GMW

5204 Projected Field Electromagnet

OVERVIEW

The 5204 electromagnet is a projected field magnet providing field of any orientation at a location above the magnet surface. It is intended for applications where the space around the working volume needs to be freely accessible.

Custom pole extensions may be located on the pole faces in order to achieve desired field properties for a specific application. The 5204 can be mounted in any orientation and the light weight (1.5kg) allows the magnet to be integrated into dynamic applications such as wafer testing.

FEATURES

- **Projected vector field up to 0.3T**
- **Interchangeable pole extensions**
- **Small and light weight**
- **Any mounting orientation**
- **Up to 200 Hz operation**

APPLICATIONS

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

Revised 26 April 2015

GMW Associates **• 955 Industrial Road • San Carlos, CA 94070 • USA**

Tel +1 (650) 802-8292 • Fax +1 (650) 802-8298 • sales@gmw.com • www.gmw.com

MODEL 5204 GENERAL SPECIFICATIONS	
Peak operating field	Br=±300mT,Bz=±100mT
Axial viewing port	Ø5mm
Dimensions	70mm W x 70mm D x 64.5mm H (2.76 inch w x 2.76 inch D x 2.54 inch H)
Weight (excluding hoses and water)	1.5 kg (3.3 pounds)

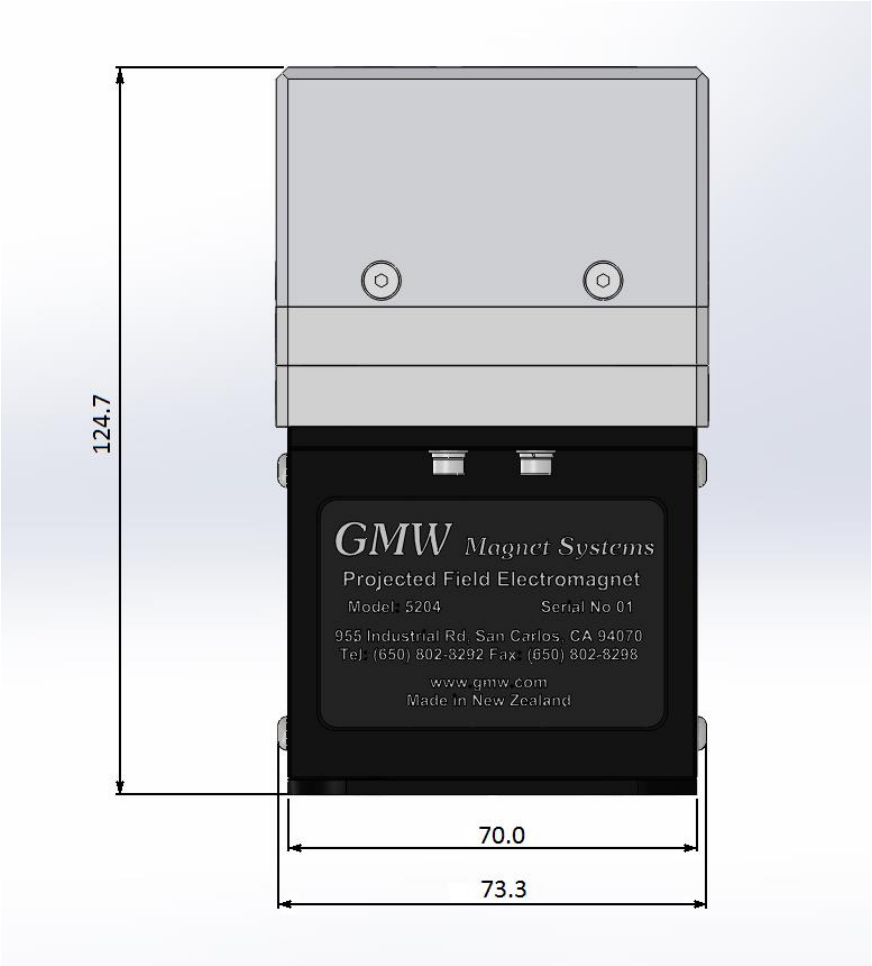
Coils (3 coils per magnet)	
Resistance (20°C)	39.4 mΩ
Max. Resistance (80°C)	51.4 mΩ
Max. continuous current	62A
Max. peak current	100A
Max. continuous Power	200 W/coil
Max. Peak Power	515 W/coil
Coil Inductance	175 μH/coil
Water Cooling (supply 18°C @ 60 psid)	4 Litre/min
Anticipate max. sinusoidal frequency	200 Hz
Over Temperature Interlock	80°C

Bipolar Power Supply	DC OUTPUT RANGE		Power (W)
	Voltage (V_{DC})	Current (A_{DC})	
BOP 20-20M	0 to ±20	0 to ±20	400
BOP 20-50M	0 to ±20	0 to ±50	1000

Revised 26 April 2015

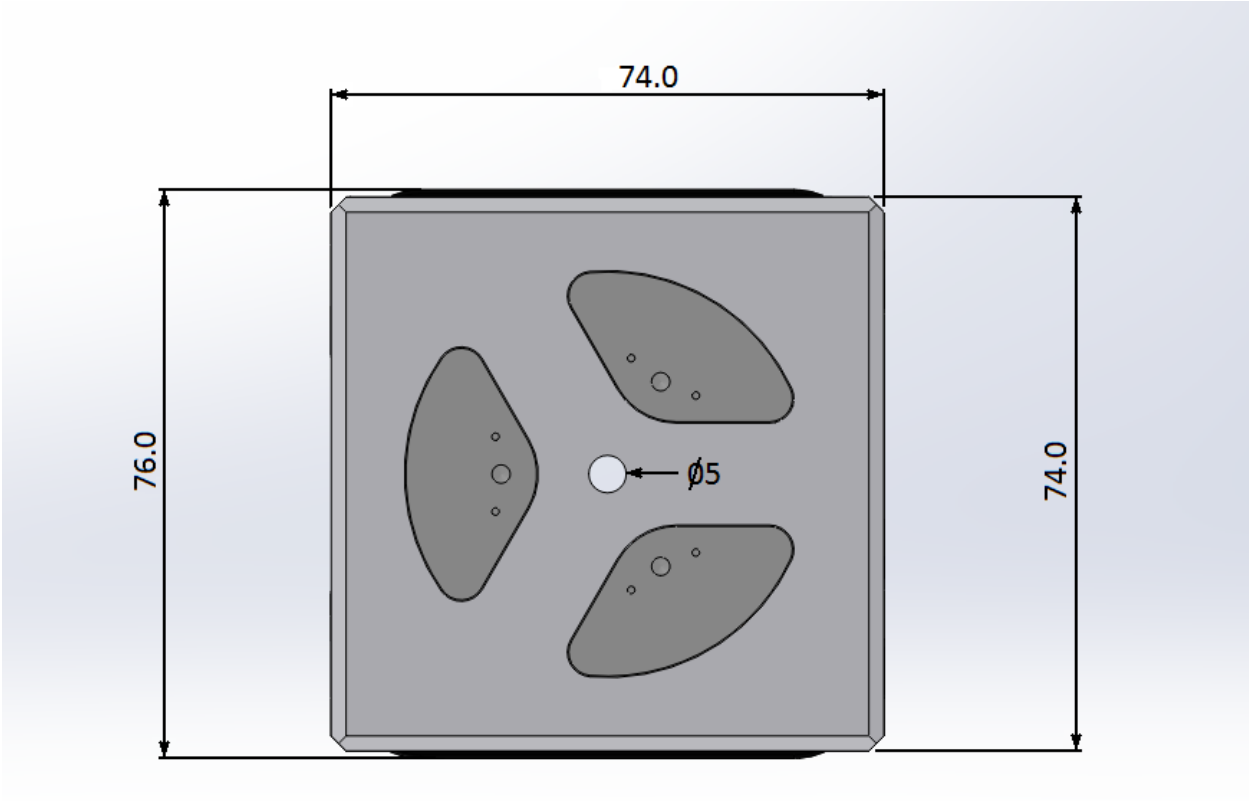
GMW Associates • 955 Industrial Road • San Carlos, CA 94070 • USA

Tel +1 (650) 802-8292 • Fax +1 (650) 802-8298 • sales@gmw.com • www.gmw.com



GMW Associates **• 955 Industrial Road • San Carlos, CA 94070 • USA**

Tel +1 (650) 802-8292 • Fax +1 (650) 802-8298 • sales@gmw.com • www.gmw.com



GMW Associates **• 955 Industrial Road • San Carlos, CA 94070 • USA**

Tel +1 (650) 802-8292 • Fax +1 (650) 802-8298 • sales@gmw.com • www.gmw.com

Pole Configuration 1:

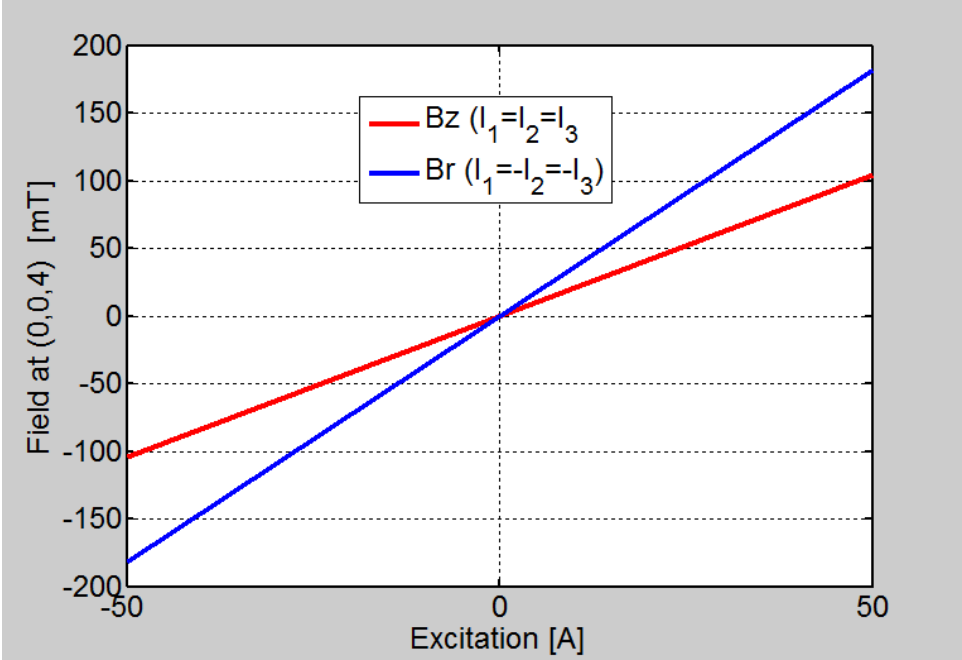
Magnet with Condenser Plate

The magnet is fitted with a condenser plate and the excitation curves for each of the three coils are calculated to provide a rotating field of 106 mT in plane at 5mm above the condenser plate. The field rotates at 200 Hz with very low ripple (~0.5 mT) and <0.1 mT of Bz component.

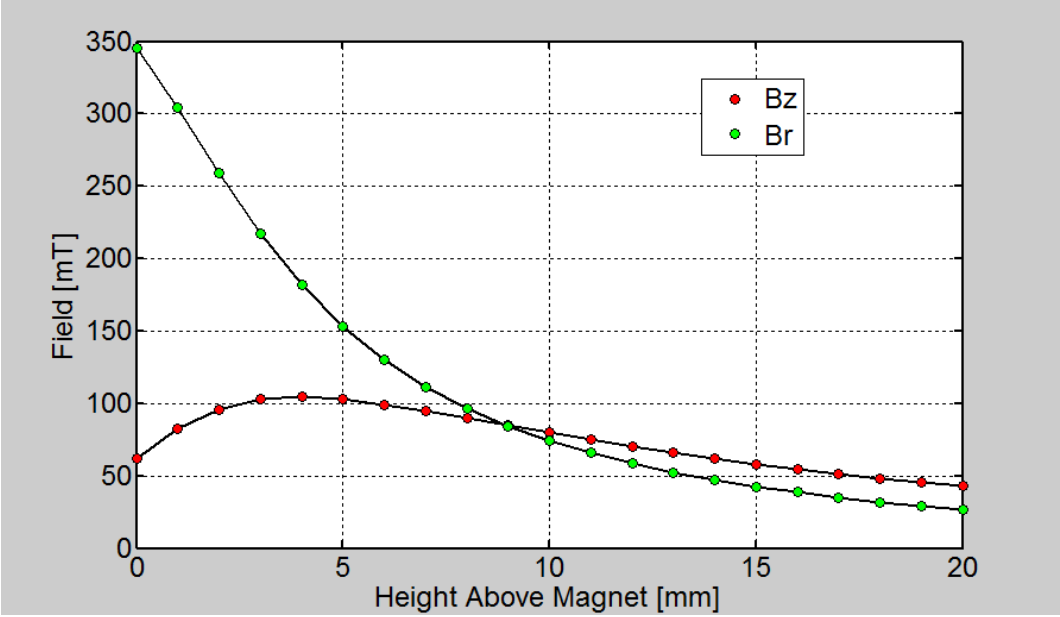
GMW Associates • 955 Industrial Road • San Carlos, CA 94070 • USA

Tel +1 (650) 802-8292 • Fax +1 (650) 802-8298 • sales@gmw.com • www.gmw.com

Excitation Curves for the Bz and Br fields at 4mm above the Pole Faces



Field Strength Versus Height above Magnet (60A operation)

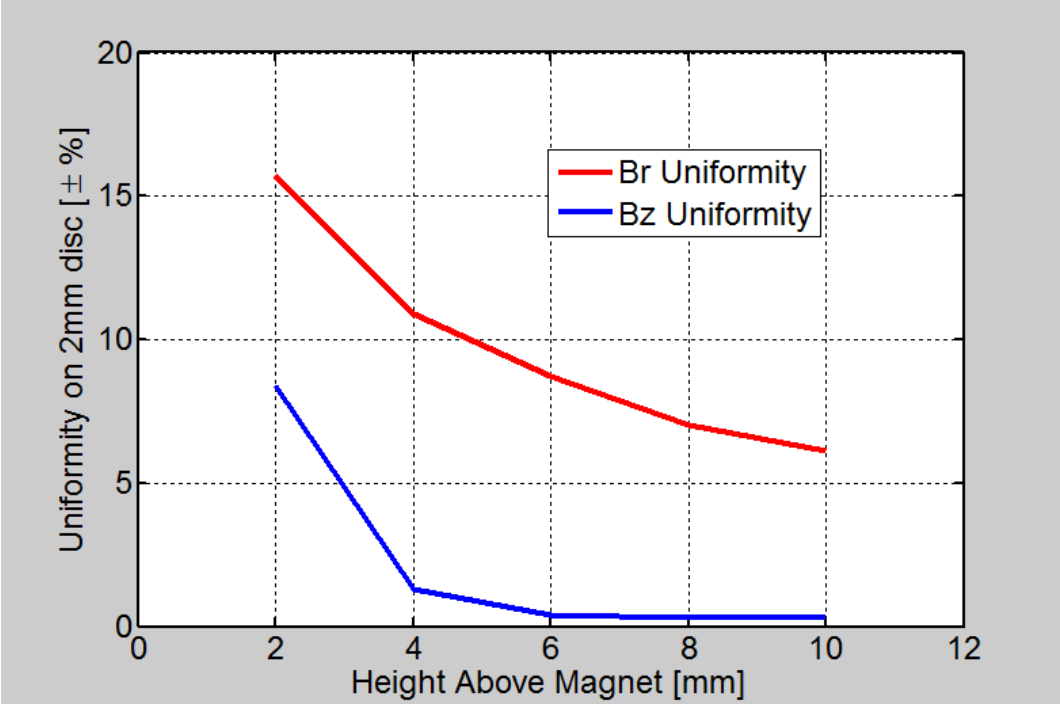


Revised 26 April 2015

GMW Associates • 955 Industrial Road • San Carlos, CA 94070 • USA

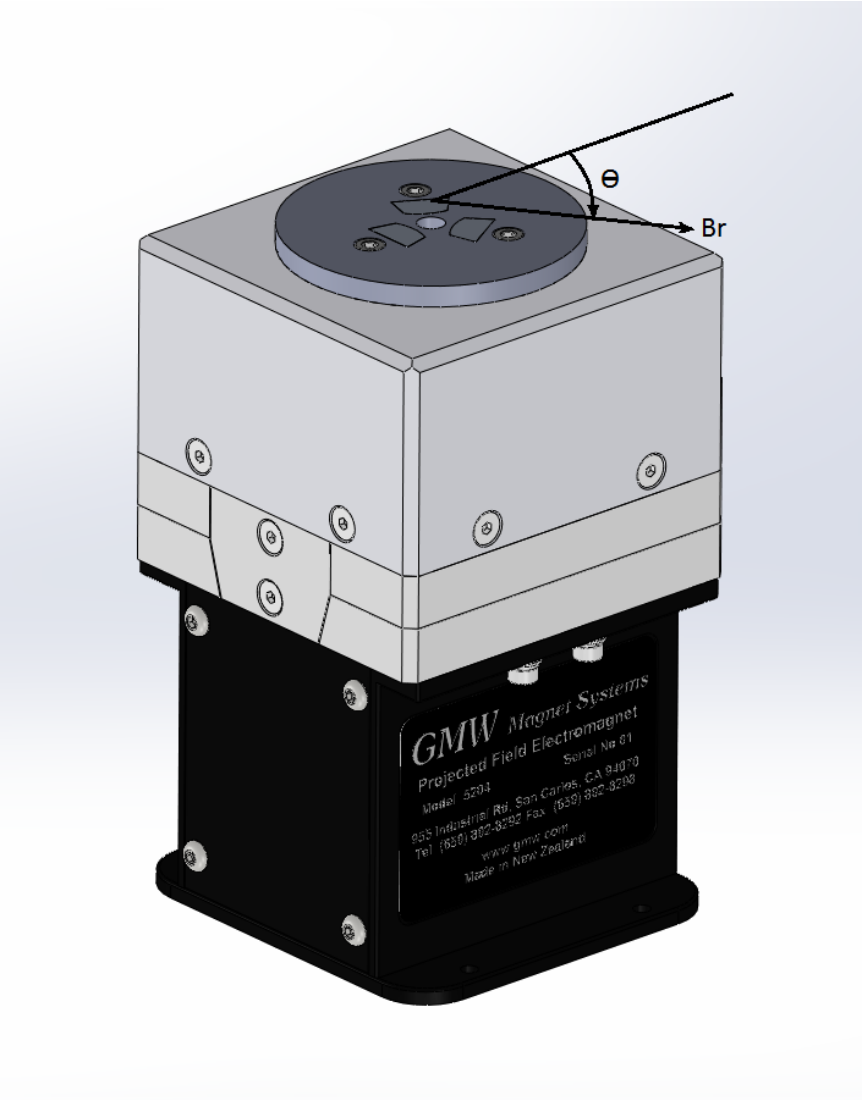
Tel +1 (650) 802-8292 • Fax +1 (650) 802-8298 • sales@gmw.com • www.gmw.com

Field Uniformity on a Ø2mm Disc Versus Height Above Magnet



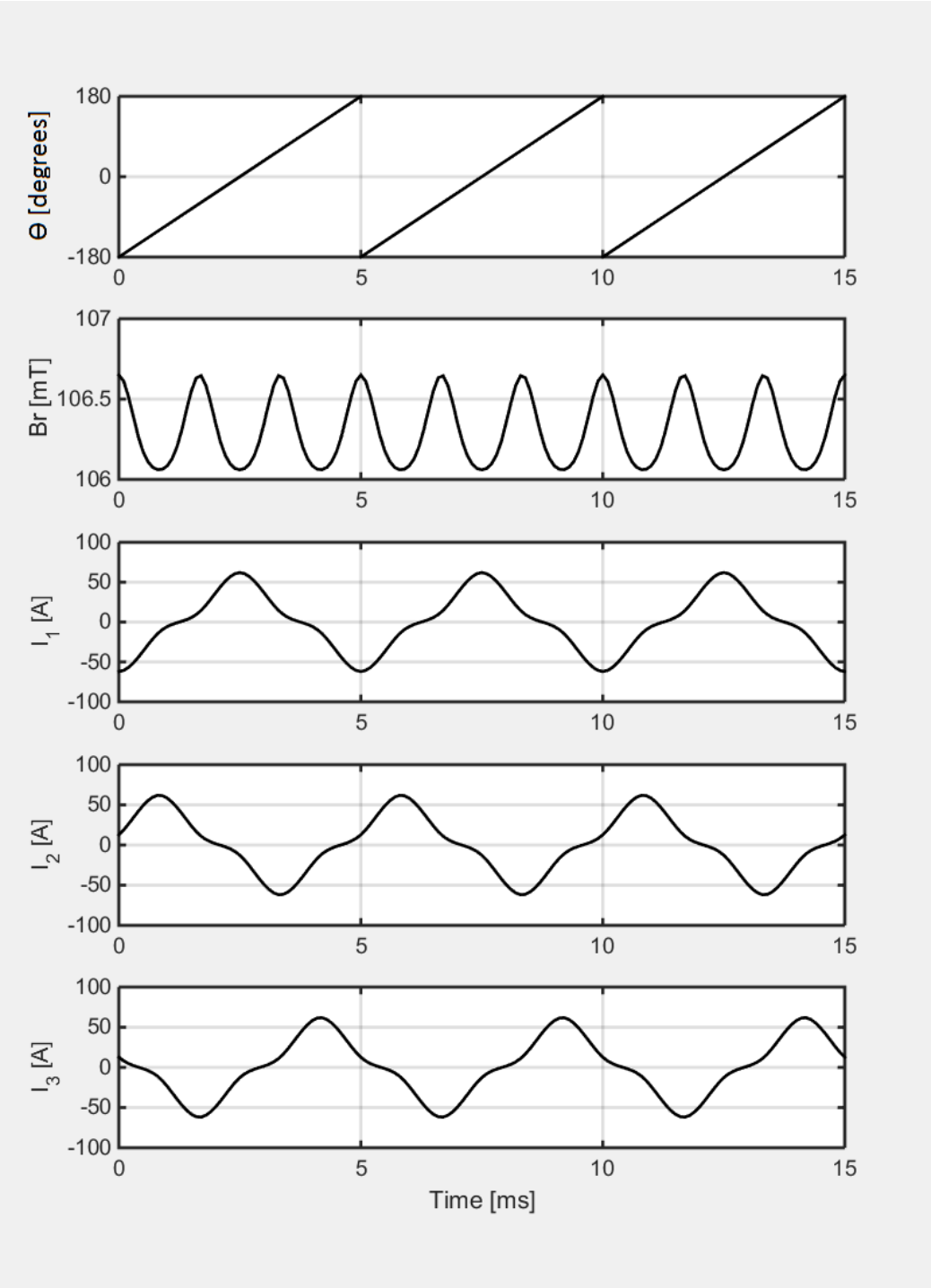
GMW Associates • 955 Industrial Road • San Carlos, CA 94070 • USA

Tel +1 (650) 802-8292 • Fax +1 (650) 802-8298 • sales@gmw.com • www.gmw.com



Field is measured at 5mm above top of condenser plate.

Revised 26 April 2015



GMW Associates **• 955 Industrial Road • San Carlos, CA 94070 • USA**

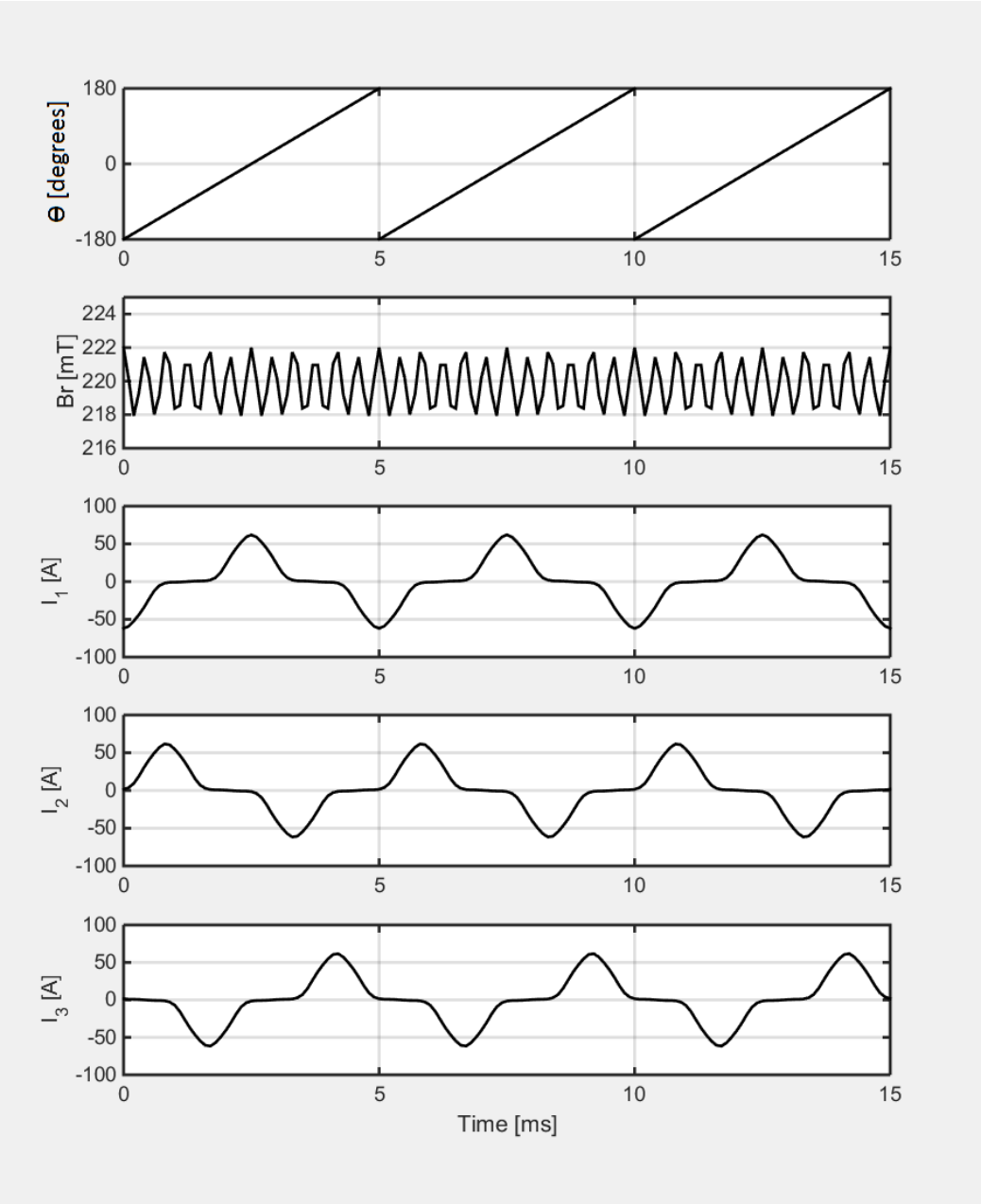
Tel +1 (650) 802-8292 • Fax +1 (650) 802-8298 • sales@gmw.com • www.gmw.com

Pole Configuration 2:

Custom Poles for Increased In-Plane Field

The custom designed pole tips create increased field over 1mm^3 volume. Pole tips are optimized as per customer requirements. Field is measured at 1mm above top of pole tips.

Revised 26 April 2015



GMW Associates **• 955 Industrial Road • San Carlos, CA 94070 • USA**

Tel +1 (650) 802-8292 • Fax +1 (650) 802-8298 • sales@gmw.com • www.gmw.com