

RTM 10 Channel Down-Converter.

Data Sheet

DRTM-DWC10

Applications

- Telecommunication
- Automation industry
- Civil aviation
- Accelerators
- Research & development



Features

- Double width MTCA.4, Rear-Transition Module (RTM), Class A1.1 compatible
- 10 channel high-frequency down-conversion from 700MHz – 4GHz
- Short-term AM, PM stability
< 0.005%, <10fs (rms) [10Hz,1MHz]
- Supports various intermediate frequencies between 5MHz and 65MHz
- Switchable front-end attenuators
- LO, CLK from front panel or RF-backplane
- On board LO power level monitor
- On board user I2C support
- RoHS compliant
- Options:
 - RF-backplane support
 - DC-channel input
 - Channel isolation enhancement

The DRTM-DWC10 is a ten channel high frequency down-converter RTM module compliant with the MTCA.4 specification. The unit operates in the L-, S-band at input center frequencies from 700MHz – 4GHz band. It offers an excellent amplitude and phase short-term stability of typically <0.005% and <10fs (rms) in the range of 10Hz to 1MHz*.

Each output intermediate frequency of the DRTM-DWC10 is fully differential available at the RTM Zone 3 connector. The signals can be readout by any Class A1.1 compatible AMC digitizer board.

The DRTM-DWC10 offers switchable front-end power level attenuators for an accurate full-scale operation of AMC digitizers. The unit supports LO and CLK input signals externally from the front panel as well as internally from an RF-backplane. The module offers an on board LO power level monitor and a user I2C interface for general purpose.

DESY offers the DRTM-DWC10 for licensing to industry. DESY can modify this product to meet special customer requirements.

*Measured at 1.3GHz, 3GHz, 3.9GHz



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Technical Specifications

Architecture			
Physical		Dimensions	Double width, Mid-Height with Full-Height option Width: 5.486” (148.5mm) Depth: 7.110” (180.6mm)
Standards		MTCA.4 Module management	Rear-Transition-Module (RTM) IPMI Version 2.0, MMC V1.0 compatible
Compatibility		Zone3 classification RF-backplane support Required EMI classification Compatible AMC products	Class A1.1 Yes not defined yet SIS8300, DAMC-DS800, AMC520
Configuration			
Type	RTM Down-Converter	Number of channels Frequency range	10 L-, S-band 700MHz - 4GHz 1.3GHz, 3.0GHz, 3.9GHz (tested)
Electrical properties		Power consumption Short-term amplitude stability Short-term phase stability Noise figure (SSB) Spectral purity RF-input attenuation Non-linearity Channel isolation Intermediate spurious Total latency	<15W 0.003% in the range [10Hz, 1MHz] at 1.3GHz 4fs (rms) in the range [10Hz, 1MHz] at 1.3GHz typical 12dB < -155dBc/Hz for offset frequencies > 10kHz 0dB ... +31.5dB in 0.5dB steps < -55dBc, <1% error, nom. input power level < -65 ... -90dB, optional enhancement possible < -80dB TBD
Connectivity			
Inputs	RF-inputs (CH1...CH8)	Front panel Connector type Impedance / Coupling Return loss Maximum input power level Input 1dB compression	8 channels FBM multi-coax, single-ended (FCT - FM8W8, FBM022154MR) 50Ω / AC < -10dB +15dBm (for 0dB attenuation) +9dBm (for 0dB attenuation)
	RF-input (CH0)	Front panel Connector type Impedance / Coupling Return loss Maximum input power level Input 1dB compression	1 channel SMA, single-ended 50Ω / AC < -10dB +15dBm (for 0dB attenuation) +9dBm (for 0dB attenuation)
	DC-input (CH0)	Front panel Connector type Impedance / Coupling Frequency range Return loss	1 channel SMA, single-ended 50Ω / DC DC – 320MHz (-3dB bandwidth) < -15dB
	RF-input (CH9)	Front / Rear panel Connector type Impedance / Coupling Return loss Maximum input power level Input 1dB compression	1 input, optional jumpered to RF-backplane SMA, single-ended 50Ω / AC < -15dB +15dBm (for 0dB attenuation) +9dBm (for 0dB attenuation)

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Technical Specifications (Continued)

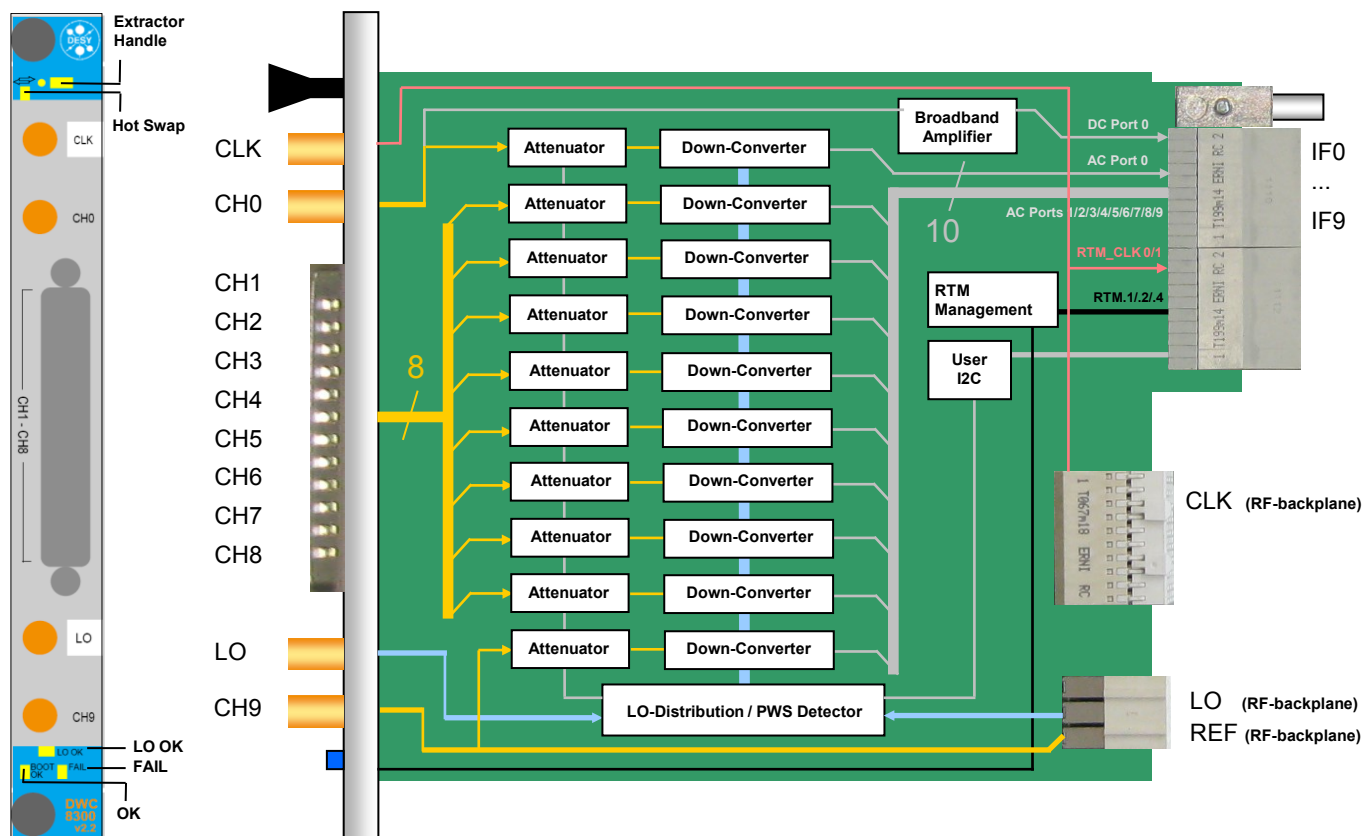
Connectivity, continued					
Outputs	LO-Input (LO)	Front / Rear panel	1 input, optional jumpered to RF-backplane		
		Connector type	SMA type, single-ended		
		Impedance / Coupling	50Ω / AC		
		Return loss	< -10dB		
		Maximum input power level	+18dBm		
		Operating power level	+12dBm		
		CLK-input	Front / Rear panel	1 input, optional jumpered to RF-backplane	
	Connector type		SMA type, single-ended, 50Ω		
	Frequency range		5MHz ... 130MHz		
	Power level		+7dBm... +11dBm		
	Throughput		bias the AMC digitizer ADCs low jitter clocks		
	IF-outputs	Zone3		9 channels, AC-Ports	
				1 channel, AC-Port or DC-Port	
			Type	differential, 100Ω	
			Frequency range	5MHz ... 65MHz (tested)	
			Power level	+7dBm, 2V p-p differential, 100Ω	
			Throughput	bias the AMC digitizer ADCs inputs	
		CLK-outputs	Zone3	2 channels, RTM_CLK0, RTM_CLK1	
Type			differential, 100Ω		
Frequency range			5MHz ... 65MHz (tested)		
Power level			+3dBm... +7dBm at nom. CLK-input power level		
Throughput			bias the AMC digitizer ADCs low jitter clocks		
Grounding			Zone 3	Compatible to Class A1.1	DC-Ports 1...9 grounded
					RTM clocks 2,3,4,5 grounded
DAC outputs 0,1,2,3,4 unused open					
Other Features					
On board		LO-power level monitor	Yes, readout via user I2C Zone3		
		User I2C interface	Yes		
		User SFP-Support	No		
Interface		LEDs	IPMI management control, LO-power monitor		
		Mechanical	Hot swap ejector handle		
Environmental		Operating temperature	0 ... 50° C		
		Storage temperature	-40 ...+ 90° C		
		Relative humidity	5 to 90%, non-condensing		
		Weight	0.3kg		

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Functional Block Diagram and Front Panel



Options

DRTM-DWC10 - A - B - C - DEFG - H - J

A = RF input (CH0...CH9) operating frequency
xxxx = (0400...3900) MHz

B = LO input (LO) local frequency
xxxx = (0400...3900) MHz

C = IF-output (IF) intermediate frequency
xxx = (005...065) MHz

D = RF input / DC-input (CH0)
0 = AC Port0 used
1 = DC Port0 used

E = RF-input (CH9) source
0 = Front panel
1 = RF-backplane

F = LO-input (LO) source
0 = Front panel
1 = RF-backplane

G = CLK-input (CLK) source
0 = Front panel
1 = RF-backplane

H = Channel isolation enhancement
xx = dB attenuation value

J = Conformal Coating
0 = None
1 = Reserved

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