

DESCRIPTION

The XA2163 is GaAs MMIC SPDT (Single Pole Double Throw) switch which was developed for 2.4 GHz and 6 GHz dual-band wireless LAN. This device can operate at frequencies from 0.5 to 2.5 GHz, 4.9 to 6.0 GHz and 8.0 GHz, with low insertion loss and high isolation.

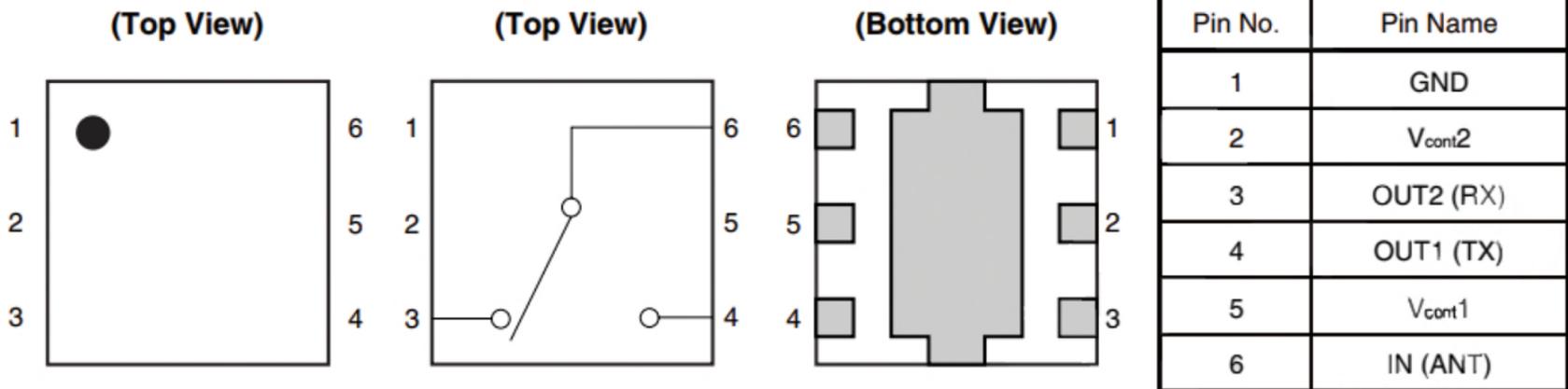
This device is housed in a 6-pin plastic TSON (Thin Small Out-line Non-leaded) package. And this package is able to high-density surface mounting.

FEATURES

- Operating frequency : $f = 0.5$ to 2.5 GHz, 4.9 to 6.0 GHz and 8.0 GHz
- Switch control voltage : $V_{\text{cont (H)}} = 2.8$ to 5.0 V (3.0 V TYP.)
: $V_{\text{cont (L)}} = -0.3$ to 0.3 V (0 V TYP.)
- Low insertion loss : $L_{\text{ins1}} = 0.40$ dB TYP. @ $f = 2.4$ to 2.5 GHz
: $L_{\text{ins2}} = 0.50$ dB TYP. @ $f = 4.9$ to 6.0 GHz
: $L_{\text{ins3}} = 0.90$ dB TYP. @ $f = 8.0$ GHz
: $L_{\text{ins4}} = 0.50$ dB TYP. @ $f = 0.5$ to 2.5 GHz
- High isolation : $\text{ISL1} = 38$ dB TYP. @ $f = 2.4$ to 2.5 GHz
: $\text{ISL2} = 30$ dB TYP. @ $f = 4.9$ to 6.0 GHz
: $\text{ISL3} = 23$ dB TYP. @ $f = 8.0$ GHz
: $\text{ISL4} = 43$ dB TYP. @ $f = 0.5$ to 1.0 GHz
: $\text{ISL5} = 38$ dB TYP. @ $f = 1.0$ to 2.5 GHz
- Handling power : $P_{\text{in (1 dB)}} = +31.0$ dBm TYP. @ $f = 2.5$ GHz, $V_{\text{cont (H)}} = 3.0$ V, $V_{\text{cont (L)}} = 0$ V
: $P_{\text{in (1 dB)}} = +29.0$ dBm TYP. @ $f = 6.0$ GHz, $V_{\text{cont (H)}} = 3.0$ V, $V_{\text{cont (L)}} = 0$ V

XA2163 TSON6

PIN CONNECTIONS AND INTERNAL BLOCK DIAGRAM



Remark Exposed pad : GND

TRUTH TABLE

V _{cont1}	V _{cont2}	IN (ANT)–OUT1 (TX)	IN (ANT)–OUT2 (RX)
High	Low	OFF	ON
Low	High	ON	OFF

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

Parameter	Symbol	Ratings	Unit
Switch Control Voltage	V _{cont}	–6.0 to +6.0	V
Input Power	P _{in}	+32	dBm
Operating Ambient Temperature	T _A	–45 to +85	°C
Storage Temperature	T _{stg}	–55 to +135	°C

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

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Switch Control Voltage (H)	V _{cont (H)}	2.8	3.0	5.0	V
Switch Control Voltage (L)	V _{cont (L)}	–0.3	0	0.3	V
Operating Frequency 1 ^{Note 1}	f ₁	2.4	–	2.5	GHz
Operating Frequency 2 ^{Note 1}	f ₂	4.9	–	6.0	GHz
Operating Frequency 3 ^{Note 2}	f ₃	–	8.0	–	GHz
Operating Frequency 4 ^{Note 3}	f ₄	0.5	–	1.0	GHz
Operating Frequency 5 ^{Note 3}	f ₅	1.0	–	2.4	GHz

- Notes**
1. DC blocking capacitors = 4 pF
 2. DC blocking capacitors = 2 pF
 3. DC blocking capacitors = 100 pF

ELECTRICAL CHARACTERISTICS

($T_A = +25^\circ\text{C}$, $V_{\text{cont (H)}} = 3.0\text{ V}$, $V_{\text{cont (L)}} = 0\text{ V}$, $Z_0 = 50\ \Omega$, DC blocking capacitors = 4 pF, unless otherwise specified)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Insertion Loss 1	L _{ins1}	f = 2.4 to 2.5 GHz	–	0.40	0.60	dB
Insertion Loss 2	L _{ins2}	f = 4.9 to 6.0 GHz	–	0.50	0.80	dB
Insertion Loss 3	L _{ins3}	f = 8.0 GHz ^{Note 1}	–	0.90	–	dB
Insertion Loss 4	L _{ins4}	f = 0.5 to 2.5 GHz ^{Note 2}	–	0.50	–	dB
Isolation 1	ISL1	f = 2.4 to 2.5 GHz	35	38	–	dB
Isolation 2	ISL2	f = 4.9 to 6.0 GHz	27	30	–	dB
Isolation 3	ISL3	f = 8.0 GHz ^{Note 1}	–	23	–	dB
Isolation 4	ISL4	f = 0.5 to 1.0 GHz ^{Note 2}	40	43	–	dB
Isolation 5	ISL5	f = 1.0 to 2.5 GHz ^{Note 2}	35	38	–	dB
Input Return Loss 1	RL _{in1}	f = 2.4 to 2.5 GHz	–	15	–	dB
Input Return Loss 2	RL _{in2}	f = 4.9 to 6.0 GHz	–	15	–	dB
Input Return Loss 3	RL _{in3}	f = 8.0 GHz ^{Note 1}	–	15	–	dB
Input Return Loss 4	RL _{in4}	f = 0.5 to 2.5 GHz ^{Note 2}	–	20	–	dB
Output Return Loss 1	RL _{out1}	f = 2.4 to 2.5 GHz	–	15	–	dB
Output Return Loss 2	RL _{out2}	f = 4.9 to 6.0 GHz	–	15	–	dB
Output Return Loss 3	RL _{out3}	f = 8.0 GHz ^{Note 1}	–	15	–	dB
Output Return Loss 4	RL _{out4}	f = 0.5 to 2.5 GHz ^{Note 2}	–	20	–	dB
1 dB Loss Compression Input Power 1 ^{Note 3}	P _{in (1 dB) 1}	f = 2.4 to 2.5 GHz	–	+31.0	–	dBm
1 dB Loss Compression Input Power 2 ^{Note 3}	P _{in (1 dB) 2}	f = 4.9 to 6.0 GHz	–	+29.0	–	dBm
Input 3rd Order Intercept Point	IIP ₃		–	+55	–	dBm
Switch Control Current	I _{cont}		–	0.1	1.0	μA
Switch Control Speed	t _{sw}	50% CTL to 90/10%	–	50	–	ns

Notes 1. DC blocking capacitors = 2 pF

2. DC blocking capacitors = 100 pF

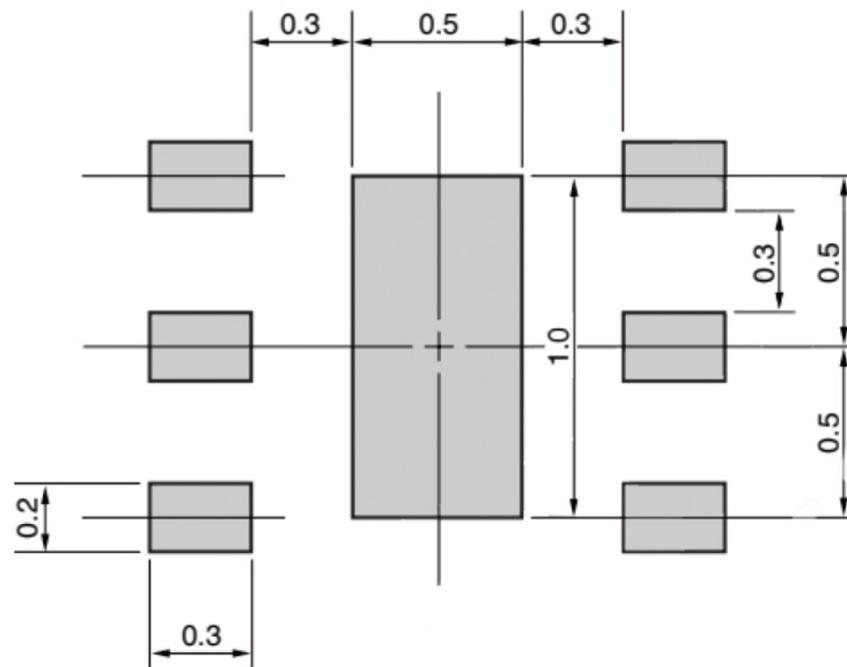
3. P_{in (1 dB)} is measured the input power level when the insertion loss increases more 1 dB than that of linear range.

Caution This device is used it is necessary to use DC blocking capacitors.

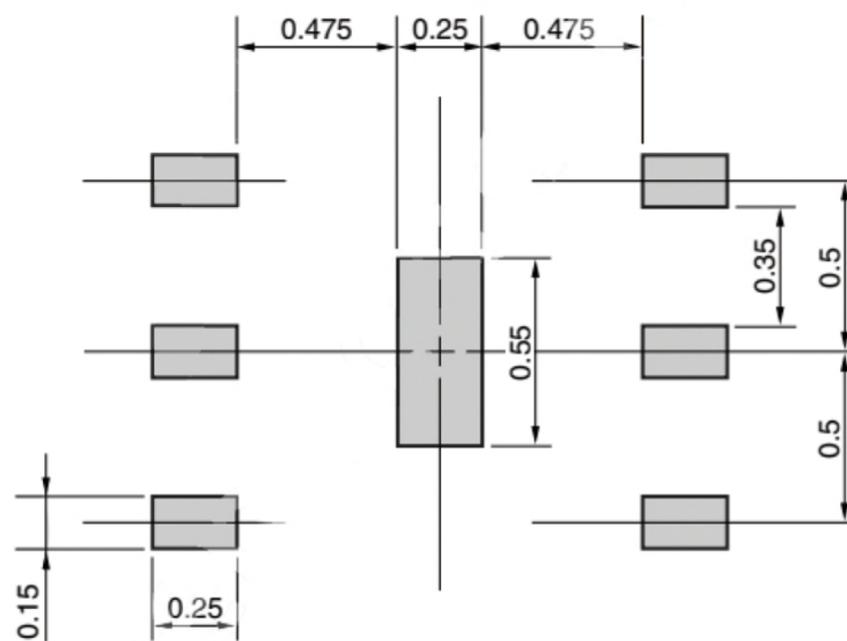
MOUNTING PAD AND SOLDER MASK LAYOUT DIMENSIONS

6-PIN PLASTIC TSON (UNIT: mm)

MOUNTING PAD



SOLDER MASK



Solder thickness : 0.08 mm

Remark The mounting pad and solder mask layouts in this document are for reference only. When designing PCB, please consider workability of mounting, solder joint reliability, prevention of solder bridge and so on, in order to optimize the design.