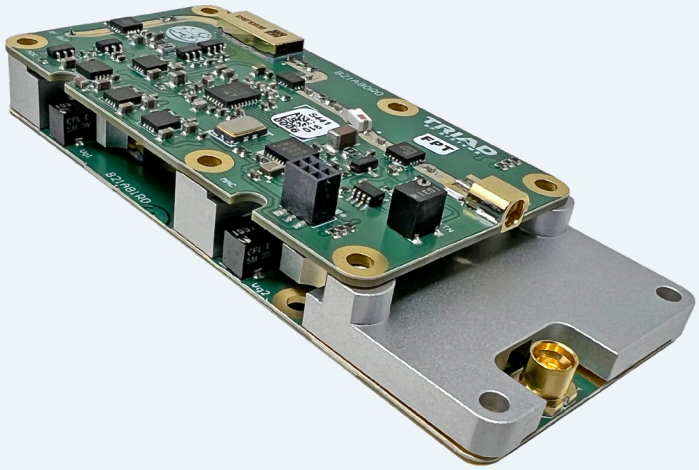


Innovation for Low Earth Orbit

The TFTA1010 is a highly integrated, extremely low SWaP S-Band to X-Band frequency converter card. It has been designed to fit into half the space of a standard CubeSat card. It allows CubeSat designers to operate their link in the X-Band with existing S-Band hardware. Upconversion of the target radio system only requires an RF input, and no external oscillator reference is required for simple, seamless integration.

TFTA1010

TABLE OF CONTENTS

TFTA1010 FEATURES

- Complete 1/2 card converter assembly with internal synthesizer and reference
- Forward output power detection
- Phase Noise, Spurious / Harmonic Performance suitable for LEO RF communications links
- Low DC current draw for power sensitive applications
- UART communications for RF output power, DC current draw, and temperature reporting
- UART controllable on/off control and thermal shut-off thresholds

CHARACTERISTICS/SPECIFICATIONS

TX RF Performance Specifications

Parameter	Min.	Typ.	Max	Unit	Notes
Operating Frequency (Input)	2125	—	2625	MHz	
Operating Frequency (Output)	8000	—	8500	MHz	
Psat Power Output	—	35	—	dBm	
Conversion Gain (Linear)	28	—	30	dB	
Conversion Gain (Psat)	25	—	28	dB	
CW Input Power to drive to PSat	—	+9	—	dBm	
Gain Flatness (Peak to Peak)	—	1.5	2	dB	
Temperature dependant gain fluctuation	—	—	+/-1.5	dB	
Input Return Loss	—	-15	—	dB	
Maximum Input Power	—	—	+16	dBm	
2nd Harmonic	—	—	-60	dB	
3rd Harmonic	—	—	-60	dB	
Spurious	—	—	-30	dBm	

Electrical Specifications

Parameter	Min.	Typ.	Max	Unit	Notes
Supply Voltage Range	6.5	7	7.5	VDC	Supply voltage directly tied to MMIC devices through MOSFET switch. All performance data is based on 7.0V operation. Lower voltage may yield lower RF performance.
Quiescent Current Draw (Disabled)	—	.02	—	A	
Quiescent Current Draw (Enabled)	—	2.7	—	A	
Operating Current Draw	—	3.1	—	A	
ON/OFF Control Enabled (High)	—	+5	—	VDC	5V TTL Levels
ON/OFF Control Disabled (Low)	—	0	—	VDC	5V TTL Levels

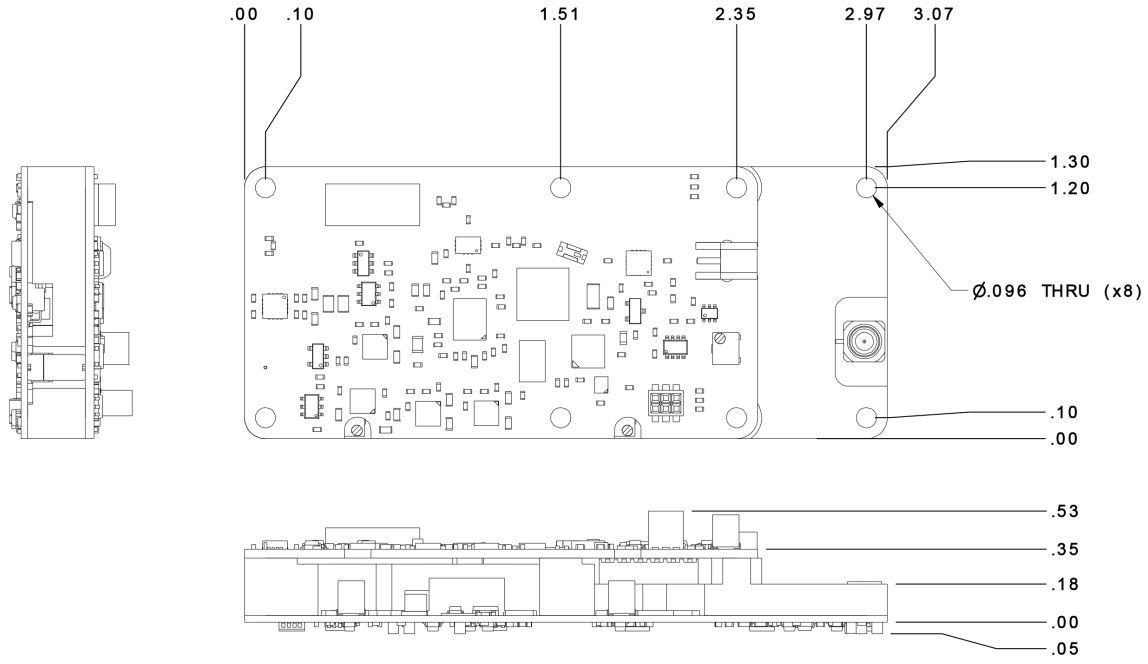
Environmental Specifications

Parameter	Min.	Typ.	Max	Unit	Notes
Operating Temperature	-40	—	+85	°C	Amplifier Baseplate Temperature -tested on a .150" thick aluminum test fixture.
PA Shut-off Temperature	—	+90	—	°C	
Shock / Vibration	MIL-STD-810			—	

Mechanical Specifications

Parameter	Value	Unit	Notes
Dimensions	3.07 x 1.3 x 0.55 (77.98 x 33.02 x 13.97)	in (mm)	L x W x H
Input RF Connectors	MMCX -F	Connector Type	Mating Connector Type: MMCX -M
Output RF Connectors	SMP Vertical-M	Connector Type	Mating Connector Type: SMP Vertical -F
DC/Control Connector	Omnetics PZN A79643-001	Part Number	Mating Connector PN: Omnetics A79640-001
Mounting	2-56 Through Holes	—	See Mechanical Drawing Below
Weight	1.2 (34.02)	oz (g)	

MECHANICAL DRAWING



DC/CONTROL CONNECTORS

DC Connector
(Omnetics PN: PZN A79643-001)

Pin	Description	Type	I/O	Notes
1	ON/OFF	Input	Input	High = Enabled, Low = Disabled
2	UART	Digital	Output	uP Interface (TX)
3	UART	Digital	Input	uP Interface (RX)
4	GND	Power	Input	Ground
5	GND	Power	Input	Ground
6	GND	Power	Input	Ground
7	GND	Power	Input	Ground
8	GND	Power	Input	Ground
9	GND	Power	Input	Ground
10	GND	Power	Input	Ground
11	+VDC	Power	Input	Supply Voltage
12	+VDC	Power	Input	Supply Voltage
13	+VDC	Power	Input	Supply Voltage
14	+VDC	Power	Input	Supply Voltage
15	+VDC	Power	Input	Supply Voltage
16	+VDC	Power	Input	Supply Voltage
17	+VDC	Power	Input	Supply Voltage
18	+VDC	Power	Input	Supply Voltage
19	GND	Power	Input	Ground
20	GND	Power	Input	Ground

CABLE OPTIONS

For available cable options, please contact us for inquiries and pricing.