



Pulse Embedded (SMT) Antennas for GPS/ Glonass/Beidou/ Iridium Applications

Ceramic Patch
Rev H.04 (April 2019)

App.	Type	Pulse Part number	RF Performance								ME requirement			Note	
			Operating Frequency (MHz)	RL Min. (dB)	RHCP Gain (dBic)		Linear Gain (dBi)		Efficiency %/(dB)		Antenna DIM. (LxWxH,mm)	GC-area (L x W,mm)	Evaluation Board Size (L x W,mm)		
					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	7 x 1.6 x 1.6	6 x 20	30 x 20	3 Matching components	
		W3009		-12	-3.5	-3.9	0.1	-0.2	50/-3	45/-3.5		6 x 11	40 x 11		
		W3011		-11	0.2	-0.6	3	2.3	83/-0.8	70/-1.5	10 x 3.2 x 4.0	10.80 x 6.25	80 x 37	On Ground shunt 3.3pF	
		W3212		-12	0.85	0.5	3.4	3	85/-0.7	80/-1	3.2 x 1.6 x 1.1	4.00 x 4.25	80 x 37	w/o matching	
	Patch	W3213		-13	-7	-	-	-	-	-	-	10 x 10 x 4	-	30 x 30	
		W3099		-13	-1.5	-	-	-	-	-	-	13 x 13 x 4	-	30 x 30	
		W3110		-14	3.5	-	-	-	-	-	-	25 x 25 x 4	-	70 x 70	
	Helical	W3110		-16	-2.1	-2.4	1.3	0.7	47/-3.3	43/-3.7	5.0 x 2.5 x 5.5	7.50 x 5.50	100 x 40	Vertical SMD, @ Corner	
GPS, Glonass, and/ or Beidou	Ceramic chip	W3000	1561 ± 2/ 1575.42 ± 1.023/ 1602.56 ± 4	-18	-0.2	-1	2.4	1.5	70/-1.55	65/-1.9	7 x 1.6 x 1.6	6 x 10	80 x 37	3 Matching components, Horiz. Mount + @Corner	
		W3010		-12	1	0	3	2.2	75/-1.25	70/-1.5	10 x 3.2 x 2	10.80 x 6.25	80 x 37	@ Position1 shunt 3.3pF	
		W3011A		-12	1.5	0.4	3	1.8	70/-1.55	50/-3.0				@ Position2 shunt2.2pF	
		W3062A		-16	1	-0.4	3.7	2.5	88/-0.6	70/-1.5	3.2 x 1.6 x 1.1	4.00 x 6.25	80 x 37	Shunt 1.8pF	
		W3207		-10	0	-0.5	2.5	2.0	80/-1	60/-2.1	7 x 1.6 x 1.6	7.80 x 5.25	80 x 37	Shunt 2.2pF	
	Patch (Pin)	W3216	-4	2.1	0.9	-	-	-	-	-	25 x 25 x 4	-	70 x 70		
		W3223	-7	-2	-	-	-	60	50	13 x 13 x 5	-	50 x 50			
		W3224	-10	4	3.5	-	-	97/-0.2	93/-0.6	25 x 25 x 4	-	70 x 70	TS 16949		
	Patch (SMD)	W3224	-10	2.5	2.0	-	-	95/-0.5	79/-2	18 x 18 x 4	-	70 x 70	SMD		
		W3225	-10	3	-	-	-	96/-0.3	92/-0.7	25 x 25 x 4	-	70 x 70	SMD		
GNSS + GPS L1 & L5	Ceramic chip	W3089	1170 - 1249	-5	-	-	2.1	0.9	72	55	10 x 3.2 x 2	11 x 14	120 x 50	Center Edge, Dual Feed	
		1559-1608	-8	-	-	-0.7	-1.1	48	48						
Iridium	Patch (Pin)	W3228	1621 ± 4	-15	4.8	4.3	-	-	84	80	25 x 25 x 4	-	60 x 60	Iridium certified, AR < 2	
Iridium/ GNSS		W3227	1559-1660	-10	4.2	0.0	-	-	91	70	40 x 40 x 6.6	-	63 x 63	Iridium certified, VSWR < 3.5 @ 1532-1709MHz	
WiFi and GPS Combo	Ceramic chip	W3056	2400-2483.5	-8	-	-	3.2	2.5	80	70	10 x 3.2 x 1.5	10.80 x 6.25 (Notch)	100 x 40	Single feed and 2.4GHz+GPS	
			1575.42 ± 1.023	-10	-	-	2.5	1.5	75	65					
		W3064C	2400-2483.5	-11	-	-	-0.7	-1.7	80	70	10 x 3.2 x 1.5	10.80 x 6.40 (Divided)	96 x 45	Dual feed and 2.4GHz+GPS	
			1575.42 ± 1.023	-15	-	-	-1	-2.0	70	60					
		W3095	2400-2483.5	-10	-	-	2.7	1.5	85	80	10 x 3.2 x 1.5	17.80 x 6.45	80 x 50	Dual feed and Dual WiFi+GPS/Glonass	
			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. 4. Recommended order of antenna selection: W3010 > W3062A > W3011A