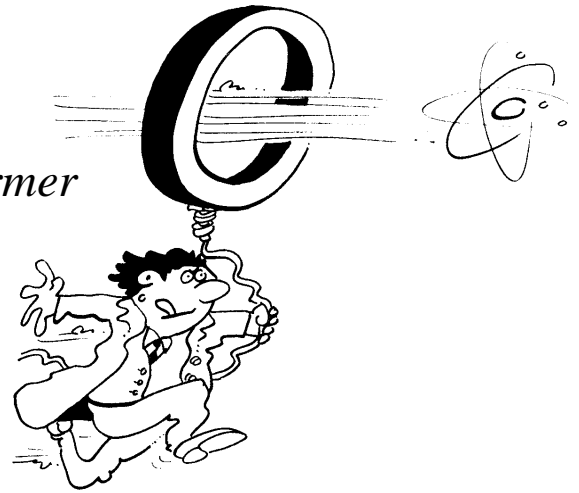


FCT *Fast Current Transformer*

Most sensitive & fastest current transformer



Beam wideband current transformer for pulsed or CW beams

For installation in air, outside vacuum chamber

To measure

Particle beam current waveform and fast pulses, from

Accelerated beams in linacs, transfer lines and synchrotrons, injection or extraction

Bandwidth up to 1.75 GHz
200-ps risetime

Droop down to 0.1 %/ μ s
down to 160 Hz lower cutoff frequency

Extra-high sensitivity up to 5 V/A

Standard apertures from 16 mm to 178 mm diameter. Larger diameters on request

Other models available for installation in vacuum down to 1E-8 mbar

Technology

Composite* magnetic cores of Cobalt-based nanocrystalline and amorphous alloys provide high permeability and very fast risetime.

Alloys are thermally and magnetically processed in-house, to obtain unequalled performance. Annealing techniques are the result of 20 years experience with cobalt-based alloy processing.

Proprietary multithread winding techniques and numerically analysed modelling to assure uniform field density in magnetic core.



* Amorphous / nanocrystalline composite cores are made from two or more alloy composition batches. Alloy batches are individually annealed to give each of them specific characteristics. High-temperature annealing is performed under fixed or rotating magnetic field. Proper selection of alloy composition and annealing process enhances desired characteristics of high permeability, low remanent field density, high frequency response or low loss. By combining batches of different alloys and annealing process, composite cores have superior performance in high-frequency, sensitivity, loss and inductance than any single-process core could provide.

Specifications

Fastest wideband (-WB) models

Technology: Predominantly amorphous

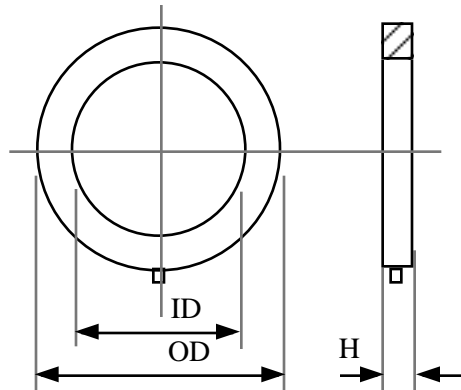
Turns ratio	100:1	50:1	20:1	10:1	05:1	Units
Sensitivity (nominal)	0.25	0.5	1.25	2.5	5.0	V/A
Rise time (typ.)	600	300	200	300	500	ps
Droop	<1	<3	<6	<10	<20	%/μs
Upper cutoff frequency -3dB (typ.)	580	1170	1750	1170	700	MHz
Lower cutoff frequency -3dB	<1.6	<4.8	<9.5	<16	<32	kHz
Position sensitivity (on axis)	<0.2	<0.2	<0.2	<0.2	<0.2	%/mm
L/R time constant (min.)	100	35	17	10	5	μs
Max. charge/pulse (pulses <1ns)	2	1	0.4	0.2	0.1	μC
Max. peak current (pulses >1ns)	2000	1000	400	200	100	A
Max. rms current ($f > 10$ kHz)	28	14	5.6	2.8	1.4	A

Low droop (-LD) models

Technology: Predominantly nanocrystalline

Turns ratio	100:1	50:1	20:1	10:1	05:1	Units
Sensitivity (nominal)	0.25	0.5	1.25	2.5	5.0	V/A
Rise time (typ.)	1000	540	400	500	780	ps
Droop	<0.05	<0.2	<1	<3	<8	%/μs
Upper cutoff frequency -3dB (typ.)	350	650	850	700	450	MHz
Lower cutoff frequency -3dB	<0.08	<0.32	<1.6	<5	<13	kHz
Position sensitivity (on axis)	<0.2	<0.2	<0.2	<0.2	<0.2	%/mm
L/R time constant (min.)	2000	500	100	30	12	μs
Max. charge/pulse (pulses <1ns)	3.8	1.8	0.7	0.4	0.1	μC
Max. peak current (pulses >1ns)	2000	1000	400	200	100	A
Max. rms current ($f > 10$ kHz)	50	25	10	5	2.5	A

Dimensions



FCT Order codes * (XX:1 = turns ratio)	ID (min)	OD (max)	H (max)
FCT-016-XX:1	16	42	
FCT-028-XX:1	28	64	
FCT-055-XX:1	55	91	
FCT-082-XX:1	82	118	
FCT-122-XX:1	122	156	
FCT-178-XX:1	178	226	
FCT-XXX-05:1			35
FCT-XXX-10:1 to 100:1			22

Environment

Maximum temperature
100°C (212°F) any time
Core saturation
20 Gauss radial field
2A permanent dc current
PTFE connector damage level
1E3 Gray max
Rad-hard models
6E7 Gray max
1E17 n/cm2 max

Connector

SMA jack 50Ω, BNC/N on option

Order codes

FCT-WB- Wide band
FCT-LD- Low droop
-XXX- Inner diameter (mm)
-XX:1 Turns ratio e.g. 20:1

Options

Rad-hard, append suffix -H
BNC connector, append suffix -B
N connector, append suffix -N

Distributors

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Instrumentation