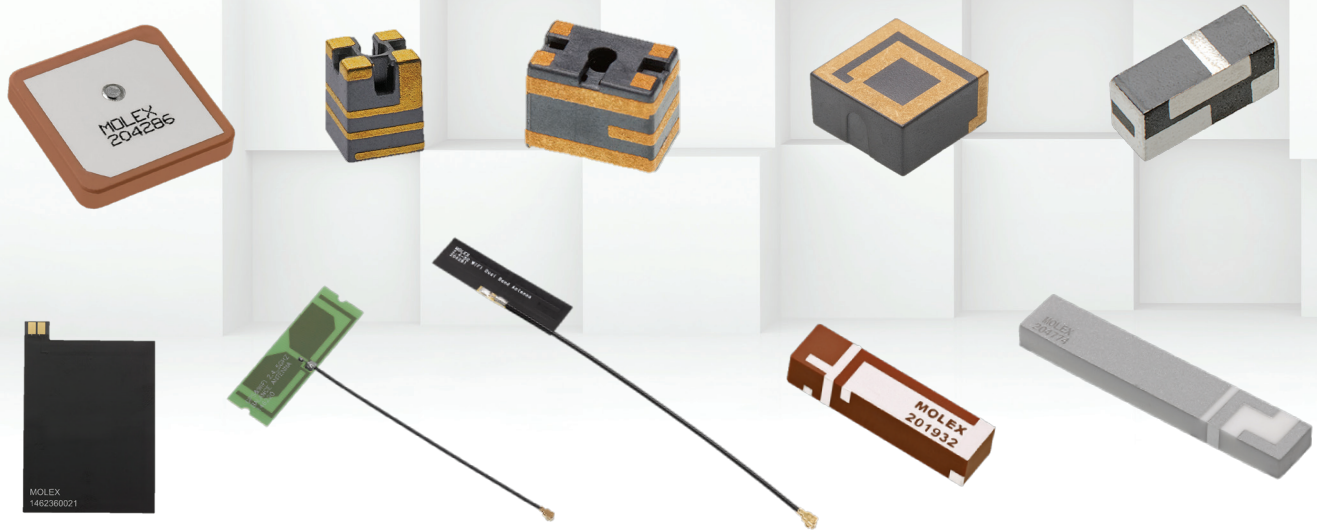


Standard Antennas



molex[®]

Bluetooth/Wi-Fi Antennas

146153 - 2.4/5 GHz Balanced Flexible Antenna
146187 - 2.4/5 GHz Balanced PCB Antenna
204281 - 2.4/5 GHz Balanced Flexible Antenna side-fed cable
146175 - 2.4/5 GHz SMT MID Chip Antenna
47948 - 2.4 GHz SMT MID Chip Antenna
203006 - 2.4/5 GHz Ceramic Chip Antenna

GNSS Antennas

146235 - Helix SMT GPS† Antenna
146216 - RHCP LDS SMT GPS† Antenna
146168 - RHCP GPS Ceramic Antenna (25x25mm)
204286 - GNSS Ceramic Antenna (25x25mm)
204283 - Low-profile GNSS Ceramic Antenna

Combo Antennas (Wi-Fi, GPS, ISM, Cellular...)

146186 - 2.4/5 GHz, Combo GPS/Wi-Fi Flexible Antennas
146220 - 2.4/5 GHz, Combo GPS/Wi-Fi PCB Antennas
203007 - 2.4/5 GHz, Combo GPS/Wi-Fi Ceramic Antennas
201932 - 2.4/5 GHz & 900 MHz Triple-band Ceramic Antenna

Cellular Antennas

105263 - Multi(6)-band Cellular Flexible Antenna
146185 - Cellular Quad-band Flexible Antenna
146200 - Full LTE SMT Antenna
204774 - Cellular 790 to 2700 MHz Ceramic Antenna

Ultra Wide Band (UWB) Antennas

146184 - Ultra Wide Band (UWB) PCB Antenna

Industrial, Scientific and Medical (ISM) Antennas

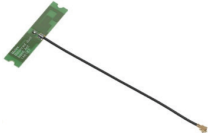
105262 - 868/915 MHz ISM Standalone Antenna
204287 - 433 MHz ISM Antenna

Near Field Communications (NFC) Antennas

146236 - NFC Rectangular Antenna

Bluetooth/Wi-Fi Antennas (1 of 2)



Series	146153		146187		204281	
Name	2.4/5 GHz Balanced Flex Antenna with Center-Fed Cable		2.4/5 GHz Balanced PCB Antenna with Center-Fed Cable		2.4/5 GHz Balanced Flex Antenna with Side-Fed Cable	
Size	34.90mm x 9.00mm		40.95mm x 9.00mm		35.00mm x 11.00mm	
Cable Length	50, 100, 150, 200, 250, 300mm		50, 100, 150, 200, 250, 300mm		50, 100, 150, 200, 250, 300mm	
Material	Flexible		PCB		Flexible	
Antenna Type	Dipole-type, Balanced		Dipole-type, Balanced		Dipole-type, Balanced	
Frequency Range	2.4 to 2.5 GHz	5.15 to 5.85 GHz	2.4 to 2.5 GHz	5,15 to 5.85 GHz	2.4 to 2.5 GHz	5.15 to 5.85 GHz
Return Loss	<-10 dB		-10 dB		<-10 dB	
Peak Gain	3.0 dBi	4.0 dBi	3.2 dBi	4.5 dBi	2.0 dBi	3.3 dBi
Total Radiation Efficiency	>75%	>75%	>80%	>75%	>65%	>68%
Polarization	Linear		Linear		Linear	
Input Impedance	50 ohms		50 ohms		50 ohms	
Product Image						

Note: Performance values above are based on 100mm cable

Bluetooth/Wi-Fi Antennas (continued)



Series	146175		47948	203006		
Name	2.4/5 GHz Wi-Fi SMT Chip Antenna		2.4 GHz Wi-Fi SMT Chip Antenna	2.4/5 GHz Ceramic SMT Antenna		
Size	3.00 by 5.00 by 4.00mm		3.00 by 3.00 by 4.00mm	3.20 by 1.60 by 1.10mm		
PCB Clearance	4.00 by 6.00mm		4.00 by 4.00mm	4.00 by 6.00mm		
Material	LDS-MID		LDS-MID	Ceramic		
Antenna Type	Inverted F-Antenna (IFA)		Monopole	Loop		
Frequency Range	2.4 to 2.5 GHz	5.15 to 5.85 GHz	2.4 to 2.5 GHz	2.4 GHz	2.4 to 2.5 GHz	5.15 to 5.85 GHz
Return Loss	<-6 dB		<-7 dB	-10 dB	-5 dB	
Peak Gain	3.0 dBi	4.2 dBi	3.0 dBi	2.3 dBi	2.1 dBi	1.5 dBi
Total Radiation Efficiency	>70%		>70%	>70%	>60%	>55%
Polarization	Linear		Linear	Linear		
Input Impedance	50 ohms		50 ohms	50 ohms		
Product Image						

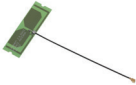
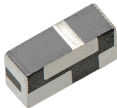
GNSS Antennas



Part No.	146235			146216			146168	204286			204283		
Name	Helix GPS Antenna			RHCP MID GPS Antenna			RHCP Ceramic GPS Antenna	GPS/BEIDOU/GLONASS Ceramic Antenna			Low-profile GNSS Ceramic Antenna		
Size	3.00 by 5.00 by 4.00mm			11.80 by 11.55 by 6.00mm			25.00 by 25.00 by 4.00mm	25.00 by 25.00 by 4.00mm			3.20 by 1.60 by 1.10mm		
PCB Clearance	4.00 by 6.00mm			No PCB Clearance			No PCB Clearance	No PCB Clearance			5.00 by 6.00mm		
Material	LDS-MID			LDS-MID			Ceramic	Ceramic			Ceramic		
Antenna Type	Monopole			Planar Inverted-F Antenna (PIFA)			Patch	Patch			Loop		
Frequency Range	1561 ±5 MHz	1575 ±5 MHz	1602 ±5 MHz	1561 ±5 MHz	1575 ±5 MHz	1602 ±5 MHz	1.575GHz	1561 ±5 MHz	1575 ±5 MHz	1602 ±5 MHz	1561 ±5 MHz	1575 ±5 MHz	1602 ±5 MHz
Return Loss	<-8 dB			<-10 dB			<-15 dB	<-10 dB			<-8 dB	<-10 dB	<-8 dB
Peak Gain	0.7 dBi	1.1 dBi	1.1 dBi	0.7 dBi	0.7 dBi	1.5 dBi	5.5 dBi	5.2 dBi	5.4 dBi	5.6 dBi	1.5 dBi	2.0 dBi	1.6 dBi
Total Radiation Efficiency	>50%	>55%	>50%	>55%	>57%	>60%	>75%	>70%	>70%	>75%	>60%	>65%	>60%
Polarization	Elliptic			RHCP			RHCP	Elliptic			Linear		
Axial Ratio	<6.0 dB			<3.0 dB			<3.0 dB	<13.0 dB	<7 dB	<12 dB	-		
Input Impedance	50 ohms			50 ohms			50 ohms	50 ohms			50 ohms		

Combo Antenna (Wi-Fi, GPS, ISM and Cellular)

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Series	146186				146220				203007					201932		
Name	GPS/Wi-Fi Combo Balanced Flexible Antenna				GPS/Wi-Fi Combo Balanced PCB Antenna				2.4/5 GHz, Combo GPS/Wi-Fi Ceramic Antennas					2.4/5 GHz & 900 MHz Triple band Antenna		
Size	53.00 by 18.00mm				53.50 by 16.60mm				3.20 by 1.60 by 1.10mm					20.00 by 5.00 by 4.00mm		
Material	Flexible				PCB				Ceramic					Ceramic		
Antenna Type	Dipole-type, Balanced				Dipole-type, Balanced				Loop					IFA		
PCB Clearance	N.A.				N.A.				6.20 by 8.00mm					30.00 by 6.00mm		
Cable Length	50, 100, 150, 200, 250, 300mm				50, 100, 150, 200, 250, 300mm				N.A.					N.A.		
Frequency Range	1.575 to 1.602 GHz	2.4 to 2.5 GHz	5.15 to 5.85 GHz	3 to 6 GHz	1.575 to 1.602 GHz	2.4 to 2.5 GHz	5.15 to 5.85 GHz	3 GHz to 6 GHz	1.561 GHz	1.575 GHz	1.602 GHz	2.4 to 2.5 GHz	5.15 to 5.85 GHz	900 to 924 MHz	2.4 to 2.5 GHz	5.15 to 5.85 GHz
Return Loss	<-10 dB				<- 8 dB				<-6 dB	<-10 dB	<-6 dB	<-6 dB	<-5.5 dB	< -5dB	< -6 dB	< -5 dB
Peak Gain	3.0 dBi	3.0 dBi	4.0 dBi	4.7 dBi	2.4 dBi	2.9 dBi	3.8 dBi	3.5 dBi	0.9 dBi	1 dBi	0.3 dBi	0.6 dBi	1 dBi	0.7 dBi	4.2 dBi	4.5dBi
Total Radiation Efficiency	>70%	>75%	>70%	>80%	>82%	>80%	>83%	>78%	>55%	>55%	>50%	>55%	>50%	>40%	>65%	>55%
Polarization	Linear				Linear				Linear					Linear		
Input Impedance	50 ohms				50 ohms				50 ohms					50 ohms		
Product Image																

Note: Performance values above are based on 100mm cable

Cellular Antennas



Part No.	105263		146185		146200		204774	
Name	Multi(6)-band Cellular Flexible Antenna		Multi-band Combo Cellular Wi-Fi Flexible Antenna		Full LTE SMT Antenna		791 to 960 and 1710 to 2700 MHz Penta-band Ceramic Antenna	
Size	106.6 by 13.00mm		84.00 by 15mm		40.00 by 5.00 by 5.00mm		33.00 by 6.00 by 3.00mm	
Material	Flexible		Flexible		Ceramic		Ceramic	
Antenna Type	Dipole-type, Balanced		Dipole-type, Balanced		SD type with MobliquA Technology		Coupler	
PCB Clearance	N.A.		N.A.		50.00 by 10.00mm		43.00 by 9.00mm	
Cable Length	50, 100, 150, 200, 250, 300mm		50, 100, 150, 200, 250, 300mm		N.A.		N.A.	
Frequency Range	824 to 960 MHz	1.71 to 2.7 GHz	824 to 960 MHz	1.7 to 2.7 GHz	698 to 960 MHz	1.71GHz to 2.7 GHz	790 to 960 MHz	1.71 to 2.17 GHz
Return Loss	<-6 dB		<-4 dB	<-4 dB	<-5 dB		<-6 dB	
Peak Gain	2.3 dBi	3.1 dBi	1.4 dBi	3 dBi	1.1 dBi	4.5 dBi	0.6 dBi	4.8 dBi
Total Radiation Efficiency	>66%	>60%	>60%	>65%	>60%	>70%	>50%	>70%
Polarization	Linear		Linear		Linear		Linear	
Input Impedance	50 ohms		50 ohms		50 ohms		50 ohms	
Product Image								

Ultra Wide Band (UWB) Antennas



	146184
Name	Ultra Wideband PCB Antenna
Size	47.00 by 17.6mm
Material	PCB
Antenna Type	Dipole, Balanced
Cable Length	100mm
Frequency Range	3GHz to 6GHz
Return Loss	<-6 dB
Total Radiation Efficiency	70%
Peak Gain	4.5 dBi
Polarization	Linear
Input Impedance	50 ohms
Product Image	

Industrial, Scientific and Medical (ISM) Antennas



Series	105262		204287
Name	868/915 MHz ISM Standalone Antenna		433 MHz ISM Antenna
Size	79.00 by 10.00mm		90.00 by 40.00mm
Material	Flexible		Flexible
Antenna Type	MobliquA Technology, Balanced		Dipole-type, Balanced
Cable Length	50, 100, 150, 200, 250, 300mm		50, 100, 150, 200, 250, 300mm
Frequency Range	863 - 870 MHz	902 - 928 MHz	433 MHz
Return Loss	<-6 dB		<-10 dB
Total Radiation Efficiency	50%	66%	>56% (50mm cable), >55% (100mm cable), >54% (150mm cable), >52% (200mm), >51% (250mm), >50% (300mm)
Peak Gain	0.4 dBi (100mm cable) 0.3 dBi (150mm cable) 0.2 dBi (200mm cable)	1.4 dBi (100mm cable) 1.3 dBi (150mm cable) 1.2 dBi (200mm cable)	0.8 dBi (50mm cable), 0.7 dBi (100mm cable), 0.6 dBi (150mm cable), 0.5 dBi (200mm), 0.4 dBi (250mm), 0.3 dBi (300mm)
Polarization	Linear		Linear
Input Impedance	50 ohms		50 ohms
Product Image			

Near Field Communication (NFC) Antenna



Series	146236	
Name	NFC antenna without Ferrite	NFC antenna with Ferrite
Sizes	15.00 by 15.00mm 23.00 by 27.00mm 34.00 by 46.00mm 45.00 by 55.00mm	
Material	FPC	FPC + Ferrite
Antenna Type	Near Field Coupling	
Frequency Range	13.56 MHz	
Inductor @ 13.56 MHz	2.11 μ H 2.09 μ H 2.76 μ H 2.59 μ H	3.32 μ H 3.22 μ H 4.25 μ H 3.92 μ H
Product Image		

Molex Standard Antenna Matrix



Category	Protocol	Series No.	Operating Frequency		Antenna Type		SMD Mounting Type		PCB/Flexible Antenna Mounting		Cable Alignment with Antenna		Cable Diameter (mm)	Cable Length (mm)		Connector Type	
			2.4 GHz	5.0 GHz	Embedded	Internal cable assy	PCB Corner	PCB Center-edge	Peel-and-stick	Screw mounting	Parallel	Perpendicular	1.13	50/100/150 200/250/300	Custom Length	UFL MHF1	Custom
BT/WiFi	Zigbee Bluetooth BLE Thread WiFi	47948	√		√		√										
		146175	√	√	√		√										
		203006	√	√	√			√									
		146153	√	√		√			√			√	√	√	√	√	√
		204281	√	√		√			√		√		√	√	√	√	√
		146187	√	√		√				√		√	√	√	√	√	√

Category	Protocol	Series No.	Operating Frequency (MHz)			Antenna Type		Polarization			Mounting		Antenna Size (mm)
			1561	1575	1602	Passive	Active	RHCP	Elliptic	Linear	SMD	Pin and Adhesive	
GNSS	GPS Glonass Beidou Galileo	146235	√	√	√	√			√		√		3x5x4
		146216	√	√	√	√		√			√		11.8x11.55x6
		146168		√		√		√				√	25x25x4
		204286	√	√	√	√			√			√	25x25x4
		204283	√	√	√	√				√	√		3.2x1.6x1.1

Category	Protocol	Series No.	Operating Frequency (MHz)			Antenna Type		Flexible Antenna Mounting	Cable Alignment w/ Antenna		Cable Diameter (mm)	Cable Length (mm)			Connector Type	
			433	868	915	Embedded	Internal cable assy	Peel-and-stick	Parallel	Perpendicular	1.13	100/150/200	50/250/300	Custom Length	UFL MHF1	Custom
ISM	Sigfox Neul Z-wave LoRa	105262		√	√		√	√		√	√	√			√	√
		204287	√				√	√		√	√	√	√	√	√	√

Molex Standard Antenna Matrix



Category	Protocol	Series No.	Operating Frequency (MHz)				Antenna Type		SMD Mounting Type	Flex antenna mounting	Cable Alignment w/ Antenna		Cable Diameter (mm)	Cable Length (mm)			Connector Type	
			698 to 960	790 to 960	824 to 960	1710 to 2700	Embedded	Internal cable assy	PCB End	Peel-and-stick	Parallel	Perpendicular	1.13	100/150/200	50/250/300	Custom Length	UFL MHF1	Custom
Cellular	Cellular 2G/3G/4G LTE LPWA (Cat-M1/NB1)	105263			√	√		√		√		√	√	√			√	√
		146185			√	√		√		√		√	√	√	√	√	√	√
		146200	√			√	√		√									
		204774		√		√	√		√									

Category	Protocol	Series No.	Operating Frequency band		Antenna Type		PCB/Flex antenna mounting		Cable Alignment with Antenna		Cable diameter (mm)	Cable Length (mm)		Connector Type	
			2.4/5 GHz+GPS	2.4/5GHz+900 MHz	Embedded	Internal cable assy	Peel-and-stick	Screw mounting	Parallel	Perpendicular	1.13	50, 100, 150, 200, 250, 300	Custom Length	UFL MHF1	Custom
Combo	WiFi + GPS; WiFi + 900 MHz	146186	√			√	√			√	√	√	√	√	√
		146220	√			√		√		√	√	√	√	√	√
		203007	√		√										
		201932		√	√										

Category	Protocol	Series No.	Frequency	Antenna Type		Flex antenna mounting	Cable Alignment with Antenna		Cable Diameter (mm)	Cable Length (mm)		Connector Type	
			3 to 6 GHz	Embedded	Internal cable assy	Peel-and-stick	Parallel	Perpendicular	1.13	50, 100, 150, 200, 250, 300	Custom Length	UFL MHF1	Custom
UWB	UWB	146184	√		√	√	√		√	√	√	√	√

Category	Protocol	Series No.	Frequency 13.56 MHz	With Ferrite	Without Ferrite	With Cabl	Without Cable	Size (mm)
NFC	NFC	146236	√	√	√	X	√	"15 by 15; 23 by 27; 34 by 46; 45 by 55"

www.molex.com/link/standard_antennas.html

