

### X-band to 720MHz Downconverters

INPUT SPECIFICATION		Options
1. RF tuning band:	7GHz to 9GHz (see model table)	
2. Connector:	SMA	N-Type
3. Impedance:	50Ω	
4. Return loss:	≥18dB	
OUTPUT SPECIFICATION		
5. Frequency range:	720MHz ±200MHz (520 to 920MHz)	
6. Connector:	SMA	
7. Impedance:	50Ω	
8. Return loss:	≥15dB	
9. 1dB compression point:	+10dBm	
10. Third order intercept:	+20dBm	
TRANSFER CHARACTERISTICS		
11. Gain:	25 to 45dB, adjustable in 0.1dB steps	(2)
12. Gain ripple:	over ±200MHz	≤1.5dB p.t.p. (2)
	over input band, 1GHz:	≤3dB p.t.p. (2) (3)
	over input band, 2GHz:	≤4dB p.t.p. (2) (3)
13. Gain stability, 0°C to 50°C:	±1dB	
	24hr. at constant temperature:	±0.1dB
14. Frequency stability, -10°C to +60°C:	1x10 <sup>-7</sup> from -10°C to +60°C	
	1x10 <sup>-8</sup> at constant temperature over 24 hrs.	
15. External reference:	10MHz, 0dBm	5MHz, 0dBm
16. Synthesiser step size:	1kHz	
17. Noise figure (full gain):	<17dB	
Spurii		
18. Image rejection:	> 50dB	(1)
19. In-band spurii (at 0dBm output):	< -55dBc	(1)
PHASE NOISE		
20. 10Hz:	<-45dBc/Hz	
21. 100Hz:	<-70dBc/Hz	
22. 1kHz:	<-80dBc/Hz	
23. 10kHz:	<-85dBc/Hz	
24. 100kHz:	<-95dBc/Hz	
25. 1MHz:	<-110dBc/Hz	
26. Mains related:	<-50dBc	
MISCELLANEOUS (Indoor units – D688-x)		
27. Power supply:	115V/230V ±10%	
	50/60Hz ±10%, 50VA	
28. Mechanical:	1U 19" frame, 500mm deep	
29. Temperature:	Operating: 0° to 50°C	
	Storage: -40° to 85°C	
30. Relative humidity:	Operating: 0 to 90%	
	Storage: 0 to 95%	
31. Summary alarm:	NO and NC dry relay contacts via rear mounted connector	
32. Summary alarm indication:	Front panel LED	
33. Remote control:	<ul style="list-style-type: none"> <li>• RS232 or RS422/RS485, connector D-type 9P F</li> <li>• Serial emulation over TCP/IP, connector RJ45</li> <li>• SNMP and HTTP over TCP/IP Ethernet, connector RJ45</li> </ul>	

**MISCELLANEOUS (Outdoor units – D688-xE)**

- 34. Power supply: 115V/230V ±10%  
50/60Hz ±10%, 50VA
- 35. Mechanical: Metal box, IP67 rating, 510x325x70mm
- 36. Temperature: Operating: -20° to +50°C  
Storage: -50° to +85°C
- 37. Relative humidity: Operating: 0 to 90%  
Storage: 0 to 95%
- 38. Summary alarm: NO and NC dry relay contacts via rear mounted connector
- 39. Summary alarm indication: Via serial remote interface
- 40. Remote control: RS232 or RS422/RS485
- 41. Connectors: In, out and External 10MHz are N-type

- Novella SatComs reserves the right to modify or amend the present specification without prior notice. While best efforts were used to ensure feasibility and adherence to spec figures, adjustments may be required.

(1) Measured at maximum gain.

(2) Gain and frequency dependant measurements must be performed using a calibrated scalar (or vector) analyser, minimum standard Agilent model 8757D. All cables must be calibrated and their losses taken into account. Failure to adhere to these industry standard practices will render measurements invalid. No claims under warranty for "Out of Spec" items will be accepted by Novella SatComs unless such procedures are rigorously adhered to.

(3) Ripple spec measurement does not include 200MHz segment below the lowest limit and above the highest.

**MODEL TABLE (a)**

Model	Input tuning band	Output (b)
D688-1 (D628)	7.0 - 9.0GHz (a)	720 ± 200MHz
D688-2	7.7 - 8.5GHz (a)	720 ± 200MHz
D688-3	8.0 - 8.4GHz (a)	720 ± 200MHz
D688-4	8.0 - 8.5GHz (a)	720 ± 200MHz
D688-5	8.0 - 9.0GHz (a)	720 ± 200MHz
D688-6	7.2 - 7.8GHz (a)	720 ± 200MHz
D688-7	7.945 - 8.945GHz <sup>(a)</sup>	720 ± 200MHz
D688-8	7.8 - 8.8GHz (a)	720 ± 200MHz
D688-9	7.7 - 7.9GHz (a)	720 ± 200MHz
D688-10	7.0 - 8.0GHz (a)	720 ± 200MHz
D688-11	7.75 - 8.4GHz (a)	720 ± 200MHz
D688-12	7.9 - 8.5GHz (a)	720 ± 200MHz

(a) Input frequencies are an illustrative sample. Any other values from 7GHz to 9GHz, usually in 50MHz steps, are possible.

(b) Other IF's and bandwidths possible.

**NOTE**

All Novella's frequency converter synthesisers are of the conventional phase-locked type. No DDS techniques or ICs are used. DDS synthesisers suffer from an inherent phase uncertainty (due to the inevitable residual frequency error) rendering them unsuitable for differential phase measurements used typically in satellite ranging and monopulse tracking systems which rely on differential phase measurements between two coherent signals processed by two downlink chains.