



Product Specification

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20 GHz Analog RF over Fiber Transmitter

Part #BBATX-20-FL-FC

PRODUCT FEATURES

- Bandwidth: DC to 20 GHz
- Output Power >13 dBm (20 mW)
- Noise Figure <22 dB at 10 GHz
- Very High Linearity, High Dynamic Range, High RF Saturation
- Fully integrated module with all electronics and optical components



APPLICATIONS

- Broad band RF over fiber – distances up to 10 km
- Antenna remoting for wireless systems, electronic sensors, and networks
- RF over fiber systems that require high linearity, robust, compact solutions
- High frequency phase interferometry RF systems

DESCRIPTION

This product is a high linearity, 20 GHz analog RF over Fiber (RFoF) optical transmitter which is part of a high performance solution for RF remoting. It is a self-contained, compact module that includes ultra-low noise driver electronics, low RIN laser with shot noise performance, and high performance modulator. The transmitter can be operated either by an on/off switch using predefined settings or through a built-in GUI that enables the user to control all internal components (i.e. laser, modulator, and built-in test). The transmitter offers DC-20 GHz RF instantaneous bandwidth which, when coupled with APIC's high responsivity and linearity receivers, offers unmatched RFoF link performance.

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Minimum	Maximum	Units	Condition/Comments
Storage Temperature		-55	85	°C	
Operating Temperature		-40	75	°C	
Maximum RF Input Power	P_{RF}		26	dBm	
Operating Voltage	V_{CC}	14	16	V	
Operating Current	I_{CC}		2	A	
ESD			±500	V	

OPTICAL AND ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Min.	Typ.	Max.	Units	Condition/Comments
Operational Wavelength	λ	1530		1565	nm	Factory ordered at selected ITU wavelengths
Optical Output Power		20	25		mW	$I=I_{op}$, Modulator at quadrature
Output power flatness	P_{flat}	-0.5		0.5	dB	Over full temperature range; Modulator at quadrature
Laser Linewidth			250	500	KHz	At Factory Setting, no modulation
Relative Intensity Noise	RIN		-168	-165	dB/Hz	Over 50 MHz to 20 GHz at $I=I_{op}$
Side Mode Suppression	SMSR	40	50		dB	At Factory Setting
Laser Threshold Current	I_{th}		13	16	mA	At room temperature
Laser Operating Current	I_{op}		500	550	mA	CW operation
Optical Return Loss	ORL	30	45		dB	

RF SPECIFICATIONS

Parameter	Symbol	Min.	Typ.	Max.	Units	Condition/Comments
RF Bandwidth	f_{3dB}		20	20	GHz	3 dB RF roll off
RF Gain at 10 GHz	G	-10	-8		dB	
Noise Figure	NF		22	23	dB	At 10 GHz, with APIC ARX
Spur-Free Dynamic Range	SFDR	113	114		dB/Hz ^{2/3}	At 10 GHz, with APIC ARX
Third Order Intercept Point	IIP3	19	20		dBm	At 10 GHz, with APIC ARX
Second Order Intercept Point	IIP2	46	53		dBm	At 2 GHz with APIC ARX
1 dB Compression Point	P1dB	11	12		dB	At 10 GHz with APIC ARX
Phase Stability	PS		1	2	deg	Measured over 1 Hour at 10 GHz
Return Loss	S_{11}		10		dB	From DC to 20 GHz

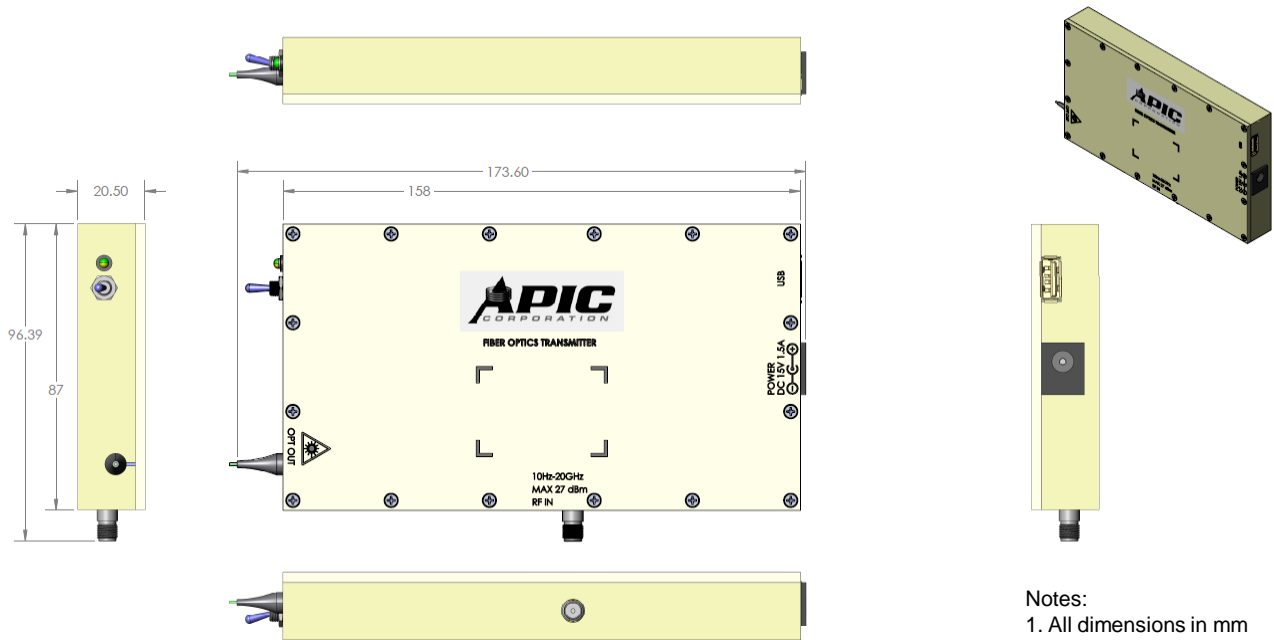
MECHANICAL SPECIFICATIONS

Parameter	Symbol	Minimum	Maximum	Units	Condition/Comments
Height	H		20.5	mm	
Length	L		173.6	mm	Main Body Dimensions
Width	W		87	mm	
RF Connector					SMA (Female)
Electrical Connector Type (Power)					2.1mm ID /5.5mm OD, for 15 V, 2 A DC Source
Package Heat Flow					Package Base
Fiber Pigtail Length		0.93		m	Polarization-Maintaining Fiber
Pigtail Termination					FC/APC

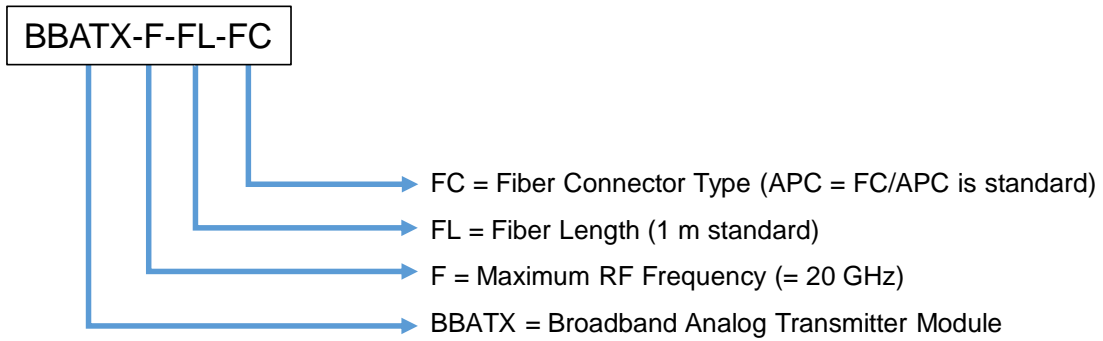
ENVIRONMENTAL SPECIFICATIONS (Preliminary, Qualification in Progress)

Parameter	Minimum	Maximum	Units	Condition/Comments
Operating Temperature	0	+65	°C	Case temperature
Storage Temperature	-40	+85	°C	
Operating Humidity	0	80	% RH	
Reliability Performance	40,000		hours	

MECHANICAL DRAWING



ORDERING INFORMATION



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