



## ADVANCED DATASHEET

2V Dual-Mode WCDMA & Triple Band GSM/DCS/PCS Switch  
0.5 – 2.2 GHz

MASWSS0017

Rev 1.2

### Features

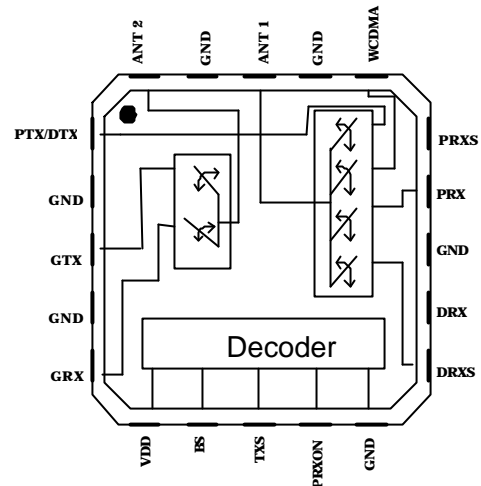
- GSM Power handling with +2.0V Control Voltage.
- Low Power consumption. Less than 1 $\mu$ A current in Receive mode.
- Integrated Decoder.
- Leadless 4 x 4 mm FQFP-N, 20 Pin Package
- Low Insertion Loss of 0.3 dB in GSM Transmit mode.

### Description

The M/A-COM MASWSS0017 is a GaAs monolithic switch in a low cost, FQFP-N, surface mount plastic package. The MASWSS0017 is ideally suited for applications where very low power consumption, high power handling, and low cost are required. The MASWSS0017 includes an integrated decoder. The switch offers GSM power handling with below +2.5 V control voltage. The supply voltage VDD should be connected to the highest available voltage.

The MASWSS0017 is fabricated using a new 0.5-micron gate length GaAs pHEMT process. The process features full chip passivation for increased performance and reliability. This switch is designed for Dual Mode WCDMA, Triple band GSM/DCS/PCS handsets, where the phone needs to be able to simultaneously receive a WCDMA and GSM signal.

### Functional Schematic



### Ordering Information

Part Number	Description
MASWSS0017-XFLT1	MASWSS0017 on 1000 Piece Tape and Reel
MASWSS0017-XFLT3	MASWSS0017 on 3000 Piece Tape and Reel
MASWSS0017-XFLS0	MASWSS0017 Sample Test Board

\* If specific reel size is required, consult factory for part number assignment

The Advanced Specifications Data Sheet Contains Typical Electrical Specifications Which May Change Prior to Final Introduction.

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**ELECTRICAL CHARACTERISTICS: Test Conditions: VDD = 2.5V, Vctrl = 2.0V, TA = +25°C**

Mode	Specifications	Freq. (MHz)	Units	Min.	Typ.	Max.
ANT2 -> GSM RX	Insertion Loss	925 -960	dB	0.54	0.6	0.7
ANT1 -> UMTS Tx	Insertion Loss	1920-1980	dB	0.84	0.9	1.0
ANT1 -> UMTS Rx	Insertion Loss	2110-2170	dB	0.89	0.95	1.05
	Isolation ANT1 to DCS Tx	1710-1785	dB	20	20	20
	Isolation ANT2 to GSM Tx	880 - 915	dB	20	20	20
	Isolation UMTS to DCS Rx	1920 -1980	dB	30	30	30
	Isolation UMTS to PCS Rx	1920 - 1980	dB	30	30	30
	Isolation UMTS to GSM Rx	1920 -1980	dB	30	30	30
	Isolation UMTS to GSM Tx	1920 -1980	dB	30	30	30
	Isolation DCS Tx to DCS Rx	1710 - 1785	dB	30	30	30
	Isolation DCS Tx to GSM Rx	1710 - 1785	dB	30	30	30
	Isolation GSM Tx to DCS Rx	880 - 915	dB	30	30	30
	Isolation GSM Tx to GSM Rx	1710 - 1785	dB	20	20	20
ANT1 -> DCS RX	Insertion Loss	1805 -1880	dB	0.89	0.95	1.05
	Isolation ANT1 to DCS Tx	1710 - 1785	dB	20	20	20
	Isolation ANT2 to GSM Tx	880 - 915	dB	15	15	15
	Isolation DCS Tx to DCS Rx	1710 - 1785	dB	20	20	20
	Isolation DCS Tx to PCS Rx	1710 - 1785	dB	30	30	30
	Isolation DCS Tx to GSM Rx	1710 - 1785	dB	30	30	30
	Isolation GSM Tx to DCS Rx	880 - 915	dB	30	30	30
	Isolation GSM Tx to PCS Rx	880 - 915	dB	30	30	30
	Isolation GSM Tx to GSM Rx	880 - 915	dB	30	30	30
ANT1 -> PCS RX	Insertion Loss	1930-1990	dB	0.89	.95	1.05
	Isolation ANT1 to DCS Tx	1710 - 1785	dB	20	20	20
	Isolation ANT2 to GSM Tx	880 - 915	dB	15	15	15
	Isolation DCS Tx to DCS Rx	1710 - 1785	dB	30	30	30
	Isolation DCS Tx to PCS Rx	1710 - 1785	dB	20	20	20
	Isolation DCS Tx to GSM Rx	1710 - 1785	dB	30	30	30
	Isolation GSM Tx to DCS Rx	880 - 915	dB	30	30	30
	Isolation GSM Tx to PCS Rx	880 - 915	dB	30	30	30
	Isolation GSM Tx to GSM Rx	880 - 915	dB	30	30	30
ANT2 -> GSM TX	Insertion Loss	880 - 915	dB	0.24	0.3	0.4
	Isolation GSM Tx to UMTS	880 - 915	dB	30	30	30
	Isolation GSM Tx to DCS Rx	880 - 915	dB	30	30	30
	Isolation GSM Tx to PCS Rx	880 - 915	dB	30	30	30
	Isolation GSM Tx to GSM Rx	880 - 915	dB	25	25	25
	Isolation DCS Tx to DCS Rx	1710 - 1785	dB	30	30	30
	Isolation DCS Tx to PCS Rx	1710 - 1785	dB	30	30	30
	Isolation DCS Tx to GSM Rx	1710 - 1785	dB	30	30	30
ANT1 -> DCS TX	Insertion Loss	1710 -1785	dB	0.59	0.65	0.75
	Isolation DCS Tx to UMTS	1710 -1785	dB	20	20	20
	Isolation DCS Tx to DCS Rx	1710 -1785	dB	30	30	30
	Isolation DCS Tx to PCS Rx	1710 - 1785	dB	30	30	30
	Isolation DCS Tx to GSM Rx	1710 -1785	dB	30	30	30
	Isolation GSM Tx to DCS Rx	880 - 915	dB	30	30	30
	Isolation GSM Tx to PCS Rx	880 - 915	dB	30	30	30
	Isolation GSM Tx to GSM Rx	880 - 915	dB	30	30	30
2 <sup>nd</sup> Harmonics			dBc	-89	-85	-70
3 <sup>rd</sup> Harmonics			dBc	-74	-72	-65
Supply Voltage			Volts	2.0	2.5	4.0
High Control Voltages			Volts	2.0	2.5	4.0
Low Control Voltages			Volts	-0.2	0	0.2

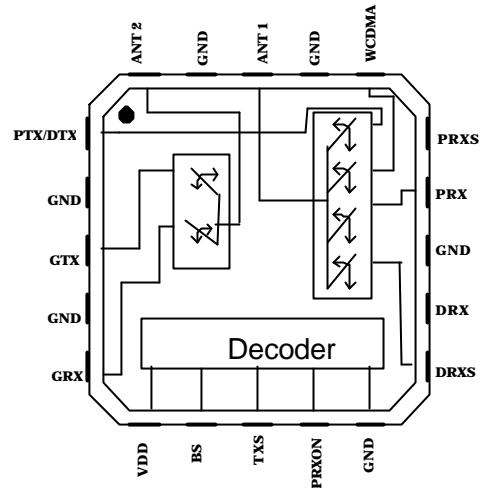
- DC blocking capacitors are required on all RF and shunt ports
- All impedances are 50 ohms

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**Pin Configuration**

Pin No.	Pin Name	Description
1	PTX/DTX	DCS/PCS Tx Port
2	GND	RF Ground
3	GTX	GSM Tx Port
4	GND	RF Ground
5	GRX	GSM Rx Port
6	VDD	Decoder Vdd
7	BS	Control 1
8	TXS	Control 2
9	PRXON	Control 3
10	GND	RF Ground
11	DRXS	DCS Rx Shunt
12	DRX	DCS Rx Port
13	GND	RF Ground
14	PRX	PCS Rx Port
15	PRXS	PCS Rx Shunt
16	WCDMA	WCDMA Tx/Rx Port
17	GND	RF Ground
18	ANT1	WCDMA/DCS/PCS ANTENNA
19	GND	RF Ground
20	ANT2	GSM ANTENNA
21	GND	Paddle

**Block Diagram**



**Truth Table**

BS	TXS	PRXON	Mode
0	0	0	GSM RX-Ant2 WCDMA -Ant1
0	1	0	GSM TX-Ant2
1	0	0	DCS RX-Ant1
1	0	1	PCS RX-Ant1
1	1	0	DCS TX-Ant1

Logic Level	Voltage Level
V <sub>Lo</sub> "0" =	0 V
V <sub>Hi</sub> "1" =	2.5 V

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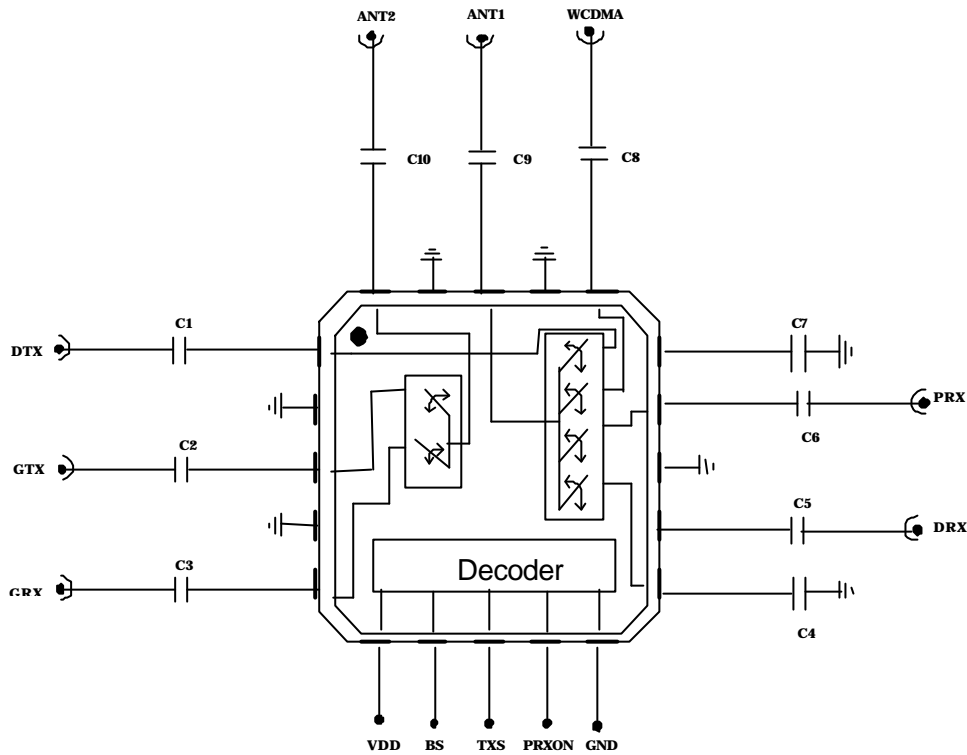
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Sample Board Schematic



External Circuitry Parts List (Note: Values of external elements not final)

Ref. Designation	Value	Purpose
C1	22pF	DC Block
C2	22pF	DC Block
C3	22pF	DC Block
C4	4.7pF	RF Shunt
C5	22pF	DC Block
C6	22pF	DC Block
C7	4.7pF	RF Shunt
C8	22pF	DC Block
C9	22pF	DC Block
C10	22pF	DC Block

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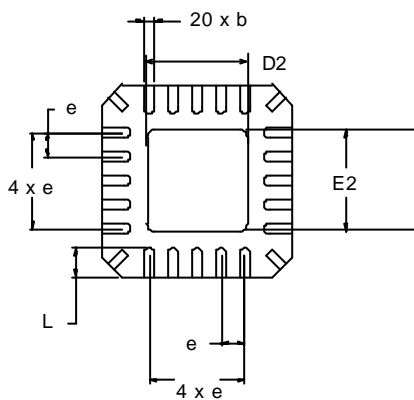
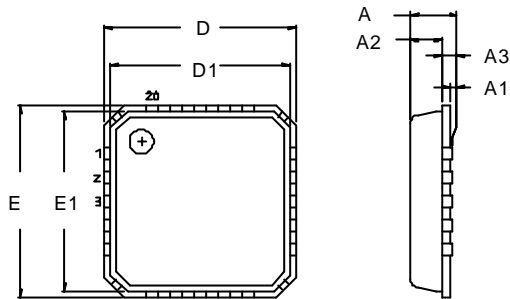
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4 mm FQFP-N, 20-Lead



Dimension	Measurement (mm)		
	Min.	Nom.	Max.
A	0.80	0.90	1.00
A1	0	0.02	0.05
A2	0	0.65	1.00
A3		0.25 ref.	
b	0.18	0.23	0.30
D		4.00 basic	
D1		3.75 basic	
D2	0.75	1.70	2.25
e		0.50 basic	
E		4.00 basic	
E1		3.75 basic	
E2	0.75	1.70	2.25
L	0.35	0.55	0.75

**Note:** See JEDEC MO-220A VGGD-1 for additional dimensional and tolerance information

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