Legend: s : Sign bit | : Range bits | :Exponent bits | : Mantissa bits

pfloat16d, pfloat32d, pfloat64d

Remark: Same sign, range & exponent bits for 16-/32-/64 bits

s	Range bits	Exponent bits	Mantissa bits		Range exponent adder	Resulting bias	Range bias adder	Mantissa bits pfloat64d	Mantissa bits pfloat32d	Mantissa bits pfloat16d
S	15	1 1 1 1 1 1 1 1 1 1		inf and nan	511	2047		50	18	2
		1 1 1 1 1 1 1 1 1 0		2^1023	510	2046		50	18	2
		1 1 1 1 1 1 1 1 0 1		2^1022	509	2045		50	18	2
								50	18	2
		0 0 0 0 0 0 0 0 1 0		2^515	2	1538		50	18	2
		0 0 0 0 0 0 0 0 0 1		2^514	1	1537		50	18	2
		0 0 0 0 0 0 0 0 0 0		2^513	0	1536	1536	50	18	2
	14	1 1 1 1 1 1 1 1 1		2^512	255	1535		51	19	3
		1 1 1 1 1 1 1 1 0		2^511	254	1534		51	19	3
		1 1 1 1 1 1 1 0 1		2^510	253	1533		51	19	3
								51	19	3
		0 0 0 0 0 0 0 1 0		2^259	2	1282		51	19	3
		0 0 0 0 0 0 0 0 1		2^258	1	1281		51	19	3
		0 0 0 0 0 0 0 0 0		2^257	0	1280	1280	51	19	3
	13	1 1 1 1 1 1 1 1		2^256	127	1279		52	20	4
		1 1 1 1 1 1 1 0		2^255	126	1278		52	20	4
		1 1 0 1 1 0 1		2^254	125	1277		52	20	4
								52	20	4
		0 0 0 0 0 0 1 0		2^131	2	1154		52	20	4
		0 0 0 0 0 0 0 1		2^130	1	1153		52	20	4
		0 0 0 0 0 0 0 0		2^129	0	1152	1152	52	20	4
	12	1 1 1 1 1 1 1		2^128	63	1151		53	21	5
		1 1 0 1 1 1 0		2^127	62	1150		53	21	5
		1 0 1 1 0 1		2^126	61	1149		53	21	5
								53	21	5
		0 0 0 0 0 1 0		2^68	2	1090		53	21	5
		0 0 0 0 0 0 1		2^67	1	1089		53	21	5
		0 0 0 0 0 0 0		2^65	0	1088	1088	53	21	5
	11	1 1 1 1 1 1		2^64	31	1087		54	22	6
		1 1 1 1 1 0		2^63	30	1086		54	22	6
		1 1 1 0 1		2^62	29	1085		54	22	6
								54	22	6
		0 0 0 1 0		2^35	2	1058		54	22	6
		0 0 0 0 1		2^34	1	1057		54	22	6
		0 0 0 0 0		2^33	0	1056	1056	54	22	6
	10	1 1 1 1		2^32	15	1055		55	23	7
		1 1 1 0		2^31	14	1054		55	23	7
		1 1 0 1		2^30	13	1053		55	23	7
								55	23	7
		0 0 1 0		2^19	2	1042		55	23	7
		0 0 0 1		2^18	1	1041		55	23	7
		0 0 0 0		2^17	0	1040	1040	55	23	7
	9	1 1 1		2^16	7	1039		56	24	8
		1 1 0		2^15	6	1038		56	24	8
		1 0 0		2^14	5	1037		56	24	8
		1 0 0		2^13	4	1036		56	24	8
		0 1 1		2^12	3	1035		56	24	8
		0 1 0		2^11	2	1034		56	24	8
		0 0 1		2^10	1	1033		56	24	8
		0 0 0		2^9	0	1032	1032	56	24	8
	8	1 1 1		2^8	7	1031		56	24	8
		1 1 0		2^7	6	1030		56	24	8
		1 0 0		2^6	5	1029		56	24	8
		1 0 0		2^5	4	1028		56	24	8
		0 1 1		2^4	3	1027		56	24	8
		0 1 0		2^3	2	1026		56	24	8
		0 0 1		2^2	1	1025		56	24	8
		0 0 0		2^1	0	1024	1024	56	24	8
	7	1 1 1		2^0	7	1023		56	24	8
		1 1 0		2^-1	6	1022		56	24	8
		1 0 0		2^-2	5	1021		56	24	8
		1 0 0		2^-3	4	1020		56	24	8
		0 1 1		2^-4	3	1019		56	24	8
		0 1 0		2^-5	2	1018		56	24	8
		0 0 1		2^-6	1	1017		56	24	8
		0 0 0		2^-7	0	1016	1016	56	24	8
	6	1 1 1		2^-8	7	1015		56	24	8
		1 1 0		2^-9	6	1014		56	24	8
		1 0 0		2^-10	5	1013		56	24	8
		1 0 0		2^-11	4	1012		56	24	8
		0 1 1		2^-12	3	1011		56	24	8
		0 1 0		2^-13	2	1010		56	24	8
		0 0 1		2^-14	1	1009		56	24	8
		0 0 0		2^-15	0	1008	1008	56	24	8
	5	1 1 1 1		2^-16	15	1007		55	23	7
		1 1 1 0		2^-17	14	1006		55	23	7
		1 1 0 1		2^-18	13	1005		55	23	7
								55	23	7
		0 0 1 0		2^-16	2	994		55	23	7
		0 0 0 1		2^-16	1	993		55	23	7
		0 0 0 0		2^-31	0	992	992	55	23	7
	4	1 1 1 1 1		2^-32	31	991		54	22	6
		1 1 1 1 0		2^-33	30	990		54	22	6
		1 1 1 0 1		2^-34	29	989		54	22	6
								54	22	6
		0 0 0 1 0		2^-61	2	962		54	22	6
		0 0 0 0 1		2^-62	1	961		54	22	6
		0 0 0 0 0		2^-63	0	960	960	54	22	6
	3	1 1 1 1 1 1		2^-64	63	959		53	21	5
		1 1 0 1 1 0		2^-65	62	958		53	21	5
		1 0 1 1 0 1		2^-67	61	957		53	21	5
								53	21	5
		0 0 0 0 1 0		2^-125	2	898		53	21	5
		0 0 0 0 0 1		2^-126	1	897		53	21	5
		0 0 0 0 0 0		2^-127	0	896	896	53	21	5
	2	1 1 1 1 1 1 1		2^-128	127	895		52	20	4
		1 1 1 1 1 1 0		2^-129	126	894		52	20	4
		1 1 0 1 1 0 1		2^-130	125	893		52	20	4
								52	20	4
		0 0 0 0 0 1 0		2^-253	2	770		52	20	4
		0 0 0 0 0 0 1		2^-254	1	769		52	20	4
		0 0 0 0 0 0 0		2^-255	0	768	768	52	20	4
	1	1 1 1 1 1 1 1 1		2^-256	255	767		51	19	3
		1 1 1 1 1 1 1 0		2^-257	254	766		51	19	3
		1 1 1 1 1 1 0 1		2^-258	253	765		51	19	3
								51	19	3
		0 0 0 0 0 0 1 0		2^-509	2	514		51	19	3
		0 0 0 0 0 0 0 1		2^-510	1	513		51	19	3
		0 0 0 0 0 0 0 0		2^-511	0	512	512	51	19	3
	0	1 1 1 1 1 1 1 1 1		2^-512	511	511		50	18	2
		1 1 1 1 1 1 1 1 0		2^-513	510	510		50	18	2
		1 1 1 1 1 1 1 0 1		2^-514	509	509		50	18	2
								50	18	2
		0 0 0 0 0 0 0 1 0		2^-1021	2	2		50	18	2
		0 0 0 0 0 0 0 0 1		2^-1022	1	1		50	18	2
s	0 0 0 0 0	0 0 0 0 0 0 0 0 0 0		subnormal	0	0	0	50	18	2

pfloat16 ends here

32 mantissa bits are added for pfloat64

pfloat32 ends here

Same or more mantissa bits bits compared to bfloat16 or float respecively

Same or more mantissa bits bits compared to bfloat16 or float respecively

Same or more mantissa bits bits compared to bfloat16 or float respecively

Same or more mantissa bits bits compared to bfloat16 or float respecively