VIAVI Solutions

Data Sheet

VIAVI
ATC-5000NG

NextGen ATC/DME Test Set and ADS-B Target Generator

Transmitter

Frequency	
Range	952 MHz to 1223 MHz
Resolution	100 kHz
Accuracy	2.5 ppm
Phase Noise	<-80 dBc/Hz @ 100 kHz
Power	
Range (Transponder)	+5 to -110 dBm
Resolution	0.1 dB
Accuracy @ 1030 MHz	±1 dB (+5 to -100 dBm)
	±3 dB (< -100 dBm)
Range (UAT, top antenna port only)	+5 to -100 dBm
Resolution	0.1 dB
Accuracy	±1 dB @ 978 MHz
Range (Multi-Receiver)	-20 to -90 dBm (Low Power Mode)
	-5 to -65 dBm (High Power Mode)
	-40 to -110 dBm (Very Low Power Mode)
Resolution	1 dB
Accuracy	±1 dB (+5 to -100 dBm)
	±3 dB (< -100 dBm) @978, 1030 and 1090 MHz
Range (DO-260B)	-20 to -90 dBm (Low Power Mode)
	-5 to -65 dBm (High Power Mode)
	-40 to -110 dBm (Very Low Power Mode)
Resolution	1 dB
Accuracy	±1 dB (+5 to -100 dBm)
	±3 dB (< -100 dBm) @ 1090 MHz
Range (DME, Top Port Only)	+5 to -110 dBm
Resolution	0.1 dB
Accuracy	±1 dB (-100 to +5 dBm)
	±3 dB (< -100 dBm)
	952 to 1223 MHz
Spectral Purity	
Harmonics	<-50 dBc
Spurious	<-55 dBc, 350 to 1800 MHz
Residual FM	250 Hz Peak
Phase Noise	<-80 dBc/Hz @ 100 kHz
DME Pulse Spectrum at ± 800 kHz Offset	<-52 dBc
Channels	
No. of Channels	2 (DME Option)
	4 (XPDR/UAT)
	6 (ADS-B Option)
Diversity	
Power	±20 dB
Resolution	0.1 dB
Accuracy	±1 dB
Timing	±1 µs
Resolution	25 ns
Accuracy	±10 ns

Transmitter (continued)

Modulation	
Pulse On/Off Ratio	>80 dB
Pulse Position (high speed rise/fall time mode)	
Mode A Interrogation P1-P3 Default	8.0 µs
Accuracy	±10 ns
Mode C Interrogation P1-P3 Default	21.0 µs
Accuracy	±10 ns
ATCRBS Interrogation P1-P2 Default	2.0 µs
Accuracy	±15 ns
ATCRBS Interrogation P3-P4 Default	2.0 µs
Accuracy	±15 ns
ATCRBS Interrogation Variation	±1.95 µs
Resolution	25 ns
Accuracy (P1-P3)	±10 ns
Accuracy (P1-P2 and P3-P4)	±15 ns
Mode S Interrogation P1-P2 Default	2.0 µs
Accuracy	±10 ns
Mode S Interrogation P1-P2 Variation	±1.95 µs
Resolution	25 ns
Accuracy	±10 ns
Mode S Interrogation P6 to SPR Default	1.25 µs
Accuracy	±15 ns
Mode S Interrogation P6 Variation	±1.95 µs
Resolution	25 ns
Accuracy	±15 ns
Mode S Interrogation P2 to SPR Default	2.75 µs
Accuracy	±15 ns
Mode S Interrogation SPR Variation	±1.0 µs
Resolution	25 ns
Accuracy	±15 ns
Mode S Interrogation P5 prior SPR Default	400 ns
Accuracy	±15 ns
Mode S Interrogation P5 Variation	±1.95 µs
Resolution	25 ns
Accuracy	±15 ns
Interference Interrogation Signal #1 (Relative to P1 Pulse)	-17.5 to 400 µs
Resolution	25 ns
Accuracy	±20 ns
Interference Interrogation Signal #2 (Relative to signal #1)	0 to 400 µs
Resolution	25 ns
Accuracy	±10 ns
Double/Interlace Interrogation	0 to 400 µs
Resolution	25 ns
Accuracy	±10 ns
DME P1 to P2 Default	12 or 30 µs
Accuracy	±50 ns
DME P1 to P2 Variation	DME X +7.9 µs to -2.5 µs
	DME Y +7.9 µs to -7.9 µs
Resolution	25 ns
Accuracy	±50 ns
Pulse Width (high speed rise/fall time mode)	
ATCRBS Interrogation P1/P2/P3 Default	0.8 µs
Accuracy	±10 ns
ATCRBS Interrogation P4 Short	0.8 µs
Accuracy	±10 ns
ATCRBS Interrogation P4 Long	1.6 µs
Accuracy	±10 ns
ATCRBS Interrogation P1/P2/P3/P4 Variation	0 to 1.95 µs for P1, P2 and P3, 0 to 2.75 µs for P4
Resolution	25 ns
Accuracy	±10 ns (PW ≥ 0.2 µs)
Mode S Interrogation P1/P2 Default	0.8 µs
Accuracy	±10 ns
Mode S Interrogation P1/P2 Variation	0 to 1.95 µs
Resolution	25 ns
Accuracy	±10 ns (PW ≥ 0.2 µs)
Mode S Interrogation P6 Short Default	16.25 µs
Accuracy	±10 ns
Mode S Interrogation P6 Long Default	30.25 µs
Accuracy	±10 ns
Mode S Interrogation P6 Variation	
P6 Overall	-0.5 to +1.45 µs (offset range)
Resolution	25 ns
Accuracy	±10 ns

Transmitter (continued)

Mode S Interrogation P5 Default	0.8 µs
Accuracy	±10 ns
Mode S Interrogation P5 Variation	0.2 to 1.95 µs
Resolution	25 ns
Accuracy	±10 ns
Interference Pulse Width	0.2 to 32.0 µs
Resolution	25 ns
Accuracy	±25 ns
DME P1/P2 Default	3.5 µs
Accuracy	±250 ns
DME P1/P2 Variation	3.5 to 9.0 µs
Resolution	25 ns
Accuracy	±250 ns
Pulse Rise/Fall Time	
Transponder	<50 / <50 ns
Accuracy	<50 ns
DME	2.0 / 2.5 µs
Accuracy	±25 µs
Pulse Amplitude	
ATCRBS Interrogation Variation (all pulses)	+9 to -19 dB
Resolution	0.1 dB
Accuracy	±0.5 dB
Mode S Interrogation Variation P2, P6 and P5 (SLS)	+9 to -19 dB
Resolution	0.1 dB
Accuracy	±0.5 dB
Interference	+9 to -19 dB
Resolution	0.1 dB
Accuracy	±0.5 dB
DME Echo	+6 to -15 dB
Resolution	0.1 dB
Accuracy	±0.5 dB
Interrogation Table/Burst Mode	
Unique Messages	1 to 1000
Interrogations/Burst	1 to 10K
Burst Spacing	0 to 20 s (0 s for single burst transmissions
Resolution	0.1 s
Accuracy	±100 ms
Bursts/Trigger	1, continuous or until stop command received

Block Transmissions	
Unique Messages	1 to 2000 messages
No. of Blocks	1 to 50,000 or infinite
Interrogation Spacing within Block	User defines spacing between interrogations: Min: 10 µs Max: block period -120 µs
Resolution	1.0 µs
Period	10 ms to 90 seconds
Resolution	1 ms
Accuracy	±1 ms
PRF	
Single Interrogation	1 to 10,000 Hz
Resolution	1 Hz
Accuracy	0.1% of setting
Interrogation Table (Continuous and Burst)	1 to 10,000 Hz
Resolution	1 Hz
Accuracy	0.1 % of setting
Double Interrogation	
Each message	1 to 10 kHz
PRF	in sync or non-sync
Resolution	1 Hz
Accuracy	0.1% of setting
Interlace	1 to 10 kHz
Resolution	1 Hz
Accuracy	0.1% of setting
Interlace Ratio	
Ratio	1:1 to 1:1000
Suppressor Pulse	
XPDR	Position: 3.4 µs prior to P1 of interrogation Width: duration of transmission
Accuracy	±0.3 µs
DME	Position: 3.4 µs prior to P1 of reply, Width: 36 µs
Accuracy	±0.3 µs, ±2.0 µs for Width
Amplitude	>25 V (fixed)
DME Simulation	
Equalizing Pulse Pair	100 µs after ident pulse pair
Accuracy	±0.1 µs
Ident Frequency	1350 Hz
Accuracy	±0.02%
Dot Default	120 ms
Accuracy	±1 ms
Dot Variation	50 to 250 ms
Resolution	10 ms
Accuracy	±1 ms
Dash Default	360 ms
Accuracy	±1 ms
Dash Variation	150 to 750 ms
Resolution	10 ms
Accuracy	±1 ms

Transmitter (continued)

Space Default	150 ms
Accuracy	±1 ms
Space Variation	50 to 250 ms
Resolution	10 ms
Accuracy	±1 ms
Code Rate Default	30 s
Accuracy	±100 ms
Code Rate Variation	10 to 65 s
Resolution	0.1 s
Accuracy	±100 ms
Echo Range	30 nmi
Accuracy	±0.02 nmi
Range	-1 to 400 nmi
Resolution	0.01 nmi
Accuracy	±0.02 nmi
Velocity	0 to 10000 knots
Resolution	1 knot
Accuracy	±0.001% of setting
Acceleration	0 to 400 ft/s2
Resolution	1 ft/s2
Accuracy	±0.05% of setting
Squitter	0 to 8000 Hz
Resolution	1 Hz
Accuracy	10 Hz or 2%, whichever is greater
Reply Efficiency	0 to 100 %
Resolution	1%
Accuracy	±0.5%
RNAV	
X Channel Spacing	50 µs @ 0 nmi
Accuracy	±0.5 µs
Y Channel Spacing	56 µs @ 0 nmi
Accuracy	±0.5 µs
Width (X and Y)	7 µs
Accuracy	±1.0 µs

Receiver

VSWR	
<1.4 (952 to 1223 MHz)	
Max Input Power	
+60 dBm	
Operating Range	
XPDR, +17 to +60 dBm (1090 ±3 MHz)	
UAT (bottom antenna port only), +30 to +57 dBm (978 ±3 MHz)	
DME, +17 to +60 dBm (1020 to 1155 ±3 MHz)	
Receiver Decoding	
Messages	ATCRBS Interrogation and Replies
	Mode S Interrogations and Replies
	UAT Ground and Airborne Messages [UAT Option]
	DME Interrogations
Channels	
No. of Channels	2, Top/Bottom
Measurement	
Power	+17 to +60 dBm
XPDR	1090 ±3 MHz
DME	1025 to 1150 MHz
Resolution	0.1 dB
Accuracy	±0.5 dB
Frequency (XPDR)	1090 MHz ±3 MHz
Resolution	1 kHz
Accuracy	±50 kHz
Frequency (DME)	RX Channels (1025 to 1150 MHz ±1 MHz)
Resolution	1 kHz
Accuracy	±20 kHz
Pulse Spacing	
Resolution	1 ns
Accuracy	±10 ns (XPDR) ±50 ns (DME)
Pulse Width	
Resolution	1 ns
Accuracy	±15 ns (XPDR) ±50 ns (DME)
Pulse Rise/Fall Time	
Resolution	1 ns
Accuracy	±15 ns (XPDR) ±100 ns (DME)
Reply Delay (XPDR: ATCRBS & Mode S)	
Resolution	25 ns
Accuracy	±50 ns
Reply Jitter	
Resolution	1 ns
Accuracy	±20 ns
Percent Reply	0 to 100% (sample size equal to PRF or 200, whichever is greater)
Resolution	0.1 %
Accuracy	±1 %

Receiver (continued)

Mode S Squitter Rate	
DF11	0.01 s to 4.0 s
Resolution	1 ms
Accuracy	±1 ms ±2.5 ppm
DF17	
Airborne Position	0.01 s to 2.0 s
Resolution	1 ms
Accuracy	±1 ms ±2.5 ppm
Surface Position	0.01 s to 15.0 s
Resolution	1 ms
Accuracy	±1 ms ±2.5 ppm
A/C Identification	0.01 s to 25.0 s
Resolution	1 ms
Accuracy	±1 ms ±2.5 ppm
Airborne Velocity	0.01 s to 2.0 s
Resolution	1 ms
Accuracy	±1 ms ±2.5 ppm
Event Driven	0.01 s to 25.0 s
Resolution	1 ms
Accuracy	±1 ms ±2.5 ppm
Interrogation Rate (DME)	0 to 10 kHz
Resolution	1 Hz
Accuracy	±1 Hz
Scope Trigger Output (Scope 1 and Scope 2)	
Width (XPDR, DME)	1.0 µs
Accuracy	±0.5 µs
XPDR Position	
Interrogation	-1.0 to +600 µs relative to rising edge of P1 (default -1.0 µs)
Resolution	25 ns
Accuracy	±0.5 µs Typical
Reply	-1.0 µs prior to 1st pulse of reply (F1/P1)
Resolution	25 ns
Accuracy	±0.5 µs Typical
DME Position	
Squitter Echo Ident Reply	4.5 µs prior to 1st pulse of any selected transmission
Accuracy	±0.5 µs
Interrogation	2.5 µs following Trise of received interrogation pulse P1
Accuracy	±0.5 µs Typical

Environmental

Temperature	
Requires 45 minute warm-up period to meet specified performance	
Full specified performance	23°C, ±5°C (73.4°F, ±41°F)
Operating	0 to +40°C (32° to 104°F)
Storage	0 to +71°C (32° to 159.8°F)
Relative Humidity	0 to 95% noncondensing
Degree of Protection	IPX-0
AC Input Power	
Voltage Range	100 to 240 VAC, 50 to 60 Hz
Power Consumption	100 W nominal

Physical Characteristics

Dimensions	10.5 in (H) x 19 in (W) x 24 in (D) (26.7 cm x 48.3 cm x 60.9 cm)
Weight	41 lbs (18.6 kg) test set only

Functional Characteristics

Remote Interface
Ethernet
GPIB
Inputs/Outputs
Suppression bus (front/back)
2 scope BNC outputs (front/back)
LAN (front/back)
2 USB Type A (front) for HID/flash drives

Test Set Certifications

MIL-PRF-28800F (Class 3 Device)
CE
UL/EN 61010-1
EN 61326-1

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