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Smart Metering



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- 169,315,433,868,915 MHz, GPRS, 3G, 4G.



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- Whip
- Radome Omni
- GPS
- Cable Assemblies
- Anti Vandalism
- Mast Mounted, Wall Mounted
- 169MHz, 868MHz, 915MHz, 3G, GPS



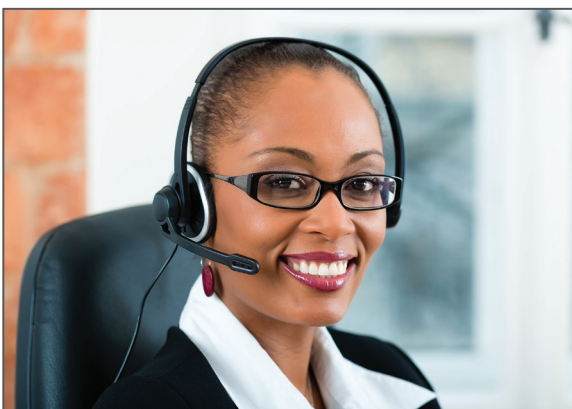
PULSE NO-NONSENSE™ WARRANTY

Every effort is made to assure the integrity and long life of each Pulse product. In the unfortunate event a problem does occur, you will find us ready to make it right!

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EMBEDDED SOLUTIONS FOR ISM NETWORKS

App.	Type	Pulse Part number	RF Performance					
			Frequency range (MHz)	RL Min. (dB)	Peak Gain (dBi)		Efficiency (%)	
					Peak	Band edges	Peak	Band edges
868MHz (868MHz-870MHz)	Ceramic chip	W3000	868-870	-15	-1.4	-1.5	30	29
		W3013	868-870	-11	1.5	1.4	65	64
		W3016	868-870	-19	-2.2	-2.5	25	23
	Helical	W3117	869-894	-9	0	-1.3	56	40
		W3118A	869-894	-9	0	-1.4	52	38
915MHz (902MHz-928MHz)	Ceramic chip	W3012	902-928	-6	2	0.5	70	50
		W3014	880-960	-7	-0.5		45	40
	Helical	W3112A	902-928	-10	0.9	-0.3	67	50
		W3113	902-928	-10	0.8	-0.3	66	51
Combo 868/915MHz and 2.4GHz	Direct PCB	W3331	863-928	-6	1.7	0.9	64	53
			2400-2500	-12	4	1.5	85	69
	Direct PCB	W3333	863-928	-8	2.4	1.8	75	-
			2400-2500	-12	4.5	3.0	85	66
433MHz	Ceramic chip	W3015L	433 +/- 1	-10	-2.5	-	35	-
	Helical	W3127	433-435	-15	-2.9	-	-	-
315 MHz	Helical	W3126	315	-10	-5	-	-	-
169 MHz	Helical	W3100	169MHz	-10	-4	-	55	-

Note: 1. ISM application for 902MHz-928MHz band (center frequency 915MHz). 2. Applications from ECA chart for 862MHz-890MHz. (a) Alarms: 868.6-869.7MHz, (b) RFID: 865-868MHz, (c) Tracking, tracing, and data acquisition: 870-875.6MHz, and (d) Wireless audio/multimedia: 863-865MHz. 3. "Stock" Stocked parts are typically available from Pulse distribution partners immediately.



ME requirement			Note
Antenna DIM. (LxWxH,mm)	GC-area (L x W,mm)	Evaluation Board Size (L x W,mm)	
7 x 1.6 x 1.6	20 x 9.50	40 x 20	Vertical, tuned by stripline on PCB
10 x 3.2 x 4.0	10.80 x 8.25	80 x 37	Center edge
10 x 3.2 x 4.0	11.50 x 7	25 x 25	Corner, Small GC-area and PCB
12.4 x 8 x 2.5	8 x 40	100 x 40	Horizontal, Center top
2.5 x 8 x 8	6 x 11	100 x 40	Vertical, Corner
10 x 3.2 x 4	10.80 x 8.25	100 x 37	Center edge
10 x 3.2 x 1.5	40 x 16	96 x 40	Center Top
2.5 x 8 x 8	6 x 11	100 x 40	Vertical, Corner
12.4 x 8 x 2.5	8 x 40	100 x 40	Horizontal, Center top
45 x 10 x 0.8	45 x 4.5	119 x 102	Corner, Small GC-area and PCB, Dual feeds
40 x 15 x 0.8	40 x 4.5	119 x 102	Corner, Small GC-area and PCB, Dual feeds
10 x 3.2 x 4.0	10.80 x 14	200 x 37	Center edge
35.35 x 9.90	8 x 40	100 x 40	Center Top
35.35 x 9.90	8 x 40	100 x 40	Center Top
91 x 9.8	-	95 x 45	coil on free space

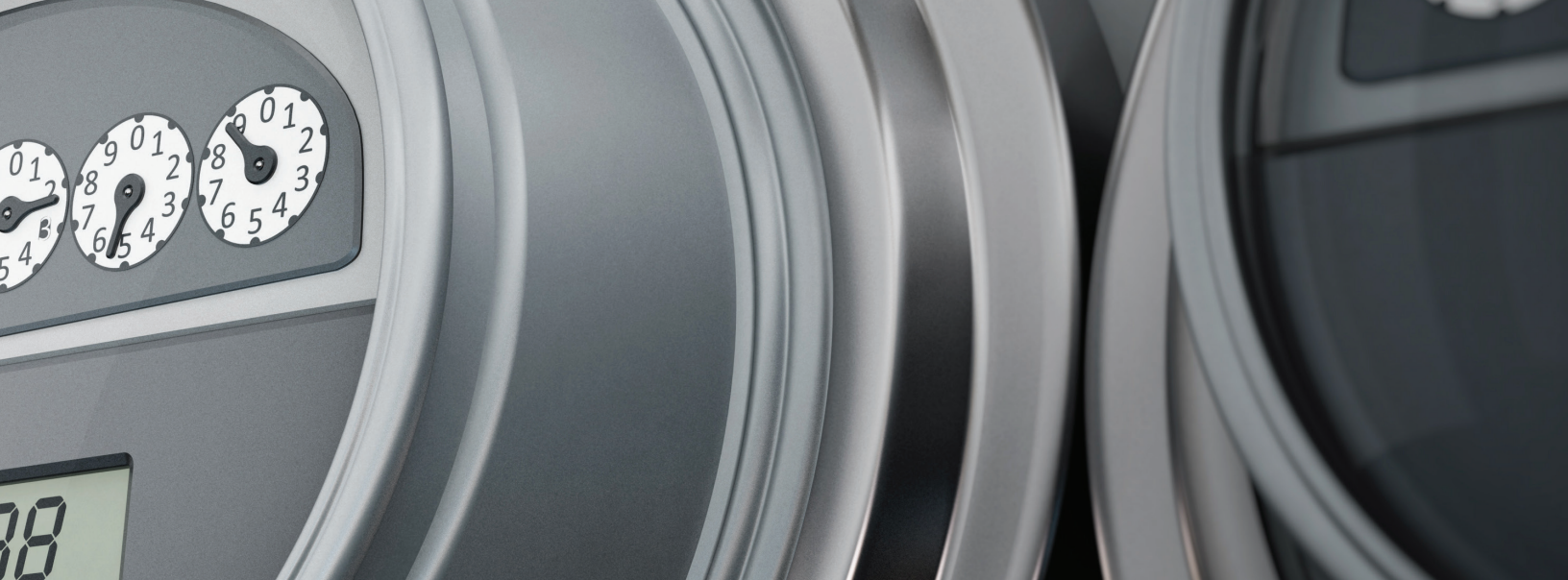




EMBEDDED SOLUTIONS FOR 2.4 GHZ COMBINATIONS

App.	Type	Pulse Part Number	RF Performance					
			Operating Frequency (MHz)	RL Min. (dB)	Peak Gain (dBi)		Efficiency (%)	
					Peak	Band edges	Peak	Band Edges
Single WiFi, BT, Zigbee	Ceramic chip	W3000	2400-2483.5	-18	2.5	2.1	65	55
		W3001		-12	2.2	1.5	53	45
		W3008		-6	1.5	0.5	75	60
		W3008C		-8	1.7	0.7	70	55
		W3043		-11	2.2	1.9	75	70
		W3092		-12	4		70	
		W3108		-6	2	0	60	43
	Helical	W3108		-8	1.5		50	
Dual WiFi	Ceramic chip	W3006	2400-2483.5	-8	3.2	2.7	70	65
			5150-5850	-10	4.2	3.0	80	70
		W3078	2400-2483.5	-10	1.7	1.0	65	55
			4950-5850	-6	4.3	3.7	80	55
		W3079	2400-2483.5	-13	2.5	1.3	72	60
			4950-5850	-8	5.7	3.3	78	55
Combo GPS+WiFi or ISM 868/915 + WiFi	Ceramic chip	W3056	2400-2483.5	-8	3.2	2.5	80	70
			1575.42 + 1.023	-10	2.5	1.5	75	65
		W3064C	2400-2483.5	-11	-0.7	-1.7	80	70
			1575.42 + 1.023	-15		-2.0	70	60
		W3095	2400-2483.5	-11	2.5	1.5	85	80
			4950-5850	-6	3.5	1.0	70	50
			1575-1610	-10	1.5	0.8	75	60
		W3320	863-928	-8	1.5	0.8	67	55
			2400-2500	-6	3.4	1.4	61	45

* NOTE: 1. Recommended minimum GND dimensions of PIFA type and Monopole's are roughly 40x20mm and 30x20mm (or 40x11mm), respectively. Need to construct matching values to optimize antenna performance on surrounding mechanics and materials. 2. Pulse offers very unique GPS+WiFi combo antennas on single ceramic chip (10x3.2x1.5mm). There are three different types of combo antennas. W3056 (2.4G Wifi +GPS, single feed), W3064C (2.4G WiFi+GPS, dual feed), and W3095 (2.4G and 5G Wifi +GPS/Glonass/Beidou, dual feed). 3. "Stock" Stocked parts are typically available from Pulse distribution partners immediately.



	ME requirement			Note
	Antenna DIM. (LxWxH,mm)	GC-area (L x W,mm)	Evaluation Board Size (L x W,mm)	
	7 x 1.6 x 1.6	6.00 x 11.00	40 x 11	3 Matching components Horiz. mount
		6.00 x 20.00	30 x 20	
	10 x 3.2 x 4.0	10.80 x 6.25	80 x 37	On Ground soluton
	3.2 x 1.6 x 1.1	4.00 x 4.25	80 x 37	
	3.2 x 1.6 x 1.1	4.00 x 6.25	80 x 37	
	3.2 x 1.6 x 1.1	5.60 x 20	37 x 20	Small PCB size
	2 x 1.2 x 0.55	8 x 2.5	110 x 55	small antenna size
	5.0 x 2.5 x 5.5	7.50 x 5.50	100 x 40	Vertical SMD @ Corner
	10 x 3.2 x 1.5	11.60 x 6.00	80 x 37	
	3.2 x 1.6 x 1.1	11.15 x 6.40	80 x 37	@ Corner
	3.2 x 1.6 x 1.1	11 x 6	80 x 37	Center
	10 x 3.2 x 1.5	10.80 x 6.25 (Notch)	100 x 40	Single feed and 2.4GHz WiFi
	10 x 3.2 x 1.5	10.80 x 6.40 (Divided)	96 x 45	Dual feed and 2.4GHz WiFi
	10 x 3.2 x 1.5	17.80 x 6.45	70 x 35	Dual feed and Dual WiFi + GPS/Glonass/Beidou
	10 x 3.2 x 2	12 x 9.5	120 x 50	Center, Dual feed
		4.6 x 3.95		





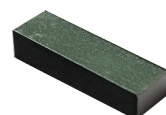
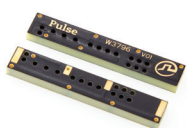
EMBEDDED SOLUTIONS FOR 2G/3G/4G

App.	Type	Pulse Part number	RF Performance			
			Frequency range (MHz)	RL Min. (dB)	Peak Gain (dBi)	
					Peak	Band edges
LTE	Composite	W3796	698-960	-6	1.5 (Avg. peak gain)	
			1427.9-1660.9	-5.5	2 (Avg. peak gain)	
			1695-2200	-6	5.5 (Avg. peak gain)	
			2300-2700	-6	5 (Avg. peak gain)	
Penta Band		W3544A	824-960	-3.7	0.5	1.8
			1710-1880	-4.6	2.9	2.3
			1850-1990	-8.6	2.4	1.7
			1920-2170	-5.6	2.2	1.1
		W3544B	824-960	-6.5	1	-0.7
			1710-1880	-5.7	2.7	1.7
			1850-1990	-9.3	2	1
			1920-2170	-5	1.8	0.2
Quad band (US)	W3073	824-894	-4.7	0.4	-2.6	
		1710-1880	-3.5	2.3	0.7	
		1850-1990	-5.9	2.5	1.6	
		1920-2170	-3.3	2.2	0.9	
Quad band (EU)	W3073	880-960	-3.8	1	-1.8	
		1710-1880	-4.9	2.9	2	
		1850-1990	-8	2.9	2.5	
		1920-2170	-4.4	2.8	2.3	
Dual band (EU)	W3070	880-960	-5.1	1.2	-0.4	
		1710-1880	-5.7	2.5	1.5	

NOTE: 1. “Stock” Stocked parts are typically available from Pulse distribution partners immediately.
 2. * SE = Series and *SH = Shunt



		ME requirement			Note
Efficiency (%)/(dB)		Antenna DIM. (LxWxH,mm)	GC-area (L x W,mm)	Evaluation Board Size (L x W,mm)	
Peak	Band edges				
65 (Avg.)		40 x 7 x 3	40.6 x 15	120 x 40.6	- Top mount: Horizontal - Matching: SE3.3nH+SH0.7pF; SH6.8nH
55 (Avg.)					
75 (Avg.)					
70 (Avg.)					
65	44	7.65 x 26 x 3	21 x 33.5 (W3544A)	110 x 50	1. Corner mount (vertical). 2.matching: *SE12nH
74	45				
74	64				
68	60				
70	53	7.65 x 26 x 3	50 x 18 (W3544B)	110 x 50	1. Top mount (Horizontal) 2.matching: 10nH
77	59				
77	69				
71	58				
51	28	10 x 3.2 x 4	40 x 10	105 x 40	1. Matching: SE10nH+SE12nH+SH12nH. 2.Tuning strip on PCB.
59	40				
59	54				
58	46				
60	34	10 x 3.2 x 4	40 x 10	105 x 40	1. Matching: *SE10nH+*SE10nH+*SH-15nH. 2.Tuning strip on PCB.
70	54				
71	62				
67	59				
65	47	10 x 3.2 x 2	40 x 10	95 x 40	Matching: *SE18nH+ *SE10nH
60	50				





EMBEDDED SATCOM ANTENNA SOLUTIONS

App.	Type	Pulse Part number	RF Performance							
			Operating Frequency (MHz)	RL Min. (dB)	RHCP Gain (dBic)		Linear Gain (dBi)		Efficiency (%) / (dB)	
					Peak	Band edges	Peak	Band edges	Peak	Band edges
GPS Only	Ceramic chip	W3000	1575.42+1.023	-15	-3.9	-4.1	0.3	0	50/-3	45/-3.5
				-12	-3.5	-3.9	0.1	-0.2	50/-3	45/-3.5
		W3009		-11	0.2	-0.6	3	2.3	83/-0.8	70/-1.5
		W3011		-12	0.85	0.5	3.4	3	85/-0.7	80/-1
	Patch	W3213		-13	-1.5	-	-	-	-	-
		W3099		-14	3.5	-	-	-	-	-
	Helical	W3110		-16	-2.1	-2.4	1.3	0.7	47/-3.3	43/-3.7
GPS, Glonass, & Beidou	Ceramic chip	W3000	1561+2/ 1575.42+1.023/ 1602.56+4	-18	-0.2		2.4	1.5	70/-1.55	65/-1.9
		W3010		-12	1	0	3	2.2	75/-1.25	70/-1.5
				-12	1.5	0.4	3	1.8	70/-1.55	50/-3.0
		W3011A		-16	1	-0.4	3.7	2.5	88/-0.6	70/-1.5
		W3062A		-10	0	-0.5	2.5	2.0	80/-1	60/-2.1
	Patch	W3216	1575.42+1.023/ 1602.56+4	-7	-2	-	-	-	60	50
		W3223		-10	4	3.5	-	-	97/-0.2	93/-0.6
		W3224		-10	2.5	2.0	-	-	95/-0.5	79/-2
		W3225		-10	3	-	-	-	96/-0.3	92/-0.7
WiFi and GPS Combo	Ceramic chip	W3056	2400-2483.5	-8	-	-	3.2	2.5	80	70
			1575.42 + 1.023	-10			2.5	1.5	75	65
		W3064C	2400-2483.5	-11	-	-	-0.7	-1.7	80	70
			1575.42 + 1.023	-15				-2.0	70	60
		W3095	2400-2483.5	-10	-	-	2.7	1.5	85	80
			4950-5850	-6	-	-	3.7	1.0	73	53
			1575-1610	-8			1.7	0.7	75	62

NOTE: 1. Recommended minimum GND dimensions of PIFA type and Monopole are roughly 40x20mm and 30x20mm (or 40x11mm), respectively. Need to construct matching values to optimize antenna performance on surrounding mechanics and materials. 2. Pulse offers very unique GPS+WiFi combo antennas on single ceramic chip (10x3.2x1.5mm). There are three different types of combo antennas. W3056 (2.4G Wifi +GPS, single feed), W3064C (2.4G WiFi+GPS, dual feed), and W3095 (2.4G and 5G Wifi +GPS/Glonass/Beidou, dual feed). 3. “Stock” Stocked parts are typically available from Pulse distribution partners immediately.



ME requirement			Note
Antenna DIM. (LxWxH,mm)	GC-area (L x W,mm)	Evaluation Board Size (L x W,mm)	
7 x 1.6 x 1.6	6 x 20	30 x 20	3 Matching components
	6 x 11	40 x 11	
10 x 3.2 x 4.0	10.80 x 6.25	80 x 37	On Ground shunt 3.3pF
3.2 x 1.6 x 1.1	4.00 x 4.25	80 x 37	w/o matching
13 x 13 x 4	-	30 x 30	
25 x 25 x 4	-	70 x 70	
5.0 x 2.5 x 5.5	7.50 x 5.50	100 x 40	Vertical SMD, @ Corner
7 x 1.6 x 1.6	6 x 10	80 x 37	3 Matching components, Horiz. Mount + @Corner
10 x 3.2 x 2	10.80 x 6.25	80 x 37	@ Position1 shunt 3.3pF
			@ Position2 shunt 2.2pF
3.2 x 1.6 x 1.1	4.00 x 6.25	80 x 37	Shunt 1.8pF
7 x 1.6 x 1.6	7.80 x 5.25	80 x 37	Shunt 2.2pF
13 x 13 x 5	-	50 x 50	
25 x 25 x 4	-	70 x 70	TS 16949
18 x 18 x 4	-	70 x 70	SMD
25 x 25 x 4	-	70 x 70	SMD
10 x 3.2 x 1.5	10.80 x 6.25 (Notch)	100 x 40	Single feed and 2.4GHz+GPS
10 x 3.2 x 1.5	10.80 x 6.40 (Divided)	96 x 45	Dual feed and 2.4GHz+GPS
10 x 3.2 x 1.5	17.80 x 6.45	80 x 50	Dual feed and Dual WiFi+GPS/Glonass





EMBEDDED ACTIVE SATCOM ANTENNA SOLUTIONS

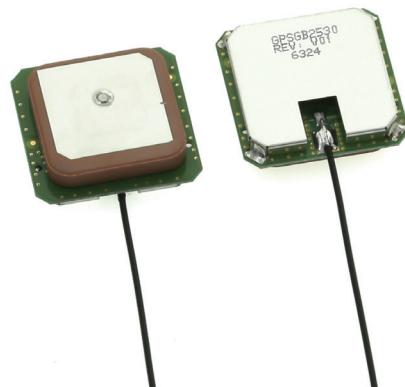
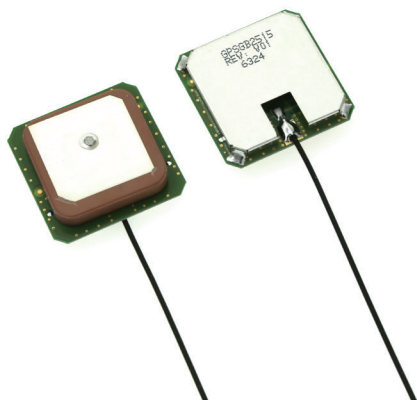
App.	Type	Pulse Part Number	RF Performance					
			Operating Frequency (MHz)	Antenna Element		LNA		
				VSWR	RHCP Gain (dBic)	Gain (dB)	NF (dB)	Current (mA)
GNSS (GPS, Glonass, BeiDou, and Galileo)	Ceramic patch with LNA	GPSGB1315	1561 +/- 2.046, 1575.42 +/- 10.23, and 1602.5625 +/- 4 MHz	2	-1 + 1	15 + 2	< 2.4	< 6
		GPSGB1330		2	-1 + 1	30 + 2	< 2.4	< 6
		GPSGB2515		2	1 + 1	15 + 2	< 2.4	< 6
		GPSGB2530		2	1 + 1	30 + 2	< 2.4	< 6

Note: 1. Further detailed specs such as ‘Out of band rejection’ of LNA can be found on a datasheet.





	ME requirement			
VCC (Vdc)	Antenna Dimension (mm)	Overall Dimension (mm)	Connector type	Coaxial Cable (Length; Diameter)
3.3-5 + 0.5	13x13x5	16x17x8.15	IPEX MHF 20278	L:100; D:1.13
3.3-5 + 0.5	13x13x5	16x17x8.15	IPEX MHF 20278	L:100; D:1.13
3.3-5 + 0.5	25x25x4	30x30x8	IPEX MHF 20278	L:100; D:1.13
3.3-5 + 0.5	25x25x4	30x30x8	IPEX MHF 20278	L:100; D:1.13



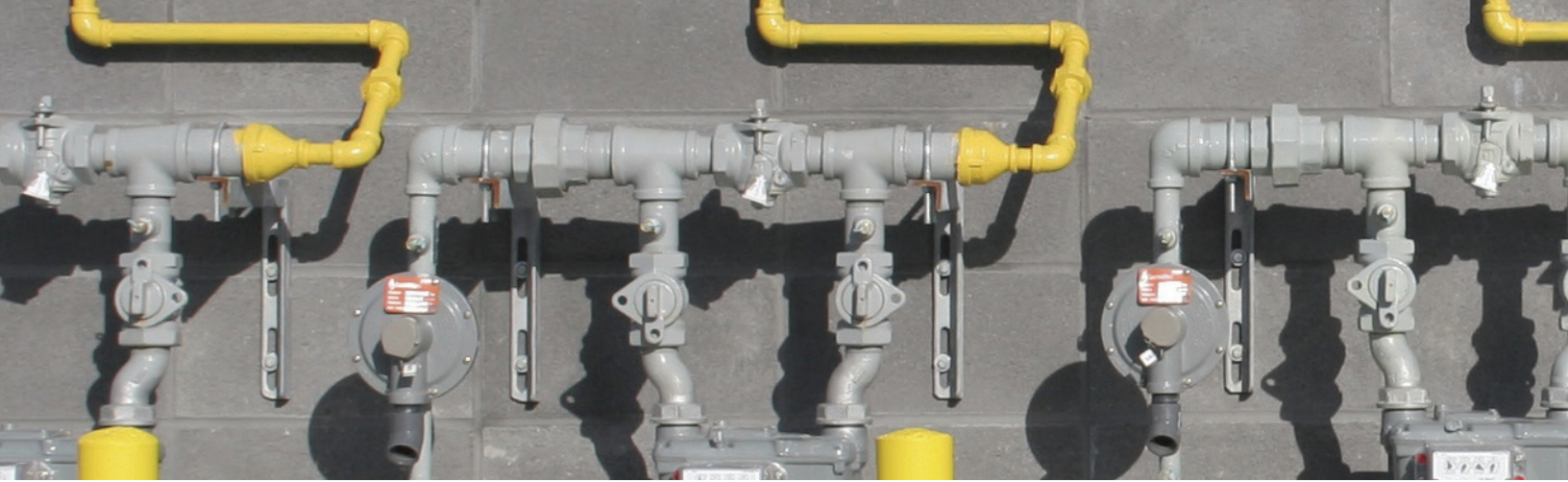
INTERNAL FLEXIBLE ANTENNA SOLUTIONS

App.	Type	Pulse Part Number	RF Performance					
			Operating Frequency (MHz)	RL Min. (dB)	Peak Gain (dBi)		Efficiency (%)	
					Max.	Min.	Max.	
ISM	FPC	W3312B0100	860-930	-8	2.3	-	50 (Avg.)	
ISM + WiFi Combo	PCB	W3332B0150	863-928	-5	0.2	-	55 (Avg.)	
			2400-2500	-10	4.1	-	64 (Avg.)	
GNSS	FPC	W3908B0100	1560-1610	-12	0.3	-0.2	36	
WiFi, BT, Zigbee	PCB	W3525B039	2400-2483.5	-10	2	0.6	65	
		W3593B0100	4900-5850	-10	2	0.5	70	
		W3513B0212	2400-2500; 4900-5850	-13; -10	2;2.7	1.4; 0.4	70; 67	
		W3919B0050	4900-5925	-10	3.7	2.5	72	
	FPC	W3921B0100	2400-2500	-13	1.8	1	57	
		W3920B0050	4900-5925	-10	3.7	2.2	75	
		W3315B0100MHF1	2400-2500	-10	2	1	75	
			4900-5875	-10	5.5	4	85	
		W3334B0150	2400-2500	-10	4.8	3.4	53	
			4900-5900	-10	5.5	3.5	90	
		W3917B0050	2400-2500	-10	2.7	1.8	62	
			4900-5925	-10	4.9	3	89	
		W3918B0050	2400-2500	-10	3.8	3.4	73	
			4900-5925	-10	5.3	3.3	90	
MIMO WiFi	FPC	W6102B0100	2400-2500	-10	isolation: -20	2 (Avg.)	45 (Avg.)	
			4900-5900	-10	isolation: -20	5 (Avg.)	75 (Avg.)	
		W6103B0100	2400-2500	-10	isolation: -15	4.5 (Avg.)	70 (Avg.)	
			4900-5900	-10	isolation: -15	5 (Avg.)	75 (Avg.)	
3G	PCB	W3502B0020	824-960; 1710-1990	-6; -4	2; 2.4	0.8; -0.4	78; 80	
		W3538B0200	824-960; 1710-2170	-6; -6	-	-	57; 71	
	FPC	W3501B0140	824-960; 1710-1990	-7; -8	1.5; 4.2	0.8; 2.8	61; 71	
3G + GNSS Combo	FPC	W3915	880-960; 1710-2170	-6; -8	3; 3.5	1; 2.8	73; 87	
1565-1605			-6	2	0.5	68		
W3554B0140		698-960; 1710-2690	-5; -8	1.5; 3.9	-0.6; 1.9	75; 86		
		W3907B0100	698-960; 1427-1610	-8; -7	2.2; 1.8	-0.5; 0	70; 65	
1695-2700; 3400-3600			-7; -10	3.5; 4	1; 2.5	72; 80		
W3906B0100		698-960; 1427-1610	-13; -8	2.6; 2.2	-0.6; 1.2	70; 60		
		1695-2700; 3400-3600	-7; -10	3.6; 4	1.8; 3.5	76; 85		
		1550-1625	-10	2	0.5	37		
MIMO 4G (LTE)		W6112B0100	698-960; 1428-2170	-6; -7.5	isolation: -10; -15	4.3; 3.8 (Avg)	55; 68 (Avg.)	
			2300-3600	-10	isolation: -15	4 (Avg.)	65 (Avg.)	
MIMO 4G + GNSS Combo		W6113B0100	698-960; 1428-2200	-6; -7.5	isolation: -10; -13	2.9; 1.7; 3.4	55; 60; 65 (Avg.)	
			2300-3600	-7.5	isolation: -13	3.8; 4.2	70; 65 (Avg.)	
			1570-1610	-10	isolation: -13	0.8	35 (Avg.)	

Note: 1. FPC antenna is measured on the 2mm PC plate. 2.Connector: Equivalent of I-PEX MHF 20278-11R-13 or compatible with U.FL connector. 3. Receptacle: Equivalent of I-PEX MHF 20279-001E (3pad), 20441-001E-01(4pad) or compatible with U.FL receptacles. 4.Cable length is a distance between the edge of PCB and the center of connector. 5. See datasheets for details. 6. Contact sales for available or custom cable lengths. Email: antennas.us@pulseelectronics.com. Phone: 800-ANTENNA (268-3662) or 360-944-7551.

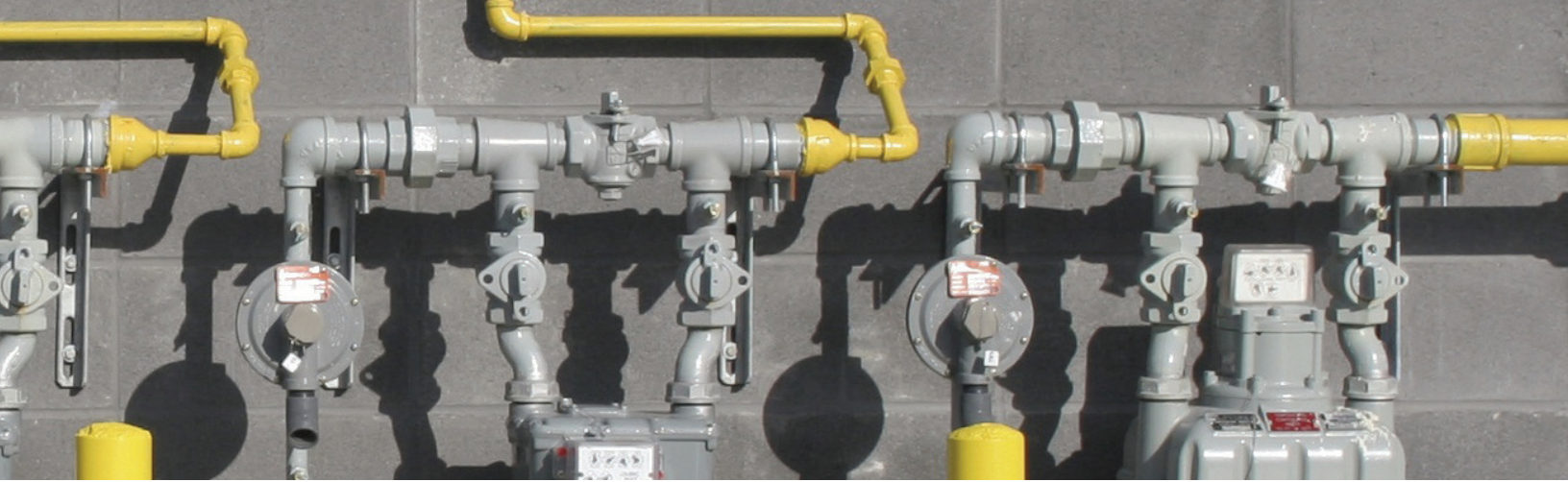
	ME requirement				Note
Min.	Antenna DIM. (LxWxH,mm)	Cable Length from edge/ Diameter, mm	Connector Type	Cable Alignment w/ Antenna	
	75 x 15	L:100 / D:1.13	U.FL compatible	Perpendicular	Alternative: W3502, W3538 , W3501
	82 x 15 x 0.56	L:150 / D:1.13	U.FL compatible	Perpendicular	ISM 868/915 and 2.4GHz WiFi (two feed cables). Isolation: <-11dB.
33	20 x 26.80 x 0.1	L:93 / D:1.13	U.FL compatible	Parallel	
55	48 x 11 x 0.8	L:100 / D:1.13	U.FL compatible	Perpendicular	w/ adhesive: W3525BTWxxx
50	45 x 7 x 0.8	L:100 / D:1.13	U.FL compatible	Perpendicular	No adhesive
68; 52	16 x 70 x 0.9	L:212 / D:1.13	U.FL compatible	Parallel	No adhesive
50	15.9 x 7.6 x 0.45	L: 50 / D: 1.13	U.FL compatible	Perpendicular	W3919XXXXX (for custom cable length)
50	33 x 7.7 x 0.1	L: 100/ D:1.13	U.FL compatible	Perpendicular	W3921XXXXX (for custom cable length)
55	12.5 x 7.6 x 0.15	L: 50 / D: 1.13	U.FL compatible	Perpendicular	W3920XXXXX (for custom cable length)
65	45 x 6 x 0.1	L:100 / D:1.13	U.FL compatible	Parallel	W3315B0100 (MHF-A13) W3315B0100MHFIII (MHFIII 20367 or equivalent)) W3315B0100MHF4 (MHF4)
62					
49	14 x 5 x 0.1	L:150 / D:1.13	U.FL compatible	Parallel	W3334XXXXX (for custom cable length)
65					
53	42.6 x 8.6 x 0.15	L:50 / D:1.13	U.FL compatible	Parallel	W3917XXXXX (for custom cable length)
69					
60	35.2 x 8.5 x 0.15	L:50 / D:1.13	U.FL compatible	Perpendicular	W3918XXXXX (for custom cable length)
70					
	50 x 20 x 0.1	L:100 / D:1.13	U.FL compatible	Perpendicular	Two cables (2x Dual WiFi)
	80 x 20 x 0.1	L:100 / D:1.13	U.FL compatible	Perpendicular	Three cables (3x Dual WiFi)
55; 70	43 x 17 x 0.5	L:20 / D:1.13	U.FL compatible	Perpendicular	80mm ground plane with 5mm gap
41; 50	40 x 15 x 0.7	L:200 / D:1.13	U.FL compatible	Perpendicular	
50; 50	87 x 25 x 0.2	L:140 / D:1.13	U.FL compatible	Perpendicular	W/ adhesive: W3571B0140.
51; 75	74 x 19 x 0.2	L:100/ D:1.13	U.FL compatible	Perpendicular	Two cables (1x GSM900, 1x GPS/Glonass)
55					
50; 65	120 x 30 x 0.2	L:140 / D:1.13	U.FL compatible	Perpendicular	W/ adhesive: W3554B0140T
50;50	115.7 x 20 x 0.1	L:100 / D:1.13	U.FL compatible	Perpendicular	
52; 78					
50;50	120.4 x 26.8 x 0.1	L:100 / D:1.13	U.FL compatible	Perpendicular	Two cables (1x LTE, 1x GNSS)
52; 80					
30					
	224 x 20 x 0.1	L:100 / D:1.13	U.FL compatible	Perpendicular	Two cables (2x LTE)
	224 x 20 x 0.1	L:100 / D:1.13	U.FL compatible	Perpendicular	Three cables (2x LTE, 1x GNSS)



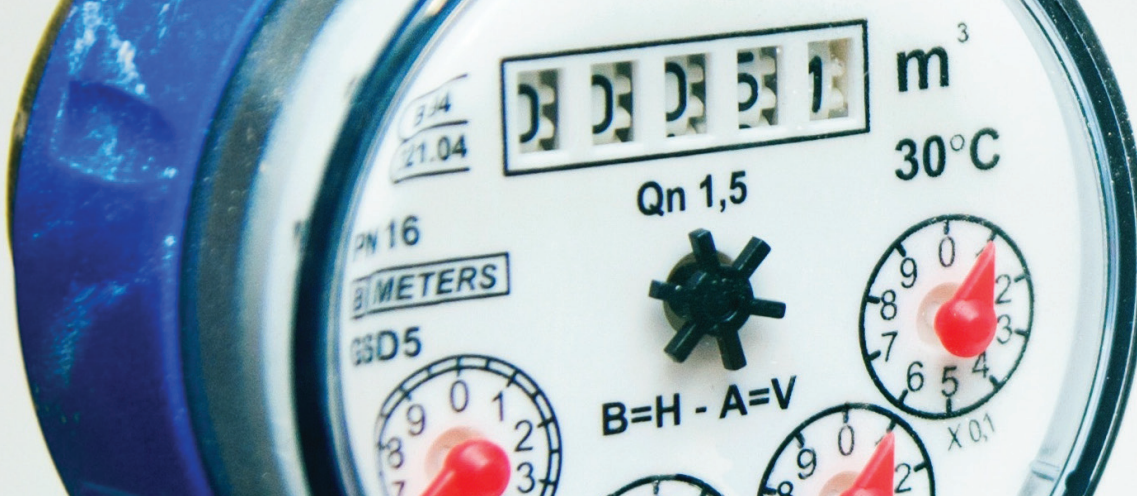


EXTERNAL MULTI-BAND ANTENNA SOLUTIONS

App.	Type	Pulse Part Number	RF Performance			
			Frequency Range (MHz)	RL Min. (dB)	Peak Gain (dBi)	Height (mm)
						Straight (Bent)
ISM	Stick/Swivel	W1063	868-928	-8	3	195 (172)
		W1063M	902-928	-8	3	195 (172)
	Stick/ no Swivel	W5012	868-928	-8	2	179
		W5017	868-928	-8	2	179
		W5021	868-928	-8	2	171
WiFi (2.4GHz)	Stick/Swivel	W1010	2400-2500	-10	2	108 (86)
		W1030	2400-2500	-10	2	108 (86)
		W1027	2400-2500	-11	3.2	136 (110)
		W1037	2400-2500	-10	3.2	197 (170)
		W1038	2400-2500	-10	3.2	197 (170)
		W1059	2400-2500	-10	5	195 (154)
	Stick/ no Swivel	W5001	2400-2500	-10	1.5	128
		W5010	2400-2500	-10	1.5	130
		W5011	2400-2500	-10	1.5	130
		W5039	2400-2500	-10	1.3	94
WiFi (5GHz)	Stick/Swivel	W1028B	5150-5850	-9	2	136 (114)
Dual WiFi (2.4/5GHz)	Blade/ Swivel	W1043	2400-2500; 5150-5850	-10	2	157 (130)
		W1044	2400-2500; 5150-5850	-10	2	157 (126)
		SPDA17RP2400/5900	2400-2500; 4900-5900	-10	0.8; 5.9	175 (150)
	Stick/ no Swivel	W5028	2400-2500; 5150-5850	-10	0	128
2G	Blade/ Swivel	SPDA24850/1900	824-894; 1850-1990	-7.5	0; 1.5	176 (147)
		SPDA17850/1900	824-894; 1850-1990	-10	0; 1.2	176 (147)
3G	Stick/ no Swivel	W1900	824-960, 1710-2170	-4;-6	0.5; 2.5	49
		W1902	824-960, 1710-2170	-4;-6	0.5; 2.5	49
		W1910	824-960, 1710-2170	-4;-6	0.5; 2.5	49
		W1911	824-960, 1710-2170	-4;-6	0.5; 2.5	49
	Blade/ Swivel	SPDA17806/2170	806-960; 1710-2170	-7.5	0.5; 0.5	192 (159)
4G	Blade/ Swivel	SPDA24700/2700	698-960; 1710-2170; 2500-2700	-7.5	0.6; 1.5; 3.4	223 (192)
		W5095X	698-960; 1447-1510; 1710-2170; 2500-2700	-7.5	1.5; 2.5	229 (198)
		W5084X		-7.5	2.0; 4.0	229 (198)



Mechanical requirement				Note
Diameter(mm)	Package type	Connector	IP-rate	
Max (Min)				
13 (6)	B	RP-SMA		See W1063 datasheet
13 (6)	B	SMA (m)		
10	A	RP-SMA		
10	A	SMA (m)	IP65	
10	G	RP-SMA (Right angle)		
10 (7.8)	B	SMA(m)		
10 (7.8)	B	RP-SMA		W1030W (White)
10 (6)	C	RP-SMA		
13.2 (7.4)	C	RP-SMA		
13.2 (7.4)	C	RP-SMA		Color option (Grey)
13 (6)	C	SMA (m)		
10 (6)	G	RP-SMA (Right angle)	IP65	
10 (6)	A	RP-SMA		
10 (6)	A	SMA (m)		
10 (6)	F	RP-SMA	IP67	
9.2 (6)	C	RP-SMA		
17.6 (13)	E	RP-SMA		
17.6 (13)	E	SMA (m)		See W1043 datasheet
21.8 (13.7)	H	RP-TNC		
10 (6)	G	RP-SMA (Right angle)	IP65	
21.8 (13.7)	H	SMA (m)		
21.8 (13.7)	H	TNC		
8	D	SMA (m) (Right angle)		Tested on ground plane (70x50mm)
8	D	RP-SMA (Right angle)		
10.4	F	SMA (m)		
10.4	F	RP-SMA		
23.8 (15.7)	H	TNC		Medium Grey
23.8 (15.6)	H	SMA (m)		
29 (15.5)	H	SMA (m): W5095K TNC: W5095	IP65	
44 (15.5)	H	SMA (m): W5084K TNC: W5084	IP65	



OUTDOOR ANTENNA SOLUTIONS

Style	App.	Type	Pulse Part Number	Frequency range (MHz)	RL, Min. (dB)	Gal
Outdoor (IP 65 or IP 67)	ISM 868/915	Stick / no Swivel	W5012	868-928	-8	
			W5017	868-928	-8	
			W5021	868-928	-10	
		LP	LP800	806-960	-13	
		LPT	LPT698/2700DMN	860-930 (698-960)	-10	
		SLPT	SLPT698/2170DMN	860-930 (698-960)	-10	
		Radome Omni	RO8061/21702NF	860-930 (824-960)	-10	
			W5063	863-928	-10	
			RO8063/21704NF	860-930 (806-960)	-10	
			RO8605NF	860-930	-10	
			RO3ISMNM	430-440 / 860-930	-10	
	ISM 868	Magnetic mount	MS3E800SMA	806-896	-10	
	ISM 915		MS3E900SMA	890-960	-10	
	ISM 169	1 λ 2 Radome Omni	RO1692NFKIT	168-170	-10	
		1 λ 2 with Bracket	WHIP1692NFKIT	168-170	-12	
		1 λ 2 Loaded	KDNF169HWKIT	168-170	-10	
	GPS L1 & L2 band combo		GNSSDML1L2	L1 & L2	-12	
	3G/4G		W1960NF	3G/4G 824-2170MHz	-10	2.

Note: 1. See datasheets for details. 2. Sales/FAE contact. Email: antennas.us@pulseelectronics.com.
 Phone: 800-ANTENNA (268-3662) or 360-944-7551.
<http://www.pulseelectronics.com/products/antennas/>



Gain, Peak (dBi)	Efficiency, Avg. (%)	Height (mm),	Diameter (mm), Max [Min]	Cable Type, Length (mm)	Connector type	Note
2	-	179	10	-	RP-SMA (m)	IP65
2	-	179	10	-	SMA (m)	IP65
2.2	70	179	10	-	Right Angle RP-SMA (m)	IP65
3	-	31	143 [95]	RG58, L: 914	SMA (m)	Tested on 12x12" GND
3	80	77	41	-	N (f)	Tested on 12x12" GND
4	90	79	38	-	N (f)	Tested on 19" DIA. GND
1	-	215	26 [22]	-	N (f) or N (m)	N (m): W5005
1.5	-	196	26 [22]	-	N (m)	
3	-	388	37 [33]	-	N (f) or N (m)	N (m): RO8063/2170NM
5	65	795	25 [22]	-	N (f)	Sigfox approved
3 / 3	90 / 65	541	37 [33]		N (f) or N (m)	Public safety
4	-	330	-	RG58, L: 914	SMA (m)	
4	-	330	-	RG58, L: 914	SMA (m)	
1.6	85	983	-	N/A	NCBI	IP67 / Conical shape radome
1.3	85	410	-	N/A	NCBI	IP67
1.6	85	830 + Bracket		N/A	NCBI	IP67
30	65		100	RG174, L:400	SMA(m)	IP67
8 / 3.5	65	77.2	40.9 to 32.2	RG174, L:419	SMA(m)	IP67





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