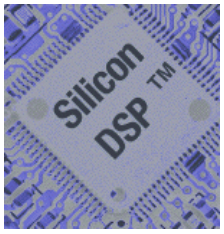
Physical Layer Frame Organization



Silicon DSP Corporation

PPDU
PLCP Protocol Data Unit

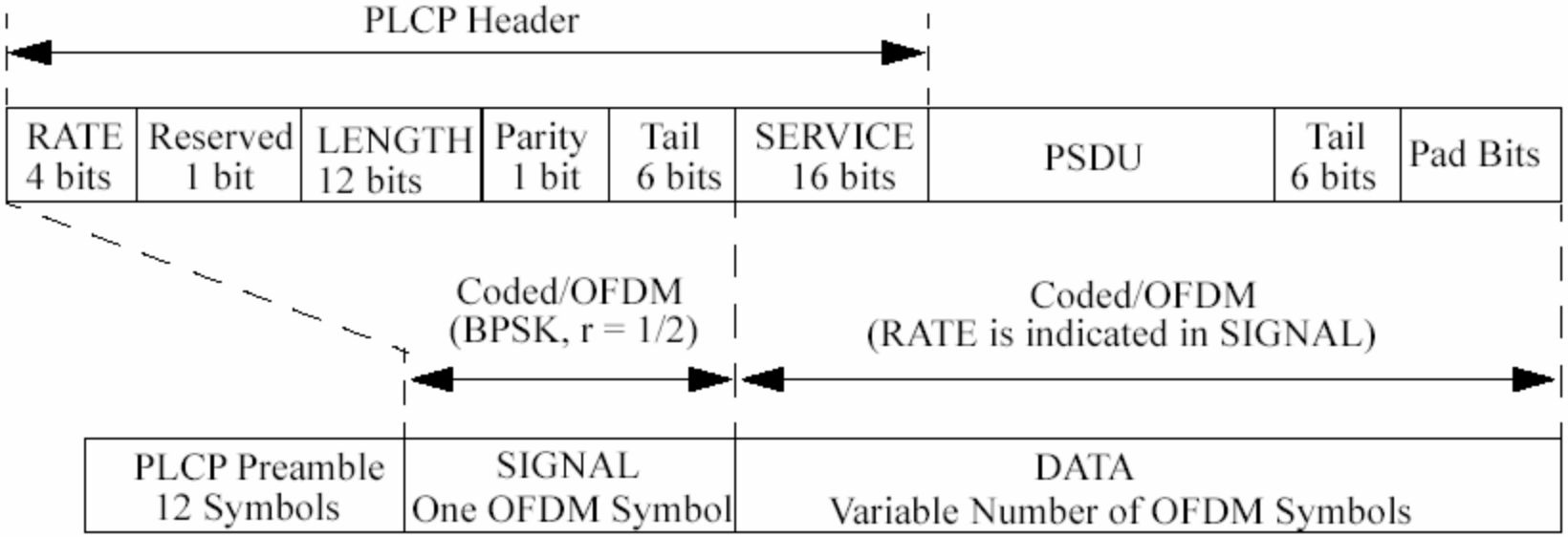


Figure 107—PPDU frame format

PLCP: Physical Layer Convergence Procedure

Signal Field

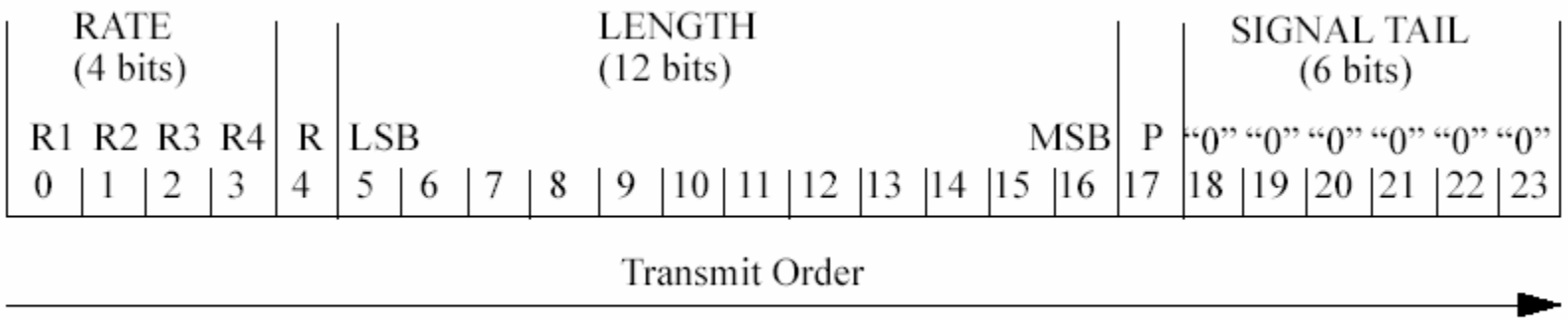


Figure 111—SIGNAL field bit assignment

Parity is even

Rate (Mbits/s)	R1–R4
6	1101
9	1111
12	0101
18	0111
24	1001
36	1011
48	0001
54	0011

Service Field

17.3.5.1 Service field (SERVICE)

The IEEE 802.11 SERVICE field has 16 bits, which shall be denoted as bits 0–15. The bit 0 shall be transmitted first in time. The bits from 0–6 of the SERVICE field, which are transmitted first, are set to zeros and are used to synchronize the descrambler in the receiver. The remaining 9 bits (7–15) of the SERVICE field shall be reserved for future use. All reserved bits shall be set to zero. Refer to Figure 112.

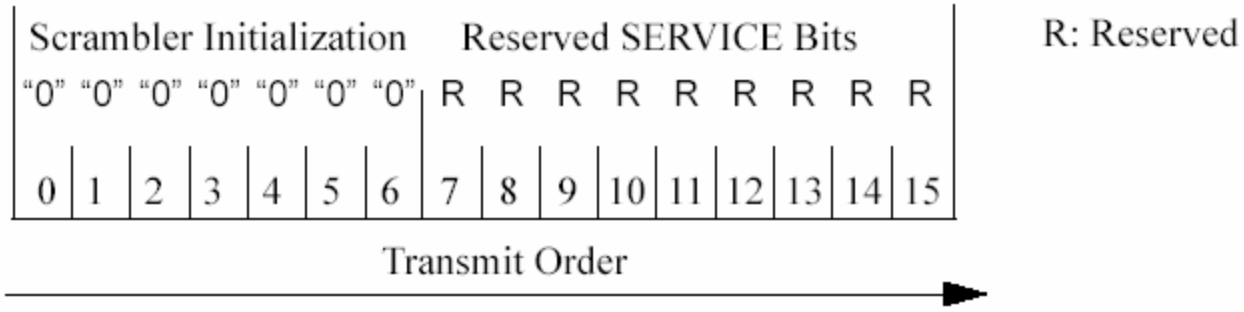


Figure 112—SERVICE field bit assignment

Pad Bits

The number of bits in the DATA field shall be a multiple of N_{CBPS}

N_{CBPS}: Number of Coded Bits per Symbol (Rate Dependent)

N_{DBPS}: Number of Data Bits per Symbol (Rate Dependent)

$$N_{SYM} = \text{Ceiling}\left((16 + 8 \times \text{LENGTH} + 6)/N_{DBPS}\right)$$

$$N_{DATA} = N_{SYM} \times N_{DBPS}$$

$$N_{PAD} = N_{DATA} - (16 + 8 \times \text{LENGTH} + 6)$$

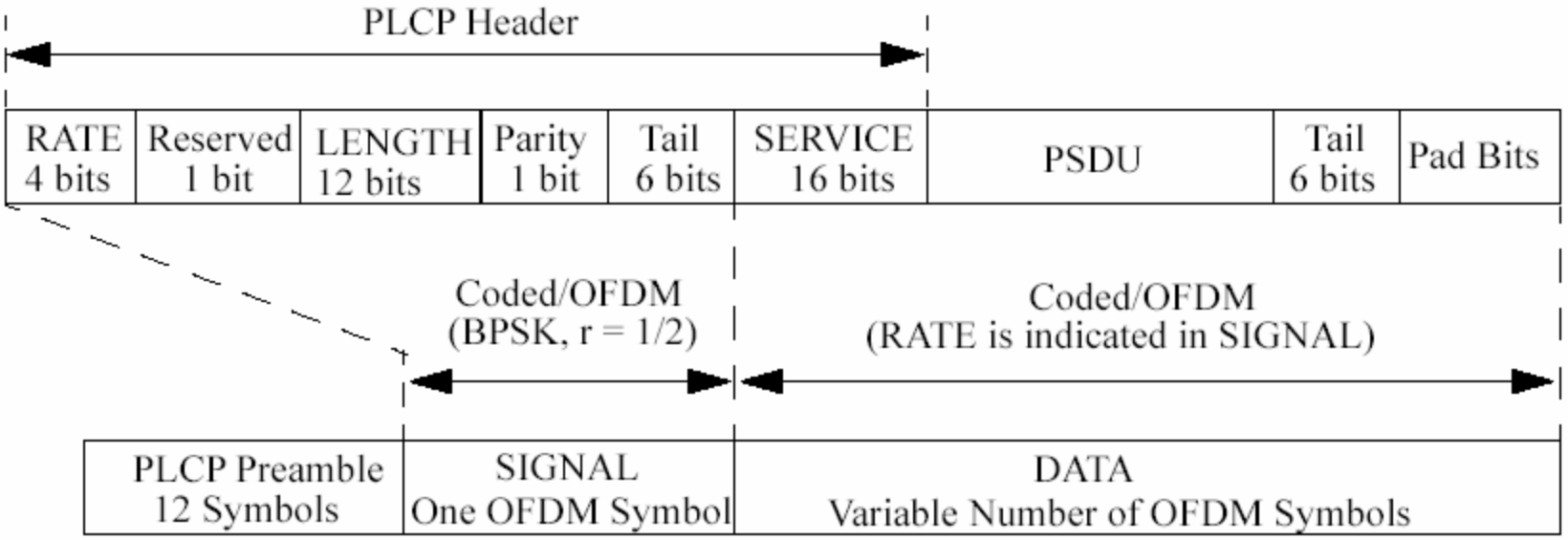


Figure 107—PPDU frame format

Data rate (Mbits/s)	Modulation	Coding rate (R)	Coded bits per subcarrier (N_{BPSC})	Coded bits per OFDM symbol (N_{CBPS})	Data bits per OFDM symbol (N_{DBPS})
54	64-QAM	3/4	6	288	216

Table 78—Rate-dependent parameters

Data rate (Mbits/s)	Modulation	Coding rate (R)	Coded bits per subcarrier (N_{BPSC})	Coded bits per OFDM symbol (N_{CBPS})	Data bits per OFDM symbol (N_{DBPS})
6	BPSK	1/2	1	48	24
9	BPSK	3/4	1	48	36
12	QPSK	1/2	2	96	48
18	QPSK	3/4	2	96	72
24	16-QAM	1/2	4	192	96
36	16-QAM	3/4	4	192	144
48	64-QAM	2/3	6	288	192
54	64-QAM	3/4	6	288	216

PLCP Preamble