thm_2Ebinary__ieee_2Enum2float__compare__11 (TMRJALYfXrV2db9VJcndcEf148nh1mdqaRt)

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Let $c\_2Enum\_2EZERO\_\_REP : \iota$ be given. Assume the following.

$$c\_2Enum\_2EZERO\_\_REP \in omega \tag{1}$$

Let $ty\_2Enum\_2Enum : \iota$ be given. Assume the following.

$$nonempty\ ty\_2Enum\_2Enum \tag{2}$$

Let $c\_2Enum\_2EABS\_\_num : \iota$ be given. Assume the following.

$$c\_2Enum\_2EABS\_\_num \in (ty\_2Enum\_2Enum^{omega}) \tag{3}$$

Definition 1 *We define* c_2Emin_2E_3D *to be* $\lambda A.\lambda x \in A.\lambda y \in A.inj\_\_o\ (x = y)$ *of type* $\iota \Rightarrow \iota$.

Definition 2 *We define* c_2Enum_2E0 *to be* $(ap\ c\_2Enum\_2EABS\_\_num\ c\_2Enum\_2EZERO\_\_REP)$.

Definition 3 *We define* c_2Earithmetic_2EZERO *to be* c_2Enum_2E0*.*

Let $c\_2Enum\_2EREP\_\_num : \iota$ be given. Assume the following.

$$c\_2Enum\_2EREP\_\_num \in (omega^{ty\_2Enum\_2Enum}) \tag{4}$$

Let $c\_2Enum\_2ESUC\_\_REP : \iota$ be given. Assume the following.

$$c\_2Enum\_2ESUC\_\_REP \in (omega^{omega}) \tag{5}$$

Definition 4 *We define* c_2Ebool_2ET *to be* $(ap\ (ap\ (\mathsf{c\_2Emin\_2E\_3D}\ (2^{2}))\ (\lambda V0x \in 2.V0x))\ (\lambda V1x \in 2.V$

Definition 5 *We define* c_2Ebool_2E_21 *to be* $\lambda A\_27a : \iota.(\lambda V0P \in (2^{A\_27a}).(ap\ (ap\ (\mathsf{c\_2Emin\_2E\_3D}\ (2^{A\_27}$

Definition 6 *We define* c_2Enum_2ESUC *to be* $\lambda V0m \in ty\_2Enum\_2Enum.(ap\ c\_2Enum\_2EABS\_\_num\ ($

Let $c\_2Earithmetic\_2E\_2B : \iota$ be given. Assume the following.

$$c\_2Earithmetic\_2E\_2B \in ((ty\_2Enum\_2Enum^{ty\_2Enum\_2Enum})^{ty\_2Enum\_2Enum}) \tag{6}$$

Definition 7 *We define* c_2Earithmetic_2EBIT1 *to be* $\lambda V0n \in ty\_2Enum\_2Enum.(ap\ (ap\ c\_2Earithmetic\_$

Definition 8 *We define* c_2Earithmetic_2EBIT2 *to be* $\lambda V0n \in ty\_2Enum\_2Enum.(ap\ (ap\ c\_2Earithmetic\_$

Definition 9 *We define* c_2Earithmetic_2ENUMERAL *to be* $\lambda V0x \in ty\_2Enum\_2Enum.V0x.$

Definition 10 *We define* c_2Ebool_2EF *to be* $(ap\ (\mathsf{c\_2Ebool\_2E\_21}\ 2)\ (\lambda V0t \in 2.V0t)).$

Definition 11 *We define* c_2Emin_2E_3D_3D_3E *to be* $\lambda P \in 2.\lambda Q \in 2.inj\_\_o\ (p\ P \Rightarrow p\ Q)$ *of type* ι.

Definition 12 *We define* c_2Ebool_2E_7E *to be* $(\lambda V0t \in 2.(ap\ (ap\ \mathsf{c\_2Emin\_2E\_3D\_3D\_3E}\ V0t)\ \mathsf{c\_2Ebool\_2E}$

Definition 13 *We define* c_2Ebool_2E_2F_5C *to be* $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap\ (\mathsf{c\_2Ebool\_2E\_21}\ 2)\ (\lambda V2t \in$

Definition 14 *We define* c_2Emin_2E_40 *to be* $\lambda A.\lambda P \in 2^A.$**if** $(\exists x \in A.p\ (ap\ P\ x))$ **then** $(the\ (\lambda x.x \in A \wedge$ *of type* $\iota \Rightarrow \iota$.

Definition 15 *We define* c_2Ebool_2E_3F *to be* $\lambda A\_27a : \iota.(\lambda V0P \in (2^{A\_27a}).(ap\ V0P\ (ap\ (\mathsf{c\_2Emin\_2E\_40}$

Definition 16 *We define* c_2Eprim__rec_2E_3C *to be* $\lambda V0m \in ty\_2Enum\_2Enum.\lambda V1n \in ty\_2Enum\_2Enu$

Let $ty\_2Ebinary\_\_ieee\_2Efloat\_\_compare : \iota$ be given. Assume the following.

$$nonempty\ ty\_2Ebinary\_\_ieee\_2Efloat\_\_compare \tag{7}$$

Let $c\_2Ebinary\_\_ieee\_2Efloat\_\_compare2num : \iota$ be given. Assume the following.

$$c\_2Ebinary\_\_ieee\_2Efloat\_\_compare2num \in (ty\_2Enum\_2Enum^{ty\_2Ebinary\_\_ieee\_2Efloat\_\_compare}) \tag{8}$$

Let $c\_2Ebinary\_\_ieee\_2Enum2float\_\_compare : \iota$ be given. Assume the following.

$$c\_2Ebinary\_\_ieee\_2Enum2float\_\_compare \in (ty\_2Ebinary\_\_ieee\_2Efloat\_\_compare^{ty\_2Enum\_2Enum}) \tag{9}$$

Assume the following.

$$((\forall V0a \in ty\_2Ebinary\_\_ieee\_2Efloat\_\_compare.((ap\ c\_2Ebinary\_\_ieee\_2Enum2float\_\_compare\ (ap\ c\_2Ebinary\_\_ieee\_2Efloat\_\_compare2num\ V0a)) = V0a)) \wedge (\forall V1r \in ty\_2Enum\_2Enum.((p\ (ap\ (\lambda V2n \in ty\_2Enum\_2Enum.(ap\ (ap\ \mathsf{c\_2Eprim\_\_rec\_2E\_3C}\ V2n)\ (ap\ \mathsf{c\_2Earithmetic\_2ENUMERAL}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT2}\ (ap\ \mathsf{c\_2Earithmetic\_2EBIT1}\ \mathsf{c\_2Earithmetic\_2EZERO})))))\ V1r)) \Leftrightarrow ((ap\ c\_2Ebinary\_\_ieee\_2Efloat\_\_compare2num\ (ap\ c\_2Ebinary\_\_ieee\_2Enum2float\_\_compare\ V1r)) = V1r)))) \tag{10}$$

Assume the following.

$$(\forall V0t1 \in 2.(\forall V1t2 \in 2.(((p\ V0t1) \Rightarrow (p\ V1t2)) \Rightarrow (((p\ V1t2) \Rightarrow (p\ V0t1)) \Rightarrow ((p\ V0t1) \Leftrightarrow (p\ V1t2)))))) \tag{11}$$

Theorem 1

$$(\forall V0r \in ty_2Enum_2Enum.(\forall V1r_27 \in ty_2Enum_2Enum.
((p\ (ap\ (ap\ \mathsf{c_2Eprim__rec_2E_3C}\ V0r)\ (ap\ \mathsf{c_2Earithmetic_2ENUMERAL}
(ap\ \mathsf{c_2Earithmetic_2EBIT2}\ (ap\ \mathsf{c_2Earithmetic_2EBIT1}\ \mathsf{c_2Earithmetic_2EZERO})))))\Rightarrow
((p\ (ap\ (ap\ \mathsf{c_2Eprim__rec_2E_3C}\ V1r_27)\ (ap\ \mathsf{c_2Earithmetic_2ENUMERAL}
(ap\ \mathsf{c_2Earithmetic_2EBIT2}\ (ap\ \mathsf{c_2Earithmetic_2EBIT1}\ \mathsf{c_2Earithmetic_2EZERO})))))\Rightarrow
(((ap\ c_2Ebinary__ieee_2Enum2float__compare\ V0r) = (ap\ c_2Ebinary__ieee_2Enum2float__compare
V1r_27))\Leftrightarrow(V0r = V1r_27))))))$$