

thm_2Ebit_2EBIT_SLICE_THM2 (TMFevsngAAGUMJgQWz7GiYh35yJRSbK38fe)

October 26, 2020

Let $c_2Enum_2ZERO_REP : \iota$ be given. Assume the following.

$$c_2Enum_2ZERO_REP \in \omega \quad (1)$$

Let $ty_2Enum_2Enum : \iota$ be given. Assume the following.

$$nonempty\ ty_2Enum_2Enum \quad (2)$$

Let $c_2Enum_2ABS_num : \iota$ be given. Assume the following.

$$c_2Enum_2ABS_num \in (ty_2Enum_2Enum^{\omega}) \quad (3)$$

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 ($ap\ c_2Enum_2ABS_num\ c_2Enum_2ZERO_REP$).

Definition 3 We define $c_2Earithmetic_2ZERO$ to be c_2Enum_2E0 .

Let $c_2Enum_2EREP_num : \iota$ be given. Assume the following.

$$c_2Enum_2EREP_num \in (\omega^{ty_2Enum_2Enum}) \quad (4)$$

Let $c_2Enum_2SUC_REP : \iota$ be given. Assume the following.

$$c_2Enum_2SUC_REP \in (\omega^{\omega}) \quad (5)$$

Definition 4 We define c_2Ebool_2ET to be ($ap\ (ap\ (c_2Emin_2E_3D\ (2^2))\ (\lambda V0x \in 2.V0x))\ (\lambda V1x \in 2.V1x)$).

Definition 5 We define $c_2Ebool_2E_21$ to be $\lambda A. 27a : \iota. (\lambda V0P \in (2^{A-27a}).(ap\ (ap\ (c_2Emin_2E_3D\ (2^{A-27a}))\ (\lambda V1x \in 2.V1x)))$.

Definition 6 We define c_2Enum_2ESUC to be $\lambda V0m \in ty_2Enum_2Enum. (ap\ c_2Enum_2ABS_num\ (c_2Emin_2E_3D\ (2^{A-27a})))$.

Let $c_2Earithmetic_2E_2B : \iota$ be given. Assume the following.

$$c_2Earithmetic_2E_2B \in ((ty_2Enum_2Enum^{ty_2Enum_2Enum})^{ty_2Enum_2Enum}) \quad (6)$$

Definition 7 We define $c_2Earithmetic_2EBIT2$ to be $\lambda V0n \in ty_2Enum_2Enum.(ap\ (ap\ c_2Earithmetic_2EBIT2\ n)\ V)$

Definition 8 We define $c_2Earithmetic_2ENUMERAL$ to be $\lambda V0x \in ty_2Enum_2Enum. V0x$.

Let $c_2 \in \text{Arithmetc_EXP} : \iota$ be given. Assume the following.

$$c_2Earithmetic_2EEXP \in ((ty_2Enum_2Enum^{ty_2Enum_2Enum})^{ty_2Enum_2Enum})^{ty_2Enum_2Enum} \quad (7)$$

Let c_2 be given. Assume the following.

$$c_2Earithmetic_2EMOD \in ((ty_2Enum_2Enum^{ty_2Enum_2Enum})^{ty_2Enum_2Enum}) \quad (8)$$

Definition 9 We define $\text{c_2Ebit_2EMOD_2EXP}$ to be $\lambda V0x \in \text{ty_2Enum_2Enum}. \lambda V1n \in \text{ty_2Enum_2En}$

Let c_2 be given. Assume the following.

$$c_2Earithmetic_2E_2D \in ((ty_2Enum_2Enum^{ty_2Enum^{ty_2Enum_2Enum}})^{ty_2Enum_2Enum}) \quad (9)$$

Definition 10 We define $c_2Ebit_2ESLICE$ to be $\lambda V0h \in ty_2Enum_2Enum. \lambda V1l \in ty_2Enum_2Enum. \lambda V2m \in ty_2Enum_2Enum. \lambda V3n \in ty_2Enum_2Enum. \lambda V4o \in ty_2Enum_2Enum. \lambda V5p \in ty_2Enum_2Enum. \lambda V6q \in ty_2Enum_2Enum. \lambda V7r \in ty_2Enum_2Enum. \lambda V8s \in ty_2Enum_2Enum. \lambda V9t \in ty_2Enum_2Enum. \lambda V10u \in ty_2Enum_2Enum. \lambda V11v \in ty_2Enum_2Enum. \lambda V12w \in ty_2Enum_2Enum. \lambda V13x \in ty_2Enum_2Enum. \lambda V14y \in ty_2Enum_2Enum. \lambda V15z \in ty_2Enum_2Enum.$

Definition 11 We define $c_2Earthmetic_2EBIT1$ to be $\lambda V0n \in ty_2Enum_2Enum.(ap\ (ap\ c_2Earthmetic\ 0\ n)\ V)$

Let $c_2Earithmetic_2EDIV : \iota$ be given. Assume the following.

$$c_2Earithmetic_2EDIV \in ((ty_2Enum_2Enum ty_2Enum_2Enum) ty_2Enum_2Enum) \\ (10)$$

Definition 12 We define $c_2Ebit_2EDIV_2EXP$ to be $\lambda V0x \in ty_2Enum_2Enum. \lambda V1n \in ty_2Enum_2En$

Definition 13 We define c_2EBit_2EBITS to be $\lambda V0h \in ty_2Enum_2Enum. \lambda V1l \in ty_2Enum_2Enum. \lambda V$

Definition 14 We define c_2EBit_2EBIT to be $\lambda V0b \in ty_2Enum_2Enum. \lambda V1n \in ty_2Enum_2Enum.(ap$

Definition 15 We define c_2Ebool_2EF to be $(ap\ (c_2Ebool_2E_21\ 2)\ (\lambda V0t\ t \in 2.V0t))$.

Definition 16 We define $c_Emin_D_D_E$ to be $\lambda P \in 2.\lambda Q \in 2.inj_o (p \ P \Rightarrow p \ Q)$ of type ι .

Definition 17 We define $c_2Ebool_2E_2F_5C$ to be $(\lambda V0t1 \in 2.(\lambda V1t2 \in 2.(ap\ (c_2Ebool_2E_21\ 2)\ (\lambda V2t \in$

Definition 18 We define $c_{\text{Emin}}.40$ to be $\lambda A. \lambda P \in 2^A. \text{if } (\exists x \in A. p \ (ap \ P \ x)) \ \text{then} \ (\lambda x. x \in A \wedge \text{of type } \iota \Rightarrow \iota)$.

Definition 19 We define c_2Ebool_2ECOND to be $\lambda A._27a : \iota.(\lambda V0t \in 2.(\lambda V1t1 \in A._27a.(\lambda V2t2 \in A._27a.($

Definition 20 We define c_2Ebit_2ESBIT to be $\lambda V0b \in 2.\lambda V1n \in ty_2Enum_2Enum.(ap\ (ap\ (ap\ (ap\ (c_2Ebo$

Definition 21 We define $\mathcal{C}_{\text{EBCS}}(\mathbb{Z}, \mathbb{Z})$ to be $(\forall x \in \mathbb{Z}, (\forall y \in \mathbb{Z}, (ap((c_{\text{EBCS}}(x, y), z), w) \rightarrow \exists t \in \mathbb{Z}, ap((c_{\text{EBCS}}(x, t), y), z) \wedge ap((c_{\text{EBCS}}(t, y), z), w)))$

Definition 22 We define $c_2Ebool_2E_7E$ to be $(\lambda V0t \in 2.(ap (ap c_2Emin_2E_3D_3D_3E V0t) c_2Ebool_2E))$

Assume the following.

$$(\forall V0n \in ty_2Enum_2Enum.(\neg((ap (ap c_2Earithmetic_2EXP (ap c_2Earithmetic_2ENUMERAL (ap (ap c_2Earithmetic_2EBIT2 c_2Earithmetic_2EZERO))) V0n) = c_2Enum_2E0)))) \quad (11)$$

Assume the following.

$$(\forall V0x \in ty_2Enum_2Enum.(\forall V1n \in ty_2Enum_2Enum.((ap (ap c_2Ebit_2ESBIT (ap (ap c_2Ebit_2EBIT V0x) V1n)) V0x) = (ap (ap c_2Ebit_2ESLICE V0x) V0x) V1n)))) \quad (12)$$

Assume the following.

$$True \quad (13)$$

Assume the following.

$$(\forall V0t1 \in 2.(\forall V1t2 \in 2.(((p V0t1) \Rightarrow (p V1t2)) \Rightarrow (((p V1t2) \Rightarrow (p V0t1)) \Rightarrow ((p V0t1) \Leftrightarrow (p V1t2))))) \quad (14)$$

Assume the following.

$$(\forall V0t \in 2.(False \Rightarrow (p V0t))) \quad (15)$$

Assume the following.

$$(\forall V0t \in 2.((p V0t) \vee (\neg(p V0t)))) \quad (16)$$

Assume the following.

$$((\forall V0t \in 2.((\neg(\neg(p V0t))) \Leftrightarrow (p V0t))) \wedge (((\neg True) \Leftrightarrow False) \wedge ((\neg False) \Leftrightarrow True))) \quad (17)$$

Assume the following.

$$\forall A_27a.\text{nonempty } A_27a \Rightarrow (\forall V0x \in A_27a.((V0x = V0x) \Leftrightarrow True)) \quad (18)$$

Assume the following.

$$\forall A_27a.\text{nonempty } A_27a \Rightarrow (\forall V0x \in A_27a.(\forall V1y \in A_27a.((V0x = V1y) \Leftrightarrow (V1y = V0x)))) \quad (19)$$

Assume the following.

$$(\forall V0t \in 2.(((True \Leftrightarrow (p V0t)) \Leftrightarrow (p V0t)) \wedge (((p V0t) \Leftrightarrow True) \Leftrightarrow (p V0t)) \wedge (((False \Leftrightarrow (p V0t)) \Leftrightarrow (\neg(p V0t))) \wedge (((p V0t) \Leftrightarrow False) \Leftrightarrow (\neg(p V0t))))) \quad (20)$$

Assume the following.

$$\begin{aligned} \forall A_27a.\text{nonempty } A_27a \Rightarrow (\forall V0t1 \in A_27a. (\forall V1t2 \in \\ A_27a. (((ap (ap (ap (c_2Ebool_2ECOND A_27a) c_2Ebool_2ET) V0t1) \\ V1t2) = V0t1) \wedge ((ap (ap (ap (c_2Ebool_2ECOND A_27a) c_2Ebool_2EF) \\ V0t1) V1t2) = V1t2)))))) \end{aligned} \quad (21)$$

Theorem 1

$$(\forall V0b \in ty_2Enum_2Enum. (\forall V1n \in ty_2Enum_2Enum. (\\ (p (ap (ap c_2Ebit_2EBIT V0b) V1n)) \Leftrightarrow ((ap (ap (ap c_2Ebit_2ESLICE \\ V0b) V1n) = (ap (ap c_2Earithmetic_2EEXP (ap c_2Earithmetic_2ENUMERAL \\ (ap c_2Earithmetic_2EBIT2 c_2Earithmetic_2EZERO))) V0b))))))$$