MCQ1805

$3kV_{RMS}$ Isolated Hall-Effect Current Sensor with $580V_{RMS}$ Working Voltage and Over-Current Detection, AEC-Q100 Qualified

DESCRIPTION

The MCQ1805 is an automotive-grade, linear Hall-effect current sensor for AC or DC current sensing. The Hall array is differential, which cancels out any stray magnetic field.

A primary conductor with a low resistance allows the current to flow close to the IC, which contains high-accuracy Hall-effect sensors. This current generates a magnetic field that is sensed at two different points by the integrated Hall-effect transducers. The magnetic field difference between these two points is then converted into a voltage that is proportional to the applied current. A spinning current technique is used for a low, stable offset.

The galvanic isolation between the pins of the primary conductive path and the sensor leads allows the MCQ1805 to replace optoisolators and other isolation devices.

The MCQ1805 provides fast over-current detection (OCD) to monitor the system for over-current (OC) faults.

The MCQ1805 requires a minimal number of readily available, standard external components. The device's small SOIC-8 footprint saves board area and makes it well-suited for space-constrained applications.

FEATURES

- 3.3V or 5V Single-Supply Options
- Immune to External Gradient Magnetic Fields via Differential Sensing
- Extreme Low-Noise Density
- $3kV_{RMS}$ Minimum Isolation Voltage
- $580V_{RMS}$ Maximum Working Voltage
- ±2.5% Total Accuracy
- 5A to 50A Bidirectional or Unidirectional Range
- 120kHz Bandwidth
- Custom Over-Current Detection (OCD) from 50% to 240% of the Rated Current (I_{PMAX})
- Fast OCD with 1µs Response Time
- Output Voltage (V_{OUT}) Proportional to AC or DC Currents
- Ratiometric Output from Supply Voltage
- Factory-Trimmed for Accuracy
- Available in an SOIC-8 Package
- Available in AEC-Q100 Grade 1

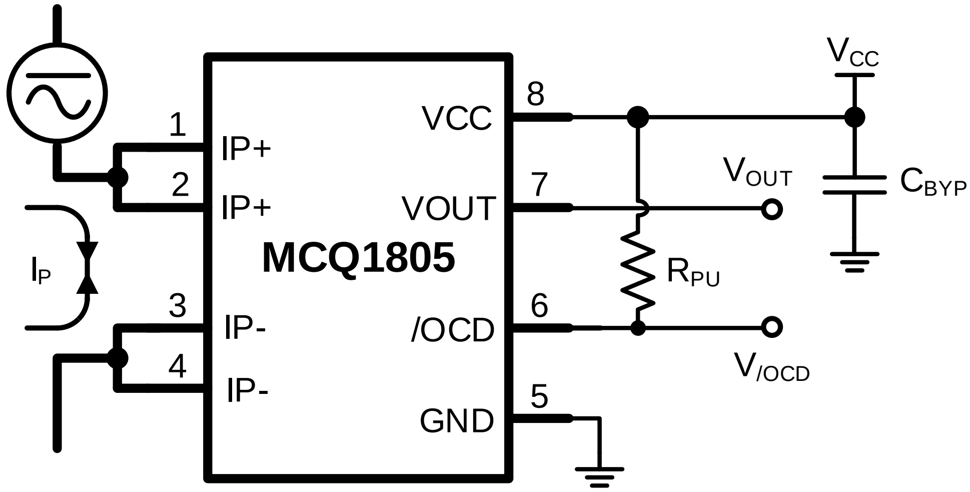
Certificate Number:
B 113824 0012 Rev.00
CBS 113824 0013 Rev.00

CB Certificate Number:
CA-11398-UL

APPLICATIONS

- Automotive Systems
- Motor Controls
- Load Detection and Management
- Switch-Mode Power Supplies
- Over-Current (OC) Fault Protection

TYPICAL APPLICATION



ORDERING INFORMATION

Part Number *, **	Supply Voltage (V)	Rated Current Range (A)	Sensitivity (SENS) (mV/A)	OCD Threshold (A)	Top Marking	MSL Rating
MCQ1805GS-305-BAEC	3.3	±5	264	±5	*MCQ1805*	*1*
MCQ1805GS-310-BAEC	3.3	±10	132	±10		
MCQ1805GS-320-BAEC	3.3	±20	66	±20		
MCQ1805GS-330-BAEC	3.3	±30	44	±30		
MCQ1805GS-340-BAEC	3.3	±40	33	±40		
MCQ1805GS-350-BAEC	3.3	±50	26.4	±50		
MCQ1805GS-305-UAEC	3.3	5	528	5		
MCQ1805GS-310-UAEC	3.3	10	264	10		
MCQ1805GS-320-UAEC	3.3	20	132	20		
MCQ1805GS-330-UAEC	3.3	30	88	30		
MCQ1805GS-340-UAEC	3.3	40	66	40		
MCQ1805GS-350-UAEC	3.3	50	52.8	50		
MCQ1805GS-505-BAEC	5	±5	400	±5		
MCQ1805GS-510-BAEC	5	±10	200	±10		
MCQ1805GS-520-BAEC	5	±20	100	±20		
MCQ1805GS-530-BAEC	5	±30	66	±30		
MCQ1805GS-540-BAEC	5	±40	50	±40		
MCQ1805GS-550-BAEC	5	±50	40	±50		
MCQ1805GS-505-UAEC	5	5	800	5		
MCQ1805GS-510-UAEC	5	10	400	10		
MCQ1805GS-520-UAEC	5	20	200	20		
MCQ1805GS-530-UAEC	5	30	132	30		
MCQ1805GS-540-UAEC	5	40	100	40		
MCQ1805GS-550-UAEC	5	50	80	50		

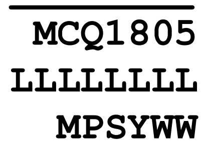
* For Tape & Reel, add suffix -Z (e.g. MCQ1805GS-305-BAEC-Z).

** Contact an MPS FAE for additional variants.

PART NUMBERING (MCQ1805GS-ABB-CDDDAEC)

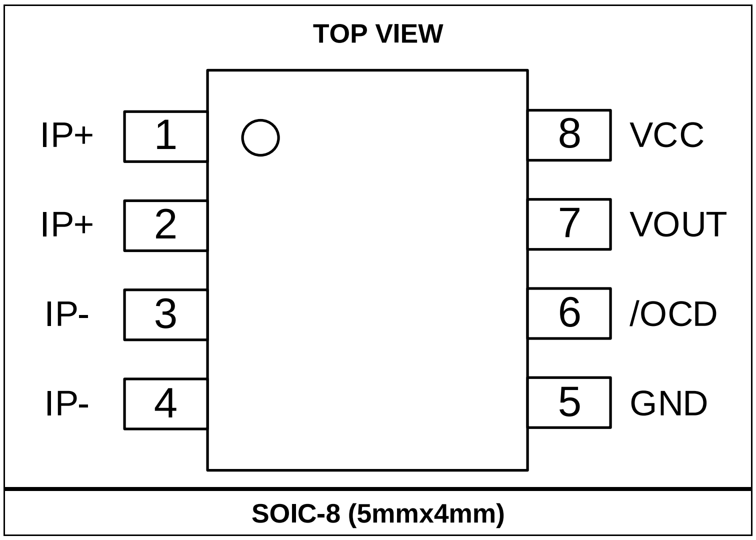
G	Operating temperature (T_J): -40°C to +125°C	C	Current polarity: B = Bidirectional U = Unidirectional
S	Package code for SOIC-8	DDD	OCD threshold: Blank = 100% I_{PMAX} (default) 050 = 50% of I_{PMAX} 150 = 150% of I_{PMAX} Contact the factory for other OCD level options.
A	Supply voltage: 3 = 3.3V supply 5 = 5V supply	AEC	AECQ-100 qualified
BB	Rated current range		

TOP MARKING



MCQ1805: Part number
LLLLLLLL: Lot number
MPS: MPS prefix
Y: Year code
WW: Week code

PACKAGE REFERENCE



PIN FUNCTIONS

Pin #	Name	Description
1, 2	IP+	**Primary current (+).** IP+ is the positive terminal pin for the current being sampled. The IP+ pins are connected together internally.
3, 4	IP-	**Primary current (-).** IP- is the negative terminal pin for the current being sampled. The IP- pins are connected together internally.
5	GND	**Ground.** GND is the signal ground terminal pin.
6	/OCD	**Over-current detection.** The /OCD pin is an open-drain, active-low output. Connect a 10kΩ to 500kΩ resistor between the /OCD and VCC pins.
7	VOUT	**Analog output.**
8	VCC	**Voltage supply.** Connect a 0.1µF to 1µF bypass capacitor between the VCC and GND pins.

ABSOLUTE MAXIMUM RATINGS (1)

Supply voltage (V_{CC}) ....-0.3V to +6.5V
Output voltage (V_{OUT})...................-0.3V to +6.5V
$V_{/OCD}$...-0.3V to +6.5V
Junction temperature (T_J) ....165°C
Lead temperature ....260°C
Storage temperature .... -65°C to +165°C

ESD Ratings

Human body model (HBM) .... ±2kV
Charged-device model (CDM) .... ±2kV

Recommended Operating Conditions (2)

V_{CC} for the 3.3V option....................... 3V to 3.6V
V_{CC} for the 5V option....................... 4.5V to 5.5V
Operating junction temp (T_J).....-40°C to +125°C

Notes:

1) Exceeding these ratings may damage the device.
2) The device is not guaranteed to function outside of its operating conditions.

ISOLATION CHARACTERISTICS

Parameters	Symbol	Condition	Rating	Units
Dielectric surge strength test voltage	V_{SURGE}	Test ±5 pulses at 2 pulses per minute, 1.2µs rise, 50µs width, according to IEC 61000-4-5	6000	V
Withstand isolation voltage	V_{ISO}	Agency type-tested for 60s, 100% tested in production, in accordance with IEC62368-1:2018	3000	V_{RMS}
Maximum isolation working voltage	V_{IOWM}	Maximum approved working voltage for basic isolation, according to IEC 62368-1:2018	820	V_{PK} or V_{DC}
			580	V_{RMS}
External clearance	CLR	Shortest distance through the air from the IP+ and IP- leads to the signal leads	4.2	mm
External creepage	CPG	Shortest distance along the package body from the IP+ and IP- leads to the signal leads	4.2	mm

WITHSTANDING CURRENT CAPABILITY

Parameters	Symbol	Conditions	Rating	Units
Surge current test	I_{SURGE}	Test ±5 pulses at 2 pulse per minute, 8µs rise, 20µs width, according to IEC61000-4-5	3000	A
Transient current test (3)	$I_{TRANSIENT}$	Single peak, 10ms	200	A

Note:

3) For the detailed transient current capability test, refer to MPS application note AN178, available on the MPS website.

MCQ1805 COMMON ELECTRICAL CHARACTERISTICS

V_{CC} = 3.3V for the 3.3V option, V_{CC} = 5V for the 5V option, T_J = -40°C to +125°C, typical values are tested at T_J = 25°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ	Max	Units
Supply voltage	V_{CC}	3.3V option	3		3.6	V
		5V option	4.5		5.5	V
V_{CC} under-voltage lockout (UVLO) threshold	V_{CC_UVLO}	V_{CC} rising	2	2.5	3	V
V_{CC} UVLO hysteresis	$V_{CC\_UVLO\_HYS}$			400	500	mV
Operating supply current	I_{CC}	V_{CC} = 3.3V for 3.3V option		8	12	mA
		V_{CC} = 5V for 5V option		8	12	mA
Output capacitance load (6)	C_L	From VOUT to GND			4.7	nF
Output resistive load (6)	R_L	From VOUT to GND	4.7			kΩ
Primary conductor resistance	R_P	Effective		1.2		mΩ
Frequency bandwidth	f_{BW}			120		kHz
Power-on time	t_{PO}	$I_P = I_{PMAX}$		80		µs
Rising time	t_R	$I_P = I_{PMAX}$		3		µs
Propagation delay	t_{PD}	$I_P = I_{PMAX}$		2		µs
Response time	$t_{RESPONSE}$	$I_P = I_{PMAX}$		4		µs
Noise density	I_{ND}	Input referred noise density		100		µA(rms) / √Hz
Noise	I_N	Input referred noise, 120kHz bandwidth		35		$mA_{(RMS)}$
Nonlinearity	E_{LIN}	Across the full I_P range		0.5		%
Ratiometry (6)	K_{SENS}	$V_{CC} = V_{CC\_MIN}$ to V_{CC_MAX}	98	100	102	%
	K_{VO}	$V_{CC} = V_{CC\_MIN}$ to V_{CC_MAX}, I_P = 0A	99	100	101	%
Zero-current output voltage (V_{OUT})	$V_{OUT(Q)}$	I_P = 0A, bidirectional option		V_{CC} / 2		V
		I_P = 0A, unidirectional option		0.1 x V_{CC}		V
First Hall magnetic coupling factor	P_{MCF1}			1.15		mT/A
Second Hall magnetic coupling factor	P_{MCF2}			0.25		mT/A
Hall plate matching	M_H			±1		%
Saturation voltage (4) (6)	$V_{OUT(H)}$	3.3V option, R_L = 4.7kΩ, T_J = 25°C	V_{CC} - 0.3			V
		5V option, R_L = 4.7kΩ, T_J = 25°C	V_{CC} - 0.5			V
	$V_{OUT(L)}$	3.3V option, R_L = 4.7kΩ, T_J = 25°C			0.3	V
		5V option, R_L = 4.7kΩ, T_J = 25°C			0.5	V

MCQ1805 COMMON ELECTRICAL CHARACTERISTICS *(continued)*

V_{CC} = 3.3V for the 3.3V option, V_{CC} = 5V for the 5V option, T_J = -40°C to +125°C, typical values are tested at T_J = 25°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ	Max	Units
/OCD low voltage (6)	$V_{/OCD\_L}$	Over-current detection (OCD) triggered, R_{PU} = 10kΩ			0.3	V
/OCD external pull-up resistance (6)	R_{PU}	Connect from /OCD to VCC	10		500	kΩ
OCD current hysteresis	$I_{/OCD\_HYS}$	Percentage of $I_{/OCD}$	3	12		%
OCD error	$E_{/OCD}$		-10	±5	+10	%
OCD response time (6)	$t_{RESPONSE\_/OCD}$	Time from $I_P > I_{/OCD}$ to $V_{/OCD}$ falling below $V_{/OCD\_L}$		1	1.5	µs

MCQ1805-305-BAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 3.3V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		-5		+5	A
Sensitivity	SENS	-5A ≤ I_P ≤ +5A, T_J = 25°C		264		mV/A
Sensitivity error	E_{SENS}	I_P = 5A, T_J = 25°C to 125°C	-2		+2	%
		I_P = 5A, T_J = -40°C to +25°C		±1.5		%
Offset voltage	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-15		+15	mV
		I_P = 0A, T_J = -40°C to +25°C		±10		mV
Total output error	E_{TOT}	I_P = 5A, T_J = 25°C to 125°C	-2.5		+2.5	%
		I_P = 5A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

MCQ1805-310-BAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 3.3V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		-10		+10	A
Sensitivity	SENS	-10A ≤ I_P ≤ +10A, T_J = 25°C		132		mV/A
Sensitivity error	E_{SENS}	I_P = 10A, T_J = 25°C to 125°C	-2		+2	%
		I_P = 10A, T_J = -40°C to +25°C		±1.5		%
Offset voltage	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-10		+10	mV
		I_P = 0A, T_J = -40°C to +25°C		±5		mV
Total output error	E_{TOT}	I_P = 10A, T_J = 25°C to 125°C	-2.5		+2.5	%
		I_P = 10A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

MCQ1805-320-BAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 3.3V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		-20		+20	A
Sensitivity	SENS	-20A ≤ I_P ≤ +20A, T_J = 25°C		66		mV/A
Sensitivity error	E_{SENS}	I_P = 20A, T_J = 25°C to 125°C	-2		+2	%
		I_P = 20A, T_J = -40°C to +25°C		±1.5		%
Offset voltage	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-10		+10	mV
		I_P = 0A, T_J = -40°C to +25°C		±5		mV
Total output error	E_{TOT}	I_P = 20A, T_J = 25°C to 125°C	-2.5		+2.5	%
		I_P = 20A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

MCQ1805-330-BAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 3.3V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		-30		+30	A
Sensitivity	SENS	-30A ≤ I_P ≤ +30A, T_J = 25°C		44		mV/A
Sensitivity error	E_{SENS}	I_P = 30A, T_J = 25°C to 125°C	-2		+2	%
		I_P = 30A, T_J = -40°C to +25°C		±1.5		%
Offset voltage	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-10		+10	mV
		I_P = 0A, T_J = -40°C to +25°C		±5		mV
Total output error	E_{TOT}	I_P = 30A, T_J = 25°C to 125°C	-2.5		+2.5	%
		I_P = 30A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

MCQ1805-340-BAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 3.3V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		-40		+40	A
Sensitivity	SENS	-40A ≤ I_P ≤ +40A, T_J = 25°C		33		mV/A
Sensitivity error	E_{SENS}	I_P = 40A, T_J = 25°C to 125°C	-2		+2	%
		I_P = 40A, T_J = -40°C to +25°C		±1.5		%
Offset voltage	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-10		+10	mV
		I_P = 0A, T_J = -40°C to +25°C		±5		mV
Total output error	E_{TOT}	I_P = 40A, T_J = 25°C to 125°C	-2.5		+2.5	%
		I_P = 40A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

MCQ1805-350-BAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 3.3V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		-50		+50	A
Sensitivity	SENS	-50A ≤ I_P ≤ +50A, T_J = 25°C		26.4		mV/A
Sensitivity error	E_{SENS}	I_P = 50A, T_J = 25°C to 125°C	-2		+2	%
		I_P = 50A, T_J = -40°C to +25°C		±1.5		%
Offset voltage	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-10		+10	mV
		I_P = 0A, T_J = -40°C to +25°C		±5		mV
Total output error	E_{TOT}	I_P = 50A, T_J = 25°C to 125°C	-2.5		+2.5	%
		I_P = 50A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

MCQ1805-305-UAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 3.3V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		0		5	A
Sensitivity	SENS	0A ≤ I_P ≤ 5A, T_J = 25°C		528		mV/A
Sensitivity error	E_{SENS}	I_P = 5A, T_J = 25°C to 125°C	-2		+2	%
		I_P = 5A, T_J = -40°C to +25°C		±1.5		%
Offset voltage	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-15		+15	mV
		I_P = 0A, T_J = -40°C to +25°C		±10		mV
Total output error	E_{TOT}	I_P = 5A, T_J = 25°C to 125°C	-2.5		+2.5	%
		I_P = 5A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

MCQ1805-310-UAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 3.3V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		0		10	A
Sensitivity	SENS	0A ≤ I_P ≤ 10A, T_J = 25°C		264		mV/A
Sensitivity error	E_{SENS}	I_P = 10A, T_J = 25°C to 125°C	-2		+2	%
		I_P = 10A, T_J = -40°C to +25°C		±1.5		%
Offset voltage	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-10		+10	mV
		I_P = 0A, T_J =- 40°C to +25°C		±5		mV
Total output error	E_{TOT}	I_P = 10A, T_J = 25°C to 125°C	-2.5		+2.5	%
		I_P = 10A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

MCQ1805-320-UAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 3.3V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		0		20	A
Sensitivity	SENS	0A ≤ I_P ≤ 20A, T_J = 25°C		132		mV/A
Sensitivity error	E_{SENS}	I_P= 20A, T_J = 25°C to 125°C	-2		+2	%
		I_P = 20A, T_J = -40°C to +25°C		±1.5		%
Offset voltage	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-10		+10	mV
		I_P = 0A, T_J = -40°C to +25°C		±5		mV
Total output error	E_{TOT}	I_P = 20A, T_J = 25°C to 125°C	-2.5		+2.5	%
		I_P = 20A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

MCQ1805-330-UAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 3.3V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		0		30	A
Sensitivity	SENS	0A ≤ I_P ≤ 30A, T_J = 25°C		88		mV/A
Sensitivity error	E_{SENS}	I_P = 30A, T_J = 25°C to 125°C	-2		+2	%
		I_P = 30A, T_J = -40°C to +25°C		±1.5		%
Offset voltage	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-10		+10	mV
		I_P = 0A, T_J = -40°C to +25°C		±5		mV
Total output error	E_{TOT}	I_P = 30A, T_J = 25°C to 125°C	-2.5		+2.5	%
		I_P = 30A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

MCQ1805-340-UAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 3.3V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		0		40	A
Sensitivity	SENS	0A ≤ I_P ≤ 40A, T_J = 25°C		66		mV/A
Sensitivity error	E_{SENS}	I_P = 40A, T_J = 25°C to 125°C	-2		+2	%
		I_P = 40A, T_J = -40°C to +25°C		±1.5		%
Offset voltage	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-10		+10	mV
		I_P = 0A, T_J = -40°C to +25°C		±5		mV
Total output error	E_{TOT}	I_P = 40A, T_J = 25°C to 125°C	-2.5		+2.5	%
		I_P = 40A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

MCQ1805-350-UAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 3.3V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		0		50	A
Sensitivity	SENS	0A ≤ I_P ≤ 50A, T_J = 25°C		52.8		mV/A
Sensitivity error	E_{SENS}	I_P = 50A, T_J = 25°C to 125°C	-2		+2	%
		I_P = 50A, T_J = -40°C to +25°C		±1.5		%
Offset voltage	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-10		+10	mV
		I_P = 0A, T_J = -40°C to +25°C		±5		mV
Total output error	E_{TOT}	I_P = 50A, T_J = 25°C to 125°C	-2.5		+2.5	%
		I_P = 50A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

MCQ1805-505-BAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 5V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		-5		+5	A
Sensitivity	SENS	-5A ≤ I_P ≤ +5A, T_J = 25°C		400		mV/A
Sensitivity error	E_{SENS}	I_P = 5A, T_J = 25°C to 125°C	-2		+2	%
		I_P = 5A, T_J = -40°C to +25°C		±1.5		%
Offset voltage	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-15		+15	mV
		I_P = 0A, T_J = -40°C to +25°C		±10		mV
Total output error	E_{TOT}	I_P = 5A, T_J = 25°C to 125°C	-2.5		+2.5	%
		I_P = 5A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

MCQ1805-510-BAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 5V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		-10		+10	A
Sensitivity	SENS	-10A ≤ I_P ≤ +10A, T_J = 25°C		200		mV/A
Sensitivity error	E_{SENS}	I_P = 10A, T_J = 25°C to 125°C	-2		+2	%
		I_P = 10A, T_J = -40°C to +25°C		±1.5		%
Offset voltage	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-15		+15	mV
		I_P = 0A, T_J = -40°C to +25°C		±10		mV
Total output error	E_{TOT}	I_P = 10A, T_J = 25°C to 125°C	-2.5		+2.5	%
		I_P = 10A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

MCQ1805-520-BAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 5V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		-20		+20	A
Sensitivity	SENS	-20A ≤ I_P ≤ +20A, T_J = 25°C		100		mV/A
Sensitivity error	E_{SENS}	I_P = 20A, T_J = 25°C to 125°C	-2		+2	%
		I_P = 20A, T_J = -40°C to +25°C		±1.5		%
Offset voltage	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-10		+10	mV
		I_P = 0A, T_J = -40°C to +25°C		±5		mV
Total output error	E_{TOT}	I_P = 20A, T_J = 25°C to 125°C	-2.5		+2.5	%
		I_P = 20A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

MCQ1805-530-BAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 5V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		-30		+30	A
Sensitivity	SENS	-30A ≤ I_P ≤ +30A, T_J = 25°C		66		mV/A
Sensitivity error	E_{SENS}	I_P = 30A, T_J = 25°C to 125°C	-2		+2	%
		I_P = 30A, T_J = -40°C to +25°C		±1.5		%
Offset voltage (6)	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-10		+10	mV
		I_P = 0A, T_J = -40°C to +25°C		±5		mV
Total output error	E_{TOT}	I_P = 30A, T_J = 25°C to 125°C	-2.5		+2.5	%
		I_P = 30A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

MCQ1805-540-BAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 5V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		-40		+40	A
Sensitivity	SENS	-40A ≤ I_P ≤ +40A, T_J = 25°C		50		mV/A
Sensitivity error	E_{SENS}	I_P = 40A, T_J = 25°C to 125°C	-2		+2	%
		I_P = 40A, T_J = -40°C to +25°C		±1.5		%
Offset voltage	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-10		+10	mV
		I_P = 0A, T_J = -40°C to +25°C		±5		mV
Total output error	E_{TOT}	I_P = 40A, T_J = 25°C to 125°C	-2.5		+2.5	%
		I_P = 40A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

MCQ1805-550-BAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 5V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		-50		+50	A
Sensitivity	SENS	-50A ≤ I_P ≤ +50A, T_J = 25°C		40		mV/A
Sensitivity error	E_{SENS}	I_P = 50A, T_J= 25°C to 125°C	-2		+2	%
		I_P = 50A, T_J = -40°C to +25°C		±1.5		%
Offset voltage	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-10		+10	mV
		I_P = 0A, T_J = -40°C to +25°C		±5		mV
Total output error	E_{TOT}	I_P = 50A, T_J = 25°C to 125°C	-2.5		+2.5	%
		I_P = 50A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

MCQ1805-505-UAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 5V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		0		5	A
Sensitivity	SENS	0A ≤ I_P ≤ 5A, T_J = 25°C		800		mV/A
Sensitivity error	E_{SENS}	I_P = 5A, T_J = 25°C to 125°C	-2		+2	%
		I_P = 5A, T_J = -40°C to +25°C		±1.5		%
Offset voltage	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-35		+35	mV
		I_P = 0A, T_J = -40°C to +25°C		±20		mV
Total output error	E_{TOT}	I_P = 5A, T_J = 25°C to 125°C	-2.5		+2.5	%
		I_P = 5A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

MCQ1805-510-UAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 5V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		0		10	A
Sensitivity	SENS	0A ≤ I_P ≤ 10A, T_J = 25°C		400		mV/A
Sensitivity error	E_{SENS}	I_P = 10A, T_J = 25°C to 125°C	-2		+2	%
		I_P = 10A, T_J = -40°C to +25°C		±1.5		%
Offset voltage	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-20		+20	mV
		I_P = 0A, T_J = -40°C to +25°C		±10		mV
Total output error	E_{TOT}	I_P = 10A, T_J = 25°C to 125°C	-2.5		+2.5	%
		I_P = 10A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

MCQ1805-520-UAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 5V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		0		20	A
Sensitivity	SENS	0A ≤ I_P ≤ 20A, T_J = 25°C		200		mV/A
Sensitivity error	E_{SENS}	I_P = 20A, T_J = 25°C to 125°C	-2		+2	%
		I_P = 20A, T_J = -40°C to +25°C		±1.5		%
Offset voltage	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-10		+10	mV
		I_P = 0A, T_J = -40°C to +25°C		±5		mV
Total output error	E_{TOT}	I_P = 20A, T_J = 25°C to 125°C	-2.5		+2.5	%
		I_P = 20A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

MCQ1805-530-UAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 5V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		0		30	A
Sensitivity	SENS	0A ≤ I_P ≤ 30A, T_J = 25°C		132		mV/A
Sensitivity error	E_{SENS}	I_P = 30A, T_J = 25°C to 125°C	-2		+2	%
		I_P = 30A, T_J = -40°C to +25°C		±1.5		%
Offset voltage	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-10		+10	mV
		I_P =0A, T_J = -40°C to +25°C		±5		mV
Total output error	E_{TOT}	I_P = 30A, T_J = 25°C to 125°C	-2.5		+2.5	%
		I_P = 30A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

MCQ1805-540-UAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 5V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		0		40	A
Sensitivity	SENS	0A ≤ I_P ≤ 40A, T_J = 25°C		100		mV/A
Sensitivity error	E_{SENS}	I_P = 40A, T_J = 25°C to 125°C	-2		+2	%
		I_P = 40A, T_J = -40°C to +25°C		±1.5		%
Offset voltage	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-10		+10	mV
		I_P = 0A, T_J = -40°C to +25°C		±5		mV
Total output error	E_{TOT}	I_P = 40A, T_J = 25°C to 125°C	-2.5		+2.5	%
		I_P = 40A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

MCQ1805-550-UAEC PERFORMANCE CHARACTERISTICS

V_{CC} = 5V, T_J = -40°C to +125°C, unless otherwise noted.

Parameters	Symbol	Condition	Min	Typ (5)	Max	Units
Rated current range	I_P		0		50	A
Sensitivity	SENS	0A ≤ I_P ≤ 50A, T_J = 25°C		80		mV/A
Sensitivity error	E_{SENS}	I_P = 50A, T_J = 25°C to 125°C	-2		+2	%
		I_P = 50A, T_J = -40°C to +25°C		±1.5		%
Offset voltage	V_{OE}	I_P = 0A, T_J = 25°C to 125°C	-10		+10	mV
		I_P = 0A, T_J = -40°C to +25°C		±5		mV
Total output error	E_{TOT}	I_P = 50A, T_J =25°C to 125°C	-2.5		+2.5	%
		I_P = 50A, T_J = -40°C to +25°C		±2		%
Sensitivity error lifetime drift	$E_{SENS(D)}$			±1		%
Total output error lifetime drift	$E_{TOT(D)}$			±1		%

Notes:

4) Beyond the rated current range, the current sensor continues to provide an analog V_{OUT} proportional to the primary current (I_P) until the device reaches the high or low saturation voltage. the nonlinearity increases when I_P exceeds the upper end of the specified rated current range (I_{PMAX}).
5) Typical values with "±" are ±3σ values.
6) Guaranteed by design and characterization.

FUNCTIONAL BLOCK DIAGRAM

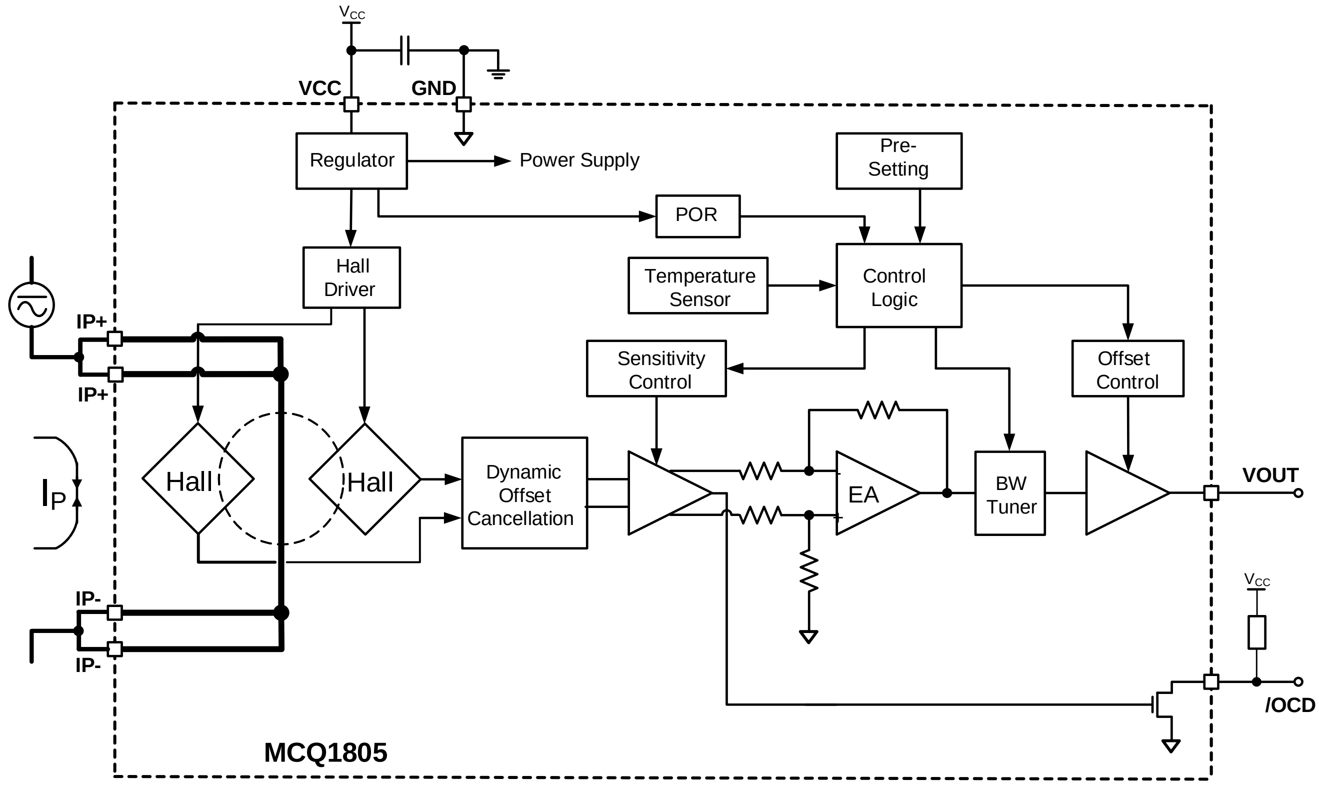


Figure 1: Functional Block Diagram

OPERATION

Current Rating

I_{PMAX} is the rated current. The sensor output is linear, and is a function of the primary current (I_P). The output voltage (V_{OUT}) follows the specified performances when I_P is within the rated current range (-I_{PMAX} and + I_{PMAX}) (see Figure 2).

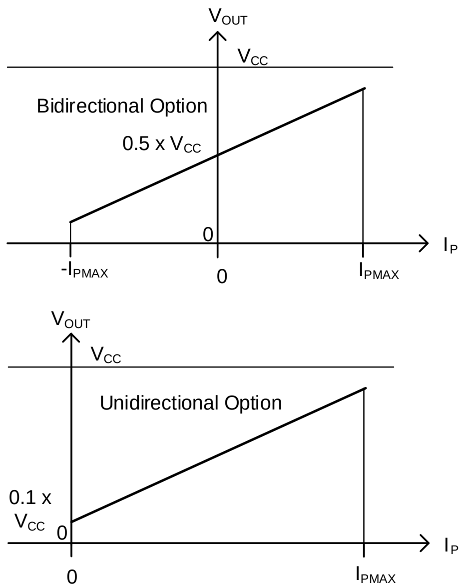


Figure 2: Sensor Output Function

The sensor's ideal V_{OUT} can be calculated with Equation (1):

$$V_{OUT\_IDEAL}(I_P) = V_{OUT(Q)\_TYP} + SENS_{\_TYP} \times I_P \quad (1)$$

Where $V_{OUT(Q)\_TYP}$ is the typical zero-current V_{OUT}, and $SENS_{\_TYP}$ is the typical sensitivity.

Sensitivity (SENS)

The sensitivity (SENS, in mV/A) indicates how the output changes when I_P changes. SENS is the product of the average between the two coupling constants (P_{MCF1} and P_{MCF2}, in mT/A) and the transducer gain (in mV/mT). The gain is factory-trimmed to the sensor's target sensitivity.

Coupling Constants (P_{MCF1} and P_{MCF2})

Figure 3 shows a cross-section of the sensor. The first and second Hall magnetic coupling factors are defined as the amount of vertical magnetic field produced at the sensing points 1 and 2 (B_1 and B_2, respectively) per unit of current injected in the primary conductor. Due to the asymmetrical shape of the primary conductor, the magnetic field generated in the two sensing points is different.

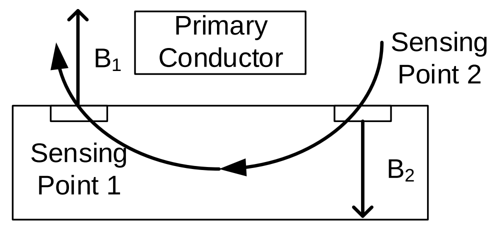


Figure 3: Sensor Cross-Section

Noise (I_N)

The noise (I_N) is a random deviation that cannot be removed by calibrating the device. The input's referred noise is the root mean square (RMS) of the sensor's output noise (in mV), divided by SENS (in mV/A). I_N represents the smallest current that the device is able to resolve without any external signal treatment.

Zero-Current Output Voltage ($V_{OUT(Q)}$)

The zero-current V_{OUT} ($V_{OUT(Q)}$) is V_{OUT} while I_P is 0A. See the Electrical Characteristics section on page 7 for the typical value.

Offset Voltage (V_{OE})

The offset voltage (V_{OE}) is the difference between the typical $V_{OUT(Q)}$ and the actual $V_{OUT(Q)}$. The variation is due to thermal drift, as well as the factory's resolution limits related to voltage offset trimming. To convert this voltage into amperes, divide V_{OE} by SENS.

Nonlinearity (E_{LIN})

I_P and the sensor output should have a linear relationship, indicated by a straight line. A line that is not straight indicates nonlinearity (E_{LIN}), which is a deviation.

E_{LIN} (in %) can be estimated with Equation (2):

$$E_{LIN} = \frac{Max(V_{OUT}(I_P) - V_{LIN}(I_P))}{V_{OUT}(I_{PMAX}) - V_{OUT}(-I_{PMAX})} \times 100 \quad (2)$$

Where $V_{LIN}(I_P)$ is the approximate straight line calculated by the least square method.

Note that depending on the curvature of $V_{OUT}(I_P)$, E_{LIN} can be positive or negative.

Total Output Error (E_{TOT})

The total output error (E_{TOT}, in %) is the relative difference between the sensor output and the ideal output at a given I_P. E_{TOT} can be calculated with Equation (3):

$$E_{TOT}(I_P) = \frac{V_{OUT}(I_P) - V_{OUT\_IDEAL}(I_P)}{SENS_{\_TYP} \times I_P} \times 100 \quad (3)$$

Where $SENS_{\_TYP}$ is the typical sensitivity, and $V_{OUT\_IDEAL}(I_P)$ is the ideal V_{OUT} calculated with Equation (1) on page 18.

E_{TOT} incorporates all error sources, and is a function of I_P. At currents close to I_{PMAX}, E_{TOT} is mainly affected by the SENS error. At currents close to 0A, E_{TOT} is mostly caused by V_{OE}. Note that when I_P = 0A, E_{TOT} diverges to infinity due to the constant offset.

Ratiometry Coefficients

Ideally, the sensor output should be ratiometric. This means that SENS and $V_{OUT(Q)}$ scale with the supply voltage (V_{CC}). The ratiometry coefficients (K_{SENS} and K_{VO}) measure whether the SENS and $V_{OUT(Q)}$ are proportional.

K_{SENS} can be estimated with Equation (4):

$$K_{SENS} = \frac{SENS(V_{CC}) / SENS(V_{CC\_TYP})}{V_{CC} / V_{CC\_TYP}} \quad (4)$$

K_{VO} can be calculated with Equation (5):

$$K_{VO} = \frac{V_{OUT}(I_P = 0, V_{CC}) / V_{OUT}(I_P = 0, V_{CC\_TYP})}{V_{CC} / V_{CC\_TYP}} \quad (5)$$

Where V_{CC_TYP} is 3.3V for the 3.3V option, and V_{CC_TYP} is 5V for the 5V option.

Ideally both K_{SENS} and K_{VO} should equal 1.

Power-On Time (t_{PO})

The power-on time (t_{PO}) is the time interval from when power is first applied to the device until the output can correctly indicate the applied I_P. t_{PO} is defined as the time between the following moments:

1. t1: V_{CC} reaches the minimum operating voltage (V_{CC_UVLO}).
2. t2: V_{OUT} reaches 90% of its final value (V_{OUT_FINAL}) under an applied I_P (see Figure 4).

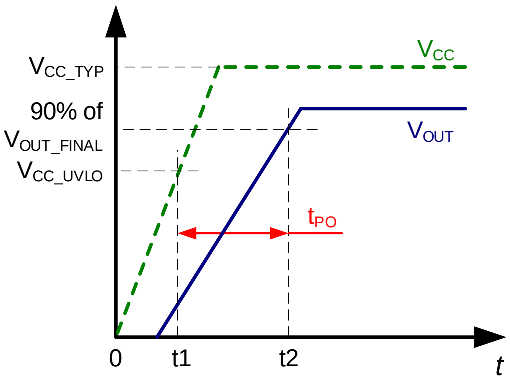


Figure 4: Power-On Time (t_{PO})

Propagation Delay (t_{PD})

The propagation delay (t_{PD}) represents the internal latency between an event that has been measured and the sensor's response. t_{PD} is defined as the time between the following moments:

1. t1: I_P reaches 20% of its final value (I_{P_FINAL}).
2. t2: V_{OUT} reaches 20% of V_{OUT_FINAL}, as it corresponds to the applied I_P (see Figure 5).

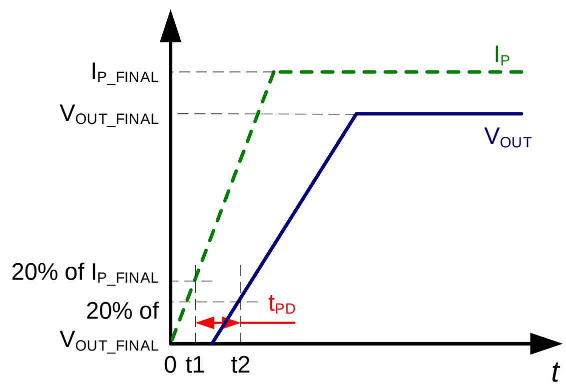


Figure 5: Propagation Delay (t_{PD})

Rising Time (t_R)

The rising time (t_R) is defined as the time between the following moments:

1. t1: The sensor's V_{OUT} reaches 10% of its full-scale value (V_{OUT_MAX}).
2. t2: The sensor's V_{OUT} reaches 90% of V_{OUT_MAX} (see Figure 6 on page 20).

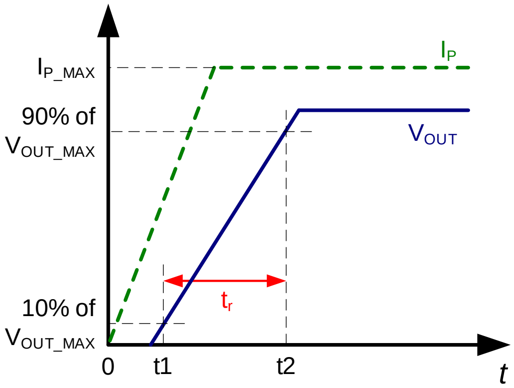


Figure 6: Rising Time (t_R)

The sensor bandwidth (f_{BW}) is defined as the 3dB cutoff frequency. Using t_R, f_{BW} can be estimated with Equation (6):

$$f_{BW} = 0.35 / t_R \quad (6)$$

Response Time ($t_{RESPONSE}$)

The response time ($t_{RESPONSE}$) is defined as the time between the following moments:

1. t1: The I_P signal reaches 90% of I_{P_FINAL}.
2. t2: V_{OUT} reaches 90% of V_{OUT_FINAL}, as it corresponds to the applied I_P (see Figure 7).
3.

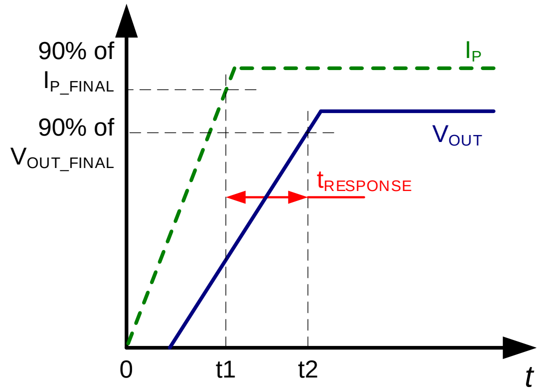


Figure 7: Response Time ($t_{RESPONSE}$)

APPLICATION INFORMATION

Over-Current Detection (OCD)

The MCQ1805 integrates fast over-current detection (OCD) via the /OCD pin. When I_P exceeds the current limit ($I_{/OCD}$), a high-speed detection circuit triggers OCD during the OCD response time ($t_{RESPONSE\_/OCD}$). $I_{/OCD}$ can be preset between 50% and 240% of I_{PMAX} for different part numbers. Figure 8 shows OCD timing.

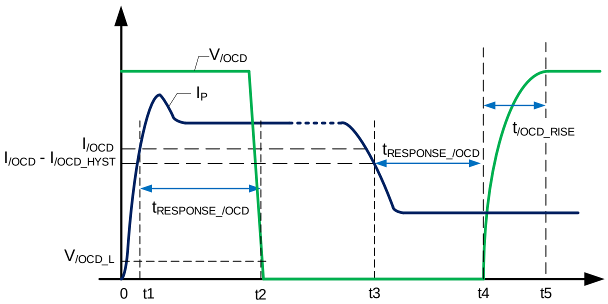


Figure 8: OCD Timing

If I_P remains at $I_{/OCD}$ for longer than $t_{RESPONSE\_/OCD}$, then the /OCD pin voltage ($V_{/OCD}$) is pulled down to the /OCD low voltage threshold ($V_{/OCD\_L}$).

If I_P falls below ($I_{/OCD}$ - $I_{/OCD\_HYS}$) during the next $t_{RESPONSE\_/OCD}$, $V_{/OCD}$ rises. $t_{/OCD\_RISE}$ is the time it takes for $V_{/OCD}$ to rise from logic low to logic high. This time is determined by the pull-up resistance (R_{PU}) and the capacitance between the /OCD and GND pins. A small resistance and capacitance results in a fast /OCD rising time.

Self-Heating Performance

The conductor and MCQ1805 temperatures can rise when current flows through the primary conductor. This means that self-heating should be carefully verified to ensure that the IC junction temperature (T_J) does not exceed its maximum threshold (165°C).

The thermal behavior strongly depends on the IC's thermal environment and cooling capacity. In particular, thermal behavior depends on the PCB copper area and thickness. The thermal response is also related to the current (e.g. the amplitude and frequency of an AC current, or the peaks and duty cycle of a pulsed DC current).

Figure 9 shows the self-heating performance of the MCQ1805 with a DC current input. This data was collected with the part mounted on the MCQ1805 evaluation board (see Figure 10 on page 22) when T_A = 25°C. Values were taken after 10 minutes of continuous current.

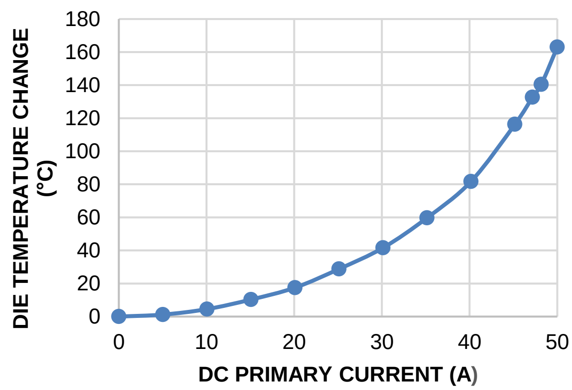
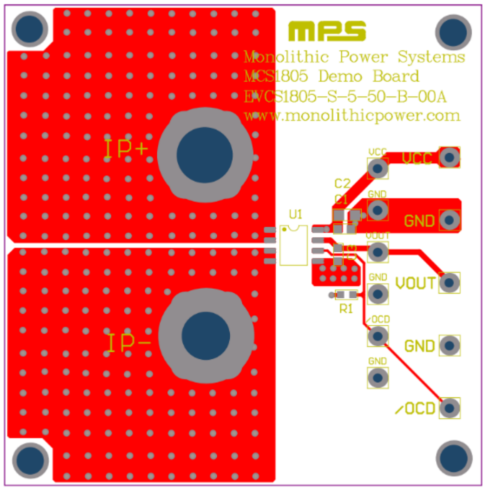
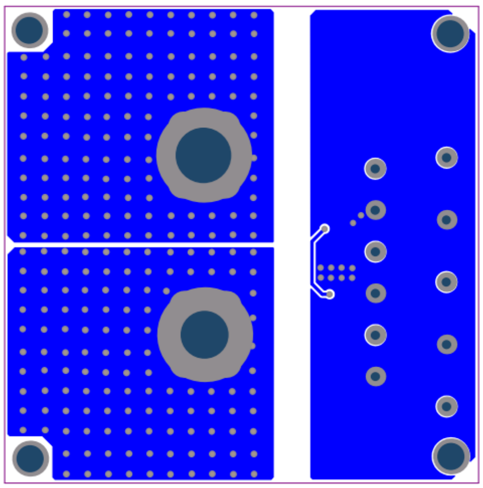


Figure 9: Self-Heating Performance with a DC Current Input

Figure 10 on page 22 shows the top and bottom layers of the MCQS1805's evaluation board. In total, the board includes 37cm^2, and has 4oz of copper connected to the primary conductor via the IP+ and IP- pins. The copper covers both the top and bottom layers. Thermal vias connect the two layers.



Top Layer



Bottom Layer

Figure 10: MCQ1805 Evaluation Board

TYPICAL APPLICATION CIRCUIT

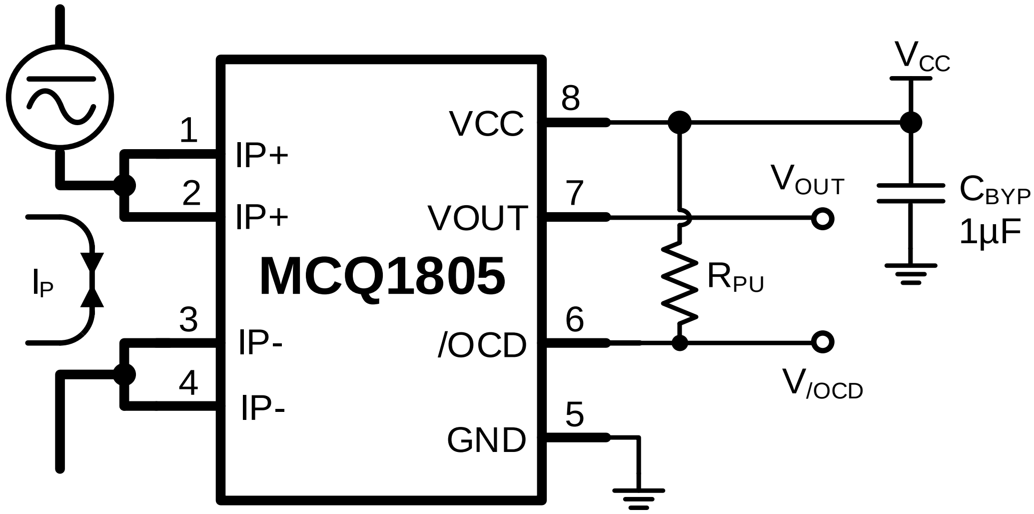
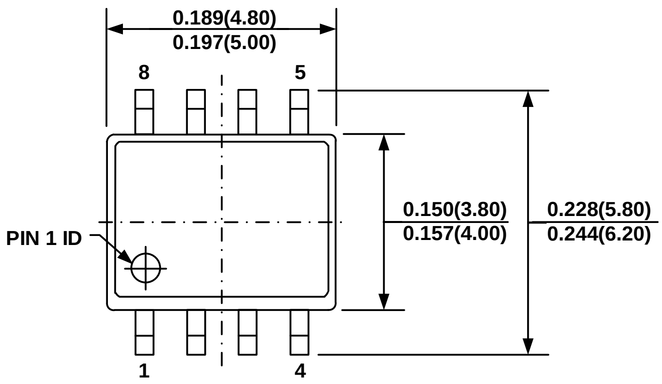


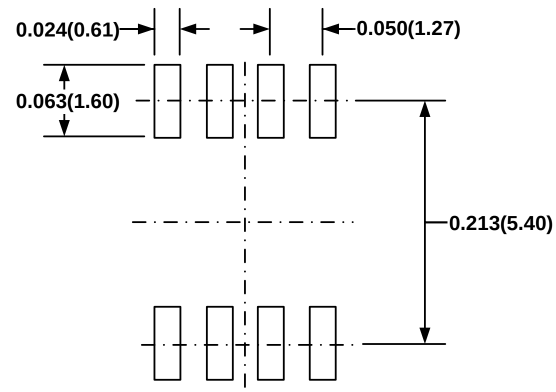
Figure 11: Typical Application Circuit

PACKAGE INFORMATION

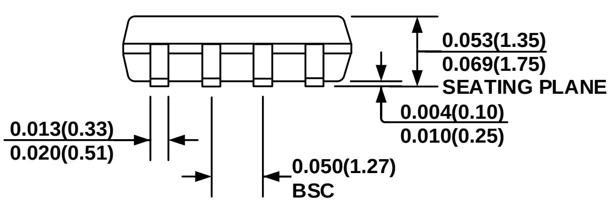
SOIC-8



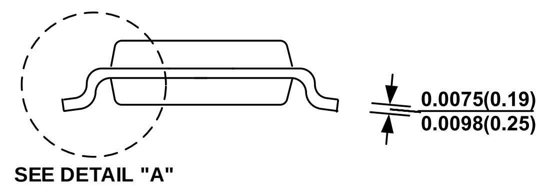
TOP VIEW



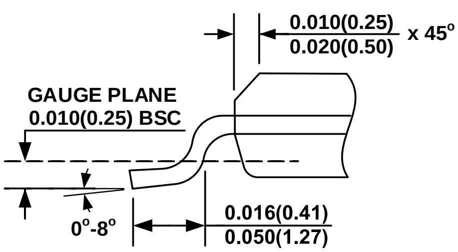
RECOMMENDED LAND PATTERN



FRONT VIEW



SIDE VIEW

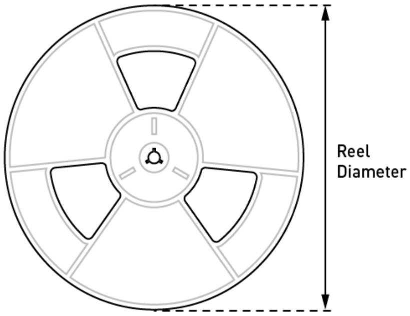


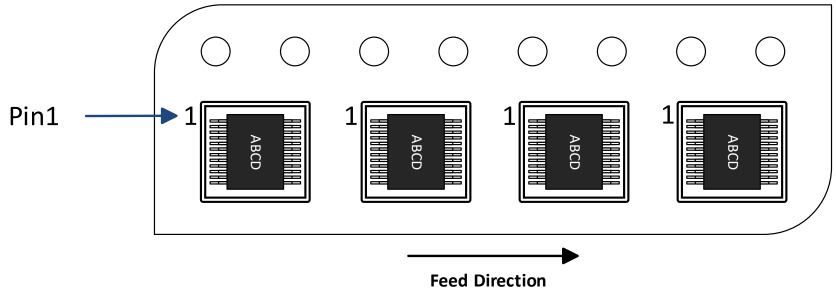
DETAIL "A"

NOTE:

1) CONTROL DIMENSION IS IN INCHES. DIMENSION IN BRACKET IS IN MILLIMETERS.
2) PACKAGE LENGTH DOES NOT INCLUDE MOLD FLASH, PROTRUSION, OR GATE BURRS.
3) PACKAGE WIDTH DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSIONS.
4) LEAD COPLANARITY (BOTTOM OF LEADS AFTER FORMING) SHALL BE 0.004" INCHES MAX.
5) DRAWING CONFORMS TO JEDEC MS-012, VARIATION AA.
6) DRAWING IS NOT TO SCALE.

CARRIER INFORMATION





Part Number	Package Description	Quantity/ Reel	Quantity/ Tube	Quantity/ Tray	Reel Diameter	Carrier Tape Width	Carrier Tape Pitch
MCQ1805GS-505-BAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm
MCQ1805GS-510-BAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm
MCQ1805GS-520-BAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm
MCQ1805GS-530-BAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm
MCQ1805GS-540-BAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm
MCQ1805GS-550-BAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm
MCQ1805GS-505-UAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm
MCQ1805GS-510-UAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm
MCQ1805GS-520-UAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm
MCQ1805GS-530-UAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm
MCQ1805GS-540-UAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm
MCQ1805GS-550-UAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm
MCQ1805GS-305-BAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm
MCQ1805GS-310-BAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm
MCQ1805GS-320-BAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm
MCQ1805GS-330-BAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm
MCQ1805GS-340-BAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm
MCQ1805GS-350-BAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm
MCQ1805GS-305-UAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm
MCQ1805GS-310-UAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm
MCQ1805GS-320-UAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm
MCQ1805GS-330-UAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm
MCQ1805GS-340-UAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm
MCQ1805GS-350-UAEC	SOIC-8	2500	N/A	N/A	13in	12mm	8mm

REVISION HISTORY

Revision #	Revision Date	Description	Pages Updated
1.0	7/18/2023	Initial Release	-
1.01	4/23/2024	Added the UL certification logo	1