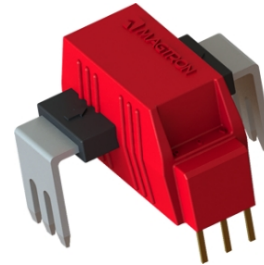


Based on Magtron Quadracore ASIC Solution



Features

- ◆ Ultra small packaging
- ◆ Magtron Quadracore™ technology
- ◆ Open loop programmable solution
- ◆ Single 5V supply voltage
- ◆ Printed circuit board mounting
- ◆ Casing and materials UL-listed
- ◆ Appearance patented
- ◆ Stable accuracy
- ◆ Low temperature coefficient
- ◆ High immunity to external interference
- ◆ Programmable analog output
- ◆ Low insertion loss
- ◆ Integration frequency filter
- ◆ Easy to mount with automatic handling system

Applications

- ◆ Inverter and Servo
- ◆ Home appliance
- ◆ Shunt solution replacement
- ◆ Uninterruptible Power Supply

Standards

- ◆ EN50178 : 1997
- ◆ IEC61010-1 : 2010
- ◆ UL508 : 2010

Select Part List

Part Number	IPN (A)	IPM (A)	Accuracy
MG10A	10	±25	3%
MG16A	16	±40	3%
MG20A	20	±50	3%
MG32A	32	±80	3%
MG10B	10	±25	5%
MG16B	16	±40	5%
MG20B	20	±50	5%
MG32B	32	±80	5%

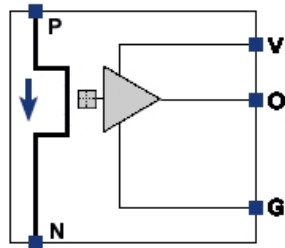
Overview

The MGxx series device is a high performance current sensor based on Magtron ASIC Quadracore technology with high accuracy in the full temperature range, adjustable analog output.

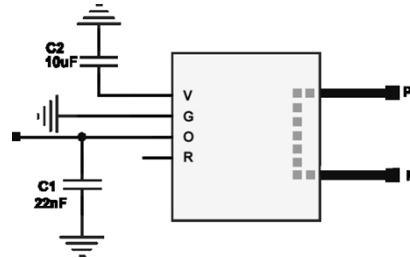
It's suitable for the application of industrial products, such as the inverter, UPS, servo motor driver and other industrial products. The ultra-small package is designed for the high power density application and easy to use.

MGxx series is designed for the replacement of shunt solution and the transformer solution with high cost effective.

Application circuit



Functional block diagram



Application circuit

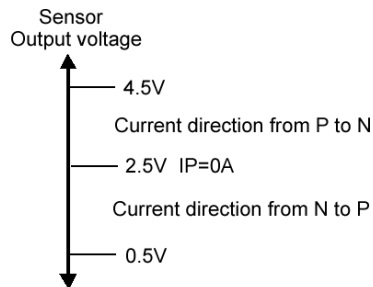
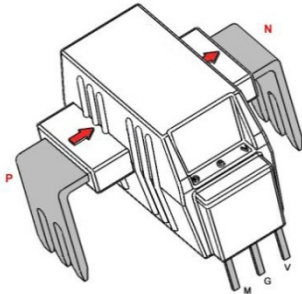
Note: C1, C2 should be close to the current sensor's pin
 Component selection reference:

Designator	Description
C1	TDK,X7R,22nF/16V,±10%,0603
C2	TDK,X5R,10µF/16V,±10%,0603

Pin Definition

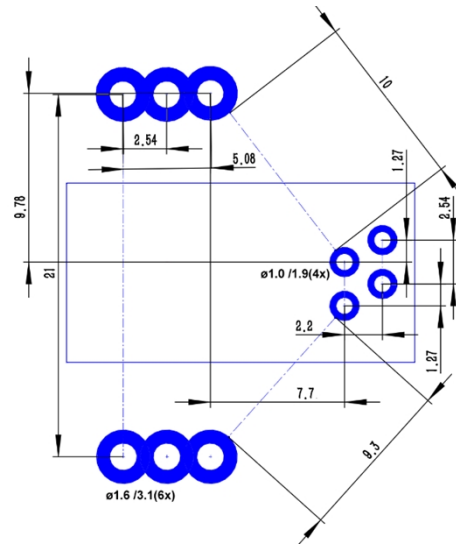
Symbol	Description
V	Power supply pin
G	Power GND pin
O	Signal output pin
R	Reserved

Assembly PIN output:



- ① P, N: The primary side Pin (P: Positive ,N : Negative)
- ② M,G,V: Secondary side Pin

PCB Footprint (in mm. Tolerance ±0.2mm) Top view



Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage(not operating)	V_C			9	V
Jumper temperature	T_J		120		$^{\circ}\text{C}$
Ambient operating temperature	T_A	-40		+85	$^{\circ}\text{C}$
Ambient storage temperature	T_A	-40		+105	$^{\circ}\text{C}$
ESD rating, Human Body Model(HBM)	U_{ESD}		2		kV

Isolation Characteristics

Parameter	Symbol	Min	Unit	Comment
RMS Voltage for AC Insulation test 50/60Hz/1 min	V_D	3	kV	
Through hole conductor isolation distance suggestion	D_{CP}	9.3	mm	
Distance between source side lead and secondary side pin	D_{SS}	10.8	mm	

Electrical data MG10A

At $T_a=25^{\circ}\text{C}$, $V_c=5\text{V}$, $R_L=10\text{K}\Omega$, unless otherwise noted

Parameter	Symbol	Min	Typ	Max	Unit	Comment
Primary nominal RMS current	I_{PN}		10		A	
Primary current , measuring range	I_{PM}	-25		+25	A	
Supply voltage	V_C	4.75	5	5.25	V	
Number of primary turns	N_P		1			
Resistance of primary jumper	R_P		0.21		m Ω	@+25 $^{\circ}\text{C}$
Current consumption	I_C		20	25	mA	
Output Voltage range @ I_{PM}	V_O		2.5 \pm 2		V	
Temperature coefficient of V_O @ $I_p=0\text{A}$	TCV_O		\pm 200		PPM/K	@40~+85 $^{\circ}\text{C}$
Theoretical Sensitivity	G_{TH}		80		mV/A	
Temperature coefficient of Gain	TCG		\pm 400		PPM/K	@-40~+85 $^{\circ}\text{C}$
Linearity error 0~ I_{PM}	ϵ_L		0.4		% of I_{PM}	
Magnetic offset voltage	V_{OM}		10		mV	
Total Accuracy @ I_{PM}	X		3		% of V_{om}	@+25 $^{\circ}\text{C}$
Frequency bandwidth(-3 dB)	BW		150		kHz	
Reaction time @10% of I_{PN}	T_{RA}		2.5		μS	
Reaction time @90% of I_{PN}	T_A		2.9		μS	

Electrical data MG10B

At Ta=25°C, Vc=5V, RL=10KΩ, unless otherwise noted

Parameter	Symbol	Min	Typ	Max	Unit	Comment
Primary nominal RMS current	I _{PN}		10		A	
Primary current , measuring range	I _{PM}	-25		+25	A	
Supply voltage	V _C	4.75	5	5.25	V	
Number of primary turns	N _P		1			
Resistance of primary jumper	R _P		0.21		mΩ	@+25°C
Current consumption	I _C		20	25	mA	
Output Voltage range @I _{PM}	V _O		2.5±2		V	
Temperature coefficient of V _O @I _p =0A	TCV _O		±300		PPM/K	@-40~+85°C
Theoretical Sensitivity	G _{TH}		80		mV/A	
Temperature coefficient of Gain	TCG		±400		PPM/K	@-40~+85°C
Linearity error 0~I _{PM}	ε _L		0.4		% of I _{PM}	
Magnetic offset voltage	V _{OM}		10		mV	
Total Accuracy @I _{PM}	X		5		% of Vom	@+25°C
Frequency bandwidth(-3 dB)	BW		150		kHz	
Reaction time @10% of I _{PN}	T _{RA}		2.5		uS	
Reaction time @90% of I _{PN}	T _A		2.9		uS	

Electrical data MG16A

At Ta=25°C, Vc=5V, RL=10KΩ, unless otherwise noted

Parameter	Symbol	Min	Typ	Max	Unit	Comment
Primary nominal RMS current	I _{PN}		16		A	
Primary current , measuring range	I _{PM}	-40		+40	A	
Supply voltage	V _C	4.75	5	5.25	V	
Number of primary turns	N _P		1			
Resistance of primary jumper	R _P		0.21		mΩ	@+25°C
Current consumption	I _C		20	25	mA	
Output Voltage range @I _{PM}	V _O		2.5±2		V	
Temperature coefficient of V _O @I _p =0A	TCV _O		±200		PPM/K	@-40~+85°C
Theoretical Sensitivity	G _{TH}		50		mV/A	
Temperature coefficient of Gain	TCG		±400		PPM/K	@-40~+85°C
Linearity error 0~I _{PM}	ε _L		0.4		% of I _{PM}	
Magnetic offset voltage	V _{OM}		10		mV	
Total Accuracy @I _{PM}	X		3		% of Vom	@+25°C
Frequency bandwidth(-3 dB)	BW		150		kHz	
Reaction time @10% of I _{PN}	T _{RA}		2.5		uS	
Reaction time @90% of I _{PN}	T _A		2.9		uS	

Electrical data MG16B

At Ta=25°C, Vc=5V, RL=10KΩ, unless otherwise noted

Parameter	Symbol	Min	Typ	Max	Unit	Comment
Primary nominal RMS current	I _{PN}		16		A	
Primary current , measuring range	I _{PM}	-40		+40	A	
Supply voltage	V _C	4.75	5	5.25	V	
Number of primary turns	N _P		1			
Resistance of primary jumper	R _P		0.21		mΩ	@+25°C
Current consumption	I _C		20	25	mA	

Output Voltage range @I _{PM}	V _O	2.5±2	V
Temperature coefficient of V _O @I _p =0A	TCV _O	±200	PPM/K @-40~+85°C
Theoretical Sensitivity	G _{TH}	50	mV/A
Temperature coefficient of Gain	TCG	±400	PPM/K @-40~+85°C
Linearity error 0~I _{PM}	ε _L	0.4	% of I _{PM}
Magnetic offset voltage	V _{OM}	10	mV
Total Accuracy @I _{PM}	X	5	% of Vom @+25°C
Frequency bandwidth(-3 dB)	BW	150	kHz
Reaction time @10% of I _{PN}	T _{RA}	2.5	uS
Reaction time @90% of I _{PN}	T _A	2.9	uS

Electrical data MG20A

At Ta=25°C, Vc=5V, RL=10KΩ, unless otherwise noted

Parameter	Symbol	Min	Typ	Max	Unit	Comment
Primary nominal RMS current	I _{PN}		20		A	
Primary current , measuring range	I _{PM}	-50		+50	A	
Supply voltage	Vc	4.75	5	5.25	V	
Number of primary turns	N _P		1			
Resistance of primary jumper	R _P		0.21		mΩ	@+25°C
Current consumption	I _C		20	25	mA	
Output Voltage range @I _{PM}	V _O		2.5±2		V	
Temperature coefficient of V _O @I _p =0A	TCV _O		±200		PPM/K	@-40~+85°C
Theoretical Sensitivity	G _{TH}		40		mV/A	
Temperature coefficient of Gain	TCG		±400		PPM/K	@-40~+85°C
Linearity error 0~I _{PM}	ε _L		0.4		% of I _{PM}	
Magnetic offset voltage	V _{OM}		10		mV	
Total Accuracy @I _{PM}	X		3		% of Vom	@+25°C
Frequency bandwidth(-3 dB)	BW		150		kHz	
Reaction time @10% of I _{PN}	T _{RA}		2.5		uS	
Reaction time @90% of I _{PN}	T _A		2.9		uS	

Electrical data MG20B

At Ta=25°C, Vc=5V, RL=10KΩ, unless otherwise noted

Parameter	Symbol	Min	Typ	Max	Unit	Comment
Primary nominal RMS current	I _{PN}		20		A	
Primary current , measuring range	I _{PM}	-50		+50	A	
Supply voltage	Vc	4.75	5	5.25	V	
Number of primary turns	N _P		1			
Resistance of primary jumper	R _P		0.21		mΩ	@+25°C
Current consumption	I _C		20	25	mA	
Output Voltage range @I _{PM}	V _O		2.5±2		V	
Temperature coefficient of V _O @I _p =0A	TCV _O		±200		PPM/K	@-40~+85°C
Theoretical Sensitivity	G _{TH}		40		mV/A	
Temperature coefficient of Gain	TCG		±400		PPM/K	@-40~+85°C
Linearity error 0~I _{PM}	ε _L		0.4		% of I _{PM}	
Magnetic offset voltage	V _{OM}		10		mV	
Total Accuracy @I _{PM}	X		5		% of Vom	@+25°C
Frequency bandwidth(-3 dB)	BW		150		kHz	