

**REVISIONS**

Rev	ECN	Description	Date	Approved
A	C52533	Production release	1/25/12	A.P.
B	C54040	Add rev b assy dwg	4/02/12	A.P.
C	C54343	Changed op. temp from +90 to +85, current consumption, water proof	5/8/12	A.P.



Approvals	Date	Bulkhead Antenna – 5V TNC GPS & GLONASS RoHS Compliant Trimble Specification			
DRAWN					
CHECKED		Sheet	Size	Drawing Number	Revision
ISSUED		1 of 5	A	<b>70228-20-SP</b>	<b>C</b>

TRIMBLE NAVIGATION LIMITED  
5V BULKHEAD  
GPS/GLONASS ANTENNA WITH LOW NOISE AMPLIFIER  
RoHS COMPLIANT

**Part Number 70228-20**

Part Number 70228-20-SP

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Sunnyvale, CA 94085

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SPECIFICATION FOR GPS/GLONASS ANTENNA WITH LOW NOISE AMPLIFIER  
RoHS COMPLIANT

ALL ELECTRICAL VALUES ARE DEFINED AT 25±15°C, 65±20 % RH, POWER HANDLING 1  
uWATT, AIR PRESSURE 960 ±100 HPA UNLESS OTHERWISE NOTED. PATCH  
CHARACTERISTICS ARE MEASURED WITH TEST GROUND PLANE IN AN ANECHOIC  
CHAMBER.

1.0 APPLICATION

THIS SPECIFICATION DESCRIBES THE ELECTRICAL AND MECHANICAL  
CONDITIONS OF THE TRIMBLE BULKHEAD ANTENNA, P/N 70228-20.

2.0 SYSTEM

THIS ANTENNA SYSTEM CONSISTS OF TWO FUNCTIONAL BLOCKS LISTED BELOW.

2.1 ANTENNA ELEMENT

2.2 LNA

SEE ATTACHED FIGURE

3.0 GENERAL

3.1 ENVIRONMENTAL CONDITIONS

3.1.1 OPERATING TEMPERATURE -40°C TO +85°C

3.1.2 STORAGE TEMPERATURE -40°C TO +85°C

3.1.3 RELATIVE HUMIDITY 65 ± 20% RH

3.2 ELECTRICAL SPECIFICATIONS

3.2.1 INPUT VOLTAGE 5.0V +/- 0.6V

3.2.2 CURRENT CONSUMPTION 16 +/- 3 mA (at 5.0 +/- 0.1 V)

3.2.3 OUTPUT CONNECTOR TNC (FEMALE). TORQUE CONNECTOR  
TO BASE WITH 10 IN-LBS.

3.3 MECHANICAL SPECIFICATIONS

3.3.1 MOUNTING NUT MOUNT

3.3.2 WATER PROOF IP67 with Rubber Cap on Connector

3.3.3 SHOCK 50G : VERTICAL AXIS

30G : ALL AXIS

3.3.4 VIBRATION 10 ~ 200Hz. LOG. SWEEP 3.0G

(SWEEP TIME : 15 MIN.), 3 AXIS

3.3.5 ANTI-COROSION BASED ON JIS Z 2371, SPRAY 5%

SALT WATER 35°C SHOULD NOT

CORRODE AFTER 96Hrs.

3.3.6 CONFIGURATION AND SEE MECHANICAL DRAWING

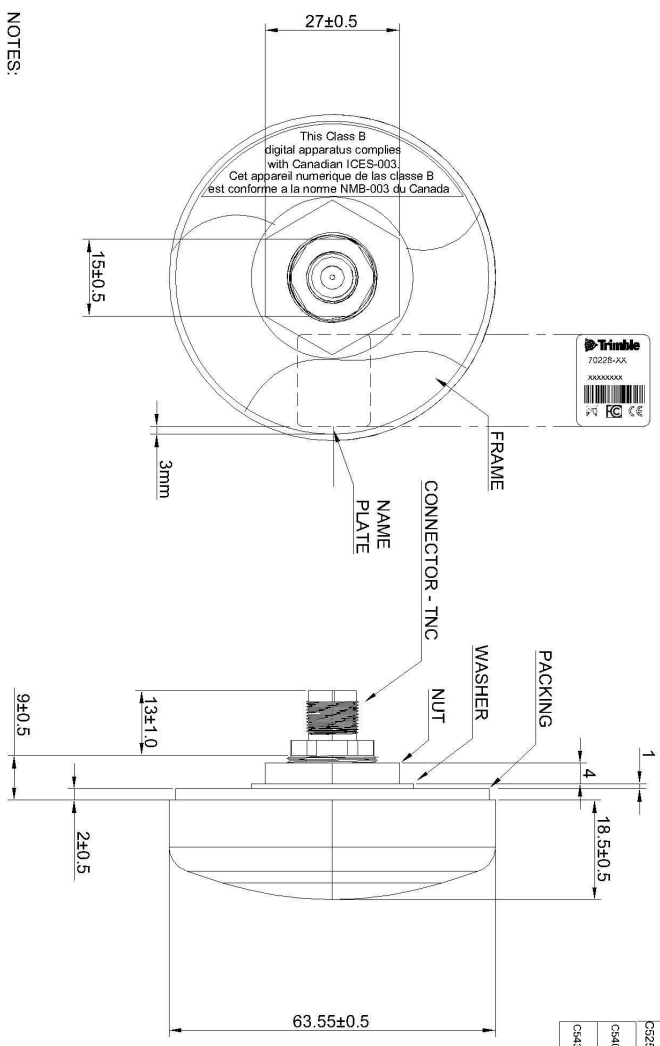
3.3.7 DIMENSION

3.3.7 WEIGHT 150g MAX.

SPECIFICATION FOR GPS/GLONASS ANTENNA WITH LOW NOISE AMPLIFIER

4.0	ANTENNA	
4.1	FREQUENCY RANGE	1575-1610 MHz
4.2	CENTER FREQUENCY	1593 MHz
4.3	BANDWIDTH (10dB Return Loss)	36 MHz TYP
4.4	GAIN	4.0 dBic TYP
4.5	POLARIZATION	RHCP
4.6	AXIAL RATIO	90° : 4.0dB MAX. 10° : 6.0dB MAX.
5.0	LNA	
5.1	FREQUENCY RANGE	1575 – 1615 MHz
5.2	CENTER FREQUENCY	1593 MHz
5.3	GAIN	30dB MIN.
5.4	NOISE FIGURE	2.0 dB TYP
5.5	OUT OF BAND REJECTION	$f_0=1,593\text{MHz}$ $f_0 \pm 20\text{MHz}$ 7dB MIN $f_0 \pm 30\text{MHz}$ 12dB MIN. $f_0 \pm 50\text{MHz}$ 20dB MIN. $f_0 \pm 100\text{MHz}$ 30dB MIN.
5.6	OUTPUT IMPEDANCE	50Ω
5.7	OUTPUT VSWR	2.5 MAX.
6.0	OVERALL SPECIFICATIONS (THROUGH ANTENNA, LNA, CABLE AND CONNECTOR)	
6.1	FREQUENCY RANGE	1575-1615 MHz
6.2	CENTER FREQUENCY	1593 MHz
6.2	GAIN	32 dBi MIN. (+25°C +/- 5°C)
6.3	NOISE FIGURE	2.0dB MAX. (+23°C) 2.5dB MAX. (+85°C)
6.4	OUTPUT IMPEDANCE	50Ω
6.5	VSWR	2.5 MAX.
6.6	OSCILLATION	NO OSCILLATION MUST BE FOUND IN BAND AND OUTBAND.
7.0	MTBF	TBD
8.0	RECOMMENDED STORAGE CONDITION AND STORAGE TERM	STORE IN ROOM CONDITION AS LISTED BELOW: TEMPERATURE -20°C~+45°C, HUMIDITY 80% MAX.
9.0	RELIABILITY TEST	TBD
10.0	EXTERNAL APPEARANCE	NO STAIN OR FLAW MUST BE FOUND.
11.0	DATA	GAIN (AT 5.0 ± 0.6V f=1593MHz) AND POWER CONSUMPTION AT ROOM TEMPERATURE.

REVISIONS				
ECN	REV	DESCRIPTION	DATE	APPROVED
CS2333	A	PRODUCTION RELEASE	1/28/12	D.C.
CS4040	B	ROTATE THE NAMEPLATE	3/7/12	AP
CS4343	C	ADDED CANADIAN FCC LABEL	5/14/12	AP



- NOTES:
1. LABEL TO BE 50 MICRON THK SILVER MAT ON POLYESTER FILM WITH PERMANENT ADHESIVE.
  2. PRINTING TO BE BLACK , UV PROTECTION, HELVETICA BOLD CONDENSED.
  3. SERIAL NUMBER TO BE 9 DIGITS CODED AS FOLLOWS  
XX Y ZZ WWWW/  
WHERE, XX = DATE (DAY) OF THE MONTH,  
Y = NUMBER OF THE MONTH 1-9-OCT+0, NOV=/N-DEC= D  
ZZ = YEAR AS 2009=09  
WWWW = ORIGINAL NUMBER OF THE UNIT PRODUCED ON THAT DAY ( IE 0001 THRU 9999 )

UNITS: DIMENSIONS SPECIFIED IN MILLIMETERS TOLERANCES ARE:	CONTRACT NO.	DATE
FRACTIONS: 00	Critical dimension Number in parentheses	1/28/12
DECIMALS: X ±.20 XX ±.05	APPROVALS	
ANGLES: ±1.0	DRAWN: AP	
DA: -1.0/VS	CHECKED	
MATERIAL:	ISSUED	
PAPER:	ALL DIMENSIONS IN mm	
DONOT SCALE DRAWING		



GSP/GLONASS ANTENNA

SIZE: TFSOM NO. B  
SCALE: 2X

DWG NO. 70228-20-AD

SHEET 1 OF 1

REV C

FILE: 70228-20-AD

DWG NO.	70228-20-AD
SHT.	1
REV.	