

**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 $\mu$ s	$\hat{U}_w$	kV	8	
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	<i>CTI</i>		600	
Application example	-	-	600 V CAT III PD2	Reinforced insulation, non uniform field according to EN 50178, IEC 61010
Application example	-	-	1000 V CAT III PD2	Simple insulation, non uniform field according to EN 50178, IEC 61010
Application example	-	-	600 V CAT III PD2	According to UL 508

**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	
Mass	$m$	g			5	

**Electrical data HLSR 10-P/SP33**

At  $T_A = 25\text{ °C}$ ,  $U_C = +3.3\text{ V}$ ,  $R_L = 10\text{ k}\Omega$  unless otherwise noted (see Min, Max, typ. definition paragraph in page 9).

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	$I_{PN}$	A		10		
Primary current, measuring range	$I_{PM}$	A	-25		25	For $U_C = 3.3\text{ V} \pm 5\%$
Number of primary turns	$N_P$	-		1		
Resistance of primary jumper @ $T_A = 25\text{ °C}$	$R_P$	m $\Omega$		0.21		
Resistance of primary jumper @ $T_A = 105\text{ °C}$	$R_P$	m $\Omega$		0.29		T jumper = 120 °C
Supply voltage	$U_C$	V	3.135	3.3	3.465	
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	$R_{ref}$	$\Omega$	130	200	300	series
$V_{out}$ output resistance	$R_{out}$	$\Omega$		2	5	series
Capacitive loading	$C_L$	nF	0		6	
Electrical offset voltage @ $I_P = 0$	$V_{OE}$	mV	-5		5	$V_{out} - V_{ref}$
Electrical offset current referred to primary	$I_{OE}$	mA	-109		109	
Temperature coefficient of $V_{ref}$	$TCV_{ref}$	ppm/K	-150		150	-40 °C ... 105 °C
Temperature coefficient of $V_{OE}$	$TCV_{OE}$	mV/K	-0.075		0.075	
Temperature coefficient of $I_{OE}$	$TCI_{OE}$	mA/K	-1.63		1.63	
Theoretical sensitivity	$G_{th}$	mV/A		46		460 mV @ $I_{PN}$
Sensitivity error	$\epsilon_G$	%	-0.5		0.5	Factory adjustment
Temperature coefficient of G	$TCG$	ppm/K	-200		200	
Linearity error 0 ... $I_{PN}$	$\epsilon_L$	% of $I_{PN}$	-0.5		0.5	
Linearity error 0 ... $I_{PM}$	$\epsilon_L$	% of $I_{PM}$	-0.8		0.8	
Magnetic offset current (@ $10 \times I_{PN}$ ) referred to primary	$I_{OM}$	A	-0.25		0.25	
Reaction time @ 10 % of $I_{PN}$	$t_{ra}$	$\mu$ s			2	@ 50 A/ $\mu$ s
Response time @ 90 % of $I_{PN}$	$t_r$	$\mu$ s			2.5	@ 50 A/ $\mu$ s
Frequency bandwidth (-3 dB)	$BW$	kHz		450		
Output rms voltage noise spectral density 100 Hz ... 100 kHz	$e_{no}$	$\mu$ V/ $\sqrt{\text{Hz}}$			16	
Output voltage noise DC ... 10 kHz DC ... 100 kHz DC ... 1 MHz	$V_{no}$	mVpp		9 22 40		
Accuracy @ $I_{PN}$	$X$	% of $I_{PN}$	-1		1	
Accuracy @ $I_{PN}$ @ $T_A = +85\text{ °C}$	$X_{85\text{ °C}}$	% of $I_{PN}$	-3.2		3.2	See formula note <sup>1)</sup>
Accuracy @ $I_{PN}$ @ $T_A = +105\text{ °C}$	$X_{105\text{ °C}}$	% of $I_{PN}$	-3.9		3.9	See formula note <sup>1)</sup>

Note: <sup>1)</sup> Accuracy @  $T_A$  (% of  $I_{PN}$ ) =  $X + \left(\frac{TCG}{10000} \times (T_A - 25)\right) + \left(\frac{TCI_{OE}}{1000 \times I_{PN}} \times 100 \times (T_A - 25)\right)$ .