LMSP33QM-B16

SP10T ASM

Module outline

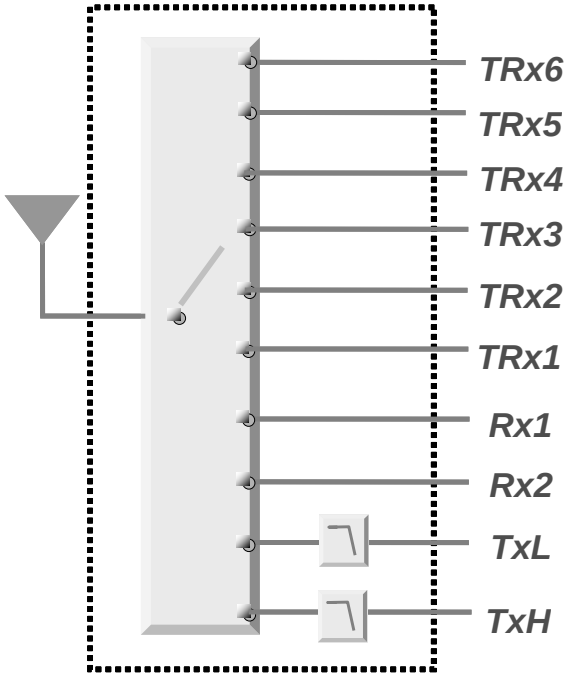
Murata LMSP33QM-B16 is SP10T CMOS switch with GSM Tx Low Pass Filter function.

This module has six TRx port, which can be UMTS/CDMA Tx and Rx pass.

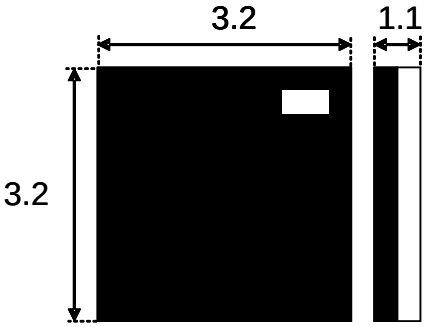
Key feature

- CMOS SP10T switch for smaller package
- Low Pass Filter are embedded in LTCC substrate
- No DC cut capacitor is required for RF ports
- RoHS compliance
- Standby Mode

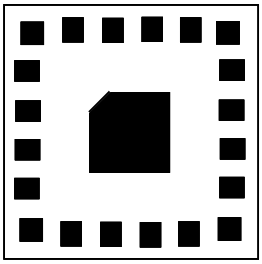
<Block Diagram>



<Top view>



<Bottom view>



Electrical Characteristics

(1) DC characteristics

a. Operating conditions

DC supply	Min	Max	Unit
Power supply (Vdd)	2.5	3.0	V
Control voltage, high status	1.4	Vdd	V
Control Voltage, low status	0.0	0.3	V
Supply current		0.22	mA
Operating temperature	-30	85	^{o}C

b. Modes of operation

Mode	CTLA	CTLB	CTLC	CTLD	Vdd
TxL	High	High	Low	Low	2.50 - 3.00 V
TxH	High	Low	Low	Low	
Rx1	Low	Low	High	Low	
Rx2	Low	High	High	Low	
TRx1	High	High	High	Low	
TRx2	High	Low	High	High	
TRx3	High	High	High	High	
TRx4	High	Low	Low	High	
TRx5	High	Low	High	Low	
TRx6	Low	High	Low	Low	
Standby Mode	Low	Low	Low	Low	

High : 1.4 - Vdd (V)

Low : 0 - 0.3 (V)

(2) RF performance

TRx electrical performance specifications

*Symbol of frequency

892.0±68.0MHz (ful)
1940.0±230.0MHz (fuh)

Parameter	Conditions		Minimum	Maximum	Units
Input power (TRx)				26.0	dBm
Insertion loss (TRx - ANT)	ful	25 deg.		0.85	dB
		-30 ~ +85 deg.		1.00	
	fuh	25 deg.		0.95	dB
		-30 ~ +85 deg.		1.10	
Isolation	TRx1 mode	TRx1 - TRx2	30.0		dB
		TRx1 - TRx3	28.0		dB
		TRx1 - TRx4	25.0		dB
		TRx1 - Rx1	18.0		dB
		TRx1 - Rx2	21.0		dB
	TRx2 mode	TRx2 - TRx1	30.0		dB
		TRx2 - TRx3	23.0		dB
		TRx2 - TRx4	23.0		dB
		TRx2 - Rx1	24.0		dB
		TRx2 - Rx2	18.0		dB
	TRx3 mode	TRx3 - TRx1	30.0		dB
		TRx3 - TRx2	24.0		dB
		TRx3 - TRx4	16.0		dB
		TRx3 - Rx1,2	20.0		dB
	TRx4 mode	TRx4 - TRx1	30.0		dB
		TRx4 - TRx2	27.0		dB
		TRx4 - TRx3	16.0		dB
		TRx4 - Rx1,2	23.0		dB
Harmonics*[1] (TRx - ANT)	2 x ful MHz			-67	dBc
	3 x ful MHz			-67	dBc
	2 x fuh MHz			-67	dBc
	3 x fuh MHz			-67	dBc
V.S.W.R.	TRx			1.70	-
	Ant			1.70	-
Current Consumption*[2]				0.22	mA

*[1]Harmonics specification condition in -30 to +75 degrees
*[2]VDD condition is 2.7V

GSM Tx electrical performance specifications

*Symbol of frequency

836.5±12.5MHz (fat) 897.5±17.5MHz (fgt)
1745.5±37.5MHz (fdt) 1880.0±30.0MHz (fpt)

Parameter		Conditions		Minimum	Maximum	Units
Input power		TxL			35.0	dBm
		TxH			32.0	dBm
Insertion loss	TxL - ANT	fat	25 deg.		1.35	dB
			-30 ~ +85 deg.		1.50	dB
		fgt	25 deg.		1.50	dB
			-30 ~ +85 deg.		1.65	dB
	TxH - ANT	fdt, fpt	25 deg.		1.40	dB
			-30 ~ +85 deg.		1.55	dB
Attenuation		TxL - ANT	2 x fat, fgt	20.0		dB
			3 x fat, fgt	28.0		dB
		TxH - ANT	2 x fdt, fpt	20.0		dB
			3 x fdt, fpt	25.0		dB
Isolation		TxL mode	TxL - Rx1,2	30.0		dB
			TxL - UMTS5,6	26.0		dB
		TxH mode	TxH - Rx1,2	20.0		dB
			TxH - UMTS5,6	20.0		dB
V.S.W.R		TxL			1.70	-
		TxH			1.80	-
Harmonics*[1]		TxL - ANT	2 x fat, fgt MHz		-70	dBc
			3 x fat, fgt MHz		-70	dBc
		TxH - ANT	2 x fdt, fpt MHz		-67	dBc
			3 x fdt, fpt MHz		-67	dBc
Current Consumption*[2]					0.22	mA

*[1]Harmonics specification condition in -30 to +75 degrees
*[2]VDD condition is 2.7V

GSM Rx electrical performance specifications

*Symbol of frequency

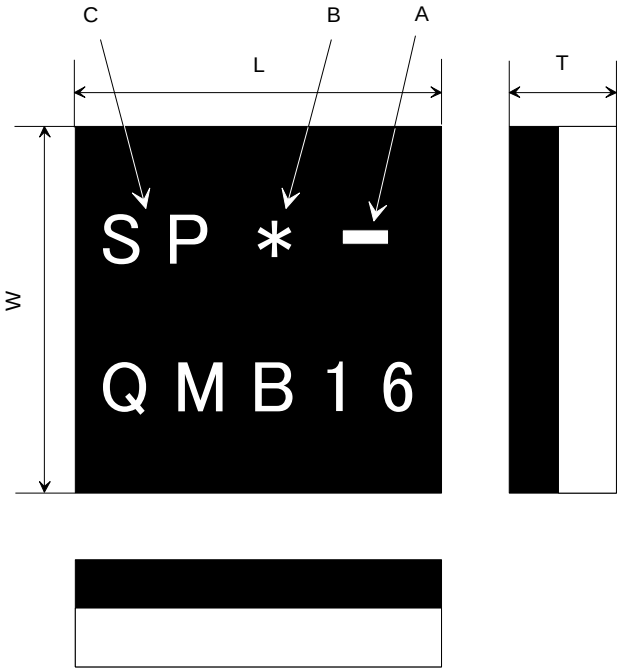
881.5±12.5MHz (far) 942.5±17.5MHz (fgr)
1842.5±37.5MHz (fdr) 1960.0±30.0MHz (fpr)

Parameter	Conditions		Minimum	Maximum	Units
Insertion loss (Rx - ANT)	far, fgr	25 deg.		1.25	dB
		-30 ~ +85 deg.		1.40	dB
	fdr, fpr	25 deg.		1.45	dB
		-30 ~ +85 deg.		1.60	dB
Isolation	TxL - ANT in fat, fgt		30.0		dB
	TxH - ANT in fdt, fpt		29.0		dB
V.S.W.R	ANT			1.70	-
Current Consumption*[2]				0.22	mA

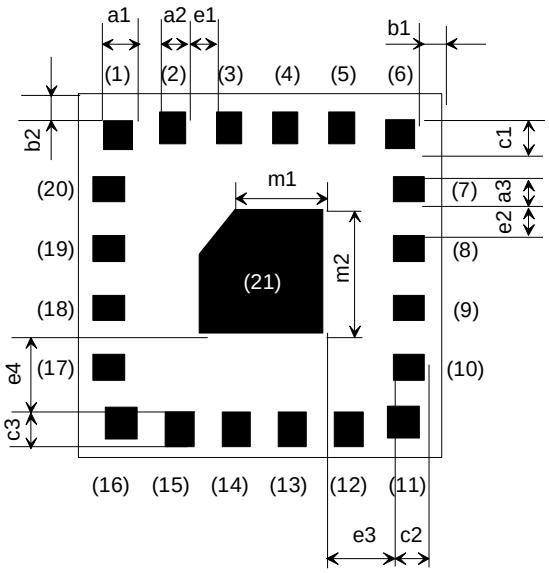
*[1]Harmonics specification condition in -30 to +75 degrees
*[2]VDD condition is 2.7V

Component package information

<Top View>



<Bottom View>



(in:mm)

Mark	Meaning
A	Pin 1 Marking
B	Date Code (EIAJ)
C	Type Indication

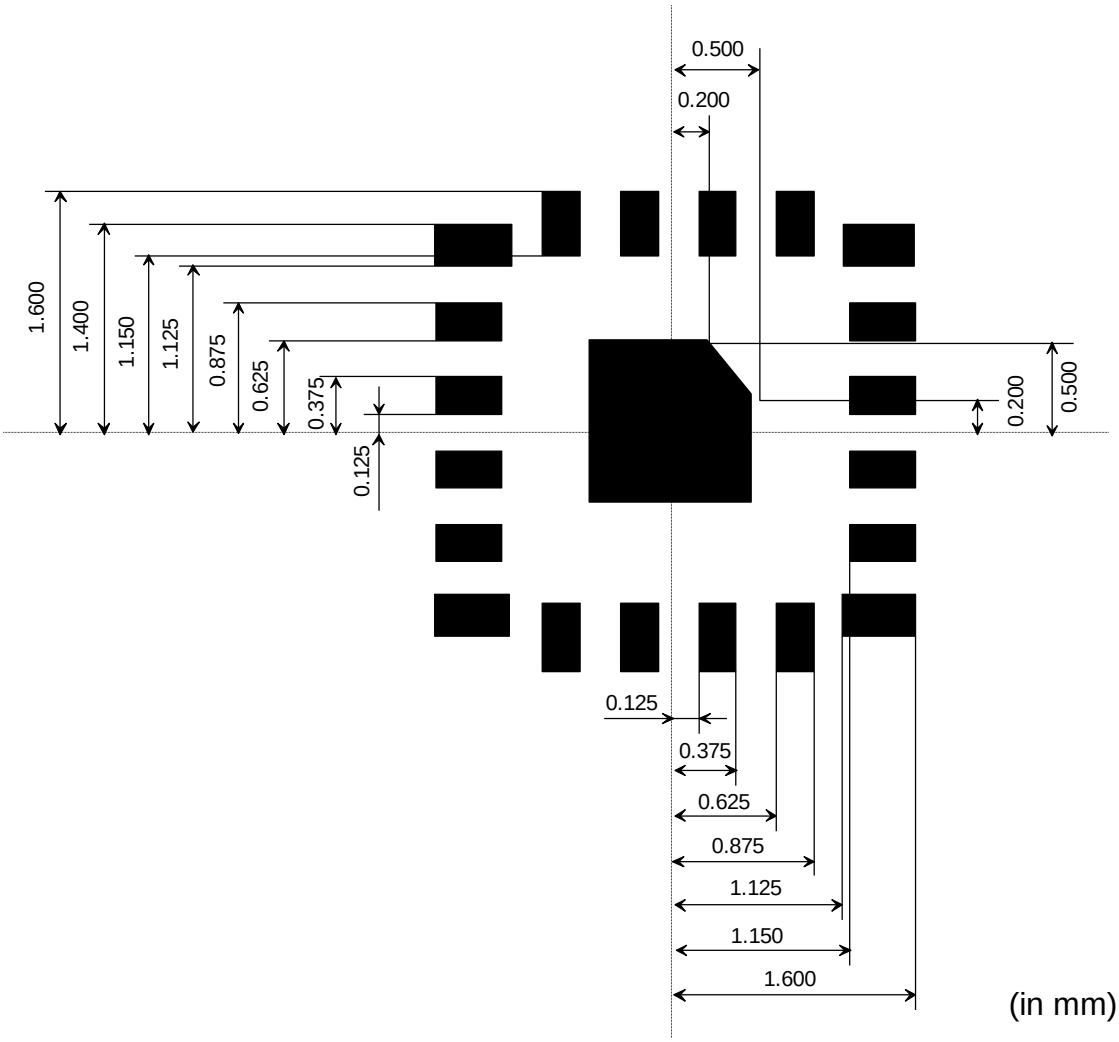
Mark	Dimensions	Mark	Dimensions	Mark	Dimensions
L	3.2 ± 0.2	b1	0.2 ± 0.2	e2	0.25 ± 0.10
W	3.2 ± 0.2	b2	0.2 ± 0.2	e3	0.65 ± 0.10
T	1.1 max.	c1	0.275 ± 0.100	e4	0.65 ± 0.10
a1	0.275 ± 0.100	c2	0.3 ± 0.1	m1	0.7 ± 0.1
a2	0.25 ± 0.10	c3	0.3 ± 0.1	m2	1.0 ± 0.1
a3	0.25 ± 0.10	e1	0.25 ± 0.10	-	-

Terminal Configuration

Pin number	Function	Description
1	CTLA	Operation mode control
2	TRx2	Tx/Rx port for UMTS/CDMA
3	GND	RF and DC Ground
4	TRx3	Tx/Rx port for UMTS/CDMA
5	TRx4	Tx/Rx port for UMTS/CDMA
6	GND	RF and DC Ground
7	ANT	RF signal in/out Antenna
8	GND	RF and DC Ground
9	TxH	GSM 1710 – 1910MHz Tx signal output
10	TxL	GSM 824 – 915MHz Tx signal output
11	TRx6	Tx/Rx port for UMTS/CDMA
12	TRx5	Tx/Rx port for UMTS/CDMA
13	Rx2	Rx Port for GSM
14	Rx1	Rx Port for GSM
15	TRx1	Tx/Rx port for UMTS/CDMA
16	GND	RF and DC Ground
17	Vdd	Power supply
18	CTLD	Operation mode control
19	CTLC	Operation mode control
20	CTLB	Operation mode control
21	GND	RF and DC Ground

Evaluation board information

Land pattern

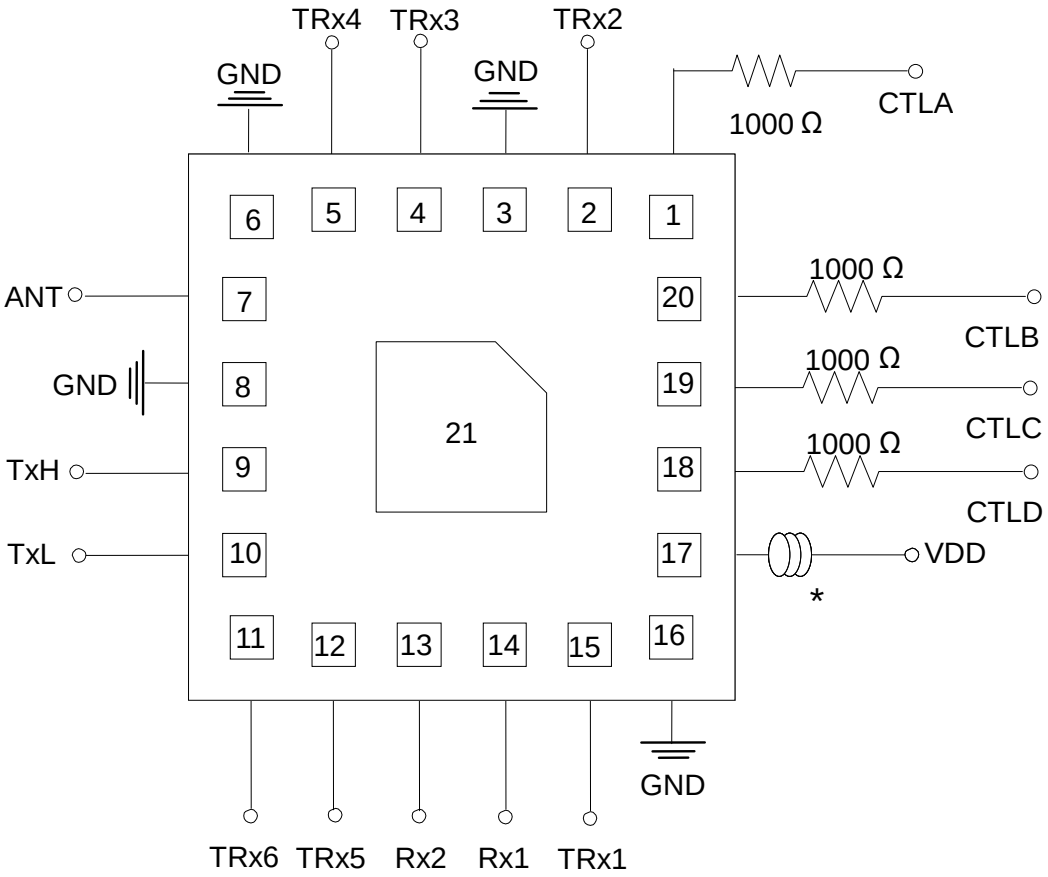


(in mm)

Evaluation Circuit (external components)

<Top view>

(*)
Murata BLM15BB121SN1 is used.



Change History

Version	Date	Author	Comment
1.0	May. 25, 2010	Y. SUGA	Initial
A	Mar.30, 2011	T. Ito	P.9 Evaluation Circuit (external components) updated