

**Insulation coordination**

Parameter	Symbol	Unit	Value	Comment
Rms voltage for AC isolation test 50/60 Hz/1 min	$U_d$	kV	4.3	
Impulse withstand voltage 1.2/50 $\mu$ s	$\dot{U}_w$	kV	8	
Partial discharge extinction rms voltage @ 10 pC	$U_e$	V	1650	
Clearance (pri. - sec.)	$d_{Cl}$	mm	8	Shortest distance through air
Creepage distance (pri. - sec.)	$d_{cp}$	mm	8	Shortest path along device body
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
Application example	-	-	300 V CAT III PD2	Reinforced insulation, non uniform field according to IEC 61010
Application example	-	-	1000 V CAT III PD2	Simple insulation, non uniform field according to EN 50178, IEC 61010

**Environmental and mechanical characteristics**

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Ambient operating temperature	$T_A$	$^{\circ}$ C	-40		105	
Ambient storage temperature	$T_S$	$^{\circ}$ C	-40		105	
Surrounding temperature according to UL 508		$^{\circ}$ C			105	
Mass	$m$	g		5		

**Electrical data HO 8-NSM/SP33-1000**

 At  $T_A = 25^\circ\text{C}$ ,  $U_C = +3.3\text{ V}$ ,  $N_P = 3$  turns,  $R_L = 10\text{ K}\Omega$  unless otherwise noted (see Min, Max, typ. definition paragraph in page 12).

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	$I_{PN}$	At		8		
Primary current, measuring range	$I_{PM}$	At	-20		20	
Number of primary turns	$N_P$			1,2,3		
Supply voltage	$U_C$	V	3.14	3.3	3.46	
Current consumption	$I_C$	mA			25	
Reference voltage	$V_{ref}$	V	1.636	1.65	1.664	Internal reference
External reference voltage	$V_{ref}$	V	0.5		1.85	@ $U_C = 3.3 \approx 3.46\text{ V}$
			0.5		1.7	@ $U_C = 3.14 \approx 3.3\text{ V}$
Output voltage range @ $I_{PM}$	$V_{out} - V_{ref}$	V	-1.15		1.15	
Output voltage @ $I_P = 0\text{ A}$	$V_{out}$	V		$V_{ref} + V_{OE}$		
Electrical offset voltage	$V_{OE}$	mV	-7		7	
Temperature coefficient of $V_{ref}$	$TCV_{ref}$	ppm/K			$\pm 170$	-20 °C .. 85 °C Internal reference
					$\pm 180$	-40 °C .. 105 °C Internal reference
Temperature coefficient of $V_{OE}$	$TCV_{OE}$	mV/K			$\pm 0.080$	-40 °C .. 105 °C
Theoretical sensitivity	$G_{th}$	mV/A		57.5		460 mV/ $I_{PN}$ @ $U_C = 3.3\text{ V}$
Sensitivity error	$\epsilon_G$	%			$\pm 0.5$	Factory adjustment
Temperature coefficient of $G$	$TCG$	ppm/K			$\pm 200$	-20 °C .. 85 °C
					$\pm 210$	-40 °C .. 105 °C
Linearity error 0 .. $I_{PN}$	$\epsilon_L$	% of $I_{PN}$			$\pm 0.5$	@ $U_C = 3.3\text{ V}$
Linearity error 0 .. $I_{PM}$	$\epsilon_L$	% of $I_{PM}$			$\pm 0.8$	@ $U_C = 3.3\text{ V}$
Gain error with respect to $U_C \pm 10\%$		%/%			$\pm 0.4$	Gain error per $U_C$ drift
Magnetic offset voltage @ $I_P = 0$ after $2.5 \times I_{PN}$	$V_{OM}$	mV			$\pm 4$	
Reaction time @ 10 % of $I_{PN}$	$t_{ra}$	$\mu\text{s}$			2	$di/dt = I_{PN}/\mu\text{s}$
Response time @ 90 % of $I_{PN}$	$t_r$	$\mu\text{s}$			3.5	$di/dt = I_{PN}/\mu\text{s}$
Frequency bandwidth (-3 dB)	$BW$	kHz		250		
Output rms voltage noise (spectral density) (DC .. 100 kHz)	$e_{no}$	$\mu\text{V}/\sqrt{\text{Hz}}$			18.9	
Output voltage noise (DC .. 20 MHz)	$V_{no}$	mVpp		40		
Standby pin "0" level		V			0.3	
Standby pin "1" level		V	$U_C - 0.3$			
Time to switch from standby to normal mode		$\mu\text{s}$			20	
Over-current detect		At	$2.6 \times I_{PN}$	$2.9 \times I_{PN}$	$3.2 \times I_{PN}$	peak value
Accuracy @ $I_{PN}$	X	% of $I_{PN}$			$\pm 1$	$= \epsilon_G + \epsilon_L$
Accuracy @ $I_{PN}$ @ $T_A = +85^\circ\text{C}$	X	% of $I_{PN}$			$\pm 3.3$	See formula note <sup>1)</sup>
Accuracy @ $I_{PN}$ @ $T_A = +105^\circ\text{C}$	X	% of $I_{PN}$			$\pm 4.1$	See formula note <sup>1)</sup>

**Note:** <sup>1)</sup> Accuracy @  $I_P$  and  $X_{TA} = \pm [X + (TCG/10000) \cdot (T_A - 25) + TCV_{OE} \cdot 100 \cdot (T_A - 25) / (G_{th} \cdot I_P)]$ .