

# Integra-FIDU+

Dual Transceiver XPIC Capable Full-Indoor IP Radio



## Features

- Up to 2.2 Gbps capacity in each direction, uncompressed
- Various product versions with one or two transceivers, with separate Tx/Rx ports or with built-in diplexer
- Up to 112 MHz channel on each transceiver
- 4QAM to 4096QAM modulations
- High radio performance due to the Adaptive Digital Pre-Distortion (ADPD) algorithm
- Compatibility with SAF Indoor Branching units
- Available in 4U ... 13 GHz bands
- 10 Gbps SFP+ Ethernet interfaces
- FIPS197 certified AES256 traffic encryption (licensed option)
- 4.3-inch LCD display for status monitoring with PIN protection

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24a Ganību Dambis, Rīga LV-1005, Latvia



## Technical specification

		Integra-FIDU+
<b>General</b>		
Concept / form factor	Full Indoor radio in 19" rack mount design	
Frequency bands	4U*, 5*, 6 (6L, 6U), 7*, 8*, 11*, 13* GHz. Ask SAF representative for availability*.	
Duplex spacing	Any applicable	
Frequency stability	± 10 ppm	
Capacity	2+0 version: up to 2.2 Gbps / up to 1.68 Gbps in AES mode 1+0 version: up to 1.1 Gbps / up to 0.84 Gbps in AES mode	
Max modulation	4096QAM	
Configurations	1+0, 2+0 XPIC, 2+0 ACAP, 2+0 ACCP, 1+1 SD (FD, HSB) modes w. one FIDU. 2+2 SD with L2 aggregation, 1+1 HSB Full redundancy with two FIDUs.	
ATPC	Yes	
ACM	Adaptive Code Modulation, Hitless. Variable Tx power mode supported.	
Channel bandwidth	5 to 112 MHz	
Display	4.3-inch LCD, resolution 480 × 3 (RGB) × 272, PIN protected access control.	
<b>Ports</b>		
Ethernet	2x SFP+	For Fiber Optics, up to 10 Gbps (1, 2.5 and 10 Gbps speed supported)
	1 x RJ-45	GbE (auto 10/100/1000 Mbps) electrical port with PoE and surge arrestor
Power	2x DC port	2x Screw type terminal block, pluggable, 2 pin, 5.08mm / 0.2 inches
Service ports	3.5 mm	Audible alignment and RSSI
	USB B	RS232 serial over USB B-Type
	LED	Power On, RSL
	RJ-45	1x or 2x management ports for active IBU switching
Antenna	SMA	Separate Tx/Rx SMA ports, for 1+0 and 2+0 models without diplexer
	WG	N-type female or standard waveguide flange, for 1+0 model with diplexer
<b>Ethernet</b>		
Ethernet	Built-in Carrier L2 Ethernet 10 Gbps Switch with 50 Gbps switching capacity	
VLAN	802.1Q 4096 VLANs, QinQ (Double Tagging), VLAN Rate	
Quality of Service	8 level VLAN 802.1p, 64 level IPv4/6 DSCP, CoS, 8 level MPLS-TP exp bit, Port-based priority. Per port egress schedulers: SP, RR, WRR, DWRR, Hybrid.	
Spanning Tree Prot.	802.1D-1998 STP, 802.1D-2004 RSTP, 802.1Q-2005 MSTP	
Link State Propagation	LSP with Backup path switching, each Ethernet port separately configurable.	
Synchronization	SyncE, IEEE 1588 v2 PTP TC mode	
Carrier Ethernet	Header compression*, Packet fragmentation	
Jumbo frames	Yes, 12288 bytes	
Encryption	AES256** (licensed option***)	
Management	SNMP v1/2c/3, SSH, Telnet, HTTPS, Serial, RADIUS, NTP, SFTP	
	In-band mgmt. over the same ETH port. Out-band mgmt. configurable using VLANs. External and internal IP addressing for mgmt. access.	
One-way latency	The best figure: 82 µs @ 4096QAM Weak FEC, 112MHz & 64B L2 frame	
Perf. monitoring	Performance graphs, constellation diagram*, alarms, detailed counters, equalizer graph, Rx spectrum, HCRMON QoS statistics	
Aggregation	L1 2+0 bonding. Proprietary L2 aggregation w. RTAG-7 based hashing	

\* In development. Enquire SAF representative for more information.

\*\* Integra-FIDU+ encryption algorithm fully complies with [Federal Information Processing Standards Publication 197 \(2001\)](#),

and has been certified with the validation # A5174: [SAF FIPS AES-256 Encryption Engine](#)

\*\*\* AES mode is not compatible with protection modes like 1+1 SD (FD, HSB) w. one FIDU and 2+2 SD with two FIDU due to current hardware limitations.

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## Electrical specification

Power consumption	Up to 110 W depending on freq. band, model, and mode, see table below.
Voltage range	38...57 V DC
Surge protection	DC power port conforms to IEC EN 61000-4-5 Class 3, up to 2KV surge

### Mechanical & Environmental

Stationary use	Climatic Class 3.1E compliant (ETSI ETS 300 019-1-3); IP 20; weather protected locations
Temperature range	-5...+55 °C / 23...+130 °F
Dimensions HxWxD	88.9 x 428 x 349 mm / 3.5" x 16.9" x 13.7", 2U 19" Rack
Weight	Up to 8.5 kg / 18.7 lbs (TBD)
Mount	Free standing or 19" Rack mount
Antenna	Antenna connected using SAF Indoor branching unit and waveguide, for 1+0 and 2+0 models without diplexer
	Antenna connected using the waveguide, for 1+0 model with diplexer

### Power consumption and rated current at 36 – 57 V DC

Frequency band	4U* GHz			6, 7* and 8* GHz			11* and 13* GHz		
	2+0		1+0	2+0		1+0	2+0		1+0
Radio model*	2+0		1+0	2+0		1+0	2+0		1+0
Mode	2+0	1+0	1+0	2+0	1+0	1+0	2+0	1+0	1+0
Power [W] @ 38–57V DC	105	90	70	100	85	65	95	80	60
Current [A] @ 38 V DC	2.8	2.4	1.9	2.8	2.3	1.7	2.6	2.1	1.6
Current [A] @ 48 V DC	2.2	1.9	1.5	2.1	1.8	1.4	2.0	1.7	1.3
Current [A] @ 57 V DC	1.9	1.6	1.3	1.8	1.5	1.2	1.7	1.4	1.1

\*Power consumption of any radio with AES256 encryption support is 10W higher, the maximum value 115 W.

### Tx Power [dBm] for Integra-FIDU+

	4U* GHz VHP	6L and 6U GHz VHP	6 and 7* GHz	8* and 11* GHz	13* GHz
<b>Minimum Tx Power</b>	+10	+10	+10	+6	+6
<b>Modulation</b>	<b>Maximum Tx Power</b>				
4 QAM	+35	+33	+31	+31	+29
16 QAM	+34	+32	+30	+30	+28
32 QAM	+34	+32	+30	+30	+28
64 QAM	+33	+31	+29	+29	+27
128 QAM	+33	+31	+29	+29	+27
256 QAM	+32	+30	+28	+28	+26
512 QAM	+32	+30	+28	+28	+26
1024 QAM	+31	+29	+27	+27	+25
2048 QAM	+30	+28	+26	+26	+24
4096 QAM	+30	+28	+26	+26	+24
4096 QAM Weak FEC	+30	+28	+26	+26	+24

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## RSL Thresholds and Capacity for Integra-FIDU+

BW, MHz	Modulation, FEC	Guaranteed RSL Threshold, dBm*								Capacity, Mbps	
		4U GHz VHP	6L GHz VHP	6U GHz VHP	6 GHz	7 GHz	8 GHz	11 GHz	13 GHz	Single Channel Mode	2+0 ACAP, ACCP, XPIC Mode
5	4QAM Strong	-95.5	-96.5	-96.0	-95.0	-95.5	-96.5	-95.5	-94.5	7	14
	16QAM Strong	-90.5	-90.0	-90.5	-90.5	-91.5	-92.0	-92.5	-90.5	12	24
	32QAM Strong	-87.5	-86.5	-86.0	-87.0	-87.5	-88.0	-88.5	-87.5	15	30
	64QAM Strong	-84.5	-84.5	-84.0	-84.0	-84.5	-85.0	-85.0	-84.5	20	40
	128QAM Strong	-81.5	-81.5	-81.0	-82.0	-81.5	-82.0	-82.0	-81.5	24	48
	256QAM Strong	-77.5	-78.0	-78.5	-78.5	-78.0	-79.0	-79.0	-77.5	28	56
	512QAM Strong	-74.5	-74.5	-75.0	-74.0	-76.0	-76.0	-76.0	-75.5	32	64
	1024QAM Strong	-70.5	-71.5	-72.0	-72.5	-72.0	-73.0	-73.0	-71.5	36	72
	2048QAM Strong	-67.5	-68.0	-68.5	-68.0	-69.0	-69.0	-69.5	-68.5	39	78
	4096QAM Strong	-62.5	-64.5	-64.0	-65.0	-65.0	-66.0	-65.0	-64.5	43	86
4096QAM Weak	-59.5	-62.0	-61.5	-63.0	-63.0	-64.0	-64.0	-62.5	45	90	
7	4QAM Strong	-93.5	-95.0	-95.0	-93.5	-94.0	-95.0	-93.0	-93.5	10	20
	16QAM Strong	-89.5	-89.0	-89.0	-89.5	-89.5	-90.0	-89.0	-87.5	17	34
	32QAM Strong	-85.5	-86.0	-85.5	-85.5	-86.5	-86.0	-85.5	-84.5	22	44
	64QAM Strong	-82.5	-83.0	-82.5	-82.5	-83.5	-83.0	-82.5	-81.5	29	58
	128QAM Strong	-79.5	-80.0	-80.0	-80.5	-80.5	-80.0	-79.5	-78.5	35	70
	256QAM Strong	-76.5	-77.5	-77.0	-77.5	-76.5	-77.0	-76.5	-75.5	41	82
	512QAM Strong	-72.5	-74.0	-73.5	-73.0	-74.5	-74.0	-73.5	-72.5	47	94
	1024QAM Strong	-69.5	-70.0	-70.5	-71.0	-70.5	-70.5	-71.0	-69.5	52	104
	2048QAM Strong	-66.5	-67.0	-67.0	-67.0	-67.5	-68.0	-67.5	-66.5	58	116
	4096QAM Strong	-62.5	-63.0	-62.5	-63.5	-63.5	-64.0	-63.5	-62.5	63	126
4096QAM Weak	-60.5	-61.0	-60.5	-61.5	-61.5	-62.0	-61.5	-60.5	65	130	
10	4QAM Strong	-91.5	-92.5	-93.0	-91.5	-92.5	-93.5	-92.0	-92.5	14	28
	16QAM Strong	-87.5	-87.0	-87.0	-87.5	-88.5	-88.0	-88.0	-86.5	25	50
	32QAM Strong	-83.5	-84.0	-84.5	-84.5	-84.5	-84.5	-85.0	-83.5	31	62
	64QAM Strong	-81.5	-81.5	-81.5	-81.5	-82.5	-82.0	-82.0	-80.5	41	82
	128QAM Strong	-77.5	-78.0	-78.5	-78.5	-79.5	-79.0	-78.5	-77.5	49	98
	256QAM Strong	-74.5	-75.0	-75.5	-75.0	-75.5	-75.5	-75.5	-74.5	58	116
	512QAM Strong	-71.5	-71.5	-72.0	-71.5	-72.5	-72.5	-72.5	-71.5	66	132
	1024QAM Strong	-68.5	-69.0	-69.0	-69.5	-69.5	-69.0	-69.0	-68.5	74	148
	2048QAM Strong	-64.5	-65.0	-65.5	-65.5	-66.5	-66.0	-66.0	-64.5	81	162
	4096QAM Strong	-61.5	-62.0	-62.5	-62.5	-62.5	-63.0	-62.0	-60.5	88	176
4096QAM Weak	-59.5	-59.0	-59.0	-59.5	-60.5	-60.0	-60.5	-58.5	93	186	
14	4QAM Strong	-90.5	-92.0	-91.5	-90.5	-91.5	-92.5	-90.5	-90.5	20	40
	16QAM Strong	-86.5	-86.5	-86.5	-86.5	-87.5	-87.0	-86.0	-85.5	34	68
	32QAM Strong	-82.5	-83.0	-82.5	-82.5	-83.5	-83.0	-82.5	-81.5	43	86
	64QAM Strong	-79.5	-80.0	-79.5	-79.5	-80.5	-80.0	-80.0	-78.5	58	116
	128QAM Strong	-76.5	-77.0	-77.5	-77.5	-77.5	-77.0	-77.5	-76.5	69	138
	256QAM Strong	-73.5	-74.0	-74.5	-74.5	-73.5	-74.0	-74.0	-72.5	81	162
	512QAM Strong	-69.5	-71.0	-71.5	-70.5	-71.5	-71.0	-71.0	-69.5	92	184
	1024QAM Strong	-66.5	-68.0	-68.0	-68.5	-68.5	-67.5	-67.5	-66.5	104	208
	2048QAM Strong	-63.5	-64.5	-64.5	-64.5	-64.5	-65.0	-64.0	-63.5	115	230
	4096QAM Strong	-59.5	-61.5	-61.0	-60.5	-61.5	-61.0	-60.5	-59.5	125	250
4096QAM Weak	-58.5	-58.5	-59.0	-58.5	-59.5	-59.0	-58.5	-57.5	131	262	
20	4QAM Strong	-88.5	-90.5	-90.5	-88.5	-89.5	-90.5	-89.0	-88.5	29	58
	16QAM Strong	-84.5	-85.0	-85.5	-84.5	-85.5	-85.0	-84.5	-83.5	50	100
	32QAM Strong	-80.5	-82.5	-82.5	-81.5	-81.5	-81.5	-81.0	-80.5	62	124
	64QAM Strong	-76.5	-79.5	-79.0	-78.5	-78.5	-78.0	-78.0	-77.5	83	166
	128QAM Strong	-74.5	-75.5	-75.0	-75.5	-76.5	-75.5	-75.5	-74.5	100	200
	256QAM Strong	-71.5	-72.0	-72.5	-72.5	-72.0	-72.0	-72.0	-70.5	117	234
	512QAM Strong	-68.5	-68.5	-69.5	-68.5	-69.5	-69.0	-69.5	-67.5	133	266
	1024QAM Strong	-65.5	-65.5	-66.5	-66.5	-65.5	-66.0	-66.0	-64.5	150	300
	2048QAM Strong	-61.5	-62.5	-63.5	-62.5	-63.5	-63.0	-63.0	-61.5	166	322
	4096QAM Strong	-58.5	-59.0	-59.5	-59.5	-59.5	-60.0	-59.0	-57.5	181	362
4096QAM Weak	-56.5	-56.5	-57.5	-57.5	-57.5	-58.0	-57.0	-55.5	190	380	
20	4QAM Strong	-88.5	-90.5	-90.5	-88.5	-89.5	-90.5	-89.0	-88.5	30	60
	16QAM Strong	-84.5	-85.0	-85.5	-84.5	-85.5	-85.0	-84.5	-83.5	51	102
	32QAM Strong	-80.5	-82.5	-82.5	-81.5	-81.5	-81.5	-80.5	-80.5	64	128
	64QAM Strong	-76.5	-79.5	-79.0	-78.5	-78.5	-78.0	-78.0	-77.5	85	170
	128QAM Strong	-74.5	-75.5	-75.0	-75.5	-76.5	-75.5	-75.0	-74.5	102	204
	256QAM Strong	-71.5	-72.0	-72.5	-72.5	-72.0	-72.0	-72.0	-70.5	119	238
	512QAM Strong	-68.5	-68.5	-69.5	-68.5	-69.5	-69.0	-69.0	-67.5	136	272
	1024QAM Strong	-65.5	-65.5	-66.5	-66.5	-65.5	-66.0	-65.5	-64.5	154	308
	2048QAM Strong	-61.5	-62.5	-63.5	-62.5	-63.5	-63.0	-62.5	-61.5	170	340
	4096QAM Strong	-58.5	-59.0	-59.5	-59.5	-59.5	-60.0	-59.0	-57.5	186	372
4096QAM Weak	-56.5	-56.5	-57.5	-57.5	-57.5	-58.0	-57.0	-55.5	194	388	



		Guaranteed RSL Threshold, dBm*								Capacity, Mbps	
BW, MHz	Modulation, FEC	4U GHz VHP	6L GHz VHP	6U GHz VHP	6 GHz	7 GHz	8 GHz	11 GHz	13 GHz	Single Channel Mode	2+0 ACAP, ACCP, XPIC Mode
25	4QAM Strong	-87.5	-88.5	-88.5	-86.5	-88.5	-89.5	-89.0	-87.5	37	74
	16QAM Strong	-83.5	-83.5	-83.5	-84.0	-84.0	-84.0	-84.5	-83.5	63	126
	32QAM Strong	-79.5	-80.0	-80.5	-80.5	-80.5	-80.5	-80.5	-79.5	79	158
	64QAM Strong	-77.5	-78.0	-77.0	-77.5	-77.5	-77.0	-78.0	-76.5	105	210
	128QAM Strong	-73.5	-75.0	-74.5	-74.5	-75.0	-75.0	-74.5	-73.5	126	252
	256QAM Strong	-70.5	-72.0	-71.5	-71.5	-71.5	-71.0	-71.5	-69.5	147	294
	512QAM Strong	-67.5	-68.0	-68.0	-68.5	-68.5	-68.0	-68.5	-67.5	168	336
	1024QAM Strong	-64.5	-65.0	-65.5	-65.5	-65.0	-65.0	-65.0	-63.5	189	378
	2048QAM Strong	-61.5	-62.0	-62.5	-61.5	-61.5	-62.0	-62.0	-60.5	209	418
	4096QAM Strong	-57.5	-58.5	-58.5	-58.5	-58.5	-59.0	-58.5	-56.5	229	458
4096QAM Weak	-55.5	-56.5	-56.5	-56.5	-56.0	-57.0	-56.5	-54.5	239	478	
28	4QAM Strong	-87.5	-89.0	-88.5	-87.5	-88.5	-88.5	-88.5	-86.5	40	80
	16QAM Strong	-82.5	-83.0	-83.5	-83.5	-83.5	-84.0	-84.0	-82.5	69	138
	32QAM Strong	-79.5	-79.5	-80.0	-79.5	-80.5	-80.0	-80.0	-78.5	87	174
	64QAM Strong	-76.5	-77.0	-76.5	-76.5	-77.0	-77.0	-77.5	-76.5	116	232
	128QAM Strong	-73.5	-74.0	-74.0	-74.5	-74.0	-74.0	-74.0	-72.5	139	278
	256QAM Strong	-70.5	-71.5	-71.5	-71.5	-70.5	-71.0	-71.0	-69.5	162	324
	512QAM Strong	-67.5	-68.5	-68.0	-67.5	-68.5	-68.0	-68.0	-66.5	185	370
	1024QAM Strong	-63.5	-65.0	-65.0	-64.5	-64.5	-65.0	-65.0	-63.5	208	416
	2048QAM Strong	-60.5	-61.5	-62.0	-61.5	-61.0	-61.5	-61.5	-60.5	230	460
	4096QAM Strong	-57.5	-58.5	-58.5	-57.5	-58.0	-58.0	-58.0	-56.5	250	500
4096QAM Weak	-55.5	-56.0	-56.5	-56.0	-56.5	-56.5	-56.0	-54.5	262	524	
30	4QAM Strong	-86.5	-86.5	-88.5	-87.5	-87.0	-88.5	-88.5	-86.5	43	86
	16QAM Strong	-82.5	-82.5	-83.0	-82.5	-83.5	-83.0	-83.5	-82.5	75	150
	32QAM Strong	-78.5	-80.0	-80.0	-79.5	-80.0	-80.0	-79.5	-78.5	94	188
	64QAM Strong	-75.5	-77.0	-76.5	-75.5	-77.0	-77.0	-77.0	-75.5	125	250
	128QAM Strong	-71.5	-74.0	-74.0	-73.5	-74.0	-74.0	-74.0	-72.5	150	300
	256QAM Strong	-69.5	-71.0	-71.0	-71.5	-69.5	-70.5	-71.0	-69.5	175	350
	512QAM Strong	-67.5	-68.0	-68.0	-67.5	-67.5	-67.5	-67.5	-66.5	200	400
	1024QAM Strong	-63.5	-64.5	-65.0	-64.5	-64.0	-64.0	-64.5	-62.5	225	450
	2048QAM Strong	-60.5	-62.0	-61.5	-60.5	-61.0	-61.0	-61.5	-59.5	248	496
	4096QAM Strong	-57.5	-58.0	-58.0	-57.5	-57.5	-58.0	-57.5	-56.5	272	544
4096QAM Weak	-55.5	-55.5	-56.0	-55.5	-55.0	-56.0	-56.0	-54.5	284	568	
40	4QAM Strong	-83.5	-86.0	-86.5	-84.5	-86.0	-87.0	-85.5	-85.5	60	120
	16QAM Strong	-78.5	-80.5	-81.5	-81.5	-82.0	-82.0	-82.0	-80.5	103	206
	32QAM Strong	-76.5	-77.5	-78.5	-78.5	-78.5	-78.5	-78.5	-77.5	129	258
	64QAM Strong	-72.5	-75.0	-75.5	-74.5	-75.5	-75.0	-75.5	-74.5	172	344
	128QAM Strong	-69.5	-72.5	-72.5	-72.5	-72.5	-73.0	-72.5	-71.5	206	412
	256QAM Strong	-66.5	-69.5	-69.0	-69.5	-67.5	-69.0	-69.5	-67.5	241	482
	512QAM Strong	-64.5	-66.0	-66.0	-64.5	-66.0	-66.0	-66.0	-65.5	275	550
	1024QAM Strong	-61.5	-63.5	-63.0	-63.5	-61.5	-63.0	-63.0	-61.5	310	620
	2048QAM Strong	-58.5	-60.5	-60.0	-59.5	-60.0	-60.0	-59.5	-58.5	342	684
	4096QAM Strong	-55.5	-57.0	-56.5	-56.5	-56.0	-57.0	-56.0	-54.5	374	748
4096QAM Weak	-53.5	-55.0	-54.5	-54.5	-54.0	-55.0	-54.5	-52.5	391	782	
40	4QAM Strong	-83.5	-86.0	-86.5	-84.5	-86.0	-87.0	-87.0	-85.5	58	116
	16QAM Strong	-80.5	-80.5	-81.5	-81.5	-82.0	-82.0	-82.0	-80.5	100	200
	32QAM Strong	-76.5	-77.5	-78.5	-78.5	-78.5	-78.5	-78.5	-77.5	125	250
	64QAM Strong	-72.5	-75.0	-75.5	-74.5	-75.5	-75.0	-75.5	-74.5	167	334
	128QAM Strong	-70.5	-72.5	-72.5	-72.5	-72.5	-73.0	-72.5	-71.5	201	402
	256QAM Strong	-68.5	-69.5	-69.0	-69.5	-67.5	-69.0	-69.0	-67.5	234	468
	512QAM Strong	-65.5	-66.0	-66.0	-64.5	-66.0	-66.0	-66.5	-65.5	267	534
	1024QAM Strong	-61.5	-63.5	-63.0	-63.5	-61.5	-63.0	-63.0	-61.5	301	602
	2048QAM Strong	-59.5	-60.5	-60.0	-59.5	-60.0	-60.0	-60.0	-58.5	332	664
	4096QAM Strong	-56.5	-56.5	-56.5	-56.5	-56.0	-57.0	-56.0	-54.5	363	726
4096QAM Weak	-54.5	-55.0	-54.5	-54.5	-54.0	-55.0	-54.5	-52.5	380	760	
50	4QAM Strong	-85.5	-86.0	-86.0	-85.5	-85.5	-86.0	-86.0	-84.5	75	150
	16QAM Strong	-80.5	-80.0	-81.0	-80.5	-81.5	-81.0	-81.5	-79.5	129	258
	32QAM Strong	-77.5	-77.0	-77.5	-77.5	-77.5	-77.0	-77.5	-75.5	162	324
	64QAM Strong	-73.5	-74.0	-74.5	-73.5	-75.5	-75.0	-74.5	-73.5	216	432
	128QAM Strong	-71.5	-71.5	-71.5	-71.5	-71.5	-72.0	-71.5	-70.5	259	518
	256QAM Strong	-68.5	-69.0	-69.0	-68.5	-67.5	-68.0	-68.5	-67.5	302	604
	512QAM Strong	-63.5	-65.0	-65.0	-63.5	-65.5	-65.5	-65.5	-64.5	345	690
	1024QAM Strong	-62.5	-62.0	-62.5	-62.5	-60.5	-62.0	-62.0	-60.5	388	776
	2048QAM Strong	-58.5	-59.0	-59.5	-58.5	-59.5	-59.0	-59.0	-57.5	429	858
	4096QAM Strong	-55.5	-56.0	-55.0	-55.5	-55.5	-55.0	-55.0	-53.5	469	938
4096QAM Weak	-53.5	-53.5	-53.0	-53.5	-53.5	-54.0	-53.5	-51.5	491	982	

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		Guaranteed RSL Threshold, dBm*								Capacity, Mbps		
BW, MHz	Modulation, FEC	4U GHz VHP	6L GHz VHP	6U GHz VHP	6 GHz	7 GHz	8 GHz	11 GHz	13 GHz	Single Channel Mode	2+0 ACAP, ACCP, XPIC Mode	
56	ETSI	4QAM Strong	-84.5	-85.0	-85.5	-84.5	-84.5	-85.5	-85.5	-83.5	85	170
		16QAM Strong	-80.5	-80.0	-80.5	-80.5	-80.5	-81.0	-80.5	-79.5	145	290
		32QAM Strong	-76.5	-76.5	-77.0	-76.5	-77.5	-77.0	-77.0	-75.5	182	364
		64QAM Strong	-73.5	-73.5	-74.0	-73.5	-74.5	-74.0	-74.0	-72.5	242	484
		128QAM Strong	-70.5	-71.0	-71.5	-70.5	-71.5	-71.0	-71.0	-69.5	291	582
		256QAM Strong	-68.5	-68.0	-68.0	-68.5	-66.5	-68.0	-68.0	-66.5	339	678
		512QAM Strong	-64.5	-64.5	-65.0	-64.5	-64.5	-65.0	-64.5	-63.5	388	776
		1024QAM Strong	-61.5	-61.5	-62.0	-61.5	-59.5	-62.0	-61.5	-60.5	436	872
		2048QAM Strong	-57.5	-58.0	-58.5	-57.5	-58.5	-58.5	-58.0	-56.5	482	964
		4096QAM Strong	-54.5	-54.5	-55.5	-54.5	-55.5	-55.0	-55.0	-53.5	527	1054
	4096QAM Weak	-52.5	-52.5	-53.0	-52.5	-53.5	-53.0	-53.0	-51.5	551	1102	
60	FCC	4QAM Strong	-84.5	-85.0	-85.5	-84.5	-84.5	-85.5	-85.5	-83.5	88	176
		16QAM Strong	-80.5	-80.0	-80.5	-80.5	-80.5	-80.0	-80.5	-78.5	151	302
		32QAM Strong	-76.5	-76.5	-77.0	-76.5	-77.5	-76.5	-77.0	-75.5	189	378
		64QAM Strong	-73.5	-73.5	-74.0	-73.5	-74.5	-74.0	-74.0	-72.5	252	504
		128QAM Strong	-70.5	-71.0	-71.5	-70.5	-71.5	-71.0	-71.0	-69.5	302	604
		256QAM Strong	-67.5	-68.0	-68.0	-67.5	-66.5	-67.5	-67.5	-66.5	353	706
		512QAM Strong	-63.5	-64.5	-65.0	-63.5	-64.5	-65.0	-64.5	-63.5	403	806
		1024QAM Strong	-61.5	-61.5	-62.0	-61.5	-59.5	-61.0	-61.0	-59.5	454	908
		2048QAM Strong	-58.5	-58.0	-58.5	-58.5	-58.5	-58.5	-58.0	-55.5	501	1002
		4096QAM Strong	-54.5	-54.5	-55.5	-54.5	-54.5	-55.0	-54.5	-52.5	548	1096
	4096QAM Weak	-52.5	-52.5	-53.0	-52.5	-53.5	-53.0	-52.5	-50.5	573	1146	
60	ETSI	4QAM Strong	-84.5	-85.0	-85.5	-84.5	-84.5	-85.5	-85.5	-83.5	85	170
		16QAM Strong	-80.5	-80.0	-80.5	-80.5	-80.5	-80.0	-80.5	-78.5	145	290
		32QAM Strong	-76.5	-76.5	-77.0	-76.5	-77.5	-76.5	-77.0	-75.5	182	364
		64QAM Strong	-73.5	-73.5	-74.0	-73.5	-74.5	-74.0	-74.0	-72.5	242	484
		128QAM Strong	-70.5	-71.0	-71.5	-70.5	-71.5	-71.0	-71.0	-69.5	291	582
		256QAM Strong	-67.5	-68.0	-68.0	-67.5	-66.5	-67.5	-68.0	-66.5	339	678
		512QAM Strong	-63.5	-64.5	-65.0	-63.5	-64.5	-65.0	-64.5	-63.5	388	776
		1024QAM Strong	-61.5	-61.5	-62.0	-61.5	-59.5	-61.0	-61.0	-59.5	436	872
		2048QAM Strong	-58.5	-58.0	-58.5	-58.5	-58.5	-58.5	-58.0	-55.5	482	964
		4096QAM Strong	-54.5	-54.5	-55.5	-54.5	-54.5	-55.0	-55.0	-52.5	527	1054
	4096QAM Weak	-52.5	-52.5	-53.0	-52.5	-53.5	-53.0	-53.0	-50.5	551	1102	
75	FCC	4QAM Strong								106	212	
		16QAM Strong								182	364	
		32QAM Strong								228	456	
		64QAM Strong								304	608	
		128QAM Strong								365	730	
		256QAM Strong								425	850	
		512QAM Strong								486	972	
		1024QAM Strong								547	1094	
		2048QAM Strong								604	1208	
		4096QAM Strong								661	1322	
	4096QAM Weak								691	1382		
80	FCC	4QAM Strong	-83.5	-84.0	-83.5	-83.5	-83.5	-84.0	-84.5	-82.5	118	236
		16QAM Strong	-79.5	-79.5	-79.0	-79.5	-79.5	-79.0	-79.5	-77.5	203	406
		32QAM Strong	-75.5	-75.5	-76.0	-75.5	-75.5	-75.5	-76.0	-74.5	254	508
		64QAM Strong	-71.5	-72.5	-73.0	-71.5	-72.5	-73.0	-73.0	-71.5	338	676
		128QAM Strong	-69.5	-69.5	-69.5	-69.5	-69.5	-70.0	-70.0	-68.5	406	812
		256QAM Strong	-66.5	-66.0	-66.5	-66.5	-65.5	-66.0	-66.5	-65.5	473	946
		512QAM Strong	-61.5	-62.0	-62.5	-61.5	-63.5	-63.5	-63.5	-62.5	541	1082
		1024QAM Strong	-59.5	-59.0	-59.5	-59.5	-58.5	-60.0	-60.5	-58.5	608	1216
		2048QAM Strong	-56.5	-56.5	-56.0	-56.5	-57.5	-57.0	-57.0	-54.5	672	1344
		4096QAM Strong	-53.5	-53.5	-53.0	-53.5	-53.5	-54.0	-53.5	-51.5	735	1470
	4096QAM Weak	-51.5	-51.5	-51.0	-51.5	-51.5	-52.0	-51.5	-49.5	769	1538	
100	FCC	4QAM Strong	-81.5	-82.5	-82.0	-81.5	-81.5	-83.0	-83.5	-78.5	148	296
		16QAM Strong	-78.5	-78.0	-78.0	-78.5	-78.5	-78.0	-78.5	-76.5	254	508
		32QAM Strong	-74.5	-75.0	-75.0	-74.5	-74.5	-74.0	-74.5	-73.5	318	636
		64QAM Strong	-70.5	-72.0	-71.5	-70.5	-71.5	-71.0	-72.0	-70.5	423	846
		128QAM Strong	-68.5	-69.0	-69.0	-68.5	-68.5	-68.5	-68.5	-67.5	508	1016
		256QAM Strong	-65.5	-65.5	-65.0	-65.5	-65.5	-65.0	-65.5	-63.5	592	1184
		512QAM Strong	-60.5	-62.0	-61.5	-60.5	-62.5	-62.0	-62.5	-60.5	677	1354
		1024QAM Strong	-58.5	-59.0	-58.0	-58.5	-59.5	-59.0	-59.5	-57.5	761	1522
		2048QAM Strong	-54.5	-55.0	-54.5	-54.5	-55.5	-56.0	-56.0	-52.5	841	1682
		4096QAM Strong	-52.5	-52.5	-52.0	-52.5	-52.5	-53.0	-52.5	-50.5	920	1840
	4096QAM Weak	-50.5	-51.0	-50.5	-50.5	-50.5	-51.0	-50.5	-48.5	962	1924	

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BW, MHz	Modulation, FEC	Guaranteed RSL Threshold, dBm*								Capacity, Mbps	
		4U GHz VHP	6L GHz VHP	6U GHz VHP	6 GHz	7 GHz	8 GHz	11 GHz	13 GHz	Single Channel Mode	2+0 ACAP, ACCP, XPIC Mode
	4QAM Strong	-80.5	-82.0	-82.5	-81.5	-82.5	-82.5	-82.5	-80.5	170	340
	16QAM Strong	-77.5	-77.0	-77.5	-77.5	-77.5	-77.0	-78.0	-75.5	291	582
	32QAM Strong	-73.5	-74.0	-73.5	-73.5	-74.5	-74.0	-74.0	-72.5	364	728
	64QAM Strong	-69.5	-70.5	-70.5	-69.5	-70.5	-71.0	-71.0	-69.5	486	972
	128QAM Strong	-67.5	-67.5	-67.5	-67.5	-68.5	-68.0	-68.0	-66.5	583	1166
112	256QAM Strong	-64.5	-64.5	-64.5	-64.5	-64.5	-64.5	-65.0	-63.5	680	1360
ETSI	512QAM Strong	-59.5	-61.0	-61.5	-59.5	-61.5	-62.0	-62.0	-60.5	777	1554
***	1024QAM Strong	-58.5	-58.0	-58.5	-58.5	-57.5	-58.5	-58.5	-56.5	874	1748
***	2048QAM Strong	-55.5	-55.5	-55.0	-55.5	-55.5	-55.0	-55.0	-53.5	965	1930
***	4096QAM Strong	-51.5	-52.5	-52.0	-51.5	-52.5	-52.0	-51.5	-49.5	1055	2110
***	4096QAM Weak	-49.5	-49.5	-50.0	-49.5	-49.5	-50.0	-49.5	-48.5	1104	2208

\* Enquire SAF representative for availability and more information.

\*\* Modes, marked with hyphen do not have guaranteed RSL values.

Blank cells mean, the mode is still not tested for specific product.

\*\*\* Modes, marked with "\*\*\*" are not available if AES256 is switched on.

