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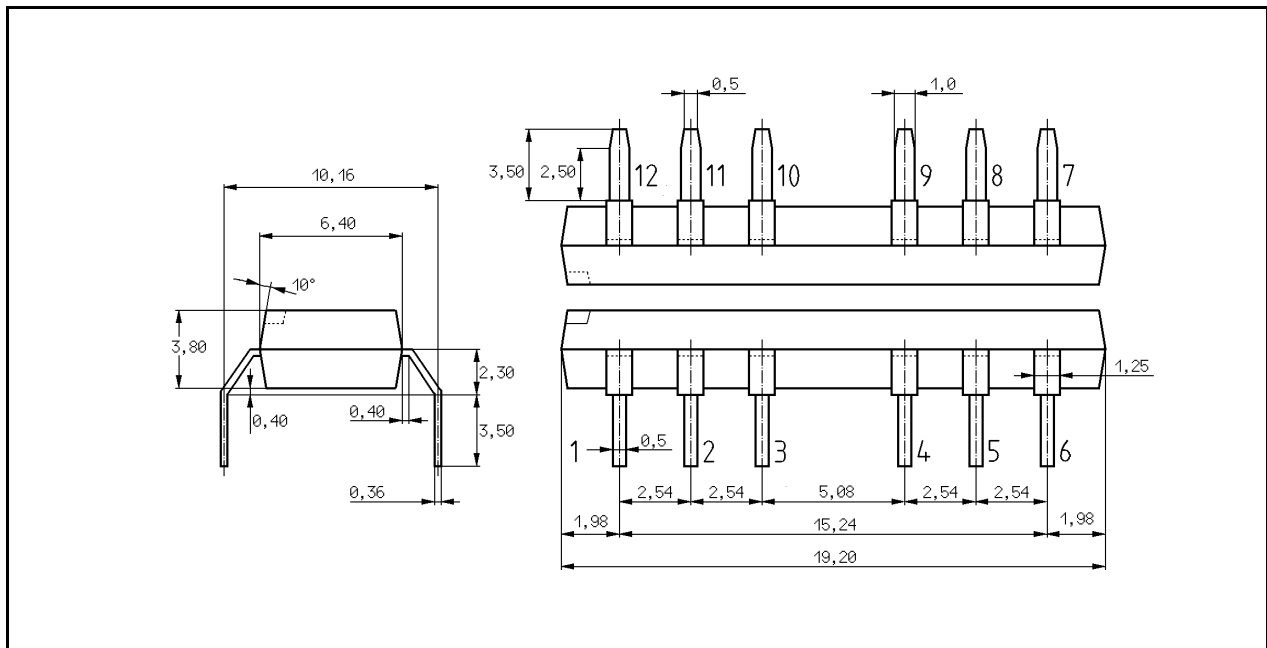
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Current Sensor

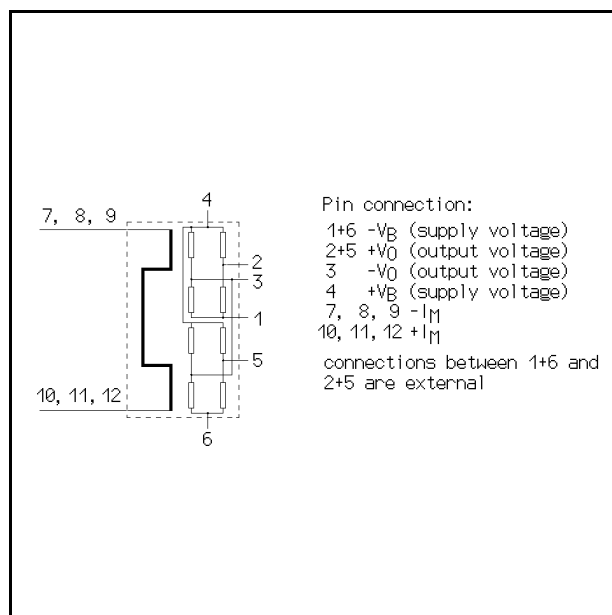
Issue 2 - July 2006

ZMC10D



FEATURES

- Package : mod. DIL-14 (12 pin)
- Double magnetic sensor chip (employing the magnetoresistive effect of thin film permalloy) measures the magnetic field generated by an internal current-carrying conductor
- measurable direct or alternating current I_M up to 10A
- supply voltage 12 V
- no auxiliary field H_X required
- it's possible to overload the conductor (between pin's 8,9,10 and 11,12,13) with 300A for 10 ms at $T_{amb} = 25^\circ C$



ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol		Unit
Supply voltage	V_{br}	12	V
Supply current	I_{br}	20	mA
Measurable current at DC: absolute value at AC: peak value	I_m	10	A
Operating temperature range	T_{amb}	-25 to +100	°C
Storage temperature range	T_{stg}	-25 to +125	°C

ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25\text{ °C}$ unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Input-Output-Insulation (pin 7, 8, 9, 10, 11, 12 shorted together and pin 1, 2, 3, 4, 5, 6 shorted together)	I_{i-o}	-	-	5	nA	test voltage: 2000V DC test time: 1s
Bridge resistance	R_{br}	600	800	1300	Ω	
Temperature coefficient of bridge resistance	T_{crbr}	-	+0.3	-	%/K	$T_{amb} = -25...+100\text{ °C}$
Bridge supply current (con- stant current source)	I_{br}	-	13	-	mA	$T_{amb} = -25...+100\text{ °C}$
Offset coefficient of $V_{outoff1}$ (current supply re- jection ratio)	CSRR	-	± 1.5	± 2.5	mV/mA	
Offset voltage (static, con- stant)	$V_{outoff1}$	-	± 19	≈ 32	mV	$I_{br} = 13\text{mA}$ and $R_{br} = 0.8\text{k}\Omega$
Offset voltage (dynamic, nonlinear)	$V_{outoff2}$	-	-	± 2	mV	in dependence on I_m and T_{amb}
Temperature coefficient of $V_{outoff1}$	T_{cvoff1}	-35	-	+35	$\mu\text{V/K}$	$I_{br} = 13\text{mA}$ and $R_{br} = 0.8\text{k}\Omega$
Open circuit sensitivity (absolute V_{out}/I_m , with off- set compensation, no dis- turbance field allowed)	S_a	2.7	3.9	5.1	mV/A	$I_{br} = 13\text{mA}$ and $R_{br} = 0.8\text{k}\Omega$
Resistance of the conductor	R	-	0.7	-	m Ω	$I_m \leq 10\text{A}$
Operating frequency	f_{max}	0	-	100	kHz	

ZMC 10D

ELECTRICAL CHARACTERISTICS (at T_{amb} = 25 °C unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Temperature coefficient of S _a	T _{csi}	-	-	-0.12	%/K	I _{br} = 13mA and R _{br} = 0.8kΩ
Output voltage range	V _{out}	-	—	<±10 0	mV	I _{br} = 13mA and R _{br} = 0.8kΩ
Nonlinearity error of S _a	NLE	-	6	—	%	I _{m1} = 1A; I _{m2} = 2A
Disturbance signal influence on disturbing field H _d (V _{out} = I _m *S _a + V _{outhd})	V _{outhd}	-	±0.5	-	mV	I _{br} = 13mA; R _{br} = 0.8kΩ and H _d = 10A/m in 50mm distance to sensor

Equations of condition:

$$V_{\text{outoff1}} [\text{mV}] = \text{CSRR} [\text{mV/mA}] * I_{\text{br}} [\text{mA}]$$

$$\text{CSRR} [\text{mV/mA}] = (R_{34} + R_{12} - R_{24} - R_{13}) [\Omega] * 0.5 \quad (\text{at } I_m = 0)$$

pinning of magnetoresistive resistors:

R₃₄ : between pin 3 and pin 4

R₁₂ : between pin 1 and pin 2

R₂₄ : between pin 2 and pin 4

R₁₃ : between pin 1 and pin 3

external connections:

pin 2 shorted to pin 5

pin 1 shorted to pin 6

Circuit connections:

condition: pin4: +I_{br} and pin 1,6: -I_{br}

pin 7, 8, 9 : +I_m pin 2, 5: -V_{out} and pin 3: +V_{out}
pin 10, 11, 12 : -I_m

pin 7, 8, 9 : -I_m pin 2, 5: +V_{out} and pin 3: -V_{out}
pin 10, 11, 12 : +I_m

Devices are identified by type on the body of the device:

ZMC10D ZMC10D

Ordering information:

ZMC10D..... in boxes

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