Insulation coordination

Parameter	Symbol	Unit	Value	Comment
Rms voltage for AC insulation test 50/60 Hz/1 min	U_d	kV	4.3	
Impulse withstand voltage 1.2/50 µs	$\hat{U}_W$	kV	8	
Partial discharge extinction rms voltage @ 10 pC	U_e	V	> 1200	Busbar / Secondary
Clearance (pri. - sec.)	d_{Cl}	mm	> 8	Shortest distance through air
Creepage distance (pri. - sec.)	d_{Cp}	mm	> 8	Shortest path along device body
Clearance (pri. - sec.)	-	mm	> 8	When mounted on PCB with recommended layout
Case material	-	-	V0	According to UL 94
Comparative tracking index	*CTI*		600	
Application example	-	-	600 V CAT III PD2	Reinforced insulation, non uniform field according to EN 50178, EN 61010
Application example	-	-	1000 V CAT III PD2	Based insulation, non uniform field according to EN 50178, EN 61010
Application example	-	-	600 V CAT III PD2	Simple insulation, non uniform field according to UL 508

Environmental and mechanical characteristics

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Ambient operating temperature	T_A	°C	−40		105	
Ambient storage temperature	T_S	°C	−40		105	
Mass	*m*	g		32		

Electrical data HO 50-S/SP33-1106

At T_A = 25 °C, U_C = +3.3 V, R_L = 10 kΩ unless otherwise noted (see Min, Max, typ. definition paragraph in page 12).

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	A		50		
Primary current, measuring range	I_{PM}	A	−125		125	
Number of primary turns	N_P	-		1		See application information
Supply voltage	U_C	V	3.14	3.3	3.46	
Current consumption	I_C	mA		19	25	
Reference voltage (output)	V_{ref}	V	1.63	1.65	1.67	Internal reference
Reference voltage (input)	V_{ref}	V	0.5		1.7	External reference
Output voltage range @ I_{PM}	$V_{out} - V_{ref}$	V	−1.15		1.15	Over operating temperature range
V_{ref} output resistance	R_{ref}	Ω	130	200	300	Series
V_{out} output resistance	R_{out}	Ω		2	5	Series
Allowed capacitive load	C_L	nF	0		6	
OCD output: On resistance	R_{on}	Ω	70	95	150	Open drain, active low Over operating temperature range
OCD output: Hold time	t_{hold}	ms	0.7	1	1.4	Additional time after threshold has released
EEPROM control	V_{out}	mV	0		50	V_{out} forced to GND when EEPROM in an error state [1]
Electrical offset voltage @ I_P = 0 A	V_{OE}	mV	−5		5	$V_{out} - V_{ref}$ @ V_{ref} = 1.65 V
Electrical offset current Referred to primary	I_{OE}	A	−0.5435		0.5435	
Temperature coefficient of V_{ref}	TCV_{ref}	ppm/K	−170		170	−40 °C … 105 °C
Temperature coefficient of V_{OE}	TCV_{OE}	mV/K	−0.075		0.075	−40 °C … 105 °C
Offset drift referred to primary @ I_P = 0 A	TCI_{OE}	mA/K	−8.15		8.15	−40 °C … 105 °C
Theoretical sensitivity	G_{th}	mV/A		9.2		460 mV @ I_{PN}
Sensitivity error @ I_{PN}	ε	%	−0.5		0.5	Factory adjustment (straight bus-bar)
Temperature coefficient of G	TCG	ppm/K	−350		350	−40 °C … 105 °C
Linearity error 0 … I_{PN}	ε_L	% of I_{PN}	−0.75		0.75	
Linearity error 0 … I_{PM}	ε_L	% of I_{PM}	−0.5		0.5	
Magnetic offset current (@ 10 × I_{PN}) referred to primary	I_{OM}	A	−0.92		0.92	One turn
Reaction time @ 10 % of I_{PN}	t_{ra}	µs			2.5	@ 50 A/µs
Response time @ 90 % of I_{PN}	t_r	µs			3.5	@ 50 A/µs
Frequency bandwidth (−3 dB)	BW	kHz		100		Small signals
Output rms voltage noise (spectral density) (100 Hz … 100 kHz)	e_{no}	µV/√Hz			8.8	
Output voltage noise (DC … 10 kHz) (DC … 100 kHz) (DC … 1 MHz)	V_{no}	mVpp		4.1 8.1 18.5		
Over-current detect		A	2.63 × I_{PN}	2.92 × I_{PN}	3.21 × I_{PN}	Peak value ±10 %
Accuracy @ I_{PN}	X	% of I_{PN}	−1.25		1.25	
Accuracy @ I_{PN} @ T_A = +105 °C	X	% of I_{PN}	−5.35		5.35	See formula note [2]
Accuracy @ I_{PN} @ T_A = +85 °C	X	% of I_{PN}	−4.33		4.33	See formula note [2]

Notes: [1] EEPROM in an error state makes the transducer behave like a reverse current saturation. Use of the OCD may help to differentiate the two cases.

[2] Accuracy @ $X_{TA}(\% \text{ of } I_{PN}) = X + \left(\frac{TCG}{10000} \times (T_A - 25) + \frac{TCI_{OE}}{1000 \times I_P} \times 100 \times (T_A - 25)\right)$.