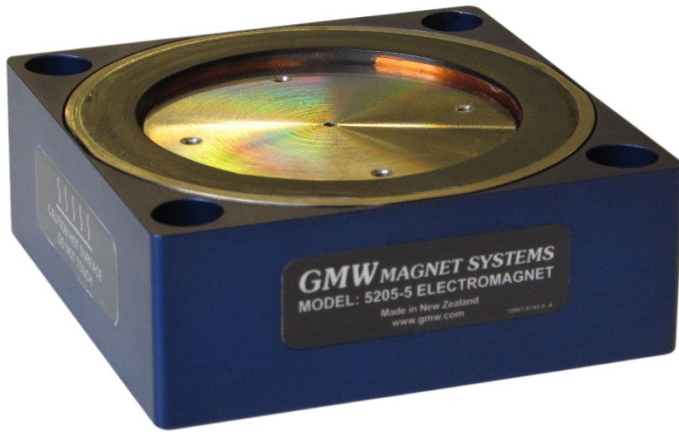


# 5205 Electromagnet



## OVERVIEW

The **5205 Electromagnet** is a low profile projected vertical field magnet providing uniform Bz field at a location above the magnet surface. It is intended for applications where the space around the working volume needs to be freely accessible.

The 5205 can be mounted in any orientation and the light weight (1.3kg) allows the magnet to be integrated into dynamic applications such as wafer testing.

The 5205 is designed to operate up to 100°C in order to determine the performance of the device under test in both magnetic field and at temperature.

## Features

- Uniform projected field ( $\pm 5\%$ ) up to 25mT
- Very compact, light weight
- Any mounting orientation
- Fast cycle times
- High operating temperature

## Applications

- Spintronic Devices
- Hall Effect Studies
- Magneto-Optical Studies

**GMW** Associates

🌐 [www.gmw.com](http://www.gmw.com)

✉ [sales@gmw.com](mailto:sales@gmw.com)

☎ +1-650-802-8292

📍 955 Industrial Road  
San Carlos, California, USA

## Model 5205 General Specifications

### Mechanical

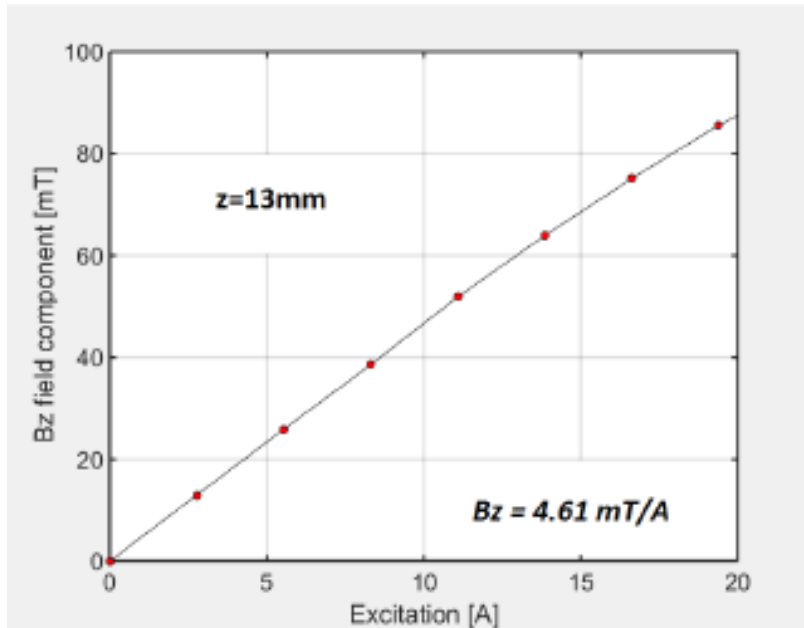
Dimensions	92mm W x 92mm D x 32.6mm H
Weight	1.3 kg
Pole Face Diameter	65 mm

### Coils

Resistance (20°C)	0.924 $\Omega$
Max. Resistance (100°C)	1.210 $\Omega$
Max. Peak Current (continuous)	5.4 A
Max. Peak Current (sinusoid)	7.6 A
Max. Peak Current (triangle)	9.4 A
Max. Time Averaged Power	35 W
Inductance	16 mH
Ramp Rate (0-25mT)	2 ms
Anticipate max. sinusoidal frequency (5mT)	20 Hz
Over Temperature Interlock	100°C

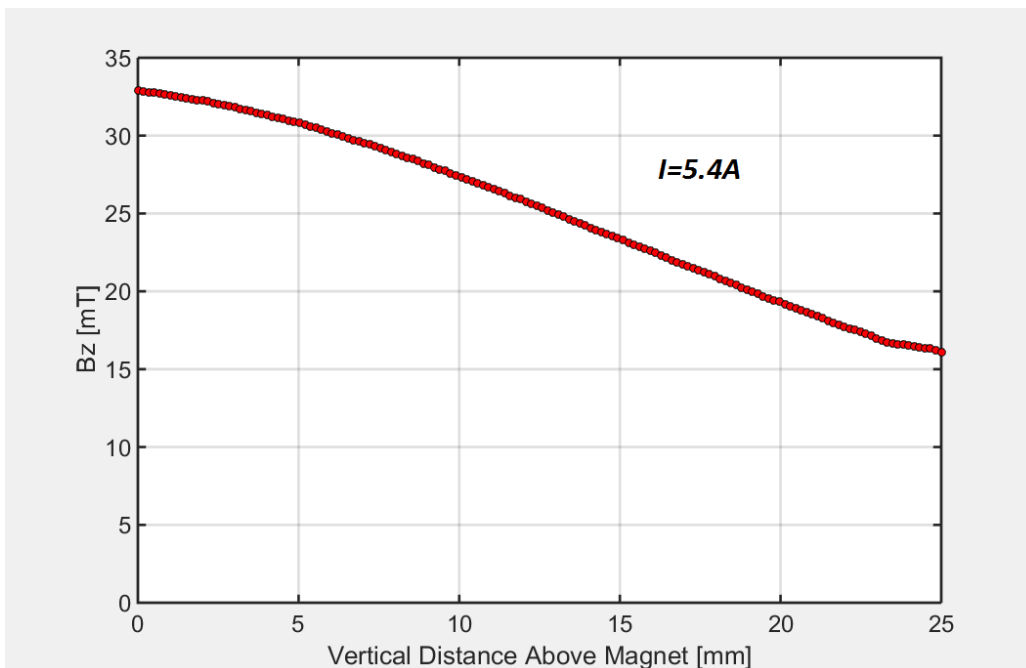
The magnet may be convectively cooled in air. Improved performance is achieved by clamping the lower surface of the magnet to a heatsink.

Excitation curves for the Bz field at 13mm above the Standard Pole Face

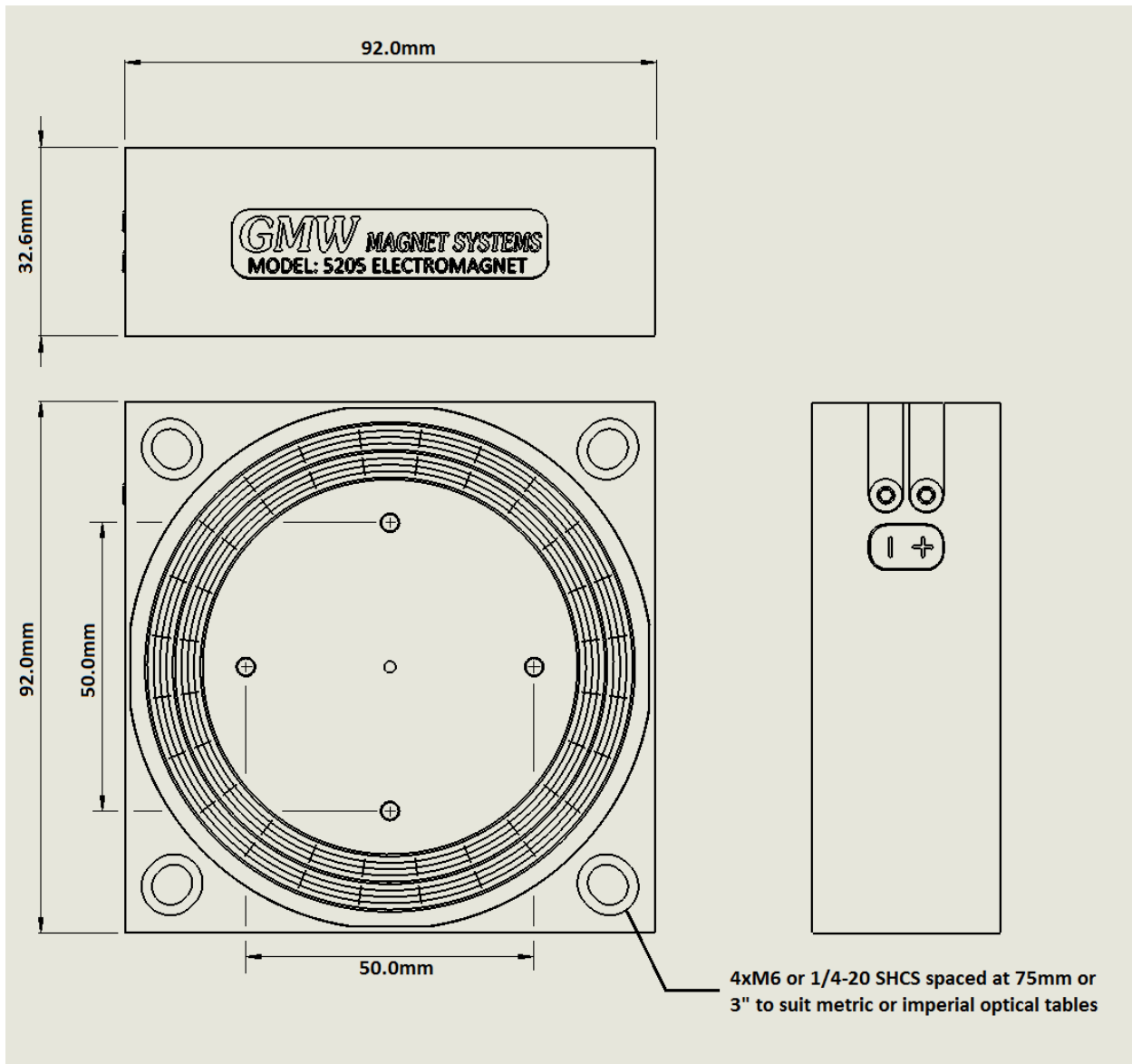


Bipolar Power Supply	DC OUTPUT RANGE		Power (W)	Configuration
	Voltage (V <sub>DC</sub> )	Current (A <sub>DC</sub> )		
BOP 20-5M	0 to ±20 V	0 to ±5A	100	Single
BOP 72-6M	0 to ±72 V	0 to ±6 A	400	8 in series

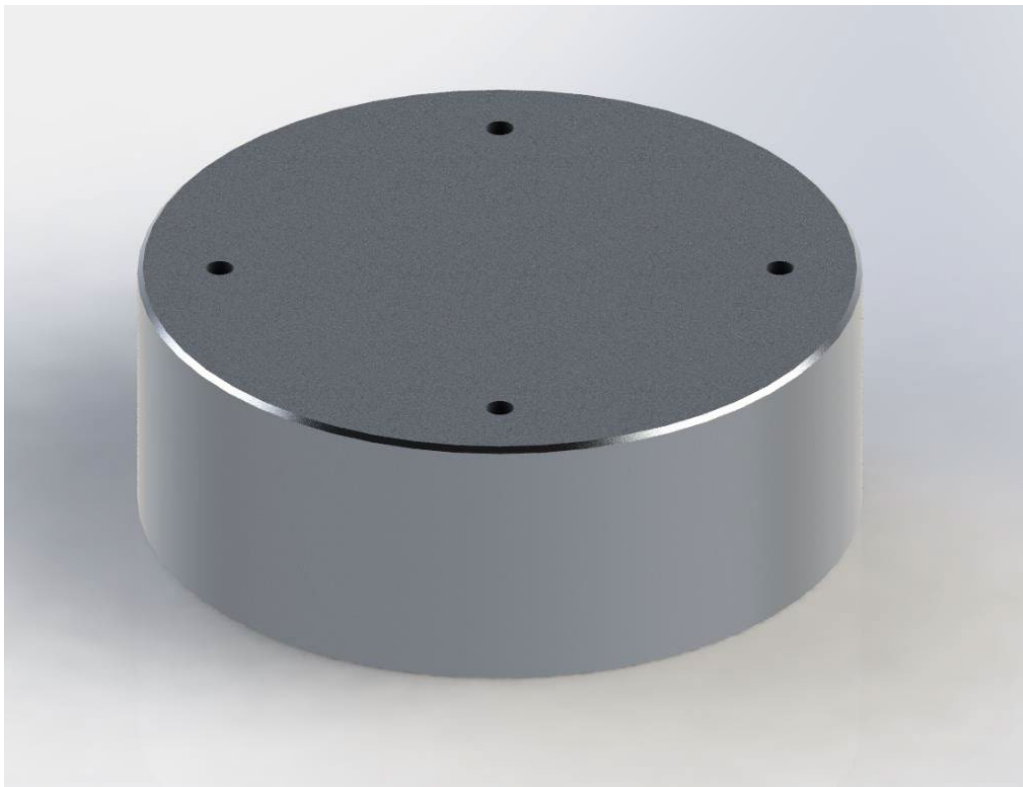
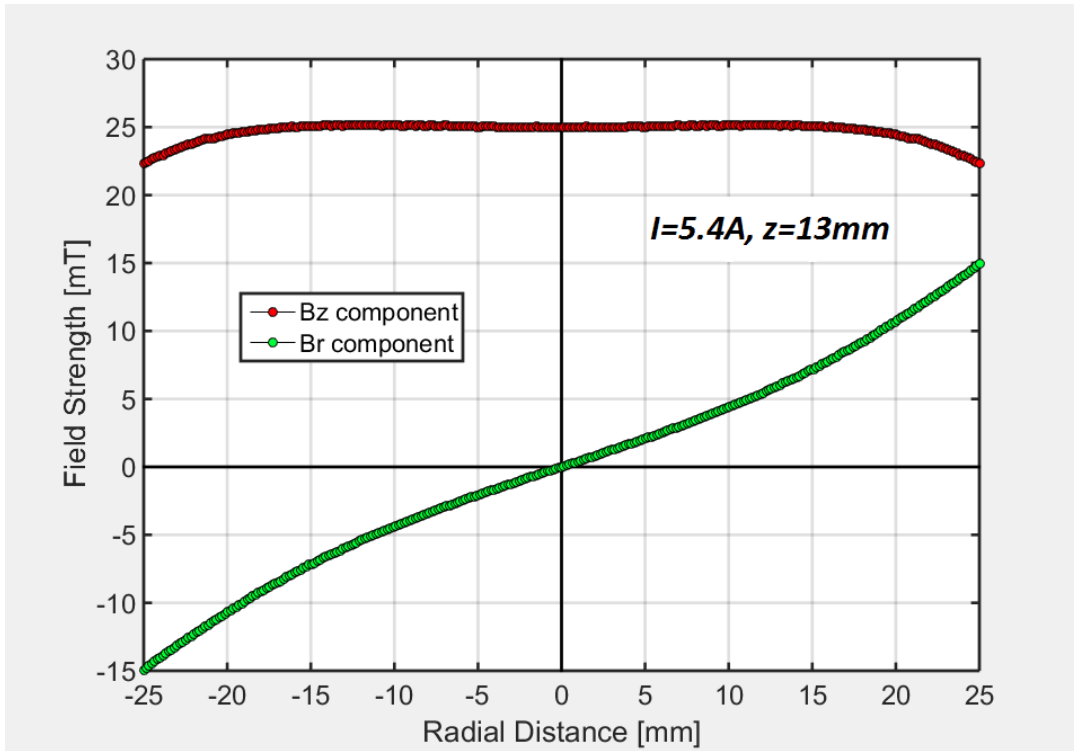
Bz Field Component as a Function of Distance Above the Magnet – Standard Pole



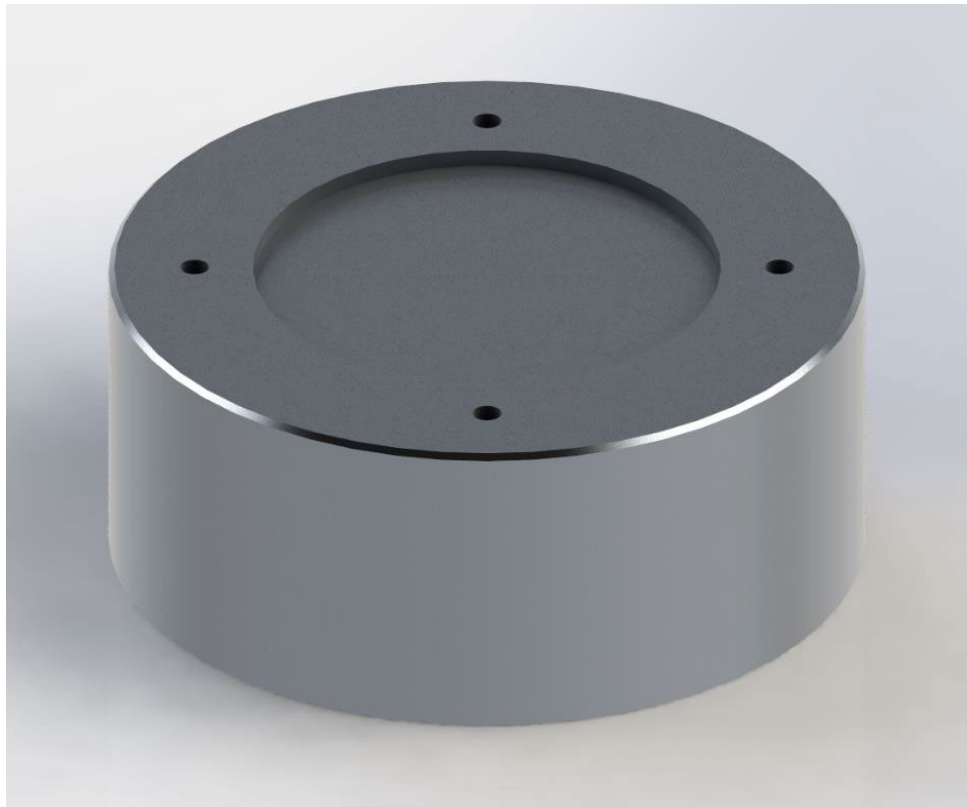
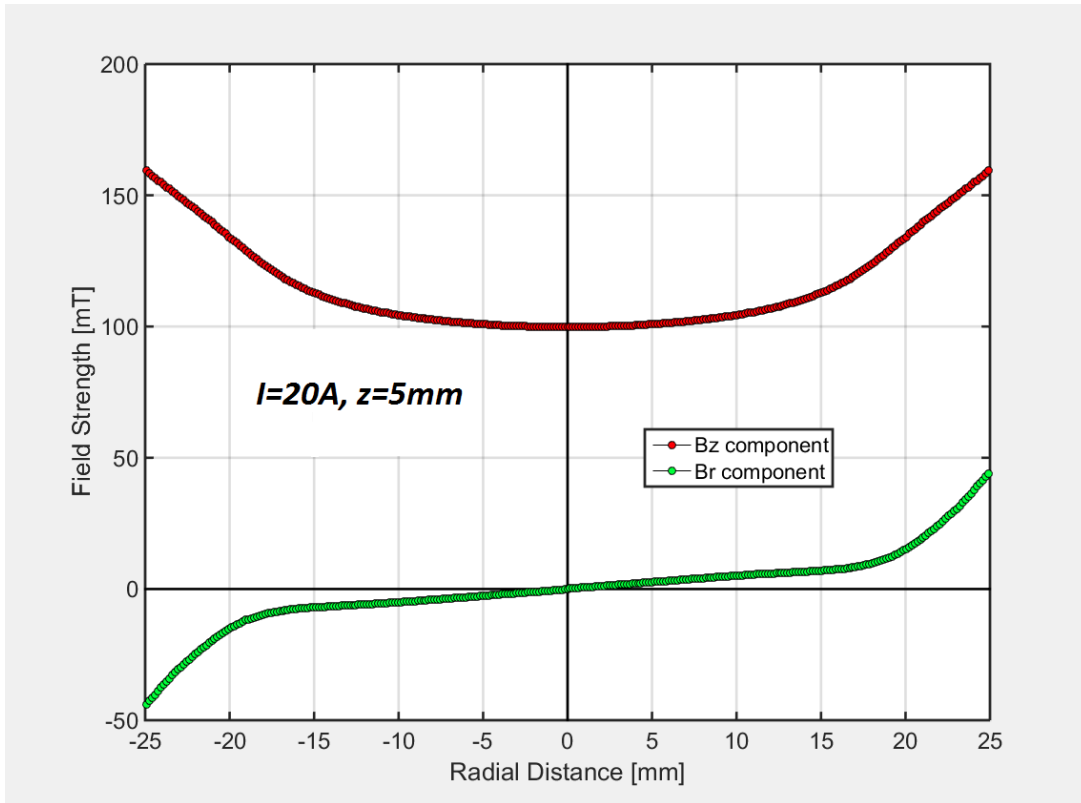
## Physical Dimension and Mounting Fixtures



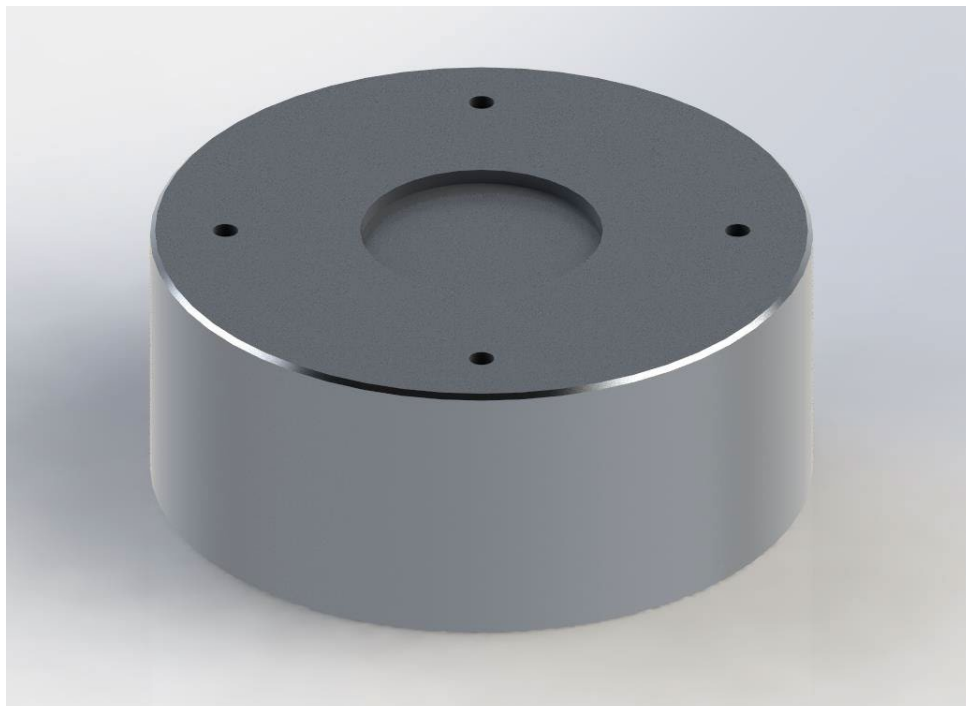
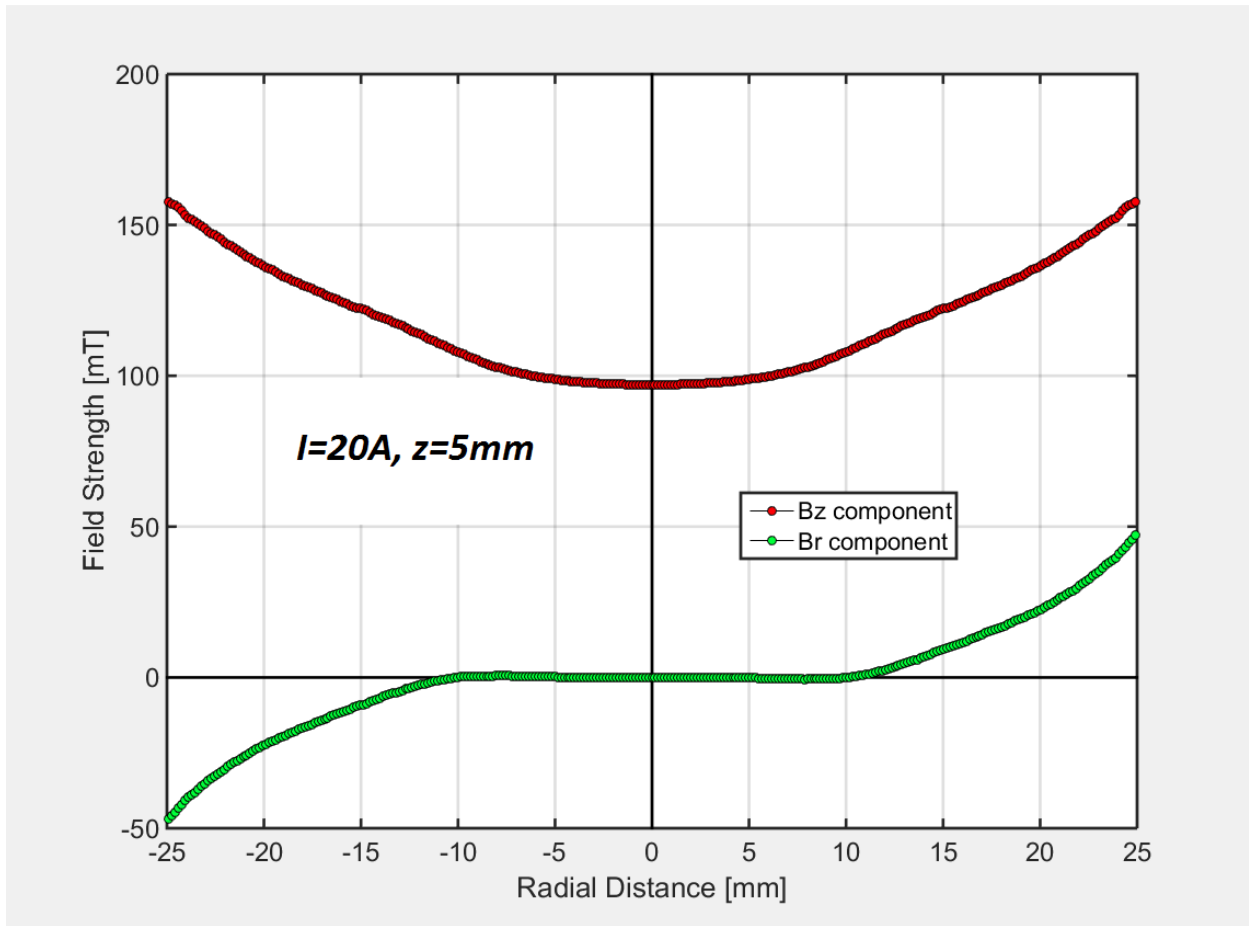
Variation of Br and Bz fields at 13mm above "Standard" Pole Face



Variation of Br and Bz fields at 5mm Above "Low Br" Pole Face



Variation of Br and Bz fields at 5mm Above "No Br" Pole Face



With reference to the table below the "Low Br" pole provides good uniformity of Bz over a 10mm diameter area but there is a small Br component. If the Br component cannot be present, then the "No Br" pole can be used; the Bz uniformity is not as good but the Br component is all but eliminated.

<b>Pole</b>	<b>Height above pole</b>	<b>Current</b>	<b>Bz</b>	<b>Uniformity Bz Ø10mm</b>	<b>Uniformity Br/BzØ10mm</b>
<b>Standard</b>	<b>13 mm</b>	<b>5.4 A</b>	<b>25.3 mT</b>	<b>0.7%</b>	<b>28.5%</b>
<b>Low Br</b>	<b>5 mm</b>	<b>20 A</b>	<b>100 mT</b>	<b>1.0%</b>	<b>2.5%</b>
<b>No Br</b>	<b>5 mm</b>	<b>20 A</b>	<b>97 mT</b>	<b>1.8%</b>	<b>0.1%</b>