
Description

The CXM3645ER is a high power and ultra-high linearity DPDT switch for wireless communication systems. The CXM3645ER can be used for SVLTE and carrier aggregation requiring very high linearity. This IC has a 1.8 V CMOS compatible decoder. The Sony GaAs junction gate pHEMT (JPHEMT) MMIC process is used for low insertion loss and high linearity. (Application: LTE/CDMA/GSM/UMTS Handsets and mini base-stations)

Features

- ◆ Very Low Insertion loss: 0.23dB (Typ.) (Cellular Band)
0.35 dB (Typ.) (IMT2000)
- ◆ Ultra-high linearity: IIP3 = 82dBm (Min.) for SVLTE
2f0 = -78dBm(Max) at Band13, Pin=25dBm
3f0 = -95dBm (Typ.) at Band17, Pin=25dBm
- ◆ Low voltage operation: $V_{DD} = 2.5\text{ V}$
- ◆ No DC blocking capacitors required on RF ports
- ◆ 2 Control input
- ◆ Small package size: VQFN-18 pin (2.4 mm × 2.0 mm)
- ◆ Lead-Free and RoHS compliant

Structure

GaAs JPHEMT MMIC switch, CMOS decoder

Moisture Sensitivity

Moisture Sensitivity Level for this part is MSL= 2

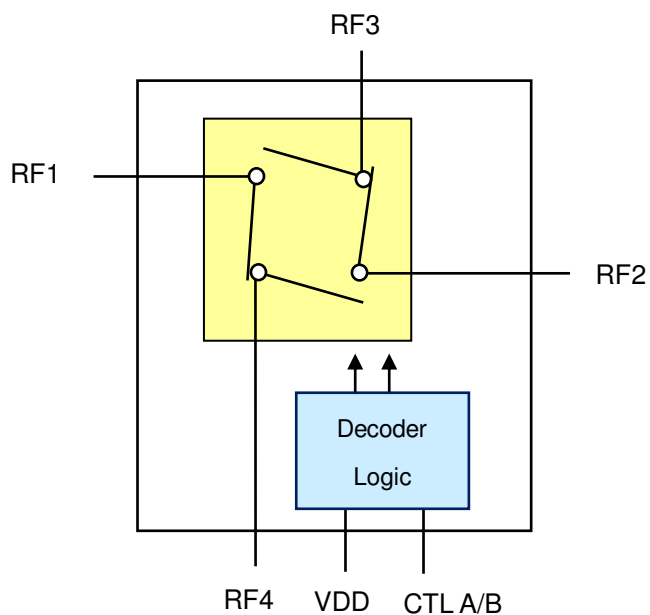
Absolute Maximum Ratings

◆ Bias voltage	V_{DD}	4	V	($T_a = 25\text{ }^{\circ}\text{C}$)
◆ Control voltage	V_{ctl}	4	V	($T_a = 25\text{ }^{\circ}\text{C}$)
◆ Maximum input power		36	dBm	(Duty cycle = 12.5 to 50 %, $T_a = 25\text{ }^{\circ}\text{C}$)
◆ Operating temperature	T_{opr}	-35 to +90	$^{\circ}\text{C}$	
◆ Storage temperature	T_{stg}	-65 to +150	$^{\circ}\text{C}$	

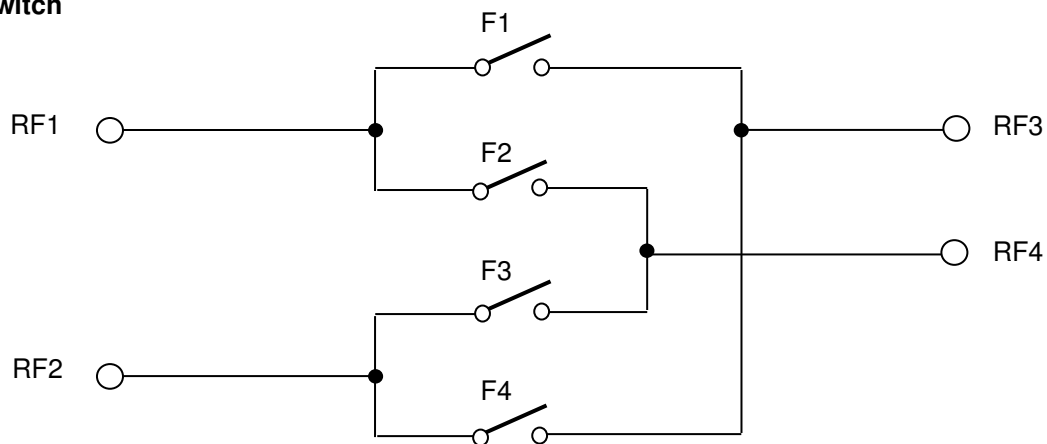
This IC is ESD sensitive device. Special handling precautions are required.

Block Diagram

DPDT Antenna Switch



MMIC Switch



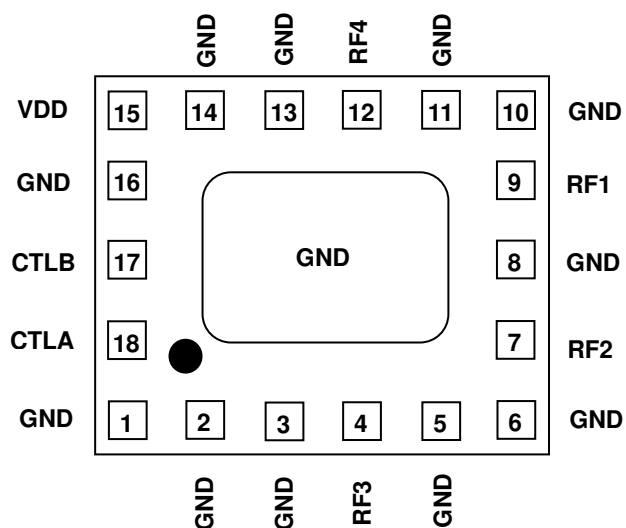
Truth Table

CTL A	CTL B	Active path	F1	F2	F3	F4
L	L	RF1-RF4 RF2-RF3	OFF	ON	OFF	ON
L	H	RF1-RF3 RF2-RF4	ON	OFF	ON	OFF
H	L	RF1-RF4 RF2, RF3 Off	OFF	ON	OFF	OFF
H	H	RF1-RF3 RF2, RF4 Off	ON	OFF	OFF	OFF

Pin Configuration

VQFN-18P PKG (2.4mm x 2.0mm)

(Top View)



DC Bias Condition

Parameter	Min.	Typ.	Max.	Unit
V_{DD}	2.5	2.7	3.3	V
Vctl (H)	1.35	1.8	3.3	
Vctl (L)	0	—	0.45	

Target Electrical Characteristics

(Ta = 25 °C, V_{DD} = 2.5 V, V_{ctl} = 0/1.8 V)

Item	Symbol	Path	Condition	Min.	Typ.	Max.	Unit
Insertion loss	IL	RF1-RF4 RF2-RF3	*1, *2, *3, *7, *9	—	0.23	0.33	dB
			*4, *5, *8, *10	—	0.35	0.45	
			*6	—	0.47	0.62	
		RF1-RF3 RF2-RF4	*1, *2, *3, *7, *9	—	0.23	0.33	
			*4, *5, *8, *10	—	0.35	0.45	
			*6	—	0.47	0.62	
		RF1-RF4 (RF2, RF3 Off)	*1, *2, *3, *7, *9	—	0.23	0.33	dB
			*4, *5, *8, *10	—	0.35	0.45	
			*6	—	0.47	0.62	
		RF1-RF3 (RF2, RF4 Off)	*1, *2, *3, *7, *9	—	0.23	0.33	
			*4, *5, *8, *10	—	0.35	0.45	
			*6	—	0.47	0.62	
Isolation	ISO	RF1-RF4 RF2-RF3	*1, *2, *3, *7, *9	20	23	—	dB
			*4, *5, *8, *10	14	16.5	—	
			*6	12	14.5	—	
		RF1-RF3 RF2-RF4	*1, *2, *3, *7, *9	20	25	—	
			*4, *5, *8, *10	14	18.5	—	
			*6	12	16.5	—	
		RF2-RF3 (RF1-RF4 Active)	*1, *2, *3, *7, *9	16	19	—	dB
			*4, *5, *8, *10	10	12.5	—	
			*6	8	10.5	—	
		RF2-RF4 (RF1-RF3 Active)	*1, *2, *3, *7, *9	16	19	—	
			*4, *5, *8, *10	10	12.5	—	
			*6	8	10.5	—	
VSWR	VSWR	All ports in active paths	700 to 2700 MHz	—	—	1.5	—
Harmonics	2f ₀	RF1-RF4, RF3 RF2-RF3, RF4	*7	—	-60	-45	dBm
	3f ₀			—	-61	-45	
	2f ₀		*8	—	-58	-50	
	3f ₀			—	-68	-55	
	2f ₀		*3, *4, *6	—	—	-60	
	3f ₀			—	—	-65	
	2f ₀		*2	—	-81	-78	
	3f ₀		*1		-95	-85	