Hybrid-Float6 MAC

IEEE 754 single-precision floating-point   Float6

Sign   Exponent   Mantissa

8-bit   23-bit   4-bit   1-bit

S E E E E E E E E M M M M M M M M M M M M M M M M M M M M M M M M M   S E E E E M

S_H E_H M_H S_F E_F M_F

$1.M_H$ **a) Multiply**

24-bit

Mantissa multiplication

$\gg 1$ 0

$E_H - 127$ $E_F - 7$ 1   0

8-bit   4-bit   1-bit

24-bit   24-bit

+   +

8-bit exponent   24-bit mantissa

BarrelShift (exponent, mantissa)

Accumulator_t

64-bit   64-bit

$-/+$

+ $S_H \oplus S_F$

b) Accumulate

64-bit

Accumulator_{t+1}
64-bit fixed-point, 23-bit fraction