

**NAME**

ctanh, ctanhf, ctanhl – complex hyperbolic tangent

**SYNOPSIS**

```
#include <complex.h>
```

```
double complex ctanh(double complex z);
```

```
float complex ctanhf(float complex z);
```

```
long double complex ctanhl(long double complex z);
```

Link with `-lm`.

**DESCRIPTION**

These functions calculate the complex hyperbolic tangent of  $z$ .

The complex hyperbolic tangent function is defined mathematically as:

$$\operatorname{ctanh}(z) = \operatorname{csinh}(z) / \operatorname{ccosh}(z)$$

**VERSIONS**

These functions first appeared in glibc in version 2.1.

**ATTRIBUTES**

For an explanation of the terms used in this section, see **attributes(7)**.

Interface	Attribute	Value
<b>ctanh()</b> , <b>ctanhf()</b> , <b>ctanhl()</b>	Thread safety	MT-Safe

**CONFORMING TO**

C99, POSIX.1-2001, POSIX.1-2008.

**SEE ALSO**

**cabs(3)**, **catanh(3)**, **ccosh(3)**, **csinh(3)**, **complex(7)**

**COLOPHON**

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