ETSI licensed bands

Datasheet













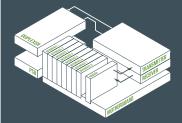




The Aprisa XE in brief

- 300 MHz, 400 MHz, 600 MHz, 800 MHz, 900 MHz, 1.4 GHz, 1.8 GHz, 2.0 GHz and 2.5 GHz licensed bands
- Built-in cross-connect and multiplexer
- Up to 65.4 Mbit/s capacity
- 25 kHz, 50 kHz, 75 kHz, 125 kHz, 150 kHz, 200 kHz, 250 kHz, 500 kHz, 1.0 MHz, 1.35 MHz, 1.75 MHz, 3.5 MHz, 7.0 MHz and 14.0 MHz channel sizes
- QPSK to 128 QAM modulation
- Range of 150+ km (100+ miles)
- Industry-leading reliability •
- Web server and SNMP management
- All voice, data and IP applications
- MHSB and HSD protection options

Future-proof single-box architecture



Aprisa XE

POINT-TO-POINT DIGITAL MICROWAVE LINKS 300 MHz to 2.5 GHz licensed ETSI bands



ETSI Aprisa XE: maximizing spectrum use and making challenging long distance links possible

- Efficient future-proof single-box architecture: the Aprisa XE's built-in multiplexer and cross-connect eliminate external equipment and minimize the over-the-air requirements, with customer-configurable interface slots integrating all IP, voice and data traffic. Configuration, performance monitoring and diagnostics are easy with the 4RF embedded web-based element management system, SuperVisor.
- High capacity: class-leading spectral efficiency and up to 128 QAM modulation make the maximum use of the available spectrum, with industry leading capacity of up to 65.4 Mbit/s in a 14.0 MHz channel.
- Long range: a single Aprisa XE can link distances in excess of 150 km (100 miles), overcoming the problems of water, environmental conditions and topographical obstacles.
- Carrier-class performance: Aprisa XE links are engineered to achieve 'five 9s' availability, benefiting from state of the art forward error correction and inherent low latencies, for unrivalled quality of service.
- Cost effective: the Aprisa XE has a low total cost of ownership, providing a rapid return on investment by minimizing both capital and operational expenditure.
- Redundancy options: Monitored Hot Standby and Hitless Space Diversity are available for protection in mission-critical applications.
- Reliable: the Aprisa XE has an actual MTBF of 95.72 years, and zero out-of-the-box failures in 2008. It can be relied upon to perform in the harshest and most remote environments.

SYSTEM SPECIFICATION

RF	BAND	TUNING RANGE	SYNTHESIZER STEP SIZE					
FREQUENCIES	300 MHz	330 – 400 MHz	6.25 kHz					
	400 MHz	394 – 460 MHz	5.0 kHz					
	400 MHz	400 – 470 MHz	6.25 kHz					
	600 MHz	620 – 715 MHz	12.5 kHz					
	800 MHz	805 – 890 MHz	12.5 kHz					
	900 MHz	850 – 960 MHz	12.5 kHz					
	1400 MHz	1350 – 1550 MHz	12.5 kHz					
	1800 MHz	1700 – 2100 MHz	62.5 kHz					
	2000 MHz	1900 – 2300 MHz	62.5 kHz					
	2500 MHz	2300 – 2700 MHz	62.5 kHz					
MODULATION TYPES	Software configurable	Software configurable: QPSK/16/32/64/128 QAM						
FREQUENCY STABILITY	Short term \pm 1 ppm (environmental effects and power supply variations) Long term \pm 2 ppm (aging of crystal oscillators \approx over 5 years)							
ANTENNA CONNECTION	N-type female 50 ohm	I						
TRANSMITTER POWER	OUTPUT	300 – 1800 MHz	2000 – 2500 MHz					
QPSK		+21 to +35 dBm	+20 to +34 dBm					
16 QAM		+17 to +31 dBm	+17 to +31 dBm					
32 QAM		+16 to +30 dBm	+16 to +30 dBm					
64 QAM		+15 to +29 dBm	+15 to +29 dBm					
128 QAM		+15 to +29 dBm	+15 to +29 dBm					
RECEIVER								
MAXIMUM INPUT LEVEL	–20 dBm							
DYNAMIC RANGE	58 to 87 dB at 10 ⁻⁶ BE	R						
C/I RATIO	Co-channel	QPSK	better than 16 dB					
		16 QAM	better than 20 dB					
		32 QAM	better than 23 dB					
		64 QAM	better than 27 dB					
		128 QAM	better than 30 dB					
	First adjacent channel		better than –5 dB					
	Second adjacent chan	nel	better than -30 dB					
DUPLEXER (bandpass)	TX / RX SPLIT	FREQUENCY BANDS						
500 kHz	≥ 5 MHz	300, 400 MHz						
2.0 MHz	≥ 9.45 MHz	300, 400 MHz						
3.5 MHz	≥ 20 MHz	300, 400 MHz						
7.0 MHz	≥ 45 MHz	600 MHz						
	≥ 40 MHz	800, 900 MHz						
	≥ 48 MHz	1400 MHz						
14.0 MHz	≥ 47.5 MHz	1800 MHz						
	≥ 91 MHz	2000 MHz						
	≥ 74 MHz	2500 MHz						

POWER SUPPLY						
INPUT RANGE	115/230 VAC, 50/60 Hz					
	± 12 VDC (10.5 – 18 VDC), ± 24 VDC (20.5 – 30 VDC), ± 48 VDC (40 – 60 VDC)					
	+12 VDC (10.5 – 18 VDC) Low Power Option					
POWER CONSUMPTION	53 – 180 W input power (dependent on interface cards fitted and transmitter output power level)					
LOW POWER OPTION (12 VDC)	$41-53\ensuremath{\mathrm{W}}$ input power (dependent on interface cards fitted and transmitter output power level)					
INTERFACES						
ETHERNET	Integrated 4-port 10/100Base-T switch with port-based rate limiting, VLAN tagging and QoS Support					
E1 / T1	Quad 120 ohm G.703/G.704					
DATA	Quad V.24 asynchronous, synchronous and over sampling mode Single synchronous X.21 /V.35 / RS-449 / RS-530					
ANALOGUE	Dual 2-wire FXS / FXO (POTS); Quad 4-wire E&M					
AUXILIARY INTERFAC	ES					
ALARMS	4 external alarm outputs, 2 external alarm inputs					
CONFIGURATION	Embedded web server with SNMP					
MANAGEMENT	Ethernet interface for SuperVisor and SNMP, V.24 setup port					
RSSI	Front panel test point					
ENVIRONMENTAL						
OPERATING	-10° C to +50° C (+14° F to +122° F)					
STORAGE	-20° C to +70° C (-4° F to +158° F)					
HUMIDITY	Maximum 95 % non-condensing					
MECHANICAL						
RACK MOUNT	19" 2U high (internal duplexer)					
WEIGHT	10 kg (23 lbs) typical					
PROTECTED OPTION	5					
MHSB	\leq 4 dB splitter/cable loss, \leq 1 dB TX relay/cable loss (system gain reduced by a maximum of 5 dB)					
HSD	\leq 1 dB TX relay/cable loss, $<$ 25 ms TX switching/hitless RX switching					
COMPLIANCE						
RADIO	EN 302 217					
EMI /EMC	EN 301 489 Parts 1 & 4					
SAFETY	EN 60950-1:2006					
ENVIRONMENTAL	ETS 300 019 Class 3.2, EN 50385, WEEE					

PRODUCT RANGE

		CHANNEL SIZE													
		25 kHz	50 kHz	75 kHz	125 kHz	150 kHz	200 kHz	250 kHz	500 kHz	1 MHz	1.35 MHz	1.75 MHz	3.5 MHz	7 MHz	14 MHz
	300 MHz	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	400 MHz	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
۵	600 MHz												✓		
FREQUENCY BAND	800 MHz			✓				✓	✓	✓		✓	✓		
	900 MHz	✓	✓	✓		✓	✓	✓				✓			
	1400 MHz			✓		✓		✓	✓	✓			✓	✓	
H	1800 MHz							✓	✓	✓		✓	✓	✓	✓
	2000 MHz								✓	✓		✓	✓	√	\checkmark
	2500 MHz							✓	\checkmark	✓		✓	~	✓	\checkmark

ETSI licensed bands

Datasheet

SYSTEM PERFORMANCE

RECEIVER SENSITIVITY ² -87 dBm -81 dBm -78 dBm -75 dBm -72 dBm SYSTEM GAIN ² 122 dB 112 dB 108 dB 104 dB 101 dB 14.0 MHz CHANNEL QPSK 16 QAM 32 QAM 64 QAM 128 QAM ³							
serviceindexindexindexindexindexindexindexSTING GUTIF<IFIFIFIF<IFIF<IFIF<IF<IF<IF<IF<IF<IF<IF<IF<IF<IF<IF<IFIF<IF<IFIF	25 kHz CHANNEL		QPSK	16 QAM	32 QAM	64 QAM	128 QAM ³
SYTU GAYVAUndal13 ad13 ad15 adB MA GAMONITGOXGOX164 AD20 (4 1 x - 1) hith20 (1 1 x - 1) hith20 (1 1 x - 1) hithG MA10 (1 1 x - 1) hith10 (1 1 x - 1) hith10 (1 1 x - 1) hith44 (1 1 x - 1) hith44 (1 1 x - 1) hithG CACHIY10 (1 1 x - 1) hith10 (1 1 x - 1) hith10 (1 1 x - 1) hith44 (1 1 x - 1) hith44 (1 1 x - 1) hithG CACHIY90 (1 1 x - 10) hith10 (1 1 x - 1) hithSYNG GAA'70 (1 1 x - 10) hith10 (1 1 x - 1) hithSYNG GAA'10 (1 1 x - 1) hith10 (1 1 x - 1) hithSYNG GAA'10 (1 1 x - 1) hith10 (1 1 x - 1) hithSYNG GAA'10 (1 1 x - 1) hith10 (1 1 x - 1) hithSYNG GAA'90 (1 1 x - 1) hith10 (1 1 x - 1) hithSYNG GAA'90 (1 1 x - 1) hith10 (1 1 x - 1) hithSYNG GAA'90 (1 1 x - 1) hith10 (1 1 x - 1) hithSYNG GAA'90 (1 1 x - 1) hith10 (1 1 x - 1) hith10 (1 1 x - 1) hith10 (1 1 x - 1) hi	CAPACITY ¹	gross (E1 + wayside)	N/A	72 (1 TS + 8) kbit/s	96 (1 TS + 32) kbit/s	112 (1 TS + 48) kbit/s	136 (2 TS + 8) kbit/s
Shikarowcipadacip			N/A	–105 dBm	-102 dBm	–99 dBm	-96 dBm
GAMC1Birls Any and Part Part Part Part Part Part Part Part	SYSTEM GAIN 2		N/A	136 dB	132 dB	128 dB	125 dB
IECUYG SUMMY10 AGM	50 kHz CHANNEL		QPSK	16 QAM	32 QAM	64 QAM	128 QAM ³
SYTH GGM/I 16.40 10.40 10.60 20.40 12.40 25 MB GGM/GE 6656 162.00M 20.00M 662.00M 12.00M/M 0567 126.12.5 = 0.1600 20.414 (1 + s).1601 32.443 (1 + s).1601 460.4 (1 + s) - 160.10M 460.4 (1 + s) - 160.10M 12.00 M 12		gross (E1 + wayside)	80 (1 TS + 16) kbit/s		. ,		
DiskDi	RECEIVER SENSITIVITY 2		–109 dBm	–103 dBm	-100 dBm	–97 dBm	-94 dBm
nmmspaces							
BKCF078 SMUMIY-101 dBm401 dBm56 dBm95 dBm12 dBm <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>							
SYTH GAM:YeadYeadYeadYeadYeadYeadYeadYead15 Mar ColumnYeadYeadYeadYeadYeadYeadYeadYeadYead15 Mar ColumnYead		gross (E1 + wayside)			. ,	. ,	
District Share							
GRACITYyens (E1 wargels)38(37 ± 16 kbm)34(475 ± 40 kbm)36(375 ± 24 kbm)36(375 ± 24 kbm)36(375 ± 24 kbm)RECIVE SIGNITYI *16 dam3-9 dm3-6 dm3-6 dm3-0 dm3-0 dmSTREA GAN **16 dm3-6 dm3-0 dm3-0 dm3-0 dmSTREA GAN **16 dm3-0 dm3-0 dm3-0 dm3-0 dmSTREA GAN **13 dm3-0 dm3-0 dm3-0 dm3-0 dmSTREA GAN **13 dm3-0 dm3-0 dm3-0 dm3-0 dmSTREA GAN **3-0 dm3-0 dm3-0 dm3-0 dm3-0 dmSTREA GAN **13 dm3-0 dm3-0 dm3-0 dm3-0 dmSTREA GAN **3-0 dm3-0 dm3-0 dm3-0 dm3-0 dmSTREA GAN **13 dm3-0 dm3-0 dm3-0 dm3-0 dmSTREA GAN ***13 dm3-0 dm3-0 dm3-0 dm3-0 dmSTREA GAN ***13 dm3-0 dm3-0 dm3-0 dm3-0 dmSTREA GAN ***14 dm3-0 dm3-0 dm3-0 dm3-0 dmSTREA GAN ***14 dm3-0 dm3-0 dm3-0 dmSTREA GAN ***14 dm <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>							
RECIVER SENSITIVE-103 allm-94 dm-94 dm							128 QAM ³
SPSTEM GAN1: Hal dati 139 dat 126 dat 122 dat 119 dat 126 Mar CAMARIL OrX 16 QAA 20 QAA 62 QAA 72 QAA	CAPACITY ¹	gross (E1 + wayside)	208 (3 TS + 16) kbit/s	424 (6 TS + 40) kbit/s	536 (8 TS + 24) kbit/s	640 (10 TS + 0) kbit/s	744 (11 TS + 40) kbit/s
IDD MLC dFAUNTELQSIXQSI			–105 dBm	-99 dBm	-96 dBm	-93 dBm	-90 dBm
CMCRITYgens (E1 xwgind)Sid (AT S + 2) kbinSid (AT S + 2) kbinS	SYSTEM GAIN 2		140 dB	130 dB	126 dB	122 dB	119 dB
RECEVER SENSITYITY'104 dBm-90 dBm92 dBm92 dBm82 dBmSYSTEM CAN*138 dB128 dB128 dB127 dB127 dB128 dB128 dBCAMCUYgross (E1 + wayside)326 (55 x + 16) kbits680 (10 15 + 40) kbits600 (131 x + 8) kbits1024 (151 x + 0) kbits1168 (151 x + 16) kbitsRECEVER SENTIVITY'102 dBm-90 dBm-90 dBm-90 dBm-90 dBm-87 dBmSYSTEM CAN*172 dB172 dB172 dB120 dB199 dB116 dB250 ME (CANNEL-012 dBm-90 dBm-90 dBm-90 dBm-80 dBm-80 dBm250 ME (CANNEL-012 dBm-90 dBm-92 dBm-90 dBm-80 dBm-80 dBm250 ME (CANNEL-105 dBm126 (12 5 + 24) kbits1202 (15 1 + 8) kbits1201 (15 1 + 8) kbits1201 (15 1 + 9) kbits1201 (15 1 + 9) kbits250 ME (CANNEL-105 dBm126 dBm-92 dBm-92 dBm-92 dBm-82 dBm-82 dBmCAPACITY'gross (E1 + wayside)1202 (15 1 + 21) kbits1502 (15 1 + 55) kbits192 (13 1 + 8) kbits1201 (15 1 + 20) kbits120 (15 1 + 70) kbitsRECEVER SENSITIVTY'-93 dBm-92 dBm200 dBm-92 dBm-92 dBm-92 dBm-92 dBmCAPACITY'gross (E1 + wayside)124 (25 1 + 24) kbits1502 (15 1 + 35) kbits488 (2 E 1 + 72) kbits13 dBRECEVER SENSITIVT'-13 dB12 dB200 (15 1 + 25) kbits400 (15 1 + 25) kbits13 dB13 dBLAPACITY'gross (E1 + wayside	150 kHz CHANNEL		QPSK	16 QAM	32 QAM	64 QAM	128 QAM ³
SYSTEM GAIN?199 dB129 dB129 dB129 dB121 dB111 dB118 dB200 MC CANNELoprix (CANNEL)oprix (E 1 + ways6)365 (ST + 16) bbits660 (10T + 40) bbits640 (MT > 129 bbits1024 (TET > 10) bbits118 (TET > 10 bbitsRECEVER SENSITIVTY'-102 dbm-36 dbm23 dbm-30 dbm-87 dbm-87 dbmSYSTEM GAIN.*T37 dB127 dB127 dB123 dB119 dB116 dBSYSTEM GAIN.*Ord (E 1 + ways6e)406 (5 F + 24) bbits120 (16 F + 8) bbits1240 (19 T > 24) bbits1480 (21 F + 40) bbitsCANCTY *gross (E 1 + ways6e)406 (5 F + 24) bbits120 (16 F + 8) bbits1240 (19 T > 24) bbits1480 (21 F + 40) bbitsRECEVER SENSITIVT *-01 dbm-96 dbm-92 dbm-96 dbm-86 dbm-86 dbmSYSTEM GAIN.*100 dB120 (25 F + 56) bbits120 (21 F + 8) bbits128 (21 F + 704) bbits128 (21 F + 704) bbitsSYSTEM GAIN.*190 (E 1 + ways6e)729 (12 F + 24) bbits159 (21 F + 56) bbits199 (21 F + 8) bbits292 (11 F + 704) bbitsSYSTEM GAIN.*190 (E 1 + ways6e)729 (12 F + 24) bbits159 (21 F + 36) bbits292 (11 F + 704) bbits292 (11 F + 704) bbitsSYSTEM GAIN.*190 (E 1 + ways6e)124 (23 T > - 24) bbits120 dbm20 dbm-60 dbm220 dbmSYSTEM GAIN.*190 (E 1 + ways6e)124 (23 T > - 24) bbits202 (11 F + 704) bbits292 (11 F + 704) bbits292 (11 F + 704) bbitsSYSTEM GAIN.*190 (E 1 + ways6e) <td>CAPACITY ¹</td> <td>gross (E1 + wayside)</td> <td>264 (4 TS + 8) kbit/s</td> <td>536 (8 TS + 24) kbit/s</td> <td>672 (10 TS + 32) kbit/s</td> <td>808 (12 TS + 40) kbit/s</td> <td>944 (14 TS + 48) kbit/s</td>	CAPACITY ¹	gross (E1 + wayside)	264 (4 TS + 8) kbit/s	536 (8 TS + 24) kbit/s	672 (10 TS + 32) kbit/s	808 (12 TS + 40) kbit/s	944 (14 TS + 48) kbit/s
200 LH2 CHANNELQPSA90%C	RECEIVER SENSITIVITY 2						
CARCITY*genc E1 + wayada38 (51 × 16) habia60 (10 T × 0) habia90 (10 T × 0) habia102 (10 T ×				129 dB	125 dB	121 dB	
RECEIVER SENSITIVITY -102 dbm -96 dbm -93 dbm -90 dbm -87 dbm SYSTEM GAN ¹² 137 db 127 db 123 db 110 db 156 db 290 kHz CKANNEL 608x 600X 220 AM 120 db	200 kHz CHANNEL		QPSK	16 QAM	32 QAM	64 QAM	128 QAM ³
SYSTEM GAN1*137 d8127 d8122 d8123 d8119 d8116 d8200 MC CANNUEOPK60 AM32 QAM64 QAM128 QAM1CARCITY*905 (E1 + wapide)486 (E5 24) bits)824 (125 t- 56) bits)1020 (165 t- 84) bits)240 (195 t- 24) bits)148 (22 15 + 04) bits)STSTEM GAN1*130 d8126 d8122 d8122 d8180 d815 d8150 d8SOT MC CANNUE09K160 AM32 QAM64 QAM239 (111 + 304) bits)239 (111 + 104) bits239 (111 + 104) bits	CAPACITY ¹	gross (E1 + wayside)	336 (5 TS + 16) kbit/s	680 (10 TS + 40) kbit/s	840 (13 TS + 8) kbit/s	1024 (16 TS + 0) kbit/s	1168 (18 TS + 16) kbit/s
Zob Hriz CHANNELQFSK16 QAM22 QAM64 QAM22 QAMACARACTY*gross (E1+warpide)408 (6 T3 + 24) kbits824 (17 T3 + 66) kbits1320 (10 T3 + 24) kbits1448 (22 T3 + 40) kbitsRECEIVER SEISTIVITY*-01 d8m92 d8m-92 d8m-90 d8m-96 d8m-96 d8mSYSTEM GAIL*-10 d8d126 d8122 d8118 d8156 d8SON Hr.A CANNEL056 E1 + warpide)192 (12 T3 + 24) kbits192 (21 T3 + 56) kbits929 (21 T3 + 56) kbits929 (21 T1 + 104) kbitsCARACTY*095 E1 + warpide)192 (12 T3 + 24) kbits192 (21 T5 + 56) kbits929 (21 T3 + 56) kbits929 (21 T3 + 56) kbits929 (21 T1 + 104) kbitsCARACTY*095 E1 + warpide)192 (12 T3 + 24) kbits192 (21 T3 + 24) kbits920 kBits-67 d8m-87 d8mSTSTEM GAIL*095 E1 + warpide)162 (25 T3 + 24) kbits120 dB110 dB120 dB113 dB120 dBRECEVER SENSITIVITY*-66 d8m-90 d8m-87 d8m-84 d8m114 dB100 dBSTSTEM GAIL*13 dB120 dB117 dB113 dB100 dB100 dBSTSTEM GAIL*13 dB200 (11 E1 + 112) kbits400 (21 E1 + 22) kbits616 (31 E1 + 32) kbits720 (31 E1 + 156) kbitsSTSTEM GAIL*053 CEI + warpide)202 (11 E1 + 704) kbits400 (21 E1 + 22) kbits616 (31 E1 + 32) kbits610 dBSTSTEM GAIL**053 CEI + warpide)203 CEI + 152 (bits512 (21 E1 + 364) kbits616 (31 E1 + 32) kbits616 (31 E1 + 32) kbitsSTSTEM GAIL** <t< td=""><td>RECEIVER SENSITIVITY ²</td><td></td><td>-102 dBm</td><td>-96 dBm</td><td>–93 dBm</td><td>-90 dBm</td><td>87 dBm</td></t<>	RECEIVER SENSITIVITY ²		-102 dBm	-96 dBm	–93 dBm	-90 dBm	87 dBm
CAPACITY'gross (E1 + wayside)408 (6 15 + 24) kbits)824 (1 27 5 + 5) kbits)1020 (1 61 5 + 8) kbits)1240 (1 91 5 + 24) kbits)1448 (2 2 1 5 + 40) kbits)RECEVER SENSITIVTY'-101 dBm-95 dBm-92 dBm-90 dBm <td< td=""><td>SYSTEM GAIN 2</td><td></td><td>137 dB</td><td>127 dB</td><td>123 dB</td><td>119 dB</td><td>116 dB</td></td<>	SYSTEM GAIN 2		137 dB	127 dB	123 dB	119 dB	116 dB
RECEIVER SENSITIVITY -101 diam -95 diam -92 diam -99 diam -86 diam SYSTEM GAN ² 136 dia 126 dia 122 dia 118 dia 15 dia SOO KH2 CHANNEL 075K 156 QdA 22 QdA 64 QAA 64 QAA 152 QAA ¹ SOO KH2 CHANNEL 075K 1592 (21 TS + 26) kbits 1992 (31 TS + 8) kbits 292 (1E + 1404) kbits 292 (1E + 174) kbits RECEIVER SENSITIVITY -99 diam -93 diam -90 diam -87 diam -84 diam SYSTEM GAN ² 133 dia 124 dia 120 dia 16 diam 13 diam 1.0 MH2 CHANNEL 075K 66 QAH 22 QAH 64 QAM 64 QAM 528 QAH / 51 (2E + 1528) kbits RECEIVER SENSITIVITY -96 diam -90 diam -87 diam -84 diam -81 diam SYSTEM GAN ² -96 diam -90 diam -87 diam -84 diam -81 diam SYSTEM GAN ² -96 diam -90 diam -87 diam -84 diam -81 diam 1.0 MH2 CHANNEL 131 dia 121 diam 102 dia	250 kHz CHANNEL		QPSK	16 QAM	32 QAM	64 QAM	128 QAM ³
SYSTEM GAIN ¹ J86 BB 126 GB 122 dB 118 dB 115 dB 500 Hr>, CAPACITY ¹ yross (E1 + waysic) 792 (12 Ts + 24) lbits 1592 (24 Ts + 56) lbits 1992 (31 Ts + 3) lbits 2392 (1E1 + 304) lbits 2792 (1E1 + 704) lbits CAPACITY ¹ yross (E1 + waysic) 792 (12 Ts + 24) lbits 1592 (24 Ts + 56) lbits 1992 (31 Ts + 3) lbits 2392 (1E1 + 304) lbits 2792 (1E1 + 704) lbits SYSTEM GAIN ² 13 dB 124 dB 120 dB 116 dB 13 dB 10 MBC CARANTE 095K 16 QAM 20 QAM 64 QAM 2704/15 CAPACITY ¹ yross (E1 + waysic) 1624 (25 Ts + 24) lbits 256 (1E1 + 1168) lbits 4072 (1E1 + 1984) lbits 4888 (2E1 + 712) lbits 5704 (2E1 + 1528) lbits SYSTEM GAIN ² - 65 dBm - 040m - 870 Bm - 870 Bm SYSTEM GAIN ² - 65 dBm - 040m - 870 Bm - 870 Bm - 870 Bm SYSTEM GAIN ² - 05 dBm - 040 BM 20 AM 64 GAM 20 AM ³ CAPACITY ¹ gross (E1 + waysic) 130 dB 120 dB 116 dB 112 dB 1002 (4E1 + 120 lbits) SYSTEM GAIN ² - 05 dBm -	CAPACITY ¹	gross (E1 + wayside)	408 (6 TS + 24) kbit/s	824 (12 TS + 56) kbit/s	1032 (16 TS + 8) kbit/s	1240 (19 TS + 24) kbit/s	1448 (22 TS + 40) kbit/s
500 kHz CHANNEL QPSX 16 QAM 32 QAM 64 QAM 128 QAM ³ CAPACITY ¹ gross (E 1 + wayside) 72 (1 TS + 24) kbits 1592 (2 H TS + 8) kbits 2392 (1 E 1 + 304) kbits 2792 (1 E 1 + 704) kbits RECEIVER SENSITIVITY ³ -99 dBm -93 dBm -90 dBm -87 dBm -87 dBm SYSTEM GAN ³ 13 dB 124 dB 120 dB 116 dB 113 dB CAPACITY ¹ gross (E 1 + wayside) 1624 (2 TS + 24) kbits 32 GAM 64 QAM 23 QAM CAPACITY ¹ gross (E 1 + wayside) 1624 (2 TS + 24) kbits 3256 (1 E 1 + 1168) kbits 472 (1 E 1 + 1984) kbits 4888 (2 E 1 + 712) kbits 570 (2 E 1 + 1528) kbits SYSTEM GAIN ² -96 dBm -90 dBm -87 dBm -84 dBm -81 dBm SYSTEM GAIN ² 13 dB 121 dB 170 dM 10 dB 120 dB CAPACITY ¹ gross (E 1 + wayside) 200 (1 E 1 + 122) kbits 512 (2 E 1 + 1336) kbits 616 (3 E 1 + 352) kbits 720 (3 E 1 + 156) kbits SYSTEM GAIN ² -95 dBm -99 dBm -80 dBm -80 dBm -80 dBm <td>RECEIVER SENSITIVITY ²</td> <td></td> <td>-101 dBm</td> <td>–95 dBm</td> <td>-92 dBm</td> <td>-89 dBm</td> <td>-86 dBm</td>	RECEIVER SENSITIVITY ²		-101 dBm	–95 dBm	-92 dBm	-89 dBm	-86 dBm
CAPACITY1gross (E1 + wayside)792 (12 Ts + 24) kbits1992 (24 Ts + 56) kbits1992 (13 Ts + 8) kbits292 (12 F1 + 704) kbits292 (12 F1 + 704) kbitsRECEIVER SENSITVITY2-99 dBm-93 dBm-90 dBm-90 dBm-87 dBm-84 dBmSYSTEM GAIN 2134 dB124 dB120 dB116 dB113 dB113 dBCAPACITY1gross (E1 + wayside)1624 (25 Ts + 24) kbits255 (1 E1 + 1168) kbits4072 (1 E1 + 1944) kbits488 (2 E1 + 712) kbits5074 (2 E1 + 1528) kbitsCAPACITY1gross (E1 + wayside)1624 (25 Ts + 24) kbits255 (1 E1 + 1168) kbits4072 (1 E1 + 1944) kbits488 (2 E1 + 712) kbits5074 (2 E1 + 1528) kbitsRECEIVER SENSITVITY2-96 dBm-90 dBm-87 dBm48 dBm-81 dBmSYSTEM GAIN 2US (1 E1 + 112) kbits162 (4 LS TS + 24) kbits512 (2 E1 + 136) kbits616 (3 E1 + 352) kbits720 (3 E1 + 136) kbitsRECEIVER SENSITVITY205 STEM GAIN 2US (1 E1 + 784) kbits152 (2 E1 + 1576) kbits512 (2 E1 + 136) kbits616 (3 E1 + 352) kbits100 dBSYSTEM GAIN 2US (E1 + wayside)130 GE (1 + 172) kbits16 QAB20 QAM62 QAM62 QAM128 QAM ³ SYSTEM GAIN 2US (E1 + wayside)1872 (1 E1 + 784) kbits152 (2 E1 + 1576) kbits192 (3 E1 + 328) kbits823 (4 E1 + 280) kbits100 dBSYSTEM GAIN 2US (E1 + wayside)1872 (1 E1 + 784) kbits152 (2 E1 + 1576) kbits152 (2 E1 + 1576) kbits132 (3 E1 + 328) kbits100 dBSYSTEM GAIN 2US (2	SYSTEM GAIN 2		136 dB	126 dB	122 dB	118 dB	115 dB
RECEIVER SENSITIVITY ¹ -99 dBm -93 dBm -90 dBm -87 dBm -84 dBm SYSTEM GAN ² 134 dB 124 dB 120 dB 116 dB 113 dB 10 MLC CHANNEL QPSK 16 QAM 22 QAM 64 QAM 128 QAM ³ CAPACITY ¹ gross (E1 + wayside) 1624 (25 15 + 24) kbits 3256 (1 E1 + 1168) kbits 407 (2 E1 + 1394) kbits 4888 (2 E1 + 72) kbits 504 (2 E1 + 1528) kbits SYSTEM GAN ² -95 dBm -96 dBm -87 dBm -84 dBm -81 dBm SYSTEM GAN ² 131 dB 121 dB 117 dB 113 dB 10 dB SYSTEM GAN ² 131 dB 120 dB 17 dB 661 (3 E1 + 52) kbits 720 (3 E1 + 1456) kbits RECEIVER SENSTIVITY ² -95 dBm 69 dBm -86 dBm 83 dBm -80 dBm SYSTEM GAN ² 130 dB 120 dB 16 dBm 12 dB 100 dB SYSTEM GAN ² 130 dB 120 dB 16 dBm 12 dB 100 dB SYSTEM GAN ² 130 dB 150 dB 12 dB 100 dB 100 Z2 (4 E1 + 1720 kbits SYSTEM GAN ² 130 dB 16 QAM 20 QAM 64 QAM 20 QAM ³ CAPACITY ¹ gross (E1 + wayside) 827 (1 E1 + 784) kbits 575 (2 E1 + 1550) kbits <td>500 kHz CHANNEL</td> <td></td> <td>QPSK</td> <td>16 QAM</td> <td>32 QAM</td> <td>64 QAM</td> <td>128 QAM ³</td>	500 kHz CHANNEL		QPSK	16 QAM	32 QAM	64 QAM	128 QAM ³
SYSTEM GAIN '184 dB124 dB120 dB116 dB113 dB1.0 MHz CHANNELOPSK160 AM32 0AM64 QAM128 0AM'CAPACITY 'gross (E1 + wayside)1624 (25 Ts + 24) kbity3256 (1 E1 + 1168) kbity4072 (1 E1 + 1984) kbity4888 (2 E1 + 712) kbity5704 (2 E1 + 1528) kbityRECEIVER SENSITIVITY '-96 dBm-90 dBm-87 dBm-84 dBm-81 dBmSYSTEM GAIN 2'131 dB121 dB117 dB113 dB10 dBCAPACITY 'gross (E1 + wayside)200 (1 E1 + 112) kbity4408 (2 E1 + 222) kbity5512 (2 E1 + 136) kbity6616 (3 E1 + 352) kbity720 (3 E1 + 1456) kbityACAPCITY 'gross (E1 + wayside)200 (1 E1 + 112) kbity4408 (2 E1 + 222) kbity5512 (2 E1 + 136) kbity6616 (3 E1 + 352) kbity720 (3 E1 + 1456) kbityRECEIVER SENSITIVITY '-95 dBm-89 dBm-86 dBm-83 dBm-80 dBm-80 dBmSYSTEM GAIN 2'130 dB120 dB116 dB112 dB109 dB120 dB17.5 MHZ CHANNELOPSK160 AAM20 QAM64 QAM128 QAM'CAPACITY 'gross (E1 + wayside)720 (2 E1 + 1576) kbity179 (2 E1 + 720 kbity863 QL (2 E1 + 280 kbitySYSTEM GAIN 2'90 dBm-80 dBm-80 dBm-80 dBm-80 dBm-80 dBmSYSTEM GAIN 2'90 SK160 AM20 QAM64 QAM20 QAM'CAPACITY 'gross (E1 + wayside)5702 (E1 ± 1576) kbity113 dB111 dB107 dBSYSTEM GAIN 2'129 dB119 dB <t< td=""><td>CAPACITY ¹</td><td>gross (E1 + wayside)</td><td>792 (12 TS + 24) kbit/s</td><td>1592 (24 TS + 56) kbit/s</td><td>1992 (31 TS + 8) kbit/s</td><td>2392 (1 E1 + 304) kbit/s</td><td>2792 (1 E1 + 704) kbit/s</td></t<>	CAPACITY ¹	gross (E1 + wayside)	792 (12 TS + 24) kbit/s	1592 (24 TS + 56) kbit/s	1992 (31 TS + 8) kbit/s	2392 (1 E1 + 304) kbit/s	2792 (1 E1 + 704) kbit/s
10 MHz CHANNELQFSK16 QAM32 QAM64 QAM128 QAM ¹ CAPACITYgross (E1 + wayside)1624 (25 TS + 24) kbits3256 (1 E1 + 1168) kbits4702 (1 E1 + 1984) kbits4888 (2 E1 + 712) kbits5704 (2 E1 + 1528) kbitsRECEIVER SENSITIVITY-96 dBm-90 dBm-87 dBm-84 dBm-81 dBmSYSTEM GAIN ² 11 dB11 dB11 dB11 dB11 dB135 MHz CHANNELOPSK16 QAM22 QAM64 QAM280 QAMCAPACITYgross (E1 + wayside)2200 (1 E1 + 112) kbits4408 (2 E1 + 322) kbits512 (2 E1 + 1336) kbits616 (3 E1 + 532) kbits720 (3 E1 + 456) kbitsRECEIVER SENSITIVITY-95 dBm-89 dBm-86 dBm-83 dBm-80 dBm-80 dBmSYSTEM GAIN ² 19 dB120 dB16 QAM22 QAM64QAM120 dB150 dB120 dB16 QAM20 QAM64QAM120 dB109 dBCAPACITY ¹ gross (E1 + wayside)2872 (1 E1 + 784) kbits5752 (2 E1 + 1576) kbits8632 (4 E1 + 280) kbits1072 (4 E1 + 120) kbitsSYSTEM GAIN ² -94 dBm88 dBm-85 dBm-82 dBm-92 dBm-99 dBmSYSTEM GAIN ² 90 dB1148 (5 E1 + 100 B) kbits1132 (5 E1 + 1784) kbits1074 (8 E1 + 472) kbits2040 (9 E1 + 122) kbitsSYSTEM GAIN ² 190 dB1148 (5 E1 + 100 B) kbits1312 (5 E1 + 712) kbits140 dB104 dB104 dBSYSTEM GAIN ² 190 dB1148 (5 E1 + 100 B) kbits1312 (5 E1 + 172) kbits142 (9 L1 E1 + 100 kbits	RECEIVER SENSITIVITY ²		-99 dBm	-93 dBm	-90 dBm	-87 dBm	-84 dBm
CAPACITY 'gross (E1 + wayside)1624 (25 TS + 24) kbits/s2526 (1 E1 + 1168) kbits/s4072 (1 E1 + 1984) kbits/s4888 (2 E1 + 712) kbits/s5704 (2 E1 + 528) kbits/sRECEIVER SENSITIVITY '-96 dBm-90 dBm-87 dBm-84 dBm-81 dBm-81 dBmSYSTEM GAIN 2'131 dB121 dB117 dB113 dB110 dB120 dAM 'ADARC CHANNEL075K160 AM20 AM64 QAM64 QAM28 QAM 'CAPACITY 'gross (E1 + wayside)200 (1 E1 + 112) kbits408 (2 E1 + 222) kbits5512 (2 E1 + 136) kbits6616 (3 E1 + 525) kbits702 (3 E1 + 1456) kbitsRECEIVER SENSITIVITY '-95 dBm-95 dBm86 dBm-83 dBm-80 dBm-80 dBm-80 dBmSYSTEM GAIN 2'130 dB120 dB116 dB112 dB100 dL120 QAM 'CAPACITY 1gross (E1 + wayside)2872 (1 E1 + 784) kbits5752 (2 E1 + 1576) kbits7192 (3 E1 + 928) kbits652 (4 E1 + 280) kbits1007 (4 E1 + 1720) kbitsRECEIVER SENSITIVITY '-94 dBm-88 dBm-85 dBm-82 dBm-79 dBmSYSTEM GAIN 2'-94 dBm-80 dBm32 QAM64 QAM128 QAM 'SYSTEM GAIN 2'-94 dBm-80 dBm32 QAM64 QAM128 QAMSYSTEM GAIN 2'-94 dBm-81 dBm-81 dBm-82 dBm-82 dBmSYSTEM GAIN 2'-94 dBm-81 dBm116 dB110 dB100 dQ (9 E1 + 1420) kbitsSYSTEM GAIN 2'-94 dBm-84 dBm116 dB110 dB20 QAMSYSTEM GAIN 2' <td>SYSTEM GAIN 2</td> <td></td> <td>134 dB</td> <td>124 dB</td> <td>120 dB</td> <td>116 dB</td> <td>113 dB</td>	SYSTEM GAIN 2		134 dB	124 dB	120 dB	116 dB	113 dB
RECEIVER SENSITIVITY ¹ -96 dBm -90 dBm -87 dBm -84 dBm -81 dBm SYSTEM GAIN ² 131 dB 121 dB 121 dB 117 dB 131 dB 110 dB L35 MH2 CHANNEL OPSK 60 AM 32 QAM 64 QAM 128 QAM ³ CAPACITY ¹ gross (E1 + wayside) 200 (1 E1 + 112) kbits 408 (2 E1 + 232) kbits 5512 (2 E1 + 1336) kbits 6616 (3 E1 + 322) kbits 720 (3 E1 + 1456) kbits RECEIVER SENSITIVITY ² -95 dBm -98 dBm -86 dBm -83 dBm -80 dBm -80 dBm SYSTEM GAIN ³ 130 dB 120 dB 116 dB 112 dB 109 dB 175 MH2 CHANNEL OPSK 16 QAM 22 QAM 64 QAM 128 QAM ³ CAPACITY ¹ gross (E1 + wayside) 2872 (1 E1 + 784) kbits 5752 (2 E1 + 1576) kbits 7192 (3 E1 + 928) kbits 8632 (4 E1 + 280) kbits 1007 (4 E1 + 1720) kbits RECEIVER SENSITIVITY ² -94 dBm -88 dBm -85 dBm -82 dBm -92 dBm -92 dBm SYSTEM GAIN ³ 120 gB 119 dB 115 dB 111 dB 108 dB 128 QAM ³ CAPACITY ¹ gross (E1 + wayside) 5720 (2 E1 + 1544) kbits 1432 (6 E1 + 1784) kbits 1716 (8 E1 + 472) kbits 280 QAM SYSTEM GAIN ³	1.0 MHz CHANNEL		QPSK	16 QAM	32 QAM	64 QAM	128 QAM ³
SYSTEM GAIN ¹ 131 dB 121 dB 121 dB 117 dB 117 dB 113 dB 10 dB L35 MHz CHANNEL QPSK 16 QAM 32 QAM 64 QAM 128 QAM ³ CAPACITY ¹ gross (E1 + wayide) 2200 (1 E1 + 112) kbits 4408 (2 E1 + 232) kbits 5512 (2 E1 + 1336) kbits 6616 (3 E1 + 352) kbits 7720 (3 E1 + 1456) kbits RECEIVER SENSITIVITY ² -95 dBm -98 dBm -86 dBm -83 dBm -80 dBm -80 dBm SYSTEM GAIN ² 130 dB 120 dB	CAPACITY ¹	gross (E1 + wayside)	1624 (25 TS + 24) kbit/s	3256 (1 E1 + 1168) kbit/s	4072 (1 E1 + 1984) kbit/s	4888 (2 E1 + 712) kbit/s	5704 (2 E1 + 1528) kbit/s
1.35 MH2 CHANNELQPSK16 QAM32 QAM64 QAM12 8 QAM 3CAPACITY 1gross (E1 + wayside)2200 (1 E1 + 112) kbitys4408 (2 E1 + 232) kbitys5512 (2 E1 + 133 h kbitys6616 (3 E1 + 352) kbitys7720 (3 E1 + 145 h kbitysRECEIVER SENSITIVITY 1-95 dBm-89 dBm-86 dBm-83 dBm-83 dBm-80 dBmSYSTEM GAIN 2130 dB120 dB116 dB112 dB109 dBCAPACITY 1gross (E1 + wayside)2872 (1 E1 + 784) kbitys5752 (2 E1 + 1576) kbitys7192 (3 E1 + 928) kbitys632 (4 E1 + 280) kbitys10072 (4 E1 + 1720) kbitysRECEIVER SENSITIVITY 2-94 dBm-88 dBm-85 dBm-82 dBm-82 dBm-79 dBmSYSTEM GAIN 212 9 dB119 dB115 dB111 dB108 dB104 dBSYSTEM GAIN 2-90 dBm64 QAM128 QAM 3204 04 9 E1 + 128) kbitys128 QAM 3CAPACITY 1gross (E1 + wayside)5720 (2 E1 + 1544) kbity1148 (5 E1 + 1008) kbity14312 (6 E1 + 1784) kbity1716 (8 E1 + 472) kbity2040 9 E1 + 128) kbitysRECEIVER SENSITIVITY 2-90 dBm-84 dBm-81 dBm-78 dBm-78 dBm2040 9 E1 + 128) kbitysSYSTEM GAIN 2Gross (E1 + wayside)1182 (5 E1 + 1392) kbity23572 (11 E1 + 704) kbitys25952 (14 E1 + 360) kbitys35512 (17 E1 + 16) kbitys1432 (19 E1 + 1760) kbitysSYSTEM GAIN 2Gross (E1 + wayside)1182 (5 E1 + 1392) kbitys23672 (11 E1 + 704) kbitys25952 (14 E1 + 360) kbitys35512 (17 E1 + 16) kbitys1423 (19 E1 + 1760)	RECEIVER SENSITIVITY 2		-96 dBm	-90 dBm	87 dBm	-84 dBm	81 dBm
CAPACITY ¹ gross (E1 + wayside) 2200 (1 E1 + 112) kbits 4408 (2 E1 + 232) kbits 5512 (2 E1 + 136) kbits 6616 (3 E1 + 352) kbits 7220 (3 E1 + 1456) kbits RECEIVER SENSITIVITY ² -95 dBm -89 dBm -86 dBm -83 dBm -80 dBm SYSTEM GAIN ² 130 dB 120 dB 116 dB 112 dB 109 dB SYSTEM GAIN ² gross (E1 + wayside) 2872 (1 E1 + 784) kbits 5752 (2 E1 + 1576) kbits 7192 (3 E1 + 928) kbits 8632 (4 E1 + 280) kbits 10072 (4 E1 + 1720) kbits RECEIVER SENSITIVITY ² -94 dBm -88 dBm -85 dBm -82 dBm -92 dBm SYSTEM GAIN ² 129 dB 119 dB 115 dB 111 dB 108 dB SYSTEM GAIN ² 90 dBm -84 dBm -81 dBm -78 dBm -79 dBm CAPACITY ¹ gross (E1 + wayside) 1520 (2 E1 + 154) kbits 11448 (5 E1 + 1008) kbits 1412 (6 E1 + 1784) kbits 1716 (8 E1 + 372) kbits 204 (9 E1 + 280) kbits SYSTEM GAIN ² -90 dBm -84 dBm -81 dBm -78 dBm -75 dBm CAPACITY ¹ gross (E1 + wayside) 1122 (5 E1	SYSTEM GAIN 2		131 dB	121 dB	117 dB	113 dB	110 dB
RECEIVER SENSITIVITY -95 dBm -89 dBm -86 dBm -83 dBm -80 dBm SYSTEM GAIN ² 130 dB 120 dB 116 dB 112 dB 199 dB 1.75 MHz CHANNEL QPSK 16 QAM 32 QAM 64 QAM 128 QAM ³ CAPACITY ¹ gross (E1 + wayside) 2872 (1 E1 + 784) kbit/s 5752 (2 E1 + 1576) kbit/s 7192 (3 E1 + 928) kbit/s 8632 (4 E1 + 280) kbit/s 10072 (4 E1 + 1720) kbit/s RECEIVER SENSITIVITY ² -94 dBm -88 dBm -85 dBm -82 dBm -79 dBm SYSTEM GAIN ² 129 dB 119 dB 115 dB 111 dB 108 dB SYSTEM GAIN ² -90 dBm -84 dBm -81 dBm -78 dBm -75 dBm SYSTEM GAIN ² -90 dBm -84 dBm -81 dBm -78 dBm -75 dBm SYSTEM GAIN ² -90 dBm -84 dBm -81 dBm -78 dBm -75 dBm SYSTEM GAIN ² -90 dBm -84 dBm -81 dBm -78 dBm -75 dBm SYSTEM GAIN ² -90 dBm -84 dBm -81 dBm -78 dBm -75	1.35 MHz CHANNEL		QPSK	16 QAM	32 QAM	64 QAM	128 QAM ³
SYSTEM GAIN ² 130 dB 120 dB 116 dB 112 dB 109 dB 1.7.5 MHz CHANNEL OPSK 16 QAM 32 QAM 64 QAM 128 QAM ³ CAPACITY ¹ gross (E1 + wayside) 2872 (1 E1 + 784) kbit/s 5752 (2 E1 + 1576) kbit/s 7192 (3 E1 + 928) kbit/s 8632 (4 E1 + 280) kbit/s 10072 (4 E1 + 1720) kbit/s RECEIVER SENSITIVITY ² -94 dBm -88 dBm -85 dBm -82 dBm -79 dBm SYSTEM GAIN ² 129 dB 119 dB 115 dB 111 dB 108 dB SYSTEM GAIN ² OPSK 16 QAM 32 QAM 64 QAM 128 QAM ³ CAPACITY ¹ gross (E1 + wayside) 5720 (2 E1 + 1544) kbit/s 11448 (5 E1 + 1008) kbit/s 14312 (6 E1 + 1784) kbit/s 17176 (8 E1 + 472) kbit/s 20040 (9 E1 + 1248) kbit/s SYSTEM GAIN ² -90 dBm -84 dBm -81 dBm -78 dBm -75 dBm -75 dBm SYSTEM GAIN ² -90 dBm 115 dB 111 dB 107 dB 104 dB 128 QAM ³ CAPACITY ¹ gross (E1 + wayside) 11832 (5 E1 + 1392) kbit/s 23672 (11 E1 + 704) kbit/s 25922 (14 E1 + 360) kbit/s 35512 (17 E1 + 16) kbit/s 41432 (19 E1 + 17	CAPACITY ¹	gross (E1 + wayside)	2200 (1 E1 + 112) kbit/s	4408 (2 E1 + 232) kbit/s	5512 (2 E1 + 1336) kbit/s	6616 (3 E1 + 352) kbit/s	7720 (3 E1 + 1456) kbit/s
1.75 MHz CHANNEL QPSK 16 QAM 32 QAM 64 QAM 128 QAM ³ CAPACITY ¹ gross (E1 + wayside) 2872 (1 E1 + 784) kbit/s 5752 (2 E1 + 1576) kbit/s 7192 (3 E1 + 928) kbit/s 8632 (4 E1 + 280) kbit/s 10072 (4 E1 + 1720) kbit/s RECEIVER SENSITIVITY ² -94 dBm -88 dBm -85 dBm -82 dBm -79 dBm SYSTEM GAIN ² 129 dB 119 dB 115 dB 111 dB 108 dB 3.5 MHz CHANNEL QPSK 16 QAM 32 QAM 64 QAM 128 QAM ³ CAPACITY ¹ gross (E1 + wayside) 5720 (2 E1 + 1544) kbit/s 11448 (5 E1 + 1008) kbit/s 14312 (6 E1 + 1784) kbit/s 17176 (8 E1 + 472) kbit/s 20040 (9 E1 + 1248) kbit/s RECEIVER SENSITIVITY ² -90 dBm -84 dBm -81 dBm -78 dBm -75 dBm SYSTEM GAIN ² 125 dB 115 dB 111 dB 107 dB 104 dB CAPACITY ¹ gross (E1 + wayside) 1832 (5 E1 + 1392) kbit/s 2672 (11 E1 + 704) kbit/s 2592 (14 E1 + 360) kbit/s 3512 (17 E1 + 16) kbit/s 1432 (19 E1 + 1706) kbit/s SYSTEM GAIN ² -87 dBm	RECEIVER SENSITIVITY ²		-95 dBm	-89 dBm	-86 dBm	-83 dBm	-80 dBm
CAPACITY 1 gross (E1 + wayside) 2872 (1 E1 + 784) kbit/s 5752 (2 E1 + 1576) kbit/s 7192 (3 E1 + 928) kbit/s 8632 (4 E1 + 280) kbit/s 10072 (4 E1 + 1720) kbit/s RECEIVER SENSITIVITY 2 -94 dBm -88 dBm -85 dBm -82 dBm -79 dBm SYSTEM GAIN 2 129 dB 119 dB 115 dB 111 dB 108 dB CAPACITY 1 gross (E1 + wayside) 5720 (2 E1 + 1544) kbit/s 1448 (5 E1 + 1008) kbit/s 1432 (6 E1 + 1784) kbit/s 17176 (8 E1 + 472) kbit/s 2040 (9 E1 + 1248) kbit/s CAPACITY 1 gross (E1 + wayside) 5720 (2 E1 + 1544) kbit/s 11448 (5 E1 + 1008) kbit/s 14312 (6 E1 + 1784) kbit/s 17176 (8 E1 + 472) kbit/s 2040 (9 E1 + 1248) kbit/s SYSTEM GAIN 2 -90 dBm -84 dBm -81 dBm -78 dBm -75 dBm SYSTEM GAIN 2 125 dB 115 dB 111 dB 107 dB 104 dB SYSTEM GAIN 2 290 kS 16 QAM 2QAM 64 QAM 1432 (19 E1 + 1708) kbit/s SYSTEM GAIN 2 gross (E1 + wayside) 11832 (5 E1 + 1392 kbit/s 23672 (11 E1 + 704 kbit/s 29592 (14 E1 + 360 kbit/s) 5512 (17 E1 + 16) kbit/s 1432 (19 E1 + 1706 kbit/s) SYSTEM GAIN 2 -87 dBm <td>SYSTEM GAIN 2</td> <td></td> <td>130 dB</td> <td>120 dB</td> <td>116 dB</td> <td>112 dB</td> <td>109 dB</td>	SYSTEM GAIN 2		130 dB	120 dB	116 dB	112 dB	109 dB
RECEIVER SENSITIVITY ² -94 dBm -88 dBm -85 dBm -82 dBm -79 dBm SYSTEM GAIN ² 129 dB 119 dB 115 dB 111 dB 108 dB 3.5 MHz CHANNEL QPSK 16 QAM 32 QAM 64 QAM 28 QAM ³ CAPACITY ¹ gross (E1 + wayside) 5720 (2 E1 + 1544) kbit/s 11448 (5 E1 + 1008) kbit/s 14312 (6 E1 + 1784) kbit/s 17176 (8 E1 + 472) kbit/s 20040 (9 E1 + 1248) kbit/s RECEIVER SENSITIVITY ² -90 dBm -84 dBm -81 dBm -78 dBm -75 dBm SYSTEM GAIN ² 125 dB 115 dB 111 dB 107 dB 104 dB SYSTEM GAIN ² QPSK 16 QAM 22 QAM 64 QAM 128 QAM ³ CAPACITY ¹ gross (E1 + wayside) 125 dB 115 dB 111 dB 107 dB 104 dB CAPACITY ¹ gross (E1 + wayside) 1832 (5 E1 + 1392) kbit/s 23672 (11 E1 + 704) kbit/s 29592 (14 E1 + 360) kbit/s 35512 (17 E1 + 16) kbit/s 1432 (19 E1 + 1760) kbit/s RECEIVER SENSITIVITY ² -87 dBm -81 dBm -78 dBm -72 dBm -72 dBm SYSTEM GAIN ² 122 dB 112 dB 108 d	1.75 MHz CHANNEL		QPSK	16 QAM	32 QAM	64 QAM	128 QAM ³
SYSTEM GAIN ² 129 dB 119 dB 15 dB 111 dB 108 dB 3.5 MHz CHANNEL QPSK 16 QAM 32 QAM 64 QAM 128 QAM ³ CAPACITY ¹ gross (E1 + wayside) 5720 (2 E1 + 1544) kbits 11448 (5 E1 + 1008) kbits 14312 (6 E1 + 1784) kbits 17176 (8 E1 + 472) kbits 20040 (9 E1 + 1248) kbits RECEIVER SENSITIVITY ² -90 dBm -84 dBm -81 dBm -78 dBm -75 dBm SYSTEM GAIN ² 125 dB 115 dB 111 dB 107 dB 144 dB 144 dB YO MHZ CHANNEL QPSK 16 QAM 32 QAM 64 QAM 128 QAM ³ CAPACITY ¹ gross (E1 + wayside) 11832 (5 E1 + 1392) kbits 23672 (11 E1 + 704) kbits 29592 (14 E1 + 360) kbits 35512 (17 E1 + 16) kbits 41432 (19 E1 + 1706) kbits RECEIVER SENSITIVITY ² -87 dBm -81 dBm -78 dBm -75 dBm -72 dBm SYSTEM GAIN ² 122 dB 112 dB 108 dB 104 dB 101 dB SYSTEM GAIN ² QPSK 16 QAM 32 QAM 64 QAM 128 QAM ³ RECEIVER SENSITIVITY ² QPSK 16 QAM 32 QAM 64 QAM	CAPACITY ¹	gross (E1 + wayside)	2872 (1 E1 + 784) kbit/s	5752 (2 E1 + 1576) kbit/s	7192 (3 E1 + 928) kbit/s	8632 (4 E1 + 280) kbit/s	10072 (4 E1 + 1720) kbit/s
3.5 MHz CHANNEL QPSK 16 QAM 32 QAM 64 QAM 128 QAM ³ CAPACITY ¹ gross (E1 + wayside) 5720 (2 E1 + 1544) kbits 11448 (5 E1 + 1008) kbits 14312 (6 E1 + 1784) kbits 17176 (8 E1 + 472) kbits 20040 (9 E1 + 1248) kbits RECEIVER SENSITIVITY ² -90 dBm -84 dBm -81 dBm -78 dBm -75 dBm SYSTEM GAIN ² 125 dB 115 dB 111 dB 107 dB 1448 (2 E1 + 1302) kbits 1448 (2 E1 + 1704) kbits 292 QAM 64 QAM 128 QAM ³ CAPACITY ¹ gross (E1 + wayside) 11832 (5 E1 + 1392) kbits 23672 (11 E1 + 704) kbits 29592 (14 E1 + 360) kbits 35512 (17 E1 + 16) kbits 41432 (19 E1 + 1706) kbits RECEIVER SENSITIVITY ² -87 dBm -81 dBm -78 dBm -75 dBm -72 dBm SYSTEM GAIN ² 122 dB 112 dB 108 dB 104 dB 101 dB SYSTEM GAIN ² 975K 16 QAM 32 QAM 64 QAM 128 QAM ³ CAPACITY ¹ gross (E1 + wayside) 2392 (11 E1 + 1024) kbits 47992 (22 E1 + 2056) kbits 59992 (28 E1 + 1528) kbits 6404AM 128 Q	RECEIVER SENSITIVITY ²		-94 dBm	-88 dBm	85 dBm	-82 dBm	-79 dBm
CAPACITY ¹ gross (E1 + wayside) 5720 (2 E1 + 1544) kbit/s 1448 (5 E1 + 1008) kbit/s 14312 (6 E1 + 1784) kbit/s 7176 (8 E1 + 472) kbit/s 20040 (9 E1 + 1248) kbit/s RECEIVER SENSITIVITY ² -90 dBm -84 dBm -81 dBm -78 dBm -75 dBm SYSTEM GAIN ² 125 dB 115 dB 111 dB 107 dB 104 dB 7.0 MHz CHANNEL OP5K 16 QAM 32 QAM 64 QAM 128 QAM ³ CAPACITY ¹ gross (E1 + wayside) 11832 (5 E1 + 1392) kbit/s 23672 (11 E1 + 704) kbit/s 29592 (14 E1 + 360) kbit/s 5512 (17 E1 + 16) kbit/s 41432 (19 E1 + 1706) kbit/s RECEIVER SENSITIVITY ² -87 dBm -81 dBm -78 dBm -75 dBm -72 dBm SYSTEM GAIN ² 122 dB 112 dB 108 dB 104 dB 101 dB SYSTEM GAIN ² QPSK 16 QAM 32 QAM 64 QAM 128 QAM ³ CAPACITY ¹ gross (E1 + wayside) 23992 (11 E1 + 1024) kbit/s 47992 (22 E1 + 2056) kbit/s 59992 (28 E1 + 1528) kbit/s 6464 (28 E1 + 7000) kbit/s CAPACITY ¹ gross (E1 + wayside) 23992 (11 E1 + 1024) kbit	SYSTEM GAIN ²		129 dB	119 dB	115 dB	111 dB	108 dB
RECEIVER SENSITIVITY ² -90 dBm -84 dBm -81 dBm -78 dBm -75 dBm SYSTEM GAIN ² 125 dB 115 dB 111 dB 107 dB 104 dB 7.0 MHz CHANNEL QPSK 16 QAM 32 QAM 64 QAM 128 QAM ³ CAPACITY ¹ gross (E1 + wayside) 11832 (5 E1 + 1392) kbit/s 23672 (11 E1 + 704) kbit/s 29592 (14 E1 + 360) kbit/s 35512 (17 E1 + 16) kbit/s 41432 (19 E1 + 1760) kbit/s RECEIVER SENSITIVITY ² -87 dBm -81 dBm -78 dBm 75 dBm -72 dBm SYSTEM GAIN ² 122 dB 112 dB 108 dB 104 dB 101 dB SYSTEM GAIN ² QPSK 16 QAM 32 QAM 64 QAM 28 QAM ³ CAPACITY ¹ gross (E1 + wayside) 122 dB 112 dB 108 dB 104 dB 101 dB CAPACITY ¹ gross (E1 + wayside) 23992 (11 E1 + 1024) kbit/s 47992 (22 E1 + 2056) kbit/s 59992 (28 E1 + 1528) kbit/s 65464 (28 E1 + 7000) kbit/s 65400 (28 E1 + 6936) kbit/s RECEIVER SENSITIVITY ² -84 dBm -78 dBm -75 dBm -72 dBm -69 dBm	3.5 MHz CHANNEL		QPSK	16 QAM	32 QAM	64 QAM	128 QAM ³
SYSTEM GAIN 2 125 dB 115 dB 111 dB 107 dB 104 dB 7.0 MHz CHANNEL QPSK 16 QAM 32 QAM 64 QAM 128 QAM ³ CAPACITY 1 gross (E1 + wayside) 11832 (5 E1 + 1392) kbit/s 23672 (11 E1 + 704) kbit/s 29592 (14 E1 + 360) kbit/s 3512 (17 E1 + 16) kbit/s 41432 (19 E1 + 1706) kbit/s RECEIVER SENSITIVTY 2 -87 dBm -81 dBm -78 dBm -75 dBm -72 dBm SYSTEM GAIN 2 122 dB 112 dB 108 dB 104 dB 101 dB 101 dB SYSTEM GAIN 2 0PSK 16 QAM 32 QAM 64 QAM 64 QAM 20 Bm GAPACITY 1 gross (E1 + wayside) 29292 (11 E1 + 1024) kbit/s 47992 (22 E1 + 2056) kbit/s 59992 (28 E1 + 1528) kbit/s 65464 (28 E1 + 7000) kbit/s 6400 (28 E1 + 6936) kbit/s GAPACITY 1 gross (E1 + wayside) 23992 (11 E1 + 1024) kbit/s 47992 (22 E1 + 2056) kbit/s 59992 (28 E1 + 1528) kbit/s 65464 (28 E1 + 7000) kbit/s 6400 (28 E1 + 6936) kbit/s GAPACITY 1 gross (E1 + wayside) 249Bm -78 dBm -78 dBm -72 dBm 640 (28 E1 + 7000) kbit/s 6400 (28 E1 + 6936) kbit/s	CAPACITY ¹	gross (E1 + wayside)	5720 (2 E1 + 1544) kbit/s	11448 (5 E1 + 1008) kbit/s	14312 (6 E1 + 1784) kbit/s	17176 (8 E1 + 472) kbit/s	20040 (9 E1 + 1248) kbit/s
7.0 MHz CHANNEL QPSK 16 QAM 32 QAM 64 QAM 128 QAM ³ CAPACITY ¹ gross (E1 + wayside) 11832 (5 E1 + 1392) kit/s 23672 (11 E1 + 704) kit/s 29592 (14 E1 + 360) kit/s 35512 (17 E1 + 16) kit/s 41432 (19 E1 + 1760) kit/s RECEIVER SENSITIVITY ² -87 dBm -81 dBm -78 dBm -75 dBm -72 dBm SYSTEM GAIN ² 12 2 dB 112 dB 108 dB 104 dB 101 dB 14.0 MHz CHANNEL OPSK 16 QAM 32 QAM 64 QAM 28 QAM ³ CAPACITY ¹ gross (E1 + wayside) 23992 (11 E1 + 1024) kit/s 47992 (22 E1 + 2056) kit/s 59992 (28 E1 + 1528) kit/s 5464 (28 E1 + 7000) kit/s 6400 (28 E1 + 6936) kit/s RECEIVER SENSITIVITY ² -84 dBm -78 dBm -76 dBm -72 dBm -69 dBm	RECEIVER SENSITIVITY ²		-90 dBm	-84 dBm	81 dBm	-78 dBm	-75 dBm
CAPACITY ¹ gross (E1 + wayside) 11832 (5 E1 + 1392) kbits 23672 (11 E1 + 704) kbits 29592 (14 E1 + 360) kbits 35512 (17 E1 + 16) kbits 4432 (19 E1 + 1760) kbits RECEIVER SENSITIVITY ² -87 dBm -81 dBm -78 dBm -75 dBm -72 dBm SYSTEM GAIN ² 122 dB 112 dB 108 dB 104 dB 101 dB 14.0 MHz CHANNEL QPSK 60 QM 22 QAM 64 QAM 28 QAM ³ CAPACITY ¹ gross (E1 + wayside) 23992 (11 E1 + 1024) kbits 47992 (22 E1 + 2056) kbits 5992 (28 E1 + 1528) kbits 65464 (28 E1 + 7000) kbits 65400 (28 E1 + 6936) kbits RECEIVER SENSITIVITY ² -84 dBm -78 dBm -75 dBm -72 dBm -99 dBm	SYSTEM GAIN 2		125 dB	115 dB	111 dB	107 dB	104 dB
RECEIVER SENSITIVITY ² -87 dBm -81 dBm -78 dBm -75 dBm -72 dBm SYSTEM GAIN ² 122 dB 112 dB 108 dB 104 dB 101 dB 14.0 MHz CHANNEL QPSK 16 QAM 32 QAM 64 QAM 128 QAM ³ CAPACITY ¹ gross (E1 + wayside) 23992 (11 E1 + 1024) kbits 47992 (22 E1 + 2056) kbits 59992 (28 E1 + 1528) kbits 65464 (28 E1 + 7000) kbits 65400 (28 E1 + 6936) kbits RECEIVER SENSITIVITY ² -84 dBm -78 dBm -75 dBm -72 dBm -99 dBm	7.0 MHz CHANNEL		QPSK	16 QAM	32 QAM	64 QAM	128 QAM ³
SYSTEM GAIN ² 122 dB 12 dB 108 dB 104 dB 101 dB 14.0 MHz CHANNEL QPSK 16 QAM 32 QAM 64 QAM 128 QAM ³ CAPACITY ¹ gross (E1 + wayside) 23992 (11 E1 + 1024) kits/ 47992 (22 E1 + 2056) kits/ 59992 (28 E1 + 1528) kits/ 65464 (28 E1 + 7000) kits/ 6400 (28 E1 + 6306) kits/ RECEIVER SENSITIVITY ² -84 dBm -78 dBm -75 dBm -72 dBm -99 dBm	CAPACITY ¹	gross (E1 + wayside)	11832 (5 E1 + 1392) kbit/s	23672 (11 E1 + 704) kbit/s	29592 (14 E1 + 360) kbit/s	35512 (17 E1 + 16) kbit/s	41432 (19 E1 + 1760) kbit/s
14.0 MHz CHANNEL QP5K 16 QAM 32 QAM 64 QAM 128 QAM ³ CAPACITY ¹ gross (E1 + wayside) 23992 (11 E1 + 1024) kbits 47992 (22 E1 + 2056) kbits 59992 (28 E1 + 1528) kbits 65464 (28 E1 + 7000) kbits 65400 (28 E1 + 6936) kbits RECEIVER SENSITIVITY ² -84 dBm -78 dBm -75 dBm -72 dBm -69 dBm	RECEIVER SENSITIVITY ²		-87 dBm	81 dBm	-78 dBm	-75 dBm	-72 dBm
CAPACITY ¹ gross (E1 + wayside) 23992 (11 E1 + 1024) kits 47992 (22 E1 + 2056) kits 59992 (28 E1 + 1528) kits 5464 (28 E1 + 7000) kits 6400 (28 E1 + 6936) kits RECEIVER SENSITIVITY ² -84 Bm -78 Bm -75 Bm -72 Bm -99 Bm	SYSTEM GAIN 2		122 dB	112 dB	108 dB	104 dB	101 dB
RECEIVER SENSITIVITY ² -84 dBm -78 dBm -75 dBm -72 dBm -69 dBm	14.0 MHz CHANNEL		QPSK	16 QAM	32 QAM	64 QAM	128 QAM ³
	CAPACITY ¹	gross (E1 + wayside)	23992 (11 E1 + 1024) kbit/s	47992 (22 E1 + 2056) kbit/s	59992 (28 E1 + 1528) kbit/s	65464 (28 E1 + 7000) kbit/s	65400 (28 E1 + 6936) kbit/s
SYSTEM GAIN ² 119 dB 109 dB 105 dB 101 dB 98 dB	RECEIVER SENSITIVITY ²		-84 dBm	-78 dBm	-75 dBm	-72 dBm	-69 dBm
	SYSTEM GAIN ²		119 dB	109 dB	105 dB	101 dB	98 dB

NOTES

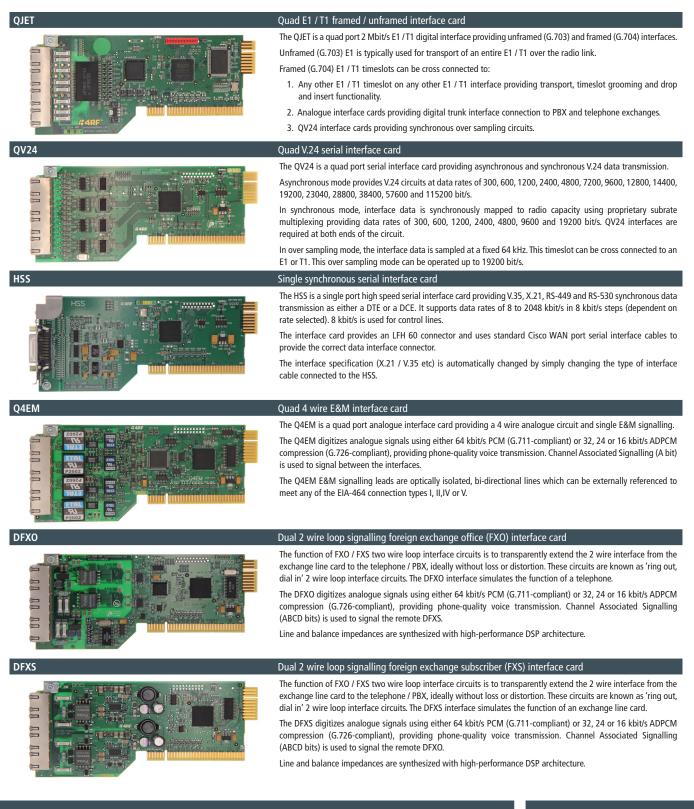
1 Capacities are specified as unframed. The management Ethernet capacity must be subtracted from the gross capacity (default 64 kbit/s).

2 Performance specified at the antenna port for 10⁶ BER. Figures for 10³ BER are typically 1 dB better.

3 Unreleased: Please contact 4RF for availability.



INTERFACE CARDS



ABOUT 4RF COMMUNICATIONS

Operating in more than 120 countries, 4RF Communications provides radio communications equipment for critical infrastructure applications. Customers include utilities, oil and gas companies, transport companies, telecommunications operators, international aid organisations, public safety, military and security organisations. 4RF point-to-point and point-to-multipoint products are optimized for performance in harsh climates and difficult terrain, supporting IP, legacy analogue, serial data and PDH applications.

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