



Eelink Communication Technology Co., Ltd.

GPT12-X Ultra (nRF9161 Version) Specification & Certification

Product Specification

Item	Specification
Model	GPT12-X Ultra
Core Chip	Nordic nRF9161 SiP (Integrated LTE-M/NB-IoT, GNSS, MCU, Security)
Network Bands	LTE Cat-M1 / NB-IoT (B1/2/3/4/5/8/12/13/14/17/18/19/20/25/26/28/66)
GNSS	GPS / GLONASS / Galileo / BeiDou / QZSS
Dimensions	<=35 x 35 x 12 mm (including battery)
Enclosure	Industrial PC+GF; IP67 waterproof & dustproof
Battery	3.6V Li-MnO ₂ 5000mAh (optional Li-SOCl ₂ / rechargeable Li-ion)
Battery Life	1 report/day >=3 years; 1/hour >=1 year; real-time >=30 days
Power Modes	PSM / eDRX / SMS Wake / Button Wake
Sensors	3D accelerometer / light / tamper / temperature (optional)
Interfaces	UART / SWD / I2C (debug)
Antenna	Embedded LTE + patch GNSS; isolation & keep-out zones
Position Accuracy	GNSS <2 m; hybrid <50 m
Operating Temperature	-20 C to +60 C (Li-Mn) / -40 C to +85 C (Li-SOCl ₂)
Firmware	OTA / FOTA / DTLS / MQTT / HTTPS
Installation	Adhesive / screw / magnetic
Certifications	CE, FCC, PTCRB, GCF, RoHS, UN38.3, MSDS
Applications	Asset tracking, reusable containers, UAV payload, pallet pool, cold chain

Thermal Design Verification

Item	Verification Method	Criteria
SiP Pad Heat Dissipation	>=400 mm ² copper area, >=20 vias	Thermal resistance <=15 C/W
Thermal Path Evaluation	Infrared after 10 min LTE transmit	Chip <75 C
Chamber Test	45 C ambient, PSM/report cycle	Casing <60 C

RF Verification

Test Item	Target	Verification
LTE Efficiency	>= -3 dBi	OTA TRP/TIS test
GNSS Sensitivity	<= -155 dBm	Simulator & field test
Antenna Isolation	>= 25 dB	Vector network analyzer S21
Harmonics/Spurious	Compliant ETSI/FCC	Spectrum analyzer

Band Coverage	B1-B28 / B66	LTE Callbox
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Power Consumption Verification

Mode	Condition	Typical Current	Estimated Lifetime
PSM	1 report/day + GNSS 30s	15 uA	>=3 years
eDRX	1 report/hour	50 uA	>=1 year
Real-time	1/min report + GNSS on	8 mA	>=30 days
SMS Wake	1/week trigger	20 uA	>=2.5 years

Certification Checklist

Category	Standard	Description
Wireless Communication	PTCRB / GCF	LTE-M/NB-IoT module certification
EMC	CE RED / FCC Part15B	RF EMC / radiation test
Battery Safety	UN38.3 / MSDS / IEC62133	Battery compliance certification
Environmental Compliance	RoHS / REACH	Material safety
IP Rating	IP67	Ingress protection verification
Thermal Cycle	IEC60068-2-14	-40 C to +85 C temperature cycling
Drop Test	ISTA 1A	1 m multiple directions
Platform Compatibility	Cloud Platform Compatible	API & Cloud integration validation

Contact Information

Eelink Communication Technology Co., Ltd.
Website: www.eelinktech.com
Email: info@eelinktech.com
Address: Shenzhen, China