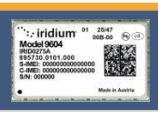
Hybrid Module Comparison Chart – Feature Overview

IRIDIUM & IRIDIUM PARTNERS ONLY

	Iridium® 9604 	ORBCOMM/ SKYWAVE ST4000	Globalstar RM200M 	Murata Type 1SC-NTN 	Semtech HL781x 	Quectel BG770A-SN 
Satellite Network	Iridium LEO (global, pole-to-pole)	Inmarsat GEO (global)	Globalstar LEO (L/S bands)	3GPP NTN (Rel-17 satellite standard)	3GPP NTN via partner networks	3GPP Rel-17 NTN (5G NB-IoT satellite)
Cellular Technology	LTE-M (Cat M1), 17 bands	LTE-M (Cat M1), 17 bands	None (satellite-only module; requires external cellular)	LTE-M & NB-IoT + NTN	LTE-M & NB-IoT + NTN	5G NB-IoT + NTN
Satellite Data Rates	SBD MO: 340 bytes, MT: 270 bytes	IDP (OGx upgradeable via firmware) MO up to 6.4 Kb, MT: up to 10 kB; <15 s latency (100 B), <60 s (1000 B)	MO: 9–144 bytes, MT: 9–128 bytes	Depends on NTN operator deployment	Depends on NTN operator & Skylo service	Depends on operator NTN service
Cellular Peak Speeds	LTE-M: 588 kbps DL / 1200 kbps UL	LTE-M: 588 kbps DL /1200 kbps UL	N/A (no integrated cellular)	LTE-M ~1 Mbps; NB-IoT ~200 kbps	Cat-M1 ~1 Mbps; NB-IoT ~200 kbps	5G NB-IoT (enhanced throughput vs legacy NB-IoT)
GNSS Positioning	Integrated u-blox M10 (GPS, GLONASS, BeiDou, Galileo); shared antenna with satellite	Integrated u-blox M10 (GPS, GLONASS, BeiDou, Galileo); shared antenna with satellite	72-channel GPS/GLONASS/BeiDou/Galileo; dedicated interface	Optional GPS/GLONASS; shared modem resources	Dependent on host system (module does not include integrated GNSS)	Varies by variant (optional GNSS in select SKUs)
Form Factor & Dimensions	96-pin LGA, 16 × 26 × 2.4 mm, <3 g	96-pin LGA, 16 × 26 × 2.4 mm, <3 g	28.3 × 50.8 × 3.6 mm, 11 g	96-pin LGA, 11.1 × 11.4 × 1.5 mm (max), 0.45 g	CF3 form factor (module dimensions vary by variant)	Varies by module variant
Power PSM Sleep	1 µA (LTE-M PSM)	1 µA (LTE-M PSM)	60 µA (sleep at room temp)	1.5 µA (hibernation)	<3 µA (hibernate in PSM)	exact spec TBD per variant
Power Active/Tx	LTE-M connected: 195 mA @ 23 dBm; Satellite Tx: TBD	LTE-M: 195 mA @ 23 dBm; Satellite Tx ≈ 2 A (burst-mode)	Active: 61 mA, Tx: 324 mA, Rx: 134 mA @ 3.3 V	Cat-M1 Tx: 400 mA @ 23 dBm; NB-IoT Tx: 800 mA @ 23 dBm	Cat-M1: ~400 mA Tx; NB-IoT: ~800 mA Tx	Varies by operational mode and band
Operating Temp	–40°C to +85°C	–40°C to +85°C	–40°C to +85°C	–40°C to +85°C	–40°C to +85°C	–40°C to +85°C
Certifications	FCC, ISED, CE-RED, UKCA, PTCRB, GCF, ITU, AT&T/FirstNet	FCC, ISED, GCF, PTCRB, RED, RCM, NCC, AT&T; AWS IoT Core Qualified; Microsoft Azure Certified (module-level)	FCC Parts 15/25, ISED; ITU GMPCS, ANATEL (in progress)	FCC/IC, ETSI, TELEC, PTCRB, GCF; AT&T, Vodafone, DT, Telefonica, and others	FCC, IC, CE, RCM, PTCRB, GCF (varies by SKU)	Varies by module variant and target market
Key Interfaces	2× UART (4-wire configurable), I²C, USB (diagnostics), up to 7 GPIO; USIM (1.8V / 3.0V)	2× UART (8-wire configurable); USB (diagnostics); I²C (DDC); up to 6 GPIO; USIM (1.8 V / 3.0 V)	1× UART, 1× USB, 1× I²C, 1× SPI, 10× GPIO, 7× analog inputs	Up to 3× UART, I²C, USB, SPI, multiple GPIO	Multiple UART, USB, I²C, SPI, GPIO (CF3 standard pinout)	USB, UART, I²C, SPI, GPIO (varies by variant)
Developer Platform	AT commands; uFOTA (cellular); IPv4/IPv6;TCP/UDP/FTP/HTTP/MQTT/MQTT-SN; CoAP; LwM2M; TLS/DTLS; secure boot; antenna/SIM detection; Last Gasp; SDK, HDK with reference designs	AT commands; uFOTA (cellular); Satellite FOTA (via IDP); IPv4/IPv6; TCP/UDP/FTP/HTTP/MQTT/MQTT-SN; CoAP; LwM2M; TLS/DTLS; secure boot; antenna/SIM detection; Last Gasp	Realm Edge Application Platform for custom apps, AT commands, API library	AT commands per 3GPP TS27.005/27.007 + custom commands, OTA FW upgrade	AT command control, standard Sierra Wireless toolchain	AT commands, Quectel SDK and tools

Data shown is sourced from manufacturers' published datasheets and may vary from actual performance. For the most current information, please refer to the official websites of the referenced companies.

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Hybrid Module Comparison Chart – Buyer Evaluation Matrix

IRIDIUM & IRIDIUM PARTNERS ONLY

	Iridium® 9604 	ORBCOMM/ SKYWAVE ST4000	Globalstar RM200M 	Murata Type 1SC-NTN 	Semtech HL781x 	Quectel BG770A-SN 
Global Coverage Today	Pole-to-pole, Truly Global LEO 100% Earth's Surface	Global GEO 80%-90% Earth's Surface	Globalstar LEO (regional gaps)	Depends on operator NTN rollout	Depends on Skylo partnerships	Depends on 5G NTN operators
Service Maturity	20+ years proven SBD®	IDP service today; OGx upgrade	Established Globalstar service	Emerging 3GPP NTN standard	Emerging NTN via Skylo	Future 5G NTN
Integration Complexity	Single module: satellite + LTE-M + GNSS	Single module: satellite + LTE-M + GNSS	Satellite only; requires external cellular modem	Component only; requires NTN operator	Component only; no integrated GNSS	Component only; operator-dependent
Board Space Savings	>60% vs discrete components	Similar integration efficiency	Larger footprint; external modem needed	Ultra-compact but incomplete solution	Standard LPWA footprint	Varies by SKU
Time to Market	SDK, dev kits available	Available with u-blox toolchain	Available with Realm Edge platform	Available but requires operator agreements	Available but limited by Skylo coverage	Future-dependent on 5G NTN
Turnkey Solution	Complete satellite service + global partner ecosystem	Complete satellite service + global partner ecosystem	Globalstar service bundle	Module only; negotiate operators separately	Module only; Skylo partnerships required	Module only; operator-dependent
Developer Control	Full failover logic control; location-aware routing	Standard AT commands; FOTA options	Realm Edge platform for custom apps	Standard AT commands	Standard AT commands	Standard AT commands
Industrial Grade	AEC-Q104-based qualification; ISO/TS 16949 manufacturing; RoHS compliant	AEC-Q104-based qualification; ISO/TS 16949 manufacturing; RoHS compliant	Industrial-grade	PTCRB/GCF certified	PTCRB/GCF certified	Industrial variants available
Power Efficiency	PSM 1 µA; eDRX 180 µA	PSM 1 µA; eDRX 180 µA	60 µA sleep	1.5 µA hibernation	<3 µA hibernate	Ultra-low PSM
Best For	Mission-critical global deployments requiring proven reliability	ORBCOMM ecosystem, IoT in remote, mobile, coverage-challenged	Edge computing + satellite; sensor aggregation	Compact battery devices; dual LPWA flexibility	Mass-market LPWA with occasional satellite backup	Future 5G NTN early adopters

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