

Invax

Antennas
RF Coaxial Connector
Coaxial Cable Assembly



Antenna and RF Connector Products

INNOVATIVE SOLUTIONS FOR WIRELESS COMMUNICATIONS

With the in-depth knowledge of RF & Antennas technology, Invax is able to offer a wide range of wireless & RF connector and Antennas for various telecommunication applications.

Invax draws from its extensive capability to provide the best quality products & technical support to deliver the right products for small or volume demand on time.



Quality and Performance
優良的品質與性能

Reliability and Durability
高可靠度及耐用性

Competitive Price
價格競爭力的優勢

Reliable and Honest Partnership
誠信的合作夥伴

Innovative and Attractive Design
創新技術及新穎外型

Rapid Design and Delivery
高效率研發及生產



The best service and innovative products come from Invax System Technology

Invax is a professional company in the design, manufacture and distribution of various high quality antennas and RF connectors for wireless AP, mobile phone and industrial applications; We are the professional global supplier of communication and RF connection products for over 20 years, our corporate mission is leading the market to develop and manufacture the new generation wireless antennas and RF connection products offering the best value for booming new communication industry.

Invax has been a main supplier in wireless antenna and RF products for worldwide customers. A more than 32,500 square meter building located in China and high levels of facility have been invested in order to establish a strong R&D and manufacturing abilities to meet the customer requirement. Invax is ISO9001:2000 & ISO14001 Certified for high quality management, all the products are made in house, our manufacturing facility is capable of quick turnaround of short run and volume production requirement in a controlled planning and logistics system. We are confidently assure that for the most types of antenna will be designed and produced by Invax that are all competitive enough in aspect of quality, reliability and price-effective to rise the value of our customer's products.

英碩科技 - 結合研發設計、生產製造及行銷於一體的專業天線及高頻連接元件廠商，通過ISO9001:2000及ISO14001的認證，所生產的各類天線廣泛地應用於無線網路AP、行動電話及各類商業及工業的RF通訊無線產品，全系列天線產品及相關零件都自行研發生產，嚴格控管品質，掌握關鍵技術，具備了21年的專業經驗來迎向無線產品的創新趨勢。

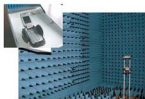
英碩科技 - 在無線通信連接器及天線的專業領域，提供客戶多樣化的產品需求。我們建置三萬二千五百平方公尺的生產基地，所有零組件及成品均自行生產供應及組裝，以維持最嚴格的品質，並設置自動化生產線及各類最新精密的研發生產設備及世界級的實驗量測儀器，來強化研發能力及生產品質和產能，以符合客戶及市場的需求。良好的企業規劃、專業的研發生產團隊及管理運作系統，優良的品質及優勢的價格競爭力。



英碩科技具有專業經驗及不斷研發創新的精神，將是您全方位可信賴的合作夥伴。



ISO 9001:2000 and ISO 14001 certified and patent technologies for innovative design and high quality products.



From conception to delivery

Engineering Design 工程研發

Expertise, experience and innovative technology, our R&D abilities always meet the customer's requirement. High levels of the engineering equipments enable to provide you with the perfect results.

完整的研發設計能力及專業的經驗，可符合各種天線應有的需要，配置最先的3D模擬及射頻實驗室及網路分析儀，能精確測量工程數據研發最優良的產品。

Prototyping 工程製樣

From the initial design to the prototype produce, our independent sample house can provide you the most reliable prototype quickly.

一貫式的模擬及製樣設備，能快速有效地製作出理想的初試樣品，以配合工程分析及客戶的需求。

Production 量產製造

In our modern and automation production shop, all the key parts and finished products are produced in-house to ensure both the best quality & efficiency.

掌握關鍵零件全部自行生產，以確保產品的品質及生產配合計畫，現代化，自動化生產線，可發揮最高的生產效率及彈性的變化，以降低生產成本，提升客戶的競爭力。

Testing 測試分析

Full range of the test equipments & the latest test method will assure the quality and reliability of the products.

各階段的品質測試設備，能確保產品的品質及可靠性，包括3D微波實驗室、網路分析儀、耐壓測試、老化、鹽霧、溫度測試、拉力及機械性測試、震動、衝擊、掉漆測試、阻抗測試、RoHS及各種材料分析等。

Quality Assurance 品質保證

We strive to achieve excellence to implement strict quality management, according to ISO9001:2000 and ISO14001 through out the production process.

符合最高的品質要求標準，並通過ISO9001:2000品質規範及ISO14001的環境認證，品質人員被要求以最嚴格的標準，來確保產品的品質。

Antenna Application Types

- 無限網路AP天線
Wimax, WiFi, WLAN Access Point Antenna
IEEE 802.11 a / b / g / n , IEEE 802.16 a / b / e
2.4GHz-5.2GHz & 4.9GHz-5.9GHz (2G-11GHz)
- 內建隱藏式資料處理器及筆記型電腦天線
Patch Antennas for Notebook PC
WLAN-IEEE 802.11 a / b / g / n
2.4GHz-5.2GHz & 4.9GHz-5.9GHz
- 行動電話、手機天線
Stubby / Dual & Triple Band Mobile Antenna
GSM 824M-960MHz, 1710MHz-2170MHz
- 數位TV天線
DVB-T / ISDB-T / ATSC Antennas for Digital TV
300MHz - 900MHz
- 磁吸盤底座型天線
Magnetic & suck cap base Extender Antennas
- GPS 衛星定位天線
GPS Tracking & Location Antennas
- 工業及設備應用天線
ISM Application Antennas
- 隱藏式手機天線、藍芽天線
Metal Patch Embedded / Dual & Triple Band
Bluetooth Embedded

System Name	Frequency Range (MHz)	Application	Impedance	Connection
—	27	Tracing Record	50 ohm	PAL / F
VHF	80 - 120	Radio	75 ohm	PAL / F
VHF	170 - 470	Car / Radio / DVB / Wireless Phone	75 ohm	PAL / F
UHF	400 - 450	Car / TV / DVB / Wireless Phone	75 ohm	PAL / F
DVB	470 - 870	Mobile TV / Smart Phone	75 ohm	PAL / F
CDMA-800 / AMPS	824 - 894	Mobile Phone / Smart Phone	50 ohm	SMA / SMB / MCX / MMCX
GSM / GPRS-900	880 - 960	Mobile Phone / Smart Phone	50 ohm	SMA / SMB / MCX / MMCX
GPS	1573 - 1577	Car / Smart Phone	50 ohm	SMA / SMB / MCX / MMCX
GSM / GPRS-1800 / DCS	1710 - 1880	Mobile Phone / Smart Phone	50 ohm	SMA / SMB / MCX / MMCX
GSM / GPRS-1900 / PCS	1850 - 1990	Mobile Phone / Smart Phone	50 ohm	SMA / SMB / MCX / MMCX
CDMA-1900	1850 - 1990	Mobile Phone / Smart Phone	50 ohm	SMA / SMB / MCX / MMCX
PHS-1900	1880 - 1930	Mobile Phone / Smart Phone	50 ohm	SMA / SMB / MCX / MMCX
W-CDMA (3G) / UMTS	1920 - 2170	Mobile Phone / Smart Phone	50 ohm	SMA / SMB / MCX / MMCX
TD-SCDMA	1920 - 2170	Smart Phone / Notebook PC	50 ohm	SMA / SMB / MCX / MMCX
HSDPA	1920 - 2170	Smart Phone / Notebook PC	50 ohm	SMA / SMB / MCX / MMCX
Bluetooth	2400 - 2500	Mobile / Smart Phone / Earphone / Notebook PC	50 ohm	SMA / SMB / MCX / MMCX
WLAN-IEEE 802.11 b/g/n	2400 - 2500	Smart Phone / Notebook PC	50 ohm	SMA / SMB / MCX / MMCX
WLAN-IEEE 802.11 a	4900 - 5900	Smart Phone / Notebook PC	50 ohm	SMA / SMB / MCX / MMCX
Wimax-IEEE 802.16 n	2000 - 11000	Smart Phone / Notebook PC / Hotspot	50 ohm	SMA / SMB / MCX / MMCX
UWB / Wireless USB	3100 - 10600	Smart Phone / Notebook PC	50 ohm	SMA / SMB / MCX / MMCX

Monopole and Dipole Antennas

This series "Rubber Duck" Monopole and Dipole Antennas provide broad coverage and different gain options. It's designed by a coaxial sleeve or steel / copper wire with an omni-directional radiation pattern. The series antennas are ideally suited for Wireless LAN AP · Wireless Video · GSM · RFID · DVB-T · WiFi · WMAX · ISM and Hotspot applications.

Electrical Specification

Frequency – Single / Dual / Tri Band / Quad Band
400M-870M Hz, 900M / 1800M / 1900M Hz and 2.4G / 5G Hz systems
Impedance – Normal 50 Ohm / 75 Ohm
Polarization – Linear Vertical / omni-direction pattern
Gain – 2 ~ 10 dBi

Mechanical Specification

Radiator – Copper wire · Spring · Steelwire
Connector – TNC / SMA / N / MMCX (RP Type) · I-PEX
Working Temperature – -30°C ~ +50°C
D-90° adjustable swivel and water proof design
RoHS – Compliant

AN SERIES

AN01
9x113



AN03
13x142



AN03-A
12x132~



AN05
8x140~



AN08
14x179~



AN09
20x160~



AN12B
22x60



AN12-C
16x60



AN13A
13x225



AN13A-B
15x218.5



AN13-T9
12x182



AN14
15x65



AN16
17x102



AN16C
17x175



AN16D
18x175



AN16HS
14x65



AN17
13x160



AN17-A
13x152



AN18
14x80~



AN19-C
20x175



AN19-D
13x170



AN22
10x104



AN24
13x131



AN26
10x81



■ Main Application : ■ WLAN ■ GSM ■ DVB-T ■ ISM ■ WMAX

* The dimension is subject to change with different frequency and connector type request.



AN27A
 9x280-



AN28
 14x83



AN28L
 15x135



AN29
 9x55



AN29-A
 10x66



AN30
 6x54



AN31
 11x128



AN31-MX
 11x136



AN32
 10x64



AN33
 7x30



AN33-A
 9x72



AN33-B
 9x50



AN33B-FE
 8x50



AN33-C
 9x50



AN33D
 9x45



AN34
 15x208-



AN34B
 16x306-



AN35
 10x25



AN36
 20x170



AN37
 10x104



AN37-E
 10x73



AN46
 9x75



AN47
 5x90



AN48
 10x136





AN48-A
13X133



AN48B
18x192



AN51B
15X35X130



AN52
10X112



AN53
13x160



AN53-A
13x158



AN54
16x109



AN55
16x119



AN55B
8X25X87



AN55C
11X26X88



AN56E
9X106



AN57
9x109



AN57-B
10x78



AN57-BN
10x115



AN57C
10x85



AN57-D
10x78



AN57-SF
9x109



AN58-A
16x130



AN58L
9X175



AN59
13x294



AN60
13X294



AN61
18X195



AN61TNC-1
18X205



AN62-A
16X115



● Main Application : ■ WLAN ■ GSM ■ DVB-T ■ ISM ■ WMAX

● The dimension is subject to change with different frequency and connector type request.



AN64
18x164



AN64-A
18x158



AN65
13x143



AN65-A
13x138



AN65-B
13x132



AN66
15x187



AN67
20x138



AN68
32x30



AN68-A
95x134



AN69
20x32



AN69-A
108x135



AN70
14x202



AN72
7x173-



AN72C
15x79



AN72S
14x190



AN77
13x61



AN77A
12x86



AN90
91x105



AN91
13x199



AN92
13x195



AN92-A
13x196



AN92-B
13x173



AN93
13x207



AN93-A
13x180



Dimension : Dxl.(mm)



More Antennas in the particular application with different connectors or cable leads available on request

AN SERIES

The most standard types

AN03 	AN13 	AN13A 	AN13B 	AN14 	AN16HS
AN17 	AN28 	AN30 	AN32 	AN33 	AN33B
AN47 	AN48 	AN52-A 	AN56-E 	AN57 	AN57-B
AN57C 	AN58L 	AN59 	AN50 	AN64 	AN65
AN66 	AN67 	AN72S 	AN77A 	AN90 	AN92



Type 系列	Frequency 頻率範圍 (MHz)	Gain 增益 dBS	VSWR 駐波比	Band 適用頻段	Impedance 阻抗 Ω	Coax Conn. Type 連接器類型	Cable Lead Type 出線連接器類型	Coax Cable Type 出線線材類型
AN63	2400-2500/4900-5900	3	≤2.0	WLAN	50	SMA/SMB TNC/BNC	IPEX/SMA/SMB MCX/MMCX	0.81/1.13 1.37/RG178
	800/900/1800/1900/2100	1	≤3.5	GSM/ISM	50			
	2500-2700	3	≤2.0	WIMAX	50			
AN13	2400-2500/4900-5900	5	≤2.0	WLAN	50	SMA/SMB TNC/BNC	—	—
	800/900/1800/1900/2100	2	≤3.5	GSM/ISM	50			
	2500-2700	5	≤2.0	WIMAX	50			
AN13A	2400-2500/4900-5900	5	≤2.0	WLAN	50	SMA/SMB TNC/BNC	IPEX/SMA/SMB MCX/MMCX	0.81/1.13 1.37/RG178
	800/900/1800/1900/2100	2	≤3.5	GSM/ISM	50			
	2500-2700	5	≤2.0	WIMAX	50			
AN13B	2400-2500/4900-5900	5	≤2.0	WLAN	50	SMA/SMB TNC/BNC	IPEX/SMA/SMB MCX/MMCX	0.81/1.13 1.37/RG178
	800/900/1800/1900/2100	2	≤3.5	GSM/ISM	50			
	2500-2700	5	≤2.0	WIMAX	50			
AN14	2400-2500/4900-5900	2	≤2.0	WLAN	50	SMA/SMB TNC/BNC	—	—
	800/900/1800/1900/2100	0	≤3.5	GSM/ISM	50			
	2500-2700	2	≤2.0	WIMAX	50			
AN16HS	2400-2500/4900-5900	2	≤2.0	WLAN	50	SMA/SMB TNC/BNC	—	—
	800/900/1800/1900/2100	0	≤3.5	GSM/ISM	50			
	2500-2700	2	≤2.0	WIMAX	50			
AN17	2400-2500/4900-5900	4	≤2.0	WLAN	50	SMA/SMB TNC/BNC	IPEX/SMA/SMB MCX/MMCX	0.81/1.13 1.37/RG178
	800/900/1800/1900/2100	2	≤3.5	GSM/ISM	50			
	2500-2700	4	≤2.0	WIMAX	50			
AN28	2400-2500	2	≤2.0	WLAN	50	SMA	—	—
	902-928	0	≤3.5	ISM	50			
	25000-2700	2	≤2.0	WIMAX	50			
AN20	2400-2500	2	≤2.0	WLAN	50	—	IPEX/SMA/SMB MCX/MMCX	0.81/1.13 1.37/RG178
	902-928	0	≤3.5	ISM	50			
AN32	2400-2500	2	≤2.0	WLAN	50	—	IPEX/SMA/SMB MCX/MMCX	0.81/1.13 1.37/RG178
AN33	2400-2500	1	≤2.0	WLAN	50	SMA	—	—
	800/900/1800/1900/2100	1	≤3.5	GSM/ISM	50			
	2500-2700	1	≤2.0	WIMAX	50			
AN33B	2400-2500	1	≤2.0	WLAN	50	SMA	—	—
	800/900/1800/1900/2100	1	≤3.5	GSM/ISM	50			
	2500-2700	1	≤2.0	WIMAX	50			
AN47	2400-2500	2	≤2.0	WLAN	50	MCX MMCX	—	—
	470-870	0	≤3.5	DVB-T	50			
AN48	2400-2500/4900-5900	3	≤2.0	WLAN	50	SMA SMB	IPEX/SMA/SMB MCX/MMCX	0.81/1.13 1.37/RG178
	800/900/1800/1900/2100	1	≤3.5	GSM/ISM	50			
	2500-2700	3	≤2.0	WIMAX	50			
AN52-A	2400-2500/4900-5900	2	≤2.0	WLAN	50	—	IPEX/SMA/SMB MCX/MMCX	0.81/1.13 1.37/RG178
	800/900/1800/1900/2100	1	≤3.5	GSM/ISM	50			
	2500-2700	2	≤2.0	WIMAX	50			
AN56E	2400-2500/4900-5900	2	≤2.0	WLAN	50	—	IPEX/SMA/SMB MCX/MMCX	0.81/1.13 1.37/RG178
	800/900/1800/1900/2100	1	≤3.5	GSM/ISM	50			
	2500-2700	2	≤2.0	WIMAX	50			
AN57	2400-2500/4900-5900	2	≤2.0	WLAN	50	SMA SMB	IPEX/SMA/SMB MCX/MMCX	0.81/1.13 1.37/RG178
	800/900/1800/1900/2100	1	≤3.5	GSM/ISM	50			
	2500-2700	2	≤2.0	WIMAX	50			
AN57-B	2400-2500/4900-5900	2	≤2.0	WLAN	50	SMA	—	—
	800/900/1800/1900/2100	1	≤3.5	GSM/ISM	50			
	2500-2700	2	≤2.0	WIMAX	50			
AN57C	2400-2500/4900-5900	2	≤2.0	WLAN	50	SMA SMB	IPEX/SMA/SMB MCX/MMCX	0.81/1.13 1.37/RG178
	800/900/1800/1900/2100	1	≤3.5	GSM/ISM	50			
	2500-2700	2	≤2.0	WIMAX	50			
AN58L	2400-2500/4900-5900	5	≤2.0	WLAN	50	SMA SMB	IPEX/SMA/SMB MCX/MMCX	0.81/1.13 1.37/RG178
	800/900/1800/1900/2100	2	≤3.5	GSM/ISM	50			
	2500-2700	5	≤2.0	WIMAX	50			
AN59	2400-2500/4900-5900	9	≤2.0	WLAN	50	SMA/SMB TNC/N	IPEX/SMA/SMB MCX/MMCX	0.81/1.13 1.37/RG178
	800/900/1800/1900/2100	2	≤3.5	GSM/ISM	50			
	2500-2700	9	≤2.0	WIMAX	50			
AN60	2400-2500/4900-5900	7	≤2.0	WLAN	50	SMA/SMB TNC/N	IPEX/SMA/SMB MCX/MMCX	0.81/1.13 1.37/RG178
	800/900/1800/1900/2100	2	≤3.5	GSM/ISM	50			
	2500-2700	7	≤2.0	WIMAX	50			
AN64	2400-2500/4900-5900	4	≤2.0	WLAN	50	SMA/SMB TNC/BNC	IPEX/SMA/SMB MCX/MMCX	0.81/1.13 1.37/RG178
	800/900/1800/1900/2100	2	≤3.5	GSM/ISM	50			
	2500-2700	4	≤2.0	WIMAX	50			
AN65	2400-2500/4900-5900	2	≤2.0	WLAN	50	SMA/SMB TNC/BNC	IPEX/SMA/SMB MCX/MMCX	0.81/1.13 1.37/RG178
	800/900/1800/1900/2100	1	≤3.5	GSM/ISM	50			
	2500-2700	3	≤2.0	WIMAX	50			
AN66	2400-2500/4900-5900	5	≤2.0	WLAN	50	SMA/SMB TNC/BNC	—	—
	800/900/1800/1900/2100	2	≤3.5	GSM/ISM	50			
	2500-2700	5	≤2.0	WIMAX	50			
AN67	2400-2500/4900-5900	2	≤2.0	WLAN	50	—	IPEX/SMA/SMB MCX/MMCX	0.81/1.13 1.37/RG178
	800/900/1800/1900/2100	2	≤3.5	GSM/ISM	50			
	2500-2700	1	≤2.0	WIMAX	50			
AN72S	902-928	0	≤3.5	ISM	50	SMA	—	—
	470-870	0	≤3.5	DVB-T	50			
AN77A	2400-2500	2	≤2.0	WLAN	50	IPEX/SMA/SMB MCX/MMCX	—	0.81/1.13 1.37/RG178
	2500-2700	2	≤2.0	WIMAX	50			
	2400-2500/4900-5900	8	≤2.0	WLAN	50			
AN80	2400-2500/4900-5900	1	≤3.5	GSM/ISM	50	SMA/SMB TNC/BNC	—	—
	800/900/1800/1900/2100	1	≤3.5	GSM/ISM	50			
	2500-2700	8	≤2.0	WIMAX	50			
AN82	2400-2500/4900-5900	5	≤2.0	WLAN	50	SMA/SMB TNC/BNC	IPEX/SMA/SMB MCX/MMCX	0.81/1.13 1.37/RG178
	800/900/1800/1900/2100	2	≤3.5	GSM/ISM	50			
	2500-2700	5	≤2.0	WIMAX	50			

Magnetic Mount & Suck Cap Base Extender Antennas

This magnetic or suck cap base antenna provides single or multi band for DVB-T, 900MHz, 1800MHz, 1900MHz, 2.4GHz, 5GHz. The compact design of this type antenna is ideal for extending the operation coverage and the magnetic and suck cap base are suitable for fixing to any flat and metal surfaces.

- DVB-T, APMS, GSM, DCS, PCS, UMTS, ISM, WLAN, Wireless Video WiFi and WIMAX applications
- 400M ~ 870M Hz, 900M / 1800M / 1900M Hz and 2.4G / 5G Hz systems
- Amplifier integrated active antenna
- High performance and compact size
- Magnetic mount or suck cap base mounting
- Fix or Tilt-Swivel flexibility, water proof application design
- Cable and connector customisable
- RoHS Compliant



AB SERIES



AB02
35x105



AB03
48x114



AB04-Y
85x160-



AB04-LH
85x227



AB25-Y
30x163-



AB26-Y
30x156-



AB26-R
30x123-



AB27-C
50x145



AB27-F
50x189



AB27-H
50x223



AB27-K
50x223



AB27-W
50x131



AB28
27x144-



AB29-Y
49x163-



AB29-AY
64x167-



AB29-F
49x182



AB36-G
49x133



AB36-AG
64x140



AB36-W
50x105



AB37-H
60x223



AB37-I
60x183



AB37-T
60x222



AB38-W
40x97



AB39
48x132



AB39-A
46x143



AB39-B
40x171



AB40-A
62x115-



AB40-B
46x95



AB40-C
68x100



AB41
43x120-



AB42-ADS
88x110-



AB42-W
88x146



AB43-Y
68x330-



AB43-W
68x130



AB45
50x82



AB45-A
50x95



AB46-A
36x34



AB48
50x88



AB49-AY
46x161-



AB49-BY
47x230-



AB69-H
95x278



AB70
9x45-



AB70-A
50x218-



AB70-B
50x218-



AB70-C
62x212-



AB71-A
60x218-



AB71-D
60x205-



AB71-E
60x165-



AB71-F
55x480



AB74
28x141



AB75
17x150



AB76
25x150



AB77
22x115



AB78
27x145x25



AB82-FM
40x80



AB82G
60x70



AB86-LT
85x296



AB86-H
85x205



AB87
28x138



AB87-A
28x116



AB87-B
42x148



AB87-C
42x126



AB88-Y
45x280



AB88-A
45x95



AB88-B
45x130



AB88-C
45x148



AB88-F
45x115



AB88-G
45x136



AB88-H
45x176



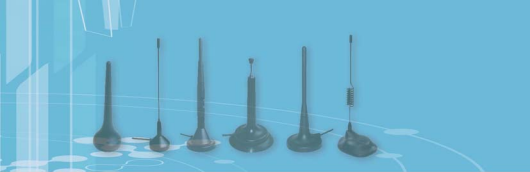
AB88-I
45x136



AB88-J
45x121



AB88-R
45x150



AB86-W
45x107



AB91-LF
83x140



AB91-LH
83x228



AB91-K
83x228



AB91-W
83x133



AB91-Z
83x135



AB93
20x240-



AB93-A
20x230-



AB93-B
25x240-



AB93-WY
45x283-



AB94-G
60x207



AB94-LH
60x219



AB94-K
60x238



AB94-S
60x437



AB94-T
80x337



AB94-Z
80x147



AB97
56x141



AB98
34x150-



AB98-A
46x171-



AB99B
85x78x158



AB99-Z
80x67



AB99-H
80x233



AB99-2H
80x220



AB99-W
80x142

More Antennas in the particular application with different connectors or cable leads available on request

AB02 	AB26-Y 	AB27-F 	AB28-Y 	AB29-Y
AB39-A 	AB40-A 	AB43-W 	AB43-Y 	AB48
AB71-A 	AB75 	AB76 	AB77 	AB78
AB82G 	AB86-H 	AB87A 	AB93 	AB94-LH
AB97 	AB98-Y 	AB99-2H 	AB99-B 	AB99-Z



Type 系列	Frequency 頻率範圍 (MHz)	Gain 增益dBi	VSWR 駐波比	Band 適用頻段	Impedance 阻抗 Q	Coax Conn. Type 連接器類型	Coax Cable Type 出線纜材規格
AB02	2400-2500	2	≤ 2.0	WLAN	50	SMA/SMB	RG-174U
	800/900/1800/1900/2100	1	≤ 2.0	GSM15M	50	MCK/MMCK	1.5C2V
AB26-Y	2500-2700	2	≤ 2.0	WMAX	50		
	800/900/1800/1900/2100	1	≤ 2.0	GSM15M	50	SMA/SMB/PAL	RG-174U
AB27-F	470-870	0	≤ 2.0	DVB-T	50	MCK/MMCK/F	1.5C2V
	2400-2500	3	≤ 2.0	WLAN	50		
AB28-Y	800/900/1800/1900/2100	1	≤ 2.0	GSM15M	50	SMA/SMB	RG-174U
	2500-2700	3	≤ 2.0	WMAX	50	MCK/MMCK	1.5C2V
AB29-Y	800/900/1800/1900/2100	1	≤ 2.0	GSM15M	50	SMA/SMB/PAL	RG-174U
	470-870	0	≤ 2.0	DVB-T	50	MCK/MMCK/F	1.5C2V
AB29-Y	2400-2500	2-9	≤ 2.0	WLAN	50		
	800/900/1800/1900/2100	2	≤ 2.0	GSM15M	50	SMA/SMB/PAL	RG-174U
AB39-A	2500-2700	2-9	≤ 2.0	WMAX	50	MCK/MMCK/F	1.5C2V
	470-870	0	≤ 2.0	DVB-T	50		
AB40-A	2400-2500	2	≤ 2.0	WLAN	50		
	800/900/1800/1900/2100	2	≤ 2.0	GSM15M	50	SMA/SMB/PAL	RG-174U
AB40-A	2500-2700	2	≤ 2.0	WMAX	50	MCK/MMCK/F	1.5C2V
	470-870	0	≤ 2.0	DVB-T	50		
AB40-A	470-870	0	≤ 2.0	DVB-T	50	SMA/SMB/PAL	RG-174U
	902-928	0	≤ 2.0	ISM	50	MCK/MMCK/F	1.5C2V
AB43-W	2400-2500	2-9	≤ 2.0	WLAN	50		
	800/900/1800/1900/2100	2	≤ 2.0	GSM15M	50	SMA/SMB/PAL	RG-174U
AB43-W	2500-2700	2-9	≤ 2.0	WMAX	50	MCK/MMCK/F	1.5C2V
	470-870	0	≤ 2.0	DVB-T	50		
AB43-Y	2400-2500	2-9	≤ 2.0	WLAN	50		
	800/900/1800/1900/2100	2	≤ 2.0	GSM15M	50	SMA/SMB/PAL	RG-174U
AB43-Y	2500-2700	2-9	≤ 2.0	WMAX	50	MCK/MMCK/F	1.5C2V
	470-870	0	≤ 2.0	DVB-T	50		
AB48	2400-2500	2	≤ 2.0	WLAN	50		
	800/900/1800/1900/2100	1	≤ 2.0	GSM15M	50	SMA/SMB	RG-174U
AB48	2500-2700	2	≤ 2.0	WMAX	50	MCK/MMCK	1.5C2V
	2400-2500	2	≤ 2.0	WLAN	50		
AB71-A	800/900/1800/1900/2100	2	≤ 2.0	GSM15M	50	SMA/SMB/PAL	RG-174U
	2500-2700	2	≤ 2.0	WMAX	50	MCK/MMCK/F	1.5C2V
AB71-A	470-870	0	≤ 2.0	DVB-T	50		
	2400-2500	2	≤ 2.0	WLAN	50		
AB75	800/900/1800/1900/2100	2	≤ 2.0	GSM15M	50	SMA/SMB/PAL	RG-174U
	2500-2700	2	≤ 2.0	WMAX	50	MCK/MMCK/F	1.5C2V
AB75	470-870	0	≤ 2.0	DVB-T	50		
	2400-2500	2	≤ 2.0	WLAN	50		
AB76	800/900/1800/1900/2100	2	≤ 2.0	GSM15M	50	SMA/SMB/PAL	RG-174U
	2500-2700	2	≤ 2.0	WMAX	50	MCK/MMCK/F	1.5C2V
AB76	470-870	0	≤ 2.0	DVB-T	50		
	2400-2500	2	≤ 2.0	WLAN	50		
AB77	800/900/1800/1900/2100	2	≤ 2.0	GSM15M	50	SMA/SMB/PAL	RG-174U
	2500-2700	2	≤ 2.0	WMAX	50	MCK/MMCK/F	1.5C2V
AB77	470-870	0	≤ 2.0	DVB-T	50		
	2400-2500	2	≤ 2.0	WLAN	50		
AB78	800/900/1800/1900/2100	5	≤ 2.0	GSM15M	50	SMA/SMB	RG-174U
	2500-2700	5	≤ 2.0	WMAX	50	MCK/MMCK	1.5C2V
AB82G	470-870	0	≤ 2.0	DVB-T	50	SMA/SMB/PAL	RG-174U
	902-928	0	≤ 2.0	ISM	50	MCK/MMCK/F	1.5C2V
AB86-H	2400-2500	5	≤ 2.0	WLAN	50		
	800/900/1800/1900/2100	2	≤ 2.0	GSM15M	50	SMA/SMB	RG-174U
AB86-H	2500-2700	5	≤ 2.0	WMAX	50	MCK/MMCK	1.5C2V
	2400-2500	2	≤ 2.0	WLAN	50		
AB87A	800/900/1800/1900/2100	0	≤ 2.0	GSM15M	50	SMA/SMB	RG-174U
	2500-2700	2	≤ 2.0	WMAX	50	MCK/MMCK	1.5C2V
AB93	470-870	2	≤ 2.0	DVB-T	50	SMA/SMB/USB	RG-174U
	2400-2500	5	≤ 2.0	WLAN	50	MCK/MMCK	1.5C2V
AB94-LH	800/900/1800/1900/2100	2	≤ 2.0	GSM15M	50	SMA/SMB	RG-174U
	2500-2700	5	≤ 2.0	WMAX	50	MCK/MMCK	1.5C2V
AB97	2400-2500	2	≤ 2.0	WLAN	50		
	800/900/1800/1900/2100	2	≤ 2.0	GSM15M	50	SMA/SMB	RG-174U
AB97	2500-2700	2	≤ 2.0	WMAX	50	MCK/MMCK	1.5C2V
	800/900/1800/1900/2100	1	≤ 2.0	GSM15M	50	SMA/SMB/PAL	RG-174U
AB98	470-870	0	≤ 2.0	DVB-T	50	MCK/MMCK/F	1.5C2V/RG58
	2400-2500	7	≤ 2.0	WLAN	50		
AB99B	800/900/1800/1900/2100	2	≤ 2.0	GSM15M	50	SMA/SMB	RG-174U
	2500-2700	7	≤ 2.0	WMAX	50	MCK/MMCK	1.5C2V
AB99-Z	2400-2500	8	≤ 2.0	WLAN	50		
	800/900/1800/1900/2100	1	≤ 2.0	GSM15M	50	SMA/SMB	RG-174U
AB99-Z	2500-2700	8	≤ 2.0	WMAX	50	MCK/MMCK	1.5C2V
	2400-2500	8	≤ 2.0	WLAN	50		
AB99ZH	800/900/1800/1900/2100	2	≤ 2.0	GSM15M	50	SMA/SMB	RG-174U
	2500-2700	5	≤ 2.0	WMAX	50	MCK/MMCK	1.5C2V

Patch Internal Antennas

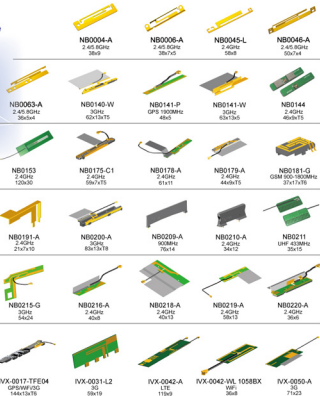
Notebook PC / PDA / Mobile Phone Antennas and ISM portable equipment antennas

For Mobile Phone & Notebook PC WLAN / PDA and ISM applications, this patch antenna is designed by metal stamping or integrated on the plastic frame with PIFA radiation pattern. These miniature size antennas are mostly suited for the exquisite wireless products of compact & miniature equipment including the mobile phone, WLAN, Bluetooth, security or audio and video applications.

Mobile Phone



Tablet / Laptop Mobile Device



◆ This PIFA type internal antenna is designed mostly custom made for the particular product application.

◆ Dimension: LxDxH(mm), "T" means thickness.

External Magnetic Mount and Suck Cap Antenna Bases

The various options of the antenna base are well suited for desktop for fixing to any flat and metal surfaces. The antenna base provides the different mating interface of RF connectors or metal studs to fit any external antenna connector type with the different cable types to extending the wireless coverage. The magnetic or suck cap base are the options for more flexible fixing applications.

Antenna Bases



GPS Antennas

External GPS Tracking & Location Antenna with Multi-Band + GPS Integrated design

AG Series GPS Antenna is the compact design with excellent Signal Amplification compatible with almost every GPS receiver model and provides an excellent alternative for a vast range of GPS Mobile applications including AVL, Vehicle Navigation, Aviation.



Flat Patch, Ceiling Mount & Rooftop Omni-directional High Gain Antennas

High Performance and rugged industrial grade design antennas are ideal for indoor and outdoor use. The antenna of different type options can be installed for either vertical or horizontal polarization.

- WLAN, Hotspot, GSM, ISM and MIMO for Indoor/outdoor multipoint and extending applications
- Outdoor, Marine and Vehicle Grade durable UV-stable housing or fiberglass radome weather-proof
- Providing broad coverage and different gain options, high performance and compact size
- GSM 850M / 900M / 1800M / 1900M / 2100M Hz & WLAN 2.4G / 5G Hz and Multi-band systems
- ISM Band 433M / 450M / 868M-870M / 915M / 928M Hz, Custom antennas can be designed on request
- Integral N-Female or TNC connector or extension cable end, cable & connector customisable
- RoHS Compliant

Flat Patch



DF01
104x58x28



DF21
270x145x37



DF31
280x260x37



DF41
350x260x37



DF51
397x352x37



DF21-C
Coax Lead Type



DF10
135x125x36



DF15
221x188x36



DF22
220x220x30



DF23
165x163x16



DF28
164x144x45



DF32
300x300x30



DF33
322x322x12

Ceiling Mount



DR12
120x53



DR16
168x190



DR13
125x135



DR40
50x48

Marine & Vehicle



DR50
Multi-Band GPS+GSM



DR60
Vehicle GPS



DR13-A
Marine Multi-Band



DR70
Marine GPS



DR80
Marine GPS

Omni Outdoor Antennas



DS01
22x192



DS01A
22x192



DS01B
22x192



DS02
20x287



DS02A
20x287



DS20



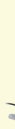
DS03
13x285



DS04
13x412



DS10
35x400-



DS10-S
Rooftop Stand Type



DS10-C
Coax Lead Type



DS10
High Gain



DS11

RF Cable Assemblies

- RF & Mini Coaxial Cable Assembly
OD: 0.81 / 0.98 / 1.13 / 1.32 / 1.37 / 1.48mm
- RF Flexible & Semi-Rigid Cable Assembly
- RG / LMR low loss Coaxial Cable Assembly
- Pigtail Micro Coaxial Cable Assembly



* The most standard cable groups are available for stock : 1.5C2V RG-174U RG-178U RG-179U RG-316U 0.81 1.13 LMR100 LMR200 LMR400

RF Coaxial Connectors

- SMA
- SMB
- SMC
- SMS
- MCX
- SSMB
- MMCX
- SSMCX
- TNC
- BNC
- QMA
- MC
- 7/16
- UHF
- MINI UHF
- PAL (IEC)
- FAKRA
- RF Switch
- F
- N

Wireless Communication
Telecommunication
Mobile Communication
Satellite Communication
Data Communication



SMA 12GHz

7/16 7.5GHz
716-002
Flange Mount Cable Plug

MMCX 8GHz
MMCX 001
PCB Mount Angle Plug

SMC 10GHz
SMC 100
Cable Mount Submini Plug

PAL 1GHz
PAL 001
Cable Mount Plug
PAL 005
Cable Mount Plug

SSMCX 6GHz
SSMCX 001
Cable Mount Plug
SSMCX 100
Cable Mount Jack

F 2GHz
F 001
Cable Mount Plug
F 020
Cable Mount Plug
F 030
Cable Mount Angle Plug

SSMB 12GHz
SSMB 001
Cable Mount Plug
SSMB 020
PCB Mount Angle Plug
SSMB 100
Cable Mount Jack
SSMB 120
Cable Mount Angle Jack

SMB 4GHz
SMB 001
Flange Mount Plug
SMB 010
Cable Mount Submini Plug

N

18GHz

**N 001**
Cable Mount Plug**N 010**
Cable Mount Plug**N 100**
Flange Mount Jack**N 110**
Cable Mount Subfeed Jack**N 120**
Cable Mount Clamp Jack**N 130**
Cable Mount Jack**TNC**

4GHz

**TNC 001**
Cable Mount Plug**TNC 010**
Cable Mount Angle Plug**TNC 100**
Cable Mount Subfeed Jack**TNC 110**
PCB Mount Jack**TNC 120**
Flange Mount Jack**TNC 210**
PCB Mount Angle Jack**TNC 211**
PCB Mount Angle Jack**MCX**

6GHz

**MCX 001**
Cable Mount Plug**MCX 020**
Cable Mount Angle Plug**MCX 100**
PCB Mount Jack**MCX 110**
PCB Mount Jack**MCX 111**
PCB Mount Jack**MCX 120**
Cable Mount Subfeed Jack**MCX 200**
PCB Mount Subfeed Jack**SMA 010**
Cable Mount Plug**SMA 050**
Cable Mount Angle Plug**SMA 133**
Cable Mount Subfeed Jack**SMA 134**
Cable Mount Subfeed Jack**SMA 243**
PCB Mount Angle Jack**SMA 244**
PCB Mount Angle Jack**SMA 301**
Flange Mount Jack**SMA 302**
Flange Mount Plug**SMA 303**
Flange Mount Jack**SMA 310**
PCB Mount Jack**SMA 311**
PCB Mount Jack**SMA 312**
PCB Mount Jack**SMA 330**
PCB Mount Jack**SMA 340**
PCB Mount Plug**SMA 341**
PCB Mount Angle Plug**SMA 342**
PCB Mount Plug**MMCX 010**
SMD Mount Plug**MMCX 020**
Cable Mount Plug**MMCX 040**
Cable Mount Angle Plug**MMCX 100**
PCB Mount Jack**MMCX 110**
PCB Mount Jack**MMCX 111**
PCB Mount Jack**MMCX 120**
PCB Mount Angle Jack**MMCX 130**
Cable Mount Jack**PAL 010**
Cable Mount Angle Plug**PAL 020**
PCB Mount Angle Plug**PAL 100**
Cable Mount Jack**PAL 110**
PCB Mount Jack**PAL 120**
PCB Mount Angle Jack**PAL 130**
PCB Mount Jack**PAL 140**
PCB Mount Angle Jack**PAL 150**
Cable Mount Jack**F 100**
Cable Mount Subfeed Jack**F 120**
Flange Mount Jack**F 121**
Flange Mount Jack**F 130**
PCB Mount Jack**F 140**
PCB Mount Angle Jack**F 150**
PCB Mount Angle Jack**F 160**
PCB Mount Jack**F 278**
PCB Mount Plug**SMB 020**
Cable Mount Plug**SMB 030**
Cable Mount Angle Plug**SMB 040**
PCB Mount Angle Plug**SMB 050**
PCB Mount Plug**SMB 100**
PCB Mount Angle Jack**SMB 110**
PCB Mount Jack**SMB 120**
Cable Mount Jack**SMB 130**
Cable Mount Angle Jack

BNC 4GHz



BNC 010
PCB Mount Subminiature Angle Jack



BNC 013
Cable Mount Subminiature Jack



BNC 075
PCB Mount Angle Jack



BNC 099
PCB Mount Jack



BNC 101
PCB Mount Jack



BNC 103
Cable Mount Plug



BNC 126
PCB Mount Subminiature Angle Jack



BNC 130
Cable Mount High Plug



BNC 241
Terminator Plug



BNC 1130
PCB Mount Angle Jack



BNC 1131
PCB Mount Angle Stack Jack



BNC 1147
Tee Adapter



• BNCFN9 1X2
Angle Type



• BNCFN8 1X2
Angle Type



• BNCFN9 1X3
Angle Type



• BNCFN8 1X3
Angle Type



• BNCFN9 1X4
Angle Type



• BNCFN8 1X4
Angle Type



• BNCFN9 1X5
Angle Type



• BNCFN8 1X5
Angle Type



• BNCFN9 2X1
Angle Type



• BNCFN9 2X2
Angle Type



• BNCFN8 2X2
Angle Type



• BNCFN9 2X3
Angle Type



• BNCFN8 2X3
Angle Type



• BNCFN9 2X4
Angle Type



• BNCFN8 2X4
Angle Type



FME 001
Cable Mount Jack



FME 010
Cable Mount Subminiature Jack



FME 100
Cable Mount Plug

FME 30MHz



UHF 001
Cable Mount Plug



UHF 100
Cable Mount Jack



UHF 110
Cable Mount Angle Jack

UHF 200MHz

Adaptors



AA 008
SMA - SMA



AA 118
SMA - F



BF 008
F - BNC



BP 1154
BNC - F



BP 1160
BNC - SMA



FA 120
SMA - F



FF 008
F - F



FF 009
F - F



FF 118
F - F



FF 119
F - F



FF 120
SMA - F



FN8 PN8
N - MCK



FP 008
F - F



FP 018
F - SMA



M 3724
SP SMA - MCK



MA 120
SMA - MCK



MXN 801
F - MCK



N8 SAR8
N - SMA



NN 118
N - N



NS 002
SMA - N



SMAIPX
SMA - PEX



SS 009
SMA - SMA



SS 128
SMA - SMA



TS 008
N - SMA



TT 008
TNC - TNC

• Switch Function Option

Reflection Performance

VSWR	Return Loss (dB)	Transmission (dB)	Reflection Coefficient (dB)	Power Transmission (%)	Power Reflection (%)
1.00	-	0.000	0.00	100.0	0.0
1.01	46.1	0.002	0.00	100.0	0.0
1.02	43.1	0.004	0.01	100.0	0.0
1.03	40.6	0.007	0.01	100.0	0.0
1.04	38.2	0.010	0.02	100.0	0.0
1.05	35.7	0.013	0.02	99.9	0.1
1.06	33.2	0.016	0.03	99.8	0.2
1.07	30.7	0.019	0.03	99.8	0.2
1.08	28.2	0.022	0.04	99.7	0.3
1.09	25.7	0.025	0.04	99.6	0.4
1.10	23.2	0.028	0.05	99.6	0.4
1.11	20.7	0.031	0.05	99.5	0.5
1.12	18.2	0.034	0.06	99.5	0.5
1.13	15.7	0.037	0.06	99.4	0.6
1.14	13.2	0.040	0.07	99.4	0.6
1.15	10.7	0.043	0.07	99.3	0.7
1.16	8.2	0.046	0.08	99.3	0.7
1.17	5.7	0.049	0.08	99.2	0.8
1.18	3.2	0.052	0.09	99.2	0.8
1.19	0.8	0.055	0.09	99.2	0.8
1.20	0.0	0.058	0.10	99.1	0.9
1.21	0.0	0.061	0.10	99.1	0.9
1.22	0.0	0.064	0.10	99.0	1.0
1.23	0.0	0.067	0.11	98.9	1.1
1.24	0.0	0.070	0.11	98.9	1.1
1.25	0.0	0.073	0.11	98.8	1.2
1.26	0.0	0.076	0.12	98.7	1.3
1.27	0.0	0.079	0.12	98.6	1.4
1.28	0.0	0.082	0.12	98.6	1.4
1.29	0.0	0.085	0.12	98.5	1.5
1.30	0.0	0.088	0.13	98.4	1.6
1.31	0.0	0.091	0.13	98.3	1.7
1.32	0.0	0.094	0.13	98.3	1.7
1.33	0.0	0.097	0.14	98.2	1.8
1.34	0.0	0.100	0.14	98.1	1.9
1.35	0.0	0.103	0.14	98.1	1.9
1.36	0.0	0.106	0.14	98.0	2.0
1.37	0.0	0.109	0.15	97.9	2.1
1.38	0.0	0.112	0.15	97.9	2.1
1.39	0.0	0.115	0.15	97.8	2.2
1.40	0.0	0.118	0.15	97.7	2.3
1.41	0.0	0.121	0.16	97.6	2.4
1.42	0.0	0.124	0.16	97.5	2.5
1.43	0.0	0.127	0.16	97.5	2.5
1.44	0.0	0.130	0.16	97.4	2.6
1.45	0.0	0.133	0.17	97.3	2.7
1.46	0.0	0.136	0.17	97.3	2.7
1.47	0.0	0.139	0.17	97.2	2.8
1.48	0.0	0.142	0.17	97.1	2.9
1.49	0.0	0.145	0.18	97.0	3.0
1.50	0.0	0.148	0.18	96.9	3.1
1.51	0.0	0.151	0.18	96.8	3.2
1.52	0.0	0.154	0.18	96.7	3.3
1.53	0.0	0.157	0.19	96.6	3.4
1.54	0.0	0.160	0.19	96.5	3.5
1.55	0.0	0.163	0.19	96.4	3.6
1.56	0.0	0.166	0.19	96.3	3.7
1.57	0.0	0.169	0.20	96.2	3.8
1.58	0.0	0.172	0.20	96.1	3.9
1.59	0.0	0.175	0.20	96.0	4.0
1.60	0.0	0.178	0.21	95.9	4.1
1.61	0.0	0.181	0.21	95.8	4.2
1.62	0.0	0.184	0.21	95.7	4.3
1.63	0.0	0.187	0.21	95.6	4.4
1.64	0.0	0.190	0.22	95.5	4.5
1.65	0.0	0.193	0.22	95.4	4.6
1.66	0.0	0.196	0.22	95.3	4.7
1.67	0.0	0.199	0.22	95.2	4.8
1.68	0.0	0.202	0.23	95.1	4.9
1.69	0.0	0.205	0.23	95.0	5.0
1.70	0.0	0.208	0.23	94.9	5.1
1.71	0.0	0.211	0.24	94.8	5.2
1.72	0.0	0.214	0.24	94.7	5.3
1.73	0.0	0.217	0.24	94.6	5.4
1.74	0.0	0.220	0.24	94.5	5.5
1.75	0.0	0.223	0.25	94.4	5.6
1.76	0.0	0.226	0.25	94.3	5.7
1.77	0.0	0.229	0.25	94.2	5.8
1.78	0.0	0.232	0.25	94.1	5.9
1.79	0.0	0.235	0.26	94.0	6.0
1.80	0.0	0.238	0.26	93.9	6.1
1.81	0.0	0.241	0.26	93.8	6.2
1.82	0.0	0.244	0.26	93.7	6.3
1.83	0.0	0.247	0.27	93.6	6.4
1.84	0.0	0.250	0.27	93.5	6.5
1.85	0.0	0.253	0.27	93.4	6.6
1.86	0.0	0.256	0.27	93.3	6.7
1.87	0.0	0.259	0.28	93.2	6.8
1.88	0.0	0.262	0.28	93.1	6.9
1.89	0.0	0.265	0.28	93.0	7.0
1.90	0.0	0.268	0.28	92.9	7.1
1.91	0.0	0.271	0.29	92.8	7.2
1.92	0.0	0.274	0.29	92.7	7.3
1.93	0.0	0.277	0.29	92.6	7.4
1.94	0.0	0.280	0.29	92.5	7.5
1.95	0.0	0.283	0.30	92.4	7.6
1.96	0.0	0.286	0.30	92.3	7.7
1.97	0.0	0.289	0.30	92.2	7.8
1.98	0.0	0.292	0.30	92.1	7.9
1.99	0.0	0.295	0.31	92.0	8.0
2.00	0.0	0.298	0.31	91.9	8.1
2.01	0.0	0.301	0.31	91.8	8.2
2.02	0.0	0.304	0.31	91.7	8.3
2.03	0.0	0.307	0.32	91.6	8.4
2.04	0.0	0.310	0.32	91.5	8.5
2.05	0.0	0.313	0.32	91.4	8.6
2.06	0.0	0.316	0.32	91.3	8.7
2.07	0.0	0.319	0.33	91.2	8.8
2.08	0.0	0.322	0.33	91.1	8.9
2.09	0.0	0.325	0.33	91.0	9.0
2.10	0.0	0.328	0.33	90.9	9.1
2.11	0.0	0.331	0.34	90.8	9.2
2.12	0.0	0.334	0.34	90.7	9.3
2.13	0.0	0.337	0.34	90.6	9.4
2.14	0.0	0.340	0.34	90.5	9.5
2.15	0.0	0.343	0.35	90.4	9.6
2.16	0.0	0.346	0.35	90.3	9.7
2.17	0.0	0.349	0.35	90.2	9.8
2.18	0.0	0.352	0.35	90.1	9.9
2.19	0.0	0.355	0.36	90.0	10.0
2.20	0.0	0.358	0.36	89.9	10.1
2.21	0.0	0.361	0.36	89.8	10.2
2.22	0.0	0.364	0.36	89.7	10.3
2.23	0.0	0.367	0.37	89.6	10.4
2.24	0.0	0.370	0.37	89.5	10.5
2.25	0.0	0.373	0.37	89.4	10.6
2.26	0.0	0.376	0.37	89.3	10.7
2.27	0.0	0.379	0.38	89.2	10.8
2.28	0.0	0.382	0.38	89.1	10.9
2.29	0.0	0.385	0.38	89.0	11.0
2.30	0.0	0.388	0.38	88.9	11.1
2.31	0.0	0.391	0.39	88.8	11.2
2.32	0.0	0.394	0.39	88.7	11.3
2.33	0.0	0.397	0.39	88.6	11.4
2.34	0.0	0.400	0.39	88.5	11.5
2.35	0.0	0.403	0.40	88.4	11.6
2.36	0.0	0.406	0.40	88.3	11.7
2.37	0.0	0.409	0.40	88.2	11.8
2.38	0.0	0.412	0.40	88.1	11.9
2.39	0.0	0.415	0.41	88.0	12.0
2.40	0.0	0.418	0.41	87.9	12.1
2.41	0.0	0.421	0.41	87.8	12.2
2.42	0.0	0.424	0.41	87.7	12.3
2.43	0.0	0.427	0.42	87.6	12.4
2.44	0.0	0.430	0.42	87.5	12.5
2.45	0.0	0.433	0.42	87.4	12.6
2.46	0.0	0.436	0.42	87.3	12.7
2.47	0.0	0.439	0.43	87.2	12.8
2.48	0.0	0.442	0.43	87.1	12.9
2.49	0.0	0.445	0.43	87.0	13.0
2.50	0.0	0.448	0.43	86.9	13.1
2.51	0.0	0.451	0.44	86.8	13.2
2.52	0.0	0.454	0.44	86.7	13.3
2.53	0.0	0.457	0.44	86.6	13.4
2.54	0.0	0.460	0.44	86.5	13.5
2.55	0.0	0.463	0.45	86.4	13.6
2.56	0.0	0.466	0.45	86.3	13.7
2.57	0.0	0.469	0.45	86.2	13.8
2.58	0.0	0.472	0.45	86.1	13.9
2.59	0.0	0.475	0.46	86.0	14.0
2.60	0.0	0.478	0.46	85.9	14.1
2.61	0.0	0.481	0.46	85.8	14.2
2.62	0.0	0.484	0.46	85.7	14.3
2.63	0.0	0.487	0.47	85.6	14.4
2.64	0.0	0.490	0.47	85.5	14.5
2.65	0.0	0.493	0.47	85.4	14.6
2.66	0.0	0.496	0.47	85.3	14.7
2.67	0.0	0.499	0.48	85.2	14.8
2.68	0.0	0.502	0.48	85.1	14.9
2.69	0.0	0.505	0.48	85.0	15.0
2.70	0.0	0.508	0.48	84.9	15.1
2.71	0.0	0.511	0.49	84.8	15.2
2.72	0.0	0.514	0.49	84.7	15.3
2.73	0.0	0.517	0.49	84.6	15.4
2.74	0.0	0.520	0.49	84.5	15.5
2.75	0.0	0.523	0.49	84.4	15.6
2.76	0.0	0.526	0.50	84.3	15.7
2.77	0.0	0.529	0.50	84.2	15.8
2.78	0.0	0.532	0.50	84.1	15.9
2.79	0.0	0.535	0.50	84.0	16.0
2.80	0.0	0.538	0.50	83.9	16.1
2.81	0.0	0.541	0.51	83.8	16.2
2.82	0.0	0.544	0.51	83.7	16.3
2.83	0.0	0.547	0.51	83.6	16.4
2.84	0.0	0.550	0.51	83.5	16.5
2.85	0.0	0.553	0.51	83.4	16.6
2.86	0.0	0.556	0.52	83.3	16.7
2.87	0.0	0.559	0.52	83.2	16.8
2.88	0.0	0.562	0.52	83.1	16.9
2.89	0.0	0.565	0.52	83.0	17.0
2.90	0.0	0.568	0.52	82.9	17.1
2.91	0.0	0.571	0.53	82.8	17.2
2.92	0.0	0.574	0.53	82.7	17.3
2.93	0.0	0.577	0.53	82.6	17.4
2.94	0.0	0.580	0.53	82.5	17.5
2.95	0.0	0.583	0.53	82.4	17.6
2.96	0.0	0.586	0.54	82.3	17.7
2.97	0.0	0.589	0.54	82.2	17.8
2.98	0.0	0.592	0.54	82.1	17.9
2.99	0.0	0.595	0.54	82.0	18.0
3.00	0.0	0.598	0.54	81.9	18.1
3.01	0.0	0.601	0.55	81.8	18.2
3.02	0.0	0.604	0.55	81.7	18.3
3.03	0.0	0.607	0.55	81.6	18.4
3.04	0.0	0.610	0.55	81.5	18.5
3.05	0.0	0.613	0.55	81.4	18.6
3.06	0.0	0.616	0.56	81.3	18.7
3.07	0.0	0.619	0.56	81.2	18.8
3.08	0.0	0.622	0.56	81.1	18.9



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