

## Features

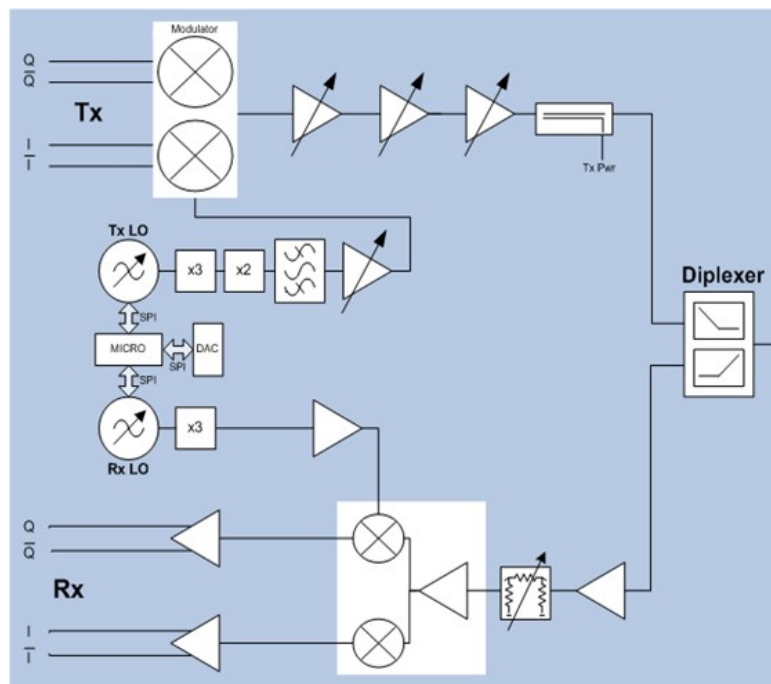
- Fully integrated 71/81 to 76/86 GHz modules
- High Tx output power
- 2GHz baseband bandwidth
- Low phase noise  $-112\text{dBc/Hz}$  at 1MHz
- Supports 256QAM modulation
- Integrated Diplexer
- Single T/R port for antenna interface
- Single connector modem interface
- 100% tested- ODU ready
- Small Form Factor
- Highly linear Rx

## Description

Orpheus E-Band transceiver modules provide a turn-key solution for carrier grade mobile backhaul applications. Each module contains all the transmit and receive functions necessary for the RF section of an E Band link and provides a simple connection to a high data rate full duplex modem. The integrated diplexer connects directly to an antenna of choice via a standard WR12 interface. Internal, low phase noise VCOs are settable via an SPI interface in 31.25MHz steps to support ECC/ITU channel arrangements

- Proven system performance — 10 Gbps demonstrated with spectral efficient 256QAM modulation.
- Field proven technology — tens of thousands of Filtronic millimetre wave transceivers deployed worldwide.

Orpheus modules are designed for easy incorporation into ODUs for rapid time to market with minimal customer engineering resource.



Orpheus transceiver block diagram



## Outline Specification

Over Baseplate operating temperature -33 to +75C

All RF parameters referenced to antenna port (inclusive of diplexer loss)

Parameter	Note	Min	Typ	Max	Units
Tx Frequency	TA 406	71		76	GHz
	TA 407	81		86	
Baseband Bandwidth				2.0	GHz
Tx Baseband input power		-17		-7.5	dBm
Tx Power control range		20			dB
$P_{SAT}$			22		dBm
Tx ALC accuracy		-2		2	dB
Output IP3 @ 16dBm		23	29		dBm
I/Q Gain imbalance	Tx and Rx	-3		+3	dB
I/Q Phase imbalance	Tx and Rx	-10		+10	degrees
I/Q impedance - differential	Tx and Rx		100		Ohms
Tx LO Cancellation			-30	-5	dBc
Tx Sideband suppression			-40	-20	dBc
Rx Frequency	TA 406	81		86	GHz
	TA 407	71		76	
Rx Noise Figure	High gain mode		7	10	dB
Rx Gain High mode		22	25	28	dB
Rx Gain Low mode		14.5	17.5	20.5	dB
Rx Gain accuracy reported over SPI		-1.5		+1.5	dB
RF input power				-23	dBm
Input IP3	Low Gain mode	-10	-7		dBm
Phase Noise	100kHz			-89	dBc/Hz
	1MHz			-112	
LO frequency step	Tx and Rx	31.25			MHz

## Power Supplies

Voltage (V)	Max Current (mA)	Tolerance (±)	Abs' max voltage (V)
5.1	2850	2%	5.5
3.3	150	2%	3.6
2.8	800	2%	3.0
18	25	2%	20
-5	50	2%	-5.5



### Connector pin out

The interface between the Filtronic E-band Module and the customer modem is a single 50-way connector. This connector is used for all communication between the module and modem; DC power, baseband data and control signals.

Pin number	Description	Description	Pin number
1	5.1V	5.1V	2
3	5.1V	5.1V	4
5	GND	GND	6
7	GND	GND	8
9	-5V	3.3V	10
11	GND	3.3V	12
13	18V	GND	14
15	GND	GND	16
17	GND	2.8V	18
19	GND	2.8V	20
21	GND	GND	22
23	GND	GND	24
25	GND	Txl	26
27	Rxlbar	GND	28
29	GND	Txlbar	30
31	Rxl	GND	32
33	GND	TxQ	34
35	RxQ	GND	36
37	GND	TxQbar	38
39	RxQbar	GND	40
41	GND	GND	42
43	GND	RST-SBWD	44
45	SPARE	SPI_CS_RFM	46
47	Connected	SPI_MOSI	48
49	SPI_CLK	SPI_MISO	50

### Environmental

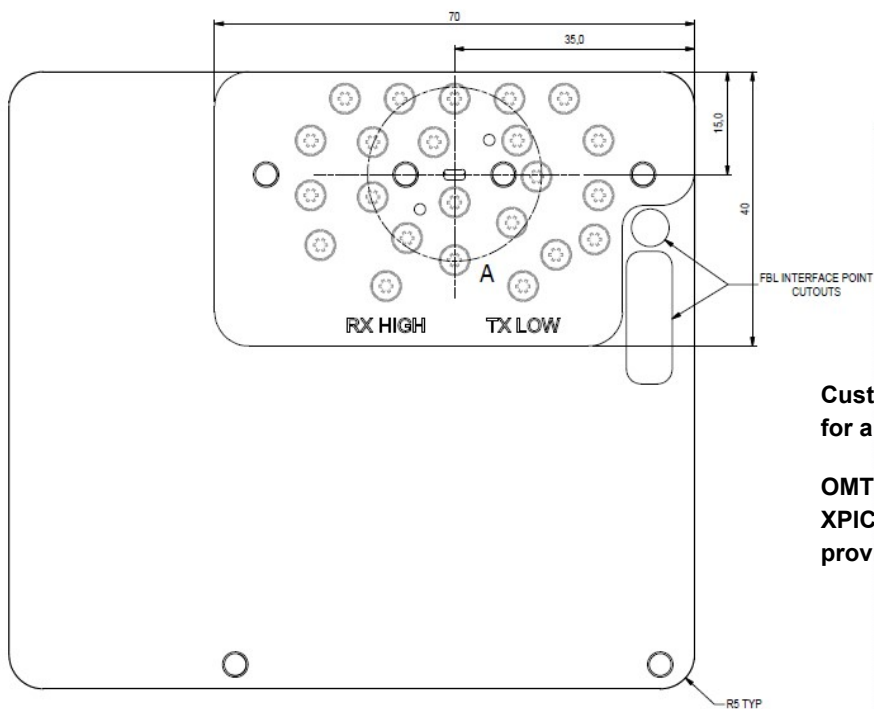
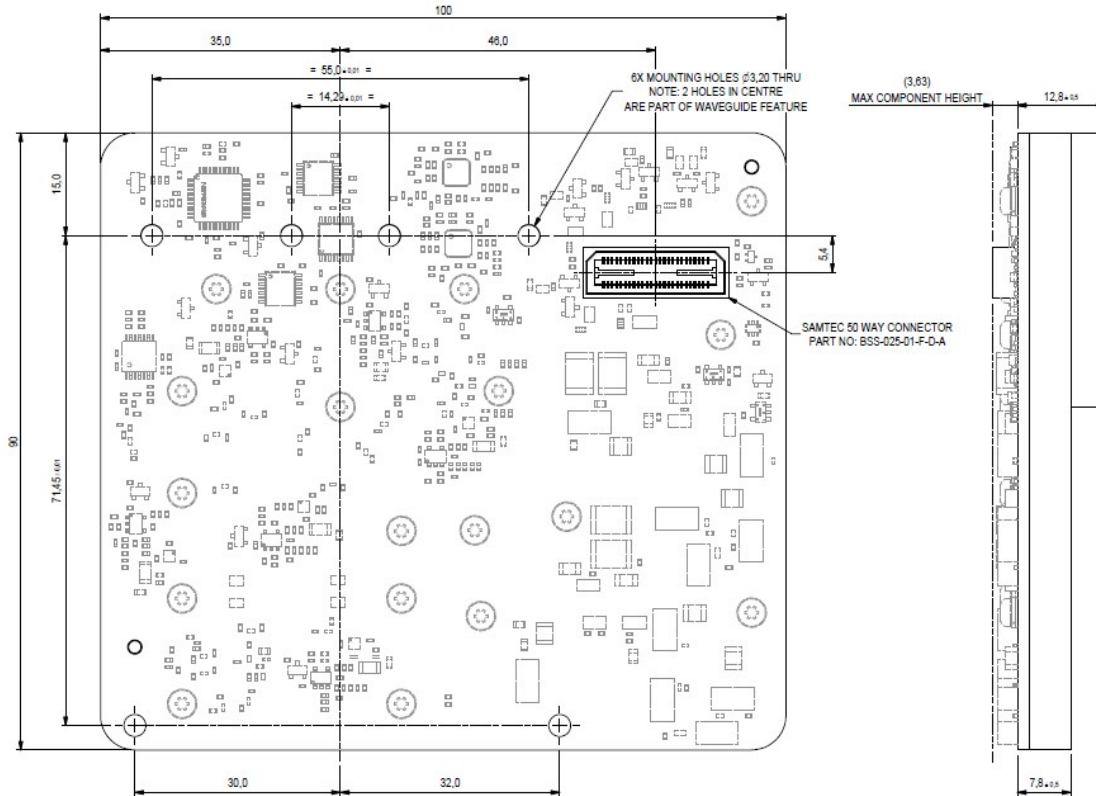
Parameter	
Operating Temperature	-33 to 75 °C
Storage Temperature	-45 to +80 °C
Mechanical shock and vibration	ETS 300 019-2-4 Class 4M3
MTBF	>10 <sup>6</sup> Hours (per Bellcore TR-332 with ambient temperature of +40°C )
ROHS & REACH	COC for ROHS & REACH Compliance available

# Orpheus

## TA406 & TA407 E Band Transceivers



### Mechanical Outline



Custom adapters can be provided for all popular antennas.

OMT and Polariser options for XPIC applications may also be provided