V_{CTL\_H}$	+1.6	+1.8	+3.0	V	
Current on V1 pin	$I_{CTL}$			5	$\mu A$	
Supply current	$I_{DD}$		45	60	$\mu A$	$V_{DD} = 2.8 V, V1 = V_{CTL\_H}$
DC supply turn-on/turn-off time	$t_{on}$			10	$\mu s$	Measured from 50% of final $V_{DD}$ supply voltage to 90% of final RF power
RF path switching time	$t_{sw}$		1	2	$\mu s$	From one active state to another active state transition, measured from 50% of final control voltage to 90% of final RF power
Supply ripple	$V_{PP}$			20	mV <sub>pp</sub>	
<b>RF Specifications</b>						
Insertion loss (RF1 or RF2 to ANT pin)	IL		0.35		dB	700 to 960 MHz
			0.40		dB	1710 to 2170 MHz
			0.45		dB	2170 to 2690 MHz
Isolation (ANT to RF1 or RF2)	ISO	32	35		dB	700 to 960 MHz
		27	30		dB	1710 to 2170 MHz
		22	25		dB	2170 to 2690 MHz
Voltage Standing Wave Ratio, all ports	VSWR		1.25:1	1.5:1	-	Referenced to 50 $\Omega$ , 700 to 2690 MHz
0.1dB compression point ( from antenna to RF1 and RF2 )			29		dBm	Tested at 950 MHz

**Absolute Maximum Ratings**
**Table 5. Maximum ratings**

Parameters	Symbol	Minimum	Maximum	Units
Supply voltage	$V_{DD}$	+2.5	+3.0	V
Digital control voltage	$V_{CTL}$	0	+3.0	V
RF input power	$P_{IN}$		+29	dBm
Operating temperature	$T_{OP}$	-30	+85	$^{\circ}C$
Storage temperature	$T_{STG}$	-55	+150	$^{\circ}C$
Electrostatic discharge: Human Body Model (HBM), Class 1C Machine Model (MM), Class A	ESD		1000	V
			100	V

**Note:** Exposure to maximum rating conditions for extended periods may reduce device reliability. There is no damage to device with only one parameter set at the limit and all other parameters set at or below their nominal value. Exceeding any of the limits listed here may result in permanent damage to the device.

Package Outline Dimension

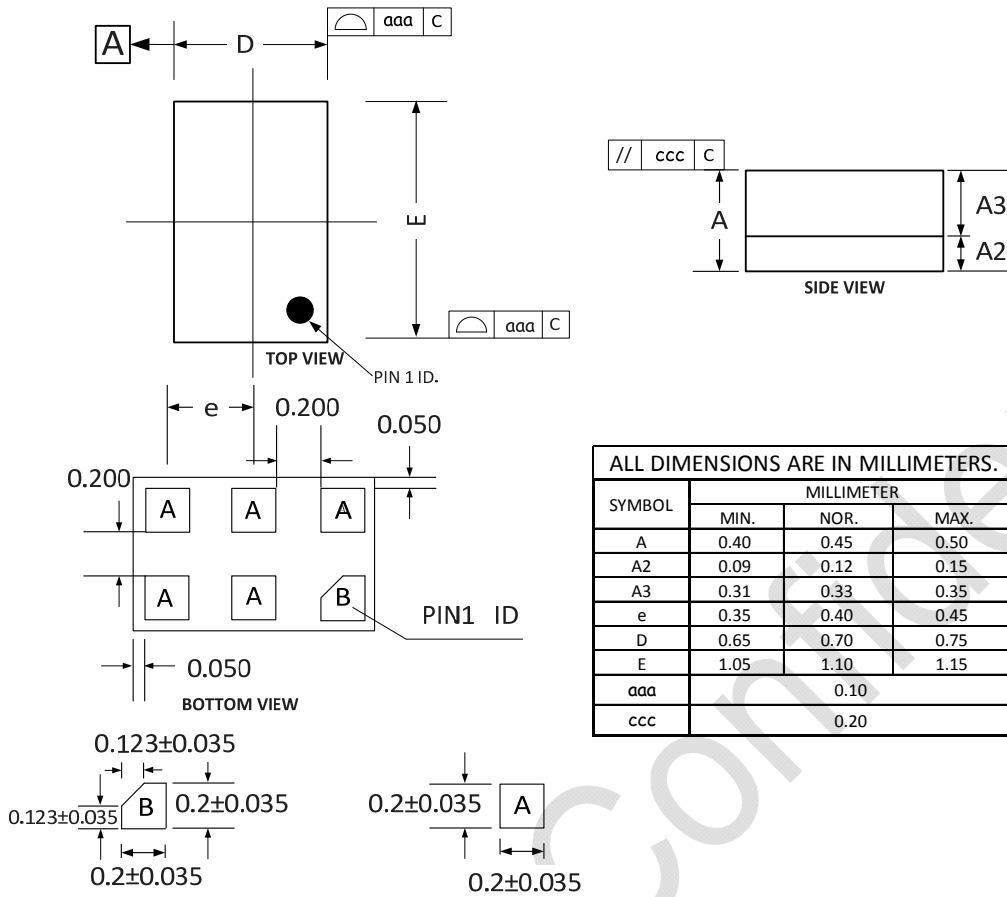


Figure 3. Package outline dimension

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## Reflow Chart

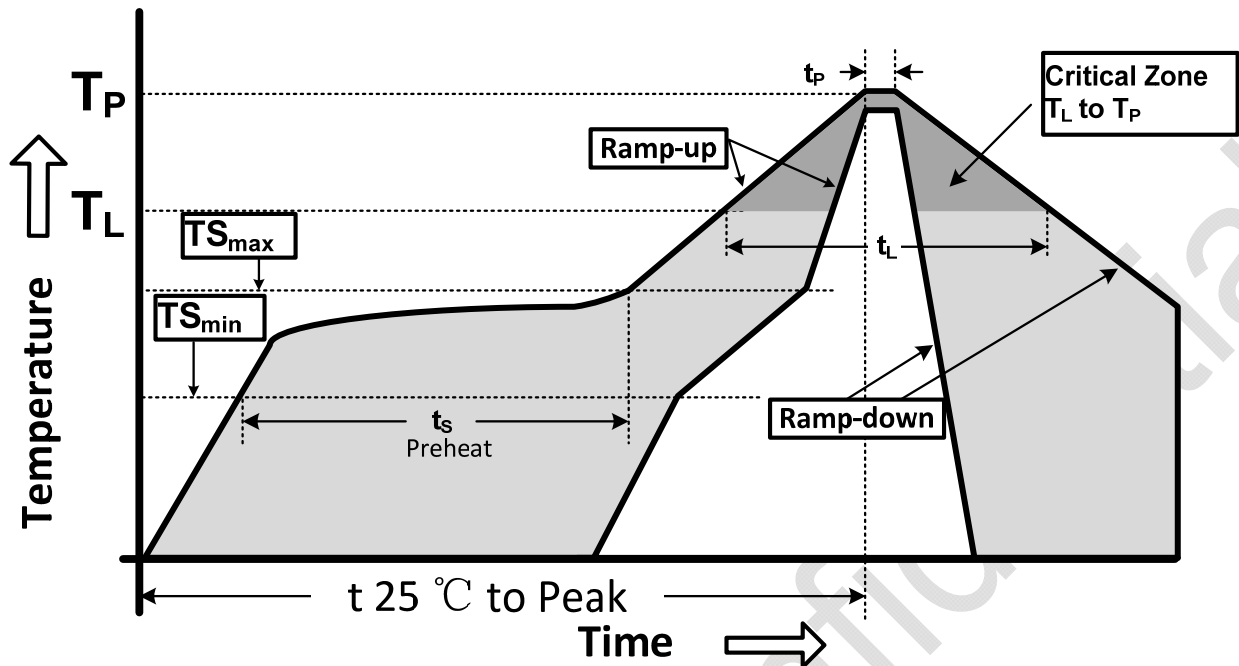


Figure 4. Recommended Lead-Free Reflow Profile

Table 6.

Profile Parameter	Lead-Free Assembly, Convection, IR/Convection
Ramp-up rate ( $TS_{max}$ to $T_p$ )	3°C/second max.
Preheat temperature ( $TS_{min}$ to $TS_{max}$ )	150°C to 200°C
Preheat time ( $t_s$ )	60 - 180 seconds
Time above $T_L$ , 217°C ( $t_L$ )	60 - 150 seconds
Peak temperature ( $T_p$ )	260°C
Time within 5°C of peak temperature( $t_p$ )	20 - 40 seconds
Ramp-down rate	6°C/second max.
Time 25°C to peak temperature	8 minutes max.

**ESD Sensitivity**

Integrated circuits are ESD sensitive and can be damaged by static electric charge. Proper ESD protection techniques should be used when handling these devices.

**RoHS Compliant**

This product does not contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE), and are considered RoHS compliant.