

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 μ 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	CTI		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	°C	-40		105	
Ambient storage temperature	T_S	°C	-40		105	
Mass	m	g			5	

Electrical data HLSR 10-SM/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 Ω		0.21		
Resistance of primary jumper @ $T_A = 105\text{ °C}$	R_P	m Ω		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}	Ω	130	200	300	series
V_{out} output resistance	R_{out}	Ω		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	ϵ_G	%	-0.5		0.5	Factory adjustment
Temperature coefficient of G	TCG	ppm/K	-200		200	
Linearity error 0 ... I_{PN}	ϵ_L	% of I_{PN}	-0.5		0.5	
Linearity error 0 ... I_{PM}	ϵ_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}	μ s			2	@ 50 A/ μ s
Response time @ 90 % of I_{PN}	t_r	μ s			2.5	@ 50 A/ μ s
Frequency bandwidth (-3 dB)	BW	kHz		450		
Output rms voltage noise spectral density 100 Hz ... 100 kHz	e_{no}	μ 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 ¹⁾
Accuracy @ I_{PN} @ $T_A = +105\text{ °C}$	$X_{105\text{ °C}}$	% of I_{PN}	-3.9		3.9	See formula note ¹⁾

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