

Attachment2 Next Generation GPS Receiver Environmental Test condition

item	Contents										
Temperature range	Storage : -10°C ~ +40°C										
	Transportation : -20°C ~ +52°C										
	On-orbit non-ioeration: -30°C ~ +60°C (GPSP, GPSL) -30°C ~ +95°C (GPSA)										
	On-orbit operation : -15°C ~ +55°C (GPSP, GPSL) -30°C ~ +95°C (GPSA)										
Sine wave vibration		Qualification Test Level			Protoflight Test Level			Acceptance Test Level			
		Sweep: 2oct/min Max Amplitude: 12.7mmDA			Sweep: 4oct/min Max Amplitude: 12.7mmDA			Sweep: 4oct/min Max Amplitude: 12.7mmDA			
		Axis	Frequency[Hz]	Accel.[m/s ²]	Axis	Frequency[Hz]	Accel.[m/s ²]	Axis	Frequency[Hz]	Accel.[m/s ²]	
	GPSP	in-plane	5~31.27 31.27 ~ 100	12.7mmDA 245	in-plane	5~31.27 31.27 ~ 100	12.7mmDA 245	in-plane	5~27.97 27.97 ~ 100	12.7mmDA 196	
		out-of-plane	5 ~ 31.27 31.27 ~ 100	12.7mmDA 245	out-of-plane	5 ~ 31.27 31.27 ~ 100	12.7mmDA 245	out-of-plane	5 ~ 27.97 27.97 ~ 100	12.7mmDA 196	
	GPSA GPSL	in-plane	5~19.77 19.77 ~ 100	12.7mmDA 98	in-plane	5~19.77 19.77 ~ 100	12.7mmDA 98	in-plane	5~17.68 17.68 ~ 100	12.7mmDA 78.5	
		out-of-plane	5 ~ 27.96 27.96 ~ 100	12.7mmDA 196	out-of-plane	5 ~ 27.96 27.96 ~ 100	12.7mmDA 196	out-of-plane	5 ~ 25.01 25.01 ~ 100	12.7mmDA 156.9	
	Random vibration		time: 180 sec			time: 60 sec			time: 60 sec		
			Axis	Frequency[Hz]	PSD[m ² /s ⁴ /Hz]	Axis	Frequency[Hz]	PSD[m ² /s ⁴ /Hz]	Axis	Frequency[Hz]	PSD[m ² /s ⁴ /Hz]
			GPSP	All axis	20 - 80	+4.5dB/Oct	All axis	20 - 80	+4.5dB/Oct	All axis	20 - 80
80 - 267		70.0			80 - 267	70.0		80 - 267	35.0		
			267 - 413	-6dB/Oct		267 - 413	-6dB/Oct		267 - 413	-6dB/Oct	
			413 - 895	29.3		413 - 895	29.3		413 - 895	14.7	
			895 - 2000	-6dB/Oct		895 - 2000	-6dB/Oct		895 - 2000	-6dB/Oct	
			Overall:225 m/s ² rms			Overall:225 m/s ² rms			Overall:159 m/s ² rms		
GPSA		All axis	20 - 70	+6dB/Oct	All axis	20 - 70	+6dB/Oct	All axis	20 - 70	+6dB/Oct	
			70 - 260	68.2		70 - 260	68.2		70 - 260	30.3	
	260 - 400		-6dB/Oct	260 - 400		-6 dB/Oct	260 - 400		-6dB/Oct		
		400 - 1000	28.8		400 - 1000	28.8		400 - 1000	12.8		
		1000 - 2000	-8dB/Oct		1000 - 2000	-8dB/Oct		1000 - 2000	-8dB/Oct		
		Overall:223 m/s ² rms			Overall:223 m/s ² rms			Overall:149 m/s ² rms			
GPSL	All axis	20 - 80	+9dB/Oct	All axis	20 - 80	+9dB/Oct	All axis	20 - 80	+9dB/Oct		
		80 - 171	69.1		80 - 171	69.1		80 - 171	30.7		
		171 - 400	-3dB/Oct		171 - 400	-3dB/Oct		171 - 400	-3dB/Oct		
		400 - 900	28.8		400 - 900	28.8		400 - 900	12.8		
		900 - 2000	-8dB/Oct		900 - 2000	-8dB/Oct		900 - 2000	-8dB/Oct		
		Overall:209 m/s ² rms			Overall: 209 m/s ² rms			Overall: 139 m/s ² rms			
Shock	100 ~ 800[Hz]					+8 dB/oct					
	800 ~ 4000[Hz]					9800m/s ² (1000 G)					
Radiation	Resistance of total dose : above 300Gy(30kRad) (correspond to 7 years in LEO)										
	SEL: LET Threshold >60Mev/mg/cm ²										
	SEU: LET Threshold >50Mev/mg/cm ² *For components below the SEU threshold, countermeasures are adopted and its SEE rate calculation is analyzed.										
	SEE except SEL or SEU: Countermeasures are adopted and its SEE rate calculation is analyzed.										