

PRODUCT DESCRIPTION

FM1630C is a single pole, dual-throw (SPDT) LTE MMB transmit/receive switch. Switching is controlled by an integrated GPIO interface with a single control pin. Depending on the logic voltage level applied to the logic control pin, the antenna port is connected to one of the switched RF ports (RF1 or RF2) through a low insertion loss path, while the path between the antenna port and the other RF port is in a high isolation high impedance state. No external DC blocking capacitors are required as long as no DC voltage is applied on any RF path. The FM1630C is manufactured using a state-of-the-art.

Silicon-On-Insulator (SOI) process and is provided in a compact 1.1 x 0.7 x 0.45 mm, 6-pin surface mount Dual Flat No-Lead (DFN) package.

A functional block diagram is shown in Figure 1. The pin configuration and package are shown in Figure 2. Signal pin assignments and functional pin descriptions are provided in Table 1.

FEATURES

- Broadband frequency range: 0.1 to 2.7 GHz
- No external DC blocking capacitors required
- Single GPIO control line with VDD voltage regulator:
 - VCTL = 1.8 V typical
 - VDD = 2.85V typical
- Small, DFN (6-pin, 1.1 x 0.7 x 0.45 mm) package (MSL1, 260 °C per JEDEC J-STD-020)

APPLICATIONS

- LTE TDD/FDD transmit/receive and pre-PA
- Embedded modules

LTE TDD/FDD transmit/receive and pre-PA
 Embedded modules

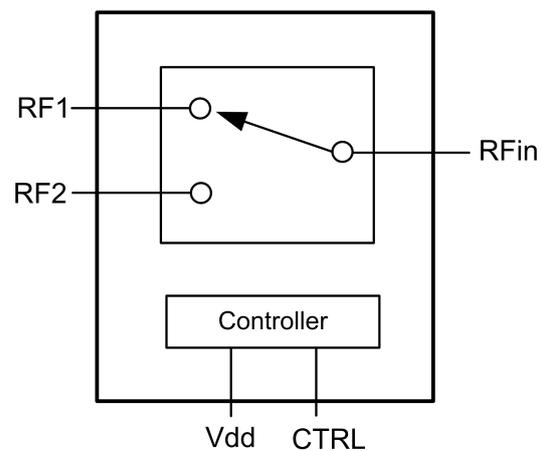


Figure 1. FM1630C Block Diagram

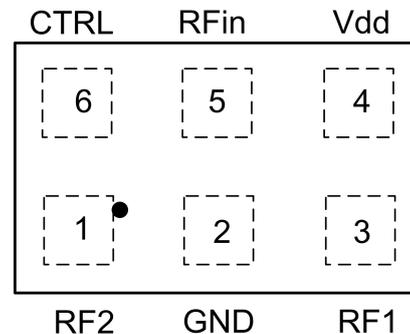


Figure 2. FM1630C Pinout (TOP View)



Table 1. FM1630C Signal Descriptions

Pin#	Name	Description	Pin#	Name	Description
1	RF2	RF I/O, port 2	4	VDD	Voltage supply
2	GND	Ground	5	ANT	RF I/O, antenna port
3	RF1	RF I/O, port 1	6	VCTL	Switch control line

Electrical and Mechanical Specifications

The absolute maximum ratings of the FM1630C are provided in Table 2.

Electrical specifications are provided in Table 3.

The state of the FM1630C is determined by the logic provided in Table 4.

Table 2. FM1630C Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Unit
Supply voltage	VDD	+2.5	+5	V
Digital control voltage	VCTL	0	3.3	V
RF input power	P _{IN}		+34	dBm
Operating temperature	T _{OP}	-40	+85	°C
Storage temperature	T _{STG}	-55	+150	°C
Electrostatic Discharge: Human Body Model (HBM), Class 2	ESD		1000	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.

Table 3. FM1630C Electrical Specifications (Note 1)

(V_{DD} = 2.85 V, T_{OP} = +25 °C, Characteristic Impedance [Z₀] = 50 Ω, Unless Otherwise Specified)

Parameter	Symbol	Test Condition	Min	Typical	Max	Unit
DC Specifications						
Supply voltage	VDD		2.50	2.85	5.0	V
Control voltage:						
Low	VCTL_L		0	0	0.4	V
High	VCTL_H		1.20	1.80	3.30	V
Current on VCTL pin	I_CTL				5	μA
Supply current	IDD	VCTL = 1.8V		80	130	μA



FM1630C (File No.: S&CIC2080)

HIGH LINEARITY SP2T SWITCH

DC supply turn-on/turn-off	T _{ON}	Measured from VDD supply VDD minimum to final RF output power ±1 dB (Note 2), PIN = +26 dBm, TOP = -10 °C to +85 °C		20	25	μs
RF path switching time	T _{SW}	Measured from VCTL_HIGH minimum or VCTL_LOW maximum to RF output power ±1 dB (Note 2), PIN = +26 dBm, TOP = -10 °C to +85 °C.		2	5	μs
RF Specifications						
Insertion loss (RF1 or RF2 to ANT pin)	IL	0.1 to 0.7 GHz		0.40	0.65	dB
		0.7 to 1.0 GHz		0.45	0.65	dB
		1.0 to 2.2 GHz		0.55	0.80	dB
		2.2 to 2.7 GHz		0.60	0.95	dB
Isolation from any active port to any other port	Iso	0.1 to 0.7 GHz	30	32		dB
		0.7 to 1.0 GHz	25	28		dB
		1.0 to 2.2 GHz	22	25		dB
		2.2 to 2.7 GHz	17	20		dB
Voltage Standing Wave Ratio, all ports	VSWR	Referenced to 50 Ω, 0.1 to 2.7 GHz		1.2:1	1.5:1	-
Harmonic RF1 or RF2 to ANT	Harm	f _o = 0.1 to 2.7 GHz, PIN = +26 dBm,		-55		dBm

Table 4. FM1630C Truth Table

State	Active Path	VCTL (Pin 6)
0	ANT to RF1	0
1	ANT to RF2	1

Note: "1" = 1.20 V to 3.3 V. "0" = 0 V to +0.4 V.

Evaluation Board Description

The FM1630C Evaluation Board is used to test the performance of the FM1630C SP2T Switch. An Evaluation Board schematic diagram is provided in Figure 3.

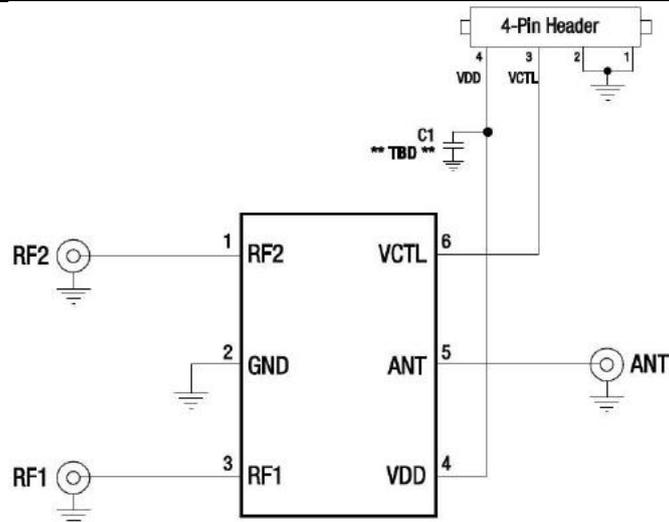


Figure 3. FM1630C Evaluation Board Schematic

Package and Handling Information

Instructions on the shipping container label regarding exposure to moisture after the container seal is broken must be followed. Otherwise, problems related to moisture absorption may occur when the part is subjected to high temperature during solder assembly.

THE FM1630C is rated to Moisture Sensitivity Level 1 (MSL1) at 260 °C. It can be used for lead or lead-free soldering. Care must be taken when attaching this product, whether it is done manually or in a production solder reflow environment. Production quantities of this product are shipped in a standard tape and reel format.

Package dimensions for the FM1630C are shown in Figure 4 and Table 5

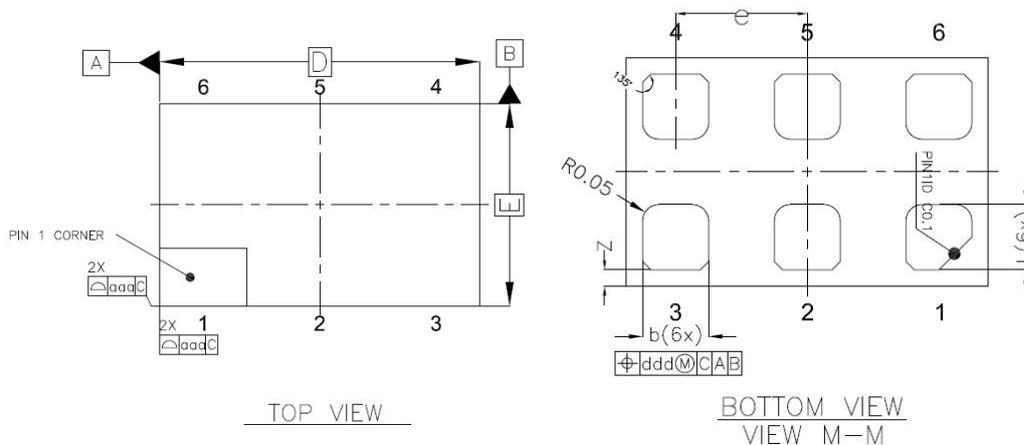


Figure 4. FM1630C Package Dimension

Table 5 FM1630C Package Dimension parameter

SYMBOL	PARAMETER		
	MIN	NOR	MAX
A	0.4	0.45	0.5
A2			0.05
A3	0.25	0.30	0.35
e	0.40BSC		
D	0.65	0.70	0.75
E	1.05	1.10	1.15
aaa	0.10		
ccc	0.05		